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Critical Review of Rate Constants for Reactions of Hydrated Electrons, Hydrogen Atoms and Hydroxyl Radicals (·OH/·O⁻) in Aqueous Solution

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Kinetic data for the radicals H· and ·OH in aqueous solution, and the corresponding radical anions, ·O⁻ and e_{aq}^-, have been critically reviewed. Reactions of the radicals in aqueous solution have been studied by pulse radiolysis, flash photolysis and other methods. Rate constants for over 3,500 reactions are tabulated, including reactions with molecules, ions and other radicals derived from inorganic and organic solutes.

Key words: aqueous solution; chemical kinetics; critical review; data compilation; hydrated electron; hydrogen atom; hydroxyl radical; rate constants.

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1. General Introduction

The development of aqueous radiation chemistry,[1] and especially the pulse radiolysis technique,[2] has provided chemists with a very simple and clean method of generating and studying the reactions of unstable species in aqueous solution such as organic and inorganic free radicals and metal ions in unusual oxidation states. This review comprises a critically evaluated compilation of the rate constants which have been measured for the reactions with solutes of the hydrated electron, e_{aq}^-, the hydrogen atom, H·, the hydroxyl radical, ·OH, and its basic form, the oxide radical ion, $\cdot O^-$. A knowledge of these data enables the chemist to choose the appropriate conditions for generating the species of interest starting with these free radicals, and this knowledge has many applications in the whole field of chemistry in aqueous solution.

Many reviews, data compilations, and monographs have been published on the reactivity of transients from water.[3–10] This compilation contains data published through 1986 and is a complete reevaluation and update of the earlier NSRDS-NBS reports[8–10].

1.1. Properties of e_{aq}^-, H·, ·OH and $\cdot O^-$

The properties of these species are listed in Table 1 and their optical absorption spectra are shown in Fig. 1.

1.1.1. The Hydrated Electron

The hydrated electron may be visualized as an excess electron surrounded by a small number of oriented water molecules and behaving in some ways like a singly charged anion of about the same size as the iodide ion. Its intense absorption band in the visible region of the spectrum makes it a simple matter to measure its reaction rate constants using pulse radiolysis combined with kinetic spectrophotometry.

As expected from its standard reduction potential[22,29] of −2.9 V, the hydrated electron reacts rapidly with many species having more positive reduction potentials. Its mode of reaction can be generally represented as the one-electron transfer process

$$e_{aq}^- + S^n \rightarrow S^{n-1} \qquad (1)$$

where n is the positive charge on the solute, although in some cases the electron adduct immediately dissociates. Its rate constants range from $\sim 10^1$ L mol^{-1} s^{-1} up to the diffusion controlled limit but the activation energies are invariably small and lie in the range 6–30 kJ mol^{-1}. This suggests that the dominant kinetic parameter is the availability of a vacant orbital of the solute into which the electron can transfer.

The hydrated electron acts as a nucleophile in its reactions with organic molecules, and its reactivity is greatly enhanced by electron-withdrawing substituents adjacent to alkene double bonds or attached to aromatic rings. Increased reactivity is also observed when organic molecules contain substituent halogen atoms, in which case the negative ion formed in Eq. (2) rapidly eliminates the halide ion.

$$e_{aq}^- + RX \rightarrow RX^- \rightarrow R\cdot + X^- \qquad (2)$$

TABLE 1. Properties of the primary water radiolysis species in aqueous solution, e_{aq}^-, H·, ·OH and ·O⁻

	e_{aq}^-	H·	·OH	·O⁻
Absorption maximum[a] (nm)	720	<200	~225	240
Extinction coefficient[a], ε (L mol^{-1} cm^{-1})	19000 (720 nm)	1620 (188 nm)	540 (188 nm)	240 (240 nm)
$dh\nu/dT$ (0 to 100°C) (eV K^{-1} × 10^3)	−2.9[3]			
Half-width (eV)	0.93[3]			
Oscillator strength	0.71[3]			
ESR g-factor	2.0002[17]	2.00210[20]		
	2.00033[25]			
	2.0002, 2.0003[24]			
ESR line width (gauss)	<0.06[24]			
	<0.15[29]			
ESR hyperfine coupling constant (gauss)		503.0[19]		
		503.2[20]		
Charge	−1	0	0	−1
Radius (cm × 10^8)	2.5 ⩽ r ⩽ 3.0[3]		2.2[16]	
	2.98[1,13]			
Primary yield[b] (molecules per 100 eV), pH 7	2.6	0.6	2.7	
Diffusion coefficient (cm^2 s^{-1} × 10^5)	4.90[3,18]	8[37]	2.3[6,23]	
	4.75[1,14]	7[38]	2[16]	
			2.1[37]	
Equivalent conductivity (mho cm^2)	190[3,18]			
Mobility (cm^2 V^{-1} s^{-1} × 10^3)	1.98[3,18]			
	1.8[14]			
Reduction potential (V)	−2.77[c 3]	−2.1[d 1]	1.77[e 31]	1.64[g 31,34]
	−2.6[c 1]	−2.3[d 22,29]	1.89[e 32]	1.76[g 32]
	−2.9[c 22]		1.91[e 33]	1.78[g 33]
	−2.87[c 29]		2.59[f 31]	
			2.72[f 32]	
			2.74[f 33]	
pK_a		9.6[h 22]	11.9[i 11]	
ΔH (ionization) (kJ mol^{-1})			42[21]	
Electron affinity (eV)		0.776[j 23]	1.83[j,k 27,26]	
$\Delta G_f°$ (kJ mol^{-1})	276[29]	222[29]	13[31,34]	96[29]
	277[1 35]	222[15]	25[32]	92[32]
	−157[13]		27[33]	95[33]
			19[29]	93[21]
			35.7[1 39]	81.2[31,34]
				103[1 39]
$\Delta H_f°$ (kJ mol^{-1})	277[1 35]	213[29]	−7[27]	38[21]
	−136.4[m 35]	214[15]	−4[29]	13[29]
	−153[13]			
$S°_{298}$ (J mol^{-1} K^{-1})	13[13]	38[15]	96[27]	
	65[1 35]			
	69.8[m 35]			
	65.2[36]			
ΔG(hydration) (kJ mol^{-1})	−156[13]	18[29]	−10[32]	−438[31]
			−21[31]	−415[1 39]
ΔH(hydration) (kJ mol^{-1})	−159[13]		−42[29]	−473[21]
	−167[1,12]	−3[29]		
	−142[m 35]			
ΔS(hydration) (J mol^{-1} K^{-1})	−7.9[13]			
	49[m 35]			

[a]See Fig. 1.[30]
[b]See Sec. 2.1., Fig. 2.
[c]($H_2O + e^- \rightarrow e_{aq}^-$)
[d]($H_2O + e^- + H^+ \rightarrow \cdot H_{aq}$)
[e]($\cdot OH + e^- \rightarrow OH^-$)
[f]($\cdot OH + e^- + H^+ \rightarrow H_2O$)
[g]($\cdot O^- + e^- + H^+ \rightarrow OH^-$)
[h]($H\cdot + H_2O \rightarrow H_3O^+ + e_{aq}^-$)
[i]($\cdot OH + H_2O \rightarrow H_3O^+ + \cdot O^-$)
[j]Gas phase.
[k]5.8 eV calcd. for aqueous phase[6] based on gas phase value of 2 eV.
[l]Based on convention that $\Delta H_f°$, $\Delta G_f°$, and $S°$ for $H_{aq}^+ = 0$.
[m]Based on values for H_{aq}^+: $\Delta H_f° = 413$ kJ mol^{-1}, $\Delta G_f° = 434$ kJ mol^{-1}, and $S° = -4.89$ J mol^{-1} K^{-1}.

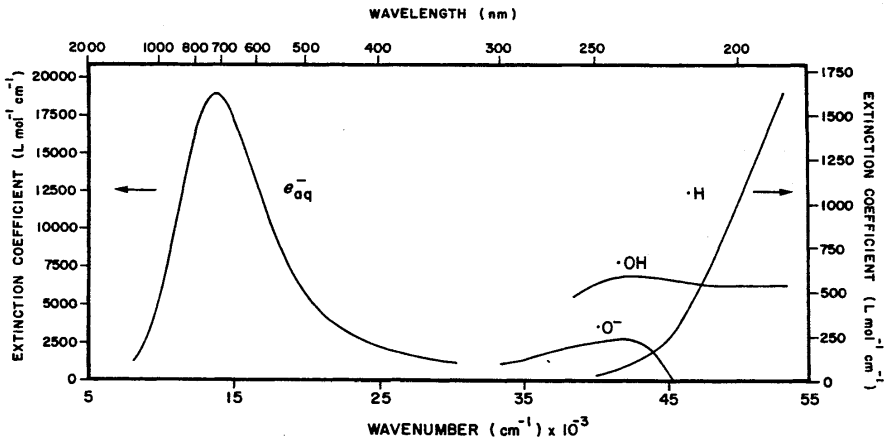

FIG. 1. Optical absorption spectra for e_{aq}^-, H·, ·OH and ·O⁻. Figure prepared by G. L. Hug from spectra in NSRDS-NBS 69[30].

1.1.2. The Hydrogen Atom

The hydrogen atom is the conjugate acid of e_{aq}^-, and it is the major reducing species in acidic solution, Eq. (3).

$$e_{aq}^- + H_3O^+ \rightarrow H \qquad (3)$$

It absorbs only weakly in the ultraviolet so that its reactions are not readily measured by observing H· itself. With a reduction potential[22,29] of −2.3 V the hydrogen atom is a slightly less powerful reducing agent than e_{aq}^-, but its chemistry is often quite different. It readily reduces inorganic ions having more positive reduction potentials than itself, but often at slower rates than e_{aq}^-. In some cases, in highly acidic solution, it effectively reacts as an oxidant, forming a hydride intermediate which decomposes to molecular hydrogen and the oxidized solute[40,41], for example,

$$H\cdot + Fe^{2+} \rightarrow Fe^{3+}H^- \xrightarrow{H^+} Fe^{3+} + H_2 \qquad (4)$$

$$H\cdot + I^- \rightarrow HI^- \xrightarrow{I^-} HI_2^{2-} \xrightarrow{H^+} H_2 + I_2^-. \qquad (5)$$

The hydrogen atom reacts with organic compounds by abstracting H from saturated molecules and by adding to centers of unsaturation, for example,

$$H\cdot + CH_3OH \rightarrow \cdot CH_2OH + H_2 \qquad (6)$$

$$H\cdot + CH_2{=}CH_2 \rightarrow \cdot CH_2CH_3. \qquad (7)$$

In this respect it resembles the hydroxyl radical, although the latter is more reactive and less selective in abstraction reactions. A good illustration of the different chemistry of H· and e_{aq}^- is provided by their reactions with chloroacetic acid, as shown by Eqs. (8) and (9),

$$H\cdot + ClCH_2CO_2H \rightarrow \cdot CHClCO_2H + H_2 \qquad (8)$$

$$e_{aq}^- + ClCH_2CO_2H \rightarrow \cdot CH_2CO_2H + Cl^-. \qquad (9)$$

1.1.3. The Hydroxyl Radical

The hydroxyl radical is a powerful oxidant, having a standard reduction potential[31-33] of 2.7 V in acidic solution and 1.8 V in neutral solution where the free energy of neutralization of OH^- by H^+ is not available. The reaction of ·OH with ions is often represented as a simple electron transfer,

$$\cdot OH + S^n \rightarrow S^{n+1} + OH^- \qquad (10)$$

where n is the charge on the ion, but such a simple step is unlikely because of the large solvent reorganization energy involved in forming the hydrated hydroxide ion. Instead, it is suggested[42] that an intermediate adduct is formed. Such an adduct is observed in the oxidation of halide and pseudo-halide ions,

$$\cdot OH + X^- \rightarrow HOX^-. \qquad (11)$$

Although there are several examples of ·OH reacting with inorganic ions at the diffusion controlled rate, rate constants for oxidation of many aquated metal cations seem to be no more than $\sim 3 \times 10^8$ L mol^{-1} s^{-1}. A suggested reason[43] for this is that ·OH abstracts H from a coordinated water molecule and this is followed by electron transfer from the metal to the oxidized ligand.

$$\cdot OH + M^{n+}H_2O \rightarrow M^{n+}OH \rightarrow M^{(n+1)+} + OH^- \qquad (12)$$

An alternative proposal[42] is that ·OH adds to the metal ion to increase its coordination number and oxidation takes place via an inner-sphere mechanism in the equilibrium stage.

$$[M(H_2O)_k]^{n+} + \cdot OH \rightleftharpoons [(H_2O)_kM\text{–}OH]^{n+} \rightarrow [M(H_2O)_k]^{(n+1)+} + OH^- \qquad (13)$$

It is known that $M^{n+}OH$ is indeed the initial product when M^{n+} = Tl^+, Ag^+, Cu^{2+}, Sn^{2+}, Fe^{2+} and Mn^{2+}, and ligand substitution by ·OH is ruled out because there is no correlation between rates of substitution and oxidation.

In strongly alkaline solution ·OH is rapidly converted to its conjugate base ·O⁻,

$$\cdot OH + OH^- \rightleftharpoons \cdot O^- + H_2O \qquad (14)$$

with $k_{14} = 1.2 \times 10^{10}$ L mol^{-1} s^{-1}, $k_{-14} = 10^8$ s^{-1} and $pK_a(\cdot OH) = 11.9$. Thus equilibrium between ·OH and

$\cdot O^-$ is established when $k[S] < 10^7\ s^{-1}$ for ·OH reactions. $\cdot O^-$ reacts much more slowly than ·OH with several inorganic anions, and the rate is immeasurably slow with Br^-, CO_3^{2-} and $Fe(CN)_6^{4-}$ although these ions are all rapidly oxidized by ·OH.

In its reactions with organic molecules ·OH behaves as an electrophile whereas $\cdot O^-$ is a nucleophile. Thus ·OH readily adds to unsaturated bonds but $\cdot O^-$ does not. Both forms of the radical abstract H from C–H bonds, and this can result in the formation of different products when the pH is raised to where $\cdot O^-$, rather than ·OH, is the reactant. For example, if an aromatic molecule carries an aliphatic side chain, $\cdot O^-$ attacks there by H abstraction whilst ·OH adds preferentially to the aromatic ring. As mentioned in Sec. 1.1.2., hydroxyl radicals and hydrogen atoms undergo similar types of reaction with organic molecules, but in abstraction from C–H bonds ·OH is more reactive and less selective than H· because the formation of the H–OH bond is 57 kJ mol^{-1} more exothermic than the formation of the H–H bond.

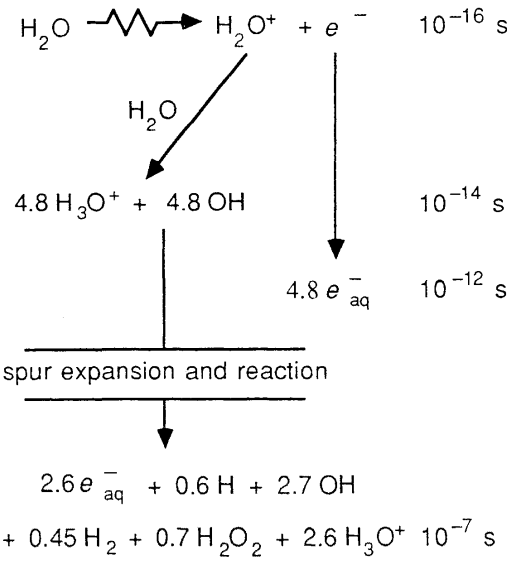

FIG. 2. Scheme for the radiolysis of water. G-values for species in neutral water at 10^{-16} to 10^{-7} s after irradiation. In S.I. units the radiation chemical yield G is expressed as mol J^{-1}. The relationship between this quantity and that defined in the text is G(molecules/100 eV) $\equiv 103.6\ G$ nmol j^{-1} ($0.1036\ G\ \mu$mol J^{-1}).

2. Methods of Generation of e_{aq}^-, H·, ·OH, and $\cdot O^-$

All of these radicals are most readily generated in the radiolysis of water, which is described in Sec. 2.1. Although this is by far the most commonly used method, some of the radicals can also be generated in one or more of the following ways: (i) photolysis of an appropriate solute, (ii) production of H· by electric discharge in hydrogen gas, (iii) sonolysis of water, and (iv) Fenton-type reactions.

2.1. Radiolysis of Water

This is summarized in the scheme given in Fig. 2 where the numbers represent the G-value of each species in neutral water.

$$G = \frac{\text{no. of molecules formed}}{100\ \text{eV}} \qquad (15)$$

This scheme represents the sequence of events initiated by a fast electron either injected from an accelerator or generated *in situ* by ^{60}Co γ-rays. Fast electrons are by far the most commonly used type of ionizing radiation.

The initial radiolysis products are generated in isolated volume elements called spurs. As the spurs expand through diffusion a fraction of the species react together while the remainder escape into the bulk solution. In water, 10^{-7} s is the lifetime of a radical reacting at the diffusion-controlled rate with a solute S, whose concentration is 10^{-3} mol L^{-1}, i.e. $k[S] = 10^7\ s^{-1}$ where k is the bimolecular rate constant. Thus, under these conditions the yields (G) of e_{aq}^-, H· and ·OH available are as shown in the scheme at 10^{-7} s. When $k[S] < 10^7\ s^{-1}$ the available yields scarcely change provided [S] $\gg$ [radicals], but when $k[S] > 10^7\ s^{-1}$ the yields can increase by 0.3–0.5 for each 10-fold increase in $k[S]$. This is an important consideration when evaluating, for example, the extinction coefficient of a reaction product.

In pure water there is scarcely any net decomposition because the radiolytic products undergo very efficient back reactions. The reactions which occur in pure water are listed in Table 2.

The great advantage of the radiolysis method over other methods for generating reactive intermediates lies in the fact that the amount of energy absorbed by any component of the system is proportional to its electron fraction. This means that in moderately dilute ($\leqslant 0.1$ mol L^{-1}) aqueous solution essentially all the energy is absorbed by the water so that the yields of the primary radicals, e_{aq}^-, H· and ·OH are always well known.

2.2. Other Methods

These do not have wide applicability in the context of this review but can be useful in certain circumstances, for example in providing corroborative evidence for a particular reaction.

2.2.1. Photolysis

Examples of solutes which can be photolysed to generate some of the primary water radicals are listed below.

$$Fe(CN)_6^{4-} \rightarrow Fe(CN)_6^{3-} + e_{aq}^- \qquad (16)$$

$$I^- \rightarrow I + e_{aq}^- \qquad (17)$$

TABLE 2. Reactions in the radiolysis of pure water

Reaction	k (L mol^{-1} s^{-1})
$e_{aq}^- + H_2O \rightarrow H\cdot + OH^-$	1.9×10^1
$e_{aq}^- + e_{aq}^- \rightarrow H_2 + 2\,OH^-$	$2k = 1.1 \times 10^{10}$ [a]
$e_{aq}^- + H\cdot \rightarrow H_2 + OH^-$	2.5×10^{10}
$e_{aq}^- + \cdot OH \rightarrow OH^-$	3.0×10^{10}
$e_{aq}^- + \cdot O^- \rightarrow 2\,OH^-$	2.2×10^{10}
$e_{aq}^- + H^+ \rightarrow H\cdot$	2.3×10^{10} [a]
$e_{aq}^- + H_2O_2 \rightarrow OH^- + \cdot OH$	1.1×10^{10}
$e_{aq}^- + HO_2^- \rightarrow 2\,OH^- + \cdot OH$	3.5×10^9
$e_{aq}^- + O_2 \rightarrow O_2\cdot^-$	1.9×10^{10} [a]
$e_{aq}^- + O_2\cdot^- \rightarrow O_2^{2-}$	1.3×10^{10}
$H\cdot + H_2O \rightarrow H_2 + \cdot OH$	1×10^1
$H\cdot + H\cdot \rightarrow H_2$	$2k = 1.55 \times 10^{10}$ [a]
$H\cdot + \cdot OH \rightarrow H_2O$	7.0×10^9
$H\cdot + OH^- \rightarrow e_{aq}^-$	2.2×10^7 [a]
$H\cdot + H_2O_2 \rightarrow \cdot OH + H_2O$	9×10^7
$H\cdot + O_2 \rightarrow HO_2\cdot$	2.1×10^{10} [a]
$H\cdot + HO_2\cdot \rightarrow H_2O_2$	$\sim 10^{10}$
$\cdot OH + \cdot OH \rightarrow H_2O_2$	$2k = 1.1 \times 10^{10}$ [a]
$\cdot OH + \cdot O^- \rightarrow HO_2^-$	$<2 \times 10^{10}$
$\cdot OH + H_2 \rightarrow H\cdot + H_2O$	4.2×10^7
$\cdot OH + OH^- \rightarrow \cdot O^- + H_2O$	1.3×10^{10}
$\cdot OH + H_2O_2 \rightarrow H_2O + HO_2\cdot \rightleftharpoons O_2\cdot^- + H^+$	2.7×10^7
$\cdot OH + HO_2^- \rightarrow OH^- + HO_2\cdot \rightleftharpoons O_2\cdot^- + H^+$	7.5×10^9
$\cdot OH + H_2O_2^+ \rightarrow H_3O^+ + O_2$	1.2×10^{10}
$\cdot OH + HO_2\cdot \rightarrow H_2O + O_2$	6×10^9
$\cdot OH + O_2\cdot^- \rightarrow OH^- + O_2$	8×10^9
$\cdot O^- + H_2O \rightarrow OH^- + \cdot OH$	1.8×10^6
$\cdot O^- + \cdot O^- \rightarrow O_2^{2-}$	[b]
$\cdot O^- + H_2 \rightarrow H\cdot + OH^-$	8.0×10^7
$\cdot O^- + H_2O_2 \rightarrow O_2\cdot^- + H_2O$	$\leqslant 5 \times 10^8$
$\cdot O^- + HO_2^- \rightarrow O_2\cdot^- + OH^-$	4×10^8
$\cdot O^- + O_2 \rightarrow O_3^-$	3.6×10^9 [a]
$\cdot O^- + O_2\cdot^- \rightarrow 2\,OH^- + O_2$	6.0×10^8

[a] Selected value.
[b] No reliable measurement.

$$H_2O_2 \rightarrow \cdot OH + \cdot OH \quad (18)$$

$$FeOH^{2+} \rightarrow Fe^{2+} + \cdot OH \quad (19)$$

$$BrO_3^- \rightarrow BrO_2 + \cdot O^- \quad (20)$$

2.2.2. High Frequency Electric Discharge

This method can be used to produce H· atoms in pure H_2 gas which is then pumped through the vigorously stirred solution. Mass transfer of H· from the gas phase into solution has to be taken into account in the kinetic analysis.[44]

2.2.3. Sonolysis

Like the electric discharge method, sonolysis of water saturated with an inert gas generates radicals in the gas phase, in this case due to decomposition of the water vapor at the very high temperatures and pressures generated in the gas bubbles by the ultrasound.[45] Direct evidence has been obtained recently[46] that the decomposition reaction is

$$H_2O \rightarrow H\cdot + \cdot OH. \quad (21)$$

2.2.4. Fenton-Type Reactions

These are used to generate ·OH, the main reactions used being

$$Fe^{2+} + H_2O_2 \rightarrow \cdot OH + Fe^{3+} + OH^- \quad (22)$$

$$Ti^{3+} + H_2O_2 \rightarrow \cdot OH + Ti^{4+} + OH^-. \quad (23)$$

The first of these was widely employed[47] before the development of radiation chemistry; the second, being a much faster reaction, provides a convenient method for generating secondary radicals for study by esr using flow methods.[48]

3. Kinetic Features of Reactions of Transient Species

By their very nature, transient species can only be measured using fast reaction techniques. These involve pulse methods in which either absolute rate constants are obtained by direct observation of the decay of the transient or the growth of its product, or, where only relative rate constants can be deduced, from measurements of product yields using the competition method. The latter method is also used in continuous radiolysis, but here it is inherently less accurate unless the mechanism by which the measured products are formed is known completely.

3.1. Direct Method

Ideally conditions are chosen such that only one primary radical is present and the concentration of the reactive solute is high enough to ensure that pseudo-first order kinetics are obeyed. As noted above, the reaction may be followed by monitoring the decay of the primary radical, which is generally the case for e_{aq}^- because of its very suitable absorption spectrum (see Fig. 1), or by monitoring the growth of the product, which is usual for H·, ·OH and $\cdot O^-$ because their spectral properties are quite unsuitable for monitoring their decay. In all cases the concentration of the reactive solute should be varied to demonstrate that the pseudo-first order rate constant is proportional to the solute concentration. This eliminates error due to reaction of the primary radicals with themselves or with impurities in the solvent.

3.1.1. Sources of Error

One source of error arises when the conditions specified above are not, or cannot be, fulfilled. Reasons for this include limited solubility of the reactive solute, or

poor observability of the product necessitating a higher than ideal dose per pulse, both of which can result in a fraction of the primary radicals reacting with themselves in competition with their reaction with the solute. These conditions are not always recognizable from the kinetics alone and so one should demonstrate that the yield of the reaction product matches the yield of the primary radical.

In most cases the reaction product is itself a free radical and so is an unstable species. Therefore, when the growth of such a transient product is being measured, corrections for its simultaneous decay should be applied. Again, it is not always obvious from the growth kinetics alone that such corrections are necessary, but measurements of the yield of the product and its relative stability will clarify the situation.

Sometimes there can be more than one step involved in the formation of the observed reaction product from the primary radical so that the rate of formation of this product is not a measure of the rate of reaction of the primary radical. Well known examples of this are the reactions of ·OH with halide and pseudo-halide ions (X^-) where the first product is $HOX\cdot^-$ although the measured product is $\cdot X_2^-$.

$$\cdot OH + X^- \rightarrow HOX\cdot^- \quad (11)$$

$$HOX\cdot^- \rightarrow X\cdot + OH^- \quad (24)$$

$$X\cdot + X^- \rightarrow \cdot X_2^- \quad (25)$$

Instrumental errors can arise in the kinetic spectroscopic detection and analysis of transient species, from the lack of adequate calibration of the detection equipment.[49] Oscilloscope, digitizer or streak camera timebase calibration, in particular, is essential for accurate half-life or decay rate determinations. In computer-automated or manual computation of transient decay curves or other kinetic results, the adequacy and validity of computer programs or analytical methods designed to assess kinetic order parameters, and curve fitting, goodness-of-fit criteria or regression curve analysis, will also influence the overall accuracy obtained. Other practical considerations include an assessment of the stability of the solute under pulse radiolysis conditions in particular by the intense illumination from the analyzing light source and any deleterious effects from the machine dark current or from multiple pulses of ionizing radiation to the solution.

3.2. Competition Kinetics

This method is used in pulse radiolysis when neither the primary radical nor the reaction product can be observed directly. The general scheme is shown below where R· represents the primary radical, S the solutes and P the products,

$$R\cdot + S_1 \xrightarrow{k_1} P_1 \quad (26)$$

$$R\cdot + S_2 \xrightarrow{k_2} P_2 \quad (27)$$

so that if P_1 is the observable product

$$\frac{G(R\cdot)}{G(P_1)} - 1 = \frac{k_2[S_2]}{k_1[S_1]\cdot} \quad (28)$$

Ideally, concentrations of S_1 and S_2 are chosen so that reaction is complete during the pulse and $[S_2]/[S_1]$ is varied over a suitable range, but with $\Sigma k_i[S_i]$ kept constant so that $G(R)$ does not vary (see Sec. 2.1).

3.2.1. Sources of Error

Generally, conditions can be chosen to eliminate reactions of the primary radicals with themselves, but this should be checked by measuring $G(P_1)$ in the absence of S_2, and by showing that G-values are independent of dose per pulse. Care should be exercised in the choice of the reference solute, S_1; in some cases where P_1 is not formed in a single step, e.g.

$$R\cdot + S_1 \rightarrow X \rightarrow P_1 \quad (29)$$

the intermediate species X may react with S_2 leading to an erroneous evaluation of k_2. This situation has been identified when SCN^- is used as the reference solute,[50] and can be revealed by the use of more than one reference solute to measure k_2. Indeed, it is good practice to use more than one competitor to measure the same rate constant. This also helps to reveal any errors in the reference rate constant.

Errors can arise, of course, through misinterpretation of the experimental data. This can happen particularly when reactions of ·OH and/or $\cdot O^-$ are being measured in alkaline solutions where both forms are present in equilibrium, Eq. (14), under normal conditions.[51] A typical fault is to assume, for example, that in 1 mol L^{-1} OH^- solution the equilibrium in Eq. (14) lies wholly to the right and to attribute any measured rate constant to the reaction of $\cdot O^-$. However, in reality, the system comprises 1% ·OH so that if the observed rate constant is 100-fold lower than that known for the reaction of ·OH with the same solute, it means that $\cdot O^-$ must react at an even slower rate, if it reacts at all.

3.3. Steady-state Method

In principle the competition method can be used in steady-state experiments and, in fact, much reliable data has been obtained in this way. It is an inherent weakness of the steady-state method, however, that only the permanent reaction products can be measured and so considerable reliance has to be placed on an exact knowledge of the reaction mechanism leading to their formation from the primary radicals.

The most reliable systems are those where the measured product is formed in a single step from the primary radical and is itself unreactive towards other radicals. Thus relative rate constants of H· can generally be measured reliably by steady-state methods by choosing a pair of competing reactions where one produces H_2 and the other does not, for example,

$$H\cdot + RH \rightarrow H_2 + R\cdot \quad (30)$$

$$H\cdot + S \rightarrow \text{not } H_2 \quad (31)$$

where RH is a saturated organic molecule with a single kind of C–H bond and S is the solute whose rate constant is sought.

3.3.1. Sources of Error

Without doubt the greatest source of error in the steady-state method is the lack of mechanistic information. Because of the very much longer timescales and lower dose rates as compared with the pulse method (see Sec. 3.2), relatively unreactive secondary species can interfere, whereas they are essentially inert on the timescales of the pulse experiments.

4. Reaction Rates for the Hydrated Electron

4.1. Methods

4.1.1. Direct Method

Because of its intense optical absorbance in the visible and near infrared regions of the spectrum, e_{aq}^- is most conveniently and reliably observed directly using pulse radiolysis, and the majority of rate constants included in Table 6 have been measured by the method of decay kinetics (d.k.). When the hydrated electron is formed radiolytically it is produced concomitantly with the other radiolysis species H· and ·OH. Therefore care must be taken to ensure that competing side-reactions involving other reactive intermediates or impurities are minimized. One way commonly used to achieve this is to add a scavenger that removes, or converts to unreactive products, all but the reactive species under study. In the case of e_{aq}^-, the use of *tert*-butyl alcohol is generally accepted as an effective means of removing ·OH and, to a lesser extent, the lower yield of H·.

$$(CH_3)_3COH + \cdot OH \rightarrow \cdot CH_2C(CH_3)_2OH + H_2O, \quad k = 6 \times 10^8 \quad (32)$$

$$(CH_3)_3COH + H\cdot \rightarrow \cdot CH_2C(CH_3)_2OH + H_2, \quad k = 10^5 \quad (33)$$

It must be remembered that any experimental determination of e_{aq}^- rate constants, based on observing e_{aq}^- decay or the appearance of transient product species is subject to experimental errors and uncertainties, and necessitates certain assumptions and needs the correction of observed data for potential errors.

Corrections must be made for competing reactions, Eqs. (34–36), involving solute S, e_{aq}^- and any impurities I (including H^+ and O_2 for example).

$$S + e_{aq}^- \rightarrow S\cdot^- \quad (34)$$

$$e_{aq}^- + e_{aq}^- (+2H_2O) \rightarrow H_2 + 2OH^- \quad (35)$$

$$I + e_{aq}^- \rightarrow \text{products} \quad (36)$$

$$H\cdot + OH^- \rightarrow e_{aq}^- \quad (37)$$

The differential equation for the hydrated electron reaction is:

$$\frac{d[S\cdot^-]}{dt} \approx -\frac{d[e_{aq}^-]}{dt} = k_{34}[S][e_{aq}^-] + 2k_{35}[e_{aq}^-]^2 + k_{36}[I][e_{aq}^-] - k_{37}[H\cdot][OH^-] \quad (38)$$

which can be integrated, but does not yield simple exponential decay of the hydrated electron. If reaction (34) is the dominant reaction, the decay approaches simple exponential and corrections for the "observed" rate constant can be derived for the limiting cases ($[I] \rightarrow 0$), ($[H\cdot] \rightarrow 0$) and ($[e_{aq}^-] \rightarrow 0$).

In order to minimize errors associated with the radiation chemical conditions and design of the experiment, it is necessary to reduce the contribution from reactants other than the solute reacting with e_{aq}^- (i.e. by using pH buffers to control $[H^+]$ and degassing solutions to remove oxygen), reduce the contribution from other primary radicals by use of scavengers, controlling the temperature and/or ionic strength, reducing impurities, and operating at low doses to minimize the bimolecular reaction, Eq. (35). Each experimental rate constant determination should preferably be derived from results obtained for a series of different doses and solute concentrations.

4.1.2. Competition Kinetics

Data are also included in Table 6 in which the rate constants are obtained by steady-state or pulse radiolysis competition kinetics (c.k.). Less than 5% of the hydrated electron rate constants in Table 6 have been determined by this method. In competition kinetics, the rate constant k for the reaction of e_{aq}^- with a solute is determined relative to that with a competing solute whose rate constant k_C is known. This is generally done by monitoring the decrease in the yield of the product P of the reaction between e_{aq}^- and competitor with increasing solute concentration: See Sec. 3.2, Eqs. (26–28). Competing reactants which have been succesfully used to determine relative rate constants are listed in Table 3a.

TABLE 3a. Selected e_{aq}^- rate constants

Reactant	k(L mol^{-1} s^{-1})
Hydrogen ion	2.3×10^{10} [a]
Oxygen	1.9×10^{10}
Nitrous oxide	9.1×10^{9}
Nitrate ion	9.7×10^{9}
Chloroacetate	1.0×10^{9}
Bromophenol	7.0×10^{9}

[a]Low [H$^+$] or $I \rightarrow 0$.

4.2. Evaluation of the Data

Rate data were selected as suitable for inclusion in this listing on the basis of the best available direct determinations, preference being given to data derived from pulse radiolysis or other kinetic or time-resolved methods capable of monitoring either the e_{aq}^- decay or the formation of the transient product of its reaction with the solute. Also, high priority was given to those entries derived from publications containing the most comprehensive information concerning the experimental methodology, errors, conditions of the experiment, details of parameters needed for the unambiguous indentification and characterization of the reactive species and nature of the reaction, and those factors influencing or controlling the reaction kinetics. Consideration was given to the date of publication and the consequent developments in physical and chemical techniques of production, detection and kinetic analysis of transients, and the uncertainty and errors associated with computing rate constant data.

4.2.1. Selected Rate Constants for e_{aq}^-

Reactants and their rate constants selected as reference values for competition kinetic studies are shown in Table 3a; those values have been listed in bold face at the head of the entries in Table 6. The reference values have been obtained from pulse radiolysis determinations and selected on the basis of internal consistency with values obtained by direct methods. The selected rate constant for the reaction of e_{aq}^- with H^+ is only strictly applicable at low ionic strength. For $I \geqslant 0.05$, the authors' values for $k(e_{aq}^- + H^+)$ have been used and are included in the Comment.

All rate constants measured relative to these reactants have been renormalized to the selected values. Other reactants that have been used with less reliable results in competition kinetic studies reported in Table 6 are: acetone, copper(II) ions, and peroxydisulfate ions. Data judged acceptable for inclusion in the compilation, in the case of multiple entries for a given solute, have been averaged and the average is listed at the head of the values used to obtain the average. No average is given for multiple values that diverge by more than a factor of two nor those where different ionic strengths can lead to divergent values.

4.2.2. Ionic Strength Effects

Since e_{aq}^- is a negatively charged species, it will be influenced by electrostatic charges on the solute, and its reactivity will be dependent upon the ionic strength I of the solution:

$$I = \tfrac{1}{2} \sum_i Z_i^2 C_i \qquad (39)$$

where C_i and Z_i are the molar concentration and the number of charges of the solute components i, respectively.

According to the Brønsted-Bjerrum equation:

$$\log \frac{k}{k_0} = \frac{1.02\, Z_s I^{1/2}}{1 + I^{1/2}} \qquad (40)$$

where k and k_0 are the rate constants at ionic strength I and zero, respectively.

Rate constants corrected for ionic strength have been quoted when reported by the authors and "k cor. for I" has been added to the comments; k_{obs} is also given in the comment, if available. The reviewers did not attempt to make corrections for ionic strength because of uncertainties such as actual charge on the ions, concentrations, etc.

5. Reaction Rates for the Hydrogen Atom

5.1. Methods

5.1.1. Direct Methods

Because the H· atom absorbs light only in the ultra-violet region of the spectrum, mainly below 200 nm, direct observation of decay of the transient using kinetic optical spectroscopy is not a suitable technique. Directly determined rate constants listed in Table 7 include those obtained from direct observation of the absorbing transient products of the H· atom reaction with the solute by optical methods. Rate constants have also been determined by direct observation of the H· atom generated by pulse radiolysis by esr or by competitive reduction of the esr signal due to the addition of solutes.[19,20,52,53] Observation of the hydrogen atom esr signal is possible because of its enhancement by spin polarization effects and its decay is followed to give a pseudo-first order rate in the presence of a solute.

5.1.2. Competition Kinetics

Many H· atom rate constants have been determined indirectly by steady-state or pulse radiolysis using competition kinetic methods. Here the rate constant for the reaction of H· atoms with a solute S_2 is compared with

the rate constant k_1 for the reaction with a competitive solute, S_1. In competition kinetics, the relative yield of a product is monitored as a function of the ratio of solute to competitor concentration: See Sec. 3.2, Eqs. (26–28). In addition to competition kinetics by product analysis, rate constants have been determined by the comparison of the decrease in the esr signal for the hydrogen atom in the presence of competing solutes in a steady-state experiment.

Competing reactants used to determine relative rate constants are listed in Table 3b. Other reactants, considered unreliable, that have been used in competition kinetic studies reported in the main table are: glucose, hydrogen peroxide, silver(I) ion, copper(II) ion, iron(II) ion, iron(III) ion, nitrate ion, nitrite ion, allyl alcohol, benzoquinone, methanol-d_3, 2-methyl-1-propanol, p-nitrobenzoic acid and phenol.

5.2. Evaluation of the Data

The criteria used for evaluating H· atom rate constants for inclusion in this compilation are substantially the same as those outlined for e_{aq}^- data.

Emphasis is placed on recent determinations containing comprehensive information covering a wide range of conditions, quoting errors, and a consideration of the experimental design including the use of appropriate scavengers and corrections for secondary reactions and other complicating circumstances. Other requirements considered important are the evidence supporting first-order kinetics, the establishment of conditions for a single reaction between reactants and supporting evidence for or a means of identifying the species involved and the reaction scheme, rate data given for a range of solute concentrations with matrix corrections for impurities, oxygen and self-reactions or secondary reactions (dose and dose-rate dependent), and the selection of appropriate chemical conditions (pH, dose, concentration, etc).

TABLE 3b. Selected H· rate constants

Reactant	k(L mol^{-1} s^{-1})
Hydrogen atom	7.8×10^9
Ferricyanide ion	6.3×10^9
Hydroxide ion	2.2×10^7
Oxygen	2.1×10^{10}
Benzoic acid (BzOH)	9.2×10^8
Ethanol	1.7×10^7
Methanol	2.6×10^6
2-Propanol	7.4×10^7
Formate ion	2.1×10^8 [a]
d-Formate ion	2.9×10^7 [a]
Formic acid	4.4×10^5 [a]
2-Propanol-2d	9.6×10^6 [a]
2-Propanol-d_7	8.9×10^6 [a]

[a]Fitted values derived from a comparison with those values selected above.

Rate constants for reactions of H· with metal complexes where atomized hydrogen was produced by electric discharge (see Sec. 2.2.2) were included whenever other data were not available; the rate constants should be considered to have error limits of a factor of two.

5.2.1. Selected Rate Constants for H·

Several reactants and their values of k_1 have been selected as reference values for competition kinetics and are shown in Table 3b. These values have been obtained by pulse radiolysis using either optical or esr detection. Additional reference values have been selected for several reactants with rate constants determined relative to the primary reference values. All rate constants measured relative to these reactants have been renormalized to the selected values.

6. Reaction Rates for the Hydroxyl Radical and the Oxide Radical Ion

6.1. Methods

These have already been described in general terms in Sec. 3.

6.1.1. Direct Method

In principle, the most reliable data are to be obtained using pulse radiolysis and observing directly the decay of ·OH and/or the formation of product,

$$\cdot OH + S_1 \rightarrow P_1 \qquad (41)$$

In practice, the decay of ·OH generally cannot be followed because of its weak ultraviolet absorption spectrum, and of course the formation of P_1 can only be measured when it has a suitable absorption spectrum. This is the so-called method of product build-up kinetics (p.b.k.), and it generally requires the use of rather low concentrations of solute, S_1. It is important, therefore, either to choose conditions where reaction of ·OH with itself is negligible and the product P_1 does not react further, or to make appropriate corrections when these conditions cannot be realized.

6.1.2. Competition Kinetics

This method (c.k.) is quite widely used to measure ·OH reaction rate constants by pulse radiolysis. A number of suitable standard competitors are available (see Table 3c), and it is desirable to measure the unknown rate constant relative to more than one of these standards. The competition method has the advantage that higher concentration of solutes can be employed, thereby eliminating the possibility of ·OH reacting with itself, and also shortening the timescale of observation

TABLE 3c. Selected rate constants for ·OH and ·O⁻

Reactant	k(L mol^{-1} s^{-1})
·OH Reactions	
Bicarbonate ion	8.5×10^6
Thiocyanate ion	1.1×10^{10}
Carbonate ion	3.9×10^8
Ferrocyanide ion	1.05×10^{10}
Iodide ion	1.1×10^{10}
ABTS	1.2×10^{10}
Benzoate ion (BzO^-)	5.9×10^9
N,N-Dimethyl-4-nitrosoaniline (RNO)	1.25×10^{10}
Ethanol	1.9×10^9
Formate ion	3.2×10^9
Methanol	9.7×10^8
2-Methyl-2-propanol (*tert* BuOH)	6.0×10^8
Nitrobenzene (NB)	3.9×10^9
4-Nitrobenzoate ion ($PNBA^-$)	2.6×10^9
2-Propanol	1.9×10^9
Thymine (5-MeU)	6.4×10^9
·O⁻ Reactions	
Oxygen	3.6×10^9
Ethanol	1.2×10^9
3-Hexene-1,6-dioate ion (3-HX)	6.3×10^8
Methanol	7.5×10^8
2-Propanol	1.2×10^9

and so minimizing the extent of reactions of the product. In using the competition method it is obviously important to state what value of the reference rate constant has been selected.

6.1.3. Steady-State Method

The steady-state method most frequently involves either γ-radiolysis or the use of the Fenton reaction to generate ·OH. In either case rate constants are deduced from measurements of stable products. As mentioned earlier, the method necessarily requires that the mechanism of product formation be known completely, and whilst there are numerous examples to show that the steady-state method does give reliable results, there are many others that show just the opposite.

6.2. Evaluation of the Data

All reported values of ·OH and ·O⁻ rate constants have been examined with the aim of obtaining a set of valid data. For reasons discussed above, the more reliable data are considered to be those obtained by pulse radiolysis, and of these the most reliable are those concordant values which have been obtained by more than one method. Where concordant data have been obtained by both pulse radiolysis and steady-state methods, the latter have been omitted from Table 8 but are retained in Appendix C. In many cases only a single determination of a rate constant has been made and its value is listed in Table 8 regardless of the method of its measurement, provided that the value can be judged to be a reasonable one, for example by comparing it with data for similar compounds.

6.2.1. Selected Rate Constants for ·OH

Certain rate constants have been measured many times by various methods and their values are considered to be well established (Table 3c). These are recommended for use in the pulse radiolysis competition method.

To obtain a self-consistent set of selected values the following procedure has been adopted. The rate constant for reaction (42) has been chosen as the primary standard because it is measureable by direct observation of the formation of the stable product $Fe(CN)_6^{3-}$.

$$\cdot OH + Fe(CN)_6^{4-} \rightarrow Fe(CN)_6^{3-} + OH^- \qquad (42)$$

Moreover, this reaction is almost certainly diffusion-controlled, so that if an intermediate adduct of ·OH and $Fe(CN)_6^{4-}$ is formed it must be very short-lived. Secondary standards were then chosen on the basis that their rate constants can be related directly or indirectly to k_{42}. Consider methanol as an example. The value of k_{43} for reaction (43)

$$\cdot OH + CH_3OH \rightarrow \cdot CH_2OH + H_2O \qquad (43)$$

has only been determined by the competition method, but the same value is obtained, within the usual error limits for kinetics measurements, using eight different competitors. It follows, therefore, that the rate constants for these eight compounds must be correct. In this way a set of selected rate constants has been built up whose values are mutually consistent.

6.2.2. Selected Rate Constants for ·O⁻

The same procedure has been followed as for ·OH. The chosen primary standard in this case is the rate constant for reaction (44) between ·O⁻ and 3-hexene-1,6-dioate ion which has been carefully measured[54] by the p.b.k. method.

$$\cdot O^- + {}^-O_2CCH_2CH{=}CHCH_2CO_2^- \rightarrow \text{product} \qquad (44)$$

6.2.3. Comments on Data for ·O⁻

In general, reactions of ·O⁻ are measured in alkaline solution (pH > 13), although reaction (45) has been exploited[55] to make such measurements in neutral solution.

$$e_{aq}^- + N_2O \rightarrow N_2 + \cdot O^- \qquad (45)$$

In all cases it is important to remember that the equilibrium between ·OH and ·O⁻ is rapidly established so that corrections for the presence of ·OH will generally be necessary. For the reaction scheme

$$\cdot OH + OH^- \overset{K}{\rightleftharpoons} \cdot O^- + H_2O \quad (14)$$

$$\cdot OH + S \xrightarrow{k_{46}} P \quad (46)$$

$$\cdot O^- + S \xrightarrow{k_{47}} P \quad (47)$$

the observed rate constant is given by Eq. (48),

$$k_{obs} = \frac{k_{46} + k_{47}\frac{K_{\cdot OH}}{[H^+]}}{1 + \frac{K_{\cdot OH}}{[H^+]}} \quad (48)$$

so that by choosing conditions where equilibrium (14) is maintained, and by varying the pH, one can evaluate both k_{46} and k_{47} unambiguously, provided that the reactivity of the solute S does not change in the pH range of interest.

Care is needed in obtaining rate constants for $\cdot O^-$ when the corresponding rate constants for ·OH are an order of magnitude larger. A clear example of this is provided by the system "OH" and "H_2O_2" in alkaline solution, where $pK_a(\cdot OH) = 11.9$, Eq. (14), and $pK_a(H_2O_2) = 11.7$, Eq. (49).

$$H_2O_2 + OH^- \overset{K}{\rightleftharpoons} HO_2^- + H_2O \quad (49)$$

For the reactions,

$$\cdot OH + H_2O_2 \rightarrow O_2\cdot^- + H_2O \quad (50)$$

$$\cdot OH + HO_2^- \rightarrow O_2\cdot^- + H_2O \quad (51)$$

$$\cdot O^- + H_2O_2 \rightarrow O_2\cdot^- + H_2O \quad (52)$$

$$\cdot O^- + HO_2^- \rightarrow O_2\cdot^- + OH^- \quad (53)$$

the observed rate constant,

$$k_{obs} = \frac{k_{50}}{\left(1 + \frac{K_{\cdot OH}}{[H^+]}\right)\left(1 + \frac{K_{H_2O_2}}{[H^+]}\right)} + \frac{k_{51}}{\left(1 + \frac{K_{\cdot OH}}{[H^+]}\right)\left(1 + \frac{[H^+]}{K_{H_2O_2}}\right)} + \frac{k_{52}}{\left(1 + \frac{[H^+]}{K_{\cdot OH}}\right)\left(1 + \frac{K_{H_2O_2}}{[H^+]}\right)} + \frac{k_{53}}{\left(1 + \frac{[H^+]}{K_{\cdot OH}}\right)\left(1 + \frac{[H^+]}{K_{H_2O_2}}\right)}. \quad (54)$$

Fig. 3 shows the experimental values of k_{obs} from five investigations[56,57,58,59,60]. The solid lines show the contributions of the terms in Eq. (54) for k_{51} and k_{53} using the parameters taken from Table 2. The dominant term is that for k_{51} for $10^{-4} \leqslant [OH^-] \leqslant 10^{-1}$ mol L^{-1}. The term

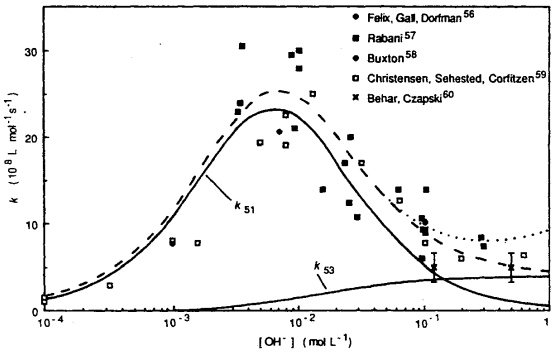

Fig. 3. Observed rate constant for the reaction of $\cdot OH/\cdot O^-$ with H_2O_2/HO_2^- for $10^{-4} \leqslant [OH^-] \leqslant 1$ mol L^{-1}. The broken line _ _ _ is calculated by Eq. (54) using parameters from Table 2: $k_{50}(\cdot OH + H_2O_2) = 2.7 \times 10^7$, $k_{51}(\cdot OH + HO_2^-) = 7.5 \times 10^9$, $k_{52}(\cdot O^- + H_2O_2) \leqslant 5 \times 10^8$, and $k_{53}(\cdot O^- + HO_2^-) = 4 \times 10^8$; the dotted line . . . illustrates the effect of ionic strength with $k_{53}^0 = 2.74 \times 10^8$ and $k_{53} = k_{53}^0 \times 10^{f(I)}$. Calculated contributions to k_{obs} by reactions (51) and (53) are also shown.

in k_{52} is negligible if $k_{52} < 5 \times 10^8$ L mol^{-1} s^{-1} and the term in k_{50} is also small, negligible for $[OH^-] \geqslant 10^{-3}$ mol L^{-1}. The contribution from the term in k_{53} becomes significant at $[OH^-] \geqslant 10^{-2}$ mol L^{-1} and dominant at $[OH^-] \geqslant 10^{-1}$ mol L^{-1}. Above 10^{-1} mol L^{-1} OH^-, the effect of ionic strength is illustrated using Rabani's value[57] ($k_{53}^0 = 2.74 \times 10^8$ at $I = 0$). The calculated dotted line shows the contribution from $k_{53}\ 10^{f(I)}$ in this region where,

$$f(I) = 1.02\frac{I^{1/2}}{1 + I^{1/2}} \quad (55)$$

assuming the ionic strength is the same as the hydroxide concentration.

A number of reported rate constants for $\cdot O^-$ reactions have been omitted from Table 9 because their values become negligibly small when k_{obs} is corrected for the contribution from ·OH.

7. Data Fitting and Statistical Analysis

As is the case with recent compilations of extinction coefficients for triplet-triplet absorption[61] and reactivity of singlet oxygen in solution[62], the data in this compilation have been analysed mathematically as part of the effort to find the best value for each rate constant. For these data several different algorithms have been tried to find "best" values from a network of relative data, the values intercompared, and found to be in statistical agreement. The method has been used first to focus attention on cases in which there is disagreement between values, thus indicating that further evaluation is required, and second to recalculate rate constants from relative measurements bringing a measure of internal consistency to the values reported.

The method of data fitting used for these data is not a true least squares method, rather it is a restricted form of averaging. Primarily, the distinction is that values that are widely accepted or that are known to have been determined with unusual care and attention to details are not subjected to the random vagaries of the fitting procedures. Thus a set of reference values (see Tables 3a, 3b, and 3c) was fixed apart from the fitting procedure. The true least squares fitting would require that the rate constants for both competitors in relative rate measurements be adjusted; the designated reference rate constants, however, were not adjusted. Thus the fitting procedure used adjusts only the subset of rate constants that can not be objectively chosen. The fitting procedure gives a value for each rate constant, an average, and for reactants with more than one measured rate constant a standard deviation that gauges how well the measurements agree with each other. For all four fitting algorithms tested the results were similar.

The first use of these fittings was to flag problems that required resolution. One problem resulted when a global fitting gave a rate constant for a reaction that did not match the value that is widely accepted. Another problem occurred when measured values were far apart. After fixing several reference values, and omitting measurements thought to be less reliable, the fitting procedure gave acceptable results. These results were subjected to the same statistical tests as used by Carmichael *et al.*[61] The deviations of the measurements relative to the fit values may be considered to be normally distributed such that 95% of the measurements will be within about 50% of the fit value. Specifically, 51% for hydrated electron rate constants, 46% for directly determined hydrogen atom rate constants, 62% for relative determinations of hydrogen atom rate constants, 63% for directly determined hydroxyl radical rate constants, and 47% for relative determinations of hydroxyl radical rate constants. These values suggest that the differences between rate constants reported from different laboratories exceed the typical quoted error estimates. This also forms the basis for not reporting an average if measurements differ by a factor of two.

For rate constants known to be determined relative to another rate constant, the ratio of the two rate constants, reported or implied, was used with the selected or averaged rate constant for the designated reference rate constant to recalculate the value reported in these tables. Recalculated rate constants have been rounded to two significant figures unless the original authors report only one significant figure, in which case we report only one. In some cases this leads to reporting an average which seems to be in error. The reason for that is the following. When we recalculate relative rate constants using our selected or averaged values, the rounding is not done until *after* the average is calculated. An example is the reaction of Hydrogen atom with 2-Methyl-1-propanol with two reported values, both relative to Benzoic acid, one value obtained by the esr method and the other value by the method of product yields in gamma radiolysis (see Table 7, entry 441). The value 6.4×10^7 L mol^{-1} s^{-1} was reported by the esr method assuming a value of 1.0×10^9 for Benzoic acid, thus $k(\text{H}\cdot + (\text{CH}_3)_2\text{CHCH}_2\text{OH})/k(\text{H}\cdot + \text{BzOH}) = 0.06400$. The value 5×10^7 was reported by the product yields method, also assuming 1.0×10^9, thus the ratio is 0.05000. These ratios are multiplied by our selected value for $k(\text{H}\cdot + \text{BzOH}) = 9.2 \times 10^8$. The calculated values, 5.888×10^7 and 4.600×10^7, give an average of 5.244×10^7. These round to 5.9×10^7 and 5×10^7 with the average rounded to 5.2×10^7 L mol^{-1} s^{-1}.

8. Activation Energies

Kinetic spectroscopy is a convenient direct method to measure activation energies of the reactions of water radiolysis species, particularly e_{aq}^-. Such determinations are important not only in mechanistic studies[63,64], but also in such diverse areas of applied radiation chemistry as nuclear reactor coolant chemistry[65] and hyperthermia treatment of cancer[66].

Activation energies of e_{aq}^-, ·OH and H· reactions have been measured by pulse radiolysis and competition kinetics for a wide range of reaction rate constants (Table 4). Diffusion controlled reactions of most solutes in water have activation energies (E_a) between 3 and 4 kcal mol^{-1} (10 to 18 kJ mol^{-1}). In slower reactions, the measured activation energy approximates the enthalpy term ($H = E_a + RT$).

The most common method of determining activation energies is to measure a rate constant k for a given reaction at several temperatures (T) and to calculate the slope of the so-called Arrhenius plot of ln k against $1/T$ to fit the equation:

$$\ln k = \ln A - \frac{E_a}{RT} \tag{56}$$

where R is the gas constant and RT at room temperature is 2.4 kJ mol^{-1}.

Some Arrhenius plots such as the one for the decay of e_s^- in 10 mol L^{-1} OH$^-$ are nonlinear[67], and it is necessary to obtain rate constant data over a wide temperature range in order to detect these anomalies. Some reasons for the nonlinearity may be associated with steric factors, viscosity changes, complications from secondary or competing reactions, and tunneling or inhomogeneous diffusion kinetics. It may be possible to determine activation energies under such nonideal conditions by using the modified Eq. (57):

$$\ln k = \ln A - \frac{E_a}{R(T - T_{\text{fixed}})} \tag{57}$$

TABLE 4. Activation energies

Reactant	E_a[a]	log A[b]	k[c]	$\Delta S\ddagger$[d]	Ref.[e]	No.[f]
			e_{aq}^- reactions			
$e_{aq}^- + e_{aq}^-$	23		5.		86A009	5.1.1
	22		7		85A373	
	22		5.5		80A187	
					81A370	
	18		5.0		76A250	
	22		6.3		670109	
Bromate ion	19		7.8		690567	6.31
Chlorate ion	13		0.22		690567	6.63
Cobalt(II) ions	24		12.		650044	6.65
$Co(NH_3)_6^{3+}$	18		90.		650044	6.81
$Co(NH_3)_5^{3+}$	13		58.	−3	670098	6.82
Hydrogen ion	11		22.		710580	6.230
					690567	
	10		28.		700243	
	13				640046	
	16		22.		650044	
	13		25.	−9	670098	
Manganese(II) ions	32		0.038		650044	6.265
$Mn^{II}EDTA$	17		0.0015		670299	6.269
Permanganate ion	13		44.		690567	6.279
Nitrite ion	7		3.4		690567	6.294
	14		3.4	−26	670098	
Nitrate ion	10		9.3		690567	6.295
	16		11.	−16	670098	
$Ni^{II}NTA$	22		0.6		690277	6.319
$Ni^{II}EDTA$	18				690277	6.321
Oxygen	13	12.5	18.		771174	6.331
Hydrogen peroxide	15		11.		690567	6.332
Water	19			−130	670532	6.334
	19				640046	
				−109	85A373	
Thiosulfate ion	16		0.6		690567	6.420
Thallium(I) ion	10		28.		710580	6.453
					690567	
Acetamide	15		0.035	−63	670098	6.493
Acetone	11	11.9	8.0	−18	85A282	6.498
	12	11.9	6.6	−16	79A117	
Acetonitrile	23	11.6	0.044	−22	79A117	6.500
Acrylamide	16		33.		690567	6.534
Allyl alcohol	24	11.8	0.072	−18	84A357	6.571
	14	9.7	0.020	−60	79A117	
2-Aminopyrimidine	15		7.6	−14	670098	6.584
Benzenesulfonate ion	15		1.2	−36	670098	6.625
Benzoate ion	15		3.6	−26	670098	6.630
Benzyl alcohol	15		0.18	−50	670098	6.644
4-Bromophenol	13		12.		690567	6.685
	13		12.	−15	670098	
5-Bromouracil	16		19.		690567	6.694
Carbon tetrachloride	15		24.		771041	6.716
Chloroacetate ion	12		0.89		670299	6.721
	16		1.1	−36	670098	
2-Chloroethanol	13		0.33		670299	6.739
3-Chloropropionate ion	15		0.44		670299	6.755
Cyclobutanone	15		8.2		761103	6.784
Cycloheptanone	16		6.0		761103	6.785
Cyclohexanone	15		7.8	−19	670098	6.789
	15		7.2		761103	
Cyclooctanone	15		4.3		761103	6.792
Cyclopentanone	15		7.4		761103	6.793
Ethyl acetate	16	10.5	0.046	−44	79A117	6.923
Formamide	13		0.033	−64	670098	6.953
5-Iodouracil	10		17.		690567	6.1107

TABLE 4. Activation energies — Continued

Reactant	E_a[a]	log A[b]	k[c]	$\Delta S\ddagger$[d]	Ref.[e]	No.[f]
Nitrobenzene	18	13.6	38.	16	85A282	6.1256
	19	13.9	40.	20	84A357	
	18	13.6	25.	15	84A200	
	15	13.3	42.	9	79A117	
	9.1		28.		690567	
4-Nitrophenol	11		36.		690567	6.1273
Phenol	15	10.0	0.021	−53	85A282	6.1315
	20	10.9	0.025	−36	84A200	
	15	9.8	0.016	−57	79A117	
Phenylacetate ion	14		0.032	−65	670098	6.1319
Phenylalanine	14		0.14	−51	670098	6.1321
	15[g]		~0.3		80A064	
3-Phenylpropionate ion	15		~0.04		80A064	6.1337
Phthalate ion	13		4.6	−24	670098	6.1339
Propargyl alcohol	18	11.4	0.21	−27	79A117	6.1351
Pyridine	19		3.7		690567	6.1365
	16		34.6	−25	670098	
Toluene	20	10.6	0.014	−42	85A282	6.1466
Tryptophan	21	12.3	0.32	−10	84A200	6.1489
Urea	14		0.00032	−105	670098	6.1496
			·H reactions			
Silver(I) ion	90	19.	27.		751197	7.1
Iron(II) ion	14	10.2	~0.05		760011	7.76
Manganese(II) ions	20	12.3	0.66		751197	7.99
Hydroxide ion	26		0.045	−25	85A373	7.117
α-Methylstyrene	10		0.45		751198	7.446
2-Propanol	16	11.0	0.14		751197	7.493
2-Propanol-d_7	20	10.8			760011	7.495
	23	10.4			760011	
			·OH reactions			
·OH + ·OH	8				81A370	5.3.1
Bicarbonate ion	21.2	12.8	0.01		870901	8.18
Carbonate ion	23.6	10.8	0.4		870901	8.19
Thiocyanate ion	11		9.6		84A349	8.26
	13				84A349	
Copper(II) ions	13		0.31		80A187	8.67
Deuterium	23		0.017		590028	8.83
Iron(II) ion	9		0.43		81A370	8.85
Ferrocyanide ion	13		10		84A349	8.90
Hydrogen	19		0.035		83A015	8.104
	13		0.040		771079	
	20		0.032		590028	
Iodide ion	12		12.		84A349	8.109
Hydrogen peroxide	14		0.027		82A096	8.159
Formate ion	8.5		3.8		84A349	8.672
2-Methyl-2-propanol	10		0.66		84A349	8.954
2-Propanol	5		2.3		84A349	8.1090

[a]kJ mol^{-1}.
[b]A in L mol^{-1} s^{-1}.
[c]In units of 10^9 L mol^{-1} s^{-1}, at room temperature.
[d]J K^{-1} mol^{-1}
[e]See Section 13 for reference list following Tables 6–10.
[f]Entry numbers in Tables 5–8.
[g]Dependent on pH.

9. Contents and Arrangement of Tables 5–10

Table 5 contains radical-radical reactions of the hydrated electron, hydrogen atom, hydroxyl radical and oxide radical ion with each other and with other radicals derived from solutes. Separate tables (6–9) are provided for reactions of the hydrated electron, hydrogen atom, hydroxyl radical, and oxide radical ion. Reactions of those radicals with macromolecules, and with molecules in heterogeneous systems are collected in Table 10.

For solutes encapsulated in vesicles or micelles the rate-determining step is often that for diffusion of e_{aq}^- or ·OH to the surface of the vesicle or micelle. Thus, it is not usually valid to assign the rate constant which is measured to the reaction of the radical with the solute. In other cases where reaction does not occur at every encounter, Michaelis-Menten type kinetics will apply.

When the solute is a polymer the value of k_{obs}, the observed rate constant based on monomer concentration, is concentration dependent. Therefore it is not always possible to compare quoted values when details of concentration are not given. The measured rate constant also depends on the degree of polymerization, i.e. molecular weight of the polymer, and on its shape (e.g. folded, unfolded, etc.).

Only rate data at ambient temperature in aqueous homogeneous solution, for which normal diffusion theory applies, have been included in tables 6–9. Data involving deuterated species have been included but rate constants in D_2O solution have been omitted (that is, reactions of e_d^-, D·, ·OD are omitted). Unpublished or unrefereed data have been omitted unless sufficient details were available so that the data could be evaluated. Estimated or single values, upper and lower limits have only been included in the absence of more definitive data. Ambiguous data reported for mixtures of different solutes or different forms of one solute were not knowingly included. In certain cases, pK_a values or other pertinent information have been included under 'comments' when available.

Arrangement of Reactants: Tables 6–9 are arranged similarly with the inorganic reactants listed first, grouped alphabetically by main element. Within the groupings by element the arrangement is in order of increasing oxidation state. Within a particular oxidation state for a metal, aquated ions are listed first followed by complexes with neutral ligands (amines). Complexes with anionic inorganic ligands are listed next, followed by complexes with anionic organic ligands, such as carboxylic acids, amino acids and peptides; polynuclear metal species are listed last. The metal ions are generally shown without ligated water (see below). The inorganic reactants are followed by the organic reactants, arranged alphabetically by name. Table 10 is arranged alphabetically by the name of the substrate; reactions with e_{aq}^-, H·, ·OH and $\cdot O^-$ are collected in the entry for each substrate. The "Reactant/Radical" column identifies the radical for which data are given.

Each entry in the tables is headed by the name of the reactant. Systematic names are used in the tables for the substrates unless the reactant has a complex structure or is better known by a common name (e.g. Camphor rather than 1,7,7-Trimethylbicyclo[2.2.1]heptan-2-one). Alternate names are given in the chemical name index.

Indexes: The indexes, which follow the tables, have been generated from entries in the RCDC registry file for the chemical species included in this compilation. The chemical name index contains both systematic and common names; inverted names are also included in the index whenever they are present in the registry file. A molecular formula index is also provided as an aid to locating particular reactants. The indexes refer to the reactants in Tables 6–10 and give the entry numbers in the various tables where data for those reactants appear.

Reactions: The reactions in column 2 of Tables 5–9 use line formulae whenever they are available in the registry file and when space allows; otherwise, abbreviations or symbols, or in some cases the molecular formula, have been used. Reactions include products only when evidence for their identity has been reported.

pH Effects: The pH is quoted whenever it was given. In some cases rate constants have been determined for particular ionic forms of the reactants. When observed rate data over a pH range have been used to calculate k for an individual ionic form, that is noted in the comments. The observed k may be for a mixture of ionic forms of the substrate. When the studies were carried out near the pK of a reactant and the contributions of the individual species were not determined, the pK has been included in the comments and the rate constant should be understood to be for a mixture of reactant species. In some cases pK's given by the authors are included in the comment, in other cases the pK's have been obtained from standard reference works[68]. Their only function in the table is to indicate the possible ionic forms of the substrate. The pK's quoted have not been evaluated by the present authors.

Metal ions may also exist in a variety of forms due to hydrolysis. When insufficient information is available the metal species have been indicated only by their oxidation number (Stock number) and the species could include one or more forms such as $M(OH)_x^{n\pm}$, $MO^{n\pm}$, $MO_2^{n\pm}$, etc., as well as polynuclear metal ions. Water molecules coordinated to metal ions have been omitted, e.g. Cr^{2+} is listed not $Cr(H_2O)_6^{2+}$, but coordinated hydroxide ions and other anions are included, e.g. $FeOH^{2+}$, $ThSO_4^{2+}$, etc.

Rate Constants: Rate constants have been rounded to one or two significant figures and author's error limits have been omitted. For certain reactions a **selected value** is listed in bold-face type at the top of the entry and those values have been used to normalize relative rate constants. Tables 3a, 3b, and 3c provide a summary of selected values. Other entries may include two or more values for which an *average value* is listed in italics at the top of the entry. See Sec. 7 for a discussion of the averaged values. No average has been computed if the data

[illegible] obtained under conditions (pH, ionic strength) [illegible] which were were substantially different. Furthermore, the average is omitted if the values differ by more than a factor of two. A few single values which are included are not recommended because of deficiencies in the method and are so indicated by footnote a.[a] Multiple values with a large discrepancy may also not be recommended and are so indicated by footnote b.[b]

Values for the rate constants for radical-radical reactions for e_{aq}^-, H·, ·OH and ·O^- in Table 5 (5.1.1, 5.2.1, 5.3.1, and 5.4.1) are given as k (and not $2k$ as usually determined). If it was not clear which was reported, the value is the one given by the authors.

Comments: The Comments column indicates the method of generation of the radical by symbols such as p.r., f.p., etc., identified in the list of abbreviations and symbols in Sec. 10. Other details about the determination and the system are included as comments. Temperature and pressure are assumed to be ambient; when other data are available from studies made at higher temperatures or pressures that has been noted. Whenever the rate constant listed in the k column depends on a reference value for another reactant that has been noted in the comment, e.g. rel. to k(·OH + SCN^-). In such cases the reference value used in these tables is the value at the head of the entry for the reference reactant which may be a selected value, an *average* value, or a single value.

References: The references to the tables are listed by serial number assigned by the Radiation Chemistry Data Center and included in the RCDC Bibliographic Data Base. The reference list follows the tables.

Appendices: A number of rate constants for e_{aq}^-, H· and ·OH which have been reported were not included in Tables 6–8 for reasons outlined above. References to papers containing omitted data are listed in the Appendices; the original papers may be consulted for further information such as kinetic data determined by alternative methods, pH effects, or product analysis.

RCDC Databases: The data contained in these tables are stored in a computer-searchable database. Information about online access may be obtained from the Radiation Chemistry Data Center. In addition, data which have not been included in the tables (superseded values and other omitted data) have been retained as separate files which are available for use in future reevaluations.

10. List of Abbreviations and Symbols

A	frequency factor
AA	allyl alcohol
abs.	absorption
abstr.	abstraction
ABTS	2,2′-azinobis(3-ethylbenzothiazoline-6-sulfonate ion)
Ac	acetyl
acac	acetylacetonato (2,4-pentanedionato)
addn.	addition
Ala	alanine
alk.	alkaline
An	anthracene
anal.	analysis
AQ	9,10-anthraquinone
Arg	arginine
Asn	asparagine
Asp	aspartic acid
bpy	2,2′-bipyridine
4,4′-bpy	4,4′-bipyridine
BuOH	butanol
tert-BuOH	*tert*-butyl alcohol (2-methyl-2-propanol)
BzO^-	benzoate ion
BzOH	benzoic acid
calcd.	calculated
CDTA	cyclohexanediaminetetraacetic acid
chem.	chemical
c.k.	competition kinetics
CMC	critical micelle concentration
concn.	concentration
condy.	conductivity
contg.	containing
cor.	corrected
CTAB	hexadecyltrimethylammonium bromide
CTAC	hexadecyltrimethylammonium chloride
Cys	cysteine
Cyt	cystine
DABCO	1,4-diazabicyclo[2.2.2]octane
DCIP	dichloroindophenol
detd.	determined
DHU	dihydrouracil
dien	diethylenetriamine
d.k.	decay kinetics
DMPO	5,5-dimethyl-1-pyrroline 1-oxyl
DMSO	dimethyl sulfoxide
ϵ	extinction coefficient (molar absorptivity)
E_a	activation energy
e.d.	electric discharge
EDTA	ethylenediaminetetraacetate
elec.	electrolysis, electrochemical method
en	ethylenediamine
e–r.	electron radiolysis
esr	electron spin resonance
estd.	estimated
Et	ethyl
EtOH	ethanol
Fc	ferrocene
formn.	formation
f.p.	flash photolysis
γ–r.	gamma radiolysis
G	radiation yield (molecules per 100 eV)
Gln	glutamine
Glu	glutamic acid
$GlucOC_6H_5$	phenyl-β-D-glucopyranoside

[a] Unrecommended value because of deficiencies in the method. The value is included since it is the only reported data on the substrate.

[b] Discrepancy in these data. No recommendation.

Gly	glycine
$\Delta H‡$	activation enthalpy
His	histidine
Hyp	hydroxyproline
3-HX	3-hexene-1,6-dioate ion
I	ionic strength
IDA	iminodiacetate ion
Ile	isoleucine
Im	imidazole
In	indole
irradn.	irradiation
isn	isonicotinamide
J	joules (4.184 J = 1 cal)
K	equilibrium constant
k	rate constant
L	ligand
Leu	leucine
Lys	lysine
Me	methyl
MeOH	methanol
Met	methionine
5-MeU	thymine
N	newton (133 N m^{-2} = 1 torr)
na	nicotinamide
NAD	nicotinamide adenine dinucleotide
NB	nitrobenzene
NBT	Nitro Blue Tetrazolium
Nor	norvaline
Np	naphthalene
NQ	1,4-naphthoquinone
NTA	nitrilotriacetate
obs.	observed
o.d.	optical density
opt.	optical
Orn	ornithine
ox	oxalato
PA^-	phenylacetate ion
p.b.k.	product buildup kinetics
Ph	phenyl
Phe	phenylalanine
phen	1,10-phenanthroline
PhH	benzene
PhOH	phenol
phot.	photolysis
pK_a	negative logarithm of the acid dissociation constant, e.g., where $AH + H_2O \rightleftharpoons A^- + H_3O^+$
$PNBA^-$	*p*-nitrobenzoate ion
PNBPA	*p*-nitrobenzoato(pentaammine)-cobalt(III) ion
p.r.	pulse radiolysis
Pro	proline
PrOH	propanol
pts	3,10,17,24-tetrasulfophthalocyanine
py	pyridine
Q	1,4-benzoquinone
redn.	reduction
rel.	relative
RNO	*N*,*N*-dimethyl-*p*-nitrosoaniline
$\Delta S‡$	activation entropy
Sar	sarcosine
satd.	saturated
SDS	sodium dodecylsulfate
soln.	solution
soly.	solubility
son.	sonolysis
tetraen	tetraethyldiethylenetriamine
Thr	threonine
TMpyP	tetramethylpyridylporphine
TPP	tetraphenylporphine
TPPS	tetraphenylporphinesulfonate
TrpH	tryptophan
TyrOH	tyrosine
U	uracil
Val	valine

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TABLE 5. Rate constants for radical-radical reactions

No.	Reaction	pH	k (L mol^{-1} s^{-1})	Comment	Ref.
1	**Hydrated electron**				
1.1	$e_{aq}^- + e_{aq}^- \rightarrow H_2 + OH^-$		**5.5 × 10^9**	**Selected value**	
		11-13	5.0 × 10^9	p.r.; D.k.; *tert*-BuOH or H_2 as ·OH scavenger; temperature dependence (5-300 °C) was studied.	86A009
		12.8	5 × 10^9	f.p.; Phot. of OH^-; d.k. at 700 nm; $[H_2] = 7 \times 10^{-4}$ mol L^{-1}, $[NaOH] = 7 \times 10^{-2}$ mol L^{-1}	86A329
		12	7 × 10^9	p.r.; D.k. at 600 nm; value of from graph; ϵ(600 nm) = 11,500 L mol^{-1} cm^{-1}; ($[H_2] = 8 \times 10^{-2}$ mol L^{-1}; activation energy determined at 15-60°C.	85A373
		11.6-13	5.0 × 10^9	p.r.; D.k. at 600 nm in soln. under 30 atm. H_2 ($[H_2] = 2.7 \times 10^{-2}$ and 2.1×10^{-2} mol L^{-1} at 5 and 65°C, resp.) taking ϵ = 12,400 L mol^{-1} cm^{-1}.	76A250
		10.5	6.2 × 10^9	p.r.; D.k. at 575 nm in solution under 100 atm. H_2 taking ϵ = 10,500 L mol^{-1} cm^{-1}.	751036
		12.7	5.0 × 10^9	p.r.; Apparent change in k with pH has been obs.; k cor. for I.	700749
		alk.	5.8 × 10^9	f.p.; D.k.; H_2-satd.; ϵ = 10,900 L mol^{-1} cm^{-1} at 578 nm.	697106
		11	6 × 10^9	D.k. at 700 nm; soln. H_2-satd.; ϵ = 18,500 L mol^{-1} cm^{-1}.	687143
		13.3	5.5 × 10^9	p.r.; D.k. at 578 nm; soln. in equil. with 100 atm. H_2; ϵ = 10,600 L mol^{-1} cm^{-1}.	650009
		10.9	5.0 × 10^9	p.r.; D.k. at 578 nm assuming $\epsilon = 10.4 \times 10^3$ L mol^{-1} cm^{-1}; contg. EtOH, MeOH or ferrocyanide.	630073
1.2	$H\cdot + e_{aq}^- \rightarrow H_2 + OH^-$	10.5	2.5 × 10^{10}	p.r.; Calcd. from d.k. at 578 nm; soln. is in equil. with 100 atm. H_2.	650009
1.3	$\cdot OH + e_{aq}^- \rightarrow OH^-$	10.5	3.0 × 10^{10}	p.r.; Calcd. from d.k. at 578 nm; soln. contains NaOH.	650009
1.4	$O\cdot^- + e_{aq}^- \rightarrow OH^-$	13	2.2 × 10^{10}	p.r.; D.k. at 578 nm; soln. in equil. with 50 atm. H_2, contains NaOH; assuming that $2k(\cdot O^- + \cdot O^-) = 2k(e_{aq}^- + e_{aq}^-)$ and $\epsilon(e_{aq}^-) = 10{,}600$ L mol^{-1} cm^{-1}.	650009
1.5	$O_2\cdot^- + e_{aq}^- \rightarrow O_2^{2-}$	11.1	1.3 × 10^{10}	p.r.; Calcd. from d.k. at 650 nm.	710171
2	**Hydrogen atom**				
2.1	$H\cdot + H\cdot \rightarrow H_2$		**7.8 × 10^9**	**Selected value**	
		1	9 × 10^9	p.r.; esr; Calcd. from time profile and absorbed dose in deaerated soln. contg. 10^{-2} mol L^{-1} *tert*-BuOH; flow system.	83A153
		1	1.2 × 10^{10}	p.r.; esr; Calcd. from obs. half-life and concn. in soln. contg. 2×10^{-3} mol L^{-1} *tert*-BuOH and 0.1 mol L^{-1} $HClO_4$.	775254
		3	7.8 × 10^9	p.r.; D.k. at 200 nm; ϵ = 900 L mol^{-1} cm^{-1}.	690083
2.2	$\cdot OH + H\cdot \rightarrow H_2O$	3	7 × 10^9	p.r.; D.k. at 260 nm (·OH).	650010
2.3	$HO_2\cdot + H\cdot \rightarrow H_2O_2$	<3	2 × 10^{10}	p.r.; Obs. $G(Fe^{3+})$ in $FeSO_4$-$CuSO_4$ soln. at various dose rates.	700063
		0.4	1 × 10^{10}	p.r.; Obs. $G(H_2)$.; rel. to $k(\cdot H + \cdot H)$.	630043
3	**Hydroxyl**				
3.1	$\cdot OH + \cdot OH \rightarrow H_2O_2$		**5.5 × 10^9**	**Selected value**	
		7	5.2 × 10^9	p.r.; D.k. 200-250 nm; ϵ = 450-530 L mol^{-1} cm^{-1}; cor. for ·H and OH^-.	690083
		~7	6.2 × 10^9	p.r.; C.k.; rel. to $k(\cdot OH + Fe(CN)_6^{4-})$.	660424
		3.7	5.2 × 10^9	p.r.; D.k. at 260 nm, ϵ = 370 L mol^{-1} cm^{-1}.	650010

TABLE 5. Rate constants for radical-radical reactions—Continued

No.	Reaction	pH	k (L mol^{-1} s^{-1})	Comment	Ref.
8	**Hydroxyl**—Continued				
3.2	$O^{\bullet -} + {}^{\bullet}OH \rightarrow HO_2^-$	>12	$\leq 2 \times 10^{10}$	p.r.; C.k. with $Fe(CN)_6^{4-}$; $pK_a(^{\bullet}OH) = 11.9$; estimate based on numerous assumptions and may be fourfold less.	660424
3.3	$O_2^{\bullet -} + {}^{\bullet}OH \rightarrow OH^- + O_2$	7	7×10^9	p.-r.; Calcd. from $[O_2^{\bullet -}]$ and yields following pulse; rel. to $k(^{\bullet}OH + {}^{\bullet}OH)$.	690547
		2.74-6.75	9.4×10^9	p.r.; Obs. $G(H_2O_2)$; data fitting; $pK(HO_2^{\bullet} \rightleftarrows H^+ + O_2^{\bullet -}) = 4.45$; rel. to $k(^{\bullet}OH + {}^{\bullet}OH)$.	680014
3.4	$HO_2^{\bullet} + {}^{\bullet}OH \rightarrow H_2O + O_2$	0.46-6.75	6.6×10^9	p.r.; Dose rate effect on $G(H_2O_2)$; $pK_a(HO_2^{\bullet}) = 4.45$; rel. to $k(^{\bullet}OH + {}^{\bullet}OH)$.	680014
		>2	6×10^9	p.r.; Calcd. from obs. $G(H_2O_2)$.; rel. to $k(^{\bullet}OH + {}^{\bullet}OH)$.	630043
3.5	$H_2O_2^+ + {}^{\bullet}OH \rightarrow H_3O^+ + O_2$	0.46-1.51	1.2×10^{10}	p.r.; Dose rate effect on $G(H_2O_2)$; $pK(H_2O_2^{\bullet +} \rightleftarrows H^+ + HO_2^{\bullet}) = 1.2$; rel. to $k(^{\bullet}OH + {}^{\bullet}OH)$.	680014
4	**Oxide radical ion**				
4.1	$O^{\bullet -} + O^{\bullet -} \rightarrow O_2^{2-}$	13	8.4×10^9	p.r.; C.k.; obs. O_3^-; $[^{\bullet}O^-] = 8.4 \times 10^{-6}$; most direct method but substantial amount of $O_2^{\bullet -}$ present by comparison with spectra in [82A133]; not reliable; rel. to $k(^{\bullet}O^- + O_2)$.	660001
		>12	$\leq 9 \times 10^8$	p.r.; C.k. with $Fe(CN)_6^{4-}$; est. based on numerous assumptions; $pK(^{\bullet}OH) = 11.9$. Not reliable.; rel. to $k(^{\bullet}OH + Fe(CN)_6^{4-})$.	660424
4.2	$O_2^{\bullet -} + O^{\bullet -} \rightarrow OH^- + OH^- + O_2$	13-14	6.0×10^8	p.r.; D.k. at 430 nm (O_3^-) as well simultaneous buildup at 250 nm ($O_2^{\bullet -}$) and decay, in soln. satd. with 4×10^6 N m^{-2} N_2O and 0-1 $\times 10^6$ N m^{-2} O_2; computer simulation.	82A133
5	**Dibromine radical ion**				
5.1	$Br_2^{\bullet -} + e_{aq}^- \rightarrow 2\ Br^-$	7	1.3×10^{10}	p.r.; Calcd. from d.k. at 365 nm ($Br_2^{\bullet -}$), soln. contains 10^{-4}-10^{-2} mol L^{-1} KBr; assumed $k(e_{aq}^- + Br_2) = k(e_{aq}^- + Br_3^-) = 1 \times 10^{10}$.	660425
5.2	$Br_2^{\bullet -} + H^{\bullet} \rightarrow H^+ + 2\ Br^-$	2	7×10^9	f.p.; No details given.	707726
6	**Bromine dioxide**				
6.1	$BrO_2^{\bullet} + {}^{\bullet}OH \rightarrow H^+ + BrO_3^-$	nat	2.0×10^9	p.r.; D.k. in N_2-satd. soln. contg. 4×10^{-3} mol L^{-1} BrO_3^-.	82A169
7	**Dichlorine radical ion**				
7.1	$Cl_2^{\bullet -} + H^{\bullet} \rightarrow H^+ + 2\ Cl^-$	~1	7×10^9	p.r.; Calcd. fit to d.k. at 340 nm in Ar-satd. soln. contg. 0.05 mol L^{-1} Cl^- and 0.15 mol L^{-1} $HClO_4$; assumed $G(Cl_2^{\bullet -}) = 2.9$, $G(H^{\bullet}) = 3.7$, $2k(Cl_2^{\bullet -} + Cl_2^{\bullet -}) = 4 \times 10^9$, $2k(H^{\bullet} + H^{\bullet}) = 2.2 \times 10^{10}$.	80A378
7.2	$Cl_2^{\bullet -} + {}^{\bullet}OH \rightarrow HOCl + Cl^-$		1×10^9	f.p.; Data fitting using condy. data from solutions contg. HCl at pH 2-5 and assumed values for concurrent reactions.	86A368
8	**Chlorine dioxide**				
8.1	$ClO_2^{\bullet} + {}^{\bullet}OH \rightarrow H^+ + ClO_3^-$	~7	4.0×10^9	p.r.; D.k. at 360 nm in N_2O-satd. soln.	85A039
8.2	$ClO_2^{\bullet} + O^{\bullet -} \rightarrow ClO_3^-$	alk.	2.7×10^9	p.r.; D.k. at 360 nm in N_2O-satd. soln.	85A039
9	**Diiodine radical ion**				
9.1	$I_2^{\bullet -} + e_{aq}^- \rightarrow$		9×10^{10}	f.p.; Estd. from d.k. at 650 nm and 425 nm in 0.2 mol L$^-$ KI assuming $k(e_{aq}^- + I^-) = 2.4 \times 10^5$ and $k(I_2^{\bullet -} + I_2^{\bullet -}) = 8 \times 10^9$.	79A110
9.2	$I_2^{\bullet -} + H^{\bullet} \rightarrow H^+ + 2\ I^-$	3.5-11	1.8×10^7	phot.; estd.	620057
10	**Nitric oxide**				
10.1	$NO + e_{aq}^- \rightarrow NO^-$	7	2.3×10^{10}	p.r.; D.k.	700014
		7	3.1×10^{10}	p.r.; D.k. at 578 nm in presence of 10^{-3} mol L^{-1} MeOH, $[NO] = 22$-200×10^{-6} mol L^{-1}.	630073
10.2	$NO + H^{\bullet} \rightarrow$	7	1.1×10^{10}	γ-r.; C.k.; obs. $G(N_2O)$; rel. to $k(H^{\bullet} + NO_2^-)$.	670231

TABLE 5. Rate constants for radical-radical reactions—Continued

No.	Reaction	pH	k (L mol^{-1} s^{-1})	Comment	Ref.
10	**Nitric oxide—Continued**				
10.3	$NO + {}^{\bullet}OH \rightarrow H^+ + NO_2^-$		2×10^{10}	f.p.; (condy.); Estd. from redn. in hydrolysis of N_2O_3 (from NO + NO_2) in soln. contg. NO_2^- and NO.; rel. to $k({}^{\bullet}OH + NO_2^-)$.	82A428
		7	1.0×10^{10}	p.r.; P.b.k. at 220 nm (NO_2^-).	730096
			1.7×10^{10}	f.p.; C.k.; rel. to $k({}^{\bullet}OH + NO_2^-)$.	707264
11	**Nitrogen dioxide**				
11.1	$NO_2 + {}^{\bullet}OH \rightarrow HO_2NO$		1×10^{10}	f.p.; Estd. from condy. study in 5×10^{-4} mol L^{-1} HNO_3; rel. to $k({}^{\bullet}OH + {}^{\bullet}OH)$.	80A366
		9	1.3×10^{9}	p.r.; Meas. buildup of abs. at 302 nm in NO_3^- soln.; calcn. involves $k({}^{\bullet}OH + {}^{\bullet}OH) = 0.6 \times 10^{10}$ and $k(NO_3^{2-} + H_2O \rightarrow NO_2 + 2\ OH^-) = 5.5 \times 10^4$ s^{-1}.	700151
12	**Ozonide ion**				
12.1	$O_3^{\bullet-} + {}^{\bullet}OH \rightarrow$	10-13	8.5×10^{9}	p.r.; D.k. at 430 nm as well as p.b.k. at 260 nm in soln. (under 40 atm. of N_2O) contg. 1.2×10^{-3} mol L^{-1} O_2 and ~0.9 mol L^{-1} N_2O; computer simulation; overall reaction; products are $O_2^{\bullet-}$ (re-forming O_3^-) and OH^- + O_3 (about 30% of total reaction).	84A040
12.1	$O_3^{\bullet-} + O^{\bullet-} \rightarrow O_2^{\bullet-} + O_2^{\bullet-}$	13-14	7.0×10^{8}	p.r.; D.k. at 430 nm (O_3^-) as well simultaneous buildup at 250 nm ($O_2^{\bullet-}$) and decay, in soln. satd. with 4×10^6 N m^{-2} N_2O and 0.1×10^6 N m^{-2} O_2; computer simulation.	82A133
	$O_3^{\bullet-} + O^{\bullet-} \rightarrow O_4^{2-}$	>13	$\sim 7 \times 10^{8}$	p.r.; D.k. (O_3^-); k estd. from steady state approx. for [$^{\bullet}O^-$].; rel. to $k({}^{\bullet}O^- + O_2)$.	690002
		13-13.7	8×10^{8}	f.p.; D.k. at 430 nm; complex anal. uses other rate constants.	687277
13	**Phosphite radical ion**				
13.1	$PO_3^{2-} + e_{aq}^- \rightarrow HPO_3^{2-} + OH^-$		1.0×10^{9}	p.r.; esr; Estd. from fit with other radical-radical processes.	82A085
14	**Sulfite radical ion**				
14.1	$SO_3^- + e_{aq}^- \rightarrow SO_3^{2-} + OH^-$		2.1×10^{9}	p.r.; esr; Estd. from fit with other radical-radical processes.	82A085
15	**Tetrakis(*p*-sulfonatophenyl)porphinatozincate(II) ion, triplet state**				
15.1	$^3(ZnTPPS^{4-})^* + H^{\bullet} \rightarrow ZnTPPS(H)^{4-}$		$\sim 1.5 \times 10^{10}$	p.r.; P.b.k. in N_2O-satd. soln. contg. *tert*-BuOH; triplet produced by photolysis.	82A279
15.2	$^3(ZnTPPS^{4-})^* + {}^{\bullet}OH \rightarrow Zn(TPPS\text{-}OH)^{4-}$	7	$\sim 1 \times 10^{10}$	p.r.; P.b.k.; triplet produced by photolysis.	82A279
16	**Daunomycin, radical anion**				
16.1	$D^{\bullet-} + e_{aq}^- \rightarrow D^{2-}$		9×10^{9}	p.r.; Calcd. from variation in [$D^{\bullet-}$], [D^{2-}] with $[D]_0$. $D^{\bullet-}$ may be semiquinone and D^{2-} may be hydroquinone form.	82A440
17	**1,6-Diazabicyclo[4.4.4]tetradecane radical cation**				
17.1	$DABCT^{\bullet+} + e_{aq}^- \rightarrow DABCT$		1.2×10^{10}	p.r.; D.k. in N_2-satd. soln. contg. 1-20 $\times$ 10^{-5} mol L^{-1} radical cation; product analysis supported by condy. measurements.	86A272
17.2	$DABCT^{\bullet+} + H^{\bullet} \rightarrow$ H abstr.	~1	3×10^{8}	p.r.; D.k. in soln. contg. 0.1 mol SCN^- and 0.2-10 $\times$ 10^{-4} mol L^{-1} radical cation.	86A272
17.3	$DABCT^{\bullet+} + {}^{\bullet}OH \rightarrow$ H abstr.	~4	8.0×10^{9}	p.r.; D.k. at 480 nm (as well as condy.) in N_2O-satd. soln. contg. 1-10 $\times$ 10^{-5} mol L^{-1} radical cation.	86A272
18	**1-Hydroxyethyl**				
18.1	$CH_3\dot{C}HOH + e_{aq}^- \rightarrow C_2H_5OH$	7	6×10^{9}	γ-r.; Estd. from product yields (CH_3CHO, H_2O_2) in soln. contg. 0.1 mol L^{-1} EtOH and 1.8-2.8 $\times$ 10^{-5} mol L^{-1} oxygen.	86G077

TABLE 5. Rate constants for radical-radical reactions—Continued

No.	Reaction	pH	k (L mol^{-1} s^{-1})	Comment	Ref.
19	**2-Naphthoxyl radical**				
19.1	NpO· + H· → 2-NpOH		5×10^9	f.p.; estd.; $k = 1 \times 10^{10}$ for the hydrated 2-naphthyloxy radical.	84A310
20	**Nitrobenzene radical anion**				
20.1	$[C_6H_5NO_2]^{\cdot -} + e_{aq}^- + H^+ \rightarrow [C_6H_5NO_2H]^{\cdot -}$	10	2.5×10^{10}	p.r.; Calcd. from p.b.k. during train of pulses (train length ~100 μs); both opt. and condy. methods.	710171
21	**Nitromethane anion**				
21.1	$CH_3NO_2^- + e_{aq}^- \rightarrow CH_3NO_2^{2-}$	10	$\sim 1 \times 10^{10}$	p.r.; D.k.; k has same order of magnitude as for $e_{aq}^- + CH_3NO_2 \rightarrow CH_3NO_2^-$.	710171
22	**Tryptophan radical cation**				
23.1	$TrpH^{\cdot +} + e_{aq}^- \rightarrow$		9×10^{10}	f.p.; Estd. from d.k.	79A110
23	**Tyrosine radical**				
24.1	TyrO· + $e_{aq}^- \rightarrow$		$\sim 3 \times 10^{10}$	f.p.; Radical by photoionization of tyrosine; d.k. of transients; data fitting assuming $k(e_{aq}^- + e_{aq}^-) = 1 \times 10^{10}$ and $k(e_{aq}^- +$ tyrosine$) = 3 \times 10^8$.	78A255
			7.5×10^{10}	f.p.; Estd. from d.k.	79A110

TABLE 6. Rate constants for reactions of hydrated electrons in aqueous solution

No.	Reaction	pH	k (L mol^{-1} s^{-1})	Comment	Ref.
1	**Silver(I) ion**				
	$e_{aq}^- + Ag^+ \rightarrow Ag^0$		*8.7 × 10^{10}*	Average of 5 values.	
			3.6 × 10^{10}	p.r.; D.k. at 640 nm; counterion SO_4^{2-}.	83R031
			4.5 × 10^{10}	p.r.; D.k. at 600 nm; concn. dependent; counterion ClO_4^-; k cor. for I.	76A251
		7	3.5 × 10^{10}	p.r.; D.k. at 720 nm as well as p.b.k. at 360 nm (Ag^0), counterion SO_4^{2-}.	680431
		7	3.2 × 10^{10}	p.r.; P.b.k. at 310 nm, as well as d.k. at 545 nm.	650393
		7	3.6 × 10^{10}	p.r.; D.k. at 578 nm.	630073
2	**Diamminesilver(I) ion**				
	$e_{aq}^- + Ag(NH_3)_2^+ \rightarrow Ag^0 + NH_3$		3.2 × 10^{10} [b]	p.r.; D.k. at 720 nm as well as p.b.k. at 360 nm (Ag^0), counterion SO_4^{2-}; soln. contains 0.1 mol L^{-1} NH_3.	680435
		11.1	8.0 × 10^{10} [b]	p.r.; D.k.; counterion ClO_4^-; soln. contains 0.2 mol L^{-1} NH_3.	650047
3	**Dicyanoargentate(I) ion**				
	$e_{aq}^- + Ag(CN)_2^- \rightarrow$	10	1.5 × 10^9	p.r.; D.k.; counterion ClO_4^-; contains 0.1 mol L^{-1} CN^-; cor. for matrix reaction.	650047
4	**Nitrilotriacetatoargentate(I) ion**				
	$e_{aq}^- + AgNTA^{2-} \rightarrow$	10.9	4.4 × 10^9	p.r; D.k. at 575 nm; counterion SO_4^{2-}; soln. contains 2 × 10^{-2} mol L^{-1} nitrilotriacetate ion.	690277
5	**Ethylenediaminetetraacetatoargentate(I) ion**				
	$e_{aq}^- + AgEDTA^{3-} \rightarrow$	11-12	1.6 × 10^9	p.r.; D.k. at 575 nm; counterion Na^+; $I = 0.2$.	690276
6	**Tetrakis(4-*N*-methylpyridyl)porphinatosilver(II) ion**				
	$e_{aq}^- + AgTMpyP^{4+} \rightarrow [AgTMpyP]^{\bullet 3+}$	7	1 × 10^{10}	p.r.; P.b.k. in soln. contg. 2-PrOH, initial fast reaction followed by slow grow-in due to 2-PrOH radical.	83C026
7	**Tetrakis(*p*-sulfonatophenyl)porphinatoargentate(II) ion**				
	$e_{aq}^- + AgTPPS^{4-} \rightarrow AgTPPS^{5-}$	8.7	1.6 × 10^{10}	p.r.; D.k. at 540 nm in soln. contg. 0.1 mol L^{-1} *tert*-BuOH and borate buffer.	81A247
8	**Tetrakis(*p*-sulfonatophenyl)porphinatoargentate(III) ion**				
	$e_{aq}^- + AgTPPS^{3-} \rightarrow AgTPPS^{4-}$	8.7	1.0 × 10^{10}	p.r.; D.k. in soln. contg. *tert*-BuOH.	81A247
9	**Aluminum(III)**				
	$e_{aq}^- + Al(OH)_3 \rightarrow$	6.8	2.0 × 10^9	p.r.; D.k., counterion ClO_4^-; $pK_h = 4.9$, 5.43, 5.86, 11.22.	650047
10	**Aluminate(III) ion**				
	$e_{aq}^- + Al(OH)_4^- \rightarrow$	14	5.5 × 10^6	p.r.; D.k.; counterion Na^+.	650047
11	**Tris(glycinato)aluminum(III)**				
	$e_{aq}^- + Al(Gly)_3 \rightarrow$	11.1	$<1.8 \times 10^7$	p.r.; D.k. at 575 nm; counterion SO_4^{2-}; soln. contains 10^{-1} mol L^{-1} glycine.	690277
12	**Nitrilotriacetatoaluminum(III)**				
	$e_{aq}^- + AlNTA \rightarrow$	10.9	$>1 \times 10^8$	p.r.; D.k. at 575 nm; soln. contains 2 × 10^{-2} mol L^{-1} nitrilotriacetic acid, 10^{-2} mol L^{-1} $Al_2(SO_4)_3$.	690277
13	**Bis(nitrilotriacetato)aluminate(III) ion**				
	$e_{aq}^- + Al(NTA)_2^{3-} \rightarrow$	10.9	$<2 \times 10^7$	p.r.; D.k. at 575 nm; soln. contains 2 × 10^{-2} mol L^{-1} nitrilotriacetic acid, 10^{-3} mol L^{-1} $Al_2(SO_4)_3$.	690277
14	**Ethylenediaminetetraacetatoaluminate(III) ion**				
	$e_{aq}^- + AlEDTA^- \rightarrow$	11-12	3.0 × 10^7	p.r.; D.k. at 575 nm; counterion Na^+; $I = 0.2$.	690276

TABLE 6. Rate constants for reactions of hydrated electrons in aqueous solution—Continued

No.	Reaction	pH	k (L mol^{-1} s^{-1})	Comment	Ref.
15	**Americium(III) ion**				
	$e_{aq}^- + Am^{3+} \rightarrow Am(II)$	5.8	1.6×10^8	p.r.; D.k. at 650 nm in He-satd. soln contg. (0.079-1.24) $\times 10^{-3}$ mol L^{-1} Am^{3+} and 0.1 mol L^{-1} *tert*-BuOH, and 0.11 mol L^{-1} $LiClO_4$; pK_h = 5.92, 10.7; I = 0.11.	78A044
		6	3×10^8	p.r.; P.b.k.; soln. contains 3×10^{-3} mol L^{-1} Am^{3+} and 0.1 mol L^{-1} *tert*-BuOH.	761232
16	**Dioxoamericium(V) ion**				
	$e_{aq}^- + AmO_2^+ \rightarrow Am(IV)$	6.0	3.2×10^{10}	p.r.; D.k. at 650 nm in He-satd. soln. contg. 0.1 mol L^{-1} *tert*-BuOH and 0.11 mol L^{-1} $LiClO_4$; at pH 5.2 $k = 2.8 \times 10^{10}$; I = 0.11.	78A044
17	**Dioxoamericium(VI) ion**				
	$e_{aq}^- + AmO_2^{2+} \rightarrow AmO_2^+$	6.0	3.9×10^{10}	p.r.; D.k. at 650 nm in He-satd. soln. contg. 0.1 mol L^{-1} *tert*-BuOH and 0.11 mol L^{-1} $LiClO_4$; at pH 5.3 $k = 3.1 \times 10^{10}$; I = 0.11.	78A044
18	**Arsenite(III) ion**				
	$e_{aq}^- + AsO_2^- \rightarrow$	10.6	5.5×10^6	p.r.; D.k.; counterion Na^+; at I = 0.0075 k_{obs} = 5.9×10^8; pK = 9.23.; k cor. for I.	680295
19	**Hydrogen arsenate(V) ion**				
	$e_{aq}^- + HAsO_4^{2-} \rightarrow$	11.0	1.9×10^8	p.r.; D.k.; counterion Na^+; at $I = 10^{-3}$ k_{obs} = 2.0×10^8; pK = 2.25, 6.77, 11.6.; k cor. for I.	680295
20	**Hexafluoroarsenate(V) ion**				
	$e_{aq}^- + AsF_6^- \rightarrow AsF_6^{2-}$		*9.5 × 10^9*	Average of 2 values.	
		9.2	1×10^{10}	p.r.; D.k. at 720 nm, as well as p.b.k. at 310 nm; contains 10^{-2} mol L^{-1} borax buffer.	761148
		7.0	9.0×10^9	p.r.; D.k.	650047
21	**Octafluorodi-μ-oxodiarsenate(V) ion**				
	$e_{aq}^- + As_2O_2F_8^{2-} \rightarrow$	9.2	$\sim 1 \times 10^{10}$	p.r.; D.k. at 720 nm; contains 10^{-2} mol L^{-1} borax buffer.	761148
22	**Dicyanoaurate(I) ion**				
	$e_{aq}^- + Au(CN)_2^- \rightarrow Au^0$	10.6	3.5×10^9	p.r.; D.k.; counterion K^+; at $I = 10^{-2}$ k_{obs} = 4.2×10^9; k cor. for I.	680295
		11	8.0×10^9	p.r.; P.b.k. at 410 nm; soln. contg. 10^{-3} mol L^{-1} NaOH; counterion K^+.	680302
23	**Boric acid**				
	$e_{aq}^- + H_3BO_3 \rightarrow H^\cdot + H_2BO_3^-$	6.7	$< 5 \times 10^3$	p.r.; D.k. at 700 nm gave a rate constant consistent with impurity such as nitrate; no pH dependence was found for the decay rate in deaerated solution contg. 0.5 mol L^{-1} boric acid.	87A045
24	**Decaborane(14)**				
	$e_{aq}^- + B_{10}H_{14} \rightarrow B_{10}H_{14}^-$		$> 2 \times 10^{10}$	p.r.; C.k.; H^+ competes if concn. $\geq 4 \times 10^{-4}$ mol L^{-1}.	761036
25	**Tetrafluoroborate(III) ion**				
	$e_{aq}^- + BF_4^- \rightarrow$	5.8	$< 2.3 \times 10^5$	p.r.; D.k.; counterion Na^+; at I = 0.2 k_{obs} = 4.0×10^5; k cor. for I.	680295
26	**Barium ion**				
	$e_{aq}^- + Ba^{2+} \rightarrow$		$< 5 \times 10^5$	p.r.; No effect of 0.02 mol L^{-1} metal ion on e_{aq}^- decay.	650044
27	**Bromine**				
	$e_{aq}^- + Br_2 \rightarrow$		5.3×10^{10}	p.r.; D.k. at 600 nm; detd. in Br_2-Br^- soln.	771005
28	**Tribromine ion**				
	$e_{aq}^- + Br_3^- \rightarrow$		2.7×10^{10}	p.r.; D.k. at 600 nm in soln. contg. 0.5 mol L^{-1} Br^-; k cor. for I.	771005

TABLE 6. Rate constants for reactions of hydrated electrons in aqueous solution—Continued

No.	Reaction	pH	k (L mol^{-1} s^{-1})	Comment	Ref.
29	**Hypobromite ion** $e_{aq}^- + BrO^- \rightarrow O^{\cdot -} + Br^-$	13	1.5×10^{10}	p.r.; D.k. at 600 nm; counterion Na^+; at $I = 0.1$ $k_{obs} = 2.3 \times 10^{10}$; see also [680152] for c.k. with N_2O giving $k = (1.2\text{-}2.5) \times 10^{10}$ at pH 10-14; k cor. for I.	680153
30	**Bromite ion** $e_{aq}^- + BrO_2^- \rightarrow BrO + O^{2-}$	13	1.1×10^{10}	p.r.; D.k. at 600 nm; counterions Na^+, BrO_3^-, Br^-; at $I = 0.1$ $k_{obs} = 1.8 \times 10^{10}$; k cor. for I.	680153
31	**Bromate ion** $e_{aq}^- + BrO_3^- \rightarrow BrO_3^{2-}$		*2.6 × 10^9*	Average of 3 values.	
		~7	3.4×10^9	p.r.; D.k. at 550 nm in soln. contg. 10^{-1} mol L^{-1} EtOH and 0.01, 0.1 and 1 mol L^{-1} $NaBrO_3$; k cor. for I.	700242
		13	2.3×10^9	p.r.; D.k. at 600 nm; counterion K^+; at $I = 0.1$ $k_{obs} = 4.1 \times 10^9$; k cor. for I.	680153
		7	2.1×10^9	p.r.; D.k.; counterion K^+.	650047
32	**Perbromate ion** $e_{aq}^- + BrO_4^- \rightarrow O^{\cdot -} + BrO_3^-$	~7	7.0×10^9	p.r.; D.k.; counterion K^+.	730106
33	**Carbon monoxide** $e_{aq}^- + CO \rightarrow CO^-$		*1.7 × 10^9*	Average of 2 values.	
		6.2	1.6×10^9	p.r.; D.k. in unbuffered soln.; same result in soln. contg. 0.1 mol L^{-1} NaCl and 0.1 mol L^{-1} MeOH.	78A004
			1.8×10^9	p.r.; D.k.	771107
34	**Carbon dioxide** $e_{aq}^- + CO_2 \rightarrow$	7	7.7×10^9	p.r.; D.k. at 578 nm in pres. of 10^{-3} mol L^{-1} MeOH, $[CO_2] = 50\text{-}200 \times 10^{-6}$ mol L^{-1}.	630073
35	**Bicarbonate ion** $e_{aq}^- + HCO_3^- \rightarrow$		$<1 \times 10^6$	p.r.; D.k.; concn. 10^{-3} mol L^{-1}, no OH scavenger added; see also [670218] for c.k. with CO_2 giving $k \approx 6 \times 10^5$.	640046
36	**Carbonate ion** $e_{aq}^- + CO_3^{2-} \rightarrow$	11.4	3.9×10^5	p.r.; D.k. in soln. contg. 0.1 mol L^{-1} *tert*-BuOH and 0.01 mol L^{-1} sodium carbonate.	81A148
37	**Cyanide ion** $e_{aq}^- + CN^- \rightarrow$		3×10^5	p.r.; D.k.; concn. of 0.125 or 0.25 mol L^{-1} KCN required to reduce lifetime of e_{aq}^-.	771115
38	**Cyanogen** $e_{aq}^- + C_2N_2 \rightarrow (CN)_2^-$	6	2.1×10^{10}	p.r.; D.k. (e_{aq}^-) as well as p.b.k. (adduct).	710038
39	**Thiocyanate ion** $e_{aq}^- + SCN^- \rightarrow$	~7	$<1 \times 10^6$	p.r.; D.k. (unreactive), concn. 2×10^{-4} mol L^{-1}, contg. 10^{-3} mol L^{-1} MeOH.	640046
40	**Cadmium(II) ion** $e_{aq}^- + Cd^{2+} \rightarrow Cd^+$		*5.4 × 10^{10}*	Average of 6 values.	
		6.1	4.8×10^{10}	p.r.; D.k. at 600 nm; counter ion SO_4^{2-}; $I = 1.8 \times 10^{-3}$.	751027
		6.1	6.0×10^{10}	p.r.; D.k.; k also detd. at 6.4 kbar (6.4×10^8 N/m^2); counter ion SO_4^{2-}.	720102
		4.4	6.4×10^{10}	p.r.; D.k. at 550 nm in soln. contg. 10^{-3} mol L^{-1} EtOH and 1 and 0.1 mol L^{-1} $CdSO_4$; k cor. for I.	700242
		6.0	5.1×10^{10}	p.r.; D.k. at 575 nm; $I = 4.0 \times 10^{-5}$.	690277
		7	5.2×10^{10}	p.r.; D.k.; counterion Cl^- or ClO_4^-.	650044
		6.5	4.8×10^{10}	p.r.; D.k.; counterion SO_4^{2-}.	650047

TABLE 6. Rate constants for reactions of hydrated electrons in aqueous solution—Continued

No.	Reaction	pH	k (L mol^{-1} s^{-1})	Comment	Ref.
41	**Tetraamminecadmium(II) ion**				
	$e_{aq}^- + Cd(NH_3)_4^{2+} \rightarrow$	6.5	3.1×10^{10}	p.r.; D.k.; contains 0.2 mol L^{-1} NH_3, counterion SO_4^{2-}.	650047
42	**Ethylenediaminecadmium(II) ion**				
	$e_{aq}^- + Cd(en)^{2+} \rightarrow$	~9	6.3×10^{10}	p.r.; D.k. at 575 nm; $I = \sim 10^{-4}$; k cor. for I.	690277
43	**Bis(ethylenediamine)cadmium(II) ion**				
	$e_{aq}^- + Cd(en)_2^{2+} \rightarrow$	~10	4.4×10^{10}	p.r.; D.k. at 575 nm; $I = \sim 10^{-3}$; k cor. for I.	690277
44	**Tris(ethylenediamine)cadmium(II) ion**				
	$e_{aq}^- + Cd(en)_3^{2+} \rightarrow$	~11	6.8×10^{9}	p.r.; D.k. at 575 nm; $I = \sim 10^{-1}$; k cor. for I.	690277
45	**1,4,8,11-Tetraazacyclotetradecanecadmium(II) ion**				
	$e_{aq}^- + Cd(cyclam)^{2+} \rightarrow Cd(cyclam)^+$		2.8×10^{10}	p.r.; D.k. at 600 nm in He-satd. soln. contg. 0.09 mol L^{-1} *tert*-BuOH.	80A380
46	**Chlorocadmium(II) ion**				
	$e_{aq}^- + CdCl^+ \rightarrow$	6.8	1.1×10^{10}	p.r.; D.k.; contains 1.0 mol L^{-1} Cl^- as well as $CdCl_2(H_2O)_2$ and $CdCl_3(H_2O)^-$, counterion SO_4^{2-}.	650047
47	**Tetraiodocadmate(II) ion**				
	$e_{aq}^- + CdI_4^{2-} \rightarrow$	7.2	1.6×10^{10}	p.r.; D.k.; contains 0.2 mol L^{-1} I^-, counterion SO_4^{2-}.	650047
48	**Tetracyanocadmate(II) ion**				
	$e_{aq}^- + Cd(CN)_4^{2-} \rightarrow$	10	1.4×10^{8}	p.r.; D.k.; contains 0.1 mol L^{-1} CN^-, counterions SO_4^{2-}, K^+.	650047
49	**Glycinatocadmium(II) ion**				
	$e_{aq}^- + Cd(Gly)^+ \rightarrow$	~9	1.8×10^{10}	p.r.; D.k. at 575 nm; counterion SO_4^{2-}; $I = \sim 10^{-4}$.	690277
50	**Bis(glycinato)cadmium(II)**				
	$e_{aq}^- + Cd(Gly)_2 \rightarrow$	~10	1.4×10^{10}	p.r.; D.k. at 575 nm; counterion SO_4^{2-}; $I = \sim 10^{-3}$.	690277
51	**Tris(glycinato)cadmate(II) ion**				
	$e_{aq}^- + Cd(Gly)_3^- \rightarrow$	~11	4.8×10^{9}	p.r.; D.k. at 575 nm; counterion SO_4^{2-}; $I = \sim 10^{-1}$; k cor. for I.	690277
52	**Bis(nitrilotriacetato)cadmate(II) ion**				
	$e_{aq}^- + Cd(NTA)_2^{4-} \rightarrow$	10.9	$<2.3 \times 10^{7}$	p.r.; D.k. at 575 nm; counterion SO_4^{2-}, soln. contains 2×10^{-2} mol L^{-1} nitrilotriacetic acid.	690277
53	**Ethylenediaminetetraacetatocadmate(II) ion**				
	$e_{aq}^- + CdEDTA^{2-} \rightarrow CdEDTA^{3-}$	11.5	2.0×10^{8}	p.r.; D.k. in buffered soln. contg. 0.5% *n*-BuOH; product identified in [80A072]; $I = 0.016$.	77A252
		11-12	3.9×10^{8}	p.r.; D.k. at 575 nm; counterion Na^+; $I = 0.2$.	690276
54	**Cyclohexanediaminetetraacetatocadmate(II) ion**				
	$e_{aq}^- + CdCDTA^{2-} \rightarrow CdCDTA^{3-}$	11	1×10^{8}	p.r.; D.k.; soln. contg. SO_4^{2-} and *n*-BuOH; product identified by opt. spectra; $I = 0.01$.	80A072
55	**Tetrakis(4-*N*-methylpyridyl)porphinatocadmium(II) ion**				
	$e_{aq}^- + CdTMpyP^{1+} \rightarrow [CdTMpyP]^{\cdot 3+}$	7	1×10^{10}	p.r.; P.b.k. in soln. contg. 2-PrOH, initial fast reaction followed by slow grow-in due to 2-PrOH radical.	83C026
56	**Tetrakis(*p*-sulfonatophenyl)porphinatocadmate(II) ion**				
	$e_{aq}^- + CdTPPS^{4-} \rightarrow [CdTPPS]^{\cdot 5-}$	7	1×10^{10}	p.r.; P.b.k. in soln. contg. 2-PrOH, initial fast reaction followed by slow grow-in due to 2-PrOH radical.	83C026
57	**Cerium(III) ion**				
	$e_{aq}^- + Ce^{3+} \rightarrow$		$<1 \times 10^{9}$	p.r.; D.k.	640132
58	**Ethylenediaminetetraacetatocerate(III) ion**				
	$e_{aq}^- + CeEDTA^- \rightarrow$	11.5	$<3.2 \times 10^{7}$	p.r.; D.k. at 575 nm; counterion Na^+; $I = 0.2$.	690276

TABLE 6. Rate constants for reactions of hydrated electrons in aqueous solution—Continued

No.	Reaction	pH	k (L mol^{-1} s^{-1})	Comment	Ref.
59	**Californium(III) ion**				
	$e_{aq}^- + Cf^{3+} \rightarrow Cf(II)$	5.3	$>3 \times 10^9$	p.r.; D.k. in soln. contg. 5×10^{-4} mol L^{-1} $Cf(ClO_4)_3$ and 0.1 mol L^{-1} *tert*-BuOH.	83A171
60	**Chloride ion**				
	$e_{aq}^- + Cl^- \rightarrow$	~7	$<1 \times 10^6$	p.r.; D.k. (unreactive), concn. 10^{-3} mol L^{-1}.	640046
61	**Hypochlorite ion**				
	$e_{aq}^- + ClO^- \rightarrow O^{\bullet -} + Cl^-$		*7.2 × 10^9*	Average of 2 values.	
		9.2	7.3×10^9	p.r.; D.k. at 700 nm in soln. contg. 10^{-2} mol L^{-1} borax and $1\text{-}6 \times 10^{-4}$ mol L^{-1} ClO^-; $k_{obs} = 9.8 \times 10^9$; k cor. for I.	87A902
		10.2	7.0×10^9	p.r.; D.k.; counterion Na^+; at $I = 10^{-3}$, $k_{obs} = 7.2 \times 10^9$; k cor. for I.	680295
62	**Chlorite ion**				
	$e_{aq}^- + ClO_2^- \rightarrow O^{\bullet -} + ClO^-$	10	2.5×10^9	p.r.; D.k. at 690 or 560 nm in Ar-satd. soln.; dose dependent; k calcd. from slope of plot of $[ClO_2^-]$ vs. k_{obs} at 600 krad per pulse.	81A242
63	**Chlorate ion**				
	$e_{aq}^- + ClO_3^- \rightarrow$		$<1 \times 10^6$	p.r.; Solute has no effect on d.k. of e_{aq}^-.	720301
64	**Perchlorate ion**				
	$e_{aq}^- + ClO_4^- \rightarrow$	~10	$<1 \times 10^6$	p.r.; D.k.; concn. 10^{-2} mol L^{-1}.	640046
			$<1 \times 10^6$	p.r.	640132
65	**Cobalt(II) ions**				
	$e_{aq}^- + Co^{2+} \rightarrow Co^+$		1.3×10^{10}	p.r.; D.k. at 578 nm; deaerated soln. contg. 10^{-2} mol L^{-1} MeOH; counterion SO_4^{2-}.	761136
			6.6×10^9	p.r.; D.k. at 600 nm; counterion SO_4^{2-}; $I = 3.3 \times 10^{-3}$.	751027
		4.0	9.5×10^9	p.r.; D.k. at 550 nm in soln. contg. 10^{-3} mol L^{-1} EtOH and 1 mol L^{-1} $Co(ClO_4)_2$; k cor. for I.	700242
			1.2×10^{10}	p.r.; D.k.; k detd. at 19.5 and 73 °C.	650044
66	**2,2′-Bipyridinecobalt(II) ion**				
	$e_{aq}^- + Co(bpy)^{2+} \rightarrow Co(bpy)^+$		3.5×10^{10}	p.r.; D.k. at 650 nm in soln. contg. 5×10^{-5} mol L^{-1} Co^{2+}, 0.15 mol L^{-1} EtOH and 0.005 mol L^{-1} phosphate buffer and varied [bpy].	85A034
67	**Bis(2,2′-bipyridine)cobalt(II) ion**				
	$e_{aq}^- + Co(bpy)_2^{2+} \rightarrow Co(bpy)_2^+$		5.3×10^{10}	p.r.; D.k. at 650 nm in soln. contg. 5×10^{-5} mol L^{-1} Co^{2+}, 0.15 mol L^{-1} EtOH and 0.005 mol L^{-1} phosphate buffer and varied [bpy]	85A034
68	**Tris(2,2′-bipyridine)cobalt(II) ion**				
	$e_{aq}^- + Co(bpy)_3^{2+} \rightarrow Co(bpy)_3^+$		7.1×10^{10}	p.r.; D.k. at 650 nm in soln. contg. 5×10^{-5} mol L^{-1} Co^{2+}, 0.15 mol L^{-1} EtOH and 0.005 mol L^{-1} phosphate buffer and varied [bpy].	85A034
69	**4,4′-Dimethyl-2,2′-bispyridinecobalt(II) ion**				
	$e_{aq}^- + Co(dmb)_n^{2+} \rightarrow Co(dmb)_n^+$	5-7	$>3 \times 10^{10}$	p.r.; P.b.k. in soln. contg. $(0.3\text{-}10) \times 10^{-4}$ mol L^{-1} of both $CoSO_4$ and 4,4′-$(CH_3)_2$bpy and 0.1 mol L^{-1} 2-PrOH; $n>1$.	82A278
70	**5,7,7,12,14,14-Hexamethyl-1,4,8,11-tetraazacyclotetradeca-4,11-dienecobalt(II) ion**				
	$e_{aq}^- + Co(4,11\text{-dieneN}_4)^{2+} \rightarrow Co(4,11\text{-dieneN}_4)^+$		*4.4 × 10^{10}*	Average of 2 values.	
			4.4×10^{10}	p.r.; D.k. at 600 nm.	78A200
		6-10	4.4×10^{10}	p.r.; D.k. at 700 and 500 nm in Ar-satd. soln. contg. 1 mol L^{-1} *tert*-BuOH and phosphate or borate buffer.	761001

TABLE 6. Rate constants for reactions of hydrated electrons in aqueous solution—Continued

No.	Reaction	pH	k (L mol^{-1} s^{-1})	Comment	Ref.
71	**5,7,7,12,12,14-Hexamethyl-1,4,8,11-tetraazacyclotetradeca-4,14-dienecobalt(II) ion**				
	$e_{aq}^- + Co(4,14\text{-dieneN}_4)^{2+} \rightarrow$	6-10	3.4×10^{10}	p.r.; D.k. at 700 and 500 nm in Ar-satd. soln. contg. 1 mol L^{-1} *tert*-BuOH and phosphate or borate buffer; pK of the diene 10, 11.	761001
72	**2,3,9,10-Tetramethyl-1,4,8,11-tetraazacyclotetradeca-1,3,8,10-tetraenecobalt(II) ion**				
	$e_{aq}^- + Co(1,3,8,10\text{-tetraeneN}_4)^{2+} \rightarrow$	6-10	4.9×10^{10}	p.r.; D.k. at 700 and 500 nm in Ar-satd. soln. contg. 1 mol L^{-1} *tert*-BuOH and phosphate or borate buffer.	761001
73	**Pentacyanocobaltate(II) ion**				
	$e_{aq}^- + Co(CN)_5^{3-} \rightarrow Co(CN)_5^{4-}$		*1.9 × 10^{10}*	Average of 2 values.	
		~13	1.2×10^{10}	p.r.; D.k. at 578 nm in soln. contg. 10^{-2} mol L^{-1} *tert*-BuOH and ~10^{-5} mol L^{-1} complex and 0-3 × 10^{-4} mol L^{-1} CN^- under 1 atm H_2; $k_H/k_D \simeq 1.2$.	710097
		13	1.4×10^{10}	p.r.; D.k. at 578 nm; k is the same in D_2O soln.	690443
74	**Pentacyano(nitrosyl)cobaltate(II) ion**				
	$e_{aq}^- + Co(CN)_5NO^{3-} \rightarrow$		8.6×10^9	γ-r.; C.k.; counterion K^+; rel. to $k(e_{aq}^- + NO_3^-)$.	710407
75	**Nitrilotriacetatocobaltate(II) ion**				
	$e_{aq}^- + CoNTA^- \rightarrow CoNTA^{2-}$	7	9.6×10^8	p.r.; D.k. as well as p.b.k. at 360 nm in soln. contg. phosphate buffer and *tert*-BuOH or formate ion.	79A255
76	**Bis(nitrilotriacetato)cobaltate(II) ion**				
	$e_{aq}^- + Co(NTA)_2^{4-} \rightarrow$	10.9	$<1.4 \times 10^8$	p.r.; D.k. at 575 nm; counterion SO_4^{2-}; contains 2 × 10^{-2} mol L^{-1} nitrilotriacetic acid.	690277
77	**Ethylenediaminetetraacetatocobaltate(II) ion**				
	$e_{aq}^- + CoEDTA^{2-} \rightarrow$	11.5	$<5.6 \times 10^8$	p.r.; D.k. in buffered soln. contg. 0.5% *n*-BuOH; $I = 0.019$.	77A252
		11-12	$<5.2 \times 10^8$	p.r.; D.k. at 575 nm; counterion Na^+; $I = 0.2$.	690276
78	**Tetrakis(*p*-sulfonatophenyl)porphinatocobaltate(II) ion**				
	$e_{aq}^- + CoTPPS^{4-} \rightarrow CoTPPS^{5-}$	8	1.2×10^{10}	p.r.; D.k. at ~600 nm in soln. contg. 1.5 mol L^{-1} 2-PrOH; rapid e_{aq}^- decay followed by slower reaction.	83A088
79	**Hydroxytetrakis(*p*-sulfonatophenyl)porphinatocobaltate(II) ion**				
	$e_{aq}^- + (HO)CoTPPS^{5-} \rightarrow (HO)CoTPPS^{6-}$	13	1.4×10^{10}	p.r.; D.k. at ~600 nm in soln. contg. 1.5 mol L^{-1} 2-PrOH; rapid e_{aq}^- decay followed by slower reaction.	83A088
80	**3,10,17,24-Tetrasulfophthalocyaninecobaltate(II) ion dimer**				
	$e_{aq}^- + [Co(pts)]_2^{8-} \rightarrow Co(tspc)^{5-}$		*3.2 × 10^9*	Average of 2 values.	
		9	3.0×10^9	p.r.; D.k. at 570 nm in soln. contg. *tert*-BuOH; cor. for radical reaction.	80A146
		9	3.3×10^9	p.r.; P.b.k. at 460 nm; cor. for OH reaction; soln. N_2-satd.	80A146
81	**Hexaamminecobalt(III) ion**				
	$e_{aq}^- + Co(NH_3)_6^{3+} \rightarrow$		*8.7 × 10^{10}*	Average of 5 values.	
		~7	8.8×10^{10}	p.r.; D.k. at 690 nm, counterion Cl^-; soln. contains < 10^{-3} mol L^{-1} H_2.	690186
		5-6	8.5×10^{10}	p.r.; D.k. at 575 nm, counterion ClO_4^-.	690428
		6.7	8.2×10^{10}	p.r.; D.k.; counterion ClO_4^-; $I = 6 \times 10^{-5}$; k cor. for I.	680295
		11.1	9.0×10^{10}	p.r.; D.k.; counterion ClO_4^-; soln. contains 0.2 mol L^{-1} NH_3.	650047
			9.0×10^{10}	p.r.; D.k.; counterion ClO_4^-; k detd. at 21 and 77.5 °C.	650044

TABLE 6. Rate constants for reactions of hydrated electrons in aqueous solution—Continued

No.	Reaction	pH	k (L mol^{-1} s^{-1})	Comment	Ref.
82	**Pentaamminecobalt(III) ion**				
	$e_{aq}^- + Co(NH_3)_5^{3+} \rightarrow$		*6.8 × 10^{10}*	Average of 3 values.	
		10.0	6.0 × 10^{10}	p.r.; D.k. at 575 nm, counterion ClO_4^-.	690428
		4.9	8.2 × 10^{10}	p.r.; D.k.; counterion ClO_4^-; $I = 6 \times 10^{-5}$, $k_{obs} = 8.1 \times 10^{10}$; k cor. for I.	680295
			6.2 × 10^{10}	p.r.; D.k.; counterion ClO_4^-.	650044
83	**Tetraamminecobalt(III) ion**				
	$e_{aq}^- + Co(NH_3)_4^{3+} \rightarrow$		4.4 × 10^{10}	p.r.; D.k.; counterion ClO_4^-.	650044
84	**Tris(ethylenediamine)cobalt(III) ion**				
	$e_{aq}^- + Co(en)_3^{3+} \rightarrow$		*8.0 × 10^{10}*	Average of 3 values.	
		5-6	8.5 × 10^{10}	p.r.; D.k. at 575 nm, counterion Cl^-; pK of ligand 6.8, 9.9.	690428
		6.55	7.3 × 10^{10}	p.r.; D.k.; counterion Cl^-.	650018
			8.2 × 10^{10}	p.r.; D.k.; counterion ClO_4^-.	650044
85	**Bis(diethylenetriamine)cobalt(III) ion**				
	$e_{aq}^- + Co(dien)_2^{3+} \rightarrow$	~7	7.6 × 10^{10}	p.r.; D.k. at 690 nm; counterion Cl^-; soln. contains $< 10^{-3}$ mol L^{-1} H_2; $I = 10^{-4}$.	690186
86	**Hydroxy(5,7,7,12,14,14-hexamethyl-1,4,8,11-tetraazacyclotetradeca-4,11-diene)cobalt(III) ion**				
	$e_{aq}^- + Co(4,11\text{-dieneN}_4)OH^{2+} \rightarrow Co(4,11\text{-dieneN}_4)OH^+$	6.5	5.0 × 10^{10}	p.r.; D.k. at 700 nm in soln. contg. 1 mol L^{-1} *tert*-BuOH; pK of ligand ~10, 11.	761203
87	**Dihydroxy(5,7,7,12,14,14-hexamethyl-1,4,8,11-tetraazacyclotetradeca-4,11-diene)cobalt(III) ion**				
	$e_{aq}^- + Co(4,11\text{-dieneN}_4)(OH)_2^+ \rightarrow Co(4,11\text{-dieneN}_4)(OH)_2$	11.0	3.9 × 10^{10}	p.r.; D.k. at 700 nm in soln. contg. 1 mol L^{-1} *tert*-BuOH.	761203
88	**Hydroxy(2,3,9,10-tetramethyl-1,4,8,11-tetraazacyclotetradeca-1,3,8,10-tetraene)cobalt(III) ion**				
	$e_{aq}^- + Co(tetraeneN_4)OH^{2+} \rightarrow Co(tetraeneN_4)OH^+$	6.5	5.0 × 10^{10}	p.r.; D.k. at 700 nm in soln. contg. 1 mol L^{-1} *tert*-BuOH.	761203
89	**Dihydroxy(2,3,9,10-tetramethyl-1,4,8,11-tetraazacyclotetradeca-1,3,8,10-tetraene)cobalt(III) ion**				
	$e_{aq}^- + Co(tetraeneN_4)(OH)_2^+ \rightarrow Co(tetraeneN_4)(OH)_2$	10.0	4.1 × 10^{10}	p.r.; D.k. at 700 nm in soln. contg. 1 mol L^{-1} *tert*-BuOH.	761203
90	**Tris(2,2'-bipyridine)cobalt(III) ion**				
	$e_{aq}^- + Co(bpy)_3^{3+} \rightarrow Co(bpy)_3^{2+}$		*8.3 × 10^{10}*	Average of 2 values.	
		6.9	8.3 × 10^{10}	p.r.; D.k. at 700 nm in Ar-satd. soln. contg. 0.1 mol L^{-1} *tert*-BuOH.	79A034
		~7	8.3 × 10^{10}	p.r.; D.k. at 690 nm; counterion ClO_4^-; soln. contains $< 10^{-3}$ mol L^{-1} H_2.	690186
91	**Tris(terpyridine)cobalt(III) ion**				
	$e_{aq}^- + Co(terpy)_3^{3+} \rightarrow$		6.5 × 10^{10}	p.r.; P.b.k. in soln. contg. 10^{-4} mol L^{-1} complex and 0.5 mol L^{-1} *tert*-BuOH; obs. transient precursor to $Co(terpy)_2^{2+}$.	720381
92	**Tris(1,10-phenanthroline)cobalt(III) ion**				
	$e_{aq}^- + Co(phen)_3^{3+} \rightarrow$	~7	7.5 × 10^{10}	p.r.; D.k. at 690 nm; counterion ClO_4^-; soln. contains $< 10^{-3}$ mol L^{-1} H_2.	690186
93	**Pentaammine(imidazole)cobalt(III) ion**				
	$e_{aq}^- + (NH_3)_5CoImH^{3+} \rightarrow (NH_3)_5CoImH^{2+}$		6.8 × 10^{10}	p.r.; D.k. at 580 in N_2-purged soln. contg. 0.1 mol L^{-1} *tert*-BuOH.	83A270
94	**Pentaamminebromocobalt(III) ion**				
	$e_{aq}^- + Co(NH_3)_5Br^{2+} \rightarrow$		*7.1 × 10^{10}*	Average of 2 values.	
		5-6	8.0 × 10^{10}	p.r.; D.k. at 575 nm, counterion ClO_4^-.	690428
		7.7	6.2 × 10^{10}	p.r.; D.k.; counterion ClO_4^-; $I = 4 \times 10^{-5}$.	680295
95	**Pentaamminechlorocobalt(III) ion**				
	$e_{aq}^- + Co(NH_3)_5Cl^{2+} \rightarrow$		*6.4 × 10^{10}*	Average of 3 values.	
		5-6	7.8 × 10^{10}	p.r.; D.k. at 575 nm, counterion ClO_4^-.	690428
		7.3	6.1 × 10^{10}	p.r.; D.k.; counterion ClO_4^-; $I = 4 \times 10^{-5}$.	680295

TABLE 6. Rate constants for reactions of hydrated electrons in aqueous solution—Continued

No.	Reaction	pH	k (L mol^{-1} s^{-1})	Comment	Ref.
95	**Pentaamminechlorocobalt(III) ion**—Continued				
			5.4×10^{10}	p.r.; D.k.; counterion ClO_4^-.	650044
96	***cis*-Amminechlorobis(ethylenediamine)cobalt(III) ion**				
	$e_{aq}^- + cis\text{-}Co(en)_2(NH_3)Cl^{2+} \rightarrow$	5-6	6.6×10^{10}	p.r.; D.k. at 575 nm; pK of ligand 6.8, 9.9.	690428
97	**Bis(ethylenediamine)dichlorocobalt(III) ion**				
	$e_{aq}^- + Co(en)_2Cl_2^+ \rightarrow$		3.2×10^{10}	p.r.; D.k.; counterion ClO_4^-.	650044
98	***cis*-Dichlorobis(ethylenediamine)cobalt(III) ion**				
	$e_{aq}^- + cis\text{-}Co(en)_2Cl_2^+ \rightarrow$	5-6	7.3×10^{10}	p.r.; D.k. at 575 nm, counterion ClO_4^-; pK of ligand 6.8, 9.9.	690428
99	***trans*-Dichlorobis(ethylenediamine)cobalt(III) ion**				
	$e_{aq}^- + trans\text{-}Co(en)_2Cl_2^+ \rightarrow$		*7.4×10^{10}*	Average of 2 values.	
		5-6	7.7×10^{10}	p.r.; D.k. at 575 nm, counterion Cl^-.	690428
		5.55	7.1×10^{10}	p.r.; D.k.; counterion NO_3^-; k cor. for NO_3^-.	650018
100	**Pentaamminefluorocobalt(III) ion**				
	$e_{aq}^- + Co(NH_3)_5F^{2+} \rightarrow$	5-6	6.6×10^{10}	p.r.; D.k. at 575 nm, counterion ClO_4^-.	690428
101	**Bis(ethylenediamine)fluorocobalt(III) ion**				
	$e_{aq}^- + Co(en)_2(H_2O)F^{2+} \rightarrow$	5-6	6.3×10^{10}	p.r.; D.k. at 575 nm; pK of ligand 6.8, 9.9.	690428
102	***cis*-Bis(ethylenediamine)difluorocobalt(III) ion**				
	$e_{aq}^- + cis\text{-}Co(en)_2F_2^+ \rightarrow$	5-6	4.9×10^{10}	p.r.; D.k. at 575 nm.	690428
103	**Pentaammine(azido)cobalt(III) ion**				
	$e_{aq}^- + Co(NH_3)_5N_3^{2+} \rightarrow$		*6.7×10^{10}*	Average of 2 values.	
		5-6	7.2×10^{10}	p.r.; D.k. at 575 nm; counterion ClO_4^-.	690428
		6.3-8.2	6.3×10^{10}	p.r.; D.k.; counterion ClO_4^-; $I = 4 \times 10^{-5}$.	680295
104	**Carbonatobis(ethylenediamine)cobalt(III) ion**				
	$e_{aq}^- + Co(en)_2CO_3^+ \rightarrow$		*4.8×10^{10}*	Average of 2 values.	
		5-6	4.8×10^{10}	p.r.; D.k. at 575 nm; pK of ligand 6.8, 9.9.	690428
		7.2	4.9×10^{10}	p.r.; D.k.; counterion ClO_4^-; $I = 2 \times 10^{-5}$.	680295
105	**Tetraammine(aqua)cyanocobalt(III) ion**				
	$e_{aq}^- + Co(NH_3)_4(H_2O)CN^{2+} \rightarrow$	6.1	5.6×10^{10}	p.r.; D.k.; counterion ClO_4^-; $I = 4 \times 10^{-5}$.	680295
106	**Pentaamminecyanocobalt(III) ion**				
	$e_{aq}^- + Co(NH_3)_5CN^{2+} \rightarrow$		*6.9×10^{10}*	Average of 2 values.	
		5-6	7.4×10^{10}	p.r.; D.k. at 575 nm, counterion ClO_4^-.	690428
		6.1	6.3×10^{10}	p.r.; D.k.; counterion ClO_4^-; $I = 4 \times 10^{-5}$.	680295
107	**(Aqua)pentacyanocobaltate(III) ion**				
	$e_{aq}^- + Co(CN)_5H_2O^{2-} \rightarrow$	7	1.2×10^{10}	p.r.; D.k. at 578 nm; counterion K^+; p$K \simeq 10$.	710364
108	**Pentacyano(hydroxy)cobaltate(III) ion**				
	$e_{aq}^- + Co(CN)_5OH^{3-} \rightarrow$		*1.2×10^{10}*	Average of 2 values.	
		13	1.2×10^{10}	p.r.; D.k. at 578 nm in H_2-satd. soln. contg. MeOH; counterion K^+.	710364
			1.1×10^{10}	p.r.; D.k.	650044
109	**Pentacyano(hydrido)cobaltate(III) ion**				
	$e_{aq}^- + Co(CN)_5H^{3-} \rightarrow$	13	6.7×10^{9}	p.r.; D.k. at 578 nm in H_2-satd. soln.; counterion K^+.	710364
110	**(Azido)pentacyanocobaltate(III) ion**				
	$e_{aq}^- + Co(CN)_5N_3^{3-} \rightarrow$		1.3×10^{10}	p.r.; D.k.	650044
111	**(Chloro)pentacyanocobaltate(III) ion**				
	$e_{aq}^- + Co(CN)_5Cl^{3-} \rightarrow$		1.8×10^{10}	p.r.; D.k.	650044
112	**Pentacyano(iodo)cobaltate(III) ion**				
	$e_{aq}^- + Co(CN)_5I^{3-} \rightarrow$	7	2.1×10^{10}	p.r.; D.k. at 478 nm; H_2-satd.; contains formate ion; counterion K^+.	710364

TABLE 6. Rate constants for reactions of hydrated electrons in aqueous solution—Continued

No.	Reaction	pH	k (L mol^{-1} s^{-1})	Comment	Ref.
113	**Pentacyano(nitro)cobaltate(III) ion**				
	$e_{aq}^- + Co(CN)_5NO_2^{3-} \rightarrow$		8.0×10^9	p.r.; D.k.	650044
114	**Hexacyanocobaltate(III) ion**				
	$e_{aq}^- + Co(CN)_6^{3-} \rightarrow Co(CN)_6^{4-}$		*4.6 × 10⁹*	Average of 3 values.	
		7	3.3×10^9	p.r.; D.k. at 578 nm in soln. contg. 0.2 mol L^{-1} *tert*-BuOH.	731087
		7, 13	5.4×10^9	p.r.; D.k. at 578 nm in H_2-satd. soln. contg. MeOH; counterion K^+.	710364
		13	5.0×10^9	p.r.; D.k. at 578 nm; contains ~0.1 mol L^{-1} H_2; two distinct transients were observed (~50% each)	690443
115	***cis*-Nitroamminebis(ethylenediamine)cobalt(III) ion**				
	$e_{aq}^- +$ *cis*-$Co(en)_2(NH_3)NO_2^{2+} \rightarrow$	5-6	6.6×10^{10}	p.r.; D.k. at 575 nm; pK of ligand 6.8, 9.9.	690428
116	**Hexanitrocobaltate(III) ion**				
	$e_{aq}^- + Co(NO_2)_6^{3-} \rightarrow$		5.8×10^{10}	p.r.; D.k.; counterion K^+.	650044
117	**Pentaammine(thiocyanato-*N*)cobalt(III) ion**				
	$e_{aq}^- + Co(NH_3)_5NCS^{2+} \rightarrow$	5-6	7.3×10^{10}	p.r.; D.k. at 575 nm, counterion SO_4^{2-}.	690428
118	***cis*-Bis(thiocyanato-*N*)bis(ethylenediamine)cobalt(III) ion**				
	$e_{aq}^- +$ *cis*-$Co(en)_2(NCS)_2^+ \rightarrow$	6.00	6.9×10^{10}	p.r.; D.k.; counterion SCN^-; pK of ligand 6.8, 9.9.	650018
119	***trans*-Bis(thiocyanato-*N*)bis(ethylenediamine)cobalt(III) ion**				
	$e_{aq}^- +$ *trans*-$Co(en)_2(NCS)_2^+ \rightarrow$	6.50	5.4×10^{10}	p.r.; D.k.; counterion Cl^-.	650018
120	**Penta(cyano-*C*)(thiocyanato-*N*)cobaltate(III) ion**				
	$e_{aq}^- + Co(CN)_5NCS^{3-} \rightarrow$	7	1.6×10^{10}	p.r.; D.k. at 478 nm in H_2-satd. soln.; contains formate ion; counterion $(C_4H_9)_4N^+$.	710364
121	**Pentaammine(formato)cobalt(III)**				
	$e_{aq}^- + Co(NH_3)_5O_2CH^{2+} \rightarrow Co^{2+} + HCO_2^- + NH_3$	6	~5×10^{10}	Estd. from obs. $G(Co^{2+}) = 1.3$ in O_2-satd. soln. contg. 5×10^{-4} mol L^{-1} complex and 0.5 mol L^{-1} Na formate.	79A250
122	**(Acetato)pentaamminecobalt(III) ion**				
	$e_{aq}^- + Co(NH_3)_5O_2CCH_3^{2+} \rightarrow$	5-6	7.3×10^{10}	p.r.; D.k. at 575 nm, counterion ClO_4^-.	690428
123	**Pentaammine(fumarato)cobalt(III) ion**				
	$e_{aq}^- + Co(NH_3)_5fum^+ \rightarrow$	5-6	6.5×10^{10}	p.r.; D.k. at 575 nm, counterion ClO_4^-.	690428
124	**Trioxalatocobaltate(III) ion**				
	$e_{aq}^- + Co(C_2O_4)_3^{3-} \rightarrow$		1.2×10^{10}	p.r.; D.k.	650044
125	**Pentaammine(2-nitrobenzoato)cobalt(III) ion**				
	$e_{aq}^- + o\text{-}O_2NC_6H_4CO_2Co(NH_3)_5^{2+} \rightarrow$		8×10^{10}	p.r.; D.k.	771027
126	**Pentaammine(3-nitrobenzoato)cobalt(III) ion**				
	$e_{aq}^- + m\text{-}O_2NC_6H_4CO_2Co(NH_3)_5^{2+} \rightarrow$		8.0×10^{10}	p.r.; D.k.	771027
127	**Pentaammine(4-nitrobenzoato)cobalt(III) ion (PNBPA)**				
	$e_{aq}^- + p\text{-}O_2NC_6H_4CO_2Co(NH_3)_5^{2+} \rightarrow$		8.0×10^{10}	p.r.; D.k.	771027
128	**Pentaammine(2,4-dinitrobenzoato)cobalt(III) ion**				
	$e_{aq}^- + Co(NH_3)_5O_2CC_6H_3(NO_2)_2^{2+} \rightarrow$		8.0×10^{10}	p.r.; D.k.	771027
129	**Pentaammine(3,5-dinitrobenzoato)cobalt(III) ion**				
	$e_{aq}^- + Co(NH_3)_5O_2CC_6H_3(NO_2)_2^{2+} \rightarrow$		8.0×10^{10}	p.r.; D.k.	771027
130	**Pentaammine(terephthalato)cobalt(III) ion**				
	$e_{aq}^- + Co(NH_3)_5terephthal^+ \rightarrow$		6×10^{10}	p.r.; D.k.	640045

TABLE 6. Rate constants for reactions of hydrated electrons in aqueous solution—Continued

No.	Reaction	pH	k (L mol^{-1} s^{-1})	Comment	Ref.
131	**Bis(iminodiacetato)cobaltate(III) ion**				
	$e_{aq}^- + Co(IDA)_2^- \rightarrow Co(IDA)_2^{2-}$	7	2.3×10^{10}	γ-r.; C.k. in soln. contg. $NaNO_3$; value of reference rate not given; rel. to $k(e_{aq}^- + NO_3^-)$.	78G090
132	**Nitrilotriacetatocobaltate(III)**				
	$e_{aq}^- + CoNTA \rightarrow CoNTA^-$	6	1.0×10^{10}	γ-r.; C.k., obs. $G(-CoNTA)$ in aerated soln. contg. various $[NO_3^-]$; rel. to $k(e_{aq}^- + NO_3^-)$.	770170
133	**Ethylenediaminetetraacetatocobaltate(III) ion**				
	$e_{aq}^- + CoEDTA^- \rightarrow CoEDTA^{2-}$		*2.9 × 10^{10}*	Average of 2 values.	
		11-12	2.9×10^{10}	p.r.; D.k. at 575 nm; counterion Na^+; $I = 0.2$.	690276
			2.9×10^{10}	p.r.; D.k.	650044
134	**Tris(acetylacetonato)cobalt(III)**				
	$e_{aq}^- + Co(acac)_3 \rightarrow$	6-7	4×10^{10}	r.; C.k.; rel. to $k(e_{aq}^- + O_2)$.	700094
135	**Decaammine-μ-(superoxido)dicobalt(III) ion**				
	$e_{aq}^- + O_2[Co(NH_3)_5]_2^{5+} \rightarrow$	5.9	8.2×10^{10}	p.r.; D.k.; counterion Br^-; $I = 5 \times 10^{-5}$.	680295
136	**Decakis(cyano)-μ-superoxidodicobaltate(III) ion**				
	$e_{aq}^- + O_2[Co(CN)_5]_2^{5-} \rightarrow O_2[Co(CN)_5]_2^{6-}$		*2.9 × 10^{10}*	Average of 2 values.	
		~5.0	2.9×10^{10}	p.r.; D.k.; counterion K^+.	81A009
		7.0	2.9×10^{10}	p.r.; D.k.; counterion K^+; $I = 10^{-4}$.	680295
137	**μ-Amido-μ-superoxidotetrakis(ethylenediamine)dicobalt(III)] ion**				
	$e_{aq}^- + O_2[Co(en)_2]_2NH_2^{4+} \rightarrow O_2[Co(en)_2]_2NH_2^{3+}$		*9.7 × 10^{10}*	Average of 2 values.	
		~5.0	9.8×10^{10}	p.r.; D.k.; counterion NO_3^-; pK of ligand 6.8, 9.9.	81A009
		6.2	9.6×10^{10}	p.r.; D.k.; counterion Br^-; $I = 10^{-4}$.	680295
138	**Cyanocob(III)alamin**				
	$e_{aq}^- + B12 \rightarrow B12r$		*4.3 × 10^{10}*	Average of 3 values.	
			3.8×10^{10}	p.r.; P.b.k. in Ar-satd. soln. contg. 0.1 mol L^{-1} *tert*-BuOH.	82A462
			3.8×10^{10}	p.r.; D.k. at 360 nm as well as p.b.k. at 310 nm.	741105
		6.1	5.2×10^{10}	p.r.; D.k. at 600 nm; also d.k. at other wavelengths 310-520 nm; at pH 11.1 $k = 3.5 \times 10^{10}$.	730116
139	**Hydroxocob(III)alamin**				
	$e_{aq}^- + B12a \rightarrow B12r$	6.0	3.3×10^{10}	p.r.; D.k. at 650 nm.	723046
140	**Coenzyme B_{12}**				
	$e_{aq}^- + C_{72}H_{100}CoN_{18}O_{17}P \rightarrow B12r$	6	3.2×10^{10}	p.r.; D.k. at 650 nm in deoxygenated soln. contg. 0.1 mol L^{-1} *tert*-BuOH; p.b.k. at 310 nm gave $k = 3 \times 10^{10}$, and in 0.05 mol L^{-1} glycol soln. $k = 3.4 \times 10^{10}$.	751169
141	**Chromium(II) ion**				
	$e_{aq}^- + Cr^{2+} \rightarrow Cr^+$	4.8-5.1	1.5×10^{10} [b]	p.r.; D.k. at 600 nm.	741142
		6.9	4.2×10^{10} [b]	p.r.; D.k.; Cr^{2+} soln. produced by electrolytic redn. of $Cr(ClO_4)_3$; counter ion ClO_4^-; at pH 11.2 $k = 1.9 \times 10^{10}$ (counterion Na^+).	650047
142	**Pentacyanonitrosylchromate(II) ion**				
	$e_{aq}^- + Cr(CN)_5NO^{3-} \rightarrow$		3.2×10^9	γ-r.; C.k.; counterion K^+; rel. to $k(e_{aq}^- + NO_3^-)$.	710407
143	**Hexacyanochromate(II) ion**				
	$e_{aq}^- + Cr(CN)_6^{4-} \rightarrow$	10.0	3.3×10^9	p.r.; D.k.; counterion K^+; $I = 5 \times 10^{-2}$, $k_{obs} = 1.4 \times 10^{10}$; k cor. for I.	680295

TABLE 6. Rate constants for reactions of hydrated electrons in aqueous solution—Continued

No.	Reaction	pH	k (L mol^{-1} s^{-1})	Comment	Ref.
144	**Chromium(III) ions**				
	$e_{aq}^- + Cr(III) \rightarrow$		*5.0 × 10^{10}*	Average of 2 values.	
		7.1	6.0 × 10^{10}	p.r.; D.k.; counterion ClO_4^-; at pH 10.9 k = 4.6 × 10^{10}.	650047
			4.0 × 10^{10}	p.r.; D.k.; counterion ClO_4^-.	650044
145	**Chromate(III) ion**				
	$e_{aq}^- + CrO_2^- \rightarrow$	14	2.0 × 10^{8}	p.r.; D.k.; counterion Na^+; soln. contains 1 mol L^{-1} NaOH; in 3 mol L^{-1} OH^- k = 2.2 × 10^{8}.	650047
146	**Tris(ethylenediamine)chromium(III) ion**				
	$e_{aq}^- + Cr(en)_3^{3+} \rightarrow$		*6.4 × 10^{10}*	Average of 2 values.	
		6.83	5.3 × 10^{10}	p.r.; D.k.; counterion Cl^-; pK of ligand 6.8, 9.9.	650018
			7.5 × 10^{10}	p.r.; D.k.; counterion ClO_4^-.	650044
147	**Tris(4,4'-diphenyl-2,2'-bipyridine)chromium(III) ion**				
	$e_{aq}^- + Cr(4,4'\text{-}Ph_2bpy)_3^{3+} \rightarrow Cr(4,4'\text{-}Ph_2bpy)_3^{2+}$	~1	1.0 × 10^{11}	p.r.; D.k. at 600 nm in 1 mol L^{-1} HCl.	81A060
148	**Tris(4,7-dimethyl-1,10-phenanthroline)chromium(III) ion**				
	$e_{aq}^- + Cr(4,7\text{-}Me_2phen)_3^{3+} \rightarrow Cr(4,7\text{-}Me_2phen)_3^{2+}$	~1	8.1 × 10^{10}	p.r.; D.k. at 575 nm in 1 mol L^{-1} HCl.	81A060
149	**Tris(5-phenyl-1,10-phenanthroline)chromium(III) ion**				
	$e_{aq}^- + Cr(5\text{-}Phphen)_3^{3+} \rightarrow Cr(5\text{-}Phphen)_3^{2+}$	~1	~5 × 10^{10}	p.r.; D.k. in 1 mol L^{-1} HCl.	81A060
150	**Tris(4,7-diphenyl-1,10-phenanthroline)chromium(III) ion**				
	$e_{aq}^- + Cr(4,7\text{-}Ph_2phen)_3^{3+} \rightarrow Cr(4,7\text{-}Ph_2phen)_3^{2+}$	~1	8.2 × 10^{10}	p.r.; D.k. at 575 nm in 1 mol L^{-1} HCl.	81A060
151	**Pentaammine(chloro)chromium(III) ion**				
	$e_{aq}^- + Cr(NH_3)_5Cl^{2+} \rightarrow$	6.7	6.2 × 10^{10}	p.r.; D.k.; counterion Cl^-; $I = 10^{-4}$.	680295
152	***cis*-Dichlorobis(ethylenediamine)chromium(III) ion**				
	$e_{aq}^- + cis\text{-}Cr(en)_2Cl_2^+ \rightarrow$	5.55	7.1 × 10^{10}	p.r.; D.k.; counterion Cl^-; pK of ligand 6.8, 9.9.	650018
153	**Hexafluorochromate(III) ion**				
	$e_{aq}^- + CrF_6^{3-} \rightarrow$	10	1.4 × 10^{10}	p.r.; D.k.; soln. contains 0.2 mol L^{-1} F^-.	650047
154	**Hexacyanochromate(III) ion**				
	$e_{aq}^- + Cr(CN)_6^{3-} \rightarrow$	10	1.5 × 10^{10}	p.r.; D.k.; soln. contains 0.1 mol L^{-1} CN^-.	650047
155	***cis*-Bis(ethylenediamine)bis(thiocyanato-*N*)chromium(III) ion**				
	$e_{aq}^- + cis\text{-}Cr(en)_2(NCS)_2^+ \rightarrow$	5.65	4.2 × 10^{10}	p.r.; D.k.; counterion SCN^-.	650018
156	***cis*-Bisoxalatochromate(III) ion**				
	$e_{aq}^- + cis\text{-}Cr(C_2O_4)_2^- \rightarrow$	6.4	1.3 × 10^{10}	p.r.; D.k.; counterion K^+.	650018
157	***trans*-Bisoxalatochromate(III) ion**				
	$e_{aq}^- + trans\text{-}Cr(C_2O_4)_2^- \rightarrow$	6.18	1.5 × 10^{10}	p.r.; D.k.; counterion K^+.	650018
158	**Trioxalatochromate(III) ion**				
	$e_{aq}^- + Cr(C_2O_4)_3^{3-} \rightarrow$	6.7	6.5 × 10^{9} [b]	p.r.; D.k.; k also detd. at 6.4 kbar (6.4 × 10^{8} N/m^2); counterion K^+.	720102
		4.76-6.13	1.8 × 10^{10} [b]	p.r.; D.k.; counterion K^+.	650018
159	**Ethylenediaminetetraacetatochromate(III) ion**				
	$e_{aq}^- + CrEDTA^- \rightarrow$		*2.6 × 10^{10}*	Average of 2 values.	
		11-12	2.6 × 10^{10}	p.r.; D.k. at 575 nm; counterion Na^+; I = 0.2.	690276
		4.9-5.0	2.6 × 10^{10}	p.r.; D.k.; k cor. for H^+ content.	650018
160	**Chromate ion, hydrogen**				
	$e_{aq}^- + HCrO_4^- \rightarrow$		3.0 × 10^{10}	p.r.; D.k. at 600 nm; K^+ counterion; estd. from K_h = 0.03 for $Cr_2O_7^{2-}$; k cor. for I.	84A459

TABLE 6. Rate constants for reactions of hydrated electrons in aqueous solution—Continued

No.	Reaction	pH	k (L mol^{-1} s^{-1})	Comment	Ref.
161	**Chromate(VI) ion**				
	$e_{aq}^- + CrO_4^{2-} \rightarrow CrO_4^{3-}$	5.7-6.4	1.9×10^{10}	p.r.; D.k.; CrO_4^{2-} and $HCrO_4^-$; pK_a = 0.74, 6.49.	741122
		~7	1.8×10^{10}	p.r.; D.k. at 550 nm in soln. contg. 10^{-3} mol L^{-1} EtOH and 1, 0.1 and 0.01 mol L^{-1} Na_2CrO_4; k cor. for I.	700242
			1.8×10^{10}	p.r.; D.k.	650044
162	**Trichromatochromate(III) ion**				
	$e_{aq}^- + Cr(CrO_4)_3^{3-} \rightarrow$	7	2.1×10^{10}	p.r.	660144
163	**Dichromate(VI) ion**				
	$e_{aq}^- + Cr_2O_7^{2-} \rightarrow$		2.9×10^{10}	p.r.; D.k. at 600 nm; counterion K^+; k cor. for I.	84A459
		~7	6.0×10^{10}	p.r.; D.k. at 550 nm in soln. contg. 10^{-3} mol L^{-1} EtOH and 1, 0.1 and 0.01 mol L^{-1} $Na_2Cr_2O_7$; k cor. for I.	700242
		~7.0	3.3×10^{10}	p.r.; D.k.; at pH ~13.0 $k = 5.4 \times 10^{10}$.	640046
164	**Cesium(I) ion**				
	$e_{aq}^- + Cs^+ \rightarrow Cs^0$		2×10^4	f.p.; Phot. of OH^-; d.k. at 700 nm; $[H_2] = 7 \times 10^{-4}$ mol L^{-1}, [NaOH] = 10^{-3}-0.3 mol L^{-1}; k cor. for I.	86A329
			$<2 \times 10^4$	p.r.; Counterion SO_4^{2-}.	766009
165	**Copper(I) ion**				
	$e_{aq}^- + Cu(I) \rightarrow Cu^0$	5.8	2.7×10^{10}	p.r.; D.k. at 720 nm in soln. contg. 2.5×10^{-3} mol L^{-1} CuCl and 2 mol L^{-1} NaCl; Cu(I) exists as $CuCl_n^{(n-1)-}$.	86G256
166	**Copper(II) ion**				
	$e_{aq}^- + Cu^{2+} \rightarrow Cu^+$		*5.8* $\times$ *10^{10}*	Average of 5 values.	
		~7	3.1×10^{10}	p.r.; D.k. at 650 nm in soln. contg. 0.1 mol L^{-1} *tert*-BuOH.	76A256
			3.0×10^{10}	p.r.; D.k.	731004
		3.4-4	4.5×10^{10}	p.r.; D.k. at 550 nm, soln. contg. 10^{-3} mol L^{-1} EtOH; counterion ClO_4^- or SO_4^{2-}; k cor. for I.	700242
			2.9×10^{10}	p.r.; D.k.	650044
		6.8	3.0×10^{10}	p.r.; D.k.; counterion ClO_4^-.	650047
167	**Copper(II) ions**				
	$e_{aq}^- + Cu(II) \rightarrow Cu(I)$	14	5.8×10^9	p.r.; D.k.; counterions ClO_4^-, Na^+; at 3 and 5 mol L^{-1} OH^- $k = 4.5 \times 10^9$ and 3.4×10^9, resp.	650047
168	**Tetraamminecopper(II) ion**				
	$e_{aq}^- + Cu(NH_3)_4^{2+} \rightarrow$	11.1	1.8×10^{10}	p.r.; D.k.; soln. contains 0.2 mol L^{-1} NH_3.	650047
169	**Tris(ethylenediamine)copper(II) ion**				
	$e_{aq}^- + Cu(en)_3^{2+} \rightarrow$	11.2	2.0×10^{10}	p.r.; D.k. at 575 nm; counterion SO_4^{2-}; soln. contains 0.1 mol L^{-1} ethylenediamine dihydrochloride.	690277
170	**5,7,7,12,14,14-Hexamethyl-1,4,8,11-tetraazacyclotetradeca-4,11-dieneCopper(II) ion**				
	$e_{aq}^- + Cu(4,11\text{-dieneN}_4)^{2+} \rightarrow Cu(4,11\text{-dieneN}_4)^+$	6-10	5.0×10^{10}	p.r.; D.k. at 700 nm; soln. contg. 1 mol L^{-1} *tert*-BuOH, Ar-satd., with phosphate or tetraborate buffer; pK of ligand 10, 11.	761039
171	**Tetracyanocuprate(II) ion**				
	$e_{aq}^- + Cu(CN)_4^{2-} \rightarrow$	10	3.0×10^8	p.r.; D.k.; soln. contains 0.1 mol L^{-1} CN^-.	650047
172	**Glycinatocopper(II) ion**				
	$e_{aq}^- + Cu(Gly)^+ \rightarrow$	0.7	2.9×10^8	γ-r.; C.k.; rel. to $k(e_{aq}^- + ClAcO^-)$.	670310

TABLE 6. Rate constants for reactions of hydrated electrons in aqueous solution—Continued

No.	Reaction	pH	k (L mol^{-1} s^{-1})	Comment	Ref.
173	**Tris(glycinato)cuprate(II) ion**				
	$e_{aq}^- + Cu(Gly)_3^- \rightarrow$	11.1	1.4×10^{10}	p.r.; D.k. at 575 nm; counterion SO_4^{2-}; soln. contains 10^{-1} mol L^{-1} glycine.	690277
174	**Glycylglycylglycinatocopper complex**				
	$e_{aq}^- + Cu(GlyGlyGly)_n^{(2-n)+} \rightarrow$	9.3	4.8×10^9	p.r.; D.k. at 550 nm, soln. contg. 10^{-1} *tert*-BuOH, 4×10^{-4} mol L^{-1} Cu^{2+} and 8×10^{-4} triglycine (n=2), as well as Cu^{2+}:glycine 1:5 and 1:3, resp.	761016
175	**β-Alanylhistidinecopper(II) complex**				
	$e_{aq}^- + Cu(\beta\text{-AlaHis}) \rightarrow$	7.5	5.6×10^9	p.r.; D.k. at 550 nm.	771138
176	**Histidinecopper(II) complex**				
	$e_{aq}^- + Cu(His)_2 \rightarrow$	11.0	6.5×10^9	p.r.; D.k. at 550 nm.	771138
177	**Bis(nitrilotriacetato)cuprate(II) ion**				
	$e_{aq}^- + Cu(NTA)_2^{4-} \rightarrow$	10.9	1.0×10^{10}	p.r.; D.k. at 575 nm; counterion SO_4^{2-}; soln. contains 2×10^{-2} mol L^{-1} nitrilotriacetic acid.	690277
178	**Ethylenediaminetetraacetatocuprate(II) ion**				
	$e_{aq}^- + CuEDTA^{2-} \rightarrow$	7.5-11	4.5×10^9	p.r.; D.k. at 700 nm in soln. contg. *tert*-BuOH or 2-PrOH; k cor. for I.	80A145
		11-12	1.0×10^{10}	p.r.; D.k. at 575 nm; counterion Na^+; I — 0.2.	690276
179	**Ethylenediaminetetraacetato(hydroxy)copper(II) ion**				
	$e_{aq}^- + Cu(EDTA)OH^{3-} \rightarrow$	>12	4.8×10^9	p.r.; D.k. at 700 nm in soln. contg. *tert*-BuOH or 2-PrOH; k cor. for I.	80A145
180	**Glutathione (oxidized) copper(II) complex**				
	$e_{aq}^- + Cu^{II}(GSSG)_n \rightarrow Cu^{I}(GSSG)_n$	11	3.3×10^9	p.r.; D.k. at 595 nm (Cu^{II}) or p.b.k. at 410 nm ($RSSR^-$) in soln. contg. 0.1 mol L^{-1} *tert*-BuOH, 10^{-3} mol L^{-1} Cu^{2+} and 3×10^{-3} mol L^{-1} glutathione; n = 2,3,5	761016
181	**Tetra(glycylhistidine)tetracopper(II) complex**				
	$e_{aq}^- + Cu_4(GlyHis)_4^{4+} \rightarrow$	6.5	6.0×10^9	p.r.; D.k.; cor. for reaction of ligand with e_{aq}^-; at pH 11 $k = 4.6 \times 10^9$.	771138
182	**Tetrakis(4-*N*-methylpyridyl)porphinatocopper(II) ion**				
	$e_{aq}^- + CuTMpyP^{4+} \rightarrow [CuTMpyP]\cdot^{3+}$	7	1×10^{10}	p.r.; P.b.k. in soln. contg. 2-PrOH, initial fast reaction followed by slow grow-in due to 2-PrOH radical.	83C026
183	**Tetrakis(*p*-sulfonatophenyl)porphinatocuprate(II) ion**				
	$e_{aq}^- + CuTPPS^{4-} \rightarrow [CuTPPS]\cdot^{5-}$	7	1×10^{10}	p.r.; P.b.k. in soln. contg. 2-PrOH, initial fast reaction followed by slow grow-in due to 2-PrOH radical.	83C026
184	**Dysprosium(III) ion**				
	$e_{aq}^- + Dy^{3+} \rightarrow$	6.0	3.5×10^9	p.r.; D.k.; counterion ClO_4^-.	76A248
185	**Ethylenediaminetetraacetatodysprosate(III) ion**				
	$e_{aq}^- + DyEDTA^- \rightarrow$	11-12	9.3×10^6	p.r.; D.k. at 575 nm; counterion Na^+; $I = 0.2$.	690276
186	**Erbium(III) ion**				
	$e_{aq}^- + Er^{3+} \rightarrow$	6.0	1.0×10^7	p.r.; D.k.; perchlorate salt.	76A248
187	**Ethylenediaminetetraacetatoerbate(III) ion**				
	$e_{aq}^- + ErEDTA^- \rightarrow$	11-12	1.1×10^7	p.r.; D.k. at 575 nm; counterion Na^+; $I = 0.2$.	690276
188	**Europium(III) ion**				
	$e_{aq}^- + Eu^{3+} \rightarrow$	6	6.5×10^{10}	p.r.; D.k.; counterion ClO_4^-.	76A248
		~6	6.1×10^{10}	p.r.; D.k. in Ar-satd. soln. contg. 10^{-2} mol L^{-1} MeOH and 4×10^{-5} mol L^{-1} $Eu_2(SO_4)_3$; k cor. for I.	720065
		5.55	6.1×10^{10}	p.r.; D.k.; counterion SO_4^{2-}	640046

TABLE 6. Rate constants for reactions of hydrated electrons in aqueous solution—Continued

No.	Reaction	pH	k (L mol^{-1} s^{-1})	Comment	Ref.
189	**Europium(III) salicylate**				
	$e_{aq}^- + C_6H_4(OH)CO_2Eu^{2+} \rightarrow [C_6H_4(OH)CO_2Eu]^{\cdot+}$	6.7	7×10^{10}	p.r.	81A083
190	**Ethylenediaminetetraacetatoeuropate(III) ion**				
	$e_{aq}^- + EuEDTA^- \rightarrow$	11.5	5.6×10^9	p.r.; D.k. at 575 nm; counterion Na^+; $I = 0.2$.	690276
191	**Fluoride ion**				
	$e_{aq}^- + F^- \rightarrow$	7.2	$<2 \times 10^4$	p.r.; k calcd. from exptl. data in this ref.	650001
192	**Hydrofluoric acid**				
	$e_{aq}^- + HF \rightarrow HF^-$	5.02	6×10^7	X-r.; Calcd. from data in [620021] cor. for I, where HF_2^- is 95% of the acid present, and the pK of HF and HF_2^- differ by 0.6; pK HF ~ 3 ($2\ HF \rightarrow HF_2^- + H^+$)	670099
193	**Hydrogen difluoride ion**				
	$e_{aq}^- + HF_2^- \rightarrow H\cdot + F^-$	5.03	4.3×10^7	X-r.; C.k., soln. contains 9.6×10^{-3} mol L^{-1} HF, 1.6×10^{-2} mol L^{-1} HF_2^- and $0\text{-}10^{-4}$ mol L^{-1} acetone; rel. to $k(e_{aq}^- + CH_3COCH_3)$; $I = 0.46$.	620021
		5.03	1.8×10^7	phot.; C.k. rel. to H^+, soln. contains 9×10^{-3} mol L^{-1} HF, 4.4×10^{-1} mol L^{-1} F^-, 1.6×10^{-2} mol L^{-1} HF_2^-, 1.5×10^{-1} mol L^{-1} I^-.	620021
194	**Iron(II) ion**				
	$e_{aq}^- + Fe^{2+} \rightarrow$		$\sim 1.6 \times 10^8$	p.r.; D.k.	650044
195	**Tris(1,10-phenanthroline)iron(II) ion**				
	$e_{aq}^- + Fe(phen)_3^{2+} \rightarrow$		7.2×10^{10}	p.r.; D.k. in soln. contg. 10^{-2} mol L^{-1} *tert*-BuOH; counterion ClO_4^-.	771121
196	**Amminepentacyanoferrate(II) ion**				
	$e_{aq}^- + Fe(CN)_5NH_3^{3-} \rightarrow$	8.6	$<1.0 \times 10^7$	p.r.; D.k.; counterion Na^+; $I = 0.005$.	680295
197	**Ferrocyanide ion**				
	$e_{aq}^- + Fe(CN)_6^{4-} \rightarrow$		$<7 \times 10^4$	p.r.; D.k. at 580 nm, soln. contg. 0.5 mol L^{-1} EtOH and 1 mol L^{-1} Na_2SO_4, Ar-satd.	741064
198	**Hydrogen hexacyanoferrate(II) ion**				
	$e_{aq}^- + HFe(CN)_6^{3-} \rightarrow H\cdot + Fe(CN)_6^{4-}$	~3	2.3×10^9	phot.; C.k.; rel. to $k(e_{aq}^- + N_2O)$; k cor. for I.	667025
199	**Ethylenediaminetetraacetatoferrate(II) ion**				
	$e_{aq}^- + FeEDTA^{2-} \rightarrow$	11-12	$<1.0 \times 10^9$	p.r.; D.k. at 575 nm; counterion Na^+; value probably high due to partial oxidation; $I = 0.2$.	690276
200	**Iron(II) protoporphyrin**				
	$e_{aq}^- + PFe^{II} \rightarrow PFe^{I}$		6×10^9	p.r.; D.k. in Ar-satd. soln. contg. 0.1 mol L^{-1} *tert*-BuOH.	85A006
201	**2-Carboxyethylferrocenium**				
	$e_{aq}^- + Fc^+(CH_2)_2CO_2^- \rightarrow Fc(CH_2)_2CO_2^-$	9	3.2×10^{10}	p.r.; D.k. at 628 nm; ferricenium ion produced by γ-r. in soln. contg. 0.01 mol L^{-1} borax, 0.02 mol L^{-1} KBr and the substituted ferrocene, satd. with N_2O; reaction with the substituted ferrocene $\leq 5 \times 10^8$.	86A040
202	**3-Carboxypropylferrocenium**				
	$e_{aq}^- + Fc^+(CH_2)_3CO_2^- \rightarrow Fc(CH_2)_3CO_2^-$	9	2.8×10^{10}	p.r.; D.k. at 628 nm; ferricenium ion produced by γ-r. in soln. contg. 0.01 mol L^{-1} borax, 0.02 mol L^{-1} KBr and the substituted ferrocene, satd. with N_2O; reaction with the substituted ferrocene $\leq 5 \times 10^8$.	86A040

TABLE 6. Rate constants for reactions of hydrated electrons in aqueous solution—Continued

No.	Reaction	pH	k (L mol^{-1} s^{-1})	Comment	Ref.
203	**4-Carboxybutylferrocenium** $e_{aq}^- + Fc^+(CH_2)_4CO_2^- \rightarrow Fc(CH_2)_4CO_2^-$	9	3.2×10^{10}	p.r.; D.k. at 628 nm; ferricenium ion produced by γ-r. in soln. contg. 0.01 mol L^{-1} borax, 0.02 mol L^{-1} KBr and the substituted ferrocene, satd. with N_2O; reaction with the substituted ferrocene $\leq 5 \times 10^8$.	86A040
204	**Ferrocenylacrylate ion** $e_{aq}^- + FcCH{=}CHCO_2^- \rightarrow$	9	$\sim 9 \times 10^9$	p.r.; D.k. at 628 nm.	86A040
205	**Ferrocenylbenzoate ion** $e_{aq}^- + FcC_6H_4CO_2^- \rightarrow$	9	$\sim 1.6 \times 10^9$	p.r.; D.k. at 628 nm; rate constant with the ferricenium ion $\sim 2.5 \times 10^{10}$.	86A040
206	**Iron(III) ion** $e_{aq}^- + Fe^{3+} \rightarrow Fe^{2+}$	acid	6.0×10^{10}	p.r.; D.k.; perchlorate salt; extrapolated from picosecond measurement.	771105
207	**Hydroxyiron(III) ion** $e_{aq}^- + Fe(OH)_2^+ \rightarrow FeOH^+$	~7	6.0×10^{10}	p.r.; D.k. at 650 nm; pK 2.46 and 4.5	76A256
208	**Sulfatoiron(III) ion** $e_{aq}^- + FeSO_4^+ \rightarrow$	2.1-2.9	$\sim 2 \times 10^{10}$	γ-r.; C.k.; soln. contg. 0.5 mol L^{-1} Na_2SO_4 in H_2SO_4; rel. to $k(e_{aq}^- + H^+)$.	710203
209	**Hexafluoroferrate(III) ion** $e_{aq}^- + FeF_6^{3-} \rightarrow$	6.6	2.2×10^9	p.r.; D.k.; counterion K^+; $I = 10^{-1}$, $k_{obs} = 1.05 \times 10^{10}$; k cor. for I.	680295
210	**Pentacyanonitrosylferrate(III) ion** $e_{aq}^- + Fe(CN)_5NO^{2-} \rightarrow Fe(CN)_5NO^{3-}$		*2.0×10^{10}*	Average of 4 values.	
		7	2.4×10^{10}	p.r.; P.b.k. at 435 nm in Ar-satd. soln. contg. 0.05 mol L^{-1} ethylene glycol, with and without phosphate buffer; also detd. by f.p. of DABCO, pH 10.5, from concn. dependence of substrate, giving $k = 1.1 \times 10^{10}$.	86A306
		8.5	1.0×10^{10}	p.r.; D.k., soln. contg. 0.5 mol L^{-1} *tert*-BuOH, 0.13 mol L^{-1} phosphate buffer, Ar-satd.	771120
			2.2×10^{10}	p.r.; D.k. at 600 nm.	690052
		10.5	2.3×10^{10}	p.r.; D.k.; counterion Na^+; $I = 10^{-4}$.	680295
211	**Ferricyanide ion** $e_{aq}^- + Fe(CN)_6^{3-} \rightarrow Fe(CN)_6^{4-}$		*3.1×10^9*	Average of 4 values.	
			3.7×10^9	p.r.; D.k. at 600 nm; counterion K^+; k cor. for I.	84A459
		~8	3.4×10^9	p.r.; D.k. at 720 nm; $k_{obs} = 4.0 \times 10^9$; k cor. for I.	77A201
			2.4×10^9	p.r.; D.k. at 580 nm; ~12% aquation ($\rightarrow Fe(CN)_5H_2O^{3-} + CN^-$); k cor. for I.	741064
		7, 10.3	3.0×10^9	p.r.; D.k.; counterion K^+; k cor. for I.	630073
212	**Potassium hexacyanoferrate(III) ion** $e_{aq}^- + KFe(CN)_6^{2-} \rightarrow KFe(CN)_6^{3-}$		2.7×10^9	p.r.; D.k. at 580 nm; k cor. for I.	741064
213	**Ethylenediaminetetraacetatoferrate(III) ion** $e_{aq}^- + FeEDTA^- \rightarrow OH^- + FeEDTA^{2-}$	10	3×10^{10}	p.r.; Detd. from buildup of complex of Fe(II)EDTA with O_2^- at 300 nm which depends on competition of this reaction with $e_{aq}^- + O_2$ in air-satd. soln contg. 10^{-2} mol L^{-1} Na formate and 0.5-2 $\times 10^{-3}$ mol L^{-1} carbonate buffer; pK = 7.6, 9.4.	771088
		11-12	2.3×10^{10}	p.r.; D.k. at 575 nm; counterion Na^+; $I = 0.2$.	690276
214	**Tetrakis-4-(*N,N,N*-trimethylammonio)phenylporphineiron(III) ion** $e_{aq}^- + FeTAPP^{5+} \rightarrow$	11.0	2.2×10^{10}	p.r.; D.k. at 550 nm in soln. contg. *tert*-BuOH.	84A426

TABLE 6. Rate constants for reactions of hydrated electrons in aqueous solution—Continued

No.	Reaction	pH	k (L mol^{-1} s^{-1})	Comment	Ref.
215	**Tetrakis(4-*N*-methylpyridyl)porphinatoiron(III) ion**				
	$e_{aq}^- + FeTMpyP^{5+} \rightarrow FeTMpyP^{4+}$	8	6.9×10^{10} [b]	p.r.; D.k. in soln. contg. 1% *tert*-BuOH.	86A118
		8.2	2.0×10^{10} [b]	p.r.; D.k. at 510 nm (e_{aq}^-), 420 nm (Fe^{III}) and p.b.k. at 445 nm (Fe^{II}) in Ar-satd. soln. contg. 0.1 mol L^{-1} *tert*-BuOH.	82A119
		7.8	2.4×10^{10} [b]	p.r.; D.k. at 580 nm in soln. contg. 0.15 mol L^{-1} *tert*-BuOH.	81A207
216	**Dicyanotetrakis(4-*N*-methylpyridyl)porphineiron(III) ion**				
	$e_{aq}^- + FeTMpyP(CN)_2^{3+} \rightarrow FeTMpyP(CN)_2^{2+}$	10.1	1.0×10^{10}	p.r.; D.k. at 435 as well as p.b.k. at 470 nm in soln. contg. 2.0×10^{-3} mol L^{-1} KCN and 1-5 $\times 10^{-5}$ mol L^{-1} Fe^{III} complex.	82A119
217	**Tetrakis(*p*-sulfonatophenyl)porphinatoferrate(III) ion**				
	$e_{aq}^- + FeTPPS^{3-} \rightarrow FeTPPS^{4-}$	5	3.8×10^{10}	p.r.; D.k. in soln. contg. 1% *tert*-BuOH.	86A118
		11.0	1.7×10^{10}	p.r.; D.k. at 550 nm in soln. contg. *tert*-BuOH.	84A426
218	**Iron(III) tetrakis(*p*-sulfonatophenyl)porphyrin dimer**				
	$e_{aq}^- + (TPPS)Fe\text{-}O\text{-}Fe(TPPS)^{8-} \rightarrow (TPPS)Fe^{III}\text{-}O\text{-}Fe^{II}(TPPS)^{9-}$	9	2.3×10^{10}	p.r.; D.k. in soln. contg. 1% *tert*-BuOH.	86A118
219	**α,α,α,β-Tetrakis(*N*-methylisonicotinamidophenyl)porphinatoiron(III) ion**				
	$e_{aq}^- + FePFP^{5+} \rightarrow FePFP^{4+}$	5.8-7.9	3.7×10^{10}	p.r.; D.k. at 510 nm (e_{aq}^-) as well as 420 nm (Fe^{III}) and p.b.k. at 440 nm (Fe^{II}) in soln. contg. (5-50) $\times 10^{-6}$ mol L^{-1} Fe^{III}; pK_a $FePFP(H_2O)_2^{5+} = 3.9$.	86A154
220	**Bis(cyano)-α,α,α,β-tetrakis(*N*-methylisonicotinamidophenyl)porphinatoiron(III) ion**				
	$e_{aq}^- + FePFP(CN)_2^{3+} \rightarrow FePFP(CN)_2^{2+}$	10.2	2.2×10^{10}	p.r.; D.k. at 422 nm (Fe^{III}) as well as p.b.k. at 442 nm (Fe^{II}) in soln. contg. (1-5) $\times 10^{-5}$ mol L^{-1} Fe^{III}, 10^{-3} mol L^{-1} carbonate, 5 $\times 10^{-4}$ mol L^{-1} KCN.	86A154
221	**Bis(1-methylimidazole)-α,α,α,β-tetrakis(*N*-methylisonicotinamidophenyl)porphinatoiron(III) ion**				
	$e_{aq}^- + FePFP(1\text{-}MeIm)_2^{3+} \rightarrow FePFP(1\text{-}MeIm)_2^{2+}$	7.9	1.4×10^{10}	p.r.; D.k. at 510 nm (e_{aq}^-) as well as 420 nm (Fe^{III}) and p.b.k. at 440 nm (Fe^{II}).	86A154
222	**Hemin**				
	$e_{aq}^- + Fe^{3+}$ heme →	9.2	5.2×10^9	p.r.; D.k. at 650 nm in Ar-satd. soln. (10^{-5}-10^{-4} mol L^{-1} hacmin monomer) contg. 0.2 mol L^{-1} SDS.	78A033
		9.2	2.0×10^{10}	p.r.; D.k. at 720 nm in soln. contg. *tert*-BuOH and 1.5-5 $\times 10^{-5}$ mol L^{-1} hydroxy protoferrihaem dimer.; $I = 0.1$.	761071
223	**Hemin c**				
	$e_{aq}^- + Hem\text{-}Fe^{III} \rightarrow$	7.0	2.1×10^{10}	p.r.; Soln. contg. 10^{-3} mol L^{-1} phosphate buffer and 10^{-2} mol L^{-1} *tert*-BuOH.	75A241
224	**Ferrate(VI) ion**				
	$e_{aq}^- + FeO_4^{2-} \rightarrow FeO_4^{3-}$		2.0×10^{10}	p.r.; D.k.; soln. contains 5 mol L^{-1} NaOH.	86A018
225	**Gallium(III) ions**				
	$e_{aq}^- + Ga^{3+} \rightarrow Ga^{2+}$	2.3	9×10^{10}	p.r.; C.k.; counterion ClO_4^-; $k_{obs} = 7.3 \times 10^9$; p$K_h = 2.9$; at pH 2.9 $k = 3.2 \times 10^9$; rel. to $k(e_{aq}^- + H^+)$; k cor. for I.	79A190
226	**Gallium(III) ions**				
	$e_{aq}^- + Ga(III) \rightarrow Ga(II)$	11.7-13.3	4.6×10^8	p.r.; C.k.; counterion ClO_4^-; $k_{obs} = (0.7\text{-}2.0) \times 10^9$; p$K = 10.3$, 11.7 for $Ga(OH)_4^- \rightarrow Ga(OH)_6^{3-}$; rel. to $k(e_{aq}^- + H^+)$; k cor. for I.	79A190
227	**Ethylenediaminetetraacetatogallate(III) ion**				
	$e_{aq}^- + GaEDTA^- \rightarrow$	11.5	4.7×10^7	p.r.; D.k. in buffered soln. contg. 0.5% *tert*-BuOH; $I = 0.032$.	77A252
		11-12	7.8×10^7	p.r.; D.k. at 575 nm; counterion Na^+; $I = 0.2$.	690276

TABLE 6. Rate constants for reactions of hydrated electrons in aqueous solution—Continued

No.	Reaction	pH	k (L mol^{-1} s^{-1})	Comment	Ref.
228	**Gadolinium(III) ion**				
	$e_{aq}^- + Gd^{3+} \rightarrow Gd^{2+}$	6.0	9.1×10^7	p.r.; D.k.; counterion ClO_4^-.	76A248
229	**Ethylenediaminetetraacetatogadolinate(III) ion**				
	$e_{aq}^- + GdEDTA^- \rightarrow$	11-12	6.0×10^6	p.r.; D.k. at 575 nm; counterion Na^+; $I = 0.2$.	690276
230	**Hydrogen ion**				
	$e_{aq}^- + H^+ \rightarrow H\cdot$		**2.3×10^{10}**	**Selected value.**	
		2	2.3×10^{10}	p.r.; D.k. at 600 nm.; k cor. for I.	771043
			2.2×10^{10}	p.r.; D.k. in $HClO_4$ (10^{-5}-10^{-1} mol L^{-1}).	720194
			2.2×10^{10}	p.r.; D.k. at 600 nm; k increases with pressure → 3.5 kbar, then remains constant → 6.4 kbar (6.4×10^8 N/m^2).	720298
		acid	2.2×10^{10}	p.r.; D.k.; k(1.6 to 2.2) $\times 10^{10}$ varied with concn. of added EtOH, KI, and $MgCl_2$.	710580
		4.1-4.7	2.3×10^{10}	p.r.; D.k. at 577 nm, soln. contains H_2SO_4 or $HClO_4$.	630045
		4-5	2.4×10^{10}	p.r.; D.k. at 578 nm ($HClO_4$).	630050
231	**Hydrogen**				
	$e_{aq}^- + H_2 \rightarrow$		$<1 \times 10^7$	p.r.	640048
232	**Mercury(II) hydroxide**				
	$e_{aq}^- + Hg(OH)_2 \rightarrow HgOH$		*1.9×10^{10}*	Average of 2 values.	
		7	2.3×10^{10}	p.r.; D.k. at 500 nm in deaerated soln. contg. 10^{-2} mol L^{-1} *tert*-BuOH; pK = 3.5, 4.0, 14.8.	751044
		7.5	1.6×10^{10}	p.r.; D.k. at 700 nm	751218
233	**Mercury(II) ions**				
	$e_{aq}^- + Hg(II) \rightarrow Hg(I)$	14	7.1×10^9	p.r.; D.k. at 720 nm; transient spectrum (Hg^I) formed varies with pH.	83A178
234	**Tris(ethylenediamine)mercury(II) ion**				
	$e_{aq}^- + Hg(en)_3^{2+} \rightarrow$	11.2	1.6×10^{10}	p.r.; D.k. at 575 nm; counterion Cl^-; soln. contains 2×10^{-2} mol L^{-1} ethylenediamine-diHCl.	690277
235	**1,4,8,11-Tetraazacyclotetradecanemercury(II) ion**				
	$e_{aq}^- + Hg(cyclam)^{2+} \rightarrow Hg(cyclam)^+$		4.2×10^{10}	p.r.; D.k. at 600 nm in He-satd. soln. contg. 0.09 mol L^{-1} *tert*-BuOH.	80A380
236	**Mercury(II) bromide**				
	$e_{aq}^- + HgBr_2 \rightarrow Br^- + HgBr$		*3.7×10^{10}*	Average of 2 values.	
			3.4×10^{10}	p.r.; D.k. at 700 nm as well as p.b.k. (HgBr).	761042
			4.0×10^{10}	p.r.; D.k. at 500 nm.	761087
237	**Mercury(II) chloride**				
	$e_{aq}^- + HgCl_2 \rightarrow Cl^- + HgCl$		*4.0×10^{10}*	Average of 2 values.	
			4.0×10^{10}	p.r.; D.k. at 640 nm in soln. of $HgCl_2$.	83R031
		5.0	4.0×10^{10}	p.r.; D.k. at 720 nm.	730043
238	**Mercury(II) iodide**				
	$e_{aq}^- + HgI_2 \rightarrow I^- + HgI$		*3.0×10^{10}*	Average of 2 values.	
			3.1×10^{10}	p.r.; D.k. at 720 nm in soln. contg. *tert*-BuOH.	78A165
			3.0×10^{10}	p.r.; D.k. at 700 nm as well as p.b.k. (HgI)	761042
239	**Mercury(II) cyanide**				
	$e_{aq}^- + Hg(CN)_2 \rightarrow HgCN + CN^-$		*1.4×10^{10}*	Average of 2 values.	
			1.6×10^{10}	p.r.; D.k. at 700 nm as well as p.b.k.	761042
			1.3×10^{10}	p.r.; D.k. at 500 nm in soln. contg. 10^{-2} mol L^{-1} *tert*-BuOH.	751203

TABLE 6. Rate constants for reactions of hydrated electrons in aqueous solution—Continued

No.	Reaction	pH	k (L mol^{-1} s^{-1})	Comment	Ref.
240	**Mercury(II) thiocyanate**				
	$e_{aq}^- + Hg(SCN)_2 \rightarrow SCN^- +$ HgSCN		4.5×10^{10}	p.r.; D.k. at 700 nm as well as p.b.k. (HgSCN).	761042
241	**Tris(glycinato)mercurate(II) ion**				
	$e_{aq}^- + Hg(Gly)_3^- \rightarrow$	11.1	1.5×10^{10}	p.r.; D.k. at 575 nm; counterion Cl^-; soln. contains 10^{-1} mol L^{-1} glycine.	690277
242	**Bis(nitrilotriacetato)mercurate(II) ion**				
	$e_{aq}^- + Hg(NTA)_2^{4-} \rightarrow$	10.9	3.9×10^9	p.r.; D.k. at 575 nm; counterion Cl^-; soln. contains 2×10^{-2} mol L^{-1} nitrilotriacetic acid.	690277
243	**Ethylenediaminetetraacetatomercurate(II) ion**				
	$e_{aq}^- + HgEDTA^{2-} \rightarrow$	11.5	2.1×10^9	p.r.; D.k. in buffered soln. contg. 0.5% n-BuOH; $I = 0.016$.	77A252
		11-12	5.1×10^9	p.r.; D.k. at 575 nm; counterion Na^+; $I = 0.2$.	690276
244	**Holmium(III) ion**				
	$e_{aq}^- + Ho^{3+} \rightarrow Ho^{2+}$	0.0	1.4×10^7	p.r.; D.k.; counterion ClO_4^-.	76A248
245	**Ethylenediaminetetraacetatoholmate(III) ion**				
	$e_{aq}^- + HoEDTA^- \rightarrow$	11-12	9.8×10^6	p.r.; D.k. at 575 nm; counterion Na^+; $I = 0.2$.	690276
246	**Iodide ion**				
	$e_{aq}^- + I^- \rightarrow$	7	$< 2.4 \times 10^5$	p.r.; D.k., 5×10^{-4} mol L^{-1} phosphate buffer	701230
247	**Triiodine ion**				
	$e_{aq}^- + I_3^- \rightarrow I_2^{\cdot -} + I^-$		3.5×10^{10}	p.r.; D.k. at 600 nm in soln. contg. 0.02 mol L^{-1} I^-; k cor. for I.	771005
248	**Iodine**				
	$e_{aq}^- + I_2 \rightarrow I_2^{\cdot -}$		*5.8×10^{10}*	Average of 3 values.	
			5.1×10^{10}	p.r.; D.k. at 600 nm.	78A131
			5.6×10^{10}	p.r.; D.k. at 600 nm; detd. in I_2-I^- soln.	771005
		7	5.1×10^{10}	p.r.; D.k.(e_{aq}^-) as well as p.b.k. (I_2^-).	640046
249	**Hypoiodous acid**				
	$e_{aq}^- + HOI \rightarrow HOI^-$	9	2.0×10^{10}	p.r.; D.k. at 710 nm in soln. contg. formate ion, 10^{-2} mol L^{-1} borax buffer and HOI ($1\text{-}5 \times 10^{-4}$ mol L^{-1}).	86A901
250	**Hypoiodite ion**				
	$e_{aq}^- + IO^- \rightarrow IO^{2-}$		1.6×10^{10}	p.r.; D.k. at 710 nm in soln. contg. formate ion, 5×10^{-2} mol L^{-1} OH^- and IO^- ($1\text{-}5 \times 10^{-4}$ mol L^{-1}).	86A901
251	**Iodate ion**				
	$e_{aq}^- + IO_3^- \rightarrow HIO_3^-$		*7.8×10^9*	Average of 3 values.	
			7.1×10^9	p.r.; D.k. at 600 nm; counterion Na^+; product see [85A037].; k cor. for I.	84A459
		~7	8.5×10^9	p.r.; D.k. at 550 nm in soln. contg. 10^{-3} mol L^{-1} EtOH and 0.01 and 0.1 mol L^{-1} KIO_3; k cor. for I.	700242
		7	7.7×10^9	p.r.; D.k., counterion K^+.	650047
252	**Periodate ion**				
	$e_{aq}^- + IO_4^- \rightarrow$	7	1.1×10^{10}	p.r.; D.k., counterion Na^+.	650047
253	**Indium(III) ion**				
	$e_{aq}^- + In^{3+} \rightarrow In^{2+}$	2.7-4.0	2.8×10^{10}	p.r.; Calcd. from obs. In^{2+} abs. in soln. contg. 5×10^{-2} mol L^{-1} 2-PrOH over a pH range; $pK(In(H_2O)^{3+} \rightarrow InOH^{2+} + H^+) = 3.5, 4.2$; $pK(In(H_2O)^{2+} \rightarrow InOH^+ + H^+) = 4.5$; counterion ClO_4^-; rel. to $k(e_{aq}^- + H^+) = 1.3 \times 10^{10}$.	84A008
		1-2	9.2×10^{10}	p.r.; C.k., obs. formn. of In^{2+}; counterion ClO_4^-; rel. to $k(e_{aq}^- + H^+)$; k cor. for I.	83A206

TABLE 6. Rate constants for reactions of hydrated electrons in aqueous solution—Continued

No.	Reaction	pH	k (L mol^{-1} s^{-1})	Comment	Ref.
254	**Hydroxyindium(III) ion**				
	$e_{aq}^- + InOH^{2+} \rightarrow InOH^+$	>3.75	$\sim 1 \times 10^9$	p.r.; Calcd. from pH effect on c.k. with H^+,	83A206
255	**Sulfatoindium(III) ion**				
	$e_{aq}^- + InSO_4^+ \rightarrow$ In(II)	2	4.4×10^{10}	p.r.; C.k. in soln. contg. $In_2(SO_4)_3$; obs. In^{II} formn.; solute is predominantly in the form $InSO_4^+$; rel. to $k(e_{aq}^- + H^+)$.	78A412
256	**Ethylenediaminetetraacetatoindate(III) ion**				
	$e_{aq}^- +$ InEDTA$^- \rightarrow$	11.5	2.3×10^8	p.r.; D.k. in buffered soln. contg. 0.5% *n*-BuOH; $I = 0.019$.	77A252
		11-12	4.1×10^8	p.r.; D.k. at 575 nm; counterion Na^+; $I = 0.2$.	690276
257	**(2,2′-Bipyrid-3-ylium-C^3,N')bis(2,2′-bipyridine-N,N')iridium(III) ion**				
	$e_{aq}^- + [Ir(Hbpy\text{-}C^3,N')(bpy)_2(OH)]^{2+} \rightarrow [Ir(Hbpy\text{-}C^3,N')(bpy)_2(OH)]^+$	5.3	4.5×10^{10}	p.r.; D.k. at 600 nm in He-satd. soln. contg. 0.1 mol L^{-1} *tert*-BuOH and (5-30) $\times 10^{-6}$ mol L^{-1} $[Ir(Hbpy\text{-}C^3,N')(bpy)_2](ClO_4)_3$, p$K_a = 3.0$.	85A160
258	**Hexachloroiridate(III) ion**				
	$e_{aq}^- + IrCl_6^{3-} \rightarrow IrCl_6^{4-}$		6.4×10^9 [b]	p.r.; D.k. at 600 nm in N_2-satd. soln. contg. *tert*-BuOH; k cor. for I.	731066
		10.6	3.0×10^9 [b]	p.r.; D.k.; counterion K^+; at $I = 5 \times 10^{-2}$, $k_{obs} = 9.4 \times 10^9$; k cor. for I.	680295
259	**Hexachloroiridate(IV) ion**				
	$e_{aq}^- + IrCl_6^{2-} \rightarrow IrCl_6^{3-}$		*1.0* × *10*^{10}	Average of 3 values.	
		~8	1.2×10^{10}	p.r.; D.k. at 720 nm; $k_{obs} = 1.7 \times 10^{10}$; k cor. for I.	77A201
			9.6×10^9	p.r.; D.k. at 600 nm in N_2-satd. soln. contg. *tert*-BuOH; k cor. for I.	731066
		10.2	9.3×10^9	p.r.; D.k.; counterion K^+; at $I = 5 \times 10^{-2}$; $k_{obs} = 2.0 \times 10^{10}$; k cor. for I.	680295
260	**Potassium ion**				
	$e_{aq}^- + K^+ \rightarrow$		$<5 \times 10^5$	p.r.; No effect of 0.02 mol L^{-1} K^+ on e_{aq}^- d.k.	640132 650044
261	**Lanthanum(III) ion**				
	$e_{aq}^- + La^{3+} \rightarrow$		6.9×10^8 [b]	p.r.; D.k.; counterion SO_4^{2-}.	650044
		6.98	3.4×10^8 [b]	p.r.; D.k.; sulfate salt.	640046
262	**Ethylenediaminetetraacetatolanthanate(III) ion**				
	$e_{aq}^- +$ LaEDTA$^- \rightarrow$	11-12	$<1.2 \times 10^6$	p.r.; D.k. at 575 nm; counterion Na^+; $I = 0.2$.	690276
263	**Lutetium(III) ion**				
	$e_{aq}^- + Lu^{3+} \rightarrow$	6.0	4.9×10^6	p.r.; D.k.; counterion ClO_4^-.	76A248
264	**Ethylenediaminetetraacetatolutetate(III) ion**				
	$e_{aq}^- +$ LuEDTA$^- \rightarrow$	11-12	1.5×10^7	p.r.; D.k. at 575 nm; counterion Na^+; $I = 0.2$.	690276
265	**Manganese(II) ions**				
	$e_{aq}^- + Mn^{2+} \rightarrow Mn^+$		2.0×10^7	p.r.; D.k. at 600 nm in soln. contg. 0.05 mol L^{-1} MeOH.	771011
266	**Hexacyanomanganate(II) ion**				
	$e_{aq}^- + Mn(CN)_6^{4-} \rightarrow$	9.0	5.9×10^9	p.r.; D.k.; counterion K^+; at $I = 5 \times 10^{-2}$ $k_{obs} = 2.5 \times 10^{10}$; k cor. for I.	680295
267	**Tris(glycinato)manganate(II) ion**				
	$e_{aq}^- + Mn(Gly)_3^- \rightarrow$	11.1	$<1.7 \times 10^7$	p.r.; D.k. at 575 nm; counterion SO_4^{2-}; soln. contains 10^{-1} mol L^{-1}glycine.	690277
268	**Bis(nitrilotriacetato)manganate(II) ion**				
	$e_{aq}^- + Mn(NTA)_2^{4-} \rightarrow$	10.9	$<5 \times 10^6$	p.r.; D.k. at 575 nm; counterion SO_4^{2-}; soln. contains 2×10^{-2} mol L^{-1}nitrilotriacetic acid.	690277
269	**Ethylenediaminetetraacetatomanganate(II) ion**				
	$e_{aq}^- +$ MnEDTA$^{2-} \rightarrow$	11-12	$<2.2 \times 10^6$	p.r.; D.k. at 575 nm; counterion Na^+; $I = 0.2$.	690276

TABLE 6. Rate constants for reactions of hydrated electrons in aqueous solution—Continued

No.	Reaction	pH	k (L mol^{-1} s^{-1})	Comment	Ref.
270	**Tetrakis(4-*N*-methylpyridyl)porphinatomanganese(II) ion**				
	$e_{aq}^- + MnTMpyP^{4+} \rightarrow [MnTMpyP]^{\cdot 3+}$	6.8	$\sim 3 \times 10^{10}$	p.r.	84A120
271	**Tetrakis(*p*-sulfonatophenyl)porphinatomanganate(II) ion**				
	$e_{aq}^- + MnTPPS^{4-} \rightarrow [MnTPPS]^{\cdot 5-}$	6.8	$\sim 1 \times 10^{10}$	p.r.	84A120
272	**Tetrakis-4-(*N,N,N*-trimethylammonio)phenylporphinatomanganese(III) ion**				
	$e_{aq}^- + MnTAPP^{5+} \rightarrow MnTAPP^{4+}$	6.7	3.5×10^{10}	p.r.; D.k. at 570 nm in phosphate buffer	86A313
273	**Tetrakis(4-pyridyl)porphinatomanganese(III) ion**				
	$e_{aq}^- + MnTpyP^{+} \rightarrow MnTpyP$	6.8	$\sim 1 \times 10^{10}$	p.r.	84A120
274	**Tetrakis(4-*N*-methylpyridyl)porphinatomanganese(III) ion**				
	$e_{aq}^- + MnTMpyP^{5+} \rightarrow MnTMpyP^{4+}$		*3.8 × 10^{10}*	Average of 2 values.	
		6.7	4.7×10^{10}	p.r.; D.k. at 570 nm in phosphate buffer; pK_a = 8.0, 10.6; at pH 9.3 $k = 4.0 \times 10^{10}$.	86A313
		6.8	$\sim 3 \times 10^{10}$	p.r.	84A120
275	**Dihydroxytetrakis(4-*N*-methylpyridyl)porphinatomanganese(III) ion**				
	$e_{aq}^- + (OH)_2MnTMpyP^{3+} \rightarrow [MnTMpyP(OH)_2]^{\cdot 2+}$	11.0	4.7×10^{10}	p.r.; D.k. at 550 nm in soln. contg. *tert*-BuOH.	84A426
276	**α,α,α,β-Tetrakis(*N*-methylisonicotinamidophenyl)porphinatomanganese(III) ion**				
	$e_{aq}^- + MnPFP^{5+} \rightarrow MnPFP^{4+}$	6.7	2.3×10^{10}	p.r.; D.k. at 570 nm in phosphate buffer	86A313
277	**Tetrakis(*p*-sulfonatophenyl)porphinatomanganate(III) ion**				
	$e_{aq}^- + MnTPPS^{3-} \rightarrow MnTPPS^{4-}$	6.8	$\sim 1 \times 10^{10}$	p.r.	84A120
278	**Manganate(VI) ion**				
	$e_{aq}^- + MnO_4^{2-} \rightarrow MnO_4^{3-}$	13	2×10^{10}	p.r.; P.b.k. at 305 nm in Ar-satd. soln.; I = 0.1.	81A057
279	**Permanganate ion**				
	$e_{aq}^- + MnO_4^- \rightarrow MnO_4^{2-}$		*2.6 × 10^{10}*	Average of 2 values.	
			3×10^{10}	p.r.; D.k.	650044
		7.0	2.2×10^{10}	p.r.; D.k.; at pH 13 $k = 3.7 \times 10^{10}$.	640046
280	**Octacyanomolybdate(IV) ion**				
	$e_{aq}^- + Mo(CN)_8^{4-} \rightarrow$		7.1×10^{9}	p.r.; D.k. at 578 nm.	690443
281	**Bis(μ-oxo)(ethylenediaminetetraacetato)bis[oxomolybdate(V)] ion**				
	$e_{aq}^- + [Mo_2O_4(EDTA)]^{2-} \rightarrow [Mo^{IV}Mo^{V}O_4(EDTA)]^{3-}$	6	1.5×10^{10}	p.r.; D.k. at 720 nm in soln. contg. 0.1 mol L^{-1} *tert*-BuOH and 1-10 × 10^{-5} mol L^{-1} Mo^{V} complex.	85A363
282	**Bis(μ-oxo)bis[(cysteinato)oxomolybdate(V)] ion**				
	$e_{aq}^- + [Mo_2O_4(Cys)_2]^{2-} \rightarrow [Mo^{IV}Mo^{V}O_4(Cys)_2]^{3-}$	6	1.5×10^{10}	p.r.; D.k. at 720 nm in soln. contg. 0.1 mol L^{-1} *tert*-BuOH and 1-10 × 10^{-5} mol L^{-1} Mo^{V} complex.	85A363
283	**Molybdate(VI) ion**				
	$e_{aq}^- + MoO_4^{2-} \rightarrow$		2×10^{9}	p.r.; D.k.; extrapolated from picosecond measurement.	771105
284	**Azide ion**				
	$e_{aq}^- + N_3^- \rightarrow$	~7	$< 1.5 \times 10^{6}$	p.r.; D.k.; concn. 1 mol L^{-1}; unreactive.	710007
285	**Hydrogen azide**				
	$e_{aq}^- + HN_3 \rightarrow HN_3^{\cdot -}$		1.2×10^{10}	p.r.; D.k. (at 0.0126 mol L^{-1} NaN_3 at pH 5.03 azide is 34% HN_3; N_3^- does not contribute since at pH 10.7 $k < 5 \times 10^{6}$); similar results in 0.12 mol L^{-1} azide at pH 6.0 and 7.3; pH and azide concn. dependence: $k_{obs} = 8 \times 10^{4} + 3 \times 10^{10}[H^+] + 3.3 \times 10^{7}[HN_3]$.	86A060
286	**Hydrazine**				
	$e_{aq}^- + H_2NNH_2 \rightarrow$	10.5	2.3×10^{6}	p.r.; D.k. at 700 nm.	720003

TABLE 6. Rate constants for reactions of hydrated electrons in aqueous solution—Continued

No.	Reaction	pH	k (L mol^{-1} s^{-1})	Comment	Ref.
287	**Hydrazinium ion**				
	$e_{aq}^- + H_2NNH_3^+ \rightarrow$	6.0	2.2×10^8	p.r.; D.k. at 700 nm; pK_a = -0.67, 7.956.	720003
288	**Hydroxylamine**				
	$e_{aq}^- + NH_2OH \rightarrow \cdot NH_2 + OH^-$	9.0	9.2×10^8	p.r.; D.k. at 700 nm; ; product detn. [78A218].	710493
289	**Hydroxylammonium ion**				
	$e_{aq}^- + NH_3OH^+ \rightarrow NH_3 + \cdot OH$	4.8	1.2×10^{10}	p.r.; D.k. at 700 nm; pK_a = 6.08; product detn. [78A218].	710493
290	**Sulfamate ion**				
	$e_{aq}^- + NH_2SO_3^- \rightarrow$	11.7	$<1.3 \times 10^6$	p.r.; D.k.; counterion Na^+; I = 0.02; k_{obs} = < 1.7×10^6; k cor. for I.	680295
291	**Hydroxylaminedisulfonate ion**				
	$e_{aq}^- + HON(SO_3)_2^{2-} \rightarrow$	12	4×10^8	p.r.; D.k. at 700 nm; counterion K^+.	680460
292	**Nitrosyldisulfonate ion**				
	$e_{aq}^- + NO(SO_3)_2^{2-} \rightarrow$	6.25	3.9×10^9	γ-r.; C.k., obs. $G(H_2)$; rel. to $k(e_{aq}^- + H_2PO_4^-)$; k cor. for I.	690649
293	**Nitrous oxide**				
	$e_{aq}^- + N_2O \rightarrow OH^- + \cdot OH + N_2$		**9.1×10^9**	**Selected value.**	
		~6.0-6.5	9.1×10^9	p.r.; D.k. at 580 nm in N_2-bubbled (O_2-free) soln. satd. with N_2O; N_2O concn. = 0.0265 mol L^{-1}; reaction period 2.9 ns.	82A137
			8.0×10^9	p.r.; D.k. in N_2O soln. <0.5 mol L^{-1}; obs. $k/G(e_{aq}^-)$; $G(e_{aq}^-) = 5.2$.	710587
		7	8.7×10^9	p.r.; D.k. at 578 nm; soln. contg. 10^{-3} mol L^{-1} MeOH; N_2O concn. (5-30) $\times 10^{-5}$ mol L^{-1}.	630073
294	**Nitrite ion**				
	$e_{aq}^- + NO_2^- \rightarrow \dot{N}O_2^{2-}$		*4.1×10^9*	Average of 4 values.	
			3.8×10^9	p.r.; D.k. at 700 nm.	761171
			4.5×10^9	p.r.; D.k.; counterion K^+; H_2-satd.	700417
			3.5×10^9	p.r.; D.k.; counterion Na^+.	650044
		~7.0	4.6×10^9	p.r.; D.k.; counterion Na^+.	640046
295	**Nitrate ion**				
	$e_{aq}^- + NO_3^- \rightarrow \dot{N}O_3^{2-}$		**9.7×10^9**	**Selected value.**	
			1.1×10^{10}	p.r.; D.k.	731004
			8.6×10^9	p.r.; D.k. at 600 nm; k decreases with added ethanol to 3×10^7 at 99% ethanol; k cor. for I.	731008
		6.4	1.0×10^{10}	p.r.; D.k.; k also detd. at 6.4 kbar (6.4×10^8 N/m^2). counterion Na^+	720102
		~7	1.0×10^{10}	p.r.; D.k. at 550 nm, soln. contg. 10^{-3} mol L^{-1} EtOH and 0.01, 0.1 and 1 mol L^{-1} $NaNO_3$; k cor. for I.	700242
			9×10^9	p.r.; D.k., counterion K^+; H_2-satd.	700417
			9.3×10^9	p.r.; D.k. at 650 nm, k detd. at 15-80°C.	710580
296	**Sodium ion**				
	$e_{aq}^- + Na^+ \rightarrow Na^0$		2×10^4	f.p.; Phot. of OH^-; d.k. at 700 nm; $[H_2] = 7 \times 10^{-4}$ mol L^{-1}, [NaOH] = 10^{-3}-0.3 mol L^{-1}; I = 0.	86A329
			$<5 \times 10^5$	p.r.; No effect of 0.02 mol L^{-1} Na^+ on e_{aq}^- d.k.	640132 650044
297	**Neodymium(III) ion**				
	$e_{aq}^- + Nd^{3+} \rightarrow$	6.0	3.2×10^6	p.r.; D.k.; counterion ClO_4^-.	76A248
298	**Ethylenediaminetetraacetatoneodymate(III) ion**				
	$e_{aq}^- + NdEDTA^- \rightarrow$	11-12	2.8×10^6	p.r.; D.k. at 575 nm; counterion Na^+; I = 0.2.	690276

TABLE 6. Rate constants for reactions of hydrated electrons in aqueous solution—Continued

No.	Reaction	pH	k (L mol^{-1} s^{-1})	Comment	Ref.
299	**Nickel(II) ion**				
	$e_{aq}^- + Ni^{2+} \rightarrow Ni^+$		*1.9 × 10^{10}*	Average of 3 values.	
			1.4 × 10^{10}	p.r.; D.k. at 600 nm; counterion SO_4^{2-}; I = 3.3 × 10^{-3}.	751027
		3.7	2.2 × 10^{10}	p.r.; D.k. at 550 nm in soln. contg. 10^{-3} mol L^{-1} EtOH and 1 and 0.01 mol L^{-1} $NiSO_4$; k cor. for I.	700242
		6.0	2.2 × 10^{10}	p.r.; D.k.; I = 4 × 10^{-5}.	690277
300	**Tetraamminenickel(II) ion**				
	$e_{aq}^- + Ni(NH_3)_4^{2+} \rightarrow$	11.3	8.4 × 10^9	p.r.; D.k. at 575 nm; soln. contains 0.67 mol L^{-1} NH_3 and 10^{-3}-10^{-4} mol L^{-1} $NiSO_4$; no. of ligands in complex are unknown, $Ni(NH_3)_6^{2+}$ and $Ni(NH_3)_6^{3+}$ are also assumed to be present.	720460
301	**Ethylenediaminenickel(II) ion**				
	$e_{aq}^- + Ni(en)^{2+} \rightarrow$	~8	2.2 × 10^{10}	p.r.; D.k. at 575 nm; counterion SO_4^{2-}; I = ≈10^{-4}; k cor. for I.	690277
302	**Bis(ethylenediamine)nickel(II) ion**				
	$e_{aq}^- + Ni(en)_2^{2+} \rightarrow$	~9	1.9 × 10^{10} [b]	p.r.; D.k. at 575 nm; counterion SO_4^{2-}; I = ~10^{-4}; k cor. for I.	690277
		11	7.5 × 10^9 [b]	p.r.; D.k.; counterion SO_4^{2-}; contained some $Ni(en)_3^{2+}$; I = 10^{-3}.	680295
303	**Tris(ethylenediamine)nickel(II) ion**				
	$e_{aq}^- + Ni(en)_3^{2+} \rightarrow$	~11	<2 × 10^7	p.r.; D.k. at 575 nm; counterion SO_4^{2-}; I = 0.2.	690277
304	**1,4,7,10-Tetraazacyclotridecanenickel(II) ion**				
	$e_{aq}^- + NiL^{2+} \rightarrow NiL^+$	6.0	3.3 × 10^{10}	p.r.; D.k. at 600 nm in Ar-satd. soln. contg. 0.1 mol L^{-1} *tert*-BuOH and 1-10 × 10^{-5} mol L^{-1} Ni complex.	85A145
305	**1,4,8,11-Tetraazacyclotetradecanenickel(II) ion**				
	$e_{aq}^- + Ni(cyclam)^{2+} \rightarrow Ni(cyclam)^+$	6.0	3.8 × 10^{10}	p.r.; D.k. at 600 nm, as well as p.b.k., in Ar-satd. soln. contg. 0.1 mol L^{-1} *tert*-BuOH and (1-10) × 10^{-5} mol L^{-1} complex.	85A032
306	**1,4,8,12-Tetraazacyclopentadecanenickel(II) ion**				
	$e_{aq}^- + NiL^{2+} \rightarrow NiL^+$	5.5	1.2 × 10^{10}	p.r.; D.k. as well as p.b.k. in Ar-satd. soln. contg. (1-10) × 10^{-5} mol L^{-1} nickel complex and 0.1 mol L^{-1} *tert*-BuOH.	85A145
307	**1,4,8,11-Tetramethyl-1,4,8,11-tetraazacyclotetradecanenickel(II) ion**				
	$e_{aq}^- + NiL^{2+} \rightarrow NiL^+$	6.0	1.2 × 10^{10}	p.r.; D.k. at 600 nm, as well as p.b.k., in Ar-satd. soln. contg. 0.1 mol L^{-1} *tert*-BuOH and (1-10) × 10^{-5} mol L^{-1} complex.	85A032
308	**5,7,7,12,14,14-Hexamethyl-1,4,8,11-tetraazacyclotetradecanenickel(II) ion**				
	$e_{aq}^- + Ni(aneN_4)^{2+} \rightarrow$	6-10	5.6 × 10^{10}	p.r.; D.k. at 700 nm in Ar-satd. soln. contg. 1 mol L^{-1} *tert*-BuOH and phosphate or tetraborate buffer.	761039
309	**5,7,7,12,14,14-Hexamethyl-1,4,8,11-tetraazacyclotetradeca-4,11-dienenickel(II) ion**				
	$e_{aq}^- + Ni(4,11\text{-}dieneN_4)^{2+} \rightarrow$	6-10	7.8 × 10^{10}	p.r.; D.k. at 700 nm in Ar-satd. soln. contg. 1 mol L^{-1} *tert*-BuOH and phosphate or tetraborate buffer; pK of ligand 10, 11.	761039
310	**α-2,12-Dimethyl-3,7,11,17-tetraazabicyclo[11.3.1]heptadeca-1(17),13,15-trienenickel(II) ion**				
	$e_{aq}^- + Ni(CR+4H)^{2+} \rightarrow Ni(CR+4H)^+$	7	3.8 × 10^{10}	p.r.; Solute mixt. with diaquated complex (1:1); d.k. in N_2-satd. soln. contg. 0.1 mol L^{-1} *tert*-BuOH.	82A106
311	**α-2,12-Dimethyl-3,7,11,17-tetraazabicyclo[11.3.1]heptadeca-1(17),2,11,13,15-pentaenenickel(II) ion**				
	$e_{aq}^- + Ni(CR)^{2+} \rightarrow Ni(CR)^+$	7	4.5 × 10^{10}	p.r.; D.k. in N_2-satd. soln. contg. 0.1 mol L^{-1} *tert*-BuOH.	82A106

TABLE 6. Rate constants for reactions of hydrated electrons in aqueous solution—Continued

No.	Reaction	pH	k (L mol^{-1} s^{-1})	Comment	Ref.
312	**α-2,12-Dimethyl-3,7,11,17-tetraazabicyclo[11.3.1]heptadeca-1(17),2,6,11,13,15-hexaenenickel(II) ion**				
	$e_{aq}^- + Ni(CR\text{-}2H)^{2+} \rightarrow Ni(CR\text{-}2H)^+$	7	5.2×10^{10}	p.r.; D.k. in N_2-satd. soln. contg. 0.1 mol L^{-1} *tert*-BuOH.	82A106
313	**1,4,5,7,7,8,11,12,14,14-Decamethyl-1,4,8,11-tetraazacyclotetradecanenickel(II) ion**				
	$e_{aq}^- + NiL^{2+} \rightarrow NiL^+$	6.0	8.7×10^{10}	p.r.; D.k. at 600 nm, as well as p.b.k., in Ar-satd. soln. contg. 0.1 mol L^{-1} *tert*-BuOH and (1-10) $\times 10^{-5}$ mol L^{-1} complex.	85A032
314	**Fluoronickel(II) ion**				
	$e_{aq}^- + NiF^+ \rightarrow$	8.5	$<1.2 \times 10^{10}$	p.r.; D.k.; counterion F^-, $I = 10^{-1}$, $k_{obs} = 7.2 \times 10^9$. The real value for NiF^+ is lower since the soln. contained 12% Ni^{2+}; k cor. for I.	680295
315	**Tetracyanonickelate(II) ion**				
	$e_{aq}^- + Ni(CN)_4^{2-} \rightarrow Ni(CN)_4^{3-}$		3.0×10^9	p.r.; D.k. in deaerated soln. contg. 0.5 mol L^{-1} MeOH.	741072
		11.0	4.1×10^9	p.r.; D.k.; counterion K^+; $I = 5 \times 10^{-3}$, $k_{obs} = 5.5 \times 10^9$; k cor. for I.	680295
316	**Glycinatonickel(II) ion**				
	$e_{aq}^- + Ni(Gly)^+ \rightarrow$	> 8	1.6×10^{10}	p.r.; D.k. at 575 nm; counterion SO_4^{2-}; $I = \sim 10^{-4}$.	690277
317	**Bis(glycinato)nickel(II)**				
	$e_{aq}^- + Ni(Gly)_2 \rightarrow$	~9	2.7×10^9	p.r.; D.k. at 575 nm; counterion SO_4^{2-}; $I = \sim 10^{-3}$.	690277
318	**Tris(glycinato)nickelate(II) ion**				
	$e_{aq}^- + Ni(Gly)_3^- \rightarrow$	~10	$<2.5 \times 10^7$	p.r.; D.k. at 575 nm; counterion SO_4^{2-}; $I = \sim 10^{-1}$; k cor. for I.	690277
319	**Nitrilotriacetatonickelate(II) ion**				
	$e_{aq}^- + NiNTA^- \rightarrow NiNTA^{2-}$	7	1.5×10^9 [b]	p.r.; D.k. at 560 nm in soln. contg. *tert*-BuOH.	80A194
		~8	6×10^8 [b]	p.r.; D.k. at 575 nm; counterion SO_4^{2-}; concn. $\sim 10^{-4}$ mol L^{-1}.	690277
320	**Bis(nitrilotriacetato)nickelate(II) ion**				
	$e_{aq}^- + Ni(NTA)_2^{4-} \rightarrow$	~11	$<1.8 \times 10^7$	p.r.; D.k. at 575 nm; counterion SO_4^{2-}; concn. $\sim 10^{-2}$ mol L^{-1}.	690277
321	**Ethylenediaminetetraacetatonickelate(II) ion**				
	$e_{aq}^- + NiEDTA^{2-} \rightarrow$	11.5	8.2×10^8 [b]	p.r.; D.k. in buffered soln. contg. 0.5% *n*-BuOH; $I = 0.037$.	77A252
		11-12	1.0×10^8 [b]	p.r.; D.k. at 575 nm; counterion Na^+; $I = 0.2$.	690276
322	**Pentacarbonatoneptunate(IV) ion**				
	$e_{aq}^- + Np(CO_3)_5^{6-} \rightarrow$		5×10^9	p.r.; D.k. in Ar-satd. soln. contg. 0.1 mol L^{-1} $HClO_4$, 0.025 mol L^{-1} H_2SO_4, and 0.1-4 mol L^{-1} K_2CO_3. Calcd. $k = 1.3 \times 10^8$ for $I = 0$ [751177].	741170
323	**Bis(carbonato)dioxoneptunate(V) ion**				
	$e_{aq}^- + NpO_2(CO_3)_2^{3-} \rightarrow Np(CO_3)_5^{6-}$		2.5×10^9	p.r.; D.k. in soln. contg. 0.1-5 mol L^{-1} K_2CO_3 and 2×10^{-4} mol L^{-1} Np(V). Calcd. $k = 4.5 \times 10^8$ for $I = 0$ [751177].	741170
324	**Dioxoneptunium(V) ion**				
	$e_{aq}^- + NpO_2^+ \rightarrow NpO_2$	3	2.4×10^{10}	p.r.; D.k. in soln. contg. 0.01 mol L^{-1} EtOH and (0.2-1.0) $\times 10^{-3}$ mol L^{-1} NpO_2ClO_4; $pK(NpO_2^+) = 4.5$, 8.75; rel. to $k(e_{aq}^- + H^+)$; k cor. for I.	80A130
		5.3	2.0×10^{10}	p.r.; D.k.; (0.21-2.1) $\times 10^{-4}$ mol L^{-1} Np(V), counterion ClO_4^-; at pH 5.8 and 6.1 $k = 5.4 \times 10^{10}$ and 2.1×10^{10}; $I = 10^{-3}$.	761084

TABLE 6. Rate constants for reactions of hydrated electrons in aqueous solution—Continued

No.	Reaction	pH	k (L mol^{-1} s^{-1})	Comment	Ref.
325	**Neptunate(V) ion**				
	$e_{aq}^- + Np(V) \rightarrow Np(IV)$	~14	5.0×10^9	p.r.; D.k. at 650 nm in soln. contg. 1.0 mol L^{-1} OH^-; k = 6.1, 6.6, and 3.2 × 10^9 at 2.0, 5.0, and 7.5 mol L^{-1} OH^-, resp.	731123
326	**Dioxoneptunium(VI) ion**				
	$e_{aq}^- + NpO_2^{2+} \rightarrow NpO_2^+$	2.5	1.0×10^{11}	p.r.; Extrapolated from d.k. (condy.) in soln. contg. 1, 2, and 4 × 10^{-3} mol L^{-1} solute and 0.05 mol L^{-1} *tert*-BuOH; counterion ClO_4^-.	83A071
327	**Hydroxydioxoneptunium(VI) ion**				
	$e_{aq}^- + NpO_2OH^+ \rightarrow NpO_2OH$		2.9×10^{10}	p.r.; Extrapolated from k detd. in soln. at pH 2.5 (condy.) and at 5.3 and 5.8 [761084, 76A248]; pK = 5.45.	83A071
328	**Neptunate(VI) ion**				
	$e_{aq}^- + Np(VI) \rightarrow Np(V)$	~13	2.3×10^{10}	p.r.; D.k. at 650 nm; k = 1.3, 1.3, 2.0, 1.1, 0.83, 0.68 × 10^{10} at 1.0, 2.0, 5.0, 7.5, 10.0, and 12.5 mol L^{-1} OH^-, resp.	731123
329	**Tris(carbonato)dioxoneptunate(VI) ion**				
	$e_{aq}^- + NpO_2(CO_3)_3^{4-} \rightarrow NpO_2(CO_3)_3^{5-}$		2.3×10^{10}	p.r.; D.k. at 600 nm in 0.05 mol L^{-1} sodium carbonate soln.	84A155
			1.9×10^{10}	p.r.; D.k. in soln. contg. 0.05 mol L^{-1} Na_2CO_3 and 0.05 mol L^{-1} $NaHCO_3$ to 5 mol L^{-1} CO_3^{2-}; Calcd. $k = 2.1 \times 10^9$ for $I = 0$ [751177].	741170
330	**Neptunate(VII) ion**				
	$e_{aq}^- + Np(VII) \rightarrow$	~13	2.9×10^{10}	p.r.; D.k. at 650 nm; k = 3.2, 2.0, 2.1, 1.7, 1.3, 0.88, and 0.6 × 10^{10} at 0.5, 1.0, 2.0, 5.0, 7.5, 10.0, 12.5 mol L^{-1} OH^-, resp.	731123
331	**Oxygen**				
	$e_{aq}^- + O_2 \rightarrow O_2^{\cdot -}$		**1.9×10^{10}**	**Selected value.**	
			1.9×10^{10}	p.r.; D.k. at 600 nm.	78A131
		7	1.8×10^{10}	p.r.; D.k. at 578 nm.	771174
		6.4	2.2×10^{10}	p.r.; D.k.; k also detd. at 6.4 kbar (6.4 × 10^8 N/m^2).	720102
		7	1.9×10^{10}	p.r.; D.k. at 578 nm, $[O_2]$ = 35-120 × 10^{-6} mol L^{-1}, with and without 10^{-3} mol L^{-1} MeOH.	630050
332	**Hydrogen peroxide**				
	$e_{aq}^- + H_2O_2 \rightarrow OH^- + \cdot OH$		*1.1×10^{10}*	Average of 3 values.	
			9.5×10^9	p.r.; D.k. at 650 nm in deaerated soln. contg. 0.5 mol L^{-1} *tert*-BuOH.	81A374
			1.2×10^{10}	p.r.; D.k. at 600 nm.	78A131
		7	1.2×10^{10}	p.r.; D.k. at 578 nm, with and without 10^{-3} mol L^{-1} MeOH.	630073
333	**Hydroperoxide ion**				
	$e_{aq}^- + HO_2^- \rightarrow$	13.0	3.5×10^9	p.r.; D.k. at 720 nm; soln. contains (4-13) × 10^{-4} mol L^{-1} H_2O_2; p$K(H_2O_2)$ = 11.8.	670132
334	**Water**				
	$e_{aq}^- + H_2O \rightarrow H\cdot + OH^-$		*1.9×10^1*	Average of 2 values.	
		11	2.2×10^1	p.r.; First order d.k.; contains $Ba(OH)_2$ and 4 × 10^{-3} mol L^{-1} formate ion; extrapolated to formate concn. = 0.	680418
		8.3-9.0	1.6×10^1	p.r.; First order d.k.; contains 7 × 10^{-4} mol L^{-1} H_2.	660015

TABLE 6. Rate constants for reactions of hydrated electrons in aqueous solution—Continued

No.	Reaction	pH	k (L mol^{-1} s^{-1})	Comment	Ref.
335	**Ozone** $e_{aq}^- + O_3 \rightarrow O_3^{\cdot -}$	9	3.6×10^{10}	p.r.; C.k.; obs. abs. at 430 nm (O_3^-) in soln. contg. 0.15 mol L^{-1} HCO_3^- and $\sim 10^{-4}$ mol L^{-1} ozone; rel. to $k(e_{aq}^- + O_2)$.	83A117
336	**Hexacyanoosmate(II) ion** $e_{aq}^- + Os(CN)_6^{4-} \rightarrow$	10.5	$<1.0 \times 10^6$	p.r.; D.k.; counterion K^+; $I = 10^{-3}$.	680295
337	**Pentaammine(chloro)osmium(III) ion** $e_{aq}^- + Os(NH_3)_5Cl^{2+} \rightarrow Os(NH_3)_5Cl^+$	4.8	$>5 \times 10^9$	p.r.; Soln. Ar-satd. contg. acetate buffer, 0.1 mol L^{-1} *tert*-BuOH and 10^{-4} mol L^{-1} complex; $I = 0.01$.	82A145
338	**(Aqua)pentachloroosmate(IV) ion** $e_{aq}^- + OsCl_5(H_2O)^- \rightarrow OsCl_5(H_2O)^{2-}$		4.4×10^{10}	p.r.; D.k. at 700 nm in N_2-satd. soln. contg. 1 mol L^{-1} *tert*-BuOH and Na_2OsCl_6; ionic strength effect on addition of $NaClO_4$ showed that the complex was aquated; k cor. for I.	77A219
339	**Hypophosphite ion** $e_{aq}^- + H_2PO_2^- \rightarrow$	6.8	1.0×10^5	p.r.; D.k.; counterion Na^+; $I = 10^{-2}$, $k_{obs} = 1.1 \times 10^5$; k cor. for I.	680295
340	**Sodium polyphosphite** $e_{aq}^- + (NaPO_3)_n \rightarrow$		$<1 \times 10^6$	p.r.; Solute has no effect on lifetime of e_{aq}^-; n = 50.	740036
341	**Dihydrogen phosphite ion** $e_{aq}^- + H_2PO_3^- \rightarrow$	6.7	5.5×10^6	p.r.; D.k.; counterion K^+; pK 2.0, 6.59; at $I = 2 \times 10^{-2}$, $k_{obs} = 7.2 \times 10^6$; k cor. for I.	680295
342	**Phosphoric acid** $e_{aq}^- + H_3PO_4 \rightarrow H\cdot + H_2PO_4^-$	<4	$\sim 1 \times 10^9$	p.r.; D.k. at 550 nm in soln. contg. 0.01 mol L^{-1} *tert*-BuOH and 1 mol L^{-1} phosphate; k estd. from pH dependence taking p$K(H_3PO_4) = \sim 1.7$	86A364
343	**Dihydrogen phosphate ion** $e_{aq}^- + H_2PO_4^- \rightarrow H\cdot + HPO_4^{2-}$	5-7	1.9×10^7	p.r.; D.k. at 550 nm in soln. contg. 0.01 mol L^{-1} *tert*-BuOH and 1 mol L^{-1} phosphate; k estd. from pH dependence taking p$K(H_2PO_4^-) = 6.4$; above pH 9 $k_{obs} < 2 \times 10^6$ ($e_{aq}^- + HPO_4^{2-}$ very slow).	86A364
		4	1.2×10^7	p.r.; D.k.; $I = 0.1$.	731049
		6.25	3.1×10^6	X-r.; C.k.; obs. $G(H_2)$ in 0.1 mol L^{-1} KH_2PO_4-Na_2HPO_4 soln.; rel. to $k(e_{aq}^- + Fe(CN)_6^{3-})$.	620021
344	**Hydrogen phosphate ion** $e_{aq}^- + HPO_4^{2-} \rightarrow$	9-12.3	1.4×10^5	p.r.; D.k.; p$K_a(H_3PO_4) = 2.12, 7.21, 12.32$; $I = 0.6$.	731049
345	**Pyrophosphate ion** $e_{aq}^- + P_2O_7^{4-} \rightarrow$	9.7, 10.3	2.4×10^6	p.r.; D.k.; p$K_a(H_4P_2O_7) = \sim 1, \sim 2, 6.7, 9.4$; $I = 0.8$.	731049
346	**Dihydrogen peroxodiphosphate ion** $e_{aq}^- + H_2P_2O_8^{2-} \rightarrow H_2PO_4^- + H_2PO_4\cdot$	4.23	5.3×10^9	p.r.; D.k.; cor. for H^+ reaction.	751095
347	**Hydrogen peroxodiphosphate ion** $e_{aq}^- + HP_2O_8^{3-} \rightarrow HPO_4^{2-} + HPO_4^{\cdot -}$	6.54	1.6×10^9	p.r.; D.k.	751095
348	**Peroxodiphosphate ion** $e_{aq}^- + P_2O_8^{4-} \rightarrow PO_4^{3-} + PO_4^{\cdot 2-}$	10.5	1.8×10^8	p.r.; D.k.	751095
349	**Hydrogen peroxomonophosphate ion** $e_{aq}^- + HPO_5^{2-} \rightarrow \cdot OH + PO_4^{3-}$	7	4.4×10^8	p.r.; D.k. (also produces $OH^- + PO_4^{2-}$).	771047

TABLE 6. Rate constants for reactions of hydrated electrons in aqueous solution—Continued

No.	Reaction	pH	k (L mol^{-1} s^{-1})	Comment	Ref.
350	**Lead(II) ion**				
	$e_{aq}^- + Pb^{2+} \rightarrow Pb^+$		*9.8 × 10^{10}*	Average of 3 values.	
			3.5 × 10^{10}	p.r.; D.k. at 578 nm in soln. contg. 10^{-2} mol L^{-1} MeOH; pK 7.8, 9.4, 10.8	78A206
			3.9 × 10^{10}	p.r.; D.k.	650044
		7	3.9 × 10^{10}	p.r.; D.k.; counterion ClO_4^-.	650047
351	**Lead(II) ions**				
	$e_{aq}^- + Pb(II) \rightarrow Pb(I)$	12.3	1.2 × 10^9	p.r.; D.k. at 720 nm; counterion ClO_4^-.	82A425
		14	1.0 × 10^{10}	p.r.; D.k.; soln. contains 1 mol L^{-1} NaOH; at 3 mol L^{-1} OH^- k = 9.2 × 10^9.	650047
352	**Tris(ethylenediamine)lead(II) ion**				
	$e_{aq}^- + Pb(en)_3^{2+} \rightarrow$	11.2	2.3 × 10^{10}	p.r.; D.k. at 575 nm; counterion Cl^-; soln. contains 10^{-1} mol L^{-1} ethylenediamine dihydrochloride.	690277
353	**Tetrakis(4-*N*-methylpyridyl)porphinatolead(II) ion**				
	$e_{aq}^- + PbTMpyP^{4+} \rightarrow [PbTMpyP]^{\cdot 3+}$	7	1 × 10^{10}	p.r.; P.b.k. in soln. contg. 2-PrOH, initial fast reaction followed by slow grow-in due to 2-PrOH radical.	83C026
354	**Tris(glycinato)plumbate(II) ion**				
	$e_{aq}^- + Pb(Gly)_3^- \rightarrow$	11.1	1.6 × 10^{10}	p.r.; D.k. at 575 nm; counterion Cl^-; soln. contains 10^{-1} mol L^{-1} glycine.	690277
355	**Bis(nitrilotriacetato)plumbate(II) ion**				
	$e_{aq}^- + Pb(NTA)_2^{4-} \rightarrow$	10.9	3.2 × 10^9	p.r.; D.k. at 575 nm; counterion Cl^-; soln. contains 2 × 10^{-2} mol L^{-1} nitrilotriacetic acid.	690277
356	**Ethylenediaminetetraacetatoplumbate(II) ion**				
	$e_{aq}^- + PbEDTA^{2-} \rightarrow PbEDTA^{3-}$	11.5	1.9 × 10^9	p.r.; D.k. in buffered soln. contg. 0.5% *n*-BuOH; product identified in [80A072]; I = 0.016.	77A252
		11-12	3.8 × 10^9	p.r.; D.k. at 575 nm; counterion Na^+; I = 0.2.	690276
357	**Cyclohexanediaminetetraacetatoplumbate(II) ion**				
	$e_{aq}^- + PbCDTA^{2-} \rightarrow PbCDTA^{3-}$	11	1.9 × 10^9	p.r.; D.k.; product identified by abs. spectra; soln. contg. *n*-BuOH; counterion Cl^-; I = 0.01.	80A072
358	**Tetrachloropalladate(II) ion**				
	$e_{aq}^- + PdCl_4^{2-} \rightarrow PdCl_4^{3-}$		*1.2 × 10^{10}*	Average of 2 values.	
			1.1 × 10^{10}	p.r.; Soln. contg. 0.01 mol L^{-1} NaCl.	741087
		7.1	1.2 × 10^{10}	p.r.; D.k.; counterion K^+; soln. contg. 0.1 mol L^{-1} Cl^-.	650047
359	**Tetracyanopalladate(II) ion**				
	$e_{aq}^- + Pd(CN)_4^{2-} \rightarrow$	10.6	1.9 × 10^9	p.r.; D.k.; counterion K^+; I = 10^{-2}, k_{obs} = 2.8 × 10^9; k cor. for I.	680295
360	**Tetrakis(4-*N*-methylpyridyl)porphinatopalladium(II) ion**				
	$e_{aq}^- + PdTMpyP^{4+} \rightarrow [PdTMpyP]^{\cdot 5+}$	7	1 × 10^{10}	p.r.; P.b.k. in soln. contg. 2-PrOH, initial fast reaction followed by slow grow-in due to 2-PrOH radical.	83C026
361	**Tetrakis(*p*-sulfonatophenyl)porphinatopalladate(II) ion**				
	$e_{aq}^- + PdTPPS^{4-} \rightarrow [PdTPPS]^{\cdot 5-}$	7	1 × 10^{10}	p.r.; P.b.k. in soln. contg. 2-PrOH, initial fast reaction followed by slow grow-in due to 2-PrOH radical.	83C026
362	**Praseodymium(III) ion**				
	$e_{aq}^- + Pr^{3+} \rightarrow$	6.0	2.3 × 10^6 [b]	p.r.; D.k.; perchlorate counterion.	76A248
		5.5	6 × 10^6 [b]	p.r.; D.k. in Ar-satd. soln. contg. 10^{-2} mol L^{-1} MeOH and 0.1 mol L^{-1} Pr(III) sulfate; I = 0.1.	720066
363	**Ethylenediaminetetraacetatopraseodymate(II) ion**				
	$e_{aq}^- + PrEDTA^- \rightarrow$	11.5	3.6 × 10^6	p.r.; D.k. at 575 nm; counterion Na^+; I = 0.2.	690276

TABLE 6. Rate constants for reactions of hydrated electrons in aqueous solution—Continued

No.	Reaction	pH	k (L mol^{-1} s^{-1})	Comment	Ref.
364	**Tetraammineplatinum(II) ion**				
	$e_{aq}^- + Pt(NH_3)_4^{2+} \rightarrow Pt(NH_3)_4^+$	5.6	1.9×10^{10}	p.r.; D.k. at 578 nm in soln. contg. 0.1 mol L^{-1} 2-PrOH and (1.5 - 17.4) $\times 10^{-5}$ mol L^{-1} complex.	81A353
365	**Bis(ethylenediamine)platinum(II) ion**				
	$e_{aq}^- + Pt(en)_2^{2+} \rightarrow Pt(en)_2^+$		1.2×10^{10}	p.r.; D.k. at 578 nm.	751188
366	**Chloro(diethylenetriamine)platinum(II) ion**				
	$e_{aq}^- + Pt(dien)Cl^+ \rightarrow Pt(dien)Cl$		1.9×10^{10}	p.r.; D.k. at 578 nm.	751188
367	**Chloro(tetraethyldiethylenetriamine)platinum(II) ion**				
	$e_{aq}^- + Pt(Et_4dien)Cl^+ \rightarrow Pt(Et_4dien)Cl$		1.4×10^{10}	p.r.; D.k. at 578 nm.	751188
368	***cis*-Dichlorodiammineplatinum(II)**				
	$e_{aq}^- + Pt(NH_3)_2Cl_2 \rightarrow Pt(NH_3)_2Cl_2^-$		1.2×10^{10}	p.r.; D.k. at 600 nm in soln. contg. 1 mol L^{-1} *tert*-BuOH and (0.25-1) $\times 10^{-3}$ mol L^{-1} Pt complex.	85A090
369	***trans*-Dichlorodiammineplatinum(II)**				
	$e_{aq}^- + Pt(NH_3)_2Cl_2 \rightarrow Pt(NH_3)_2Cl_2^-$		1.3×10^{10}	p.r.; D.k. at 600 nm in soln. contg. 1 mol L^{-1} *tert*-BuOH and (0.25-1) $\times 10^{-3}$ mol L^{-1} Pt complex.	85A090
370	***cis*-[Dichlorobis(1-(2-hydroxyethyl)-2-methyl-5-nitroimidazole-N^3)]platinum(II)**				
	$e_{aq}^- +$ *cis*-Flap $\rightarrow C_{12}H_{18}Cl_2N_6O_6P^-$		3.3×10^{10}	p.r.; D.k. at 600 nm in soln. contg. 1 mol L^{-1} *tert*-BuOH and (0.25-1) $\times 10^{-3}$ mol L^{-1} Pt complex.	85A090
371	**Tetrachloroplatinate(II) ion**				
	$e_{aq}^- + PtCl_4^{2-} \rightarrow PtCl_4^{3-}$		*9.2* $\times$ *10^9*	Average of 3 values.	
			9.3×10^9	p.r.	76A249
		7	9.3×10^9	p.r.; P.b.k. at 310 nm.	690144
			9.0×10^9	p.r.; D.k.	650044
372	**Tetracyanoplatinate(II) ion**				
	$e_{aq}^- + Pt(CN)_4^{2-} \rightarrow Pt(CN)_4^{3-}$	11	4.4×10^9	p.r.; P.b.k. at 360 nm.	690144
		10.6	2.9×10^9	p.r.; D.k.; counterion K^+; $I = 10^{-2}$, $k_{obs} = 3.9 \times 10^9$; k cor. for I.	680295
373	***cis*-Bis(glycinato)platinum(II)**				
	$e_{aq}^- +$ *cis*-Pt(Gly)$_2$ $\rightarrow$	~5.7	1.3×10^{10}	p.r.; P.b.k. at 240-270 nm, as well as d.k. at 578 nm, in soln. contg. 1 mol L^{-1} 2-PrOH; cor. for presence of 2-PrOH radical.	771053
374	***trans*-Bis(glycinato)platinum(II)**				
	$e_{aq}^- +$ *trans*-Pt(Gly)$_2$ $\rightarrow$	~5.7	1.4×10^{10}	p.r.; P.b.k. at 250-270 nm, as well as d.k. at 578 nm, in soln. contg. 1 mol L^{-1} 2-PrOH; cor. for presence of 2-PrOH radical.	771053
375	**Octahydrogen tetrakis(diphosphito)diplatinate(II) ion**				
	$e_{aq}^- + [Pt_2(P_2O_5H_2)_4]^{4-} \rightarrow [Pt_2(P_2O_5H_2^{2-})_4]^{5-}$	~6.8	1.8×10^{10}	p.r.; D.k. at 550 nm in soln. contg. 2 $\times 10^{-3}$ mol L^{-1} phosphate buffer and 1% *tert*-BuOH.	84A241
376	***trans*-Tetraamminebis(hydroxy)platinum(IV) ion**				
	$e_{aq}^- +$ *trans*-$Pt(NH_3)_4(OH)_2^{2+} \rightarrow Pt(NH_3)_4(OH)_2^+$	~5.6	4.9×10^{10}	p.r.; D.k. at 578 nm in soln. contg. (16-50) $\times 10^{-6}$ mol L^{-1} $[Pt(NH_3)_4(OH)_2](ClO_4)_2$	82A074
377	**1,8-Diamino-3,6,10,13,16,19-hexaazabicyclo[6.6.6]eicosaneplatinum(IV) ion**				
	$e_{aq}^- + Pt(diamsar)^{4+} \rightarrow Pt(diamsar)^{3+}$	6.8, 10	2.3×10^{10}	p.r.; D.k. at 600 nm in He-purged soln. contg. 0.1 mol L^{-1} *tert*-BuOH	83A148
378	***trans*-Dihydroxybis(ethylenediamine)platinum(IV) ion**				
	$e_{aq}^- +$ *trans*-$Pt(en)_2(OH)_2^{2+} \rightarrow$	9.8	5.8×10^{10}	p.r.; D.k. at 578 nm in soln. contg. 1 mol L^{-1} *tert*-BuOH.	80A286

TABLE 6. Rate constants for reactions of hydrated electrons in aqueous solution—Continued

No.	Reaction	pH	k (L mol^{-1} s^{-1})	Comment	Ref.
379	***cis*-Dichlorobis(isopropylamine)-*trans*-dihydroxyplatinum(IV)**				
	$e_{aq}^- + PtCl_2(OH)_2(2\text{-}PrNH_2)_2 \rightarrow PtCl_2(OH)_2(2\text{-}PrNH_2)_2^-$		1.0×10^{10}	p.r.; D.k. at 600 nm in soln. contg. 1 mol L^{-1} *tert*-BuOH and (0.25-1) $\times 10^{-3}$ mol L^{-1} Pt complex.	85A090
380	***trans*-Dichlorobis(ethylenediamine)platinum(IV) ion**				
	$e_{aq}^- + trans\text{-}Pt(en)_2Cl_2^{2+} \rightarrow$		6.6×10^{10}	p.r.; D.k. at 578 nm.	751188
381	**Hexachloroplatinate(IV) ion**				
	$e_{aq}^- + PtCl_6^{2-} \rightarrow PtCl_5^{2-}$		2.0×10^{10}	p.r.	76A249
		10	1.4×10^{10}	p.r.; D.k.; counterion K^+; $I = 10^{-2}$, $k_{obs} = 2.0 \times 10^{10}$; k cor. for I.	680295
		11	3.6×10^{10}	p.r.; D.k. at 545 nm; counterions K^+, Na^+.	670063
382	**Dioxoplutonium(VI) ion**				
	$e_{aq}^- + PuO_2^{2+} \rightarrow PuO_2^+$	5.6	6.4×10^{10}	p.r.; D.k.; at pH 6.1 $k = 5.8 \times 10^{10}$, counterion ClO_4^-; $I = 10^{-3}$.	761084
383	**Plutonate(VI) ion**				
	$e_{aq}^- + Pu(VI) \rightarrow$	~14	1.9×10^{10}	p.r.; D.k. at 650 nm in 2 mol L^{-1} OH^-; $k =$ 2.0 and 0.66 $\times 10^{10}$ at 5.0 and 7.5 mol L^{-1} OH^-.	731123
384	**Tris(carbonato)dioxoplutonate(VI) ion**				
	$e_{aq}^- + PuO_2(CO_3)_3^{4-} \rightarrow PuO_2(CO_3)_3^{5-}$		2.3×10^{10}	p.r.; D.k. at 600 nm in 0.05 mol L^{-1} sodium carbonate soln.	84A155
			2.3×10^{10}	p.r.; D.k.; soln. contg. 0.1-5 mol L^{-1} CO_3^{2-}. Calcd. $k = 2.2 \times 10^9$ for $I = 0$ [751177].	741170
385	**Plutonate(VII) ion**				
	$e_{aq}^- + Pu(VII) \rightarrow Pu(VI)$	14	3.5×10^{10}	p.r.; D.k. at 650 nm in soln. contg. 1.0 mol OH^-; $k = 4.2$, 2.3, 2.0 $\times 10^{10}$ at 2.0, 5.0 and 7.5 mol L^{-1} OH^-.	731123
386	**Bis(ethylenediamine)dioxorhenium(V) ion**				
	$e_{aq}^- + Re(en)_2O_2^+ \rightarrow Re(en)_2O_2$	7	2.3×10^{10}	p.r.; D.k. at 580 nm in N_2-satd. soln. contg. 0.1 mol L^{-1} *tert*-BuOH.	86A387
387	**Bis(1,3-propylenediamine)dioxorhenium(V) ion**				
	$e_{aq}^- + Re(pn)_2O_2^+ \rightarrow Re(pn)_2O_2$	7	2.4×10^{10}	p.r.; D.k. at 580 nm in N_2-satd. soln. contg. 0.1 mol L^{-1} *tert*-BuOH.	86A387
388	**Perrhenate(VII) ion**				
	$e_{aq}^- + ReO_4^- \rightarrow ReO_4^-$	7	1.3×10^{10}	p.r.; D.k. at 680 nm in N_2-purged soln. contg. 0.1 mol L^{-1} *tert*-BuOH; same rate in basic (0.01 mol L^{-1} NaOH) soln.	85A234
389	**Pentaammine(aqua)rhodium(III) ion**				
	$e_{aq}^- + Rh(NH_3)_5H_2O^{3+} \rightarrow$	5.8	7.9×10^{10}	p.r.; D.k. at 700 nm in soln. contg. *tert*-BuOH; counterion ClO_4^-.	751128
390	**Pentaammineazidorhodium(III) ion**				
	$e_{aq}^- + Rh(NH_3)_5N_3^{2+} \rightarrow$	6.1	7.3×10^{10}	p.r.; D.k. at 700 nm in soln. contg. *tert*-BuOH; counterion ClO_4^-.	751128
391	**Tetraamminedibromorhodium(III) ion**				
	$e_{aq}^- + Rh(NH_3)_4Br_2^+ \rightarrow$	6.4	6.9×10^{10}	p.r.; D.k. at 700 nm in soln. contg. 10^{-2} mol L^{-1} *tert*-BuOH; counterion ClO_4^-.	751128
392	**Pentaamminechlororhodium(III) ion**				
	$e_{aq}^- + Rh(NH_3)_5Cl^{2+} \rightarrow Rh(NH_3)_5Cl^+$	6.3	6.7×10^{10}	p.r.; D.k. at 700 nm in soln. contg. *tert*-BuOH; counterion ClO_4^-.	751128
393	**Chlororhodium(III) ion**				
	$e_{aq}^- + RhCl^{2+} \rightarrow RhCl^+$		5.5×10^{10}	p.r.; D.k. at 700 nm in N_2-satd. soln. of $RhCl_6^{3-}$ which had stood for 24 hr.; k cor. for I.	771050

TABLE 6. Rate constants for reactions of hydrated electrons in aqueous solution—Continued

No.	Reaction	pH	k (L mol^{-1} s^{-1})	Comment	Ref.
394	**Pentachlororhodate(III) ion**				
	$e_{aq}^- + RhCl_5^{2-} \rightarrow RhCl_5^{3-}$		4.4×10^{10}	p.r.; D.k. at 700 nm in N_2-satd. soln. of $RhCl_6^{3-}$ which had stood for 20 min.; k cor. for I.	771050
395	**Rhodium(II) acetate**				
	$e_{aq}^- + (CH_3CO_2)_2Rh \rightarrow (CH_3CO_2)Rh^-$	6.8	$\sim 1 \times 10^{10}$	p.r.; P.b.k. in N_2-satd. soln. contg. 0.5 mol L^{-1} *tert*-BuOH and 10^{-4} mol L^{-1} Rh(II) acetate.	85R110
396	**Bis(2,2'-bipyridine)dihydroxyrhodium(III) ion**				
	$e_{aq}^- + Rh(bpy)_2(OH)_2^+ \rightarrow Rh(bpy)_2(H_2O)_2^{2+}$		4.5×10^{10}	p.r.; Product can be $Rh(bpy)_2(OH)_2$ or $Rh(bpy)_2(H_2O)OH^+$ or $Rh(bpy)_2(H_2O)_2^{2+}$	83A046
397	**Tris(2,2'-bipyridine)rhodium(III) ion**				
	$e_{aq}^- + Rh(bpy)_3^{3+} \rightarrow Rh(bpy)_3^{2+}$	7	8.1×10^{10}	p.r.; D.k. at 578 (e_{aq}^-) or 320 (substrate), as well as p.b.k. at 270 nm in Ar-purged soln. contg. 0.5 mol L^{-1} MeOH.	81A134
398	**1,8,6,8,10,13,16,19-Octaazabicyclo[6.6.6]eicosanerhodium(III) ion**				
	$e_{aq}^- + Rh(sep)^{3+} \rightarrow Rh(sep)^{2+}$	6.9	1.4×10^{10}	p.r.; D.k. at 600 nm as well as p.b.k. at 340 nm in He-satd. soln. contg. 0.02 mol L^{-1} phosphate buffer; first-order decay of product 0.5 s^{-1} gave the original absorption; $I = 0.02$.	83A298
399	**Dihydroxytetrakis(*p*-sulfonatophenyl)porphinerhodate(III) ion**				
	$e_{aq}^- + RhTPPS(OH)_2^{5-} \rightarrow RhTPPS(OH)_2^{6-}$	13	3×10^{10}	p.r.; D.k. in N_2-satd. soln. contg. 1 mol L^{-1} *tert*-BuOH.	85A114
400	**Pentaammine(dinitrogen)ruthenium(II) ion**				
	$e_{aq}^- + Ru(NH_3)_5N_2^{2+} \rightarrow Ru(NH_3)_5N_2^+$		4.2×10^9	p.r.; D.k. at 650 nm.	710234
401	**Decaammine(dinitrogen)diruthenium(II) ion**				
	$e_{aq}^- + [Ru(NH_3)_5]_2N_2^{4+} \rightarrow [Ru(NH_3)_5]_2N_2^{3+}$	6.8-10	3.0×10^{10}	p.r.; D.k. at 680 nm.	82A135
402	**Tris(2,2'-bipyridine)ruthenium(II) ion**				
	$e_{aq}^- + Ru(bpy)_3^{2+} \rightarrow Ru(bpy)_3^+$		*6.9* $\times$ *10^{10}*	Average of 2 values.	
			5.6×10^{10}	p.r.; D.k. at 600 nm in soln. contg. 1.7×10^{-2} mol L^{-1} *tert*-BuOH.	771093
		7	*8.2* $\times$ *10^{10}*	p.r.; D.k.	720381
403	**Bis(2,2'-bipyridine)bis(*cyano*)ruthenium(II)**				
	$e_{aq}^- + Ru(bpy)_2(CN)_2 \rightarrow Ru(bpy)_2(CN)_2^-$		3.5×10^{10}	p.r.; D.k. at 700 by f.p. gave 3.3×10^{10}.	84A177
404	**Tris(2,2'-bipyrazine)ruthenium(II) ion**				
	$e_{aq}^- + Ru(bpz)_3^{2+} \rightarrow Ru(bpz)_2(bpz^{\cdot-})^{2+}$	nat.	4.7×10^{10}	p.r.; D.k. at 720 nm in Ar-satd. soln. contg. 0.1 mol L^{-1} formate ion and 25-50 $\times$ 10^{-6} mol L^{-1} metal complex; in the presence of 0.13 mol L^{-1} 2-PrOH $k = 9.0 \times 10^{10}$; $I = 0.1$.	86A422
405	**Hexacyanoruthenate(II) ion**				
	$e_{aq}^- + Ru(CN)_6^{4-} \rightarrow$	10.6	$< 1.0 \times 10^6$	p.r.; D.k.; counterion K^+; $I = 0.01$.	680295
406	**Hexaammineruthenium(III) ion**				
	$e_{aq}^- + Ru(NH_3)_6^{3+} \rightarrow Ru(NH_3)_6^{2+}$		*6.8* $\times$ *10^{10}*	p.r.; D.k.	700178
407	***Pentammine(hydroxy)*ruthenium(III) ion**				
	$e_{aq}^- + Ru(NH_3)_5OH^{2+} \rightarrow$	6	5.9×10^{10}	p.r.; D.k.; p$K = 4.2$.	730107
408	**Pentaammine(nitroso)ruthenium(III) ion**				
	$e_{aq}^- + Ru(NH_3)_5NO^{3+} \rightarrow Ru(NH_3)_5NO^{2+}$	8.6	5.3×10^{10}	p.r.; D.k. at 700 nm in Ar-satd. soln. contg. 0.5 mol L^{-1} *tert*-BuOH.	751049
409	**Pentaammine(bromo)ruthenium(III) ion**				
	$e_{aq}^- + Ru(NH_3)_5Br^{2+} \rightarrow$		*5.0* $\times$ *10^{10}*	p.r.; D.k.	*730107*

TABLE 6. Rate constants for reactions of hydrated electrons in aqueous solution—Continued

No.	Reaction	pH	k (L mol^{-1} s^{-1})	Comment	Ref.
410	**Ruthenium(III) chloride**				
	$e_{aq}^- + RuCl_3 \rightarrow RuCl_3^-$		4.2×10^{10}	p.r.; D.k. at 700 nm in soln. contg. $RuCl_6^{3-}$, no ionic strength effect.	80A114
411	**Chloropentaammineruthenium(III) ion**				
	$e_{aq}^- + Ru(NH_3)_5Cl^{2+} \rightarrow Ru(NH_3)_5Cl^+$		*6.1 × 10^{10}*	Average of 2 values.	
			6.0×10^{10}	p.r.; D.k.	730107
			6.2×10^{10}	p.r.; D.k.	700178
412	**Iodopentaammineruthenium(III) ion**				
	$e_{aq}^- + Ru(NH_3)_5I^{2+} \rightarrow$		$\sim 6 \times 10^{10}$	p.r.; D.k.	730107
413	**(Isonicotinamide)pentaammineruthenium(III) ion**				
	$e_{aq}^- + Ru(NH_3)_5isn^{3+} \rightarrow Ru(NH_3)_5isn^{2+}$	3.14	2.8×10^{10}	p.r.; C.k. in He-satd. soln. contg. *tert*-BuOH and 0.1 mol L^{-1} sodium trifluoromethanesulfonate; rel. to $k(e_{aq}^- + H^+) = 2 \times 10^{10}$; $I = 0.1$.	80A317
414	**Tris(2,2′-bipyridine)ruthenium(III) ion**				
	$e_{aq}^- + Ru(bpy)_3^{3+} \rightarrow Ru(bpy)_3^{2+}$	4.6	5.2×10^{10}	p.r.; D.k. at 600 nm, as well as p.b.k. at 365 nm, as well as emission p.b.k. at 600 nm; soln. contg. 0.5 mol L^{-1} *tert*-BuOH; excited states of the product are formed.	78A070
415	**Hydrogen sulfide**				
	$e_{aq}^- + H_2S \rightarrow H\cdot + HS^-$		*1.2 × 10^{10}*	Average of 2 values.	
			1.1×10^{10}	p.r.; No details given; no reaction in alk. soln.	670273
		5.5-6	1.4×10^{10}	p.r.; D.k. at 550 nm; also produced $H_2 + S^-$.	650013
416	**Bisulfide ion**				
	$e_{aq}^- + HS^- \rightarrow H\cdot + S^{2-}$	10.9-12.7	3.0×10^7	p.r.; D.k. at 578 nm in soln. contg. (1-3) × 10^{-2} mol L^{-1} H_2S, pH adjusted by NaOH.	731012
417	**Sulfite ion**				
	$e_{aq}^- + SO_3^{2-} \rightarrow$	alk.	$< 1.5 \times 10^6$	p.r.; D.k. in Ar-satd. soln.; half-life of e_{aq}^- increases with sulfite concn.	710461
		10.0	$< 1.3 \times 10^6$	p.r.; D.k.; counterion Na^+; $I = 10^{-3}$.	680295
418	**Sulfur hexafluoride**				
	$e_{aq}^- + SF_6 \rightarrow \cdot SF_5 + F^-$	~7	1.6×10^{10}	p.r.; D.k. in Ar-satd. soln.; overall reaction consists of fast steps $\rightarrow SF_5 + F^-$, $SF_5 + 2H_2O \rightarrow OH + SF_4 + F^- + H_3O^+$, followed by slow hydrolysis: $SF_4 + 9H_2O \rightarrow SO_3^{2-} + 4F^- + 6H_3O^+$ [700107].	680159
419	**Sulfate ion**				
	$e_{aq}^- + SO_4^{2-} \rightarrow$	~7	$< 1 \times 10^6$	p.r.; D.k.; concn 10^{-2} mol L^{-1}.	640046
		~7	$< 1 \times 10^6$	p.r.; D.k. (unreactive), concn. 10^{-2} mol L^{-1}.	640132
420	**Thiosulfate ion**				
	$e_{aq}^- + S_2O_3^{2-} \rightarrow SO_3^{2-} + \cdot S^-$	6.5	$\sim 1.5 \times 10^8$	p.r.; D.k. at 700 nm in soln. contg. 10^{-2} and 10^{-1} mol L^{-1} $Na_2S_2O_3$ and various concns. of Na_2SO_4; extrapolated from obs. $k = 1.8 \times 10^8$ in 1.07×10^{-2} mol L^{-1} $Na_2S_2O_3$; soln. contained $S_2O_3^{2-}$ and $NaS_2O_3^-$; k cor. for I.	84A007
		~9.5	7.6×10^7	p.r.; D.k. at 600 nm in deaerated soln. contg. 1 mol L^{-1} *tert*-BuOH. no product abs. in 270-650 nm region; k cor. for I.	84A096
421	**Tetrathionate ion**				
	$e_{aq}^- + S_4O_6^{2-} \rightarrow S_4O_6^{3-}$		3.5×10^9	p.r.; D.k. at 600 nm; counterion Na^+; k cor. for I.	82B083
			5.8×10^9	p.r.; D.k. at 720 nm.	731027
422	**Peroxodisulfate ion**				
	$e_{aq}^- + S_2O_8^{2-} \rightarrow SO_4\cdot^- + SO_4^{2-}$		*1.2 × 10^{10}*	Average of 2 values.	

TABLE 6. Rate constants for reactions of hydrated electrons in aqueous solution—Continued

No.	Reaction	pH	k (L mol^{-1} s^{-1})	Comment	Ref.
422	**Peroxodisulfate ion—Continued**				
		5.7	1.4×10^{10}	p.r.; D.k.; k also detd. at 6.4 kbar (6.4×10^8 N/m^2); counterion K^+.	720102
			1.1×10^{10}	p.r.; D.k. at 720 nm.	690158
423	**Hydrogen peroxomonosulfate ion**				
	$e_{aq}^- + HSO_5^- \rightarrow SO_4^{2-} + \cdot OH$		8.4×10^9	p.r.; D.k. at 720 nm.	690158
424	**Antimonate(V) ion**				
	$e_{aq}^- + SbO_3^- \rightarrow$		*1.2×10^{10}*	Average of 2 values.	
		11.0	1.3×10^{10}	p.r.; D.k.; counterion K^+; $I = 10^{-3}$.	680295
		11.0	1.2×10^{10}	p.r.; D.k.	650047
425	**Ethylenediaminetetraacetatoscandate(III) ion**				
	$e_{aq}^- + ScEDTA^- \rightarrow$	11.5	3.5×10^7	p.r.; D.k. at 575 nm; counterion Na^+; $I = 0.2$.	690276
426	**Hydrogen selenide**				
	$e_{aq}^- + H_2Se \rightarrow H\cdot + HSe^-$	6.0	1.1×10^{10}	p.r.; D.k. at 720 nm; cor. for $e_{aq}^- + HSe^-$.	690564
427	**Hydroselenide ion**				
	$e_{aq}^- + HSe^- \rightarrow H_2 + Se^- + \cdot OH$	9-12.6	4.8×10^7	p.r.; D.k. at 720 nm; concn. 10^{-3}-10^{-2} mol L^{-1}.	690564
428	**Hydrogen selenite(IV) ion**				
	$e_{aq}^- + HSeO_3^- \rightarrow OH^- + SeO_2^-$	6.0	1.7×10^9	p.r.; D.k. at 578 nm in soln. contg. 0.1 mol L^{-1} MeOH and SeO_2; pK 2.46, 7.31.	771173
429	**Selenite(IV) ion**				
	$e_{aq}^- + SeO_3^{2-} \rightarrow OH^- + SeO_2^-$	10.8	$< 1 \times 10^7$	p.r.; D.k. at 578 nm in soln. contg. 0.1 mol L^{-1} MeOH and SeO_2.	771173
		10.8	2.3×10^6	p.r.; D.k.; counterion Na^+; $I = 0.25$, $k_{obs} = 1.2 \times 10^7$; k cor. for I.	680295
430	**Selenate(VI) ion**				
	$e_{aq}^- + SeO_4^{2-} \rightarrow OH^- + SeO_3^-$	11.0	1.1×10^9	p.r.; D.k.; counterion Na^+; product detn. in [86A335].; $I = 10^{-3}$.	680295
431	**Hexafluorosilicate(IV) ion**				
	$e_{aq}^- + SiF_6^{2-} \rightarrow$	5.9	$< 5.5 \times 10^5$	p.r.; D.k.; counterion Li^+; $I = 0.15$, $k_{obs} = 1.5 \times 10^6$; k cor. for I.	680295
432	**Samarium(III) ion**				
	$e_{aq}^- + Sm^{3+} \rightarrow Sm^{2+}$	6.0	2.0×10^{10}	p.r.; D.k.; perchlorate salt.	76A248
		5.6	2.2×10^{10}	p.r.; D.k.; k also detd. at 6.4 kbar (6.4×10^8 N/m^2); counterion SO_4^{2-}.	720102
		~6	2.7×10^{10}	p.r.; D.k. in Ar-satd. soln. contg. 10^{-2} mol L^{-1} MeOH and 4×10^{-5} mol L^{-1} $Sm_2(SO_4)_3$; k cor. for I.	720065
		5.96	2.5×10^{10}	p.r.; D.k.; counterion SO_4^{2-}.	640046
433	**Ethylenediamietetraacetatosamarate(III) ion**				
	$e_{aq}^- + SmEDTA^- \rightarrow$	11.5	2.6×10^7	p.r.; D.k. at 575 nm; counterion Na^+; $I = 0.2$.	690276
434	**Stannate(II) ion**				
	$e_{aq}^- + Sn(II) \rightarrow$	11	3.4×10^9	p.r.; D.k.; counterions Cl^-, Na^+; in 1 mol L^{-1} NaOH $k = 6.2 \times 10^9$	650047
435	**Ethylenediaminetetraacetatostannate(II) ion**				
	$e_{aq}^- + SnEDTA^{2-} \rightarrow$	11-12	1.4×10^9	p.r.; D.k. at 575 nm; counterion Na^+; $I = 0.2$.	690276
436	**Tetrakis(4-pyridyl)porphinatotin(IV) ion**				
	$e_{aq}^- + SnTpyP^{2+} \rightarrow [SnTpyP]^{\cdot+}$	7	1×10^{10}	p.r.; P.b.k. in soln. contg. 2-PrOH, initial fast reaction followed by slow grow-in due to 2-PrOH radical.	83C026

TABLE 6. Rate constants for reactions of hydrated electrons in aqueous solution—Continued

No.	Reaction	pH	k (L mol^{-1} s^{-1})	Comment	Ref.
437	**Tetrakis(4-*N*-methylpyridyl)porphinatotin(IV) ion**				
	$e_{aq}^- + SnTMpyP^{6+} \rightarrow [SnTMpyP]^{\cdot 5+}$	7	1×10^{10}	p.r.; P.b.k. in soln. contg. 2-PrOH, initial fast reaction followed by slow grow-in due to 2-PrOH radical.	83C026
438	**Dihydroxy[tetrakis(4-*N*-methylpyridyl)porphinato]tin(IV) ion**				
	$e_{aq}^- + SnTMpyP(OH)_2^{4+} \rightarrow [SnTMpyP(OH)_2]^{\cdot 3+}$	13	4×10^{10}	p.r.	84A121
439	**Tetrakis(*p*-sulfonatophenyl)porphinatostannate(IV) ion**				
	$e_{aq}^- + SnTPPS^{2-} \rightarrow [SnTPPS]^{\cdot 3-}$	7	1×10^{10}	p.r.; P.b.k. in soln. contg. 2-PrOH, initial fast reaction followed by slow grow-in due to 2-PrOH radical.	83C026
440	**Stannate(IV) ion**				
	$e_{aq}^- + SnO_3^{2-} \rightarrow$	11.0	5.9×10^8	p.r.; D.k.; counterion Na^+; $I = 10^{-3}$, $k_{obs} = 6.3 \times 10^8$; $I = 10^{-3}$; k cor. for I.	680295
441	**Hexafluorostannate(IV) ion**				
	$e_{aq}^- + SnF_6^{2-} \rightarrow$	6.5	2.9×10^9	p.r.; D.k.; counterion K^+; $I = 10^{-2}$, $k_{obs} = 4.1 \times 10^9$; k cor. for I.	680295
442	**Bis(nitrilotriacetato)stannate(IV) ion**				
	$e_{aq}^- + Sn(NTA)_2^{2-} \rightarrow$	10.9	1.7×10^9	p.r.; D.k. at 575 nm; counterion Cl^-; soln. contains 2×10^{-2} mol L^{-1} nitrilotriacetic acid.	690277
443	**Terbium(III) ion**				
	$e_{aq}^- + Tb^{3+} \rightarrow$	6.0	$<1 \times 10^6$	p.r.; D.k.; perchlorate salt.	76A248
444	**Ethylenediaminetetraacetatoterbate(III) ion**				
	$e_{aq}^- + TbEDTA^- \rightarrow$	11-12	5.3×10^6	p.r.; D.k. at 575 nm; counterion Na^+; $I = 0.2$.	690276
445	**Technetate(VII) ion**				
	$e_{aq}^- + TcO_4^- \rightarrow TcO_4^{2-}$	6.0-6.5	1.9×10^{10}	p.r.; D.k. at 580 nm in Ar satd. soln. contg. *tert*-BuOH and $K^{99}TcO_4$	81A173
		13	2.5×10^{10}	p.r.; D.k. in soln. contg. 0.10 mol L^{-1} NaOH and (1-6) $\times 10^{-5}$ mol L^{-1} $^{99}TcO_4^-$.	78A390
		~7	1.3×10^{10}	p.r.; D.k. at 700 nm as well as p.b.k. at 360 nm in soln. contg. 5×10^{-2} mol L^{-1} *tert*-BuOH.	77A245
446	**Tellurite(IV) ion**				
	$e_{aq}^- + TeO_3^{2-} \rightarrow$	10.9	1.1×10^9	p.r.; D.k.; counterion Na^+; $I = 10^{-3}$.	680295
447	**Telluric acid**				
	$e_{aq}^- + Te(OH)_6 \rightarrow$		3.2×10^{10}	p.r.; D.k.; extrapolated from picosecond measurement; $pK_a = 7.68, 11.29$.	771105
448	**Tellurate(VI) ion**				
	$e_{aq}^- + TeO_4^{2-} \rightarrow$	11.0	1.6×10^{10}	p.r.; D.k.; counterion Na^+; $I = 10^{-3}$.	680295
449	**Thorium(IV) ion**				
	$e_{aq}^- + Th^{4+} \rightarrow$	3	1.9×10^{10}	p.r.; D.k. at 650 nm in Ar-satd. soln. contg. $Th(ClO_4)_2$; k cor. for I.	82A416
450	**Sulfatothorium(IV) ion**				
	$e_{aq}^- + ThSO_4^{2+} \rightarrow ThSO_4^+$		1.1×10^{10}	p.r.; D.k. at 650 nm.	82A416
		3	1.0×10^{10}	p.r.; D.k. at 650 nm in soln. contg. $Th(SO_4)_2$ and *tert*-BuOH; soln. contains Th^{4+}, $ThSO_4^{2+}$ and $Th(SO_4)_2$; k cor. for I.	83A127
451	**Hydroxytitanium(III) ion**				
	$e_{aq}^- + TiOH^{2+} \rightarrow TiOH^+$	2.5	1.2×10^{10}	γ-r.; C.k.; obs. $G(H_2)$ in Ar-satd. soln. contg. 0.2 mol L^{-1} Na_2SO_4. and EtOH; pK 1.29; rel. to $k(e_{aq}^- + H^+)$; $I = 0.84$.	79A341
452	**Hexafluorotitanate(IV) ion**				
	$e_{aq}^- + TiF_6^{2-} \rightarrow$	6.6	3.5×10^9	p.r.; D.k.; counterion Na^+; $I = 0.1$, $k_{obs} = 5.8 \times 10^9$; k cor. for I.	680295

TABLE 6. Rate constants for reactions of hydrated electrons in aqueous solution—Continued

No.	Reaction	pH	k (L mol^{-1} s^{-1})	Comment	Ref.
453	**Thallium(I) ion**				
	$e_{aq}^- + Tl^+ \rightarrow Tl$		2.0×10^{10}	p.r.; D.k. at 600 nm in soln. contg. 1 mol L^{-1} $LiClO_4$; $I = 1$.	84C015
		6.1	5.4×10^{10}	p.r.; D.k.; k also detd. at 6.4 kbar (6.4×10^8 N/m^2); counterion SO_4^{2-}.	720102
			2.8×10^{10}	p.r.; D.k. at 650 nm; addn. of 0.1 - 0.3 mol/dm^3 ethanol gave $k = (3.0$ to $3.7) \times 10^{10}$ detd. at 10-75°C.	710580
		8.5	4.0×10^{10}	p.r.; D.k.; counterion SO_4^{2-}; $I = 10^{-3}$, $k_{obs} = 3.7 \times 10^{10}$; k cor. for I.	680295
		7	3.0×10^{10}	p.r.; D.k.	650044
454	**Diethylthallium ion**				
	$e_{aq}^- + Tl(C_2H_5)_2 \rightarrow Tl^+$		3.1×10^{10}	γ-r.; C.k. in air-free soln. contg. 10^{-2} mol L^{-1} diethylthallium sulfate, 3×10^{-2} mol L^{-1} KNO_3, 0.1-0.5 mol L^{-1} MeOH; obs. $G(NO_2^-)$; rel. to $k(e_{aq}^- + NO_3^-)$.	660629
455	**Thulium(III) ion**				
	$e_{aq}^- + Tm^{3+} \rightarrow Tm^{2+}$	6.0	3.3×10^8	p.r.; D.k.; perchlorate counterion.	76A248
456	**Ethylenediaminetetraacetatothulate(III) ion**				
	$e_{aq}^- + TmEDTA^- \rightarrow$	11-12	1.4×10^7	p.r.; D.k. at 575 nm; counterion Na^+; $I = 0.2$.	690276
457	**Uranium(IV) ion**				
	$e_{aq}^- + U^{4+} \rightarrow U^{3+}$	~0	1.0×10^{11}	p.r.; C.k.; obs. absorption of U(III) in soln. contg. 0.01-0.1 mol L^{-1} U(IV) and 1 mol L^{-1} $HClO_4$; $pK_h = 0.68$; rel. to $k(e_{aq}^- + H^+) = 1.15 \times 10^{10}$ for 1 mol L^{-1} H^+.	81A410 85A236
458	**Hydroxyuranium(IV) ion**				
	$e_{aq}^- + UOH^{3+} \rightarrow UOH^{2+}$	~1	5×10^{11}	p.r.; Calc. from measurements at 0.1 and 0.05 mol L^{-1} $HClO_4$ at 0.01-0.1 mol L^{-1} U(IV) where U(IV) contains 20% and 30% of UOH^{3+} and $k_{obs} = 6.5 \times 10^{10}$ and 6.8×10^{10}; rel. to $k(e_{aq}^- + H^+) = 2 \times 10^{10}$ and 1.5×10^{10} at 0.05 and 0.1 mol L^{-1} H^+, resp.	81A410 85A236
459	**Uranyl(VI) ion**				
	$e_{aq}^- + UO_2^{2+} \rightarrow UO_2^+$	5.3	1.7×10^{10}	p.r.; D.k.; $(0.5\text{-}10) \times 10^{-4}$ mol L^{-1} U(VI), counterion ClO_4^-; 24% $UO_2(H_2O)_5OH^+$ [81A148], $pK_a = 5.2$ [78G312]; $I = 10^{-3}$.	761084
460	**Hydroxydioxouranium(VI) ion**				
	$e_{aq}^- + UO_2OH^+ \rightarrow UO_2OH$	6.8	1.3×10^{10}	p.r.; D.k.; $(0.1\text{-}1) \times 10^{-4}$ mol L^{-1} U(IV), counterion ClO_4^-; 9% $UO_2(H_2O)_6^{2+}$ [81A148]; $I = 10^{-3}$.	761084
461	**Triscarbonatodioxouranate(VI) ion**				
	$e_{aq}^- + UO_2(CO_3)_3^{4-} \rightarrow UO_2(CO_3)_3^{5-}$	11.4	1.3×10^{10}	p.r.; D.k. in soln. contg. 0.1 mol L^{-1} *tert*-BuOH and 0.01 mol L^{-1} carbonate and 0.4-7 $\times 10^{-4}$ mol L^{-1} U(VI).	81A148
462	**Bisoxalatodioxouranate(VI) ion**				
	$e_{aq}^- + UO_2(ox)_2^{2-} \rightarrow UO_2(ox)_2^{3-}$	5.0	2.7×10^{10}	p.r.; D.k. in soln. contg. 0.1 mol L^{-1} *tert*-BuOH and 0.01 mol L^{-1} oxalate and 0.4-7 $\times 10^{-4}$ mol L^{-1} U(VI).	81A148
463	**Iminodiacetatodioxouranium(VI)**				
	$e_{aq}^- + UO_2IDA \rightarrow UO_2IDA^-$	10.5	1.9×10^{10}	p.r.; D.k. in soln. contg. 0.1 mol L^{-1} *tert*-BuOH and 0.1 mol L^{-1} IDA and 0.4-7 $\times 10^{-4}$ mol L^{-1}U(VI); k increased to 3.87 and 3.1×10^{10} resp. at concn. 0.05 and 0.25 mol L^{-1} IDA at pH 8.	81A148

TABLE 6. Rate constants for reactions of hydrated electrons in aqueous solution—Continued

No.	Reaction	pH	k (L mol^{-1} s^{-1})	Comment	Ref.
464	**Nitrilotriacetatodioxouranate(VI) ion**				
	$e_{aq}^- + UO_2NTA^- \rightarrow UO_2NTA^{2-}$	9.0	1.7×10^{10}	p.r.; D.k. in soln. contg. 0.1 mol L^{-1} *tert*-BuOH and 0.01 mol L^{-1} NTA and 0.4-7 $\times$ 10^{-3} mol L^{-1} U(VI); k increased to 1.9 and 2.4 $\times$ 10^{10}, resp. at 0.05 and 0.25 mol L^{-1} NTA.	81A148
465	**Vanadyl(IV) ion**				
	$e_{aq}^- + VO^{2+} \rightarrow VO^+$	3.8-4.6	8×10^{10}	p.r.; D.k. in soln. contg. (2-5) $\times$ 10^{-4} mol L^{-1} $VO(ClO_4)_2$ and 0.01-0.05 mol L^{-1} EtOH or 0.12 mol L^{-1} *tert*-BuOH; pK_a = 5.79, estd. $k = 6 \times 10^{10}$ for $e_{aq}^- + VOOH^+$ cor. for charge on cation.	86A152
466	**Vanadate(V) ion**				
	$e_{aq}^- + VO_3^- \rightarrow$	11.0	4.9×10^9	p.r.; D.k.; counterion NH_4^+; $I = 10^{-4}$.	680295
467	**Salicylatovanadium(III) ion**				
	$e_{aq}^- + C_6H_4(OH)CO_2V^{2+} \rightarrow [C_6H_4(OH)CO_2V]^{\cdot +}$	6.8	1.9×10^{10}	p.r.	81A083
468	**Europium(III) decatungstate ion**				
	$e_{aq}^- + EuW_{10}O_{36}^{9-} \rightarrow EuW_{10}O_{36}^{10-}$	~6	1.4×10^{10}	p.r.; D.k. in Ar-satd. soln. contg. MeOH or 2-PrOH and (50-200) $\times$ 10^{-6} mol L^{-1} polytungstate; suggested that reaction mainly involves Eu^{III} reduction.	85A148
469	**Neodymium(III) decatungstate ion**				
	$e_{aq}^- + NdW_{10}O_{36}^{9-} \rightarrow NdW_{10}O_{36}^{10-}$	~6	1.3×10^{10}	p.r.; D.k. in Ar-satd. soln. contg. 1% 2-PrOH and polytungstate; suggested that reaction mainly involves $W_5O_{18}^{6-}$ ligand reduction.	85A148
470	**Octadecatungstodiphosphate(V) ion**				
	$e_{aq}^- + P_2W_{18}O_{62}^{6-} \rightarrow P_2W_{18}O_{62}^{7-}$	6.0	~2×10^{11}	p.r.; D.k. at 700 nm.	81A385
471	**Hydrogen perxenate(VIII) ion**				
	$e_{aq}^- + HXeO_6^{3-} \rightarrow OH^- + H_3XeO_6^{2-}$	11-13	2.4×10^{10}	p.r.; D.k. at 600 nm.	82A160
472	**Yttrium(III) ion**				
	$e_{aq}^- + Y^{3+} \rightarrow$		~2.0×10^8	p.r.; D.k.; counterion SO_4^{2-}.	650044
473	**Ethylenediaminetetraacetatoyttrate(III) ion**				
	$e_{aq}^- + Y(EDTA)^- \rightarrow$	11-12	1.1×10^7	p.r.; D.k. at 575 nm; counterion Na^+; $I = 0.2$.	690276
474	**Ytterbium(III) ions**				
	$e_{aq}^- + Yb^{3+} \rightarrow Yb^{2+}$	6.0	4.3×10^{10}	p.r.; D.k. (2.19-22.6 $\times$ 10^{-5} mol L^{-1} perchlorate salt).	76A248
		~6	4.7×10^{10}	p.r.; D.k. in Ar-satd. soln. contg. 10^{-2} mol L^{-1} MeOH and 4 $\times$ 10^{-5} mol L^{-1} $Yb_2(SO_4)_3$; k cor. for I.	720065
			3.7×10^{10}	p.r.; D.k.; counterion SO_4^{2-}.	650044
		6.03	4.3×10^{10}	p.r.; D.k. (3.3 $\times$ 10^{-5} mol L^{-1} sulfate salt).	640046
475	**Ethylenediaminetetraacetatoytterbate(III) ion**				
	$e_{aq}^- + YbEDTA^- \rightarrow$	11-12	2.0×10^9	p.r.; D.k. at 575 nm; counterion Na^+; $I = 0.2$.	690276
476	**Zinc(II) ion**				
	$e_{aq}^- + Zn^{2+} \rightarrow Zn^+$		1.5×10^9	f.p.; D.k.	82R106
			9.5×10^8	p.r.; D.k.. at 600 nm in soln. contg. 0.05 mol L^{-1} MeOH and $MgSO_4$ or $MnSO_4$; k cor. for I.	771011
			1×10^9	p.r.; D.k.; k increases in mixtures up to 60% ethanol; k cor. for I.	731008
		6.0	1.5×10^9	p.r.; D.k.	690277
			1.5×10^9	p.r.; D.k.	650044
		6.8	1.0×10^9	p.r.; D.k.; counterion SO_4^{2-}; at pH 9.7 and 12, $k = 5.6 \times 10^8$ and 2.0×10^8, resp.	650047

TABLE 6. Rate constants for reactions of hydrated electrons in aqueous solution—Continued

No.	Reaction	pH	k (L mol^{-1} s^{-1})	Comment	Ref.
477	**Trihydroxyzincate(II) ion**				
	$e_{aq}^- + Zn(OH)_3^- \rightarrow Zn(OH)_3^{2-}$	~14	2.7×10^8	p.r.; Calcd. from d.k. at 700 nm at $[OH^-] = 1$ to 5 mol L^{-1}, $k_{obs} = (14 \text{ to } 3.8) \times 10^6$, p$K$ 12.7.	81A195
478	**Tetrahydroxozincate(II) ion**				
	$e_{aq}^- + Zn(OH)_4^{2-} \rightarrow OH^- + Zn(OH)_3^{2-}$		*1.5×10^6*	Average of 2 values.	
		~14	1.2×10^6	p.r.; Calcd. from d.k. at 700 nm at $[OH^-] = 1$ to 5 mol L^{-1}, $k_{obs} = (14 \text{ to } 3.8) \times 10^6$, p$K$ 12.7.	81A195
		14	1.7×10^6	p.r.; D.k., 3 mol L^{-1} OH^-, counterions SO_4^{2-}, Na^+; at 1 mol L^{-1} OH^- $k_{obs} = 1.6 \times 10^7$; k cor. for I.	650047
479	**Tetraamminezinc(II) ion**				
	$e_{aq}^- + Zn(NH_3)_4^{2+} \rightarrow$	11.1	6.5×10^8	p.r.; D.k.; soln. contains 0.2 mol L^{-1} NH_3.	650047
480	**Tris(ethylenediamine)zinc(II) ion**				
	$e_{aq}^- + Zn(en)_3^{2+} \rightarrow$	11.2	5.2×10^8	p.r.; D.k. at 575 nm; counterion SO_4^{2-}; soln. contains 10^{-1} mol L^{-1} ethylenediamine dihydrochloride.	690277
481	**1,4,8,11-Tetraazacyclotetradecanezinc(II) ion**				
	$e_{aq}^- + Zn(cyclam)^{2+} \rightarrow Zn(cyclam)^+$		7.2×10^8	p.r.; D.k. at 600 nm in He-satd. soln. contg. 0.9 mol L^{-1} *tert*-BuOH.	80A380
482	**Tetracyanozincate(II) ion**				
	$e_{aq}^- + Zn(CN)_4^{2-} \rightarrow$	10	1.8×10^8	p.r.; D.k.; soln. contains 0.1 mol L^{-1} CN^-.	650047
483	**Tris(glycinato)zincate(II) ion**				
	$e_{aq}^- + Zn(Gly)_3^- \rightarrow$	11.1	4.8×10^7	p.r.; D.k. at 575 nm; counterion SO_4^{2-}; soln. contains 10^{-1} mol L^{-1} glycine.	690277
484	**Nitrilotriacetatozincate(II) ion**				
	$e_{aq}^- + ZnNTA^- \rightarrow$	~10	7.5×10^7	p.r.; D.k. at 575 nm; counterion SO_4^{2-}; concn. ~10^{-4} mol L^{-1}.	690277
485	**Bis(nitrilotriacetato)zincate(II) ion**				
	$e_{aq}^- + Zn(NTA)_2^{4-} \rightarrow$	~11	$<1 \times 10^7$	p.r.; D.k. at 575 nm; counterion SO_4^{2-}, concn. ~10^{-2} mol L^{-1}.	690277
486	**Ethylenediaminetetraacetatozincate(II) ion**				
	$e_{aq}^- + ZnEDTA^{2-} \rightarrow$	11.5	5.1×10^6	p.r.; D.k. in buffered soln. contg. 0.5% *n*-BuOH; $I = 0.27$.	77A252
487	**Tetrakis-4-(*N,N,N*-trimethylammonio)phenylporphinezinc(II) ion**				
	$e_{aq}^- + ZnTAPP^{4+} \rightarrow [ZnTAPP]^{\cdot 3+}$		~8×10^{10}	p.r.; D.k. as well as p.b.k. (radical anion) in soln. contg. *tert*-BuOH.	81A317
488	**Tetrakis(4-*N*-methylpyridyl)porphinezinc(II) ion**				
	$e_{aq}^- + ZnTMpyP^{4+} \rightarrow [ZnTMpyP]^{\cdot 3+}$		~8×10^{10}	p.r.; D.k. as well as p.b.k. (radical anion) in soln. contg. *tert*-BuOH.	81A317
489	**Tetrakis(*p*-sulfonatophenyl)porphinatozincate(II) ion**				
	$e_{aq}^- + ZnTPPS^{4-} \rightarrow [ZnTPPS]^{\cdot 5-}$		2×10^{10}	p.r.; D.k. as well as p.b.k. (radical anion) in soln. contg. *tert*-BuOH.	81A317
490	**Tetrakis[4-*N*-(3-sulfonatopropyl)pyridyl]porphinatozinc(II)**				
	$e_{aq}^- + ZnTZP \rightarrow [ZnTZP]^{\cdot -}$	7	1×10^{10}	p.r.; P.b.k. in soln. contg. 2-PrOH, initial fast reaction followed by slow grow-in due to 2-PrOH radical.	83C026
491	**Acetaldehyde**				
	$e_{aq}^- + CH_3CHO \rightarrow$		*4.9×10^9*	*Average of 2 values.*	
			4.4×10^9	p.r.; D.k. at 600 nm.	84A459
		6.6, 11	5.4×10^9	p.r.; D.k. at 578 nm; cor. for the hydrated form, $k_{obs} = 3.5 \times 10^9$.	630073

TABLE 6. Rate constants for reactions of hydrated electrons in aqueous solution—Continued

No.	Reaction	pH	k (L mol^{-1} s^{-1})	Comment	Ref.
492	**Acetaldoxime**				
	$e_{aq}^- + CH_3CH{=}NOH \rightarrow$	10.8	7.2×10^7	p.r.; D.k. in soln. contg. 1×10^{-3} mol L^{-1} EtOH.	670298
493	**Acetamide**				
	$e_{aq}^- + CH_3CONH_2 \rightarrow CH_3\dot{C}(O^-)NH_2$		*4.0 × 10^7*	Average of 2 values.	
		5.2	4.5×10^7	p.r.; D.k. at 600 nm; k increases with pressure 0-6.4 kbar (6.4×10^8 N/m^2).	720298
		9.2	3.5×10^7	p.r.; D.k. in soln. contg. 0.5 mol L^{-1} *tert*-BuOH and borate buffer.	710414
494	**2-Acetamido-2-deoxy-D-galactopyranose**				
	$e_{aq}^- +$ GlNAc $\rightarrow$		1.1×10^7	p.r.; D.k. at 650 nm.	703081
495	**2-Acetamido-2-deoxy-α-D-glucopyranose**				
	$e_{aq}^- +$ GlcNAc $\rightarrow$	7.8	$<1 \times 10^7$	p.r.; D.k.	751114
496	**Acetate ion**				
	$e_{aq}^- + CH_3CO_2^- \rightarrow$	9-11.5	1.1×10^6	p.r.; D.k. at 720 nm in Ar-satd. soln. contg. 0.1 mol L^{-1} *tert*-BuOH and 10^{-4}-10^{-2} mol L^{-1} acetate.	85A158
		~10	$<1 \times 10^6$	p.r.; D.k. at 578 nm, concn. 1 mol L^{-1}.	630073
497	**Acetic acid**				
	$e_{aq}^- + CH_3CO_2H \rightarrow H\cdot + CH_3CO_2^-$		*2.0 × 10^8*	Average of 2 values.	
			2.2×10^8	p.r.; D.k.	771107
		5.4	1.8×10^6	p.r.; D.k. at 578 nm, concn. 10^{-6}-10^{-2} mol L^{-1}; calcd. contribution for unionized acid alone.	630073
498	**Acetone**				
	$e_{aq}^- + CH_3COCH_3 \rightarrow (CH_3)_2\dot{C}O^-$		*6.5 × 10^9*	Average of 6 values.	
			8.0×10^9	p.r.; D.k.	85A282
			5.8×10^9	p.r.; D.k.	84A357
			5.6×10^9	p.r.; D.k. at 600 nm; also see [79A145].	80A116
			7.2×10^9	p.r.; D.k.	79A109
			6.5×10^9	p.r.; D.k. at 600 nm; k unchanged in water-ethanol mixtures.	731008
		7	5.9×10^9	p.r.; D.k., 10^{-3} mol L^{-1} MeOH present, at pH 11, 14 and 3 mol L^{-1} OH$^-$ $k = 5.6 \times 10^9$, 5.2×10^9 and 4.2×10^9, resp.	650047
499	**Acetone oxime**				
	$e_{aq}^- + (CH_3)_2C{=}NOH \rightarrow$		*3.3 × 10^8*	Average of 2 values.	
		7.0	3.5×10^8	p.r.; D.k. at 600 nm; k increases with pressure → 6.4 kbar (6.4×10^8 N/m^2).	720298
		7.75	3.0×10^8	p.r.; D.k. in unbuffered soln. contg. 1×10^{-3} mol L^{-1} EtOH.	670298
500	**Acetonitrile**				
	$e_{aq}^- + CH_3CN \rightarrow$		*3.7 × 10^7*	Average of 3 values.	
			4.4×10^7	p.r.; D.k. in Ar-satd. soln.	79A117
			3.0×10^7	p.r.; D.k.	771107
		12.0	3.8×10^7	p.r.; D.k. in soln. contg. 5×10^{-2} mol L^{-1} Na_2SO_3 and $2\text{-}8 \times 10^{-3}$ mol acetonitrile; esr method rel. to SO_3^-.	765249
501	**Acetophenone**				
	$e_{aq}^- + C_6H_5COCH_3 \rightarrow C_6H_5\dot{C}O^-CH_3$		*2.4 × 10^{10}*	Average of 2 values.	

TABLE 6. Rate constants for reactions of hydrated electrons in aqueous solution—Continued

No.	Reaction	pH	k (L mol^{-1} s^{-1})	Comment	Ref.
501	**Acetophenone**—Continued				
		13	2.0×10^{10}	p.r.; D.k.; also p.b.k. for formn. of ketyl radical (λ_{max} = 440 nm) and cyclohexadienyl radical (λ_{max} = 315 nm). C.k. with O_2 in soln. contg. 10^{-2} mol L^{-1} formate was used to det. rate of formation of the ketyl radical 1.6×10^{10}.	80A254
		~9.2	2.8×10^{10}	p.r.; D.k. at 700 nm in soln. contg. 0.1 mol L^{-1} *tert*-BuOH.	720171
502	***N*-Acetylalanine, negative ion**				
	$e_{aq}^- + AcAla^- \rightarrow$		*1.1* × *10*^{7}	Average of 2 values.	
		7.0	1.2×10^7	p.r.; D.k. at 700 nm in buffered soln. contg. 1 mol L^{-1} *tert*-BuOH; pK_a = 3.7.	741058
		8.6-9.0	1.0×10^7	p.r.; D.k. at 720 nm.	673005
503	***N*-Acetylalanylalanylalanine, negative ion**				
	$e_{aq}^- + Ac(Ala)_3^- \rightarrow$	9.2	6.8×10^8	p.r.; D.k. at 700 nm in buffered soln. contg. 1 mol L^{-1} *tert*-BuOH.	741058
504	***N*-Acetylalanylalanylalanylalanylalanylalanine, negative ion**				
	$e_{aq}^- + Ac(Ala)_6^- \rightarrow$	9.2	8.2×10^8	p.r.; D.k. at 700 nm in buffered soln. contg. 1 mol L^{-1} *tert*-BuOH.	741058
505	**2-(*N*-Acetylamino)acetophenone**				
	$e_{aq}^- + CH_3CONHC_6H_4COCH_3 \rightarrow$	7.6	2.9×10^{10}	p.r.; D.k. at 700 nm in soln. contg. 10^{-3} mol L^{-1} phosphate buffer and 0.1 mol L^{-1} *tert*-BuOH.	771099
506	***N*-Acetylaminofluorene**				
	$e_{aq}^- + C_{15}H_{13}NO \rightarrow$	~7	1.6×10^{10}	p.r.; D.k. at 650 nm in soln. contg. 0.1 *tert*-BuOH.	76A256
507	***N*-Acetylcysteamine**				
	$e_{aq}^- + CH_3CONHCH_2CH_2SH \rightarrow$ $\cdot CH_2CH_2NHCOCH_3 + HS^-$	7.1	9.1×10^9	p.r.; D.k. at 700 nm in soln. contg. ~0.1 mol L^{-1} *tert*-BuOH; p$K_a \simeq 9.5$.	730090
508	***N*-Acetylcysteamine, negative ion**				
	$e_{aq}^- + CH_3CONHCH_2CH_2S^- \rightarrow$ $\cdot CH_2CH_2NHCOCH_3 + HS^- + OH^-$	12.6	1.9×10^9	p.r.; D.k. at 700 nm in soln. contg. ~0.1 mol L^{-1} *tert*-BuOH.	730090
509	***N*-Acetylcysteine, negative ion**				
	$e_{aq}^- + HSCH_2CH(NHAc)CO_2^- \rightarrow$ $\cdot CH_2CH(NHAc)CO_2^- + HS^-$	7.1	5.6×10^9	p.r.; D.k. at 700 nm in soln. contg. ~0.1 mol L^{-1} *tert*-BuOH	730090
510	***N*-Acetylcysteine, dianion**				
	$e_{aq}^- + {}^-SCH_2CH(NHAc)CO_2^- \rightarrow$ $\cdot CH_2CH(NHAc)CO_2^- + HS^- + OH^-$	12.5	3.3×10^8	p.r.; D.k. at 700 nm in soln. contg. ~0.1 mol L^{-1} *tert*-BuOH; p$K_a \simeq 2, 9.5$.	730090
511	**Acetylene**				
	$e_{aq}^- + HC{\equiv}CH \rightarrow$		2.0×10^7	p.r.; D.k. at 700 nm in soln. contg. C_2H_2-Ar mixt.	78A007
512	***N*-Acetylglycine, negative ion**				
	$e_{aq}^- + CH_3CONHCH_2CO_2^- \rightarrow$	11.5	2.6×10^6 [b]	p.r.; D.k. at 700 nm.	713052
		5.95	2×10^7 [b]	p.r.; D.k. at 720 nm; pK_a = 3.7.	673005
513	***N*-Acetylglycinamide**				
	$e_{aq}^- + AcGlyNH_2 \rightarrow$ $CH_3\dot{C}ONHCH_2CO^-NH_2 +$ $CH_3CO^-NHCH_2\dot{C}ONH_2$	9.2	2.1×10^8	p.r.; D.k. at 700 nm.	713052
514	***N*-Acetylglycine methyl ester**				
	$e_{aq}^- + CH_3CONHCH_2CO_2CH_3 \rightarrow$	8.7	3.3×10^8	p.r.; D.k. at 700 nm.	713052
515	***N*-Acetylglycylglycinamide**				
	$e_{aq}^- + AcGlyGlyNH_2 \rightarrow$ $[AcGlyGlyNH_2]\cdot^-$	9.2	4.2×10^8	p.r.; D.k. at 700 nm.	713052

TABLE 6. Rate constants for reactions of hydrated electrons in aqueous solution—Continued

No.	Reaction	pH	k (L mol^{-1} s^{-1})	Comment	Ref.
516	***N*-Acetylglycylglycine, negative ion**				
	$e_{aq}^- + AcGlyGly^- \rightarrow$	11.2	6.4×10^7	p.r.; D.k. at 700 nm.	713052
517	***N*-Acetylglycylglycylglycine, negative ion**				
	$e_{aq}^- + AcGlyGlyGly^- \rightarrow$	9.2	4.4×10^8	p.r.; D.k. at 700 nm in buffered soln. contg. 1 mol L^{-1} *tert*-BuOH.	741058
518	**2-(*N*-Acetyl-*N*-methylamino)acetophenone**				
	$e_{aq}^- + CH_3CON(CH_3)C_6H_4COCH_3 \rightarrow$	7.6	2.0×10^{10}	p.r.; D.k. at 700 nm in Ar-satd. soln. contg. 0.1 mol L^{-1} *tert*-BuOH and 10^{-3} mol L^{-1} phosphate buffer.	771099
519	***N*-Acetylneuraminic acid**				
	$e_{aq}^- + C_{11}H_{19}NO_9 \rightarrow$	7.8	$<1 \times 10^7$	p.r.; D.k.	751114
520	**Acetyl peroxide**				
	$e_{aq}^- + (CH_3CO)_2O_2 \rightarrow CH_3\dot{C}O + CH_3CO_2^-$		9.5×10^9	p.r.; D.k. at 650 nm in deaerated soln. contg. 0.5 mol L^{-1} *tert*-BuOH.	81A374
521	***N*-Acetylphenylalanine amide**				
	$e_{aq}^- + C_6H_5CH_2CH(NHCOCH_3)CONH_2 \rightarrow$	9.3	2.5×10^8	p.r.; D.k. at 700 nm in soln. contg. *tert*-BuOH.	741083
522	***N*-Acetylphenylalanine, negative ion**				
	$e_{aq}^- + AcPhe^- \rightarrow$	9.2	5.3×10^7	p.r.; D.k. at 700 nm in soln. contg. *tert*-BuOH.	741083
523	***N*-Acetylphenylglycine, negative ion**				
	$e_{aq}^- + AcPhGly^- \rightarrow$	9.2	1.7×10^8	p.r.; D.k. at 700 nm in soln. contg. *tert*-BuOH.	741083
524	**3-Acetylpyridine**				
	$e_{aq}^- + pyCOCH_3 \rightarrow py(H)COCH_3$	9.6	2.4×10^{10}	p.r.; D.k. at 700 nm.	741089
525	***N*-Acetylsarcosine, negative ion**				
	$e_{aq}^- + AcSar^- \rightarrow$	12.5	9×10^6	p.r.; D.k. at 700 nm in buffered soln. contg. 1 mol L^{-1} *tert*-BuOH.	741058
526	***N*-Acetylsarcosylsarcosylsarcosine, negative ion**				
	$e_{aq}^- + AcSarSarSar^- \rightarrow$	9.0	3.9×10^8	p.r.; D.k. at 700 nm in buffered soln. contg. 1 mol L^{-1} *tert*-BuOH.	741058
527	**Acid Blue 40 monoanion**				
	$e_{aq}^- + AB\text{-}40 \rightarrow$	6.3	1.3×10^{10}	C.k.; obs. $G(-\text{dye})$; rel. to $k(e_{aq}^- + NO_3^-)$.	760062
528	**Acid Chrome Blue trianion**				
	$e_{aq}^- + ACB \rightarrow$ addn.	7	1.1×10^{10}	γ-r.; C.k. in soln. contg. EtOH; obs. $G(-\text{dye})$ in aerated soln.; reference rate not given; rel. to $k(e_{aq}^- + O_2)$.	81A312
529	***cis*-Aconitate ion**				
	$e_{aq}^- + {}^-O_2CCH{=}C(CO_2^-)CH_2CO_2^- \rightarrow$	11	1.8×10^8	γ-r.; C.k.; relative rate is twice this value at pH 13; rel. to $k(e_{aq}^- + ClCH_2CO_2^-)$.	660160
530	**Acridine**				
	$e_{aq}^- + A \rightarrow \cdot AH$	10	1.3×10^{10}	p.r.; D.k. at 720 nm; pH adjusted by $Ba(OH)_2$.	82A385
		12.3	4×10^{10}	f.p.; D.k. at 660 nm in deoxygenated soln.; product identified by abs. spectrum, $\lambda_{max} =$ 510 nm, $\epsilon_{max} = 4000$ L mol^{-1} cm^{-1}.	82B006
		13	3.0×10^{10}	p.r.; P.b.k.	79A305
		9.2	2.2×10^{10}	p.r.; D.k. at 700 nm in Ar-satd. soln. contg. *tert*-BuOH.	741127
531	**Acridine, conjugate acid**				
	$e_{aq}^- + AH^+ \rightarrow$	5.7	2.1×10^{10}	p.r.; D.k. at 720 nm, $pK_a = 5.5$, cor. for unprotonated form.	82A385
532	**Acridine Orange**				
	$e_{aq}^- + AO \rightarrow [AO]\cdot^-$		*2.6 × 10^{10}*	Average of 2 values.	
		6.5	3.0×10^{10}	p.r.; D.k. at 650 nm in soln. contg. 10^{-2} mol L^{-1} glucose.	78A153

TABLE 6. Rate constants for reactions of hydrated electrons in aqueous solution—Continued

No.	Reaction	pH	k (L mol^{-1} s^{-1})	Comment	Ref.
532	**Acridine Orange**—Continued				
		~7	2.3×10^{10}	p.r.; D.k. at 650 nm in soln. contg. 0.1 mol L^{-1} *tert*-BuOH.	76A256
533	**Acriflavin** $e_{aq}^- + ACFl^+ \rightarrow [ACFl]\cdot$		3.7×10^{10}	p.r.; D.k. at 650 nm.	700241
534	**Acrylamide** $e_{aq}^- + H_2C{=}CHCONH_2 \rightarrow [CH_2CHCONH_2]\cdot^-$		*2.2×10^{10}*	Average of 4 values.	
		9.2	3.1×10^{10}	p.r.; D.k. at 700 nm in soln. contg. ~0.1 mol L^{-1} *tert*-BuOH and 10^{-3} mol L^{-1} borate.	751052
		6.3	2.0×10^{10}	p.r.; D.k.; k also detd. at 6.4 kbar (6.4×10^8 N/m^2).	720102
		7	2.1×10^{10}	p.r.; D.k. at 580 nm, one detn. from growth of absorption at 275 nm gave $k = 1.8 \times 10^{10}$.	670171
		7	1.8×10^{10}	p.r.; D.k. at 578 nm in pres. of 10^{-3} mol L^{-1} MeOH.	630073
535	**Acrylate ion** $e_{aq}^- + CH_2{=}CHCO_2^- \rightarrow [CH_2CHCO_2]\cdot^{2-}$	9.2	5.3×10^9	p.r.; D.k. in soln. contg. 0.1 mol L^{-1} *tert*-BuOH.	761113
536	**Acrylic acid** $e_{aq}^- + H_2C{=}CHCO_2H \rightarrow [CH_2CHCO_2H]\cdot^-$	2.0-3.7	2.4×10^{10}	p.r.; C.k. in soln. contg. 0.1 mol L^{-1} *tert*-BuOH; rel. to $k(e_{aq}^- + H^+)$.	761113
537	**Acrylonitrile** $e_{aq}^- + H_2C{=}CHCN \rightarrow CH_3\dot{C}HCN$		1.3×10^{10}	p.r.; D.k. at 575 nm in Ar-satd. soln.; other radical product identified by opt. and esr measurements.	79A144
538	**Actinomycin D** $e_{aq}^- + C_{62}H_{86}N_{12}O_{16} \rightarrow$	~7	3.3×10^{10}	p.r.; D.k. at 650 nm in soln. contg. 0.1 mol L^{-1} *tert*-BuOH.	76A256
539	**Adenine** $e_{aq}^- + A \rightarrow [A]\cdot^-$	7	9.0×10^9	p.r.; D.k.; pK_a = 4.2, 9.8; at pH 11 $k = 1.1 \times 10^9$; I = 0.1.	710375
540	**Adenosine** $e_{aq}^- + A \rightarrow [A]\cdot^-$		*1.1×10^{10}*	Average of 2 values.	
		7.0	1.2×10^{10}	p.r.; D.k. at 700 nm.	751060
		6-11	9.2×10^9	p.r.; D.k.; pK_a = 3.5, 12.5; I = 0.1.	710375
541	**Adenosine 5'-monophosphate** $e_{aq}^- + AMP \rightarrow AMP\cdot^-$		*3.8×10^9*	Average of 3 values.	
		6-12	3.6×10^9	p.r.; D.k.; I = 0.1.	710375
			4.0×10^9	p.r.; D.k. at 700 nm in soln. contg. formate ion.	680441
		7	3.8×10^9	p.r.; D.k.	650388
542	**Adrenaline** $e_{aq}^- + Adr \rightarrow (HO)_2C_6H_3CHOH\dot{C}H_2 + CH_3NH_2$		2.5×10^8	p.r.; D.k. at 720 nm; calcd. from k_{obs} over pH range (8-11.5); $MeNH_2$ identified by γ-r.	771029
543	**Adrenaline, conjugate acid** $e_{aq}^- + MeNH_2{}^+CH_2CHOHC_6H_3(OH)_2 \rightarrow (HO)_2C_6H_3CHOH\dot{C}H_2 + CH_3NH_2$		*6.0×10^8*	Average of 2 values.	
		5.8	4.4×10^8	p.r.; D.k.; pK_a = 8.55.	82A439
			7.5×10^8	p.r.; D.k. at 720 nm in Ar-satd. soln. contg. 0.25-1 mol L^{-1} *tert*-BuOH; calcd. from k_{obs} over pH range (8-11.5); cor. for $e_{aq}^- + H^+$; $MeNH_2$ identified by γ-r.	771029

TABLE 6. Rate constants for reactions of hydrated electrons in aqueous solution—Continued

No.	Reaction	pH	k (L mol^{-1} s^{-1})	Comment	Ref.
544	**Adrenalone**				
	$e_{aq}^- + MeNHCH_2COC_6H_3(OH)_2 \rightarrow (HO)_2C_6H_3\dot{C}O^-CH_2NHCH_3$	7.5	2.7×10^{11}	p.r.; D.k. at 670 nm; pK_a = 6.8.	79A240
545	**Adriamycin, negative ion**				
	$e_{aq}^- + AdH^- \rightarrow OH^- + AdH_2^{\cdot -}$	11.5	1.5×10^{10}	p.r.; D.k. in soln. contg. 5-30 $\times 10^{-6}$ mol L^{-1} adriamycin.	85A360
546	**Adriamycin, conjugate acid**				
	$e_{aq}^- + {}^+HAdH_2 \rightarrow {}^+HAdH_2^{\cdot -}$	6.5	2.5×10^{10}	p.r.; D.k. in soln. contg. 5-30 $\times 10^{-6}$ mol L^{-1} adriamycin; pK_a = 8.22, 9.01, 9.36, 10.1, 13.2.	85A360
			3.5×10^{10}	p.r.; D.k. at 650 nm.	81R163
		~7	6.0×10^{10}	p.r.; D.k. at 650 nm in soln. contg. 0.1 mol L^{-1} *tert*-BuOH.	76A256
547	**Alanine**				
	$e_{aq}^- + Ala \rightarrow$		*9.0 × 10^6*	Average of 2 values.	
		7.4	1.2×10^7	p.r.; D.k. at 700 nm in buffered soln. contg. 1 mol L^{-1} *tert*-BuOH.	741058
		6.4	5.9×10^6	p.r.; D.k. at 650 nm; solute is DL.	650389
548	**Alanine anhydride**				
	$e_{aq}^- + -CH(Me)CONHCH(Me)CONH- \rightarrow AA^{\cdot -}$	0.2	2.0×10^9	p.r.; D.k. at 700 nm in soln. contg. 0.2 mol L^{-1} *tert*-BuOH and borate buffer.	710554
549	**Alanine dodecapeptide**				
	$e_{aq}^- + (Ala)_{12} \rightarrow$	6.0	6.1×10^9	p.r.; D.k. at 550 nm in Ar-satd. unbuffered soln. contg. 0.1 mol L^{-1} *tert*-BuOH.	751045
550	**Alanine eicosapeptide**				
	$e_{aq}^- + (Ala)_{20} \rightarrow$	6.0	1.2×10^{10}	p.r.; D.k. at 550 nm in Ar-satd. unbuffered soln. contg. 0.1 mol L^{-1} *tert*-BuOH.	751045
551	**Alanine octapeptide**				
	$e_{aq}^- + (Ala)_8 \rightarrow$	6.0	4.0×10^9	p.r.; D.k. at 550 nm in Ar-satd. unbuffered soln. contg. 0.1 mol L^{-1} *tert*-BuOH.	751045
552	**Alanylalanine**				
	$e_{aq}^- + AlaAla \rightarrow$		*2.0 × 10^8*	Average of 2 values.	
		6.2	2.7×10^8	p.r.; D.k. at 550 nm in Ar-satd. unbuffered soln. contg. 0.1 mol L^{-1} *tert*-BuOH.	751045
		6.27	1.3×10^8	p.r.; D.k. at 720 nm; solute is DL.	673005
553	**Alanylalanylalanine**				
	$e_{aq}^- + (Ala)_3 \rightarrow$	6.0	4.9×10^8	p.r.; D.k. at 550 nm in Ar-satd. unbuffered soln. contg. 0.1 mol L^{-1} *tert*-BuOH.	751045
554	**Alanylalanylalanylalanine**				
	$e_{aq}^- + (Ala)_4 \rightarrow$	6.1	1.2×10^9	p.r.; D.k. at 550 nm in Ar-satd. unbuffered soln. contg. 0.1 mol L^{-1} *tert*-BuOH.	751045
555	**Alanylalanylalanylalanylalanine**				
	$e_{aq}^- + (Ala)_5 \rightarrow$	6.0	1.9×10^9	p.r.; D.k. at 550 nm in Ar-satd. unbuffered soln. contg. 0.1 mol L^{-1} *tert*-BuOH.	751045
556	**Alanylglycine**				
	$e_{aq}^- + AlaGly \rightarrow$	6.22	2.1×10^8	p.r.; D.k. at 720 nm.	673005
557	**DL-Alanyl-DL-leucine**				
	$e_{aq}^- + AlaLeu \rightarrow$	6.46	1.3×10^8	p.r.; D.k. at 720 nm.	673005
558	**Alanyllysine**				
	$e_{aq}^- + AlaLys \rightarrow$		3.2×10^8	p.r.; D.k. at 550 nm in Ar-satd. unbuffered soln. contg. 0.1 mol L^{-1} *tert*-BuOH.	751045
559	**Alanylmethionine**				
	$e_{aq}^- + AlaMet \rightarrow$		1.3×10^8	p.r.; D.k. at 550 nm in Ar-satd. unbuffered soln. contg. 0.1 mol L^{-1} *tert*-BuOH.	751045

TABLE 6. Rate constants for reactions of hydrated electrons in aqueous solution—Continued

No.	Reaction	pH	k (L mol^{-1} s^{-1})	Comment	Ref.
560	**Alanylserine** $e_{aq}^- + AlaSer \rightarrow$		3.3×10^8	p.r.; D.k. at 550 nm in Ar-satd. unbuffered soln. contg. 0.1 mol L^{-1} *tert*-BuOH.	751045
561	**β-Alanine** $e_{aq}^- + \beta$-Ala $\rightarrow$	6.9	4.2×10^6	p.r.; D.k. at 700 nm in buffered soln. contg. 1 mol L^{-1} *tert*-BuOH.	741058
562	**β-Alanylalanine** $e_{aq}^- + \beta$-AlaAla $\rightarrow$	6.50	3.9×10^7	p.r.; D.k. at 550 nm in soln. contg. *tert*-BuOH; pK_a = 8.3.	771122
563	**β-Alanyl-β-alanine** $e_{aq}^- + \beta$-Ala-β-Ala $\rightarrow$	5.8	1.2×10^8	p.r.; D.k. at 700 nm in buffered soln. contg. 1 mol L^{-1} *tert*-BuOH.	741058
564	**β-Alanyl-β-alanine, negative ion** $e_{aq}^- + \beta$-Ala-β-Ala$^-$ $\rightarrow$	12.2	4.5×10^7	p.r.; D.k. at 700 nm in buffered soln. contg. 1 mol L^{-1} *tert*-BuOH.	741058
565	**β-Alanylglycylglycine** $e_{aq}^- + \beta$-AlaGlyGly $\rightarrow$	6.4	2.8×10^8	p.r.; D.k. at 700 nm in buffered soln. contg. 1 mol L^{-1} *tert*-BuOH.	741058
566	**β-Alanylglycylglycine, negative ion** $e_{aq}^- + \beta$-AlaGlyGly$^-$ $\rightarrow$	12.2	7.1×10^7	p.r.; D.k. at 700 nm in buffered soln. contg. 1 mol L^{-1} *tert*-BuOH.	741058
567	**β-Alanylhistidine** $e_{aq}^- + \beta$-AlaHis $\rightarrow$	8.01	2.4×10^8	p.r.; D.k. at 550 nm in soln. contg. *tert*-BuOH; pK_a = 2.6, 6.86, 9.40. values at other pH reported.	771122
568	**β-Alanylhistidine, conjugate monoacid** $e_{aq}^- + \beta$-AlaHisH$^+$ $\rightarrow$	4.82	2.7×10^9	p.r.; D.k. at 550 nm in soln. contg. *tert*-BuOH.	771122
569	**β-Alanylhistidine, negative ion** $e_{aq}^- + \beta$-AlaHis$^-$ $\rightarrow$	11.0	9.0×10^6	p.r.; D.k. at 550 nm in soln. contg. *tert*-BuOH.	771122
570	**Alloxan** $e_{aq}^- + Al \rightarrow$ ·AlH	4.8	1.7×10^{10}	p.r.; D.k. at 490 nm in Ar-satd. soln. contg. HCO_2^-; reaction complete in 100 ns before $\cdot CO_2^-$ reacts.	80A197
571	**Allyl alcohol** $e_{aq}^- + H_2C{=}CHCH_2OH \rightarrow [CH_2CHCH_2OH]\cdot^-$		7.2×10^7	p.r.; D.k.	84A357
			2.0×10^7	p.r.; D.k.; k detd. at four temperatures from 298 to ~360K.	79A117
			1.2×10^7	p.r.; D.k.	771107
572	**Allylamine** $e_{aq}^- + H_2C{=}CHCH_2NH_2 \rightarrow$	11.3	1.2×10^7	p.r.; D.k. at 720 nm in soln. contg. 0.1 mol L^{-1} amine.	700371
573	**2-Aminobenzoate ion** $e_{aq}^- + 2\text{-}H_2NC_6H_4CO_2^- \rightarrow$	~7	1.9×10^9	p.r.; D.k. in Ar-satd. soln. contg. 0.1 mol L^{-1} Na formate.	741063
574	**3-Aminobenzoate ion** $e_{aq}^- + 3\text{-}H_2NC_6H_4CO_2^- \rightarrow$	~7	5.6×10^9	p.r.; D.k. at 720 nm.	80A202
575	**4-Aminobenzoate ion** $e_{aq}^- + 4\text{-}H_2NC_6H_4CO_2^- \rightarrow$	~11	2.1×10^9	p.r.; D.k.	640138
576	**4-Aminobutanethiol, conjugate acid** $e_{aq}^- + HS(CH_2)_4NH_3^+ \rightarrow$	2.4-4.0	1.8×10^{10}	γ-r.; C.k.; obs. $G(H_2S)$; rel. to $k(e_{aq}^- + H^+)$.	760333
577	**4-Aminobutyric acid** $e_{aq}^- + H_3N^+(CH_2)_3CO_2^- \rightarrow$	6.65	$<9 \times 10^6$	p.r.; D.k. at 720 nm.	660011

TABLE 6. Rate constants for reactions of hydrated electrons in aqueous solution—Continued

No.	Reaction	pH	k (L mol^{-1} s^{-1})	Comment	Ref.
578	**4-Aminobutyrylglycine** $e_{aq}^- + H_3N^+(CH_2)_3CONHCH_2CO_2^- \rightarrow$	6.0	3.4×10^7	p.r.; D.k. at 700 nm in buffered soln. contg. 1 mol L^{-1} *tert*-BuOH.	741058
579	**7-Aminocephalosporanic acid** $e_{aq}^- +$ 7-ACS $\rightarrow$	6.0	8.6×10^9	p.r.; D.k. at 700 nm.	731142
580	**4(5)-Aminoimidazole-5(4)-carboxamide** $e_{aq}^- +$ AIC $\rightarrow$ AIC$\cdot^-$	6.8	9.2×10^8	p.r.; D.k. at 600 nm in deaerated soln. contg. *tert*-BuOH or 2-PrOH.	80A349
581	**1-Aminonaphthalene-4-sulfonate ion** $e_{aq}^- +$ AnsH $\rightarrow$ AnsH$\cdot^-$	~7	6.7×10^9	p.r.; D.k. at 700 nm.	78A328
582	**6-Aminopenicillanic acid** $e_{aq}^- + C_8H_{12}N_2O_3S \rightarrow$	0.0	3.6×10^9	p.r.; D.k. at 700 nm.	731142
583	**3-Aminopropanethiol, conjugate acid** $e_{aq}^- + HS(CH_2)_3NH_3^+ \rightarrow$	2.4-4.0	1.7×10^{10}	γ-r.; C.k.; obs. $G(H_2S)$; rel. to $k(e_{aq}^- + H^+)$.	760333
584	**2-Aminopyrimidine** $e_{aq}^- +$ 2-AmPm $\rightarrow$		*1.0×10^{10}*	Average of 2 values.	
		5.5-6	7.6×10^9	γ-r.; C.k.; k detd. at 20, 45, and 70°C; rel. to $k(e_{aq}^- +$ BrPhOH).	670098
		5.5-6	1.2×10^{10}	γ-r.; C.k.; rel. to $k(e_{aq}^- + NO_3^-)$.	670098
585	**4-Aminopyrimidine** $e_{aq}^- +$ 4-AmPm $\rightarrow$ 4-AmP$\dot{}$mH	8.2	1.1×10^{10}	p.r.; D.k. at 700 nm in soln. contg. ~0.5 mol L^{-1} *tert*-BuOH.	771034
586	**Ampicillin** $e_{aq}^- + C_{16}H_{19}N_3O_4S \rightarrow$	6.0	5.7×10^9	p.r.; D.k. at 700 nm.	733020
587	***n*-Amylamine** $e_{aq}^- + CH_3(CH_2)_4NH_2 \rightarrow$	13	1.0×10^6	p.r.; D.k. at 720 nm; calcd. from k_{obs} over a pH range.	730016
588	**Amylammonium ion** $e_{aq}^- + n\text{-}C_5H_{11}NH_3^+ \rightarrow$	8.5	2.7×10^6	p.r.; D.k. at 720 nm, calcd. from k_{obs} over a pH range.	730016
589	**Aniline** $e_{aq}^- + C_6H_5NH_2 \rightarrow OH^- + C_6H_6NH_2$		*2.8×10^7*	Average of 2 values.	
		9.0	3.0×10^7	p.r.; D.k. at 720 nm in soln. contg. 1-4 mol L^{-1} *tert*-BuOH and 5-10 $\times 10^{-4}$ mol L^{-1} aniline.	86A365
		10	2.6×10^7	p.r.; D.k.	720289
		11.94	$<2 \times 10^7$	p.r.; D.k. at 578 nm.	640044
590	**8-Anilino-1-naphthalenesulfonate ion** $e_{aq}^- +$ ANS $\rightarrow$	~7	4.0×10^{10}	p.r.; D.k. at 650 nm in soln. contg. 0.1 mol L^{-1} *tert*-BuOH; k decreased on addn. of lipid.	76A256
591	**Anisole** $e_{aq}^- + C_6H_5OCH_3 \rightarrow$		$<3 \times 10^5$	p.r.; D.k.	771107
592	**9,10-Anthraquinone-1-sulfonate ion** $e_{aq}^- +$ 1-$SO_3AQ^- \rightarrow$ [1-SO_3AQ]$\cdot^{2-}$		2.3×10^{10}	p.r.; D.k. at 700 nm.	720391
593	**9,10-Anthraquinone-2-sulfonate ion** $e_{aq}^- +$ 2-$SO_3AQ^- \rightarrow$ [2-SO_3AQ]$\cdot^{2-}$		*2.5×10^{10}*	Average of 2 values.	
		~9.2	2.2×10^{10}	p.r.; D.k. at 700 nm in soln. contg. 0.1 mol L^{-1} *tert*-BuOH.	720171
			2.8×10^{10}	p.r.; D.k. at 700 nm.	720391
594	**Anthrone** $e_{aq}^- + C_{14}H_{10}O \rightarrow$	~9.2	3.3×10^{10}	p.r.; D.k. at 700 nm in soln. contg. 0.1 mol L^{-1} *tert*-BuOH.	720171

TABLE 6. Rate constants for reactions of hydrated electrons in aqueous solution—Continued

No.	Reaction	pH	k (L mol^{-1} s^{-1})	Comment	Ref.
595	**Arabinose** $e_{aq}^- + C_5H_{10}O_5 \rightarrow$	7	4×10^6	p.r.; D.k.	79A366
596	**Arabitol** $e_{aq}^- + C_5H_{12}O_5 \rightarrow$	7	7×10^7	p.r.; D.k.	79A366
597	**Arginine** $e_{aq}^- + Arg \rightarrow$	11.5	5×10^7	p.r.; D.k. at 720 nm; value of k from graph; solute is L isomer; pK_a = 1.82, 9.04, 12.48; k cor. for I.	660011
598	**Arginine, conjugate monoacid** $e_{aq}^- + ArgH^+ \rightarrow$	6.10	1.5×10^8	p.r.; D.k. at 720 nm.	660011
599	**Ascaridole** $e_{aq}^- + C_{10}H_{16}O_2 \rightarrow OH^-$		4×10^9	p.r.; D.k. at 650 nm in deaerated soln. contg. 0.5 mol L^{-1} *tert*-BuOH.	81A374
600	**Ascorbate ion** $e_{aq}^- + AH^- \rightarrow$		*3.5 × 10^8*	Average of 2 values.	
		7	3.0×10^8	p.r.; D.k. at 600 nm in soln. contg. 10^{-3} mol L^{-1} phosphate buffer and 0.1 mol L^{-1} *tert*-BuOH; I = 0.03.	741053
		7	4×10^8	p.r.; D.k. at 720 nm.	720266
601	**Asparagine** $e_{aq}^- + Asn \rightarrow$	7.3	1.5×10^8	p.r.; D.k. at 720 nm; pK_a = 2.213, 8.85.	660011
602	**Asparagine, negative ion** $e_{aq}^- + H_2NCOCH_2CH(NH_2)CO_2^- \rightarrow$	11.7	2.4×10^7	p.r.; D.k. at 720 nm.	660011
603	**Aspartate dianion** $e_{aq}^- + Asp^{2-} \rightarrow$	10.5	$<5 \times 10^6$	p.r.; D.k. at 720 nm.	660011
604	**Aspartate monoanion** $e_{aq}^- + Asp^- \rightarrow$	7	1.8×10^7	γ-r.; C.k.; pK_a = 2.10, 3.86, ~9.5; calcd. from values obs. at pH 3.0 and 7.0; $k_{obs} = 2.0 \times 10^7$ at pH 7.0; rel. to $k(e_{aq}^- + BrPhOH)$.	720027
605	**Aspartic acid** $e_{aq}^- + Asp \rightarrow$		6×10^8	γ-r.; C.k.; pK_a = 2.10, 3.86, ~9.5; calcd. from values obs. at pH 3.0 and 7.0; rel. to $k(e_{aq}^- + BrPhOH)$.	720027
606	**Aspartic acid, conjugate acid** $e_{aq}^- + AspH^+ \rightarrow$		6×10^9	γ-r.; C.k.; pK_a = 2.10, 3.86, ~9.5; calcd. from values obs. at pH 3.0 and 7.0; $k_{obs} = 1.2 \times 10^9$ at pH 3.0; rel. to $k(e_{aq}^- + BrPhOH)$.	720027
607	**5-Azacytidine** $e_{aq}^- + 5\text{-AzaCy} \rightarrow [5\text{-AzaCy}]^{\cdot -}$	8.0	1.2×10^9	p.r.; D.k. at 550 nm in Ar-satd. soln. contg. 1-10 × 10^{-4} mol L^{-1} substrate, 0.2 mol L^{-1} *tert*-BuOH and 10^{-3} mol L^{-1} phosphate buffer.	83A297
608	**5-Azacytosine** $e_{aq}^- + 5\text{-AzaCy} \rightarrow [5\text{-AzaCy}]^{\cdot -}$	8.0	1.2×10^{10}	p.r.; D.k. at 550 nm in Ar-satd. soln. contg. 1-10 × 10^{-4} mol L^{-1} substrate, 0.2 mol L^{-1} *tert*-BuOH and 10^{-3} mol L^{-1} phosphate buffer.	83A297
609	**6-Azacytosine** $e_{aq}^- + 6\text{-AzaCy} \rightarrow [6\text{-AzaCy}]^{\cdot -}$	8.0	5.7×10^9	p.r.; D.k. at 550 nm in Ar-satd. soln. contg. 1-10 × 10^{-4} mol L^{-1} substrate, 0.2 mol L^{-1} *tert*-BuOH and 10^{-3} mol L^{-1} phosphate buffer.	83A297
610	**6-Azathymine** $e_{aq}^- + 6\text{-Aza-5-MeU} \rightarrow [6\text{-Aza-5-MeU}]^{\cdot -}$	8.0	9.5×10^9	p.r.; D.k. at 550 nm in Ar-satd. soln. contg. 1-10 × 10^{-4} mol L^{-1} substrate, 0.2 mol L^{-1} *tert*-BuOH and 10^{-3} mol L^{-1} phosphate buffer.	83A297

TABLE 6. Rate constants for reactions of hydrated electrons in aqueous solution—Continued

No.	Reaction	pH	k (L mol^{-1} s^{-1})	Comment	Ref.
611	**5-Azauracil**				
	$e_{aq}^- + 5\text{-AzaU} \rightarrow [5\text{-AzaU}]\cdot^-$	8.0	2.8×10^9	p.r.; D.k. at 550 nm in Ar-satd. soln. contg. 1-10 × 10^{-4} mol L^{-1} substrate, 0.2 mol L^{-1} *tert*-BuOH and 10^{-3} mol L^{-1} phosphate buffer.	83A297
612	**6-Azauracil**				
	$e_{aq}^- + 6\text{-AzaU} \rightarrow [6\text{-AzaU}]\cdot^-$	8.0	4.6×10^9	p.r.; D.k. at 550 nm in Ar-satd. soln. contg. 1-10 × 10^{-4} mol L^{-1} substrate, 0.2 mol L^{-1} *tert*-BuOH and 10^{-3} mol L^{-1} phosphate buffer.	83A297
613	**6-Azauridine**				
	$e_{aq}^- + 6\text{-AzaUr} \rightarrow [6\text{-AzaUr}]\cdot^-$	8.0	7.6×10^9	p.r.; D.k. at 550 nm in Ar-satd. soln. contg. 1-10 × 10^{-4} mol L^{-1} substrate, 0.2 mol L^{-1} *tert*-BuOH and 10^{-3} mol L^{-1} phosphate buffer.	83A297
614	**2,2'-Azinobis(3-ethylbenzothiazoline-6-sulfonate ion)**				
	$e_{aq}^- + \text{ABTS} \rightarrow$	7.0	5.1×10^9	p.r.; D.k. at 580 nm in N_2-satd. soln. contg. 0.1 mol L^{-1} *tert*-BuOH.	82A196
615	***anti*-Azobenzene**				
	$e_{aq}^- + C_6H_5N{=}NC_6H_5 \rightarrow [C_6H_5N{=}NC_6H_5]\cdot^-$	14	3.3×10^{10}	p.r.; D.k. at 600 nm in soln. contg. 1 mol L^{-1} NaOH and 0.1 mol L^{-1} MeOH; also p.b.k. at 380 nm.	771169
616	***syn*-Azobenzene**				
	$e_{aq}^- + C_6H_5N{=}NC_6H_5 \rightarrow [C_6H_5N{=}NC_6H_5]\cdot^-$	14	3.2×10^{10}	p.r.; D.k. at 600 nm in soln. contg. 1 mol L^{-1} NaOH and 0.1 mol L^{-1} MeOH; also p.b.k. at 380 nm.	771169
617	**1,1'-Azobis(*N,N*-dimethylformamide)**				
	$e_{aq}^- + (CH_3)_2NCON{=}NCON(CH_3)_2 \rightarrow [NCON(CH_3)_2]_2\cdot^-$		*2.8 × 10^{10}*	Average of 3 values.	
		~7	2.8×10^{10}	p.r.; D.k. at 650 nm in soln. contg. 0.1 mol L^{-1} *tert*-BuOH; k decreased on addn. of serum albumin, little effect with DNA, carbohydrates or lipids.	76A256
		8.0	2.8×10^{10}	p.r.; D.k. at 625 nm in soln. contg. 0.2 mol L^{-1} *tert*-BuOH, N_2-satd., as well as p.b.k. at 400 nm.	751194
		7.1	2.9×10^{10}	p.r.; D.k. at 675 nm	741061
618	**Barbiturate ion**				
	$e_{aq}^- + C_4H_3N_2O_3^- \rightarrow$	7.6	1.1×10^8	γ-r.; Calcd. from values obs. at pH 2.6, 4.0, 5.0 and 7.6; k_{obs} at pH 7.6 = 1.1×10^8; rel. to $k(e_{aq}^- + \text{BrPhOH})$.	720027
619	**Barbituric acid**				
	$e_{aq}^- + C_4H_4N_2O_3 \rightarrow$	2.6	1.1×10^{10}	γ-r.; C.k.; pK_a = 3.9, 12.5; calcd. from values obs. at pH 2.6, 4.0, 5.0 and 7.6; k_{obs} = 1.1×10^{10} at pH 2.6; rel. to $k(e_{aq}^- + \text{BrPhOH})$.	720027
620	**Benzaldoxime**				
	$e_{aq}^- + C_6H_5CH{=}NOH \rightarrow [C_6H_5CHNOH]\cdot^-$		~1×10^{10}		761182
621	**Benzamide**				
	$e_{aq}^- + C_6H_5CONH_2 \rightarrow C_6H_5\dot{C}O^-NH_2$		*1.8 × 10^{10}*	Average of 3 values.	
		5.7	1.9×10^{10}	p.r.; D.k.; k also detd. at 6.4 kbar (6.4×10^8 N/m^2).	720102
		~9.2	1.9×10^{10}	p.r.; D.k. at 700 nm in soln. contg. 0.1 mol L^{-1} *tert*-BuOH.	720171
		~11	1.7×10^{10}	p.r.; D.k.	640138

TABLE 6. Rate constants for reactions of hydrated electrons in aqueous solution—Continued

No.	Reaction	pH	k (L mol^{-1} s^{-1})	Comment	Ref.
622	**Benzene**				
	$e_{aq}^- + PhH \rightarrow [C_6H_6]\cdot^-$	9-11.5	9.0×10^6	p.r.; D.k. at 720 nm in Ar-satd. soln. contg. 0.1 mol L^{-1} *tert*-BuOH and 10^{-1}-10^{-2} mol L^{-1} benzene.	85A158
		11	7.2×10^6	p.r.; D.k. at 600 nm in soln. contg. 2 mol L^{-1} *tert*-BuOH; $k = 9.0 \times 10^6$ in soln. without *tert*-BuOH.	771012
		11, 13	1.3×10^7	p.r.; D.k. at 600 nm in Ar-satd. soln. contg. 0.8 or 2 mol L^{-1} *tert*-BuOH or 0.6 mol L^{-1} isobutanol.	741090
			1.3×10^7	p.r.; D.k. at 600 nm; also reported k in micellar solutions; $k = 1.1 \times 10^8$ in CTAB, 4×10^6 in SDS, 6×10^6 in Igepal CO-730.	710586
623	**Benzenediazonium ion**				
	$e_{aq}^- + C_6H_5N_2^+ \rightarrow C_6H_5N_2\cdot$		2.8×10^{10}	p.r.; D.k. at 700 nm in 50:50 (v:v) H_2O-*tert*-BuOH; counterion tetrafluoroborate.	80A200
624	**Benzenesulfonamide**				
	$e_{aq}^- + C_6H_5SO_2NH_2 \rightarrow$		9.8×10^9	p.r.; D.k.	730094
		~11	1.6×10^{10}	p.r.; D.k.	640138
625	**Benzenesulfonate ion**				
	$e_{aq}^- + C_6H_5SO_3^- \rightarrow C_6H_6SO_3^-$	~11	4.0×10^9	p.r.; D.k.; for product detn. see [720107].	640138
626	**1,3,5-Benzenetricarboxylate ion**				
	$e_{aq}^- + 1,3,5\text{-}C_6H_3(CO_2^-)_3 \rightarrow$	8.8	3.0×10^9	p.r.; D.k.; at pH 5.74, 6.96, and 12.39 $k = 3.5 \times 10^9$, 2.5×10^9, and 2.8×10^9; k cor. for I.	650018
627	**Benzhydrylamine**				
	$e_{aq}^- + (C_6H_5)_2CHNH_2 \rightarrow [(C_6H_5)_2CHNH_2]\cdot^-$	11.2	3.3×10^8	p.r.; P.b.k. at 310 nm in N_2-satd. soln. contg. 2 mol L^{-1} *tert*-BuOH and 2.5-5 $\times 10^{-3}$ mol L^{-1} amine.	86A410
628	**Benzhydrylammonium ion**				
	$e_{aq}^- + (C_6H_5)_2CHNH_3^+ \rightarrow NH_3 + (C_6H_5)_2CH$	~6	3.0×10^9	p.r.; D.k. at 600 nm, as well as p.b.k. at 327 nm (benzyl radical) in N_2-satd. soln. contg. 1 mol L^{-1} *tert*-BuOH and 1-11 $\times 10^{-4}$ mol L^{-1} amine; 70% deamination.	86A410
629	**Benzil**				
	$e_{aq}^- + C_6H_5COCOC_6H_5 \rightarrow C_6H_5\dot{C}OCO^-C_6H_5$	~9.2	3.6×10^{10}	p.r.; D.k. at 700 nm in soln. contg. 0.1 mol L^{-1} *tert*-BuOH.	720171
630	**Benzoate ion**				
	$e_{aq}^- + C_6H_5CO_2^- \rightarrow C_6H_5\dot{C}O_2^-$		*9.2 × 10^9*	Average of 3 values.	
		9-11.5	3.0×10^9	p.r.; D.k. at 720 nm in Ar-satd. soln. contg. 0.1 mol L^{-1} *tert*-BuOH and 10^{-1}-10^{-2} mol L^{-1} benzoate.	85A158
		7.2-7.7	3.1×10^9	p.r.; D.k.; at pH 5.35-5.45 and 12.3 $k = 5.4 \times 10^9$ and 2.8×10^9 (cor.), resp.	650018
		7	3.5×10^9	p.r.; D.k.; at pH 11, 14 and 3 mol L^{-1} OH^- $k = 3.1 \times 10^9$ 2.9×10^9 and 2.4×10^9, resp.	650047
631	**Benzoflavine**				
	$e_{aq}^- + BZFl \rightarrow [BZFl]\cdot^-$	6.5	3.2×10^{10}	p.r.; D.k. at 650 nm (as well as at 440 nm) in soln. contg. 10^{-2} mol L^{-1} glucose.	78A153
632	**Benzoic acid**				
	$e_{aq}^- + C_6H_5CO_2H \rightarrow C_6H_5\dot{C}(OH)_2$	3-4	7.1×10^9	p.r.; C.k.; ratio of H· (+ $C_6H_5CO_2^-$) to benzoyl formation ≤0.1; cor. for $e_{aq}^- + C_6H_5CO_2^-$; rel. to $k(e_{aq}^- + H^+)\cdot = 1.6 \times 10^{10}$.	720057

TABLE 6. Rate constants for reactions of hydrated electrons in aqueous solution—Continued

No.	Reaction	pH	k (L mol^{-1} s^{-1})	Comment	Ref.
632	**Benzoic acid**—Continued				
		3.8	1.6×10^{10}	p.r.; Calcd. from pK($C_6H_5CO_2H$) = 4.19 and $k_{obs} = 1.33 \times 10^{10}$ assuming $k(e_{aq}^- + C_6H_5CO_2^-) = 3.2 \times 10^9$; obs. product abs. at 300 nm in soln. contg. 10^{-2} mol L^{-1} benzoic acid and 1 mol L^{-1} *tert*-BuOH on addn. of 2.5×10^{-3} mol L^{-1} N_2O; pK_a = 4.2; pK_a of radical = 5.3, 12.0 (see Benzoate ion).	720107
633	**Benzoin** $e_{aq}^- + C_6H_5CH(OH)COC_6H_5 \rightarrow C_6H_5CHOHCO^-C_6H_5$	~9.2	1.7×10^{10}	p.r.; D.k. at 700 nm in soln. contg. 0.1 mol L^{-1} *tert*-BuOH.	720171
634	**Benzonitrile** $e_{aq}^- + C_6H_5CN \rightarrow [C_6H_5CN]^{\cdot -}$	7.16	1.9×10^{10}	p.r.; D.k. at 600 nm; soln. contains 5×10^{-2} mol L^{-1} formate; p.b.k. at 315 nm gave 1.7×10^{10}.	700657
635	**Benzophenone** $e_{aq}^- + (C_6H_5)_2CO \rightarrow (C_6H_5)_2\dot{C}O^-$	6-10	1.0×10^{10}	p.r.; D.k. at 600 and 720 nm.	751125
		~9.2	2.8×10^{10}	p.r.; D.k. at 700 nm in soln. contg. 0.1 mol L^{-1} *tert*-BuOH.	720171
636	**Benzo[*a*]pyrene** $e_{aq}^- + C_{20}H_{12} \rightarrow$	~7	6×10^9	p.r.; D.k. at 650 nm in soln. contg. 0.1 mol L^{-1} *tert*-BuOH.	76A256
637	**1,4-Benzoquinone** $e_{aq}^- + Q \rightarrow 4\text{-}^-OC_6H_4O\cdot$		2.3×10^{10}	p.r.; D.k. at 600 nm.	78A131
638	**2,1,3-Benzothiadiazole-4,7-dicarbonitrile** $e_{aq}^- + BTDN \rightarrow BTDN^{\cdot -}$		1.8×10^{10}	p.r.; D.k. at 600 nm.	86A098
639	**3-Benzoyl-*N*-methylpyridinium ion** $e_{aq}^- + 3\text{-}C_6H_5COC_5H_4NCH_3^+ \rightarrow$	9.0	5.5×10^{10}	p.r.; D.k. at 700 nm.	720359
640	**2-Benzoylpyridine** $e_{aq}^- + C_6H_5COpy \rightarrow$	9.0	2.5×10^{10}	p.r.; D.k. at 700 nm.	720359
641	**3-Benzoylpyridine** $e_{aq}^- + C_6H_5COpy \rightarrow$	9.0	3.0×10^{10}	p.r.; D.k. at 700 nm.	720359
642	**4-Benzoylpyridine** $e_{aq}^- + C_6H_5COpy \rightarrow$	9.0	2.8×10^{10}	p.r.; D.k. at 700 nm.	720359
643	**Benzyl acetate** $e_{aq}^- + CH_3CO_2CH_2C_6H_5 \rightarrow C_6H_5\dot{C}H_2 + CH_3CO_2^-$		1.1×10^9	p.r.; P.b.k. (benzyl radical).	730089
644	**Benzyl alcohol** $e_{aq}^- + C_6H_5CH_2OH \rightarrow$	6.5	2×10^8	p.r.; D.k. at 600 nm; k increases with pressure $\rightarrow 6.4 \times 10^8$ N m^{-2}.	720298
645	**Benzylamine** $e_{aq}^- + C_6H_5CH_2NH_2 \rightarrow [C_6H_5CH_2NH_2]^{\cdot -}$	11.2	8.0×10^7	p.r.; P.b.k. at 310 nm in N_2-satd. soln. contg. 2 mol L^{-1} *tert*-BuOH and 2-5 $\times 10^{-3}$ mol L^{-1} benzylamine.	86A410
		10.9	1.6×10^8	p.r.; D.k. at 700 nm in soln. contg. *tert*-BuOH; ~10% deamination and 90% addn.	741083
		11.4	3.4×10^7	p.r.; D.k. at 720 nm in soln. contg. 0.1 mol L^{-1} amine (k_{obs}); calcd. $k = 1.0 \times 10^6$ for neutral amine.	700371
646	**Benzylammonium ion** $e_{aq}^- + C_6H_5CH_2NH_3^+ \rightarrow C_6H_5\dot{C}H_2 + NH_3$	~7	1.5×10^9	p.r.; D.k. at 600 nm, as well as p.b.k. at 314 nm (benzyl radical) in N_2-satd. soln. contg. 1 mol L^{-1} *tert*-BuOH and 4-6 $\times 10^{-4}$ mol L^{-1} benzylamine; 70% deamination.	86A410
		6.9	8.0×10^8	p.r.; D.k. at 700 nm in soln. contg. *tert*-BuOH; ~60% deamination and 40% addn.	741083

TABLE 6. Rate constants for reactions of hydrated electrons in aqueous solution—Continued

No.	Reaction	pH	k (L mol^{-1} s^{-1})	Comment	Ref.
646	**Benzylammonium ion**—Continued				
		8.8	1.3×10^9	p.r.; D.k. at 720 nm in Ar-satd. soln.; pK_a = 9.34; k_{obs}; calcd. 1.5×10^9 for protonated amine.	700371
647	**Benzyl bromide** $e_{aq}^- + C_6H_5CH_2Br \rightarrow C_6H_5\dot{C}H_2 + Br^-$		1.5×10^9	p.r.; P.b.k. (benzyl radical).	730089
648	**Benzyl chloride** $e_{aq}^- + C_6H_5CH_2Cl \rightarrow Cl^- + C_6H_5\dot{C}H_2$		4.5×10^9 [b]	p.r.; D.k. at 720 nm.	79A355
			1.6×10^9 [b]	p.r.; P.b.k. (benzyl radical).	730089
649	**Benzyl formate** $e_{aq}^- + C_6H_5CH_2OCOH \rightarrow C_6H_5\dot{C}H_2 + HCO_2^-$		1.5×10^9	p.r.; P.b.k. (benzyl radical).	730089
650	**β-Benzylglucoside** $e_{aq}^- + GluOCH_2C_6H_5 \rightarrow$	~7	7×10^7	p.r.; D.k.	710480
651	**Benzyl mercaptan** $e_{aq}^- + C_6H_5CH_2SH \rightarrow HS^- + C_6H_5\dot{C}H_2$	7.0	8.7×10^9	p.r.; D.k. at 700 nm in soln. contg. ~0.1 mol L^{-1} *tert*-BuOH.	730090
652	**Benzylpenicillin** $e_{aq}^- + C_{16}H_{18}N_2O_4S \rightarrow$	6.0	2.8×10^9	p.r.; D.k. at 700 nm.	733020
653	**Benzylpenicillin, methyl ester** $e_{aq}^- + C_{17}H_{20}N_2O_4S \rightarrow$	6.0	7.0×10^9	p.r.; D.k. at 700 nm.	733020
654	**Benzylpenicilloic acid** $e_{aq}^- + C_{15}H_{20}N_2O_3S \rightarrow$		1.4×10^9	p.r.; D.k.	730134
655	**Benzyl thiocyanate** $e_{aq}^- + C_6H_5CH_2SCN \rightarrow C_6H_5\dot{C}H_2 + SCN^-$		2.0×10^9	p.r.; P.b.k. (benzyl radical).	730089
656	**Benzyltrimethylammonium ion** $e_{aq}^- + C_6H_5CH_2\overset{+}{N}(CH_3)_3^+ \rightarrow (CH_3)_3N + C_6H_5\dot{C}H_2$	11	4.3×10^9	p.r.; D.k. at 600 nm as well as p.b.k. at 260 nm.	81A034
657	**Benzyltriphenylphosphonium ion** $e_{aq}^- + C_6H_5CH_2P^+(C_6H_5)_3 \rightarrow C_6H_5CH_2P(C_6H_5)_3$		2.7×10^{10}	p.r.; D.k.	82A051
658	**Bilirubin dianion** $e_{aq}^- + BR^{2-} \rightarrow BR^{\cdot 3-}$		*1.4×10^{10}*	Average of 2 values.	
		12	9.5×10^9	p.r.; D.k. at 700 nm in N_2-satd. soln. contg. 10^{-2} mol L^{-1} NaOH, 10^{-5}-10^{-4} mol L^{-1} bilirubin and 0.3 mol L^{-1} *tert*-BuOH; $k = 7 \times 10^{10}$ for complex with bovine serum albumin.	771137
		10.9	1.8×10^{10}	p.r.; D.k. at 720 nm in soln. contg. 0.3 mol L^{-1} *tert*-BuOH and 10^{-3} mol L^{-1} NaOH.	83A302
659	**Biliverdin dianion** $e_{aq}^- + BV^{2-} \rightarrow BV^{\cdot 3-}$	10.9	2.3×10^{10}	p.r.; D.k. at 720 nm in soln. contg. 0.3 mol L^{-1} *tert*-BuOH and 10^{-3} mol L^{-1} NaOH.	83A302
660	**Biotin, anion** $e_{aq}^- + C_{10}H_{15}N_2O_3S^- \rightarrow$	9.0	$<5 \times 10^7$	p.r.; D.k. at 700 nm in soln. contg. ~0.5 mol L^{-1} *tert*-BuOH.	771034
661	**Biphenyl** $e_{aq}^- + C_6H_5C_6H_5 \rightarrow [C_6H_5C_6H_5]^{\cdot -}$		*9.5×10^9*	Average of 2 values.	
		9	1.2×10^{10}	p.r.; P.b.k. at 390 nm as well as d.k. at 700 nm.	751096
		12.1	7×10^9	p.r.; D.k. in soln. contg. 1% MeOH; k = 2.1-2.3 $\times 10^{10}$ in soln. contg. CTAB	741011

TABLE 6. Rate constants for reactions of hydrated electrons in aqueous solution—Continued

No.	Reaction	pH	k (L mol^{-1} s^{-1})	Comment	Ref.
662	**2,2'-Bipyridine**				
	$e_{aq}^- + bpy \rightarrow bpyH$		*2.2 × 10^{10}*	Average of 2 values.	
		8	1.9 × 10^{10}	p.r.; D.k. at 720 nm in soln. contg. 10^{-2} mol L^{-1} *tert*-BuOH.	85A184
		9.2	2.5 × 10^{10}	p.r.; D.k. at 650 nm.	710582
663	**4,4'-Bipyridine**				
	$e_{aq}^- + 4,4'\text{-bpy} \rightarrow$		*2.9 × 10^{10}*	Average of 2 values.	
		8.3	2.5 × 10^{10}	p.r.; D.k. at 720 nm in Ar-satd. soln. contg. 10^{-2} mol L^{-1} *tert*-BuOH. Same transient spectrum obtained with e_{aq}^- at pH 3.7 and pH 7 and with the 2-PrOH radical at pH 1; transient believed to be [4,4'-bpyH$_2$]$^{\cdot+}$ with no pK in the pH range 1-7.	84A325
		9.3	3.3 × 10^{10}	p.r.; D.k. at 650 nm.	710582
664	**1,1'-Bis(carboxyethyl)-4,4'-bipyridinium ion**				
	$e_{aq}^- + CQ^{2+} \rightarrow CQ^{\cdot+}$		2.4 × 10^{10}	p.r.; D.k.; counterion Cl$^-$.	761169
665	**1,1'-Bis(4-cyanophenyl)-4,4'-bipyridinium ion**				
	$e_{aq}^- + CV^{2+} \rightarrow CV^{\cdot+}$	6.8	4.8 × 10^{10}	p.r.; D.k. at 700 nm; counterion Cl$^-$.	78A321
666	**Bis(2-guanidinoethyl)disulfide**				
	$e_{aq}^- + [H_2NC(=NH)NHCH_2CH_2S]_2 \rightarrow$	7.4	2 × 10^{10}	p.r.; D.k. at 720 nm.	660011
667	**1,1'-Bis(2-hydroxyethyl)-4,4'-bipyridinium ion**				
	$e_{aq}^- + BP^{2+} \rightarrow BP^{\cdot+}$	6.8	6.5 × 10^{10}	p.r.; D.k. at 700 nm.; counterion Cl$^-$.	78A321
668	**2,2-Bis(hydroxymethyl)-2,2',2''-nitrilotriethanol**				
	$e_{aq}^- + (HOCH_2CH_2)_2NC(CH_2OH)_3 \rightarrow$		3 × 10^7	p.r.	78A471
669	**1,1'-Bis(3-sulfonatopropyl)-4,4'-bipyridinium ion**				
	$e_{aq}^- + SPV \rightarrow SPV^-$		~4 × 10^{10}	p.r.; Estd. in soln. contg. *tert*-BuOH; obs. formn. of SPV$^-$ absorption at 578 nm (ϵ = 10,300 L mol^{-1} cm^{-1}).	87N002
670	**1,1'-Bis(4-sulfonatotolyl)-4,4'-bipyridinium ion**				
	$e_{aq}^- + DSV \rightarrow DSV^{\cdot-}$	10	4 × 10^{10}	p.r.; D.k. in deaerated soln. contg. *tert*-BuOH.	85A064
671	**Biuret**				
	$e_{aq}^- + H_2NCONHCONH_2 \rightarrow H_2NC(O^-)NHCONH_2$	10.3	2.5 × 10^8	p.r.; D.k. at 700 nm in soln. contg. ~0.1-1 mol L^{-1} *tert*-BuOH.	730091
672	**Bleomycin**				
	$e_{aq}^- +$ Bleomycin $\rightarrow$	~7	5.0 × 10^{10}	p.r.; D.k. at 650 nm in soln. contg. 0.1 mol L^{-1} *tert*-BuOH.	76A256
673	**Bromoacetate ion**				
	$e_{aq}^- + BrCH_2CO_2^- \rightarrow$	~10	6.2 × 10^9	p.r.; D.k.	650015
674	**Bromobenzene**				
	$e_{aq}^- + C_6H_5Br \rightarrow {\cdot}C_6H_5 + Br^-$	6-10	1.0 × 10^{10} [b]	p.r.; D.k. at 700 nm in soln. contg. 0.25-1 mol L^{-1} MeOH.	761200
		~11	4.3 × 10^9 [b]	p.r.; D.k.	640138
675	**4-Bromobenzenediazonium ion**				
	$e_{aq}^- + 4\text{-}BrC_6H_4N_2^+ \rightarrow 4\text{-}BrC_6H_4N_2{\cdot}$		5.5 × 10^{10}	p.r.; D.k. at 600 nm in N_2-purged soln. contg. *tert*-BuOH; counterion tetrafluoroborate.	81A297
676	**4-Bromobenzoate ion**				
	$e_{aq}^- + 4\text{-}BrC_6H_4CO_2^- \rightarrow$	~11	7.7 × 10^9	p.r.; D.k.	640138
677	**1-Bromobutane**				
	$e_{aq}^- + CH_3(CH_2)_3Br \rightarrow {\cdot}CH_2(CH_2)_2CH_3 + Br^-$		*1.0 × 10^{10}*	Average of 2 values.	
		9-10	1.0 × 10^{10}	p.r.; D.k.	700407
		6.57	1.0 × 10^{10}	p.r.; D.k.	650018

TABLE 6. Rate constants for reactions of hydrated electrons in aqueous solution—Continued

No.	Reaction	pH	k (L mol^{-1} s^{-1})	Comment	Ref.
678	**1-Bromo-1-chloro-2,2,2-trifluoroethane**				
	$e_{aq}^- + CF_3CHClBr \rightarrow Br^- + CF_3\dot{C}HCl$	7	1.4×10^{10}	p.r.; D.k. in deaerated soln. contg. 10% *tert*-BuOH.	83A195
679	**Bromoethane**				
	$e_{aq}^- + C_2H_5Br \rightarrow \cdot CH_2CH_3 + Br^-$		*1.2* × *10*^{10}	Average of 2 values.	
		9-10	1.2×10^{10}	p.r.; D.k. at 600 nm.	700407
		7.1	1.2×10^{10}	p.r.; D.k.	650018
680	**2-Bromoethanol**				
	$e_{aq}^- + BrCH_2CH_2OH \rightarrow$	~10	1.6×10^9	p.r.; D.k.	650015
681	**1-Bromonaphthalene**				
	$e_{aq}^- + C_{10}H_7Br \rightarrow Br^- + Np\cdot$		1.8×10^{10}	p.r.; D.k. at 650 nm in soln. contg. 1 mol L^{-1} EtOH; $k = 2.0 \times 10^{10}$ in micellar CTAB soln.	82N112
682	**2-Bromo-5-nitrothiazole**				
	$e_{aq}^- + C_3HBrN_2O_2S \rightarrow C_3HBrN_2O_2S^-$	7	2.0×10^{10}	p.r.; D.k. at 600 nm in soln. contg. 0.5 mol L^{-1} *tert*-BuOH, as well as p.b.k.	761075
683	**5-Bromoorotate dianion**				
	$e_{aq}^- + 5\text{-Br-6-}UCO_2^{2-} \rightarrow$	11	3×10^9	p.r.; D.k. at 600 nm.	730002
684	**5-Bromoorotate ion**				
	$e_{aq}^- + 5\text{-}BrUCO_2^- \rightarrow$	7	1×10^{10}	p.r.; D.k. at 600 nm; pK 2.4, 7.3.	730002
685	**4-Bromophenol**				
	$e_{aq}^- + BrPhOH \rightarrow Br^- + \cdot C_6H_4OH$		**7 × 10^9**	**Selected value.**	
		5-6	7×10^9	p.r.; D.k. (no buffer added).	720027
686	**2-Bromophenoxide ion**				
	$e_{aq}^- + 2\text{-}BrC_6H_4O^- \rightarrow Br^- + \cdot C_6H_4O^-$		*2.1* × *10*^{9}	Average of 2 values.	
		11.5	2.3×10^9	p.r.; D.k. at 470 nm (as well as p.b.k. at 400 nm) in N_2-purged soln. contg. 4×10^{-4} mol L^{-1} 2-bromophenol and 0.2 mol L^{-1} *tert*-BuOH.	761068
		~11	1.9×10^9	p.r.; D.k.	640138
687	**3-Bromophenoxide ion**				
	$e_{aq}^- + BrC_6H_4O^- \rightarrow Br^- + \cdot C_6H_4O^-$	~11	2.7×10^9	p.r.; D.k.	640138
688	**4-Bromophenoxide ion**				
	$e_{aq}^- + 4\text{-}BrC_6H_4O^- \rightarrow Br^- + \cdot C_6H_4O^-$		*3.2* × *10*^{9}	Average of 2 values.	
		11	3.4×10^9	p.r.; D.k.	720027
		~11	2.9×10^9	p.r.; D.k.	640138
689	**1-Bromopropane**				
	$e_{aq}^- + CH_3CH_2CH_2Br \rightarrow$	6.15	8.5×10^9	p.r.; D.k.	650018
690	**2-Bromopropionate ion**				
	$e_{aq}^- + CH_3CHBrCO_2^- \rightarrow$	~10	5.3×10^9	p.r.; D.k.	650015
691	**3-Bromopropionate ion**				
	$e_{aq}^- + BrCH_2CH_2CO_2^- \rightarrow$	~10	2.7×10^9	p.r.; D.k.	650015
692	**α-Bromotetronate ion**				
	$e_{aq}^- + BrTr^- \rightarrow$	7	4.4×10^9	p.r.; D.k. at 600 nm in soln. contg. 10^{-3} mol L^{-1} phosphate buffer and 0.1 mol L^{-1} *tert*-BuOH. At pH 10.5 $k = 2.5 \times 10^9$; $I = 0.03$.	741053
693	**Bromotrifluoromethane**				
	$e_{aq}^- + CBrF_3 \rightarrow \cdot CF_3 + Br^-$	9-10	2.3×10^{10}	p.r.; D.k. at 600 nm.	700407
694	**5-Bromouracil**				
	$e_{aq}^- + 5\text{-BrU} \rightarrow 5\text{-BrU}\cdot^-$		*2.1* × *10*^{10}	Average of 2 values.	

TABLE 6. Rate constants for reactions of hydrated electrons in aqueous solution—Continued

No.	Reaction	pH	k (L mol^{-1} s^{-1})	Comment	Ref.
694	**5-Bromouracil**—Continued				
		7	1.6×10^{10}	p.r.; D.k. at 600 nm in soln. contg. *tert*-BuOH and Na_2SO_4; at pH 9 and 11 $k = 8.2 \times 10^9$ and 7.0×10^9, resp.; $I = 0.05$.	720049
		7.0	2.6×10^{10}	p.r.; D.k. at 578 nm.	690826
695	**Bromphenol Blue**				
	$e_{aq}^- + BPB^+ \rightarrow$		1.1×10^{10}	γ-r.; C.k.; obs. $G(-\text{dye})$; rel. to $k(e_{aq}^- + NO_3^-)$.	79G085
696	**Butadiene**				
	$e_{aq}^- + H_2C{=}CHCH{=}CH_2 \rightarrow$	7	8×10^9	p.r.; D.k. at 578 nm; unbuffered soln.	640044
697	**1,4-Butanediol dimethanesulfonate**				
	$e_{aq}^- + CH_3SO_2O(CH_2)_4OSO_2CH_3 \rightarrow$	6.8	3×10^7	p.r.; D.k. at 600 nm in deaerated soln. contg. *tert*-BuOH or 2-PrOH.	80A349
698	**2,3-Butanedione**				
	$e_{aq}^- + CH_3COCOCH_3 \rightarrow$		*9.9* × *10*^{9}	Average of 2 values.	
			9.9×10^9	p.r.; D.k. at 600 nm.	84A459
			1.0×10^{10}	p.r.; D.k. at 720 nm.	680249
699	***trans*-2-Buten-1-ol**				
	$e_{aq}^- + CH_3CH{=}CHCH_2OH \rightarrow$		5.5×10^7	p.r.; D.k.	771107
700	**3-Buten-1-ol**				
	$e_{aq}^- + H_2C{=}CHCH_2CH_2OH \rightarrow$		8×10^5 [b]	p.r.; D.k.	79A109
			4.1×10^6 [b]	p.r.; D.k.	771107
701	**3-Buten-2-ol**				
	$e_{aq}^- + H_2C{=}CHCH(OH)CH_3 \rightarrow$		5.9×10^7	p.r.; D.k.	771107
702	***N-tert*-Butylacetamide**				
	$e_{aq}^- + CH_3CONHC(CH_3)_3 \rightarrow$	9.2	1.2×10^7	p.r.; D.k. in soln. contg. 0.5 mol L^{-1} *tert*-BuOH and borate buffer.	710414
703	***n*-Butylamine**				
	$e_{aq}^- + CH_3(CH_2)_3NH_2 \rightarrow$	13	1.1×10^6	p.r.; D.k.at 720 nm; calcd. from k_{obs} over pH range; soln. contg. 0.1 mol L^{-1} amine.	730016
704	***tert*-Butylamine**				
	$e_{aq}^- + (CH_3)_3CNH_2 \rightarrow$	12.3	1.1×10^6	p.r.; D.k. at 720 nm in soln. contg. 0.1 mol L^{-1} amine.	700371
705	**Butylammonium ion**				
	$e_{aq}^- + n\text{-}C_4H_9NH_3^+ \rightarrow$	8.5	2.6×10^6	p.r.; D.k. at 720 nm; calcd. from k_{obs} over pH range; soln. contg. 0.1 mol L^{-1} amine.	730016
706	***tert*-Butylammonium ion**				
	$e_{aq}^- + (CH_3)_3CNH_3^+ \rightarrow$	7.9	1.1×10^6	p.r.; D.k. at 720 nm in Ar-satd. soln. contg. 0.1 mol L^{-1} amine.	700371
707	**4-*tert*-Butyl-1,2-benzoquinone**				
	$e_{aq}^- + (CH_3)_3C\text{-}o\text{-}Q \rightarrow (CH_3)_3C\text{-}o\text{-}Q\cdot^-$	7.1	1×10^{10}	p.r.; P.b.k. at 313 nm in N_2-satd. soln. contg. 0.5 mol L^{-1} *tert*-BuOH.	79A099
708	***tert*-Butyl hydroperoxide**				
	$e_{aq}^- + (CH_3)_3COOH \rightarrow OH^- + (CH_3)_3CO\cdot$	8.2	1.6×10^{10} [b]	p.r.; D.k. at 680 in N_2-satd. soln. contg. 6.5×10^{-2} mol L^{-1} 2-PrOH.	82A451
			6×10^9 [b]	p.r.; D.k. at 650 nm in deaerated soln. contg. 0.5 mol L^{-1} *tert*-BuOH.	81A374
709	**Caffeine**				
	$e_{aq}^- + C_8H_{10}N_4O_2 \rightarrow$		1.5×10^{10}	p.r.; D.k.	85R089
710	**Camphor**				
	$e_{aq}^- + C_{10}H_{16}O \rightarrow C_{10}H_{16}O^-$	9.2	3.1×10^9	p.r.; D.k. at 700 nm in Ar-satd. soln.; pK for ketyl radical = 12.0.	79A191

TABLE 6. Rate constants for reactions of hydrated electrons in aqueous solution—Continued

No.	Reaction	pH	k (L mol^{-1} s^{-1})	Comment	Ref.
711	**Camphoroquinone**				
	$e_{aq}^- + C_{10}H_{14}O_2 \rightarrow C_{10}H_{14}O_2^-$	~7	2.8×10^{10}	p.r.; D.k. at 700 nm in soln. contg. 0.1 mol L^{-1} *tert*-BuOH; pK for semiquinone = 4.1.	731138
712	**3-Carboxamido-2,2,5,5-tetramethylpyrrolidin-1-yloxy**				
	$e_{aq}^- +$ NX-s →		9×10^9	p.r.; D.k. at 600-700 nm.	761152
713	**3-Carboxamido-2,2,5,5-tetramethyl-3-pyrrolin-1-yloxy**				
	$e_{aq}^- +$ NX-u →		1.9×10^{10}	p.r.; D.k. at 600-700 nm.	761152
714	**Carbenicillin**				
	$e_{aq}^- + C_{17}H_{18}N_2O_6S \rightarrow$	6.0	1.1×10^9	p.r.; D.k. at 700 nm.	733020
715	**Carbon disulfide**				
	$e_{aq}^- + CS_2 \rightarrow CS_2^{\cdot -}$		*3.1 × 10^{10}*	Average of 2 values.	
			3.1×10^{10}	p.r.	731015
		7	3.1×10^{10}	p.r.; D.k. at 578 nm.	630073
716	**Carbon tetrachloride**				
	$e_{aq}^- + CCl_4 \rightarrow Cl^- + {\cdot}CCl_3$		*1.6 × 10^{10}*	Average of 2 values.	
			1.3×10^{10}	p.r.; D.k.	79A109
			1.9×10^{10}	p.r.; D.k. at 600 nm.	771093
717	**Cephaloridine**				
	$e_{aq}^- + C_{19}H_{17}N_3O_4S_2 \rightarrow$	6.0	2.8×10^{10}	p.r.; D.k. at 700 nm.	733020
718	**Cephalosporin C**				
	$e_{aq}^- + C_{16}H_{21}N_3O_8S \rightarrow$	6.0	8.9×10^9	p.r.; D.k. at 700 nm.	733020
719	**Cephalothin**				
	$e_{aq}^- + C_{16}H_{16}N_2O_6S_2 \rightarrow$	6.0	1.1×10^{10}	p.r.; D.k. at 700 nm.	733020
720	**Chloral hydrate**				
	$e_{aq}^- + CCl_3CH(OH)_2 \rightarrow$		1.2×10^{10}	p.r.; D.k. at 720 nm.	730062
721	**Chloroacetate ion**				
	$e_{aq}^- + ClCH_2CO_2^- \rightarrow Cl^- + {\cdot}CH_2CO_2^-$		**1.0×10^9**	**Selected value.**	
		11.0	8.9×10^8	p.r.; D.k.; k detd. at 2-62°C.	670299
		~10	1.2×10^9	p.r.; D.k.	650015
722	**Chloroacetic acid**				
	$e_{aq}^- + ClCH_2CO_2H \rightarrow Cl^- + {\cdot}CH_2CO_2H$	1.0	6.9×10^9	γ-r.; C.k.; obs. $G(Cl^-)$ and $G(H_2)$; rel. to $k(e_{aq}^- + H^+)$.	610025
723	***N*-(Chloroacetyl)glycine, negative ion**				
	$e_{aq}^- + ClCH_2CONHCH_2CO_2^- \rightarrow Cl^- + {\cdot}CH_2COGly$	~6	1.0×10^9	p.r.; Ar-satd. soln. contg. 0.1 mol L^{-1} *tert*-BuOH.	751195
724	***N*-(2-Chloroacetyl)glycylglycine, negative ion**				
	$e_{aq}^- + ClCH_2CONHGlyCH_2CO_2^- \rightarrow Cl^- + {\cdot}CH_2COGlyGly$	~6	1.5×10^9	p.r.; Ar-satd. soln. contg. 0.1 mol L^{-1} *tert*-BuOH.	751195
725	***N*-(2-Chloroacetyl)phenylalanine, negative ion**				
	$e_{aq}^- +$ ClAcPhe$^- \rightarrow$ $PhCH_2CH(CO_2^-)NHCO\dot{C}H_2$	9.2	2.3×10^9	p.r.; D.k. at 700 nm in soln. contg. *tert*-BuOH.	741083
726	***N*-(2-Chloroacetyl)tryptophan, negative ion**				
	$e_{aq}^- +$ ClAcTrp$^- \rightarrow$	6.0	4.0×10^9	p.r.; D.k. at 550 nm in soln. contg. *tert*-BuOH; k cor. for I.	771139
727	**2-Chloroaniline**				
	$e_{aq}^- + ClC_6H_4NH_2 \rightarrow Cl^- + C_6H_4NH_2$	6-10	5.4×10^8	p.r.; D.k. at 700 nm in 0.25-1 mol L^{-1} MeOH.	761200
728	**3-Chloroaniline**				
	$e_{aq}^- + ClC_6H_4NH_2 \rightarrow Cl^- + C_6H_4NH_2$	6-10	5.3×10^8	p.r.; D.k. at 700 nm in soln. contg. 0.25-1 mol L^{-1} MeOH.	761200

TABLE 6. Rate constants for reactions of hydrated electrons in aqueous solution—Continued

No.	Reaction	pH	k (L mol^{-1} s^{-1})	Comment	Ref.
729	**4-Chloroaniline**				
	$e_{aq}^- + ClC_6H_4NH_2 \rightarrow Cl^- + {\cdot}C_6H_4NH_2$	6-10	5.2×10^8	p.r.; D.k. at 700 nm in soln. contg. MeOH.	761200
730	**Chlorobenzene**				
	$e_{aq}^- + C_6H_5Cl \rightarrow Cl^- + {\cdot}C_6H_5$	6-10	5.0×10^8	p.r.; D.k. at 700 nm in soln. contg. MeOH.	761200
		~11	5.0×10^8	p.r.; D.k.	640138
731	**4-Chlorobenzenediazonium ion**				
	$e_{aq}^- + 4\text{-}ClC_6H_4N_2^+ \rightarrow 4\text{-}ClC_6H_4N_2{\cdot}$		*3.7 × 10^{10}*	Average of 2 values.	
			5.1×10^{10}	p.r.; D.k. at 600 nm in N_2-purged soln. contg. *tert*-BuOH; counterion tetrafluoroborate.	81A297
			2.4×10^{10}	p.r.; D.k. at 700 nm in 50:50 (v:v) H_2O-*tert*-BuOH; counterion tetrafluoroborate.	80A200
732	**2-Chlorobenzoate ion**				
	$e_{aq}^- + 2\text{-}ClC_6H_4CO_2^- \rightarrow$	~11	1.2×10^9	p.r.; D.k.	640138
733	**3-Chlorobenzoate ion**				
	$e_{aq}^- + 3\text{-}ClC_6H_4CO_2^- \rightarrow$	~11	5.5×10^9	p.r.; D.k.	640138
734	**4-Chlorobenzoate ion**				
	$e_{aq}^- + 4\text{-}ClC_6H_4CO_2^- \rightarrow$	~11	6.0×10^9	p.r.; D.k.	640138
735	**1-Chlorobutane**				
	$e_{aq}^- + CH_3(CH_2)_3Cl \rightarrow Cl^- + {\cdot}CH_2(CH_2)_2CH_3$		4.8×10^7 [b]	p.r.; D.k.	771107
		9-10	4.5×10^8 [b]	p.r.; D.k. at 600 nm.	700407
		7.28	4.5×10^8 [b]	p.r.; D.k.	650018
736	**2-Chlorobutane**				
	$e_{aq}^- + C_2H_5CH(Cl)CH_3 \rightarrow$	6.64	5.1×10^8	p.r.; D.k.	650018
737	**Chlorodifluoromethane**				
	$e_{aq}^- + CHClF_2 \rightarrow Cl^- + {\cdot}CHF_2$		2.9×10^9	γ-r.; C.k.; obs. $G(Cl^-)$ relative to N_2O, NO_3^- or SF_6; reference rates not given.	760157
738	**Chlorodiphenylmethane**				
	$e_{aq}^- + (C_6H_5)_2CHCl \rightarrow (C_6H_5)_2\dot{C}H + Cl^-$	~8	9.5×10^8	p.r.; P.b.k. in at 327 nm in N_2-satd. soln. contg. 1 mol L^{-1} *tert*-BuOH and 9-20 × 10^{-4} mol L^{-1} Ph_2CHCl.	86A410
739	**2-Chloroethanol**				
	$e_{aq}^- + ClCH_2CH_2OH \rightarrow$	9-11.5	2.0×10^8 [b]	p.r.; D.k. at 720 nm in Ar-satd. soln. contg. 0.1 mol L^{-1} *tert*-BuOH and 10^{-4}-10^{-2} mol L^{-1} 2-chloroethanol.	85A158
		6.2	6.4×10^8 [b]	p.r.; D.k. at 600 nm; k increases with pressure → 6.4 kbar (6.4×10^8 N/m^2).	720298
740	**(2-Chloroethyl)benzene**				
	$e_{aq}^- + C_6H_5CH_2CH_2Cl \rightarrow Cl^- + C_6H_5CH_2\dot{C}H_2$		*5.7 × 10^8*	Average of 2 values.	
			5.3×10^8	p.r.; D.k. at 720 nm.	79A355
		9.2	6.0×10^8	p.r.; D.k. at 700 nm in soln. contg. *tert*-BuOH.	741083
741	**Chloroform**				
	$e_{aq}^- + CHCl_3 \rightarrow$	7	3.0×10^{10}	p.r.; D.k. at 578 nm; unbuffered soln.	640044
741a	**Chloromethane**				
	$e_{aq}^- + CH_3Cl \rightarrow Cl^- + CH_3{\cdot}$	10	~8×10^8	p.r.; $k = 1.1 \times 10^9$ by c.k. with SF_6.	700225
742	**1-Chloro-2-methylpropane**				
	$e_{aq}^- + (CH_3)_2CHCH_2Cl \rightarrow$	5.82	5.1×10^8	p.r.; D.k.	650018
743	**1-Chloronaphthalene**				
	$e_{aq}^- + NpCl \rightarrow Cl^- + Np{\cdot}$		1.4×10^{10}	p.r.; D.k. at 650 nm in soln. contg. 1 mol L^{-1} EtOH; $k = 2.2 \times 10^{10}$ in micellar CTAB soln.	82N112

TABLE 6. Rate constants for reactions of hydrated electrons in aqueous solution—Continued

No.	Reaction	pH	k (L mol^{-1} s^{-1})	Comment	Ref.
744	**2-Chlorophenol**				
	$e_{aq}^- + ClC_6H_4OH \rightarrow$	7.5-8.5	4.4×10^8	p.r.; D.k. at 720 nm in deoxygenated soln. contg. 5-10 $\times$ 10^{-5} mol L^{-1} substrate.	86A463
745	**2-Chlorophenoxide ion**				
	$e_{aq}^- + 2\text{-}ClC_6H_4O^- \rightarrow$	~11	2.0×10^8	p.r.; D.k.	640138
746	**3-Chlorophenoxide ion**				
	$e_{aq}^- + 3\text{-}C_6H_4O^- \rightarrow$	~11	5.0×10^8	p.r.; D.k.	640138
747	**4-Chlorophenoxide ion**				
	$e_{aq}^- + 4\text{-}ClC_6H_4O^- \rightarrow$	~11	6.4×10^8	p.r.; D.k.	640138
748	**α-Chlorophenylacetate ion**				
	$e_{aq}^- + C_6H_5CHClCO_2^- \rightarrow Cl^- + C_6H_5\dot{C}HCO_2^-$	9.2	2.7×10^9	p.r.; D.k. at 700 nm in soln. contg. *tert*-BuOH.	741083
749	***p*-Chlorophenyl-β-D-glucopyranoside**				
	$e_{aq}^- + GluOC_6H_4Cl \rightarrow$		2.6×10^9	p.r.; D.k.	710056
750	**1-Chloropropane**				
	$e_{aq}^- + CH_3CH_2CH_2Cl \rightarrow Cl^- + \cdot CH_2CH_2CH_3$		*6.9 × 10^8*	Average of 2 values.	
		9-10	6.9×10^8	p.r.; D.k. at 600 nm.	700407
		6.3	6.9×10^8	p.r.; D.k.	650018
751	**3-Chloro-1,2-propanediol**				
	$e_{aq}^- + ClCH_2CH(OH)CH_2OH \rightarrow Cl^- + \cdot CH_2CHOHCH_2OH$		6.7×10^8	γ-r.; C.k.; 0.1 mol L^{-1} solute; obs. $G(H_2)$; rel. to $k(e_{aq}^- + H^+)$.	81A397
752	**2-Chloropropionamide**				
	$e_{aq}^- + CH_3CH(Cl)CONH_2 \rightarrow$	~6	5.8×10^9	p.r.; D.k. at 580 nm; soln. satd. with ethylene.	700052
753	**3-Chloropropionamide**				
	$e_{aq}^- + ClCH_2CH_2CONH_2 \rightarrow$	~6	1.8×10^9	p.r.; D.k. at 580 nm; soln. satd. with ethylene.	700052
754	**2-Chloropropionate ion**				
	$e_{aq}^- + CH_3CHClCO_2^- \rightarrow$	~10	1.4×10^9	p.r.; D.k.	650015
755	**3-Chloropropionate ion**				
	$e_{aq}^- + ClCH_2CH_2CO_2^- \rightarrow$	11.0	4.4×10^8	p.r.; D.k.; k detd. at 2-62°C.	670299
756	***p*-Chlorotoluene**				
	$e_{aq}^- + CH_3C_6H_4Cl \rightarrow$	~11	4.5×10^8	p.r.; D.k.	640138
757	**Chlorotrifluoromethane**				
	$e_{aq}^- + CClF_3 \rightarrow Cl^- + \cdot CF_3$	9-10	4.4×10^9	p.r.; D.k. at 600 nm.	700407
758	**5-Chlorouracil**				
	$e_{aq}^- + 5\text{-}ClU \rightarrow 5\text{-}ClU^{\cdot -}$		*1.8 × 10^{10}*	Average of 2 values.	
		~5	2.2×10^{10}	p.r.	751111
		7	1.5×10^{10}	p.r.; D.k. at 600 nm in soln. contg. *tert*-BuOH and Na_2SO_4; at pH 9 and 11 $k = 6.3 \times 10^9$ and 5.5 $\times$ 10^9, resp.; pK = 7.95.; I = 0.05.	720049
759	**Chlorpromazine, conjugate acid**				
	$e_{aq}^- + CZH^+ \rightarrow [CZH]\cdot$		*1.7 × 10^{10}*	Average of 2 values.	
		7	1.2×10^{10}	p.r.; D.k. at 720 nm in N_2-satd. soln. contg. 0.1 mol L^{-1} *tert*-BuOH; pK_a = 9.3.	83A272
		5-6	2.2×10^{10}	p.r.; D.k. at 720 nm in Ar-satd. soln. contg. 0.5 mol L^{-1} *tert*-BuOH.	79A060
760	**Choline**				
	$e_{aq}^- + HOCH_2CH_2N(CH_3)_3^+ \rightarrow$	7.8	8×10^7	p.r.; D.k.; counterion Cl^-	751114
761	**Chromagen**				
	$e_{aq}^- + Chg \rightarrow$ addn.	7	1.4×10^{10}	γ-r.; C.k. in soln. contg. EtOH; obs. G(−dye) in aerated soln.; reference rate not given; rel. to $k(e_{aq}^- + O_2)$.	81A312

TABLE 6. Rate constants for reactions of hydrated electrons in aqueous solution—Continued

No.	Reaction	pH	k (L mol^{-1} s^{-1})	Comment	Ref.
762	***trans*-Cinnamamide** $e_{aq}^- + C_6H_5CH{=}CHCONH_2 \rightarrow [C_6H_5CHCHCONH_2]\cdot^-$	9.2	3.0×10^{10}	p.r.; D.k. at 700 nm in soln. contg. 10^{-3} mol L^{-1} borate and ~0.1 mol L^{-1} *tert*-BuOH.	751052
763	**Cinnamate ion** $e_{aq}^- + C_6H_5CH{=}CHCO_2^- \rightarrow [C_6H_5CHCHCO_2]\cdot^{2-}$	9.2	1.4×10^{10}	p.r., D.k., as well as p.b.k.	761113
764	***trans*-Cinnamic acid** $e_{aq}^- + C_6H_5CH{=}CHCO_2H \rightarrow [C_6H_5CHCHCO_2H]\cdot^-$	2.0-3.7	2.2×10^{10}	p.r.; C.k.; pK_a = 4.4; rel. to $k(e_{aq}^- + H^+)$.	761113
765	**Citrate ion** $e_{aq}^- +$ citrate $\rightarrow$		$<1 \times 10^5$	p.r.; 10^{-1} mol L^{-1} soln. unreactive.	640046
766	**Cloxacillin** $e_{aq}^- + C_{19}H_{18}ClN_3O_5S \rightarrow$	6.0	7.5×10^9	p.r.; D.k. at 700 nm.	733020
767	**Coumarin** $e_{aq}^- + C_9H_6O_2 \rightarrow$		1.6×10^{10}	p.r.; D.k. at 700 nm.	79E282
768	**Creatine** $e_{aq}^- +$ $H_2NC(=NH)N(CH_3)CH_2CO_2^- \rightarrow$	7.0	2.7×10^7	p.r.; D.k.	650389
769	**Cresol Red** $e_{aq}^- + C_{21}H_{18}O_5S \rightarrow$	11	8.5×10^9	f.p.; D.k. at 700 nm.	710437
770	***p*-Cresol** $e_{aq}^- + CH_3C_6H_4OH \rightarrow$	7.9	4.2×10^7	p.r.; D.k. at 690 nm in soln. contg. 0.1 mol L^{-1} *tert*-BuOH.	730003
771	**Crocetin dianion** $e_{aq}^- + C_{20}H_{22}O_4^{2-} \rightarrow$	8.2	7.1×10^{10}	p.r.; P.b.k. at 800 nm, as well as d.k. at 400 nm.	82R027
772	**Crocin** $e_{aq}^- + C_{44}H_{64}O_{24} \rightarrow$	8.2	1.1×10^{11}	p.r.; D.k. at 680 nm (e_{aq}^-) as well as 400 nm (crocin).	82R027
773	***trans*-Crotonamide** $e_{aq}^- + CH_3CH{=}CHCONH_2 \rightarrow [CH_3CHCHCONH_2]\cdot^-$	9.2	1.3×10^{10}	p.r.; D.k. at 700 nm in soln. contg. 10^{-3} mol L^{-1} borate and ~0.1 mol L^{-1} *tert*-BuOH.	751052
774	***trans*-Crotonate ion** $e_{aq}^- + CH_3CH{=}CHCO_2^- \rightarrow [CH_3CHCHCO_2]\cdot^{2-}$	9.2	1.3×10^9	p.r.; D.k., as well as p.b.k.	761113
775	***trans*-Crotonic acid** $e_{aq}^- + CH_3CH{=}CHCO_2H \rightarrow [CH_3CHCHCO_2H]\cdot^-$	2.0-3.7	1.8×10^{10}	p.r.; C.k.; pK_a = 4.69; rel. to $k(e_{aq}^- + H^+)$.	761113
776	**Cumene hydroperoxide** $e_{aq}^- + C_6H_5C(CH_3)_2O_2H \rightarrow OH^- + C_6H_5C(CH_3)_2O\cdot$		*4.2 × 10^9*	Average of 2 values.	
		7, 9	4.4×10^9	p.r.; D.k. at 600 nm in soln. contg. 1 mol L^{-1} *tert*-BuOH.	84A160
			4×10^9	p.r.; D.k. at 650 nm in deaerated soln. contg. 0.5 mol L^{-1} *tert*-BuOH.	81A374
777	**Cyanamide** $e_{aq}^- + H_2NCN \rightarrow H_2NCN^-$	3-4	1.5×10^9	γ-r.; C.k.; obs. $G(H_2)$; rel. to $k(e_{aq}^- + H^+)$; I = 0.002.	78A258
778	**4-Cyanobenzenediazonium ion** $e_{aq}^- + p\text{-}CNC_6H_4N_2^+ \rightarrow$ 4-$CNC_6H_4N_2\cdot$		3.0×10^{10}	p.r.; D.k. at 700 nm in 50:50 (v:v) H_2O-*tert*-BuOH; counterion tetrafluoroborate.	80A200
779	**4-Cyanobenzoate ion** $e_{aq}^- +$ 4-$NCC_6H_4CO_2^- \rightarrow$	~11	1.0×10^{10}	p.r.; D.k.	640138

TABLE 6. Rate constants for reactions of hydrated electrons in aqueous solution—Continued

No.	Reaction	pH	k (L mol^{-1} s^{-1})	Comment	Ref.
780	**2-Cyanophenoxide ion** $e_{aq}^- + 2\text{-}CNC_6H_4O^- \rightarrow$	~11	8.2×10^9	p.r.; D.k.	640138
781	**3-Cyanophenoxide ion** $e_{aq}^- + 3\text{-}CNC_6H_4O^- \rightarrow$	~11	4.8×10^9	p.r.; D.k.	640138
782	**4-Cyanophenoxide ion** $e_{aq}^- + 4\text{-}NCC_6H_4O^- \rightarrow$	~11	2.0×10^9	p.r.; D.k.	640138
783	**4-Cyanophenyl-*N*-*tert*-butylnitrone** $e_{aq}^- +$ 4-CN-PBN $\rightarrow OH^- +$ 4-CN-PBN(H)	7	1.0×10^{10}	p.r.; D.k. at 650 nm in deaerated soln. contg. *tert*-BuOH.	82A184
784	**Cyclobutanone** $e_{aq}^- +$ -$(CH_2)_3CO$- $\rightarrow$ -$\dot{C}H_2CO^-(CH_2)_2$-		8.2×10^9	p.r.; D.k. at 600 nm in soln. contg. 0.1 mol L^{-1} *tert*-BuOH; rate constant for 3°C; at 64° $k =$ 2.6×10^{10}.	761103
785	**Cycloheptanone** $e_{aq}^- +$ -$(CH_2)_6CO$- $\rightarrow$ -$\dot{C}H_2CO^-(CH_2)_5$-		6.0×10^9	p.r.; D.k. at 600 nm in soln. contg. 0.1 mol L^{-1} *tert*-BuOH; rate constant for 3 °C; at 64° $k =$ 1.9×10^{10}.	761103
786	**Cycloheptatriene** $e_{aq}^- +$ *c*-$C_7H_8 \rightarrow$		6×10^9	p.r.; D.k. at 720 nm.	710710
787	**1,3-Cyclohexadiene** $e_{aq}^- +$ *c*-$C_6H_8 \rightarrow$	11	1×10^9	p.r.; D.k. at 715 nm.	700211
788	**1,4-Cyclohexadiene** $e_{aq}^- +$ *c*-$C_6H_8 \rightarrow$	11	$<7.5 \times 10^5$	p.r.; D.k. at 715 nm.	700211
789	**Cyclohexanone** $e_{aq}^- +$ -$(CH_2)_5CO$- $\rightarrow$ -$\dot{C}H_2CO^-(CH_2)_4$-		7.2×10^9	p.r.; D.k. at 600 nm in soln. contg. 0.1 mol L^{-1} *tert*-BuOH; rate constant for 3 °C; at 64° $k =$ 2.5×10^{10}.	761103
790	**Cyclohexene** $e_{aq}^- +$ *c*-$C_6H_{10} \rightarrow$	11	$<1 \times 10^6$	p.r.; D.k. at 715 nm.	700211
791	**Cyclohexylamine** $e_{aq}^- +$ *c*-$C_6H_{11}NH_2 \rightarrow$	11.8	1.7×10^6	p.r.; D.k. at 720 nm in Ar-satd. soln. contg. 0.1 mol L^{-1} amine.	700371
792	**Cyclooctanone** $e_{aq}^- +$ -$(CH_2)_7CO$- $\rightarrow$ -$\dot{C}H_2CO^-(CH_2)_6$-		4.3×10^9	p.r.; D.k. at 600 nm in soln. contg. 0.1 mol L^{-1} *tert*-BuOH; rate constant for 3 °C; at 64° $k =$ 1.4×10^{10}.	761103
793	**Cyclopentanone** $e_{aq}^- +$ -$(CH_2)_4CO$- $\rightarrow$ -$\dot{C}H_2CO^-(CH_2)_3$-		7.4×10^9	p.r.; D.k. at 600 nm in soln. contg. 0.1 mol L^{-1} *tert*-BuOH; rate constant for 3 °C; at 64° $k =$ 2.4×10^{10}.	761103
794	**Cyclophosphamide** $e_{aq}^- + C_7H_{15}Cl_2N_2O_2P \rightarrow$	6.8	8.5×10^8	p.r.; D.k. at 600 nm in deaerated soln. contg. *tert*-BuOH or 2-PrOH.	80A349
795	**Cystamine** $e_{aq}^- + S_2(CH_2CH_2NH_2)_2 \rightarrow$ $[H_2NCH_2CH_2S]_2^{\cdot -}$	11.1	1.8×10^{10}	p.r.; D.k. at 700 nm in soln. contg. ~0.1 mol L^{-1} *tert*-BuOH	720388
796	**Cystamine, conjugate diacid** $e_{aq}^- + S_2(CH_2CH_2NH_3)_2^{2+} \rightarrow$ $[S_2(CH_2CH_2NH_3)_2]^{\cdot +}$		*4.1* $\times$ *10^{10}*	Average of 3 values.	
			4.2×10^{10}	p.r.; D.k. at 600 nm contg. 5×10^{-3} mol L^{-1} phosphate buffer; also see [79A145].	80A116
		6.7	4.2×10^{10}	p.r.; D.k. at 700 nm in soln. contg. ~0.1 mol L^{-1} *tert*-BuOH	720388
		7.3	4×10^{10}	p.r.; D.k. at 720 nm; pK_a = 8.82, 9.16.	660011

TABLE 6. Rate constants for reactions of hydrated electrons in aqueous solution—Continued

No.	Reaction	pH	k (L mol^{-1} s^{-1})	Comment	Ref.
797	**Cysteamine, conjugate acid** $e_{aq}^- + HSCH_2CH_2NH_3^+ \rightarrow \cdot CH_2CH_2NH_2 + H_2S$	5.5	3.0×10^{10}	p.r.; D.k. at 700 nm in soln. contg. ~0.1 mol L^{-1} *tert*-BuOH; pK_a = 8.6, 10.7.	730090
798	**Cysteamine, negative ion** $e_{aq}^- + H_2NCH_2CH_2S^- \rightarrow HS^- + OH^- + \cdot CH_2CH_2NH_2$	12.5	1.5×10^9	p.r.; D.k. at 700 nm in soln. contg. ~0.1 mol L^{-1} *tert*-BuOH.	730090
799	**Cysteine** $e_{aq}^- + CysSH \rightarrow HS^- + \cdot CH_2CH(NH_3^+)CO_2^-$		*1.2* × *10^{10}*	Average of 2 values.	
		~7	1.0×10^{10}	p.r.; D.k. at 650 nm in soln. contg. 0.1 mol L^{-1} *tert*-BuOH; same with 0.1% DNA added.	76A256
		5.8	1.3×10^{10}	p.r.; D.k. at 700 nm in soln. contg. ~0.1 mol L^{-1} *tert*-BuOH; pK_a = 1.8, 8.3, 10.8.	730090
800	**Cysteine, conjugate acid** $e_{aq}^- + HSCH_2CH(NH_3^+)CO_2H \rightarrow$	1	3.1×10^{10}	γ-r.; C.k.; rel. to $k(e_{aq}^- + H^+)$.	730286
801	**Cysteine, negative ion** $e_{aq}^- + Cys^- \rightarrow \cdot CH_2CH(NH_2)CO_2^- + HS^- + OH^-$	12.5	2.0×10^8	p.r.; D.k. at 700 nm in soln. contg. ~0.1 mol L^{-1} *tert*-BuOH.	730090
802	**Cysteine, methyl ester, conjugate acid** $e_{aq}^- + HSCH_2CH(NH_3^+)CO_2CH_3 \rightarrow \cdot CH_2CH(NH_2)CO_2CH_3 + HS^-$	5.1	1.8×10^{10}	p.r.; D.k. at 700 nm in soln. contg. ~0.1 mol L^{-1} *tert*-BuOH; pK_a = 6.5, 9.0; at pH 10.1 k = 6.9 × 10^9.	730090
803	**Cystine** $e_{aq}^- + S_2[CH_2CH(NH_3^+)CO_2^-]_2 \rightarrow [CysSSCys]\cdot^-$		*1.6* × *10^{10}*	Average of 2 values.	
		5.6	1.6×10^{10}	p.r.; D.k.; pK_a = 1.90, 7.85, 9.85, 11.80, 12.40(?).	720187
		6.2	1.5×10^{10}	p.r.; D.k. at 700 nm in soln. contg. ~0.1 mol L^{-1} *tert*-BuOH.	720388
804	**Cystine, dianion** $e_{aq}^- + S_2[CH_2CH(NH_2)CO_2^-]_2 \rightarrow$		*4.2* × *10^9*	Average of 2 values.	
		12.1	5.0×10^9	p.r.; D.k. at 700 nm in soln. contg. ~0.1 mol L^{-1} *tert*-BuOH	720388
		12.0	3.4×10^9	p.r.; D.k. at 578 nm; L-isomer.	640044
805	**Cystine, dimethyl ester** $e_{aq}^- + S_2[CH_2CH(NH_3^+)CO_2CH_3]_2 \rightarrow \cdot S_2[CH_2CH(NH_3^+)CO_2CH_3]_2^-$	6.3	5.1×10^{10}	p.r.; D.k.; pK_a 6.9; at pH 9.2 k = 2.1 × 10^{10}.	720388
806	**Cytidine** $e_{aq}^- + C_9H_{13}N_3O_5 \rightarrow$	7	1.3×10^{10}	p.r.; D.k.; pK_a = 4.22, 12.3; at pH 14 k = 9.5 × 10^9; I = 0.1.	710375
807	**Cytidine 2',3'-cyclicmonophosphate ion** $e_{aq}^- + 2',3'$-CMP $\rightarrow$	7	1.0×10^{10}	p.r.; D.k.; pK_a = ~4, 6, 12.3; at pH 14 k = 7.5 × 10^9; I = 0.1.	710375
808	**Cytidine 5'-monophosphate** $e_{aq}^- + CMP \rightarrow$	7-14	6.8×10^9	p.r.; D.k.; pK_a = 4.5, 6.3; I = 0.1.	710375
809	**Cytosine** $e_{aq}^- + Cy \rightarrow$	7	1.3×10^{10}	p.r.; D.k.; pK_a = 12.2; at pH 14 k = 3.6 × 10^9; I = 0.1.	710375
810	**Daunomycin** $e_{aq}^- + D \rightarrow D\cdot^-$	7	1.6×10^{10}	p.r.; D.k. at 580-700 nm in deaerated soln. contg. 0.1 mol L^{-1} *tert*-BuOH and 6 × 10^{-2} mol L^{-1} phosphate buffer.	85A001

TABLE 6. Rate constants for reactions of hydrated electrons in aqueous solution—Continued

No.	Reaction	pH	k (L mol^{-1} s^{-1})	Comment	Ref.
811	**Decyl sulfate ion**				
	$e_{aq}^- + CH_3(CH_2)_9OSO_3^- \rightarrow$	6	$\sim 1 \times 10^6$	p.r.; D.k. at 650 nm in soln. contg. 10^{-3} mol L^{-1} glucose, counterion Na^+	773034
812	**Dehydromethionine**				
	$e_{aq}^- + C_5H_9NO_2S \rightarrow$	5	8.7×10^9	p.r.; D.k.	85B093
813	**2′-Deoxyadenosine**				
	$e_{aq}^- + dA \rightarrow dA^{\cdot -}$	7	8.2×10^9	p.r.; D.k.; at pH 14 $k = 5.6 \times 10^9$.	81A027
814	**2-Deoxy-D-ribose**				
	$e_{aq}^- +$ deoxyribose $\rightarrow$	7	1×10^7	p.r.; D.k.; H_2-satd.	710256
815	**2-Deoxy-2-sulfonamino-D-glucose**				
	$e_{aq}^- + C_6H_{13}NO_8S \rightarrow$		*1.8 × 10^7*	Average of 2 values.	
		6.8	1.8×10^7	p.r.; D.k. at 650 nm.	78A146
			1.7×10^7	p.r.; D.k. at 650 nm.	703081
816	**Deoxyuridine 5′-monophosphate, mercurated**				
	$e_{aq}^- +$ HgdUMP $\rightarrow$	7	1.8×10^9	f.p.; D.k. at 720 nm in Ar-satd. soln. contg. *N*-acetyltryptophanamide.	81A232
817	**Diacetamide**				
	$e_{aq}^- + (CH_3CO)_2NH \rightarrow [(CH_3CO)_2NH]^{\cdot -}$	6.5	1.1×10^{10}	p.r.; D.k. at 700 nm in soln. contg. ~0.1-1 mol L^{-1} *tert*-BuOH.	730091
818	**3,6-Diaminoacridine (Proflavine)**				
	$e_{aq}^- +$ PF $\rightarrow$		*2.9 × 10^{10}*	Average of 3 values.	
			3.4×10^{10}	p.r.; D.k. at 650 nm in soln. contg. 10^{-2} mol L^{-1} glucose.	78A153
		~7	2.8×10^{10}	p.r.; D.k. at 650 nm in soln. contg. 0.1 mol L^{-1} *tert*-BuOH.	76A256
		~7	2.5×10^{10}	p.r.; D.k. at 625 nm, as well as dye bleaching at 450 nm.	753094
819	**2,4-Diaminoazobenzene**				
	$e_{aq}^- + C_6H_5N{=}NC_6H_3(NH_2)_2 \rightarrow$ addn.	7	7.3×10^9	γ-r.; C.k. in soln. contg. EtOH; obs. G(−dye) in aerated soln.; $pK_a = 5.3$; reference rate not given; rel. to $k(e_{aq}^- + O_2)$.	81A312
820	**Diatrizoate ion**				
	$e_{aq}^- + (CH_3CONH)_2C_6I_3CO_2^- \rightarrow I^- + C_{11}H_8I_2N_2O_4^-$	5.6, 7	2.1×10^{10}	p.r.	79A364
821	**2,3-Diazabicyclo[2.2.1]hept-2-ene**				
	$e_{aq}^- + R_2N_2 \rightarrow R_2N_2^{\cdot -}$		2.3×10^{10}	p.r.; D.k. at 650 nm.	84A341
822	**2,3-Diazabicyclo[2.2.2]oct-2-ene**				
	$e_{aq}^- + R_2N_2 \rightarrow R_2N_2^{\cdot -}$		2.0×10^{10}	p.r.; D.k. at 650 nm.	84A341
823	**1,1′-Dibenzyl-4,4′-bipyridinium ion**				
	$e_{aq}^- + BV^{2+} \rightarrow BV^{\cdot +}$		*6.2 × 10^{10}*	Average of 2 values.	
		7	4.5×10^{10}	p.r.; D.k. at 700 nm in 0.002 mol L^{-1} phosphate buffer contg. 0.2 mol L^{-1} 2-PrOH and 0.1-1.3 × 10^{-5} mol L^{-1} benzyl viologen.	86N187
		6.8	7.9×10^{10}	p.r.; D.k. at 700 nm; counterion I^-.	78A321
824	**1,4-Dibromonaphthalene**				
	$e_{aq}^- +$ 1,4-$NpBr_2 \rightarrow Br^- +$ BrNp$^{\cdot}$		3.0×10^{10}	p.r.; D.k. at 650 nm in soln. contg. 1 mol L^{-1} EtOH; $k = 2.9 \times 10^{10}$ in micellar CTAB soln.	82N112
825	**Di-*tert*-butyl peroxide**				
	$e_{aq}^- + (CH_3)_3COOC(CH_3)_3 \rightarrow$		1.4×10^8	p.r.; D.k.	84A159
826	***m*-Dichlorobenzene**				
	$e_{aq}^- + C_6H_4Cl_2 \rightarrow$	~11	5.2×10^9	p.r.; D.k.	640138

TABLE 6. Rate constants for reactions of hydrated electrons in aqueous solution—Continued

No.	Reaction	pH	k (L mol^{-1} s^{-1})	Comment	Ref.
827	**o-Dichlorobenzene** $e_{aq}^- + C_6H_4Cl_2 \rightarrow$	~11	4.7×10^9	p.r.; D.k.	640138
828	**p-Dichlorobenzene** $e_{aq}^- + C_6H_4Cl_2 \rightarrow$	~11	5.0×10^9	p.r.; D.k.	640138
829	**Dichlorobenzoyl hydroperoxide** $e_{aq}^- + Cl_2C_6H_3CO_3H \rightarrow OH^- + Cl_2C_6H_3\dot{C}O$		9×10^9	p.r.; D.k. at 650 nm in deaerated soln. contg. 0.5 mol L^{-1} *tert*-BuOH.	81A374
830	**Dichlorobenzoyl peroxide** $e_{aq}^- + (Cl_2C_6H_3CO)_2O_2 \rightarrow Cl_2C_6H_3\dot{C}O + Cl_2C_6H_3CO_2^-$		5×10^9	p.r.; D.k. at 650 nm in deaerated soln. contg. 0.5 mol L^{-2} *tert*-BuOH.	81A374
831	**Dichlorodifluoromethane** $e_{aq}^- + CCl_2F_2 \rightarrow Cl^- + \dot{C}ClF_2$	~6	1.4×10^{10}	γ-r.; C.k. (condy.); also c.k. with H^+; rel. to $k(e_{aq}^- + N_2O)$.	710026
832	***trans*-1,2-Dichloroethylene** $e_{aq}^- + ClCH{=}CHCl \rightarrow Cl^- + \dot{C}HClCH$	~6.5	7.5×10^9	p.r.; D.k. at 720 nm in soln. contg. 0.5 mol L^{-1} *tert*-BuOH.	710709
833	**Dichloromethane** $e_{aq}^- + CH_2Cl_2 \rightarrow Cl^- + \cdot CH_2Cl$	10	6.3×10^9	p.r.; D.k. at 620 nm; concn. 4.7-18.2 mol L^{-1}.	720159
834	**Dicyandiamide** $e_{aq}^- + NCN{=}C(NH_2)_2 \rightarrow [H_2NC(=NH)NHCN]\cdot^-$	3-4	1.2×10^{10}	γ-r.; C.k. in soln. contg. 0.05 mol L^{-1} EtOH plus $KClO_4$; obs. $G(H_2)$; rel. to $k(e_{aq}^- + H^+)$; I = 0.002.	79A030
835	**1,4-Dicyanobenzene** $e_{aq}^- + DCNB \rightarrow DCNB\cdot^-$		2.4×10^{10}	p.r.; D.k. at 600 nm.	730121
836	**2,4-Diethoxypyrimidine** $e_{aq}^- + C_8H_{12}N_2O_2 \rightarrow$	7	2.8×10^9	p.r.; D.k. in buffered soln. contg. 10^{-2} mol L^{-1} MeOH, I = 0.1 (Na_2SO_4); at pH 11 $k = 3.2 \times 10^9$; I = 0.1	680316
837	***N,N*-Diethylacetamide** $e_{aq}^- + CH_3CON(C_2H_5)_2 \rightarrow$	9.2	8.0×10^6	p.r.; D.k. in soln. contg. 0.5 mol L^{-1} *tert*-BuOH and borate buffer.	710414
838	**Diethyl ether** $e_{aq}^- + (C_2H_5)_2O \rightarrow$		$<1 \times 10^7$	p.r.; D.k. at 578 nm.	640048
839	***N,N*-Diethylhydroxylamine** $e_{aq}^- + (C_2H_5)_2NOH \rightarrow$	9	4.8×10^7	p.r.; D.k.	79A162
840	**o-Difluorobenzene** $e_{aq}^- + C_6H_4F_2 \rightarrow C_6H_5F_2$	~6.5	1.2×10^9	p.r.; D.k. in soln. contg. 0.5 mol L^{-1} *tert*-BuOH or 0.2 mol L^{-1} MeOH.	730054
841	**p-Difluorobenzene** $e_{aq}^- + C_6H_4F_2 \rightarrow C_6H_5F_2$	~6.5	2.0×10^9	p.r.; D.k. in soln. contg. 0.5 mol L^{-1} *tert*-BuOH or 0.2 mol L^{-1} MeOH.	730054
842	**5,6-Dihydroorotate Ion** $e_{aq}^- +$ 6-DHU-$CO_2^- \rightarrow$	7	1.6×10^{10}	p.r.; D.k. at 600 nm in soln. contg. *tert*-BuOH, as well as p.b.k.	700567
843	**4',5'-Dihydropsoralen** $e_{aq}^- + C_{11}H_8O_3 \rightarrow$		1.8×10^{10}	p.r.; D.k. at 700 nm.	79E282
844	**5,6-Dihydrouracil** $e_{aq}^- +$ DHU $\rightarrow$	7	4.5×10^9	p.r.; D.k. in buffered soln. contg. 10^{-2} mol L^{-1} MeOH and Na_2SO_4; I = 0.1.	680316
845	**3,4-Dihydroxyacetophenone** $e_{aq}^- + (HO)_2C_6H_3COCH_3 \rightarrow (HO)_2C_6H_3CO^-CH_3$	7	3.3×10^{11}	p.r.; D.k. at 670 nm.	79A303

TABLE 6. Rate constants for reactions of hydrated electrons in aqueous solution—Continued

No.	Reaction	pH	k (L mol^{-1} s^{-1})	Comment	Ref.
846	**3,4-Dihydroxybenzaldehyde**				
	$e_{aq}^- + (HO)_2C_6H_3CHO \rightarrow [(HO)_2C_6H_3CHO]\cdot^-$	7	1.2×10^{11}	p.r.; D.k. at 670 nm; pK_a = 7.27, 11.4.	79A303
847	**5,8-Dihydroxy-1,4-naphthoquinone**				
	$e_{aq}^- + NQ(OH)_2 \rightarrow \cdot NQ(OH)_2^-$	5.8	3.1×10^{10}	p.r.; D.k. at 700 nm in Ar-satd. soln. contg. 0.1 mol L^{-1} Na formate; at pH 9.2 $k = 2.4 \times 10^{10}$; pK_a = 7.85, 10.70.	83A039
848	**5,8-Dihydroxy-1,4-naphthoquinone, conjugate dibase**				
	$e_{aq}^- + NQ(O^-)_2 \rightarrow OH^- + \cdot NQ(OH)_2^-$	13.0	2.2×10^{10}	p.r.; D.k. at 700 nm in Ar-satd. soln. contg. 0.1 mol L^{-1} Na formate; pK_a (semiquinone) = 2.7, ≥ 13.8.	83A039
849	**3-(3,4-Dihydroxyphenyl)-L-alanine**				
	$e_{aq}^- +$ DOPA → ·	6.95	1.6×10^8	p.r.; D.k. at 720 nm.	660011
850	**3,4-Dihydroxytoluene**				
	$e_{aq}^- + 3\text{-}CH_3C_6H_3\text{-}1,2\text{-}(OH)_2 \rightarrow$	7	2.0×10^7	p.r.; D.k. at 720 nm in soln. contg. 1 mol L^{-1} *tert*-BuOH; at pH 12 $k = 1 \times 10^7$.	771116
851	**Diiodomethane**				
	$e_{aq}^- + CH_2I_2 \rightarrow$		3.4×10^{10}	p.r.; D.k.	741005
852	***N,N*-Dimethylacetamide**				
	$e_{aq}^- + CH_3CON(CH_3)_2 \rightarrow$		9.0×10^6 [b]	p.r.	82G098
		9.2	2.1×10^7 [b]	p.r.; D.k. in soln. contg. 0.5 mol L^{-1} *tert*-BuOH and borate buffer.	710414
853	***N,N*-Dimethylacrylamide**				
	$e_{aq}^- + CH_2{=}CHCON(CH_3)_2 \rightarrow [CH_2CHCON(CH_3)_2]\cdot^-$	9.2	1.6×10^{10}	p.r.; D.k. at 700 nm in soln. contg. ~0.1 mol L^{-1} *tert*-BuOH and 10^{-3} mol L^{-1} borate.	751052
854	**β,β-Dimethylacrylamide**				
	$e_{aq}^- + (CH_3)_2C{=}CHCONH_2 \rightarrow [(CH_3)_2CCHCONH_2]\cdot^-$	9.2	5.6×10^9	p.r.; D.k. at 700 nm in soln. contg. ~0.1 mol L^{-1} *tert*-BuOH and 10^{-3} mol L^{-1} borate.	751052
855	**β,β-Dimethylacrylate ion**				
	$e_{aq}^- + (CH_3)_2C{=}CHCO_2^- \rightarrow [(CH_3)_2CCHCO_2]\cdot^{2-}$	9.2	5.9×10^8	p.r.; D.k.	761113
856	**3,3-Dimethylacrylic acid**				
	$e_{aq}^- + (CH_3)_2C{=}CHCO_2H \rightarrow [(CH_3)_2CCHCO_2H]\cdot^-$	2.0-3.7	1.5×10^{10}	p.r.; C.k.; rel. to $k(e_{aq}^- + H^+)$.	761113
857	**4-(Dimethylamino)benzenediazonium ion**				
	$e_{aq}^- + 4\text{-}(CH_3)_2NC_6H_4N_2^+ \rightarrow 4\text{-}(CH_3)_2NC_6H_4N_2\cdot$		*9.1 × 10^{10}*	Average of 2 values.	
			4.0×10^{10}	p.r.; D.k. at 600 nm in N_2-purged soln. contg. *tert*-BuOH; counterion tetrafluoroborate.	81A297
			2.3×10^{10}	p.r.; D.k. at 700 nm in 50:50 (v:v) H_2O-*tert*-BuOH; counterion tetrafluoroborate.	80A200
858	**5,6-Dimethylbenzimidazole**				
	$e_{aq}^- + C_9H_{10}N_2 \rightarrow$	6.5	5.1×10^{10}	p.r.; D.k.	730116
859	**2,5-Dimethyl-1,4-benzoquinone**				
	$e_{aq}^- + 2,5\text{-}(CH_3)_2Q \rightarrow [2,5\text{-}(CH_3)_2Q]\cdot^-$	7.2	3.1×10^{10}	p.r.; P.b.k. at 430 nm in air-satd. soln. contg. 0.1 mol L^{-1} *tert*-BuOH.	761063
860	***N,N*-Dimethylbenzylamine**				
	$e_{aq}^- + C_6H_5CH_2N(CH_3)_2 \rightarrow [C_6H_5CH_2N(CH_3)_2]\cdot^-$	11.1	1.5×10^8	p.r.; D.k. at 600 nm in N_2-satd. soln. contg. 1 mol L^{-1} *tert*-BuOH and 5×10^{-3} mol L^{-1} amine.	86A410
861	***N,N*-Dimethylbenzylammonium ion**				
	$e_{aq}^- + C_9H_{14}N^+ \rightarrow NH_3 + C_6H_5CH_2$	6.9	2.5×10^9	p.r.; D.k. at 600 nm in N_2-satd. soln. contg. 1 mol L^{-1} *tert*-BuOH and 1-4 × 10^{-3} mol L^{-1} amine; 65% deamination.	86A410

TABLE 6. Rate constants for reactions of hydrated electrons in aqueous solution—Continued

No.	Reaction	pH	k (L mol^{-1} s^{-1})	Comment	Ref.
862	**1,1′-Dimethyl-4,4′-bipyridinium ion**				
	$e_{aq}^- + MV^{2+} \rightarrow MV^{\cdot+}$	9.7	6.7×10^{10}	p.r.; P.b.k. at 392.5 mn in air-free soln. contg. 10^{-5} mol L^{-1} MV^{2+} and 10^{-2} mol L^{-1} *tert*-BuOH.	82A216
		8.2	8.3×10^{10}	p.r.; D.k. at 720 nm in air-free soln. contg. 10^{-5} mol L^{-1} MV^{2+} and 5×10^{-3} mol L^{-1} *tert*-BuOH.	82A216
			5.4×10^{10}	p.r.; D.k. at 550 nm as well as p.b.k. at 395 nm in deaerated soln. contg. 0.1 mol L^{-1} *tert*-BuOH with (2-10) $\times 10^{-6}$ mol L^{-1} $MVCl_2$.	78A246
			7.0×10^{10}	p.r.; D.k. in aerated soln.; counterion Cl^-.	771177
			8.4×10^{10}	p.r.; D.k. at 700 nm; counterion Cl^-.	731074
863	**Dimethyldiphenylphosphonium ion**				
	$e_{aq}^- + (CH_3)_2P^+(C_6H_5)_2 \rightarrow (CH_3)_2\dot{P}(C_6H_5)_2$	~7	2.2×10^{10}	p.r.; D.k. in soln. contg. 0.2 mol L^{-1} *tert*-BuOH.	82A051
864	**5,5′-Dimethyl-1,1′-ethylene-2,2′-bipyridinium ion**				
	$e_{aq}^- + BP^{2+} \rightarrow BP^{\cdot+}$	7.0	5.0×10^{10}	p.r.; P.b.k. in O_2-free soln. at ~380 nm.	84A292
865	***N,N*-Dimethylformamide**				
	$e_{aq}^- + HCON(CH_3)_2 \rightarrow$		5.2×10^{7} [b]	p.r.; D.k.	670054
		9.2	4.6×10^{8} [b]	p.r.; D.k. in soln. contg. 0.5 mol L^{-1} *tert*-BuOH and borate buffer; impurities might account for high k.	710414
866	**Dimethyl fumarate**				
	$e_{aq}^- + CH_3O_2CCH{=}CHCO_2CH_3 \rightarrow [(CHCO_2CH_3)_2]^{\cdot-}$	9.2	3.3×10^{10}	p.r.; D.k. at 700 nm in soln. contg. ~0.5 mol L^{-1} *tert*-BuOH.	730097
867	**1,1-Dimethylhydrazine**				
	$e_{aq}^- + (CH_3)_2NNH_2 \rightarrow$	12.0	2.4×10^{7}	p.r.; D.k. at 700 nm.	720003
868	**1,2-Dimethylhydrazine**				
	$e_{aq}^- + CH_3NHNHCH_3 \rightarrow$	12.4	6.1×10^{6}	p.r.; D.k. at 700 nm.	720003
869	**1,1-Dimethylhydrazinium ion**				
	$e_{aq}^- + (CH_3)_2NNH_3^+ \rightarrow$	5.6	5.8×10^{9}	p.r.; D.k. at 700 nm.	720003
870	**1,2-Dimethylhydrazinium ion**				
	$e_{aq}^- + CH_3NHNH_2CH_3^+ \rightarrow$	5.6	2.3×10^{9}	p.r.; D.k. at 700 nm.	720003
871	**1,3-Dimethyllumichrome**				
	$e_{aq}^- + Fl \rightarrow FlH\cdot$	6, 10	2.9×10^{10}	p.r.; D.k. at 720 nm in deaerated soln. contg. 0.5 mol L^{-1} *tert*-BuOH.	82B104
872	**Dimethyl maleate**				
	$e_{aq}^- + cis\text{-}CH_3O_2CCH{=}CHCO_2CH_3 \rightarrow [DMM]^{\cdot-}$	9.2	3.2×10^{10}	p.r.; D.k. at 700 nm in soln. contg. ~0.5 mol L^{-1} *tert*-BuOH.	730097
873	**2,3-Dimethylnaphthoquinone**				
	$e_{aq}^- + 2,3\text{-}(CH_3)_2NQ \rightarrow 2,3\text{-}(CH_3)_2NQ^{\cdot-}$	7	3.8×10^{10}	p.r.; D.k. at 700 nm in phosphate buffer (0.002 mol L^{-1} KH_2PO_4 + 0.003 mol L^{-1} Na_2HPO_4) contg. 0.2 mol L^{-1} 2-PrOH and varied quinone concn.; $k = 2.8 \times 10^{9}$ in SDS micelles.	86N187
874	***N,N*-Dimethyl-4-nitrosoaniline**				
	$e_{aq}^- + Me_2NC_6H_4NO \rightarrow$		3.4×10^{10}	p.r.; D.k. at 700 nm in Ar-satd. soln.	680066
875	**Dimethyl oxalate**				
	$e_{aq}^- + CH_3O_2CCO_2CH_3 \rightarrow$		2×10^{10}	p.r.; D.k. at 600 nm.	84A459
876	***N,N*-Dimethyl-*p*-phenylenediamine**				
	$e_{aq}^- + (CH_3)_2NC_6H_4NH_2 \rightarrow$	9.0	1.6×10^{8}	p.r.; D.k. at 700 nm in soln. contg. ~0.5 mol L^{-1} *tert*-BuOH.	751057
877	**2,4-Dimethylphenyl-β-D-glucopyranoside**				
	$e_{aq}^- + GluOC_6H_3(CH_3)_2 \rightarrow$		5.0×10^{7}	p.r.; D.k.	710056

TABLE 6. Rate constants for reactions of hydrated electrons in aqueous solution—Continued

No.	Reaction	pH	k (L mol^{-1} s^{-1})	Comment	Ref.
878	**1,2-Dimethyl-3-phenylisoindole-4,7-dione**				
	$e_{aq}^- + C_{16}H_{13}NO_2 \rightarrow C_{16}H_{13}NO_2^-$	7	2.4×10^{10}	p.r.; D.k.	84R027
879	**2,5-Dimethyl-3-phenylisoindole-4,7-dione**				
	$e_{aq}^- + C_{16}H_{13}NO_2 \rightarrow C_{16}H_{13}NO_2^-$		3.5×10^{10}	p.r.	82A329
880	**5,6-Dimethyl-3-phenyl-1,2-trimethyleneisoindole-4,7-dione**				
	$e_{aq}^- + C_{19}H_{17}NO_2 \rightarrow C_{19}H_{17}NO_2^-$	7	2.4×10^{10}	p.r.; D.k.	84R027
881	***N,N*-Dimethylpivalamide**				
	$e_{aq}^- + (CH_3)_3CCON(CH_3)_2 \rightarrow [(CH_3)_3CCON(CH_3)_2]\cdot^-$	9.2	1.2×10^7	p.r.; D.k. in soln. contg. 0.5 mol L^{-1} *tert*-BuOH and borate buffer.	710414
882	**5,5-Dimethyl-1-pyrroline-1-oxyl**				
	$e_{aq}^- +$ DMPO $\rightarrow$		*1.5* $\times$ *10^{10}*	Average of 2 values.	
			1.0×10^{10}	p.r.; D.k. at 650 nm.	86A472
		11.0	2.0×10^{10}	p.r.; D.k. at 550 nm in soln. contg. *tert*-BuOH.	84A426
883	**Dimethyl sulfide**				
	$e_{aq}^- + (CH_3)_2S \rightarrow$		2.0×10^7	p.r.; D.k. at 720 nm.	670186
884	**Dimethyl sulfoxide**				
	$e_{aq}^- + CH_3SOCH_3 \rightarrow$		3.8×10^6 [b]	p.r.; D.k.	771107
			1.6×10^6 [b]	p.r.; D.k. in soln. up to 3.5 mol L^{-1} DMSO; obs. $k/G(e_{aq}^-)$; cor. for $e_{aq}^- + H_2O$.	710587
			1.7×10^6 [b]	p.r.; D.k. at 720 nm.	670186
885	**5,5'-Dimethyl-1,1'-tetramethylene-2,2'-bipyridinium ion**				
	$e_{aq}^- + BP^{2+} \rightarrow BP\cdot^+$	7.0	5.0×10^{10}	p.r.; P.b.k. in O_2-free soln. at ~380 nm.	84A292
886	**5-(3,3-Dimethyl-1-triaseno)imidazole-4-carboxamide**				
	$e_{aq}^- +$ DTIC $\rightarrow$ DTIC$\cdot^-$	6.8	2.1×10^{10}	p.r.; D.k. at 600 nm in deaerated soln. contg. *tert*-BuOH or 2-PrOH.	80A349
887	**5,5'-Dimethyl-1,1'-trimethylene-2,2'-bipyridinium ion**				
	$e_{aq}^- + BP^{2+} \rightarrow BP\cdot^+$	7.0	5.5×10^{10}	p.r.; P.b.k. in O_2-free soln. at ~380 nm.	84A292
888	**1,5-Dimethyl-2,3-trimethyleneisoindole-4,7-dione**				
	$e_{aq}^- + C_{13}H_{13}NO_2 \rightarrow C_{13}H_{13}NO_2^-$		3.5×10^{10}	p.r.	82A329
889	**1,3-Dimethyluracil**				
	$e_{aq}^- +$ 1,3-DMU $\rightarrow$ [1,3-DMU]$\cdot^-$		*1.3* $\times$ *10^{10}*	Average of 2 values.	
			1.0×10^{10}	p.r.; D.k., independent of pH.	80A279
		7	1.6×10^{10}	p.r.; D.k. in buffered soln. contg. 10^{-2} mol L^{-1} MeOH, $I = 0.1$ (Na_2SO_4); $k = 1.45 \times 10^{10}$ at pH 11; $I = 0.1$.	680316
890	***cis,syn*-1,3-Dimethyluracil dimer**				
	$e_{aq}^- + (1,3\text{-DMU})_2 \rightarrow$		1.2×10^{10}	p.r.; D.k. at 550 nm, independent of pH.	80A279
891	**3,5-Dinitroanisole**				
	$e_{aq}^- + (NO_2)_2C_6H_3OCH_3 \rightarrow [(NO_2)_2C_6H_3OCH_3]\cdot^-$		4.2×10^{10}	p.r.; D.k. at 577 nm in soln. contg. 0.1 mol L^{-1} 2-PrOH.	79A176
892	**α,*p*-Dinitrocumene**				
	$e_{aq}^- + NO_2C_6H_4C(NO_2)(CH_3)_2 \rightarrow [NO_2C_6H_4CNO_2(CH_3)_2]\cdot^-$	12	3.0×10^{10}	p.r.; D.k. at 700 nm as well as p.b.k. at 305 nm in soln. contg. 1 mol L^{-1} *tert*-BuOH and 1.56×10^{-2} mol L^{-1} NaOH.	78A458
893	**3,8-Dinitro-5-methyl-6-phenylphenanthridium ion**				
	$e_{aq}^- + C_{20}H_{16}N_3O_4^+ \rightarrow$	~7	3.5×10^{10}	p.r.; D.k. at 650 nm in soln. contg. 0.1 mol L^{-1} *tert*-BuOH; k decrease to $< 1 \times 10^{10}$ on addn. of DNA; counterion Br^-.	76A256
894	**1,1'-Dioctadecyl-4,4'-bipyridinium ion**				
	$e_{aq}^- + SV^{2+} \rightarrow SV\cdot^+$	3	8.8×10^{10}	p.r.; D.k. in Ar-satd. soln. contg. 1 mol L^{-1} MeOH; expts. by E.J. Land.	82N168

TABLE 6. Rate constants for reactions of hydrated electrons in aqueous solution—Continued

No.	Reaction	pH	k (L mol^{-1} s^{-1})	Comment	Ref.
895	**1,3-Diphenylacetone** $e_{aq}^- + C_6H_5CH_2COCH_2C_6H_5 \rightarrow (C_6H_5CH_2)_2CO^-$	~9.2	1.1×10^{10}	p.r.; D.k. at 700 nm in soln. contg. 0.1 mol L^{-1} *tert*-BuOH.	720171
896	**Diphenylamine** $e_{aq}^- + (C_6H_5)_2NH \rightarrow$	9.2	1.5×10^9	p.r.; D.k. at 700 nm in soln. contg. ~0.5 mol L^{-1} *tert*-BuOH.	751057
897	**1,1'-Diphenyl-4,4'-bipyridinium ion** $e_{aq}^- + BP^{2+} \rightarrow BP^{\cdot+}$	6.8	6.6×10^{10}	p.r.; D.k. at 700 nm; counterion Cl^-.	78A321
898	**1,1-Diphenylethylene** $e_{aq}^- + (C_6H_5)_2C{=}CH_2 \rightarrow$	5.5	1.3×10^9	p.r.; D.k. at 720 nm.	77A236
899	**2,2'-Dipyridylamine** $e_{aq}^- + (py)_2NH \rightarrow$	9.1	1.4×10^{10}	p.r.; D.k. at 650 nm.	710582
900	**2,2'-Dithiobisacetate ion** $e_{aq}^- + (SCH_2CO_2^-)_2 \rightarrow$ $\cdot S_2(CH_2CO_2^-)_2^{\cdot-}$	10.8	4.3×10^9	p.r.; D.k. at 700 nm in soln. contg. ~0.1 mol L^{-1} *tert*-BuOH	720388
901	**3,3'-Dithiobispropionate ion** $e_{aq}^- + (SCH_2CH_2CO_2^-)_2 \rightarrow$ $\cdot S_2(CH_2CH_2CO_2)_2^{\cdot-}$	6.4	4.4×10^9	p.r.; D.k. at 700 nm in soln. contg. ~0.1 mol L^{-1} *tert*-BuOH; at pH 10.8 $k = 4.3 \times 10^9$.	720388
902	**Dithiothreitol** $e_{aq}^- + DTT \rightarrow H_2S + DTT^{\cdot-}$	5.2	1.0×10^{10}	p.r.; D.k. at 700 nm in N_2-satd. soln. contg. 0.2 mol L^{-1} *tert*-BuOH; at pH 9.3 $k = 5.7 \times 10^9$.	82A171
903	**Djenkolate ion** $e_{aq}^- + CH_2(SCH_2CH(NH_2)CO_2^-)_2 \rightarrow$	11	1×10^8	p.r.; D.k. at 720 nm.	660011
904	**1-Dodecyl-1'-methyl-4,4'-bipyridinium ion** $e_{aq}^- + MDV^{2+} \rightarrow MDV^{\cdot+}$		3.1×10^{10}	p.r.; D.k. at 500 nm, as well as p.b.k. at 395 nm, in soln. contg. 0.1 mol L^{-1} 2-PrOH; $k = 5.3 \times 10^9$ in 8.0×10^{-2} mol L^{-1} SDS and 2.5×10^{10} in 4×10^{-2} mol L^{-1} CTAB.	84A010
905	**Dodecyl sulfate ion** $e_{aq}^- + CH_3(CH_2)_{11}OSO_3^- \rightarrow$	6	$\sim 1 \times 10^6$	p.r.; D.k. at 650 nm in soln. contg. 10^{-3} mol L^{-1} glucose; concn. 4×10^{-4} mol L^{-1}, counterion Na^+.	773034
906	**Duroquinone** $e_{aq}^- + DQ \rightarrow DQ^{\cdot-}$	7	3.1×10^{10}	p.r.; D.k. at 700 nm in phosphate buffer (0.002 mol L^{-1} KH_2PO_4 + 0.003 mol L^{-1} Na_2HPO_4) contg 0.2 mol L^{-1} 2-PrOH and varied quinone concn.; $k = 4.2 \times 10^9$ in SDS micelles.	86N187
907	**Eosin dianion** $e_{aq}^- + C_{20}H_6Br_4O_5^{2-} \rightarrow$	12.0	1.9×10^{10}	p.r.; D.k., contains 10^{-2} mol L^{-1} formate ion; p.b.k. at 405 nm gave 1.0×10^{10}.	700253
908	**Ephedrine, conjugate acid** $e_{aq}^- + PhCHOHCH(CH_3)NH_2^+CH_3 \rightarrow$	6.5	2.8×10^8	p.r.; D.k. at 720 nm; $pK_a = 9.96$.	83C015
909	***l*-Ephedrine** $e_{aq}^- + PhCH(OH)CH(CH_3)NHCH_3 \rightarrow$ $[PhCH(OH)CH(CH_3)NHCH_3]^{\cdot-}$	11.0	2.6×10^8	p.r.; D.k. at 600 nm as well as p.b.k. at 260 nm, in nitrogen-satd. soln. contg. 0.5 mol L^{-1} *tert*-BuOH.	83A176
910	**Erythritol** $e_{aq}^- + HOCH_2[CH(OH)]_2CH_2OH \rightarrow$	7	5×10^6	p.r.; D.k.	79A366
911	**Erythrosin dianion** $e_{aq}^- + C_{20}H_6I_4O_5^{2-} \rightarrow$	8.0	$>8 \times 10^9$	X-r.; C.k. with O_2; contains Br^- as OH scavenger; obs. $G(-\text{dye})$; assume $k(e_{aq}^- + O_2) = 1.9 \times 10^{10}$	710295

TABLE 6. Rate constants for reactions of hydrated electrons in aqueous solution—Continued

No.	Reaction	pH	k (L mol^{-1} s^{-1})	Comment	Ref.
912	**Estradiol**				
	$e_{aq}^- + C_{18}H_{24}O_2 \rightarrow$	13	2.7×10^{10} [a]	γ-r.; C.k. with Safranine T, in Ar-satd. soln. contg. 0.5 mol L^{-1} *tert*-BuOH; rel. to $k(e_{aq}^- + Co(en)_3^{3+})$.	85R203
913	**Estriol**				
	$e_{aq}^- + C_{18}H_{24}O_3 \rightarrow$	13	2.6×10^{10} [a]	γ-r.; C.k. with Safranine T, in Ar-satd. soln. contg. 0.5 mol L^{-1} *tert*-BuOH; rel. to $k(e_{aq}^- + Co(en)_3^{3+})$.	85R203
914	**1,1''-Ethanediylbis(1'-methyl-4,4'-bipyridinium) ion**				
	$e_{aq}^- + ETQ^{4+} \rightarrow ETQ^{\cdot 3+}$	7.2	5.8×10^{10}	p.r.; D.k. at 650 nm in soln. contg. 5-10 × 10^{-5} mol L^{-1} viologen.; $I = 0.03$.	86A266
915	**Ethanesulfonate ion**				
	$e_{aq}^- + C_2H_5SO_3^- \rightarrow$		3.5×10^7	p.r.; D.k. at 650 nm.	680352
916	**Ethanolamine**				
	$e_{aq}^- + H_2NCH_2CH_2OH \rightarrow$	7.8	2×10^7	p.r.; D.k.	751114
917	**Ethidium**				
	$e_{aq}^- + C_{21}H_{20}N_3^+ \rightarrow$		*3.7 × 10^{10}*	Average of 3 values.	
		~7	4.0×10^{10}	p.r.; D.k. at 650 nm in soln. contg. 0.1 mol L^{-1} *tert*-BuOH; decreased with added protein, DNA, carbohydrate and lipid; counterion Br^-.	76A256
			4.0×10^{10}	p.r.; D.k.; counterion Br^-.	751185
		~7	3.0×10^{10}	p.r.; D.k. at 700 nm; DNA bound dye, $k = 2.2 \times 10^9$.	753094
918	**4-(Ethoxycarbonyl)benzenediazonium ion**				
	$e_{aq}^- + p\text{-}C_2H_5O_2CC_6H_4N_2^+ \rightarrow$ 4-$C_2H_5O_2CC_6H_4N_2^{\cdot}$		2.7×10^{10}	p.r.; D.k. at 700 nm in 50:50 (v:v) H_2O-*tert*-BuOH; counterion tetrafluoroborate.	80A200
919	**1-Ethoxycarbonyl-2,5-dimethyl-3-phenylisoindole-4,7-dione**				
	$e_{aq}^- + C_{19}H_{17}NO_4 \rightarrow C_{19}H_{17}NO_4^-$	7	2.4×10^{10}	p.r.; D.k.	84R027
920	**1-Ethoxycarbonyl-6-methoxy-5-methyl-2,3-trimethyleneisoindole-4,7-dione**				
	$e_{aq}^- + C_{16}N_{17}NO_5 \rightarrow C_{16}N_{17}NO_5^-$	7	2.4×10^{10}	p.r.; D.k.	84R027
921	**1-Ethoxycarbonyl-5-methyl-2,3-trimethyleneisoindole-4,7-dione**				
	$e_{aq}^- + C_{15}H_{15}NO_4 \rightarrow C_{15}H_{15}NO_4^-$	7	2.4×10^{10}	p.r.; D.k.	84R027
922	***N*-Ethylacetamide**				
	$e_{aq}^- + CH_3CONHC_2H_5 \rightarrow$	6.7	9.8×10^7	γ-r.; C.k.; also detd. at pH 3; rel. to $k(e_{aq}^- + ClCH_2CO_2H)$.	670310
923	**Ethyl acetate**				
	$e_{aq}^- + CH_3CO_2C_2H_5 \rightarrow$		4.6×10^7 [b]	p.r.; D.k. in Ar-satd. soln.	79A117
			2.2×10^7 [b]	p.r.; D.k.	771107
		6.53	5.9×10^7 [b]	p.r.; D.k. in unbuffered soln. contg. 1 × 10^{-3} mol L^{-1} EtOH.	670298
924	**Ethyl acrylate**				
	$e_{aq}^- + H_2C{=}CHCO_2C_2H_5 \rightarrow$	11	8.7×10^9	f.p.; D.k.; H_2-satd. soln. contg. 10^{-3} mol L^{-1} NaOH.	717345
925	**Ethylamine**				
	$e_{aq}^- + C_2H_5NH_2 \rightarrow$	13	1.0×10^6	p.r.; D.k. at 720 nm; calcd. from k_{obs} over a pH range; 0.1 mol L^{-1} soln.	730016
926	**Ethyl 2-aminoacetate**				
	$e_{aq}^- + H_2NCH_2CO_2C_2H_5 \rightarrow$	6.7	8.3×10^8	γ-r.; C.k.; rel. to $k(e_{aq}^- + ClCH_2CO_2^-)$.	670310
927	**Ethylammonium ion**				
	$e_{aq}^- + C_2H_5NH_3^+ \rightarrow$	8.5	2.5×10^6	p.r.; D.k. at 720 nm; calcd. from k_{obs} over a pH range; 0.1 mol L^{-1} soln.	730016

TABLE 6. Rate constants for reactions of hydrated electrons in aqueous solution—Continued

No.	Reaction	pH	k (L mol^{-1} s^{-1})	Comment	Ref.
928	**Ethyl cyanoacetate** $e_{aq}^- + NCCH_2CO_2C_2H_5 \rightarrow$	10.92	3.2×10^8	p.r.; D.k. in unbuffered soln. contg. 1×10^{-3} mol L^{-1} EtOH.	670298
929	**Ethylene** $e_{aq}^- + H_2C{=}CH_2 \rightarrow$		$<3 \times 10^5$	p.r.; D.k.	771107
930	**1,1'-Ethylene-2,2'-bipyridinium ion** $e_{aq}^- + BP^{2+} \rightarrow BP^{\cdot+}$		*5.6 × 10^{10}*	Average of 2 values.	
		6.8	6.2×10^{10}	p.r.; D.k. at 700 nm; counterion Br^-.	78A321
			5.0×10^{10}	p.r.; D.k.; counterion Br^-; value revised in [84A292].	761169
931	**Ethylenediaminetetraacetate ion** $e_{aq}^- + [CH_2N(CH_2CO_2^-)_2]_2 \rightarrow$	>11	$<3 \times 10^5$	p.r.; D.k. in buffered 0.5% BuOH soln.; measured k vs. pH; k for $HEDTA^{3-}$ ~4.7 × 10^6, k for H_2EDTA^{2-} ~1×10^8, at pH 10 and 6.5-8.5, resp.; $I = 0.12$.	77A252
932	**Ethyl hydroperoxide** $e_{aq}^- + C_2H_5O_2H \rightarrow OH^-$		5×10^9	p.r.; D.k. at 650 nm in deaerated soln. contg. 0.5 mol L^{-1} *tert*-BuOH.	81A374
933	***N*-Ethylmaleamate ion** $e_{aq}^- + C_2H_5NHCOCH{=}CHCO_2^- \rightarrow$ NEMA$^{\cdot-}$	7.9	8.5×10^9	p.r.; D.k. at 700 nm in soln. contg. *tert*-BuOH.	720144
934	***N*-Ethylmaleimide** $e_{aq}^- + NEM \rightarrow NEM^{\cdot-}$	6.0	3.8×10^{10}	p.r.; D.k. at 700 nm in soln. contg. *tert*-BuOH.	720144
935	**17α-Ethynylestradiol** $e_{aq}^- + C_{20}H_{24}O_2 \rightarrow$	13	2.8×10^{10} [a]	γ-r.; C.k. with Safranine T, in Ar-satd. soln. contg. 0.5 mol L^{-1} *tert*-BuOH; rel. to $k(e_{aq}^- + Co(en)_3^{3+})$.	85R203
936	**Flavine mononucleotide** $e_{aq}^- + FMN \rightarrow FMN^{\cdot-}$	6.0	3.3×10^{10}	p.r.; At pH 11.0 $k = 2.5 \times 10^{10}$; N_2-satd. soln. contg. 0.4 mol L^{-1} *tert*-BuOH and 0.1 mol L^{-1} NaCl; $I = 0.1$.	83A091
937	**Fluorene** $e_{aq}^- + C_{13}H_{10} \rightarrow C_{13}H_{10}^-$	12.1	5×10^9	p.r., D.k. in 1% MeOH soln.; $k = 2.2 \times 10^{10}$ in CTAB (detc. 2.7×10^{10} by p.b.k.).	741011
938	**9-Fluorenone** $e_{aq}^- + C_{13}H_8O \rightarrow C_{13}H_8O^-$	~9.2	3.3×10^{10}	p.r.; D.k. at 700 nm in soln. contg. 0.1 mol L^{-1} *tert*-BuOH.	720171
939	**Fluorescein dianion** $e_{aq}^- + Fl^{2-} \rightarrow$	9.2	1.4×10^{10}	p.r.; D.k.; soln. contains 10^{-2} mol L^{-1} formate ion.	680172
940	**Fluoroacetate ion** $e_{aq}^- + FCH_2CO_2^- \rightarrow$	~10	$<1.2 \times 10^6$	p.r.; D.k.; $k_{obs} < 2.0 \times 10^6$; k cor. for I.	650015
941	**Fluoroacetone** $e_{aq}^- + CH_3COCH_2F \rightarrow$	6.7	1.0×10^9	p.r.; D.k. in unbuffered soln. contg. 1×10^{-3} mol L^{-1} EtOH; at pH 10.86 $k = 8.8 \times 10^8$.	670298
942	**Fluorobenzene** $e_{aq}^- + C_6H_5F \rightarrow$	6-10	3.0×10^7 [b]	p.r.; D.k. at 700 nm in 0.25-1 mol L^{-1} MeOH soln.	761200
		~6.5	7×10^7 [b]	p.r.; D.k. in soln. contg. 0.5 mol L^{-1} *tert*-BuOH or 0.2 mol L^{-1} MeOH; product is fluorocyclohexadienyl.	730054
		~11	6.0×10^7 [b]	p.r.; D.k.	640138
943	**2-Fluorobenzoate ion** $e_{aq}^- + 2\text{-}FC_6H_4CO_2^- \rightarrow$	~11	3.1×10^9	p.r.; D.k.	640138

TABLE 6. Rate constants for reactions of hydrated electrons in aqueous solution—Continued

No.	Reaction	pH	k (L mol^{-1} s^{-1})	Comment	Ref.
944	**3-Fluorobenzoate ion**				
	$e_{aq}^- + 3\text{-}FC_6H_4CO_2^- \rightarrow$	~11	6.7×10^9	p.r.; D.k.	640138
945	**4-Fluorobenzoate ion**				
	$e_{aq}^- + 4\text{-}FC_6H_4CO_2^- \rightarrow$	~11	3.8×10^9	p.r.; D.k.	640138
946	***p*-Fluorobenzonitrile**				
	$e_{aq}^- + FC_6H_4CN \rightarrow [4\text{-}FC_6H_4CN]\cdot^-$	10	1.6×10^{10}	p.r.; D.k. at 720 nm in Ar-satd. soln. contg. $Ba(OH)_2$.	761194
947	**2-Fluorophenoxide ion**				
	$e_{aq}^- + 2\text{-}FC_6H_4O^- \rightarrow$	~11	3.4×10^8	p.r.; D.k.	640138
948	**3-Fluorophenoxide ion**				
	$e_{aq}^- + 3\text{-}FC_6H_4O^- \rightarrow$	~11	2.0×10^8	p.r.; D.k.	640138
949	**4-Fluorophenoxide ion**				
	$e_{aq}^- + 4\text{-}FC_6H_4O^- \rightarrow$	~11	1.2×10^8	p.r.; D.k.	640138
950	**5-Fluorouracil**				
	$e_{aq}^- + 5\text{-}FU \rightarrow 5\text{-}FU\cdot^-$	7	1.2×10^{10}	p.r.; D.k. at 600 nm in soln. contg. *tert*-BuOH and Na_2SO_4; at pH 9 and 11 $k = 5.7 \times 10^9$ and 5.0×10^9, resp.; $I = 0.05$.	720049
951	**Folic acid**				
	$e_{aq}^- + FH \rightarrow \cdot FH_2$	6.0	2.2×10^{10}	p.r.; D.k. at 700 nm in soln. contg. 0.5 mol L^{-1} *tert*-BuOH; pK_a = ~2.3, 8.26; at pH 12.0 $k = 1.1 \times 10^{10}$.	761060
952	**Formaldehyde**				
	$e_{aq}^- + HCHO \rightarrow OH^- + \cdot CH_2OH$	7	$\sim 1 \times 10^7$	p.r.; D.k. at 650 nm in Ar-satd. soln.	710924
		7	$< 1 \times 10^7$	p.r.; D.k. at 578 nm; concn. 2×10^{-4} mol L^{-1}.	630073
953	**Formamide**				
	$e_{aq}^- + HCONH_2 \rightarrow$	6.3	1.8×10^7 [b]	p.r.; D.k. at 600 nm; k increases with pressure → 6.4 kbar (6.4×10^8 N/m^2).	720298
		9.2	6.3×10^7 [b]	p.r.; D.k. in soln. contg. 0.5 mol L^{-1} *tert*-BuOH and borate buffer.	710414
			$< 1 \times 10^6$ [b]	p.r.; No effect of 10^{-2} mol L^{-1} formamide on d.k.	670054
954	**Formate ion**				
	$e_{aq}^- + HCO_2^- \rightarrow$	~10	$< 1 \times 10^6$	p.r.; D.k. at 578 nm. in soln. contg. 1 mol L^{-1} formate ion.	630073
955	**Formic acid**				
	$e_{aq}^- + HCO_2H \rightarrow$	5.0	1.4×10^8	p.r.; D.k. at 578 nm, concn. 1.1-21 $\times 10^{-3}$ mol L^{-1}; contribution of unionized acid alone.	630073
956	**2-(*N*-Formylamino)acetophenone**				
	$e_{aq}^- + HCONHC_6H_4COCH_3 \rightarrow$	7.6	1.8×10^{10}	p.r.; D.k. at 700 nm in soln. contg. 10^{-3} mol L^{-1} phosphate buffer and 0.1 mol L^{-1} *tert*-BuOH.	771099
957	**2-(*N*-Formylamino)-3′-aminopropiophenone**				
	$e_{aq}^- + HCONHC_6H_4COCH_2CH_2NH_2 \rightarrow$		2.0×10^{10}	p.r.; D.k. at 700 nm in soln. contg. 10^{-3} mol L^{-1} phosphate buffer and 0.1 mol L^{-1} *tert*-BuOH.	771099
958	***N*-Formylglycine, negative ion**				
	$e_{aq}^- + HCONHCH_2CO_2^- \rightarrow$	10.5	2.9×10^7	p.r.; D.k. at 700 nm.	713052
959	***N*-Formylkynurenine**				
	$e_{aq}^- + FK \rightarrow FKH\cdot$	7.6	2.0×10^{10}	p.r.; D.k. at 700 nm in soln. contg. 10^{-3} mol L^{-1} phosphate buffer and 0.1 mol L^{-1} *tert*-BuOH.	771099
960	**2-(*N*-Formyl-*N*-methylamino)acetophenone**				
	$e_{aq}^- + HCON(CH_3)C_6H_4COCH_3 \rightarrow$	7.6	1.8×10^{10}	p.r.; D.k. at 700 nm.	771099

TABLE 6. Rate constants for reactions of hydrated electrons in aqueous solution—Continued

No.	Reaction	pH	k (L mol^{-1} s^{-1})	Comment	Ref.
961	**D-Fructose** $e_{aq}^- + C_6H_{12}O_6 \rightarrow$	7	1×10^7	p.r.; D.k. at 650-700 nm.	79A366
962	**D-Fructose-1,6-diphosphate** $e_{aq}^- + C_6H_{14}O_{12}P_2 \rightarrow$	7	2.6×10^8	p.r.; D.k.	79A366
963	**Fumarate ion** $e_{aq}^- + trans\text{-}^-O_2CCH{=}CHCO_2^- \rightarrow [^-O_2CCHCHCO_2^-]^{\cdot -}$		*7.4 × 10⁹*	Average of 2 values.	
		8.5	7.4×10^9	p.r.; D.k. at 600 nm; counterion Na^+; k cor. for I.	84A459
		13	7.5×10^9	p.r.; D.k. at 578 nm; product identified by abs. spectra [730097].	640044
964	**Furadantin** $e_{aq}^- + NO_2F \rightarrow NO_2F^{\cdot -}$	7	3.4×10^{10}	p.r.; D.k.	731018
965	**Furamazone** $e_{aq}^- + NO_2F \rightarrow NO_2F^{\cdot -}$	7	3.3×10^{10}	p.r.; D.k.	731018
966	**Furan** $e_{aq}^- + C_4H_4O \rightarrow$	7.94	3.0×10^6	p.r.; D.k.	650018
967	**D-Galactosamine** $e_{aq}^- + GlNH_2 \rightarrow$		8.4×10^7	p.r.; D.k. at 650 nm.	703081
968	**D-Galactose** $e_{aq}^- + C_6H_{12}O_6 \rightarrow$	6.5	$<6 \times 10^6$	p.r.; D.k. at 650 nm.	78A146
969	**D-Glucosamine** $e_{aq}^- + GlcNH_2 \rightarrow$	7.7	3.5×10^7	p.r.; D.k. at 720 nm.	660011
970	**Glucose** $e_{aq}^- +$ glucose $\rightarrow$	~7	$<4 \times 10^6$	p.r.; D.k. at 650 nm in deaerated soln.	79A298
			$<3 \times 10^5$	p.r.; D.k. at 510 nm; no significant reaction at solute concn. 5×10^{-4}-5×10^{-2} mol L^{-1}.	650391
971	**Glucose-1-phosphate** $e_{aq}^- + C_6H_{13}O_9P \rightarrow$	~7	4×10^6	p.r.; D.k. at 650 nm in deaerated solution.	79A298
972	**D-Glucose-3-sulfate ion** $e_{aq}^- + C_6H_{12}O_9S^- \rightarrow$	6.5	1.8×10^7	p.r.; D.k. at 650 nm.	78A146
973	**D-Glucose-6-sulfate ion** $e_{aq}^- + C_6H_{12}O_9S^- \rightarrow$	6.5	6.6×10^7	p.r.; D.k. at 650 nm.	78A146
974	**D-Glucuronate ion** $e_{aq}^- + HOCH_2(CHOH)_4CO_2^- \rightarrow$		$<1 \times 10^6$	p.r.; Concn. 10^{-1} mol L^{-1}.	700509
975	**Glutamate ion** $e_{aq}^- + Glu^- \rightarrow$	5.7	$\sim 2 \times 10^7$	p.r.; D.k. at 720 nm; pK = 2.13, 4.31, 9.85.	660011
		7	$<1 \times 10^7$	p.r.; D.k. at 578 nm.	640048
976	**Glutamylglutamylglutamate ion** $e_{aq}^- +$ GluGluGlu $\rightarrow$	6.3	2.3×10^9	p.r.; D.k. at 700 nm in buffered soln. contg. 1 mol L^{-1} *tert*-BuOH; $k = 5.8 \times 10^8$ at pH 9.6.	741058
977	**Glutathione** $e_{aq}^- + GSH \rightarrow HS^- + G^{\cdot}$	7.2	4.5×10^9	p.r.; D.k. at 700 nm in soln. contg. ~0.1 mol L^{-1} *tert*-BuOH; pK_a = 2.1, 3.6, 8.8, 9.7; at pH 12.7 $k = 4.7 \times 10^8$.	730090
978	**Glutathione, oxidized** $e_{aq}^- + GSSG \rightarrow GSSG^{\cdot -}$		*3.7 × 10⁹*	Average of 3 values.	
		7	5.0×10^9	p.r.; Deaerated soln.	773089
		4.5-7.9	2.7×10^9	p.r.; D.k. at 580 nm in soln. contg. 2×10^{-3} mol L^{-1} *tert*-BuOH.	720380

TABLE 6. Rate constants for reactions of hydrated electrons in aqueous solution—Continued

No.	Reaction	pH	k (L mol^{-1} s^{-1})	Comment	Ref.
978	**Glutathione, oxidised**—Continued				
		6.8	3.4×10^9	p.r.; D.k. at 700 nm in soln. contg. ~0.1 mol L^{-1} *tert*-BuOH; pK = 3.15, 4.03, 8.57, 9.54. at pH 12.6 $k = 2.1 \times 10^9$.	720388
979	**Glycinamide, conjugate acid** $e_{aq}^- + H_3N^+CH_2CONH_2 \rightarrow$ $\cdot CH_2CONH_2 + NH_3$	6.5	2.1×10^9	p.r.; D.k.; 90% deamination; pK_a = 7.9.	713052
980	**Glycinamide** $e_{aq}^- + H_2NCH_2CONH_2 \rightarrow$ $\cdot CH_2CONH_2 + NH_3$	11.4	2.8×10^8	p.r.; D.k.	713052
981	**Glycine** $e_{aq}^- + Gly \rightarrow$		*8.8×10^6*	Average of 3 values.	
		7.0	1.0×10^7	γ-r.; C.k.; rel. to $k(e_{aq}^- + BrPhOH)$.	720027
		6.2	8.3×10^6	p.r.; D.k.	710782
		6.4	8×10^6	p.r.; D.k. at 720 nm.	660011
982	**Glycine, negative ion** $e_{aq}^- + H_2NCH_2CO_2^- \rightarrow$	11.8	1.7×10^6	p.r.; D.k.	710782
983	**Glycine anhydride** $e_{aq}^- + \text{-}CH_2CONHCH_2CONH\text{-} \rightarrow$ $[\text{-}NHCOCH_2NHCOCH_2\text{-}]\cdot^-$	9.2	1.7×10^9	p.r.; D.k. at 700 nm in soln. contg. 0.2 mol L^{-1} *tert*-BuOH and borate buffer.	710554
984	**Glycolaldehyde** $e_{aq}^- + HOCH_2CHO \rightarrow HOCH_2\dot{C}HO^-$		2.3×10^9	γ-r.; C.k., obs. $G(H_2)$, assume ratio of H addn. to H abstr. = 0.31; rel. to $k(e_{aq}^- + H^+)$.	82G238
985	**Glycolamide** $e_{aq}^- + HOCH_2CONH_2 \rightarrow$	8.5	2.9×10^8	p.r.; D.k. at 700 nm in soln. contg. *tert*-BuOH.	751053
986	**Glycolate ion** $e_{aq}^- + HOCH_2CO_2^- \rightarrow$	7.0	8.2×10^6	p.r.; D.k. at 700 nm in soln. contg. *tert*-BuOH; unexpected high value may be due to impurity.	751053
987	**Glycolic acid** $e_{aq}^- + HOCH_2CO_2H \rightarrow OH^- +$ $HOCH_2\dot{C}O$	3-4	4.3×10^8	γ-r.; C.k.; ratio of formn. of H· (and $HOCH_2CO_2^-$) to OH^- (and $HOCH_2\dot{C}O$) $<<0.1$; rel. ro $k(e_{aq}^- + H^+) = 1.6 \times 10^{10}$; I = 0.05.	720057
988	**Glycylalanine** $e_{aq}^- + GlyAla \rightarrow$		*3.0×10^8*	Average of 2 values.	
		6.1	3.1×10^8	p.r.; D.k. at 550 nm in Ar-satd. unbuffered soln. contg. 0.1 mol L^{-1} *tert*-BuOH.	751045
		6.2	2.9×10^8	p.r.; D.k. at 720 nm; solute is DL.	673005
989	**Glycyl-β-alanineamide, conjugate acid** $e_{aq}^- + (Gly\text{-}\beta\text{-}AlaNH_2)H^+ \rightarrow$	6.0	1.4×10^9	p.r.; D.k. at 700 nm in buffered soln. contg. 1 mol L^{-1} *tert*-BuOH.	741058
990	**Glycyl-β-alanineamide** $e_{aq}^- + Gly\text{-}\beta\text{-}AlaNH_2 \rightarrow$	12.0	3.3×10^8	p.r.; D.k. at 700 nm in buffered soln. contg. 1 mol L^{-1} *tert*-BuOH.	741058
991	**Glycyl-β-alanine** $e_{aq}^- + Gly\text{-}\beta\text{-}Ala \rightarrow$	6.4	6.5×10^8	p.r.; D.k. at 700 nm in buffered soln. contg. 1 mol L^{-1} *tert*-BuOH.	741058
992	**Glycyl-β-alanine, negative ion** $e_{aq}^- + Gly\text{-}\beta\text{-}Ala^- \rightarrow$	11.3	6.3×10^7	p.r.; D.k. at 700 nm in buffered soln. contg. 1 mol L^{-1} *tert*-BuOH.	741058
993	**L-Glycylasparagine** $e_{aq}^- + GlyAsn \rightarrow$	5.33	5.4×10^8	p.r.; D.k. at 720 nm; at pH 11.41 $k = 8 \times 10^7$.	673005

TABLE 6. Rate constants for reactions of hydrated electrons in aqueous solution—Continued

No.	Reaction	pH	k (L mol^{-1} s^{-1})	Comment	Ref.
994	**Glycylaspartic acid**				
	$e_{aq}^- + GlyAsp \rightarrow$	5.8	3.8×10^8	p.r.; D.k. at 550 nm in Ar-satd. unbuffered soln. contg. 0.1 mol L^{-1} *tert*-BuOH.	751045
995	**Glycylglutamic acid**				
	$e_{aq}^- + GlyGlu \rightarrow$	5.7	2.2×10^8	p.r.; D.k. at 550 nm in Ar-satd. unbuffered soln. contg. 0.1 mol L^{-1} *tert*-BuOH.	751045
996	**Glycylglycine**				
	$e_{aq}^- + GlyGly \rightarrow$ $\cdot CH_2CONHCH_2CO_2^- + NH_3$		*3.0 × 10^8*	Average of 4 values.	
		5.9	2.2×10^8	p.r.; D.k. at 550 nm in Ar-satd. unbuffered soln. contg. 0.1 mol L^{-1} *tert*-BuOH.	751045
		6.4	3.7×10^8	p.r.; D.k. at 700 nm; 80% deamination.	713052
		6.4	2.5×10^8	p.r.; D.k. at 720 nm.	673005
			3.4×10^8	p.r.; D.k.	650389
997	**Glycylglycine, negative ion**				
	$e_{aq}^- + GlyGly^- \rightarrow$	10.9	2.4×10^7	p.r.; D.k. at 550 nm in soln. contg. *tert*-BuOH; $pK_a = 8.26$.	771122
		13.1	4.9×10^7	p.r.; D.k. at 700 nm.	713052
		11.75	5×10^7	p.r.; D.k. at 720 nm.	673005
998	**Glycylglycine amide, conjugate acid**				
	$e_{aq}^- + (GlyGlyNH_2)H^+ \rightarrow$ $\cdot CH_2COGlyNH_2 + NH_3$	5.7	4.2×10^9	p.r.; D.k. at 700 nm; ≥ 80% deamination; at pH 11.4 $k = 1.7 \times 10^9$.	713052
999	**Glycylglycine, ethyl ester, conjugate acid**				
	$e_{aq}^- +$ $H_3N^+CH_2CONHCH_2CO_2C_2H_5 \rightarrow$ $\cdot CH_2COGlyOEt + NH_3$	5.9	4.0×10^9	p.r.; D.k. at 700 nm; ≥ 85% deamination; at pH 11.4 $k = 1.7 \times 10^9$.	713052
1000	**Glycylglycylalanine**				
	$e_{aq}^- + GlyGlyAla \rightarrow$	6.1	8.6×10^8	p.r.; D.k. at 550 nm in Ar-satd. unbuffered soln. contg. 0.1 mol L^{-1} *tert*-BuOH.	751045
1001	**Glycylglycyl-β-alanine**				
	$e_{aq}^- + GlyGly\text{-}\beta\text{-}Ala \rightarrow$	5.5	1.4×10^9	p.r.; D.k. at 700 nm in buffered soln. contg. 1 mol L^{-1} *tert*-BuOH.	741058
1002	**Glycylglycyl-β-alanine, negative ion**				
	$e_{aq}^- + GlyGly\text{-}\beta\text{-}Ala^- \rightarrow$	12.2	2.3×10^8	p.r.; D.k. at 700 nm in buffered soln. contg. 1 mol L^{-1} *tert*-BuOH.	741058
1003	**Glycylglycylglycine**				
	$e_{aq}^- + GlyGlyGly \rightarrow \cdot CH_2COGlyGly + NH_3$	6.1	1.1×10^9	p.r.; D.k. at 550 nm in Ar-satd. unbuffered soln. contg. 0.1 mol L^{-1} *tert*-BuOH; $pK = 3.225$, 8.090.	751045
		6.1	1.8×10^9	p.r.; D.k. at 700 nm; ≥ 90% deamination.	713052
		6.0	9.0×10^8	p.r.; D.k. at 720 nm.	673005
1004	**Glycylglycylglycine, negative ion**				
	$e_{aq}^- + GlyGlyGly^- \rightarrow$	10.9	3.4×10^8 [b]	p.r.; D.k. at 700 nm.	713052
		11.1	9×10^7 [b]	p.r.; D.k. at 720 nm.	673005
1005	**Glycylglycylglycine amide, conjugate acid**				
	$e_{aq}^- + (GlyGlyGlyNH_2)H^+ \rightarrow$ $\cdot CH_2COGlyGlyNH_2 + NH_3$	5.0	7.4×10^9	p.r.; D.k. at 700 nm; ≥ 70% deamination; at pH 11.2 $k = 1.5 \times 10^9$.	713052
1006	**Glycylglycylglycylglycine**				
	$e_{aq}^- + (Gly)_4 \rightarrow$ $\cdot CH_2COGlyGlyGlyO^- + NH_3$		*2.1 × 10^9*	Average of 2 values.	
		6.0	1.5×10^9	p.r.; D.k. at 550 nm in Ar-satd. unbuffered soln. contg. 0.1 mol L^{-1} *tert*-BuOH.	751045
		5.9	2.6×10^9	p.r.; D.k. at 700 nm in buffered soln. contg. 1 mol L^{-1} *tert*-BuOH.	741058

TABLE 6. Rate constants for reactions of hydrated electrons in aqueous solution—Continued

No.	Reaction	pH	k (L mol^{-1} s^{-1})	Comment	Ref.
1007	**Glycylglycylglycylglycine, negative ion**				
	$e_{aq}^- + (Gly_4)^- \rightarrow$		*4.5 × 10^8*	Average of 2 values.	
		11.5	5.0 × 10^8	p.r.; D.k. at 550 nm in Ar-satd. unbuffered soln. contg. 0.1 mol L^{-1} *tert*-BuOH.	751045
		10.2	3.9 × 10^8	p.r.; D.k. at 700 nm in buffered soln. contg. 1 mol L^{-1} *tert*-BuOH.	741058
1008	**Glycylglycylglycylglycine amide, conjugate acid**				
	$e_{aq}^- + (Gly_4NH_2)H^+ \rightarrow$ $\cdot CH_2COGlyGlyGlyNH_2 + NH_3$	6.3	8.8 × 10^9	p.r.; D.k. at 700 nm; ~55% deamination; at pH 9.7 k = 3.7 × 10^9.	713052
1009	**Glycylglycylglycylglycylglycine**				
	$e_{aq}^- + (Gly_5) \rightarrow$ $\cdot CH_2COGlyGlyGlyGlyO^- + NH_3$	6.0	1.9 × 10^9 [b]	p.r.; D.k. at 550 nm in Ar-satd. soln. contg. 0.1 mol L^{-1} *tert*-BuOH.	751045
		6.1	4.0 × 10^9 [b]	p.r.; D.k. at 700 nm in buffered soln. contg. 1.0 mol L^{-1} *tert*-BuOH.	741058
1010	**Glycylglycylglycylglycylglycylglycine, negative ion**				
	$e_{aq}^- + (Gly_5)^- \rightarrow$		*6.8 × 10^8*	Average of 2 values.	
		11.5	8.0 × 10^8	p.r.; D.k. at 550 nm in Ar-satd. soln. contg. 0.1 mol L^{-1} *tert*-BuOH.	751045
		11.2	5.6 × 10^8	p.r.; D.k. at 700 nm in buffered soln. contg. 1.0 mol L^{-1} *tert*-BuOH.	741058
1011	**Glycylglycylleucine**				
	$e_{aq}^- +$ GlyGlyLeu $\rightarrow$	6.1	1.1 × 10^9	p.r.; D.k. at 550 nm in Ar-satd. unbuffered soln. contg. 0.1 mol L^{-1} *tert*-BuOH.	751045
1012	**Glycylglycylphenylalanine**				
	$e_{aq}^- +$ GlyGlyPhe $\rightarrow$ $\cdot CH_2CONHCH(CH_2C_6H_5)CO_2^- + NH_3$	6.1	1.2 × 10^9	p.r.; D.k. at 700 nm in soln. contg. *tert*-BuOH; at pH 5.7 45% deamination, 55% addn. to ring.	741083
1013	**Glycylglycylphenylalanine, negative ion**				
	$e_{aq}^- +$ GlyGlyPhe$^- \rightarrow$	9.1	3.8 × 10^8	p.r.; D.k. at 700 nm in soln. contg. *tert*-BuOH.	741083
1014	**Glycylglycylproline**				
	$e_{aq}^- +$ GlyGlyPro $\rightarrow$	6.2	8.0 × 10^8	p.r.; D.k. at 550 nm in Ar-satd. unbuffered soln. contg. 0.1 mol L^{-1} *tert*-BuOH.	751045
1015	**Glycylglycyltryptophan**				
	$e_{aq}^- +$ GlyGlyTrpH $\rightarrow$	6.0	7.7 × 10^8	p.r.; D.k. at 550 nm in soln. contg. *tert*-BuOH.	771139
1016	**Glycylglycyltryptophan, negative ion**				
	$e_{aq}^- +$ GlyGlyTrp$^- \rightarrow$	11.0	1.3 × 10^8	p.r.; D.k. at 550 nm in soln. contg. *tert*-BuOH.; k cor. for I.	771139
1017	**Glycylhistidine**				
	$e_{aq}^- +$ GlyHis $\rightarrow$	7.5	6.2 × 10^8	p.r.; D.k. at 550 nm in soln. contg. *tert*-BuOH; pK_a = 6.79, 8.20; k_{obs} = 1.0 × 10^9; values at other pH reported; 50% deamination.	771122
1018	**Glycylhistidine, conjugate acid**				
	$e_{aq}^- +$ GlyHisH$^+ \rightarrow$ GlyHisH$^\bullet$	4.76	4.0 × 10^9	p.r.; D.k. at 550 nm in soln. contg. *tert*-BuOH; pK_a = 6.79, 8.20; see paper for product anal.	771122
1019	**Glycylhistidine, negative ion**				
	$e_{aq}^- +$ GlyHis$^- \rightarrow$	11.30	1.3 × 10^7	p.r.; D.k. at 550 nm in soln. contg. *tert*-BuOH; see paper for product anal.	771122
1020	**Glycylisoleucine**				
	$e_{aq}^- +$ GlyIle $\rightarrow$	5.6	2.7 × 10^8	p.r.; D.k. at 550 nm in Ar-satd. unbuffered soln. contg. 0.1 mol L^{-1} *tert*-BuOH.	751045
1021	**Glycylleucine**				
	$e_{aq}^- +$ GlyLeu $\rightarrow$		*2.8 × 10^8*	Average of 3 values.	
		5.5	2.7 × 10^8	p.r.; D.k. at 550 nm in Ar-satd. unbuffered soln. contg. 0.1 mol L^{-1} *tert*-BuOH.	751045

TABLE 6. Rate constants for reactions of hydrated electrons in aqueous solution—Continued

No.	Reaction	pH	k (L mol^{-1} s^{-1})	Comment	Ref.
1021	**Glycylleucine**—Continued				
		6.46	2.8×10^8	p.r.; D.k. at 720 nm; at pH 8.74 and 8.94 $k = 7 \times 10^7$ and 6.5×10^7, resp.; L isomer.	673005
		5.9	1.5×10^8	p.r.; D.k.; solute is L-isomer.	650389
1022	**Glycylleucyltyrosine**				
	$e_{aq}^- + GlyLeuTyr \rightarrow$	6.1	9.2×10^8	p.r.; D.k. at 550 nm in Ar-satd. unbuffered soln. contg. *tert*-BuOH.	751045
1023	**Glycylmethionine**				
	$e_{aq}^- + GlyMet \rightarrow$	6.1	3.7×10^8	p.r.; D.k. at 550 nm in Ar-satd. unbuffered soln. contg. 0.1 mol L^{-1} *tert*-BuOH.	751045
1024	**Glycylphenylalanine**				
	$e_{aq}^- + GlyPhe \rightarrow$	6.7	1.6×10^8 [b]	p.r.; D.k. at 550 nm in Ar-satd. unbuffered soln. contg. 0.1 mol L^{-1} *tert*-BuOH.	751045
		5.9	6.1×10^8 [b]	p.r.; D.k. at 700 nm in soln. contg. *tert*-BuOH; at pH 5.9 50% deamination, 50% addn. $k = 1.3 \times 10^8$ at pH 9.4; pK_a = 3.1, 8.2.	741083
		6.7	1.6×10^8 [b]	p.r.; D.k.; solute is L-isomer.	650389
1025	**L-Glycylphenylalanylglycine**				
	$e_{aq}^- + GlyPheGly \rightarrow$	5.5	1.6×10^9	p.r.; D.k. at 700 nm in soln. contg. *tert*-BuOH; at pH 5.5 40% deamination, 50% addn.	741083
1026	**Glycylphenylalanylglycine, negative ion**				
	$e_{aq}^- + GlyPheGly^- \rightarrow$	11.6	5.4×10^8	p.r.; D.k. at 700 nm in soln. contg. *tert*-BuOH; at pH 5.5 40% deamination, 50% addn.	741083
1027	**Glycylproline**				
	$e_{aq}^- + GlyPro \rightarrow$		*9.2 × 10^8*	Average of 2 values.	
		6.2	7.3×10^8	p.r.; D.k. at 550 nm in Ar-satd. unbuffered soln. contg. 0.1 mol L^{-1} *tert*-BuOH.	751045
		6.66	1.1×10^9	p.r.; D.k. at 720 nm; solute is L-isomer.	673005
1028	**Glycylsarcosine**				
	$e_{aq}^- + GlySar \rightarrow$	6.4	6.9×10^8	p.r.; D.k. at 700 nm in buffered soln. contg. 1 mol L^{-1} *tert*-BuOH.	741058
1029	**Glycylsarcosine, negative ion**				
	$e_{aq}^- + GlySar^- \rightarrow$	11.3	1.0×10^8	p.r.; D.k. at 700 nm in buffered soln. contg. 1 mol L^{-1} *tert*-BuOH.	741058
1030	**Glycylserine**				
	$e_{aq}^- + GlySer \rightarrow$	6.2	3.7×10^8	p.r.; D.k. at 550 nm in Ar-satd. unbuffered soln. contg. 0.1 mol L^{-1} *tert*-BuOH.	751045
1031	**Glycyltryptophan**				
	$e_{aq}^- + GlyTrpH \rightarrow$		*4.9 × 10^8*	Average of 3 values.	
		6.0	3.8×10^8	p.r.; D.k. at 550 nm in buffered soln. contg. *tert*-BuOH.	771139
		5.6	4.5×10^8	p.r.; D.k. at 550 nm in Ar-satd. unbuffered soln. contg. 0.1 mol L^{-1} *tert*-BuOH.	751045
		6.37	4.5×10^8	p.r.; D.k. at 720 nm,	673005
1032	**Glycyltryptophan, negative ion**				
	$e_{aq}^- + GlyTrp^- \rightarrow$	11.0	7.4×10^7	p.r.; D.k. at 550 nm in buffered soln. contg. *tert*-BuOH; k cor. for I.	771139
1033	**Glycyltryptophanylglycine**				
	$e_{aq}^- + GlyTrpGly \rightarrow$	6.0	8.0×10^8	p.r.; D.k. at 550 nm.	771139
1034	**Glycyltryptophanylglycine, negative ion**				
	$e_{aq}^- + GlyTrpGly^- \rightarrow$	11.0	1.8×10^8	p.r.; D.k. at 550 nm; k cor. for I.	771139
1035	**Glycyltyrosine**				
	$e_{aq}^- + GlyTyrOH \rightarrow$		*4.0 × 10^8*	Average of 2 values.	

TABLE 6. Rate constants for reactions of hydrated electrons in aqueous solution—Continued

No.	Reaction	pH	k (L mol^{-1} s^{-1})	Comment	Ref.
1035	**Glycyltyrosine**—Continued				
		5.7	3.8×10^8	p.r.; D.k. at 550 nm in unbuffered soln. contg. 0.1 mol L^{-1} *tert*-BuOH.	751045
		6.13	4.1×10^8	p.r.; D.k. at 720 nm; solute is L-isomer.	673005
1036	**Glycylvaline**				
	$e_{aq}^- + GlyVal \rightarrow$		*2.6* × *10*^{8}	Average of 2 values.	
		5.5	2.6×10^8	p.r.; D.k. at 550 nm in Ar-satd. unbuffered soln. contg. 0.1 mol L^{-1} *tert*-BuOH.	751045
		5.97	2.6×10^8	p.r.; D.k. at 720 nm; solute is DL-isomer.	673005
1037	**Glyoxylic acid**				
	$e_{aq}^- + HCOCO_2H \rightarrow OH^- +$ ·COCHO	3-4	1.3×10^9	γ-r.; C.k.; ratio of formn. of H· (and $CHOCO_2^-$) to OH^- (and CHOCO) $<<0.1$; cor. for pK (3.30); rel. to $k(e_{aq}^- + H^+) = 1.6 \times 10^{10}$; $I = 0.05$.	720057
1038	**Guanidine**				
	$e_{aq}^- + H_2NC(=NH)NH_2 \rightarrow$	11.9	1.6×10^6	p.r.; D.k. at 720 nm; values for k from graph. at pH 11.1 $k = 1.9 \times 10^8$, at pH 6.1 $k = 2.5 \times 10^8$.	660011
1039	**Guanine**				
	$e_{aq}^- + G \rightarrow$	7	1.4×10^{10}	p.r.; D.k.; little change in k on addn. of surfactants; at pH 11 $k = 2.0 \times 10^9$.	733013
1040	**Guanosine**				
	$e_{aq}^- + G \rightarrow$	6.7	6.0×10^9	p.r.; D.k. at 700 nm; pK = 1.6, 9.2, 12.4.	751060
1041	**Guanosine 5'-monophosphate**				
	$e_{aq}^- + GMP \rightarrow$	8	1.5×10^9	p.r.; D.k.	751084
1042	**Hematoporphyrin**				
	$e_{aq}^- + C_{34}H_{38}N_4O_6 \rightarrow$	7.0	1.5×10^{10}	p.r.; D.k. at 600-650 nm in Ar-satd. soln. contg. 0.1 mol L^{-1} *tert*-BuOH; at pH 13 $k = 2.5 \times 10^{10}$.	741040
1043	**Hexadecanoate ion**				
	$e_{aq}^- + CH_3(CH_2)_{14}CO_2^- \rightarrow$	6	1×10^7	p.r.; Unreactive	731142
1044	**Hexadecylpyridinium ion**				
	$e_{aq}^- + C_{16}H_{33}pyH^+ \rightarrow$		7.0×10^9 [b]	p.r.; D.k. at 600 nm in soln. contg. 0.2 mol L^{-1} *tert*-BuOH.	741130
			2.6×10^{10} [b]	p.r.; D.k.	682104
1045	**Hexadecyltrimethylammonium ion**				
	$e_{aq}^- +$ CTAB $\rightarrow$	7	$<1 \times 10^7$	p.r.; D.k.; concn. < CMC.	733013
1046	***trans,trans*-2,4-Hexadienoate ion (Sorbate ion)**				
	$e_{aq}^- + CH_3CH{=}CHCH{=}CHCO_2^- \rightarrow [CH_3CHCHCHCHCO_2^-]\cdot^-$	9.2	5.8×10^9	p.r.; D.k. in soln. contg. 0.1 mol L^{-1} *tert*-BuOH.	761113
1047	***trans,trans*-2,4-Hexadienoic acid**				
	$e_{aq}^- + CH_3CH{=}CHCH{=}CHCO_2H \rightarrow [CH_3CHCHCHCHCO_2H]\cdot^-$	2.0-3.7	2.9×10^{10}	p.r.; C.k. in soln. contg. 0.1 mol L^{-1} *tert*-BuOH; rel. to $k(e_{aq}^- + H^+)$.	761113
1048	**Hexafluorobenzene**				
	$e_{aq}^- + C_6F_6 \rightarrow F^- + C_6F_5$	~6.5	2.0×10^{10}	p.r.; D.k. in soln. contg. 0.5 mol L^{-1} *tert*-BuOH or 0.2 mol L^{-1} MeOH.	730054
1049	**5,7,7,12,14,14-Hexamethyl-1,4,8,11-tetraazacyclotetradeca-4,11-diene, conjugate diacid**				
	$e_{aq}^- +$ 4,11-dieneN$_4$H$_2^{2+} \rightarrow$ [4,11-dieneN$_4$H$_2$]$\cdot^+$	7	1.2×10^{10}	p.r.; D.k. at 700 nm in soln. contg. 1 mol L^{-1} *tert*-BuOH; counterion $CF_3SO_3^-$; pH study, value from graph.	761203
1050	**5,7,7,12,14,14-Hexamethyl-1,4,8,11-tetraazacyclotetradeca-4,11-diene**				
	$e_{aq}^- +$ 4,11-diene $\rightarrow$	12	2×10^9	p.r.; D.k. at 700 nm in soln. contg. 1 mol L^{-1} *tert*-BuOH; counterion $CF_3SO_3^-$; pH study, value from graph.	761203

TABLE 6. Rate constants for reactions of hydrated electrons in aqueous solution—Continued

No.	Reaction	pH	k (L mol^{-1} s^{-1})	Comment	Ref.
1051	**Hexyl sulfate ion**				
	$e_{aq}^- + CH_3(CH_2)_5OSO_3^- \rightarrow$	6	$\sim 1 \times 10^6$	p.r.; D.k. at 650 nm in soln. contg. 10^{-3} mol L^{-1} glucose; concn. 3×10^{-4} mol L^{-1}, counterion Na^+.	773034
1052	**Histamine, conjugate diacid**				
	$e_{aq}^- + ImH^+CH_2CH_2NH_3^+ \rightarrow$	5.3	3.7×10^8	p.r.; D.k. at 720 nm; k decreases with pH; addn. of heparin does not change k; pK = 5.8, 9.7.	79A413
1053	**Histidine**				
	$e_{aq}^- + His \rightarrow$		*6.4* $\times$ *10^7*	Average of 2 values.	
		8.02	6.7×10^7	p.r.; D.k. at 550 nm in soln. contg. *tert*-BuOH; pK_a = 6.0, 9.17; see paper for product anal.; at pH 6.52 $k = 9.0 \times 10^8$.	771122
		~7	6×10^7	p.r.; D.k. at 720 nm; at pH 8.58, $k_{obs} = 4.5 \times 10^7$.	660011
1054	**Histidine, conjugate monoacid**				
	$e_{aq}^- + HisH^+ \rightarrow$	4.82	2.8×10^9	p.r.; D.k. at 550 nm in soln. contg. *tert*-BuOH; pK_a = 6.0, 9.17; see paper for product anal.	771122
1055	**Histidine, negative ion**				
	$e_{aq}^- + His^- \rightarrow$	11.04	$<1.4 \times 10^6$	p.r.; D.k. at 550 nm in soln. contg. *tert*-BuOH; pK_a = 6.0, 9.17; see paper for product anal.; at pH 10.24 $k = 5.3 \times 10^6$.	771122
1056	**Histidylhistidine**				
	$e_{aq}^- + HisHis \rightarrow$	6.83	2.4×10^9	p.r.; D.k. at 720 nm; at pH 5.5, 7.3 and 8.37 $k = 7.9 \times 10^9$, 1.3×10^9 and 2.85×10^8, resp; pK_a = ~2, 5.4, 6.5, 8.	673005
1057	**Histidylhistidine, negative ion**				
	$e_{aq}^- + HisHis^- \rightarrow$	11.0	5.1×10^7	p.r.; D.k. at 720 nm.	673005
1058	**Homocysteine thiolactone**				
	$e_{aq}^- + C_4H_7NOS \rightarrow NH_3$		3.7×10^{10}	p.r.; D.k. in Ar-satd. soln.	741029
1059	**Homocystine**				
	$e_{aq}^- + [^-O_2CCH(NH_3^+)CH_2CH_2S]_2 \rightarrow$	6.90	9×10^9	p.r.; D.k. at 720 nm.	660011
1060	**13-Hydroperoxylinoleate ion**				
	$e_{aq}^- +$ 13-HOPD $\rightarrow$	8.2	6.1×10^9	p.r.; D.k. at 680 in N_2-satd. soln. contg. 6.5×10^{-2} mol L^{-1} 2-PrOH.	82A451
1061	**9-Hydroperoxylinoleate ion**				
	$e_{aq}^- +$ 9-HOPD $\rightarrow$	8.2	6.6×10^9	p.r.; D.k. at 680 in N_2-satd. soln. contg. 6.5×10^{-2} mol L^{-1} 2-PrOH.	82A451
1062	**13-Hydroperoxylinolenate ion**				
	$e_{aq}^- +$ 13-HOPT $\rightarrow$	8.2	8.9×10^9	p.r.; D.k. at 680 in N_2-satd. soln. contg. 6.5×10^{-2} mol L^{-1} 2-PrOH.	82A451
1063	**9-Hydroperoxylinolenate ion**				
	$e_{aq}^- +$ 9-HOPT $\rightarrow$	8.2	5.4×10^9	p.r.; D.k. at 680 in N_2-satd. soln. contg. 6.5×10^{-2} mol L^{-1} 2-PrOH.	82A451
1064	**Hydroquinone, dianion**				
	$e_{aq}^- + 4\text{-}^-OC_6H_4O^- \rightarrow$	13	$<1 \times 10^7$	p.r.; pK = 10.35, 11.5.	640044
1065	**3-Hydroxybenzoate ion, dianion**				
	$e_{aq}^- + 3\text{-}(^-O)C_6H_4CO_2^- \rightarrow$	~11	1.1×10^9	p.r.; D.k.; pK_a = 4.06, 9.92.	640138
1066	**4-Hydroxybenzoate ion, dianion**				
	$e_{aq}^- + 4\text{-}(^-O)C_6H_4CO_2^- \rightarrow$	~11	4.0×10^8	p.r.; D.k.; pK_a = 4.48, 9.32	640138
1067	**3-Hydroxy-2-butanone**				
	$e_{aq}^- + CH_3COCH(OH)CH_3 \rightarrow$		6.0×10^9	p.r.; D.k. at 720 nm.	680249

TABLE 6. Rate constants for reactions of hydrated electrons in aqueous solution—Continued

No.	Reaction	pH	k (L mol^{-1} s^{-1})	Comment	Ref.
1068	**Hydroxycycloheptatriene**				
	$e_{aq}^- + c\text{-}C_7H_7OH \rightarrow C_7H_8OH$		6×10^9	p.r.; D.k.; non-conducting product ϵ(315 nm) = 4200 L mol^{-1} cm^{-1}.	710710
1069	**2-Hydroxyethyl acetate**				
	$e_{aq}^- + CH_3CO_2CH_2CH_2OH \rightarrow$		2.6×10^7	p.r.; D.k. at 700 nm.	751126
1070	**1-(2-Hydroxyethyl)-2-methyl-5-nitromidazole**				
	$e_{aq}^- + HOCH_2CH_2Im(CH_3)NO_2 \rightarrow RNO_2\cdot^-$		*3.7 × 10^{10}*	Average of 2 values.	
			3.0×10^{10}	p.r.; D.k. at 625 nm in N_2-satd. soln. contg. 0.2 mol L^{-1} *tert*-BuOH.	751067
			4.5×10^{10}	p.r.; D.k. at 580 nm in N_2-satd. soln. contg. 1 mol L^{-1} *tert*-BuOH and 10^{-3} mol L^{-1} $NaHPO_4$.	741135
1071	**1-(2-Hydroxy-3-methoxypropyl)-2-nitroimidazole**				
	$e_{aq}^- + CH_3OCH_2CHOHCH_2ImNO_2 \rightarrow RNO_2\cdot^-$		3.0×10^{10}	p.r.; D.k. at 625 nm in N_2-satd. soln. contg. 0.2 mol L^{-1} *tert*-BuOH.	751067
1072	**4-Hydroxy-2-nitrobenzofuran**				
	$e_{aq}^- + NO_2F \rightarrow NO_2F\cdot^-$	7	$\sim 2 \times 10^{10}$	p.r.; Electron adduct formed in Ar-satd. soln. contg. 0.1 mol L^{-1} 2-PrOH and 10^{-2} mol L^{-1} phosphate buffer.	82R087
1073	**5-Hydroxy-2-nitrobenzofuran**				
	$e_{aq}^- + NO_2F \rightarrow NO_2F\cdot^-$	7	$\sim 2 \times 10^{10}$	p.r.; Electron adduct formed in Ar-satd. soln. contg. 0.1 mol L^{-1} 2-PrOH and 10^{-2} mol L^{-1} phosphate buffer.	82R087
1074	**6-Hydroxy-2-nitrobenzofuran**				
	$e_{aq}^- + NO_2F \rightarrow NO_2F\cdot^-$	7	$\sim 2 \times 10^{10}$	p.r.; Electron adduct formed in Ar-satd. soln. contg. 0.1 mol L^{-1} 2-PrOH and 10^{-2} mol L^{-1} phosphate buffer.	82R087
1075	**7-Hydroxy-2-nitrobenzofuran**				
	$e_{aq}^- + NO_2F \rightarrow NO_2F\cdot^-$	7	$\sim 2 \times 10^{10}$	p.r.; Electron adduct formed in Ar-satd. soln. contg. 0.1 mol L^{-1} 2-PrOH and 10^{-2} mol L^{-1} phosphate buffer.	82R087
1076	**6-Hydroxy-5-nitrothymine**				
	$e_{aq}^- + TNO_2(OH) \rightarrow TNO_2(OH)^-$		2×10^{10}	p.r.; C.k.; obs. formn. of $\cdot SO_4^-$ at 465 nm; pK_a = 4.3 for $TNO_2(OH)$, pK_a for radical ion ~ 2.5 (condy. method); rel. to $k(e_{aq}^- + S_2O_8^{2-})$.	80A210
1077	**6-Hydroxy-5-nitrothymine, conjugate base**				
	$e_{aq}^- + TNO_2(O^-) \rightarrow TNO_2(O^-)^-$		1.6×10^{10}	p.r.; C.k.; obs. formn. of $\cdot SO_4^-$ at 465 nm; rel. to $k(e_{aq}^- + S_2O_8^{2-})$.	80A210
1078	***p*-Hydroxyphenyl-β-D-glucopyranoside**				
	$e_{aq}^- + C_{12}H_{16}O_7 \rightarrow$	~7	$\sim 1 \times 10^7$	p.r.; D.k.	710480
1079	**3-(*p*-Hydroxyphenyl)propionate ion**				
	$e_{aq}^- + 4\text{-}HOC_6H_4(CH_2)_2CO_2^- \rightarrow$	7.0	4.6×10^7	p.r.; D.k. at 690 nm in soln. contg. ~0.1 mol L^{-1} *tert*-BuOH; pK_a = 4.6, 10.1.	730003
1080	**3-(*p*-Hydroxyphenyl)propionate ion, dianion**				
	$e_{aq}^- + {}^-OC_6H_4CH_2CH_2CO_2^- \rightarrow$	12.5	2.1×10^7	p.r.; D.k.	730003
1081	**L-Hydroxyproline**				
	$e_{aq}^- + Hyp \rightarrow$	7.0	4.5×10^7	p.r.; D.k. at 720 nm; at pH 10.8 $k = 1.1 \times 10^7$.	660011
1082	**2-Hydroxypropionamide**				
	$e_{aq}^- + CH_3CHOHCONH_2 \rightarrow$	7.0	1.9×10^8	p.r.; D.k. at 700 nm in soln. contg. *tert*-BuOH.	751053
1083	**Hydroxyurea**				
	$e_{aq}^- + HONHCONH_2 \rightarrow [HONHCONH_2]\cdot^-$	6.8	4.8×10^8	p.r.; D.k. at 600 nm in deaerated soln. contg. *tert*-BuOH or 2-PrOH.	80A349

TABLE 6. Rate constants for reactions of hydrated electrons in aqueous solution—Continued

No.	Reaction	pH	k (L mol^{-1} s^{-1})	Comment	Ref.
1084	**Hypoxanthine (Purin-6-one)**				
	$e_{aq}^- + HxOH \rightarrow HxO^{\cdot -}$	6.6	1.7×10^{10}	p.r.; D.k. at 578 nm.	640044
1085	**Imidazole**				
	$e_{aq}^- + Im \rightarrow$		*2.2 × 10^7*	Average of 2 values.	
		10.9	2.0×10^7	p.r.; D.k. at 700 nm in soln. contg. ~1 mol L^{-1} *tert*-BuOH over 1 atm Ar.	751066
		11.5	2.4×10^7	p.r.; D.k. at 720 nm.	660011
1086	**Imidazolium ion**				
	$e_{aq}^- + ImH^+ \rightarrow$		*3.9 × 10^9*	Average of 2 values.	
		6	3.4×10^9	p.r.; D.k. in buffered soln. contg. 10^{-2} mol L^{-1} MeOH and Na_2SO_4; pK = 7.05; I = 0.1.	680316
		6.3	4.3×10^9	p.r.; D.k. at 720 nm.	660011
1087	**Iminodiacetate ion**				
	$e_{aq}^- + HN(CH_2CO_2)_2^{2-} \rightarrow [HN(CH_2CO_2)_2]^{\cdot 3-}$	10.5	1.2×10^7	p.r.; D.k. in soln. contg. 0.1 mol L^{-1} *tert*-BuOH and 0.01 mol L^{-1} IDA; at 0.25 mol L^{-1} and pH 8 $k = 1.7 \times 10^7$.	81A148
1088	**Indigotetrasulfonate ion**				
	$e_{aq}^- + ITS^{4-} \rightarrow$	6	7.1×10^9	γ-r.; C.k., counterion K^+; rel. to $k(e_{aq}^- + N_2O)$.	680059
1089	**Indole**				
	$e_{aq}^- + In \rightarrow$		*2.8 × 10^8*	Average of 2 values.	
		11	2.6×10^8	p.r.; D.k. in H_2-satd. soln.	720541
		7.7	1.9×10^8	p.r.; D.k. at 635 nm.	690459
1090	**Indole-3-acetate ion**				
	$e_{aq}^- + 3\text{-}InCH_2CO_2^- \rightarrow$	11	1.7×10^8	f.p.; D.k. in H_2-satd. soln.	720541
1091	**Indole-3-propionate ion**				
	$e_{aq}^- + 3\text{-}InCH_2CH_2CO_2^- \rightarrow$	11	2.6×10^8	f.p.; D.k. in H_2-satd. soln.	720541
1092	**Iodipamide dianion**				
	$e_{aq}^- + C_{20}H_{12}I_6N_2O_6^{2-} \rightarrow I^- + C_{20}H_{12}I_5N_2O_6^{2-}$	5:6, 7	2.1×10^{10}	p.r.	79A364
1093	**Iodoacetamide**				
	$e_{aq}^- + ICH_2CONH_2 \rightarrow I^- + {\cdot}CH_2CONH_2$		5×10^{10}	p.r.; Products identified by spectra with peaks at 390 (I_2^-) and 240 (carbamylmethyl radical).	693030
1094	**Iodoacetate ion**				
	$e_{aq}^- + ICH_2CO_2^- \rightarrow$	~10	1.2×10^{10}	p.r.; D.k.	650015
1095	**Iodobenzene**				
	$e_{aq}^- + C_6H_5I \rightarrow$	~11	1.2×10^{10}	p.r.; D.k.	640138
1096	**2-Iodobenzoate ion**				
	$e_{aq}^- + 2\text{-}IC_6H_4CO_2^- \rightarrow$	~11	4.6×10^9	p.r.; D.k.	640138
1097	**3-Iodobenzoate ion**				
	$e_{aq}^- + 3\text{-}IC_6H_4CO_2^- \rightarrow$	~11	1.3×10^{10}	p.r.; D.k.	640138
1098	**4-Iodobenzoate ion**				
	$e_{aq}^- + 4\text{-}IC_6H_4CO_2^- \rightarrow$	~11	9.1×10^9	p.r.; D.k.	640138
1099	**1-Iodobutane**				
	$e_{aq}^- + CH_3(CH_2)_3I \rightarrow$	7.60	1.2×10^{10}	p.r.; D.k.	650018
1100	**Iodoethane**				
	$e_{aq}^- + C_2H_5I \rightarrow {\cdot}CH_2CH_3 + I^-$		*1.5 × 10^{10}*	Average of 2 values.	
		9-10	1.5×10^{10}	p.r.; D.k. at 600 nm.	700407
		6.04-6.75	1.5×10^{10}	p.r.; D.k.	650018
1101	***o*-Iodohippurate ion**				
	$e_{aq}^- + 2\text{-}IC_6H_4CONHCH_2CO_2^- \rightarrow$	~7	5.5×10^9	p.r.; D.k. at 720 nm in Ar-satd. soln.	761191

TABLE 6. Rate constants for reactions of hydrated electrons in aqueous solution—Continued

No.	Reaction	pH	k (L mol^{-1} s^{-1})	Comment	Ref.
1102	**Iodomethane**				
	$e_{aq}^- + CH_3I \rightarrow I^- + {}^\bullet CH_3$		*1.6 × 10^{10}*	Average of 2 values.	
		9-10	1.6 × 10^{10}	p.r.; D.k. at 600 nm.	700407
			1.6 × 10^{10}	p.r.; D.k. at 600 nm as well as p.b.k. at 230 nm (I^-), soln. contains 10^{-3} mol L^{-1} ethylene.	670041
1103	**1-Iodopropane**				
	$e_{aq}^- + CH_3CH_2CH_2I \rightarrow$	6.2	1.3 × 10^{10}	p.r.; D.k.	650018
1104	**2-Iodopropionate ion**				
	$e_{aq}^- + CH_3CHICO_2^- \rightarrow$	~10	6.6 × 10^9	p.r.; D.k.	650015
1105	**3-Iodopropionate ion**				
	$e_{aq}^- + ICH_2CH_2CO_2^- \rightarrow$	7	5.8 × 10^9	p.r.; D.k.; 5 × 10^{-4} mol L^{-1} phosphate buffer.	701230
1106	**4-Iodotoluene**				
	$e_{aq}^- + 4\text{-}IC_6H_4CH_3 \rightarrow$	~11	1.3 × 10^{10}	p.r.; D.k.	640138
1107	**5-Iodouracil**				
	$e_{aq}^- +$ 5-IU $\rightarrow$		1.7 × 10^{10}	p.r.; D.k. at 650 nm; k detd. at 15-80°C.	690567
1108	**Iothalamate ion**				
	$e_{aq}^- + C_{11}H_9I_3N_2O_4^- \rightarrow I^- + C_{11}H_9I_2N_2O_4^-$	5.6, 7	2.1 × 10^{10}	p.r.	79A364
1109	**Isoamylamine**				
	$e_{aq}^- + (CH_3)_2CHCH_2CH_2NH_2 \rightarrow$	11.8	1.0 × 10^6	p.r.; D.k. at 720 nm in Ar-satd. soln. contg. 0.1 mol L^{-1} amine.	700371
1110	**Isobutylamine**				
	$e_{aq}^- + (CH_3)_2CHCH_2NH_2 \rightarrow$	11.9	1.1 × 10^7	p.r.; D.k. at 720 nm in soln. contg. 0.1 mol L^{-1} amine.	700371
1111	**Isocitrate ion**				
	$e_{aq}^- + {}^-O_2CCH_2CH(CO_2^-)CHOHCO_2^- \rightarrow$	11,13	2 × 10^7	γ-r.; C.k.; rel. to $k(e_{aq}^- + ClCH_2CO_2^-)$.	660160
1112	**Isoorotate ion**				
	$e_{aq}^- + 5\text{-}UCO_2^- \rightarrow [5\text{-}UCO_2^-]^{\bullet -}$	7	1.1 × 10^{10}	p.r.; D.k. at 600 nm in soln. contg. *tert*-BuOH, as well as p.b.k.	700567
1113	**Isopropylamine**				
	$e_{aq}^- + (CH_3)_2CHNH_2 \rightarrow$	12.3	1.5 × 10^6	p.r.; D.k. at 720 nm in Ar-satd. soln. contg. 0.1 mol L^{-1} amine.	700371
1114	**Lactate ion**				
	$e_{aq}^- + CH_3CHOHCO_2^- \rightarrow$	9	<1 × 10^7	p.r.; D.k. at 578 nm.	640048
1115	**Lactic acid**				
	$e_{aq}^- + CH_3CH(OH)CO_2H \rightarrow OH^- + CH_3\dot{C}HOHCO$	3.0	8 × 10^8	γ-r.; C.k.; obs. $G(Br^-)$; pK_a = 3.82; k_{obs} = 6.8 × 10^8 at pH 3 and 5.8 × 10^7 at pH 7; rel. to $k(e_{aq}^- + BrPhOH)$.	720027
		3-4	6.3 × 10^8	γ-r.; C.k.; ratio of formn. of H$^\bullet$ (and $CH_3CHOHCO_2^-$) to OH^- (and $CH_3\dot{C}HOHCO$) <<0.1; rel. to $k(e_{aq}^- + H^+)$ = 1.6 × 10^{10}; I = 0.05.	720057
1116	**Lactose**				
	$e_{aq}^- + C_{12}H_{22}O_{11} \rightarrow$	6.5	<4 × 10^6	p.r.; D.k. at 650 nm.	78A146
1117	**Leucine**				
	$e_{aq}^- +$ Leu $\rightarrow$	6.5	<1 × 10^7	p.r.; D.k. at 720 nm; solute concn. 10^{-2} mol L^{-1}.	660011
1118	**L-Leucyl-L-alanine**				
	$e_{aq}^- +$ LeuAla $\rightarrow$	6.1	1.7 × 10^8	p.r.; D.k. at 720 nm.	673005
1119	**DL-Leucylglycine**				
	$e_{aq}^- +$ LeuGly $\rightarrow$	6.09	1.1 × 10^8	p.r.; D.k. at 720 nm.	673005

TABLE 6. Rate constants for reactions of hydrated electrons in aqueous solution—Continued

No.	Reaction	pH	k (L mol^{-1} s^{-1})	Comment	Ref.
1120	**Leucylglycylglycine**				
	$e_{aq}^- + LeuGlyGly \rightarrow$		*2.4 × 10^8*	Average of 2 values.	
		6.93	2.8 × 10^8	p.r.; D.k. at 720 nm; at pH 9.5 $k = 5 \times 10^7$.	673005
		6.0	2.0 × 10^8	p.r.; D.k.	650389
1121	**L-Leucyl-L-leucine**				
	$e_{aq}^- + LeuLeu \rightarrow$	5.97	9 × 10^7	p.r.; D.k. at 720 nm.	673005
1122	**Lipoate ion**				
	$e_{aq}^- + RSSR \rightarrow RSSR^{\cdot -}$		*1.5 × 10^{10}*	Average of 3 values.	
		6.5	1.5 × 10^{10}	p.r.; P.b.k. at 400 nm in soln. contg. 0.3 mol L^{-1} diglycine, 1 mol L^{-1} *tert*-BuOH and 5-40 × 10^{-4} mol L^{-1} lipoate.	731146
		7.0	1.5 × 10^{10}	p.r.; D.k. at 700 nm in soln. contg. ~0.1 mol L^{-1} *tert*-BuOH.	720388
		7	1.5 × 10^{10}	p.r.; D.k. at 600 nm in soln. contg. 1 mol L^{-1} *tert*-BuOH.	700560
1123	**Lumazine**				
	$e_{aq}^- + LH_2 \rightarrow (LH_2)^{\cdot -}$	6.3	2.9 × 10^{10}	p.r.; D.k. at 700 nm in Ar-satd. soln. contg. ~0.1 mol L^{-1} *tert*-BuOH. At pH 9.0 and 14.0 k = 2.1 × 10^{10} and 1.9 × 10^{10}, resp.	751056
1124	**Lumichrome**				
	$e_{aq}^- + Fl \rightarrow FlH^{\cdot}$	6	2.6 × 10^{10}	p.r.; D.k. at 720 nm in deaerated soln. contg. 0.5 mol L^{-1} *tert*-BuOH; at pH 10 $k = 2.4 \times 10^{10}$, pK_a ~8.5.	82B104
1125	**Lumiflavin-3-acetate ion**				
	$e_{aq}^- + Fl_{ox}CH_2CO_2^- \rightarrow HFlCH_2CO_2^-$	4-8	3 × 10^{10}	p.r.; D.k. in soln. contg. 0.1 mol L^{-1} *tert*-BuOH.	751116
1126	**Lysine**				
	$e_{aq}^- + Lys \rightarrow$	7, 7.8	~2 × 10^7	p.r.; D.k. at 720 nm.	660011
1127	**Malate ion**				
	$e_{aq}^- + {}^-O_2CCH_2CHOHCO_2^- \rightarrow$	11	6 × 10^7	γ-r.; C.k.; rel. to $k(e_{aq}^- + ClCH_2CO_2^-)$.	660160
1128	**Malic acid**				
	$e_{aq}^- + HO_2CCH_2CH(OH)CO_2H \rightarrow$	2.4	>3 × 10^9	γ-r.; C.k. in O_2-free soln.; obs. $G(H_2)$; rel. to $k(e_{aq}^- + H^+)$.	85G126
1129	**Maleate ion**				
	$e_{aq}^- + cis\text{-}O_2CCH{=}CHCO_2^- \rightarrow [(CHCO_2^-)_2]^{\cdot -}$		*1.7 × 10^9*	Average of 3 values.	
		8.5	1.7 × 10^9	p.r.; D.k. at 600 nm; counterion Na^+; k cor. for I.	84A459
		10.5	1.6 × 10^9	p.r.; D.k. at 700 nm.	730097
		8.45	1.7 × 10^9	p.r.; D.k. at 578 nm; at pH 12.7 $k = 1.7 \times 10^9$ (cor.); $k_{obs} = 2.2 \times 10^9$.	640044
1130	**Maleate ion, hydrogen**				
	$e_{aq}^- + cis\text{-}HO_2CCH{=}CHCO_2^- \rightarrow [MH]^{\cdot 2-}$		9 × 10^9	p.r.; D.k. at 600 nm; k cor. for I.	84A459
			1.8 × 10^{10}	p.r.; D.k. at 700 nm; calcd. from $k_{obs.} = 1.45 \times 10^{10}$ at pH 5.77; pK = 1.83, 6.07.	730097
1131	**Maleic acid**				
	$e_{aq}^- + HO_2CCH{=}CHCO_2H \rightarrow$		2.9 × 10^{10}	p.r.; D.k. at 600 nm; pK_a = 1.92, 6.23; k cor. for I.	84A459
1132	**Maleic hydrazide, conjugate base**				
	$e_{aq}^- + MH^- \rightarrow$		3.7 × 10^9	p.r.	83A165
1133	**Malonamide**				
	$e_{aq}^- + H_2NCOCH_2CONH_2 \rightarrow$	7.0	1.1 × 10^9	p.r.; D.k. at 700 nm in soln. contg. ~0.1-1 mol L^{-1} *tert*-BuOH.	730091

TABLE 6. Rate constants for reactions of hydrated electrons in aqueous solution—Continued

No.	Reaction	pH	k (L mol^{-1} s^{-1})	Comment	Ref.
1134	**Malonate ion** $e_{aq}^- + CH_2(CO_2^-)_2 \rightarrow$		1×10^7	γ-r.; C.k.; calcd. from pH study; $k_{obs} = 1.4 \times 10^7$ at pH 7.2; rel. to $k(e_{aq}^- + BrPhOH)$.	720027
1135	**Malonate ion, hydrogen** $e_{aq}^- + HOOCCH_2CO_2^- \rightarrow OH^- + \dot{O}CCH_2CO_2^-$		4.0×10^8	p.r.; D.k. at 600 nm; k cor. for I.	84A459
			7×10^8	γ-r.; C.k.; obs. $G(Br^-)$; calcd. from pH study; $pK_a = 2.86, 5.5$; rel. to $k(e_{aq}^- + BrPhOH)$.	720027
		3-4	6.1×10^8	γ-r.; C.k.; ratio of formn. of H· (and $^-O_2CCH_2CO_2^-$) to OH^- (and $\dot{O}CCH_2CO_2^-$) ≤0.1; rel. to $k(e_{aq}^- + H^+) = 1.6 \times 10^{10}$; $I = 0.05$.	720057
1136	**Malonic acid** $e_{aq}^- + HO_2CCH_2CO_2H \rightarrow OH^- + \dot{O}CCH_2CO_2H$		1.6×10^9	p.r.; D.k. at 600 nm; k cor. for I.	84A459
			5.0×10^9	γ-r.; C.k.; calcd. from pH study; $k_{obs} = 1.2 \times 10^9$ at pH 2.1; rel. to $k(e_{aq}^- + BrPhOH)$.	720027
		3-4	1.5×10^9	γ-r.; C.k.; author cor. for e_{aq}^- + malonate ions; rel. to $k(e_{aq}^- + H^+) = 1.6 \times 10^{10}$; $I = 0.05$.	720057
1137	**Malononitrile** $e_{aq}^- + NCCH_2CN \rightarrow$	3-4	7.3×10^9	γ-r.; C.k.; rel. to $k(e_{aq}^- + H^+)$; $I = 0.002$.	730364
1138	**Maltose** $e_{aq}^- + C_{12}H_{22}O_{11} \rightarrow$	6.5	$<1 \times 10^7$	D.k. at 650 nm.	78A146
1139	**Mannitol** $e_{aq}^- + HOCH_2(CHOH)_4CH_2OH \rightarrow$	7	7×10^6	p.r.; D.k.	79A366
1140	**2-Mercaptoethanol** $e_{aq}^- + HSCH_2CH_2OH \rightarrow$	5.7-9.0	1.2×10^{10}	p.r.; D.k. at 650 nm; $pK_a = 10.3$.	710175
1141	**2-Mercaptoethylguanidine** $e_{aq}^- + H_2NC(=NH)NHCH_2CH_2SH \rightarrow$	6.74	2×10^{10}	p.r.; D.k. at 720 nm.	660011
1142	**2-Mercaptopropionate ion** $e_{aq}^- + CH_3CH(SH)CO_2^- \rightarrow \dot{C}H_3CHCO_2^- + HS^-$	7.2	5.0×10^9	p.r.; D.k. at 700 nm in soln. contg. ~0.1 mol L^{-1} *tert*-BuOH; $pK_a \simeq 4$, 10.7. at pH 12.2 $k = 7.7 \times 10^8$.	730090
1143	**3-Mercaptopropionate ion** $e_{aq}^- + HSCH_2CH_2CO_2^- \rightarrow \cdot CH_2CH_2CO_2^- + HS^-$	7.4	5.0×10^9	p.r.; D.k. at 700 nm in soln. contg. ~0.1 mol L^{-1} *tert*-BuOH; $pK_a = 4.3, 10.3$; at pH 13.0 $k = \sim 2.8 \times 10^8$.	730090
1144	**2-Mercaptopropionic acid** $e_{aq}^- + CH_3CH(SH)CO_2H \rightarrow \dot{C}H_3CHCO_2H + HS^-$	1.6-3.0	$\sim 3.5 \times 10^9$	γ-r.; C.k.; k increases with pH; rel. to $k(e_{aq}^- + H^+)$.	730286
1145	**3-Mercaptopropionic acid** $e_{aq}^- + HSCH_2CH_2CO_2H \rightarrow$	1.6-3.0	5.4×10^9	γ-r.; C.k.; rel. to $k(e_{aq}^- + H^+)$.	730286
1146	**Methacrylamide** $e_{aq}^- + H_2C{=}C(CH_3)CONH_2 \rightarrow [\dot{C}H_2C(CH_3)CONH_2]^{\cdot -}$	9.2	2.4×10^{10}	p.r.; D.k. at 700 nm in soln. contg. ~0.1 mol L^{-1} *tert*-BuOH and 10^{-3} mol L^{-1} borate.	751052
1147	**Methacrylate ion** $e_{aq}^- + CH_2{=}C(CH_3)CO_2^- \rightarrow [\dot{C}H_2C(CH_3)CO_2]^{\cdot 2-}$	9.2	4.5×10^9	p.r.; D.k.	761113
1148	**Methacrylic acid** $e_{aq}^- + H_2C{=}C(CH_3)CO_2H \rightarrow [\dot{C}H_2C(CH_3)CO_2H]^{\cdot -}$	2.0-3.7	1.9×10^{10}	p.r.; C.k. in soln. contg. 0.1 mol L^{-1} *tert*-BuOH; rel. to $k(e_{aq}^- + H^+)$.	761113
1149	**Methane** $e_{aq}^- + CH_4 \rightarrow$		$<1 \times 10^7$	p.r.; D.k. at 578 nm.	640048

TABLE 6. Rate constants for reactions of hydrated electrons in aqueous solution—Continued

No.	Reaction	pH	k (L mol^{-1} s^{-1})	Comment	Ref.
1150	**Methanesulfonate ion**				
	$e_{aq}^- + CH_3SO_3^- \rightarrow$	alk.	$<1 \times 10^6$	p.r.	751072
1151	**Methanethiol**				
	$e_{aq}^- + CH_3SH \rightarrow \cdot CH_3 + HS^-$	7	7.5×10^9	p.r.; D.k. at 720 nm in Ar-satd. soln.	690553
1152	**Methanol**				
	$e_{aq}^- + CH_3OH \rightarrow H\cdot + CH_3O^-$		$<1 \times 10^4$	p.r.; Addn. of 10-20% methanol did not alter the half-life of e_{aq}^- in aqueous solns. of aromatic compounds.	640138
1153	**Methicillin**				
	$e_{aq}^- + C_{17}H_{20}N_2O_6S \rightarrow$	6.0	2.8×10^9	p.r.; D.k. at 700 nm.	733020
1154	**Methionine**				
	$e_{aq}^- +$ Met $\rightarrow$		*4.0* × *10*^{7}	Average of 2 values.	
		7.3	4.5×10^7	p.r.; D.k. at 700 nm in soln. contg. ~0.1 mol L^{-1} *tert*-BuOH; pK_a = 2.3, 9.2.	730090
		6.0	3.5×10^7	p.r.; D.k. at 720 nm; DL-isomer.	660011
1155	**Methionylglycine**				
	$e_{aq}^- +$ MetGly $\rightarrow$	6.3	3.7×10^9	p.r.; D.k. at 550 nm in Ar-satd. unbuffered soln. contg. 0.1 mol L^{-1} *tert*-BuOH.	751045
1156	**Methionylisoleucine**				
	$e_{aq}^- +$ MetIle $\rightarrow$	5.9	4.4×10^8	p.r.; D.k. at 550 nm in Ar-satd. unbuffered soln. contg. 0.1 mol L^{-1} *tert*-BuOH.	751045
1157	**Methionylvaline**				
	$e_{aq}^- +$ MetVal $\rightarrow$	5.5	1.8×10^8	p.r.; D.k. at 550 nm in Ar-satd. unbuffered soln. contg. 0.1 mol L^{-1} *tert*-BuOH.	751045
1158	**4-Methoxybenzenediazonium ion**				
	$e_{aq}^- + p\text{-}CH_3OC_6H_4N_2^+ \rightarrow 4\text{-}CH_3OC_6H_4N_2\cdot$		*3.8* × *10*^{10}	Average of 2 values.	
			4.4×10^{10}	p.r.; D.k. at 600 nm in N_2-purged soln. contg. *tert*-BuOH; counterion tetrafluoroborate.	81A297
			3.2×10^{10}	p.r.; D.k. at 700 nm in 50:50 (v:v) H_2O-*tert*-BuOH; counterion tetrafluoroborate.	80A200
1159	**5-Methoxyindole**				
	$e_{aq}^- + 5\text{-}CH_3OIn \rightarrow$	7	7×10^8	f.p.; D.k. at 700 nm.	85A104
1160	**9-(2-Methoxy-4-methylsulfonylaminoanilino)acridinium ion**				
	$e_{aq}^- + m\text{-AMSA}^+ \rightarrow m\text{-AMSA}\cdot$	5.9	4.0×10^{10}	p.r.; D.k. at 680 nm in soln. contg. 0.2 mol L^{-1} *tert*-BuOH.	84C001
1161	**5-Methoxy-2-nitrobenzofuran**				
	$e_{aq}^- + NO_2F \rightarrow NO_2F\cdot^-$	7	$\sim 2 \times 10^{10}$	p.r.; Electron adduct formed in Ar-satd. soln. contg. 0.1 mol L^{-1} 2-PrOH and 10^{-2} mol L^{-1} phosphate buffer.	82R087
1162	**7-Methoxy-2-nitrobenzofuran**				
	$e_{aq}^- + NO_2F \rightarrow NO_2F\cdot^-$	7	$\sim 2 \times 10^{10}$	p.r.; Electron adduct formed in Ar-satd. soln. contg. 0.1 mol L^{-1} 2-PrOH and 10^{-2} mol L^{-1} phosphate buffer.	82R087
1163	**Methoxyphenol**				
	$e_{aq}^- + CH_3OC_6H_4OH \rightarrow$	6.9	1.7×10^9	X-r; C.k.; obs. decrease in emission from Cyanosin on addn. of substrate; isomer not specified; rel. to $k(e_{aq}^- + NO_3^-)$.	766558
1164	**4-Methoxyphenyl-*N*-*tert*-butylnitrone**				
	$e_{aq}^- +$ 4-CH_3O-PBN $\rightarrow OH^- +$ 4-CH_3O-PBN(H)	7	1.5×10^{10}	p.r.; D.k. at 650 nm in deaerated soln. contg. *tert*-BuOH.	82A184
1165	**8-Methoxypsoralen**				
	$e_{aq}^- +$ 8-MOP $\rightarrow$ 8-MOP$\cdot^-$		2.0×10^{10}	p.r.; D.k. at 700 nm in soln. contg. 5×10^{-2} mol L^{-1} glucose.	80R035

TABLE 6. Rate constants for reactions of hydrated electrons in aqueous solution—Continued

No.	Reaction	pH	k (L mol^{-1} s^{-1})	Comment	Ref.
1165	**8-Methoxypsoralen**—Continued				
		7	1.1×10^{10}	p.r.; D.k. at 600 nm in N_2-satd. soln. contg. 0.5 mol L^{-1} *tert*-BuOH.	78A126
1166	**Methyl Green, dication**				
	$e_{aq}^- + MG^{2+} \rightarrow$		4.3×10^{10}	p.r.; D.k. in soln. contg. glucose; also studied effect of heparin on rate.	682104
1167	***N*-Methylacetamide**				
	$e_{aq}^- + CH_3CONHCH_3 \rightarrow$		2.3×10^6	p.r.	82G098
1168	**Methyl acetate**				
	$e_{aq}^- + CH_3CO_2CH_3 \rightarrow CH_3\dot{C}(O^-)OCH_3$	7.8, 13	8.7×10^7	p.r.; Soln. contg. *tert*-BuOH.	78A402
1169	**Methyl acrylate**				
	$e_{aq}^- + H_2C{=}CHCO_2CH_3 \rightarrow [H_2\dot{C}CHCO_2CH_3]^{\cdot -}$	11	9.4×10^9	f.p.; D.k.; H_2-satd. soln. contg. 10^{-3} mol L^{-1} NaOH.	717345
1170	**2-Methyladenine**				
	$e_{aq}^- + C_6H_7N_5 \rightarrow$	7	8.4×10^9	p.r.; D.k.; pK_a ~10; at pH 11 $k = 1.0 \times 10^9$; $I = 0.1$.	710375
1171	**7-Methyladenine**				
	$e_{aq}^- + C_6H_7N_5 \rightarrow$	6-12	1.3×10^{10}	p.r.; D.k.; $I = 0.1$.	710375
1172	**Methylamine**				
	$e_{aq}^- + CH_3NH_2 \rightarrow$	11.8	9×10^5	p.r.; D.k. at 720 or 815 nm in 0.1 mol L^{-1} soln.; calcd. from k_{obs} over a pH range.	700371
1173	**Methylammonium ion**				
	$e_{aq}^- + CH_3NH_3^+ \rightarrow H\cdot + CH_3NH_2$		*1.9 × 10^6*	Average of 2 values.	
		7.8	1.9×10^6	p.r.; D.k. at 720 or 815 nm in 0.1 mol L^{-1} soln.; calcd. from k_{obs} over a pH range.	700371
		7.6	1.8×10^6	p.r.; D.k. at 720 nm.	660011
1174	**Methyl 2-aminoacetate**				
	$e_{aq}^- + H_2NCH_2CO_2CH_3 \rightarrow$		*3.1 × 10^8*	Average of 2 values.	
		11.2	3.3×10^8	p.r.; D.k. at 700 nm.	713052
		10.7	2.9×10^8	p.r.; D.k. in unbuffered soln. contg. 1×10^{-3} mol L^{-1} EtOH.	670298
1175	**Methyl 2-aminoacetate, conjugate acid**				
	$e_{aq}^- + H_3N^+CH_2CO_2CH_3 \rightarrow$	5.3	6.8×10^9	p.r.; D.k. at 700 nm; ≥ 90% deamination; pK = 7.75.	713052
1176	**4-Methylbenzenediazonium ion**				
	$e_{aq}^- + p\text{-}CH_3C_6H_4N_2^+ \rightarrow 4\text{-}CH_3C_6H_4N_2\cdot$		5.7×10^{10}	p.r.; D.k. at 600 nm in N_2-purged soln. contg. *tert*-BuOH; counterion tetrafluoroborate.	81A297
			2.5×10^{10}	p.r.; D.k. at 700 nm in 50:50 (v:v) H_2O-*tert*-BuOH; counterion tetrafluoroborate.	80A200
1177	**α-Methylbenzylamine**				
	$e_{aq}^- + C_6H_5CH(CH_3)NH_2 \rightarrow [C_6H_5\dot{C}H(CH_3)NH_2]^{\cdot -}$	11.2	6.2×10^7	p.r.; P.b.k. at 317 nm in N_2-satd. soln. contg. 1 mol L^{-1} *tert*-BuOH and 5×10^{-3} mol L^{-1} amine.	86A410
1178	**α-Methylbenzylammonium ion**				
	$e_{aq}^- + C_6H_5CH_2NH_2^+CH_3 \rightarrow NH_3 + C_6H_5\dot{C}HCH_3$	~7	6.6×10^8	p.r.; D.k. at 600 nm, as well as p.b.k. at 318 nm (benzyl radical) in N_2-satd. soln. contg. 1 mol L^{-1} *tert*-BuOH and 5-10 $\times 10^{-4}$ mol L^{-1} amine; 42% deamination.	86A410
1179	***N*-Methylbenzylamine**				
	$e_{aq}^- + C_6H_5CH_2NHCH_3 \rightarrow [C_6H_5CH_2\dot{N}HCH_3]^{\cdot -}$	11.2	8.1×10^7	p.r.; D.k. at 600 nm in N_2-satd. soln. contg. 1 mol L^{-1} *tert*-BuOH and 5×10^{-3} mol L^{-1} amine.	86A410

TABLE 6. Rate constants for reactions of hydrated electrons in aqueous solution—Continued

No.	Reaction	pH	k (L mol^{-1} s^{-1})	Comment	Ref.
1180	***N*-Methylbenzylammonium ion**				
	$e_{aq}^- + C_8H_{12}N^+ \rightarrow NH_3 + C_6H_5CH_2$	7.1	1.6×10^9	p.r.; D.k. at 600 nm in N_2-satd. soln. contg. 1 mol L^{-1} *tert*-BuOH and 1-5 × 10^{-3} mol L^{-1} amine; 42% deamination.	86A410
1181	**3-Methyl-7,8-bis,nor-5-deazalumiflavin**				
	$e_{aq}^- + dFl_{ox} \rightarrow HdFl$	7.2	1.7×10^{10}	p.r.; P.b.k. at 515 nm in soln. contg. phosphate buffer.	81A434
1182	**20-Methylcholanthrene**				
	$e_{aq}^- + C_{21}H_{16} \rightarrow$	~7	6×10^9	p.r.; D.k. at 650 nm in soln. contg. 0.1 mol L^{-1} *tert*-BuOH.	76A256
1183	***S*-Methylcysteine**				
	$e_{aq}^- + CH_3SCH_2CH(NH_3^+)CO_2^- \rightarrow$	5.4	7.2×10^8	p.r.; D.k. at 700 nm in soln. contg. ~0.1 mol L^{-1} *tert*-BuOH; pK_a = 2, 8.8.	730090
1184	***S*-Methylcysteine, negative ion**				
	$e_{aq}^- + CH_3SCH_2CH(NH_2)CO_2^- \rightarrow$	12.2	1.5×10^8	p.r.; D.k. at 700 nm in soln. contg. ~0.1 mol L^{-1} *tert*-BuOH; pK_a = 2, 8.8.	730090
1185	**1-Methylcytosine**				
	$e_{aq}^- +$ 1-MeCy $\rightarrow$	7-14	1.4×10^{10}	p.r.; D.k.; I = 0.1.	710375
1186	**5-Methylcytosine**				
	$e_{aq}^- +$ 5-MeCy $\rightarrow$	7.7	1.0×10^{10}	p.r.; D.k. at 578 nm.	640044
1187	**Methylene Blue cation**				
	$e_{aq}^- + MB^+ \rightarrow MB\cdot$		*2.5 × 10^{10}*	Average of 4 values.	
		7.5	2.2×10^{10}	p.r.; D.k. at 730 nm in Ar-satd. soln. contg. 2 × 10^{-2} mol L^{-1} *tert*-BuOH and 10^{-5} mol L^{-1} dye.	82A258
		7.4	3.1×10^{10}	p.r.; D.k. at 720 nm in soln. contg. formate; k decreases with addn. of heparin.	79A413
			2.4×10^{10}	p.r.; D.k. at 720 nm; soln. contains 10^{-2} mol L^{-1} glucose; also studied effect of various polyanions on rate.	680238
		7.8	2.5×10^{10}	p.r.; D.k. at 520 nm (e_{aq}^-) as well as d.k. at 580 nm (dye) and p.b.k. at 425 nm (semiquinone), soln. contains 10^{-1} mol L^{-1} formate.	650396
1188	***N*-Methylformamide**				
	$e_{aq}^- + HCONHCH_3 \rightarrow$	9.2	7.1×10^7 [b]	p.r.; D.k. in soln. contg. 0.5 mol L^{-1} *tert*-BuOH and borate buffer.	710414
			1.5×10^7 [b]	p.r.; D.k.; 10^{-2} mol L^{-1} soln. of amide.	670054
1189	**Methyl fumarate ion**				
	$e_{aq}^- +$ *trans*-$CH_3O_2CCH{=}CHCO_2^-$ → $MMF^{\cdot 2-}$		1.3×10^{10}	p.r.; D.k. at 700 nm in soln. contg. 0.5 mol L^{-1} *tert*-BuOH.	730097
1190	**1-Methylguanosine**				
	$e_{aq}^- + C_{11}H_{15}N_5O_5 \rightarrow$	9.2	7.7×10^9	p.r.; D.k. at 700 nm.	751060
1191	***N*-Methylhistidine, conjugate acid**				
	$e_{aq}^- + MeHisH^+ \rightarrow MeHisH\cdot$	6.0	5.1×10^9	p.r.; D.k. at 700 nm in soln. contg. ~1.0 mol L^{-1} *tert*-BuOH at 1 atm. Ar; pK_a = 6.6, 8.6; at pH 10.9 k = 2.2 × 10^7.	751066
1192	**Methylhydrazine**				
	$e_{aq}^- + CH_3NHNH_2 \rightarrow$	12.0	6.5×10^6	p.r.; D.k. at 700 nm.	720003
1193	**Methylhydrazinium ion**				
	$e_{aq}^- + CH_3NHNH_3^+ \rightarrow$	5.5	1.4×10^9	p.r.; D.k. at 700 nm.	720003
1194	**Methyl hydroxyacetate**				
	$e_{aq}^- + HOCH_2CO_2CH_3 \rightarrow$	10.6	4.8×10^8	p.r.; D.k. in unbuffered soln. contg. 1 × 10^{-3} mol L^{-1} EtOH.	670298

TABLE 6. Rate constants for reactions of hydrated electrons in aqueous solution—Continued

No.	Reaction	pH	k (L mol^{-1} s^{-1})	Comment	Ref.
1195	***N*-Methylhydroxylamine**				
	$e_{aq}^- + CH_3NHOH \rightarrow$	9.0	2.4×10^8	p.r.; D.k. at 700 nm.	710493
1196	***N*-Methylhydroxylammonium ion**				
	$e_{aq}^- + CH_3NH_2OH^+ \rightarrow$	4.8	1.3×10^{10}	p.r.; D.k. at 700 nm; obs. value, could be ~30% higher; pK_a = 4.75.	710493
1197	***O*-Methylhydroxylamine**				
	$e_{aq}^- + CH_3ONH_2 \rightarrow$	9.1	4.4×10^8	p.r.; D.k. at 700 nm.	710493
1198	***O*-Methylhydroxylammonium ion**				
	$e_{aq}^- + CH_3ONH_3^+ \rightarrow$	4.5	$>1.9 \times 10^{10}$	p.r.; D.k. at 700 nm; obs. value, could be ~30% higher; pK_a = 4.6.	710493
1199	**1-Methylimidazole**				
	$e_{aq}^- + 1\text{-}CH_3Im \rightarrow$	10.2	3.3×10^7	p.r.; D.k. at 700 nm in soln. contg. ~1.0 mol L^{-1} *tert*-BuOH at 1 atm. Ar.	751066
1200	**1-Methylimidazole, conjugate acid**				
	$e_{aq}^- + CH_3ImH^+ \rightarrow$	6.0	1.0×10^{10}	p.r.; D.k. at 700 nm in soln. contg. ~1.0 mol L^{-1} *tert*-BuOH at 1 atm. Ar; pK_a = 7.0.	751066
1201	**2-Methylindole**				
	$e_{aq}^- +$ 2-MeIn $\rightarrow$	7.1	6×10^7	p.r.; D.k. at 635 nm.	690459
1202	**3-Methylindole**				
	$e_{aq}^- +$ 3-MeIn $\rightarrow$	8.2	2.6×10^8	p.r; D.k. at 635 nm.	690459
1203	**1-Methyllumichrome**				
	$e_{aq}^- +$ Fl $\rightarrow$ FlH$\cdot$	6	2.2×10^{10}	p.r.; D.k. at 720 nm in deaerated soln. contg. 0.5 mol L^{-1} *tert*-BuOH; at pH 10 $k = 2.3 \times 10^{10}$, pK_a ~8.5.	82B104
1204	**3-Methyllumichrome**				
	$e_{aq}^- +$ Fl $\rightarrow$ FlH$\cdot$	6	2.8×10^{10}	p.r.; D.k. at 720 nm in deaerated soln. contg. 0.5 mol L^{-1} *tert*-BuOH; at pH 10 $k = 3.3 \times 10^{10}$, pK_a ~8.5.	82B104
1205	**Methyl methacrylate**				
	$e_{aq}^- + H_2C{=}C(CH_3)CO_2CH_3 \rightarrow [CH_2C(CH_3)CO_2CH_3]\cdot^-$	9.2	1.3×10^{10}	p.r.; D.k. at 700 nm in soln. contg. ~0.1 mol L^{-1} *tert*-BuOH and 10^{-3} mol L^{-1} borate.	751052
1206	**Methyl methylthiomethyl sulfoxide**				
	$e_{aq}^- + CH_3SOCH_2SCH_3 \rightarrow CH_3SO^-CH_2SCH_3$	6-11	1.3×10^8	p.r.; D.k. at 600 nm in soln. contg. 1 mol L^{-1} *tert*-BuOH.	82A275
1207	**2-Methyl-1,4-naphthoquinone**				
	$e_{aq}^- +$ 2-CH_3-NQ $\rightarrow$ 2-CH_3-NQ$\cdot^-$		*4.5* $\times$ *10^{10}*	Average of 3 values.	
		7	3.1×10^{10}	p.r.; D.k. at 700 nm in phosphate buffer (0.002 mol L^{-1} KH_2PO_4 + 0.003 mol L^{-1} Na_2HPO_4) contg. 0.2 mol L^{-1} 2-PrOH and varied quinone concn.; $k = 6.5 \times 10^9$ in SDS micelles.	86N187
		~7	5.0×10^{10}	p.r.; D.k. at 650 nm in soln. contg. 0.1 mol L^{-1} *tert*-BuOH.	76A256
			5.4×10^{10}	p.r.; No details given.	723057
1208	**1-Methylnicotinamide**				
	$e_{aq}^- +$ 3-py$^+$(CH$_3$)CONH$_2$ $\rightarrow$ 3-py(CH$_3$)CONH$_2$		*4.1* $\times$ *10^{10}*	Average of 3 values.	
			4.1×10^{10}	p.r.; D.k.; counterion I^-.	761169
		9.0	4.1×10^{10}	p.r.; D.k. at 700 nm.	741089
		8.5	4.1×10^{10}	p.r.; Soln. contains 10^{-1} mol L^{-1} sodium formate.	680441
1209	**2-Methyl-5-nitroimidazole**				
	$e_{aq}^- + CH_3ImNO_2 \rightarrow [CH_3ImNO_2]\cdot^-$	7	3.0×10^{10}	p.r.; D.k. at 600 nm in soln. contg. 0.5 mol L^{-1} *tert*-BuOH, as well as p.b.k.	761075

TABLE 6. Rate constants for reactions of hydrated electrons in aqueous solution—Continued

No.	Reaction	pH	k (L mol^{-1} s^{-1})	Comment	Ref.
1210	**7-*con*-*O*-Methylnogalarol** $e_{aq}^- + C_{30}H_{33}NO_{12} \rightarrow$		3.5×10^{10}	p.r.; D.k. at 650 nm.	81R163
1211	**7-*dis*-*O*-Methylnogalarol** $e_{aq}^- + C_{30}H_{33}NO_{12} \rightarrow$		3.5×10^{10}	p.r.; D.k. at 650 nm.	81R163
1212	**7-*con*-*O*-Methylnogarol** $e_{aq}^- + C_{28}H_{31}NO_{10} \rightarrow$		3.5×10^{10}	p.r.; D.k. at 650 nm.	81R163
1213	**7-*dis*-*O*-Methylnogarol** $e_{aq}^- + C_{28}H_{31}NO_{10} \rightarrow$		3.5×10^{10}	p.r.; D.k. at 650 nm.	81R163
1214	**1-Methyl-1'-octadecyl-4,4'-bipyridinium ion** $e_{aq}^- + SV^{2+} \rightarrow SV^{\bullet+}$	3	8.8×10^{10}	p.r.; Ar-satd. soln. contg. 1 mol L^{-1} MeOH.	82S292
1215	**Methylpenicillin** $e_{aq}^- + C_{10}H_{14}N_2O_4S \rightarrow$	6.0	2.0×10^9	p.r.; D.k. at 700 nm.	733020
1216	**4-Methylphenyl-*N*-*tert*-butylnitrone** $e_{aq}^- + 4\text{-}CH_3\text{-PBN} \rightarrow OH^- +$ 4-CH_3-PBN(H)	7	1.0×10^{10}	p.r.; D.k. at 650 nm in deaerated soln. contg. *tert*-BuOH.	82A184
1217	**5-Methyl-1-phenyl-2,3-trimethyleneisoindole-4,7-dione** $e_{aq}^- + C_{18}H_{15}NO_2 \rightarrow C_{18}H_{15}NO_2^-$		3.5×10^{10}	p.r.	82A329
1218	**2-Methyl-2-propanethiol** $e_{aq}^- + (CH_3)_3CSH \rightarrow HS^- +$ $(CH_3)_3\dot{C}$	7	3.0×10^9	p.r.; D.k. at 720 nm in Ar-satd. soln.	690553
1219	**2-Methyl-2-propanol** $e_{aq}^- + (CH_3)_3COH \rightarrow$	9-11.5	4×10^5	p.r.; D.k. at 720 nm in Ar-satd. soln. contg. *tert*-BuOH.	85A158
1220	**Methyl propionate** $e_{aq}^- + C_2H_5CO_2CH_3 \rightarrow$	6.81	9.0×10^7	p.r.; D.k. in unbuffered soln. contg. 1×10^{-3} mol L^{-1} EtOH.	670298
1221	**3-Methylpterin** $e_{aq}^- + C_7H_7N_5O \rightarrow$	7.7	2.9×10^{10}	p.r.; D.k. at 700 nm in soln. contg. 0.5 mol L^{-1} *tert*-BuOH.	761060
1222	**9-Methylpurine** $e_{aq}^- + C_6H_6N_4 \rightarrow$	8.5	1.9×10^{10}	p.r.; D.k. at 700 nm.	751060
1223	**1-Methyl-2-pyrrolidinone** $e_{aq}^- + C_5H_9NO \rightarrow$		6.2×10^6	p.r.	82G098
1224	**α-Methylstyrene** $e_{aq}^- + C_6H_5C(CH_3)=CH_2 \rightarrow$	5.5	3.0×10^9	p.r.; D.k. at 720 nm.	77A236
1225	***N*-Methylsuccinimide** $e_{aq}^- + C_5H_7NO_2 \rightarrow$	6.9	1.3×10^{10}	p.r.; D.k. at 700 nm in soln. contg. ~0.1-1 mol L^{-1} *tert*-BuOH.	730091
1226	**Methyl sulfate ion** $e_{aq}^- + CH_3OSO_3^- \rightarrow$	6	$\sim 1 \times 10^9$	p.r.; D.k. at 650 nm in soln. contg. 10^{-3} mol L^{-1} glucose; counterion Na^+.	773034
1227	**Methyl thioglycolate** $e_{aq}^- + HSCH_2CO_2CH_3 \rightarrow$ $\cdot CH_2CO_2CH_3 + HS^-$	5.2	1.4×10^{10}	p.r.; D.k. at 700 nm in soln. contg. ~0.1 mol L^{-1} *tert*-BuOH; pK_a = 7.8; at pH 10.3 $k = 1.4 \times 10^9$.	730090
1228	**Methyl trifluoroacetate** $e_{aq}^- + CF_3CO_2CH_3 \rightarrow$	10.62	1.9×10^9	p.r.; D.k. in unbuffered soln. contg. 1×10^{-3} mol L^{-1} EtOH.	670298
1229	**Methyl trimethylacetate** $e_{aq}^- + (CH_3)_3CCO_2CH_3 \rightarrow$	5.91	2.3×10^7	p.r.; D.k. in unbuffered soln. contg. 1×10^{-3} mol L^{-1} EtOH.	670298

TABLE 6. Rate constants for reactions of hydrated electrons in aqueous solution—Continued

No.	Reaction	pH	k (L mol^{-1} s^{-1})	Comment	Ref.
1230	**5-Methyl-1,2-trimethyleneisoindole-4,7-dione**				
	$e_{aq}^- + C_{12}H_{11}NO_2 \rightarrow C_{12}H_{11}NO_2^-$	7	2.4×10^{10}	p.r.; D.k.	84R027
1231	**Methyltriphenylphosphonium ion**				
	$e_{aq}^- + CH_3P^+(C_6H_5)_3 \rightarrow CH_3\dot{P}(C_6H_5)_3$	~7	2.4×10^{10}	p.r.; D.k. in soln. contg. 0.2 mol L^{-1} *tert*-BuOH.	82A051
1232	**Metiasinic acid, conjugate base**				
	$e_{aq}^- + MZ^- \rightarrow MZ^{\cdot 2-}$	10	1.5×10^9	p.r.; D.k. at 600 nm in N_2-satd. soln. contg. *tert*-BuOH.	81A162
1233	**Naphthalene**				
	$e_{aq}^- + C_{10}H_8 \rightarrow [C_{10}H_8]^{\cdot -}$		*5.1* $\times$ *10^9*	Average of 3 values.	
			5.0×10^9	p.r.; D.k. at 650 nm in Ar-satd. soln. contg. 1 mol L^{-1} EtOH.	80N019
		12.1	5×10^9	p.r.; D.k. in 1% MeOH soln.; $k = 2.9 \times 10^{10}$ in CTAB (3.0×10^{10} by p.b.k.).	741011
		~11	5.4×10^9	p.r.; D.k.	640138
1234	**2-Naphthalenesulfonate ion**				
	$e_{aq}^- + 2\text{-NpSO}_3^- \rightarrow 2\text{-NpSO}_3^{\cdot 2-}$	8.5	8×10^9	p.r.; P.b.k. in Ar-satd. soln. contg. 1 mol L^{-1} *tert*-BuOH and 10^{-3} mol L^{-1} substrate.	767189
1235	**1-Naphthoate ion**				
	$e_{aq}^- + 1\text{-NpCO}_2^- \rightarrow$	~11	6.1×10^9	p.r.; D.k.	640138
1236	**2-Naphthoate ion**				
	$e_{aq}^- + 2\text{-NpCO}_2^- \rightarrow$	~11	9.5×10^9	p.r.; D.k.	640138
1237	**1-Naphthonitrile**				
	$e_{aq}^- + 1\text{-NpCN} \rightarrow$	~11	2.1×10^{10}	p.r.; D.k.	640138
1238	**2-Naphthonitrile**				
	$e_{aq}^- + 2\text{-NpCN} \rightarrow$	~11	2.1×10^{10}	p.r.; D.k.	640138
1239	**1,2-Naphthoquinone-4-sulfonate ion**				
	$e_{aq}^- + 4\text{-SO}_3\text{NQ}^- \rightarrow 4\text{-SO}_3\text{NQ}^{\cdot 2-}$	~9.2	1.7×10^{10}	p.r.; D.k. at 700 nm in soln. contg. 0.1 mol L^{-1} *tert*-BuOH.	720171
1240	**1,4-Naphthoquinone-2-sulfonate ion**				
	$e_{aq}^- + 2\text{-SO}_3\text{NQ}^- \rightarrow 2\text{-SO}_3\text{NQ}^{\cdot 2-}$	~9.2	2.6×10^{10}	p.r.; D.k. at 700 nm in soln. contg. 0.1 mol L^{-1} *tert*-BuOH.	720171
1241	**β-Naphthylamine**				
	$e_{aq}^- + 2\ \text{NpNH}_2 \rightarrow$	~7	1.8×10^{10}	p.r.; D.k. at 650 nm in soln. contg. 0.1 mol L^{-1} *tert*-BuOH.	76A256
1242	**1-Naphthoxide ion**				
	$e_{aq}^- + 1\text{-NpO}^- \rightarrow$	~11	9.6×10^8	p.r.; D.k.	640138
1243	**2-Naphthoxide ion**				
	$e_{aq}^- + 2\text{-NpO}^- \rightarrow$	11	1.8×10^9	p.r.; D.k. at 578 nm.	640044
1244	**Nicotinamide**				
	$e_{aq}^- + 3\text{-pyCONH}_2 \rightarrow \text{py(H)CONH}_2$	7.5	2.4×10^{10}	p.r.; D.k. at 650 nm.	710582
1245	**Nicotinamide adenine dinucleotide**				
	$e_{aq}^- + NAD^+ \rightarrow NAD\cdot$		*2.5* $\times$ *10^{10}*	Average of 2 values.	
			2.5×10^{10}	p.r.; D.k. at 680 nm.	761169
		6.4	2.5×10^{10}	p.r.; D.k. at 700 nm; soln. contains 10^{-1} mol L^{-1} sodium formate.	680441
1246	**Nicotinamide adenine dinucleotide, reduced**				
	$e_{aq}^- + NADH \rightarrow NAD\cdot$	~7	5.2×10^9	p.r.; D.k. at 700 nm; soln. N_2O-satd.	680441
1247	**Nicotinate ion**				
	$e_{aq}^- + 3\text{-pyCO}_2^- \rightarrow 3\text{-py(H)CO}_2^-$	10.5	1.0×10^{10}	p.r.; D.k. at 650 nm.	710582

TABLE 6. Rate constants for reactions of hydrated electrons in aqueous solution—Continued

No.	Reaction	pH	k (L mol^{-1} s^{-1})	Comment	Ref.
1248	**Nicotinylglycine**				
	$e_{aq}^- + $ 3-pyCOGly → 3-py(H)COGly	9.2	2.1×10^{10}	p.r.; D.k. at 650 nm.	710582
1249	**Nifuroxime**				
	$e_{aq}^- + $ NF → NF·$^-$	6.8	3.8×10^{10}	p.r.; D.k. at 550 nm (e_{aq}^-) or at 360 nm (NF) as well as p.b.k. at 395 nm; slight decrease in k with increase in pH (4-12).	731018
1250	**Nitrilotriacetate ion**				
	$e_{aq}^- + HN^+(CH_2CO_2^-)_3$ →	9.0	3.6×10^7	p.r.; D.k. in soln. contg. 0.1 mol L^{-1} *tert*-BuOH and 0.01 mol L^{-1} NTA; k decreased to 3×10^6 at 0.25 mol L^{-1} NTA.	81A148
1251	**Nitrilotriethanol, conjugate acid**				
	$e_{aq}^- + (HOCH_2CH_2)_3NH^+$ → $(HOCH_2CH_2)_3N + H$·		1.6×10^6	p.r.; D.k. at 460 nm.	82G071
1252	**Nitro Blue Tetrazolium**				
	$e_{aq}^- + NBT^{2+}$ → NBT·$^+$		$\sim 7.3 \times 10^{10}$	p.r.; D.k. at 800 nm in deoxygenated soln. contg. formate ion and buffer gave $k_{obs} = 4 \times 10^{10}$ ($I = 0.13$); k cor. for I.	84A240
1253	***p*-Nitroacetophenone**				
	$e_{aq}^- + $ PNAP → PNAP		*4.3 × 10^{10}*	Average of 2 values.	
		6.8	4.1×10^{10}	p.r.; D.k. at 578 nm as well as p.b.k. at 350 nm in soln. contg. 0.4 mol L^{-1} *tert*-BuOH.	761017
		~7	4.5×10^{10}	p.r.; D.k. in soln. contg. *tert*-BuOH.	751207
1254	***p*-Nitroaniline**				
	$e_{aq}^- + 4\text{-}O_2NC_6H_4NH_2$ →	9.6	1.8×10^9	p.r.; D.k. at 380 nm in Ar-satd. soln. contg. 0.1 mol L^{-1} *tert*-BuOH.	771118
1255	**5-Nitrobarbiturate ion**				
	$e_{aq}^- + $ 6-OH-5-NO_2U → [6-OH-5-NO_2U]·$^-$	5.9	1.8×10^{10}	p.r.; D.k. at 600 nm in deoxygenated soln. contg. 0.5 mol L^{-1} *tert*-BuOH.	731003
1256	**Nitrobenzene**				
	$e_{aq}^- + C_6H_5NO_2$ → $C_6H_5\dot{N}O_2^-$		*3.7 × 10^{10}*	Average of 7 values.	
			3.8×10^{10}	p.r.; D.k.	85A282
			3.9×10^{10}	p.r.; D.k.	84A357
			2.5×10^{10}	p.r.; D.k.	84A200
			3.9×10^{10}	p.r.; D.k.	79A109
			3.5×10^{10}	p.r.; D.k. at 600 nm.	78A131
		~8	4.2×10^{10}	p.r.; D.k. at 720 nm in soln. contg. 0.005-0.01 mol L^{-1} *tert*-BuOH.	77A201
			4.2×10^{10}	p.r.; D.k.; k decreased in H_2O-ethanol mixtures.	731008
1257	**4-Nitrobenzenediazonium ion**				
	$e_{aq}^- + 4\text{-}NO_2C_6H_4N{=}N^+$ → 4-$NO_2C_6H_4N_2$·		4.7×10^{10}	p.r.; D.k. at 600 nm in N_2-purged soln. contg. *tert*-BuOH; counterion tetrafluoroborate.	81A297
1258	**4-Nitrobenzoate ion**				
	$e_{aq}^- + 4\text{-}NO_2C_6H_4CO_2^-$ →		3.4×10^{10}	p.r.; D.k. at 715 nm	700211
1259	**2-Nitrobenzofuran**				
	$e_{aq}^- + NO_2F$ → NO_2F·$^-$	7	$\sim 2 \times 10^{10}$	p.r.; Electron adduct formed in Ar-satd. soln. contg. 0.1 mol L^{-1} 2-PrOH and 10^{-2} mol L^{-1} phosphate buffer.	82R087
1260	**Nitroethane**				
	$e_{aq}^- + C_2H_5NO_2$ →	0-6	2.7×10^{10}	γ-r.; C.k.; rel. to $k(e_{aq}^- + H^+)$.	670180
1261	**5-Nitro-2-furaldehyde**				
	$e_{aq}^- + $ NF → NF·$^-$	7	3.4×10^{10}	p.r.; D.k.	731018
1262	**5-Nitro-2-furaldehyde diacetate**				
	$e_{aq}^- + $ NF → NF·$^-$	7	3.0×10^{10}	p.r.; D.k.	731018

TABLE 6. Rate constants for reactions of hydrated electrons in aqueous solution—Continued

No.	Reaction	pH	k (L mol^{-1} s^{-1})	Comment	Ref.
1263	**5-Nitro-2-furaldehyde semicarbazone**				
	$e_{aq}^- + NF \rightarrow NF^{\cdot -}$		2.8×10^{10}	p.r.; D.k. at 550 nm as well as p.b.k. in deoxygenated soln. contg. 0.1 mol L^{-1} *tert*-BuOH.	733016
1264	**5-Nitrofuroate ion**				
	$e_{aq}^- + NF \rightarrow NF^{\cdot -}$	3.3-7	2.2×10^{10}	p.r.; D.k. at 600 nm as well as p.b.k. at 375 nm, in O_2-free soln. contg. 0.5 mol L^{-1} *tert*-BuOH.	730114
1265	**2-Nitroimidazole**				
	$e_{aq}^- + ImNO_2 \rightarrow [ImNO_2]^{\cdot -}$	7	3.7×10^{10}	p.r.; D.k. at 600 nm in soln. contg. 0.5 mol L^{-1} *tert*-BuOH, as well as p.b.k.	761075
1266	**4-Nitroimidazole**				
	$e_{aq}^- + ImNO_2 \rightarrow [ImNO_2]^{\cdot -}$	7	3.1×10^{10}	p.r.; D.k. at 600 nm in soln. contg. 0.5 mol L^{-1} *tert*-BuOH, as well as p.b.k.	761075
1267	**4-Nitroisothiazole**				
	$e_{aq}^- + IThNO_2 \rightarrow [IThNO_2]^{\cdot -}$	7	3.3×10^{10}	p.r.; D.k. at 600 nm in soln. contg. 0.5 mol L^{-1} *tert*-BuOH, as well as p.b.k.	761075
1268	**Nitromethane**				
	$e_{aq}^- + CH_3NO_2 \rightarrow CH_3NO_2^-$		*2.2 × 10^{10}*	Average of 2 values.	
			2.2×10^{10}	p.r.; D.k. at 720 nm; k unchanged in sodium dodecyl sulfate soln.	731004
		7	2.1×10^{10}	p.r.; D.k. at 720 nm.	660800
1269	***aci*-Nitromethane anion**				
	$e_{aq}^- + CH_2NO_2^- \rightarrow OH^- + CH_3NO_2^-$	12	6.6×10^{9}	p.r.; D.k. at 720 nm.	660800
1270	**5-Nitro-6-methyluracil**				
	$e_{aq}^- + 5\text{-}NO_2\text{-}6\text{-}MeU \rightarrow [5\text{-}NO_2\text{-}6\text{-}MeU]^{\cdot -}$	5.9	1.9×10^{10}	p.r.; D.k. at 600 nm in deoxygenated soln. contg. 0.5 mol L^{-1} *tert*-BuOH.	731003
1271	**5-Nitroorotate ion**				
	$e_{aq}^- + 5\text{-}NO_2U\text{-}6\text{-}CO_2^- \rightarrow [5\text{-}NO_2U\text{-}6\text{-}CO_2^-]^{\cdot -}$	5.9	1.8×10^{10}	p.r.; D.k. at 600 nm in deoxyg. soln. contg. 0.5 mol L^{-1} *tert*-BuOH.	731003
1272	***p*-Nitroperoxybenzoic acid**				
	$e_{aq}^- + O_2NC_6H_4CO_3H \rightarrow [O_2NC_6H_4CO_3H]^{\cdot -}$	5.0	1.5×10^{10}	p.r.; D.k. in soln. contg. 0.5 mol L^{-1} *tert*-amyl alcohol; pK = 6.95.	741078
1273	**4-Nitrophenol**				
	$e_{aq}^- + 4\text{-}O_2NC_6H_4OH \rightarrow HOC_6H_4NO_2^-$	5.5	4.4×10^{10}	p.r.; D.k.; k also detd. at 6.4×10^8 N m^{-2}.	720102
1274	**2-Nitrophenoxide ion**				
	$e_{aq}^- + 2\text{-}NO_2C_6H_4O^- \rightarrow$	~11	2.0×10^{10}	p.r.; D.k.	640138
1275	**3-Nitrophenoxide ion**				
	$e_{aq}^- + 3\text{-}NO_2C_6H_4O^- \rightarrow$	~11	2.5×10^{10}	p.r.; D.k.	640138
1276	**4-Nitrophenoxide ion**				
	$e_{aq}^- + 4\text{-}NO_2C_6H_4O^- \rightarrow$	~11	2.5×10^{10}	p.r.; D.k.	640138
1277	**4-Nitrophenylacetate ion**				
	$e_{aq}^- + 4\text{-}NO_2C_6H_4CH_2CO_2^- \rightarrow$	7	1.8×10^{10}	p.r.; D.k.; at pH 11, 14 and 3 mol L^{-1} OH^- k = 1.9×10^{10}, 2.1×10^{10}, and 1.7×10^{10}, resp.	650047
1278	**4-Nitrophenyl-*N*-*tert*-butylnitrone**				
	$e_{aq}^- + 4\text{-}NO_2\text{-}PBN \rightarrow OH^- + 4\text{-}NO_2\text{-}PBN(H)$	7	1.2×10^{10}	p.r.; D.k. at 650 nm in deaerated soln. contg. *tert*-BuOH.	82A184
1279	***o*-Nitrophenyl-β-D-glucopyranoside**				
	$e_{aq}^- + GluOC_6H_4NO_2 \rightarrow gluOC_6H_4NO_2^{\cdot -}$		2.5×10^{10}	p.r.; D.k.	710056

TABLE 6. Rate constants for reactions of hydrated electrons in aqueous solution—Continued

No.	Reaction	pH	k (L mol^{-1} s^{-1})	Comment	Ref.
1280	***p*-Nitrophenyl-β-D-glucopyranoside**				
	$e_{aq}^- + GluOC_6H_4NO_2 \rightarrow$		3.9×10^{10}	p.r.; D.k.	710056
1281	**1-Nitropropane**				
	$e_{aq}^- + CH_3CH_2CH_2NO_2 \rightarrow$	0-6	2.7×10^{10}	γ-r.; C.k.; rel. to $k(e_{aq}^- + H^+)$.	670180
1282	**1-Nitropyrazole**				
	$e_{aq}^- + C_3H_3N_3O_2 \rightarrow C_3H_3N_3O_2^-$	7	2.7×10^{10}	p.r.; D.k. at 600 nm in soln. contg. 0.5 mol L^{-1} *tert*-BuOH, as well as p.b.k.	761075
1283	**3-Nitropyrazole**				
	$e_{aq}^- + C_3H_3N_3O_2 \rightarrow C_3H_3N_3O_2^-$	7	3.5×10^{10}	p.r.; D.k. at 600 nm in soln. contg. 0.5 mol L^{-1} *tert*-BuOH, as well as p.b.k.	761075
1284	**2-Nitropyrrole**				
	$e_{aq}^- + C_4H_4N_2O_2 \rightarrow C_4H_4N_2O_2^-$	7	2.8×10^{10}	p.r.; D.k. at 600 nm in soln. contg. 0.5 mol L^{-1} *tert*-BuOH, as well as p.b.k.	761075
1285	**3-Nitropyrrole**				
	$e_{aq}^- + C_4H_4N_2O_2 \rightarrow C_4H_4N_2O_2^-$	7	3.3×10^{10}	p.r.; D.k. at 600 nm in soln. contg. 0.5 mol L^{-1} *tert*-BuOH, as well as p.b.k.	761075
1286	**Nitrosobenzene**				
	$e_{aq}^- + C_6H_5NO \rightarrow C_6H_5\dot{N}O^-$	7	4.3×10^{10}	p.r.; D.k. at 720 nm.	660433
1287	**2-Nitrothiophene**				
	$e_{aq}^- + C_4H_3NO_2S \rightarrow C_4H_3NO_2S^-$	7	3.0×10^{10}	p.r.; D.k. at 600 nm in soln. contg. 0.5 mol L^{-1} *tert*-BuOH, as well as p.b.k.	761075
1288	**3-Nitrothiophene**				
	$e_{aq}^- + C_4H_3NO_2S \rightarrow C_4H_3NO_2S^-$	7	3.3×10^{10}	p.r.; D.k. at 600 nm in soln. contg. 0.5 mol L^{-1} *tert*-BuOH, as well as p.b.k.	761075
1289	**4-Nitrotoluene**				
	$e_{aq}^- + CH_3C_6H_4NO_2 \rightarrow$	~11	1.9×10^{10}	p.r.; D.k.	640138
1290	**5-Nitrouracil**				
	$e_{aq}^- + 5\text{-}NO_2U \rightarrow [5\text{-}NO_2U]^{\cdot -}$	5.9	2.1×10^{10}	p.r.; D.k. at 600 nm in deoxygenated soln. contg. 0.5 mol L^{-1} *tert*-BuOH; pK = 5.5, 11.	731003
1291	**Nogalamycin**				
	$e_{aq}^- + C_{39}H_{49}NO_{16} \rightarrow$		3.5×10^{10}	p.r.; D.k. at 650 nm.	81R163
1292	***dis*-Nogamycin**				
	$e_{aq}^- + C_{37}H_{47}NO_{14} \rightarrow$		3.5×10^{10}	p.r.; D.k. at 650 nm.	81R163
1293	**Norephedrine**				
	$e_{aq}^- + C_6H_5CH(OH)CH(CH_3)NH_2 \rightarrow$	6.5	3.2×10^{8}	p.r.; D.k.	82A439
1294	**Norleucine**				
	$e_{aq}^- + Nle \rightarrow$		3.3×10^{6}	p.r.; D.k.; concn. 10^{-1} mol L^{-1}.	650389
1295	**Norpseudopelletierine *N*-oxyl**				
	$e_{aq}^- + NPPN \rightarrow$		2.4×10^{10}	p.r.; D.k. at 650 nm.	710061
1296	**Octylsulfate ion**				
	$e_{aq}^- + CH_3(CH_2)_7OSO_3^- \rightarrow$	6	$\sim 1 \times 10^{6}$	p.r.; D.k. at 650 nm in soln. contg. 10^{-3} mol L^{-1} glucose, counterion Na^+.	773034
1297	**Oleate ion**				
	$e_{aq}^- + Ol^- \rightarrow$	~7	1.0×10^{10}	p.r.; D.k. at 650 nm in soln. contg. *tert*-BuOH.	76A256
1298	**Orotate ion**				
	$e_{aq}^- + 6\text{-}UCO_2^- \rightarrow [6\text{-}UCO_2^-]^{\cdot -}$		*1.4* × *10*^{10}	Average of 2 values.	
		7.7	1.4×10^{10}	p.r.; D.k. at 600 nm in soln. contg. *tert*-BuOH, as well as p.b.k. at 320 nm (e_{aq}^- adduct). At pH 12 $k = \sim 8 \times 10^9$.	700567
		6.6	1.5×10^{10}	p.r.; D.k. at 578 nm.	640044

TABLE 6. Rate constants for reactions of hydrated electrons in aqueous solution—Continued

No.	Reaction	pH	k (L mol^{-1} s^{-1})	Comment	Ref.
1299	**Orotidine**				
	$e_{aq}^- + \text{Oro} \rightarrow \text{Oro}^{\cdot -}$	7	9×10^9	p.r.; D.k. at 600 nm in soln. contg. *tert*-BuOH, as well as p.b.k. at 320 nm (e_{aq}^- adduct).	700567
1300	**Oxalate ion**				
	$e_{aq}^- + {}^-O_2CCO_2^- \rightarrow C_2O_4^{\cdot 3-}$	7.6	3.1×10^7	p.r.; D.k. in Ar-satd. soln. contg. 0.1 mol L^{-1} oxalate ion.	86A327
			4.6×10^7	f.p.; D.k. at 650 nm in soln. contg. 0.0-0.25 mol L^{-1} oxalate ion	86A231
			1.7×10^7	p.r.; D.k. at pH 5 and 9 in soln. contg. 10^{-2} mol L^{-1} EtOH; assumed pK_1 = 1.25 and pK_2 = 4.28 for oxalic acid dissoc. and cor. for $e_{aq}^- + H_3O^+$.	710041
1301	**Oxalate ion, hydrogen**				
	$e_{aq}^- + HO_2CCO_2^- \rightarrow$		3.2×10^9	p.r.; D.k. at pH 5 and 9 in soln. contg. 10^{-2} mol L^{-1} EtOH; matrix cor.	710041
1302	**Oxalic acid**				
	$e_{aq}^- + HO_2CCO_2H \rightarrow$	1.3	$\sim 2.5 \times 10^{10}$	γ-r.; C.k.; obs. $G(H_2)$; rel. to $k(e_{aq}^- + H^+)$; k cor. for I.	690646
1303	**Oxamate ion**				
	$e_{aq}^- + H_2NCOCO_2^- \rightarrow$	9.2	5.7×10^9	p.r.; D.k.	730091
1304	**Oxamide**				
	$e_{aq}^- + H_2NCOCONH_2 \rightarrow$	9.0	3.3×10^{10}	p.r.; D.k. at 700 nm in soln. contg. ~0.1-1 mol L^{-1} *tert*-BuOH.	730091
1305	**Pantothenate ion**				
	$e_{aq}^- + PaCO_2^- \rightarrow$	6.6	1.2×10^8	p.r.; D.k. at 700 nm in soln. contg. ~0.5 mol L^{-1} *tert*-BuOH.	771034
1306	**Penamecillin**				
	$e_{aq}^- + C_{19}H_{22}N_2O_6S \rightarrow$	6.0	4.5×10^{10}	p.r.; D.k. at 700 nm.	733020
1307	**Penicillamine**				
	$e_{aq}^- + \text{PenSH} \rightarrow$ $\cdot C(CH_3)_2CH(NH_3^+)CO_2^- + HS^-$		*7.6* × *10*^{9}	Average of 2 values.	
		5.3	1.0×10^{10}	p.r.; D.k. at 700 nm in soln. contg. ~0.1 mol L^{-1} *tert*-BuOH; p$K_a \simeq$ 2, 7.9, 10.4; at pH 12.0 $k = 5.6 \times 10^8$.	730090
		6.5	5.1×10^9	p.r.; D.k. at 720 nm.	660011
1308	**Penicillamine disulfide**				
	$e_{aq}^- + (\text{PenS})_2 \rightarrow (\text{PenS})_2^{\cdot -}$	7.0	7.3×10^9	p.r.; D.k. at 700 nm in soln. contg. *tert*-BuOH and 8×10^{-3} mol L^{-1} phosphate buffer; obs. values are 4.5, 2.3, and 1.4×10^9 for pH = 8, 9, and 10, resp., net charge changes from 0 to -2 at pH 7 → 10; pK_a = 7.6, 8.8; k_{cor} = 3.7, 1.6, and 0.8×10^9, resp.	731073
		7.0	1.2×10^{10}	p.r.; D.k. at 700 nm in soln. contg. ~0.1 mol L^{-1} *tert*-BuOH; at pH 12.4 $k = 3.5 \times 10^9$.	720388
1309	**Pentafluorobenzene**				
	$e_{aq}^- + C_6HF_5 \rightarrow F^- + C_6HF_4$	~6.5	1.6×10^{10}	p.r.; D.k. in soln. contg. 0.5 mol L^{-1} *tert*-BuOH.	730054
1310	**4-Penten-2-ol**				
	$e_{aq}^- + H_2C{=}CHCH_2CH(OH)CH_3 \rightarrow$		5×10^5	p.r.; D.k.	79A109
1311	**Phenanthrene**				
	$e_{aq}^- + C_{14}H_{10} \rightarrow C_{14}H_{10}^-$	12.1	4×10^9	p.r.; D.k. in 1% MeOH soln.; $k = 3.6 \times 10^{10}$ in CTAB (4.0×10^{10} by p.b.k.).	741011
1312	**1,10-Phenanthroline**				
	$e_{aq}^- + \text{phen} \rightarrow [\text{phen}]^{\cdot -}$	7	1.8×10^{10}	p.r.; D.k. at 800 or 900 nm in soln. contg. 1 mol L^{-1} *tert*-BuOH; in 0.4 mol L^{-1} NaOH $k = 1.5 \times 10^{10}$.	80A115

TABLE 6. Rate constants for reactions of hydrated electrons in aqueous solution—Continued

No.	Reaction	pH	k (L mol^{-1} s^{-1})	Comment	Ref.
1313	**Phenethicillin**				
	$e_{aq}^- + C_{18}H_{22}N_2O_4S \rightarrow$	6.0	2.7×10^9	p.r.; D.k. at 700 nm.	733020
1314	**Phenethylamine**				
	$e_{aq}^- + C_6H_5CH_2CH_2NH_2 \rightarrow$	11.8	2.0×10^7	p.r.; D.k. at 720 nm in 0.1 mol L^{-1} soln.	700371
1315	**Phenol**				
	$e_{aq}^- + C_6H_5OH \rightarrow$		*2.0 × 10^7*	Average of 4 values.	
			2.1×10^7	p.r.; D.k.	85A282
			2.5×10^7	p.r.; D.k.	84A200
			1.6×10^7	p.r.; D.k. in Ar-satd. soln.	79A117
		6.3-6.8	1.8×10^7	p.r.; D.k. at 650 nm in Ar-satd. soln.	670122
1316	**Phenothiazine**				
	$e_{aq}^- + C_{12}H_9NS \rightarrow$	8.7	5.5×10^9	p.r.; D.k. at 720 nm in soln. contg. 0.4-0.5 mol L^{-1} *tert*-BuOH.	84A248
1317	**Phenoxide ion**				
	$e_{aq}^- + C_6H_5O^- \rightarrow$	~11	4.0×10^6	p.r.; D.k.	640138
1318	**Phenoxymethylpenicillin**				
	$e_{aq}^- + C_{16}H_{18}N_2O_5S \rightarrow$	6.0	2.7×10^9	p.r.; D.k.	733020
1319	**Phenylacetate ion**				
	$e_{aq}^- + C_6H_5CH_2CO_2^- \rightarrow$		*1.8 × 10^7*	Average of 2 values.	
		9-11.5	1.6×10^7	p.r.; D.k. at 720 nm in Ar-satd. soln. contg. 0.1 mol L^{-1} *tert*-BuOH and 10^{-4}-10^{-2} mol L^{-1} phenylacetate.	85A158
		9.0	2.0×10^7	p.r.; D.k. at 700 nm in soln. contg. *tert*-BuOH; pK_a = 4.3.	741083
1320	**Phenylacetone**				
	$e_{aq}^- + C_6H_5CH_2COCH_3 \rightarrow C_6H_5CH_2C(O^-)CH_3$	~9.2	1.2×10^{10}	p.r.; D.k. at 700 nm in soln. contg. 0.1 mol L^{-1} *tert*-BuOH.	720171
1321	**Phenylalanine**				
	$e_{aq}^- + Phe \rightarrow C_6H_5CH_2\dot{C}HCO_2^- + NH_3$		*1.4 × 10^8*	Average of 4 values.	
		5.5-7.5	~1.2×10^8	p.r.; D.k. at 600 nm; at pH 11.5-12.75 $k = 5 \times 10^7$.	86A410
		6.9	1.6×10^8	p.r.; D.k. at 700 nm in soln. contg. *tert*-BuOH; pK_a = 1.8, 9.1; 50% deamination, 50% addn.	741083
		6.28	1.1×10^8	p.r.; D.k. at 720 nm; (DL-isomer); at pH 8.65 $k = 8.8 \times 10^7$ (DL-isomer); at pH 7.0 $k = 1.5 \times 10^8$ (L-isomer).	660011
		6.7	1.5×10^8	p.r.; D.k.; DL-isomer	650389
1322	**Phenylalanine, negative ion**				
	$e_{aq}^- + Phe^- \rightarrow$	11	$<1.6 \times 10^7$	p.r.; D.k. at 600 nm.	680062
		11.2	1.4×10^7	p.r.; D.k. at 720 nm; DL-isomer; $k_{obs} = 1.7 \times 10^7$.	660011
		11	$<1 \times 10^7$	p.r.; D.k. at 578 nm; DL-isomer.	640044
1323	**Phenylalanine amide**				
	$e_{aq}^- + PheNH_2 \rightarrow C_6H_5CH_2\dot{C}HCONH_2$	9.2	1.4×10^8	p.r.; D.k. at 700 nm in soln. contg. *tert*-BuOH; pK_a = 7.2; at pH 6.2, ~60% deamination, 40% addn.	741083
1324	**Phenylalanine amide, conjugate acid**				
	$e_{aq}^- + C_6H_5CH_2CH(NH_3^+)CONH_2 \rightarrow C_6H_5CH_2\dot{C}HCONH_2$	5.4	1.4×10^9	p.r.; D.k. at 700 nm in soln. contg. *tert*-BuOH; pK_a = 7.2; at pH 6.2, ~60% deamination, 40% addn.	741083

TABLE 6. Rate constants for reactions of hydrated electrons in aqueous solution—Continued

No.	Reaction	pH	k (L mol^{-1} s^{-1})	Comment	Ref.
1825	**L-Phenylalanylglycylglycine**				
	$e_{aq}^- + PheGlyGly \rightarrow$	6.6	1.1×10^9	p.r.; D.k. at 700 nm in soln. contg. *tert*-BuOH; at pH 6.1 55% deamination, 45% addn.	741083
1826	**L-Phenylalanylglycylglycine, negative ion**				
	$e_{aq}^- + PheGlyGly^- \rightarrow$	11.3	3.7×10^8	p.r.; D.k. at 700 nm in soln. contg. *tert*-BuOH;	741083
1827	**L-Phenylalanyl-L-phenylalanine**				
	$e_{aq}^- + PhePhe \rightarrow$	5.7	4.5×10^8	p.r.; D.k. at 720 nm.	673005
1828	**Phenylboric acid**				
	$e_{aq}^- + C_6H_5B(OH)_2 \rightarrow [C_6H_5B(OH)_2]^{\cdot -}$		1.8×10^6	p.r.; Transient obs. at 297 nm in neutral soln. decreases to ca. one-half at pH 5 and is not obs. in acid soln.; pK_a = 8.84; k estd. by c.k.; rel. to $k(e_{aq}^- + H^+)$.	761126
1829	**Phenyl-*N*-*tert*-butylnitrone**				
	$e_{aq}^- + PBN \rightarrow OH^- + PBN(H)$		*1.4 × 10^{10}*	Average of 2 values.	
			1.8×10^{10}	p.r.; D.k. at 650 nm; soln. contg. 0.1 mol L^{-1} *tert*-BuOH.	86A472
		7	1.0×10^{10}	p.r.; D.k. at 650 nm in deaerated soln. contg. *tert*-BuOH.	82A184
1830	**Phenylbutyrate ion**				
	$e_{aq}^- + C_6H_5(CH_2)_3CO_2^- \rightarrow$	9-11.5	1.3×10^7	p.r.; D.k. at 720 nm in Ar-satd. soln. contg. 0.1 mol L^{-1} *tert*-BuOH and 10^{-4}-10^{-2} mol L^{-1} carboxylate.	85A158
1831	***p*-Phenylenediamine**				
	$e_{aq}^- + 1,4\text{-}C_6H_4(NH_2)_2 \rightarrow$	9.0	9.6×10^7	p.r.; D.k. at 700 nm in soln. contg. ~0.5 mol L^{-1} *tert*-BuOH.	751057
1832	**Phenyl-β-D-glucopyranoside**				
	$e_{aq}^- + GluOC_6H_5 \rightarrow$		6.5×10^7 [b]	p.r.; D.k.	710056
		~7	$<5 \times 10^6$ [b]	p.r.; D.k.	710480
1833	**Phenylglycine, negative ion**				
	$e_{aq}^- + C_6H_5CH(NH_2)CO_2^- \rightarrow C_6H_5CHCO_2^-$	9.2	3.0×10^8	p.r.; D.k. at 700 nm in soln. contg. *tert*-BuOH; pK_a = 1.8, 4.9; at pH 9, 90% deamination, 10% addn.	741083
1834	***N*-Phenylhydroxylamine**				
	$e_{aq}^- + C_6H_5NHOH \rightarrow$		1.8×10^9	p.r.; D.k. at 720 nm.	670191
1835	**Phenylhydroxylamine, conjugate base**				
	$e_{aq}^- + C_6H_5NHO^- \rightarrow$	13.5	1.4×10^9	p.r.; D.k. at 720 nm.	670191
1836	**Phenylphosphate ion**				
	$e_{aq}^- + C_6H_5OPO_3^{2-} \rightarrow$	5	3.6×10^7	p.r.; D.k. at 720 nm; at pH 7.2-11.9 $k = 5.7 \times 10^6$; pK = 1.5, 6; k cor. for I.	79A055
1837	**3-Phenylpropionate ion**				
	$e_{aq}^- + C_6H_5CH_2CH_2CO_2^- \rightarrow$		*1.3 × 10^7*	Average of 2 values.	
		9-11.5	1.4×10^7	p.r.; D.k. at 720 nm in Ar-satd. soln. contg. 0.1 mol L^{-1} *tert*-BuOH and 10^{-4}-10^{-2} mol L^{-1} carboxylate ion.	85A158
		12.1	1.1×10^7	p.r.; D.k.	650018
1838	**3-Phenylpropionic acid**				
	$e_{aq}^- + C_6H_5CH_2CH_2CO_2H \rightarrow$	5.4	4×10^8	p.r.; D.k.; calcd. from $k_{obs} = 4.9 \times 10^7$ for mixture with the anion, see above.	650018
1839	**Phthalate ion**				
	$e_{aq}^- + 1,2\text{-}C_6H_4(CO_2^-)_2 \rightarrow$	12.7	1.9×10^9	p.r.; D.k.	650018
1840	**Phthalate ion, hydrogen**				
	$e_{aq}^- + 1,2\text{-}C_6H_4(CO_2^-)CO_2H \rightarrow$	5.6	1.1×10^{10}	p.r.; D.k.; k calcd. from $k_{obs} = 6.2 \times 10^9$ assuming solute is 1:1 mixture of mono- and dianion.	650018

TABLE 6. Rate constants for reactions of hydrated electrons in aqueous solution—Continued

No.	Reaction	pH	k (L mol^{-1} s^{-1})	Comment	Ref.
1341	***m*-Phthalate ion** $e_{aq}^- + 1,3\text{-}C_6H_4(CO_2^-)_2 \rightarrow$	13	3.0×10^9	p.r.; D.k. at 577 nm.	640043
1342	***p*-Phthalate ion** $e_{aq}^- + 1,4\text{-}C_6H_4(CO_2^-)_2 \rightarrow$	13	7.3×10^9	p.r.; D.k. at 577 nm.	640043
1343	**Phthalazine** $e_{aq}^- + C_8H_6N_2 \rightarrow$	7.0	3.5×10^{10}	p.r.; D.k. at 700 nm in Ar-satd. soln. contg. *tert*-BuOH.	741127
1344	**Picrate ion** $e_{aq}^- + 2,4,6\text{-}(NO_2)_3C_6H_2O^- \rightarrow$	5.4	3.9×10^{10}	p.r.; D.k. at 578 nm; at pH 13 $k = 3.5 \times 10^{10}$.	640044
1345	**Proline** $e_{aq}^- + Pro \rightarrow$	6.7	2×10^7	p.r.; D.k. at 720 nm; $k_{obs} = 5 \times 10^6$ at pH 10.1 (22% negative ion at this pH).	000011
1346	**Prolylglycine** $e_{aq}^- + ProGly \rightarrow$	6.2	9.6×10^8	p.r.; D.k. at 700 nm in buffered soln. contg. 1 mol L^{-1} *tert*-BuOH; pK = 3.19, 8.97.	741058
1347	**Prolylglycine, negative ion** $e_{aq}^- + ProGly^- \rightarrow$	10.8	4.7×10^7	p.r.; D.k. at 700 nm in buffered soln. contg. 1 mol L^{-1} *tert*-BuOH.	741058
1348	**Promazine, conjugate acid** $e_{aq}^- + PzH^+ \rightarrow [PzH]\cdot$	5-6	5.3×10^9	p.r.; D.k. at 720 nm in Ar-satd. soln. contg. 0.5 mol L^{-1} *tert*-BuOH; pK = 9.3.	79A060
1349	**Promethazine, conjugate acid** $e_{aq}^- + PZH^+ \rightarrow$	7	5.6×10^9	p.r.; D.k. at 720 nm in N_2-satd. soln. contg. 0.1 mol L^{-1} *tert*-BuOH.	83A272
1350	**1,1′′-Propanediylbis(1′-methyl-4,4′-bipyridinium) ion** $e_{aq}^- + PTQ^{4+} \rightarrow PTQ^{\cdot 3+}$	7.2	5.9×10^{10}	p.r.; D.k. at 650 nm in soln. contg. 5-10 × 10^{-5} mol L^{-1} viologen contg. 5% 2-PrOH.; I = 0.03.	86A266
1351	**Propargyl alcohol** $e_{aq}^- + HC{\equiv}CCH_2OH \rightarrow$		2.1×10^8	p.r.; D.k.; k detd. at four temperatures from 298 to ~370K.	79A117
1352	**Propionaldehyde** $e_{aq}^- + C_2H_5CHO \rightarrow$		4.1×10^9	p.r.; D.k.	79A109
1353	**Propionamide** $e_{aq}^- + C_2H_5CONH_2 \rightarrow$		4.7×10^7	Average of 2 values.	
		9.2	5.4×10^7	p.r.; D.k. in borate buffer contg. 0.5 mol L^{-1} *tert*-BuOH.	710414
		~6	3.9×10^7	p.r.; D.k. at 580 nm; soln. satd. with ethylene.	700052
1354	**Propionic acid** $e_{aq}^- + C_2H_5CO_2H \rightarrow H\cdot + CH_3\dot{C}HCO_2^-$	3-4	2.2×10^7	γ-r.; C.k.; ratio of formn. of H· (and $CH_3\dot{C}HCO_2^-$) to OH^- (and $CH_3\dot{C}HCO$) = 0.60; rel. to $k(e_{aq}^- + H^+) = 1.6 \times 10^{10}$; I = 0.05.	720057
1355	**Propylamine** $e_{aq}^- + CH_3CH_2CH_2NH_2 \rightarrow$	13	1.1×10^6	p.r.; D.k.	730016
1356	**Propylammonium ion** $e_{aq}^- + CH_3(CH_2)_2NH_3^+ \rightarrow$	8.5	2.8×10^6	p.r.; D.k. at 720 nm; calcd. from k_{obs} over a pH range; 0.1 mol L^{-1} solute.	730016
1357	**Propylene glycol carbonate** $e_{aq}^- + \text{-}CH_2CH(CH_3)OC(O)O\text{-} \rightarrow \text{-}\dot{C}H_2CH(CH_3)OC(O^-)O\text{-}$		7.2×10^7	p.r.; D.k.	85A377
1358	**Psoralen-thymine 4′,5′-adduct** $e_{aq}^- + C_{16}H_{12}N_2O_5 \rightarrow C_{16}H_{12}N_2O_5^-$		1.4×10^{10}	p.r.; D.k. at 700 nm; soln. contains 1.3 × 10^{-5} mol L^{-1} adduct and 0.1 mol L^{-1} Na formate.	80A032

TABLE 6. Rate constants for reactions of hydrated electrons in aqueous solution—Continued

No.	Reaction	pH	k (L mol^{-1} s^{-1})	Comment	Ref.
1359	**Pteridine**				
	$e_{aq}^- + C_6H_4N_4 \rightarrow$	6.0	3.0×10^{10}	p.r.; D.k. at 700 nm in soln. contg. 0.5 mol L^{-1} *tert*-BuOH; pK_a = 4.1; pteridine is unstable in aqueous solution, 22% hydrated at pH 6.	761060
1360	**Pterin**				
	$e_{aq}^- + C_6H_5N_5O \rightarrow$	6.5	2.5×10^{10}	p.r.; D.k. at 700 nm in soln. contg. 0.5 mol L^{-1} *tert*-BuOH; pK_a = 2.27, 7.92. at pH 11.5 k = 1.9×10^{10}.	761060
1361	**Purine**				
	$e_{aq}^- + C_5H_4N_4 \rightarrow$		*1.8 × 10^{10}*	Average of 3 values.	
		6.0	2.1×10^{10}	p.r.; D.k. at 700 nm; at pH 13.0 $k = 6.5 \times 10^9$.	751060
		7	1.0×10^{10}	p.r.; D.k.; pK_a = 8.75; at pH 11 $k = 8.2 \times 10^9$; I = 0.1.	710375
		7.2	1.7×10^{10}	p.r.; D.k. at 578 nm.	640044
1362	**Pyrazine**				
	$e_{aq}^- + C_4H_4N_2 \rightarrow$	7.0	2.1×10^{10}	p.r.; D.k. at 700 nm in Ar-satd. soln. contg. 0.5-2 mol L^{-1} *tert*-BuOH.	741127
1363	**Pyrenesulfonate ion**				
	$e_{aq}^- + PSA \rightarrow PSA^-$		1.6×10^{10}	p.r.; P.b.k. at 493 nm; $k = 2 \times 10^{11}$ in CTAB (0.2 mol L^{-}) soln.; k concn. dependent.	751017
1364	**Pyridazine**				
	$e_{aq}^- + C_4H_4N_2 \rightarrow$	7.0	2.2×10^{10}	p.r.; D.k. at 700 nm in Ar-satd. soln. contg. *tert*-BuOH.	741127
1365	**Pyridine**				
	$e_{aq}^- + py \rightarrow H$ addn.		*1.0 × 10^{9}*	Average of 2 values.	
		7	1.0×10^9	p.r.; D.k.; $k = 3.7 \times 10^9$ is also reported with no explanation for the two values.	710582
		6.9-7.3	1.0×10^9	p.r.; D.k. at 578 nm.	640044
1366	**2-Pyridinealdoxime, *N*-methyl-**				
	$e_{aq}^- + HON{=}CHC_5H_4N^+CH_3 \rightarrow$ addn.	6.5	8×10^9	p.r.; D.k. at 600 nm; counterion Cl$^-$; pK = 5, 6 and 12.7 for electron adduct [761182].	81A417
1367	**2-Pyridinecarboxylate ion**				
	$e_{aq}^- + 2\text{-py}CO_2^- \rightarrow 2\text{-py(H)}CO_2^-$	9.1	1.1×10^{10}	p.r.; D.k. at 650 nm.	710582
1368	**4-Pyridinecarboxamide**				
	$e_{aq}^- + 4\text{-py}CONH_2 \rightarrow$ 4-py(H)$CONH_2$		*3.2 × 10^{10}*	Average of 2 values.	
		9.0	3.2×10^{10}	p.r.; D.k. at 700 nm.	741089
		9.0	3.2×10^{10}	p.r.; D.k. at 650 nm.	710582
1369	**4-Pyridinecarboxylate ion**				
	$e_{aq}^- + 4\text{-py}CO_2^- \rightarrow 4\text{-py(H)}CO_2^-$	10.5	2.4×10^{10}	p.r.; D.k. at 650 nm.	710582
1370	**Pyridoxal 5-phosphate**				
	$e_{aq}^- + PPH \rightarrow \cdot PPH_2$	6.3, 7.3	1.6×10^{10}	p.r.; D.k. at 700 nm in soln. contg. 0.1 mol L$^-$ *tert*-BuOH; pK_a = <2.5, 4.14, 6.2, 8.7; at pH 11.2 $k = 6.1 \times 10^9$.	751024
1371	**Pyridoxine**				
	$e_{aq}^- + PH \rightarrow \cdot PH_2$	6.8	2.2×10^{10}	p.r.; D.k. at 700 nm in soln. contg. 0.1 mol L^{-1} *tert*-BuOH; pK_a = 5.0, 8.97; at pH 11.0 $k = 2.5 \times 10^9$.	751024
1372	**α-(2-Pyridyl)-*tert*-butyl nitrone**				
	$e_{aq}^- + 2\text{-PyBN} \rightarrow$ addn.		2.5×10^{10}	p.r.; D.k. at 650 nm; soln. contg. 0.1 mol L^{-1} *tert*-BuOH.	86A472
1373	**α-(3-Pyridyl)-*tert*-butyl nitrone**				
	$e_{aq}^- + 3\text{-PyBN} \rightarrow$ addn.		2.4×10^{10}	p.r.; D.k. at 650 nm; soln. contg. 0.1 mol L^{-1} *tert*-BuOH.	86A472

TABLE 6. Rate constants for reactions of hydrated electrons in aqueous solution—Continued

No.	Reaction	pH	k (L mol^{-1} s^{-1})	Comment	Ref.
1874	**α-(4-Pyridyl)-*tert*-butyl nitrone**				
	e_{aq}^- + 4-PyBN → addn.		2.9×10^{10}	p.r.; D.k. at 650 nm; soln. contg. 0.1 mol L^{-1} *tert*-BuOH.	86A472
1875	**α-(3-Pyridyl 1-oxide)-*N*-*tert*-butylnitrone**				
	e_{aq}^- + 3-POBN → addn.		2.5×10^{10}	p.r.; D.k. at 650 nm; soln. contg. 0.1 mol L^{-1} *tert*-BuOH.	86A472
1876	**α-(4-Pyridyl 1-oxide)-*N*-*tert*-butylnitrone**				
	e_{aq}^- + 4-POBN → addn.		*3.1* × *10*^{10}	Average of 2 values.	
		11.0	3.1×10^{10}	p.r.; D.k. at 550 nm in soln. contg. *tert*-BuOH.	84A426
			3.1×10^{10}	p.r.; D.k. at 650 nm; soln. contg. 0.1 mol L^{-1} *tert*-BuOH.	86A472
1877	**Pyrimidine**				
	e_{aq}^- + $C_4H_4N_2$ → ·PmH	7.0	2.0×10^{10}	p.r.; D.k. at 700 nm in Ar-satd. soln. contg. *tert*-BuOH.	741127
1878	**Pyrrole**				
	e_{aq}^- + C_4H_5N →	10.29	6.0×10^5	p.r.; D.k.	650018
1879	**Pyrrolidine**				
	e_{aq}^- + -NH$(CH_2)_4$- →	12.08	4.2×10^6	p.r.; D.k.	650018
1880	**2-Pyrrolidinone**				
	e_{aq}^- + C_4H_7NO →		4.3×10^6 [b]	p.r.	82G098
		7.82	1.3×10^7 [b]	p.r.; D.k.	650018
1881	**Pyruvate ion**				
	e_{aq}^- + $CH_3COCO_2^-$ →	12.7	6.8×10^9	p.r.; D.k. at 578 nm.	640044
1882	**Pyruvonitrile**				
	e_{aq}^- + CH_3COCN →	7.15	3.0×10^7	p.r.; D.k. in buffered soln. contg. 10^{-3} mol L^{-1} EtOH; at pH 10.94 $k = 1.5 \times 10^8$.	670298
1883	**Quinoxaline**				
	e_{aq}^- + $C_8H_6N_2$ →	7.0	3.1×10^{10}	p.r.; D.k. at 700 nm in Ar-satd. soln. contg. *tert*-BuOH.	741127
1884	**Rhodamine B**				
	e_{aq}^- + Rh B →		4.1×10^{10}	p.r.; D.k. at 720 nm in deaerated soln. contg. EtOH; similar value for dye in dimeric form.	83A334
			2.2×10^{10}	p.r.; D.k. at 720 nm.	82A347
1885	**Rhodamine 3B**				
	e_{aq}^- + Rh 3B →		4.0×10^{10}	p.r.; D.k. at 720 nm in deaerated soln. contg. EtOH; similar value for dye in dimeric form.	83A334
1886	**Rhodamine 6G**				
	e_{aq}^- + Rh 6G →		3.8×10^{10}	p.r.; D.k. at 720 nm in deaerated soln. contg. EtOH; similar value for dye in dimeric form.	83A334
		7	1.8×10^{10}	p.r.; D.k. at 720 nm in soln. contg. 0.4 mol L^{-1} *tert*-BuOH; graphically cor. for other e_{aq}^- reactions; product (Dye^-) had $\epsilon_{410} = 34{,}000$ and $\epsilon_{650} = 2400$ L mol^{-1} cm^{-1}/	81A311
1887	**Riboflavine**				
	e_{aq}^- + RF →	5.9	2.3×10^{10}	p.r.; D.k. at 700 nm; soln. contains 10^{-1} mol L^{-1} Na formate; in 3×10^{-3} mol L^{-1} NaOH $k = 1.7 \times 10^{10}$.	690283
1888	**Ribose**				
	e_{aq}^- + $C_5H_{10}O_5$ →		1×10^7	p.r.; D.k.	79A366
1889	**D-Ribose-5-phosphate**				
	e_{aq}^- + $C_5H_9O_8P$ →		8.0×10^8	p.r.; D.k.	79A366
1890	**Safranine T**				
	e_{aq}^- + ST →	6	4.9×10^{10}	γ-r.; C.k.; rel. to $k(e_{aq}^- + N_2O)$.	680059

TABLE 6. Rate constants for reactions of hydrated electrons in aqueous solution—Continued

No.	Reaction	pH	k (L mol^{-1} s^{-1})	Comment	Ref.
1391	**Salicylate ion** $e_{aq}^- + 2\text{-}HOC_6H_4CO_2^- \rightarrow$	7	$\sim 1 \times 10^{10}$	p.r.; D.k. at 700 nm; values of 1.8_3, 0.9_6 and $1.4_7 \times 10^{10}$ were obtained.	680305
1392	**Sarcosine** $e_{aq}^- + CH_3NH_2^+CH_2CO_2^- \rightarrow$		*1.5 × 10^7*	Average of 2 values.	
		7.0	1.6×10^7	p.r.; D.k. at 700 nm in buffered soln. contg. 1 mol L^{-1} *tert*-BuOH.	741058
		7.6	1.4×10^7	p.r.; D.k. at 720.	660011
1393	**Sarcosine anhydride** $e_{aq}^- + SA \rightarrow SA^{\cdot -}$	9.2	2.0×10^9	p.r.; D.k. at 700 nm in soln. contg. 0.2 mol L^{-1} *tert*-BuOH and borate buffer.	710554
1394	**Sarcosylglycine** $e_{aq}^- + SarGly \rightarrow$	5.8	8.8×10^8	p.r.; D.k. at 700 nm in buffered soln. contg. 1 mol L^{-1} *tert*-BuOH; pK_a = 3.14, 8.66.	741058
1395	**Sarcosylglycine, negative ion** $e_{aq}^- + SarGly \rightarrow$	12.2	7.7×10^7	p.r.; D.k. at 700 nm in buffered soln. contg. 1 mol L^{-1} *tert*-BuOH.	741058
1396	**Selenocystine** $e_{aq}^- + [SeCH_2CH(NH_3^+)CO_2^-]_2 \rightarrow$	6.0	7.6×10^9	p.r.; D.k. at 700 nm; at pH 11.5 $k = 3.9 \times 10^9$.	731010
1397	**Selenomethionine** $e_{aq}^- + CH_3SeCH_2CH_2CH(NH_3^+)CO_2^- \rightarrow$		1.8×10^8	p.r.	741092
1398	**Selenourea** $e_{aq}^- + H_2NCSeNH_2 \rightarrow$	6.5	4.0×10^9	p.r.; D.k. at 700 nm in N_2-satd. soln.; k independent of pH 6-11.	700240
1399	**Serine** $e_{aq}^- + Ser \rightarrow$	6.1	$< 3 \times 10^7$	p.r.; D.k. at 720 nm.	660011
1400	**Sorbitol** $e_{aq}^- + HOCH_2(CHOH)_4CH_2OH \rightarrow$		$< 1 \times 10^7$	p.r.; D.k. at 510 nm; no significant reaction at 5 × 10^{-4} mol L^{-1} sorbitol.	650391
1401	**Stachyose** $e_{aq}^- + C_{24}H_{42}O_{21} \rightarrow$	~7	8.7×10^7	p.r.; D.k. at 650 nm.	79A298
1402	**Stearate ion** $e_{aq}^- + n\text{-}C_{17}H_{35}CO_2^- \rightarrow$	~7	1.0×10^{10}	p.r.; D.k. at 650 nm in soln. contg. *tert*-BuOH.	76A256
1403	**Styrene** $e_{aq}^- + C_6H_5CH{=}CH_2 \rightarrow [C_6H_5CHCH_2]^{\cdot -}$	5.5	3.0×10^9	p.r.; D.k. at 720 nm; also studied at pH 10.5.	741138
1404	**Succinamide** $e_{aq}^- + H_2NCOCH_2CH_2CONH_2 \rightarrow$	7.1	2.0×10^8	p.r.; D.k. at 700 nm in soln. contg. ~0.1-1 mol L^{-1} *tert*-BuOH.	730091
1405	**Succinate ion** $e_{aq}^- + {}^-O_2CCH_2CH_2CO_2^- \rightarrow$	10.0	3.1×10^7	p.r.; D.k. in unbuffered soln. contg. 10^{-3} mol L^{-1} EtOH.	670298
			7×10^5	p.r.; C.k. with *p*-bromophenol; obs. $G(Br^-)$; calcd. from pH study, 3.0-7.5.	720027
1406	**Succinate ion, hydrogen** $e_{aq}^- + HO_2CCH_2CH_2CO_2^- \rightarrow$		7×10^7	γ-r.; C.k. with *p*-bromophenol; obs. $G(Br^-)$; pK_a = 5.64; calcd. from pH study, 3.0-7.5.	720027
		6.0	3.4×10^8	p.r.; D.k. in unbuffered soln. contg. 10^{-3} mol L^{-1} EtOH; k calcd. from $k_{obs} = 1.2 \times 10^8$.	670298
1407	**Succinic acid** $e_{aq}^- + HO_2CCH_2CH_2CO_2H \rightarrow OH^- + HO_2CCH_2CH_2CO$		3.7×10^8	γ-r.; C.k. with *p*-bromophenol; calcd. from pH study.	720027

TABLE 6. Rate constants for reactions of hydrated electrons in aqueous solution—Continued

No.	Reaction	pH	k (L mol^{-1} s^{-1})	Comment	Ref.
1407	**Succinic acid—Continued**				
		3-4	8.6×10^7	γ-r.; C.k.; ratio of formn. of H· (and $HO_2CH_2\dot{C}H_2CO_2^-$) to OH^- (and $HO_2C\dot{C}H_2CH_2CO$) ≤0.1; rel. to $k(e_{aq}^- + H^+) = 1.6 \times 10^{10}$; $I = 0.05$.	720057
1408	**Succinimide**				
	$e_{aq}^- + C_4H_5NO_2 \rightarrow$	6.5	1.1×10^{10}	p.r.; D.k. at 700 nm in soln. contg. ~0.1-1 mol L^{-1} *tert*-BuOH; pK_a = 9.6; at pH 11.4 $k = 9.2 \times 10^8$.	730091
1409	**Succinonitrile**				
	$e_{aq}^- + NCCH_2CH_2CN \rightarrow$	3-4	1.7×10^9	γ-r.; C.k.; rel. to $k(e_{aq}^- + H^+)$; $I = 0.002$.	730364
1410	**Succinyl peroxide**				
	$e_{aq}^- + (^-O_2CCH_2CH_2CO)_2O_2 \rightarrow {}^-O_2CCH_2CH_2\dot{C}O_2^- + HO_2CCH_2CH_2\dot{C}O$		1×10^{10}	p.r.; D.k. at 650 nm in deaerated soln. contg. 0.5 mol L^{-1} *tert*-BuOH.	81A374
1411	**Sucrose**				
	$e_{aq}^- + C_{12}H_{22}O_{11} \rightarrow$	7	5×10^6	p.r.; D.k.	79A366
1412	**Sulfacetamide**				
	$e_{aq}^- + H_2NC_6H_4SO_2NHAc \rightarrow [H_2NC_6H_4SO_2NHAc]^{\cdot -}$	7.0	2.2×10^{10}	p.r.; D.k. at 700 nm in Ar-purged soln. contg. 0.5 mol L^{-1} *tert*-BuOH and 5×10^{-4} mol L^{-1} substrate; (also detd. $k = 2.0 \times 10^{10}$ by f.p. where e_{aq}^- is produced by photolysis of substrate).	82A138
1413	**Sulfaguanidine**				
	$e_{aq}^- + H_2NC_6H_4SO_2NHC(=NH)NH_2 \rightarrow$		8.6×10^9	p.r.; D.k.	730094
1414	**Sulfanilamide**				
	$e_{aq}^- + 4\text{-}(H_2N)C_6H_4SO_2NH_2 \rightarrow$		7.4×10^9	p.r.; D.k.	730094
1415	**Sulfanilate ion**				
	$e_{aq}^- + 4\text{-}H_2NC_6H_4SO_3^- \rightarrow$	~11	4.6×10^8	p.r.; D.k.	640138
1416	**Sulfanilic acid**				
	$e_{aq}^- + (H_3N^+)C_6H_4SO_3^- \rightarrow$		5.9×10^9	p.r.; D.k.; pH not given	730094
1417	**Sulfasuccidine**				
	$e_{aq}^- + C_{13}H_{13}N_3O_5S_2 \rightarrow$		1.4×10^{10}	p.r.; D.k.	730094
1418	**Sulfathiazole**				
	$e_{aq}^- + C_9H_9N_3O_2S_2 \rightarrow$		1.2×10^{10}	p.r.; D.k.	730094
1419	**p-Sulfodiphenylpicrylhydrazyl**				
	$e_{aq}^- + 4\text{-DPPH}(SO_3^-) \rightarrow$		6.0×10^{10}	γ-r.; C.k.; p.r. gave 6.9×10^{10}; rel. to $k(e_{aq}^- + N_2O)$.	720688
1420	**Taurocholate ion**				
	$e_{aq}^- + TC^- \rightarrow$	11	1.3×10^8	p.r.; D.k. at 600 nm; counterion Na^+; [NaTC] $< 2 \times 10^{-4}$ mol L^{-1}.	751025
1421	**Tetrabutylammonium ion**				
	$e_{aq}^- + [CH_3(CH_2)_3]_4N^+ \rightarrow$		1.4×10^6	p.r.; D.k. at 720 nm; counterion OH^-.	79A270
1422	**Tetrachloroethylene**				
	$e_{aq}^- + Cl_2C{=}CCl_2 \rightarrow Cl^- + \dot{C}Cl_2CCl$	~6.5	1.3×10^{10}	p.r.; D.k. at 720 nm in soln. contg. 0.5 mol L^{-1} *tert*-BuOH.	710709
1423	**Tetracyanoethylene**				
	$e_{aq}^- + (NC)_2C{=}C(CN)_2 \rightarrow$	7	1.5×10^{10}	p.r.; D.k. at 578 nm; unbuffered soln.	640044
1424	**Tetracycline, conjugate acid**				
	$e_{aq}^- + TCH^+ \rightarrow$		1.5×10^9	γ-r.; C.k. in 0.05 mol L^{-1} H_2SO_4, satd. with N_2O; pK_a = 3.3, 7.68, 9.69; rel. to $k(e_{aq}^- + H^+) = 3.9 \times 10^{10}$.	770124

TABLE 6. Rate constants for reactions of hydrated electrons in aqueous solution—Continued

No.	Reaction	pH	k (L mol^{-1} s^{-1})	Comment	Ref.
1425	**Tetraethylammonium ion**				
	$e_{aq}^- + (C_2H_5)_4N^+ \rightarrow$		1.2×10^7	p.r.; D.k. at 720 nm; counterion OH^-.	79A270
1426	**1,2,3,4-Tetrafluorobenzene**				
	$e_{aq}^- + C_6H_2F_4 \rightarrow F^- + C_6H_2F_3$	~6.5	2.6×10^{10}	p.r.; D.k. in soln. contg. 0.5 mol L^{-1} *tert*-BuOH or 0.2 mol L^{-1} MeOH.	730054
1427	**Tetrakis(*p*-sulfonatophenyl)porphyrin**				
	$e_{aq}^- + H_2TPPS^{4-} \rightarrow [H_2TPPS]^{\cdot 5-}$	7	8.9×10^9	p.r.; P.b.k. in Ar-satd. soln.	82A152
		11.8	1.5×10^{10}	p.r.; P.b.k. at 700 nm.	81A247
1428	**Tetramethylammonium ion**				
	$e_{aq}^- + (CH_3)_4N^+ \rightarrow$		5.6×10^6	p.r.; D.k. at 720 nm; counterion OH^-.	79A270
1429	***N,N,N',N'*-Tetramethylbenzidine**				
	$e_{aq}^- +$ TMB $\rightarrow$	9.0	1.7×10^8	p.r.; D.k. at 700 nm in soln. contg. ~0.5 mol L^{-1} *tert*-BuOH.	751057
1430	**1,1'-Tetramethylene-2,2'-bipyridinium ion**				
	$e_{aq}^- + BP^{2+} \rightarrow BP^{\cdot +}$		*4.8 × 10^{10}*	Average of 2 values.	
		6.8	4.0×10^{10}	p.r.; D.k. at 700 nm; counterion Br^-.	78A321
			5.5×10^{10}	p.r.; D.k. at 680 nm as well as p.b.k.; counterion Br^-; value revised in [84A292].	761169
1431	**4,5,4',5'-Tetramethyl-1,1'-ethylene-2,2'-bipyridinium ion**				
	$e_{aq}^- + BP^{2+} \rightarrow BP^{\cdot +}$	7.0	5.5×10^{10}	p.r.; P.b.k. in O_2-free soln. at ~380 nm.	84A292
1432	**1,2,3,5-Tetramethylisoindole-4,7-dione**				
	$e_{aq}^- + C_{12}H_{13}NO_2 \rightarrow C_{12}H_{13}NO_2^-$	7	2.4×10^{10}	p.r.; D.k.	84R027
1433	***N,N,N',N'*-Tetramethyl-*p*-phenylenediamine**				
	$e_{aq}^- +$ TMPD $\rightarrow$	8.0	9.1×10^7	p.r.; D.k. at 700 nm in soln. contg. 0.5 mol L^{-1} *tert*-BuOH.	751057
1434	**2,2,5,5-Tetramethyl-4-phenyl-3-imidazolin-1-oxyl 3-oxide**				
	$e_{aq}^- + C_{13}H_{17}N_2O_2 \rightarrow$		2.2×10^{10}	γ-r.; C.k.; H_2SO_4 soln.; rel. to $k(e_{aq}^- + H^+)$.	77D393 77G348
1435	**1,2,5,6-Tetramethyl-3-phenylisoindole-4,7-dione**				
	$e_{aq}^- + C_{18}H_{17}NO_2 \rightarrow C_{18}H_{17}NO_2^-$	7	2.4×10^{10}	p.r.; D.k.	84R027
1436	**2,2,6,6-Tetramethylpiperidine *N*-oxyl**				
	$e_{aq}^- +$ TEMPO $\rightarrow$ TEMPO(H)		7.8×10^9	p.r.; D.k.	761067
1437	**2,2,6,6-Tetramethylpiperidone *N*-oxyl**				
	$e_{aq}^- +$ TAN $\rightarrow$ TAN(H)		*2.5 × 10^{10}*	Average of 2 values.	
			2.9×10^{10}	p.r.; D.k. at ~700 nm.	761067
		~7	2.0×10^{10}	p.r.; D.k. at 650 nm in soln. contg. 0.1 mol L^{-1} *tert*-BuOH.	76A256
1438	**4,5,4'5,'-Tetramethyl-1,1'-tetramethylene-2,2'-bipyridinium ion**				
	$e_{aq}^- + BP^{2+} \rightarrow BP^{\cdot +}$	7.0	5.0×10^{10}	p.r.; P.b.k. in O_2-free soln. at ~380 nm.	84A292
1439	**4,5,4',5'-Tetramethyl-1,1'-trimethylene-2,2'-bipyridinium ion**				
	$e_{aq}^- + BP^{2+} \rightarrow BP^{\cdot +}$	7.0	5.5×10^{10}	p.r.; P.b.k. in O_2-free soln. at ~380 nm.	84A292
1440	**Tetranitromethane**				
	$e_{aq}^- + C(NO_2)_4 \rightarrow {\cdot}NO_2 + C(NO_2)_3^-$		*5.3 × 10^{10}*	Average of 2 values.	
		6	4.6×10^{10}	p.r.; D.k. at 578 nm as well as p.b.k. at 360 nm (nitroform anion).	650183
		7	6.0×10^{10}	p.r.; D.k. at 550 nm as well as p.b.k. at 350 nm.	640133
1441	**Tetraphenylphosphonium ion**				
	$e_{aq}^- + (C_6H_5)_4P^+ \rightarrow (C_6H_5)_4P{\cdot}$	~7	2.3×10^{10}	p.r.; D.k.	82A051

TABLE 6. Rate constants for reactions of hydrated electrons in aqueous solution—Continued

No.	Reaction	pH	k (L mol^{-1} s^{-1})	Comment	Ref.
1442	**Tetrapropylammonium ion**				
	$e_{aq}^- + (CH_3CH_2CH_2)_4N^+ \rightarrow$		3.2×10^7	p.r.; D.k. at 720 nm; counterion OH^-.	79A270
1443	**Tetronate ion**				
	$e_{aq}^- + C_4H_3O_3^- \rightarrow$	7	$\sim 1 \times 10^8$	p.r.; D.k. at 600 nm in 10^{-3} mol L^{-1} phosphate buffer and 0.1 mol L^{-1} *tert*-BuOH.	741053
1444	**Thalamyd**				
	$e_{aq}^- + {}^-O_2CPhCONHPhSO_2NHAc \rightarrow 1,2\text{-}C_6H_4(CO_2^-)_2 + H_2NC_6H_4SO_2NHAc$		7.4×10^9	p.r.; D.k.	730094
1445	**Theobromine**				
	$e_{aq}^- + C_7H_8N_4O_2 \rightarrow$		1.5×10^{10}	p.r.; D.k.	86R158
1446	**Theophylline**				
	$e_{aq}^- + C_7H_8N_4O_2 \rightarrow$		1.1×10^{10}	p.r.; D.k.	86R158
1447	**Thiamine cation**				
	$e_{aq}^- + Thm^+ \rightarrow Thm\cdot$	6.1	3.4×10^{10}	p.r.; D.k. at 700 nm in soln. contg. ~0.5 mol L^{-1} *tert*-BuOH; pK_a = 4.8.	771034
1448	**Thiazole**				
	$e_{aq}^- + Tz \rightarrow \cdot TzH$		*2.9* × *10^9*	Average of 2 values.	
		8.0	2.1×10^9	p.r.; D.k. at 700 nm in soln. contg. ~0.5 mol L^{-1} *tert*-BuOH.	771034
		6.6	2.5×10^9	p.r.; D.k.	650018
1449	**Thiobarbituric acid**				
	$e_{aq}^- + C_4H_4N_2O_2S \rightarrow$		$< 6 \times 10^7$	p.r.; D.k. at 578 nm.	640048
1450	**Thiodiacetate ion**				
	$e_{aq}^- + S(CH_2CO_2^-)_2 \rightarrow$	10.8	8.3×10^7	p.r.; D.k.; pK_a = 3.3, 4.5	730090
1451	**3,3'-Thiodipropionate ion**				
	$e_{aq}^- + S(CH_2CH_2CO_2^-)_2 \rightarrow$	10.8	5.8×10^7	p.r.; D.k.; pK_a = 4.	730090
1452	**Thioglycolate ion**				
	$e_{aq}^- + HSCH_2CO_2^- \rightarrow \cdot CH_2CO_2^- + HS^-$	6.5	5.5×10^9	p.r.; D.k.; pK_a = 3.7, 10.3; at pH 12.0 k = 5.6 × 10^8.	730090
1453	**Thionine cation**				
	$e_{aq}^- + Th^+ \rightarrow$	7.6	1.1×10^{10}	p.r.; D.k. at 650 nm in soln. contg. 2×10^{-2} mol L^{-1} *tert*-BuOH and 10^{-5} mol L^{-1} dye; pK_a = 6.9.	82A258
1454	**Thionine, neutral**				
	$e_{aq}^- + ThH \rightarrow$	12.6	1.4×10^{10}	p.r.; D.k. at 650 nm in soln. contg. 2×10^{-2} mol L^{-1} *tert*-BuOH and 10^{-5} mol L^{-1} dye.	82A258
1455	**Thiophene**				
	$e_{aq}^- + \text{-}SCH{=}CHCH{=}CH\text{-} \rightarrow$		*5.5* × *10^7*	Average of 2 values.	
		7, 11	4.4×10^7	p.r.; D.k. at 550 nm with and without 0.05 mol L^{-1} MeOH.	78A027
		6.7	6.5×10^7	p.r.; D.k.	650018
1456	**Thiophenoxide ion**				
	$e_{aq}^- + C_6H_5S^- \rightarrow$	~11	4.7×10^7	p.r.; D.k.	640138
1457	**Thiourea**				
	$e_{aq}^- + H_2NCSNH_2 \rightarrow$	6.4	2.9×10^9	p.r.; D.k. at 578 nm.	640044
1458	**DL-Threonine**				
	$e_{aq}^- + Thr \rightarrow$	6.2	$< 1 \times 10^7$	p.r.; D.k. at 720 nm; pK_a = 2.3, 9; at pH 9.5 k = $< 5 \times 10^6$.	660011
		7	2.0×10^7	p.r.; D.k.; concn. 10^{-2} mol L^{-1}.	650389
1459	**Thymidine-5'-monophosphate**				
	$e_{aq}^- + TMP \rightarrow TMP\cdot^-$	6.7	1.5×10^9	p.r.; D.k.	650388

TABLE 6. Rate constants for reactions of hydrated electrons in aqueous solution—Continued

No.	Reaction	pH	k (L mol^{-1} s^{-1})	Comment	Ref.
1460	**Thymine**				
	$e_{aq}^- + 5\text{-MeU} \rightarrow [5\text{-MeU}]^{\cdot -}$		*1.8 × 10^{10}*	Average of 2 values.	
		5.5	1.8 × 10^{10}	p.r.; D.k.; pK_a = 9.95	650388
		6.0	1.7 × 10^{10}	p.r.; D.k. at 578 nm.	640044
1461	**Thymine, negative ion**				
	$e_{aq}^- + 5\text{-MeU}^- \rightarrow$		*3.5 × 10^{9}*	Average of 2 values.	
		12	3.0 × 10^{9}	f.p.; D.k. (phot. of OH^-).	727036
		11	4.1 × 10^{9}	p.r.; Soln. H_2-satd.; d.k. at 690 nm.	650494
1462	***cis,syn*-Thymine dimer**				
	$e_{aq}^- + (\text{Thym})_2 \rightarrow (\text{Thym})_2^{\cdot -}$	8.0	1.5 × 10^{10}	p.r.; D.k. at 650 nm in N_2-satd. soln. contg. 0.02 mol L^{-1} phosphate buffer.	720309
1463	***m*-Toluate ion**				
	$e_{aq}^- + 3\text{-}CH_3C_6H_4CO_2^- \rightarrow$	~11	2.6 × 10^{9}	p.r.; D.k.	640138
1464	***o*-Toluate ion**				
	$e_{aq}^- + 2\text{-}CH_3C_6H_4CO_2^- \rightarrow$	~11	2.7 × 10^{8}	p.r.; D.k.	640138
1465	***p*-Toluate ion**				
	$e_{aq}^- + 4\text{-}CH_3C_6H_4CO_2^- \rightarrow$	~11	3.6 × 10^{9}	D.k.	640138
1466	**Toluene**				
	$e_{aq}^- + C_6H_5CH_3 \rightarrow$		*1.4 × 10^{7}*	Average of 3 values.	
		9-11.5	1.5 × 10^{7}	p.r.; D.k. at 720 nm in Ar-satd. soln. contg. 0.1 mol L^{-1} *tert*-BuOH and 10^{-4}-10^{-2} mol L^{-1} toluene.	85A158
			1.4 × 10^{7}	p.r.; D.k.	85A282
		~11	1.2 × 10^{7}	p.r.; D.k.	640138
1467	**4-Toluenesulfonate ion**				
	$e_{aq}^- + 4\text{-}CH_3C_6H_4SO_3^- \rightarrow$	~11	1.7 × 10^{9}	p.r.; D.k.	640138
1468	***p*-Tolunitrile**				
	$e_{aq}^- + CH_3C_6H_4CN \rightarrow 4\text{-}CH_3C_6H_4CN^-$		*1.4 × 10^{10}*	Average of 2 values.	
			1.3 × 10^{10}	p.r.; D.k., as well as p.b.k. at 310 nm, in Ar-satd. soln. contg. *tert*-BuOH.	79A350
		~11	1.4 × 10^{10}	p.r.; D.k.	640138
1469	***m*-Tolyl-β-D-glucopyranoside**				
	$e_{aq}^- + GluOC_6H_4CH_3 \rightarrow$		1.4 × 10^{8}	p.r.; D.k.	710056
1470	***o*-Tolyl-β-D-glucopyranoside**				
	$e_{aq}^- + GluOC_6H_4CH_3 \rightarrow$		4.1 × 10^{7}	p.r.; D.k.	710056
1471	***p*-Tolyl-β-D-glycopyranoside**				
	$e_{aq}^- + GluOC_6H_4CH_3 \rightarrow$		6.1 × 10^{7}	p.r.; D.k.	710056
1472	**Trichloroacetate ion**				
	$e_{aq}^- + Cl_3CCO_2^- \rightarrow$	~10	8.5 × 10^{9}	p.r.; D.k.	650015
1473	**Trichloroethylene**				
	$e_{aq}^- + ClCH{=}CCl_2 \rightarrow Cl^- + C_2HCl_2$		1.9 × 10^{10}	p.r.; D.k. at 720 nm in soln. contg. 0.5 mol L^{-1} *tert*-BuOH.	710709
1474	**Trichlorofluoromethane**				
	$e_{aq}^- + CCl_3F \rightarrow Cl^- + {\cdot}CFCl_2$	~6	1.6 × 10^{10}	γ-r.; C.k. with H^+ as well as N_2O, elec. condy.; rel. to $k(e_{aq}^- + N_2O)$.	710026
1475	**α,α,α-Trichlorotoluene**				
	$e_{aq}^- + C_6H_5CCl_3 \rightarrow$	~10	8.3 × 10^{9}	p.r.; D.k.	650015
1476	**Trifluoroacetate ion**				
	$e_{aq}^- + CF_3CO_2^- \rightarrow$	~10	<1.4 × 10^{6}	p.r.; D.k.; $k_{obs} \leq 2.6 \times 10^6$; k cor. for I.	650015

TABLE 6. Rate constants for reactions of hydrated electrons in aqueous solution—Continued

No.	Reaction	pH	k (L mol^{-1} s^{-1})	Comment	Ref.
1477	**1,1,1-Trifluoroacetone**				
	$e_{aq}^- + CF_3COCH_3 \rightarrow$	5.19	6.6×10^7	p.r.; D.k. in unbuffered soln. contg. 10^{-3} mol L^{-1} EtOH.	670298
1478	**Trifluoroiodomethane**				
	$e_{aq}^- + CF_3I \rightarrow I^- + \cdot CF_3$	9-10	1.3×10^{10}	p.r.; D.k. at 600 nm.	700407
1479	**α,α,α-Trifluorotoluene**				
	$e_{aq}^- + C_6H_5CF_3 \rightarrow$	~11	1.8×10^9	p.r.; D.k.	640138
1480	**Trimethylacetamide**				
	$e_{aq}^- + (CH_3)_3CCONH_2 \rightarrow [(CH_3)_3CCONH_2]\cdot^-$	9.2	1.5×10^7	p.r.; D.k. in borate buffer contg. 0.5 mol L^{-1} *tert*-BuOH.	710414
1481	**Trimethylcyclopropenium cation**				
	$e_{aq}^- + Cy^+ \rightarrow Cy\cdot$	5.1	3.2×10^{10}	p.r.; D.k. at 600 nm as well as p.b.k. at 500 nm in soln. contg. 0.1 mol L^{-1} *tert*-BuOH and 10^{-3} mol L^{-1} trimethylcyclopropenyl fluoborate; k cor. for I.	82A395
1482	**1,1'-Trimethylene-2,2'-bipyridinium ion**				
	$e_{aq}^- + TQ^{2+} \rightarrow TQ\cdot^+$		*6.0 × 10^{10}*	Average of 2 values.	
		6.8	5.8×10^{10}	p.r.; D.k. at 700 nm; counterion Br^-.	78A321
			6.2×10^{10}	p.r.; D.k.; counterion Br^-; value revised in [84A292].	761169
1483	**Trimethylhydrazine**				
	$e_{aq}^- + (CH_3)_2NNHCH_3 \rightarrow$	10.4	$\sim 1 \times 10^8$	p.r.; D.k. at 700 nm.	720003
1484	**Trimethylhydrazinium ion**				
	$e_{aq}^- + (CH_3)_2NNH_2CH_3^+ \rightarrow$	5.4	1.3×10^{10}	p.r.; D.k. at 700 nm.	720003
1485	**1,2,5-Trimethyl-3-phenylisoindole-4,7-dione**				
	$e_{aq}^- + C_{17}H_{15}NO_2 \rightarrow C_{17}H_{15}NO_2^-$		3.5×10^{10}	p.r.	82A329
1486	**Trimethylphenylphosphonium ion**				
	$e_{aq}^- + (CH_3)_3P^+C_6H_5 \rightarrow (CH_3)_3\dot{P}C_6H_5$	~7	1.7×10^{10}	p.r.; D.k. in soln. contg. 0.2 mol L^{-1} *tert*-BuOH.	82A051
1487	**Trimethyl phosphate**				
	$e_{aq}^- + (CH_3O)_3P(O) \rightarrow \cdot CH_3 + (CH_3O)_2PO_2^-$		2×10^5	p.r.	723008
1487a	**Trinitromethyl ion**				
	$e_{aq}^- + C(NO_2)_3^- \rightarrow$	7	3.0×10^{10}	p.r.; D.k.; counterion K^+.	650183
1488	**Trioxane**				
	$e_{aq}^- + C_3H_6O_3 \rightarrow$	11	$\sim 1 \times 10^6$	f.p.; D.k.; H_2-satd. soln. contg. 10^{-3} mol L^{-1} NaOH.	717345
1489	**Tryptophan**				
	$e_{aq}^- + TrpH \rightarrow$		*2.9 × 10^9*	Average of 3 values.	
			3.2×10^8	p.r.; D.k.	84A200
		5.9	2.5×10^8	p.r.; D.k. at 550 nm in soln. contg. *tert*-BuOH and buffer. At pH 8.0 $k = 2.2 \times 10^8$, at pH 11.5 $k = 3.1 \times 10^7$; pK_a = 2.43, 9.44, 11.73.	771139
		7.8	3.0×10^8	p.r.; D.k. at 635 nm; L-isomer.	690459
1490	**Tyramine, conjugate acid**				
	$e_{aq}^- + HOC_6H_4CH_2CH_2NH_3^+ \rightarrow$	6.9	3.5×10^8	p.r.; D.k. at 690 nm in soln. contg. ~0.1 mol L^{-1} *tert*-BuOH; pK_a = 9.5, 10.8.	730003
1491	**Tyramine, negative ion**				
	$e_{aq}^- + {}^-OC_6H_4CH_2CH_2NH_2 \rightarrow$	11.2	5.8×10^7	p.r.; D.k. at 690 nm in soln. contg. ~0.1 mol L^{-1} *tert*-BuOH;	730003
1492	**Tyrosine**				
	$e_{aq}^- + TyrOH \rightarrow$		*3.4 × 10^8*	Average of 2 values.	
		6.6	2.8×10^8	p.r.; D.k.; pK_a = 2.2, 9.1, 10.1.	730003

TABLE 6. Rate constants for reactions of hydrated electrons in aqueous solution—Continued

No.	Reaction	pH	k (L mol^{-1} s^{-1})	Comment	Ref.
1492	**Tyrosine**—Continued				
		7.8	4.0×10^8	p.r.; D.k.	650389
1493	**Tyrosine dianion**				
	$e_{aq}^- + TyrO^{2-} \rightarrow$	12.5	9.6×10^7	p.r.; D.k. at 690 nm in soln. contg. ~0.1 mol L^{-1} *tert*-BuOH.	730003
		11.0	$<1.7 \times 10^7$	p.r.; D.k. at 600 nm; 20% monoanion; L-isomer.	680062
1494	**Uracil**				
	$e_{aq}^- + U \rightarrow U\cdot^-$	7	1.5×10^{10}	p.r.; D.k. in buffered soln. contg. 10^{-2} mol L^{-1} MeOH, $I = 0.1$ (Na_2SO_4); p$K_a = 9.45$.	680316
1495	**Uracil, negative ion**				
	$e_{aq}^- + U^- \rightarrow U\cdot^-$	11	1.9×10^9	p.r.; D.k. in buffered soln. contg. 10^{-2} mol L^{-1} MeOH, $I = 0.1$ (Na_2SO_4), $k_{obs} = 3 \times 10^9$; at pH 13 $k = 1.6 \times 10^9$; k cor. for I	680316
1496	**Urea**				
	$e_{aq}^- + H_2NCONH_2 \rightarrow$	7	3.0×10^5	p.r.; D.k. in unbuffered soln. contg. 10^{-3} mol L^{-1} EtOH.	670298
1497	**Uric acid**				
	$e_{aq}^- + C_5H_4N_4O_3 \rightarrow$	5	$\sim 6 \times 10^9$	p.r.; D.k. at 578 nm; p$K = 5.78$, 10.3.	640048
1498	**Uridine**				
	$e_{aq}^- + Ur \rightarrow$	6	1.4×10^{10}	p.r.; D.k. in buffered soln. contg. 10^{-2} mol L^{-1} MeOH and Na_2SO_4; p$K_a = 9.2$, 12.5; $I = 0.1$.	680316
1499	**Uridine, negative ion**				
	$e_{aq}^- + C_9H_{11}N_2O_6^- \rightarrow$	11.8	3×10^9	p.r.; D.k. in buffered soln. contg. 10^{-2} mol L^{-1} MeOH and Na_2SO_4; $I = 0.1$.	680316
1500	**Uridine monophosphate, 2',3'-cyclic dianion**				
	$e_{aq}^- + C_9H_9N_2O_8P^{2-} \rightarrow$	6	1×10^9	p.r.; D.k. in buffered soln. contg. 10^{-2} mol L^{-1} MeOH and Na_2SO_4; p$K = 1.02$, 5.88, 9.43; $I = 0.1$.	680316
1501	**Uridine 5'-monophosphate, dianion**				
	$e_{aq}^- + C_9H_{11}N_2O_9P^{2-} \rightarrow$	7	5×10^9	p.r.; D.k. in buffered soln. contg. 10^{-2} mol L^{-1} MeOH and Na_2SO_4; p$K_a = 6.63$, 9.7; $I = 0.1$.	680316
1502	**Uridine 5'-monophosphate, trianion**				
	$e_{aq}^- + C_9H_{10}N_2O_9P^{3-} \rightarrow$	13	6.5×10^8	p.r.; D.k. in buffered soln. contg. 10^{-2} mol L^{-1} MeOH and Na_2SO_4; $I = 0.1$.	680316
1503	**Valine**				
	$e_{aq}^- + Val \rightarrow$	6.4	$<5 \times 10^6$	p.r.; D.k. at 720 nm; p$K_a = 2.286$, 9.719	660011
1504	**Valine, negative ion**				
	$e_{aq}^- + Val^- \rightarrow$	9.5	$<2 \times 10^6$	p.r.; D.k. at 720 nm; k calcd. from $k_{obs} = <5 \times 10^6$ at pH 9.5 assuming solute is 50% negative ion, 50% zwitterion.	660011
1505	**Valinylglycine**				
	$e_{aq}^- + ValGly \rightarrow$	6.2	1.3×10^7	p.r.; D.k. at 700 nm in buffered soln. contg. 1 mol L^{-1} *tert*-BuOH; p$K = 3.23$, 8.00.	741058
1506	**Vinyl acetate**				
	$e_{aq}^- + CH_3CO_2CH{=}CH_2 \rightarrow$	11	1.7×10^9	f.p.; D.k.; H_2-satd. soln. contg. 10^{-3} mol L^{-1} NaOH.	717345
1507	**Vinyl benzoate**				
	$e_{aq}^- + C_6H_5CO_2CH{=}CH_2 \rightarrow$	11	7.3×10^9	f.p.; D.k.; H_2-satd. soln. contg. 10^{-3} mol L^{-1} NaOH.	717345
1508	**Vinyl chloride**				
	$e_{aq}^- + H_2C{=}CHCl \rightarrow Cl^- + CH_2CH\cdot$	~6.5	2.5×10^8	p.r.; D.k. at 720 nm in soln. contg. 0.5 mol L^{-1} *tert*-BuOH.	710709

TABLE 6. Rate constants for reactions of hydrated electrons in aqueous solution—Continued

No.	Reaction	pH	k (L mol^{-1} s^{-1})	Comment	Ref.
1509	**Vinylidene chloride**				
	$e_{aq}^- + H_2C{=}CCl_2 \rightarrow Cl^- + CH_2\dot{C}Cl$	~6.5	2.3×10^{10}	p.r.; D.k. at 720 nm in soln. contg. 0.5 mol L^{-1} *tert*-BuOH.	710709
1510	**Vinyl isobutyl ether**				
	$e_{aq}^- + (CH_3)_2CHCH_2OCH{=}CH_2 \rightarrow$	11	$\sim 1 \times 10^7$	f.p.; D.k.; H_2-satd. soln. contg. 10^{-3} mol L^{-1} NaOH.	717345
1511	***N*-Vinyl-2-pyrrolidinone**				
	$e_{aq}^- + Vp \rightarrow Vp^{\cdot -}$		1.6×10^9	p.r.; D.k. at 580 nm in N_2-satd. soln. contg. 2 mol L^{-1} MeOH.	81A296
1512	**Vinyl sulfonate ion**				
	$e_{aq}^- + CH_2{=}CHSO_3^- \rightarrow [\dot{C}H_2CHSO_3]^{\cdot 2-}$	7	2.3×10^9	p.r.; D.k. at 600 nm in N_2-satd. soln.; product detd. by esr is $CH_3\dot{C}HSO_3^-$ in acid or alk. soln.; no *e*-adduct obs.	82A328
1513	**Xanthine**				
	$e_{aq}^- + C_5H_4N_4O_2 \rightarrow$		3.9×10^9	p.r.; D.k.	86R158
1514	**Xylenol Orange**				
	$e_{aq}^- + C_{31}H_{32}N_2O_{13}S \rightarrow$	11	5.2×10^9	f.p.; D.k. at 700 nm.	710437
1515	**D-Xylose**				
	$e_{aq}^- + C_5H_{10}O_5 \rightarrow$	7	5×10^6	p.r.; D.k.	79A366

[a] Unrecommended value because of deficiencies in the method. The value is included since it is the only reported data on the substrate.
[b] Discrepancy in these data. No recommendation.

TABLE 7. Rate constants for reactions of hydrogen atoms in aqueous solution

No.	Reaction	pH	k (L mol^{-1} s^{-1})	Comment	Ref.
1	**Silver(I) ion**				
	$H^{\bullet} + Ag^{+} \rightarrow H^{+} + Ag^{0}$	2	1.2×10^{10} [b]	p.r.; P.b.k. at 310 nm.	650393
		1	2.8×10^{10} [b]	p.r.; P.b.k. at 410 nm; contains tert-BuOH; k increases with pressure 0 → 6.72×10^{8} N m^{-2}.	731053
2	**Arsenenous(III) acid**				
	$H^{\bullet} + HAsO_2 \rightarrow H^{+} + HAsO_2^{-}$	1	7×10^{8}	p.r.; Obs. dose rate effect on $G(As^{V})$ and $G(H_2O_2)$ in 0.4 mol L^{-1} H_2SO_4 assuming k(OH + As^{III}) = 1.8×10^{9}.	750247
3	**Tetrachloroaurate(III) ion**				
	$H^{\bullet} + AuCl_4^{-} \rightarrow H^{+} + AuCl_4^{2-}$	4	5.7×10^{9}	p.r.; P.b.k. at 330 nm in soln. contg. MeOH and 0.01 mol L^{-1} KCl.	680302
4	**Bromide ion**				
	$H^{\bullet} + Br^{-} \rightarrow HBr^{-}$	~ 7	2.8×10^{7}	γ-r.; C.k.; obs. $G(H_2)$; rel. to $k(H^{\bullet} + HCO_2^{-})$.	720264
5	**Bromine**				
	$H^{\bullet} + Br_2 \rightarrow Br_2^{\bullet -} + H^{+}$	1	$\sim 1 \times 10^{10}$	p.r.; P.b.k. at 360 nm (Br_2^{-}), competes favorably with H + O_2; uncertainty in the value is 5-fold.	650382
6	**Bromate ion**				
	$H^{\bullet} + BrO_3^{-} \rightarrow$	~1.7	$\sim 2.1 \times 10^{7}$ [a]	γ-r.; C.k. with riboflavin, obs. G(-RF); rel. to $k(H^{\bullet}$ + glucose).	84A192
7	**Carbon monoxide**				
	$H^{\bullet} + CO \rightarrow CHO$	1.2	1.7×10^{7} [b]	γ-r.; C.k.; rel. to $k(H^{\bullet} + Fe^{2+})$.	630014
		1	4.9×10^{7} [b]	γ-r.; C.k.; rel. to $k(H^{\bullet}$ + HCHO).	630014
8	**Carbon dioxide**				
	$H^{\bullet} + CO_2 \rightarrow {}^{\bullet}CO_2H$	1	$< 1 \times 10^{6}$	p.r.; No abs. at 250 nm obs. in CO_2-satd. soln. of 0.1 mol L^{-1} H_2SO_4.	650384
9	**Bicarbonate ion**				
	$H^{\bullet} + HCO_3^{-} \rightarrow$	8	4.4×10^{4}	X-r.; C.k.; rel. to $k(H^{\bullet}$ + MeOH).	630049
10	**Hydrogen cyanide**				
	$H^{\bullet} + HCN \rightarrow HCNH$	2	3.7×10^{7} [b]	γ-r.; C.k., obs. $G(H_2)$; rel. to $k(H^{\bullet}$ + EtOH).	730364
			1.0×10^{8} [b]	γ-r.; C.k.; rel. to $k(H^{\bullet}$ + 2-PrOH).	680593
11	**Cyanogen**				
	$H^{\bullet} + C_2N_2 \rightarrow$	~6	$< 1 \times 10^{7}$	p.r.; No reaction; no evidence for H adduct in transient spectra obs. in 3.7×10^{-4} mol L^{-1} cyanogen soln. contg. 2.4×10^{-2} mol L^{-1} N_2O.	710038
12	**Thiocyanate ion**				
	$H^{\bullet} + SCN^{-} \rightarrow$	1	2.3×10^{8}	p.r.; P.b.k. at 425 nm in soln. contg. 0.1 mol L^{-1} $HClO_4$ and $2.5\text{-}7.5 \times 10^{-2}$ mol L^{-1} thiocyanate ion.	87A903
13	**Cadmium(II) ion**				
	$H^{\bullet} + Cd^{2+} \rightarrow$	~7	$< 3 \times 10^{5}$	γ-r.; No reaction. c.k. in soln. contg. $1\text{-}5 \times 10^{-2}$ mol L^{-1} $CdSO_4$ and 10^{-2} mol L^{-1} EtOH, obs. $G(H_2)$; rel. to $k(H^{\bullet}$ + EtOH).	650192
14	**Cerium(IV) ion**				
	$H^{\bullet} + Ce^{4+} \rightarrow$	1	3.6×10^{7}	γ-r.; C.k.; obs. $G(H_2)$; rel. to $k(H^{\bullet}$ + EtOH).	701059
15	**Trichlorine anion**				
	$H^{\bullet} + Cl_3^{-} \rightarrow H^{+} + Cl_2^{\bullet -} + Cl^{-}$		6×10^{10}	p.r.; C.k. in 1 mol L^{-1} HCl soln. contg. chlorine and oxygen; estd. from $G(Cl_2^{-})$; $k = 2 \times 10^{10}$ in 2 mol L^{-1} HCl; rel. to $k(H^{\bullet} + O_2)$.	84A462
16	**Chloride ion**				
	$H^{\bullet} + Cl^{-} \rightarrow$	~7	$< 1 \times 10^{5}$	γ-r.; No reaction; c.k. with HCO_2^{-}; obs. $G(H_2)$.	720264

TABLE 7. Rate constants for reactions of hydrogen atoms in aqueous solution—Continued

No.	Reaction	pH	k (L mol^{-1} s^{-1})	Comment	Ref.
17	**5,7,7,12,14,14-Hexamethyl-1,4,8,11-tetraazacyclotetradeca-4,14-dienecobalt(II) ion**				
	H· + $Co(4,14\text{-dieneN}_4)^{2+}$ →	1.0	3.7×10^8	p.r.; C.k. in Ar-satd. soln. contg. 0.1 mol L^{-1} *tert*-BuOH and 10^{-4} mol L^{-1} $C_6H_5CO_2H$; obs. p.b.k. for H-adduct of BzOH; rel. to k(H· + BzOH).	78A200
18	**Hexaamminecobalt(III) ion**				
	H· + $Co(NH_3)_6^{3+}$ → H^+ + $Co(NH_3)_6^{2+}$	1	$<9.0 \times 10^4$	γ-r.; C.k.; rel. to k(H· + EtOH).	660010
19	**Pentaammineaquacobalt(III) ion**				
	H· + $Co(NH_3)_5^{3+}$ → $Co(NH_3)_5H_2O^{2+}$	1	$<7.0 \times 10^5$	γ-r.; C.k.; rel. to k(H· + EtOH).	660010
		1.8-3.9	4.5×10^5 [a]	e.d.; Detd. from dose rate of H atoms and amount of redn. product.	650014
20	**Pentaamminehydroxycobalt(III) ion**				
	H· + $Co(NH_3)_5OH^{2+}$ → $Co(NH_3)_5OH^+$		*9.0* × *10*^{7}	Average of 2 values.	
		6.06-11.0	3.1×10^7 [a]	e.d.; Detd. from dose rate of H atoms and amount of redn. product.	650014
		7.5	2.8×10^7	γ-r.; C.k.; rel. to k(H· + $CH_3CDOHCH_3$).	650085
21	**Tetraamminediaquacobalt(III) ion**				
	H· + $Co(NH_3)_4^{3+}$ →	3.5	4.7×10^6 [a]	e.d.; Detd. from dose rate of H atoms and amount of redn. product.	730517
22	**Tris(ethylenediamine)cobalt(III) ion**				
	H· + $Co(en)_3^{3+}$ → $Co(en)_3^{2+}$	3.5	6×10^5 [a]	e.d.; Detd. from dose rate of H atoms and amount of redn. product.	719218
23	**Diaquabis(ethylenediamine)cobalt(III) ion**				
	H· + $Co(en)_2^{3+}$ →	3.5	1.6×10^7 [a]	e.d.; Detd. from dose rate of H atoms and amount of redn. product.	719218
24	**Bisaquabis(diethylenetriamine)cobalt(III) ion**				
	H· + $Co(dien)_2(H_2O)_2^{3+}$ →	3.5	7.7×10^7 [a]	e.d.; Detd. from dose rate of H atoms and amount of redn. product.	730517
25	**Pentaamminebromocobalt(III) ion**				
	H· + $Co(NH_3)_5Br^{2+}$ → $Co(NH_3)_5Br^+$	1	6.3×10^9 [b]	γ-r.; C.k.; rel. to k(H· + EtOH).	660010
		4-6	1×10^9 [b]	γ-r.; C.k.; rel. to k(H· + $CH_3CDOHCH_3$).	650085
26	**Tetraamminedibromocobalt(III) ion**				
	H· + $Co(NH_3)_4Br_2^+$ →	3.5	5.5×10^8 [a]	e.d.; Detd. from dose rate of H atoms and amount of redn. product.	730517
27	***cis*-Dibromobis(diethylenetriamine)cobalt(III) ion**				
	H· + *cis*-$Co(dien)_2Br_2^+$ →	3.5	3.0×10^8 [a]	e.d.; Detd. from dose rate of H atoms and amount of redn. product.	730517
28	***trans*-Dibromobis(diethylenetriamine)cobalt(III) ion**				
	H· + *trans*-$Co(dien)_2Br_2^+$ →	3.5	4.1×10^8 [a]	e.d.; Detd. from dose rate of H atoms and amount of redn. product.	730517
29	**Pentaamminechlorocobalt(III) ion**				
	H· + $Co(NH_3)_5Cl^{2+}$ → $Co(NH_3)_5Cl^+$	1	7.2×10^8 [b]	γ-r.; C.k.; rel. to k(H· + EtOH).	660010
		4-6	2.5×10^8 [b]	γ-r.; C.k.; rel. to k(H· + $CH_3CDOHCH_3$).	650085
30	**Tetraamminedichlorocobalt(III) ion**				
	H· + $Co(NH_3)_4Cl_2^+$ →	3.5	2.8×10^8 [a]	e.d.; Detd. from dose rate of H atoms and amount of redn. product.	730517
31	**Dichloro(triethylenetetramine)cobalt(III) ion**				
	H· + $CoCl_2(trien)^+$ →	3.5	7.1×10^7 [a]	e.d.; Detd. from dose rate of H atoms and amount of redn. product.	730517
32	***cis*-Dichlorobis(diethylenetriamine)cobalt(III) ion**				
	H· + *cis*-$Co(dien)_2Cl_2^+$ →	3.5	1.1×10^8 [a]	e.d.; Detd. from dose rate of H atoms and amount of redn. product.	730517

TABLE 7. Rate constants for reactions of hydrogen atoms in aqueous solution—Continued

No.	Reaction	pH	k (L mol^{-1} s^{-1})	Comment	Ref.
33	***trans*-Dichlorobis(diethylenetriamine)cobalt(III) ion**				
	$H^{\cdot} + trans\text{-}Co(dien)_2Cl_2^{+} \rightarrow$	3.5	1.4×10^{8} [a]	e.d.; Detd. from dose rate of H atoms and amount of redn. product.	730517
34	**Pentaamminefluorocobalt(III) ion**				
	$H^{\cdot} + Co(NH_3)_5F^{2+} \rightarrow Co(NH_3)_5F^{+}$	1	$<1.4 \times 10^{6}$	γ-r.; C.k.; rel. to $k(H^{\cdot} + EtOH)$.	660010
35	**Tetraamminedifluorocobalt(III) ion**				
	$H^{\cdot} + Co(NH_3)_4F_2^{+} \rightarrow$	3.5	6.1×10^{6} [a]	e.d.; Detd. from dose rate of H atoms and amount of redn. product.	730517
36	**Bis(ethylenediamine)difluorocobalt(III) ion**				
	$H^{\cdot} + Co(en)_2F_2^{+} \rightarrow$	3.5	2.8×10^{6} [a]	e.d.; Detd. from dose rate of H atoms and amount of redn. product.	719218
37	***trans*-Bis(diethylenetriamine)difluorocobalt(III) ion**				
	$H^{\cdot} + trans\text{-}Co(dien)_2F_2^{+} \rightarrow$	3.5	4.6×10^{6} [a]	e.d.; Detd. from dose rate of H atoms and amount of redn. product.	730517
38	**Pentaamminelodocobalt(III) ion**				
	$H^{\cdot} + Co(NH_3)_5I^{2+} \rightarrow Co(NH_3)_5I^{+}$	1	1.5×10^{10}	γ-r.; C.k.; rel. to $k(H^{\cdot} + EtOH)$.	660010
39	**Pentaammine(azido)cobalt(III) ion**				
	$H^{\cdot} + Co(NH_3)_5N_3^{2+} \rightarrow$		*4.7 × 10⁸*	Average of 2 values.	
		1	4.9×10^{8}	γ-r.; C.k.; rel. to $k(H^{\cdot} + EtOH)$.	660010
		4-6	4.4×10^{8}	γ-r.; C.k.; rel. to $k(H^{\cdot} + CH_3CDOHCH_3)$.	650085
40	**Trinitrotrisamminecobalt(III)**				
	$H^{\cdot} + Co(NH_3)_3(NO_2)_3 \rightarrow$	1	4.3×10^{8}	γ-r.; C.k.; rel. to $k(H^{\cdot} + EtOH)$.	660010
41	**Pentaammine(nitrito-*N*)cobalt(III) ion**				
	$H^{\cdot} + Co(NH_3)_5NO_2^{2+} \rightarrow$	1	7.2×10^{7}	γ-r.; C.k.; rel. to $k(H^{\cdot} + EtOH)$.	660010
42	**Pentaamminecyanocobalt(III) ion**				
	$H^{\cdot} + Co(NH_3)_5CN^{2+} \rightarrow Co(NH_3)_5CN^{+}$		*3.5 × 10⁷*	Average of 2 values.	
		1	2.7×10^{7}	γ-r.; C.k.; rel. to $k(H^{\cdot} + EtOH)$.	660010
		4-6	4.2×10^{7}	γ-r.; C.k.; rel. to $k(H^{\cdot} + CH_3CDOHCH_3)$.	650085
43	**Hexacyanocobaltate(III) ion**				
	$H^{\cdot} + Co(CN)_6^{3-} \rightarrow$	1	8.9×10^{6}	γ-r.; C.k.; rel. to $k(H^{\cdot} + EtOH)$.	660010
44	**Phosphatopentaamminecobalt(III)**				
	$H^{\cdot} + Co(NH_3)_5PO_4 \rightarrow$	1	$<5.0 \times 10^{5}$	γ-r.; C.k.; rel. to $k(H^{\cdot} + EtOH)$.	660010
45	**Pentaammine(thiocyanato-*N*)cobalt(III) ion**				
	$H^{\cdot} + Co(NH_3)_5NCS^{2+} \rightarrow$	1	2.8×10^{9}	γ-r.; C.k.; rel. to $k(H^{\cdot} + EtOH)$.	660010
46	**Pentaammine(formato)cobalt(III) ion**				
	$H^{\cdot} + Co(NH_3)_5O_2CH^{2+} \rightarrow [Co(NH_3)_5O_2C]^{2+} + H_2$	3.5	1.5×10^{7} [a]	e.d.; Detd. from dose rate of H atoms and amount of redn. product.	730512
47	**(Acetato)pentaamminecobalt(III) ion**				
	$H^{\cdot} + Co(NH_3)_5O_2CCH_3^{2+} \rightarrow$		1.3×10^{6} [a]	e.d.; Detd. from dose rate of H atoms and amount of redn. product.	730512
48	**Pentaammine(chloroacetato-*O*)cobalt(III) ion**				
	$H^{\cdot} + Co(NH_3)_5O_2CCH_2Cl^{2+} \rightarrow$		1.7×10^{7} [a]	e.d.; Detd. from dose rate of H atoms and amount of redn. product.	730512
49	**Pentaammine(dichloroacetato-*O*)cobalt(III) ion**				
	$H^{\cdot} + Co(NH_3)_5O_2CCHCl_2^{2+} \rightarrow$		6.0×10^{6} [a]	e.d.; Detd. from dose rate of H atoms and amount of redn. product.	730512
50	**Pentaammine(trichloroacetato-*O*)cobalt(III) ion**				
	$H^{\cdot} + Co(NH_3)_5O_2CCCl_3^{2+} \rightarrow$		5.5×10^{5} [a]	e.d.; Detd. from dose rate of H atoms and amount of redn. product.	730512
51	**Pentaammine(trifluoroacetato)cobalt(III) ion**				
	$H^{\cdot} + Co(NH_3)_5O_2CCF_3^{2+} \rightarrow$	1	$<1.8 \times 10^{5}$	γ-r.; C.k.; rel. to $k(H^{\cdot} + EtOH)$.	660010

TABLE 7. Rate constants for reactions of hydrogen atoms in aqueous solution—Continued

No.	Reaction	pH	k (L mol^{-1} s^{-1})	Comment	Ref.
52	**Pentaammine(propionato-*O*)cobalt(III) ion**				
	$H^{\cdot} + Co(NH_3)_5O_2CCH_2CH_3^{2+} \rightarrow$		4.7×10^6 [a]	e.d.; Detd. from dose rate of H atoms and amount of redn. product.	730512
53	**Pentaammine(butanoato-*O*)cobalt(III) ion**				
	$H^{\cdot} + Co(NH_3)_5O_2C(CH_2)_2CH_3^{2+} \rightarrow$		3.6×10^6 [a]	e.d.; Detd. from dose rate of H atoms and amount of redn. product.	730512
54	**Pentaammine(isobutyrato)cobalt(III) ion**				
	$H^{\cdot} + Co(NH_3)_5O_2CCH(CH_3)_2^{2+} \rightarrow$		5.7×10^6 [a]	e.d.; Detd. from dose rate of H atoms and amount of redn. product.	730512
55	**Pentaammine(pentanoato)cobalt(III) ion**				
	$H^{\cdot} + Co(NH_3)_5O_2C(CH_2)_3CH_3^{2+} \rightarrow$		3.8×10^6 [a]	e.d.; Detd. from dose rate of H atoms and amount of redn. product.	730512
56	**Pentaammine(fumarato)cobalt(III) ion**				
	$H^{\cdot} + Co(NH_3)_5H\text{-}fum^{2+} \rightarrow$	1	2.7×10^9	γ-r.; C.k.; rel. to $k(H^{\cdot} + EtOH)$.	660010
57	**Trioxalatocobaltate(III) ion**				
	$H^{\cdot} + Co(C_2O_4)_3^{3-} \rightarrow H^+ + Co(C_2O_4)_2^{2-} + {}^-O_2CCO_2^-$	7	6.8×10^8	γ-r.; C.k.; rel. to $k(H^{\cdot} + NO_2^-)$.	670498
58	**Ethylenediaminebis(oxalato)cobaltate(III) ion**				
	$H^{\cdot} + Co(en)(C_2O_4)_2^- \rightarrow$	3.5	2.8×10^6 [a]	e.d.; Detd. from dose rate of H atoms and amount of redn. product.	719218
59	**Bis(ethylenediamine)oxalatocobalt(III) ion**				
	$H^{\cdot} + Co(en)_2(C_2O_4)^+ \rightarrow$	3.5	8×10^5 [a]	e.d.; Detd. from dose rate of H atoms and amount of redn. product.	719218
60	**Pentaammine(benzoato)cobalt(III) ion**				
	$H^{\cdot} + Co(NH_3)_5O_2CC_6H_5^{2+} \rightarrow Co(NH_3)_5O_2CC_6H_6^{2+}$		*1.6×10^9*	Average of 2 values.	
			1.5×10^9	p.r.; P.b.k.	771027
		1.0	1.6×10^9	p.r.; P.b.k. at 345 nm in Ar-satd. soln. contg. 0.01 mol L^{-1} MeOH.	710282
61	**Pentaammine(4-nitrobenzoato)cobalt(III) ion (PNBPA)**				
	$H^{\cdot} + p\text{-}O_2NC_6H_4CO_2Co(NH_3)_5^{2+} \rightarrow Co(NH_3)_5O_2CC_6H_5\text{-}4\text{-}NO_2^{2+}$	1	1.9×10^9	p.r.; P.b.k. at 410 nm in soln. contg. 1 mol L^{-1} *tert*-BuOH; abs. spectrum indicates ring addn.	771027
62	**Tris(glycinato)cobalt(III)**				
	$H^{\cdot} + Co(Gly)_3 \rightarrow$	3.5	3.4×10^6 [a]	e.d.; Detd. from dose rate of H atoms and amount of redn. product.	730512
63	**Tris(alaninato)cobalt(III)**				
	$H^{\cdot} + Co(Ala)_3 \rightarrow$	3.5	7.6×10^6 [a]	e.d.; Detd. from dose rate of H atoms and amount of redn. product.	730512
64	**Tris(L-2-aminopentanoato)cobalt(III)**				
	$H^{\cdot} + Co(Val)_3 \rightarrow$	3.5	1.6×10^7 [a]	e.d.; Detd. from dose rate of H atoms and amount of redn. product.	730512
65	**Nitrilotriacetatocobaltate(III)**				
	$H^{\cdot} + CoNTA \rightarrow$	6	$<1.0 \times 10^6$ [a]	γ-r.; Est. from redn. in $G(-CoNTA)$ on addn. of *tert*-BuOH; rel. to $k(H^{\cdot} + tert\text{-}BuOH)$.	770170
66	**Tris(acetylacetonato)cobalt(III)**				
	$H^{\cdot} + Co(acac)_3 \rightarrow$	1	1.3×10^9	γ-r.; C.k.; rel. to $k(H^{\cdot} + 2\text{-}PrOH)$.	700094
67	**Chromium(II) ion**				
	$H^{\cdot} + Cr^{2+} \rightarrow CrH^{2+}$	0-2	1.5×10^9	p.r.; P.b.k. (250-470 nm) in Ar-satd. soln. contg. $HClO_4$.	741142
68	**Trioxalatochromate(III) ion**				
	$H^{\cdot} + Cr(C_2O_4)_3^{3-} \rightarrow$	3.5	1.1×10^6 [a]	e.d.; Detd. from dose rate of H atoms and amount of redn. product.	719218

TABLE 7. Rate constants for reactions of hydrogen atoms in aqueous solution—Continued

No.	Reaction	pH	k (L mol^{-1} s^{-1})	Comment	Ref.
69	**Chromate(VI) ion**				
	$H^\bullet + CrO_4^{2-} \rightarrow$		*8.2 × 10^9*	Average of 2 values.	
			6.3 × 10^9	γ-r.; C.k.; rel. to $k(H^\bullet + HCO_2^-)$.	660616
		~7	1.0 × 10^{10}	γ-r.; C.k.; rel. to $k(H^\bullet$ + EtOH).	650192
70	**Dichromate(VI) ion**				
	$H^\bullet + Cr_2O_7^{2-} \rightarrow$	~7	2 × 10^{10}	γ-r.; C.k.; rel. to $k(H^\bullet$ + EtOH).	650192
71	**Copper(I) ion**				
	$H^\bullet + Cu^+ \rightarrow CuH^+$	5.6	~5.0 × 10^9	p.r.; P.b.k. at 340 nm in 10^{-3} mol L^{-1} $CuSO_4$ soln. under 100 atm H_2.	82A104
72	**Copper(II) ion**				
	$H^\bullet + Cu^{2+} \rightarrow H^+ + Cu^+$		*9.1 × 10^7*	Average of 3 values.	
		1	8.8 × 10^7	γ-r.; C.k.; obs. $G(H_2)$; rel. to $k(H^\bullet$ + MeOH).	84G172
		1-2	9.9 × 10^7	γ-r.; C.k.; obs. $G(H_2)$; rel. to $k(H^\bullet$ + MeOH).	680444
		1	8.6 × 10^7	X-r.; C.k.; rel. to $k(H^\bullet$ + MeOH).	580009
73	**(5,7,7,12,14,14-Hexamethyl-1,4,8,11-tetraazacyclotetradeca-4,11-diene)copper(II) ion**				
	$H^\bullet + Cu(4,11\text{-dieneN}_4)^{2+} \rightarrow Cu(4,11\text{-dieneN}_4)^+$	1.0	>5 × 10^9	p.r.; P.b.k. in Ar-satd. soln. contg. 1 mol L^{-1} *tert*-BuOH.	761039
74	**Deuterium**				
	$H^\bullet + D_2 \rightarrow HD + D$	2.12	<2 × 10^4	γ-r.; C.k.; rel. to $k(H^\bullet + Fe^{3+})$.	590012
75	**Fluoride ion**				
	$H^\bullet + F^- \rightarrow HF + e_{aq}^-$	8.3	1.0 × 10^4	p.r.; Effect of H_2 concn. on e_{aq}^- decay in 1.0 mol L^{-1} KF.	670115
76	**Iron(II) ions**				
	$H^\bullet + Fe^{2+} \rightarrow FeH^{2+}$	0	7.5 × 10^6	p.r.; P.b.k. at 270 nm (FeH^{2+}); assuming $k(H^\bullet + H^\bullet) = 2.6 \times 10^{10}$; $k(FeH^{2+} + H^+ \rightarrow Fe^{3+} + H_2) = 1.06 \times 10^4$.	690434
77	**Ferrocyanide ion**				
	$H^\bullet + Fe(CN)_6^{4-} \rightarrow Fe(CN)_6H^{4-}$	1.0-3.3	3.9 × 10^7	p.r.; P.b.k.	741064
78	**Iron(III) ions**				
	$H^\bullet + Fe^{3+} \rightarrow H^+ + Fe^{2+}$	~1-2	<2 × 10^6	γ-r.; C.k. in $HClO_4$ soln.; $k(H^\bullet + FeOH^{2+}) >> 500\ k(H^\bullet + Fe^{3+})$ detd. from pH study; rel. to $k(H^\bullet$ + MeOH).	680444
		0.3	<7.5 × 10^5	e.d.; C.k. in $HClO_4$; rel. to $k(H^\bullet + Fe^{2+})$.	660345
79	**Hydroxoiron(III) ion**				
	$H^\bullet + FeOH^{2+} \rightarrow H^+ + Fe^{2+}$		*1.2 × 10^9*	Average of 2 values.	
		~1-2	1.2 × 10^9	γ-r.; C.k. in $HClO_4$; rel. to $k(H^\bullet$ + MeOH).	680444
		0.3	1.2 × 10^9	e.d.; C.k. in $HClO_4$; rel. to $k(H^\bullet + Fe^{2+})$.	660345
80	**Sulfatoiron(III) ion**				
	$H^\bullet + FeSO_4^+ \rightarrow H^+ + Fe^{2+}$	0.3	7.5 × 10^5	e.d.; C.k. in H_2SO_4; rel. to $k(H^\bullet + Fe^{2+})$.	660345
81	**Chloroiron(III) ion**				
	$H^\bullet + FeCl^{2+} \rightarrow H^+ + Fe^{2+} + Cl^-$	0.8	2 × 10^9 [b]	e.d.; C.k. in HCl; rel. to $k(H^\bullet + Fe^{2+})$.	660345
		0.8	4.8 × 10^9 [b]	γ-r.; C.k. in HCl; rel. to $k(H^\bullet + O_2)$.	570008
82	**Fluoroiron(III) ion**				
	$H^\bullet + FeF^{2+} \rightarrow$	0.8	~3 × 10^5	e.d.; C.k., also contains FeF_2^+; rel. to $k(H^\bullet + Fe^{2+})$.	660345
83	**Tris(2,2'-bipyridine)iron(III) ion**				
	$H^\bullet + Fe(bpy)_3^{3+} \rightarrow$	0.3	2.2 × 10^9 [a]	e.d.; Detd. from dose rate of H atoms and amount of redn. product.	660345
84	**Tris(1,10-phenanthroline)iron(III) ion**				
	$H^\bullet + Fe(phen)_3^{3+} \rightarrow H^+ + Fe(phen)_3^{2+}$		*4.5 × 10^9*	Average of 2 values.	

TABLE 7. Rate constants for reactions of hydrogen atoms in aqueous solution—Continued

No.	Reaction	pH	k (L mol^{-1} s^{-1})	Comment	Ref.
84	**Tris(1,10-phenanthroline)iron(III) ion**—Continued				
		<1	4.0×10^9	p.r.; P.b.k. at 490 nm in soln. contg. *tert*-BuOH; fast step.	85A284
		~0	5.0×10^9	p.r.; P.b.k. at 510 nm in soln. contg. 0.1 mol L^{-1} *tert*-BuOH and 0.025 mol L^{-1} H_2SO_4.	79A174
85	**Pentacyanonitrosylferrate(III) ion** $H\cdot + Fe(CN)_5NO^{2-} \rightarrow H^+ + Fe(CN)_5NO^{3-}$	4.6	7×10^7	p.r.; P.b.k. in N_2O-satd. soln.	771120
86	**Ferricyanide ion** $H\cdot + Fe(CN)_6^{3-} \rightarrow H^+ + Fe(CN)_6^{4-}$		**6.3×10^9**	**Selected value.**	
		0.4-3.2	5.5×10^9	p.r.; D.k.; cor. for H + $Fe(CN)_6^{4-}$ and H + H; ~10% aquation (→ $Fe(CN)_5H_2O^{3-}$ + HCN); pK of substrate about 3 [81G006].	741064
		1.9	7.5×10^9	p.r.; D.k. at 410 nm in soln. contg. 1 mol L^{-1} *tert*-BuOH.	710618
		2-3	6.0×10^9	p.r.; D.k. at 420 nm; recalcd. with cor. for competing reactions [741064].	680324
87	**Trioxalatoferrate(III) ion** $H\cdot + Fe(C_2O_4)_3^{3-} \rightarrow$	3.5	3.4×10^6 [a]	e.d.; Detd. from dose rate of H atoms and amount of redn. product.	719218
88	**Hemin** $H\cdot + Fe^{3+}$ heme → addn. (to porphyrin)	7	$>3 \times 10^{10}$	p.r.; P.b.k. at 610 nm; intermed. formed decays to give Fe^{2+} heme.	771128
89	**Mercury(I) ion dimer** $H\cdot + Hg_2^{2+} \rightarrow H^+ + Hg_2^+$	1.0	4.7×10^9	p.r.; P.b.k. at 300 nm; at pH 1.5-1.6 and 0, resp., $k = 4.1 \times 10^9$ and 4.6×10^9.	79A063
90	**Mercury(II) ion** $H\cdot + Hg^{2+} \rightarrow H^+ + Hg^+$		*2.0×10^9*	Average of 2 values.	
		acid	$\sim 2.1 \times 10^9$	p.r.; C.k.; rel. to $k(H\cdot + O_2)$.	751218
		1.5	1.9×10^9	γ-r.; C.k.; rel. to $k(H\cdot$ + 2-PrOH).	690275
91	**Mercury(II) hydroxide** $H\cdot + Hg(OH)_2 \rightarrow HgOH + H^+$		*2.4×10^9*	Average of 2 values.	
		~ 7	2.3×10^9	γ-r.; C.k.; 8×10^{-6} mol L^{-1} $HgCl_2$ and 2×10^{-5} mol L^{-1} HCOONa; rel. to $k(H\cdot + HCO_2^-)$.	660616
		~ 7	2.0×10^9	γ-r.; C.k.; error in reported ratio (1.5×10^3) noted in [660616]; rel. to $k(H\cdot$ + EtOH).	650192
92	**Mercury(II) chloride** $H\cdot + HgCl_2 \rightarrow H^+ + HgCl + Cl^-$	1	1.0×10^{10}	p.r.; P.b.k. at 330 nm (HgCl).	730043
93	**Mercury(II) iodide** $H\cdot + HgI_2 \rightarrow HgI_2(H)$		1.5×10^{10}	p.r.; P.b.k. in soln. contg. *tert*-BuOH and H^+; adduct formn. ($\epsilon^{470} = 4700$ L mol^{-1} cm^{-1}).	78A165
94	**Iodine** $H\cdot + I_2 \rightarrow H^+ + I_2^{\cdot -}$	2	3.5×10^{10}	p.r.; P.b.k. in soln. contg. 2×10^{-5} mol L^{-1} I_2 and 5×10^{-4} mol L^{-1} KI.	86A070
95	**Triiodine ion** $H\cdot + I_3^- \rightarrow I_2^{\cdot -} + H^+ + I^-$	1.5	4.5×10^{10} [b]	γ-r.; C.k.; obs. $G(H_2)$; rel. to $k(H\cdot$ + glucose).	690338
		2.92	1×10^{10} [b]	phot.; C.k.; data from [627008]; rel. to $k(H\cdot$ + MeOH).	687194
		1.72-2.92	2.1×10^{10} [b]	phot.; C.k.; data from [627008]; rel. to $k(H\cdot$ + 2-PrOH).	687194
96	**Iodide ion** $H\cdot + I^- \rightarrow HI^-$	~7	3.4×10^7	γ-r.; C.k.; obs. $G(H_2)$; rel. to $k(H\cdot + HCO_2^-)$.	720264

TABLE 7. Rate constants for reactions of hydrogen atoms in aqueous solution—Continued

No.	Reaction	pH	k (L mol^{-1} s^{-1})	Comment	Ref.
97	**Indium(III) ion**				
	$H^\cdot + In^{3+} \rightarrow$	<1	$<3 \times 10^6$	p.r.; No reaction; no In(II) formed when no 2-PrOH was present in soln. contg. 1 mol L^{-1} $HClO_4$ and 5×10^{-3} mol L^{-1} In(III).	84A008
		0.1	$<1.5 \times 10^5$	p.r.; No reaction; no formn. of In^{2+} obs.	83A206
98	**Hexachloroiridate(IV) ion**				
	$H^\cdot + IrCl_6^{2-} \rightarrow H^+ + IrCl_6^{3-}$		9.2×10^9	p.r.; D.k. at 435 nm in soln. contg. $HClO_4$.	731066
99	**Manganese(II) ions**				
	$H^\cdot + Mn^{2+} \rightarrow H^+ + Mn^+$	<0	6.6×10^8	p.r.; P.b.k. at 290 nm in 6 mol L^{-1} H_2SO_4; extrapolated from measurements at ~200-250 K.	751197
100	**Permanganate ion**				
	$H^\cdot + MnO_4^- \rightarrow H^+ + MnO_4^{2-}$	3	2.4×10^{10}	p.r.; D.k. at 545 nm.	650385
101	**Azide ion**				
	$H^\cdot + N_3^- \rightarrow HN_3^{\cdot -}$		*2.9 × 10^9*	Average of 4 values.	
		6.7	1.9×10^9	p.r.; esr; D.k. of H signal in soln. contg. 0.5 mol L^{-1} phosphate and 10^{-2} mol L^{-1} *tert*-BuOH.	86A331
		6.7	$\sim 2.4 \times 10^9$	p.r.; C.k. in soln. contg. 0.5 mol L^{-1} phosphate, 1×10^{-4} mol L^{-1} *tert*-BuOH, 5×10^{-4} mol L^{-1} phenol and 10^{-4}-10^{-3} mol L^{-1} azide; rel. to $k(H^\cdot + C_6H_5OH)$.	86A331
		~ 7	4.0×10^9	γ-r.; C.k.; obs. $G(H_2)$ in Ar-satd. soln. contg. 5×10^{-4} mol L^{-1} NO_3^-, 10^{-3} mol L^{-1} N_3^- and 0.5 to 5 mol L^{-1} 2-PrOH; rel. to $k(H^\cdot$ + 2-PrOH).	710007
			3.3×10^9	γ-r.; C.k.; rel. to $k(H^\cdot + EtOH)$.	660010
102	**Hydrazoic acid**				
	$H^\cdot + HN_3 \rightarrow$	1.2	7.2×10^7	γ-r.; rel. to $k(H^\cdot + EtOH)$.	660010
103	**Ammonium ion**				
	$H^\cdot + NH_4^+ \rightarrow$	7	$<4 \times 10^4$	γ-r.; No reaction; c.k. in soln. contg. 0.1 mol L^{-1} $(NH_4)_2SO_4$ and 1.6×10^{-2} mol L^{-1} N_2O; rel. to $k(H^\cdot + DCO_2^-)$.	640095
104	**Hydrazinium ion**				
	$H^\cdot + H_2NNH_3^+ \rightarrow H^+ + H_2 + {}^\cdot NHNH_2$	~0.7	2.5×10^4	γ-r.; C.k.; obs. $G(H_2)$; at pH 6 $k = 1.2 \times 10^5$; $pK_a = 7.9$; rel. to $k(H^\cdot + H_2O_2)$.	690598
105	**Nitrosyldisulfonate ion**				
	$H^\cdot + NO(SO_3)_2^{2-} \rightarrow$	8.5	2.5×10^9	γ-r.; C.k., obs. $G(H_2)$; 0.1 mol L^{-1} Na_2HPO_4 used to adjust pH; rel. to $k(H^\cdot + HCO_2^-)$.	690649
106	**Nitrous oxide**				
	$H^\cdot + N_2O \rightarrow {}^\cdot OH + N_2$	alk.	2.1×10^6	γ-r.; C.k.; rel. to $k(H^\cdot + Fe(CN)_6^{3-})$.	680693
107	**Nitrous acid**				
	$H^\cdot + HNO_2 \rightarrow NO + H_2O$	1	4.5×10^8	γ-r.; C.k.; rel. to $k(H^\cdot + EtOH)$.	660010
108	**Nitrite ion**				
	$H^\cdot + NO_2^- \rightarrow NO + OH^-$	7	7.1×10^8	p.r.; esr; D.k. (H signal).	710303
109	**Nitrate ion**				
	$H^\cdot + NO_3^- \rightarrow$	2.5	1.4×10^6	p.r.; esr; D.k. (H signal); high concn. of NO_3^-; k concn. dependent.	710303
110	**Nickel(II) ions**				
	$H^\cdot + Ni^{2+} \rightarrow$	nat.	$<3 \times 10^5$	γ-r.; No reaction; c.k. in soln. contg. 5-10 × 10^{-2} mol L^{-1} $NiSO_4$ and 10^{-2} mol L^{-1} EtOH; obs. $G(H_2)$; rel. to $k(H^\cdot + EtOH)$.	650192
111	**5,7,7,12,14,14-Hexamethyl-1,4,8,11-tetraazacyclotetradecanenickel(II) ion**				
	$H^\cdot + Ni(aneN_4)^{2+} \rightarrow Ni(aneN_4)^+$	1.0	3.2×10^8	p.r.; P.b.k. in Ar-satd. soln. contg. 1 mol L^{-1} *tert*-BuOH.	761039

TABLE 7. Rate constants for reactions of hydrogen atoms in aqueous solution—Continued

No.	Reaction	pH	k (L mol^{-1} s^{-1})	Comment	Ref.
112	**5,7,7,12,14,14-Hexamethyl-1,4,8,11-tetraazacyclotetradeca-4,11-dienenickel(II) ion**				
	$H^{\cdot} + Ni(4,11\text{-dieneN}_4)^{2+} \rightarrow Ni(4,11\text{-dieneN}_4)^{+}$	1.0	8.7×10^{8}	p.r.; P.b.k. in Ar-satd. soln. contg. 1 mol L^{-1} *tert*-BuOH.	761039
113	**Tetracyanonickelate(II) ion**				
	$H^{\cdot} + Ni(CN)_4^{2-} \rightarrow Ni(CN)_4H^{2-}$		1.8×10^{10}	p.r.; P.b.k. at 360 nm in N_2O-satd. soln. contg. MeOH.	741072
114	**Dioxoneptunium(V) ion**				
	$H^{\cdot} + NpO_2^{+} \rightarrow$	~0	$< 5 \times 10^{6}$	p.r.; No reaction; c.k. in soln. contg. 1 mol L^{-1} $HClO_4$, 5×10^{-4} mol L^{-1} BzOH and 0.2 mol L^{-1} *tert*-BuOH; rel. to $k(H^{\cdot} + BzOH)$.	82A420 85A236
115	**Dioxoneptunium(VI) ion**				
	$H^{\cdot} + NpO_2^{2+} \rightarrow H^{+} + NpO_2^{+}$	1-3	$< 1 \times 10^{7}$	p.r.; P.b.k. in He-satd. soln. contg. 0.1 mol L^{-1} $HClO_4$; no reaction.	83A071
116	**Water**				
	$H^{\cdot} + H_2O \rightarrow H_2 + {\cdot}OH$	10-13	1.0×10^{1} [a]	phot.; Calcd. from obs. quantum yields of N_2, H_2 and H_2O_2 in N_2O-satd. soln. and Ar-satd. soln. and computer simulation of product yields based on assumed values for 26 reactions; too low to measure reliably.	82A036
117	**Hydroxide ion**				
	$H^{\cdot} + OH^{-} \rightarrow e_{aq}^{-}$		**2.2×10^{7}**	**Selected value.**	
		11.7, 12	2.5×10^{7}	p.r.; P.b.k. at 600 nm in soln. satd. with H_2 at 100 atm ($[H_2] = 8 \times 10^{-2}$ mol L^{-1}; value of k from Fig. 3-4; activation energy determined at 15-60°C.	85A373
		11.6	1.8×10^{7}	p.r.; P.b.k., soln. under 100 atm. H_2.	650009
118	**Hydrogen peroxide**				
	$H^{\cdot} + H_2O_2 \rightarrow {\cdot}OH + H_2O$	2.1	9×10^{7}	p.r.; P.b.k. (obs. Cl_2^{-} at 350 nm from OH + Cl^{-}; soln. contains 2×10^{-3} mol L^{-1} H_2O_2 and 0.2 mol L^{-1} Cl^{-}).	640093
119	**Oxygen**				
	$H^{\cdot} + O_2 \rightarrow HO_2{\cdot}$		**2.1×10^{10}**	**Selected value.**	
		1.2	2.1×10^{10}	p.r.; P.b.k. at 240 nm.	640043
120	**Ozone**				
	$H^{\cdot} + O_3 \rightarrow {\cdot}OH + O_2$	2	3.8×10^{10}	p.r.; C.k.; calcd. from abs. change at 260 nm (O_3) and 220 nm (OH and HO_2) in H_2SO_4 soln. satd. with O_2, contg. (1.2-1.4) $\times 10^{-4}$ mol L^{-1} ozone; rel. to $k(H^{\cdot} + O_2)$.	83A117
121	**Pentaammine(chloro)osmium(III) ion**				
	$H^{\cdot} + Os(NH_3)_5Cl^{2+} \rightarrow H^{+} + Os(NH_3)_5Cl^{+}$	2	$\sim 5 \times 10^{9}$	p.r.; P.b.k. (transient abs. ~305 nm) in Ar-satd. soln. contg. CF_3SO_3H, 0.1 mol L^{-1} *tert*-BuOH and 10^{-4} mol L^{-1} complex.	82A145
122	**Hypophosphorous acid**				
	$H^{\cdot} + H_3PO_2 \rightarrow H_2 + H_2PO_2{\cdot}$	~0.8	$\sim 4.4 \times 10^{9}$	γ-r.; C.k.; obs. $G(H_2)$ in 0.4 mol L^{-1} $HClO_4$; rel. to $k(H^{\cdot} + O_2)$.	83A359
123	**Phosphorous acid**				
	$H^{\cdot} + H_3PO_3 \rightarrow H_2 + H_2\dot{P}O_3$	~0.8	$\sim 5.3 \times 10^{8}$	γ-r.; C.k.; obs. $G(H_2)$ in 0.4 mol L^{-1} $HClO_4$; rel. to $k(H^{\cdot} + O_2)$.	83A359
124	**Hydrogen phosphite ion**				
	$H^{\cdot} + HPO_3^{2-} \rightarrow H_2 + \dot{P}O_3^{2-}$		*2.0×10^{9}*	Average of 2 values.	
		12-14	1.8×10^{9}	γ-r.; C.k., obs. $G(H)$; rel. to $k(H + OH^{-})$ (value not given); soln. cont. 10^{-3} mol L^{-1} $NaNO_3$, 5×10^{-3} mol L^{-1} Na phosphite and 10^{-2}-1 mol L^{-1} and NaOH.	690051
		13.6	2.2×10^{9}	γ-r.; C.k.; rel. to $k(H^{\cdot} + OH^{-})$.	650155

TABLE 7. Rate constants for reactions of hydrogen atoms in aqueous solution—Continued

No.	Reaction	pH	k (L mol^{-1} s^{-1})	Comment	Ref.
125	**Phosphoric acid** $H^\cdot + H_3PO_4 \rightarrow H_2 + H_2PO_4^\cdot$	0	5×10^5	p.r.; P.b.k. at 500 nm.	731049
126	**Dihydrogen phosphate ion** $H^\cdot + H_2PO_4^- \rightarrow H_2 + HPO_4^{\cdot -}$	3.8-4.0	5×10^5	p.r.; P.b.k. at 500 nm.	731049
127	**Hydrogen phosphate ion** $H^\cdot + HPO_4^{2-} \rightarrow H_2 + PO_4^{\cdot 2-}$	9.0-12.3	$<5 \times 10^4$	p.r.; No reaction; p.b.k. at 500 nm.	731049
128	**Lead(I) ion** $H^\cdot + Pb^+ \rightarrow PbH^+$	~3-5	3×10^9	p.r.; P.b.k. at 300 nm.	761170
129	**Lead(II) ion** $H^\cdot + Pb^{2+} \rightarrow Pb^+ + H^+$	~3-5		p.r.; No reaction; formn. of Pb^+ at 300 nm under H_2 pressure was due to e_{aq}^-.	761170
130	**Praseodymium(III) ion** $H^\cdot + Pr^{3+} \rightarrow$	1.9	$<1 \times 10^3$	γ-r.; No reaction; c.k. with CH_3OH; [method of 670099]; substrate causes little change in H_2 yield on addn. of 10^{-2}-10^{-1} mol L^{-1} Pr(III) to 10^{-4} mol L^{-1} MeOH.	720066
131	**Tetraammineplatinum(II) ion** $H^\cdot + Pt(NH_3)_4^{2+} \rightarrow HPt(NH_3)_4^{2+}$	1.1-2.9	2.8×10^{10}	p.r.; P.b.k. at 260-300, 420, and 425 nm in soln. contg. 0.1-0.2 mol L^{-1} *tert*-BuOH and (1.5-24.5) $\times 10^{-5}$ mol L^{-1} complex.	81A353
132	**Bis(ethylenediamine)platinum(II) ion** $H^\cdot + Pt(en)_2^{2+} \rightarrow$	2-3	1.4×10^{10}	p.r.; P.b.k. in soln. contg. *tert*-BuOH and $HClO_4$ (λ_{max} = 420 nm), product not Pt^I.	751188
133	**Chloro(diethylenetriamine)platinum(II) ion** $H^\cdot + Pt(dien)Cl^+ \rightarrow$	2-3	1.6×10^{10}	p.r.; P.b.k. in soln. contg. *tert*-BuOH and $HClO_4$ (λ_{max} = 410 nm), product not Pt^I.	751188
134	**Chloro(tetraethyldiethylenetriamine)platinum(II) ion** $H^\cdot + Pt(Et_4dien)Cl^+ \rightarrow$	2-3	8×10^9	p.r.; P.b.k. in soln. contg. *tert*-BuOH and $HClO_4$ (λ_{max} = 290 nm), product not Pt^I.	751188
135	***cis*-Bis(glycinato)platinum(II)** $H^\cdot + cis\text{-}Pt(Gly)_2 \rightarrow$	2	2.0×10^{10}	p.r.; P.b.k. at 250-310 nm in soln. contg. 0.01 mol L^{-1} $HClO_4$ and 0.5 mol L^{-1} *tert*-BuOH; initial product ($\epsilon^{250} \simeq 4100$ L mol^{-1} cm^{-1}) from H reaction at ligand.	771053
136	***trans*-Bis(glycinato)platinum(II)** $H^\cdot + trans\text{-}Pt(Gly)_2 \rightarrow$	2	2.2×10^{10}	p.r.; P.b.k. at 250-290 nm in soln. contg. 0.01 mol L^{-1} $HClO_4$ and 0.5 mol L^{-1} *tert*-BuOH; initial product ($\epsilon^{260} \simeq 5800$ L mol^{-1} cm^{-1}) from H reaction at ligand.	771053
137	***trans*-Dihydroxybis(ethylenediamine)platinum(IV) ion** $H^\cdot + trans\text{-}Pt(en)_2(OH)_2^{2+} \rightarrow$	3.9	$<5 \times 10^8$	p.r.; Upper limit for k based on decay of absorption of radical from 0.2 mol L^{-1} *tert*-BuOH in soln. satd. with N_2O contg. 3×10^{-4} mol L^{-1} complex.	80A286
138	***trans*-Dichlorobis(ethylenediamine)platinum(IV) ion** $H^\cdot + trans\text{-}Pt(en)_2Cl_2^{2+} \rightarrow Pt(en)_2Cl^{2+} + H^+ + Cl^-$	2	4.3×10^9	p.r.; P.b.k. at 240-300 nm in soln. contg. *tert*-BuOH and 0.01 mol L^{-1} $HClO_4$.	751188
139	**Tris(2,2′-bipyridine)rhodium(III) ion** $H^\cdot + Rh(bpy)_3^{3+} \rightarrow Rh(bpy)_2(bpyH)^{3+}$	1	1.9×10^9	p.r.; D.k. at 350 nm in Ar-purged soln. contg. 0.5 mol L^{-1} *tert*-BuOH.	81A134
140	**Tris(2,2′-bipyridine)ruthenium(II) ion** $H^\cdot + Ru(bpy)_3^{2+} \rightarrow Ru(bpy)_2(bpyH)^{2+}$	~ 2	9.5×10^9	p.r.; P.b.k. at 420 nm; product suggested to be H adduct on ligand (ϵ^{420} = 18,000 L mol^{-1} cm^{-1}).	720381

TABLE 7. Rate constants for reactions of hydrogen atoms in aqueous solution—Continued

No.	Reaction	pH	k (L mol^{-1} s^{-1})	Comment	Ref.
141	**Hexaammineruthenium(III) ion** $H^\cdot + Ru(NH_3)_6^{3+} \rightarrow$		1.8×10^{6} [a]	e.d.; Detd. from dose rate of H atoms and amount of redn. product; calcd. by method in [650012].	701229
142	**Nitrosopentaammineruthenium(III) ion** $H^\cdot + Ru(NH_3)_5NO^{3+} \rightarrow H^+ + Ru(NH_3)_5\dot{N}O^{2+}$	<1	4.0×10^{8}	p.r.; P.b.k. at 280 nm in Ar-satd. soln. contg. 0.5 mol L^{-1} *tert*-BuOH.	751049
143	**Tris(2,2'-bipyridine)ruthenium(III) ion** $H^\cdot + Ru(bpy)_3^{3+} \rightarrow H^+ + Ru(bpy)_3^{2+}$	~0	4.5×10^{9}	p.r.; P.b.k. at 455 nm in Ar-satd. soln. contg. 1 N H_2SO_4 and 0.5 mol L^{-1} *tert*-BuOH.	78A070
144	**(Isonicotinamide)pentaammineruthenium(III) ion** $H^\cdot + Ru(NH_3)_5isn^{3+} \rightarrow H^+ + Ru(NH_3)_5isn^{2+}$	~1	5×10^{6}	p.r.; Estd. from p.b.k. at 480 nm (Ru^{II}), rel. to k(H + *tert*-BuOH).	80A317
145	**Hexachlororuthenate(IV) ion** $H^\cdot + RuCl_6^{2-} \rightarrow RuCl_6^{3-}$	~0	3.3×10^{9}	p.r.; D.k. of Cl_2^{-} at 350 nm in soln. contg. 5 mol L^{-1} HCl as well as d.k. of $RuCl_6^{2-}$ at 490 nm; estd. rate, includes other reactants besides H (e.g. OH?).	80A114
146	**Thiosulfate ion** $H^\cdot + S_2O_3^{2-} \rightarrow$		~2×10^{10} [a]	Estd. from corresponding reaction of muonium.	84A007
147	**Peroxodisulfate ion** $H^\cdot + S_2O_8^{2-} \rightarrow SO_4^{2-} + HSO_4$	~ 0	2.5×10^{7}	γ-r.; C.k.; obs. $G(Ce^{III})$ in ceric - cerous system; rel. to $k(H^\cdot + O_2)$.	700169
148	**Peroxomonosulfuric acid** $H^\cdot + H_2SO_5 \rightarrow H_2O + HSO_4$	~ 0	2.2×10^{8}	γ-r.; C.k.; obs. $G(Ce^{III})$ in ceric - cerous system; rel. to $k(H^\cdot + O_2)$.	700169
149	**Selenious(IV) acid** $H^\cdot + H_2SeO_3 \rightarrow SeO_3^{\cdot -} + H^+$		$<1 \times 10^{6}$	p.r.; No formn. of $SeO_3^{\cdot -}$ detected.	86A335
150	**Hydrogen selenite(IV) ion** $H^\cdot + HSeO_3^{-} \rightarrow SeO_3^{\cdot -} + H^+$		$<1 \times 10^{6}$	p.r.; No formn. of $SeO_3^{\cdot -}$ detected.	86A335
151	**Selenite(IV) ion** $H^\cdot + SeO_3^{2-} \rightarrow SeO_3^{\cdot -} + H^+$		$<1 \times 10^{6}$	p.r.; No formn. of $SeO_3^{\cdot -}$ detected.	86A335
152	**Hydrogen selenate(VI) ion** $H^\cdot + HSeO_4^{-} \rightarrow SeO_3^{\cdot -} + H_2O$	0.3	~1×10^{6}	p.r.; Estd. from $SeO_3^{\cdot -}$ yield in $[HSeO_4^{-}] = 3 \times 10^{-2}$ mol L^{-1} under 14×10^{6} N m^{-2} H_2.	86A335
153	**Selenate(VI) ion** $H^\cdot + SeO_4^{2-} \rightarrow SeO_3^{\cdot -} + OH^-$		$<1 \times 10^{6}$	p.r.; No formn. of $SeO_3^{\cdot -}$ detected.	86A335
154	**Technetate(VII) ion** $H^\cdot + TcO_4^{-} \rightarrow$	2	$>1 \times 10^{10}$ [a]	γ-r.; Estd. from % redn. (*tert*-BuOH as scavenger) compared with soln. contg. hydrated electrons at pH 7.	81A173
155	**Tellurite(IV) ion** $H^\cdot + TeO_3^{2-} \rightarrow$	~0.6	~5×10^{6} [a]	γ-r.; 0.4 mol L^{-1} sulfuric or nitric acid soln.	770185
156	**Tellurate(VI) ion** $H^\cdot + TeO_4^{2-} \rightarrow TeO_4^{3-}$	0.4	1.1×10^{8}	γ-r.; C.k.; rel. to $k(H^\cdot + H_2O_2)$.	680356
157	**Titanium(III) ion** $H^\cdot + Ti^{3+} \rightarrow HTi^{3+}$	~1	1.1×10^{8} [b]	γ-r.; C.k.; obs. $G(H_2)$; product detn. in [79A341]; rel. to $k(H^\cdot + PhH)$.	78G126
		~1	~2.1×10^{8} [b]	γ-r.; C.k.; obs. $G(H_2)$; product detn. in [79A341]; rel. to $k(H^\cdot + H_2C{=}CHCONH_2)$.	78G126
		~1	4×10^{7} [b]	γ-r.; Obs. H_2 yields; rel. to $k(H^\cdot + (CD_3)_2CDOH)$.	730377

TABLE 7. Rate constants for reactions of hydrogen atoms in aqueous solution—Continued

No.	Reaction	pH	k (L mol^{-1} s^{-1})	Comment	Ref.
158	**Titanium(IV) ion**				
	$H^\cdot + Ti^{4+} \rightarrow H^+ + Ti^{3+}$		*5.6 × 10^7*	Average of 2 values.	
		~0	4.0 × 10^7	γ-r.; C.k.; obs. $G(H_2)$ in soln. contg. 2 mol L^{-1} H_2SO_4 and (5-200) × 10^{-1} mol L^{-1} $TiCl_4$; rel. to $k(H^\cdot + EtOH)$.	79A341
		~1	7.2 × 10^7	γ-r.; C.k.; obs. $G(H_2)$; product detn. in [79A341]; rel. to $k(H^\cdot + Ti^{3+})$.	78G126
159	**Thallium(I) ion**				
	$H^\cdot + Tl^+ \rightarrow H^+ + Tl$		*4.1 × 10^7*	Average of 2 values.	
		2	5 × 10^7	p.r.	84C015
		1	3.3 × 10^7	p.r.; C.k. with 1,4-dicyanobenzene; obs. 345 nm abs.; rel. to $k(H^\cdot$ + DCNB).	730121
160	**Thallium(III) ion**				
	$H^\cdot + Tl^{3+} \rightarrow H^+ + Tl^{2+}$		3.9 × 10^7	p.r.; P.b.k. at 270 nm in soln. contg. 1 mol L^{-1} $HClO_4$ and 10:1 Tl^{3+}:Tl^+.	741017
161	**Chlorothallium(III) ion**				
	$H^\cdot + TlCl^{2+} \rightarrow HCl + Tl^{2+}$	~0	5 × 10^8	p.r.; P.b.k. at 290 nm in soln. contg. 1 mol L^{-1} $HClO_4$ 3 × 10^{-3} mol L^{-1} HCl and 3 × 10^{-3} mol L^{-1} Tl(III); ligand abstr. mechanism proposed.	741038
162	**Dichlorothallium(III) ion**				
	$H^\cdot + TlCl_2^+ \rightarrow HCl + TlCl^+$	~0	2 × 10^9	p.r.; P.b.k. at 280 nm.	741038
163	**Thallium(III) chloride**				
	$H^\cdot + TlCl_3 \rightarrow HCl + TlCl_2$	~0	2 × 10^9	p.r.; P.b.k. at 280 nm in soln. contg. 0.99 mol L^{-1} $HClO_4$, 7.3 × 10^{-3} mol L^{-1} HCl and 3 × 10^{-4} mol L^{-1} Tl(III); ligand abstr. mechanism proposed; same rate constant as for H + $TlCl_2^+$.	741038
164	**Tetrachlorothallate(III) ion**				
	$H^\cdot + TlCl_4^- \rightarrow HCl + TlCl_3^-$	~0	2 × 10^9	p.r.; P.b.k. at 280 nm; ligand abstr. mechanism proposed; same rate constant for H + $TlCl_2^+$.	741038
165	**Uranyl(VI) ion**				
	$H^\cdot + UO_2^{2+} \rightarrow H^+ + UO_2^+$	~0	4.1 × 10^7	p.r.; C.k. in soln. contg. 1 mol L^{-1} $HClO_4$, 5 × 10^{-4} mol L^{-1} BzOH and 0.2 mol L^{-1} *tert*-BuOH; rel. to $k(H^\cdot$ + BzOH).	82A420 85A236
166	**Zinc(I) ion**				
	$H^\cdot + Zn^+ \rightarrow ZnH^+$	~3,7	1.9 × 10^9	p.r.; D.k. (Zn^+) in presence of 107 atm. H_2, 10^{-2} mol L^{-1} $ZnSO_4$; assuming $k(H + H) = 1 \times 10^{10}$.	771011
167	**Zinc(II) ion**				
	$H^\cdot + Zn^{2+} \rightarrow$	~7	<3 × 10^5	γ-r.; No reaction; c.k. in soln. contg. 1-5 × 10^{-2} mol L^{-1} $ZnSO_4$ and 10^{-2} mol L^{-1} EtOH; obs. $G(H_2)$; rel. to $k(H^\cdot$ + EtOH).	650192
168	**Tetrakis(*p*-sulfonatophenyl)porphinatozincate(II) ion**				
	$H^\cdot + ZnTPPS^{4-} \rightarrow ZnTPPS(H)^{4-}$		~1.6 × 10^{10}	p.r.; P.b.k. in N_2O-satd. soln. contg. *tert*-BuOH.	82A279
169	**Acetaldehyde**				
	$H^\cdot + CH_3CHO \rightarrow$	1	3.1 × 10^7	*e*-r.; esr; Decay of spin polarization, compared with 2-PrOH(7D); 83% H abstr. [730053]; rel. to $k(H^\cdot$ + BzOH).	710003
170	**Acetamide**				
	$H^\cdot + CH_3CONH_2 \rightarrow$		*1.5 × 10^5*	Average of 2 values.	
		1	1.2 × 10^5	*e*-r.; esr; Decay of spin polarization, compared with 2-PrOH(7D); rel. to $k(H^\cdot$ + BzOH).	710003
		1	1.7 × 10^5	γ-r.; C.k. with 2-PrOH(7D), H abstr.; rel. to $k(H^\cdot$ + BzOH).	710017

TABLE 7. Rate constants for reactions of hydrogen atoms in aqueous solution—Continued

No.	Reaction	pH	k (L mol^{-1} s^{-1})	Comment	Ref.
171	**Acetanilide** $H\cdot + C_6H_5NHCOCH_3 \rightarrow C_6H_6NHCOCH_3$		*1.0 × 10^9*	Average of 2 values.	
		1	1.0 × 10^9	e-r.; esr; Decay of spin polarization, compared with EtOH; rel. to k(H· + BzOH).	720025
		8-9	9.9 × 10^8	γ-r.; C.k.; rel. to k(H· + 2-PrOH).	660500
172	**Acetate ion** $H\cdot + CH_3CO_2^- \rightarrow H_2 + \cdot CH_2CO_2^-$		*3.5 × 10^5*	Average of 3 values.	
		7	3.9 × 10^5	e-r.; esr; Decay of spin polarization, compared with EtOH. in phosphate buffered soln.; rel. to k(H· + BzOH).	720039
		7	3.5 × 10^5	γ-r.; C.k.; rel. to k(H· + DCO_2^-).	630041
		~ 8	3.2 × 10^5	X-r.; C.k.; rel. to k(H· + NO_2^-).	620017
173	**Acetate ion-d_3** $H\cdot + CD_3CO_2^- \rightarrow HD + \cdot CD_2CO_2^-$	6	2.0 × 10^4	γ-r.; C.k.; rel. to k(H· + AcO^-).	640141
174	**Acetic acid** $H\cdot + CH_3CO_2H \rightarrow H_2 + \cdot CH_2CO_2H$		*9.8 × 10^4*	Average of 2 values.	
		1	7.7 × 10^4	e-r.; esr; Decay of spin polarization; compared with $CD_3CDOHCD_3$; rel. to k(H· + BzOH).	710003
		1	1.2 × 10^5	γ-r.; C.k. with 2-PrOH(7D); rel. to k(H· + BzOH).	710017
175	**Acetone** $H\cdot + CH_3COCH_3 \rightarrow H_2 + \cdot CH_2COCH_3$	1	2.6 × 10^6 [b]	e-r.; esr; Decay of spin polarization, compared with $CD_3CDOHCD_3$. 67% H abstr., 2.5 × 10^{-4} % enol form [730053]; rel. to k(H· + BzOH).	710003
		1	1.6 × 10^6 [b]	γ-r.; C.k. with 2-PrOH(7D); rel. to k(H· + BzOH).	710017
		~7	8.1 × 10^5 [b]	γ-r.; C.k.; rel. to k(H· + DCO_2^-).	630041
		11-13	1.8 × 10^6 [b]	X-r.; C.k.; rel. to k(H· + OH^-).	630049
176	**Acetonitrile** $H\cdot + CH_3CN \rightarrow CH_3\dot{C}NH$	2	3.6 × 10^6 [b]	γ-r.; C.k.; Obs. $G(H_2)$; rel. to k(H· + EtOH).	730364
		1	1.4 × 10^6 [b]	e-r.; esr; Decay of spin polarization, compared with 2-PrOH(7D). 7% H abstr. [730053]; rel. to k(H· + BzOH).	710003
		1	2.5 × 10^6 [b]	γ-r.; C.k. with 2-PrOH(7D); rel. to k(H· + BzOH).	710017
177	**Acetophenone** $H\cdot + C_6H_5COCH_3 \rightarrow C_6H_6COCH_3$	1.0	3.4 × 10^9 [b]	p.r.; P.b.k. (H adduct); *tert*-BuOH as OH scavenger.	720171
		1	1.1 × 10^9 [b]	p.r.; P.b.k.; CD_3OD as OH scavenger	690001
178	***N*-Acetylalanine** $H\cdot$ + AcAla →	1	7.4 × 10^6	e-r.; esr; Decay of spin polarization, compared with 2-PrOH(7D); rel. to k(H· + BzOH).	710003
179	**Acetylene** $H\cdot + HC{\equiv}CH \rightarrow$	1	2.2 × 10^9	p.r.; C.k. with phenol in Ar-satd. soln., obs. phenol-H adduct at 330 nm; rel. to k(H· + PhOH).	78A007
180	**Acetylenedicarboxylic acid** $H\cdot + HO_2CC{\equiv}CCO_2H \rightarrow$	1	9.2 × 10^8	e-r.; esr; Decay of spin polarization, compared with EtOH; rel. to k(H· + BzOH).	710040
181	***N*-Acetylglycine** H· + AcGly →	1	3.5 × 10^6	e-r.; esr; Decay of spin polarization, compared with 2-PrOH(7D); rel. to k(H· + BzOH).	710003

TABLE 7. Rate constants for reactions of hydrogen atoms in aqueous solution—Continued

No.	Reaction	pH	k (L mol^{-1} s^{-1})	Comment	Ref.
182	***N*-Acetylmethionine** $H^{\cdot} + AcMet \rightarrow$	2.0	1.3×10^{9}	p.r.; C.k.; obs. buildup of AcPhe-H at 313 nm in soln. contg. 0.5-20 × 10^{-3} mol L^{-1} AcMet and 3 × 10^{-3} mol L^{-1} AcPhe; rel. to k(H· + AcPhe).	741129
183	***N*-Acetylphenylalanine** $H^{\cdot} + AcPhe \rightarrow$ $C_6H_6CH_2CH(NHCOCH_3)CO_2H$	2.0	1.1×10^{9}	p.r.; P.b.k. at 313 nm. in soln. contg. *tert*-BuOH and 5-20 × 10^{-4} mol L^{-1} AcPhe, $HClO_4$ at pH 2 and NaH_2PO_4 at pH 6.4; at pH 6.4 $k = (8.5 \pm 0.8) \times 10^{8}$.	741129
184	***N*-Acetylphenylalanineamide** $H^{\cdot} +$ $C_6H_5CH_2CH(NHCOCH_3)CONH_2 \rightarrow$ $C_6H_6CH_2CH(NHCOCH_3)CONH_2$	2.0	1.1×10^{9}	p.r.; P.b.k. at 326 nm in soln. contg. *tert*-BuOH; at pH 6.4 $k = (9.0 \pm 0.8) \times 10^{8}$.	741129
185	**Acid Chrome Blue trianion** $H^{\cdot}$ + ACB → addn.	2.5	2.1×10^{9}	γ-r.; C.k. in aerated soln. contg. EtOH; obs. G(-dye); reference rate not given; rel. to k(H· + O_2).	81A312
186	**Acridine Orange, conjugate acid** $H^{\cdot} + AOH^{+} \rightarrow [AOH_2]^{\cdot +}$	1, 1.8, 2.8	1.0×10^{10}	p.r.; P.b.k. at 360, 410 and 560 nm in Ar-satd. soln. contg. 2 × 10^{-2} mol L^{-1} *tert*-BuOH and 5-20 × 10^{-6} mol L^{-1} AOH^{+}; computer simulation gave 70% semiquinone formn. and 10% H adduct on aromatic ring and 20% H attack on meso-C atom.	82A071
187	**Acridine, conjugate acid** $H^{\cdot} + AH^{+} \rightarrow {\cdot}AH_2^{+}$	2.7	6.3×10^{9}	p.r.; P.b.k. in soln. contg. *tert*-BuOH; 63.5% semiquinone (9-acridinyl), 31.1% N-radical (10-acridinyl) and 4.8% H-adduct formn. calcd. from total abs. and spectra of various transient products.	82A385
188	**Acrylamide** $H^{\cdot} + H_2C{=}CHCONH_2 \rightarrow$	~1.3	3.1×10^{10}	p.r.; C.k., $Fe(CN)_6^{3-}$ measured at 420 nm.; rel. to k(H· + $Fe(CN)_6^{3-}$).	700052
189	**Acrylic acid** $H^{\cdot} + H_2C{=}CHCO_2H \rightarrow CH_3\dot{C}HCO_2H$	1	3.3×10^{9}	p.r.; esr; Calcd. from time profile of H in deaerated soln. contg. various solute concns. and 10^{-2} mol L^{-1} *tert*-BuOH.	83A153
190	**Acrylonitrile** $H^{\cdot} + H_2C{=}CHCN \rightarrow CH_3\dot{C}HCN$	1	2.2×10^{9} [b]	p.r.; esr; Calcd. from time profile of H in deaerated soln. contg. various solute concns. and 10^{-2} mol L^{-1} *tert*-BuOH.	83A153
		~1	3.9×10^{9} [b]	p.r.; C.k.; soln. cont. 0.05 mol L^{-1} $HClO_4$; product identified by opt. and esr spectra; rel. to k(H· + $Fe(CN)_6^{3-}$).	79A144
191	**Adenine** $H^{\cdot} + A \rightarrow$	7	1×10^{8}	e-r.; esr; Decay of H signal.	710303
192	**Adenine, conjugate acid** $H^{\cdot} + AH^{+} \rightarrow$	2	6×10^{7}	e-r.; esr; Decay of H signal.	710303
193	**Adenosine** $H^{\cdot} + A \rightarrow$	7	1.6×10^{8}	e-r.; esr; Decay of spin polarization, compared with EtOH. in phosphate buffered soln.; uncertainty due to cor. for e_{aq}^{-} reaction; rel. to k(H· + BzOH).	720039
194	**Adenosine, conjugate acid** $H^{\cdot} + AH^{+} \rightarrow$	1	1.0×10^{8}	e-r.; esr; Decay of spin polarization, compared with EtOH; rel. to k(H· + BzOH).	710040

TABLE 7. Rate constants for reactions of hydrogen atoms in aqueous solution—Continued

No.	Reaction	pH	k (L mol^{-1} s^{-1})	Comment	Ref.
195	**Adenosine 5′-monophosphate**				
	$H^{\cdot} + AMP \rightarrow$	7-8	1.9×10^8	γ-r.; C.k. in soln. contg. 1.6×10^{-2} mol L^{-1} N_2O; rel. to $k(H^{\cdot} + DCO_2^-)$.	683038
196	**Adrenaline, conjugate acid**				
	$H^{\cdot} + MeNH_2^+CH_2CHOHC_6H_3(OH)_2 \rightarrow$		1×10^9	p.r.; P.b.k. after 5 μs (following OH reaction) at 355 nm in soln. under 60 atm H_2; product is H adduct at C_6.	761130
197	**Adriamycin, conjugate acid**				
	$H^{\cdot} + {}^+HAdH_2 \rightarrow$	1.1	3.5×10^9	p.r.; Soln. contg. 0.1 mol L^{-1} tert-BuOH and 5×10^{-2} mol L^{-1} H_2SO_4.	85A360
198	**Alanine, conjugate acid**				
	$H^{\cdot} + AlaH^+ \rightarrow$		*2.3×10^5*	Average of 2 values.	
		1	2.7×10^5	e-r.; esr; Decay of spin polarization, compared with 2-PrOH(7D); rel. to $k(H^{\cdot} + BzOH)$.	710003
		1	1.9×10^5	γ-r.; C.k.; rel. to $k(H^{\cdot} + AA)$.	680343
199	**β-Alanine, conjugate acid**				
	$H^{\cdot} + \beta\text{-}AlaH^+ \rightarrow$	1	3.1×10^5	e-r.; esr; Decay of spin polarization, compared with 2-PrOH(7D); rel. to $k(H^{\cdot} + BzOH)$.	710003
200	**Allyl alcohol**				
	$H^{\cdot} + H_2C{=}CHCH_2OH \rightarrow H_3C\dot{C}HCH_2OH$	1	1.1×10^9 [b]	γ-r.; C.k.; rel. to $k(H^{\cdot} + HCO_2H)$.	680343
		~ 6	3.4×10^9 [b]	γ-r.; C.k.; rel. to $k(H^{\cdot} + 2\text{-PrOH})$.	630041
201	**Aminoacetonitrile**				
	$H^{\cdot} + H_2NCH_2CN \rightarrow H_2NCH_2\dot{C}NH$	7	5.2×10^7	e-r.; esr; Decay of spin polarization, compared with EtOH. 58% H abstr. [730053]. in phosphate buffered soln.; rel. to $k(H^{\cdot} + BzOH)$.	720039
202	**Aminoacetonitrile, conjugate acid**				
	$H^{\cdot} + H_3N^+CH_2CN \rightarrow H_3N^+\dot{C}HCN$	1	*6.1×10^6*	e-r.; esr; Decay of spin polarization, compared with EtOH. ~1% H abstr. [730053]. in phosphate buffered soln.; rel. to $k(H^{\cdot} + BzOH)$.	720039
208	**4-Aminobutanethiol, conjugate acid (overall)**				
	$H^{\cdot} + HS(CH_2)_4NH_3^+ \rightarrow$	1	3.1×10^9	γ-r.; Calcd. from ratio of H_2 to H_2S formn. = 2.82 ± 0.27 and rate of SH abstraction; rel. to $k(H^{\cdot} + EtOH)$.	760361
204	**4-Aminobutanethiol, conjugate acid (SH abstr.)**				
	$H^{\cdot} + HS(CH_2)_4NH_3^+ \rightarrow H_2S + {\cdot}CH_2(CH_2)_3NH_3^+$	1	8.7×10^8	γ-r.; C.k., obs. $G(H_2S)$; rel. to $k(H^{\cdot} + EtOH)$.	760361
205	**2-Aminobutyric acid, conjugate acid**				
	$H^{\cdot} + CH_3CH_2CH(NH_3^+)CO_2H \rightarrow$	1	4.8×10^5	γ-r.; C.k.; rel. to $k(H^{\cdot} + AA)$.	680343
206	**2-Aminoethanol, conjugate acid**				
	$H^{\cdot} + H_3N^+CH_2CH_2OH \rightarrow$	1	2.8×10^6	e-r.; esr; Decay of spin polarization, compared with EtOH; rel. to $k(H^{\cdot} + BzOH)$.	710040
207	**α-Aminoisobutyric acid, conjugate acid**				
	$H^{\cdot} + (CH_3)_2C(NH_3^+)CO_2H \rightarrow$	1	7×10^4	e-r.; esr; Decay of spin polarization, compared with 2-PrOH(7D); rel. to $k(H^{\cdot} + BzOH)$.	710003
208	**3-Aminopropanethiol, conjugate acid (overall)**				
	$H^{\cdot} + HS(CH_2)_3NH_3^+ \rightarrow$	1	3.9×10^9	γ-r.; Calcd. from ratio of H_2 to H_2S formn. = 2.78 and rate of SH abstr.; rel. to $k(H^{\cdot} + EtOH)$.	760361
209	**3-Aminopropanethiol, conjugate acid (SH abstr.)**				
	$H^{\cdot} + HS(CH_2)_3NH_3^+ \rightarrow H_2S + {\cdot}CH_2CH_2CH_2NH_3^+$	1	1.1×10^9	γ-r.; C.k., obs. $G(H_2S)$; rel. to $k(H^{\cdot} + EtOH)$.	760361
210	**Aniline**				
	$H^{\cdot} + C_6H_5NH_2 \rightarrow C_6H_6NH_2$		*2.4×10^9*	Average of 3 values.	
		7.8-8.4	2×10^9	p.r.; C.k.; rel. to $k(H^{\cdot} + MeOH)$.	86A365

TABLE 7. Rate constants for reactions of hydrogen atoms in aqueous solution—Continued

No.	Reaction	pH	k (L mol^{-1} s^{-1})	Comment	Ref.
210	**Aniline**—Continued				
		8.2	1.9×10^9	p.r.; P.b.k. at 350 nm in soln. contg. 1 mol L^{-1} MeOH and 5×10^{-4} mol L^{-1} aniline.	86A365
			2.9×10^9	p.r.; P.b.k. at 350 nm; H_2 as OH scavenger.	720289
211	**Anilinium ion** $H^\cdot + C_6H_5NH_3^+ \rightarrow C_6H_6NH_3^+$	3	1.3×10^9	p.r.; P.b.k. at 310 nm; MeOH as OH scavenger.	720289
212	**Anisole** $H^\cdot + C_6H_5OCH_3 \rightarrow$ addn.	2	$\sim 3 \times 10^9$ [b]	p.r.; P.b.k. in soln. contg. 10^{-2} mol L^{-1} *tert*-BuOH.	751171
		1	1.1×10^9 [b]	*e*-r.; esr; Decay of spin polarization; compared with EtOH; rel. to $k(H^\cdot + BzOH)$.	720025
213	**9,10-Anthraquinone-2-sulfonate ion** $H^\cdot + 2\text{-}SO_3AQ^- \rightarrow 2\text{-}SO_3AQ(H)^-$	1.0	4.1×10^9	p.r.; P.b.k. (H adduct); *tert*-BuOH as OH scavenger.	720171
214	**Arabinose** $H^\cdot + C_5H_{10}O_5 \rightarrow$	1	5.2×10^7	*e*-r.; esr; Decay of spin polarization, compared with EtOH; rel. to $k(H^\cdot + BzOH)$.	710040
215	**Arginine, conjugate diacid** $H^\cdot + ArgH_2^{2+} \rightarrow$	1	4.5×10^6	*e*-r.; esr; Decay of spin polarization, compared with EtOH; rel. to $k(H^\cdot + BzOH)$.	710040
216	**Ascorbate ion** $H^\cdot + AH^- \rightarrow$	7	$\sim 3 \times 10^8$	*e*-r.; esr; Decay of spin polarization, compared with EtOH. in phosphate buffered soln.; uncertainty is due to cor. for e_{aq}^- reaction; rel. to $k(H^\cdot + BzOH)$.	720039
217	**Ascorbic acid** $H^\cdot + AH_2 \rightarrow \cdot AH_3$		*1.9* $\times$ *10*^{8}	Average of 2 values.	
		1	1.6×10^8	p.r.; C.k.; obs. 360 nm abs.; rel. to $k(H^\cdot +$ 2-PrOH).	720266
		1	1.0×10^8	*e*-r.; esr; Decay of spin polarization, compared with EtOH. ~2% H abstr. [730053]; rel. to $k(H^\cdot +$ BzOH).	710040
218	**Asparagine, conjugate monoacid** $H^\cdot + AsnH^+ \rightarrow$	1	4.3×10^5	*e*-r.; esr; Decay of spin polarization, compared with EtOH; rel. to $k(H^\cdot + BzOH)$.	710040
219	**Aspartate monoanion** $H^\cdot + Asp^- \rightarrow$	7	2.7×10^6	*e*-r.; esr; Decay of spin polarization, compared with EtOH. in phosphate buffered soln.; rel. to $k(H^\cdot + BzOH)$.	720039
220	**Aspartic acid, conjugate acid** $H^\cdot + AspH^+ \rightarrow$	1	7×10^5	*e*-r.; esr; Decay of spin polarization, compared with EtOH; rel. to $k(H^\cdot + BzOH)$.	710040
221	**Barbiturate ion** $H^\cdot + C_4H_3N_2O_3^- \rightarrow$	7	1.8×10^9	*e*-r.; esr; Decay of spin polarization, compared with EtOH. in phosphate buffered soln.; rel. to $k(H^\cdot + BzOH)$.	720039
222	**Barbituric acid** $H^\cdot + C_4H_4N_2O_3 \rightarrow$	1	1.8×10^7	*e*-r.; esr; Decay of spin polarization, compared with EtOH. 12% H abstr. [730053]; rel. to $k(H^\cdot +$ BzOH).	710040
223	**Benzaldehyde** $H^\cdot + C_6H_5CHO \rightarrow C_6H_6CHO$	1	1.4×10^9	*e*-r.; esr; Decay of spin polarization, compared with EtOH. ~4% H abstr. [730053]; rel. to $k(H^\cdot +$ BzOH).	720025

TABLE 7. Rate constants for reactions of hydrogen atoms in aqueous solution—Continued

No.	Reaction	pH	k (L mol^{-1} s^{-1})	Comment	Ref.
224	**Benzamide**				
	$H\cdot + C_6H_5CONH_2 \rightarrow C_6H_6CONH_2$	1	8.2×10^8	e-r.; esr; Decay of spin polarization, compared with EtOH; product ident in [720171]; rel. to k(H· + BzOH).	720025
225	**Benzene**				
	$H\cdot + PhH \rightarrow C_6H_7$		*9.1×10^8*	Average of 2 values.	
		2	7.2×10^8	p.r.; P.b.k. at 312 nm in soln. contg. 2.0 mol L^{-1} *tert*-BuOH.	771012
		3	1.1×10^9	p.r.; P.b.k. at 311 nm; contains ~ 2×10^{-2} mol L^{-1} CH_3OH, cor. for H + MeOH.	670246
226	**Benzenesulfonate ion**				
	$H\cdot + C_6H_5SO_3^- \rightarrow C_6H_6SO_3^-$		*7.9×10^8*	Average of 2 values.	
		1	8.2×10^8	p.r.; P.b.k. CD_3OD as OH scavenger.	690001
		8-9	6.4×10^8	γ-r.; C.k.; rel. to k(H· + 2-PrOH).	660500
227	**1,3,5-Benzenetricarboxylic acid**				
	$H\cdot + C_6H_3(CO_2H)_3 \rightarrow$	1	6.0×10^8	e-r.; esr; Decay of spin polarization, compared with 2-PrOH(7D); rel. to k(H· + BzOH).	710003
228	**Benzil**				
	$H\cdot + C_6H_5COCOC_6H_5 \rightarrow C_6H_6COCOC_6H_5$	1.0	1.0×10^{10}	p.r.; P.b.k. (H adduct); *tert*-BuOH as OH scavenger.	720171
229	**Benzoate ion**				
	$H\cdot + C_6H_5CO_2^- \rightarrow C_6H_6CO_2^-$		*1.1×10^9*	Average of 2 values.	
		7	8.5×10^8	e-r.; esr; Decay of spin polarization, compared with EtOH. in phosphate buffered soln.; rel. to k(H· + BzOH).	720039
		8-9	1.3×10^9	γ-r.; C.k.; rel. to k(H· + 2-PrOH).	660500
230	**Benzoic acid**				
	$H\cdot + C_6H_5CO_2H \rightarrow C_6H_6CO_2H$		**9.2×10^8**	**Selected value.**	
			8.3×10^8	p.r.; esr; Decay of H signal.	710303
		3	1.0×10^9	p.r.; P.b.k. at 347 nm; CD_3OH as OH scavenger.	690001
231	**Benzonitrile**				
	$H\cdot + C_6H_5CN \rightarrow C_6H_6CN$	1	6.8×10^8	p.r.; P.b.k.; CD_3OH as OH scavenger	690001
232	**Benzophenone**				
	$H\cdot + (C_6H_5)_2CO \rightarrow C_6H_6COC_6H_5$		*6.1×10^9*	Average of 2 values.	
		1	6.6×10^9	p.r.; P.b.k. at 390 nm in soln. contg. 0.1 mol L^{-1} *tert*-BuOH.	751125
		1.0	5.6×10^9	p.r.; P.b.k. (H adduct); tert-BuOH as OH scavenger.	720171
233	**1,4-Benzoquinone**				
	$H\cdot + Q \rightarrow 4\text{-}HOC_6H_4O\cdot$	1.9	8.3×10^9	p.r.; P.b.k. at 410 nm.	710619
234	**2-Benzoylpyridine, conjugate acid**				
	$H\cdot + C_6H_5COpyH^+ \rightarrow$ addn.	1.0	2.3×10^9	p.r.; P.b.k. at 348 nm; H adduct formn.	720359
235	**3-Benzoylpyridine, conjugate acid**				
	$H\cdot + C_6H_5COpyH^+ \rightarrow$ addn.	1.0	3.7×10^9	p.r.; P.b.k. at 400 nm; H adduct formn.	720359
236	**4-Benzoylpyridine, conjugate acid**				
	$H\cdot + C_6H_5COpyH^+ \rightarrow$ addn.	1.0	2.4×10^9	p.r.; P.b.k. at 375 nm; H adduct formn.	720359
237	**Benzyl alcohol**				
	$H\cdot + C_6H_5CH_2OH \rightarrow C_6H_6CH_2OH$		*1.1×10^9*	Average of 3 values.	
		1	1.0×10^9	e-r.; esr; Decay of spin polarization, compared with EtOH. 7% H abstr. [730053]; rel. to k(H· + BzOH).	720025
		~0.4	1.2×10^9	γ-r.; C.k.; rel. to k(H· + glucose).	680525

TABLE 7. Rate constants for reactions of hydrogen atoms in aqueous solution—Continued

No.	Reaction	pH	k (L mol^{-1} s^{-1})	Comment	Ref.
237	**Benzyl alcohol**—Continued				
		6	9.6×10^8	γ-r.; C.k.; rel. to k(H· + 2-PrOH).	630041
238	**Benzyl chloride** $H\cdot + C_6H_5CH_2Cl \rightarrow H^+ + Cl^- + C_6H_5\dot{C}H_2$	~1	9.9×10^8	p.r.; C.k.; rel. to k(H· + MeOH).	79A356
239	**Benzyltrimethylammonium ion** $H\cdot + C_6H_5CH_2N(CH_3)_3^+ \rightarrow C_6H_6CH_2N^+(CH_3)_3$	1	2.0×10^9	p.r.; P.b.k. at 322 nm in soln. contg. 0.5 mol L^{-1} *tert*-BuOH, satd. with N_2.	81A034
240	**Betaine** $H\cdot + (CH_3)_3N^+CH_2CO_2H \rightarrow$	1	7×10^4	*e*-r.; esr; Decay of spin polarization, compared with EtOH; pK_a = 1.832; rel. to k(H· + BzOH).	710040
241	**Biphenyl** $H\cdot + C_6H_5C_6H_5 \rightarrow C_6H_6C_6H_5$	3	5.0×10^9	p.r.; P.b.k. at 305, 360 nm in Ar-satd. soln. contg. 0.05 mol L^{-1} *tert*-BuOH.	751096
242	**2,2'-Bipyridine, conjugate diacid** $H\cdot + bpyH_2^{2+} \rightarrow bpyH_3^{3+}$		*1.5 × 10^8*	Average of 2 values.	
		1	1.4×10^8	p.r.; P.b.k. in soln. contg. 0.25 mol L^{-1} *tert*-BuOH.	85A184
		1	1.5×10^8	p.r.; P.b.k. (H adduct)	710582
243	**4,4'-Bipyridine, conjugate diacid** $H\cdot + 4,4'\text{-}bpyH_2^{2+} \rightarrow 4,4'\text{-}bpyH_3^{2+}$		*2.8 × 10^8*	Average of 2 values.	
		1	3.5×10^8	p.r.; P.b.k. in Ar-satd. soln. contg. 0.2 mol L^{-1} *tert*-BuOH and 4 x 10^{-4} mol L^{-1} 4,4'-bpyH$_2^{2+}$; addn. to C and N in approximately equal amounts.	84A325
		1	2×10^8	p.r.; P.b.k. (H adduct)	710582
244	**Bromoacetate ion** $H\cdot + BrCH_2CO_2^- \rightarrow HBr + \cdot CH_2CO_2^-$	8.5	5.2×10^8	γ-r.; C.k.; rel. to k(H· + 2-PrOH).	670050
245	**Bromoacetic acid** $H\cdot + BrCH_2CO_2H \rightarrow HBr + \cdot CH_2CO_2H$		*3.3 × 10^8*	Average of 3 values.	
		1	2.4×10^8	*e*-r.; esr; Decay of spin polarization, compared with 2-PrOH(7D); rel. to k(H· + BzOH).	710003
		1	3.1×10^8	γ-r.; C.k. with 2-PrOH(7D); cstd. 0.03% H abstr.; rel. to k(H· + BzOH).	710017
		1.0	4.4×10^8	γ-r.; C.k.; rel. to k(H· + 2-PrOH).	670050
246	**Bromobenzene** $H\cdot + C_6H_5Br \rightarrow C_6H_6Br$	~1	1.3×10^9	p.r.; P.b.k. at 300 nm; cor. for decay of H adduct.	79A356
247	**1-Bromo-1-chloro-2,2,2-trifluoroethane** $H\cdot + CF_3CHClBr \rightarrow$	1	3.8×10^8	p.r.; C.k. in soln. contg. 10% *tert*-BuOH; rel. to k(H· + Q).	83A195
248	**Bromoethane** $H\cdot + C_2H_5Br \rightarrow HBr + \cdot CH_2CH_3$	1	1.6×10^8	*e*-r.; esr; Decay of spin polarization, compared with 2-PrOH(7D). ~3% H abstr. [730053]; rel. to k(H· + BzOH).	710003
249	**2-Bromoethanol** $H\cdot + BrCH_2CH_2OH \rightarrow HBr + \cdot CH_2CH_2OH$	1,9	2.5×10^8	γ-r.; C.k.; rel. to k(H· + 2-PrOH).	670050
250	**5-Bromoorotic acid** $H\cdot + C_5H_3BrN_2O_4 \rightarrow$	1	1.9×10^8	*e*-r.; esr; Decay of spin polarization, compared with EtOH; rel. to k(H· + BzOH).	710040

TABLE 7. Rate constants for reactions of hydrogen atoms in aqueous solution—Continued

No.	Reaction	pH	k (L mol^{-1} s^{-1})	Comment	Ref.
251	***p*-Bromophenol** $H^{\cdot} + BrPhOH \rightarrow$	2	4.4×10^{9} [a]	e.d.; Obs. Br^- formn. and ferricyanide redn. (opt.); rel. to $k(H^{\cdot} + Fe(CN)_6^{3-})$.	719384
252	**2-Bromopropionate ion** $H^{\cdot} + CH_3CHBrCO_2^- \rightarrow HBr + CH_3\dot{C}HCO_2^-$	8.5	1.3×10^{9}	γ-r.; C.k.; rel. to $k(H^{\cdot} + 2\text{-PrOH})$.	670050
253	**3-Bromopropionate ion** $H^{\cdot} + BrCH_2CH_2CO_2^- \rightarrow HBr + {}^{\cdot}CH_2CH_2CO_2^-$	8.5	2.8×10^{8}	γ-r.; C.k.; rel. to $k(H^{\cdot} + 2\text{-PrOH})$.	670050
254	**2-Bromopropionic acid** $H^{\cdot} + CH_3CH(Br)CO_2H \rightarrow HBr + CH_3\dot{C}HCO_2H$	1.0	1.4×10^{9}	γ-r.; C.k.; rel. to $k(H^{\cdot} + 2\text{-PrOH})$.	670050
255	**3-Bromopropionic acid** $H^{\cdot} + BrCH_2CH_2CO_2H \rightarrow HBr + {}^{\cdot}CH_2CH_2CO_2H$	1.0	2.5×10^{8}	γ-r.; C.k.; rel. to $k(H^{\cdot} + 2\text{-PrOH})$.	670050
256	**5-Bromouracil** $H^{\cdot} + 5\text{-BrU} \rightarrow$	1	2.0×10^{8}	*e*-r.; esr; Decay of spin polarization, compared with EtOH; rel. to $k(H^{\cdot} + BzOH)$.	710040
257	**Bromphenol Blue** $H^{\cdot} + BPB^+ \rightarrow$		2×10^{9}	γ-r.; C.k., obs. $G(H_2)$; rel. to $k(H^{\cdot} + EtOH)$.	79G085
258	**Butadiene** $H^{\cdot} + H_2C{=}CHCH{=}CH_2 \rightarrow$		1×10^{10}	C.k.; no details given; rel. to $k(H^{\cdot} + MeOH)$.	670041
259	**Butane** $H^{\cdot} + n\text{-}C_4H_{10} \rightarrow$	1	3.6×10^{7}	*e*-r.; esr; Decay of spin polarization, compared with 2-PrOH(7D); rel. to $k(H^{\cdot} + BzOH)$.	710003
260	**2,3-Butanedione** $H^{\cdot} + CH_3COCOCH_3 \rightarrow$	1	4.3×10^{6}	*e*-r.; esr; Unpublished data, P. Neta and R.H. Schuler. 20% H abstr.; rel. to $k(H^{\cdot} + BzOH)$.	730053
261	**1-Butanol** $H^{\cdot} + CH_3(\dot{C}H_2)_3OH \rightarrow H_2 + CH_3(CH_2)_2\dot{C}HOH + CH_3CH_2\dot{C}HCH_2OH$		*3.5* × *10*^{7}	Average of 2 values.	
		1	3.5×10^{7}	*e*-r.; esr; Decay of spin polarization, compared with 2-PrOH(7D); rel. to $k(H^{\cdot} + BzOH)$.	710003
		1	3.4×10^{7}	γ-r.; C.k. with 2-PrOH(7D); rel. to $k(H^{\cdot} + BzOH)$.	710017
262	**2-Butanol** $H^{\cdot} + C_2H_5CH(OH)CH_3 \rightarrow H_2 + CH_3CH_2\dot{C}OHCH_3$		*1.0* × *10*^{8}	Average of 2 values.	
		1	1.2×10^{8}	*e*-r.; esr; Decay of spin polarization, compared with 2-PrOH(7D); product includes $CH_3\dot{C}HOHCH_3$ and ${}^{\cdot}CH_2CHOHCH_2CH_3$; rel. to $k(H^{\cdot} + BzOH)$.	710003
		1	8.7×10^{7}	γ-r.; C.k. with 2-PrOH(7D); product includes $CH_3\dot{C}HOHCH_3$ ${}^{\cdot}CH_2CHOHCH_2CH_3$, and ${}^{\cdot}CH_2CH_2CHOHCH_3$; rel. to $k(H^{\cdot} + BzOH)$.	710017
263	**1-Butene** $H^{\cdot} + CH_3CH_2CH{=}CH_2 \rightarrow$		7.0×10^{9}	C.k., no details given; rel. to $k(H^{\cdot} + MeOH)$.	670041
264	**4-*tert*-Butyl-1,2-benzoquinone** $H^{\cdot} + (CH_3)_3C\text{-}o\text{-}Q \rightarrow (CH_3)_3CC_6H_3(OH)O^{\cdot}$	7.1	7.8×10^{8}	p.r.; P.b.k. at 313 nm in N_2-satd. soln. contg. 0.5 mol L^{-1} *tert*-BuOH; H addn. followed by deprotonation to give the semiquinone.	79A099
265	**Butyrate ion** $H^{\cdot} + n\text{-}C_3H_7CO_2^- \rightarrow H_2 + CH_3CH_2\dot{C}HCO_2^-$	7	1.4×10^{7}	γ-r.; C.k.; rel. to $k(H^{\cdot} + (CH_3)_2CDOH)$.	660422

TABLE 7. Rate constants for reactions of hydrogen atoms in aqueous solution—Continued

No.	Reaction	pH	k (L mol^{-1} s^{-1})	Comment	Ref.
266	***n*-Butyric acid**				
	$H^{\bullet} + CH_3CH_2CH_2CO_2H \rightarrow H_2 + CH_3CH_2\dot{C}HCO_2H$		*7.4 × 10^6*	Average of 2 values.	
		1	7.9 × 10^6	*e*-r.; esr; Decay of spin polarization, compared with 2-PrOH(7D); rel. to $k(H^{\bullet} + BzOH)$.	710003
		1	6.8 × 10^6	γ-r.; C.k. with 2-PrOH(7D); rel. to $k(H^{\bullet} + BzOH)$.	710017
267	**3-Carboxamido-2,2,5,5-tetramethyl-3-pyrrolin-1-yloxy**				
	$H^{\bullet} + NX\text{-}u \rightarrow NX\text{-}u(H)$	3.9	6.9 × 10^9	p.r.; D.k., decrease in condy. due to protonation of product; soln. contg. 10^{-2} mol L^{-1} *tert*-BuOH and 2-30 mol L^{-1} NX-u.	761152
268	**3-Carboxamido-2,2,5,5-tetramethylpyrrolidin-1-yloxy**				
	$H^{\bullet} + NX\text{-}s \rightarrow NX\text{-}s(H)$	3.9	5.3 × 10^9	p.r.; D.k., decrease in condy. due to protonation of product; soln. contg. 10^{-2} mol L^{-1} *tert*-BuOH and 2-30 × 10^{-6} mol L^{-1} NX-s.	761152
269	**Carbon disulfide**				
	$H^{\bullet} + CS_2 \rightarrow CS_2^{\bullet -} + H^+$	1	2.0 × 10^{10}	p.r.; P.b.k. at 310 nm.	731015
270	**Carbon tetrachloride**				
	$H^{\bullet} + CCl_4 \rightarrow H^+ + Cl^- + {}^{\bullet}CCl_3$		*9.8 × 10^7*	Average of 2 values.	
		1	4.4 × 10^7	*e*-r.; esr; Decay of spin polarization, compared with 2-PrOH(7D); rel. to $k(H^{\bullet} + BzOH)$.	710003
			3.2 × 10^7	p.r.; P.b.k.	710778
271	**Chloroacetate ion**				
	$H^{\bullet} + ClCH_2CO_2^- \rightarrow H_2 + {}^{\bullet}CHClCO_2^-$		*9.6 × 10^6*	Average of 2 values.	
		~ 7	2.4 × 10^6	γ-r.; C.k.; rel. to $k(H^{\bullet} + DCO_2^-)$.	640095
		3-8,12.7	4.8 × 10^6	e.d.; C.k.; 8% Cl abstr.; rel. to $k(H^{\bullet} + OH^-)$.	629011
272	**Chloroacetic acid**				
	$H^{\bullet} + ClCH_2CO_2H \rightarrow$	0.4-2	7.2 × 10^3	e.d.; C.k.; 33% Cl abstr.; rel. to $k(H^{\bullet} + H^{\bullet})$.	629008
273	**Chlorobenzene**				
	$H^{\bullet} + C_6H_5Cl \rightarrow C_6H_6Cl$	~1	1.4 × 10^9	p.r.; P.b.k. at 300 nm; cor. for decay of H adduct.	79A356
274	**2-Chlorobenzoic acid**				
	$H^{\bullet} + ClC_6H_4CO_2H \rightarrow ClC_6H_5CO_2H$	~ 1	6.2 × 10^8	γ-r.; C.k.; obs. $G(H_2)$; rel. to $k(H^{\bullet} + 2\text{-PrOH})$.	740167
275	**3-Chlorobenzoic acid**				
	$H^{\bullet} + ClC_6H_4CO_2H \rightarrow ClC_6H_5CO_2H$	~ 1	6.5 × 10^8	γ-r.; C.k.; obs. $G(H_2)$; rel. to $k(H^{\bullet} + 2\text{-PrOH})$.	740167
276	**4-Chlorobenzoic acid**				
	$H^{\bullet} + ClC_6H_4CO_2H \rightarrow ClC_6H_5CO_2H$	1	1.1 × 10^9	p.r.; P.b.k.; CD_3OH as OH scavenger.	690001
277	**Chloroethane**				
	$H^{\bullet} + C_2H_5Cl \rightarrow$	1	1.7 × 10^6	*e*-r.; esr; Decay of spin polarization, compared with 2-PrOH(7D); single measurement on satd. soln., calcd. from solubility; rel. to $k(H^{\bullet} + BzOH)$.	710003
278	**2-Chloroethanol**				
	$H^{\bullet} + ClCH_2CH_2OH \rightarrow {}^{\bullet}CH_2CH_2OH + HCl$		2.2 × 10^6	γ-r.; C.k.; rel. to $k(H^{\bullet} + 2\text{-PrOH})$.	670050
279	**(2-Chloroethyl)benzene**				
	$H^{\bullet} + C_6H_5CH_2CH_2Cl \rightarrow C_6H_6\dot{C}H_2CH_2Cl$		2.0 × 10^9	p.r.; P.b.k. at 300 nm, cor. for decay of H adduct; k for H abstr. = 1.5 × 10^8 detd. from $G(H_2)$.	79A356
280	**Chloroform**				
	$H^{\bullet} + CHCl_3 \rightarrow {}^{\bullet}CHCl_2 + HCl + {}^{\bullet}CCl_3 + H_2$	1	1.1 × 10^7	*e*-r.; esr; Decay of spin polarization, compared with 2-PrOH(7D). 20% H abstr. [730053]; rel. to $k(H^{\bullet} + BzOH)$.	710003

TABLE 7. Rate constants for reactions of hydrogen atoms in aqueous solution—Continued

No.	Reaction	pH	k (L mol^{-1} s^{-1})	Comment	Ref.
281	**Chloromethane** $H\cdot + CH_3Cl \rightarrow HCl + \cdot CH_3 + H_2 + \cdot CH_2Cl$	1	6×10^4	e-r.; esr; Decay of spin polarization, compared with 2-PrOH(7D); single measurement on satd. soln., calcd. from solubility; 37% H abstr. [730053]; rel. to k(H· + BzOH).	710003
282	**2-Chlorophenol** $H\cdot + ClC_6H_4OH \rightarrow 2\text{-}HOC_6H_5Cl$	2.0	1.5×10^9	p.r.; P.b.k. at 340 nm in deoxygenated soln. contg. 1-10 $\times 10^{-3}$ mol L^{-1} substrate and 0.5-2.5 mol L^{-1} *tert*-BuOH.	86A463
283	**2-Chloropropionate ion** $H\cdot + CH_3CHClCO_2^- \rightarrow CH_3\dot{C}HCO_2^- + HCl + H_2 + \cdot CH_2Cl$	8.5	1.8×10^7	γ-r.; C.k.; rel. to k(H· + 2-PrOH).	670050
284	**3-Chloropropionate ion** $H\cdot + ClCH_2CH_2CO_2^- \rightarrow \cdot CH_2CH_2CO_2^- + HCl$	8.5	8.9×10^7	γ-r.; C.k.; rel. to k(H· + 2-PrOH).	670050
285	**2-Chloropropionic acid** $H\cdot + CH_3CH(Cl)CO_2H \rightarrow CH_3\dot{C}HCO_2H + HCl$	1.0	4.7×10^6	γ-r.; C.k.; rel. to k(H· + 2-PrOH).	670050
286	**3-Chloropropionic acid** $H\cdot + ClCH_2CH_2CO_2H \rightarrow \cdot CH_2CH_2CO_2H + HCl$	1.0	2.8×10^7	γ-r.; C.k.; rel. to k(H· + 2-PrOH).	670050
287	**Chlorotrifluoromethane** $H\cdot + CClF_3 \rightarrow$	1	$< 1 \times 10^6$	e-r.; esr; Decay of spin polarization, compared with 2-PrOH(7D); single measurement on satd. soln., calcd. from solubility; rel. to k(H· + BzOH).	710003
288	**5-Chlorouracil** $H\cdot + 5\text{-}ClU \rightarrow$		1.7×10^9	Average of 2 values.	
		7	2.0×10^8	γ-r.; C.k. with 2-PrOH(7D); rel. to k(H· + BzOH).	720049
		1	1.5×10^8	e-r.; esr; Decay of spin polarization, compared with EtOH; rel. to k(H· + BzOH).	710040
289	**Chromagen** $H\cdot + Chg \rightarrow$ addn.	2.5	2.5×10^9	γ-r.; C.k. in aerated soln. contg. EtOH; obs. G(−dye); rel. to k(H· + O_2).	81A312
290	**Citric acid** $H\cdot + (HO_2CCH_2)_2COH(CO_2H) \rightarrow$	1	4.0×10^5	e-r.; esr; Decay of spin polarization, compared with EtOH; rel. to k(H· + BzOH).	710040
291	**Cyanamide** $H\cdot + H_2NCN \rightarrow$ addn.	2.4	6.9×10^6	γ-r.; C.k.; obs. $G(H_2)$; rel. to k(H· + EtOH).	78A258
292	**Cyanoacetic acid** $H\cdot + NCCH_2CO_2H \rightarrow$	1	2.9×10^6	e-r.; esr; Decay of spin polarization, compared with 2-PrOH(7D). 12% H abstr. [730053]; rel. to k(H· + BzOH).	710003
293	**Cyclobutanecarboxylic acid** $H\cdot + c\text{-}C_4H_7CO_2H \rightarrow$	1	1×10^7	e-r.; esr; Unpublished data, P. Neta and R.H. Schuler. 71% H abstr.; rel. to k(H· + BzOH).	730053
294	**Cycloheptatriene** $H\cdot + c\text{-}C_7H_8 \rightarrow$		8×10^9	p.r.; C.k.; rel. to k(H· + $Fe(CN)_6^{3-}$).	710710
295	**1,3-Cyclohexadiene** $H\cdot + c\text{-}C_6H_8 \rightarrow$	2.0	9.7×10^9	p.r.; C.k., p.b.k. at 400 nm; rel. to k(H· + PNBA).	700211
296	**1,4-Cyclohexadiene** $H\cdot + c\text{-}C_6H_8 \rightarrow$	2.0	4.7×10^9	p.r.; C.k., p.b.k. at 400 nm; rel. to k(H· + PNBA).	700211

TABLE 7. Rate constants for reactions of hydrogen atoms in aqueous solution—Continued

No.	Reaction	pH	k (L mol^{-1} s^{-1})	Comment	Ref.
297	**Cyclohexane**				
	$H^{\bullet} + c\text{-}C_6H_{12} \rightarrow H_2 + c\text{-}C_6H_{11}$		*7.8 × 10^7*	Average of 3 values.	
		1	6 × 10^7	γ-r.; C.k. with 2-PrOH-d_7; rel. to k(H• + 2-PrOH(7D)).	741052
		1	7 × 10^7	*e*-r.; esr; Decay of spin polarization, compared with 2-PrOH(7D); cor. for solubility = 0.65 mol L^{-1}, authors report k = 3 × 10^7 using solubility = 0.0017 mol L^{-1}; rel. to k(H• + BzOH).	710003
		3	1 × 10^8	p.r.; P.b.k.; cor. for solubility (authors report 4 × 10^7 using solubility = 0.0017 mol L^{-1}).	680385
298	**Cyclohexanecarboxylic acid**				
	$H^{\bullet} + c\text{-}C_6H_{11}CO_2H \rightarrow H_2$	1	4.2 × 10^7	γ-r.; C.k.; rel. to k(H• + 2-PrOH(7D)).	741052
299	**Cyclohexene**				
	$H^{\bullet} + c\text{-}C_6H_{10} \rightarrow c\text{-}C_6H_{11}$		*4.1 × 10^9*	Average of 2 values.	
		1	5.2 × 10^9	γ-r.; C.k.; rel. to k(H• + 2-PrOH(7D)).	741052
		2.0	3.0 × 10^9	p.r.; C.k., p.b.k. at 400 nm; rel. to k(H• + PNBA).	700211
300	**1-Cyclohexenecarboxylic acid**				
	$H^{\bullet} + c\text{-}C_6H_9CO_2H \rightarrow$ addn.	1	2.6 × 10^9	γ-r.; C.k.; rel. to k(H• + 2-PrOH(7D)).	741052
301	**3-Cyclohexene-1-carboxylic acid**				
	$H^{\bullet} + c\text{-}C_6H_9CO_2H \rightarrow$ addn.	1	2.4 × 10^9	γ-r.; C.k.; rel. to k(H• + 2-PrOH(7D)).	741052
302	***cis*-4-Cyclohexene-1,2-dicarboxylic acid**				
	$H^{\bullet} + c\text{-}C_6H_8(CO_2H)_2 \rightarrow$	1	9.2 × 10^8	*e*-r.; esr; unpublished data, P. Neta and R.H. Schuler; 8% H abstr.; rel. to k(H• + BzOH).	730053
303	**Cyclopentane**				
	$H^{\bullet} + c\text{-}C_5H_{10} \rightarrow H_2 + c\text{-}C_5H_9$	1	8.5 × 10^7 [b]	γ-r.; C.k.; rel. to k(H• + 2-PrOH(7D)).	741052
		1	2 × 10^8 [b]	*e*-r.; esr; Decay of spin polarization, compared with 2-PrOH(7D); cor. for solubility = 2.5 × 10^{-3} mol L^{-1}; authors report k = 3 × 10^7; rel. to k(H• + BzOH).	710003
304	**Cyclopentanecarboxylic acid**				
	$H^{\bullet} + c\text{-}C_5H_9CO_2H \rightarrow H_2 + c\text{-}C_5H_8CO_2H$	1	4.1 × 10^7	γ-r.; C.k.; rel. to k(H• + 2-PrOH(7D)).	741052
305	**Cyclopentene**				
	$H^{\bullet} + c\text{-}C_5H_8 \rightarrow c\text{-}C_5H_9$	1	4.9 × 10^9	γ-r.; C.k.; 8% H abstr.; rel. to k(H• + 2-PrOH(7D)).	741052
306	**1-Cyclopentenecarboxylic acid**				
	$H^{\bullet} + -CH{=}C(CO_2H)(CH_2)_3- \rightarrow$		*2.1 × 10^9*	Average of 2 values.	
		1	2.8 × 10^9	γ-r; C.k.; 6% H abstr.; rel. to k(H• + 2-PrOH(7D)).	741052
		1	1.4 × 10^9	*e*-r.; esr; Unpublished data, P. Neta and R.H. Schuler; 9% H abstr.; rel. to k(H• + BzOH).	730053
307	**Cyclopropane**				
	$H^{\bullet} + c\text{-}C_3H_6 \rightarrow$	1	6 × 10^5	*e*-r.; esr; Decay of spin polarization, compared with 2-PrOH(7D); single measurement on satd. soln., calcd. from solubility; rel. to k(H• + BzOH).	710003
308	**Cyclopropanecarboxylic acid**				
	$H^{\bullet} + c\text{-}C_3H_5CO_2H \rightarrow$	1	4.9 × 10^6	*e*-r.; esr; Unpublished data P. Neta and R.H. Schuler; 8% H abstr.; rel. to k(H• + BzOH).	730053
309	**Cysteamine, conjugate acid (overall)**				
	$H^{\bullet} + HSCH_2CH_2NH_3^+ \rightarrow$		*3.3 × 10^9*	Average of 2 values.	

TABLE 7. Rate constants for reactions of hydrogen atoms in aqueous solution—Continued

No.	Reaction	pH	k (L mol^{-1} s^{-1})	Comment	Ref.
309	**Cysteamine, conjugate acid (overall)**—Continued				
		1	3.7×10^9	γ-r.; Derived from SH abstr. rate and ratio of H to SH abstr. = 3.55 ± 0.26; 22% SH abstr., 78% H abstr.; rel. to k(H· + EtOH).	760361
		2	3.0×10^9	p.r.; esr; Decay of H signal.	710303
310	**Cysteamine, conjugate acid (SH abstr.)** $H\cdot + HSCH_2CH_2NH_3^+ \rightarrow \cdot CH_2CH_2NH_3^+ + H_2S$	1	8.8×10^8	γ-r.; C.k.; obs. $G(H_2S)$; ratio of H to SH abstraction = 3.55; rel. to k(H· + EtOH).	760361
311	**Cysteine, conjugate acid (overall)** $H\cdot + HSCH_2CH(NH_3^+)CO_2H \rightarrow$	1	1.2×10^9 [b]	γ-r.; Derived from H abstr. rate and ratio of H to SH abstr. = 5.2 ± 0.7; rel. to k(H· + EtOH).	730241
		1	4×10^9 [b]	e-r.; esr; Decay of spin polarization, compared with EtOH. 68% H abstr. [730053]; rel. to k(H· + BzOH).	720025
		2	3.0×10^9 [b]	p.r.; esr; Decay of H signal.	710303
312	**Cysteine (H abstr.)** $H\cdot + HSCH_2CH(NH_3^+)CO_2H \rightarrow H_2 + \cdot SCH_2CH(NH_3^+)CO_2^-$	6	1.8×10^9	phot.; C.k.; obs. H_2 yields; rel. to k(H· + AA).	757486
313	**Cysteine (SH abstr.)** $H\cdot + HSCH_2CH(NH_3^+)CO_2H \rightarrow H_2S + \cdot CH_2CH(NH_3^+)CO_2^-$	~ 6	1.0×10^9 [a]	e.d.; Calcd. from loss of -SH groups at ~ 5°C, as well as formn. of H_2S.	649012
314	**Cystine** $H\cdot + S_2[CH_2CH(NH_3^+)CO_2^-]_2 \rightarrow$	6	1.5×10^9 [a]	e.d.; Calcd. from formn. of H_2S or -SH groups at ~ 5°C.	649012
315	**Cystine, conjugate diacid** $H\cdot + CytH_2^{2+} \rightarrow \cdot SCH_2CH(NH_3^+)CO_2H$	1	7×10^9 [b]	e-r.; esr; Decay of spin polarization, compared with EtOH; rel. to k(H· + BzOH).	710040
		1	1.3×10^9	γ-r.; C.k.; rel. to k(H· + HCO_2H).	680343
316	**Cytosine** $H\cdot + Cy \rightarrow$	7	$\sim 9.2 \times 10^7$	e-r.; esr; Decay of spin polarization, compared with EtOH. in phosphate buffered soln.; uncertainty due to major cor. for e_{aq}^- reaction; rel. to k(H· + BzOH).	720039
317	**Cytosine, conjugate acid** $H\cdot + CyH^+ \rightarrow$	1	8×10^7	e-r.; esr; Decay of spin polarization, compared with EtOH; rel. to k(H· + BzOH).	710040
318	**2-Deoxy-D-ribose** $H\cdot$ + deoxyribose → H_2 + R	7	2.9×10^7	γ-r.; C.k.; rel. to k(H· + DCO_2^-).	640095
319	**2,6-Diaminoacridine (Proflavine), conjugate monoacid** $H\cdot + PFH^+ \rightarrow [PFH_2]\cdot^+$	2.7	8.5×10^9	p.r.; P.b.k. at 320 nm in Ar-satd. soln. contg. 2 × 10^{-2} mol L^{-1} *tert*-BuOH; 75% semiquinone formn.; 16.5% H adduct on meso-C atom, 8% H adduct on aromatic ring; pK_a = -3, 0.5, 9.5.	82A332
320	**2,4-Diaminoazobenzene (Chrysoidin)** $H\cdot + C_6H_5N{=}NC_6H_3(NH_2)_2 \rightarrow$ addn.	2.5	6.3×10^9	γ-r.; C.k. in aerated soln. contg. EtOH; obs. G(−dye); reference rate not given; rel. to k(H· + O_2).	81A312
321	**Dichlorodifluoromethane** $H\cdot + CCl_2F_2 \rightarrow$	1	$< 1 \times 10^6$	e-r.; esr; Decay of spin polarization, compared with 2-PrOH(7D); single measurement on satd. soln., calcd. from solubility; rel. to k(H· + BzOH).	710003
322	**Dichloromethane** $H\cdot + CH_2Cl_2 \rightarrow HCl + \cdot CHCl_2 + H_2 + \cdot CH_2Cl$	1	4×10^6	e-r.; esr; Decay of spin polarization, compared with 2-PrOH(7D). 27% H abstr. [730053]; rel. to k(H· + BzOH).	710003

TABLE 7. Rate constants for reactions of hydrogen atoms in aqueous solution—Continued

No.	Reaction	pH	k (L mol^{-1} s^{-1})	Comment	Ref.
323	**Dicyandiamide**				
	$H^{\cdot} + NCN{=}C(NH_2)_2 \rightarrow$ addn.	2.4	2.7×10^6	γ-r.; C.k., obs. $G(H_2)$; rel. to $k(H^{\cdot} + EtOH)$.	79A030
324	**1,2-Dicyanobenzene**				
	$H^{\cdot} + C_6H_4(CN)_2 \rightarrow$	1	5.1×10^8	e-r.; esr; Decay of spin polarization, compared with EtOH; rel. to $k(H^{\cdot} + BzOH)$.	720025
325	**1,3-Dicyanobenzene**				
	$H^{\cdot} + C_6H_4(CN)_2 \rightarrow$	1	4.8×10^8	e-r.; esr; Decay of spin polarization, compared with EtOH; rel. to $k(H^{\cdot} + BzOH)$.	720025
326	**1,4-Dicyanobenzene**				
	$H^{\cdot}$ + DCNB → DCNB-H		*3.0×10^8*	Average of 2 values.	
		2	3.5×10^8	p.r.; P.b.k. at 320 nm in soln. contg. 2×10^{-3} mol L^{-1} MeOH; H adduct ($\epsilon^{320} = 4400$ L mol^{-1} cm^{-1}).	730121
		1	2.6×10^8	e-r.; esr; Decay of spin polarization, compared with EtOH; rel. to $k(H^{\cdot} + BzOH)$.	720025
327	**Diethyl ether**				
	$H^{\cdot} + (C_2H_5)_2O \rightarrow H^{\cdot} + CH_3\dot{C}HOC_2H_5$	1	4.3×10^7	e-r.; esr; Decay of spin polarization, compared with 2-PrOH(7D); rel. to $k(H^{\cdot} + BzOH)$.	710003
328	**Dihydro-6-methyluracil**				
	$H^{\cdot}$ + 6-MeDHU → H_2 + 6-MeU-H	2	3.4×10^8	p.r.; P.b.k. at ~ 400 nm in N_2O-satd. soln. contg. 0.1 mol L^{-1} *tert*-BuOH.	741085
329	**5,6-Dihydrothymine**				
	$H^{\cdot}$ + 5-MeDHU →	7-8	2.9×10^8	γ-r.; C.k. in soln. contg. 1.6×10^{-2} mol L^{-1} N_2O; rel. to $k(H^{\cdot} + DCO_2^-)$.	683038
330	**Dihydroxyfumaric acid**				
	$H^{\cdot}$ + *trans*-$HO_2CC(OH){=}C(OH)CO_2H$ → $HO_2C\dot{C}OHCHOHCO_2H$	1	8×10^7	e-r.; esr; Decay of spin polarization, compared with EtOH. 16% H abstr. [730053]; rel. to $k(H^{\cdot} + BzOH)$.	710040
331	**5,8-Dihydroxy-1,4-naphthoquinone**				
	$H^{\cdot} + NQ(OH)_2 \rightarrow \cdot NQH(OH)_2$	1.2	8.9×10^9	p.r.; P.b.k. in Ar-satd. soln. contg. 5×10^{-2} mol L^{-1} H_2SO_4 and 0.1 mol L^{-1} *tert*-BuOH.	83A039
332	**3,4-Dihydroxytoluene**				
	$H^{\cdot}$ + 4-$CH_3C_6H_3$-1,2-$(OH)_2$ → $CH_3C_6H_4(OH)_2$	2	1.5×10^9	p.r.; P.b.k. at 350 nm; soln. cont. 1 mol L^{-1} *tert*-BuOH; cor. for other H reactions.	771116
333	**1,2-Dimethoxybenzene**				
	$H^{\cdot} + C_6H_4(OCH_3)_2 \rightarrow$ addn.	2	$\sim 3 \times 10^9$	p.r.; P.b.k. in soln. contg. 10^{-2} mol L^{-1} *tert*-BuOH.	751171
334	**1,3-Dimethoxybenzene**				
	$H^{\cdot} + C_6H_4(OCH_3)_2 \rightarrow$ addn.	2	$\sim 3 \times 10^9$	p.r.; P.b.k. in soln. contg. 10^{-2} mol L^{-1} *tert*-BuOH.	751171
335	**1,4-Dimethoxybenzene**				
	$H^{\cdot} + C_6H_4(OCH_3)_2 \rightarrow$ addn.	2	$\sim 3 \times 10^9$	p.r.; P.b.k. in soln. contg. 10^{-2} mol L^{-1} *tert*-BuOH.	751171
336	**1,1'-Dimethyl-4,4'-bipyridinium ion**				
	$H^{\cdot} + MV^{2+} \rightarrow$	1	6.0×10^8	p.r.; Computer simulation based on p.b.k. at 390 (as well as abs. at 310, 470 and 595) nm in air-free soln. contg. 2×10^{-2} mol L^{-1}. MV^{2+} and 5×10^{-3} mol L^{-1} Cl^-; cor. for Cl_2^- and $ClOH^-$ formn. and decay; addn. to N (protonated methyl viologen radical cation) formn. and to C (H adduct) occurred in approx. equal amounts [84A322].	82A216
337	**Dimethyl fumarate**				
	$H^{\cdot} + CH_3O_2CCH{=}CHCO_2CH_3 \rightarrow CH_3O_2CCHCH_2CO_2CH_3$	0.7	9.0×10^9	p.r.; P.b.k. in soln. contg. ~1 mol L^{-1} *tert*-BuOH.	730097

TABLE 7. Rate constants for reactions of hydrogen atoms in aqueous solution—Continued

No.	Reaction	pH	k (L mol^{-1} s^{-1})	Comment	Ref.
838	**2,2-Dimethyl-1-propanol** $H^\cdot + (CH_3)_3CCH_2OH \rightarrow$	1	2.7×10^7	*e*-r.; esr; Decay of spin polarization, compared with 2-PrOH(7D); rel. to $k(H^\cdot + BzOH)$.	710003
839	**5,5-Dimethyl-1-pyrroline-1-oxyl** $H^\cdot + DMPO \rightarrow$		3.8×10^9		84A426
840	**Dimethyl sulfoxide** $H^\cdot + CH_3SOCH_3 \rightarrow CH_3S(OH)CH_3$	1	$\sim 2.7 \times 10^6$ [b]	γ-r.; C.k.; obs. G(Dimethylsulfide); rel. to $k(H^\cdot + Fe(CN)_6^{3-})$.	84A282
		~1	9.7×10^6 [b]	γ-r.; C.k.; obs. $G(H_2)$ and $G(CH_4)$; rel. to $k(H^\cdot + EtOH)$.	81A159
841	**Dioxane** $H^\cdot + -O(CH_2)_2O(CH_2)_2- \rightarrow H_2 + -O\dot{C}HCH_2O(CH_2)_2-$		*1.0* × *10*^{7}	Average of 2 values.	
		1	1.2×10^7	*e*-r.; esr; Decay of spin polarization, compared with 2-PrOH(7D); rel. to $k(H^\cdot + BzOH)$.	710003
			8.3×10^6	p.r.; C.k.; p.b.k. at ~ 310 nm (Ag^{2+}); rel. to $k(H^\cdot + Ag^+)$.	670550
842	**1,1-Diphenylethylene** $H^\cdot + (C_6H_5)_2C{=}CH_2 \rightarrow (C_6H_5)_2\dot{C}CH_3$	1	6.7×10^9	p.r.; P.b.k. at 330 nm; soln. contg. 2.0 mol L^{-1} *tert*-BuOH.	77A236
843	**Dithiodiglycolic acid** $H^\cdot + S_2(CH_2CO_2H)_2 \rightarrow$	1	9×10^9	*e*-r.; esr; Decay of spin polarization, compared with EtOH. no H abstr. [730053]; rel. to $k(H^\cdot + BzOH)$.	710040
844	**Dodecyl sulfate ion** $H^\cdot + CH_3(CH_2)_{11}OSO_3^- \rightarrow$		1.0×10^8	γ-r.; C.k.; rel. to $k(H^\cdot + 2\text{-PrOH(7D)})$.	710586
845	**Erythrosin dianion** $H^\cdot + C_{20}H_6I_4O_5^{2-} \rightarrow$	8.3	1.7×10^9	X-r.; C.k.; rel. to $k(H^\cdot + 2\text{-PrOH})$.	710354
846	**Ethane** $H^\cdot + C_2H_6 \rightarrow$	1	2.3×10^6	*e*-r.; esr; Decay of spin polarization, compared with 2-PrOH(7D); single measurement on satd. soln., calcd. from solubility; rel. to $k(H^\cdot + BzOH)$.	710003
847	**Ethanesulfonyl chloride** $H^\cdot + C_2H_5SO_2Cl \rightarrow H^+ + Cl^- + C_2H_5SO_2^\cdot$		7×10^7	p.r.; C.k.; obs. sulfonyl radical at 332 nm; also condy. study; rel. to $k(H^\cdot + MeOH)$.	761047
848	**Ethanol** $H^\cdot + C_2H_5OH \rightarrow H_2 + CH_3\dot{C}HOH$		**1.7×10^7**	**Selected value.**	
		1	2.1×10^7	p.r.; esr; Anal. of time profile of H signal.	775254
		1	1.3×10^7	p.r.; esr; Decay of H signal.	710303
849	**Ethanol-d_2** $H^\cdot + CH_3CD_2OH \rightarrow HD + CH_3\dot{C}DOH$	1.2	6.0×10^6	X-r.; C.k.; rel. to $k(H^\cdot + Fe(CN)_6^{3-})$.	620087
850	**Ethyl acetate** $H^\cdot + CH_3CO_2C_2H_5 \rightarrow H_2 + CH_3CO_2\dot{C}HCH_3$	1.0	2.5×10^5	X-r.; C.k.; rel. to $k(H^\cdot + HCO_2H)$.	560012
851	**Ethyl acetoacetate** $H^\cdot + CH_3COCH_2CO_2C_2H_5 \rightarrow$	1	1.2×10^7	*e*-r.; esr; unpublished data, P. Neta and R.H. Schuler. 22% H abstr.; 8% enol form [730053]; rel. to $k(H^\cdot + BzOH)$.	730053
852	**Ethyl dihydrogen phosphate** $H^\cdot + CH_3CH_2OPO(OH)_2 \rightarrow H_2 + CH_3\dot{C}HOPO(OH)_2$	1.3	2.8×10^6	phot.; C.k.; $pK_a = 1.6, 6.2$; rel. to $k(H^\cdot + CD_3OH)$.	657019

TABLE 7. Rate constants for reactions of hydrogen atoms in aqueous solution—Continued

No.	Reaction	pH	k (L mol^{-1} s^{-1})	Comment	Ref.
353	**Ethylene**				
	$H\cdot + H_2C{=}CH_2 \rightarrow \cdot CH_2CH_3$	1	3×10^9	*e*-r.; esr; Decay of spin polarization, compared with 2-PrOH(7D); rel. to $k(H\cdot + BzOH)$.	710003
354	**Ethylenediaminetetraacetic acid, conjugate diacid**				
	$H\cdot + H_6EDTA^{2+} \rightarrow$	1	6.0×10^7	*e*-r.; esr; Decay of spin polarization, compared with EtOH; $pK_2 = 1.55, 1.99, 2.67, 6.2, 10.9$; rel. to $k(H\cdot + BzOH)$.	710040
355	**Ethylene glycol**				
	$H\cdot + HOCH_2CH_2OH \rightarrow H_2 + \cdot CHOHCH_2OH$		*1.4* × *10*^{7}	Average of 3 values.	
		1	1.3×10^7	p.r.; C.k.; obs. Ag at 410 nm; contains *tert*-BuOH; k increases with pressure $0 \rightarrow 6.72 \times 10^8$ N m^{-2}; rel. to $k(H\cdot + Ag^+)$.	731053
		1	1.6×10^7	*e*-r.; esr; Decay of spin polarization, compared with 2-PrOH(7D); rel. to $k(H\cdot + BzOH)$.	710003
			1.4×10^7	p.r.; C.k.; p.b.k. at 313 nm (Ag^{2+}); rel. to $k(H\cdot + Ag^+)$.	670550
356	***N*-Ethylmaleamic acid**				
	$H\cdot$ + NEMA → NEMA-H	1.0	1.3×10^9	p.r.; P.b.k. in soln. contg. 1 mol L^{-1} *tert*-BuOH; 80% H-adduct and 20% H-abstraction product.	720144
357	***N*-Ethylmaleimide**				
	$H\cdot$ + NEM → NEM-H	1.0	1.4×10^{10}	p.r.; P.b.k. in soln. contg. 1 mol L^{-1} *tert*-BuOH.	720144
358	**9-Fluorenone**				
	$H\cdot + C_{13}H_8O \rightarrow$ addn.	1.0	5.4×10^9	p.r.; P.b.k. (H adduct); *tert*-BuOH as OH scavenger.	720171
359	**Fluoroacetate ion**				
	$H\cdot + FCH_2CO_2^- \rightarrow H_2 + \cdot CHFCO_2^-$	8.5	6.5×10^5	γ-r.; C.k.; practically no F^- formed; rel. to $k(H\cdot + CD_3OH)$.	670050
360	**Fluorobenzene**				
	$H\cdot + C_6H_5F \rightarrow C_6H_6F$	~1	1.5×10^9	p.r.; P.b.k. at 300 nm; cor. for decay of H adduct.	79A356
361	***p*-Fluorobenzonitrile**				
	$H\cdot + FC_6H_4CN \rightarrow 4\text{-}FC_6H_5CN$	1.8	6.7×10^8	p.r.; P.b.k. in soln. contg. 0.2 mol L^{-1} *tert*-BuOH.	761194
362	**5-Fluorouracil**				
	$H\cdot$ + 5-FU →	1	1.7×10^8	*e*-r.; esr; Decay of spin polarization, compared with EtOH; rel. to $k(H\cdot + BzOH)$.	710040
363	**Formaldehyde**				
	$H\cdot + HCHO \rightarrow H_2 + CHO$	1	5×10^6 [b]	*e*-r.; esr; unpublished data, P. Neta and R.H. Schuler. 83% H abstr. [730053]; rel. to $k(H\cdot + BzOH)$.	730053
		1.0	2.1×10^6 [b]	X-r.; C.k.; rel. to $k(H\cdot + HCO_2H)$.	560012
364	**Formate ion**				
	$H\cdot + HCO_2^- \rightarrow H_2 + \cdot CO_2^-$		**2.1×10^8**	**Selected value.**	
		7	1.2×10^8	*e*-r.; esr; Decay of spin polarization, compared with EtOH. in phosphate buffered soln.; rel. to $k(H\cdot + BzOH)$.	720039
		7	2.8×10^8	X-r.; C.k.; obs. $G(H_2)$; rel. to $k(H\cdot + Fe(CN)_6^{3-})$.	670064
		7-13.5	2.6×10^8	X-r.; C.k.; obs. pH effect on $G(H_2)$ in soln. contg. ferricyanide and formate ion; rel. to $k(H\cdot + OH^-)$.	670064
		11-13	2.4×10^8	X-r.; C.k.; obs. pH effect on $G(H_2)$; rel. to $k(H\cdot + OH^-)$.	630049

TABLE 7. Rate constants for reactions of hydrogen atoms in aqueous solution—Continued

No.	Reaction	pH	k (L mol^{-1} s^{-1})	Comment	Ref.
365	***d*-Formate ion**				
	$H\cdot + DCO_2^- \rightarrow HD + \cdot CO_2^-$		**2.9×10^7**	**Selected value.**	
		~7	3.2×10^7	γ-r.; C.k.; rel. to $k(H\cdot + HCO_2^-)$.	640095
		6	3.2×10^7	γ-r.; C.k.; rel. to $k(H\cdot + HCO_2^-)$.	640141
366	**Formic acid**				
	$H\cdot + HCO_2H \rightarrow H_2 + \cdot CO_2H$		**4.4×10^5**	**Selected value.**	
		1	6.8×10^5	*e*-r.; esr; Decay of spin polarization, compared with 2-PrOH(7D); cor. for 40% formate ion; rel. to $k(H\cdot + BzOH)$.	710003
		0.4	1.9×10^5	p.r.; Obs. dose rate effect on $G(H_2)$; rel. to $k(H\cdot + H\cdot)$.	620144
367	**Formic acid-*d***				
	$H\cdot + DCO_2H \rightarrow HD + \cdot CO_2H$	1	6.6×10^4	X-r.; C.k.; rel. to $k(H\cdot + HCO_2H)$.	560012
368	**Fumarate ion, hydrogen**				
	$H\cdot + trans\text{-}HO_2CCH{=}CHCO_2^- \rightarrow$		$\sim 2 \times 10^9$	γ-r.; C.k.; obs. $G(H_2)$; reactivity of the dianion is similar; rel. to $k(H\cdot + EtOH)$.	660010
369	**Fumaric acid**				
	$H\cdot + HO_2CCH{=}CHCO_2H \rightarrow HO_2C\dot{C}HCH_2CO_2H$	0.7	7.0×10^9 [b]	p.r.; P.b.k. in soln. contg. ~ 1 mol L^{-1} *tert*-BuOH.	730097
		1	8×10^8 [b]	*e*-r.; esr; Decay of spin polarization, compared with EtOH; rel. to $k(H\cdot + BzOH)$.	710040
370	**Glucose**				
	$H\cdot + glucose \rightarrow H_2 + R$		*6.1×10^7*	Average of 3 values.	
		1	4.3×10^7	*e*-r.; esr; Decay of spin polarization, compared with EtOH; rel. to $k(H\cdot + BzOH)$.	710040
		1.2	6×10^7	X-r.; C.k.; rel. to $k(H\cdot + Fe(CN)_6^{3-})$.	620017
		7	7.6×10^7	X-r.; C.k.; rel. to $k(H\cdot + Fe(CN)_6^{3-})$.	620024
371	**Glutamate ion**				
	$H\cdot + Glu^- \rightarrow$	7	5.2×10^6	*e*-r.; esr; Decay of spin polarization, compared with EtOH. in phosphate buffered soln.; rel. to $k(H\cdot + BzOH)$.	720039
372	**Glutamic acid, conjugate acid**				
	$H\cdot + GluH^+ \rightarrow$		*1.2×10^6*	Average of 2 values.	
		1	1.6×10^6	*e*-r.; esr; Decay of spin polarization, compared with EtOH; pK_a 2.19, 4.24, 9.67; rel. to $k(H\cdot + BzOH)$.	710040
		1	8.1×10^5	γ-r.; C.k.; rel. to $k(H\cdot + AA)$.	680343
373	**Glutathione, oxidized**				
	$H\cdot + GSSG \rightarrow GSH + GS\cdot$	1.5-2.5	1.0×10^{10}	p.r.; P.b.k. in soln. contg. 0.1-1 mol L^{-1} *tert*-BuOH.	720380
374	**Glycerol**				
	$H\cdot + HOCH_2CH(OH)CH_2OH \rightarrow$		*2.9×10^7*	Average of 3 values.	
		1	2.7×10^7	p.r.; C.k.; obs. Ag at 410 nm; contains *tert*-BuOH; k increases $0 \rightarrow 6.72 \times 10^8$ N m^{-2}; rel. to $k(H\cdot + Ag^+)$.	731053
		1	3.3×10^7	*e*-r.; esr; Decay of spin polarization, compared with EtOH; rel. to $k(H\cdot + BzOH)$.	710040
		2	2.6×10^7	p.r.; C.k.; p.b.k. at 313 nm (Ag^{2+}); rel. to $k(H\cdot + Ag^+)$.	670550
375	**Glycine**				
	$H\cdot + Gly \rightarrow H_2 + H_3N^+\dot{C}HCO_2^-$		*7.7×10^4*	Average of 2 values.	

TABLE 7. Rate constants for reactions of hydrogen atoms in aqueous solution—Continued

No.	Reaction	pH	k (L mol^{-1} s^{-1})	Comment	Ref.
375	**Glycine—Continued**				
		~ 7	7.1×10^4	p.r.; Calcd. from p.b.k. at 270 nm in Ar-satd. soln. contg. 1.5 mol L^{-1} *tert*-BuOH and 0.3-1 mol L^{-1} glycine; c.k. with *tert*-BuOH and cor. for reaction of OH with glycine; rel. to k(H· + $(CH_3)_3COH$).	741086
		7	8×10^4	*e*-r.; esr; Decay of spin polarization, compared with EtOH; rel. to k(H· + BzOH).	720039
376	**Glycine, conjugate acid** $H· + H_3N^+CH_2CO_2H \rightarrow$	1	7×10^4	*e*-r.; esr; Decay of spin polarization, compared with 2-PrOH(7D); rel. to k(H· + BzOH).	710003
377	**Glycolate ion** $H· + HOCH_2CO_2^- \rightarrow H_2 + ·CHOHCO_2^-$		4.6×10^7	Average of 2 values.	
			5.5×10^7	p.r.; Unpublished value, A. Shafferman and G. Stein.	741007
		7	3.7×10^7	*e*-r.; esr; Decay of spin polarization, compared with EtOH. in phosphate buffered soln.; rel. to k(H· + BzOH).	720039
378	**Glycolic acid** $H· + HOCH_2CO_2H \rightarrow H_2 + ·CHOHCO_2H$	1	1.7×10^7	*e*-r.; esr; Decay of spin polarization, compared with 2-PrOH(7D). 96% H abstr. [730053]; rel. to k(H· + BzOH).	710003
379	**Glycylglycine, conjugate acid** $H· + GlyGlyH^+ \rightarrow$	1	2.4×10^6	*e*-r.; esr; Decay of spin polarization, compared with EtOH; rel. to k(H· + BzOH).	710040
380	**Glycylglycylglycine, conjugate acid** $H· + GlyGlyGlyH^+ \rightarrow$	1	5.1×10^6	*e*-r.; esr; Decay of spin polarization, compared with EtOH; rel. to k(H· + BzOH).	710040
381	**Glyoxylate ion** $H· + HCOCO_2^- \rightarrow H_2 + ·COCO_2^-$	7	4.6×10^7	γ-r.; C.k.; rel. to k(H· + DCO_2^-).	630041
382	**Glyoxylic acid** $H· + HCOCO_2H \rightarrow H_2 + ·COCO_2H$	1	2.2×10^7	*e*-r.; esr; Unpublished data, P. Neta and R.H. Schuler; 100% H abstr.; rel. to k(H· + BzOH).	730053
383	**Guanidine, conjugate acid** $H· + H_2NC(=NH)NH_3^+ \rightarrow$	1	1.2×10^6	*e*-r.; esr; Decay of spin polarization, compared with EtOH; rel. to k(H· + BzOH).	710040
384	**Hexadecyltrimethylammonium bromide** $H· + CTAB \rightarrow$		1.4×10^8	γ-r.; C.k.; rel. to k(H· + 2-PrOH(7D)).	710586
385	**1,1',2,2',6,6'-Hexamethyl-4,4'-bipyridinium ion** $H· + HMV^{2+} \rightarrow HMV·^+$	~1	1×10^9	p.r.; P.b.k. in N_2-satd. soln. contg. 0.1 mol L^{-1} *tert*-BuOH and sulfuric acid.	84A330
386	**Hexamethyleneimine, conjugate acid** $H· + -NH_2^+(CH_2)_6- \rightarrow H_2 + -NH_2^+CH(CH_2)_5-$	1	1.4×10^7	*e*-r.; esr; Decay of spin polarization, compared with EtOH; rel. to k(H· + BzOH).	710040
387	**1,6-Hexanediamine, conjugate diacid** $H· + H_3N^+(CH_2)_6NH_3^+ \rightarrow$	1	4.3×10^6	*e*-r.; esr; Decay of spin polarization, compared with EtOH; rel. to k(H· + BzOH).	710040
388	***n*-Hexane** $H· + CH_3(CH_2)_4CH_3 \rightarrow$	1	1.4×10^8	*e*-r.; esr; Decay of spin polarization, compared with 2-PrOH(7D); rel. to k(H· + BzOH).	710003
389	**Hexanoate ion** $H· + CH_3(CH_2)_4CO_2^- \rightarrow$	7	4.9×10^7	*e*-r.; esr; Decay of spin polarization, compared with EtOH. in phosphate buffered soln.; rel. to k(H· + BzOH).	720039

TABLE 7. Rate constants for reactions of hydrogen atoms in aqueous solution—Continued

No.	Reaction	pH	k (L mol^{-1} s^{-1})	Comment	Ref.
390	**Hexanoic acid**				
	$H^{\cdot} + CH_3(CH_2)_4CO_2H \rightarrow$	1	4.2×10^7	e-r.; esr; Decay of spin polarization, compared with 2-PrOH(7D); rel. to $k(H^{\cdot} + BzOH)$.	710003
391	**1-Hexanol**				
	$H^{\cdot} + CH_3(CH_2)_5OH \rightarrow$		*9.4 × 10^7*	Average of 2 values.	
		7	9.2×10^7	e-r.; esr; Decay of spin polarization, compared with EtOH. in phosphate buffered soln.; rel. to $k(H^{\cdot} + BzOH)$.	720039
		1	9.6×10^7	e-r.; esr; Decay of spin polarization, compared with 2-PrOH(7D); rel. to $k(H^{\cdot} + BzOH)$.	710003
392	**1-Hexylammonium ion**				
	$H^{\cdot} + n\text{-}C_6H_{13}NH_3^+ \rightarrow$	1,7	3.2×10^7	e-r.; esr; Decay of spin polarization, compared with EtOH; rel. to $k(H^{\cdot} + BzOH)$.	710040
393	**Hippuric acid**				
	$H^{\cdot} + C_6H_5CONHCH_2CO_2H \rightarrow$	1	9.2×10^8	e-r.; esr; Decay of spin polarization, compared with EtOH; rel. to $k(H^{\cdot} + BzOH)$.	710040
394	**Histidine**				
	$H^{\cdot} + His \rightarrow$	7	2.3×10^8	e-r.; esr; Decay of spin polarization, compared with EtOH. in phosphate buffered soln.; rel. to $k(H^{\cdot} + BzOH)$.	720039
395	**Histidine, conjugate diacid**				
	$H^{\cdot} + HisH_2^{2+} \rightarrow$	1	4.4×10^7	e-r.; esr; Decay of spin polarization, compared with EtOH. ~3% H abstr. [730053]; pK_a = 1.82, 6.0, 9.17; rel. to $k(H^{\cdot} + BzOH)$.	710040
396	**Histidine, conjugate monoacid**				
	$H^{\cdot} + HisH^+ \rightarrow$	3	4.7×10^7	e-r.; esr; Decay of spin polarization, compared with EtOH; rel. to $k(H^{\cdot} + BzOH)$.	720039
397	**Hydroquinone**				
	$H^{\cdot} + 1,4\text{-}C_6H_4(OH)_2 \rightarrow$ addn.		1.3×10^9	p.r.; Unpublished data, O.I. Micic and M.T. Nenadovic; adduct abs. max. 360 nm.	760042
398	***p*-Hydroxybenzoic acid**				
	$H^{\cdot} + HOC_6H_4CO_2H \rightarrow C_7H_7O_3$		*1.9 × 10^9*	Average of 2 values.	
		1	1.5×10^9	p.r.; P.b.k.; CD_3OH as OH scavenger	690001
			2.4×10^9	p.r.; C.k.; p.b.k.; rel. to $k(H^{\cdot} + MeOH)$.	690001
399	**3-(*p*-Hydroxyphenyl)propionic acid**				
	$H^{\cdot} + HOC_6H_4CH_2CH_2CO_2H \rightarrow$ $4\text{-}HOC_6H_5(CH_2)_2CO_2H$	0.0	4.0×10^9 [b]	p.r.; P.b.k. (H adduct) in soln. contg. 1 mol L^{-1} *tert*-BuOH.	730003
		2.0-2.3	1.7×10^9 [b]	p.r.; C.k.; p.b.k. at 320 and 330 nm (H adduct); rel. to $k(H^{\cdot} + O_2)$.	690445
400	**Hydroxyproline, conjugate acid**				
	$H^{\cdot} + HypH^+ \rightarrow$	1	5.5×10^6 [b]	e-r.; esr; Decay of spin polarization, compared with EtOH; $pK_a = 1.92$; rel. to $k(H^{\cdot} + BzOH)$.	710040
		1	1.3×10^6 [b]	γ-r.; C.k.; rel. to $k(H^{\cdot} + AA)$.	080343
401	**Imidazolium ion**				
	$H^{\cdot} + ImH^+ \rightarrow$	1	5.7×10^7	e-r.; esr; Decay of spin polarization, compared with EtOH; rel. to $k(H^{\cdot} + BzOH)$.	710040
402	**Iminodiacetic acid, conjugate acid**				
	$H^{\cdot} + H_2N^+(CH_2CO_2H)_2 \rightarrow$	1	3.7×10^5	e-r.; esr; Decay of spin polarization, compared with EtOH; $pK_a = 2.5$; rel. to $k(H^{\cdot} + BzOH)$.	710040
403	**Indole**				
	$H^{\cdot} + In \rightarrow$	1	4.1×10^9	γ-r.; C.k.; rel. to $k(H^{\cdot} + 2\text{-PrOH})$.	720541
404	**Indole-3-acetic acid**				
	$H^{\cdot} + 3\text{-}InCH_2CO_2H \rightarrow$	1	6.2×10^9	γ-r.; C.k.; rel. to $k(H^{\cdot} + 2\text{-PrOH})$.	720541

TABLE 7. Rate constants for reactions of hydrogen atoms in aqueous solution—Continued

No.	Reaction	pH	k (L mol^{-1} s^{-1})	Comment	Ref.
405	**Indole-3-propionic acid**				
	$H^{\cdot} + 3\text{-In}CH_2CH_2CO_2H \rightarrow$	1	6.0×10^9	γ-r.; C.k.; rel. to $k(H^{\cdot} + 2\text{-PrOH})$.	720541
406	***o*-Iodohippuric acid**				
	$H^{\cdot} + IC_6H_4CONHCH_2CO_2H \rightarrow$ $2\text{-}IC_6H_5CONHCH_2CO_2H$	2	1.6×10^9 [a]	p.r.; C.k. in Ar-satd. soln. contg. 0.2 mol L^{-1} *tert*-BuOH, 0.01-0.2 mol L^{-1} ethylene glycol (EG) and 10^{-3} mol L^{-1} substrate; 60-70% displacement gives HI + $\cdot C_6H_4CONHCH_2CO_2^-$; rel. to $k(H^{\cdot} + EG)$.	77A214
407	**Iodomethane**				
	$H^{\cdot} + CH_3I \rightarrow$	1	$>2 \times 10^9$	*e*-r.; esr; Decay of spin polarization, compared with 2-PrOH(7D); rel. to $k(H^{\cdot} + BzOH)$.	710003
408	**Isobutane**				
	$H^{\cdot} + (CH_3)_2CHCH_3 \rightarrow$	1	1.1×10^8	*e*-r.; esr; Decay of spin polarization, compared with 2-PrOH(7D); rel. to $k(H^{\cdot} + BzOH)$.	710003
409	**Isobutylene**				
	$H^{\cdot} + (CH_3)_2C{=}CH_2 \rightarrow$		1×10^{10}	C.k., no details given.; rel. to $k(H^{\cdot} + MeOH)$.	670041
410	**Isoleucine, conjugate acid**				
	$H^{\cdot} + IleH^+ \rightarrow$		*6.1* × *10*^{9}	Average of 2 values.	
		1	7×10^6	*e*-r.; esr; Decay of spin polarization, compared with EtOH; pK_a = 2.66; rel. to $k(H^{\cdot} + BzOH)$.	710040
		1	4.9×10^6	γ-r.; C.k.; rel. to $k(H^{\cdot} + AA)$.	680343
411	**Isoorotic acid**				
	$H^{\cdot} + 5\text{-}UCO_2H \rightarrow$	1	8×10^7	*e*-r.; esr; Decay of spin polarization, compared with EtOH; rel. to $k(H^{\cdot} + BzOH)$.	710040
412	**Lactic acid**				
	$H^{\cdot} + CH_3CH(OH)CO_2H \rightarrow H_2 +$ $CH_3\dot{C}OHCO_2H$	1	2.0×10^7	*e*-r.; esr; Decay of spin polarization, compared with 2-PrOH(7D); rel. to $k(H^{\cdot} + BzOH)$.	710003
413	**Leucine, conjugate acid**				
	$H^{\cdot} + LeuH^+ \rightarrow$	1	1.6×10^7	*e*-r.; esr; Decay of spin polarization, compared with EtOH; pK_a = 2.3; rel. to $k(H^{\cdot} + BzOH)$.	710040
414	**Lysine, conjugate diacid**				
	$H^{\cdot} + LysH_2^{2+} \rightarrow$	1	1.5×10^6	*e*-r.; esr; Decay of spin polarization, compared with EtOH; pK_a = 2.18; rel. to $k(H^{\cdot} + BzOH)$.	710040
		1	8.0×10^5	γ-r.; C.k.; rel. to $k(H^{\cdot} + AA)$.	680343
415	**Malate ion**				
	$H^{\cdot} + {}^-O_2C(CH_2)_3\dot{C}H(OH)CO_2^- \rightarrow$ $H_2 + {}^-O_2C(CH_2)_2\dot{C}OHCO_2^-$		5.5×10^7	p.r.; Unpublished data, A. Shafferman and G. Stein.	741007
416	**Malic acid**				
	$H^{\cdot} + HO_2CCH_2\dot{C}H(OH)CO_2H \rightarrow$	1	2.0×10^7	*e*-r.; esr; Decay of spin polarization, compared with EtOH; rel. to $k(H^{\cdot} + BzOH)$.	710040
417	**Maleic acid**				
	$H^{\cdot} + HO_2CCH{=}CHCO_2H \rightarrow$ $HO_2C\dot{C}HCH_2CO_2H$	1	1.9×10^9 [b]	p.r.; esr; Calcd. from time profile of H in deaerated soln. contg. various solute concns. and 10^{-2} mol L^{-1} *tert*-BuOH.	83A153
		0.7	8.0×10^9 [b]	p.r.; P.b.k.	730097
418	**Malonic acid**				
	$H^{\cdot} + HO_2CCH_2CO_2H \rightarrow H_2 +$ $\cdot CH(CO_2H)_2$		*4.0* × *10*^{5}	Average of 2 values.	
		1	3.9×10^5	*e*-r.; esr; Decay of spin polarization, compared with 2-PrOH(7D). 75% H abstr., total rate estd. to be 5.4×10^5 [730053]; rel. to $k(H^{\cdot} + BzOH)$.	710003
		1	4.0×10^5	γ-r.; C.k. with 2-PrOH(7D); rel. to $k(H^{\cdot} + BzOH)$.	710017

TABLE 7. Rate constants for reactions of hydrogen atoms in aqueous solution—Continued

No.	Reaction	pH	k (L mol^{-1} s^{-1})	Comment	Ref.
419	**Malononitrile**				
	$H^{\cdot} + NCCH_2CN \rightarrow$		1.6×10^7	γ-r.; C.k., obs. $G(H_2)$; rel. to $k(H^{\cdot} + EtOH)$.	730364
420	**Mercaptoacetic acid**				
	$H^{\cdot} + HSCH_2CO_2H \rightarrow$	1	4×10^9	*e*-r.; esr; Decay of spin polarization, compared with EtOH; rel. to $k(H^{\cdot} + BzOH)$.	710040
421	**2-Mercaptoethanol (overall)**				
	$H^{\cdot} + HSCH_2CH_2OH \rightarrow$		*1.7 × 10⁹*	Average of 2 values.	
		1	1.3×10^9	γ-r.; Derived from H abstr. rate and ratio of H to SH abstr. = 5.7; rel. to $k(H^{\cdot} + AA)$.	730241
		0	2.1×10^9	p.r.; Estd. from p.r. and X.r. experiments.	710175
422	**2-Mercaptoethanol (H abstr.)**				
	$H^{\cdot} + HSCH_2CH_2OH \rightarrow H_2 + {\cdot}SCH_2CH_2OH$		*1.4 × 10⁹*	Average of 2 values.	
		1	1.1×10^9	γ-r.; C.k.; obs. $G(H_2)$; rel. to $k(H^{\cdot} + AA)$.	730241
		0	1.8×10^9	p.r.; Estd. from concn. effect on o.d. in soln. contg. O_2; rel. to $k(H^{\cdot} + O_2)$.	710175
423	**2-Mercaptoethanol (SH abstr.)**				
	$H^{\cdot} + HSCH_2CH_2OH \rightarrow {\cdot}CH_2CH_2OH + H_2S$	0	3.3×10^8 [a]	X-r.; Estd. from product anal. $G(H_2S)$, in presence and absence of O_2.	710175
424	**2-Mercaptopropionic acid (overall)**				
	$H^{\cdot} + CH_3CH(SH)CO_2H \rightarrow$	1	2.2×10^9	γ-r.; Derived from H abstr. rate and ratio of H to SH abstr. = 0.52; rel. to $k(H^{\cdot} + AA)$.	730241
425	**2-Mercaptopropionic acid (H abstr.)**				
	$H^{\cdot} + CH_3CH(SH)CO_2H \rightarrow H_2 + CH_3CH(S)CO_2H$	1	9.4×10^8	γ-r.; C.k. obs. $G(H_2)$; rel. to $k(H^{\cdot} + AA)$.	730241
426	**3-Mercaptopropionic acid (overall)**				
	$H^{\cdot} + HSCH_2CH_2CO_2H \rightarrow$	1	8.9×10^8	γ-r.; Derived from H abstr. rate and ratio of H to SH abstr. = 4.0 ± 0.4; rel. to $k(H^{\cdot} + AA)$.	730241
427	**3-Mercaptopropionic acid (H abstr.)**				
	$H^{\cdot} + HSCH_2CH_2CO_2H \rightarrow H_2 + {\cdot}SCH_2CH_2CO_2H$	1	7.2×10^8	γ-r.; C.k.; rel. to $k(H^{\cdot} + AA)$.	730241
428	**Mercaptosuccinic acid**				
	$H^{\cdot} + HO_2CCH_2CH(SH)CO_2H \rightarrow$	1	3×10^9	*e*-r.; esr; Decay of spin polarization, compared with EtOH; rel. to $k(H^{\cdot} + BzOH)$.	710040
429	**Mesitylene**				
	$H^{\cdot} + C_6H_3(CH_3)_3 \rightarrow C_6H_4(CH_3)_3$	1	3.6×10^9	p.r.; P.b.k. in soln. contg. 0.1-0.5 mol L^{-1} *tert*-BuOH and $HClO_4$.	751009
430	**Methane**				
	$H^{\cdot} + CH_4 \rightarrow$	1	$< 1 \times 10^5$	*e*-r.; esr; Decay of spin polarization, compared with 2-PrOH(7D); single measurement on satd. soln., calcd. from solubility; rel. to $k(H^{\cdot} + BzOH)$.	710003
431	**Methanesulfonyl chloride**				
	$H^{\cdot} + CH_3SO_2Cl \rightarrow H^+ + Cl^- + CH_3SO_2{\cdot}$		$\sim 2.8 \times 10^7$	p.r.; C.k., obs. sulfonyl radical abs. at 332 nm; also condy.; rel. to $k(H^{\cdot} + MeOH)$.	761047
432	**Methanol**				
	$H^{\cdot} + CH_3OH \rightarrow H_2 + {\cdot}CH_2OH$		**2.6×10^6**	**Selected value.**	
		1	3.0×10^6	p.r.; esr; Calcd. from time profile of H in deaerated soln. contg. various MeOH concns. and 10^{-2} mol L^{-1} *tert*-BuOH.	83A153
		1	2.5×10^6	p.r.; esr; Anal. of time profile of H signal.	775254
		1	2.4×10^6	p.r.; esr; Decay of H signal.	710303
433	**Methanol-d_3**				
	$H^{\cdot} + CD_3OH \rightarrow HD + {\cdot}CD_2OH$	6	1×10^5	γ-r.; C.k.; rel. to $k(H^{\cdot} + MeOH)$.	640141

TABLE 7. Rate constants for reactions of hydrogen atoms in aqueous solution—Continued

No.	Reaction	pH	k (L mol^{-1} s^{-1})	Comment	Ref.
434	**Methionine, conjugate acid** $H^{\cdot} + MetH^{+} \rightarrow$	1	3.5×10^{8}	γ-r.; C.k.; $pK_a = 2.28$; rel. to $k(H^{\cdot} + HCO_2H)$.	680343
435	**Methylammonium ion** $H^{\cdot} + CH_3NH_3^{+} \rightarrow H_2 + {\cdot}CH_2NH_3^{+}$	3	2.6×10^{6}	p.r.; C.k.; obs. p.b.k. at 300 nm; rel. to $k(H^{\cdot} +$ PhOH).	710595
436	**2-Methylbutyrate ion** $H^{\cdot} + CH_3CH_2CH(CH_3)CO_2^{-} \rightarrow$		3.2×10^{7}	γ-r.; C.k.; rel. to $k(H^{\cdot} + (CH_3)_2CDOH)$.	660422
437	**3-Methylbutyrate ion** $H^{\cdot} + CH_3CH(CH_3)CH_2CO_2^{-} \rightarrow H_2$		2.5×10^{7}	γ-r.; C.k.; rel. to $k(H^{\cdot} + (CH_3)_2CDOH)$.	660422
438	**Methylene Blue** $H^{\cdot} + MB^{+} \rightarrow {\cdot}MBH^{+}$	1-4	1.1×10^{10}	p.r.; P.b.k. at 265 (semiquinone) in Ar-satd. soln. contg. 10^{-2} mol L^{-1} *tert*-BuOH as well as d.k. and p.b.k. at 350 nm; 87% semiquinone formn., 5% H addn. to ring and 8% H attack at the -S- chromophore.	82A258
439	**Methyl methacrylate** $H^{\cdot} + H_2C{=}C(CH_3)CO_2CH_3 \rightarrow$ addn.	1	7.2×10^{8}	p.r.; esr; Calcd. from time profile of H in deaerated soln. contg. various solute concns. and 10^{-2} mol L^{-1} *tert*-BuOH.	83A153
440	**2-Methyl-1,4-naphthoquinone** $H^{\cdot} + 2\text{-}CH_3\text{-}NQ \rightarrow$	~1.7	6.7×10^{9}	γ-r.; C.k. with riboflavin, obs. G(-RF); rel. to $k(H^{\cdot} +$ glucose).	84A192
441	**2-Methyl-1-propanol** $H^{\cdot} + (CH_3)_2CHCH_2OH \rightarrow H_2 + (CH_3)_2CHCHOH$		*5.2* × *10*^{7}	Average of 2 values.	
		1	5.9×10^{7}	*e*-r.; esr; Decay of spin polarization, compared with 2-PrOH(7D); rel. to $k(H^{\cdot} +$ BzOH).	710003
		1	5×10^{7}	γ-r.; C.k. with 2-PrOH(7D); rel. to $k(H^{\cdot} +$ BzOH).	710017
442	**2-Methyl-2-propanol** $H^{\cdot} + (CH_3)_3COH \rightarrow H_2 + {\cdot}CH_2C(CH_3)_2OH$	2	1.7×10^{5}	p.r.; esr; Decay of H signal; high concn.; k concn. dependent.	710303
443	**2-Methylpropionate ion** $H^{\cdot} + (CH_3)_2CHCO_2^{-} \rightarrow H_2 + (CH_3)_2\dot{C}CO_2^{-}$		*4.2* × *10*^{7}	Average of 2 values.	
		7	5.4×10^{7}	*e*-r.; esr; Decay of spin polarization, compared with EtOH. in phosphate buffered soln.; rel. to $k(H^{\cdot} +$ BzOH).	720039
			3.0×10^{7}	γ-r.; C.k.; rel. to $k(H^{\cdot} + (CH_3)_2CDOH)$.	660422
444	**2-Methylpropionic acid** $H^{\cdot} + (CH_3)_2CHCO_2H \rightarrow$	1	2.4×10^{7}	*e*-r.; esr; Decay of spin polarization, compared with 2-PrOH(7D); rel. to $k(H^{\cdot} +$ BzOH).	710003
445	**2-Methylpropionitrile** $H^{\cdot} + (CH_3)_2CHCN \rightarrow$	1	2.0×10^{7}	*e*-r.; esr; Decay of spin polarization, compared with 2-PrOH(7D); rel. to $k(H^{\cdot} +$ BzOH).	710003
446	**α-Methylstyrene (overall)** $H^{\cdot} + C_6H_5C(CH_3){=}CH_2 \rightarrow$ addn.		4.5×10^{8}	p.r.; P.b.k. at 260 nm, 55% cyclohexadienyl, 45% benzyl radical formed.	751198
447	**6-Methyluracil** $H^{\cdot} + 6\text{-MeU} \rightarrow$	1	6×10^{8}	*e*-r.; esr; Decay of spin polarization, compared with EtOH; rel. to $k(H^{\cdot} +$ BzOH).	710040
448	**Naphthalene** $H^{\cdot} + C_{10}H_8 \rightarrow C_{10}H_9$	2.0	3.4×10^{9}	p.r.; P.b.k. at 320 nm in Ar-satd. soln. contg. 0.1 mol L^{-1} *tert*-BuOH and $HClO_4$.	80N019

TABLE 7. Rate constants for reactions of hydrogen atoms in aqueous solution—Continued

No.	Reaction	pH	k (L mol^{-1} s^{-1})	Comment	Ref.
449	**2-Naphthol**				
	$H^{\cdot} + 2\text{-NpOH} \rightarrow H_2 + NpO^{\cdot}$		1×10^9	f.p.; estd.	84A310
450	**1,4-Naphthoquinone-2-sulfonate ion**				
	$H^{\cdot} + 2\text{-}SO_3NQ^- \rightarrow 2\text{-}SO_3NQ(H)^-$	1.0	6.8×10^9	p.r.; P.b.k. (H adduct); tert-BuOH as OH scavenger.	720171
451	**1-Naphthylacetic acid**				
	$H^{\cdot} + NpCH_2CO_2H \rightarrow$	1	3.0×10^9	γ-r.; C.k.; rel. to $k(H^{\cdot} + 2\text{-PrOH})$.	720541
452	**Nicotinic acid, conjugate acid**				
	$H^{\cdot} + 3\text{-py}H^+CO_2H \rightarrow 3\text{-py}H_2{}^+CO_2H$	1	5×10^8	p.r.; P.b.k. (H adduct); *tert*-BuOH as OH scavenger.	710582
453	**Nifuroxime**				
	$H^{\cdot} + NF \rightarrow NF\text{-}H$	1,7	3×10^9	p.r.; P.b.k. at 500 nm (H adduct).	731018
454	**Nitrilotriacetic acid, conjugate acid**				
	$H^{\cdot} + HN^+(CH_2CO_2H)_3 \rightarrow$	1	6.9×10^6	e-r.; esr; Decay of spin polarization, compared with EtOH; $pK_2 = 1.65$; rel. to $k(H^{\cdot} + BzOH)$.	710040
455	***p*-Nitroacetophenone**				
	$H^{\cdot} + PNAP \rightarrow PNAP\text{-}H$	1	6×10^8	p.r.; P.b.k. at 325 nm in N_2-satd. soln. contg. 0.5 mol L^{-1} *tert*-BuOH and $HClO_4$; 30% addn. to nitro group and 70% ring addn.	77A220
456	***p*-Nitroanilinium ion**				
	$H^{\cdot} + O_2NC_6H_4NH_3{}^+ \rightarrow [O_2NC_6H_4NH_3]^{\cdot}$	2.4	2.0×10^9	p.r.; P.b.k. at 300 nm (protonated radical ion) in Ar-satd. soln. contg. 0.1 mol L^{-1} *tert*-BuOH and $HClO_4$ $pK_a = 3.29$	771118
457	**Nitrobenzene**				
	$H^{\cdot} + C_6H_5NO_2 \rightarrow C_6H_6NO_2$	1	1.0×10^9	p.r.; P.b.k.; CD_3OH as OH scavenger.	690001
			2.3×10^9	p.r.; C.k.; p.b.k.; rel. to $k(H^{\cdot} + MeOH)$.	690001
458	***p*-Nitrobenzoic acid**				
	$H^{\cdot} + O_2NC_6H_4CO_2H \rightarrow NO_2C_6H_5CO_2H$		*9.9 × 10^8*	Average of 2 values.	
		2	1.0×10^9	p.r.; P.b.k. at 400 nm; CD_3OH as OH scavenger.	700211
		1	9.8×10^8	p.r.; P.b.k.; CD_3OH as OH scavenger.	690001
459	**Nitroethane**				
	$H^{\cdot} + C_2H_5NO_2 \rightarrow$		4.7×10^7	r.; C.k.; obs. $G(H_2)$ in sulfuric acid soln.; rel. to $k(H^{\cdot} + EtOH)$.	670180
460	**Nitromethane**				
	$H^{\cdot} + CH_3NO_2 \rightarrow$		*4.3 × 10^7*	Average of 2 values.	
		1	4.0×10^7	e-r.; esr; Decay of spin polarization, compared with 2-PrOH(7D). no H abstr. [730053]; rel. to $k(H^{\cdot} + BzOH)$.	710003
			4.6×10^7	r.; C.k.; obs. $G(H_2)$ in sulfuric acid soln.; rel. to $k(H^{\cdot} + EtOH)$.	670180
461	**1-Nitropropane**				
	$H^{\cdot} + CH_3CH_2CH_2NO_2 \rightarrow$		4.9×10^7	r.; C.k.; obs. $G(H_2)$ in sulfuric acid soln.; rel. to $k(H^{\cdot} + EtOH)$.	670180
462	**Norvaline, conjugate acid**				
	$H^{\cdot} + NorH^+ \rightarrow$	1	1.4×10^6	γ-r.; C.k.; $pK_a = 2.30, 9.78$; rel. to $k(H^{\cdot} + AA)$.	680343
463	**Orotic acid**				
	$H^{\cdot} + 6\text{-}UCO_2H \rightarrow 6\text{-}U(H)CO_2H$	1	5×10^8	e-r.; esr; Decay of spin polarization, compared with EtOH; $pK_a = 2.4$; rel. to $k(H^{\cdot} + BzOH)$.	710040
464	**Oxalacetic acid**				
	$H^{\cdot} + HO_2CCH_2COCO_2H \rightarrow$		1.9×10^7	e-r.; esr; Unpublished data, P. Neta and R.H. Schuler. ~1% H abstr. [730053]; rel. to $k(H^{\cdot} + BzOH)$.	730053

TABLE 7. Rate constants for reactions of hydrogen atoms in aqueous solution—Continued

No.	Reaction	pH	k (L mol^{-1} s^{-1})	Comment	Ref.
465	**Oxalate ion**				
	$H^\cdot + {}^-O_2CCO_2^- \rightarrow$	7	$<4 \times 10^4$	*e*-r.; esr; Decay of spin polarization, compared with EtOH; too low to measure; rel. to $k(H^\cdot$ + BzOH).	720039
466	**Oxalic acid**				
	$H^\cdot + HO_2CCO_2H \rightarrow$		*3.3* × *10*^{5}	Average of 2 values.	
		1	3.8×10^5	*e*-r.; esr; Decay of spin polarization, compared with 2-PrOH(7D). no H abstr. [730053]; rel. to $k(H^\cdot$ + BzOH).	710003
		1	3×10^5	γ-r.; C.k. with 2-PrOH(7D); cor. for $k(e_{aq}^- + H_2C_2O_4) = 2.5 \times 10^{10}$; rel. to $k(H^\cdot$ + BzOH).	710017
467	**Penicillamine**				
	$H^\cdot$ + PenSH → H_2	6	2.3×10^9	phot.; C.k.; obs. H_2 yields; at pH 7.5 $k = 5.1 \times 10^9$; rel. to $k(H^\cdot$ + AA).	757486
468	**Penicillamine, conjugate acid (overall)**				
	$H^\cdot + PenSH_2^+ \rightarrow$	1	1.5×10^9	γ-r.; Derived from H abstr. rate and ratio of H to SH abstr. = 0.44; ratio of 0.50 detd. in [760146]; rel. to $k(H^\cdot$ + AA).	730241
469	**Penicillamine, conjugate acid (H abstr.)**				
	$H^\cdot + PenSH_2^+ \rightarrow H_2$	1	1.3×10^9 [b]	phot.; C.k.; obs. H_2 yields; rel. to $k(H^\cdot$ + AA).	757486
		1	4.8×10^8 [b]	γ-r.; C.k.; obs. $G(H_2)$; rel. to $k(H^\cdot$ + AA).	730241
470	**Pentamethylbenzene**				
	$H^\cdot + C_6H(CH_3)_5 \rightarrow C_6H_2(CH_3)_5$	1	2.9×10^9	p.r.; P.b.k. in soln. cont. *tert*-BuOH and $HClO_4$.	751009
471	**Pentane**				
	$H^\cdot + CH_3(CH_2)_3CH_3 \rightarrow$	1	6×10^7	*e*-r.; esr; Decay of spin polarization, compared with 2-PrOH(7D); rel. to $k(H^\cdot$ + BzOH).	710003
472	**2,4-Pentanedione**				
	$H^\cdot + CH_3COCH_2COCH_3 \rightarrow$ addn.	1	7.5×10^7	*e*-r.; esr; Unpublished data, P. Neta and R.H. Schuler; ~3% H abstr.; 80% enol formn.; rel. to $k(H^\cdot$ + BzOH).	730053
473	**Pentanoate ion**				
	$H^\cdot + CH_3(CH_2)_3CO_2^- \rightarrow$		1.8×10^7	γ-r.; C.k.; rel. to $k(H^\cdot + (CH_3)_2CDOH)$.	660422
474	**1,10-Phenanthroline, conjugate acid**				
	$H^\cdot + phenH^+ \rightarrow (phenH_2)^{\cdot+}$	1	3.3×10^9	p.r.; P.b.k. at 660 and 430 nm in deaerated soln. contg. 1 mol L^{-1} *tert*-BuOH and $HClO_4$.	80A115
475	**Phenol**				
	$H^\cdot + C_6H_5OH \rightarrow C_6H_6OH$		*1.7* × *10*^{9}	Average of 3 values.	
		3	1.2×10^9	p.r.; P.b.k. at 335 nm	86A331
		7	2.1×10^9	p.r.; esr; Decay of H signal.	710303
		2.0	1.8×10^9	p.r.; P.b.k. at 330 nm.	670122
476	**Phenothiazine**				
	$H^\cdot + C_{12}H_9NS \rightarrow$	1.3	1.2×10^{10}	p.r.; P.b.k. at 330 nm as well as 460 nm in soln. contg. 0.083 mol L^{-1} *tert*-BuOH; 77% semiquinone formn. (addn. to N), 17% addn. to S and 6% addn. to the aromatic ring.	84A248
477	**Phenyl acetate**				
	$H^\cdot + CH_3CO_2C_6H_5 \rightarrow$	1	7.9×10^8	*e*-r.; esr; Decay of spin polarization, compared with EtOH; rel. to $k(H^\cdot$ + BzOH).	720025
478	**Phenylacetate ion**				
	$H^\cdot + C_6H_5CH_2CO_2^- \rightarrow$	8-9	1.1×10^9	γ-r.; C.k.; rel. to $k(H^\cdot$ + 2-PrOH).	660500
479	**Phenylacetic acid**				
	$H^\cdot + C_6H_5CH_2CO_2H \rightarrow C_6H_6CH_2CO_2H$	1	1.0×10^9	p.r.; P.b.k.; CD_3OH as OH scavenger	690001

TABLE 7. Rate constants for reactions of hydrogen atoms in aqueous solution—Continued

No.	Reaction	pH	k (L mol^{-1} s^{-1})	Comment	Ref.
480	**Phenylalanine**				
	$H\cdot + Phe \rightarrow C_6H_6CH_2CH(NH_3^+)CO_2^-$	6.4	7.1×10^8	p.r.; P.b.k. at 297 nm in soln. contg. *tert*-BuOH 1-20 $\times 10^{-1}$ mol L^{-1} Phe and $HClO_4$ at pH 2 and NaH_2PO_4 at pH 6.4; at pH 2 $k = 9.3 \times 10^8$; DL-isomer.	741129
481	**Phenylalanine, conjugate acid**				
	$H\cdot + PheH^+ \rightarrow$	1	7.4×10^8 [b]	e-r.; esr; Decay of spin polarization, compared with EtOH; DL-isomer.; rel. to $k(H\cdot + BzOH)$.	710040
		1	2.4×10^8 [b]	γ-r.; C.k.; L-isomer; rel. to $k(H\cdot + HCO_2H)$.	680343
482	***m*-Phenylenediamine, conjugate diacid**				
	$H\cdot + C_6H_4(NH_3^+)_2 \rightarrow$	1	3.1×10^8	e-r.; esr; Decay of spin polarization, compared with EtOH; rel. to $k(H\cdot + BzOH)$.	720025
483	***o*-Phenylenediamine, conjugate diacid**				
	$H\cdot + C_6H_4(NH_3^+)_2 \rightarrow$	0	2.6×10^8	e-r.; esr; Decay of spin polarization, compared with EtOH; at pH 1 second amino group is 50% protonated ($k = 7.3 \times 10^8$); at pH 2-3 one amino group is protonated ($k = 1 \times 10^9$); k_{calc} for diamine $= 2.1 \times 10^9$; rel. to $k(H\cdot + BzOH)$.	720025
484	***p*-Phenylenediamine, conjugate diacid**				
	$H\cdot + C_6H_4(NH_3^+)_2 \rightarrow$	1	2.8×10^8	e-r.; esr; Decay of spin polarization, compared with EtOH; rel. to $k(H\cdot + BzOH)$.	720025
485	**Phenyl-β-D-glucopyranoside**				
	$H\cdot + GluOC_6H_5 \rightarrow GluOC_6H_6$	1	3.5×10^7	p.r.; P.b.k. at 320 nm (H adduct) in soln. contg. 0.22 mol L^{-1} 2-BuOH and N_2O.	710055
486	**Phenylphosphoric acid**				
	$H\cdot + C_6H_5OPO(OH)_2 \rightarrow C_6H_6OPO(OH)_2$	0.4	7.0×10^8	p.r.; P.b.k. at 320 nm in soln. contg. 0.5 mol L^{-1} *tert*-BuOH and $HClO_4$; also c.k. with MeOH.	79A055
487	**Polyoxyethylene(15), nonylphenyl ether**				
	$H\cdot + C_9H_{19}C_6H_4(OCH_2CH_2)_{15}OH \rightarrow$		1.8×10^9	γ-r.; C.k.; rel. to $k(H\cdot + 2\text{-PrOH(7D)})$.	710586
488	**L-Proline, conjugate acid**				
	$H\cdot + ProH^+ \rightarrow$		*5.8×10^5*	Average of 2 values.	
		1	7×10^5	e-r.; esr; Decay of spin polarization, compared with EtOH; p$K_a = 1.99$; rel. to $k(H\cdot + BzOH)$.	710040
		1	4.2×10^5	γ-r.; C.k.; rel. to $k(H\cdot + AA)$.	680343
489	**Propane**				
	$H\cdot + C_3H_8 \rightarrow$	1	2.0×10^7	e-r.; esr; Decay of spin polarization, compared with 2-PrOH(7D); rel. to $k(H\cdot + BzOH)$.	710003
490	**1,3-Propanediol**				
	$H\cdot + HO(CH_2)_3OH \rightarrow H_2 + \cdot CHOHCH_2CH_2OH$		1.8×10^7	γ-r.; C.k.; rel. to $k(H\cdot + (CH_3)_2CDOH)$.	660422
491	**1-Propanesulfonyl chloride**				
	$H\cdot + C_3H_7SO_2Cl \rightarrow H^+ + Cl^- + C_3H_7SO_2\cdot$		7×10^7	p.r.; C.k.; obs. sulfonyl radical at 332 nm; rel. to $k(H\cdot + MeOH)$.	761047
492	**1-Propanol**				
	$H\cdot + CH_3CH_2CH_2OH \rightarrow H_2 + CH_3CH_2\dot{C}HOH$		*2.4×10^7*	Average of 2 values.	
		1	2.3×10^7	e-r.; esr; Decay of spin polarization, compared with 2-PrOH(7D); rel. to $k(H\cdot + BzOH)$.	710003
		1	2.5×10^7	γ-r.; C.k. with 2-PrOH(7D); rel. to $k(H\cdot + BzOH)$.	710017
493	**2-Propanol**				
	$H\cdot + (CH_3)_2CHOH \rightarrow H_2 + (CH_3)_2\dot{C}OH$		**7.4×10^7**	**Selected value.**	
		1	6.8×10^7	p.r.; esr; Anal of time profile of H signal.	775254

TABLE 7. Rate constants for reactions of hydrogen atoms in aqueous solution—Continued

No.	Reaction	pH	k (L mol^{-1} s^{-1})	Comment	Ref.
493	**2-Propanol**—Continued				
		1	7.9×10^7	p.r.; esr; Decay of H signal.	710303
494	**2-Propanol-2-*d*** $H^\cdot + CH_3CDOHCH_3 \rightarrow HD + (CH_3)_2\dot{C}OH$		**9.6×10^6**	**Selected value.**	
		6, acid	9.6×10^6	γ-r.; Detd. $G(H_2)$ and $G(HD)$; rel. to $k(H^\cdot + 2\text{-PrOH})$.	640141
495	**2-Propanol-d_7** $H^\cdot + (CD_3)_2CDOH \rightarrow HD + (CD_3)_2\dot{C}OH$		**8.9×10^6**	**Selected value.**	
		1	9.9×10^6	γ-r.; C.k.; rel. to $k(H^\cdot + 2\text{-PrOH})$.	710017
		1	9.7×10^6	γ-r.; C.k.; rel. to $k(H^\cdot + BzOH)$.	710017
		0	7×10^6	γ-r.; Detd. $G(H_2)$ and $G(HD)$ in 6 mol L^{-1} H_2SO_4; rel. to $k(H^\cdot + 2\text{-PrOH})$.	690500
496	**Propionate ion** $H^\cdot + CH_3\dot{C}HCO_2^- \rightarrow H_2 + CH_3CHCO_2^-$		*1.4×10^7*	Average of 2 values.	
		7	1.7×10^7	*e*-r.; esr; Decay of spin polarization, compared with EtOH; in phosphate buffered soln.; rel. to $k(H^\cdot + BzOH)$.	720039
			1.2×10^7	γ-r.; C.k.; rel. to $k(H^\cdot + (CH_3)_2CDOH)$.	660422
497	**Propionic acid** $H^\cdot + CH_3\dot{C}HCO_2H \rightarrow H_2 + CH_3CHCO_2H$		*5.7×10^6*	Average of 2 values.	
		1	5.9×10^6	*e*-r.; esr; Decay of spin polarization, compared with 2-PrOH(7D); 96% H abstr. [730053]; rel. to $k(H^\cdot + BzOH)$.	710003
		1	5.4×10^6	γ-r.; C.k. with 2-PrOH(7D); rel. to $k(H^\cdot + BzOH)$.	710017
498	**Propionitrile** $H^\cdot + C_2H_5CN \rightarrow$		*1.0×10^7*	Average of 2 values.	
			1×10^7	γ-r.; C.k., obs. $G(H_2)$; rel. to $k(H^\cdot + EtOH)$.	730364
		1	9.8×10^6	*e*-r.; esr; Decay of spin polarization, compared with 2-PrOH(7D); rel. to $k(H^\cdot + BzOH)$.	710003
499	**Propylene** $H^\cdot + CH_3CH{=}CH_2 \rightarrow$		5.3×10^9	C.k.; no details given; rel. to $k(H^\cdot + MeOH)$.	670041
500	**Purine, conjugate diacid** $H^\cdot + (C_5H_4N_4)H_2^{2+} \rightarrow$	1	1.1×10^8	*e*-r.; esr; Decay of spin polarization, compared with EtOH; rel. to $k(H^\cdot + BzOH)$.	720025
501	**Pyrazine, conjugate diacid** $H^\cdot + (C_4H_4N_2)H_2^{2+} \rightarrow$	1	3.0×10^8	*e*-r.; esr; Decay of spin polarization, compared with EtOH; rel. to $k(H^\cdot + BzOH)$.	720025
502	**Pyridazine, conjugate diacid** $H^\cdot + (C_4H_4N_2)H_2^{2+} \rightarrow$	1	2.7×10^8	*e*-r.; esr; Decay of spin polarization, compared with EtOH; rel. to $k(H^\cdot + BzOH)$.	720025
503	**4-Pyridinealdoxime** $H^\cdot + HON{=}CHC_5H_4N \rightarrow$		1.4×10^9	p.r.; P.b.k., ~ 25% addn. to oxime and 75% ring addn. established from spectra.	761182
504	**2-Pyridinealdoxime, *N*-methyl-** $H^\cdot + HON{=}CHC_5H_4N^+CH_3 \rightarrow$	1	2.0×10^9	p.r.; C.k.; counter ion Cl^-; addn. to oxime; solute is unstable in acid soln.; value approximate; reference rate not given; rel. to $k(H^\cdot + EtOH)$.	81A417
			8×10^9	p.r.	761182

TABLE 7. Rate constants for reactions of hydrogen atoms in aqueous solution—Continued

No.	Reaction	pH	k (L mol^{-1} s^{-1})	Comment	Ref.
505	**Pyridine**				
	$H^{\bullet}$ + py → pyH		*7.8 × 10^8*	Average of 2 values.	
		7	6.0 × 10^8	*e*-r.; esr; Decay of spin polarization, compared with EtOH. in phosphate buffered soln.; rel. to k($H^{\bullet}$ + BzOH).	720039
		~ 6	9.6 × 10^8	γ-r.; C.k.; rel. to k($H^{\bullet}$ + 2-PrOH).	640095
506	**Pyridinium ion**				
	$H^{\bullet}$ + pyH^+ → pyH_2^+	1	1.7 × 10^8	p.r.; P.b.k. (H adduct); *tert*-BuOH as OH scavenger.	710582
507	**α-(4-Pyridyl 1-oxide)-*N*-*tert*-butylnitrone**				
	$H^{\bullet}$ + 4-POBN →		3.0 × 10^9		84A426
508	**Pyrimidine, conjugate acid**				
	$H^{\bullet}$ + $(C_4H_4N_2)H^+$ →	1	9.2 × 10^7	*e*-r.; esr; Decay of spin polarization, compared with EtOH; pK_a = 1.10; rel. to k($H^{\bullet}$ + BzOH).	720025
509	**Riboflavine**				
	$H^{\bullet}$ + RF →	~1.7	3.1 × 10^9	γ-r.; C.k.; rel. to k($H^{\bullet}$ + glucose).	84A192
510	**Ribose**				
	$H^{\bullet}$ + $C_5H_{10}O_5$ → H_2 + R	1	5.1 × 10^7	*e*-r.; esr; Decay of spin polarization, compared with EtOH. 83% H abstr. [730053]; rel. to k($H^{\bullet}$ + BzOH).	710040
511	**Salicylic acid**				
	$H^{\bullet}$ + $HOC_6H_4CO_2H$ → 2-$HOC_6H_5CO_2H$	2	2.4 × 10^9	p.r.; P.b.k. at 390 nm	680305
512	**Sarcosine, conjugate acid**				
	$H^{\bullet}$ + $CH_3NH_2^+CH_2CO_2H$ →	1	1.1 × 10^5	*e*-r.; esr; Decay of spin polarization, compared with EtOH; rel. to k($H^{\bullet}$ + BzOH).	710040
513	**Selenourea**				
	$H^{\bullet}$ + $H_2NCSeNH_2$ → H_2 + $H_2NC(=NH)Se$	6.5	6.3 × 10^8	p.r.; P.b.k. at 410 nm $(NH_2C(=NH)Se^-)_2^-$ in N_2O-satd. soln.	700240
514	**Serine, conjugate acid**				
	$H^{\bullet}$ + $SerH^+$ →	1	1.2 × 10^6 [b]	*e*-r.; esr; Decay of spin polarization, compared with EtOH; rel. to k($H^{\bullet}$ + BzOH).	710040
		1	3.6 × 10^6 [b]	γ-r.; C.k.; obs. G(H_2); rel. to k($H^{\bullet}$ + AA).	680343
515	**Styrene (H addn.)**				
	$H^{\bullet}$ + $C_6H_5CH{=}CH_2$ → $C_6H_5\dot{C}HCH_3$	1	5.7 × 10^9	p.r.; P.b.k. at 320 nm in Ar-satd. soln. contg. 0.1 mol L^{-1} *tert*-BuOH and H_2SO_4; > 85% benzyl radical formed.	741138
516	**Styrene (H addn. to ring)**				
	$H^{\bullet}$ + $C_6H_5CH{=}CH_2$ → $C_6H_6\dot{C}H{=}CH_2$	1	6.5 × 10^9	p.r.; P.b.k. at 345 nm (cyclohexadienyl radical) in Ar-satd. soln. contg. 0.1 mol L^{-1} *tert*-BuOH and H_2SO_4; < 15% cyclohexadienyl radical.	741138
517	**Succinate ion**				
	$H^{\bullet}$ + $^-O_2C\dot{C}HCH_2CO_2^-$ → H_2 + $^-O_2CCH_2\dot{C}HCO_2H$	7	1.0 × 10^7	*e*-r.; esr; Decay of spin polarization, compared with EtOH. in phosphate buffered soln.; rel. to k($H^{\bullet}$ + BzOH).	720039
518	**Succinic acid**				
	$H^{\bullet}$ + $HO_2CCH_2CH_2CO_2H$ → H_2 + $HO_2C\dot{C}HCH_2CO_2H$	1	3.0 × 10^6	p.r.; esr; Anal. of time profile of H signal.	775254
519	**Succinonitrile**				
	$H^{\bullet}$ + $NCCH_2CH_2CN$ →	2	1.3 × 10^7	γ-r.; C.k., obs. G(H_2); rel. to k($H^{\bullet}$ + EtOH).	730364
520	**Sucrose**				
	$H^{\bullet}$ + $C_{12}H_{22}O_{11}$ → H_2 + $C_{12}H_{21}O_{12}$	1.0	1.5 × 10^7	X-r.; C.k.; rel. to k($H^{\bullet}$ + HCO_2H).	560012

TABLE 7. Rate constants for reactions of hydrogen atoms in aqueous solution—Continued

No.	Reaction	pH	k (L mol^{-1} s^{-1})	Comment	Ref.
521	**Sulfanilic acid**				
	$H^{\cdot} + (H_3N^+)C_6H_4SO_3^- \rightarrow$	~ 0.4	4.1×10^8	γ-r.; C.k.; obs. $G(H_2)$ in air-free 0.8 N H_2SO_4; rel. to $k(H^{\cdot} + 2\text{-PrOH})$.	730270
522	**Tartaric acid**				
	$H^{\cdot} + (CHOHCO_2H)_2 \rightarrow$	1	1.6×10^7	e-r.; esr; Decay of spin polarization, compared with 2-PrOH(7D); rel. to $k(H^{\cdot} + BzOH)$.	710003
523	**Tartronic acid**				
	$H^{\cdot} + HO_2CCH(OH)CO_2H \rightarrow$	1	2.1×10^7	e-r.; esr; Decay of spin polarization, compared with EtOH; rel. to $k(H^{\cdot} + BzOH)$.	710040
524	**Tetrabutylphosphonium ion**				
	$H^{\cdot} + (C_4H_9)_4P^+ \rightarrow$		1×10^7 [a]	Estd. from quantum yields in ferrous sulfate soln.; rel. to $k(H^{\cdot} + Fe^{2+})$.	86F244
525	**Tetracycline, conjugate acid**				
	$H^{\cdot} + TCH^+ \rightarrow$	1	2.9×10^5 [a]	γ-r.; Obs. G(-TC) in N_2O-satd. soln. contg. 0.1 N H_2SO_4.	770124
526	**Tetrahydrofuran**				
	$H^{\cdot} + THF \rightarrow H_2 + -O\dot{C}H(CH_2)_3-$	1	7.2×10^7 [b]	e-r.; esr; Decay of spin polarization, compared with 2-PrOH(7D); rel. to $k(H^{\cdot} + BzOH)$.	710003
			3.3×10^7 [b]	γ-r.; C.k.; rel. to $k(H^{\cdot} + (CH_3)_2CDOH)$.	660422
527	**1,2,4,5-Tetramethoxybenzene**				
	$H^{\cdot} + TMB \rightarrow TMBH$	2	1.7×10^9	p.r.; P.b.k. at 447 nm in soln. contg. 10^{-4} mol L^{-1} TMB and 10^{-2} mol L^{-1} *tert*-BuOH.	87A041
528	**1,2,3,4-Tetramethylbenzene**				
	$H^{\cdot} + C_6H_2(CH_3)_4 \rightarrow C_6H_3(CH_3)_4$	1	2.8×10^9	p.r.; P.b.k. in soln. cont. 0.1-0.5 mol L^{-1} *tert*-BuOH and $HClO_4$.	751009
529	**1,2,3,5-Tetramethylbenzene**				
	$H^{\cdot} + C_6H_2(CH_3)_4 \rightarrow C_6H_3(CH_3)_4$	1	3.5×10^9	p.r.; P.b.k. in soln. cont. 0.1-0.5 mol L^{-1} *tert*-BuOH and $HClO_4$.	751009
530	**1,2,4,5-Tetramethylbenzene**				
	$H^{\cdot} + C_6H_2(CH_3)_4 \rightarrow C_6H_3(CH_3)_4$	1	2.8×10^9	p.r.; P.b.k. in soln. contg. 0.1-0.5 mol L^{-1} *tert*-BuOH and $HClO_4$.	751009
531	***N,N,N',N'*-Tetramethyl-*p*-phenylenediamine, conjugate diacid**				
	$H^{\cdot} + TMPDH_2^{2+} \rightarrow$	1	2.2×10^8	e-r.; esr; Decay of spin polarization, compared with EtOH; rel. to $k(H^{\cdot} + BzOH)$.	720025
532	**2,2,6,6-Tetramethylpiperidine *N*-oxyl**				
	$H^{\cdot} + TEMPO \rightarrow TEMPO(H)$		4.9×10^9	p.r.; D.k., decrease in condy obs. due to protonation of TMPN(H) to give $TMPN(H)_2^+$; soln. cont. 10^{-2} mol L^{-1} *tert*-BuOH and 2-30 × 10^{-6} mol L^{-1} TMPN.	761067
533	**2,2,6,6-Tetramethylpiperidone *N*-oxyl**				
	$H^{\cdot} + TAN \rightarrow TAN(H)$		*6.5* × *10*^{9}	Average of 3 values.	
		3.9	8.0×10^9	p.r.; D.k., decrease in condy. obs. due to protonation of TAN(H) to give $TAN(H)_2^+$; soln. cont. 10^{-2} mol L^{-1} *tert*-BuOH and 2-30 × 10^{-1} mol L^{-1} TAN.	761067
		1.9	6.7×10^9	p.r.; C.k.; p.b.k. at 410 nm (benzoquinone-H adduct); rel. to $k(H^{\cdot} + Q)$.	710618
		1.9	4.8×10^9	p.r.; C.k.; d.k. at 410 nm (ferricyanide); rel. to $k(H^{\cdot} + Fe(CN)_6^{3-})$.	710618
534	**Tetranitromethane**				
	$H^{\cdot} + C(NO_2)_4 \rightarrow {\cdot}NO_2 + H^+ + C(NO_2)_3^-$	2	5.5×10^8 [b]	p.r.; P.b.k. at 366 nm (nitroform anion); cor. for $k(H + H)$ and $k(OH + H)$.	650183
		~7	2.6×10^9 [b]	p.r.; P.b.k.; N_2O or Cu^{2+} as electron scavengers.	640133

TABLE 7. Rate constants for reactions of hydrogen atoms in aqueous solution—Continued

No.	Reaction	pH	k (L mol^{-1} s^{-1})	Comment	Ref.
535	**Tetraphenylphosphonium ion** $H^{\bullet} + (C_6H_5)_4P^+ \rightarrow C_6H_6P^+(C_6H_5)_2$	1.7	1.5×10^9	p.r.; P.b.k. at 340 nm in soln. contg. 0.6 mol L^{-1} *tert*-BuOH; counter ion Cl^-.	761097
536	**Thiamine cation** $H^{\bullet} + Thm^+ \rightarrow$	6.8	2×10^{10}	γ-r.; C.k.; pK_a = 4.8; rel. to $k(H^{\bullet} + HCO_2^-)$.	80G062
537	**Thioacetamide** $H^{\bullet} + CH_3CSNH_2 \rightarrow$	1	6×10^9	*e*-r.; esr; Decay of spin polarization, compared with EtOH; rel. to $k(H^{\bullet}$ + BzOH).	710040
538	**Thiodiglycolic acid** $H^{\bullet} + S(CH_2CO_2H)_2 \rightarrow$	1	2×10^9	*e*-r.; esr; Decay of spin polarization, compared with EtOH. no H abstr. [730053]; rel. to $k(H^{\bullet}$ + BzOH).	710040
539	**Thionine cation** $H^{\bullet} + Th^+ \rightarrow \cdot Th$	1	9.5×10^9	p.r.; P.b.k. in air-free soln. contg. 2×10^{-2} mol L^{-1} *tert*-BuOH; 89.5% semiquinone formn., 10.5% ring addn.	81A272
540	**Thiophene** $H^{\bullet}$ + -SCH=CHCH=CH- → -$SCH_2\dot{C}HCH$=CH-	2	9×10^9	p.r.; P.b.k. at 300 nm in soln. contg. 0.05 mol L^{-1} MeOH and 0.01 mol L^{-1} $HClO_4$.	78A027
541	**Thiophenol** $H^{\bullet} + C_6H_5SH \rightarrow$	1	3.7×10^9	*e*-r.; esr; Unpublished data, P. Neta and R.H. Schuler; 71% H abstr.; rel. to $k(H^{\bullet}$ + BzOH).	730053
542	**Thiourea** $H^{\bullet} + H_2NCSNH_2 \rightarrow$	1	6×10^9	*e*-r.; esr; Decay of spin polarization, compared with EtOH; rel. to $k(H^{\bullet}$ + BzOH).	710040
543	**Threonine, conjugate acid** $H^{\bullet} + CH_3CH(OH)CH(NH_3^+)CO_2H \rightarrow$		*6.9* × *10*^{8}	Average of 2 values.	
		1	7×10^8	*e*-r.; esr; Decay of spin polarization, compared with EtOH; pK_a = 2.3; rel. to $k(H^{\bullet}$ + BzOH).	710040
		1	6.4×10^8	γ-r.; C.k.; rel. to $k(H^{\bullet}$ + AA).	680343
544	**Thymidine** $H^{\bullet} + T \rightarrow$	7-8	3.2×10^8	γ-r.; C.k. in soln. contg. 1.6×10^{-2} mol L^{-1} N_2O; rel. to $k(H^{\bullet} + DCO_2^-)$.	683038
545	**Thymidine 5'-monophosphate** $H^{\bullet} + TMP \rightarrow$	7-8	2.9×10^8	γ-r.; C.k. in soln. contg. 1.6×10^{-2} mol L^{-1} N_2O; rel. to $k(H^{\bullet} + DCO_2^-)$.	683038
546	**Thymine** $H^{\bullet}$ + 5-MeU → 5-MeU-H		*5.7* × *10*^{8}	Average of 2 values.	
		1	5×10^8	*e*-r.; esr; Decay of spin polarization, compared with EtOH; rel. to $k(H^{\bullet}$ + BzOH).	710040
		0.65	6.8×10^8	p.r.; P.b.k. at 400 nm.	710529
547	**Toluene** $H^{\bullet} + C_6H_5CH_3 \rightarrow C_6H_6CH_3$	3	2.6×10^9	p.r.; P.b.k.; methanol as OH scavenger; cor. for k(H + MeOH).	670246
548	***p*-Tolunitrile** $H^{\bullet} + CH_3C_6H_4CN \rightarrow CH_3C_6H_5CN$	1	7.0×10^9	p.r.; P.b.k. at 275 nm in Ar-satd. soln.	79A350
549	**Trichlorofluoromethane** $H^{\bullet} + CCl_3F \rightarrow$	1	1.6×10^6	*e*-r.; esr; Decay of spin polarization, compared with 2 PrOH(7D); single measurement on satd. soln., calcd. from solubility; rel. to $k(H^{\bullet}$ + BzOH).	710003
550	**1,2,3-Trimethoxybenzene** $H^{\bullet} + C_6H_3(OCH_3)_3 \rightarrow$ addn.	2	$\sim 3 \times 10^9$	p.r.; P.b.k. in soln. contg. 10^{-2} mol L^{-1} *tert*-BuOH.	751171

TABLE 7. Rate constants for reactions of hydrogen atoms in aqueous solution—Continued

No.	Reaction	pH	k (L mol^{-1} s^{-1})	Comment	Ref.
551	**1,2,4-Trimethoxybenzene** $H^{\cdot} + C_6H_3(OCH_3)_3 \rightarrow$ addn.	2	$\sim 3 \times 10^9$	p.r.; P.b.k. in soln. contg. 10^{-2} mol L^{-1} *tert*-BuOH.	751171
552	**1,3,5-Trimethoxybenzene** $H^{\cdot} + C_6H_3(OCH_3)_3 \rightarrow$ addn.	2	$\sim 3 \times 10^9$	p.r.; P.b.k. in soln. contg. 10^{-2} mol L^{-1} *tert*-BuOH.	751171
553	**Trimethylacetate ion** $H^{\cdot} + (CH_3)_3CCO_2^- \rightarrow H_2 + {\cdot}CH_2C(CH_3)_2CO_2^-$		1.9×10^6	γ-r.; C.k.; rel. to $k(H^{\cdot} + (CH_3)_2CDOH)$.	660422
554	**Trimethylacetonitrile** $H^{\cdot} + (CH_3)_3CCN \rightarrow (CH_3)_3CCNH$	1	1.4×10^7	*e*-r.; esr; Unpublished data, P. Neta and R.H. Schuler. 5% H abstr. [730053]; rel. to $k(H^{\cdot} +$ BzOH).	730053
555	**Trimethylamine** $H^{\cdot} + (CH_3)_3N \rightarrow {\cdot}CH_2N(CH_3)_2$		2.0×10^8	See table I in reference.	86A113
556	**Trimethylammonium ion** $H^{\cdot} + (CH_3)_3NH^+ \rightarrow {\cdot}CH_2NH^+(CH_3)_2$		2.0×10^6	See table I in reference.	86A113
557	**Trimethylanilinium ion** $H^{\cdot} + C_6H_5N(CH_3)_3^+ \rightarrow$	1	4.1×10^8	*e*-r.; esr; Decay of spin polarization, compared with EtOH; rel. to $k(H^{\cdot} +$ BzOH).	720025
558	**1,2,3-Trimethylbenzene** $H^{\cdot} + C_6H_3(CH_3)_3 \rightarrow C_6H_4(CH_3)_3$		2.6×10^9	p.r.; P.b.k. in soln. contg. 0.1-0.5 mol L^{-1} *tert*-BuOH and $HClO_4$.	751009
559	**1,2,4-Trimethylbenzene** $H^{\cdot} + C_6H_3(CH_3)_3 \rightarrow C_6H_4(CH_3)_3$		3.3×10^9	p.r.; P.b.k. in soln. contg. 0.1-0.5 mol L^{-1} *tert*-BuOH and $HClO_4$.	751009
560	**Trimethylphenylphosphonium ion** $H^{\cdot} + (CH_3)_3P^+C_6H_5 \rightarrow (CH_3)_3P^+C_6H_6$	1.4	8.9×10^8	p.r.; P.b.k. at 330 nm in soln. contg. 5×10^{-3} mol L^{-1} $(CH_3)_3P^+C_6H_5I^-$ and 0.3 mol L^{-1} *tert*-BuOH.	82A051
561	**Tropylium ion** $H^{\cdot} + C_7H_7^+ \rightarrow H^+ + c\text{-}\dot{C}_7H_7$	3.8	7×10^9	p.r.; P.b.k. at 315 nm in soln. contg. 0.05 mol L^{-1} *tert*-BuOH.	710710
562	**Tryptophan** $H^{\cdot} +$ TrpH $\rightarrow$	~ 6	2×10^9	e.d.; D.k. at 278 nm; cor. for product abs. and H + H.	649012
563	**Tryptophan, conjugate acid** $H^{\cdot} + TrpH_2^+ \rightarrow$ addn.	1	7.4×10^9	p.r.; P.b.k. at 325 nm; methanol as OH scavenger; cor. for $k(H +$ MeOH) and $k(OH +$ tryptophan); L-isomer.	690459
564	**Tyrosine** $H^{\cdot} +$ TyrOH $\rightarrow$	~ 6	$\sim 4 \times 10^8$	e.d.; D.k. at 274 nm; cor. for product absorption and H + H; DL-isomer.	649012
565	**Tyrosine, conjugate acid** $H^{\cdot} + TyrOH_2^+ \rightarrow$ addn.	0.9	2.0×10^9	p.r.; P.b.k. (H adduct) in soln. contg. 1 mol L^{-1} *tert*-BuOH; DL-isomer.	730003
566	**Uracil** $H^{\cdot} + U \rightarrow U\text{-}H$		*3.8* × *10*^{8}	Average of 2 values.	
		2.5	4.7×10^8	γ-r.; C.k.; obs. $G(H_2)$; rel. to $k(H^{\cdot} +$ 2-PrOH).	84A304
		2	2.8×10^8	p.r.; esr; Decay of H signal.	710303
567	**Urea** $H^{\cdot} + H_2NCONH_2 \rightarrow$	1	$< 3 \times 10^4$	*e*-r.; esr; Decay of spin polarization, compared with 2-PrOH(7D).; rel. to $k(H^{\cdot} +$ BzOH).	710003

TABLE 7. Rate constants for reactions of hydrogen atoms in aqueous solution—Continued

No.	Reaction	pH	k (L mol^{-1} s^{-1})	Comment	Ref.
568	**Uridine 5'-monophosphate**				
	$H^{\bullet}$ + UMP → addn.	2.5	5.0×10^8	γ-r.; C.k.; obs. $G(H_2)$; rel. to $k(H^{\bullet}$ + 2-PrOH).	84A304
569	**Valine**				
	$H^{\bullet}$ + Val →	7	1.2×10^7	*e*-r.; esr; Decay of spin polarization, compared with EtOH. in phosphate buffered soln.; rel. to $k(H^{\bullet}$ + BzOH).	720039
570	**Valine, conjugate acid**				
	$H^{\bullet}$ + $ValH^+$ →	1	8×10^6 [b]	*e*-r.; esr; Decay of spin polarization, compared with EtOH; rel. to $k(H^{\bullet}$ + BzOH).	710040
		1	3.3×10^6 [b]	γ-r.; C.k.; rel. to $k(H^{\bullet}$ + AA).	680343
571	**Vinyl acetate**				
	$H^{\bullet} + CH_3CO_2CH{=}CH_2 \rightarrow$ addn.	1	5.6×10^8	p.r.; esr; Calcd. from time profile of H in deaerated soln. contg. various solute concns. and 10^{-2} mol L^{-1} *tert*-BuOH.	83A153
572	***m*-Xylene**				
	$H^{\bullet} + C_6H_4(CH_3)_2 \rightarrow 1,3\text{-}C_6H_5(CH_3)_2$	1	2.6×10^9	p.r.; P.b.k. in soln. contg. 0.1-0.5 mol L^{-1} *tert*-BuOH and $HClO_4$.	751009
573	***o*-Xylene**				
	$H^{\bullet} + C_6H_4(CH_3)_2 \rightarrow 1,2\text{-}C_6H_4(CH_3)_2$	1	2.0×10^9	p.r.; P.b.k. in soln. contg. 0.1-0.5 mol L^{-1} *tert*-BuOH and $HClO_4$.	751009
574	***p*-Xylene**				
	$H^{\bullet} + C_6H_4(CH_3)_2 \rightarrow 1,4\text{-}C_6H_5(CH_3)_2$	1	2.2×10^9	p.r.; P.b.k. in soln. contg. 0.1-0.5 mol L^{-1} *tert*-BuOH and $HClO_4$.	751009

[a] Unrecommended value because of deficiencies in the method. The value is included since it is the only reported data on the substrate.
[b] Discrepancy in these data. No recommendation.

TABLE 8. Rate constants for reactions of hydroxyl radicals in aqueous solution

No.	Reaction	pH	k (L mol^{-1} s^{-1})	Comment	Ref.
1	**Silver(I) ion**				
	$\cdot OH + Ag^+ \rightarrow AgOH^+$		*1.4 × 10^{10}*	Average of 2 values.	
			1.2 × 10^{10}	p.r.; P.b.k. at 320 nm.	83R031
		7	1.5 × 10^{10}	p.r.; P.b.k. at 313 and 365 nm.	680436
2	**Diamminesilver(I) ion**				
	$\cdot OH + Ag(NH_3)_2^+ \rightarrow Ag(NH_3)_2OH^+$		6 × 10^9	p.r.; No details given.	79A304
3	**Americium(III) ion**				
	$\cdot OH + Am^{3+} \rightarrow OH^- + Am(IV)$		*3.6 × 10^8*	Average of 2 values.	
		5.1	4.1 × 10^8	p.r.; P.b.k. at 320 nm in soln. contg. 0.11 mol L^{-1} $LiClO_4$.	78A044
		4	3.0 × 10^8	p.r.; P.b.k. in soln. contg. 5 or 6.7 × 10^{-5} mol L^{-1} Am^{3+}; at pH 2, 1, 0 k = 3.4 × 10^8, 1.1 and 1.6 × 10^9, resp.	771130
4	**Arsenous(III) acid**				
	$\cdot OH + HAsO_2 \rightarrow As(IV)$	~1	1.8 × 10^9 [a]	p.r.; Obs $G(As^V)$ and $G(H_2O_2)$; data fitting assuming $k(H + As^{IV})$ = 7 × 10^8; 0.4 mol L^{-1} H_2SO_4.	750247
		1-3	1 × 10^9 [a]	C.k.; in soln. contg. 5 × 10^{-5} mol L^{-1} Fe^{2+}, 2.5 × 10^{-5} mol L^{-1} H_2O_2, $HClO_4$, and added Fe^{3+} which oxidizes the As(IV) formed; rel. to $k(\cdot OH + Fe^{2+})$.	649029
5	**Arsenite(III) ion**				
	$\cdot OH + AsO_2^- \rightarrow As(IV)$	10.7	9.0 × 10^9	p.r.; C.k.; rel. to $k(\cdot OH + CO_3^{2-})$.	650190
6	**Dicyanoaurate(I) ion**				
	$\cdot OH + Au(CN)_2^- \rightarrow Au(II)$		*5.0 × 10^9*	Average of 2 values.	
		7	4.7 × 10^9	p.r.; P.b.k. at 330 nm in soln. contg. 0.01 mol L^{-1} KCl.	680302
		2	5.3 × 10^9	p.r.; C.k.; obs. Au(II) in soln. contg. MeOH and 5 × 10^{-3} mol L^{-1} H_2SO_4; rel. to $k(\cdot OH$ + MeOH).	680302
7	**Tetrahydroborate(III) ion**				
	$\cdot OH + BH_4^- \rightarrow OH^- + BH_4$	11	1.2 × 10^{10}	p.r.; P.b.k. at 400 or 280 nm.	701046
8	**Boric acid**				
	$\cdot OH + H_3BO_3 \rightarrow H_2O + H_2BO_3$	7.3	<5 × 10^4	p.r.; C.k. with benzoic acid, 0.5 mol L^{-1} boric acid had no measurable effect; also on γ-r. no effect of 0.5 mol L^{-1} boric acid was obs. on $G[Fe(CN)_6^{3-}]$ in N_2O-satd. soln. contg. 10^{-3} mol L^{-1} $Fe(CN)_6^{4-}$ and 2.0 × 10^{-3} mol L^{-1} MeOH.	87A045
9	**Borate ion**				
	$\cdot OH + B(OH)_4^- \rightarrow$	9.5	<1 × 10^6	No reaction; Unpubl. data, M. Benes and I. Janovsky; soln. contg. 0.28 mol L^{-1} $B(OH)_3$ + $B(OH)_4^-$, 0.153 mol L^{-1} NaOH and I^-.	80G098
10	**Bromide ion**				
	$\cdot OH + Br^- \rightarrow BrOH^-$	~1	1.1 × 10^{10}	p.r.; C.k.; obs. at 360 nm (Br_2^-); rel. to $k(\cdot OH$ + EtOH).	720018
11	**Hypobromite ion**				
	$\cdot OH + BrO^- \rightarrow OH^- + BrO$	11-13	4.2 × 10^9	p.r.; C.k.; assumed $pK_a(OH)$ = 11.9; rel. to $k(\cdot OH + CO_3^{2-})$.	680153
12	**Hypobromous acid**				
	$\cdot OH + HOBr \rightarrow BrO + H_2O$		2.0 × 10^9	f.p.; Acid soln. contg. HOBr; primary process gives $\cdot OH + Br\cdot$.	85A069
13	**Bromite ion**				
	$\cdot OH + BrO_2^- \rightarrow OH^- + BrO_2\cdot$		*2.0 × 10^9*	Average of 2 values.	

TABLE 8. Rate constants for reactions of hydroxyl radicals in aqueous solution—Continued

No.	Reaction	pH	k (L mol^{-1} s^{-1})	Comment	Ref.
18	**Bromite ion**—Continued				
		12-13	2.3×10^9	f.p.; C.k.; calcd. from pH dependence and effect on decay of O_3 at 410 nm (assuming $k(\cdot O^- + O_2) = 3.6 \times 10^9$.	697340
		13	1.8×10^9	p.r.; C.k.; $pK_a(OH) = 11.9$ involved in anal.; assumed $k(\cdot OH + BrO_2^-) = k(\cdot O^- + BrO_2^-)$; rel. to $k(\cdot OH + CO_3^{2-})$.	680153
14	**Bromate ion** $\cdot OH + BrO_3^- \rightarrow OH^- + BrO_3$	12-13	$\sim 5 \times 10^6$ [a]	f.p.; C.k.; calcd. from pH dependence and effect on decay of O_3^- at 410 nm (assuming $k(\cdot O^- + O_2) = 3.6 \times 10^9$.	697340
15	**Perbromate ion** $\cdot OH + BrO_4^- \rightarrow$		$< 1 \times 10^7$	p.r.; D.k. (OH); no reaction.	730106
16	**Carbon monoxide** $\cdot OH + CO \rightarrow \cdot CO_2H$		2.0×10^9 [b]	phot.; C.k.; rel. to $k(\cdot OH + H_2O_2)$.	697045
		~1	1.2×10^9 [b]	γ-r.; C.k.; rel. to $k(\cdot OH + Fe^{2+})$.	630014
		~1	1.3×10^9 [b]	Fenton; C.k.; rel. to $k(\cdot OH + Fe^{2+})$.	570014
		0.4-0.7	7.9×10^8 [b]	Fenton; C.k.; rel. to $k(\cdot OH + Fe^{2+})$.	570014
17	**Carbon dioxide** $\cdot OH + CO_2 \rightarrow CO_3\cdot^-$	4	$< 1 \times 10^6$	p.r.; No abs. at 600 nm (no reaction).	650384
18	**Bicarbonate ion** $\cdot OH + HCO_3^- \rightarrow CO_3\cdot^- + H_2O$		**8.5×10^6**	**Selected value.**	
			1.0×10^7	p.r.; P.b.k. (studied over a range of carbonate and hydroxide ion concn. at 0-200 °C, pressurized up to 240 psi He)	87A901
		7.0-9.4	8.5×10^6	p.r.; P.b.k. at 600 nm assuming $pK_a(H_2CO_3) = 6.34$ and 10.37 and $k(\cdot OH + CO_3^{2-}) = 4.2 \times 10^8$.	86A477
		6.5	1×10^7	p.r.; P.b.k. at 600 nm.	650384
19	**Carbonate ion** $\cdot OH + CO_3^{2-} \rightarrow OH^- + CO_3\cdot^-$		**3.9×10^8**	**Selected value.**	
			4.0×10^8	p.r.; P.b.k. (studied over a range of carbonate and hydroxide ion concn. at 0-200 °C, pressurized up to 240 psi He)	87A901
		11	3.7×10^8	p.r.; P.b.k. at 600 nm.	700247
		10.6	4.0×10^8	p.r.; P.b.k. at 600 nm.	690379
		<11.6	4.2×10^8	p.r.; P.b.k.; k is pH dependent; calcn. is indirect.	660139
		11	3.2×10^8	p.r.; C.k.; rel. to $k(\cdot OH + I^-)$.	650010
		11	3.5×10^8	p.r.; P.b.k. at 580 nm.	650010
20	**Hydrogen cyanide** $\cdot OH + HCN \rightarrow HOCH{=}N\cdot$	3.5	6×10^7	p.r.; Estd. from p.b.k. of adduct at ≤ 250 nm in N_2O-satd. soln.; product structure detd. by esr [725174].	761079
21	**Cyanide ion** $\cdot OH + CN^- \rightarrow \cdot C(OH){=}N^-$		*7.6×10^9*	Average of 3 values.	
		7.3-11.9	7.1×10^9	p.r.; P.b.k.; product structure detd. by esr [725174].	761079
			8×10^9	p.r.; C.k.; product hydrolyzes to $\cdot CONH_2$ which disproportionates to formamide and cyanate; reference rate not given; rel. to $k(\cdot OH + Fe(CN)_6^{4-})$.	771115
		10.6	7.6×10^9	p.r.; C.k. (borate buffer); adduct protonates and rearranges to $\cdot CONH_2$; rel. to $k(\cdot OH + SCN^-)$.	741132

TABLE 8. Rate constants for reactions of hydroxyl radicals in aqueous solution—Continued

No.	Reaction	pH	k (L mol^{-1} s^{-1})	Comment	Ref.
22	**Cyanogen**				
	$\cdot OH + C_2N_2 \rightarrow CNC\dot{N}OH$		$<1 \times 10^7$	p.r.; Kinetic anal. of abs. spectra of transients ($\cdot OH$ and $C_2N_2^-$); no reaction detected.	710038
23	**Cyanamide**				
	$\cdot OH + H_2NCN \rightarrow H_2NC(OH)=\dot{N}$		8.7×10^6	γ-r.; C.k.; obs. $G(CH_3CHO)$ in soln. contg. 0.1 mol L^{-1} NH_2CN and 2.4×10^{-4} mol L^{-1} O_2; cor. for only 84% α-radicals yielding aldehyde; rel. to $k(\cdot OH + EtOH)$.	78A258
24	**Cyanate ion**				
	$\cdot OH + OCN^- \rightarrow \cdot NC(OH)O^-$	5.0	6.7×10^7	p.r.; C.k.; rel. to methanol and *tert*-butyl alcohol.	771035
		11	4.8×10^7	p.r.; C.k.; rel. to $k(\cdot OH + 4\text{-}NO_2C_6H_4CO_2^-)$.	87A220
26	**Thiocyanate ion**				
	$\cdot OH + SCN^- \rightarrow HOSCN^-$		**1.1×10^{10}**	**Selected value.**	
			9.6×10^9	p.r.; C.k.; also measurements at 39, 59, and 79°C; rel. to $k(\cdot OH + HCO_2^-)$.	84A349
		6.5	1.0×10^{10}	p.r.; P.b.k. at 475 nm $(SCN)_2^-$.	84A421
			1.1×10^{10}	p.r.; P.b.k. $(SCN)_2^-$ at 475 nm.	720122
			1.1×10^{10}	p.r.; C.k.; 15% higher in O_2-satd. soln. contg. 0.2 mol L^{-1} thiocyanate; rel. to $k(\cdot OH +$ MeOH).	710137
			1.0×10^{10}	p.r.; C.k.; 16% higher in O_2-satd. soln. contg. 0.2 mol L^{-1} thiocyanate; rel. to $k(\cdot OH +$ EtOH).	710137
27	**Cadmium(I) ion**				
	$\cdot OH + Cd^+ \rightarrow Cd(II)$		2×10^{10}	p.r.; D.k. at 300 nm; Cd^+ from $e_{aq}^- + Cd^{2+}$; competes with $Cd^+ + H_2O_2$ and $Cd^+ + Cd^+$.	751064
28	**Cadmium(II) ion**				
	$\cdot OH + Cd^{2+} \rightarrow$		$<5 \times 10^5$	p.r.; Estd. from lack of effect of 0.25 mol L^{-1} Cd^{2+} on yield of Cu^{III} in O_2-satd. 2×10^{-3} mol L^{-1} Cu^{2+}.	751027
29	**1,4,8,11-Tetraazacyclotetradecanecadmium(II) ion**				
	$\cdot OH + Cd(cyclam)^{2+} \rightarrow$ H abstr.		7×10^9	p.r.; P.b.k.	80A380
30	**Cerium(III) ion**				
	$\cdot OH + Ce^{3+} \rightarrow Ce(IV)$		*3.0×10^8*	Average of 2 values.	
			3.0×10^8	phot.; Ce(IV) in 0.4 mol L^{-1} H_2SO_4; rel. to $k(\cdot OH + HCO_2H)$.	84F565
		2.6-2.9	2.9×10^8	p.r.; C.k.; rel. to $k(\cdot OH +$ EtOH).	710137
31	**Chloride ion**				
	$\cdot OH + Cl^- \rightarrow ClOH^-$	~2	4.3×10^9	p.r.; D.k. at 240 nm as well as p.b.k. at 340 nm (Cl_2^-); k and K also given for $ClOH^- + H^+ \rightleftarrows Cl\cdot + H_2O$ and $Cl\cdot + Cl^- \rightleftarrows Cl_2^-\cdot$; $K_{eq} =$ 0.70.	731039
32	**Hypochlorite ion**				
	$\cdot OH + ClO^- \rightarrow OH^- + ClO$	11	8.8×10^9	p.r.; C.k.; rel. to $k(\cdot OH + CO_3^{2-})$.	720301
33	**Chlorite ion**				
	$\cdot OH + ClO_2^- \rightarrow ClO_2\cdot + OH^-$		*6.6×10^9*	Average of 2 values.	
		10	7×10^9	p.r.; P.b.k. at 360 nm	81A242
		11	6.1×10^9	p.r.; C.k.; rel. to $k(\cdot OH + CO_3^{2-})$.	720301
34	**Chlorate ion**				
	$\cdot OH + ClO_3^- \rightarrow$	11	$<1 \times 10^6$	p.r.; No reaction; solute has no effect on CO_3^- formn. in carbonate soln.; estd. $\leq 4 \times 10^5$ in [717236].	720301

TABLE 8. Rate constants for reactions of hydroxyl radicals in aqueous solution—Continued

No.	Reaction	pH	k (L mol^{-1} s^{-1})	Comment	Ref.
85	**Cobalt(II) ions**				
	•OH + Co^{2+} → $CoOH^{2+}$	nat.	8×10^5	p.r.; P.b.k. at 240 nm.	761072
86	**(5,7,7,12,14,14-Hexamethyl-1,4,8,11-tetraazacyclotetradeca-4,11-diene)cobalt(II) ion**				
	•OH + $Co(4,14\text{-dieneN}_4)^{2+}$ →		*3.0 × 10^9*	Average of 2 values.	
		7	2.7×10^9	p.r.; P.b.k.	76A200
		7.0	3.2×10^9	p.r.; P.b.k. at 330 nm.	761203
87	**α-2,12-Dimethyl-3,7,11,17-tetraazabicyclo[11.3.1]heptadeca-1(17),2,11,13,15-pentaenecobalt(II) ion**				
	•OH + $Co(CR)^{2+}$ → addn.	4.0	1.1×10^{10}	p.r.; P.b.k.	86A210
88	**Pentacyano(nitrosyl)cobaltate(II) ion**				
	•OH + $Co(CN)_5NO^{3-}$ →		1.2×10^8	γ-r.; C.k.; rel. to k(•OH + RNO).	710407
89	**Bis(iminodiacetato)cobaltate(II) ion**				
	•OH + $Co(IDA)_2^{2-}$ → OH^- + $Co(IDA)_2^-$ + H_2O + CoIDA[$^-O_2CCH_2NHCHCO_2^-$]		5.8×10^8	p.r.; P.b.k.; 55% attack on metal ion, 45% attack on ligand; initial reaction suggested to be inner-sphere mechanism giving CoIDA(OH).	84A284
90	**Nitrilotriacetatocobaltate(II) ion**				
	•OH + $CoNTA^-$ → H_2O + $Co[O_2CCHN(CH_2CO_2)_2]^-$	7	1.0×10^9 [b]	p.r.; P.b.k. at 250 nm (ϵ_{250} = 6400 L mol^{-1} cm^{-1}).	79A255
		4-9.0	5.0×10^9 [b]	p.r.; P.b.k.	78A436
91	**Ethylenediaminetetraacetatocobaltate(II) ion**				
	•OH + $CoEDTA^{2-}$ →	4-9.0	3.5×10^9	p.r.; P.b.k.; both electron transfer and H-abstr.	78A436
92	**3,10,17,24-Tetrasulfophthalocyaninecobalt(II) ion dimer**				
	•OH + $[Co(pts)]_2^{8-}$ → OH^- + $[Co_2(pts)(pts\cdot)]^{7-}$	9	4.0×10^9	p.r.; D.k. at 580 nm; product contains ligand OH-adduct.	80A146
93	**Hexaamminecobalt(III) ion**				
	•OH + $Co(NH_3)_6^{3+}$ →		$< 1 \times 10^8$	p.r.; C.k.; no details given (no reaction); rel. to k(•OH + SCN^-).	710282
94	**Tris(ethylenediamine)cobalt(III) ion**				
	•OH + $Co(en)_3^{3+}$ → H abstr.	4.4	3.0×10^8	p.r.; C.k. in Ar-satd. soln.; pH effect studied; rel. to k(•OH + SCN^-).	79A003
95	**Bis(diethylenetriamine)cobalt(III) ion**				
	•OH + $Co(dien)_2^{3+}$ → H abstr.	4.4	3.2×10^8	p.r.; C.k. in Ar-satd. soln.; rel. to k(•OH + SCN^-).	79A003
96	**Pentaammine(pyridine)cobalt(III) ion**				
	•OH + $Co(NH_3)_5py^{3+}$ → $Co(NH_3)_5pyOH^{3+}$		*5.4 × 10^8*	Average of 2 values.	
		5.2	6.5×10^8	p.r.; P.b.k. at 330 nm; independent of pH 3-9.	79A213
		5.9	4.2×10^8	p.r.; P.b.k.; also c.k. with SCN^-.	76A265
97	**Pentaammine(imidazole)cobalt(III) ion**				
	•OH + $(NH_3)_5CoImH^{3+}$ → $(NH_3)_5Co(HO\text{-}ImH)^{3+}$		7.7×10^9	p.r.; C.k.; λ_{max} for transient addn. product at 280 nm; rel. to k(•OH + SCN^-).	83A270
98	**2,12-Dimethyl-3,7,11,17-tetraazabicyclo[11.3.1]heptadeca-1(17),2,11,13,15-pentaenecobalt(III) ion**				
	•OH + $Co(CR)^{3+}$ → addn.	4.0	1.2×10^9	p.r.; P.b.k.	86A210
99	**Dichloro(triethylenetetramine)cobalt(III) ion**				
	•OH + $CoCl_2(trien)^+$ →		*2.8 × 10^8*	Average of 2 values.	
		3.0-4.5	$\sim 2.7 \times 10^8$	p.r.; P.b.k. (condy.)	79A003
		4.5	2.8×10^8	p.r.; C.k.; rel. to k(•OH + SCN^-).	79A003
100	**Bis(ethylenediamine)dichlorocobalt(III) ion**				
	•OH + $Co(en)_2Cl_2^+$ →		*3.1 × 10^8*	Average of 3 values.	
		4.4	3.1×10^8	p.r.; C.k.; rel. to k(•OH + SCN^-).	79A003
		6.0	3.3×10^8	p.r.; C.k.; rel. to k(•OH + BzO^-).	79A003
		2.9-4.5	$\sim 3.0 \times 10^8$	p.r.; P.b.k. (condy.)	79A003

TABLE 8. Rate constants for reactions of hydroxyl radicals in aqueous solution—Continued

No.	Reaction	pH	k (L mol^{-1} s^{-1})	Comment	Ref.
51	**Pentaammine(azido)cobalt(III) ion**				
	$\cdot OH + Co(NH_3)_5N_3^{2+} \rightarrow [Co(NH_3)_5NNNOH]^{\cdot 2+}$		1.8×10^9	p.r.; C.k.; rel. to $k(\cdot OH + SCN^-)$.	81A284
52	**Pentaammine(formato)cobalt(III) ion**				
	$\cdot OH + Co(NH_3)_5O_2CH^{2+} \rightarrow H_2O + [Co(NH_3)_5O_2C]^{2+}$	1-7	$\sim 2 \times 10^9$	p.r.; D.k. of substrate.	79A250
53	**Pentaammine(benzoato)cobalt(III) ion**				
	$\cdot OH + Co(NH_3)_5O_2CC_6H_5^{2+} \rightarrow [Co(NH_3)_5O_2CC_6H_5OH]^{2+}$		*5.0×10^9*	Average of 2 values.	
			6.5×10^9	p.r.; P.b.k. at 345 nm.	710282
			3.5×10^9	p.r.; C.k.; O_2-satd.; rel. to $k(\cdot OH + SCN^-)$.	710282
54	**Pentaammine(nicotinamide)cobalt(III) ion**				
	$\cdot OH + Co(NH_3)_5na^{3+} \rightarrow Co(NH_3)_5naOH^{3+}$	5.9	2.1×10^9	p.r.; P.b.k.; also c.k. with SCN^-.	76A265
55	**Pentaammine(isonicotinamide)cobalt(III) ion**				
	$\cdot OH + Co(NH_3)_5isn^{3+} \rightarrow Co(NH_3)_5isnOH^{3+}$	5.9	8.0×10^8	p.r.; P.b.k.; also c.k. with SCN^-.	76A265
56	**Bis(iminodiacetato)cobaltate(III) ion**				
	$\cdot OH + Co(IDA)_2^- \rightarrow$ H abstr.	7	4.3×10^7	γ-r.; C.k.; rel. to $k(\cdot OH$ + *tert*-BuOH); reference rate not given.	78G090
57	**Nitrilotriacetatocobaltate(III)**				
	$\cdot OH + CoNTA \rightarrow OH^- + CoNTA^+$	6	4.4×10^8	γ-r.; C.k., obs. G(IDA); rel. to $k(\cdot OH + HCO_2^-)$.	770170
58	**Ethylenediaminetetraacetatocobaltate(III) ion**				
	$\cdot OH + CoEDTA^- \rightarrow$ H abstr.	7	1.1×10^9	X-r.; C.k., obs. $G(CH_2O)$; rel. to $k(\cdot OH$ + MeOH).	760284
59	**Tris(acetylacetonato)cobalt(III)**				
	$\cdot OH + Co(acac)_3 \rightarrow$	1-7	4.9×10^9	r.; C.k.; rel. to $k(\cdot OH$ + EtOH).	700094
60	**Hydroxocob(III)alamin**				
	$\cdot OH$ + B12a $\rightarrow$		$\sim 1 \times 10^{10}$	γ-r.; C.k. with RNO; no details given.	723046
61	**Cyanocob(III)alamin**				
	$\cdot OH$ + B12 $\rightarrow$		*5.4×10^9*	Average of 2 values.	
			4.3×10^9	p.r.; D.k. at 360 nm in N_2O-satd. soln.; product uncharacterized; p.b.k. at 310-330 gave $\sim 6 \times 10^9$	82A462
			6.5×10^9	p.r.; P.b.k. at 310-330 nm.	741105
62	**Chromium(II) ion**				
	$\cdot OH + Cr^{2+} \rightarrow$ Cr(III)	1	4.8×10^9	p.r.; C.k.; 0.1 mol L^{-1} $HClO_4$; rel. to $k(\cdot OH + SCN^-)$.	72G240
63	**Pentacyanonitrosylchromate(II) ion**				
	$\cdot OH + Cr(CN)_5NO^{3-} \rightarrow$		7.9×10^9	γ-r.; C.k.; assumed $k(\cdot OH + CN^-) = 3.0 \times 10^9$; rel. to $k(\cdot OH$ + RNO).	690531
64	**Tris(2,2′-bipyridine)chromium(III) ion**				
	$\cdot OH + Cr(bpy)_3^{3+} \rightarrow Cr(bpy)_2(bpyOH)^{3+}$		$\sim 1 \times 10^{10}$	p.r.	757415
65	**(2-Mercapto-2-methylpropionato-*O,S*)bis(ethylenediamine)chromium(III) ion**				
	$\cdot OH + Cr(en)_2(SC(CH_3)_2CCO_2)^+ \rightarrow$	7	8.2×10^9	p.r.; P.b.k. at 420, 410, 345 nm; two transients formed (oxid. at S and C).	761164
66	**Chromate(V) ion**				
	$\cdot OH + CrO_4^{3-} \rightarrow$ Cr(VI)		5×10^{10}	p.r.; Reoxidation of transient from e_{aq}^- or H reaction with chromate occurs with $k = 9 \times 10^6(\epsilon_{365})$.	650044

TABLE 8. Rate constants for reactions of hydroxyl radicals in aqueous solution—Continued

No.	Reaction	pH	k (L mol^{-1} s^{-1})	Comment	Ref.
66a	**Copper(I) ion**				
	$\cdot OH + Cu(I) \rightarrow Cu(II) + OH^-$		2×10^{10}	p.r.; C.k.; rel. to $k(\cdot OH + 1,4\text{-}C_6H_4(OH)_2) = 2 \times 10^{10}$.	86G256
67	**Copper(II) ion**				
	$\cdot OH + Cu^{2+} \rightarrow CuOH^{2+}$		*3.5 × 10^8*	Average of 6 values.	
			3.1×10^8	p.r.; P.b.k. at 300 nm.	80A187
		3-6	3.1×10^8	p.r.; P.b.k. at 300 nm.	710174 710775
		~5	4.0×10^8	p.r.; C.k. (condy. study); assume $k(\cdot OH + MeOH)/k(\cdot OH + tert\text{-}BuOH) = 2$ and $k(\cdot OH + MeOH) = 9 \times 10^8$; rel. to $k(\cdot OH + tert\text{-}BuOH)$.	700512
		7	3.5×10^8	p.r.; P.b.k. at 313 nm.	650044 650394
			3.7×10^8	p.r.; C.k.; obs. Cu(III) at 313 nm; rel. to $k(\cdot OH + EtOH)$.	650394
			3.7×10^8	p.r.; C.k.; obs. Cu(III) at 313 nm; rel. to $k(\cdot OH + MeOH)$.	650394
68	**Bis(ethylenediamine)copper(II) ion**				
	$\cdot OH + Cu(en)_2^{2+} \rightarrow Cu^{III}(en)_2$	6.5	3.0×10^9	p.r.; P.b.k.; at pH 10.2 and 11.2 $k = 5.0 \times 10^9$ and 8.0×10^9, resp.	710775
69	**(5,7,7,12,14,14-Hexamethyl-1,4,8,11-tetraazacyclotetradeca-4,11-diene)copper(II) ion**				
	$\cdot OH + Cu(4,11\text{-dieneN}_4)^{2+} \rightarrow$ H abstr.	1-5	1.5×10^{10}	f.p.; C.k. in H_2O_2 soln; obs. yield of oxidized complex; same transient formed by Cl_2^- reaction.	79A080
70	**α-2,12-Dimethyl-3,7,11,17-tetraazabicyclo[11.3.1]heptadeca-1(17),2,11,13,15-pentaenecopper(II) ion**				
	$\cdot OH + Cu(CR)^{2+} \rightarrow$ addn.	4.0	3.5×10^9	p.r.; P.b.k.	86A210
71	**Bis(glycinato)copper(II)**				
	$\cdot OH + Cu(Gly)_2 \rightarrow Cu^{III}(Gly)_2$	6.1	1.5×10^9	p.r.; P.b.k.	710775
72	**Bis(alaninato)cuprate(II)**				
	$\cdot OH + Cu(Ala)_2 \rightarrow Cu^{III}(Ala)_2$	6.3	1.4×10^9	p.r.; P.b.k.	710775
73	**Bis(β-alaninato)cuprate(II)**				
	$\cdot OH + Cu(\beta\text{-Ala})_2 \rightarrow Cu^{III}(\beta\text{-Ala})_2$	5.8	1.2×10^9	p.r.; P.b.k.	710775
74	**Bis(2-aminobutyrato)copper(II)**				
	$\cdot OH + Cu(CH_3CH_2CH(NH_3)CO_2)_2 \rightarrow Cu^{III}(CH_3CH_2CH(NH_3)CO_2)_2$	6.1	2.0×10^9	p.r.; P.b.k.	710775
75	**Bis(2-aminoisobutyrato)copper(II)**				
	$\cdot OH + Cu[(CH_3)_2C(NH_3)CO_2]_2 \rightarrow Cu^{III}[(CH_3)_2C(NH_3)CO_2]_2$	6.2	1.8×10^9	p.r.; P.b.k.	710775
76	**Bis(3-aminobutyrato)copper(II)**				
	$\cdot OH + Cu(CH_3CH(NH_3)CH_2CO_2)_2 \rightarrow Cu^{III}(CH_3CH(NH_3)CH_2CO_2)_2$	6.0	1.2×10^9	p.r.; P.b.k.	710775
77	**Bis(4-aminobutyrato)copper(II)**				
	$\cdot OH + Cu(NH_3(CH_2)_3CO_2)_2 \rightarrow Cu^{III}(NH_3(CH_2)_3CO_2)_2$	4.8	1.1×10^9	p.r.; P.b.k.	710775
78	**Iminodiacetatocopper(II)**				
	$\cdot OH + CuIDA \rightarrow HCHO$	~7	1.4×10^9	γ-r.; C.k.; obs. $G(CH_2O)$; rel. to $k(\cdot OH + HCO_2^-)$.	79G253
79	**Bis(iminodiacetato)cuprate(II) ion**				
	$\cdot OH + Cu(IDA)_2^{2-} \rightarrow HCHO$	~7	9.5×10^8	γ-r.; C.k. obs. $G(CH_2O)$; rel. to $k(\cdot OH + HCO_2^-)$.	79G253
	$\cdot OH + Cu(IDA)_2^{2-} \rightarrow HCOCO_2^-$	~7	4.6×10^8	γ-r.; C.k.; obs. $G(CHOCO_2^-)$; rel. to $k(\cdot OH + tert\text{-}BuOH)$.	79G253
80	**Nitrilotriacetatocuprate(II) ion**				
	$\cdot OH + CuNTA^- \rightarrow CuNTA$	4-9	2.6×10^9	p.r.; P.b.k. as well as c.k. with SCN^-.	78A436

TABLE 8. Rate constants for reactions of hydroxyl radicals in aqueous solution—Continued

No.	Reaction	pH	k (L mol^{-1} s^{-1})	Comment	Ref.
81	**Ethylenediaminetetraacetatocuprate(II) ion**				
	$\cdot OH + CuEDTA^{2-} \rightarrow CuEDTA^{-}$	4-9	3.0×10^9	p.r.; P.b.k. as well as c.k. with SCN^-.	78A436
82	**5,10,17,24-Tetrasulfophthalocyaninatocuprate(II) ion**				
	$\cdot OH + Cu(tspc)^{4-} \rightarrow$		*8.0 × 10⁹*	Average of 3 values.	
		10.7	7.8×10^9	γ-r.; C.k.; rel. to $k(\cdot OH + CO_3^{2-})$.	690827
		10.7	8.3×10^9	γ-r.; C.k.; rel. to $k(\cdot OH + MeOH)$.	690827
		10.7	7.8×10^9	γ-r.; C.k.; rel. to $k(\cdot OH + EtOH)$.	690827
83	**Deuterium**				
	$\cdot OH + D_2 \rightarrow HDO + D$	>2	1.7×10^7	Fenton; C.k.; rel. to $k(\cdot OH + Fe^{2+})$.	590028
84	**Europium(II) ion**				
	$\cdot OH + Eu^{2+} \rightarrow Eu(III)$		*1.1 × 10⁹*	Average of 2 values.	
		2	1.3×10^9	p.r.; D.k.; transient Eu(II) formed in Eu(III) soln.	731084
			9×10^8	p.r.; D.k. (Eu^{2+}) in Ar-satd. Eu(III)sulfate soln.	720065
85	**Iron(II) ion**				
	$\cdot OH + Fe^{2+} \rightarrow FeOH^{2+} + H_2O$	3	4.3×10^8	p.r.; P.b.k. at 300 nm in N_2O-satd. soln. (20-220°C) and 10^{-3} or 3×10^{-4} mol L^{-1} Fe^{2+}; best value.	81A370
		7	3.2×10^8	p.r.; P.b.k. at 300 nm in soln. contg. $FeSO_4$.	81A153
		1	2.3×10^8	p.r.; P.b.k. at 240 nm in O_2-satd. $HClO_4$ soln.; no temperature dependence 17-67°C.	720354
		4.5-6.2	3.5×10^8	p.r.; C.k.; rel. to $k(\cdot OH + EtOH)$.	710137
86	**Tris(2,2′-bipyridine)iron(II) ion**				
	$\cdot OH + Fe(bpy)_3^{2+} \rightarrow Fe(bpy)_2(bpyOH)^{2+}$	7	9×10^9	p.r.; D.k. at 450-550 nm.	82A343
87	**Tris(1,10-phenanthroline)iron(II) ion**				
	$\cdot OH + Fe(phen)_3^{2+} \rightarrow Fe(phen)(phenOH)^{2+}$	3, 4, 10	1.0×10^{10}	p.r.; P.b.k. at 310 and 420 nm.	761091
88	**Dihydrogen hexacyanoferrate(II) ion**				
	$\cdot OH + H_2Fe(CN)_6^{2-} \rightarrow$		1.7×10^9	p.r.; P.b.k. at 420 nm; pH effects obs.	720431
89	**Hydrogen hexacyanoferrate(II) ion**				
	$\cdot OH + HFe(CN)_6^{3-} \rightarrow$		9.0×10^9	p.r.; P.b.k. at 420 nm; pH effects obs.	720431
90	**Ferrocyanide ion**				
	$\cdot OH + Fe(CN)_6^{4-} \rightarrow Fe(CN)_6^{3-} + OH^-$		**1.05×10^{10}**	**Selected value.**	
			1.0×10^{10}	p.r.; P.b.k. at 420 nm.	84A349
		~10.5	9.2×10^9	p.r.; P.b.k. at 420 nm.	81G006
		~7	1.1×10^{10}	p.r.; P.b.k. at 420 nm; c.k. with 2-PrOH gave 8.0×10^9.	731031
			9.3×10^9	p.r.; P.b.k.	731039
		0-7	1.2×10^{10}	p.r.; P.b.k. at 420 nm; pH effects obs.	720431
			1.0×10^{10}	p.r.; C.k.in soln. contg. 2×10^{-4} mol L^{-1} ferrocyanide; 8% lower in O_2-satd. soln. contg. 0.05 mol L^{-1} ferrocyanide; rel. to $k(\cdot OH + EtOH)$.	710137
			1.2×10^{10}	p.r.; C.k. in soln. contg. 2×10^{-4} mol L^{-1} ferrocyanide; 8% lower in O_2-satd. soln. contg. 0.05 mol L^{-1} ferrocyanide; rel. to $k(\cdot OH + MeOH)$.	710137
		nat.	9.3×10^9	p.r.; P.b.k. at 410 nm.	710578
		3-7	1.1×10^{10}	p.r.; P.b.k. at 420 nm.	660424

TABLE 8. Rate constants for reactions of hydroxyl radicals in aqueous solution—Continued

No.	Reaction	pH	k (L mol^{-1} s^{-1})	Comment	Ref.
91	**Nitrilotriacetatoferrate(II) ion**				
	$\cdot OH + FeNTA^- \rightarrow OH^- + FeNTA$	6.0	5.0×10^9	p.r.; P.b.k.; at pH 6.2 $k = 2.5 \times 10^9$ and at pH 11 $k = 1.1 \times 10^9$.	78A436
92	**Ethylenediaminetetraacetatoferrate(II) ion**				
	$\cdot OH + FeEDTA^{2-} \rightarrow OH^- +$ $FeEDTA^-$	4.5	5.0×10^9	p.r.; P.b.k.; at pH 6.2 $k = 7.5 \times 10^9$.	78A436
93	**Carboxyferrocene ion(1-)**				
	$\cdot OH + FcCO_2^- \rightarrow OH^- + Fc^+CO_2^-$	9.0	7.3×10^9	p.r.; P.b.k. at 625 nm in 0.025 mol L^{-1} borax buffer contg. $(0.2\text{-}0.8) \times 10^{-3}$ mol L^{-1} substrate.	84A460
94	**Ferrocenylacetate ion**				
	$\cdot OH + FcCH_2CO_2^- \rightarrow OH^- +$ $Fc^+CH_2CO_2^-$	9.0	8.7×10^9	p.r.; P.b.k. at 625 nm in 0.025 mol L^{-1} borax buffer contg. $(0.2\text{-}0.8) \times 10^{-3}$ mol L^{-1} substrate.	84A460
95	**2-Carboxyethylferrocene ion(1-)**				
	$\cdot OH + Fc(CH_2)_2CO_2^- \rightarrow OH^- +$ $Fc^+(CH_2)_2CO_2^-$	9.0	1.1×10^{10}	p.r.; P.b.k. at 625 nm in 0.025 mol L^{-1} borax buffer contg. $(0.2\text{-}0.8) \times 10^{-3}$ mol L^{-1} substrate.	84A460
96	**Tris(2,2'-bipyridine)iron(III) ion**				
	$\cdot OH + Fe(bpy)_3^{3+} \rightarrow$ $Fe(bpy)_2(bpyOH)^{3+}$	3	$>1 \times 10^{10}$	p.r.; P.b.k.	82A343
97	**Tris(1,10-phenanthroline)iron(III) ion**				
	$\cdot OH + Fe(phen)_3^{3+} \rightarrow$ $Fe(phen)_2(phen\text{-}OH)^{3+}$	<1	$\sim 7 \times 10^9$	p.r.; P.b.k. at 490 nm; k estd. from $k_{obs} = 5 \times 10^9$ ($G = 5\text{-}6$) and k for H atoms (4×10^9).	85A284
98	**Tetrakis-[4-(*N,N,N*-trimethylammonio)phenyl]porphinatoiron(III) ion**				
	$\cdot OH + FeTAPP^{5+} \rightarrow$	11.0	2.4×10^{10}	p.r.; C.k.; rel. to $k(\cdot OH + Fe(CN)_6^{4-})$.	84A426
99	**Tetrakis(4-*N*-methylpyridyl)porphinatoiron(III) ion**				
	$\cdot OH + FeTMpyP^{5+} \rightarrow$	11.0	2.3×10^{10}	p.r.; C.k.; rel. to $k(\cdot OH + Fe(CN)_6^{4-})$.	84A426
100	**Tetrakis(*p*-sulfonatophenyl)porphinatoferrate(III) ion**				
	$\cdot OH + FeTPPS^{3-} \rightarrow$	11.0	1.8×10^{10}	p.r.; C.k.; rel. to $k(\cdot OH + Fe(CN)_6^{4-})$.	84A426
101	**Nitrilotriacetatoferrate(III)**				
	$\cdot OH + FeNTA \rightarrow$	~ 2	1.6×10^8	γ-r.; C.k.; obs. G(IDA); rel. to $k(\cdot OH +$ *tert*-BuOH).	82A373
102	**Ethylenediaminetetraacetatoferrate(III)**				
	$\cdot OH + FeEDTA \rightarrow$	6	1.1×10^9	X-r.; C.k.; rel. to $k(\cdot OH +$ MeOH).	750159
		1	7.0×10^8	X-r.; C.k.; rel. to $k(\cdot OH + Fe^{2+})$.	710202
			1.6×10^9	X-r.; C.k.; rel. to $k(\cdot OH +$ MeOH).	710202
103	**Ferrioxamine B**				
	$\cdot OH + C_{25}H_{45}FeN_6O_8 \rightarrow$	7.1	1.3×10^{10}	p.r.; C.k. in soln. contg. 10^{-3} mol L^{-1} phosphate buffer; rel. to $k(\cdot OH + SCN^-)$.	82A406
104	**Hydrogen**				
	$\cdot OH + H_2 \rightarrow H\cdot + H_2O$		4.2×10^7	Average of 4 values.	
		5.1-5.6	3.4×10^7	p.r.; C.k. with Cu^{2+} (obs. $CuOH^{2+}$) up to 150°C; also c.k. with O_2 (obs. O_2^-), in 1×10^6 N m^{-2} N_2O; $k = 7.7 \times 10^8$ at 230°C; studied at 20-230° C; rel. to $k(\cdot OH + Cu^{2+})$.	83A015
		4.7	4.0×10^7	p.r.; D.k. at 280 nm (OH) in N_2O-satd. (10^{-3} mol L^{-1}) soln. satd. with H_2; 2×10^{-5} mol L^{-1} $HClO_4$ (atm pressure); 90% confidence limit; studied at 15-90° C.	771079
			6.0×10^7	p.r.; D.k. at 260 nm (10-20 atm H_2).	660426
		3	3.5×10^7	p.r.; D.k. at 260 nm in N_2O-satd. soln.	650010

TABLE 8. Rate constants for reactions of hydroxyl radicals in aqueous solution—Continued

No.	Reaction	pH	k (L mol^{-1} s^{-1})	Comment	Ref.
105	**Mercury(I) chloride**				
	$\cdot OH + HgCl \rightarrow OH^- + HgCl^+$	5.0	$\sim 1 \times 10^{10}$	p.r.; D.k. at 235 nm; reaction of e_{aq}^- or H with $HgCl_2$ gives HgCl.	730043
106	**Mercury(I) cyanide**				
	$\cdot OH + HgCN \rightarrow$		3.1×10^9	p.r.; Estd. from d.k. of transient HgCN in soln. contg. 10^{-3} mol L^{-1} $Hg(CN)_2$ with no additives.	751203
107	**1,4,8,11-Tetraazacyclotetradecanemercury(II) ion**				
	$\cdot OH + Hg(cyclam)^{2+} \rightarrow$ H abstr.		7×10^9	p.r.; P.b.k.	80A380
108	**Mercury(II) bromide**				
	$\cdot OH + HgBr_2 \rightarrow HgBrOH + Br\cdot$		$>9 \times 10^8$	p.r.; P.b.k. at 355 nm in soln. contg. $HgBr_2$; obs. transient may be $HgBr_3$.	761087
109	**Iodide ion**				
	$\cdot OH + I^- \rightarrow HOI^-$		**1.1×10^{10}**	**Selected value.**	
			1.2×10^{10}	p.r.; C.k.; also measurements at 39, 59, and 79°C; rel. to $k(\cdot OH + HCO_2^-)$.	84A349
			1.2×10^{10}	p.r.; P.b.k. at 385 nm (I_2^-); also reported $k(I + I^- \rightarrow I_2^-)$ and $k(HOI^- \rightarrow I + OH^-)$.	720122
			1.0×10^{10}	p.r.; C.k.; 25% higher in O_2-satd. 0.1 mol L^{-1} I^- soln.; rel. to $k(\cdot OH + EtOH)$.	710137
		7	1.0×10^{10}	p.r.; P.b.k.; I_2^- is obs.	650010
110	**Iodine**				
	$\cdot OH + I_2 \rightarrow HOI + I\cdot$		1.1×10^{10}	p.r.; P.b.k. at 280 nm (I atom)	86A070
111	**Hypoiodous acid**				
	$\cdot OH + HOI \rightarrow HOIOH$	9	7×10^9	p.r.; P.b.k. (350-550 nm) in N_2O-satd. I^--free soln. contg. 10^{-2} mol L^{-1} borax buffer and HOI ($5\text{-}10 \times 10^{-4}$ mol L^{-1}).	86A901
112	**Iodate ion**				
	$\cdot OH + IO_3^- \rightarrow HIO_4^-$	12.4-13.6	1.3×10^9	f.p.; D.k. at 430 nm (O_3^-); value is based on $k(\cdot O^- + O_2 \rightarrow O_3^-) = 3.6 \times 10^9$.	700018
113	**Indium(II) ion**				
	$\cdot OH + In^{2+} \rightarrow OH^- + In^{3+}$	1.5-3.5	3.2×10^{10}	p.r.; D.k. of In^{2+} formed from $e_{aq}^- + In^{3+}$, independent of ionic strength.	83A206
114	**Hexachloroiridate(III) ion**				
	$\cdot OH + IrCl_6^{3-} \rightarrow OH^- + IrCl_6^{2-}$		*1.2×10^{10}*	Average of 2 values.	
		3.0-4.5	1.3×10^{10}	p.r.; P.b.k.; hydrolysis of adduct gave $IrCl_6^{2-}$ ($k = 1.2 \times 10^5$ s^{-1}[H$^+$]).	80A095
			1.0×10^{10}	p.r.; C.k.; rel. to $k(\cdot OH$ + *tert*-BuOH)	731066
115	**Manganese(II) ion**				
	$\cdot OH + Mn^{2+} \rightarrow MnOH^{2+}$		*9.0×10^7*	Average of 3 values.	
		3, 9	2.6×10^7	p.r.; P.b.k. at 250 nm in N_2O-satd. soln. contg. various concn. of $Mn(ClO_4)_2$; product suggested by condy. results at pH 9 is $Mn(OH)_2^+$; at pH 3 the same buildup kinetics but no condy. change were obtained suggesting the product $MnOH^{2+}$, $pK_a = 5.0$.	86A355
		6.7	2.9×10^7	C.k. in soln. contg. EtOH, CCl_4 and 0.1-0.3 mol L^{-1} Mn^{2+}; obs. Mn^{III} at 255 nm (cor. for $\cdot CCl_3$); rel. to $k(\cdot OH + EtOH)$.	761109
		6.7	3.6×10^7	p.r.; P.b.k. at 258 nm (Mn^{III}) $\epsilon = 2100$ L mol^{-1} cm^{-1}.	761109
116	**Pentacyano(nitrosyl)manganate(II) ion**				
	$\cdot OH + Mn(CN)_5NO^{3-} \rightarrow$		4.3×10^9	γ-r.; C.k.; depends on $k(\cdot OH + CN^-)/k(\cdot OH +$ RNO) = 0.42; rel. to $k(\cdot OH +$ RNO).	710407

TABLE 8. Rate constants for reactions of hydroxyl radicals in aqueous solution—Continued

No.	Reaction	pH	k (L mol^{-1} s^{-1})	Comment	Ref.
117	**Nitrilotriacetatomanganate(II) ion**				
	·OH + $MnNTA^-$ → H abstr.	4.5 9.0	1.5×10^9	p.r.; P.b.k.	78A436
118	**Ethylenediaminetetraacetatomanganate(II) ion**				
	·OH + $MnEDTA^{2-}$ → H abstr.	4.5	1.5×10^9	p.r.; P.b.k.; at pH 9.0 $k = 3.0 \times 10^9$.	78A436
119	**Tetrakis(4-pyridyl)porphinatomanganese(III) ion**				
	·OH + $MnTpyP^+$ → $[MnTpyP\text{-}OH]^+$	6.8	6×10^9	p.r.; D.k.; pK_a = 8.0, 10.7.	84A120
120	**Bis(hydroxo)tetrakis(4-*N*-methylpyridyl)porphinatomanganese(III) ion**				
	·OH + $(OH)_2MnTMpyP^{3+}$ → $[(OH)_2MnTMpyP\text{-}OH]^{3+}$	11.0	2.7×10^{10}	p.r.; C.k.; pK_a = 8.0, 10.6; rel. to k(·OH + $Fe(CN)_6^{4-}$).	84A426
		12.4	3.5×10^9	p.r.; D.k.	84A120
121	**Bis(hydroxo)tetrakis(*p*-sulfonatophenyl)porphinatomanganatemanganate(III) ion**				
	·OH + $(OH)_2MnTPPS^{5-}$ → $[(OH)_2MnTPPS\text{-}OH]^{5-}$	11.0	1.7×10^{10}	p.r.; C.k.; pK_a = 8.6, 11.6; rel. to k(·OH + $Fe(CN)_6^{4-}$).	84A426
		12.4	8×10^9	p.r.; D.k.	84A120
122	**Aquahydroxy(3,10,17,24-tetrasulfophthalocyanine)manganese(III) ion**				
	·OH + $Mn(pts)(OH_2)OH^{4-}$ →	~6.2	2.5×10^8	f.p.; P.b.k. at >550 nm, as well as d.k. at <470 nm.	85A065
123	**Octacyanomolybdate(IV) ion**				
	·OH + $Mo(CN)_8^{4-}$ → OH^- + $Mo(CN)_8^{3-}$	6.5	5.8×10^9	p.r.; P.b.k. at 385 nm; no pH effect (10^{-5}-1 mol $L^{-1}HClO_4$) or effect of salts $LiClO_4$, $NaClO_4$, $CsClO_4$, $KClO_4$ except the latter at 1 mol L^{-1}.	761140
124	**Ammonia**				
	·OH + NH_3 → ·NH_2 + H_2O	11.4	9×10^7	p.r.; C.k. with benzoate ion and thiocyanate; reference values not given; OH + NH_4^+ too slow to observe.	78A218
125	**Azide ion**				
	·OH + N_3^- → ·N_3 + OH^-		*1.2 × 10^{10}*	Average of 2 values.	
		7.9-13	1.2×10^{10}	p.r.; P.b.k. at 274 nm in N_2O-satd. soln. contg. NaN_3.	85A218
		9.2	1.2×10^{10}	p.r.; C.k.; obs. abs. of ·N_3 at 278 nm; rel. to k(·OH + BzO^-).	700649
126	**Hydrazoic acid**				
	·OH + HN_3 → ·N_3 + H_2O	2.2	$<1 \times 10^7$	p.r.; P.b.k.; k_{obs} 4×10^7 almost entirely attributable to ·OH + N_3^- (0.3% present at this pH).	86A060
127	**Hydrazine**				
	·OH + H_2NNH_2 → ·$NHNH_2$ + H_2O	10	1.4×10^{10}	p.r.; C.k.; rel. to k(·OH + SCN^-).	720003
128	**Hydrazinium ion**				
	·OH + $H_2NNH_3^+$ → H_2O + ·$N_2H_4^+$	6	1.0×10^9	p.r.; C.k.; rel. to k(·OH + SCN^-).	720003
129	**Hydroxylamine**				
	·OH + NH_2OH → H_2O + NHOH	8	9.5×10^9	p.r.; C.k.; rel. to k(·OH + SCN^-).	710493
130	**Hydroxylammonium ion**				
	·OH + NH_3OH^+ → ·NH_2^+OH + H_2O	4	$<5.0 \times 10^8$	p.r.; C.k.; rel. to k(·OH + SCN^-).	710493
131	**Hydroxylaminedisulfonate ion**				
	·OH + $HON(SO_3)_2^{2-}$ → $NO(SO_3)_2^{2-}$ + H_2O	8.4-8.8	5.7×10^7	*e*-r.; esr; Obs. buildup of $ON(SO_3^-)_2$; k is ten times faster at pH 11.5-12 and probably is concn. dependent; rel. to k(·OH + PhH).	680471 680642 680611
132	**Nitrosyldisulfonate ion**				
	·OH + $NO(SO_3)_2^{2-}$ →	11	2.6×10^{10}	γ-r.; Calcd. from G(Nitrosyldisulfonate) from hydroxylaminedisulfonate ion assuming values for rates for H and e_{aq}^- with nitrosyldisulfonate and OH with hydroxylaminedisulfonate.	710596

TABLE 8. Rate constants for reactions of hydroxyl radicals in aqueous solution—Continued

No.	Reaction	pH	k (L mol^{-1} s^{-1})	Comment	Ref.
133	**Nitrite ion**				
	$\cdot OH + NO_2^- \rightarrow \cdot NO_2 + OH^-$		*1.0 × 10^{10}*	Average of 6 values.	
		acid	1.1 × 10^{10}	p.r.; C.k. (condy.); rel. to $k(\cdot OH + MeOH)$.	700254
		alk.	9.1 × 10^9	p.r.; C.k. (condy.); rel. to $k(\cdot OH + MeOH)$.	700254
		>12	1.4 × 10^{10}	f.p.; C.k.; obs. dependence of O_3^- decay rate on $[OH^-]$ and $[NO_2^-]$; $k(\cdot OH + NO_2^-)/k(\cdot O^- + NO_2^-) \simeq 40$; rel. to $k(\cdot O^- + O_2) = 3.6 \times 10^9$; ratio = 4.0 ± 0.4.	707264
		11	8.0 × 10^9	p.r.; C.k.; calcd. from measurements at pH 11 and 13; rel. to $k(\cdot OH + CO_3^{2-})$.	690379
		10.7	7.0 × 10^9	p.r.; C.k.; rel. to $k(\cdot OH + CO_3^{2-})$.	650190
			1.2 × 10^{10}	p.r.; C.k. in O_2-satd. soln. contg. 0.04 mol L^{-1} $Na_2CO_3^-$; rel. to $k(\cdot OH + CO_3^{2-})$.	640131
134	**Nickel(I) ion**				
	$\cdot OH + Ni^+ \rightarrow OH^- + Ni^{2+}$		2 × 10^{10}	p.r.; Estd. from d.k. at 300 nm in soln. contg. 10^{-4} mol L^{-1} $NiSO_4$ assuming $2k(\cdot OH + OH) = 1 \times 10^{10}$; Ni^+ from $e_{aq}^- + Ni^{2+}$.	741037
135	**Nickel(II) ions**				
	$\cdot OH + Ni^{2+} \rightarrow$		<5 × 10^5	p.r.; Estd. from lack of effect of 0.25 mol L^{-1} Ni^{2+} on yield of Cu^{III} in O_2-satd. 2 × 10^{-3} mol L^{-1} Cu^{2+}.	751027
136	**Ethylenediaminenickel(II) ion**				
	$\cdot OH + Ni(en)_n^{2+} \rightarrow OH^- + Ni(en)_n^{3+}$	10.0	7.2 × 10^9	p.r.; C.k. in O_2-satd. soln.; cor. for OH + en; also detd. at pH 8.0, 8.5, and 9.0; rel. to $k(\cdot OH + SCN^-)$.	720461
137	**1,4,7,10-Tetraazacyclotridecanenickel(II) ion**				
	$\cdot OH + NiL^{2+} \rightarrow NiL^{3+}$	3.3	3.5 × 10^9	p.r.; P.b.k. in soln. contg. 1-10 × 10^{-4} mol L^{-1} $NiL(CLO_4)_2$.	86A470
138	**1,4,8,11-Tetraazacyclotetradecanenickel(II) ion**				
	$\cdot OH + Ni(cyclam)^{2+} \rightarrow OH^- + Ni(cyclam)^{3+}$	6	5 × 10^9	p.r.; P.b.k. at 545 nm in soln. contg. 0.3 mol L^{-1} ClO_4^-; at pH 3.1 $k = \sim 2 \times 10^9$; pK = 4.	80A350
139	**1,4,8,12-Tetraazacyclopentadecanenickel(II) ion**				
	$\cdot OH + NiL^{2+} \rightarrow NiL^{3+}$	3.3	4.0 × 10^9	p.r.; P.b.k. in soln. contg. 1-10 × 10^{-4} mol L^{-1} $NiL(CLO_4)_2$.	86A470
140	**5,7,7,12,14,14-Hexamethyl-1,4,8,11-tetraazacyclotetradecanenickel(II) ion**				
	$\cdot OH + Ni(aneN_4)^{2+} \rightarrow OH^- + Ni(aneN_4)^{3+}$		*1.7 × 10^9*	Average of 2 values.	
		3	1.5 × 10^9	p.r.; P.b.k. in soln. contg. SO_4^{2-}; independent of $[SO_4^{2-}]$, pH and wavelength of monitoring light.	79A249
		4-9	1.9 × 10^9	p.r.; P.b.k. in soln. contg. ClO_4^-.	78A299
141	**β-*rac*-(5,7,7,12,14,14-Hexamethyl-1,4,8,11-tetraazacyclotetradecane)nickel(II) ion**				
	$\cdot OH + \beta\text{-}Ni(aneN_4)^{2+} \rightarrow OH^- + \beta\text{-}Ni(aneN_4)^{3+}$	3.2	3 × 10^9	p.r.; P.b.k. in soln. contg. 0.3 mol L^{-1} $NaClO_4$.	81A285
142	**(5,7,7,12,14,14)Hexamethyl-1,4,8,11-tetraazacyclotetradeca-4,11-diene)nickel(II) ion**				
	$\cdot OH + Ni(4,11\text{-}dieneN_4)^{2+} \rightarrow OH^- + Ni(4,11\text{-}dieneN_4)^{3+}$		*2.8 × 10^9*	Average of 2 values.	
		5.7	2.5 × 10^9	p.r.; P.b.k.	79A002
		4-9	3.0 × 10^9	p.r.; P.b.k.	78A299
143	**5,7,7,12,14,14-Hexamethyl-1,4,8,11-tetraazacyclotetradeca-1,4,8,11-tetraenenickel(II) ion**				
	$\cdot OH + Ni(tetraeneN_4)^{2+} \rightarrow$	4-9	4.1 × 10^9	p.r.; P.b.k.	78A299
144	**1,4,7,10,13-Pentaazacyclohexadecanenickel(II) ion**				
	$\cdot OH + Ni[1,4,7,10,13\text{-}aneN_5]^{2+} \rightarrow Ni[1,4,7,10,13\text{-}aneN_5]^{3+}$	3.0-11.0	5 × 10^9	p.r.; P.b.k. (λ_{max} = 290, ϵ = 6900 L mol^{-1} cm^{-1}).	83A322

TABLE 8. Rate constants for reactions of hydroxyl radicals in aqueous solution—Continued

No.	Reaction	pH	k (L mol^{-1} s^{-1})	Comment	Ref.
145	**α-2,12-Dimethyl-3,7,11,17-tetraazabicyclo[11.3.1]heptadeca-1(17),13,15-trienenickel(II) ion**				
	$\cdot OH + Ni(CR+4H)^{2+} \rightarrow Ni(CR+3H)^{2+} + Ni(CR+3H+OH)^{2+}$	~4-9	7.1×10^9	p.r.; P.b.k. at 320 nm in soln. contg. 2×10^{-4} mol L^{-1} complex; p.b.k. at 550 nm 10-20% slower; distorted Ni(III)-OH-complex is formed (λ 550) as well as ligand radical for which decay and O_2-reaction rates were obs.	82A105
146	**α-2,12-Dimethyl-3,7,11,17-tetraazabicyclo[11.3.1]heptadeca-1(17),2,11,13,15-pentaenenickel(II) ion**				
	$\cdot OH + Ni(CR)^{2+} \rightarrow$	3.5-9.5	4.5×10^9	p.r.; P.b.k. at 350 nm in soln. contg. $<2 \times 10^{-4}$ mol L^{-1} complex; product is Ni(II) ligand radical for which rates for decay and reaction with oxygen ($\sim 10^8$) were detd.	82A105
147	**α-2,12-Dimethyl-3,7,11,17-tetraazabicyclo[11.3.1]heptadeca-1(17),2,6,11,13,15-hexaenenickel(II) ion**				
	$\cdot OH + Ni(CR-2H)^{2+} \rightarrow Ni(CR-2H)OH^{2+}$	~3-9	6×10^9	p.r.; P.b.k. in near UV region in soln. contg. $<2 \times 10^{-4}$ mol L^{-1} complex; both Ni(III) and ligand radical products are formed.	82A105
148	**Tetracyanonickelate(II) ion**				
	$\cdot OH + Ni(CN)_4^{2-} \rightarrow OH^- + Ni(CN)_4^-$		1.0×10^{10}	p.r.; C.k.; also p.b.k. at 250 nm; rel. to $k(\cdot OH + Fe(CN)_6^{4-})$.	741072
149	**Glycinatonickel(II) ion**				
	$\cdot OH + Ni(Gly)^+ \rightarrow H_2O + Ni(NH_2\dot{C}HCO_2)^+$	6.6	$\sim 1.5 \times 10^8$	p.r.; P.b.k. in soln. contg. 2×10^{-3} mol L^{-1} Ni^{2+} and 2×10^{-3} mol L^{-1} glycine.	81A128
150	**Bis(glycinato)nickel(II)**				
	$\cdot OH + Ni(Gly)_2 \rightarrow H_2O + Ni(Gly)(NH_2\dot{C}HCO_2)$	6.6	$\sim 2.5 \times 10^8$	p.r.; P.b.k. in soln. contg. 2×10^{-3} mol L^{-1} Ni^{2+} and 4×10^{-3} mol L^{-1} glycine.	81A128
151	**Tris(glycinato)nickelate(II) ion**				
	$\cdot OH + Ni(Gly)_3^- \rightarrow H_2O + Ni(Gly)_2(NH_2\dot{C}HCO_2)^-$	6.6	$\sim 2 \times 10^8$	p.r.; P.b.k. in soln. contg. 2×10^{-3} mol L^{-1} Ni^{2+} and 6×10^{-3} mol L^{-1} glycine.	81A128
152	**Glycinatonickel(II) ion**				
	$\cdot OH + Ni(Gly)_n^{(2-n)+} \rightarrow OH^- + Ni(Gly)_n^{(3-n)+}$	10.0	6.6×10^9	p.r.; C.k. in O_2-satd. soln.; cor. for $\cdot OH$ + glycine; rel. to $k(\cdot OH + SCN^-)$.	720461
153	**Iminodiacetatonickel(II)**				
	$\cdot OH + NiIDA \rightarrow H_2O + Ni(O_2CCH_2NH\dot{C}HCO_2)$	7	7.3×10^8	p.r.; P.b.k.	81A023
154	**Bis(iminodiacetato)nickelate(II) ion**				
	$\cdot OH + Ni(IDA)_2^{2-} \rightarrow H_2O + Ni(O_2CCH_2NH\dot{C}HCO_2)(IDA)^{2-}$	7	1.0×10^9	p.r.; P.b.k.	81A023
155	**Nitrilotriacetatonickelate(II) ion**				
	$\cdot OH + NiNTA^- \rightarrow H_2O + Ni[(^-O_2CCH_2)_2N\dot{C}HCO_2^-]$		*1.3×10^9*	Average of 2 values.	
		7	1.2×10^9	p.r.; P.b.k. ($\lambda_{max} = 290$ nm).	80A194
		4-9	1.4×10^9	p.r.; P.b.k.	78A436
156	**Ethylenediaminetetraacetatonickelate(II) ion**				
	$\cdot OH + NiEDTA^{2-} \rightarrow NiEDTA^-$	4.0-9.5	2.5×10^9	p.r.; P.b.k. in soln. contg. 1:1 $NiSO_4$ and Na_2EDTA; also measured by c.k. with SCN^-.	751135
157	**Neptunium(IV)**				
	$\cdot OH + Np(IV) \rightarrow OH^- + NpO_2^+$	~0	3.2×10^8	p.r.; C.k.; soln. contg. 1.0 mol L^{-1} $HClO_4$, $(1\text{-}5) \times 10^{-2}$ mol L^{-1} Np(IV) and 5×10^{-3} mol L^{-1} SCN^-; complicated due to $NpCNS^{3+}$ complex formation; rel. to $k(\cdot OH + SCN^-)$.	82A376
158	**Dioxoneptunium(V) ion**				
	$\cdot OH + NpO_2^+ \rightarrow OH^- + NpO_2^{2+}$		*5.1×10^8*	Average of 2 values.	
		1	5.9×10^8	p.r.; P.b.k.; 6.2×10^{-5} mol L^{-1} $HClO_4$; for $[HClO_4]$ 1.8×10^{-5}, 2.3×10^{-4} and 0.1, $k =$ 2.7, 4.2, and 5.8×10^8, resp.	86A370

TABLE 8. Rate constants for reactions of hydroxyl radicals in aqueous solution—Continued

No.	Reaction	pH	k (L mol^{-1} s^{-1})	Comment	Ref.
158	**Dioxoneptunium(V) ion**—Continued				
		~0	4.3×10^8	p.r.; C.k.; at pH ~ 1 and 2.52-2.96 $k = (4.4 \pm 0.5) \times 10^8$ and $(5.7 \pm 0.6) \times 10^8$, resp.; competition kinetics complicated by complex formation with Np; rel. to k(·OH + SCN$^-$).	82A376
159	**Hydrogen peroxide** ·OH + H_2O_2 → O_2·$^-$ + H_2O		*2.7 × 10^7*	Average of 4 values.	
		7.8	2.7×10^7	p.r.; P.b.k. (O_2^-) at 250-270 nm in soln. contg. 1.59×10^{-2} mol L^{-1} H_2O_2; reaction studied at 14-160°C.	82A096
		7	2.0×10^7	p.r.; C.k.; rel. to k(·OH + SCN$^-$).	81A374
		7.7-11.0	3.8×10^7	p.r.; C.k.; obs. luminol radical; rel. to k(·OH + luminol).	80A221
		7	2.4×10^7	p.r.; C.k.; rel. to k(·OH + I$^-$).	650010
160	**Hydroperoxide ion** ·OH + HO_2^- → O_2·$^-$ + H_2O		7.5×10^9	p.r.; P.b.k. (O_2^-) at 250-270 nm from pH dependence (6.8-13.8). Assumes equilibrium between OH and O$^-$ is maintained; best value.	82A096
		7.7-11	6.8×10^9	p.r.; Calcd. from c.k. with luminol, pK(H_2O_2) = 11.65.; rel. to k(·OH + luminol).	80A221
		11	5.6×10^9	p.r.; C.k.; calcd. from $1.4k + k$(·O$^-$ + H_2O_2) = 8×10^9, pK(H_2O_2) = 11.75 and pK(·OH) = 11.9. Assumes equilibrium between ·OH and ·O$^-$ is maintained; rel. to k(·OH + CO_3^{2-}).	690379
		13	8.3×10^9	p.r.; P.b.k. at 260 nm; pH study; assumes equilibrium between ·OH and ·O$^-$ is maintained.	680298
161	**Hydroxide ion** ·OH + OH$^-$ → O·$^-$ + H_2O		*1.2 × 10^{10}*	Average of 2 values.	
			1.3×10^{10}	p.r.; C.k. with MeOH and EtOH; calcd. from k(reverse) = 9.6×10^7 s^{-1} and pK(·OH) = 11.85.	710137
		11	1.2×10^{10}	p.r.; C.k. with MeOH and EtOH; soln. contains CO_3^{2-} and HCO_3^-; calcd. from k(reverse) = 9.3×10^7 s^{-1} and pK(·OH) = 11.9.	700511
162	**Ozone** ·OH + O_3 → HO_2· + O_2		*1.1 × 10^8*	Average of 2 values.	
		10.3	1×10^8	p.r.; C.k.; rel. to k(·OH + CO_3^{2-}).	84A270
		1,9-10	1.1×10^8	p.r.; P.b.k. at 430 nm (O_3^-) at pH 9-10, as well as d.k. at 280-310 nm (O_3) at pH 1.	84A270
163	**Pentaammine(nitrogeno)osmium(II) ion** ·OH + $Os(NH_3)_5N_2^{2+}$ → $Os(NH_3)_4(NH_2)N_2^{2+}$ + H_2O		1×10^{10}	p.r.; P.b.k. at 380 nm.	750309
164	**Tris(2,2'-bipyridine)osmium(II) ion** ·OH + $Os(bpy)_3^{2+}$ → $Os(bpy)_2(bpyOH)^{2+}$		~1×10^{10}	p.r.	757415
165	**Hexacyanoosmate(II) ion** ·OH + $Os(CN)_6^{4-}$ → OH$^-$ + $Os(CN)_6^{3-}$		*9.6 × 10^9*	Average of 3 values.	
			8×10^9	p.r.; C.k.; rel. to k(·OH + 2-PrOH).	731031
			1.1×10^{10}	p.r.; C.k.; rel. to k(·OH + MeOH).	731031
		~7	1.0×10^{10}	p.r.; P.b.k. at 410 nm.	731031
166	**(Aqua)pentachloroosmate(IV) ion** ·OH + $OsCl_5(H_2O)^-$ → OH$^-$ + $OsCl_5(H_2O)$		2.4×10^9	p.r.; C.k.; rel. to k(·OH + *tert*-BuOH).	77A219

TABLE 8. Rate constants for reactions of hydroxyl radicals in aqueous solution—Continued

No.	Reaction	pH	k (L mol^{-1} s^{-1})	Comment	Ref.
167	**Hypophosphite ion** $\cdot OH + H_2PO_2^- \rightarrow OH^- + H_2PO_2\cdot$	10.7	1.8×10^9	p.r.; C.k.; rel. to $k(\cdot OH + CO_3^{2-})$.	650190
168	**Dihydrogen phosphite ion** $\cdot OH + H_2PO_3^- \rightarrow PO_3^{2-} + H_2O$	3.5	1.9×10^9	p.r.; C.k.; rel. to $k(\cdot OH + SCN^-)$.	80A226
169	**Hydrogen phosphite ion** $\cdot OH + HPO_3^{2-} \rightarrow PO_3^{2-} + H_2O$		*3.7×10^9*	Average of 2 values.	
		8.5,10.5	3.6×10^9	p.r.; P.b.k. at 250 nm in soln. contg. phosphite ion.	80A226
		10.7	3.7×10^9	p.r.; C.k.; rel. to $k(\cdot OH + CO_3^{2-})$.	650190
170	**Sodium polyphosphate** $\cdot OH + (NaPO_3)_n \rightarrow$	5-5.5	$<5 \times 10^6$	p.r.; No effect on oxidation of 10^{-3} mol L^{-1} KSCN in soln.; n ≈ 50.	740036
171	**Phosphate ion** $\cdot OH + PO_4^{3-} \rightarrow$		$<1.0 \times 10^7$	p.r.; C.k.; rel. to $k(\cdot OH + CO_3^{2-})$.	700302
172	**Hydrogen phosphate ion** $\cdot OH + HPO_4^{2-} \rightarrow$		1.5×10^5	p.r.; P.b.k. at 560 nm in Na_2HPO_4 soln.	78A075
173	**Dihydrogen phosphate ion** $\cdot OH + H_2PO_4^- \rightarrow OH^- + H_2PO_4\cdot$		$\sim 2 \times 10^4$	p.r.; P.b.k. Limited reaction even at 1 mol L^{-1} $H_2PO_4^-$.	78A075
174	**Phosphoric acid** $\cdot OH + H_3PO_4 \rightarrow H_2O + H_2PO_4\cdot$	0.0	2.7×10^6	p.r.; C.k.; obs. H_2PO_4 radical at 500 nm; rel. to $k(\cdot OH + MeOH)$.	731049
175	**Pyrophosphate ion** $\cdot OH + P_2O_7^{4-} \rightarrow$	10.3	9×10^5	p.r., P.b.k. at 590 nm.	731049
176	**Peroxomonophosphate ion** $\cdot OH + HPO_5^{2-} \rightarrow H_2O + PO_5^{2-}$	7	4.3×10^7	p.r.; C.k.; rel. to $k(\cdot OH + PNBA^-)$.	771047
177	**Lead(II) ions** $\cdot OH + Pb^{2+} \rightarrow OH^- + Pb^{3+}$	3.9	$<2.0 \times 10^8$	p.r.; C.k. ($Pb(ClO_4)_2$ soln.); rel. to $k(\cdot OH$ + 2-PrOH).	82A425
178	**Tetrachloropalladate(II) ion** $\cdot OH + PdCl_4^{2-} \rightarrow OH^- + PdCl_4^-$		*6.8×10^9*	Average of 2 values.	
			6.3×10^9	p.r.	76A249
			7.2×10^9	p.r.; C.k. in 0.01 mol L^{-1} NaCl; $k = 1.2 \times 10^{10}$ in 1 mol L^{-1} NaCl. ϵ(320 nm) = 4700 L mol^{-1} cm^{-1} for product; may be $Pd(OH)Cl_4^{2-}$; rel. to $k(\cdot OH$ + *tert*-BuOH).	741087
179	**Praseodymium(III) ion** $\cdot OH + Pr^{3+} \rightarrow OH^- + Pr^{4+}$		*9.8×10^6*	Average of 2 values.	
		3.5	$\sim 3.5 \times 10^6$	p.r.; P.b.k. at 290 nm in soln. contg. 0.2 mol L^{-1} Pr(III).	731084
		5.8	4×10^6	p.r.; P.b.k. at 300 nm in soln. contg. 0.1 mol L^{-1} Pr(III); also detd. by c.k. with H_2O_2 or SCN^-.	720066
180	**Tetraammineplatinum(II) ion** $\cdot OH + Pt(NH_3)_4^{2+} \rightarrow Pt(NH_3)_4(H_2O)OH^{2+}$	~5.6	6.6×10^9	p.r.; P.b.k. at 315 nm in soln. contg. (18-62) × 10^{-6} mol L^{-1} $Pt(NH_3)_4(ClO_4)_2$	82A074
181	**Bis(ethylenediamine)platinum(II) ion** $\cdot OH + Pt(en)_2^{2+} \rightarrow Pt(en)_2OH^{2+}$	6.3-6.6	4.8×10^9	p.r.; P.b.k. at 308 nm; product identified by condy. [80A286].	761093
182	**Diethylenetriamine(pyridine)platinum(II) ion** $\cdot OH + Pt(dien)py^{2+} \rightarrow$	8.3	$>9 \times 10^9$	p.r.; C.k.; rel. to $k(\cdot OH + HCO_3^-)$.	78A363

TABLE 8. Rate constants for reactions of hydroxyl radicals in aqueous solution—Continued

No.	Reaction	pH	k (L mol^{-1} s^{-1})	Comment	Ref.
188	**Chloro(diethylenetriamine)platinum(II) ion**				
	$\cdot OH + Pt(dien)Cl^+ \rightarrow$	nat	8.7×10^9	p.r.; P.b.k. (λ 340-360 nm).	761093
184	**Chloro(tetraethyldiethylenetriamine)platinum(II) ion**				
	$\cdot OH + Pt(Et_4dien)Cl^+ \rightarrow$	nat	2.1×10^9	p.r.; P.b.k. (λ 300-400 nm).	761093
185	***cis*-Dichlorodiammineplatinum(II)**				
	$\cdot OH + Pt(NH_3)_2Cl_2 \rightarrow Pt(NH_3)_2Cl_2^+$	7.0	3.7×10^9	p.r.; P.b.k.; soln. contains 0.1 mol L^{-1} Cl^-.	85A090
186	***trans*-Dichlorodiammineplatinum(II)**				
	$\cdot OH + Pt(NH_3)_2Cl_2 \rightarrow Pt(NH_3)_2Cl_2^+$	7.0	7.4×10^9	p.r.; P.b.k.; soln. contains 0.1 mol L^{-1} Cl^-.	85A090
187	***cis*-[Dichlorobis(1-(2-hydroxyethyl)-2-methyl-5-nitroimidazole-N^3)]platinum(II)**				
	$\cdot OH +$ *cis*-Flap $\rightarrow A_2Pt^{III}Cl_2$	7.0	6.7×10^9	p.r.; P.b.k.; soln. contains 0.1 mol L^{-1} Cl^-.	85A090
188	**Tetrachloroplatinate(II) ion**				
	$\cdot OH + PtCl_4^{2-} \rightarrow Pt(OH)Cl_4^{2-}$		*8.0×10^9*	Average of 2 values.	
			8.0×10^9	p.r.	76A249
		~11	8×10^9	p.r.; P.b.k. at 450 nm.	690144
189	**Tetracyanoplatinate(II) ion**				
	$\cdot OH + Pt(CN)_4^{2-} \rightarrow OH^- + Pt(CN)_4^-$	~2	1.2×10^{10}	p.r.; C.k.; obs. Pt^{III} at 295 nm; rel. to k(·OH + MeOH).	690144
190	***cis*-Bis(glycinato)platinum(II)**				
	$\cdot OH +$ *cis*-$Pt(Gly)_2 \rightarrow$	8.5	$>6.0 \times 10^9$	p.r.; C.k.; rel. to k(·OH + HCO_3^-).	771053
		3.0-9.5	$\sim 1.5 \times 10^{10}$	p.r.; P.b.k. at 250-320 nm.	771053
191	***trans*-Bis(glycinato)platinum(II)**				
	$\cdot OH +$ *trans*-$Pt(Gly)_2 \rightarrow$	2.9-10.2	$\sim 9.0 \times 10^9$	p.r.; P.b.k. at 240-310; reported $k = 0.9\text{-}1.9 \times 10^{10}$.	771053
		8.5	$>6.0 \times 10^9$	p.r.; C.k.; rel. to k(·OH + HCO_3^-).	771053
192	***trans*-Dichlorobis(ethylenediamine)platinum(IV) ion**				
	$\cdot OH +$ *trans*-$Pt(en)_2Cl_2^{2+} \rightarrow$	8.1	$>1.4 \times 10^8$	p.r.; C.k.; rel. to k(·OH + HCO_3^-).	78A363
193	***cis*-Dichlorobis(isopropylamine)-*trans*-dihydroxyplatinum(IV)**				
	$\cdot OH + PtCl_2(OH)_2(2\text{-}PrNH_2)_2 \rightarrow PtCl_2(OH)_2(2\text{-}PrNH_2)_2^+$	7.0	7.0×10^8	p.r.; P.b.k. at 390 nm in N_2O-satd. soln. contg. Pt complex and 0.1 mol L^{-1} Cl^-.	85A090
194	**Plutonium(III) ion**				
	$\cdot OH + Pu^{3+} \rightarrow$ Pu(IV)	0	4.2×10^8	p.r.; C.k.; soln. contains 1.0 mol L^{-1} $HClO_4$; rel. to k(·OH + SCN^-).	85A236
195	**Bis(ethylenediamine)dioxorhenium(V) ion**				
	$\cdot OH + Re(en)_2O_2^+ \rightarrow Re(en)_2O_2^{2+} + OH^-$	7	7.8×10^9	p.r.; C.k.; rel. to k(·OH + SCN^-).	86A387
196	**Pentaaqua(chloro)rhodium(III) ion**				
	$\cdot OH + Rh(H_2O)_5Cl^{2+} \rightarrow OH^- + Rh(H_2O)_5Cl^{3+}$	< 1	3.2×10^9	p.r.; C.k. in 5 mol L^{-1} HCl; rel. to k(·OH + *tert*-BuOH).	771050
197	**(Aqua)pentachlororhodate(III) ion**				
	$\cdot OH + Rh(H_2O)Cl_5^{2-} \rightarrow OH^- + Rh(H_2O)Cl_5^-$	< 1	3×10^9	p.r.; C.k. in 5 mol L^{-1} HCl; rel. to k(·OH + *tert*-BuOH).	771050
198	**Rhodium(III) chloride**				
	$\cdot OH + RhCl_3 \rightarrow OH^- + RhCl_3^+$	< 1	2.9×10^9	p.r.; P.b.k. at 580 nm in 5 mol L^{-1} HCl.	771050
199	**Pentaammine(dinitrogen)ruthenium(II) ion**				
	$\cdot OH + Ru(NH_3)_5N_2^{2+} \rightarrow OH^- + Ru(NH_3)_5N_2^{3+}$		*5.4×10^9*	Average of 2 values.	
			6.1×10^9	p.r.; D.k. at 222 nm (substrate).	82A135
			4.8×10^9	p.r.; P.b.k. at 440-44 nm.	710234

TABLE 8. Rate constants for reactions of hydroxyl radicals in aqueous solution—Continued

No.	Reaction	pH	k (L mol^{-1} s^{-1})	Comment	Ref.
200	**Decaammine(dinitrogen)diruthenium(II) ion**				
	$\cdot OH + [Ru(NH_3)_5]_2N_2^{4+} \rightarrow (NH_3)_5RuN_2Ru(NH_3)_5OH^{4+}$	6.8	2.4×10^{10}	p.r.; P.b.k. at 435 nm in soln. contg. 10^{-4} mol L^{-1} substrate; similar value obtained by d.k. at 262 nm (substrate); subsequent decay and hydrolysis give $Ru(NH_3)_5N_2^{2+}$ and $Ru(NH_3)_5OH^{2+}$.	82A135
201	**Tris(2,2'-bipyridine)ruthenium(II) ion**				
	$\cdot OH + Ru(bpy)_3^{2+} \rightarrow Ru(bpy)_2(bpyOH)^{2+}$		*6.9×10^9*	Average of 2 values.	
		~7	6.8×10^9	p.r.; P.b.k. at 750 nm in unbuffered soln.	86A034
		3-7	7.0×10^9	p.r.; P.b.k. at 760 nm.	86A044
202	**Hexacyanoruthenate(II) ion**				
	$\cdot OH + Ru(CN)_6^{4-} \rightarrow OH^- + Ru(CN)_6^{3-}$		*4.8×10^9*	Average of 2 values.	
		~7	3.9×10^9	p.r.; C.k.; rel. to k($\cdot$OH + 2-PrOH).	731031
		~7	5.7×10^9	p.r.; P.b.k. at 350 nm.	731031
203	**Pentaammine(isonicotinamide)ruthenium(II) ion**				
	$\cdot OH + Ru(NH_3)_5isn^{2+} \rightarrow OH^- + Ru(NH_3)_5isn^{3+}$	2.3	$\sim 1.4 \times 10^{10}$	p.r.; Estd. from from absorbance change in soln. contg. 0.1 mol L^{-1} formic acid.	80A317
204	**Pentaammine(isonicotinamide)ruthenium(III) ion**				
	$\cdot OH + Ru(NH_3)_5isn^{3+} \rightarrow$	3.43	1.2×10^{10}	p.r.; P.b.k. at 480 nm.	80A317
205	**Hydrogen sulfide**				
	$\cdot OH + H_2S \rightarrow HS\cdot + H_2O$	6	1.5×10^{10}	p.r.; C.k.; obs. effect of MeOH on buildup of 380 nm absorption ($H_2S_2^-$); also used formate and SCN^- as competitors; rel. to k($\cdot$OH + MeOH).	670273
206	**Bisulfide ion**				
	$\cdot OH + HS^- \rightarrow HSOH\cdot^-$	10.5	9.0×10^9	p.r.; C.k.; obs. effect of MeOH on buildup of 380 nm abs. ($H_2S_2^-$); also used formate and SCN^- as competitors. See paper for discussion of $\cdot SHOH^-$ as product; rel. to k($\cdot$OH + MeOH).	670273
207	**Hydrogen sulfite ion**				
	$\cdot OH + HSO_3^- \rightarrow H_2O + \dot{S}O_3^-$	4.4	4.5×10^9	p.r.; C.k.; N_2O-satd. soln. contg. 1.09×10^{-3} mol L^{-1} $PNBA^-$ and 2.7, 7 and 10.5×10^{-4} mol L^{-1} $NaHSO_3$; rel. to k($\cdot$OH + $PNBA^-$).	87A905
208	**Sulfite ion**				
	$\cdot OH + SO_3^{2-} \rightarrow H_2O + \dot{S}O_3^-$		*5.5×10^9*	Average of 2 values.	
		11.2	5.1×10^9	p.r.; C.k.; N_2O-satd. soln. contg. 1.05×10^{-3} mol L^{-1} $PNBA^-$ and 2.9 and 6.1×10^{-4} mol L^{-1} Na_2SO_4; rel. to k($\cdot$OH + $PNBA^-$).	87A905
			5.8×10^9	p.r.; C.k. in O_2-satd. soln. contg. 0.04 mol L^{-1} $Na_2CO_3^-$; rel. to k($\cdot$OH + CO_3^{2-}).	640131
209	**Hydrogen sulfate ion**				
	$\cdot OH + HSO_4^- \rightarrow SO_4\cdot^- + H_2O$	~1	6.9×10^5	p.r.; P.b.k. at 450 nm in $KHSO_4$ soln.	660019
			1.7×10^6	p.r.; C.k.; rel. to k($\cdot$OH + MeOH).	660019
210	**Thiosulfate ion**				
	$\cdot OH + S_2O_3^{2-} \rightarrow S_2O_3OH^{2-}$		*7.0×10^9*	Average of 3 values.	
		6-11	7.8×10^9	p.r.; Calcd. from time-concn. dependence for intermediates ($S_2O_3OH^{2-}$, $S_4O_6^{3-}$, and $S_2O_3^-$) in soln. contg. 2×10^{-3} mol L^{-1} $Na_2S_2O_3$.	84A096
		~6.4	$\sim 4.7 \times 10^9$	p.r.; C.k.; obs. $Fe(CN)_6^{3-}$ at 400 nm; rel. to k($\cdot$OH + $Fe(CN)_6^{4-}$).	84A096
			8.6×10^9	p.r.; C.k.; rel. to k($\cdot$OH + SCN^-).	731027
211	**Peroxomonosulfate ion**				
	$\cdot OH + SO_5^{2-} \rightarrow SO_5\cdot^- + OH^-$	11	2.1×10^9	p.r.; C.k.; rel. to k($\cdot$OH + $PNBA^-$).	771047

TABLE 8. Rate constants for reactions of hydroxyl radicals in aqueous solution—Continued

No.	Reaction	pH	k (L mol^{-1} s^{-1})	Comment	Ref.
212	**Hydrogen peroxomonosulfate ion**				
	$\cdot OH + HSO_5^- \rightarrow SO_5^{\cdot -} + H_2O$	7	1.7×10^7	p.r.; C.k.; pK_a = 1, 9.4; rel. to k($\cdot$OH + PNBA$^-$).	771047
213	**Peroxodisulfate ion**				
	$\cdot OH + S_2O_8^{2-} \rightarrow$		$<1 \times 10^6$	p.r.; Reaction not obs.; c.k. with CO_3^{2-}.	690158
214	**Antimony(III) ion**				
	$\cdot OH + SbO^+ \rightarrow$	0.4	2×10^9 [a]	γ-r.; Cited from [62G215].; rel. to k($\cdot$OH + Fe^{2+}).	760311
215	**Hydrogen selenide**				
	$\cdot OH + H_2Se \rightarrow HSe + H_2O$	1.0	$\sim 2 \times 10^{10}$	p.r.; C.k.; rel. to SCN^-, I^- and Br^-.	690564
216	**Hydroselenide ion**				
	$\cdot OH + HSe^- \rightarrow HSe + OH^-$	8.5-11.5	$\sim 8 \times 10^9$	p.r.; C.k.; obs. $H_nSe_n^-$ at 410 nm; rel. to 2-PrOH and HCO_2^-.	690564
217	**Selenious acid**				
	$\cdot OH + H_2SeO_3 \rightarrow SeO_3^{\cdot -} + H_2O + H^+$	0.3-1	1.0×10^9	p.r.; P.b.k. at 420 nm; pK_a = 2.6, 8.3.	86A335
218	**Hydrogen selenite(IV) ion**				
	$\cdot OH + HSeO_3^- \rightarrow SeO_3^{\cdot -} + H_2O$		*2.9 × 10^8*	Average of 2 values.	
		5-6	1.6×10^8	p.r.; P.b.k. at 420 nm.	86A335
		6	2.9×10^8	p.r.; P.b.k. at 430 nm in SeO_2 soln.	771173
219	**Selenite(IV) ion**				
	$\cdot OH + SeO_3^{2-} \rightarrow OH^- + SeO_3^{\cdot -}$	9.5	3.5×10^9	p.r.; P.b.k. at 430 nm in SeO_2 soln.	771173
220	**Selenate(VI) ion**				
	$\cdot OH + SeO_4^{2-} \rightarrow OH^- + SeO_4^{\cdot -}$	11.2	3.8×10^9	p.r.; C.k. in soln. contg. 0.01 mol L^{-1} SeO_4^{2-}; rel. to k($\cdot$OH + CO_3^{2-}).	78A259
221	**Samarium(II) ion**				
	$\cdot OH + Sm^{2+} \rightarrow OH^- + Sm^{3+}$		*6.1 × 10^9*	Average of 2 values.	
		3-6	6.2×10^9	p.r.; D.k. (Sm^{2+} formed in 5×10^{-2} mol L^{-1} Sm^{3+} soln.)	731084
			6×10^9	p.r.; D.k. (Sm^{2+}) in Ar-satd. soln. contg. Sm(III) sulfate.	720065
222	**Tin(II) ion**				
	$\cdot OH + Sn^{2+} \rightarrow OH^- + Sn^{3+}$	0.8	2×10^9 [a]	γ-r.; C.k.; rel. to k($\cdot$OH + Fe^{2+}).	590007
223	**Technetate(VI) ion**				
	$\cdot OH + TcO_4^{2-} \rightarrow OH^- + TcO_4^-$		2×10^9	p.r.; D.k. at 360 nm.	77A245
224	**Tellurite(IV) ion**				
	$\cdot OH + TeO_3^{2-} \rightarrow$	10.7	3.7×10^9	p.r.; C.k.; rel. to k($\cdot$OH + CO_3^{2-}).	650190
225	**Titanium(III) ions**				
	$\cdot OH + Ti^{3+} \rightarrow OH^- + Ti^{4+}$	~1	1.2×10^9	p.r.; C.k.; rel. to k($\cdot$OH + SCN^-).	72G240
226	**Thallium(I) ion**				
	$\cdot OH + Tl^+ \rightarrow TlOH^+$		*9.9 × 10^9*	Average of 3 values.	
		5.7	1.2×10^{10}	p.r.; P.b.k. at 360 nm in soln. contg. 0.01 mol L^{-1} $NaClO_4$.; $K_{eq} = 3.6 \times 10^3$ L mol^{-1}.	84C015
		~0	1.0×10^{10}	p.r.; P.b.k. in 1 mol L^{-1} $HClO_4$ soln.	741017
		6.5	7.6×10^9	p.r.; P.b.k. at 260 nm in 5×10^{-5} mol L^{-1} Tl_2SO_4 soln.	660097
227	**Thulium(II) ion**				
	$\cdot OH + Tm^{2+} \rightarrow OH^- + Tm^{3+}$	3-6	7×10^9	p.r.; D.k. of Tm(II) formed in (5-8) $\times 10^{-2}$ mol L^{-1} Tm(III) soln.	731084

TABLE 8. Rate constants for reactions of hydroxyl radicals in aqueous solution—Continued

No.	Reaction	pH	k (L mol^{-1} s^{-1})	Comment	Ref.
228	**Uranium(III) ion**				
	$\cdot OH + U^{3+} \rightarrow UOH^{3+}$	~0.3	4.1×10^8	p.r.; D.k. at 350 nm in He-satd. soln. contg. 0.5 mol L^{-1} $HClO_4$ contg. (0.3-2.4) × 10^{-1} mol L^{-1} U^{3+}; inner-sphere mechanism.	85A122
229	**Uranium(IV) ion**				
	$\cdot OH + U^{4+} \rightarrow OH^- + U(V)$	~0	8.6×10^8	p.r.; C.k.; 1.0 mol L^{-1} $HClO_4$, (1-5) × 10^{-2} mol L^{-1} U(IV), and 5 × 10^{-3} mol L^{-1} KCNS (4-16% bound as $UCNS^{3+}$); (in 0.1 mol L^{-1} $HClO_4$ U(IV) contains 20% UOH^{3+} and $k = 9.2 \times 10^8$); rel. to $k(\cdot OH + SCN^-)$.	81A410 85A236
230	**Vanadyl(IV) ion**				
	$\cdot OH + VO^{2+} \rightarrow H^+ + VO_2^+$	~1	2.5×10^8	p.r.; C.k. in 0.1 mol L^{-1} $HClO_4$; rel. to $k(\cdot OH + SCN^-)$.	72G240
231	**Octadecatungstodiphosphate(IV) ion**				
	$\cdot OH + P_2W_{18}O_{62}^{7-} \rightarrow$	6.2	2.7×10^{11}	p.r.; Obs. second order disappearance in deaerated soln.; $P_2W_{18}O_{62}^{7-}$ formed from $e_{aq}^- + P_2W_{18}O_{62}^{6-}$.	81A385
232	**Octadecatungstodiphosphate(IV,V) ion**				
	$\cdot OH + [P_2W_{18}O_{62}\text{-}H]^{6-} \rightarrow P_2W_{18}O_{62}^{6-} + H_2O$	1.5	2.7×10^9	p.r.; D.k. at 345 nm in deaerated soln.; 10-20% of reaction is deprotonation ($\rightarrow P_2W_{18}O_{62}^{6-} + H^+$), $k \sim 5 \times 10^4$ s^{-1}; $[P_2W_{18}O_{62}\text{-}H]^{6-}$ formed from $H + P_2W_{18}O_{62}^{6-}$.	81A385
233	**Octadecatungstodiphosphate(V) ion**				
	$\cdot OH + P_2W_{18}O_{62}^{6-} \rightarrow$			No reaction, or very slow.	81A385
234	**Xenon(VI) trioxide**				
	$\cdot OH + XeO_3 \rightarrow HOOXeO_2$	8-9	$\sim 1 \times 10^7$	p.r.; P.b.k. at 400-450 nm; reported $k = 10^7$-10^8.	82A160
235	**Hydrogen xenate(VI) ion**				
	$\cdot OH + HXeO_4^- \rightarrow H^+ + HXeO_5^{2-}$	11-13	$< 5 \times 10^7$	p.r.; P.b.k. at 320 or 600 nm; assuming $pK(\cdot OH) = 11.9$.	82A160
236	**Hydrogen perxenate(VIII) ion**				
	$\cdot OH + HXeO_6^{3-} \rightarrow$	11-13	3.9×10^8	p.r.; P.b.k. assuming pK of OH = 11.9.	82A160
237	**Ytterbium(II) ion**				
	$\cdot OH + Yb^{2+} \rightarrow OH^- + Yb^{3+}$		*3.1 × 10^9*	Average of 2 values.	
		2	3.2×10^9	p.r.; D.k. (Yb^{2+} formed on p.r. of 5 × 10^{-2} mol L^{-1} Yb^{3+} soln.).	731084
			3×10^9	p.r.; D.k. (Yb^{2+}) in Ar-satd. soln. contg. Yb(III) sulfate.	720005
238	**Zinc(II) ion**				
	$\cdot OH + Zn^{2+} \rightarrow OH^- + Zn^{3+}$		$< 5 \times 10^6$	p.r.; No reaction; estd. from lack of effect of 0.25 mol L^{-1} Zn^{2+} on yield of Cu^{III} in O_2-satd. 2 × 10^{-3} mol L^{-1} Cu^{2+}.	751027
239	**1,4,8,11-Tetraazacyclotetradecanezinc(II) ion**				
	$\cdot OH + Zn(cyclam)^{2+} \rightarrow$ H abstr.		7×10^9	p.r.; P.b.k.	80A380
240	**Nitrilotriacetatozincate(II) ion**				
	$\cdot OH + ZnNTA^- \rightarrow$ H abstr.	4.0,9.0	2.0×10^9	p.r.; P.b.k. as well as c.k. with SCN^-.	78A436
241	**Ethylenediaminetetraacetatozincate(II) ion**				
	$\cdot OH + ZnEDTA^{2-} \rightarrow$ H abstr.	4.0,9.0	3.5×10^9	p.r.; P.b.k. as well as c.k. with SCN^-.	78A436
242	**Tetrakis(*p*-sulfonatophenyl)porphinatozincate(II) ion**				
	$\cdot OH + ZnTPPS^{4-} \rightarrow Zn(TPPS\text{-}OH)^{4-}$	7	$\sim 1 \times 10^{10}$	p.r.; P.b.k.	82A279
243	**Acetaldehyde**				
	$\cdot OH + CH_3CHO \rightarrow$	1	7.3×10^8	Fenton; C.k.; rel. to $k(\cdot OH + Fe^{2+})$.	490002

TABLE 8. Rate constants for reactions of hydroxyl radicals in aqueous solution—Continued

No.	Reaction	pH	k (L mol^{-1} s^{-1})	Comment	Ref.
244	**Acetamide**				
	$\cdot OH + CH_3CONH_2 \rightarrow \cdot CH_2CONH_2 + H_2O + CH_3CONH$	5.5	1.9×10^8	p.r.; C.k.; ~ 50% formn. of N radical; rel. to $k(\cdot OH + SCN^-)$.	700098
245	**2-Acetamido-2-deoxy-D-galactopyranose**				
	$\cdot OH$ + GlNAc →		1.6×10^9	p.r.; C.k.; rel. to $k(\cdot OH + SCN^-)$.	703081
246	**2-Acetamido-2-deoxy-D-glucopyranose**				
	$\cdot OH$ + GlcNAc →		3.1×10^9	p.r.; C.k.; rel. to $k(\cdot OH + SCN^-)$.	703081, 680352
247	**Acetaminophen**				
	$\cdot OH + 4\text{-}AcNHC_6H_4OH$ → addn.	7.0	9.7×10^9	p.r.; C.k. with EtOH or formate	85A460
248	**Acetanilide**				
	$\cdot OH + C_6H_5NHCOCH_3$ →	0	5.2×10^9	γ-r.; C.k. with RNO; rel. to $k(\cdot OH + EtOH)$.	660441
249	**Acetate ion**				
	$\cdot OH + CH_3CO_2^- \rightarrow \cdot CH_2CO_2^- + H_2O$		*8.5×10^7*	Average of 4 values.	
		10.7	7.4×10^7	p.r.; P.b.k. at 350 nm as well as d.k. of OH at 250 nm.	81A901
			1.0×10^8	p.r.; C.k.; obs. I_2^-; rel. to $k(\cdot OH + I^-)$.	730020
		nat.	7.9×10^7	p.r.; C.k.; rel. to $k(\cdot OH + Fe(CN)_6^{4-})$.	710578
			8.5×10^7	p.r.; P.b.k. at 350 nm.	710578
250	**Acetic acid**				
	$\cdot OH + CH_3CO_2H \rightarrow \cdot CH_2CO_2H$		*1.6×10^7*	Average of 3 values.	
		1	9.2×10^6	p.r.; D.k. at 260 nm (OH).	650010
		1.0	1.5×10^7	p.r.; C.k.; rel. to $k(\cdot OH + I^-)$.	650010
		1	2.3×10^7	p.r.; C.k.; rel. to $k(\cdot OH + SCN^-)$.	650387
251	**Acetone**				
	$\cdot OH + CH_3COCH_3$ →		*1.1×10^8*	Average of 4 values.	
		6	1.3×10^8	p.r.; C.k.; obs. $ABTS^{\cdot+}$ formn. at 415 nm; rel. to $k(\cdot OH + ABTS)$.	82A196
		nat.	1.4×10^8	p.r.; C.k.; rel. to $k(\cdot OH + Fe(CN)_6^{4-})$.	710578
		7	8.3×10^7	p.r.; C.k.; rel. to $k(\cdot OH + I^-)$.	650010
		6-7	9.7×10^7	p.r.; C.k.; rel. to $k(\cdot OH + SCN^-)$.	650387
252	**Acetone-d_6**				
	$\cdot OH + CD_3COCD_3$ →	1	2.5×10^7	Fenton; C.k.; $k(\cdot OH + MeOH)/k(\cdot OH + Fe^{2+}) = 4.3$; rel. to $k(\cdot OH + MeOH)$.	739341
253	**Acetonitrile**				
	$\cdot OH + CH_3CN$ →		2.2×10^7	p.r.; C.k.; rel. to $k(\cdot OH + PNBA^-)$.	751003
254	**Acetophenone**				
	$\cdot OH + C_6H_5COCH_3 \rightarrow HOC_6H_5COCH_3$		*5.9×10^9*	Average of 3 values.	
			5.4×10^9	p.r.; P.b.k. at 372 nm.	710578
		nat.	5.9×10^9	p.r.; C.k.; rel. to $k(\cdot OH + Fe(CN)_6^{4-})$.	710578
		7	6.5×10^9	p.r.; P.b.k. at 372 nm (hydroxycyclohexadienyl radical); cor. for (OH + OH) and (H + aromatic).	680304
255	***N*-Acetylalanine, negative ion**				
	$\cdot OH + AcAla^- \rightarrow AcNHC(CH_3)CO_2^- + H_2O$		*4.7×10^8*	Average of 2 values.	
		6.6	4.7×10^8	γ-r.; C.k.; product identified [78D088]; rel. to $k(\cdot OH + RNO)$.	760148
		9.2	4.6×10^8	p.r.; C.k.; rel. to $k(\cdot OH + SCN^-)$.	700099

TABLE 8. Rate constants for reactions of hydroxyl radicals in aqueous solution—Continued

No.	Reaction	pH	k (L mol^{-1} s^{-1})	Comment	Ref.
256	***N*-Acetylalanylalanylalanine, negative ion**				
	$\cdot OH + Ac(Ala)_3^- \rightarrow CH_3CONHC(CH_3)CO(Ala)_2^-$	9.0	3.0×10^9	p.r.; P.b.k. in buffered soln.	751004
257	***N*-Acetylalanylalanylalanylalanylalanylalanine, negative ion**				
	$\cdot OH + Ac(Ala)_6^- \rightarrow CH_3CONHC(CH_3)CO(Ala)_5^-$	9.0	2.9×10^9	p.r.; P.b.k. in buffered soln.	751004
258	**Acetylcholine**				
	$\cdot OH + C_7H_{16}NO_2^+ \rightarrow$		2.0×10^8	p.r.; C.k.; rel. to $k(\cdot OH + SCN^-)$.	78A096
259	**Acetylene**				
	$\cdot OH + HC{\equiv}CH \rightarrow \cdot CH{=}CHOH$		*4.7 × 10^9*	Average of 2 values.	
			4.5×10^9	p.r.; C.k.; rel. to $k(\cdot OH + SCN^-)$.	78A007
			4.9×10^9	p.r.; C.k.; rel. to $k(\cdot OH + Fe(CN)_6^{4-})$.	78A007
260	**2-Acetylfuran**				
	$\cdot OH + C_6H_6O_2 \rightarrow$	9	4.5×10^9	γ-r.; C.k.; method of [650356]; rel. to $k(\cdot OH$ + RNO).	83A335
261	***N*-Acetylglycine, negative ion**				
	$\cdot OH + CH_3CONHCH_2CO_2^- \rightarrow CH_3CONHCHCO_2^- + H_2O$		*4.0 × 10^8*	Average of 2 values.	
		6.6	3.8×10^8	γ-r.; C.k. in air-satd. soln.; product identified [78D088]; rel. to $k(\cdot OH$ + RNO).	760148
		8.7	4.2×10^8	p.r.; C.k.; rel. to $k(\cdot OH + SCN^-)$.	700099
262	***N*-Acetylglycylglycinamide**				
	$\cdot OH + AcGlyGlyNH_2 \rightarrow CH_3CONHCHCOGlyNH_2 + H_2O$	6.0	8.6×10^8	p.r.; P.b.k. in buffered soln.	751004
263	***N*-Acetylglycylglycine, negative ion**				
	$\cdot OH + AcGlyGly^- \rightarrow CH_3CONHCHCOGly^- + H_2O$	8.6	7.8×10^8	p.r.; C.k.; rel. to $k(\cdot OH + SCN^-)$.	700099
264	***N*-Acetylglycylglycylglycine, negative ion**				
	$\cdot OH + AcGlyGlyGly^- \rightarrow CH_3CONHCHCOGlyGly^- + H_2O$	9.0	2.4×10^9	p.r.; P.b.k. in buffered N_2O-satd. soln.	751004
265	***N*-Acetylleucine, negative ion**				
	$\cdot OH + (CH_3)_2CHCH_2CH(NHAc)CO_2^- \rightarrow$	6.4	3.1×10^9	γ-r.; C.k.; rel. to $k(\cdot OH$ + RNO).	760148
266	***N*-Acetylmethionine, negative ion**				
	$\cdot OH + AcMet^- \rightarrow$	6.4	6.7×10^9	p.r.; P.b.k. at 295 nm; unbuffered soln.	741129
267	**Acetyl peroxide**				
	$\cdot OH + (CH_3CO)_2O_2 \rightarrow$	7	6.0×10^7	p.r.; C.k. in soln. contg. 2×10^{-3} mol L^{-1} SCN^-; rel. to $k(\cdot OH + SCN^-)$.	81A374
268	***N*-Acetylsarcosylsarcosylsarcosine, negative ion**				
	$\cdot OH + AcSarSarSar^- \rightarrow CH_3CONHCHCOGlySarSar^- + H_2O$	9.0	3.8×10^9	p.r.; P.b.k. in buffered soln.; mixture of radicals.	751004
269	***N*-Acetylserinamide**				
	$\cdot OH + AcSer \rightarrow$	6.0	7.6×10^8	p.r.; P.b.k. in buffered soln.	751004
270	***N*-Acetylvaline, negative ion**				
	$\cdot OH + (CH_3)_2CHCH(NHAc)CO_2^- \rightarrow$	6.6	1.4×10^9	γ-r.; C.k.; rel. to $k(\cdot OH$ + RNO).	760148
271	**Acid Blue 40 monoanion**				
	$\cdot OH + AB\text{-}40 \rightarrow$		*1.2 × 10^{10}*	Average of 6 values.	
		6.3	1.3×10^{10}	γ-r.; C.k.; obs. G(-dye); rel. to $k(\cdot OH$ + 1-PrOH).	760062
		6.3	1.1×10^{10}	γ-r.; C.k.; obs. G(-dye); rel. to $k(\cdot OH$ + MeOH).	760062
		6.3	1.3×10^{10}	γ-r.; C.k.; obs. G(-dye); rel. to $k(\cdot OH$ + *tert*-BuOH).	760062
		6.3	1.4×10^{10}	γ-r.; C.k.; obs. G(-dye); rel. to $k(\cdot OH$ + BuOH).	760062

TABLE 8. Rate constants for reactions of hydroxyl radicals in aqueous solution—Continued

No.	Reaction	pH	k (L mol^{-1} s^{-1})	Comment	Ref.
271	**Acid Blue 40 monoanion**—Continued				
		6.3	1.3×10^{10}	γ-r.; C.k.; obs. G(-dye); rel. to k(·OH + SCN^-).	760062
		6.3	1.1×10^{10}	γ-r.; C.k.; obs. G(-dye); rel. to k(·OH + EtOH).	760062
272	**Acid Red 265 dianion**				
	·OH + AR-265 →		*1.7 × 10^{10}*	Average of 10 values.	
		6.4	1.7×10^{10}	γ-r.; C.k.; obs. G(-dye); rel. to k(·OH + SCN^-).	750188
		6.4	2.2×10^{10}	γ-r.; C.k.; obs. G(-dye); rel. to k(·OH + PhOH).	750188
		6.4	1.9×10^{10}	γ-r.; C.k.; obs. G(-dye); rel. to k(·OH + 1-PrOH).	750188
		6.4	1.7×10^{10}	γ-r.; C.k.; obs. G(-dye); rel. to k(·OH + $(CH_3)_2CHCH_2OH$).	750188
		6.4	1.9×10^{10}	γ-r.; C.k.; obs. G(-dye); rel. to k(·OH + *tert*-BuOH).	750188
		6.4	1.6×10^{10}	γ-r.; C.k.; obs. G(-dye); rel. to k(·OH + MeOH).	750188
		6.4	1.4×10^{10}	γ-r.; C.k.; obs. G(-dye); rel. to k(·OH + EtOH).	750188
		6.4	1.9×10^{10}	γ-r.; C.k.; obs. G(-dye); rel. to k(·OH + BuOH).	750188
		6.4	1.7×10^{10}	γ-r.; C.k.; obs. G(-dye); rel. to k(·OH + $C_2H_5CH(OH)CH_3$).	750188
		6.4	1.3×10^{10}	γ-r.; C.k.; obs. G(-dye); rel. to k(·OH + glucose).	750188
273	**Acridine Orange**				
	·OH + AO → AO-OH	~7	$\sim 9 \times 10^9$	p.r.; Transient formn. in soln. contg. 10^{-5} mol L^{-1} dye.	82A071
274	**Acriflavin**				
	·OH + $ACFl^+$ →		1.2×10^{10}	p.r.; D.k. at 450 nm (dye) or p.b.k. at 300-400 nm.	700241
275	**Acrolein**				
	·OH + $H_2C{=}CHCHO$ → $HOCH_2\dot{C}HCHO$		7.0×10^9	p.r.; C.k.; rel. to k(·OH + SCN^-).	700165
276	**Acrylamide**				
	·OH + $H_2C{=}CHCONH_2$ → $CH_3\dot{C}OHCONH_2$		*5.9 × 10^9*	Average of 4 values.	
		7-7.2	4.7×10^9	p.r.; C.k.; rel. to k(·OH + SCN^-).	80A240
		nat.	5.3×10^9	p.r.; C.k.; rel. to k(·OH + $Fe(CN)_6^{4-}$).	710578
			6.8×10^9	p.r.; P.b.k. at 390 nm.	710578
		~12	6.6×10^9	p.r.; C.k. at pH 10.9 and 12.9; rel. to k(·OH + CO_3^{2-}).	700052
277	**Acrylate ion**				
	·OH + $CH_2{=}CHCO_2^-$ →	7-7.2	5.7×10^9	p.r.; C.k.; rel. to k(·OH + SCN^-).	80A240
278	**Acrylic acid**				
	·OH + $H_2C{=}CHCO_2H$ →	1	1.5×10^9	Fenton; C.k.; k(·OH + MeOH)/k(·OH + Fe^{2+}) = 4.3; rel. to k(·OH + MeOH).	739341
279	**Acrylonitrile**				
	·OH + $H_2C{=}CHCN$ → $HOCH_2\dot{C}HCN$		*4.0 × 10^9*	Average of 2 values.	
		7-7.2	5.2×10^9	p.r.; C.k.; rel. to k(·OH + SCN^-).	80A240
		10.9	2.8×10^9	p.r.; C.k.; rel. to k(·OH + CO_3^{2-}).	79A144
280	**Adenine**				
	·OH + A → A-OH		*6.1 × 10^9*	Average of 2 values.	
		5.7	5.8×10^9	p.r.; P.b.k. at 450 nm.	703069
		5-5.5	6.3×10^9	p.r.; C.k.; at pH 7.3-7.5 $k = 5.1 \times 10^9$; rel. to k(·OH + SCN^-).	650388

TABLE 8. Rate constants for reactions of hydroxyl radicals in aqueous solution—Continued

No.	Reaction	pH	k (L mol^{-1} s^{-1})	Comment	Ref.
281	**Adenine, conjugate acid**				
	$\cdot OH + AH^+ \rightarrow AH^+\text{-}OH$	2-2.2	8.8×10^8	p.r.; C.k.; pK_a = 4.2, 9.8; rel. to $k(\cdot OH + SCN^-)$.	650388
282	**Adenosine**				
	$\cdot OH + A \rightarrow$		*5.8 × 10^9*	Average of 2 values.	
		5.5	5.2×10^9	p.r.; P.b.k. at 350 nm.	703069
		5-5.5	6.3×10^9	p.r.; C.k., at pH 7.3-7.5 $k = 4.2 \times 10^9$; rel. to $k(\cdot OH + SCN^-)$.	650388
283	**Adenosine, conjugate acid**				
	$\cdot OH + AH^+ \rightarrow$	2-2.2	1.9×10^9	p.r.; C.k.; pK_a 3.5, 12.3; rel. to $k(\cdot OH + SCN^-)$.	650388
284	**Adenosine diphosphate**				
	$\cdot OH$ + ADP →	~7	8.1×10^9	γ-r.; C.k.; obs. G(inorg. phosphate); 1.4% oxididative dephosphorylation; rel. to $k(\cdot OH$ + *tert*-BuOH).	753070
285	**Adenosine 5′-diphosphoribose**				
	$\cdot OH$ + ADPR →	7	4.2×10^9	γ-r.; C.k.; rel. to $k(\cdot OH$ + RNO).	80A313
286	**Adenosine 5′-monophosphate**				
	$\cdot OH + AMP \rightarrow AMP\text{-}OH$		*4.1 × 10^9*	Average of 3 values.	
		7	4.7×10^9	p.r.; P.b.k.	731071
		6.9	4.7×10^9	p.r.; P.b.k. at 350 nm.	703069
		5.2-5.5	3.0×10^9	p.r.; C.k.; rel. to $k(\cdot OH + SCN^-)$.	650388
287	**Adenosine 5′-monophosphate, conjugate acid**				
	$\cdot OH + AMPH^+ \rightarrow$	2-2.2	1.2×10^9	p.r.; C.k.; pK_a = 3.7, 6.4, 6.67, 13.06; rel. to $k(\cdot OH + SCN^-)$.	650388
288	**Adenosine 3′-monophosphate**				
	$\cdot OH$ + 3′-AMP →	~7	7.5×10^9	γ-r.; C.k.; obs. G(inorg. phosphate); 17.3% oxidative dephosphorylation; rel. to $k(\cdot OH$ + *tert*-BuOH).	753070
289	**Adenosine triphosphate**				
	$\cdot OH$ + ATP →	~7	8.9×10^9	γ-r.; C.k.; obs. G(inorg. phosphate); 0.3% oxidative dephosphorylation; rel. to $k(\cdot OH$ + *tert*-BuOH).	753070
290	**Adipic acid**				
	$\cdot OH + HO_2C(CH_2)_4CO_2H \rightarrow$	2-2.2	2.0×10^9	γ-r.; C.k.; rel. to $k(\cdot OH$ + 5-MeU).	670461
291	**Adrenaline**				
	$\cdot OH$ + Adr →	9.2	2.2×10^{10}	p.r.; C.k.; >60% oxyanion; rel. to $k(\cdot OH + SCN^-)$.	771029
292	**Adrenaline, conjugate acid**				
	$\cdot OH + MeNH_2{}^+CH_2CHOHC_6H_3(OH)_2 \rightarrow$	1	1.6×10^{10}	p.r.; C.k.; pK_a = 2.7, 9, 11; rel. to $k(\cdot OH + SCN^-)$.	761130
293	**Adrenalone**				
	$\cdot OH + MeNHCH_2COC_6H_3(OH)_2 \rightarrow MeNHCH_2COC_6H_3(OH)_3$	7.5	1.8×10^{10}	p.r.; C.k.; pK_a = 6.8; product dehydrates forming aryloxy radical; rel. to $k(\cdot OH$ + DCIP).	79A240 79A303
294	**Alanine**				
	$\cdot OH$ + Ala →	5.5-6	7.7×10^7	p.r.; C.k.; rel. to $k(\cdot OH + SCN^-)$.	650388
295	**Alanine, conjugate acid**				
	$\cdot OH + AlaH^+ \rightarrow$		*5.4 × 10^7*	Average of 2 values.	
		1	5.2×10^7	Fenton; esr; C.k. with H_2O_2; rel. to $k(\cdot OH$ + 5-MeU).	69D278
		2-2.2	5.6×10^7	γ-r.; C.k.; pK_a = 2.4, 9.8; rel. to $k(\cdot OH$ + 5-MeU).	670461

TABLE 8. Rate constants for reactions of hydroxyl radicals in aqueous solution—Continued

No.	Reaction	pH	k (L mol^{-1} s^{-1})	Comment	Ref.
296	**Alanine, negative ion**				
	$\cdot OH + Ala^- \rightarrow$	9.75	7.5×10^8	X-r.; C.k.; 50% zwitterion; not cor. for H_2O_2; at pH 6 $k = 5.2 \times 10^7$; rel. to $k(\cdot OH + Fe(CN)_6^{4-})$.	620023
297	**Alanine anhydride**				
	$\cdot OH$ + -CH(Me)CONHCH(Me)CONH- $\rightarrow$ -NHCOC(Me)NHCOCH(Me)- + H_2O	5.0	1.8×10^9	p.r.; C.k.; same rate at pH 11; rel. to $k(\cdot OH + SCN^-)$.	710554
298	**Alanylalanylalanylalanylalanylalanine, conjugate acid**				
	$\cdot OH + (Ala_6)H^+ \rightarrow$	3.6	1.7×10^9	p.r.; P.b.k. in buffered soln.	751004
299	**Alanylglycine**				
	$\cdot OH$ + AlaGly $\rightarrow$ AlaCONHCHCO$_2^-$ + H_2O	7.1	3.9×10^8	γ-r.; C.k.; rel. to $k(\cdot OH$ + RNO).	760148
300	**Alanylglycine, conjugate acid**				
	$\cdot OH + AlaGly^+ \rightarrow$	2-2.2	1.9×10^8	γ-r.; C.k.; pK_a = 3.16, 8.24; rel. to $k(\cdot OH$ + 5-MeU).	650388
301	**β-Alanylhistidine, conjugate monoacid**				
	$\cdot OH + \beta$-AlaHisH$^+ \rightarrow$	4.0	3.0×10^9	p.r.; P.b.k. in unbuffered soln.	771122
302	**β-Alanylhistidine, negative ion**				
	$\cdot OH + \beta$-AlaHis$^- \rightarrow$	10.2	9.6×10^9	p.r.; P.b.k. in unbuffered soln.	771122
303	**Allyl alcohol**				
	$\cdot OH + H_2C{=}CHCH_2OH \rightarrow$ $CH_2OHCHCH_2OH$ + $\cdot CH_2CHOHCH_2OH$		*6.0×10^9*	Average of 2 values.	
		7-7.2	5.9×10^9	p.r.; C.k.; rel. to $k(\cdot OH + SCN^-)$.	80A240
		7.0	6.0×10^9	p.r.; P.b.k.; 12% H abstr.	731070
304	**Allylammonium ion**				
	$\cdot OH + CH_2{=}CHCH_2NH_3^+ \rightarrow$	4	8.6×10^9	p.r.; C.k.; rel. to $k(\cdot OH + SCN^-)$.	700371
305	**Allyl cyanide**				
	$\cdot OH + H_2C{=}CHCH_2CN \rightarrow$	7-7.2	6.9×10^9	p.r.; C.k.; rel. to $k(\cdot OH + SCN^-)$.	80A240
306	**2-Aminobenzoate ion**				
	$\cdot OH$ + 2-$H_2NC_6H_4CO_2^- \rightarrow$ 2-$H_2NC_6H_4(OH)CO_2^-$	6.2	1.1×10^{10}	p.r.; P.b.k.; pK_a = 2, 5.	741063
307	**3-Aminobenzoate ion**				
	$\cdot OH$ + 3-$H_2NC_6H_4CO_2^- \rightarrow$ 3-$H_2NC_6H_4(OH)CO_2^-$		8.8×10^9	p.r.; C.k. in soln. contg. 5×10^{-3} mol L^{-1} carbonate; rel. to $k(\cdot OH + CO_3^{2-})$.	80A202
308	**4-Aminobenzoate ion**				
	$\cdot OH$ + 4-$H_2NC_6H_4CO_2^- \rightarrow$ 4-$H_2NC_6H_4(OH)CO_2^-$	9	8.2×10^9	γ-r.; C.k. with RNO; pK_a = 2.4, 5; rel. to $k(\cdot OH$ + EtOH)	660441
		6-7	1.6×10^{10}	p.r.; C.k.; rel. to $k(\cdot OH + SCN^-)$.	650387
309	**2-Aminobutyric acid**				
	$\cdot OH + CH_3CH_2CH(NH_3^+)CO_2^- \rightarrow$	6.4-6.9	5.3×10^8	γ-r.; C.k.; rel. to $k(\cdot OH$ + RNO).	760147
310	**2-Aminobutyric acid, conjugate acid**				
	$\cdot OH + CH_3CH_2CH(NH_3^+)CO_2H \rightarrow$	2-2.2	4.5×10^8	γ-r.; C.k.; pK_a = 2.4, 9.7; rel. to $k(\cdot OH$ + 5-MeU).	670461
311	**3-Aminobutyric acid, conjugate acid**				
	$\cdot OH + CH_3CH(NH_3^+)CH_2CO_2H \rightarrow$	2-2.2	9.3×10^7	γ-r.; C.k.; pK_a = 3.5, 10.4; rel. to $k(\cdot OH$ + 5-MeU).	670461
312	**4-Aminobutyric acid**				
	$\cdot OH + H_3N^+(CH_2)_3CO_2^- \rightarrow$	6.4-6.9	4.4×10^8	γ-r.; C.k.; rel. to $k(\cdot OH$ + RNO).	760147
313	**4-Aminobutyric acid, conjugate acid**				
	$\cdot OH + H_3N^+(CH_2)_3CO_2H \rightarrow$	2-2.2	2.6×10^8	γ-r.; C.k.; pK_a = 4.23, 10.43; rel. to $k(\cdot OH$ + 5-MeU).	670461

TABLE 8. Rate constants for reactions of hydroxyl radicals in aqueous solution—Continued

No.	Reaction	pH	k (L mol^{-1} s^{-1})	Comment	Ref.
814	**2-Amino-2-deoxy-D-galactose**				
	$\cdot OH + GlNH_2 \rightarrow$		1.2×10^9	p.r.; C.k.; rel. to $k(\cdot OH + SCN^-)$.	703081
815	**2-Amino-2-(hydroxymethyl)-propane-1,3-diol (Tris)**				
	$\cdot OH + (HOCH_2)_3CNH_2 \rightarrow$	8	1.5×10^9	γ-r.; C.k. in aerated soln. of phosphate buffer; $pK_a = 8.3$; rel. to $k(\cdot OH + 5\text{-MeU})$.	86G027
816	**5-Aminoindole**				
	$\cdot OH + 5\text{-}InNH_2 \rightarrow$	9.0	3.3×10^{10}	γ-r.; C.k. with RNO; rel. to $k(\cdot OH + TrpH)$.	710556
817	**1-Aminonaphthalene-4-sulfonate ion**				
	$\cdot OH + AnsH \rightarrow$	~7	7.3×10^9	p.r.; P.b.k. at 550 nm.	78A328
818	**2-[(3-Aminopropyl)amino]ethanethiol**				
	$\cdot OH + {}^-S(CH_2)_2NH(CH_2)_3NH_3^+ \rightarrow H_2O + \cdot S(CH_2)_2NH(CH_2)_3NH_3^+$	7	8.4×10^9	p.r.; C.k.; pK_a of the SH group was detd. to be 7.3; rel. to $k(\cdot OH + SCN^-)$.	84A411
819	**2-Aminopyridine**				
	$\cdot OH + pyNH_2 \rightarrow$	9	8.4×10^9	γ-r.; C.k.; rel. to $k(\cdot OH + RNO)$.	690280
820	**4-Aminopyridine**				
	$\cdot OH + pyNH_2 \rightarrow$	9	5.0×10^9	γ-r.; C.k.; rel. to $k(\cdot OH + RNO)$.	690280
821	**2-Aminopyrimidine**				
	$\cdot OH + 2\text{-}AmPm \rightarrow$	6-7	4.0×10^8	γ-r.; C.k.; rel. to $k(\cdot OH + RNO)$.	750294
822	**D-Amygdalin**				
	$\cdot OH + C_{20}H_{27}NO_{11} \rightarrow$ addn.		*4.2 × 10⁹*	Average of 2 values.	
			4.6×10^9	p.r.; C.k.; overall rate includes addn. and abstr.; rel. to $k(\cdot OH + Fe(CN)_6^{4-})$.	80A433
			3.7×10^9	p.r.; P.b.k. at 310 nm (hydroxycyclohexadienyl radical).	80A433
823	***tert*-Amyl alcohol**				
	$\cdot OH + C_2H_5C(CH_3)_2OH \rightarrow$	9	1.9×10^9	γ-r.; C.k. with RNO; rel. to $k(\cdot OH + EtOH)$.	660423
824	***n*-Amylamine**				
	$\cdot OH + CH_3(CH_2)_4NH_2 \rightarrow$		*8.3 × 10⁹*	Average of 3 values.	
			7.0×10^9	p.r.; C.k.; calcd. from obs. values at pH 8-13.1; rel. to $k(\cdot OH + NB)$.	730016
			9.0×10^9	p.r.; C.k.; calcd. from obs. values at pH 8-13.1; rel. to $k(\cdot OH + SCN^-)$.	730016
			8.9×10^9	p.r.; C.k.; calcd. from obs. values at pH 8-13.1; rel. to $k(\cdot OH + Fe(CN)_6^{4-})$.	730016
825	**Amylammonium ion**				
	$\cdot OH + n\text{-}C_5H_{11}NH_3^+ \rightarrow$		4.7×10^9	p.r.; C.k.; calcd. from obs. values at pH 8-13.1; rel. to $k(\cdot OH + SCN^-)$.	730016
			6.3×10^9	p.r.; C.k.; calcd. from obs. values at pH 8-13.1; rel. to $k(\cdot OH + Fe(CN)_6^{4-})$.	730016
			3.4×10^9	p.r.; C.k.; calcd. from obs. values at pH 8-13.1; rel. to $k(\cdot OH + NB)$.	730016
		4	9.8×10^9	p.r.; C.k.; rel. to $k(\cdot OH + SCN^-)$.	700371
826	**Aniline**				
	$\cdot OH + C_6H_5NH_2 \rightarrow HOC_6H_5NH_2$		*1.4 × 10¹⁰*	Average of 5 values.	
		8.1-9.2	1.7×10^{10}	p.r.; C.k.; cor. for formn. of aniline transients; rel. to $k(\cdot OH + SCN^-)$.	86A365
		8.4-9.5	1.5×10^{10}	p.r.; C.k.; rel. to $k(\cdot OH + EtOH)$.	86A365
		8-9.4	1×10^{10}	p.r.; C.k.; rel. to $k(\cdot OH + MeOH)$.	86A365
		5.0, 11.1	8.6×10^9	p.r.; P.b.k. at 375 or 395 nm in soln. contg. 2×10^{-4} mol L^{-1} aniline; $pK_a = 4.6$; cor. for O^- (14% present), at pH 11.1 $k_{obs} = 7.3 \times 10^9$; radical cation formed by OH^- elimination has pK_a of = 7.05.	85A428

TABLE 8. Rate constants for reactions of hydroxyl radicals in aqueous solution—Continued

No.	Reaction	pH	k (L mol^{-1} s^{-1})	Comment	Ref.
326	**Aniline**—Continued				
		8,11	1.4×10^{10}	p.r.; P.b.k. at 355 nm, (cyclohexadienyl radical), 295 (anilino radical), and 500 nm.	720289
327	**Anilinium ion** $\cdot OH + C_6H_5NH_3^+ \rightarrow H_2O + C_6H_5NH_2^+ + HOC_6H_5NH_3^+$		*5.1 × 10^9*	Average of 2 values.	
		~4	4.8×10^9	p.r.; P.b.k. at 415 nm; pK_a 4.5.	720289
		3	5.4×10^9	p.r.; C.k.; pH study; rel. to $k(\cdot OH + SCN^-)$.	690573
328	**Anisole** $\cdot OH + C_6H_5OCH_3 \rightarrow HOC_6H_5OCH_3$	6.5	5.4×10^9	p.r.; P.b.k.	751171
329	**9,10-Anthraquinone-1-sulfonate ion** $\cdot OH + 1\text{-}SO_3AQ^- \rightarrow 1\text{-}SO_3AQ(OH)\cdot^-$		7.2×10^9	p.r.; P.b.k. at ~ 460 nm	720391
330	**9,10-Anthraquinone-2-sulfonate ion** $\cdot OH + 2\text{-}SO_3AQ^- \rightarrow 2\text{-}SO_3AQ(OH)\cdot^-$		5.6×10^9	p.r.; P.b.k. at ~ 460 nm	720391
331	**9-Anthroate ion** $\cdot OH + 9\text{-}AnCO_2^- \rightarrow 9\text{-}An(OH)CO_2^-$	9	8.0×10^9	p.r.; P.b.k. at 325 nm.	730110
332	**Arabinitol** $\cdot OH + C_5H_{12}O_5 \rightarrow C_5H_{11}O_5 + H_2O$	7	1.8×10^9	p.r.; C.k.; rel. to $k(\cdot OH + SCN^-)$.	79A366
333	**Arabinose** $\cdot OH + C_5H_{10}O_5 \rightarrow C_5H_9O_5 + H_2O$	7	1.8×10^9	p.r.; C.k.; rel. to $k(\cdot OH + SCN^-)$.	79A366
334	**Arginine, conjugate monoacid** $\cdot OH + ArgH^+ \rightarrow$	6.5-7.5	3.5×10^9	p.r.; C.k.; pK_a = 1.9, 9.7, 12.4; at pH 2-2.2 $k = 6.7 \times 10^8$; rel. to $k(\cdot OH + SCN^-)$.	650388
335	**Ascorbate ion** $\cdot OH + AH^- \rightarrow H_2O + \cdot A^-$	11.0	4.1×10^9	p.r.; P.b.k.; pK_a = 4.1, 11.8	771036
		7	1.1×10^{10}	p.r.; P.b.k. at 360 nm.	733006
		7-8	6.5×10^9	p.r.; C.k.; obs. ascorbate radical at 360 nm; rel. to $k(\cdot OH + Phe)$.	733006
		7	1.3×10^{10}	p.r.; C.k.; rel. to $k(\cdot OH + SCN^-)$.	720266
336	**L-Ascorbate-2-sulfate ion** $\cdot OH + [2\text{-}SO_4A]^{2-} \rightarrow$ addn.		4.2×10^9	p.r.; D.k. at 254 nm; p.b.k. at 360 ($A\cdot^-$) and 290 nm ($[2\text{-}SO_4A]\cdot^-$) gave $(4.5 \pm 0.3) \times 10^9$; intermediate OH-adducts postulated.	83A203
337	**Ascorbic acid** $\cdot OH + AH_2 \rightarrow H_2O + \cdot AH$		*1.0 × 10^{10}*	Average of 2 values.	
		1.5	8.2×10^9	p.r.; C.k.; rel. to $k(\cdot OH + SCN^-)$.	720266
		1	1.2×10^{10}	p.r.; C.k.; rel. to $k(\cdot OH + SCN^-)$.	650387
338	**Asparagine** $\cdot OH + Asn \rightarrow$	6.6	4.9×10^7	γ-r.; C.k.; rel. to $k(\cdot OH + RNO)$.	730548
339	**Asparagine, conjugate monoacid** $\cdot OH + AsnH^+ \rightarrow$	2-2.2	3.8×10^7	γ-r.; C.k.; pK_a = 2.2, 8.85; rel. to $k(\cdot OH$ + 5-MeU).	670461
340	**Aspartate monoanion** $\cdot OH + Asp^- \rightarrow$	6.8-7	7.5×10^7	p.r.; C.k.; pK_a = 2.09, 3.86, 9.82; at pH 2-2.2 $k = 3.9 \times 10^7$; rel. to $k(\cdot OH + SCN^-)$.	650388
341	**5-Azacytidine** $\cdot OH$ + 5-AzaCy → 5-AzaCy-OH	8.0	2.7×10^9	p.r.; C.k. in soln. contg. 2×10^{-3} mol L^{-1} phosphate buffer; similar value obtained rel. to $k(\cdot OH + Fe(CN)_6^{4-}) = 9.3 \times 10^9$; rel. to $k(\cdot OH + SCN^-)$.	83A297

TABLE 8. Rate constants for reactions of hydroxyl radicals in aqueous solution—Continued

No.	Reaction	pH	k (L mol^{-1} s^{-1})	Comment	Ref.
842	**5-Azacytosine**				
	•OH + 5-AzaCy → 5-AzaCy-OH	8.0	2.1×10^9	p.r.; C.k. in soln. contg. 2×10^{-3} mol L^{-1} phosphate buffer; similar value obtained rel to k(•OH + $Fe(CN)_6^{4-}$) = 9.3×10^9; rel. to k(•OH + SCN^-).	83A297
843	**6-Azacytosine**				
	•OH + 6-AzaCy → 6-AzaCy-OH	8.0	4.5×10^9	p.r.; C.k. in soln. contg. 2×10^{-3} mol L^{-1} phosphate buffer; similar value obtained rel. to k(•OH + $Fe(CN)_6^{4-}$) = 9.3×10^9; rel. to k(•OH + SCN^-).	83A297
844	**6-Azathymine**				
	•OH + 6-Aza-5-MeU → 6-Aza-5-MeU-OH	8.0	2.8×10^9	p.r.; C.k. in soln. contg. 2×10^{-3} mol L^{-1} phosphate buffer; similar value obtained rel. to k(•OH + $Fe(CN)_6^{4-}$) = 9.3×10^9; rel. to k(•OH + SCN^-).	83A297
845	**5-Azauracil**				
	•OH + 5-AzaU → 5-AzaU-OH	8.0	7.0×10^9	p.r.; C.k. in soln. contg. 2×10^{-3} mol L^{-1} phosphate buffer; similar value obtained rel. to k(•OH + $Fe(CN)_6^{4-}$) = 9.3×10^9; rel. to k(•OH + SCN^-).	83A297
846	**6-Azauracil**				
	•OH + 6-AzaU → 6-AzaU-OH	8.0	4.5×10^9	p.r.; C.k. in soln. contg. 2×10^{-3} mol L^{-1} phosphate buffer; similar value obtained rel. to k(•OH + $Fe(CN)_6^{4-}$) = 9.3×10^9; rel. to k(•OH + SCN^-).	83A297
847	**6-Azauridine**				
	•OH + 6-AzaUr → 6-AzaUr-OH	8.0	7.2×10^9	p.r.; C.k. in soln. contg. 2×10^{-3} mol L^{-1} phosphate buffer; similar value obtained rel. to k(•OH + $Fe(CN)_6^{4-}$) = 9.3×10^9; rel. to k(•OH + SCN^-).	83A297
848	**Azelaic acid**				
	•OH + $HO_2C(CH_2)_7CO_2H$ →	2-2.2	5.4×10^9	γ-r.; C.k.; rel. to k(•OH + 5-MeU).	670461
849	**2,2′-Azinobis(3-ethylbenzothiazoline-6-sulfonate ion)**				
	•OH + ABTS → OH^- + $ABTS^{\bullet+}$		**1.2×10^{10}**	**Selected value.**	
		6	1.2×10^{10}	p.r.; P.b.k. at 415 nm.	82A196
850	**1,1′-Azobis(*N,N*-dimethylformide) (Diamide)**				
	•OH + $(CH_3)_2NCON{=}NCON(CH_3)_2$ →		*5.1×10^9*	Average of 4 values.	
		4-8	4.2×10^9	p.r.; C.k.; rel. to k(•OH + Phe).	751194
		7.1	7.7×10^9	p.r.; P.b.k. at 400 nm.	741061
		10.3-11	5.5×10^9	p.r.; C.k.; rel. to k(•OH + CO_3^{2-}).	741061
		7	3.0×10^9	p.r.; C.k.; rel. to k(•OH + SCN^-).	741061
851	**Benzaldehyde**				
	•OH + C_6H_5CHO →	9	4.4×10^9	γ-r.; C.k.; rel. to k(•OH + RNO).	690280
852	**Benzamide**				
	•OH + $C_6H_5CONH_2$ →		*3.4×10^9*	Average of 2 values.	
		9	4.6×10^9	γ-r.; C.k. with RNO, rel. to k(•OH + EtOH).	660441
		1	2.2×10^9	Fenton; C.k.; rel. to k(•OH + Fe^{2+}).	490003
853	**Benzene**				
	•OH + PhH → C_6H_6OH		*7.8×10^9*	Average of 4 values.	
		7	7.8×10^9	p.r.; P.b.k. at 512 nm in soln. contg. 10^{-3} mol L^{-1} N_2O.	771012
			8.2×10^9	p.r.; C.k.; k lowered in presence of surfactants; rel. to k(•OH + SCN^-).	710001 710586
		7.0	7.5×10^9	p.r.; C.k.; obs. formn. of $PNBA^-$-OH adduct at 415 nm; rel. to k(•OH + $PNBA^-$).	700211

TABLE 8. Rate constants for reactions of hydroxyl radicals in aqueous solution—Continued

No.	Reaction	pH	k (L mol^{-1} s^{-1})	Comment	Ref.
353	**Benzene**—Continued				
		7	7.8×10^9	p.r.; P.b.k. at 313 nm; cor. for (OH + OH) and (H + aromatic).	680304
354	**Benzene-d_6**				
	$\cdot OH + C_6D_6 \rightarrow C_6D_6OH$		4.7×10^9	p.r.; P.b.k. at 313 nm; no isotope effect obs.	620020
355	**Benzenesulfonamide**				
	$\cdot OH + C_6H_5SO_2NH_2 \rightarrow$		*2.8×10^9*	Average of 2 values.	
			2.8×10^9	γ-r.; C.k. with RNO; rel. to k(·OH + 4-$H_2NC_6H_4SO_3^-$).	730094
		9	2.9×10^9	γ-r.; C.k. with RNO; rel. to k(·OH + EtOH).	660441
356	**Benzenesulfonate ion**				
	$\cdot OH + C_6H_5SO_3^- \rightarrow C_6H_5(OH)SO_3^-$	7	4.7×10^9	p.r.; P.b.k. at 315 nm; cor. for (OH + OH) and (H + aromatic).	680304
357	**Benzenesulfonic acid**				
	$\cdot OH + C_6H_5SO_3H \rightarrow$	1	1.6×10^9	Fenton; C.k.; pK_a = 0.7; rel. to k(·OH + Fe^{2+}).	490003
358	**Benzhydrylammonium ion**				
	$\cdot OH + (C_6H_5)_2CHNH_3^+ \rightarrow HOC_6H_5CH(C_6H_5)NH_3^+$	7	6.9×10^9	p.r.; P.b.k. at 320 nm in N_2O-satd. soln.	86A410
359	**Benzoate ion**				
	$\cdot OH + C_6H_5CO_2^- \rightarrow HOC_6H_5CO_2^-$		**5.9×10^9**	**Selected value.**	
		6	6.2×10^9	p.r.; C.k.; obs. $ABTS^{\cdot+}$ formn. at 415 nm; rel. to k(·OH + ABTS).	82A196
		~7	5.7×10^9	p.r.; P.b.k. at 345 nm.	710282
		nat.	6.1×10^9	p.r.; C.k.; rel. to k(·OH + $Fe(CN)_6^{4-}$).	710578
		7	5.7×10^9	p.r.; P.b.k. at 330 nm.	710578
		6-9.4	6.0×10^9	p.r.; P.b.k. at 330 nm; cor. for (OH + OH) and (H + aromatic).	680304
		6-7	5.5×10^9	p.r.; C.k.; rel. to k(·OH + SCN^-).	650387
360	**Benzoflavine**				
	·OH + BZFl → BzFl(OH)	6.5	1.4×10^{10}	p.r.; D.k.(bleaching); p.b.k. at 300-390 nm gave $k = 1.2 \times 10^{10}$.	78A153
361	**Benzoic acid**				
	$\cdot OH + C_6H_5CO_2H \rightarrow HOC_6H_5CO_2H$	≤ 3	4.3×10^9	p.r.; P.b.k. at 340 nm; cor. for (H· + BzOH) and (·OH + ·OH).	680229
362	**Benzonitrile**				
	$\cdot OH + C_6H_5CN \rightarrow HOC_6H_5CN$		*4.4×10^9*	Average of 2 values.	
			3.9×10^9	p.r.; C.k.; rel. to k(·OH + SCN^-).	700657
		7	4.9×10^9	p.r.; P.b.k. at 348 nm; cor. for (OH + OH) and (H + aromatic).	680304
363	**Benzophenone**				
	$\cdot OH + (C_6H_5)_2CO \rightarrow HOC_6H_5COC_6H_5$		*8.8×10^9*	Average of 2 values.	
			9×10^9	p.r.; P.b.k. at 330 nm.	751125
			8.7×10^9	p.r.; P.b.k. at 380 nm.	680727
364	**1,4-Benzoquinone**				
	$\cdot OH + Q \rightarrow Q(OH)\cdot$	~7	1.2×10^9	p.r.; P.b.k.(OH adduct at 415 nm).	670121
365	**Benzyl alcohol**				
	$\cdot OH + C_6H_5CH_2OH \rightarrow HOC_6H_5CH_2OH$	7	8.4×10^9	p.r.; P.b.k. at 320 nm; cor. for (OH + OH) and (H + aromatic).	680304

TABLE 8. Rate constants for reactions of hydroxyl radicals in aqueous solution—Continued

No.	Reaction	pH	k (L mol^{-1} s^{-1})	Comment	Ref.
366	**Benzylammonium ion**				
	$\cdot OH + C_6H_5CH_2NH_3^+ \rightarrow HOC_6H_5CH_2NH_3^+$	7	5.5×10^9 [b]	p.r.; P.b.k. at 312 nm in N_2O-satd. soln.	86A410
		4	1.3×10^{10} [b]	p.r.; C.k.; rel. to $k(\cdot OH + SCN^-)$.	700371
367	**β-Benzylglucoside**				
	$\cdot OH + GluOCH_2C_6H_5 \rightarrow$	~7	4.2×10^{10}	p.r.; C.k.; rel. to $k(\cdot OH + SCN^-)$.	710480
368	**Benzyl methyl ether**				
	$\cdot OH + C_6H_5CH_2OCH_3 \rightarrow$	1.7-1.8	1.0×10^{10}	Fenton; C.k. with 1-phenylethanol; rel. to $k(\cdot OH$ + 2-PrOH).	749006
369	**Benzylpenicillin**				
	$\cdot OH + C_{16}H_{18}N_2O_4S \rightarrow$	7	7.1×10^9	γ-r.; C.k. with RNO; rel. to $k(\cdot OH + PA^-)$.	730134
370	**Benzylpenicilloic acid**				
	$\cdot OH + C_{15}H_{20}N_2O_3S \rightarrow$	7	7.1×10^9	γ-r.; C.k. with RNO; rel. to $k(\cdot OH + PA^-)$.	730134
371	**Benzyltributylammonium ion**				
	$\cdot OH + C_6H_5CH_2N^+(C_4H_9)_3 \rightarrow H_2O + C_6H_5CH_2N^+(C_4H_9)_2(C_4H_8)$	6.9	6.4×10^9	p.r.; P.b.k. at 325 nm (OH adduct); 45% addn., 51% H abstr. on butyl, 4% H abstr. on benzyl.	81A034
372	**Benzyltrimethylammonium ion**				
	$\cdot OH + C_6H_5CH_2N(CH_3)_3^+ \rightarrow C_6H_5\dot{C}HN^+(CH_3)_3 + HOC_6H_5CH_2N^+(CH_3)_3$	6.9	5.0×10^9	p.r.; P.b.k. at 325 nm (OH adduct); 65% addn., 35% H abstr.	81A034
373	**Bilirubin dianion**				
	$\cdot OH + BR^{2-} \rightarrow BROH^{\cdot 2-}$		*1.0×10^{10}*	Average of 2 values.	
		10.9	1.3×10^{10}	p.r.; P.b.k. in soln. contg. 10^{-3} mol L^{-1} NaOH and 10^{-4} mol L^{-1} pigment.	83A302
		12	8×10^9	p.r.; P.b.k. at 540 nm in N_2O-satd. soln. contg. $2\text{-}10 \times 10^{-5}$ mol L^{-1} bilirubin; cor. for $\cdot O^-$.	771137
374	**Biliverdin dianion**				
	$\cdot OH + BV^{2-} \rightarrow BVOH^{\cdot 2-}$	10.9	4×10^{10}	p.r.; P.b.k. in soln. contg. 10^{-3} mol L^{-1} NaOH and 10^{-4} mol L^{-1} pigment.	83A302
375	**Biotin**				
	$\cdot OH + C_{10}H_{16}N_2O_3S \rightarrow$ H abstr.	3.6	3.8×10^9	p.r.; C.k.; rel. to $k(\cdot OH + SCN^-)$.	771034
376	**Biphenyl**				
	$\cdot OH + C_6H_5C_6H_5 \rightarrow C_6H_5C_6H_5OH$		9.0×10^9	p.r.; P.b.k.	751096
377	**Biphenyl-4-carboxylate ion**				
	$\cdot OH + 4\text{-}C_6H_5C_6H_4CO_2^- \rightarrow [4\text{-}C_6H_5C_6H_4CO_2]OH$	9	6.8×10^9	p.r.; P.b.k. at 330 nm.	730110
378	**2,2′-Biphenyldicarboxylate ion**				
	$\cdot OH + 2,2'\text{-}{}^-O_2CC_6H_4C_6H_4CO_2^- \rightarrow {}^-O_2CC_6H_4C_6H_4(OH)CO_2^-$	9	7.0×10^9	p.r.; P.b.k. at 320 nm.	730110
379	**4,4′-Biphenyldicarboxylate ion**				
	$\cdot OH + {}^-O_2CC_6H_4C_6H_4CO_2^- \rightarrow {}^-O_2CC_6H_4C_6H_4(OH)CO_2^-$	9	8.3×10^9	p.r.; P.b.k. at 390 nm.	730110
380	**2,2′-Bipyridine**				
	$\cdot OH + bpy \rightarrow bpyOH$	9.3	6.2×10^9	p.r.; P.b.k.	710582
381	**4,4′-Bipyridine**				
	$\cdot OH + 4,4'\text{-}bpy \rightarrow 4,4'\text{-}bpyOH$	9.3	5.3×10^9	p.r.; P.b.k.	710582
382	**2,2-Bis(hydroxymethyl)-2,2′,2″-nitrilotriethanol**				
	$\cdot OH + (HOCH_2CH_2)_2NC(CH_2OH)_3 \rightarrow$	7	3.0×10^9	p.r.; Buffer soln. contg. phosphate; no details.	78A471
383	**2,2′-Bithiophene**				
	$\cdot OH + C_8H_6S_2 \rightarrow HOC_4H_3S^-C_4H_3S$	~7	1.6×10^{10}	p.r.; P.b.k. at 430 nm.	78A026
384	**Bromoacetate ion**				
	$\cdot OH + BrCH_2CO_2^- \rightarrow$	9	4.6×10^7	γ-r.; C.k. with RNO; rel. to $k(\cdot OH + EtOH)$.	660423

TABLE 8. Rate constants for reactions of hydroxyl radicals in aqueous solution—Continued

No.	Reaction	pH	k (L mol^{-1} s^{-1})	Comment	Ref.
385	**4-Bromobenzoate ion**				
	$\cdot OH + 4\text{-}BrC_6H_4CO_2^- \rightarrow$	9	3.2×10^9	γ-r.; C.k. with RNO; rel. to $k(\cdot OH + EtOH)$.	660441
386	**2-Bromoethanol**				
	$\cdot OH + BrCH_2CH_2OH \rightarrow$	8.5	8.0×10^8	γ-r.; C.k. with RNO; rel. to $k(\cdot OH + EtOH)$.	670050
387	**5-Bromofurfural**				
	$\cdot OH + \text{-}OCBr{=}CHCH{=}C(CHO)\text{-} \rightarrow$	9	3.9×10^9	γ-r.; C.k.; method of [650356]; rel. to $k(\cdot OH + RNO)$.	83A335
388	**5-Bromoindole**				
	$\cdot OH + 5\text{-}BrIn \rightarrow$	9.0	1.6×10^{10}	γ-r.; C.k. with RNO; rel. to $k(\cdot OH + TrpH)$.	710556
389	**5-Bromoorotate ion**				
	$\cdot OH + 5\text{-}BrUCO_2^- \rightarrow$ 5-BrU(OH)-6-CO_2^-	7	3×10^9	p.r.; P.b.k. at 340 nm; pK = 2.4, 7.3	730002
		7	6.6×10^9	p.r.; C.k.; rel. to $k(\cdot OH + SCN^-)$.	730002
390	**1-(*p*-Bromophenyl)ethanol**				
	$\cdot OH + BrC_6H_4CH(CH_3)OH \rightarrow$	1.7-1.8	6.1×10^9	Fenton; C.k. with 1-phenylethanol; rel. to $k(\cdot OH$ + 2-PrOH).	749006
391	***m*-Bromophenyl-β-D-glucopyranoside**				
	$\cdot OH + C_{12}H_{15}BrO_6 \rightarrow$		3.7×10^9	γ-r.; C.k. with RNO; rel. to $k(\cdot OH +$ $GlucOC_6H_5$).	710056
392	**2-Bromopropionate ion**				
	$\cdot OH + CH_3CHBrCO_2^- \rightarrow$	8.5	2.3×10^8	γ-r.; C.k.; rel. to $k(\cdot OH + EtOH)$.	670050
393	**3-Bromopropionate ion**				
	$\cdot OH + BrCH_2CH_2CO_2^- \rightarrow$	8.5	2.3×10^8	γ-r.; C.k.; rel. to $k(\cdot OH + EtOH)$.	670050
394	**2-Bromopyridine**				
	$\cdot OH + C_5H_4BrN \rightarrow$	9	2.4×10^9	γ-r.; C.k.; rel. to $k(\cdot OH + RNO)$.	690280
395	**3-Bromopyridine**				
	$\cdot OH + C_5H_4BrN \rightarrow$	9	1.1×10^9	γ-r.; C.k.; rel. to $k(\cdot OH + RNO)$.	690280
396	**α-Bromotetronate ion**				
	$\cdot OH + BrTr^- \rightarrow Br^- + H^+ + \cdot OTr^-$	7	7.7×10^9	p.r.; D.k. at 258 nm as well as p.b.k. at 360 nm.	741053
397	**5-Bromouracil**				
	$\cdot OH + 5\text{-}BrU \rightarrow 5\text{-}BrU(OH)$		4.4×10^9	Average of 3 values.	
		7	4.0×10^9	p.r.; C.k.; rel. to $k(\cdot OH + SCN^-)$.	720049
		7	5.6×10^9	p.r.; P.b.k. at 340 nm; 5-addn. followed by dehalogenation [720236]; at pH 11 $k = 5.8 \times 10^9$.	720049
		7.0	3.6×10^9	p.r., P.b.k. at 335 nm.	690826
398	**Butadiene**				
	$\cdot OH + H_2C{=}CHCH{=}CH_2 \rightarrow$		7.0×10^9	p.r.; C.k.; obs. formn. of I_2^- at 400 nm; rel. to $k(\cdot OH + I^-)$.	670041
399	**Butane**				
	$\cdot OH + n\text{-}C_4H_{10} \rightarrow$	2	4.6×10^9	Fenton; rel. to $k(\cdot OH$ + Ethane).	81M420
400	**1,3-Butanediol**				
	$\cdot OH + CH_3CH(OH)CH_2CH_2OH \rightarrow$	7	2.2×10^9	p.r.; C.k.; rel. to $k(\cdot OH + SCN^-)$.	650387
401	**1,4-Butanediol**				
	$\cdot OH + HO(CH_2)_4OH \rightarrow$	7	3.2×10^9	p.r.; C.k.; rel. to $k(\cdot OH + SCN^-)$.	650387
402	**2,3-Butanediol**				
	$\cdot OH + CH_3CH(OH)CH(OH)CH_3 \rightarrow$ $CH_3COHCHOHCH_3 + H_2O +$ $\cdot CH_2CHOHCHOHCH_3$	7	1.3×10^9	p.r.; C.k.; rel. to $k(\cdot OH + SCN^-)$.	650387

TABLE 8. Rate constants for reactions of hydroxyl radicals in aqueous solution—Continued

No.	Reaction	pH	k (L mol^{-1} s^{-1})	Comment	Ref.
403	**2,3-Butanedione** $\cdot OH + CH_3COCOCH_3 \rightarrow H_2O + \cdot CH_2COCOCH_3$		1.7×10^8	p.r.; C.k.; rel. to $k(\cdot OH + SCN^-)$.	680249
404	**1-Butanol** $\cdot OH + CH_3(CH_2)_3OH \rightarrow H_2O +$ $CH_3(CH_2)_2\dot{C}HOH$ (41%) + $\cdot CH_2(CH_2)_3OH + CH_3\dot{C}H(CH_2)_2OH$ + $CH_3CH_2\dot{C}HCH_2OH$ (58.5%) [730126]		*4.2 × 10^9*	Average of 3 values.	
		nat.	4.5×10^9	p.r.; C.k.; rel. to $k(\cdot OH + Fe(CN)_6^{4-})$.	710578
		7	4.3×10^9	p.r.; C.k.; rel. to $k(\cdot OH + CO_3^{2-})$.	650190
		7	3.7×10^9	p.r.; C.k.; rel. to $k(\cdot OH + SCN^-)$.	650387
405	**2-Butanol** $\cdot OH + C_2H_5CH(OH)CH_3 \rightarrow$	7	3.1×10^9	p.r.; C.k.; rel. to $k(\cdot OH + SCN^-)$.	650387
406	**2-Butanone** $\cdot OH + C_2H_5COCH_3 \rightarrow$	6-7	9.0×10^8	p.r.; C.k.; rel. to $k(\cdot OH + SCN^-)$.	650387
407	**1-Butene** $\cdot OH + CH_3CH_2CH{=}CH_2 \rightarrow$		7.0×10^9	p.r.; C.k.; obs. formn. of I_2^- at 400 nm; rel. to $k(\cdot OH + I^-)$.	670041
408	**1-Butene-3-one** $\cdot OH + H_2C{=}CHCOCH_3 \rightarrow$ $HOCH_2\dot{C}HCOCH_3$		8.5×10^9	p.r.; C.k.; rel. to $k(\cdot OH + SCN^-)$.	700165
409	***N-tert*-Butylacetamide** $\cdot OH + CH_3CONHC(CH_3)_3 \rightarrow$	5-6	1.1×10^9	p.r.; C.k.; rel. to $k(\cdot OH + SCN^-)$.	710414
410	***n*-Butylamine** $\cdot OH + CH_3(CH_2)_3NH_2 \rightarrow H_2O +$ $CH_3CH_2CH_2\dot{C}HNH_2$		*7.7 × 10^9*	Average of 3 values.	
			6.6×10^9	p.r.; C.k.; calcd. from obs. values at pH 8-13.1; rel. to $k(\cdot OH + NB)$.	730016
			8.2×10^9	p.r.; C.k.; calcd. from obs. values at pH 8-13.1; rel. to $k(\cdot OH + SCN^-)$.	730016
			8.3×10^9	p.r.; C.k.; calcd. from obs. values at pH 8-13.1; rel. to $k(\cdot OH + Fe(CN)_6^{4-})$	730016
411	**Butylammonium ion** $\cdot OH + n\text{-}C_4H_9NH_3^+ \rightarrow$		*9.6 × 10^9*	Average of 4 values.	
			3.2×10^9	p.r.; C.k.; calcd. from obs. values at pH 8-13.1; rel. to $k(\cdot OH + Fe(CN)_6^{4-})$.	730016
			2.5×10^9	p.r.; C.k.; calcd. from obs. values at pH 8-13.1; rel. to $k(\cdot OH + NB)$.	730016
			3.1×10^9	p.r.; C.k.; calcd. from obs. values at pH 8-13.1; rel. to $k(\cdot OH + SCN^-)$.	730016
		4	5.5×10^9	p.r.; C.k.; rel. to $k(\cdot OH + SCN^-)$.	700371
412	***tert*-Butylamine** $\cdot OH + (CH_3)_3CNH_2 \rightarrow (CH_3)_3\dot{C}NH +$ $H_2O + \cdot CH_2C(CH_3)_2NH_2$	12	6.0×10^9	p.r.; C.k., extrapolated from pH study; rel. to $k(\cdot OH + SCN^-)$.	710585
413	***tert*-Butylammonium ion** $\cdot OH + (CH_3)_3CNH_3^+ \rightarrow$ $\cdot CH_2C(CH_3)_2NH_3^+ + H_2O$	3.2	7.0×10^8 [b]	p.r.; C.k.; rel. to $k(\cdot OH + SCN^-)$.	710585
		4	2.4×10^8 [b]	p.r.; C.k.; rel. to $k(\cdot OH + SCN^-)$.	700371
414	**4-*tert*-Butyl-1,2-dihydroxybenzene** $\cdot OH + (CH_3)_3CC_6H_3(OH)_2 \rightarrow$ $(CH_3)_3CC_6H_3(OH)_3$	7.0	7.6×10^9	p.r.; P.b.k. at 338 nm; OH adduct loses water giving semiquinone ($pK_a = 5.2$), abs. at 313 nm; $k = 7.8 \times 10^9$ at pH 10.5 (substrate $pK_a = 9.60$) by p.b.k. at 313 nm.	79A099

TABLE 8. Rate constants for reactions of hydroxyl radicals in aqueous solution—Continued

No.	Reaction	pH	k (L mol^{-1} s^{-1})	Comment	Ref.
415	***tert*-Butyl hydroperoxide** $\cdot OH + (CH_3)_3COOH \rightarrow$	7	$<1.0 \times 10^7$	p.r.; No reaction obs.; C.k.; rel. to $k(\cdot OH + SCN^-)$.	81A374
416	***tert*-Butyl methyl ether** $\cdot OH + (CH_3)_3COCH_3 \rightarrow$		1.6×10^9	p.r.; rel. to $k(\cdot OH + SCN^-)$.	80A441
417	**4-*tert*-Butylphenol** $\cdot OH + (CH_3)_3CC_6H_4OH \rightarrow$	9	1.9×10^{10}	γ-r.; C.k.; $pK_a = 11$; rel. to $k(\cdot OH + RNO)$.	72G837
418	**Butylsulfate ion** $\cdot OH + CH_3(CH_2)_3OSO_3^- \rightarrow$		1.0×10^9	p.r.; C.k.; rel. to $k(\cdot OH + SCN^-)$.	79N061
419	**Butyltrimethylammonium ion** $\cdot OH + C_4H_9N^+(CH_3)_3 \rightarrow H_2O +$ ·BTAH		*1.8 × 10^9*	Average of 2 values.	
			2.0×10^9	p.r.; C.k.; rel. to $k(\cdot OH + Fe(CN)_6^{4-})$.	84A385
			1.6×10^9	p.r.; C.k.; rel. to $k(\cdot OH + PhOH)$.	84A385
420	**Butyraldehyde** $\cdot OH + CH_3CH_2CH_2CHO \rightarrow$	2.0	3.9×10^9	p.r.; C.k.; rel. to $k(\cdot OH + SCN^-)$.	650387
421	**Butyrate ion** $\cdot OH + n\text{-}C_3H_7CO_2^- \rightarrow$	9	2×10^9	γ-r.; C.k. with RNO; rel. to $k(\cdot OH + EtOH)$.	660423
422	***n*-Butyric acid** $\cdot OH + CH_3CH_2CH_2CO_2H \rightarrow$	2-2.2	2.2×10^9	γ-r.; C.k.; rel. to $k(\cdot OH + 5\text{-MeU})$.	670461
423	**Caffeine** $\cdot OH + C_8H_{10}N_4O_2 \rightarrow$		6.9×10^9	p.r.; C.k.; rel. to $k(\cdot OH + SCN^-)$.	85R089
424	**Camphor** $\cdot OH + C_{10}H_{16}O \rightarrow$	9.2	4.1×10^9	p.r.; P.b.k. at 330 nm.	79A191
425	**3-Carboxamido-2,2,5,5-tetramethylpyrrolidin-1-yloxy** $\cdot OH + NX\text{-}s \rightarrow OH^- + [NX\text{-}s]\cdot^+$	3.9,9.3	3.7×10^9	p.r.; Condy.; $pK_a = 5.25$.	761152
426	**3-Carboxamido-2,2,5,5-tetramethyl-3-pyrrolin-1-yloxy** $\cdot OH + NX\text{-}u \rightarrow OH^- + [NX\text{-}u]\cdot^+$	3.9,9.3	5.4×10^9	p.r.; Condy.; $pK_a = 4.95$.	761152
427	**Carbon disulfide** $\cdot OH + CS_2 \rightarrow SC(OH)S\cdot$	7.6	8.0×10^9	p.r.; C.k.; obs. abs. increase at 280 nm (CS_2OH) or at 500 nm; rel. to $k(\cdot OH + SCN^-)$.	731015
428	**2-Carboxy-5,5-dimethyl-1-pyrroline *N*-oxide** $\cdot OH +$ CDMPO $\rightarrow$		$\sim 2.6 \times 10^9$	Fenton; C.k.; k decreases with increasing concn of CDMPO; rel. to $k(\cdot OH +$ DMPO).	80A176
429	**Carmine** $\cdot OH + C_{22}H_{20}O_{13} \rightarrow$	7.3-7.5	1.3×10^{10} [a]	chem.; C.k. in soln. contg. 0.1 mol L^{-1} H_2O_2, 2.5×10^{-6} mol L^{-1} Mn^{2+} and 0.2 mol L^{-1} HCO_3^-; rel. to $k(\cdot OH + RNO)$.	79A411
430	**Catechol** $\cdot OH + 1,2\text{-}C_6H_4(OH)_2 \rightarrow$	9	1.1×10^{10}	γ-r.; C.k.; $pK_a = 9.85$; rel. to $k(\cdot OH + RNO)$.	72G837
431	**D-Cellobiose** $\cdot OH + C_{12}H_{22}O_{11} \rightarrow$	6.5	3.6×10^9	γ-r.; C.k.; rel. to $k(\cdot OH + RNO)$.	690580
432	**Chloral hydrate** $\cdot OH + CCl_3CH(OH)_2 \rightarrow CCl_3\dot{C}(OH)_2 + H_2O$		3.1×10^9	p.r.; C.k.; rel. to $k(\cdot OH + SCN^-)$.	730062
433	**5-(2-Chloroacetamido)-2,3-dihydro-1,4-phthalazinedione** $\cdot OH +$ CDP $\rightarrow$	11	$\sim 1 \times 10^{10}$	p.r.; P.b.k. in soln. satd. with 1:1 O_2-N_2O	79G176
434	**Chloroacetate ion** $\cdot OH + ClCH_2CO_2^- \rightarrow$		$\sim 4.0 \times 10^8$	γ-r.; C.k., obs. $G(Cl^-)$; ratio of H abstr. to Cl^- formn. = 4.0; rel. to $k(\cdot OH + MeOH)$.	690422

TABLE 8. Rate constants for reactions of hydroxyl radicals in aqueous solution—Continued

No.	Reaction	pH	k (L mol^{-1} s^{-1})	Comment	Ref.
435	**Chloroacetic acid**				
	$\cdot OH + ClCH_2CO_2H \rightarrow$	1	4.3×10^7	p.r.; C.k.; pK_a = 2.85; rel. to $k(\cdot OH + SCN^-)$.	650387
436	**Chlorobenzene**				
	$\cdot OH + C_6H_5Cl \rightarrow$		*5.5 × 10^9*	Average of 2 values.	
		9	4.5×10^9	γ-r.; C.k.; rel. to $k(\cdot OH + RNO)$.	690280
		10.7	6.5×10^9	γ-r.; C.k.; measured $^{14}CO_2$; rel. to $k(\cdot OH + BzO^-)$.	650099
437	**2-Chlorobenzoate ion**				
	$\cdot OH + 2\text{-}ClC_6H_4CO_2^- \rightarrow 2\text{-}ClC_6H_4(OH)CO_2^-$	7	5.9×10^9	γ-r.; C.k.; obs. G(acetone); rel. to $k(\cdot OH$ + 2-PrOH).	740167
438	**3-Chlorobenzoate ion**				
	$\cdot OH + 3\text{-}ClC_6H_4CO_2^- \rightarrow 3\text{-}ClC_6H_4(OH)CO_2^-$	7	5.3×10^9	γ-r.; C.k.; obs. G(acetone); rel. to $k(\cdot OH$ + 2-PrOH).	740167
439	**4-Chlorobenzoate ion**				
	$\cdot OH + 4\text{-}ClC_6H_4CO_2^- \rightarrow 4\text{-}ClC_6H_4(OH)CO_2^-$	6-9.4	5.0×10^9	p.r.; P.b.k. at 345 nm; cor. for (OH + OH) and (H + aromatic).	680304
440	**2-Chloro-1,1-dimethoxyethane**				
	$\cdot OH + ClCH_2CH(OCH_3)_2 \rightarrow$		1.5×10^9	p.r.; rel. to $k(\cdot OH + SCN^-)$.	80A441
441	**2-Chloroethanol**				
	$\cdot OH + ClCH_2CH_2OH \rightarrow$	8.5	9.5×10^8	γ-r.; C.k. with RNO; rel. to $k(\cdot OH$ + EtOH).	670050
442	**Chloroform**				
	$\cdot OH + CHCl_3 \rightarrow \cdot CCl_3 + H_2O$	5.5-5.8	$\sim 5 \times 10^6$ [b]	γ-r.; Est. from effect of Fe^{2+} on $G(Cl^-)$.	700013
		9	1.5×10^7 [b]	γ-r.; C.k. with RNO; rel. to $k(\cdot OH$ + EtOH).	660423
			7.4×10^6 [b]	r.; C.k. with Fe^{2+}.	669002
		0.4	7.3×10^6 [b]	Fenton; C.k.; rel. to $k(\cdot OH + Fe^{2+})$.	600016
		0.4	1.4×10^7 [b]	β-r.; C.k.; rel. to $k(\cdot OH + Fe^{2+})$.	600016
443	**5-Chloroindole**				
	$\cdot OH$ + 5-ClIn $\rightarrow$	9.0	2.0×10^{10}	γ-r.; C.k. with RNO; rel. to $k(\cdot OH$ + TrpH).	710556
444	**2-(Chloromethyl)-1,3-dioxolane**				
	$\cdot OH + \text{-}OCH(CH_2Cl)O(CH_2)_2\text{-} \rightarrow$		3.5×10^9	p.r.; rel. to $k(\cdot OH + SCN^-)$.	80A441
445	**2-Chlorophenol**				
	$\cdot OH + ClC_6H_4OH \rightarrow$ addn.	6.5-7.7	1.2×10^{10}	p.r.; P.b.k. at 300 nm in N_2O-satd. soln. contg. 5-10 × 10^{-4} mol L^{-1} substrate.	86A463
446	**3-Chlorophenol**				
	$\cdot OH + ClC_6H_4OH \rightarrow$	9	7.2×10^9	γ-r.; C.k.; pK_a = 9.02; rel. to $k(\cdot OH$ + RNO).	72G837
447	**4-Chlorophenol**				
	$\cdot OH + ClC_6H_4OH \rightarrow$	9	7.6×10^9	γ-r.; C.k. with RNO in air-satd. soln.; pK_a = 9.38; rel. to $k(\cdot OH$ + EtOH).	760371
448	***m*-Chlorophenyl-β-D-glucopyranoside**				
	$\cdot OH + C_{12}H_{15}ClO_6 \rightarrow$		3.7×10^9	γ-r.; C.k. with RNO; rel. to $k(\cdot OH$ + $GlucOC_6H_5$).	710056
449	***p*-Chlorophenyl-β-D-glucopyranoside**				
	$\cdot OH + GluOC_6H_4Cl \rightarrow$		5.0×10^9	p.r.; C.k. with SCN^-; rel. to $k(\cdot OH$ + $GlucOC_6H_5$).	710056
450	**2-Chloropropionate ion**				
	$\cdot OH + CH_3CHClCO_2^- \rightarrow$	8.5	2.5×10^8	γ-r.; C.k. with RNO; rel. to $k(\cdot OH$ + EtOH).	670050
451	**3-Chloropropionate ion**				
	$\cdot OH + ClCH_2CH_2CO_2^- \rightarrow$	8.5	3.2×10^8	γ-r.; C.k. with RNO; rel. to $k(\cdot OH$ + EtOH).	670050
452	**2-Chloropyridine**				
	$\cdot OH$ + pyCl $\rightarrow$	9	1.8×10^9	γ-r.; C.k.; rel. to $k(\cdot OH$ + RNO).	690280

TABLE 8. Rate constants for reactions of hydroxyl radicals in aqueous solution—Continued

No.	Reaction	pH	k (L mol^{-1} s^{-1})	Comment	Ref.
453	**4-Chloropyridine**				
	$\cdot OH + pyCl \rightarrow$	9	3.1×10^9	γ-r.; C.k.; rel. to $k(\cdot OH + RNO)$.	690280
454	**5-Chlorouracil**				
	$\cdot OH + 5\text{-ClU} \rightarrow 5\text{-ClU(OH)}$		*5.9 × 10^9*	Average of 2 values.	
		7	5.5×10^9	p.r.; P.b.k. at 340 nm; 5-addn. followed by dehalogenation [720236]; pK_a = 7.9; at pH 11 $k = 5.8 \times 10^9$.	720049
		7	5.2×10^9	p.r.; C.k.; rel. to $k(\cdot OH + SCN^-)$.	720049
455	**Chlorpromazine, conjugate acid**				
	$\cdot OH + CZH^+ \rightarrow H_2O + CZ^{\cdot +}$		*8.6 × 10^9*	Average of 2 values.	
		3.5	8.8×10^9	p.r.; P.b.k. at 505 nm; 28% of the OH reacts to give the radical cation, the remainder may abstract H or add.	83A272
		~4	8.3×10^9	p.r.; P.b.k.; reaction also involves OH addn. to S which leads to cation radical, addn. to ring and H abstr.; pH effect.	79A060
456	**Cinnamate ion**				
	$\cdot OH + C_6H_5CH{=}CHCO_2^- \rightarrow HOC_6H_5\text{-}CH{=}CHCO_2^- + C_6H_5CHCH(OH)CO_2^-$	6.0	8.1×10^9	p.r.; P.b.k. at 310 and 365 nm (mixed acid and anion); ~70% benzyl-type radicals and ~30% hydroxycyclohexadienyl radicals formed; product anal. showed 0.66:0.49:0.60 OH-addn. at *o*:*m*:*p*-positions.	82A308
457	**Citric acid**				
	$\cdot OH + (HO_2CCH_2)_2COH(CO_2H) \rightarrow$	1	5.0×10^7	p.r.; C.k.; pK_a = 3.08, 4.74, 5.40; rel. to $k(\cdot OH + SCN^-)$.	650387
458	**Citrulline**				
	$\cdot OH + H_2NCONH(CH_2)_3CH(NH_3^+)CO_2^- \rightarrow$	6.4-6.9	1.2×10^9	γ-r.; C.k. with RNO; rel. to $k(\cdot OH + RNO)$.	760147
459	**Coenzyme A**				
	$\cdot OH + C_{21}H_{36}N_7O_{16}P_3S \rightarrow$ addn.	~7	3.1×10^9	γ-r.; C.k.; obs. G(inorg. phosphate); 2.50% oxidative dephosphorylation; rel. to $k(\cdot OH +$ *tert*-BuOH).	753070
460	**Convicine**				
	$\cdot OH + 5\text{-Oglu-6-NH}_2U \rightarrow 5\text{-Oglu-6-NH}_2U(OH) + 5\text{-Oglu(-H)-6-NH}_2U + H_2O$	5.3-8.0	1.5×10^{10}	p.r.; P.b.k. at 300 nm; about one-third addn.	80A381
461	**Coumarin**				
	$\cdot OH + C_9H_6O_2 \rightarrow$		2×10^9	γ-r.; C.k.; effect of 2-PrOH on fluorescence intensity; details not given.	77G518
462	***o*-Cresol**				
	$\cdot OH + CH_3C_6H_4OH \rightarrow$	9	1.1×10^{10}	γ-r.; C.k.; pK_a = 10.28; rel. to $k(\cdot OH + RNO)$.	72G837
463	***p*-Cresol**				
	$\cdot OH + CH_3C_6H_4OH \rightarrow$	5.5	1.2×10^{10}	p.r.; C.k.; pK_a = 10.17; rel. to $k(\cdot OH + SCN^-)$	730003
464	**Crocetin**				
	$\cdot OH + C_{20}H_{24}O_4 \rightarrow$	5.9	2.3×10^{10}	p.r.; D.k. at 420 nm.	82R027
465	**Crocin**				
	$\cdot OH + C_{44}H_{64}O_{24} \rightarrow$		*3.1 × 10^{10}*	Average of 2 values.	
			2.9×10^{10}	p.r.; C.k.; rel. to $k(\cdot OH + DCIP)$.	82R027
		5.9	3.3×10^{10}	p.r.; D.k. at 440 nm.	82R027
466	**Crotonaldehyde**				
	$\cdot OH + CH_3CH{=}CHCHO \rightarrow CH_3CHOHCHCHO$		5.8×10^9	p.r.; C.k.; rel. to $k(\cdot OH + SCN^-)$.	700165
467	**Crotonate ion**				
	$\cdot OH + CH_3CH{=}CHCO_2^- \rightarrow$	7-7.2	5.0×10^9	p.r.; C.k.; rel. to $k(\cdot OH + SCN^-)$.	80A240

TABLE 8. Rate constants for reactions of hydroxyl radicals in aqueous solution—Continued

No.	Reaction	pH	k (L mol^{-1} s^{-1})	Comment	Ref.
468	**Crotonic acid** ·OH + $CH_3CH{=}CHCO_2H$ →	1	2.9×10^9	Fenton; C.k.; k(·OH + MeOH)/k(·OH + Fe^{2+}) = 4.3; rel. to k(·OH + MeOH).	739341
469	**Cumene** ·OH + $C_6H_5CH(CH_3)_2$ → $(CH_3)_2CHC_6H_5OH$	7	7.5×10^9	p.r.; No details given; ~15% H abstr.	79B128
470	**Cyanoacetate ion** ·OH + $CNCH_2CO_2^-$ →	9	1.6×10^7	γ-r.; C.k. with RNO; rel. to k(·OH + EtOH).	660423
471	**5-Cyanoindole** ·OH + $C_9H_6N_2$ →	9.0	1.1×10^{10}	γ-r.; C.k. with RNO; rel. to k(·OH + TrpH).	710556
472	***4-Cyanophenyl-N-tert-butylnitrone*** ·OH + 4-CN-PBN → 4-CN-PBN(OH)		6.5×10^9	p.r.; C.k.; rel. to k(·OH + SCN^-).	82A184
473	**1-(*p*-Cyanophenyl)ethanol** ·OH + $CNC_6H_4CHOHCH_3$ →	1.7-1.8	2.5×10^9	Fenton; C.k. with 1-(*p*-ethylphenyl)ethanol; rel. to k(·OH + 2-PrOH).	749006
474	***p*-Cyanophenyl-β-D-glucopyranoside** ·OH + $GluOC_6H_4CN$ →		4.1×10^9	γ-r.; C.k. with RNO; rel. to k(·OH + $GlucOC_6H_6$).	710056
475	**3-Cyanopyridine** ·OH + $C_6H_4N_2$ →	9	7.5×10^8	γ-r.; C.k.; rel. to k(·OH + RNO).	690280
476	**Cyclobutanecarboxylate ion** ·OH + *c*-$C_4H_7CO_2^-$ →	9	3.0×10^9	γ-r.; C.k. with RNO; rel. to k(·OH + EtOH).	660423
477	**Cycloheptane** ·OH + *c*-C_7H_{14} →	2	7.7×10^9	Fenton; rel. to k(·OH + Ethane).	81M420
478	**Cycloheptanol** ·OH + -$(CH_2)_5CHOHCH_2$- →	1.7-1.8	1.7×10^9	Fenton; C.k.; rel. to k(·OH + 2-PrOH).	749006
479	**Cycloheptanol-1-*d*** ·OH + -$(CH_2)_5CDOHCH_2$- →	1.7-1.8	1.3×10^9	Fenton; C.k. with 1-phenylethanol; rel. to k(·OH + 2-PrOH).	749006
480	**Cycloheptatriene** ·OH + *c*-C_7H_8 →		1×10^{10}	p.r.; C.k.; rel. to k(·OH + SCN^-).	710710
481	**1,3-Cyclohexadiene** ·OH + *c*-C_6H_8 → *c*-$C_6H_8(OH)$	7.0	9.9×10^9	p.r.; C.k., obs. formn. of $PNBA^-$-OH adduct at 415 nm; 30% H abstr.; rel. to k(·OH + $PNBA^-$).	700211
482	**1,4-Cyclohexadiene** ·OH + *c*-C_6H_8 → *c*-$C_6H_8(OH)$	7.0	7.7×10^9	p.r.; C.k.; obs. formn. of $PNBA^-$-OH adduct at 415 nm; 45% H abstr.; rel. to k(·OH + $PNBA^-$).	700211
483	**Cyclohexane** ·OH + *c*-C_6H_{12} →	2	6.1×10^9	Fenton; C.k.; rel. to k(·OH + C_2H_6).	81M420
484	**Cyclohexane-d_6** ·OH + $C_6H_6D_6$ →	2	5.4×10^9	Fenton; C.k.; rel. to k(·OH + C_2H_6).	81M420
485	**Cyclohexanecarboxylate ion** ·OH + *c*-$C_6H_{11}CO_2^-$ →	9	5.5×10^9	γ-r.; C.k. with RNO; rel. to k(·OH + EtOH).	660423
486	***trans*-1,2-Cyclohexanediamine-*N,N,N',N'*-tetraacetic acid** ·OH + *trans*-CyDTA →	~0	1.2×10^{10}	Fenton; C.k.; rel. to k(·OH + $H_2C{=}CHCONH_2$).	729162
487	**Cyclohexene** ·OH + *c*-C_6H_{10} →	7.0	8.8×10^9	p.r.; C.k.; obs. formn. of $PNBA^-$-OH adduct at 415 nm; rel. to k(·OH + $PNBA^-$).	700211
488	**Cyclohexylammonium ion** ·OH + *c*-$C_6H_{11}NH_3^+$ →	4	1.1×10^{10}	p.r.; C.k.; rel. to k(·OH + SCN^-).	700371

TABLE 8. Rate constants for reactions of hydroxyl radicals in aqueous solution—Continued

No.	Reaction	pH	k (L mol^{-1} s^{-1})	Comment	Ref.
489	**Cyclopentane**				
	$\cdot OH + c\text{-}C_5H_{10} \rightarrow c\text{-}C_5H_9 + H_2O$		*9.7 × 10^9*	Average of 2 values.	
			4.5 × 10^9	p.r.; C.k.; obs. NF^- formn. at 350 nm in soln. contg. cyclopentane + O_2 + HCO_2^- + $C(NO_2)_4$; rel. to $k(\cdot OH + HCO_2^-)$.	741051
			3.0 × 10^9	p.r.; C.k.; rel. to $k(\cdot OH + PNBA^-)$.	741052
490	**Cyclopentanecarboxylate ion**				
	$\cdot OH + c\text{-}C_5H_9CO_2^- \rightarrow$	9	4.2 × 10^9	γ-r.; C.k. with RNO; rel. to $k(\cdot OH + EtOH)$.	660423
491	**Cyclopentene**				
	$\cdot OH + c\text{-}C_5H_8 \rightarrow c\text{-}C_5H_8OH$		7.0 × 10^9	p.r.; C.k.; ~23% allylic H abstr.; rel. to $k(\cdot OH + SCN^-)$.	741052
492	**Cycloserine**				
	$\cdot OH + C_3H_6N_2O_2 \rightarrow$ addn.	6.5	9 × 10^9	p.r.; C.k.; at pH 9-11 k = 1.2-1.3 × 10^{10}; rel. to $k(\cdot OH + SCN^-)$.	84A421
493	**Cystamine, conjugate diacid**				
	$\cdot OH + S_2(CH_2CH_2NH_3)_2^{2+} \rightarrow$	1	1.7 × 10^{10}	Fenton; esr; C.k. with H_2O_2; rel. to $k(\cdot OH$ + 5-MeU).	69D278
494	**Cysteamine, conjugate acid**				
	$\cdot OH + HSCH_2CH_2NH_3^+ \rightarrow \cdot SCH_2CH_2NH_3^+ + H_2O$		*1.8 × 10^{10}*	Average of 2 values.	
			2.0 × 10^{10}	p.r.; esr; C.k.; rel. to $k(\cdot OH$ + U).	723003
		1.4	1.6 × 10^{10}	p.r.; C.k.; pK_a = 8.6, 10.7; at pH 6.5 and 9 k = 1.4 × 10^{10}; rel. to $k(\cdot OH + SCN^-)$.	670554
495	**Cysteine**				
	$\cdot OH + CysSH \rightarrow \cdot SCH_2CH(NH_3^+)CO_2^- + H_2O$		*3.4 × 10^{10}*	Average of 3 values.	
		5.8	1.9 × 10^{10}	p.r.; C.k.; pK_a = 1.8, 8.3, 10.8; at pH 9.8, 10.8 k = 1.9 × 10^{10}; rel. to $k(\cdot OH + SCN^-)$.	730090
		7	4.7 × 10^{10}	p.r.; esr; C.k.; rel. to $k(\cdot OH$ + 5-MeU).	723003
		7	3.5 × 10^{10}	p.r.; esr; C.k.; rel. to $k(\cdot OH$ + U).	723003
496	**Cysteine, conjugate acid**				
	$\cdot OH + HSCH_2CH(NH_3^+)CO_2H \rightarrow$		*1.5 × 10^{10}*	Average of 2 values.	
		0.4	1.6 × 10^{10}	p.r.; C.k.; pK_a ~2, 8.14, 10.34; rel. to $k(\cdot OH + SCN^-)$.	730090
		1	1.3 × 10^{10}	p.r.; C.k.; rel. to $k(\cdot OH + SCN^-)$.	650387
497	**Cystine**				
	$\cdot OH + S_2[CH_2CH(NH_3^+)CO_2^-]_2 \rightarrow$	6.5	2.1 × 10^9	γ-r.; C.k.; rel. to $k(\cdot OH$ + RNO).	730548
498	**Cystine, conjugate acid**				
	$\cdot OH + CytH^+ \rightarrow$	2-2.2	6.6 × 10^9	γ-r.; C.k.; pK_a = 1.90, 7.85; rel. to $k(\cdot OH$ + 5-MeU).	650388
499	**Cystine, conjugate diacid**				
	$\cdot OH + CytH_2^{2+} \rightarrow$	1	1.1 × 10^{10}	Fenton; esr; C.k. with H_2O_2; rel. to $k(\cdot OH$ + 5-MeU).	69D278
500	**Cytidine**				
	$\cdot OH + C_9H_{13}N_3O_5 \rightarrow$		*5.6 × 10^9*	Average of 3 values.	
		7	5.8 × 10^9	p.r.; P.b.k. (OH adduct); ϵ_{420} = 790 L mol^{-1} cm^{-1}.	731071
		5.6	6.4 × 10^9	p.r.; P.b.k. at 350 nm.	703069
		7.2-7.4	4.6 × 10^9	p.r.; C.k., at pH 2-2.2 k = 3.3 × 10^9; at pH 5.2-5.4 k = 8 × 10^9; rel. to $k(\cdot OH + SCN^-)$.	650388
501	**Cytidine 5′-monophosphate**				
	$\cdot OH$ + CMP → CMP-OH		*4.7 × 10^9*	Average of 3 values.	
		7	4.7 × 10^9	p.r.; P.b.k. at 425 nm (OH adduct); ϵ_{425} = 880 L mol^{-1} cm^{-1}.	731071

TABLE 8. Rate constants for reactions of hydroxyl radicals in aqueous solution—Continued

No.	Reaction	pH	k (L mol^{-1} s^{-1})	Comment	Ref.
501	**Cytidine 5′-monophosphate**—Continued				
		7.3	4.9×10^9	p.r.; P.b.k. at 425 nm.	703069
		7.4-7.6	4.4×10^9	p.r.; C.k.; at pH 2-2.2 $k = 2.5 \times 10^9$; rel. to k(·OH + SCN$^-$).	650388
502	**Cytidine 3′-monophosphate**				
	·OH + 3′-CMP →	~7	6.5×10^9	γ-r.; C.k.; obs. G(inorg. phosphate); 11.6% oxidative dephosphorylation; rel. to k(·OH + *tert*-BuOH).	753070
503	**Cytosine**				
	·OH + Cy → Cy(OH)		*6.1 × 10^9*	Average of 4 values.	
		7	6.3×10^9	p.r.; P.b.k.	78A106
		7	6.8×10^9	p.r.; P.b.k.; $\epsilon_{435} = 760$ L mol^{-1} cm^{-}.	731071
		5.8	6.2×10^9	p.r.; P.b.k. at 450 nm.	703069
		7.4-7.6	4.9×10^9	p.r.; C.k., at pH 5-6 $k = 7.5 \times 10^9$; rel. to k(·OH + SCN$^-$).	650388
504	**Cytosine, conjugate acid**				
	·OH + CyH$^+$ →	2-2.2	3.1×10^9	p.r.; C.k.; pK_a = 4.60, 12.16; rel. to k(·OH + SCN$^-$).	650388
505	**2′-Deoxyadenosine**				
	·OH + dA →	7	4.6×10^9	γ-r.; C.k.; rel. to k(·OH + RNO).	80A313
506	**2′-Deoxyadenosine-5′-monophosphate**				
	·OH + dAMP → dAMP-OH	6.4-6.6	3.5×10^9	p.r.; C.k.; at pH 2-2.2 $k = 1.4 \times 10^9$; rel. to k(·OH + SCN$^-$).	650388
507	**2′-Deoxycytidine**				
	·OH + dC → dC(OH)	7	6.0×10^9	p.r.; P.b.k.	78A106
508	**2′-Deoxycytidine-5′-monophosphate**				
	·OH + dCMP → dCMP(OH)		*5.0 × 10^9*	Average of 2 values.	
		7	4.9×10^9	p.r.; P.b.k.	731071
		6.7-7	5.0×10^9	p.r.; C.k.; pK_a = 4.6, 6; at pH 2-2.2 $k = 3.0 \times 10^9$, at pH 4.3-4.5 $k = 6.3 \times 10^9$; rel. to k(·OH + SCN$^-$).	650388
509	**2-Deoxy-D-glucose**				
	·OH + $C_6H_{12}O_5$ → H_2O + $C_6H_{11}O_5$	8.4	2.8×10^9	p.r.; No details; N_2O-satd. soln. contg. 5×10^{-3} mol L^{-1} borate buffer.	82A193
510	**Deoxyguanosine monophosphate**				
	·OH + dGMP → dGMP-OH	6.5-7	6.8×10^9	p.r.; C.k.; calcium salt; at pH 2-2.2 $k = 4.6 \times 10^9$; rel. to k(·OH + SCN$^-$).	650388
511	**Deoxyinosine monophosphate**				
	·OH + dIMP →	~7	7.4×10^9	γ-r.; C.k.; obs. G(inorg. phosphate); 6.1% oxidative dephosphorylation; rel. to k(·OH + *tert*-BuOH).	753070
512	**2-Deoxy-D-ribose**				
	·OH + $C_5H_{10}O_4$ → H_2O + R	8.4	2.5×10^9	p.r.; No details; N_2O-satd. soln. contg. 5×10^{-3} mol L^{-1} borate buffer.	82A193
513	**Deoxyribose 5-phosphate**				
	·OH + $C_5H_{12}O_7P$ →		*1.8 × 10^9*	Average of 2 values.	
		7	2.1×10^9	γ-r.; C.k.; rel. to k(·OH + RNO).	80A313
		~7	1.5×10^9	γ-r.; C.k.; obs. G(inorg. phosphate); 40.0% oxidative dephosphorylation; rel. to k(·OH + *tert*-BuOH).	753070
514	**2-Deoxy-2-sulfonamino-D-glucose**				
	·OH + $C_6H_{13}NO_8S$ →		*2.1 × 10^9*	Average of 2 values.	
		6.5	2.1×10^9	p.r.; C.k.; rel. to k(·OH + SCN$^-$).	78A146
			2.1×10^9	p.r.; C.k.; rel. to k(·OH + SCN$^-$).	703081

TABLE 8. Rate constants for reactions of hydroxyl radicals in aqueous solution—Continued

No.	Reaction	pH	k (L mol^{-1} s^{-1})	Comment	Ref.
515	**Deoxythymidine 5′-monophosphate**				
	•OH + dTMP →		5.7×10^9	r.; C.k.; k for H abstr. at C′-4 was detd. to be 1.7×10^8; rel. to k(•OH + HCO_2^-).	85G155
516	**Deoxyuridine monophosphate**				
	•OH + dUMP → dUMP-OH	~7	2.9×10^9	γ-r.; C.k.; obs. G(inorg. phosphate); 6.4% oxidative dephosphorylation; rel. to k(•OH + *tert*-BuOH).	753070
517	**Desferrioxamine B**				
	•OH + $C_{25}H_{48}N_6O_8$ →	7.1	1.3×10^{10}	p.r.; C.k. in soln. contg. 10^{-3} mol L^{-1} phosphate buffer; rel. to k(•OH + SCN^-).	82A406
518	**3,6-Diaminoacridine (Proflavine)**				
	•OH + PF →	~7	1.0×10^{10}	p.r.; D.k. at 444 nm; deduced that $k = 2 \times 10^9$ for dye bound to DNA.	753094
519	**Diatrizoate ion**				
	•OH + $(CH_3CONH)_2C_6I_3CO_2^-$ → $(CH_3CONH)_2C_6I_3(OH)CO_2^-$	5.6, 7	7×10^8	p.r.; C.k. with SCN^- or p.b.k. at 360 nm.	79A364
520	**1,4-Diazabicyclo[2.2.2]octane**				
	•OH + DABCO →	7.2	1.3×10^9	p.r.; C.k.; rel. to k(•OH + SCN^-).	78R103
521	**Dibutylamine**				
	•OH + $[CH_3(\dot{C}H_2)_3]_2NH$ → H_2O + $CH_3CH_2CH_2CHNHC_4H_9$	1.0	1.8×10^{10} [a]	Fe^{2+}-H_2O_2; C.k.; obs. polymerization of methyl methacrylate; rel. to k(•OH + $H_2C{=}C(CH_3)CO_2CH_3$).	86A305
522	**Di-*tert*-butyl disulfide**				
	•OH + $[(CH_3)_3C]_2S_2$ → OH^- + $[(CH_3)_3CS]_2^{\cdot+}$	~4	6.5×10^9	p.r.; P.b.k.; obs. radical cation formn. (~50% OH addn.); same rate constant by c.k. with SCN^-.	751089
523	**Di-*tert*-butylnaphthalenesulfonate ion**				
	•OH + $C_{18}H_{23}O_3S^-$ →		1.1×10^{10}	p.r.; P.b.k.; in distearoyl lecithin vesicles k = 56% of above.	78A096
524	**Dibutyl sulfoxide**				
	•OH + $[CH_3(CH_2)_3]_2SO$ → $[CH_3(CH_2)_3]_2SO(\dot{O}H)$		8.0×10^9	p.r.; Condy. buildup; (→ R + RSO_2^-/H^+); 48% sulfinic acid formn.	80A014
525	**Di(*tert*-butyl) sulfoxide**				
	•OH + $[(CH_3)_3C]_2SO$ → $[(CH_3)_3C]_2SO(\dot{O}H)$		5.3×10^9	p.r.; Condy. buildup; (→ R + RSO_2^-/H^+); 79% sulfinic acid formn.	80A014
526	***trans*-1,2-Dichloroethylene**				
	•OH + ClCH=CHCl → $CHCl(OH)\dot{C}HCl$		*6.2* × *10*^{9}	Average of 2 values.	
		~6.5	5.0×10^9	p.r.; P.b.k. (condy.) (Cl^-); ($CHClOHCHCl \rightarrow H^+ + Cl^- + CHOCHCl$).	710709
		~6.5	7.3×10^9	p.r.; C.k.; rel. to k(•OH + SCN^-).	710709
527	**2,6-Dichloroindophenol**				
	•OH + DCIP →		6.8×10^{10}	p.r.; C.k.; rel. to k(•OH + mannitol).	79A240
528	**Dichloromethane**				
	•OH + CH_2Cl_2 → $\cdot CHCl_2$ + H_2O	~10	5.8×10^7	p.r.; P.b.k. at 220 nm in N_2O-satd. soln. contg. 3-24 x 10^{-3} mol L^{-1} dichloromethane.	85A052
529	**Dicyandiamide**				
	•OH + $NCN{=}C(NH_2)_2$ → $NCN{=}C(\dot{N}H_2)(NH)$ + H_2O	5	7.2×10^6	γ-r.; C.k.; obs. $G(CO_2)$; ~90% abstr. 10% addn. estd. from spectra; rel. to k(•OH + HCO_2^-).	79A030
530	**1,4-Dicyanobenzene**				
	•OH + DCNB → $HOC_6H_4(CN)_2$		7.8×10^8	p.r.; C.k.; obs. buildup of OH-adduct at 370 nm (cor. for H-adduct); rel. to k(•OH + MeOH).	730121

TABLE 8. Rate constants for reactions of hydroxyl radicals in aqueous solution—Continued

No.	Reaction	pH	k (L mol^{-1} s^{-1})	Comment	Ref.
531	**Diethoxymethane**				
	$\cdot OH + CH_2(OC_2H_5)_2 \rightarrow$	9	1.6×10^9	γ-r.; C.k. with RNO; rel. to $k(\cdot OH + EtOH)$.	660423
532	**Diethylammonium ion**				
	$\cdot OH + (C_2H_5)_2NH_2^+ \rightarrow$	1	1.3×10^8	Fenton; C.k.; rel. to $k(\cdot OH + Fe^{2+})$.	490002
533	**Diethyl disulfide**				
	$\cdot OH + C_2H_5SSC_2H_5 \rightarrow OH^- + [C_2H_5SSC_2H_5]\cdot^+$	~4	1.4×10^{10}	p.r.; P.b.k.; obs. radical cation formn. (~50% OH addn.); same rate constant by c.k. with SCN^-.	751089
534	**Diethylene glycol**				
	$\cdot OH + (HOCH_2CH_2)_2O \rightarrow$	9	2.1×10^9	γ-r.; C.k. with RNO; rel. to $k(\cdot OH + EtOH)$.	660423
535	**Diethyleneglycol diethyl ether**				
	$\cdot OH + (C_2H_5OCH_2CH_2)_2O \rightarrow$	9	3.2×10^9	γ-r.; C.k. with RNO; rel. to $k(\cdot OH + EtOH)$.	660423
536	**Diethylenetriaminepentaacetate ion**				
	$\cdot OH + DTPA \rightarrow$		2.3×10^9	p.r.; C.k.; neutral pH assumed; rel. to $k(\cdot OH + SCN^-)$.	82N221
537	**Diethyl ether**				
	$\cdot OH + (C_2H_5)_2O \rightarrow H_2O + CH_3\dot{C}HOC_2H_5$		*3.6×10^9*	Average of 2 values.	
			2.9×10^9	p.r.; rel. to $k(\cdot OH + SCN^-)$.	80A441
		~7	4.2×10^9	p.r.; C.k.; obs. I_2^- formn. at 400 nm; rel. to $k(\cdot OH + I^-)$.	650010
538	***N,N*-Diethylhydroxylamine**				
	$\cdot OH + (C_2H_5)_2NOH \rightarrow H_2O + Et_2NO\cdot$	9	1.3×10^9	p.r.; P.b.k. (nitroxide radical) at 400 nm; d.k. (OH) at 260, 270 or 280 nm gave 3×10^9.	79A162
539	**Diethyl malonate**				
	$\cdot OH + C_2H_5O_2CCH_2CO_2C_2H_5 \rightarrow$	6-7	6.5×10^8	p.r.; C.k.; rel. to $k(\cdot OH + SCN^-)$.	650387
540	**Diethyl succinate**				
	$\cdot OH + C_2H_5O_2CCH_2CH_2CO_2C_2H_5 \rightarrow$	6-7	7.8×10^8	p.r.; C.k.; rel. to $k(\cdot OH + SCN^-)$.	650387
541	**Diethyl sulfide**				
	$\cdot OH + (C_2H_5)_2S \rightarrow (C_2H_5)_2\dot{S}(OH)$		1.4×10^{10}	p.r.; P.b.k. at 280 nm; $\cdot CHRSR$ and $(R_2S)_2^+$ formn. deduced by opt. and condy. studies.	751078
542	**Diethyl sulfoxide**				
	$\cdot OH + (C_2H_5)_2SO \rightarrow (C_2H_5)_2SO(OH)$		6.5×10^9	p.r.; Condy. buildup; ($\rightarrow R + RSO_2^-/H^+$); 80% sulfinic acid formn.	80A014
543	***o*-Difluorobenzene**				
	$\cdot OH + C_6H_4F_2 \rightarrow HOC_6H_4F_2$		7.5×10^9	p.r.; C.k.; rel. to $k(\cdot OH + SCN^-)$.	730054
544	***p*-Difluorobenzene**				
	$\cdot OH + C_6H_4F_2 \rightarrow HOC_6H_4F_2$		1×10^{10}	p.r.; C.k.; rel. to $k(\cdot OH + SCN^-)$.	730054
545	**2,3-Dihydro-5-hydroxy-1,4-phthalazinedione**				
	$\cdot OH + HDP \rightarrow$	11	1.2×10^{10}	p.r.; P.b.k. in soln. satd. with 1:1 O_2-N_2O.	79G176
546	**2,3-Dihydro-5-methyl-1,4-phthalazinedione**				
	$\cdot OH + MDP \rightarrow$	11	9×10^9	p.r.; P.b.k. in soln. satd. with 1:1 O_2-N_2O.	79G176
547	**Dihydro-6-methyluracil**				
	$\cdot OH + 6\text{-MeDHU} \rightarrow$		*1.1×10^9*	Average of 3 values.	
		7	1.3×10^9	p.r.; C.k.; rel. to $k(\cdot OH + tert\text{-BuOH})$.	741085
		7	1.0×10^9	p.r.; C.k.; rel. to $k(\cdot OH + EtOH)$.	741085
		7	1.0×10^9	p.r.; C.k.; rel. to $k(\cdot OH + SCN^-)$.	741085
548	**2,3-Dihydro-5-nitro-1,4-phthalazinedione**				
	$\cdot OH + NDP \rightarrow$	11	3×10^{10}	p.r.; P.b.k. in soln. satd. with 1:1 O_2-N_2O.	79G176
549	**5,6-Dihydroorotate ion**				
	$\cdot OH + 6\text{-DHU-}CO_2^- \rightarrow$	7	3.0×10^9	p.r.; P.b.k.	700567

TABLE 8. Rate constants for reactions of hydroxyl radicals in aqueous solution—Continued

No.	Reaction	pH	k (L mol^{-1} s^{-1})	Comment	Ref.
550	**5,6-Dihydrothymine**				
	·OH + 5-MeDHU →	7	~1 × 10^9	p.r.; Estd. by comparison of c.k. and p.b.k. results for dihydro-6-methyl-uracil.	741085
551	**5,6-Dihydrouracil**				
	·OH + DHU →	7	1.2 × 10^9	p.r.; C.k.; cor. for incomplete scavenging of e_{aq}^- by H_2O_2; rel. to k(·OH + SCN$^-$).	690571
552	**2,4-Dihydroxyacetophenone**				
	·OH + $(HO)_2C_6H_3COCH_3$ →		3 × 10^{10}	p.r.; C.k.; rel. to k(·OH + DCIP).	83A387
553	**2,5-Dihydroxyacetophenone**				
	·OH + $(HO)_2C_6H_3COCH_3$ →		8 × 10^9	p.r.; C.k.; rel. to k(·OH + DCIP).	83A387
554	**3,4-Dihydroxyacetophenone**				
	·OH + $(HO)_2C_6H_3COCH_3$ →	7	1.0 × 10^{10}	p.r.; C.k.; pK_a = 7.8; rel. to k(·OH + DCIP).	79A303
555	**3,4-Dihydroxybenzaldehyde**				
	·OH + $(HO)_2C_6H_3CHO$ →	7	8.3 × 10^9	p.r.; C.k.; pK_a = 7.27, 11.4; rel. to k(·OH + DCIP).	79A303
556	**3,4-Dihydroxycinnamate ion**				
	·OH + $(HO)_2C_6H_3CH{=}CHCO_2^-$ →		2.8 × 10^{10}	p.r.; C.k.; rel. to k(·OH + *tert*-BuOH)	83A387
557	**4,6-Dihydroxy-2-methylpyrimidine**				
	·OH + $C_5H_6N_2O_2$ → $C_5H_6N_2O_3$	3.7	7.4 × 10^9	p.r.; P.b.k. in soln. contg. 5-50 × 10^{-5} mol L^{-1} pyrimidine.	87A026
558	**4,6-Dihydroxy-2-methylpyrimidine anion**				
	·OH + $C_5H_5N_2O_2^-$ → $C_5H_6N_2O_3$	7.7	1.2 × 10^{10}	p.r.; P.b.k. in soln. contg. 5-50 × 10^{-5} mol L^{-1} pyrimidine.	87A026
559	**4,6-Dihydroxy-5-methylpyrimidine**				
	·OH + $C_5H_6N_2O_2$ → $C_5H_6N_2O_3$	4.3	4.2 × 10^9	p.r.; P.b.k. in soln. contg. 5-50 × 10^{-5} mol L^{-1} pyrimidine.	87A026
560	**4,6-Dihydroxy-5-methylpyrimidine anion**				
	·OH + $C_5H_5N_2O_2^-$ → $C_5H_6N_2O_3$	7.5	8.8 × 10^9	p.r.; P.b.k. in soln. contg. 5-50 × 10^{-5} mol L^{-1} pyrimidine.	87A026
561	**4,5-Dihydroxy-2,7-naphthalenedisulfonic acid**				
	·OH + $(HO)_2Np(SO_3H)_2$ → $(HO)_3Np(SO_3H)_2$	0.1	1.2 × 10^8	γ-r.; C.k.; obs. Fe^{3+} yield in air-satd. soln.; rel. to k(·OH + Fe^{2+}).	670025
562	**3,4-Dihydroxyphenethylammonium ion**				
	·OH + $(OH)_2C_6H_3CH_2CH_2NH_3^+$ → $(HO)_3C_6H_3CH_2CH_2NH_3^+$	4.7	5.9 × 10^9	p.r.; P.b.k. at 325 nm.	83A164
563	**2,3-Dihydroxy-2-propenal, conjugate base**				
	·OH + TRH^- → $TRH(OH)\cdot^-$	0.7	1.6 × 10^{10}	p.r.; C.k.; rel. to k(·OH + *tert*-BuOH).	86A151
564	**2,3-Dihydroxy-2-propenal**				
	·OH + TRH_2 → $TRH_2(OH)\cdot$	3.01	9.9 × 10^9	p.r.; C.k.; rel. to k(·OH + SCN$^-$).	86A151
565	**4,6-Dihydroxypyrimidine**				
	·OH + $C_4H_4N_2O_2$ → $C_4H_5N_2O_3$	4.0	5.7 × 10^9	p.r.; P.b.k. in soln. contg. 5-50 × 10^{-5} mol L^{-1} pyrimidine.	87A026
566	**4,6-Dihydroxypyrimidine anion**				
	·OH + $C_4H_3N_2O_2^-$ → $C_4H_5N_2O_3$	9.2	7.9 × 10^9	p.r.; P.b.k. in soln. contg. 5-50 × 10^{-5} mol L^{-1} pyrimidine.	87A026
567	**3,4-Dihydroxytoluene**				
	·OH + 3-$CH_3C_6H_3$-1,2-$(OH)_2$ →	2,7	1.6 × 10^{10}	p.r.; C.k.; rel. to k(·OH + SCN$^-$).	771116
568	**Diisopropyl disulfide**				
	·OH + $[(CH_3)_2CH]_2S_2$ → OH^- + $[(CH_3)_2CH]_2S_2\cdot^+$	~4	2.0 × 10^{10}	p.r.; P.b.k.; obs. radical cation formn. (~50% OH addn.); same rate constant by c.k. with SCN$^-$.	751089

TABLE 8. Rate constants for reactions of hydroxyl radicals in aqueous solution—Continued

No.	Reaction	pH	k (L mol^{-1} s^{-1})	Comment	Ref.
569	**Diisopropyl sulfoxide** $\cdot OH + [(CH_3)_2CH]_2SO \rightarrow [(CH_3)_2CH]_2SO(OH)$		6.8×10^9	p.r.; Condy. buildup; ($\rightarrow R + RSO_2^-/H^+$); 79% sulfinic acid formn.	80A014
570	**1,2-Dimethoxybenzene** $\cdot OH + C_6H_4(OCH_3)_2 \rightarrow HOC_6H_4(OCH_3)_2$	6.5	5.2×10^9	p.r.; P.b.k.	751171
571	**1,3-Dimethoxybenzene** $\cdot OH + C_6H_4(OCH_3)_2 \rightarrow HOC_6H_4(OCH_3)_2$	6.5	7.2×10^9	p.r.; P.b.k.	751171
572	**1,4-Dimethoxybenzene** $\cdot OH + C_6H_4(OCH_3)_2 \rightarrow HOC_6H_4(OCH_3)_2$	6.5	7.0×10^9	p.r.; P.b.k.	751171
573	**2,3-Dimethoxybenzoate ion** $\cdot OH + 2,3\text{-}(CH_3O)_2C_6H_3CO_2^- \rightarrow (CH_3O)_2C_6H_3(OH)CO_2^-$	~7	1.0×10^{10}	p.r.; C.k.; rel. to $k(\cdot OH + SCN^-)$.	771007
574	**2,4-Dimethoxybenzoate ion** $\cdot OH + 2,4\text{-}(CH_3O)_2C_6H_3CO_2^- \rightarrow (CH_3O)_2C_6H_3(OH)CO_2^-$	~7	1.0×10^{10}	p.r.; C.k.; rel. to $k(\cdot OH + SCN^-)$.	771007
575	**2,6-Dimethoxybenzoate ion** $\cdot OH + 2,6\text{-}(CH_3O)_2C_6H_3CO_2^- \rightarrow (CH_3O)_2C_6H_3(OH)CO_2^-$	~7	6.6×10^9	p.r.; C.k.; rel. to $k(\cdot OH + SCN^-)$.	771007
576	**3,4-Dimethoxybenzoate ion** $\cdot OH + 3,4\text{-}(CH_3O)_2C_6H_3CO_2^- \rightarrow (CH_3O)_2C_6H_3(OH)CO_2^-$	~7	1.2×10^{10}	p.r.; C.k.; rel. to $k(\cdot OH + SCN^-)$.	771007
577	**3,5-Dimethoxybenzoate ion** $\cdot OH + 3,5\text{-}(CH_3O)_2C_6H_3CO_2^- \rightarrow (CH_3O)_2C_6H_3(OH)CO_2^-$	~7	7.0×10^9	p.r.; C.k.; rel. to $k(\cdot OH + SCN^-)$.	771007
578	**1,1-Dimethoxyethane** $\cdot OH + CH_3CH(OCH_3)_2 \rightarrow$		2.2×10^9	p.r.; rel. to $k(\cdot OH + SCN^-)$.	80A441
579	**Dimethoxymethane** $\cdot OH + CH_2(OCH_3)_2 \rightarrow H_2O + \cdot CH_2OCH_2OCH_3$		1.2×10^9	p.r.; rel. to $k(\cdot OH + SCN^-)$.	80A441
580	**2,3-Dimethoxyphenol** $\cdot OH + (CH_3O)_2C_6H_3OH \rightarrow (CH_3O)_2C_6H_3(OH)_2$	6-7	2.0×10^{10}	p.r.; C.k.; rel. to $k(\cdot OH + SCN^-)$.	771087
581	**2,6-Dimethoxyphenol** $\cdot OH + (CH_3O)_2C_6H_3OH \rightarrow (CH_3O)_2C_6H_3(OH)_2$	6-7	2.6×10^{10}	p.r.; C.k.; rel. to $k(\cdot OH + SCN^-)$.	771087
582	**3,5-Dimethoxyphenol** $\cdot OH + (CH_3O)_2C_6H_3OH \rightarrow (CH_3O)_2C_6H_3(OH)_2$	6-7	2×10^{10}	p.r.; C.k.; rel. to $k(\cdot OH + SCN^-)$.	771087
583	***N,N*-Dimethylacetamide** $\cdot OH + CH_3CON(CH_3)_2 \rightarrow CH_3CON(CH_3)\dot{C}H_2 + H_2O$	5.5	3.5×10^9	p.r.; C.k.; rel to $k(\cdot OH + SCN^-)$.	700098
584	***N*^{6},*N*^{6}-Dimethyladenine** $\cdot OH + C_7H_9N_5 \rightarrow$	6.4	7.1×10^9	p.r.; P.b.k. at 320-330 and 510 nm; pK_a = 3.87, 10.5.	87A231
585	***N*^{6},*N*^{6}-Dimethyladenosine** $\cdot OH + DMA \rightarrow$	~7.7	6.4×10^9	p.r.; P.b.k. at at 400 nm; $pK_a = 3.65$.	87A231
586	***N,N*-Dimethylaniline** $\cdot OH + C_6H_5N(CH_3)_2 \rightarrow HOC_6H_5N(CH_3)_2 + C_6H_5N(CH_3)\dot{C}H_2 + H_2O$		*1.4 × 10^{10}*	Average of 2 values.	

TABLE 8. Rate constants for reactions of hydroxyl radicals in aqueous solution—Continued

No.	Reaction	pH	k (L mol^{-1} s^{-1})	Comment	Ref.
586	***N,N*-Dimethylaniline**—Continued				
		9	1.4×10^{10}	p.r.; P.b.k.; adduct obs. at 380 nm and gives radical cation (465 nm), H abstr. product obs. at 330 nm in ratio of 1:2 with radical cation.	771126
			1.3×10^{10}	p.r.; P.b.k. at 455 and 330 nm in unbuffered soln.	720289
587	***N,N*-Dimethylanilinium ion** $\cdot OH + C_6H_5NH(CH_3)_2^+ \rightarrow$	1	2.2×10^9	Fenton; C.k.; rel. to $k(\cdot OH + Fe^{2+})$.	490003
588	**2,3-Di-*O*-methyl-L-ascorbic acid** $\cdot OH + 2,3\text{-}(CH_3)_2A \rightarrow$ 2,3-$(CH_3)_2$A-OH	6.5-6.8	4.2×10^9	p.r.; P.b.k. at 335 nm.	84A095
589	**1,1'-Dimethyl-4,4'-bipyridinium ion** $\cdot OH + MV^{2+} \rightarrow MV(OH)^{2+}$	7	2.5×10^8	p.r.; P.b.k. at 470 nm in soln. contg. 5.4×10^{-4} mol L^{-1} methyl viologen and 2.8×10^{-2} mol L^{-1} N_2O.	85A099
590	**3,3-Dimethylbutyrate ion** $\cdot OH + (CH_3)_3CCH_2CO_2^- \rightarrow$	9	1.7×10^9	γ-r.; C.k. with RNO; rel. to $k(\cdot OH + EtOH)$.	660423
591	**2,2-Dimethyl-1,3-dioxolane** $\cdot OH + \text{-}OC(CH_3)_2O(CH_2)_2\text{-} \rightarrow H_2O +$ $\text{-}OC(CH_3)_2O\dot{C}HCH_2\text{-}$		2.1×10^9	p.r.; rel. to $k(\cdot OH + SCN^-)$.	80A441
592	**Dimethyl disulfide** $\cdot OH + CH_3SSCH_3 \rightarrow OH^- +$ $[CH_3SSCH_3]^{\cdot +}$	~4	1.7×10^{10}	p.r.; P.b.k.; obs. radical cation formn. (~50% OH addn.); same rate constant by c.k. with SCN^-.	751089
593	**Dimethyl ether** $\cdot OH + CH_3OCH_3 \rightarrow H_2O +$ $\cdot CH_2OCH_3$		1.0×10^9	p.r.; rel. to $k(\cdot OH + SCN^-)$.	80A441
594	***N,N*-Dimethylformamide** $\cdot OH + HCON(CH_3)_2 \rightarrow$ $HCON(CH_3)\dot{C}H_2 + H_2O$	5.5	1.7×10^9	p.r.; C.k.; rel. to $k(\cdot OH + SCN^-)$.	700098
595	**2,5-Dimethyl-3-hexyne-2,5-diol** $\cdot OH + HOC(CH_3)_2C{\equiv}CC(CH_3)_2OH \rightarrow$	1	3.3×10^9	Fenton; C.k.; $k(\cdot OH + MeOH)/k(\cdot OH + Fe^{2+}) = 4.3$; rel. to $k(\cdot OH + MeOH)$.	739350
596	**1,1-Dimethylhydrazine** $\cdot OH + (CH_3)_2NNH_2 \rightarrow$ $\cdot CH_2N(CH_3)NH_2 + (CH_3)_2\dot{N}NH +$ H_2O	9.7	1.6×10^{10}	p.r.; C.k.; rel. to $k(\cdot OH + SCN^-)$.	720003
597	**1,2-Dimethylhydrazine** $\cdot OH + CH_3NHNHCH_3 \rightarrow$ $\cdot CH_2NHNHCH_3 + CH_3\dot{N}NHCH_3 +$ H_2O	10.1	1.4×10^{10}	p.r.; C.k.; rel. to $k(\cdot OH + SCN^-)$.	720003
598	**1,1-Dimethylhydrazinium ion** $\cdot OH + (CH_3)_2NNH_3^+ \rightarrow$	3.5	8.1×10^8	p.r.; C.k.; $pK_a = 7.21$; rel. to $k(\cdot OH + SCN^-)$.	720003
599	**1,2-Dimethylhydrazinium ion** $\cdot OH + CH_3NHNH_2CH_3^+ \rightarrow$	3.5	7.2×10^8	p.r.; C.k.; $pK_a = 7.52$; rel. to $k(\cdot OH + SCN^-)$.	720003
600	**1,2-Dimethylindole** $\cdot OH + 1,2\text{-}(CH_3)_2In \rightarrow$	9.0	1×10^{10}	γ-r.; C.k.; rel. to $k(\cdot OH + TrpH)$.	710556
601	**1,3-Dimethylindole** $\cdot OH + 1,3\text{-}(CH_3)_2In \rightarrow$	9.0	1.1×10^{10}	γ-r.; C.k.; rel. to $k(\cdot OH + TrpH)$.	710556
602	**2,3-Dimethylindole** $\cdot OH + 2,3\text{-}(CH_3)_2In \rightarrow$	9.0	1.3×10^{10}	γ-r.; C.k.; rel. to $k(\cdot OH + TrpH)$.	710556
603	***N,N*-Dimethyl-4-nitrosoaniline** $\cdot OH + Me_2NC_6H_4NO \rightarrow$ $Me_2NC_6H_4\dot{N}O_2^-$		**1.25×10^{10}**	**Selected value.**	

TABLE 8. Rate constants for reactions of hydroxyl radicals in aqueous solution—Continued

No.	Reaction	pH	k (L mol^{-1} s^{-1})	Comment	Ref.
603	***N,N*-Dimethyl-4-nitrosoaniline**—Continued				
		9	1.4×10^{10}	p.r.; C.k.; rel. to k(·OH + EtOH).	760371
		7	1.2×10^{10}	p.r.; D.k. at 440 nm.	690156
		~7	1.8×10^{10}	p.r.; D.k. at 440 nm.	680066
			1.8×10^{10}	p.r.; C.k. with HCO_2^-, I^-, AsO_2^-, and NO_2^- in O_2-satd. soln.	680066
604	**2,4-Dimethylphenyl-β-D-glucopyranoside** ·OH + $GluOC_6H_3(CH_3)_2$ →		3.9×10^9	p.r.; C.k. with SCN^-; rel. to k(·OH + $GlucOC_6H_5$).	710056
605	**3,4-Dimethylphenyl-β-D-glucopyranoside** ·OH + $GluOC_6H_3(CH_3)_2$ →		4.2×10^9	γ-r.; C.k. with RNO; rel. to k(·OH + $GlucOC_6H_5$).	710056
606	**2,2-Dimethyl-1-phenyl-1-propanol** ·OH + $C_6H_5CHOHC(CH_3)_3$ →	1.7-1.8	9.9×10^9	Fenton; C.k. with 1-phenylethanol; rel. to k(·OH + 2-PrOH).	749006
607	**Dimethyl phosphate ion** ·OH + $(CH_3O)_2PO_2^-$ → H_2O + $·CH_2O(CH_3O)PO_2^-$		1.2×10^8	p.r.; C.k.; rel. to k(·OH + SCN^-).	723008
608	***N,N*-Dimethylpivalamide** ·OH + $(CH_3)_3CCON(CH_3)_2$ →	5-6	3.9×10^9	p.r.; C.k.; rel. to k(·OH + SCN^-).	710414
609	**2,2-Dimethyl-1-propanol** ·OH + $(CH_3)_3CCH_2OH$ →	<2	4.0×10^9	Fenton; rel. to k(·OH + Fe^{2+}).	759067
610	**2,4-Dimethylpyridine** ·OH + $(CH_3)_2py$ →	9	3.1×10^9	γ-r.; C.k.; rel. to k(·OH + RNO).	690280
611	**2,6-Dimethylpyridine** ·OH + $(CH_3)_2py$ →	9	3.0×10^9	γ-r.; C.k.; rel. to k(·OH + RNO).	690280
612	**5,5-Dimethyl-1-pyrroline-1-oxyl** ·OH + DMPO → DMPO-OH		*4.9×10^9*	Average of 3 values.	
			3.6×10^9	p.r.; P.b.k.	86A472
		11.0	4.9×10^9	p.r.; C.k.; rel. to k(·OH + $Fe(CN)_6^{4-}$).	84A426
		7	4.3×10^9	p.r.; P.b.k. at 270 nm.	80A048
613	**Dimethyl sulfide** ·OH + $(CH_3)_2S$ → $CH_3S(OH)CH_3$		1.9×10^{10}	p.r.; P.b.k. at 280 nm; $·CH_2SCH_3$ and $[(CH_3)_2S]_2^+$ formn. deduced by opt. and condy. studies.	751078
614	**Dimethyl sulfoxide** ·OH + CH_3SOCH_3 → $(CH_3)_2SO(OH)$		*6.6×10^9*	Average of 3 values.	
			7.0×10^9	p.r.; Condy. buildup; (→ R + RSO_2^- + H^+).	80A014
			5.8×10^9	p.r.; C.k.; rel. to k(·OH + SCN^-).	731077
			7.0×10^9	p.r.; C.k.; rel. to k(·OH + SCN^-).	670186
615	**4,4′-(2,3-Dimethyltetramethylene)dicatechol** ·OH + $[-CH(CH_3)CH_2C_6H_3(OH)_2]_2$ →		1.5×10^{10}	p.r.; C.k.; rel. to k(·OH + *tert*-BuOH).	83A387
616	**2,5-Dimethylthiophene** ·OH + C_6H_8S → $(CH_3)_2(OH)C_4H_2S$	~7	7.2×10^9	p.r.; P.b.k. at 300 nm; $k = 5.6 \times 10^9$ in unbuffered soln.	78A026
617	**1,3-Dimethylthiourea** ·OH + $CH_3NHCSNHCH_3$ →		1.2×10^9	p.r.; P.b.k. at 420 nm.	81A902
618	**1,3-Dimethylurea** ·OH + $CH_3NHCONHCH_3$ →		2.6×10^9	p.r.; C.k. with SCN^-; rel. to k(·OH + EtOH).	81A902

TABLE 8. Rate constants for reactions of hydroxyl radicals in aqueous solution—Continued

No.	Reaction	pH	k (L mol^{-1} s^{-1})	Comment	Ref.
619	**3,5-Dinitroanisole**				
	$\cdot OH + (NO_2)_2C_6H_3OCH_3 \rightarrow (NO_2)_2C_6H_3(OH)OCH_3$		4×10^9	p.r.; P.b.k. at 470 nm; ~10% H reaction.	79A176
620	**1,4-Dioxane**				
	$\cdot OH + -O(CH_2)_2O(CH_2)_2- \rightarrow -OCHCH_2O(CH_2)_2- + H_2O$		*2.8 × 10^9*	Average of 2 values.	
			3.1×10^9	p.r.; C.k.; rel. to $k(OH + SCN^-)$.	80A441
		7	2.5×10^9	p.r.; C.k.; obs. I_2^- formn. at 400 nm; rel. to $k(\cdot OH + I^-)$.	650010
621	**1,3-Dioxolane**				
	$\cdot OH + -OCH_2O(CH_2)_2- \rightarrow H_2O + -OCHO(CH_2)_2-$		4.0×10^9	p.r.; rel. to $k(\cdot OH + SCN^-)$.	80A441
622	**Diphenylacetate ion**				
	$\cdot OH + (C_6H_5)_2CHCO_2^- \rightarrow (C_6H_5OH)(C_6H_5)CHCO_2^-$	9.1	4×10^9	p.r.; P.b.k. at 340 nm.	720047
623	**Diphenylamine**				
	$\cdot OH + (C_6H_5)_2NH \rightarrow HOC_6H_5NHC_6H_5$		*1.2 × 10^{10}*	Average of 2 values.	
		3-9	1.0×10^{10}	p.r.; P.b.k. at 365 nm in N_2O-satd. soln.	85A283
		9	1.3×10^{10}	γ-r.; C.k.; rel. to $k(\cdot OH + RNO)$.	690280
624	**Diphenyl sulfoxide**				
	$\cdot OH + (C_6H_5)_2SO \rightarrow$		1.0×10^{10}	p.r.; Condy. buildup in H_2O-satd. soln.; 31% formn. of $C_6H_5SO_2^-/H^+$ and phenyl radical.	80A014
625	**Dipropyl sulfoxide**				
	$\cdot OH + (CH_3CH_2CH_2)_2SO \rightarrow (CH_3CH_2CH_2)_2SO(OH)$		6.3×10^9	p.r.; Condy. buildup; ($\rightarrow R + RSO_2^-/H^+$); 55% of OH leads to sulfinic acid formn.	80A014
626	**1,4-Dithiane**				
	$\cdot OH + C_4H_8S_2 \rightarrow C_4H_8S_2(OH)$	~7	1.8×10^{10}	p.r.; P.b.k. at 350 nm.	771164
627	**Dithiothreitol**				
	$\cdot OH + DTT \rightarrow H_2O + \cdot SCH_2CHOHCHOHCH_2SH$		*1.4 × 10^{10}*	Average of 3 values.	
		4	1.5×10^{10}	p.r.; P.b.k. at 380 nm.	87A108
		7	1.5×10^{10}	p.r.; P.b.k. at 390 nm.	731020
		7	1×10^{10}	p.r.; C.k.; $pK_a = 8.3, 9.5$; rel. to $k(\cdot OH + Phe)$.	731020
628	**Dodecylsulfate ion**				
	$\cdot OH + CH_3(CH_2)_{11}OSO_3^- \rightarrow$		*8.2 × 10^9*	Average of 2 values.	
			8.0×10^9	p.r.; C.k.; rel. to $k(\cdot OH + SCN^-)$.	79N061
			8.4×10^9	p.r.; C.k. with SCN^-; $k = 5.0 \times 10^8$ for micellar soln.; rel. to $k(\cdot OH + MeOH)$.	710001 710586
629	**Eosin dianion**				
	$\cdot OH + C_{20}H_6Br_4O_5^{2-} \rightarrow$	10.5	1.3×10^{10}	p.r.; C.k. in air-satd. soln.; cor. for presence of HCO_3^-; rel. to $k(\cdot OH + CO_3^{2-})$.	670038
630	***l*-Ephedrine**				
	$\cdot OH + PhCH(OH)CH(CH_3)NHCH_3 \rightarrow$	11	2.3×10^9	p.r.; Transient absorption spectrum around 300 nm produced in N_2O-satd. soln. has lower extinction than radical cation which suggests other processes also occur; also reacts at pH 7.	83A176
631	**1,2-Epoxybutane**				
	$\cdot OH + C_4H_8O \rightarrow$	9	7.8×10^8	γ-r.; C.k. with RNO; rel. to $k(\cdot OH + EtOH)$.	660423
632	**1,2-Epoxypropane**				
	$\cdot OH + C_3H_6O \rightarrow$	9	2.5×10^8	γ-r.; C.k. with RNO; rel. to $k(\cdot OH + EtOH)$.	660423
633	**2,3-Epoxypropanol**				
	$\cdot OH + C_3H_6O_2 \rightarrow$	9	4.7×10^8	γ-r.; C.k. with RNO; rel. to $k(\cdot OH + EtOH)$.	660423

TABLE 8. Rate constants for reactions of hydroxyl radicals in aqueous solution—Continued

No.	Reaction	pH	k (L mol^{-1} s^{-1})	Comment	Ref.
634	**Erythritol**				
	$\cdot OH + HOCH_2[CH(OH)]_2CH_2OH \rightarrow$	7	1.5×10^9	p.r.; C.k.; rel. to $k(\cdot OH + SCN^-)$.	79A366
635	**Ethane**				
	$\cdot OH + C_2H_6 \rightarrow \cdot CH_2CH_3 + H_2O$	4.4	1.8×10^9	p.r.; C.k., obs. decrease in 415 nm abs.; rel. to $k(\cdot OH + Fe(CN)_6^{4-})$.	751055
636	**Ethanesulfonate ion**				
	$\cdot OH + C_2H_5SO_3^- \rightarrow CH_3\dot{C}HSO_3^- + H_2O$		1.0×10^8	p.r.; C.k.; rel. to $k(\cdot OH + SCN^-)$.	680352
637	**Ethanol**				
	$\cdot OH + C_2H_5OH \rightarrow H_2O + CH_3\dot{C}HOH$ (84.3%) + $CH_3CH_2O\cdot$ (2.5%) + $\cdot CH_2CH_2OH$ (13.2%) [730126]		**1.9×10^9**	**Selected value.**	
		6	1.9×10^9	p.r.; C.k.; obs. $ABTS^{\cdot+}$ formn. at 415 nm; rel. to $k(\cdot OH + ABTS)$.	82A196
			1.9×10^9	p.r.; C.k.; rel. to $k(\cdot OH + Fe(CN)_6^{4-})$.	731046
		nat.	2.1×10^9	p.r.; C.k.; rel. to $k(\cdot OH + Fe(CN)_6^{4-})$.	710578
		11	2.1×10^9	p.r.; C.k.; assume $pK_a(\cdot OH) = 11.9$; rel. to $k(\cdot OH + CO_3^{2-})$.	700511
			1.6×10^9	p.r.; C.k.; rel. to $k(\cdot OH + RNO)$.	690156
			1.8×10^9	p.r.; C.k.; rel. to $k(\cdot OH + PA^-)$.	680304
			1.8×10^9	p.r.; C.k.; rel. to $k(\cdot OH + PNBA^-)$.	680304
			1.8×10^9	p.r.; C.k.; obs. hydroxycyclohexadienyl radical buildup; rel. to $k(\cdot OH + BzO^-)$.	680304
			2.0×10^9	p.r.; C.k. with HSO_4^-, measured abs. at 450 nm. ($SO_4\cdot^-$); rel. to $k(\cdot OH + MeOH)$.	660019
		7	2.2×10^9	p.r.; C.k.; rel. to $k(\cdot OH + Fe(CN)_6^{4-})$.	650007
		3, 10.5	1.7×10^9	γ-r.; C.k.; measured $^{14}CO_2$; rel. to $k(\cdot OH + BzO^-)$.	650099
		7	1.8×10^9	p.r.; C.k.; rel. to $k(\cdot OH + SCN^-)$.	650190
		7, 10.7	1.9×10^9	p.r.; C.k.; rel. to $k(\cdot OH + CO_3^{2-})$.	650190
		7	1.9×10^9	p.r.; C.k., at pH 2 $k = 2.8 \times 10^9$; rel. to $k(\cdot OH + SCN^-)$.	650387
638	**Ethanol-d_6**				
	$\cdot OH + C_2D_5OH \rightarrow HDO + CD_3\dot{C}DOH$	6	1.2×10^9	γ-r.; C.k. with Br^-; rel. to $k(\cdot OH + EtOH)$.	660423
639	**2-Ethoxyethanol**				
	$\cdot OH + C_2H_5OCH_2CH_2OH \rightarrow$	9	1.7×10^9	γ-r.; C.k. with RNO; rel. to $k(\cdot OH + EtOH)$.	660423
640	**Ethyl acetate**				
	$\cdot OH + CH_3CO_2C_2H_5 \rightarrow H_2O + CH_3CO_2\dot{C}HCH_3$	6-7	4.0×10^8	p.r.; C.k.; rel. to $k(\cdot OH + SCN^-)$.	650387
641	**Ethylamine**				
	$\cdot OH + C_2H_5NH_2 \rightarrow$		5.1×10^9 [b]	p.r.; C.k.; calcd. from values obs. at pH 8-13.1; rel. to $k(\cdot OH + NB)$.	730016
			6.4×10^9 [b]	p.r.; C.k.; calcd. from values obs. at pH 8-13.1; rel. to $k(\cdot OH + SCN^-)$.	730016
			1.3×10^{10} [b]	p.r.; C.k.; extrapolated from pH study; rel. to $k(\cdot OH + SCN^-)$.	710585
642	**Ethylammonium ion**				
	$\cdot OH + C_2H_5NH_3^+ \rightarrow$		*4.1×10^8*	Average of 3 values.	
			5.9×10^8	p.r.; C.k.; calcd. from values obs. at pH 8-13.1; rel. to $k(\cdot OH + SCN^-)$.	730016
			3.3×10^8	p.r.; C.k.; calcd. from values obs. at pH 8-13.1; rel. to $k(\cdot OH + NB)$.	730016
		3.1	3.0×10^8	p.r.; C.k.; rel. to $k(\cdot OH + SCN^-)$.	710585

TABLE 8. Rate constants for reactions of hydroxyl radicals in aqueous solution—Continued

No.	Reaction	pH	k (L mol^{-1} s^{-1})	Comment	Ref.
643	**Ethylbenzene**				
	$\cdot OH + C_6H_5C_2H_5 \rightarrow C_2H_5C_6H_5OH$	7	7.5×10^9	p.r.; No details given; ~15% H abstr.	79B128
644	**Ethyl butyrate**				
	$\cdot OH + CH_3CH_2CH_2CO_2C_2H_5 \rightarrow$	6-7	1.6×10^9	p.r.; C.k.; rel. to $k(\cdot OH + SCN^-)$.	650387
645	**Ethylene**				
	$\cdot OH + H_2C{=}CH_2 \rightarrow \cdot CH_2CH_2OH$		4.4×10^9 [b]	p.r.; C.k.; obs. I_2^- at 400 nm; rel. to $k(\cdot OH + I^-)$.	670041
			1.7×10^9 [b]	p.r.; C.k. with SCN^- in H_2SO_4 soln. and with HCO_3^-; details not given; rel. to $k(\cdot OH + SCN^-)$.	670269
646	**Ethylenediamine**				
	$\cdot OH + H_2NCH_2CH_2NH_2 \rightarrow H_2NCHCH_2NH_2 + H_2O$	10.0	5.5×10^9	p.r.; C.k. in O_2-satd. soln.; also detd. at pH 8.0, 8.5, and 9.0; rel. to $k(\cdot OH + SCN^-)$.	720461
647	**Ethylenediaminetetraacetate ion**				
	$\cdot OH + H_2EDTA^{2-} \rightarrow$ H abstr.	4.0	4.0×10^8	p.r.; P.b.k. as well as c.k. with SCN^-.	78A436
	$\cdot OH + HEDTA^{3-} \rightarrow$ H abstr.	9.0	2.0×10^9	p.r.; P.b.k. as well as c.k. with SCN^-; pK_a = 0.26, 0.96, 2.7, 2.7, 6.2, 10	78A436
648	**Ethylene glycol**				
	$\cdot OH + HOCH_2CH_2OH \rightarrow \cdot CHOHCH_2OH + H_2O$		*1.8 × 10^9*	Average of 4 values.	
			2.4×10^9	p.r.; C.k.; rel. to $k(\cdot OH + Fe(CN)_6^{4-})$.	731046
		nat.	1.7×10^9	p.r.; C.k.; rel. to $k(\cdot OH + Fe(CN)_6^{4-})$.	710578
		7	1.7×10^9	p.r.; C.k.; rel. to $k(\cdot OH + CO_3^{2-})$.	650190
		7	1.4×10^9	p.r.; C.k.; rel. to $k(\cdot OH + SCN^-)$.	650387
649	**Ethylene glycol diethyl ether**				
	$\cdot OH + C_2H_5OCH_2CH_2OC_2H_5 \rightarrow$	9	2.3×10^9	γ-r.; C.k. with RNO; rel. to $k(\cdot OH + EtOH)$.	660423
650	**Ethylene glycol dimethyl ether**				
	$\cdot OH + CH_3OCH_2CH_2OCH_3 \rightarrow$	9	1.6×10^9	γ-r.; C.k. with RNO; rel. to $k(\cdot OH + EtOH)$.	660423
651	**Ethylene oxide**				
	$\cdot OH + \text{-}OCH_2CH_2\text{-} \rightarrow$	9	6.8×10^7	γ-r.; C.k. with RNO; rel. to $k(\cdot OH + EtOH)$.	660423
652	**Ethyl formate**				
	$\cdot OH + HCO_2C_2H_5 \rightarrow$	6-7	3.9×10^8	p.r.; C.k.; rel. to $k(\cdot OH + SCN^-)$.	650387
653	**Ethyl hydroperoxide**				
	$\cdot OH + C_2H_5O_2H \rightarrow$	7	1.5×10^7	p.r.; C.k.; rel. to $k(\cdot OH + SCN^-)$.	81A374
654	**4-Ethyl-5-hydroxy-2-methylpyridine**				
	$\cdot OH + C_8H_{11}NO \rightarrow$	6.5	1.4×10^9	γ-r.; C.k.; rel. to $k(\cdot OH + RNO)$.	690580
655	***N*-Ethylmaleamate ion**				
	$\cdot OH +$ NEMA $\rightarrow$ NEMA-OH	6.0	7.0×10^9	p.r.; P.b.k.	720144
656	***N*-Ethylmaleimide**				
	$\cdot OH +$ NEM $\rightarrow$ NEM-OH	6.0	9.0×10^9	p.r.; P.b.k.	720144
657	**3-Ethylpentane**				
	$\cdot OH + (C_2H_5)_3CH \rightarrow$	2	5.9×10^9	Fenton; rel. to $k(\cdot OH +$ Ethane).	81M420
658	**1-(*p*-Ethylphenyl)ethanol**				
	$\cdot OH + 4\text{-}C_2H_5C_6H_4CHOHCH_3 \rightarrow$	1.7-1.8	1.3×10^{10}	Fenton; C.k. with 1-phenylethanol; rel. to $k(\cdot OH$ + 2-PrOH).	749006
659	**Ethyl phenyl sulfoxide**				
	$\cdot OH + C_6H_5SOC_2H_5 \rightarrow$		8.4×10^9	p.r.; Condy. buildup; ($\rightarrow$ R + RSO_2^-/H^+); 45% addn. to S, 55% addn. to ring.	80A014
660	**Ethyl propionate**				
	$\cdot OH + C_2H_5CO_2C_2H_5 \rightarrow$	6-7	8.7×10^8	p.r.; C.k.; rel. to $k(\cdot OH + SCN^-)$.	650387

TABLE 8. Rate constants for reactions of hydroxyl radicals in aqueous solution—Continued

No.	Reaction	pH	k (L mol^{-1} s^{-1})	Comment	Ref.
661	**1-Ethyl-2-pyrrolidinone**				
	$\cdot OH + -CH_2CH_2CON(Et)CH_2- \rightarrow -CH_2\dot{C}HCON(Et)CH_2- + H_2O$		*2.7 × 10^9*	Average of 2 values.	
			2.6 × 10^9	p.r.; D.k. at 350 nm.	81A296
			2.9 × 10^9	p.r.; C.k.; rel. to $k(\cdot OH + SCN^-)$.	81A296
662	**Ethylsulfate ion**				
	$\cdot OH + C_2H_5OSO_3^- \rightarrow H_2O + CH_3\dot{C}HOSO_3^-$		3.5 × 10^8	p.r.; C.k.; rel. to $k(\cdot OH + SCN^-)$.	79N061
663	**Flavine mononucleotide**				
	$\cdot OH$ + FMN →	~7	2.5 × 10^9	γ-r.; C.k.; obs. G(inorg. phosphate); 2.3% oxidative dephosphorylation; rel. to $k(\cdot OH$ + *tert*-BuOH).	753070
664	**Fluorescein dianion**				
	$\cdot OH + Fl^{2-} \rightarrow$	10	1.2 × 10^{10}	p.r.; D.k. as well as p.b.k.; pK_a = 2.2, 4.4, 6.7.	736068 741063
665	**Fluoroacetate ion**				
	$\cdot OH + FCH_2CO_2^- \rightarrow$	9	3.0 × 10^7	γ-r.; C.k. with RNO; rel. to $k(\cdot OH$ + EtOH).	660423
666	**Fluorobenzene**				
	$\cdot OH + C_6H_5F \rightarrow HOC_6H_5F$		1 × 10^{10}	p.r.; C.k.; rel. to $k(\cdot OH + SCN^-)$.	730064
667	**4-Fluorobenzoate ion**				
	$\cdot OH$ + 4-$FC_6H_4CO_2^-$ →	9	3.6 × 10^9	γ-r.; C.k. with RNO; rel. to $k(\cdot OH$ + EtOH).	660441
668	***p*-Fluorobenzonitrile**				
	$\cdot OH + FC_6H_4CN \rightarrow$ 4-$FC_6H_4(OH)CN$	7	3.5 × 10^9	p.r.; P.b.k.	761194
669	**5-Fluorouracil**				
	$\cdot OH$ + 5-FU → 5-FU(OH)		*5.9 × 10^9*	Average of 2 values.	
		7	5.2 × 10^9	p.r.; C.k.; rel. to $k(\cdot OH + SCN^-)$.	720049
		7	5.5 × 10^9	p.r.; P.b.k. at 340 nm; 5-addn. followed by dehalogenation [720236]; at pH 11 k = 6.0 × 10^9.	720049
670	**Folic acid**				
	$\cdot OH + FH \rightarrow F\cdot + H_2O$	5.1	9.6 × 10^9	p.r.; P.b.k.; pK_a = 8.3; at pH 10.5 k = 1.2 × 10^{10} (anion).	761060
671	**Formaldehyde**				
	$\cdot OH + HCHO \rightarrow$		~1 × 10^9	C.k.; rel. to $k(\cdot OH + H_2O_2)$.	640048
		1	1.0 × 10^9	Fenton; C.k.; rel. to $k(\cdot OH + Fe^{2+})$.	490002
672	**Formate ion**				
	$\cdot OH + HCO_2^- \rightarrow \cdot CO_2^- + H_2O$		**3.2 × 10^9**	**Selected value.**	
			3.8 × 10^9	p.r.; C.k.; also measurements at 39, 59, and 79°C; rel. to $k(\cdot OH + Fe(CN)_6^{4-})$.	84A349
		6	3.5 × 10^9	p.r.; C.k.; obs. ABTS$^{\cdot+}$ formn. at 415 nm; rel. to $k(\cdot OH$ + ABTS).	82A196
		nat.	3.2 × 10^9	p.r.; C.k.; rel. to $k(\cdot OH + Fe(CN)_6^{4-})$.	710578
			2.2 × 10^9	p.r.; C.k.; rel. to $k(\cdot OH$ + RNO).	690156
		11	4.1 × 10^9	p.r.; C.k. measurements at pH 11 and 13; rel. to $k(\cdot OH + CO_3^{2-})$.	690379
		7	2.6 × 10^9	p.r.; C.k.; I_2^- formn. at 400 nm; rel. to $k(\cdot OH + I^-)$.	650010
673	**Formic acid**				
	$\cdot OH + HCO_2H \rightarrow \cdot CO_2H + H_2O$		*1.3 × 10^8*	Average of 2 values.	
		1.0	1.4 × 10^8	p.r.; C.k.; obs. formn. of I_2^- at 400 nm; rel. to $k(\cdot OH + I^-)$.	650010
		1	1.3 × 10^8	p.r.; C.k.; rel. to $k(\cdot OH + SCN^-)$.	650387

TABLE 8. Rate constants for reactions of hydroxyl radicals in aqueous solution—Continued

No.	Reaction	pH	k (L mol^{-1} s^{-1})	Comment	Ref.
674	**5-Formylfuroate ion**				
	$\cdot OH$ + -OC(CO_2^-)=CHCH=C(CHO)- →	9	3.8×10^9	γ-r.; C.k.; method of [650356]; rel. to k($\cdot OH$ + RNO).	83A335
675	***N*-Formylkynurenine**				
	$\cdot OH$ + FK →		8×10^9	p.r.	771099
676	**D-Fructose**				
	$\cdot OH + C_6H_{12}O_6 \rightarrow H_2O + C_6H_{11}O_6$	7	1.6×10^9	p.r.; C.k.; rel. to k($\cdot OH$ + SCN^-).	79A366
677	**Fructose-1,6-diphosphate**				
	$\cdot OH + C_6H_{14}O_{12}P_2 \rightarrow H_2O +$ $C_6H_{14}O_{12}P_2$	7	8.1×10^9	p.r.; C.k.; rel. to k($\cdot OH$ + SCN^-).	79A366
678	**Fructose-1-phosphate**				
	$\cdot OH + C_6H_{13}O_9P \rightarrow H_2O +$ $C_6H_{13}O_9P$	~7	5.1×10^9	γ-r.; C.k.; obs. G(inorg. phosphate); 52.0% oxidative dephosphorylation; rel. to k($\cdot OH$ + *tert*-BuOH).	753070
679	**Fructose-6-phosphate**				
	$\cdot OH + C_6H_{13}O_9P \rightarrow H_2O +$ $C_6H_{13}O_9P$	~7	9.0×10^9	γ-r.; C.k.; obs. G(inorg. phosphate; 32.0% oxidative dephosphorylation; rel. to k($\cdot OH$ + *tert*-BuOH).	753070
680	**Fumaric acid**				
	$\cdot OH + HO_2CCH{=}CHCO_2H \rightarrow$ $HO_2CCHOH\dot{C}HCO_2H$	4-10.5	6.0×10^9	p.r.; P.b.k. at 280-400 nm; k independent of wavelength and pH; $pK_a = 3.03, 4.44$.	85A487
681	**Furadantin**				
	$\cdot OH + NO_2F \rightarrow NO_2F\text{-}OH$	7	9.3×10^9	p.r.; P.b.k. as well as d.k.	731018
682	**2-Furaldehyde**				
	$\cdot OH + C_5H_4O_2$ → addn.	9	7.8×10^9	γ-r.; C.k.; method of [650356]; rel. to k($\cdot OH$ + RNO).	730301 83A335
683	**Furamazone**				
	$\cdot OH + NO_2F \rightarrow NO_2F\text{-}OH$	7	1.0×10^{10}	p.r.; P.b.k. as well as d.k.	731018
684	**Furan**				
	$\cdot OH + C_4H_4O$ → addn.		3.9×10^9	p.r.; C.k.; rel. to k($\cdot OH$ + SCN^-).	710360
685	**2-Furancarboxamide**				
	$\cdot OH$ + -OC($CONH_2$)=CHCH=CH- →	9	5.5×10^9	γ-r.; C.k.; method of [650356]; rel. to k($\cdot OH$ + RNO).	83A335
686	**Furfuryl alcohol**				
	$\cdot OH + C_5H_6O_2$ → addn.	9	1.5×10^{10}	γ-r.; C.k.; method of [650356]; rel. to k($\cdot OH$ + RNO).	730301 83A335
687	**2-Furoate ion**				
	$\cdot OH$ + -OC(CO_2^-)=CHCH=CH- → addn.	9	1.2×10^{10}	γ-r.; C.k.; rel. to k($\cdot OH$ + RNO).	730301
688	**D-Galactose**				
	$\cdot OH + C_6H_{12}O_6 \rightarrow H_2O + C_6H_{11}O_6$	6.5	2.0×10^9	p.r.; C.k.; rel. to k($\cdot OH$ + SCN^-).	78A146
689	**Glucose**				
	$\cdot OH$ + glucose → H_2O + R		*1.5×10^9*	Average of 4 values.	
		8.4	1.0×10^9	p.r.; No details; N_2O-satd. soln. contg. 5×10^{-3} mol L^{-1} borate buffer.	82A193
			1.7×10^9	p.r.; C.k.; rel. to k($\cdot OH$ + SCN^-).	79A298
		6.5	2.3×10^9	p.r.; C.k.; rel. to k($\cdot OH$ + SCN^-).	78A146
			1.1×10^9	p.r.; C.k.; obs. G(-glucose); G reduced from 1.5 to 0.2 on addn. of equimolar KI to 5×10^{-4} mol L^{-1} D-glucose soln. satd. with N_2O; rel. to k($\cdot OH$ + I^-).	650391

TABLE 8. Rate constants for reactions of hydroxyl radicals in aqueous solution—Continued

No.	Reaction	pH	k (L mol^{-1} s^{-1})	Comment	Ref.
690	**Glucose-1-phosphate**				
	$\cdot OH + C_6H_{13}O_9P \rightarrow$ H abstr.	6.5	1.4×10^9	p.r.; C.k.; rel. to $k(\cdot OH + SCN^-)$.	79A298 78A146
691	**Glucose-6-phosphate**				
	$\cdot OH + C_6H_{13}O_9P^- \rightarrow$ H abstr.	6.5	1.4×10^9	p.r.; C.k.; rel. to $k(\cdot OH + SCN^-)$.	78A146
692	**D-Glucose-3-sulfate ion**				
	$\cdot OH + C_6H_{12}O_9S^- \rightarrow$	6.5	1.8×10^9	p.r.; C.k.; rel. to $k(\cdot OH + SCN^-)$.	78A146
693	**D-Glucose-6-sulfate ion**				
	$\cdot OH + C_6H_{12}O_9S^- \rightarrow$ H abstr.	6.8	1.4×10^9	p.r.; C.k.; rel. to $k(\cdot OH + SCN^-)$.	78A146
694	**Glucuronate ion**				
	$\cdot OH + HOCH_2(CHOH)_4CO_2^- \rightarrow$		3.0×10^9	p.r.; C.k.; rel. to $k(\cdot OH + SCN^-)$.	700509 703081
695	**Glucuronic acid**				
	$\cdot OH + HOCH_2(CHOH)_4CO_2H \rightarrow$	acid	1.3×10^9	p.r.; C.k.; rel. to $k(\cdot OH + SCN^-)$.	700509
696	**D-Glucuronolactone**				
	$\cdot OH + C_6H_8O_6 \rightarrow$		1.7×10^9	p.r.; C.k.; rel. to $k(\cdot OH + SCN^-)$.	700509
697	**Glutamate ion**				
	$\cdot OH + Glu^- \rightarrow$	6.5	2.3×10^8	γ-r.; C.k.; rel. to $k(\cdot OH + RNO)$.	730548
698	**Glutamic acid**				
	$\cdot OH + Glu \rightarrow$	2-2.2	1.6×10^8	γ-r.; C.k.; $pK_a = 2.19, 4.25, 9.67$; rel. to $k(\cdot OH + 5\text{-MeU})$.	650388
699	**Glutamine**				
	$\cdot OH + Gln \rightarrow$	6.0	5.4×10^8	γ-r.; C.k.; rel. to $k(\cdot OH + RNO)$.	730548
700	**Glutamine, conjugate acid**				
	$\cdot OH + GlnH^+ \rightarrow$	2-2.2	1.9×10^8	γ-r.; C.k.; $pK_a = 2.17, 9.13$; rel. to $k(\cdot OH + 5\text{-MeU})$.	670461
701	**Glutaric acid**				
	$\cdot OH + HO_2C(CH_2)_3CO_2H \rightarrow$	2-2.2	8.3×10^8	γ-r.; C.k.; rel. to $k(\cdot OH + 5\text{-MeU})$.	670461
702	**Glutathione**				
	$\cdot OH + GSH \rightarrow H_2O + GS\cdot$		*1.4×10^{10}*	Average of 2 values.	
		5.5	1.3×10^{10}	p.r.; C.k.; also detd. at pH 8 and 9.2; rel. to $k(\cdot OH + SCN^-)$.	773089
		1	1.4×10^{10}	p.r.; C.k.; $pK_a = 2.12, 3.53, 8.66, 9.62$; rel. to $k(\cdot OH + SCN^-)$.	650387
703	**Glutathione, oxidised**				
	$\cdot OH + GSSG \rightarrow GSOH + GS\cdot$		*9.6×10^9*	Average of 2 values.	
		7	9.3×10^9	p.r.; P.b.k.	773089
		7	9.9×10^9	p.r.; C.k.; rel. to $k(\cdot OH + SCN^-)$.	773089
704	**Glyceraldehyde-3-phosphate**				
	$\cdot OH + C_3H_7O_6P \rightarrow$	~7	9.1×10^9	γ-r.; C.k.; obs. G(inorg. phosphate); 68.0% oxidative dephosphorylation; rel. to $k(\cdot OH +$ *tert*-BuOH).	753070
705	**Glycerol**				
	$\cdot OH + HOCH_2CH(OH)CH_2OH \rightarrow$		*1.9×10^9*	Average of 6 values.	
			2.0×10^9	p.r.; C.k.; rel. to $k(\cdot OH + SCN^-)$.	731077
			1.8×10^9	p.r.; C.k.; rel. to $k(\cdot OH + Fe(CN)_6^{4-})$.	731077
		nat.	2.1×10^9	p.r.; C.k.; rel. to $k(\cdot OH + Fe(CN)_6^{4-})$.	710578
		10.7	1.9×10^9	p.r.; C.k.; at pH 7 $k = 1.6 \times 10^9$ detd. rel. to SCN^-; rel. to $k(\cdot OH + CO_3^{2-})$.	650190
		7	1.5×10^9	p.r.; C.k.; rel. to $k(\cdot OH + SCN^-)$.	650387
			2.1×10^9	p.r.; C.k. in O_2-satd. soln. contg. 0.04 mol L^{-1} $Na_2CO_3^-$; rel. to $k(\cdot OH + CO_3^{2-})$.	640131

TABLE 8. Rate constants for reactions of hydroxyl radicals in aqueous solution—Continued

No.	Reaction	pH	k (L mol^{-1} s^{-1})	Comment	Ref.
706	**α-Glycerophosphate**				
	$\cdot OH + C_3H_9O_6P \rightarrow$		*5.3 × 10^9*	Average of 2 values.	
		~7	4.9 × 10^9	γ-r.; C.k.; obs. G(inorg. phosphate); 90.0% oxidative dephosphorylation; rel. to k(·OH + *tert*-BuOH).	753070
		4	6 × 10^9	γ-r.; C.k. obs. G(phosphate); k also detd. at pH 5 and 8; reference rate not given; rel. to k(·OH + MeOH).	723148
707	**β-Glycerophosphate**				
	$\cdot OH + C_3H_9O_6P \rightarrow$	~7	1.1 × 10^{10}	γ-r.; C.k.; obs. G(inorg. phosphate); 100% oxidative dephosphorylation; rel. to k(·OH + *tert*-BuOH).	753070
708	**Glycinamide**				
	$\cdot OH + H_2NCH_2CONH_2 \rightarrow NH_2\dot{C}HCONH_2 + H_2O$	10.0	2.8 × 10^9	p.r.; P.b.k. in buffered soln.	751004
709	**Glycinamide, conjugate acid**				
	$\cdot OH + H_3N^+CH_2CONH_2 \rightarrow H_3N^+\dot{C}HCONH_2$	5.0	8.3 × 10^7	p.r.; P.b.k. in buffered soln.; pK_a = 7.9.	751004
710	**Glycine**				
	$\cdot OH$ + Gly →	5.8-6	1.7 × 10^7	p.r.; C.k.; rel. to k(·OH + SCN$^-$).	650388
711	**Glycine, conjugate acid**				
	$\cdot OH + H_3N^+CH_2CO_2H \rightarrow H_3N^+\dot{C}HCO_2H + H_2O$	1	1.7 × 10^7	p.r.; C.k.; rel. to k(·OH + SCN$^-$).	650387
		2.8-3	1.0 × 10^7	p.r.; C.k.; pK_a = 2.5, 9.87; rel. to k(·OH + SCN$^-$).	650388
712	**Glycine, negative ion**				
	$\cdot OH + H_2NCH_2CO_2^- \rightarrow H_2N\dot{C}HCO_2^- + H_2O$	10.0	5.3 × 10^9	p.r.; C.k. in O_2-satd. soln.; rel. to k(·OH + SCN$^-$).	720461
		9.5-9.7	1.9 × 10^9	p.r.; C.k.; rel. to k(·OH + SCN$^-$).	650388
713	**Glycine anhydride**				
	$\cdot OH$ + -CH_2CONHCH$_2$CONH- → -CH_2CONH$\dot{C}$HCONH- + H_2O	5.0	1.2 × 10^9	p.r.; C.k.; same rate at pH 11; rel. to k(·OH + SCN$^-$).	710554
714	**Glycolamide**				
	$\cdot OH + HOCH_2CONH_2 \rightarrow H_2O + \cdot CHOHCONH_2$	8.5	1.1 × 10^9	p.r.; C.k.; rel. to k(·OH + SCN$^-$).	751053
715	**Glycolate ion**				
	$\cdot OH + HOCH_2CO_2^- \rightarrow \cdot CHOHCO_2^- + H_2O$	5.5	8.6 × 10^8	p.r.; C.k.; rel. to k(·OH + SCN$^-$).	751053
716	**Glycolic acid**				
	$\cdot OH + HOCH_2CO_2H \rightarrow \cdot CHOHCO_2H + H_2O$		*6.0 × 10^8*	Average of 2 values.	
		2-2.2	5.4 × 10^8	γ-r.; C.k.; pK_a = 3.83; rel. to k(·OH + 5-MeU).	670461
		1	6.6 × 10^8	Fenton; C.k.; rel. to k(·OH + Fe^{2+}).	490002
717	**Glycylalanine**				
	$\cdot OH$ + GlyAla → H_2O + $NH_3^+CH_2CONH\dot{C}(CH_3)CO_2^-$	5.5-6	3.5 × 10^8	p.r.; C.k.; product identified [78D088]; rel. to k(·OH + SCN$^-$).	650388
718	**Glycylalanine, conjugate acid**				
	$\cdot OH$ + GlyAla$^+$ →	2-2.2	2.2 × 10^8	γ-r.; C.k.; pK_a = 3.2, 8.2; rel. to k(·OH + 5-MeU).	650388
719	**Glycyl-β-alaninamide**				
	$\cdot OH$ + Gly-β-AlaNH$_2$ → $H_2N\dot{C}HCO$-β-AlaNH$_2$ + H_2O	10.0	2.5 × 10^9	p.r.; P.b.k. in buffered soln.; mixture of radicals.	751004

TABLE 8. Rate constants for reactions of hydroxyl radicals in aqueous solution—Continued

No.	Reaction	pH	k (L mol^{-1} s^{-1})	Comment	Ref.
720	**Glycyl-β-alaninamide, conjugate acid**				
	$\cdot OH + (Gly\text{-}\beta\text{-}AlaNH_2)H^+ \rightarrow H_3N^+\dot{C}HCO\text{-}\beta\text{-}AlaNH_2 + H_2O$	5.0	1.1×10^9	p.r.; P.b.k. in buffered soln.; mixture of radicals.	751004
721	**Glycyl-β-alanine**				
	$\cdot OH + Gly\text{-}\beta\text{-}Ala \rightarrow$	6.2	6.6×10^8	γ-r.; C.k.; rel. to $k(\cdot OH + RNO)$.	760148
722	**Glycyl-α-aminobutyrate ion**				
	$\cdot OH + C_6H_{12}N_2O_3 \rightarrow$	7.1	1.2×10^9	γ-r.; C.k.; rel. to $k(\cdot OH + RNO)$.	760148
723	**Glycylglycine**				
	$\cdot OH + GlyGly \rightarrow H_2O + NH_3^+CH_2CONH\dot{C}HCO_2^-$		*2.4 × 10⁸*	Average of 2 values.	
		6-7	2.6×10^8	p.r.; C.k.; product identified [78D088]; rel. to $k(\cdot OH + SCN^-)$.	650387
		5.5-6	2.2×10^8	p.r.; C.k.; rel. to $k(\cdot OH + SCN^-)$.	650388
724	**Glycylglycine, conjugate acid**				
	$\cdot OH + GlyGlyH^+ \rightarrow$	2.2-2.4	1.6×10^8	p.r.; C.k.; $pK_a = 3.2, 8.2$; rel. to $k(\cdot OH + SCN^-)$.	650388
725	**Glycylglycine, negative ion**				
	$\cdot OH + GlyGly^- \rightarrow$	10.5	5.2×10^9	p.r.; C.k.; rel. to $k(\cdot OH + SCN^-)$.	700099
726	**Glycylglycinamide, conjugate acid**				
	$\cdot OH + (GlyGlyNH_2)H^+ \rightarrow H_3N^+CH_2CONH\dot{C}HCONH_2 + H_2O$	3.3	2.7×10^8	p.r.; P.b.k. in buffered soln.	751004
727	**Glycylglycylglycine**				
	$\cdot OH + GlyGlyGly \rightarrow$	5.4	7.3×10^8 [b]	p.r.; C.k.; rel. to $k(\cdot OH + SCN^-)$.	700099
		5.5-6	3.3×10^8 [b]	p.r.; C.k.; $pK_a = 3.2, 7.9$; at pH 2.8-3 $k = 2.4 \times 10^8$; at pH 8.5-8.7 $k = 2.9 \times 10^9$; rel. to $k(\cdot OH + SCN^-)$.	650388
728	**Glycylglycylglycine, negative ion**				
	$\cdot OH + GlyGlyGly^- \rightarrow$	10.6	5.0×10^9	p.r.; C.k.; rel. to $k(\cdot OH + SCN^-)$.	700099
729	**Glycylglycylglycylglycinamide**				
	$\cdot OH + GlyGlyGlyGlyNH_2 \rightarrow H_2O + NH_2\dot{C}HCOGlyGlyGlyNH_2$		*1.5 × 10⁹*	Average of 2 values.	
		10.8	1.8×10^9	p.r.; P.b.k. in buffered soln.	751004
		10.8	1.2×10^9	p.r.; C.k.; rel. to $k(\cdot OH + SCN^-)$.	751004
730	**Glycylglycylglycylglycylglycinamide, conjugate acid**				
	$\cdot OH + (Gly_4NH_2)H^+ \rightarrow H_2O + NH_3^+\dot{C}HCOGlyGlyGlyNH_2$	5.5	5.5×10^8	p.r.; P.b.k. in buffered soln.	751004
731	**Glycylglycylglycylglycylglycine**				
	$\cdot OH + (Gly)_4 \rightarrow$	5.5-6	4.5×10^8	p.r.; C.k., at pH 2.4-2.6, 7.7-7.9, and 9.5-9.7 $k = 3.5 \times 10^8$, 2×10^9, and 3.0×10^9, resp.; rel. to $k(\cdot OH + SCN^-)$.	650388
732	**Glycylhistidine, conjugate acid**				
	$\cdot OH + GlyHisH^+ \rightarrow$	3.77	2.8×10^9	p.r.; P.b.k. in unbuffered soln.; $pK_a = 2.66, 6.77, 8.24$.	771122
733	**Glycylhistidine, negative ion**				
	$\cdot OH + GlyHis^- \rightarrow$	10.1	1.0×10^{10}	p.r.; P.b.k. in unbuffered soln.	771122
734	**Glycylisoleucine**				
	$\cdot OH + GlyIle \rightarrow$	7.2	3.1×10^9	γ-r.; C.k.; rel. to $k(\cdot OH + RNO)$.	760148
735	**Glycylisoleucine, conjugate acid**				
	$\cdot OH + GlyIleH^+ \rightarrow$	2-2.2	2.9×10^9	γ-r.; C.k.; rel. to $k(\cdot OH + 5\text{-MeU})$.	650388
736	**Glycylleucine**				
	$\cdot OH + GlyLeu \rightarrow$	7.3	2.5×10^9	γ-r.; C.k.; rel. to $k(\cdot OH + RNO)$.	760148

TABLE 8. Rate constants for reactions of hydroxyl radicals in aqueous solution—Continued

No.	Reaction	pH	k (L mol^{-1} s^{-1})	Comment	Ref.
737	**Glycylleucine, conjugate acid**				
	·OH + $GlyLeuH^+$ →	2-2.2	3.1×10^9	γ-r.; C.k.; pK_a = 3.10, 8.41; rel. to k(·OH + 5-MeU).	650388
738	**Glycylmethionine**				
	·OH + GlyMet →	5-5.2	2.2×10^8	p.r.; C.k.; rel. to k(·OH + SCN^-).	650388
739	**Glycylmethionine, conjugate acid**				
	·OH + $GlyMetH^+$ →	2-2.2	1.1×10^8	p.r.; C.k.; pK_a = 3.16, 8.51; rel. to k(·OH + SCN^-).	650388
740	**Glycylnorleucine**				
	·OH + GlyNor →	6.6	4.3×10^9	γ-r.; C.k.; rel. to k(·OH + RNO).	760148
741	**Glycylnorvaline**				
	·OH + $C_7H_{14}N_2O_3$ →	6.7	2.8×10^9	γ-r.; C.k.; rel. to k(·OH + RNO).	760148
742	**Glycylphenylalanine**				
	·OH + GlyPhe → H_2O + $GlyCONHC(CO_2^-)CH_2C_6H_5$	5.8	6.2×10^9	p.r.; P.b.k. at 318 nm.	761202
743	**Glycylphenylalanine, conjugate acid**				
	·OH + $GlyPheH^+$ →	2-2.2	1.1×10^9	γ-r.; C.k.; pK_a = 3.1, 8.2; rel. to k(·OH + 5-MeU).	650388
744	**Glycylproline, conjugate acid**				
	·OH + $GlyProH^+$ →	2-2.2	1.7×10^9	γ-r.; C.k.; pK_a = 2.81, 8.65; rel. to k(·OH + 5-MeU).	650388
745	**Glycylsarcosine**				
	·OH + GlySar → $H_3N^+CH_2CON(CH_3)\dot{C}HCO_2^-$ + H_2O		*1.2 × 10^9*	Average of 2 values.	
		5.5	1.3×10^9	p.r.; C.k.; rel. to k(·OH + SCN^-).	751004
		5.5	1.1×10^9	p.r.; P.b.k. in buffered soln.	751004
746	**Glycylsarcosine, negative ion**				
	·OH + $GlySar^-$ → $H_3N^+\dot{C}HCON(CH_3)CH_2CO_2^-$ + H_2O	10.8	9.9×10^8	p.r.; C.k. in buffered soln.; rel. to k(·OH + SCN^-).	751004
747	**Glycylserine, conjugate acid**				
	·OH + $GlySerH^+$ →	2-2.2	7.0×10^8	γ-r.; C.k.; pK_a = 2.92, 8.10; product identified [78D088]; rel. to k(·OH + 5-MeU).	650388
748	**Glycyltryptophan**				
	·OH + GlyTrpH →	4.7, 11	1.2×10^{10}	p.r.; P.b.k.; (λ_{max} 310, 520-30) in unbuffered soln.; pK_a = 8.04	771139
749	**Glycyltyrosine**				
	·OH + GlyTyrOH →	5.8	6.0×10^9	p.r.; P.b.k. at 330 nm.	761202
750	**Glycyltyrosine, conjugate acid**				
	·OH + $GlyTyrOH_2^+$ →	2-2.2	1.2×10^{10}	γ-r.; C.k.; pK_a = 2.92, 8.45, 10.49; rel. to k(·OH + 5-MeU).	650388
751	**Glycyltyrosylglycine**				
	·OH + GlyTyrGly →	5.8	7.3×10^9	p.r.; P.b.k. at 330 nm.	761202
752	**Glycylvaline**				
	·OH + GlyVal →	6.1	1.6×10^9	γ-r.; C.k.; rel. to k(·OH + RNO).	760148
753	**Glycylvaline, conjugate acid**				
	·OH + $GlyValH^+$ →	2-2.2	1.4×10^9	γ-r.; C.k.; pK_a = 3.26, 8.20; rel. to k(·OH + 5-MeU).	650388
754	**Glyoxal**				
	·OH + HCOCHO → H_2O + ·COCHO	1.3	6.6×10^7	r.; C.k.; rel. to k(·OH + HO_2CCO_2H).	680503
755	**Guanine**				
	·OH + G →	10.0	9.2×10^9	γ-r.; C.k.; pK_a = 2.95, 9.32, 12.62; rel. to k(·OH + RNO).	750294

TABLE 8. Rate constants for reactions of hydroxyl radicals in aqueous solution—Continued

No.	Reaction	pH	k (L mol^{-1} s^{-1})	Comment	Ref.
756	**Guanosine**				
	•OH + G →		*7.8 × 10^9*	Average of 2 values.	
		7	8.0 × 10^9	γ-r.; C.k.; pK_a = 1.9, 9.25, 12.33; rel. to k(•OH + RNO).	80A313
		9	7.6 × 10^9	γ-r.; C.k.; based on k(•OH + RNO) = k(•OH + $Fe(CN)_6^{4-}$); rel. to k(•OH + RNO).	670555
757	**Guanosine 3′-monophosphate**				
	•OH + 3′-GMP →	~7	1.1 × 10^{10}	γ-r.; C.k.; obs. G(inorg. phosphate); 7.3% oxidative dephosphorylation; rel. to k(•OH + *tert*-BuOH).	753070
758	**Guanosine 5′-monophosphate**				
	•OH + GMP → GMP-OH	6.7	4.7 × 10^9	p.r.; P.b.k. at 325 nm.	703069
759	**Heptane**				
	•OH + $CH_3(CH_2)_5CH_3$ →	2	7.7 × 10^9	Fenton; C.k.; rel. to k(•OH + Ethane).	81M420
760	**1-Heptanol**				
	•OH + $CH_3(CH_2)_6OH$ →	2-2.2	7.4 × 10^9	γ-r.; C.k.; rel. to k(•OH + 5-MeU).	670461
761	**Hexadecylpyridinium chloride**				
	•OH + CpyC →		4.7 × 10^9	p.r.; P.b.k.; in vesicles of distearoyl lecithin k ~ 28% of this amount.	78A096
762	**Hexadecyltrimethylammonium bromide**				
	•OH + CTAB →		1.1 × 10^{10}	p.r.; C.k.; measured Br_2^- at 360 nm; concn. <9 × 10^{-4} mol L^{-1}; at higher concn. reactivity decreases by factor of >10; rel. to k(•OH + MeOH).	710001 710586
763	**2,4-Hexadien-1-ol**				
	•OH + $CH_3(CH{=}CH)_2CH_2OH$ → addn.	7.0	9.8 × 10^9	p.r.; P.b.k.; 13% H abstr.	731070
764	**Hexafluorobenzene**				
	•OH + C_6F_6 → HOC_6F_6		3 × 10^9	p.r.; C.k.; 280 nm abs. grows in at same rate as condy. (from F^-); rel. to k(•OH + SCN^-).	730054
765	**Hexamethylbenzene**				
	•OH + $C_6(CH_3)_6$ →	~7	7.2 × 10^9	p.r.; P.b.k. at 333 nm in unbuffered soln.; <50% OH abstr.; OH addn. (followed by loss of H_2O), as well as H abstr. → benzyl radical.	751009
766	**5,7,7,12,14,14-Hexamethyl-1,4,8,11-tetraazacyclotetradeca-4,11-diene, conjugate diacid**				
	•OH + 4,11-dieneN$_4$H$_2^{2+}$ → H_2O		4 × 10^9	p.r.; P.b.k. at 300-400 nm; pK_a = 9.7, 10.7.	79A038
767	**Hexane**				
	•OH + $CH_3(CH_2)_4CH_3$ →	2	6.6 × 10^9	Fenton; rel. to k(•OH + Ethane).	81M420
768	**1,6-Hexanediol**				
	•OH + $HO(CH_2)_6OH$ →	9	4.7 × 10^9	γ-r.; C.k. with RNO; rel. to k(•OH + EtOH).	660423
769	**Hexanoate ion**				
	•OH + $CH_3(CH_2)_4CO_2^-$ →	9	4.0 × 10^9	γ-r.; C.k. with RNO; rel. to k(•OH + EtOH).	660423
770	**1-Hexanol**				
	•OH + $CH_3(CH_2)_5OH$ →	2-2.2	7.0 × 10^9	γ-r.; C.k.; rel. to k(•OH + 5-MeU).	670461
771	**3-Hexene-1,6-dioate ion**				
	•OH + $^-O_2CCH_2CH{=}CHCH_2CO_2^-$ → $^-O_2CCH_2CH(OH)\dot{C}HCH_2CO_2^-$		1.3 × 10^9	p.r.; Est. from pH effect on buildup of radical at 266 nm from reaction with O^- ($^-O_2CCH_2CHCHCHCO_2^-$).	80A346
772	**Hexylamine**				
	•OH + $CH_3(CH_2)_5NH_2$ → H_2O + $CH_3(CH_2)_4\dot{C}HNH_2$	1.0	1.3 × 10^{10} [a]	Fe^{2+}-H_2O_2; C.k.; obs. polymerization of methyl methacrylate; rel. to k(•OH + $H_2C{=}C(CH_3)CO_2CH_3$).	86A305

TABLE 8. Rate constants for reactions of hydroxyl radicals in aqueous solution—Continued

No.	Reaction	pH	k (L mol^{-1} s^{-1})	Comment	Ref.
773	**Hexylsulfate ion**				
	$\cdot OH + CH_3(CH_2)_5OSO_3^- \rightarrow$		2.5×10^9	p.r.; C.k.; rel. to $k(\cdot OH + SCN^-)$.	79N061
774	**Histidine**				
	$\cdot OH$ + His → His-OH	6-7	5.0×10^9	p.r.; C.k.; pK_a = 1.82, 6.0, 9.17; at pH 2-2.2 k = 1.9×10^9; rel. to $k(\cdot OH + SCN^-)$.	650388
775	**Histidylhistidine**				
	$\cdot OH$ + HisHis → HOHisHis	5.5-6.5	9.0×10^9	p.r.; C.k.; pK_a = 2.16, 5.54, 6.80, 7.82; rel. to $k(\cdot OH + SCN^-)$.	650388
776	**Homocysteine thiolactone**				
	$\cdot OH + C_4H_7NOS \rightarrow$	7	2.9×10^9	p.r.; C.k.; pK_a = 7.1; rel. to $k(\cdot OH$ + 5-MeU).	741029
777	**Hydroquinone**				
	$\cdot OH + 1,4\text{-}C_6H_4(OH)_2 \rightarrow C_6H_4(OH)_3$		5.2×10^9 [b]	p.r.; P.b.k. at 410 nm ($C_6H_4(OH)O\cdot$) in 5×10^{-4} or 10^{-2} mol L^{-1} hydroquinone/sulfuric acid soln. under argon; [H$^+$] = 1 mol L^{-1}.	86A347
			1.0×10^{10} [b]	p.r.; C.k. with HSO_4^-; obs. decreased abs. at 450 nm; rel. to $k(\cdot OH$ + MeOH).	660019
		6-7	2.1×10^{10} [b]	p.r.; C.k.; rel. to $k(\cdot OH + SCN^-)$.	650387
778	**4-Hydroxybenzaldehyde, conjugate base**				
	$\cdot OH + {}^-OC_6H_4CHO \rightarrow$	9	1.0×10^{10}	γ r.; C.k.; pK_a = 7.6; rel. to $k(\cdot OH$ + RNO).	72G837
779	**4-Hydroxybenzoate ion**				
	$\cdot OH + 4\text{-}HOC_6H_4CO_2^- \rightarrow (HO)_2C_6H_4CO_2^-$		*8.9×10^9*	Average of 2 values.	
		9	8×10^9	γ-r.; C.k. with RNO; pK_a = 4.7, 9.4; rel. to $k(\cdot OH$ + EtOH).	760371
		7	9×10^9	p.r.; P.b.k. at 375 nm; cor. for OH + OH and H + aromatic.	680304
780	***N*-[2-Hydroxy-1,1-bis(hydroxymethyl)ethyl]glycine (Tricine)**				
	$\cdot OH + (HOCH_2)_3CNH_2^+CH_2CO_2^- \rightarrow$	8	2.2×10^9	γ-r.; C.k. in aerated soln. of phosphate buffer; pK_a = 8.15; rel. to $k(\cdot OH$ + 5-MeU).	86G027
781	**3-Hydroxy-2-butanone**				
	$\cdot OH + CH_3COCH(OH)CH_3 \rightarrow CH_3\dot{C}OHCOCH_3 + H_2O$		*1.0×10^9*	Average of 2 values.	
			1.2×10^9	p.r.; C.k.; rel. to $k(\cdot OH + SCN^-)$.	680249
		2.0	8.5×10^8	p.r.; C.k.; rel. to $k(\cdot OH + SCN^-)$.	650387
782	**2-Hydroxybutyric acid**				
	$\cdot OH + CH_3CH_2CHOHCO_2H \rightarrow$	1	1.0×10^9	Fenton; C.k.; rel. to $k(\cdot OH + Fe^{2+})$.	490002
783	***p*-Hydroxycinnamate ion**				
	$\cdot OH + HOC_6H_4CH{=}CHCO_2^- \rightarrow 4\text{-}HOC_6H_4\dot{C}HCHOHCO_2^-$	6.0	8.2×10^9	p.r.; P.b.k. at 335 nm.	84A206
784	**4-Hydroxy-3,5-dimethoxybenzoate ion**				
	$\cdot OH + HOC_6H_2(OCH_3)_2CO_2^- \rightarrow (HO)_2C_6H_2(OCH_3)_2CO_2^-$	6-7	1.6×10^{10}	p.r.; C.k.; rel. to $k(\cdot OH + SCN^-)$.	771087
785	**4-Hydroxy-3,5-dimethoxycinnamate ion**				
	$\cdot OH + (CH_3)_2C_6H_2(OH)CH{=}CHCO_2^- \rightarrow$		*2.2×10^{10}*	Average of 2 values.	
			1.6×10^{10}	p.r.; C.k.; soln. contains 2×10^{-2} mol L^{-1} acetonitrile; rel. to $k(\cdot OH$ + *tert*-BuOH).	83A387
			3×10^{10}	p.r.; C.k.; rel. to $k(\cdot OH$ + DCIP).	83A387
786	**6-Hydroxy-1,4-dimethylcarbazole**				
	$\cdot OH + C_{14}H_{13}NO \rightarrow$		1.5×10^{10}	p.r.	83A392
787	**2-Hydroxyethyl acetate**				
	$\cdot OH + CH_3CO_2CH_2CH_2OH \rightarrow CH_3CO_2CH_2\dot{C}HOH + H_2O$		9.1×10^8	p.r.; C.k.; rel. to $k(\cdot OH + SCN^-)$.	751126

TABLE 8. Rate constants for reactions of hydroxyl radicals in aqueous solution—Continued

No.	Reaction	pH	k (L mol^{-1} s^{-1})	Comment	Ref.
788	**2-Hydroxyethylethylenediaminetriacetic acid**				
	·OH + HEDTA →	~0	1.1×10^{10}	Fenton; C.k.; pK_a = 2.5, 5.3, 9.8; rel. to k(·OH + H_2C=$CHCONH_2$).	729162
789	**1-(2-Hydroxyethyl)-2-methyl-5-nitromidazole**				
	·OH + $HOCH_2CH_2Im(CH_3)NO_2$ →		*4.8×10^9*	Average of 2 values.	
			5.5×10^9	p.r.; P.b.k. at 420 nm.	751067
			4.1×10^9	p.r.; C.k.; d.k. at 320 nm gave $k \sim 10^9$; rel. to k(·OH + SCN^-).	741135
790	**4-(2-Hydroxyethyl)-1-piperazineethanesulfonate ion (Hepes)**				
	·OH + $C_8H_{18}N_2O_4S$ →	8	6.9×10^9	γ-r.; C.k. in aerated soln. of phosphate buffer; pK_a = 7.55; rel. to k(·OH + 5-MeU).	86G027
791	**2-Hydroxyethylsulfide ion**				
	·OH + $HOCH_2CH_2S^-$ → OH^- + ·SCH_2CH_2OH	11	4.0×10^9	p.r.; P.b.k. at 410-420 nm ($RSSR^-$).	690553
792	**5-Hydroxyindole**				
	·OH + 5-InOH →	9.0	1.7×10^{10}	γ-r.; C.k. with RNO; rel. to k(·OH + TrpH).	710556
793	**2-Hydroxy-5-methoxybenzoate ion**				
	·OH + $CH_3OC_6H_3(OH)CO_2^-$ → $CH_3OC_6H_3(OH)_2CO_2^-$	6-7	1.8×10^{10}	p.r.; C.k.; rel. to k(·OH + SCN^-).	771087
794	**4-Hydroxy-3-methoxybenzoate ion**				
	·OH + $HOC_6H_3(OCH_3)CO_2^-$ → $(HO)_2C_6H_3(OCH_3)CO_2^-$	6-7	1.4×10^{10}	p.r.; C.k.; rel. to k(·OH + SCN^-).	771087
795	**4-Hydroxy-3-methoxycinnamate ion**				
	·OH + $CH_3OC_6H_3(OH)CH$=$CHCO_2^-$ →		1×10^{10}	p.r.; C.k.; rel. to k(·OH + DCIP).	83A387
796	**1-(2-Hydroxy-3-methoxypropyl)-2-nitroimidazole**				
	·OH + $CH_3OCH_2CHOHCH_2ImNO_2$ →	7	7.1×10^9	p.r.; P.b.k. at 475 nm.	751067
797	**5-Hydroxymethylfurfural**				
	·OH + $C_6H_6O_3$ →	9	5.8×10^9	γ-r.; C.k.; method of [650356]; rel. to k(·OH + RNO).	83A335
798	***p*-Hydroxyphenyl-β-D-glucopyranoside**				
	·OH + $C_{12}H_{16}O_7$ →		3.1×10^9	γ-r.; C.k. with RNO; rel. to k(·OH + $GlucOC_6H_5$).	710056
799	**3-(*p*-Hydroxyphenyl)propionate dianion**				
	·OH + $^-OC_6H_4CH_2CH_2CO_2^-$ →		*1.9×10^{10}*	Average of 2 values.	
		11.0	1.6×10^{10}	p.r.; C.k.; rel. to k(·OH + SCN^-).	730003
		10.6	2.3×10^{10}	p.r.; C.k.; rel. to k(·OH + CO_3^{2-}).	680062
800	**3-(*p*-Hydroxyphenyl)propionate ion**				
	·OH + 4-$HOC_6H_4(CH_2)_2CO_2^-$ →		*1.2×10^{10}*	Average of 2 values.	
		6.3	1.2×10^{10}	p.r.; C.k., at pH 11.0 $k = 1.6 \times 10^{10}$; rel. to k(·OH + SCN^-).	730003
		4.6	1.2×10^{10}	p.r.; C.k.; pK_a = 4.6, 10.1; rel. to k(·OH + HCO_2^-).	680062
801	**Hydroxyproline**				
	·OH + Hyp →	6.8	3.2×10^8	γ-r.; C.k.; rel. to k(·OH + RNO).	730548
802	**Hydroxyproline, conjugate acid**				
	·OH + $HypH^+$ →	2-2.2	4.2×10^8	γ-r.; C.k.; pK_a = 1.92, 9.73; rel. to k(·OH + 5-MeU).	650388
803	**2-Hydroxypropionamide**				
	·OH + $CH_3CHOHCONH_2$ →	4.5	1.3×10^9	p.r.; C.k.; rel. to k(·OH + SCN^-).	751053
804	**2-Hydroxypurine**				
	·OH + $C_5H_4N_4O$ →	6-7	5.0×10^9	γ-r.; C.k.; rel. to k(·OH + RNO).	750294

TABLE 8. Rate constants for reactions of hydroxyl radicals in aqueous solution—Continued

No.	Reaction	pH	k (L mol^{-1} s^{-1})	Comment	Ref.
805	**6-Hydroxy-2,5,7,8-tetramethylchroman-2-carboxylate ion**				
	$^{\bullet}OH + HTC\text{-}CO_2^- \rightarrow$		8×10^{10} [b]	p.r.; C.k.; obs. DCIP transient at 610 nm; $k = 6 \times 10^{10}$ when DCIP transient was obs. at 455 nm; rel. to $k(^{\bullet}OH + DCIP)$.	83A387
			4.0×10^{10} [b]	p.r.; C.k.; soln. contains 5×10^{-3} mol L^{-1} acetonitrile; $k = 3.9 \times 10^{10}$ with 2×10^{-3} mol L^{-} acetonitrile; rel. to $k(^{\bullet}OH$ + *tert*-BuOH).	83A387
		6.9	2×10^{10} [b]	p.r.; C.k.; rel. to $k(^{\bullet}OH + SCN^-)$.	82N221
806	**α-Hydroxytetronate ion**				
	$^{\bullet}OH + HOTr^- \rightarrow$	7	4.7×10^9	p.r.; P.b.k. at 360 nm.	741053
807	**Hypoxanthine**				
	$^{\bullet}OH + HxOH \rightarrow$	7.8	6.5×10^9	p.r.; P.b.k. at 310 and 340 nm; $pK_a = 1.98$, 8.9, 12.1.	84A097
808	**Imidazole**				
	$^{\bullet}OH + Im \rightarrow Im(OH)$	10.9	1.2×10^{10}	p.r.; P.b.k.; OH addn.; $pK_a = 7.1$, 14.5; at pH 6.8 $k = 8.7 \times 10^9$.	751066
809	**Imidazolium ion**				
	$^{\bullet}OH + ImH^+ \rightarrow HO\text{-}ImH^+$	3.4	5.5×10^9	p.r.; P.b.k.	751066
810	**Iminodiacetate ion**				
	$^{\bullet}OH + HO_2CCH_2NHCH_2CO_2^- \rightarrow H_2O + HO_2CCH_2NH\dot{C}HCO_2^-$	7	1.9×10^8	p.r.; P.b.k.	81A023
811	**Iminodiacetic acid**				
	$^{\bullet}OH + HN(CH_2CO_2H)_2 \rightarrow H_2O + HO_2CCH_2NH\dot{C}HCO_2H$	1	4.9×10^7	γ-r.; C.k.; obs. G(glycine); $pK_a = 2.5$, 9.4; rel. to $k(^{\bullet}OH$ + *tert*-BuOH).	760243
812	**Indigodisulfonate ion**				
	$^{\bullet}OH + IDS^{2-} \rightarrow$	7.3-7.5	1.8×10^{10} [a]	chem.; C.k. in soln. contg. 0.1 mol L^{-1} H_2O_2, 2.5×10^{-6} mol L^{-1} Mn^{2+} and 0.2 mol L^{-1} HCO_3^-; rel. to $k(^{\bullet}OH + RNO)$.	79A411
813	**Indigomonosulfonate ion**				
	$^{\bullet}OH + IMS^- \rightarrow$	7.3-7.5	2.1×10^{10} [a]	chem.; C.k. in soln. contg. 0.1 mol L^{-1} H_2O_2, 2.5×10^{-6} mol L^{-1} Mn^{2+} and 0.2 mol L^{-1} HCO_3^-; rel. to $k(^{\bullet}OH + RNO)$.	79A411
814	**Indigotetrasulfonate ion**				
	$^{\bullet}OH + ITS^{4-} \rightarrow$	7.3-7.5	1.6×10^{10} [a]	chem.; C.k. in soln. contg. 0.1 mol L^{-1} H_2O_2, 2.5×10^{-6} mol L^{-1} Mn^{2+} and 0.2 mol L^{-1} HCO_3^-; rel. to $k(^{\bullet}OH + RNO)$.	79A411
815	**Indole**				
	$^{\bullet}OH + In \rightarrow In(OH)$	9.0	3.2×10^{10}	p.r.; P.b.k. at 320 nm.	710556
816	**Indole-5-acetate ion**				
	$^{\bullet}OH + InCH_2CO_2^- \rightarrow$	9.0	8.2×10^9	γ-r.; C.k. with RNO; rel. to $k(^{\bullet}OH$ + TrpH).	710556
817	**Indole-3-acetate ion**				
	$^{\bullet}OH + 3\text{-}InCH_2CO_2^- \rightarrow$	7	9.5×10^9	γ-r.; C.k.; rel. to $k(^{\bullet}OH$ + 2-PrOH).	720541
818	**Indole-3-propionate ion**				
	$^{\bullet}OH + 3\text{-}InCH_2CH_2CO_2^- \rightarrow$	7	1.2×10^{10}	γ-r.; C.k.; rel. to $k(^{\bullet}OH$ + 2-PrOH).	720541
819	**Indoline**				
	$^{\bullet}OH + InH_2 \rightarrow HO\text{-}InH_2$	9.0	3.8×10^{10}	p.r.; P.b.k. at 320 nm.	710556
820	**Inosine**				
	$^{\bullet}OH + C_{10}H_{12}N_4O_5 \rightarrow$		*4.4* × *10*^{9}	Average of 2 values.	
		7.0	4.8×10^9	p.r.; P.b.k. at 380 and 460 nm.	87A231
		7	4.0×10^9	γ-r.; C.k.; rel. to $k(^{\bullet}OH + RNO)$.	80A313
821	**Inosine monophosphate**				
	$^{\bullet}OH + IMP \rightarrow$	7	2.6×10^9 [b]	γ-r.; C.k.; rel. to $k(^{\bullet}OH + RNO)$.	80A313

TABLE 8. Rate constants for reactions of hydroxyl radicals in aqueous solution—Continued

No.	Reaction	pH	k (L mol^{-1} s^{-1})	Comment	Ref.
821	**Inosine monophosphate**—Continued				
		~7	7.5×10^9 [b]	γ-r.; C.k.; obs. G(inorg. phosphate); 8.2% oxidative dephosphorylation; rel. to k(·OH + *tert*-BuOH).	753070
822	**Inositol**				
	·OH + $C_6H_{12}O_6$ →		*1.7 × 10⁹*	Average of 2 values.	
			1.4×10^9	p.r.; C.k.; rel. to k(·OH + SCN^-).	731077
			2.0×10^9	p.r.; C.k.; rel. to k(·OH + $Fe(CN)_6^{4-}$).	731077
823	***myo*-Inositol hexasulfate**				
	·OH + $C_6H_{14}O_{24}S_6$ →		1×10^7	p.r.; C.k. with SCN^-, as well as estd. from γ-r. c.k. with myoinositol.	760181
824	**Iodipamide dianion**				
	·OH + $C_{20}H_{12}I_6N_2O_6^{2-}$ →	5.6,7	5×10^9	p.r.; P.b.k. or c.k. with SCN^-.	79A364
825	**Iodoacetic acid**				
	·OH + ICH_2CO_2H → $\cdot CH_2CO_2H$	1	5.7×10^9	p.r.; C.k.; rel. to k(·OH + $Fe(CN)_6^{4-}$).	745286
826	**Iodobenzene**				
	·OH + C_6H_5I →	9	5.0×10^9	γ-r.; C.k.; rel. to k(·OH + RNO).	690280
827	**2-Iodobenzoate ion**				
	·OH + 2-$IC_6H_4CO_2^-$ →	9	4.5×10^9	C.k. with RNO.	660849
828	**3-Iodobenzoate ion**				
	·OH + 3-$IC_6H_4CO_2^-$ →	9	2.9×10^9	C.k. with RNO.	660849
829	**4-Iodobenzoate ion**				
	·OH + 4-$IC_6H_4CO_2^-$ →	9	2.5×10^9	C.k. with RNO.	660849
830	***o*-Iodohippurate ion**				
	·OH + 2-$IC_6H_4CONHCH_2CO_2^-$ → 2-$IC_6H_4(OH)CONHCH_2CO_2^-$	~7	5.3×10^9	p.r.; C.k.; also detd. k/k(·OH + CO_3^{2-}) = 12.8; rel. to k(·OH + SCN^-).	761191
831	**3-Iodopropionate ion**				
	·OH + $ICH_2CH_2CO_2^-$ →		*2.3 × 10⁹*	Average of 2 values.	
		7	2.0×10^8	p.r.; C.k.; rel. to k(·OH + NB).	701230
		7	2.6×10^8	p.r.; C.k.; rel. to k(·OH + SCN^-).	701230
832	**Isoamylammonium ion**				
	·OH + $(CH_3)_2CHCH_2CH_2NH_3^+$ →	4	7.9×10^9	p.r.; C.k.; rel. to k(·OH + SCN^-).	700371
833	**Isobutane**				
	·OH + $(CH_3)_2CHCH_3$ →	2	4.6×10^9	Fenton; rel. to k(·OH + Ethane).	81M420
834	**Isobutylammonium ion**				
	·OH + $(CH_3)_2CHCH_2NH_3^+$ →	4	3.1×10^9	p.r.; C.k.; rel. to k(·OH + SCN^-).	700371
835	**Isobutylene**				
	·OH + $(CH_3)_2C{=}CH_2$ →		5.4×10^9	p.r.; C.k.; obs. I_2^- at 400 nm; rel. to k(·OH + I^-).	670041
836	**Isobutyramide**				
	·OH + $(CH_3)_2CHCONH_2$ →	5-6	1.6×10^9	p.r.; C.k.; rel. to k(·OH + SCN^-).	710414
837	**Isoguanine**				
	·OH + $C_5H_5N_5O$ →	11.0	1.2×10^{10}	γ-r.; C.k.; rel. to k(·OH + RNO).	750294
838	**Isoleucine**				
	·OH + Ile →	6.6	1.8×10^9	γ-r.; C.k.; rel. to k(·OH + RNO).	730548
839	**Isoleucine, conjugate acid**				
	·OH + $IleH^+$ →	2-2.2	2.2×10^9	γ-r.; C.k.; pK_a = 2.66, 9.7; rel. to k(·OH + 5-MeU).	650388
840	**Isoorotate ion**				
	·OH + 5-UCO_2^- → 5-$U(OH)CO_2^-$	7	4.0×10^9	p.r.; P.b.k. (OH adduct).	700567

TABLE 8. Rate constants for reactions of hydroxyl radicals in aqueous solution—Continued

No.	Reaction	pH	k (L mol^{-1} s^{-1})	Comment	Ref.
841	**Isopropyl acetate**				
	$\cdot OH + CH_3CO_2CH(CH_3)_2 \rightarrow$	6-7	4.5×10^8	p.r.; C.k., at pH 2.0 $k = 7 \times 10^8$; rel. to $k(\cdot OH + SCN^-)$.	650387
842	**Isopropylamine**				
	$\cdot OH + (CH_3)_2CHNH_2 \rightarrow (CH_3)_2\dot{C}NH_2 + H_2O$	12.0	1.3×10^{10}	p.r.; C.k.; value extrapolated from pH study; rel. to $k(\cdot OH + SCN^-)$.	710585
843	**Isopropylammonium ion**				
	$\cdot OH + (CH_3)_2CHNH_3^+ \rightarrow (CH_3)_2\dot{C}NH_3^+ + H_2O$		*4.9 × 10^8*	Average of 2 values.	
		3.0	5.0×10^8	p.r.; C.k.; rel. to $k(\cdot OH + SCN^-)$.	710585
		4	4.7×10^8	p.r.; C.k.; rel. to $k(\cdot OH + SCN^-)$.	700371
844	**Isopropyl phenyl sulfoxide**				
	$\cdot OH + C_6H_5SOCH(CH_3)_2 \rightarrow HOC_6H_5SOCH(CH_3)_2 + C_6H_5SO(OH)CH(CH_3)_2$		1.0×10^{10}	p.r.; Condy. buildup; ($\rightarrow R + RSO_2^- + H^+$); 45% addn. to S and 55% addn. to ring.	80A014
845	**Isouramil**				
	$\cdot OH$ + 5-OH-6-NH_2U → 5-OH-6-NH_2U(OH)	5.3-8.0	5×10^9	p.r.; P.b.k. at 249 and 290 nm.	80A381
846	**Lactate ion**				
	$\cdot OH + CH_3CHOHCO_2^- \rightarrow CH_3\dot{C}(O^-)CO_2^- + H_2O$	11	3×10^8	p.r.; No details.	765249
847	**Lactic acid**				
	$\cdot OH + CH_3CH(OH)CO_2H \rightarrow$	1	4.3×10^8	p.r.; C.k.; rel. to $k(\cdot OH + SCN^-)$.	650387
848	**Lactose**				
	$\cdot OH + C_{12}H_{22}O_{11} \rightarrow$ H abstr.	6.5	3.1×10^9	p.r.; C.k.; rel. to $k(\cdot OH + SCN^-)$.	78A146
849	**Leucine**				
	$\cdot OH$ + Leu →	5.5-6	1.7×10^9	p.r.; C.k.; $pK_a = 2.3, 9.7$; at pH 2-2.2 $k = 1.5 \times 10^9$; at pH 9.7-9.9 $k = 3.7 \times 10^9$; rel. to $k(\cdot OH + SCN^-)$.	650388
850	**Linoleate ion**				
	$\cdot OH + LCO_2^- \rightarrow$ H abstr.		*9.0 × 10^9*	Average of 2 values.	
		7	1.1×10^{10}	p.r.; P.b.k. at 280 nm (dienyl radical)	85A182
			7.4×10^9	p.r.; C.k. in soln. contg. 10^{-3} mol L^{-1} SCN^- and 0.02 mol L^{-1} phosphate; $k = 1.0 \times 10^9$ above the CMC; H abstr. at C-11.; rel. to $k(\cdot OH + SCN^-)$.	78A263
851	**Linolenate ion**				
	$\cdot OH + CH_3(CH_2CH{=}CH)_3(CH_2)_7CO_2^- \rightarrow$		7.3×10^9	p.r.; C.k.; rel. to $k(\cdot OH + SCN^-)$.	78A365
852	**Luminol**				
	$\cdot OH$ + -NHNH- → H_2O + lum$\cdot$		*8.8 × 10^9*	Average of 2 values.	
		11	9×10^9	p.r.; P.b.k. in soln. satd. with 1:1 O_2-N_2O.	79G176
		9.5	8.7×10^9	p.r.; P.b.k. at 400 nm.	731068
853	**Lysine**				
	$\cdot OH$ + Lys →	6.0	3.5×10^8	γ-r., C.k.; rel. to $k(\cdot OH + RNO)$.	730548
854	**Lysine, conjugate acid**				
	$\cdot OH + LysH^+ \rightarrow$	2-2.2	7.7×10^8	γ-r.; C.k.; $pK_a = 2.18$ (5.05, 10.53, 11.82); rel. to $k(\cdot OH$ + 5-MeU).	650388
855	**Maleic acid**				
	$\cdot OH + HO_2CCH{=}CHCO_2H \rightarrow HO_2CCHOH\dot{C}HCO_2H$	4-10.5	6.0×10^9	p.r.; P.b.k. at 280-400 nm; k independent of wavelength and pH.	85A487
856	**Maleic hydrazide**				
	$\cdot OH + MH_2 \rightarrow$ addn.		*3.2 × 10^9*	Average of 2 values.	
		3.5	2.9×10^9	p.r.; P.b.k. at 570 nm; 100% addn.	83A166

TABLE 8. Rate constants for reactions of hydroxyl radicals in aqueous solution—Continued

No.	Reaction	pH	k (L mol^{-1} s^{-1})	Comment	Ref.
856	**Maleic hydrazide**—Continued				
			3.6×10^9	p.r.; C.k.; rel. to k(·OH + MeOH).	83A166
857	**Maleic hydrazide, conjugate base**				
	·OH + MH^- →		*4.6 × 10^9*	Average of 2 values.	
		11	4.2×10^9	p.r.; P.b.k. at 430 nm; 33% addn, 67% semiquinone formn.	83A166
			4.9×10^9	p.r.; C.k.; rel. to k(·OH + MeOH).	83A166
858	**Malate ion**				
	·OH + $^-O_2CCH_2CHOHCO_2^-$ →		8.6×10^8	p.r.; No details.	741007
859	**Malic acid**				
	·OH + $HO_2CCH_2CH(OH)CO_2H$ → $HO_2CCOHCH_2CO_2H + H_2O$		*7.9 × 10^8*	Average of 2 values.	
		1.5-14	8.2×10^8	p.r.; P.b.k. at 235-330 nm ; k identical for d- and l- forms and independent of wavelength and pH; pK_a = 3.44; 5.11.	85A487
		2-2.2	6.4×10^8	γ-r.; C.k.; pK_a = 3.2, 5; rel. to k(·OH + 5-MeU).	670461
860	**Malonate ion**				
	·OH + $CH_2(CO_2^-)_2$ →	6-7	3.0×10^8	p.r.; C.k.; rel. to k(·OH + SCN^-).	650387
861	**Malonic acid**				
	·OH + $HO_2CCH_2CO_2H$ →		*2.0 × 10^7*	Average of 2 values.	
		1	1.6×10^7	Fenton; C.k.; k(·OH + MeOH)/k(·OH + Fe^{2+}) = 4.3; rel. to k(·OH + MeOH).	739341
		2-2.2	2.4×10^7	γ-r.; C.k.; pK_a = 2.8, 5.7; rel. to k(·OH + 5-MeU).	670461
862	**Maltose**				
	·OH + $C_{12}H_{22}O_{11}$ → H abstr.	6.5	2.3×10^9	p.r.; C.k.; rel. to k(·OH + SCN^-).	78A146
863	**Mannitol**				
	·OH + $HOCH_2(CHOH)_4CH_2OH$ →		*1.7 × 10^9*	Average of 4 values.	
		7	1.7×10^9	p.r.; C.k.; N_2O-satd. soln. of 2-100 x 10^{-3} mol L^{-1} mannitol and 2 x 10^{-4} mol L^{-1} KI; rel. to k(·OH + I^-).	84A427
		7	1.5×10^9	p.r.; C.k.; N_2O-satd. soln. of 5-100 x 10^{-3} mol L^{-1} mannitol and 5 x 10^{-4} mol L^{-1} K ferrocyanide; rel. to k(·OH + $Fe(CN)_6^{4-}$).	84A427
		7	2.1×10^9	p.r.; C.k.; N_2O-satd. soln. of 2-60 × 10^{-3} mol L^{-1} mannitol and 2 x 10^{-4} mol L^{-1} KSCN; rel. to k(·OH + SCN^-).	84A427
		7	1.5×10^9	p.r.; C.k.; rel. to k(·OH + SCN^-).	79A366
864	**Melibiose**				
	·OH + $C_{12}H_{22}O_{11}$ →	6.5	3.8×10^9	γ-r.; C.k.; rel. to k(·OH + RNO).	690580
865	**Mercaptoacetate ion**				
	·OH + $HSCH_2CO_2^-$ → ·$SCH_2CO_2^-$ + H_2O	6.6	5.8×10^9	p.r.; C.k.; pK_a = 3.7, 10.3, at pH 11.1 k = 5.5 × 10^9; rel. to k(·OH + SCN^-).	730090
866	**Mercaptoacetic acid**				
	·OH + $HSCH_2CO_2H$ →	1	9.0×10^8	Fenton; C.k.; rel. to k(·OH + Fe^{2+}).	490002
867	**2-Mercaptoethanol**				
	·OH + $HSCH_2CH_2OH$ → ·SCH_2CH_2OH + H_2O	6.5	6.8×10^9	p.r.; C.k.; rel. to k(·OH + $Fe(CN)_6^{4-}$).	710175
868	**2-Mercapto-1-methylimidazole**				
	·OH + MMI →		1.4×10^{10}	p.r.; C.k. (details not given).	84A317

TABLE 8. Rate constants for reactions of hydroxyl radicals in aqueous solution—Continued

No.	Reaction	pH	k (L mol^{-1} s^{-1})	Comment	Ref.
869	**2-Mercaptopropionate ion**				
	$\cdot OH + CH_3CH(SH)CO_2^- \rightarrow \cdot SCH(CH_3)CO_2^- + H_2O$	7.2	1.7×10^{10}	p.r.; C.k.; pK_a = 4, 10.7; at pH 10.8 k = 1.6×10^{10}; rel. to k($\cdot OH + SCN^-$).	730000
870	**3-Mercaptopropionate ion**				
	$\cdot OH + HSCH_2CH_2CO_2^- \rightarrow \cdot SCH_2CH_2CO_2^- + H_2O$	6.0	3.0×10^{10}	p.r.; C.k.; pK_a = 4.3, 10.3; at pH 10.7 k = 2.1×10^{10}; rel. to k($\cdot OH + SCN^-$).	730090
871	**2-Mercaptopurine**				
	$\cdot OH + C_5H_4N_4S \rightarrow$	7	$\sim 4.4 \times 10^9$	γ-r.; C.k. in air-satd. buffered soln.; pK_a = 7.15, 10.04; rel. to k($\cdot OH$ + RNO).	84A109
872	**6-Mercaptopurine**				
	$\cdot OH + C_5H_4N_4S \rightarrow$	7	$\sim 7.0 \times 10^9$	γ-r.; C.k. in air-satd. buffered soln.; pK_a = 7.77, 10.84; rel. to k($\cdot OH$ + RNO).	84A109
873	**Mesitylene**				
	$\cdot OH + C_6H_3(CH_3)_3 \rightarrow HOC_6H_3(CH_3)_3$	~7	6.4×10^9	p.r.; P.b.k. at 333 nm in unbuffered soln.; 18.5% H abstr.	751009
874	**Methacrylate ion**				
	$\cdot OH + CH_2{=}C(CH_3)CO_2^- \rightarrow$	7-7.2	1.6×10^{10}	p.r.; C.k.; rel. to k($\cdot OH + SCN^-$).	80A240
875	**Methacrylonitrile**				
	$\cdot OH + H_2C{=}C(CH_3)CN \rightarrow$	7-7.2	1.1×10^{10}	p.r.; C.k.; rel. to k($\cdot OH + SCN^-$).	80A240
876	**Methane**				
	$\cdot OH + CH_4 \rightarrow \cdot CH_3 + H_2O$		*1.1 × 10^8*	Average of 2 values.	
			1.0×10^8	p.r.; D.k. (OH) at 250 nm in soln. contg. 1.16×10^{-3} mol L^{-1} CH_4 and N_2O.	751055
		5.5	1.2×10^8	p.r.; D.k. (OH) at 250 nm in $\sim 1 \times 10^{-3}$ mol L^{-1} N_2O-CH_4 soln.	720445
877	**Methanedisulfonate ion**				
	$\cdot OH + {}^-O_3SCH_2SO_3^- \rightarrow H_2O + {}^-O_3S\dot{C}HSO_3^-$	7	4.3×10^7	p.r.; C.k.; k = 3.1×10^7 calcd. from obs. rate rel. to k($\cdot OH$ + MeOH) = 7.4×10^8 and pK = 1.5; rel. to k($\cdot OH + SCN^-$).	77A221
878	**Methanedisulfonate ion, hydrogen**				
	$\cdot OH + {}^-O_3SCH_2SO_3H \rightarrow H_2O + {}^-O_3S\dot{C}HSO_3H$	1.05	2.5×10^7	p.r.; C.k.; calcd. from obs. rate and pK_a = 1.5; rel. to k($\cdot OH$ + MeOH).	77A221
879	**Methanesulfonate ion**				
	$\cdot OH + CH_3SO_3^- \rightarrow$		1.3×10^9	p.r.; C.k.; rel. to k($\cdot OH + SCN^-$).	751072
880	**Methanol**				
	$\cdot OH + CH_3OH \rightarrow H_2O + \cdot CH_2OH$ (93%) + $CH_3O\cdot$ (7%) [730126]		**9.7×10^8**	**Selected value.**	
		6	1.0×10^9	p.r.; C.k.; obs. $ABTS^{\cdot+}$ formn. at 415 nm; rel. to k($\cdot OH$ + ABTS).	82A196
		nat.	9.7×10^8	p.r.; C.k.; rel. to k($\cdot OH + Fe(CN)_6^{4-}$).	710578
			9.5×10^8	p.r.; C.k.; rel. to k($\cdot OH$ + RNO).	690156
			8.3×10^8	p.r.; C.k.; obs. hydroxycyclohexadienyl radical buildup; rel. to k($\cdot OH$ + BzO^-).	680304
			8.3×10^8	p.r.; C.k.; rel. to k($\cdot OH + PNBA^-$).	680304
			8.3×10^8	p.r.; C.k.; rel. to k($\cdot OH + PA^-$).	680304
		10.7	8.8×10^8	p.r.; C.k.; rel. to k($\cdot OH + CO_3^{2-}$).	650190
		7.0	7.8×10^8	p.r.; C.k.; rel. to k($\cdot OH + SCN^-$).	650190
		7	8.0×10^8	p.r.; C.k., at pH 2 k = 1.2×10^9; rel. to k($\cdot OH + SCN^-$).	650387
881	**Methanol-d_3**				
	$\cdot OH + CD_3OH \rightarrow HDO + \cdot CD_2OH$	6	4.3×10^8	p.r.; C.k. with Br^-; rel. to k($\cdot OH$ + EtOH).	660423

TABLE 8. Rate constants for reactions of hydroxyl radicals in aqueous solution—Continued

No.	Reaction	pH	k (L mol^{-1} s^{-1})	Comment	Ref.
882	**Methional**				
	$\cdot OH + CH_3SCH_2CH_2CHO \rightarrow OH^- + CH_3\dot{S}^+CH_2CH_2CHO$		8.2×10^9	p.r.; C.k. with *tert*-BuOH; obs. formn of thiyl radical cation at 410 nm; ref. rate not given	761038
883	**Methionine**				
	$\cdot OH$ + Met → Met(OH)·[S]		*8.3* × *10*^{9}	Average of 2 values.	
		6-7	8.5×10^9	p.r.; C.k.; rel. to $k(\cdot OH + SCN^-)$.	650387
		5.5-5.7	8.1×10^9	p.r.; C.k.; pK_a = 2.28, 9.21; at pH 2-2.2 k = 7.7×10^9; 20% H abstr., 80% addn., product detn. in [81A124]; Also see [85B093] for product detn.; rel. to $k(\cdot OH + SCN^-)$.	650388
884	**Methoxyacetate ion**				
	$\cdot OH + CH_3OCH_2CO_2^-$ →	9	6.1×10^8	γ-r.; C.k. with RNO; rel. to $k(\cdot OH$ + EtOH).	660423
885	**2-Methoxybenzoate ion**				
	$\cdot OH + 2\text{-}CH_3OC_6H_4CO_2^-$ → $CH_3OC_6H_4(OH)CO_2^-$	~7	5.4×10^9	p.r.; C.k.; 1×10^{-4} mol L^{-1} solute; rel. to $k(\cdot OH + SCN^-)$.	771007
886	**3-Methoxybenzoate ion**				
	$\cdot OH + 3\text{-}CH_3OC_6H_4CO_2^-$ → $CH_3OC_6H_4(OH)CO_2^-$	~7	6.6×10^9	p.r.; C.k.; rel. to $k(\cdot OH + SCN^-)$.	771007
887	**4-Methoxybenzoate ion**				
	$\cdot OH + 4\text{-}CH_3OC_6H_4CO_2^-$ → $CH_3OC_6H_4(OH)CO_2^-$	~7	7.2×10^9	p.r.; C.k.; rel. to $k(\cdot OH + SCN^-)$.	771007
888	**2-Methoxyethanol**				
	$\cdot OH + CH_3OCH_2CH_2OH$ →	9	1.3×10^9	γ-r.; C.k. with RNO; rel. to $k(\cdot OH$ + EtOH).	660423
889	**5-Methoxyindole**				
	$\cdot OH$ + 5-CH_3OIn →	9.0	1.5×10^{10}	γ-r.; C.k. with RNO; rel. to $k(\cdot OH$ + TrpH).	710556
890	**1-Methoxy-2-methyl-1-phenylpropane**				
	$\cdot OH + C_6H_5CH(OCH_3)CH(CH_3)_2$ →	1.7-1.8	7.4×10^9	Fenton; C.k. with 1-phenylethanol; rel. to $k(\cdot OH$ + 2-PrOH).	749006
891	**2-Methoxyphenol**				
	$\cdot OH + 2\text{-}(CH_3O)C_6H_4OH$ → $CH_3OC_6H_4(OH)_2$	6-7	2×10^{10}	p.r.; C.k.; rel. to $k(\cdot OH + SCN^-)$.	771087
892	**3-Methoxyphenol**				
	$\cdot OH + 3\text{-}CH_3OC_6H_4OH$ → $CH_3OC_6H_4(OH)_2$	6-7	3.2×10^{10}	p.r.; C.k.; rel. to $k(\cdot OH + SCN^-)$.	771087
893	**4-Methoxyphenol**				
	$\cdot OH + 4\text{-}CH_3OC_6H_4OH$ → $CH_3OC_6H_4(OH)_2$	6-7	2.6×10^{10}	p.r.; C.k.; rel. to $k(\cdot OH + SCN^-)$.	771087
894	**4-Methoxyphenyl-*N*-*tert*-butylnitrone**				
	$\cdot OH$ + 4-CH_3O-PBN → 4-CH_3O-PBN(OH)		6.4×10^9	p.r.; C.k.; rel. to $k(\cdot OH + SCN^-)$.	82A184
895	***p*-Methoxyphenyl-β-D-glucopyranoside**				
	$\cdot OH$ + $GlucOC_6H_4OCH_3$ →		1.0×10^{10}	p.r.; C.k. with SCN^-; rel. to $k(\cdot OH$ + $GlucOC_6H_5$).	710056
896	**2-Methoxy-4-propenylphenol**				
	$\cdot OH + CH_3OC_6H_3(CH{=}CHCH_3)OH$ →		*3.9* × *10*^{10}	Average of 2 values.	
			3.3×10^{10}	p.r.; C.k.; rel. to $k(\cdot OH$ + *tert*-BuOH).	83A387
			5×10^{10}	p.r.; C.k.; rel. to $k(\cdot OH$ + DCIP).	83A387
897	**8-Methoxypsoralen**				
	$\cdot OH$ + 8-MOP →	7	1.1×10^{10}	p.r.; P.b.k. at 460 nm.	78A126
898	**6-Methoxypurine**				
	$\cdot OH + C_6H_6N_4O$ →	6.8	2.0×10^9	p.r.; P.b.k. at 380 nm; pK_a = 9.23.	87A231

TABLE 8. Rate constants for reactions of hydroxyl radicals in aqueous solution—Continued

No.	Reaction	pH	k (L mol^{-1} s^{-1})	Comment	Ref.
899	**6-Methoxypurine-9-riboside** $\cdot OH + MPR \rightarrow$	6.4	2.6×10^{9}	p.r.; P.b.k. at at 400 nm.	87A231
900	***N*-Methylacetamide** $\cdot OH + CH_3CONHCH_3 \rightarrow CH_3CONHCH_2 + H_2O$	5.5	1.6×10^{9}	p.r.; C.k.; rel. to $k(\cdot OH + SCN^-)$.	700098
901	**Methyl acetate** $\cdot OH + CH_3CO_2CH_3 \rightarrow CH_3CO_2\dot{C}H_2 + H_2O$	6-7	1.2×10^{8}	p.r.; C.k., at pH 2.0 $k = 2.2 \times 10^{8}$; rel. to $k(\cdot OH + SCN^-)$.	650387
902	***N*^{6}-Methyladenine** $\cdot OH + C_6H_7N_5 \rightarrow$	7.8	5.4×10^{9}	p.r.; P.b.k. at 310 nm; $pK_a = 4.2, 10.0$	87A231
903	**9-Methyladenine** $\cdot OH + MA \rightarrow$	7.5	5.7×10^{9}	p.r.; P.b.k. at at 400 nm; $pK_a = 3.92$.	87A231
904	***N*^{6}-Methyladenosine** $\cdot OH + C_{11}H_{15}N_5O_4 \rightarrow$	7	6.0×10^{9}	p.r.; P.b.k. at 310 and 370 nm.	87A231
905	**Methylamine** $\cdot OH + CH_3NH_2 \rightarrow \cdot CH_2NH_2 + CH_3\dot{N}H + H_2O$	10.5	1.8×10^{9}	p.r.; C.k.; studied at pH 2-13.1; rel. to $k(\cdot OH + SCN^-)$.	710595
		11.1	4.1×10^{9}	p.r.; C.k.; studied at at pH 9.7-12.8; rel. to $k(\cdot OH + NB)$.	710595
		11.5-12.5	5.7×10^{9}	p.r.; C.k.; pH study; rel. to $k(\cdot OH + NB)$.	690573
906	**Methylammonium ion** $\cdot OH + CH_3NH_3^+ \rightarrow$	4	3.5×10^{7}	p.r.; C.k., also detd. at pH 2 and 7; rel. to $k(\cdot OH + SCN^-)$.	700371
		6-8	9.1×10^{7}	p.r.; C.k.; pH study; rel. to $k(\cdot OH + NB)$.	690573
907	**Methyl α-D-arabinopyranoside** $\cdot OH + C_6H_{12}O_5 \rightarrow$	6.5	2.4×10^{9}	γ-r.; C.k.; rel. to $k(\cdot OH + RNO)$.	690580
908	**1-*O*-Methyl-L-ascorbic acid** $\cdot OH + 1\text{-}CH_3AH \rightarrow 1\text{-}CH_3AH\text{-}OH$	6.8	2.5×10^{10}	p.r.; P.b.k. at 325 nm.	84A095
909	**2-*O*-Methyl-L-ascorbic acid** $\cdot OH + 2\text{-}CH_3AH \rightarrow$	3.6-6.8	2.7×10^{9}	p.r.; P.b.k. at 360 ($A^{\cdot -}$ by loss of a methyl group) and 290 nm ($2\text{-}CH_3A^{\cdot -}$).	84A095
910	**3-*O*-Methyl-L-ascorbate ion** $\cdot OH + 3\text{-}CH_3A^- \rightarrow 3\text{-}CH_3A^-\text{-}OH$	7.2-9.5	4.8×10^{9}	p.r.; P.b.k. at 290 nm	84A095
911	**3-*O*-Methyl-L-ascorbic acid** $\cdot OH + 3\text{-}CH_3AH \rightarrow 3\text{-}CH_3AH\text{-}OH$	7.5-7.9	3.0×10^{10}	p.r.; P.b.k. at 290 nm	84A095
912	**α-Methylbenzylammonium ion** $\cdot OH + C_6H_5CH_2NH_2^+CH_3 \rightarrow HOC_6H_5CH(CH_3)NH_3^+$	7	5.2×10^{9}	p.r.; P.b.k. at 305 nm in N_2O-satd. soln.	86A410
913	***N*-Methylbenzylammonium ion** $\cdot OH + C_8H_{12}N^+ \rightarrow HOC_6H_5CH_2NH_2^+CH_3$	7	5.2×10^{9}	p.r.; P.b.k. at 320 nm in N_2O-satd. soln.	86A410
914	**2-Methylbutane** $\cdot OH + C_2H_5CH(CH_3)_2 \rightarrow$	2	5.2×10^{9}	Fenton; rel. to $k(\cdot OH + Ethane)$.	81M420
915	**3-Methyl-1-butanol** $\cdot OH + (CH_3)_2CHCH_2CH_2OH \rightarrow$		*3.8 × 10^9*	Average of 2 values.	
			3.8×10^{9}	p.r.; C.k.; rel. to $k(\cdot OH + Fe(CN)_6^{4-})$.	731077
			3.7×10^{9}	p.r.; C.k.; rel. to $k(\cdot OH + SCN^-)$.	731077
916	**Methyl butyrate** $\cdot OH + CH_3CH_2CH_2CO_2CH_3 \rightarrow$	6-7	1.7×10^{9}	p.r.; C.k.; rel. to $k(\cdot OH + SCN^-)$.	650387
917	**2-Methylbutyrate ion** $\cdot OH + CH_3CH_2CH(CH_3)CO_2^- \rightarrow$	9	2.2×10^{9}	γ-r.; C.k. with RNO; rel. to $k(\cdot OH + EtOH)$.	660423

TABLE 8. Rate constants for reactions of hydroxyl radicals in aqueous solution—Continued

No.	Reaction	pH	k (L mol^{-1} s^{-1})	Comment	Ref.
918	**3-Methylbutyrate ion** $\cdot OH + CH_3CH(CH_3)CH_2CO_2^- \rightarrow$	9	2.4×10^9	γ-r.; C.k. with RNO; rel. to $k(\cdot OH + EtOH)$.	660423
919	**3-Methylbutyric acid** $\cdot OH + (CH_3)_2CHCH_2CO_2H \rightarrow$	1	1.1×10^9	Fenton; C.k.; rel. to $k(\cdot OH + Fe^{2+})$.	490002
920	**Methylcyclohexane** $\cdot OH + MCH \rightarrow$	2	7.1×10^9	Fenton; rel. to $k(\cdot OH + Ethane)$.	81M420
921	**Methylcyclopentane** $\cdot OH + C_5H_9CH_3 \rightarrow$	2	7.0×10^9	Fenton; rel. to $k(\cdot OH + Ethane)$.	81M420
922	***S*-Methylcysteine** $\cdot OH + CH_3SCH_2CH(NH_3^+)CO_2^- \rightarrow$	5.4	8.0×10^9	C.k.; pK ≃ 2, 8.8; rel. to $k(\cdot OH + SCN^-)$.	730090
923	***S*-Methylcysteine, negative ion** $\cdot OH + CH_3SCH_2CH(NH_2)CO_2^- \rightarrow$	11.0	7.9×10^9	C.k.; rel. to $k(\cdot OH + SCN^-)$.	730090
924	**5-Methylcytosine** $\cdot OH$ + 5-MeCy → 5-MeCy(OH)	7	6.0×10^9	p.r.; P.b.k.	78A106
925	**2-Methyl-1,3-dioxolane** $\cdot OH + C_4H_8O_2 \rightarrow$		3.5×10^9	p.r.; rel. to $k(\cdot OH + SCN^-)$.	80A441
926	**Methylene Blue** $\cdot OH + MB^+ \rightarrow OH^- + \cdot MB^{2+}$		2.1×10^{10}	γ-r.; C.k.; obs. $G(-MB^+)$; rel. to $k(\cdot OH +$ MeOH).	710682
927	***N*-Methylformamide** $\cdot OH + HCONHCH_3 \rightarrow HCONH\dot{C}H_2 + H_2O$	5.5	1.2×10^9	p.r.; C.k.; rel. to $k(\cdot OH + SCN^-)$.	700098
928	**2-Methylfuran** $\cdot OH + C_5H_6O \rightarrow$	9	1.9×10^{10}	γ-r.; C.k.; method of [650356]; rel. to $k(\cdot OH +$ RNO).	83A335
929	**5-Methylfurfural** $\cdot OH + C_6H_6O_2 \rightarrow$	9	7.2×10^9	γ-r.; C.k.; method of [650356]; rel. to $k(\cdot OH +$ RNO).	83A335
930	**Methylgalactoside** $\cdot OH + C_7H_{14}O_6 \rightarrow$	6.5	1.6×10^9	γ-r.; C.k.; rel. to $k(\cdot OH +$ RNO).	690580
931	**α-Methylglucoside** $\cdot OH$ + α-MeGlu →	6.5	2.4×10^9	γ-r.; C.k. [structure of radicals formed by phot. of H_2O_2 see 82D074]; rel. to $k(\cdot OH +$ RNO).	690580
932	***O*-Methylhydroxylamine** $\cdot OH + CH_3ONH_2 \rightarrow CH_3\dot{O}NH + H_2O$	9.1	1.4×10^{10}	p.r.; C.k.; rel. to $k(\cdot OH + SCN^-)$.	710493
933	***O*-Methylhydroxylammonium ion** $\cdot OH + CH_3ONH_3^+ \rightarrow CH_3\dot{O}NH + H_2O$	4.5	$<4.0 \times 10^8$	p.r.; C.k.; obs. value, could be ~ 30% lower; $pK_a = 4.6$; rel. to $k(\cdot OH + SCN^-)$.	710493
934	**1-Methylimidazole** $\cdot OH$ + 1-CH_3Im → CH_3Im(OH)	9.4	8.1×10^9	p.r.; P.b.k.	751066
935	**1-Methylimidazole, conjugate acid** $\cdot OH + CH_3ImH^+ \rightarrow CH_3Im(OH)H^+$	5.4	5.0×10^9	p.r.; P.b.k.; $pK_a = 7.0$.	751066
936	**1-Methylindole** $\cdot OH$ + 1-MeIn →	9.0	1.5×10^{10}	γ-r.; C.k. with RNO; rel. to $k(\cdot OH +$ TrpH).	710556
937	**2-Methylindole** $\cdot OH$ + 2-MeIn →	9.0	3.4×10^{10}	p.r.; P.b.k. at 320 nm.	710556
938	**3-Methylindole** $\cdot OH$ + 3-MeIn →	9.0	3.3×10^{10}	p.r.; P.b.k. at 320 nm.	710556
939	**5-Methylindole** $\cdot OH$ + 5-MeIn →	9.0	1.7×10^{10}	γ-r.; C.k. with RNO; rel. to $k(\cdot OH +$ TrpH).	710556

TABLE 8. Rate constants for reactions of hydroxyl radicals in aqueous solution—Continued

No.	Reaction	pH	k (L mol^{-1} s^{-1})	Comment	Ref.
940	***N*-Methylisobutyramide** $\cdot OH + (CH_3)_2CHCONHCH_3 \rightarrow$	5-6	1.9×10^9	p.r.; C.k.; rel. to $k(\cdot OH + SCN^-)$.	710414
941	**Methyl methacrylate** $\cdot OH + H_2C{=}C(CH_3)CO_2CH_3 \rightarrow$	7-7.2	1.2×10^{10}	p.r.; C.k.; rel. to $k(\cdot OH + SCN^-)$.	80A240
942	**Methyl methylthiomethyl sulfoxide** $\cdot OH + CH_3SOCH_2SCH_3 \rightarrow \cdot CH_3 + CH_3SCH_2SO_2^-$	4.9	4.8×10^9	p.r.; P.b.k. (condy.)	82A275
943	**2-Methyl-1,4-naphthoquinone** $\cdot OH + 2\text{-}CH_3\text{-}NQ \rightarrow 2\text{-}CH_3NQ(OH)$		5.5×10^9	p.r.	730026
944	**2-Methyl-2-nitrosopropane** $\cdot OH + [(CH_3)_3CNO]_2 \rightarrow$		4.0×10^8	p.r.; C.k.; rel. to $k(\cdot OH + SCN^-)$.	775208
945	**2-Methyl-4-phenyl-2-butanol** $\cdot OH + C_6H_5CH_2CH_2C(CH_3)_2OH \rightarrow$	1.7-1.8	5.9×10^9	Fenton; C.k. with cycloheptanol; rel. to $k(\cdot OH$ + 2-PrOH).	749006
946	**4-Methylphenyl-*N*-*tert*-butylnitrone** $\cdot OH + 4\text{-}CH_3\text{-}PBN \rightarrow$ 4-CH_3-PBN(OH)		4.7×10^9	p.r.; C.k.; rel. to $k(\cdot OH + SCN^-)$.	82A184
947	**2-Methyl-1-phenyl-1-propanol** $\cdot OH + C_6H_5CHOHCH(CH_3)_2 \rightarrow$	1.7-1.8	9.5×10^9	Fenton; C.k. with 1-phenylethanol; rel. to $k(\cdot OH$ + 2-PrOH).	749006
948	**2-Methyl-1-phenyl-1-propanol-1-*d*** $\cdot OH + C_6H_5CDOHCH(CH_3)_2 \rightarrow$	1.7-1.8	8.6×10^9	Fenton; C.k. with 1-phenylethanol; rel. to $k(\cdot OH$ + 2-PrOH).	749006
949	**2-Methyl-1-phenyl-2-propanol** $\cdot OH + C_6H_5CH_2C(OH)(CH_3)_2 \rightarrow$	1.7-1.8	1.7×10^{10}	Fenton; C.k. with cycloheptanol; rel. to $k(\cdot OH$ + 2-PrOH).	749006
950	**Methyl phenyl sulfoxide** $\cdot OH + C_6H_5SOCH_3 \rightarrow$ $C_6H_5SO(OH)CH_3 + HOC_6H_5SOCH_3$		9.7×10^9	p.r.; Condy. buildup; ($\rightarrow R + RSO_2^-/H^+$); 45% addn. to S, 55% addn. to ring.	80A014
951	**Methylphosphonate ion** $\cdot OH + CH_3PO_3^{2-} \rightarrow H_2O +$ $\cdot CH_2PO_3^{2-}$	9	1.4×10^8 [a]	phot.; Obs. CO_2 formn. (2 hr.) in O_2-contg. soln. contg. 3 mol L^{-1} H_2O_2 and 0.32 mol L^{-1} $CH_3PO_3^{2-}$ and 0.32 mol L^{-1} AcO^-; rel. to $k(\cdot OH + AcO^-)$.	79F322
952	***N*-Methylpivalamide** $\cdot OH + (CH_3)_3CCONHCH_3 \rightarrow$	5-6	2.4×10^9	p.r.; C.k.; rel. to $k(\cdot OH + SCN^-)$.	710414
953	**2-Methyl-1-propanol** $\cdot OH + (CH_3)_2CHCH_2OH \rightarrow$ $(CH_3)_2\dot{C}HOH + H_2O$		*3.3 × 10^9*	Average of 3 values.	
			2.9×10^9	p.r.; C.k.; rel. to $k(\cdot OH + Fe(CN)_6^{4-})$.	731077
			3.6×10^9	p.r.; C.k.; rel. to $k(\cdot OH + SCN^-)$.	731077
		7	3.3×10^9	p.r.; C.k.; rel. to $k(\cdot OH + SCN^-)$.	650387
954	**2-Methyl-2-propanol** $\cdot OH + (CH_3)_3COH \rightarrow H_2O +$ $\cdot CH_2C(CH_3)_2OH$ (95.7%) + $(CH_3)_3CO\cdot$ (4.3%) [730126]		**6.0×10^8**	**Selected value.**	
			6.6×10^8	p.r.; C.k.; also measurements at 39, 59, and 79°C; rel. to $k(\cdot OH + Fe(CN)_6^{4-})$.	84A349
		6	6.0×10^8	p.r.; C.k.; obs. $ABTS^{\cdot+}$ formn. at 415 nm; rel. to $k(\cdot OH$ + ABTS).	82A196
		7	7.6×10^8	p.r.; D.k. at 280 nm (OH); 0.5-2 mol L^{-1} *tert*-BuOH.	771012
		nat.	5.9×10^8	p.r.; C.k.; rel. to $k(\cdot OH + Fe(CN)_6^{4-})$.	710578
		7	4.2×10^8	p.r.; C.k.; rel. to $k(\cdot OH + SCN^-)$.	650387

TABLE 8. Rate constants for reactions of hydroxyl radicals in aqueous solution—Continued

No.	Reaction	pH	k (L mol^{-1} s^{-1})	Comment	Ref.
955	***N*-Methylpropionamide** $\cdot OH + CH_3CH_2CONHCH_3 \rightarrow$	5-6	1.4×10^9	p.r.; C.k.; rel. to $k(\cdot OH + SCN^-)$.	710414
956	**Methyl propionate** $\cdot OH + C_2H_5CO_2CH_3 \rightarrow$	6-7	4.5×10^8	p.r.; C.k.; rel. to $k(\cdot OH + SCN^-)$.	650387
957	**2-Methylpropionate ion** $\cdot OH + (CH_3)_2CHCO_2^- \rightarrow$	9	1.3×10^9	γ-r.; C.k. with RNO; rel. to $k(\cdot OH + EtOH)$.	660423
958	**6-Methylpurine** $\cdot OH + C_6H_6N_4 \rightarrow$	6.2	4.6×10^8	p.r.; P.b.k. at 380-390 nm; $pK_a = 2.6, 9.02$.	87A231
959	**2-Methylpyridine** $\cdot OH + CH_3py \rightarrow$	9	2.5×10^9	γ-r.; C.k.; rel. to $k(\cdot OH + RNO)$.	690280
960	**3-Methylpyridine** $\cdot OH + CH_3py \rightarrow$	9	2.4×10^9	γ-r.; C.k.; rel. to $k(\cdot OH + RNO)$.	690280
961	**3-Methylpyridine-*N*-oxide** $\cdot OH + CH_3py(O) \rightarrow CH_3pyOH(O)$	7	4.2×10^9	p.r.; P.b.k.	80A048
962	**4-Methylpyridine-*N*-oxide** $\cdot OH + CH_3py(O) \rightarrow CH_3pyOH(O)$	7	2.8×10^9	p.r.; P.b.k.	80A048
963	**4-(*N*-Methylpyridinium)-*tert*-butylnitrone** $\cdot OH$ + 4-MepyBN → 4-MepyBN(OH)	6	1.1×10^9 [a]	phot.; esr; C.k.; obs. growth of spin adducts of OH and CH_2OH in soln. contg. 1% H_2O_2 + ~0.1 mol L^{-1} MeOH; rel. to $k(\cdot OH + MeOH)$.	80A102
964	**1-Methyl-2-pyrrolidinone** $\cdot OH + C_5H_9NO \rightarrow$		2.6×10^9	p.r.; C.k.; rel. to $k(\cdot OH + SCN^-)$.	81A296
965	**α-Methylstyrene** $\cdot OH + C_6H_5C(CH_3)=CH_2 \rightarrow$ $C_6H_5\dot{C}(CH_3)CH_2OH$ + $HOC_6H_5C(CH_3)=CH_2$	5.5	9.7×10^9	p.r.; P.b.k. at 320 nm.	77A236
966	**Methylsulfate ion** $\cdot OH + CH_3OSO_3^- \rightarrow$		5.0×10^7	p.r.; C.k.; rel. to $k(\cdot OH + SCN^-)$.	79N061
967	**Methyl sulfide ion** $\cdot OH + CH_3S^- \rightarrow OH^- + CH_3S\cdot$	11	6.0×10^9	p.r.; P.b.k.; obs. $RSSR^-$ at 410-420 nm; $pK =$ 10.3.	690553
968	**Methyl thioglycolate** $\cdot OH + HSCH_2CO_2CH_3 \rightarrow$ $\cdot SCH_2CO_2CH_3 + H_2O$	5.1	2.1×10^{10}	p.r.; C.k.; $pK = 7.8$; at pH 10.6 $k = 1.8 \times 10^{10}$; rel. to $k(\cdot OH + SCN^-)$.	730090
969	**2-Methylthiophene** $\cdot OH + C_5H_6S \rightarrow$	11	3.2×10^9	p.r.; P.b.k. at 300 nm; unbuffered soln.	78A026
970	**3-Methylthiophene** $\cdot OH + C_5H_6S \rightarrow$	11	3.2×10^9	p.r.; P.b.k. at 300 nm; unbuffered soln.	78A026
971	**Methylurea** $\cdot OH + CH_3NHCONH_2 \rightarrow$		$\sim 2 \times 10^9$ [a]	therm.; C.k.; Obs. ethylene generation in H_2O_2-methional, and methane generation in H_2O_2-DMSO. Rel. to $k(\cdot OH + MeOH) = 8.5 \times 10^5$, $k(\cdot OH + PhOH) = 1.4 \times 10^{10}$ as well as EtOH, BuOH, BzO^- and DMSO.	78M373
972	**Metiazinic acid, conjugate base** $\cdot OH + MZ^- \rightarrow OH^- + MZ\cdot$	10	8.4×10^9	p.r.; P.b.k. at 530 nm; also detd. by condy. increase due to formn. of radical zwitterion ($MZ\cdot$) which represents 47% of OH reaction; remainder may add or abstract H.	81A162
973	**Naphthalene** $\cdot OH + C_{10}H_8 \rightarrow C_{10}H_8OH$		5×10^9 [b]	p.r.; P.b.k. at 325 nm.	80N019
		7	1.2×10^{10} [b]	p.r.; P.b.k. at 320 nm no cor. for H rxn.	78A025

TABLE 8. Rate constants for reactions of hydroxyl radicals in aqueous solution—Continued

No.	Reaction	pH	k (L mol^{-1} s^{-1})	Comment	Ref.
974	**1-Naphthoate ion**				
	$\cdot OH + 1\text{-}NpCO_2^- \rightarrow HONpCO_2^-$	9	7.9×10^9	p.r.; P.b.k. at 330 nm.	730110
975	**2-Naphthoate ion**				
	$\cdot OH + 2\text{-}NpCO_2^- \rightarrow HONpCO_2^-$	9.2	7.6×10^9	p.r.; P.b.k. at 340 nm.	730110
976	**1-Naphthylacetate ion**				
	$\cdot OH + NpCH_2CO_2^- \rightarrow$		8.7×10^9	γ-r.; C.k.; rel. to k(·OH + 2-PrOH).	720541
977	**Nicotinamide**				
	$\cdot OH + 3\text{-}pyCONH_2 \rightarrow py(OH)CO_2NH_2$		*1.5×10^9*	Average of 2 values.	
		5.9	1.4×10^9	p.r.; P.b.k.; also c.k. with SCN^-.	76A265
		9.0	1.5×10^9	p.r.; P.b.k.	710582
978	**Nicotinamide, conjugate acid**				
	$\cdot OH + 3\text{-}pyH^+CONH_2 \rightarrow pyH^+(OH)CONH_2$	1	1.8×10^8	p.r.; P.b.k. in Ar-satd. soln.; $pK_a = 3.40$.	76A265
979	**Nicotinamide adenine dinucleotide**				
	$\cdot OH + NAD^+ \rightarrow$	7	3.2×10^9 [b]	γ-r.; C.k.; rel. to k(·OH + RNO).	80A313
		~7	8.6×10^9 [b]	γ-r.; C.k.; obs. G(inorg. phosphate); 0.3% oxidative dephosphorylation; rel. to k(·OH + *tert*-BuOH).	753070
980	**Nicotinamide mononucleotide**				
	$\cdot OH + NMN \rightarrow$	7	1.5×10^9	γ-r.; C.k.; rel. to k(·OH + RNO).	80A313
981	**Nicotinamide-*N*-oxide**				
	$\cdot OH + na(O) \rightarrow HOna(O)$	7	2.1×10^9	p.r.; P.b.k.	80A048
982	**Nicotinate ion**				
	$\cdot OH + 3\text{-}pyCO_2^- \rightarrow 3\text{-}py(OH)CO_2^-$	9.1	2.3×10^9	p.r.; P.b.k.	710582
983	**Nicotinate ion, *N*-oxide**				
	$\cdot OH + py(O)CO_2^- \rightarrow HOpy(O)CO_2^-$	7	2.3×10^9	p.r.; P.b.k.	80A048
984	**Nicotinic acid**				
	$\cdot OH + 3\text{-}pyH^+CO_2^- \rightarrow 3\text{-}py(OH)CO_2^-$	3.1	2.6×10^8	p.r.; P.b.k.; $pK_a = 1.00, 4.83$.	710582
985	**Nicotinylglycine**				
	$\cdot OH + 3\text{-}pyCOGly \rightarrow$	7.5	1.1×10^9	p.r.; P.b.k.	710582
986	**Nifuroxime**				
	$\cdot OH + NF \rightarrow NF\text{-}OH$	7	1.0×10^{10}	p.r.; P.b.k. at 500 nm as well as d.k. at 360 nm.	731018
987	**5,5′-Nitrilodibarbiturate ion (Murexide)**				
	$\cdot OH + C_8H_4N_5O_6^- \rightarrow$	7.3-7.5	1.5×10^{10} [a]	chem.; C.k. in soln. contg. 0.1 mol L^{-1} H_2O_2, 2 5 × 10^{-6} mol L^{-1} Mn^{2+} and 0.2 mol L^{-1} HCO_3^-; rel. to k(·OH + RNO).	79A411
988	**Nitrilotriacetate ion**				
	$\cdot OH + NTA^{3-} \rightarrow {}^-O_2CCHN(CH_2CO_2^-)_2 + H_2O$	9.0	2.5×10^9	p.r.; P.b.k., as well as c.k. with SCN^-, at pH 4.0 $k = 7.5 \times 10^8$; $pk_a = 0.8, 1.8, 2.5, 9.6$.	78A436
989	**Nitrilotriacetic acid**				
	$\cdot OH + N(CH_2CO_2H)_3 \rightarrow$	~0	2.1×10^9	Fenton; C.k.; rel. to k(·OH + H_2C=CHCONH$_2$).	729162
990	**Nitrilotriethanol**				
	$\cdot OH + (HOCH_2CH_2)_3N \rightarrow H_2O + (HOCH_2CH_2)_2\dot{N}CHCH_2OH + (HOCH_2CH_2)_2NCH_2\dot{C}HOH$		8.0×10^9	p.r.; C.k.; rel. to k(·OH + SCN^-).	82G071
991	**Nitrilotriethanol, conjugate acid**				
	$\cdot OH + (HOCH_2CH_2)_3NH^+ \rightarrow H_2O + (HOCH_2CH_2)_2NH^+\dot{C}HCH_2OH + (HOCH_2CH_2)_2NH^+CH_2\dot{C}HOH$		2.0×10^9	p.r.; C.k.; rel. to k(·OH + SCN^-).	82G071

TABLE 8. Rate constants for reactions of hydroxyl radicals in aqueous solution—Continued

No.	Reaction	pH	k (L mol^{-1} s^{-1})	Comment	Ref.
992	***p*-Nitroacetophenone**				
	·OH + PNAP → PNAP-OH		*3.1 × 10^9*	Average of 2 values.	
		6.5	3.3 × 10^9	p.r.; P.b.k. at 410 nm.	77A220
		6.6	2.8 × 10^9	p.r.; P.b.k. at 400 nm.	761017
993	***p*-Nitroaniline**				
	·OH + 4-$O_2NC_6H_4NH_2$ → $O_2NC_6H_4(OH)NH_2$	~6	1.4 × 10^{10}	p.r.; C.k.; rel. to k(·OH + SCN$^-$).	771118
994	**5-Nitrobarbiturate ion**				
	·OH + 6-OH-5-NO_2U → 6-OH-5-NO_2U(OH)		*8.5 × 10^9*	Average of 2 values.	
		5.9	9.2 × 10^9	p.r.; P.b.k. at 420 nm.	731003
		5.9	7.8 × 10^9	p.r.; D.k. at 350 nm; 5-addn. followed by denitration.	731003
995	**Nitrobenzene**				
	·OH + $C_6H_5NO_2$ → $HOC_6H_5NO_2$		**8.9 × 10^9**	**Selected value.**	
		7	3.2 × 10^9	p.r.; P.b.k. at 410 nm; cor. for (OH + OH) and (H + aromatic).	680304
			4.7 × 10^9	p.r.; P.b.k. at 410 nm.	670458
			3.5 × 10^9	p.r.; C.k.; rel. to k(·OH + SCN$^-$).	670458
996	**Nitrobenzene-d_5**				
	·OH + $C_6D_5NO_2$ → $HOC_6D_5NO_2$		3.1 × 10^9	γ-r.; C.k. with RNO; rel. to k(·OH + EtOH).	680157
997	**4-Nitrobenzoate ion ($PNBA^-$)**				
	·OH + 4-$NO_2C_6H_4CO_2^-$ → $NO_2C_6H_4(OH)CO_2^-$		**2.6 × 10^9**	**Selected value.**	
		6-9.4	2.6 × 10^9	p.r.; P.b.k. at 420 nm; cor. for (OH + OH) and (H + aromatic).	680304
998	**5-Nitro-2-furaldehyde**				
	·OH + NF → NF-OH	7	5.5 × 10^9	p.r.; P.b.k. at 500 nm as well as d.k. at 360 nm.	731018
999	**5-Nitro-2-furaldehyde semicarbazone**				
	·OH + NF → NF-OH	7	1.1 × 10^{10}	p.r.; P.b.k. at 500 nm as well as d.k. at 360 nm.	731018 733016
1000	**5-Nitrofuroate ion**				
	·OH + NF → NF-OH	7	5.3 × 10^9	p.r.; P.b.k. at 500 nm as well as d.k. at 300 nm.	731018 730114
1001	**5-Nitroindole**				
	·OH + 5-NO_2In →	9.0	1 × 10^{10}	γ-r.; C.k. with RNO; rel. to k(·OH + TrpH).	710556
1002	***aci*-Nitromethane anion**				
	·OH + $CH_2NO_2^-$ → $CH_2(OH)NO_2^-$	10.5	8.5 × 10^9	p.r.; P.b.k. at 280 nm.	680342
1003	**5-Nitro-6-methyluracil**				
	·OH + 5-NO_2-6-MeU → 5-NO_2-6-MeU(OH)	5.9	5.3 × 10^9	p.r.; P.b.k. at 420 nm; 5-addn. followed by denitration.	731003
1004	**5-Nitroorotate ion**				
	·OH + 5-NO_2U-6-CO_2^- → 5-NO_2U(OH)-6-CO_2^-	5.9	5.8 × 10^9	p.r.; P.b.k. at 420 nm; 5-addn. followed by denitration.	731003
1005	**2-Nitrophenoxide ion**				
	·OH + 2-$NO_2C_6H_4O^-$ →	9	9.2 × 10^9	γ-r.; C.k.; pK = 7.17; rel. to k(·OH + RNO).	72G837
1006	**3-Nitrophenoxide ion**				
	·OH + 3-$NO_2C_6H_4O^-$ →	9	7.1 × 10^9	γ-r.; C.k.; pK = 8.28; rel. to k(·OH + RNO).	72G837
1007	**4-Nitrophenol**				
	·OH + 4-$O_2NC_6H_4OH$ → 4-$HOC_6H_4NO_3^-$ + H^+	7	3.8 × 10^9	p.r.; P.b.k. at 290 nm, as well as d.k. at 400 nm; pK_a = 7.14.	680303

TABLE 8. Rate constants for reactions of hydroxyl radicals in aqueous solution—Continued

No.	Reaction	pH	k (L mol^{-1} s^{-1})	Comment	Ref.
1008	**4-Nitrophenoxide ion**				
	$\cdot OH + 4\text{-}NO_2C_6H_4O^- \rightarrow 4\text{-}HOC_6H_4NO_3^- + H^+$	9	7.6×10^9	γ-r.; C.k.; rel. to $k(\cdot OH + RNO)$.	72G837
1009	**4-Nitrophenyl-*N*-*tert*-butylnitrone**				
	$\cdot OH + 4\text{-}NO_2\text{-}PBN \rightarrow 4\text{-}NO_2\text{-}PBN(OH)$		7.4×10^9	p.r.; C.k.; rel. to $k(\cdot OH + SCN^-)$.	82A184
1010	***m*-Nitrophenyl-β-D-glucopyranoside**				
	$\cdot OH + GluOC_6H_4NO_2 \rightarrow$		4.0×10^9	γ-r.; C.k. with RNO; rel. to $k(\cdot OH + GlucOC_6H_5)$.	710056
1011	***o*-Nitrophenyl-β-D-glucopyranoside**				
	$\cdot OH + GluOC_6H_4NO_2 \rightarrow$		4.2×10^9	p.r.; C.k. with SCN^-; rel. to $k(\cdot OH + GlucOC_6H_5)$.	710056
1012	***p*-Nitrophenyl-β-D-glucopyranoside**				
	$\cdot OH + GluOC_6H_4NO_2 \rightarrow GluO\text{-}C_6H_4NO_3^-$		*2.9×10^9*	Average of 2 values.	
		~7	2.1×10^9	p.r.; C.k.; rel. to $k(\cdot OH + SCN^-)$.	751190
			3.8×10^9	p.r.; C.k. with SCN^-; rel. to $k(\cdot OH + GlucOC_6H_5)$.	710056
1013	**Nitrosobenzene**				
	$\cdot OH + C_6H_5NO \rightarrow [C_6H_5NO_2]\cdot^- + H^+$	7.0	1.8×10^{10}	p.r.; C.k.; rel. to $k(\cdot OH + SCN^-)$.	660433
1014	***p*-Nitro-*o*-toluenesulfonate ion**				
	$\cdot OH + NO_2C_6H_3(CH_3)SO_3^- \rightarrow$		1.6×10^9	r.; C.k.; rel. to $k(\cdot OH + RNO)$.	720425
1015	**5-Nitrouracil**				
	$\cdot OH + 5\text{-}NO_2U \rightarrow 5\text{-}NO_2U(OH)$		*6.4×10^9*	Average of 2 values.	
		5.9	5.4×10^9	p.r.; P.b.k. at 420 nm; 5-addn. followed by denitration.	731003
		5.9	7.4×10^9	p.r.; D.k. at 350 nm.	731003
1016	**Norleucine**				
	$\cdot OH + Nle \rightarrow$	6.4-6.9	2.5×10^9	γ-r.; C.k.; rel. to $k(\cdot OH + RNO)$.	760147
1017	**Norleucine, conjugate acid**				
	$\cdot OH + NleH^+ \rightarrow$	2.2	3.5×10^9	γ-r.; C.k.; $pK_a = 2.3, 10$; rel. to $k(\cdot OH + 5\text{-MeU})$.	670461
1018	**Norpseudopelletierine *N*-oxyl**				
	$\cdot OH + NPPN \rightarrow$		*5.8×10^9*	Average of 2 values.	
		7	4.5×10^9	p.r.; D.k. at 242 nm.	710061
		10.5	7.2×10^9	p.r.; C.k.; cor. for CO_3^- + NPPN; rel. to $k(\cdot OH + CO_3^{2-})$.	710061
1019	**Norvaline**				
	$\cdot OH + Nor \rightarrow$	6.4-6.9	1.6×10^9	γ-r.; C.k.; rel. to $k(\cdot OH + RNO)$.	760147
1020	**Norvaline, conjugate acid**				
	$\cdot OH + NorH^+ \rightarrow$	2-2.2	1.8×10^9	γ-r.; C.k.; $pK_a = 2.4, 10$; rel. to $k(\cdot OH + 5\text{-MeU})$.	670461
1021	**Octane**				
	$\cdot OH + CH_3(CH_2)_6CH_3 \rightarrow$	2	9.1×10^9	Fenton; rel. to $k(\cdot OH + Ethane)$.	81M420
1022	**1-Octanol**				
	$\cdot OH + CH_3(CH_2)_7OH \rightarrow$	2-2.2	7.7×10^9	γ-r.; C.k.; rel. to $k(\cdot OH + 5\text{-MeU})$.	670461
1023	***n*-Octylamine**				
	$\cdot OH + CH_3(CH_2)_7NH_2 \rightarrow H_2O + CH_3(CH_2)_6\dot{C}HNH_2$	1.00	1.3×10^{10} [a]	Fe^{2+}-H_2O_2; C.k.; obs. polymerization of methyl methacrylate; rel. to $k(\cdot OH + H_2C{=}C(CH_3)CO_2CH_3)$.	86A305

TABLE 8. Rate constants for reactions of hydroxyl radicals in aqueous solution—Continued

No.	Reaction	pH	k (L mol^{-1} s^{-1})	Comment	Ref.
1024	**Octylsulfate ion**				
	$\cdot OH + CH_3(CH_2)_7OSO_3^- \rightarrow$		6.5×10^9	p.r.; C.k.; rel. to $k(\cdot OH + SCN^-)$.	79N061
1025	**Ornithine**				
	$\cdot OH$ + Orn →	6.4-6.9	1.4×10^8	γ-r.; C.k.; rel. to $k(\cdot OH$ + RNO).	760147
1026	**Ornithine, conjugate acid**				
	$\cdot OH + OrnH^+ \rightarrow$	2-2.2	2.0×10^8	γ-r.; C.k.; pK_a = 1.9, 8.6, 10.8; rel. to $k(\cdot OH$ + 5-MeU).	670461
1027	**Orotate ion**				
	$\cdot OH + 6\text{-}UCO_2^- \rightarrow 6\text{-}U(OH)CO_2^-$		*5.9 × 10^9*	Average of 4 values.	
		5.2	6.5×10^9	p.r.; C.k.; rel. to $k(\cdot OH + Fe(CN)_6^{4-})$.	700567
		~5.5	6.8×10^9	p.r.; C.k.; rel. to $k(\cdot OH + SCN^-)$.	700567
		5-11	5.3×10^9	p.r.; P.b.k. at 340 nm (OH adduct).	700567
		5-11	5.0×10^9	p.r.; D.k. at 280 nm (5,6-double bond); k decreases at pH < 5.	700567
1028	**Orotidine**				
	$\cdot OH$ + Oro → Oro-OH	7	4.0×10^9	p.r.; P.b.k. (OH adduct).	700567
1029	**Orotidine monophosphate**				
	$\cdot OH$ + OMP →	~7	4.8×10^9	γ-r.; C.k.; obs. G(inorg. phosphate); 14.3% oxidative dephosphorylation; rel. to $k(\cdot OH$ + *tert*-BuOH).	753070
1030	**Oxalate ion**				
	$\cdot OH + {}^-O_2CCO_2^- \rightarrow$	6	7.7×10^6	p.r.; C.k.; rel. to $k(\cdot OH + SCN^-)$.	710041
1031	**Hydrogen oxalate ion**				
	$\cdot OH + HO_2CCO_2^- \rightarrow$	3	4.7×10^7	p.r.; C.k.; rel. to $k(\cdot OH + SCN^-)$.	710041
1032	**Oxalic acid**				
	$\cdot OH + HO_2CCO_2H \rightarrow$	0.5	1.4×10^6	p.r.; C.k.; cor. for presence of $HC_2O_4^-$; pK_a = 1.25, 4.28; rel. to $k(\cdot OH + SCN^-)$.	710041
1033	**Oxytetracycline, conjugate acid**				
	$\cdot OH + OXTCH^+ \rightarrow$	~1	1.1×10^9	γ-r.; C.k. in argon-satd. soln. contg. 5×10^{-4} - 10^{-2} mol L^{-1} Cl^-; rel. to $k(\cdot OH + Cl^-)$.	82G036
1034	**Pantothenate ion**				
	$\cdot OH + PaCO_2^- \rightarrow$ H abstr.	6.6	4.5×10^9	p.r.; C.k.; rel. to $k(\cdot OH + SCN^-)$.	771034
1035	**Penicillamine, conjugate acid**				
	$\cdot OH + PenSH_2^+ \rightarrow PenS\cdot + H_2O$	1	7.0×10^9	Fenton; esr; C.k. with H_2O_2; rel. to $k(\cdot OH$ + 5-MeU).	69D278
1036	**Penicillamine disulfide, conjugate diacid**				
	$\cdot OH + [SC(CH_3)_2CH(NH_3^+)CO_2H]_2 \rightarrow$	1	9.6×10^9	Fenton; esr; C.k. with H_2O_2; rel. to $k(\cdot OH$ + 5-MeU).	69D278
1037	**1,4-Pentadien-3-ol**				
	$\cdot OH + CH_2{=}CHCHOHCH{=}CH_2 \rightarrow$ addn.	7.0	1.0×10^{10}	p.r.; P.b.k.; 25% H abstr.	731070
1038	**Pentaerythritol**				
	$\cdot OH + C(CH_2OH)_4 \rightarrow H_2O +$ $\cdot CHOHC(CH_2OH)_3$	9	3.3×10^9	γ-r.; C.k. with RNO; rel. to $k(\cdot OH$ + EtOH).	660423
1039	**Pentafluorobenzene**				
	$\cdot OH + C_6HF_5 \rightarrow HOC_6HF_5$		7×10^9	p.r.; C.k.; rel. to $k(\cdot OH + SCN^-)$.	730054
1040	**Pentamethylbenzene**				
	$\cdot OH + C_6H(CH_3)_5 \rightarrow HOC_6H(CH_3)_5$	~7	7.5×10^9	p.r.; P.b.k. at 332 nm in unbuffered soln.; 34% H abstr.	751009
1041	**Pentane**				
	$\cdot OH + CH_3(CH_2)_3CH_3 \rightarrow$	2	5.4×10^9	Fenton; rel. to $k(\cdot OH$ + Ethane).	81M420

TABLE 8. Rate constants for reactions of hydroxyl radicals in aqueous solution—Continued

No.	Reaction	pH	k (L mol^{-1} s^{-1})	Comment	Ref.
1042	**1,5-Pentanediol**				
	$\cdot OH + HO(CH_2)_5OH \rightarrow$	9	3.6×10^9	γ-r.; C.k. with RNO; rel. to $k(\cdot OH + EtOH)$.	660423
1043	**2,4-Pentanedione**				
	$\cdot OH + CH_3COCH_2COCH_3 \rightarrow H_3CCOC\dot{H}OHCOHCH_3 + H_3CCOCHC(OH)_2CH_3$	6.4	9.9×10^9	p.r.; P.b.k. in soln. contg. *tert*-BuOH; product anal. by condy. and esr and reaction with $C(NO_2)_4$; rel. to $k(\cdot OH + tert\text{-BuOH})$.	82A102
1044	**2,4-Pentanedione, conjugate base**				
	$\cdot OH + CH_3C(O^-)=CHCOCH_3 \rightarrow CH_3C(O^-)CHOHCOCH_3 + CH_3C(O^-)OHCHCOCH_3 + H_2O$	≥10	7.4×10^9	p.r.; P.b.k. at 294 nm.	82A102
1045	**Pentanoate ion**				
	$\cdot OH + CH_3(CH_2)_3CO_2^- \rightarrow$	9	2.9×10^9	γ-r.; C.k. with RNO; rel. to $k(\cdot OH + EtOH)$.	660423
1046	**1-Pentanol**				
	$\cdot OH + CH_3(CH_2)_4OH \rightarrow$		*3.9×10^9*	Average of 2 values.	
			3.7×10^9	p.r., C.k.; rel. to $k(\cdot OH + SCN^-)$.	731077
			4.0×10^9	p.r.; C.k.; rel. to $k(\cdot OH + Fe(CN)_6^{4-})$.	731077
1047	**3-Pentanol**				
	$\cdot OH + C_2H_5CH(OH)C_2H_5 \rightarrow$	1.7 1.8	2.1×10^9	Fenton; C.k. with cycloheptanol; rel. to $k(\cdot OH + 2\text{-PrOH})$.	740006
1048	**2-Pentanone**				
	$\cdot OH + CH_3CH_2CH_2COCH_3 \rightarrow$	6-7	1.9×10^9	p.r.; C.k.; rel. to $k(\cdot OH + SCN^-)$.	650387
1049	**3-Pentanone**				
	$\cdot OH + C_2H_5COC_2H_5 \rightarrow$	6-7	1.4×10^9	p.r.; C.k.; rel. to $k(\cdot OH + SCN^-)$.	650387
1050	**1,10-Phenanthroline**				
	$\cdot OH + phen \rightarrow phenOH$		*8.9×10^9*	Average of 4 values.	
		7	7.0×10^9	p.r.; P.b.k. at 440 nm.	80A115
		7-11	8.4×10^9	p.r.; P.b.k.	79A352
		6.7	9.3×10^9	p.r.; C.k.; rel. to $k(\cdot OH + HCO_2^-)$.	78A207
		6	8.6×10^9	p.r.; P.b.k. at 425 nm.	761091
1051	**1,10-Phenanthroline, conjugate acid**				
	$\cdot OH + phenH^+ \rightarrow HOphenH^+$	3	5.9×10^9	p.r.; P.b.k.; $pK_a = -1.4, 4.6$.	79A352
1052	**Phenethyl alcohol**				
	$\cdot OH + C_6H_5CH_2CH_2OH \rightarrow$		*6.4×10^9*	Average of 2 values.	
			5.8×10^9	p.r.; C.k.; rel. to $k(\cdot OH + Fe(CN)_6^{4-})$.	731077
			7.0×10^9	p.r.; C.k.; rel. to $k(\cdot OH + SCN^-)$.	731077
1053	**Phenethylammonium ion**				
	$\cdot OH + C_6H_5CH_2CH_2NH_3^+ \rightarrow$	4	9.8×10^9	p.r.; C.k.; rel. to $k(\cdot OH + SCN^-)$.	700371
1054	**Phenol**				
	$\cdot OH + C_6H_5OH \rightarrow C_6H_5(OH)_2$	7	6.6×10^9 [b]	p.r.; P.b.k. in soln. contg. phenol. $k_{addn} = 4.5 \times 10^9$, $k_{abstr} = 2.1 \times 10^9$.	82A169
		7.4-7.7	1.4×10^{10} [b]	p.r.; P.b.k. at 330 nm; $pK_a = 9.89$.	670122
		6-7	1.8×10^{10} [b]	p.r.; C.k.; rel. to $k(\cdot OH + SCN^-)$.	650387
1055	**Phenoxide ion**				
	$\cdot OH + C_6H_5O^- \rightarrow HOC_6H_5O^-$	10.7	9.6×10^9	γ-r.; C.k.; measured $^{14}CO_2$; rel. to $k(\cdot OH + BzO^-)$.	650099
1056	**4-Phenoxybenzoate ion**				
	$\cdot OH + 4\text{-}C_6H_5OC_6H_4CO_2^- \rightarrow HO(C_6H_5OC_6H_4CO_2^-)$		7.0×10^9	p.r.; P.b.k.	751001
1057	**Phenylacetate ion (PA^-)**				
	$\cdot OH + C_6H_5CH_2CO_2^- \rightarrow HOC_6H_5CH_2CO_2^-$	6-8	7.9×10^9	p.r.; P.b.k. at 325 nm, cor. for (OH + OH) and (H + aromatic).	680304

TABLE 8. Rate constants for reactions of hydroxyl radicals in aqueous solution—Continued

No. Reaction	pH	k (L mol^{-1} s^{-1})	Comment	Ref.
1058 Phenylalanine				
·OH + Phe → PheOH		*6.5 × 10^9*	Average of 5 values.	
	7-8	6.9 × 10^9	p.r.; P.b.k.; 50% ortho-adduct, 30% para-adduct, 14% meta-adduct	85A183
	5.8	6.6 × 10^9	p.r.; P.b.k. at 318 nm.	761202
	nat.	6.8 × 10^9	p.r.; C.k.; rel. to k(·OH + Fe(CN)$_6^{4-}$).	710578
	nat.	6.6 × 10^9	p.r.; P.b.k. at 300 nm.	710578
	5.5-6	5.8 × 10^9	p.r.; C.k.; pK_a = 2.16, 9.18; at pH 2-2.2 k = 5.7 × 10^9; rel. to k(·OH + SCN$^-$).	650388
1059 Phenylalanine, negative ion				
·OH + Phe$^-$ →	10.6	9.0 × 10^9	p.r.; C.k.; rel. to k(·OH + CO_3^{2-}).	680062
1060 1-Phenyl-3-butanol				
·OH + $C_6H_5CH_2CH_2CH(OH)CH_3$ →	1.7-1.8	2 × 10^{10}	Fenton; C.k. with 1-phenylethanol; rel. to k(·OH + 2-PrOH).	749006
1061 Phenyl-*N*-*tert*-butylnitrone				
·OH + PBN → PBN(OH)		*7.3 × 10^9*	Average of 2 values.	
		6.1 × 10^9	p.r.; P.b.k.	83A388
		8.5 × 10^9	p.r.; C.k.; rel. to k(·OH + SCN$^-$).	82A184
1062 1-Phenylethanol				
·OH + $C_6H_5CHOHCH_3$ →	1.7-1.8	1.1 × 10^{10}	Fenton; C.k. with cycloheptanol; rel. to k(·OH + 2-PrOH).	749006
1063 1-Phenylethanol-1-*d*				
·OH + $C_6H_5DCOHCH_3$ →	1.7-1.8	1.1 × 10^{10}	Fenton; C.k. with 1-(*p*-bromophenyl)ethanol; rel. to k(·OH + 2-PrOH).	749006
1064 2-Phenylfuran				
·OH + -OC(C_6H_5)=CHCH=CH- →	9	1.6 × 10^{10}	γ-r.; C.k.; method of [650356]; rel. to k(·OH + RNO).	83A335
1065 5-Phenylfurfural				
·OH + -OC(C_6H_5)=CHCH=C(CHO)- →	9	5.9 × 10^9	γ-r.; C.k.; method of [650356]; rel. to k(·OH + RNO).	83A335
1066 Phenyl-β-D-glucopyranoside				
·OH + $GluOC_6H_5$ → $GluC_6H_5OH$		*5.1 × 10^9*	Average of 2 values.	
	6.8	4.4 × 10^9	p.r.; P.b.k. at 320 nm.	710055
		5.8 × 10^9	p.r.; C.k.; rel. to k(·OH + SCN$^-$).	710055
1067 *N*-Phenylhydroxylamine				
·OH + C_6H_5NHOH → HOC_6H_5NHOH	3.7-11.5	1.5 × 10^{10}	p.r.; P.b.k. at 290 nm.	670191
1068 Phenylphosphate ion				
·OH + $C_6H_5OPO_3^{2-}$ → $HOC_6H_5OPO_3^{2-}$	1-10	5.4 × 10^9	p.r.; C.k.; rel. to k(·OH + SCN$^-$).	79A055
1069 1-Phenyl-1-propanol				
·OH + $C_2H_5CH(C_6H_5)OH$ →	1.7-1.8	1.0 × 10^{10}	Fenton; C.k. with 1-phenylethanol; rel. to k(·OH + 2-PrOH).	749006
1070 1-Phenyl-2-propanol				
·OH + $C_6H_5CH_2CH(OH)CH_3$ →	1.7-1.8	2.1 × 10^{10}	Fenton; C.k. with 1-phenylethanol; rel. to k(·OH + 2-PrOH).	749006
1071 2-Phenyl-2-propanol				
·OH + $C_6H_5COH(CH_3)_2$ →	1.7-1.8	4.6 × 10^9	Fenton; C.k. with cycloheptanol; rel. to k(·OH + 2-PrOH).	749006
1072 Phosphatidic acid				
·OH + $(HO)_2POCH_2CH(O_2CR)CH_2O_2CR$ →		6.0 × 10^8	p.r.; C.k. with SCN$^-$; fatty acid diesters of glycerophosphoric acid.	78A096

TABLE 8. Rate constants for reactions of hydroxyl radicals in aqueous solution—Continued

No.	Reaction	pH	k (L mol^{-1} s^{-1})	Comment	Ref.
1073	**Phosphoenolpyruvate ion**				
	$\cdot OH + CH_2{=}C(CO_2^-)OPO(O^-)_2 \rightarrow$	~7	8.9×10^9	γ-r.; C.k.; obs. G(inorg. phosphate); 8.4% oxidative dephosphorylation; rel. to k(·OH + *tert*-BuOH).	753070
1074	**Phosphorylcholine**				
	$\cdot OH + (CH_3)_3N^+CH_2CH_2OPO_3H_2 \rightarrow$		6.4×10^8	p.r.; C.k. with SCN^-.	78A096
1075	**Phosphorylethanolamine**				
	$\cdot OH + H_3N^+CH_2CH_2OPO_3^{2-} \rightarrow$	~7	9.0×10^8	γ-r.; C.k.; obs. G(inorg. phosphate); 28.5% oxidative dephosphorylation; rel. to k(·OH + *tert*-BuOH).	753070
1076	**Phosphoserine**				
	$\cdot OH + {}^-O_3POCH_2CH(NH_3^+)CO_2^- \rightarrow$		*2.0 × 10^9*	Average of 2 values.	
		~7	2.0×10^9	γ-r.; C.k.; obs. G(inorg. phosphate); 28.7% oxidative dephosphorylation; rel. to k(·OH + *tert*-BuOH).	753070
		3,5,8	2×10^9	γ-r.; C.k. obs. G(phosphate); rel. to k(·OH + MeOH).	723148
1077	**Phthalate ion**				
	$\cdot OH + 1,2\text{-}C_6H_4(CO_2^-)_2 \rightarrow$	9.2	5.9×10^9	p.r.; P.b.k. at 330 nm.	730110
1078	***p*-Phthalate ion**				
	$\cdot OH + 1,4\text{-}C_6H_4(CO_2^-)_2 \rightarrow$	9	3.3×10^9	γ-r.; C.k. with RNO; rel. to k(·OH + EtOH).	660441
1079	**Pimelic acid**				
	$\cdot OH + HO_2C(CH_2)_5CO_2H \rightarrow$	2-2.2	3.5×10^9	γ-r.; C.k.; rel. to k(·OH + 5-MeU).	670461
1080	**Pinacol**				
	$\cdot OH + HOC(CH_3)_2C(CH_3)_2OH \rightarrow$	9	5.5×10^8	γ-r.; C.k. with RNO; rel. to k(·OH + EtOH).	660423
1081	**Polyoxyethylene(15) *p*-nonylphenyl ether**				
	$\cdot OH + C_9H_{19}C_6H_4(OCH_2CH_2)_{15}OH \rightarrow$		1×10^{10}	p.r.; C.k.; concn. $< 10^{-4}$ mol L^{-1} (CMC); at higher concn. k decreases; rel. to k(·OH + SCN^-).	710001 710586
1082	**Proline**				
	$\cdot OH$ + Pro →		*4.8 × 10^8*	Average of 2 values.	
		6.9	3.1×10^8	X-r.; C.k. obs. decrease in emission from acriflavin vs. scavenger concn.; rel. to k(·OH + MeOH).	766558
		6.8	6.5×10^8	γ-r.; C.k.; rel. to k(·OH + RNO).	730548
1083	**Proline, conjugate acid**				
	$\cdot OH + ProH^+ \rightarrow$		*3.5 × 10^8*	Average of 2 values.	
		2	3.3×10^8	X-r.; C.k. obs. decrease in emission from acriflavin vs. scavenger concn.; rel. to k(·OH + MeOH).	766558
		2-2.2	3.6×10^8	γ-r.; C.k.; $pK_a = 1.99, 10.60$; rel. to k(·OH + 5-MeU).	650388
1084	**Promazine, conjugate acid**				
	$\cdot OH + PzH^+ \rightarrow OH^- + [PzH]^{\cdot 2+}$	5.5	3.7×10^9	p.r.; P.b.k.; reaction also involves OH addn. to S which leads to cation radical, addn. to ring and H abstr.	79A060
1085	**Promethazine, conjugate acid**				
	$\cdot OH + PZH^+ \rightarrow PZH^{\cdot 2+}$		*9.2 × 10^9*	Average of 3 values.	
		3.5	9.7×10^9	p.r.; P.b.k. at 505 nm; 29% of the OH reacts to give the radical cation, the remainder may add or abstract H.	83A272
			8.0×10^9	p.r.	83A392
		7	1.0×10^{10}	p.r.; Unpubl. data.	741181

TABLE 8. Rate constants for reactions of hydroxyl radicals in aqueous solution—Continued

No.	Reaction	pH	k (L mol^{-1} s^{-1})	Comment	Ref.
1086	**Propane**				
	$\cdot OH + C_3H_8 \rightarrow$	2	3.6×10^9	Fenton; rel. to $k(\cdot OH + Ethane)$.	81M420
1087	**1,2-Propanediol**				
	$\cdot OH + CH_3CH(OH)CH_2OH \rightarrow$	7	1.7×10^9	p.r.; C.k.; rel. to $k(\cdot OH + SCN^-)$.	650387
1088	**1,3-Propanediol**				
	$\cdot OH + HO(CH_2)_3OH \rightarrow$	9	2.5×10^9	γ-r.; C.k. with RNO; rel. to $k(\cdot OH + EtOH)$.	660423
1089	**1-Propanol**				
	$\cdot OH + CH_3CH_2CH_2OH \rightarrow H_2O +$ $CH_3CH_2\dot{C}HOH$ (53.4%) + $\cdot CH_2CH_2CH_2OH + CH_3\dot{C}HCH_2OH$ (46%) [730126]		*2.8 × 10⁹*	Average of 3 values.	
		nat.	3.0×10^9	p.r.; C.k.; rel. to $k(\cdot OH + Fe(CN)_6^{4-})$.	710578
		10.7	2.9×10^9	p.r.; C.k.; rel. to $k(\cdot OH + CO_3^{2-})$.	650190 650387
		7	2.5×10^9	p.r.; C.k.; rel. to $k(\cdot OH + SCN^-)$.	650387
1090	**2-Propanol**				
	$\cdot OH + (CH_3)_2CHOH \rightarrow H_2O +$ $(CH_3)_2\dot{C}OH$ (85.5%) + $(CH_3)_2CHO\cdot$ (1.2%) + $\cdot CH_2CHOHCH_3$ (13.3%) [730126]		**1.9×10^9**	**Selected value.**	
			2.3×10^9	p.r.; C.k.; also measurements at 39, 59, and 79°C; rel. to $k(\cdot OH + SCN^-)$.	84A349
		6	1.9×10^9	p.r.; C.k.; obs. $ABTS^{\cdot+}$ formn. at 415 nm; rel. to $k(\cdot OH + ABTS)$.	82A196
		nat.	2.3×10^9	p.r.; C.k.; rel. to $k(\cdot OH + Fe(CN)_6^{4-})$.	710578
		2-10	1.9×10^9	p.r.; C.k.; rel. to $k(\cdot OH + SCN^-)$.	680316
		7	1.9×10^9	p.r.; C.k.; rel. to $k(\cdot OH + I^-)$.	650010 670041
1091	**Propionamide**				
	$\cdot OH + C_2H_5CONH_2 \rightarrow$	5-6	7.0×10^8	p.r.; C.k.; 45% $CH_3\dot{C}HCONH_2$ formed; anal. of transient spectra; rel. to $k(\cdot OH + SCN^-)$.	710414 710645
1092	**Propionate ion**				
	$\cdot OH + CH_3CH_2CO_2^- \rightarrow$	9	8.2×10^8	γ-r.; C.k. with RNO; rel. to $k(\cdot OH + EtOH)$.	660423
1093	**Propionic acid**				
	$\cdot OH + C_2H_5CO_2H \rightarrow$	2-2.2	6.2×10^8 [b]	γ-r.; C.k.; rel. to $k(\cdot OH + 5\text{-MeU})$.	670461
		1	2.9×10^8 [b]	Fenton; C.k.; rel. to $k(\cdot OH + Fe^{2+})$.	490002
1094	**Propionitrile**				
	$\cdot OH + C_2H_5CN \rightarrow$		9.3×10^7	γ-r.; C.k.; obs. $G(CO_2)$; rel. to $k(\cdot OH + HCO_2^-)$.	730364
1095	***n*-Propyl acetate**				
	$\cdot OH + CH_3CO_2CH_2CH_2CH_3 \rightarrow$	6-7	1.4×10^9	p.r.; C.k.; rel. to $k(\cdot OH + SCN^-)$.	650387
1096	**Propylamine**				
	$\cdot OH + CH_3CH_2CH_2NH_2 \rightarrow$		*6.6 × 10⁹*	Average of 2 values.	
			7.3×10^9	p.r.; C.k.; calcd. from values obs. at pH 8-13.1; rel. to $k(\cdot OH + SCN^-)$.	730016
			5.8×10^9	p.r.; C.k.; rel. to $k(\cdot OH + NB)$.	730016
1097	**Propylammonium ion**				
	$\cdot OH + CH_3(CH_2)_2NH_3^+ \rightarrow$		*1.0 × 10⁹*	Average of 3 values.	
			8.2×10^8	p.r.; C.k.; calcd. from values obs. at pH 8-13.1; rel. to $k(\cdot OH + NB)$.	730016
			1.4×10^9	p.r.; C.k.; calcd. from values obs. at pH 8-13.1; rel. to $k(\cdot OH + SCN^-)$.	730016
		4	7.5×10^8	p.r.; C.k., at pH 2 $k = 7.5 \times 10^8$; rel. to $k(\cdot OH + SCN^-)$.	700371

TABLE 8. Rate constants for reactions of hydroxyl radicals in aqueous solution—Continued

No.	Reaction	pH	k (L mol^{-1} s^{-1})	Comment	Ref.
1098	**Propylene**				
	$\cdot OH + CH_3CH{=}CH_2 \rightarrow$		7.0×10^9	p.r.; C.k.; rel. to $k(\cdot OH + I^-)$.	670041
1099	**Propyl 3,4,5-trihydroxybenzoate**				
	$\cdot OH + (HO)_3C_6H_2CO_2C_3H_7 \rightarrow$		*1.1×10^{10}*	Average of 2 values.	
			1.1×10^{10}	p.r.	83A392
		6.5	1.2×10^{10}	γ-r.; C.k.; rel. to $k(\cdot OH + RNO)$.	690580
1100	**Protoporphyrin IX, dimethyl ester**				
	$\cdot OH + C_{36}H_{38}N_4O_4 \rightarrow$		*6.0×10^{10}*	Average of 2 values.	
			6.0×10^{10}	γ-r.; C.k. in air-satd. 2*N* H_2SO_4 soln. contg. 1.5×10^{-3} mol L^{-1} *tert*-BuOH; rel. to $k(\cdot OH +$ *tert*-BuOH).	80A392
			6.1×10^{10}	γ-r.; C.k. in air-satd. 2*N* H_2SO_4 soln. contg. 10^{-4} mol L^{-1} thymine; rel. to $k(\cdot OH + 5\text{-MeU})$.	80A392
1101	**Purine**				
	$\cdot OH + C_5H_4N_4 \rightarrow$	6-7	3.0×10^8	γ-r.; C.k.; rel. to $k(\cdot OH + RNO)$.	750294
1102	**Pyrenebutyrate ion**				
	$\cdot OH + C_{20}H_{17}O_2 \rightarrow$		1.3×10^{10}	p.r.; P.b.k.	78A096
1103	**Pyridine**				
	$\cdot OH + py \rightarrow pyOH$		*3.1×10^9*	Average of 3 values.	
		5.9	4.5×10^9	p.r.; P.b.k.; also c.k. with SCN^-.	76A265
		7.0	1.8×10^9	p.r.; P.b.k.	710582
		7	3.0×10^9	p.r.; C.k.; product detn. includes pyN-OH; rel. to $k(\cdot OH + SCN^-)$.	670251
1104	**Pyridine-d_5**				
	$\cdot OH + C_5D_5N \rightarrow HOC_5D_5N$	7	2.7×10^9	p.r.; C.k.; rel. to $k(\cdot OH + SCN^-)$.	670251
1105	**Pyridinium ion**				
	$\cdot OH + pyH^+ \rightarrow HOpyH^+$		*2.7×10^7*	Average of 2 values.	
		2.0	2×10^7	p.r.; P.b.k.	710582
		1-2	3×10^7	p.r.; C.k.; rel. to $k(\cdot OH + SCN^-)$.	670251
1106	**Pyridinium ion-d_5**				
	$\cdot OH + C_5D_5NH^+ \rightarrow HOC_5D_5NH^+$	1-2	3.6×10^7	p.r.; C.k.; product detd.; rel. to $k(\cdot OH + SCN^-)$.	670251
1107	**Pyridine-*N*-oxide**				
	$\cdot OH + C_5H_5NO \rightarrow HOC_5H_5NO$	7	3.0×10^9	p.r.; P.b.k.	80A048
1108	**2-Pyridinealdoxime *N*-methyl**				
	$\cdot OH + HON{=}CHC_5H_4N^+CH_3 \rightarrow$	6.5	2.2×10^{10}	p.r.; C.k.; counter ion Cl^-; addn. to ring and to oxime; rel. to $k(\cdot OH + SCN^-)$.	81A417
1109	**4-Pyridinecarboxamide (Isonicotinamide)**				
	$\cdot OH + 4\text{-}pyCONH_2 \rightarrow isnOH$	5.9	1.6×10^9	p.r.; P.b.k.; also c.k. with SCN^-.	76A265
1110	**4-Pyridinecarboxamide, conjugate acid**				
	$\cdot OH + 4\text{-}pyH^+CONH_2 \rightarrow$ $4\text{-}pyH^+(OH)CONH_2$	1	8.0×10^7	p.r.; P.b.k. in Ar-satd. soln.	76A265
1111	**2-Pyridinecarboxylate ion**				
	$\cdot OH + 2\text{-}pyCO_2^- \rightarrow$	9	1.6×10^9	γ-r.; C.k.; rel. to $k(\cdot OH + RNO)$.	690280
1112	**4-Pyridinecarboxylate ion (Isonicotinate ion)**				
	$\cdot OH + 4\text{-}pyCO_2^- \rightarrow$	9	2.6×10^9	γ-r.; C.k.; rel. to $k(\cdot OH + RNO)$.	690280
1113	**4-Pyridinecarboxylate ion, *N*-oxide**				
	$\cdot OH + py(O)CO_2^- \rightarrow HOpy(O)CO_2^-$	7	2.0×10^9	p.r.; P.b.k.	80A048
1114	**3-Pyridinol**				
	$\cdot OH + 3\text{-}(OH)C_5H_4N \rightarrow (OH)_2C_5H_4N$		*6.1×10^9*	Average of 2 values.	
		6.5	6.8×10^9	γ-r.; C.k.; rel. to $k(\cdot OH + RNO)$.	690580

TABLE 8. Rate constants for reactions of hydroxyl radicals in aqueous solution—Continued

No.	Reaction	pH	k (L mol^{-1} s^{-1})	Comment	Ref.
1114	**3-Pyridinol**—Continued				
		9	5.4×10^9	γ-r.; C.k.; rel. to k(·OH + RNO).	090280
1115	**2-Pyridone**				
	·OH + C_5H_5NO → addn.	6-7	6.5×10^9	p.r.; C.k.; rel. to k(·OH + SCN^-).	79A219
1116	**4-Pyridone**				
	·OH + C_5H_5NO → $C_5H_6NO_2$	6-7	5.3×10^9	p.r.; C.k.; rel. to k(·OH + SCN^-).	79A219
1117	**Pyridoxal 5-phosphate**				
	·OH + PPH → PP· + H_2O	~7	6.8×10^9	γ-r.; C.k.; obs. G(inorg. phosphate); 42.0% oxidative dephosphorylation; rel. to k(·OH + *tert*-BuOH).	753070
1118	**Pyridoxamine-5-phosphate**				
	·OH + PXPH → PXP· + H_2O	~7	6.9×10^9	γ-r.; C.k.; obs. G(inorg. phosphate); 9.80% oxidative dephosphorylation; rel. to k(·OH + *tert*-BuOH).	753070
1119	**Pyridoxine**				
	·OH + PH → P· + H_2O	7.2	6.3×10^9	p.r.; P.b.k.; at pH 3.6 and 10.5 k = 4.3 and 7.4 $\times 10^9$, resp.	751024
1120	**α-(2-Pyridyl)-*tert*-butyl nitrone**				
	·OH + 2-PyBN → addn.		9.6×10^9	p.r.; P.b.k.	83A388
1121	**α-(3-Pyridyl)-*tert*-butyl nitrone**				
	·OH + 3-PyBN → addn.		4.6×10^9	p.r.; P.b.k.	83A388
1122	**α-(4-Pyridyl)-*tert*-butyl nitrone**				
	·OH + 4-PyBN → addn.		8.3×10^9	p.r.; P.b.k.	83A388
1123	**α-(2-Pyridyl 1-oxide)-*N*-*tert*-butylnitrone**				
	·OH + 2-POBN → addn.	7	3.2×10^9	p.r.; P.b.k.; ~60% addn. to ring, ~40% addn. to side chain.	80A048
1124	**α-(3-Pyridyl 1-oxide)-*N*-*tert*-butylnitrone**				
	·OH + 3-POBN → addn.		*4.6* × *10*^{9}	Average of 2 values.	
			4.5×10^9	p.r.; P.b.k.	83A388
		7	4.8×10^9	p.r.; P.b.k.; ~60% addn. to ring, ~40% addn. to side chain.	80A048
1125	**α-(4-Pyridyl 1-oxide)-*N*-*tert*-butylnitrone**				
	·OH + 4-POBN → addn.		*3.8* × *10*^{9}	Average of 2 values.	
			4.0×10^9	p.r.; P.b.k.	83A388
		7	3.5×10^9	p.r.; P.b.k.; ~60% addn. to ring, ~40% addn. to side chain.	80A048
1126	**Pyrimidine**				
	·OH + $C_4H_4N_2$ →	6-7	1.6×10^8	γ-r.; C.k.; rel. to k(·OH + RNO).	750294
1127	**Pyrrole**				
	·OH + C_4H_5N → C_4H_6NO		1.5×10^{10}	p.r.; P.b.k. at 300 nm.	710360
1128	**Pyrrolidinium ion**				
	·OH + $-NH_2^+(CH_2)_4-$ →		*5.0* × *10*^{9}	Average of 2 values.	
		6.2	5.7×10^9	p.r.; C.k.; rel. to k(·OH + SCN^-).	751016
		6	4.2×10^9	p.r.; C.k.; pK_a = 11.27; at pH 2 $k = 3.7 \times 10^9$; rel. to k(·OH + SCN^-).	700006
1129	**2-Pyrrolidinone**				
	·OH + C_4H_7NO →		*2.2* × *10*^{9}	Average of 2 values.	
			2.2×10^9	p.r.; C.k.; rel. to k(·OH + SCN^-).	81A296
			2.1×10^9	p.r.; P.b.k. at 350 nm.	81A296
1130	**Pyruvate ion**				
	·OH + $CH_3COCO_2^-$ →	9	3.1×10^7	γ-r.; C.k.; based on k(·OH + RNO) = k(·OH + $Fe(CN)_6^{4-}$); rel. to k(·OH + RNO).	670555

TABLE 8. Rate constants for reactions of hydroxyl radicals in aqueous solution—Continued

No. Reaction	pH	k (L mol^{-1} s^{-1})	Comment	Ref.
1131 Resorcinol				
•OH + 1,3-$C_6H_4(OH)_2$ →	9	1.2×10^{10}	γ-r.; C.k.; pK_a = 9.3, 11; rel. to k(•OH + RNO).	72G837
1132 Rhodamine B				
•OH + Rh B →		2.5×10^{10} [b]	p.r.; C.k.; rel. to k(•OH + *tert*-BuOH).	82A347
		$\sim 9 \times 10^{9}$ [b]	p.r.; D.k. at 530 nm as well as p.b.k. at 460 nm.	670239
1133 Rhodamine 6G				
•OH + Rh 6G →	7	1.1×10^{10}	p.r.; C.k. in soln. contg. *tert*-BuOH; product ϵ_{410} = 9800 and ϵ_{610} = 1900 L mol^{-1} cm^{-1} probably OH adduct + semiquinone; rel. to k(•OH + *tert*-BuOH).	81A311
1134 Riboflavin				
•OH + RF →	1-11	1.2×10^{10}	γ-r.; C.k. in air-satd. soln.; obs. G(-RF); rel. to k(•OH + EtOH).	82A326
1135 Ribose				
•OH + $C_5H_{10}O_5$ → R + H_2O		*1.5* × *10^9*	Average of 5 values.	
	8.4	2.1×10^{9}	p.r.; No details; N_2O-satd. soln. contg. 5×10^{-3} mol L^{-1} borate buffer.	82A193
	7	1.6×10^{9}	p.r.; C.k.; rel. to k(•OH + SCN$^-$).	79A366
	7	1.6×10^{9}	p.r.; C.k.; rel. to k(•OH + SCN$^-$).	731071
		1.2×10^{9}	p.r.; C.k.; rel. to k(•OH + SCN$^-$).	731077
		1.1×10^{9}	p.r.; C.k.; rel. to k(•OH + $Fe(CN)_6^{4-}$).	731077
1136 Ribose-5-phosphate				
•OH + $C_5H_9O_8P$ → $C_5H_8O_8P$ + H_2O	7	1.3×10^{9}	p.r.; C.k.; rel. to k(•OH + SCN$^-$).	731071
1137 Safranine T				
•OH + ST → ST(OH)	3-5.5	9.3×10^{9}	γ-r.; C.k.; OH addn.; rel to k(•OH + PhH).	690279
1138 Safranine T, conjugate acid				
•OH + STH^+ → $ST(OH)H^+$	0.4	3.4×10^{10}	γ-r.; C.k.; rel. to k(•OH + PhH).	690279
1139 Salicylaldehyde, conjugate base				
•OH + 2-(O^-)C_6H_4CHO →	9	8.6×10^{9}	γ-r.; C.k.; pK_a = 8.3; rel. to k(•OH + RNO).	72G837
1140 Salicylate ion				
•OH + 2-$HOC_6H_4CO_2^-$ → $(HO)_2C_6H_4CO_2^-$		*1.6* × *10^{10}*	Average of 2 values.	
	7	1.2×10^{10}	p.r.; P.b.k. at 350 nm; pK_a = 2.8, 12.9.	680305
	7	2.0×10^{10}	p.r.; C.k.; rel. to k(•OH + SCN$^-$).	680305
1141 Salicylic acid				
•OH + $HOC_6H_4CO_2H$ → $(HO)_2C_6H_4CO_2H$		*2.2* × *10^{10}*	Average of 2 values.	
	2	2.7×10^{10}	p.r.; C.k.; adduct obs. at 375 nm; cor. for H adduct; pK_a = 3, 13; rel. to k(•OH + MeOH).	680305
	2	1.7×10^{10}	p.r.; C.k.; adduct obs. at 375 nm; not linear over whole concn. range; rel. to k(•OH + EtOH).	680305
1142 Sarcosine anhydride				
•OH + SA → H_2O + -N(Me)COĊHN(Me)$COCH_2$-	5.0	2.6×10^{9}	p.r.; C.k.; same rate at pH 11; rel. to k(•OH + SCN$^-$).	710554
1143 Sebacic acid				
•OH + $HO_2C(CH_2)_8CO_2H$ →	2-2.2	6.4×10^{9}	γ-r.; C.k.; rel. to k(•OH + 5-MeU).	670461
1144 Selenodicysteine				
•OH + $(Cys)_2Se$ →	7	8.1×10^{9}	γ-r.; C.k. obs. G(−RNO); rel. to k(•OH + RNO).	80G013

TABLE 8. Rate constants for reactions of hydroxyl radicals in aqueous solution—Continued

No.	Reaction	pH	k (L mol^{-1} s^{-1})	Comment	Ref.
1145	**Selenocystine**				
	$\cdot OH + [SeCH_2CH(NH_3^+)CO_2^-]_2 \rightarrow$ CysSe$\cdot$		*1.3 × 10^{10}*	Average of 2 values.	
		7	1.7 × 10^{10}	p.r.; C.k.; rel. to $k(\cdot OH + SCN^-)$.	731010
		7	1.0 × 10^{10}	p.r.; P.b.k. at 460 nm (RSe$\cdot$).	731010
1146	**Selenomethionine**				
	$\cdot OH +$ $CH_3SeCH_2CH_2CH(NH_3^+)CO_2^- \rightarrow$ $\cdot SeCH_2CH_2CH(NH_3^+)CO_2^-$		*1.2 × 10^{10}*	Average of 2 values.	
		7	~1 × 10^{10}	p.r.; P.b.k. at 380 nm.	741092
			1.3 × 10^{10}	p.r.; C.k.; rel. to $k(\cdot OH + SCN^-)$.	741092
1147	**Selenourea**				
	$\cdot OH + H_2NCSeNH_2 \rightarrow H_2O +$ $\cdot NHCSeNH_2$		*1.2 × 10^{10}*	Average of 3 values.	
		6.5	1.3 × 10^{10}	p.r.; C.k.; obs. 410 nm abs.; rel. to $k(\cdot OH +$ MeOH).	700240
		6.5	1.2 × 10^{10}	p.r.; C.k.; obs. 410 nm abs.; rel. to $k(\cdot OH +$ EtOH).	700240
		6.5	1.2 × 10^{10}	p.r.; C.k.; obs. 550 nm abs.; rel. to $k(\cdot OH +$ SCN^-).	700240
1148	**Serine**				
	$\cdot OH +$ Ser $\rightarrow H_2O +$ $\cdot CHOHCH(NH_3^+)CO_2^-$	5.5-6	3.2 × 10^8	p.r.; C.k.; $pK_a = 2.21, 9.15$; at pH 2-2.2 $k =$ 2.5 × 10^8; rel. to $k(\cdot OH + SCN^-)$.	650388
1149	**Stachyose**				
	$\cdot OH + C_{24}H_{42}O_{21} \rightarrow$		1.1 × 10^9	p.r.; C.k.; rel. to $k(\cdot OH + SCN^-)$.	79A298
1150	**Styrene**				
	$\cdot OH + C_6H_5CH{=}CH_2 \rightarrow$ $C_6H_5\dot{C}HCH_2OH + HOC_6H_5CH{=}CH_2$	5.5	6.0 × 10^9	p.r.; P.b.k. at 320 nm (66% $C_6H_5\dot{C}HCH_2OH$); also p.b.k. at 345 nm (33% ring addn.).	741138
1151	**Suberic acid**				
	$\cdot OH + HO_2C(CH_2)_6CO_2H \rightarrow$	2-2.2	4.8 × 10^9	γ-r.; C.k.; rel. to $k(\cdot OH +$ 5-MeU).	670461
1152	**Succinic acid**				
	$\cdot OH + HO_2CCH_2CH_2CO_2H \rightarrow$ $HO_2C\dot{C}HCH_2CO_2H + H_2O$	1.5-10	3.1 × 10^8	p.r.; P.b.k. at 250-350 nm; k independent of wavelength and pH; $pK_a = 4.16; 5.61$.	85A487
1153	**Succinonitrile**				
	$\cdot OH + NCCH_2CH_2CN \rightarrow$		3.8 × 10^7	γ-r.; C.k.; obs. $G(CO_2)$; rel. to $k(\cdot OH +$ HCO_2^-)	730364
1154	**Succinyl peroxide**				
	$\cdot OH + (^-O_2CCH_2CH_2CO)_2O_2 \rightarrow$	7	8.0 × 10^7	p.r.; C.k.; rel. to $k(\cdot OH + SCN^-)$.	81A374
1155	**Sucrose**				
	$\cdot OH + C_{12}H_{22}O_{11} \rightarrow H_2O +$ $C_{12}H_{21}O_{12}$	7	2.3 × 10^9	p.r.; C.k.; rel. to $k(\cdot OH + SCN^-)$.	79A366
1156	**Sulfacetamide**				
	$\cdot OH + H_2NC_6H_4SO_2NHAc \rightarrow$		5.5 × 10^9	γ-r.; C.k. with RNO; rel. to $k(\cdot OH +$ $GlucOC_6H_5$).	710128
1157	**Sulfaguanidine**				
	$\cdot OH + H_2NC_6H_4SO_2NHC(=NH)NH_2 \rightarrow$		3.1 × 10^9	γ-r.; C.k. with RNO; rel. to $k(\cdot OH +$ 4-$H_2NC_6H_4SO_3^-$).	730094
1158	**Sulfanilamide**				
	$\cdot OH + 4\text{-}(H_2N)C_6H_4SO_2NH_2 \rightarrow$		*1.9 × 10^9*	Average of 2 values.	
		7-8	2.2 × 10^9	γ-r.; C.k.; rel. to $k(\cdot OH + Fe(CN)_6^{4-})$.	740283
			1.6 × 10^9	γ-r.; C.k. with RNO; rel. to $k(\cdot OH +$ 4-$H_2NC_6H_4SO_3^-$).	730094

TABLE 8. Rate constants for reactions of hydroxyl radicals in aqueous solution—Continued

No.	Reaction	pH	k (L mol^{-1} s^{-1})	Comment	Ref.
1159	**Sulfanilate ion**				
	$\cdot OH + 4\text{-}H_2NC_6H_4SO_3^- \rightarrow$	7	2.9×10^9	p.r.; P.b.k. at 270 nm.	730094
1160	**Sulfasuccidine**				
	$\cdot OH + C_{13}H_{13}N_3O_5S_2 \rightarrow$		4.6×10^9	γ-r.; C.k. with RNO; rel. to $k(\cdot OH + 4\text{-}H_2NC_6H_4SO_3^-)$.	730094
1161	**Sulfathiazole**				
	$\cdot OH + C_9H_9N_3O_2S_2 \rightarrow$		7.8×10^9	γ-r.; C.k. with RNO; rel. to $k(\cdot OH + 4\text{-}H_2NC_6H_4SO_3^-)$.	730094
1162	**2,2'-Sulfinyldiethanol**				
	$\cdot OH + (HOCH_2CH_2)_2SO \rightarrow (HOCH_2CH_2)_2SO(OH)$	3.0	5.3×10^9	p.r.; Condy. buildup; ($\rightarrow R + RSO_2^-/H^+$); 65% sulfinic acid formn.	80A014
1163	**Tartaric acid**				
	$\cdot OH + (CHOHCO_2H)_2 \rightarrow$	2-2.2	7.0×10^8	γ-r.; C.k.; rel. to $k(\cdot OH + 5\text{-MeU})$.	670461
1164	**Tartrate ion**				
	$\cdot OH + (CHOHCO_2^-)_2 \rightarrow$	0	6.8×10^8	γ-r.; C.k.; based on $k(\cdot OH + RNO) = k(\cdot OH + Fe(CN)_6^{4-})$; rel. to $k(\cdot OH + RNO)$.	670555
1165	**Tetrabutylammonium ion**				
	$\cdot OH + [CH_3(CH_2)_3]_4N^+ \rightarrow$		4.9×10^9	p.r.; C.k.; ave. of values rel. to $k(\cdot OH + SCN^-) = 1.1 \times 10^{10}$ and $k(\cdot OH + Fe(CN)_4^-) = 1.1 \times 10^{10}$.	80A346
1166	**Tetrabutylphosphonium ion**				
	$\cdot OH + (C_4H_9)_4P^+ \rightarrow$		1×10^7 [a]	phot.; Estd. from quantum yields in ferrous sulfate soln.; rel. to $k(\cdot OH + Fe^{2+})$.	86F244
1167	**Tetrachloroethylene**				
	$\cdot OH + Cl_2C{=}CCl_2 \rightarrow \cdot CCl_2CCl_2OH$		*2.6×10^9*	Average of 2 values.	
		~6.5	2.8×10^9	p.r.; C.k.; rel. to $k(\cdot OH + SCN^-)$.	710709
		~6.5	2.3×10^9	p.r.; P.b.k. (condy.) (Cl^-); ($CCl_2CCl_2OH \rightarrow H^+ + Cl^- + CCl_2COCl$).	710709
1168	**Tetracycline, conjugate acid**				
	$\cdot OH + TCH^+ \rightarrow$	~1	4.3×10^8	γ-r.; C.k. in argon-satd. soln. contg. 5×10^{-3} - 10^{-1} mol L^{-1} Cl^-; rel. to $k(\cdot OH + Cl^-)$.	82G036
1169	**α-Tetradecyl-ω-(sodiumsulfonato)tri(oxyethylene)**				
	$\cdot OH + C_{14}H_{29}(OC_2H_4)_3SO_3Na \rightarrow$		2.8×10^9	p.r.; C.k.; concn. 10^{-3} mol L^{-1}; $k = 8.4 \times 10^8$ in micelles (2×10^{-2} mol L^{-1}); rel. to $k(\cdot OH + SCN^-)$.	78A245
1170	**Tetraethylammonium ion**				
	$\cdot OH + (C_2H_5)_4N^+ \rightarrow$		1.3×10^8	p.r.; C.k.; ave. of values rel. to $k(\cdot OH + SCN^-) = 1.1 \times 10^{10}$ and $k(\cdot OH + Fe(CN)_4^-)$ 1.1×10^{10}	80A346
1171	**1,2,3,4-Tetrafluorobenzene**				
	$\cdot OH + C_6H_2F_4 \rightarrow HOC_6H_2F_4$		8×10^9	p.r.; C.k.; rel. to $k(\cdot OH + SCN^-)$.	730054
1172	**Tetrafluorohydroquinone**				
	$\cdot OH + C_6F_4(OH)_2 \rightarrow \cdot OC_6F_4O^-$	~10.5	3.1×10^9	p.r.; P.b.k. at 430 nm.	83B063
1173	**Tetrahydrofuran**				
	$\cdot OH + THF \rightarrow \text{-}O\dot{C}H(CH_2)_3\text{-} + H_2O$		4.0×10^9	p.r.; C.k.; rel. to $k(OH + SCN^-)$.	80A441
1174	**1,2,3,4-Tetrahydro-1-naphthol**				
	$\cdot OH + C_{10}H_{12}O \rightarrow$	1.7-1.8	7.0×10^9	Fenton; C.k. with 1-phenylpropanol; rel. to $k(\cdot OH + 2\text{-PrOH})$.	749006
1175	**Tetrahydropyran**				
	$\cdot OH + C_5H_{10}O \rightarrow$	1	1.5×10^9	Fenton; C.k.; rel. to $k(\cdot OH + Fe^{2+})$.	490002
1176	**Tetrahydrothiophene**				
	$\cdot OH + \text{-}(CH_2)_4S\text{-} \rightarrow [\text{-}(CH_2)_4S\text{-}(OH)]\cdot$		1.4×10^{10}	p.r.; P.b.k. at 280 nm; ·CHRSR and $(R_2S)_2^+$ formn. deduced by opt. and condy. studies.	751078

TABLE 8. Rate constants for reactions of hydroxyl radicals in aqueous solution—Continued

No.	Reaction	pH	k (L mol^{-1} s^{-1})	Comment	Ref.
1177	**Tetrahydroxysuccinate ion**				
	$\cdot OH + (CH(OH)CO_2^-)_2 \rightarrow$	9	1.3×10^9	γ-r.; C.k. with RNO; rel. to $k(\cdot OH + EtOH)$.	660423
1178	**1,2,4,5-Tetramethoxybenzene**				
	$\cdot OH + TMB \rightarrow TMBOH$		7×10^9	p.r.; P.b.k. in soln. contg. 10^{-5} mol L^{-1} TMB.	87A041
1179	**Tetramethylammonium ion**				
	$\cdot OH + (CH_3)_4N^+ \rightarrow \cdot CH_2N^+(CH_3)_3 + H_2O$		*7.0 × 10^6*	Average of 2 values.	
			7.4×10^6	p.r.; C.k.; rel. to $k(\cdot OH + SCN^-)$.	86A113
			6.6×10^6	p.r.; C.k.; ave. of values rel. to $k(\cdot OH + SCN^-) = 1.1 \times 10^{10}$ and $k(\cdot OH + Fe(CN)_4^-) = 1.1 \times 10^{10}$.	80A346
1180	**1,2,3,4-Tetramethylbenzene**				
	$\cdot OH + C_6H_2(CH_3)_4 \rightarrow HOC_6H_2(CH_3)_4$	~7	7.2×10^9	p.r.; P.b.k. at 333 nm in unbuffered soln.; 26% H abstr.	751009
1181	**1,2,3,5-Tetramethylbenzene**				
	$\cdot OH + C_6H_2(CH_3)_4 \rightarrow HOC_6H_2(CH_3)_4$	~7	7.1×10^9	p.r.; P.b.k. at 332 nm. in unbuffered soln.; 26% H abstr.	751009
1182	**1,2,4,5-Tetramethylbenzene**				
	$\cdot OH + C_6H_2(CH_3)_4 \rightarrow HOC_6H_2(CH_3)_4$	~7	7.0×10^9	p.r.; P.b.k. at 333 nm in unbuffered soln.; 26% H abstr.	751009
1183	**Tetramethylene sulfoxide**				
	$\cdot OH + C_4H_8OS \rightarrow C_4H_8OS(OH)$		7.0×10^9	p.r.; Condy. buildup in soln. (from adduct → RSO_2^-/H^+).	80A014
1184	***N,N,N′,N′*-Tetramethyl-*p*-phenylenediamine**				
	$\cdot OH + TMPD \rightarrow OH^- + TMPD^{\cdot +}$		$\sim 1 \times 10^{10}$	p.r.; See [751057] for spectra of intermediates TMPD-OH → $TMPD^{\cdot +}$.	81A122
1185	**2,2,6,6-Tetramethylpiperidine *N*-oxyl**				
	$\cdot OH + TEMPO \rightarrow$		3.4×10^9	p.r.; Condy.	761067
1186	**2,2,6,6-Tetramethyl-4-piperidone *N*-oxyl**				
	$\cdot OH + TAN \rightarrow$		*3.9 × 10^9*	Average of 4 values.	
		4.5, 9.2	4.0×10^9	p.r.; Condy.; may be both addn. and electron transfer.	761067
		nat.	3.4×10^9	p.r.; C.k.; cor. for H; obs. Phe abs. at 320 nm; rel. to $k(\cdot OH + Phe)$.	723021
		7	4.1×10^9	p.r.; D.k. at 230 nm.	710061
		10.5	4.1×10^9	p.r.; C.k.; cor. for CO_3^- + TAN; rel. to $k(\cdot OH + CO_3^{2-})$.	710061
1187	**1,1,3,3-Tetramethylurea**				
	$\cdot OH + (CH_3)_2NCON(CH_3)_2 \rightarrow$		$\sim 8 \times 10^9$ [a]	therm.; C.k.; Obs. ethylene generation in H_2O_2-methional, and methane generation in H_2O_2-DMSO. Rel. to $k(\cdot OH + MeOH) = 8.5 \times 10^5$, $k(\cdot OH + PhOH) = 1.4 \times 10^{10}$ as well as EtOH, BuOH, BzO^- and DMSO.	78M373
1188	**Tetraphenylphosphonium ion**				
	$\cdot OH + (C_6H_5)_4P^+ \rightarrow (C_6H_5)_3P^+(C_6H_5OH)$		7.2×10^9	p.r.; Observed abs. at 360 nm.; rel. to $k(\cdot OH$ + *tert*-BuOH).	761097
1189	**Tetrapropylammonium ion**				
	$\cdot OH + (CH_3CH_2CH_2)_4N^+ \rightarrow$		2.5×10^9	p.r.; C.k.; ave. of values rel. to $k(\cdot OH + SCN^-) = 1.1 \times 10^{10}$ and $k(\cdot OH + Fe(CN)_4^-) = 1.1 \times 10^{10}$.	80A346
1190	**Tetronate ion**				
	$\cdot OH + C_4H_3O_3^- \rightarrow$	7	9.2×10^9	p.r.; D.k. at 248 nm.	741053

TABLE 8. Rate constants for reactions of hydroxyl radicals in aqueous solution—Continued

No.	Reaction	pH	k (L mol^{-1} s^{-1})	Comment	Ref
1191	**Thalamyd**				
	$\cdot OH + {}^{-}O_2CPhCONHPhSO_2NHAc \rightarrow$		6.3×10^9	γ-r.; C.k. with RNO; rel. to $k(\cdot OH + 4\text{-}H_2NC_6H_4SO_3^-)$.	730094
1192	**Theobromine**				
	$\cdot OH + C_7H_8N_4O_2 \rightarrow$		5.8×10^9	p.r.; P.b.k.	86R158
1193	**Theophylline**				
	$\cdot OH + C_7H_8N_4O_2 \rightarrow$		6.3×10^9	p.r.; P.b.k.	86R158
1194	**Thiamine cation**				
	$\cdot OH + Thm^+ \rightarrow$	4.7	3.0×10^9	p.r.; C.k. (p.b.k. gave 3.2×10^9); rel. to $k(\cdot OH + SCN^-)$.	771034
1195	**Thiodiacetic acid**				
	$\cdot OH + S(CH_2CO_2H)_2 \rightarrow$	1	6.0×10^9	p.r.; C.k.; rel. to $k(\cdot OH + SCN^-)$.	650387
1196	**Thiophene**				
	$\cdot OH + C_4H_4S \rightarrow C_4H_4SOH$	~7	8.2×10^9 [b]	p.r.; P.b.k. at 300 nm in buffered soln.; $k = 5.8 \times 10^9$ in unbuffered soln.; at pH 10-11 $k = 4.1 \times 10^9$.	78A026
			3.3×10^9 [b]	p.r.; C.k.; rel. to $k(\cdot OH + SCN^-)$.	710360
1197	**Thiourea**				
	$\cdot OH + H_2NCSNH_2 \rightarrow$		3.9×10^9	p.r.; P.b.k. at 400 nm; some evidence of 2-step reaction. k could be 2 to 3 times larger.	81A90
1198	**Threonine**				
	$\cdot OH + Thr \rightarrow H_2O + HO\dot{C}(CH_3)CH(NH_3^+)CO_2^-$	6.6	5.1×10^8	γ-r.; C.k.; rel. to $k(\cdot OH + RNO)$.	730548
1199	**Threonine, conjugate acid**				
	$\cdot OH + CH_3CH(OH)CH(NH_3^+)CO_2H \rightarrow$	2-2.2	4.7×10^8	γ-r.; C.k.; $pK_a = 2.63, 10.43$; rel. to $k(\cdot OH +$ 5-MeU).	650388
1200	**Thymidine**				
	$\cdot OH + T \rightarrow$ T-OH		*4.6 × 10⁹*	Average of 2 values.	
		~7	4.7×10^9	p.r.; P.b.k. at 375 (pH = 7) and 400 (pH = 12.4) nm, at pH 12.4 $k = 2.1 \times 10^9$.	680312
		7.4-7.6	4.6×10^9	p.r.; C.k., at pH 2-2.2 and 5-5.2, $k = 7.7 \times 10^9$; rel. to $k(\cdot OH + SCN^-)$.	650388
1201	**Thymidine 5′-monophosphate**				
	$\cdot OH +$ TMP $\rightarrow$ TMP-OH	6.5-7.0	5.2×10^9	p.r.; C.k.; NH_4^+ salt; $pK_a = 1.6, 6.5, 10.0$; at pH 2-2.2 $k = 4.3 \times 10^9$; rel. to $k(\cdot OH + SCN^-)$.	650388
1202	**Thymine**				
	$\cdot OH +$ 5-MeU $\rightarrow$ 5-MeU-OH		**6.4×10^9**	**Selected value.**	
		6	5.5×10^9	p.r.; C.k.; obs. $ABTS^{\cdot+}$ formn. at 415 nm; rel. to $k(\cdot OH +$ ABTS).	82A196
		9	5.5×10^9	p.r.; P.b.k. at 375 nm; $pK_a = 9.9$.	720047
		nat.	5.1×10^9	p.r.; D.k. at 260 nm; soln. satd. with 50:50 N_2O-O_2 mixture.	710578
		nat.	5.3×10^9	p.r.; C.k.; rel. to $k(\cdot OH + Fe(CN)_6^{4-})$.	710578
		7	7.4×10^9	p.r.; D.k.; obs. disappearance of 5,6-double bond at 270 nm.	690571
		7	7.6×10^9	p.r.; C.k.; cor. for incomplete scavenging of e_{aq}^- by H_2O_2; rel. to $k(\cdot OH + SCN^-)$.	690571
		7	4.6×10^9	p.r.; P.b.k.; OH-adduct obs. at 385 nm.	690571
		~7	7.4×10^9	p.r.; P.b.k.; obs. transient at 400 and 550 (pH = 12.4) nm; at pH ~11 and ~12.4 $k = 3.9 \times 10^9$ and 1.1×10^9, resp.	680312
		1	5.2×10^9	p.r.; C.k.; rel. to $k(\cdot OH + SCN^-)$.	650387

TABLE 8. Rate constants for reactions of hydroxyl radicals in aqueous solution—Continued

No.	Reaction	pH	k (L mol^{-1} s^{-1})	Comment	Ref.
1202	**Thymine**—Continued				
		7.2-7.4	5.3×10^9	p.r.; C.k.; at pH 2-2.2 and 5-5.5 $k = 8.7 \times 10^9$ and 8.3×10^9, resp.; rel. to k(·OH + SCN$^-$).	650388
1203	**Tiron dianion**				
	·OH + $(HO)_2C_6H_2(SO_3)_2^{2-}$ → $(HO)_3C_6H_2(SO_3^-)_2$	~7	1×10^9	p.r.; C.k. in unbuffered soln.; rel. to k(·OH + *tert*-BuOH).	79A014
1204	***p*-Toluate ion**				
	·OH + 4-$CH_3C_6H_4CO_2^-$ → 4-$CH_3C_6H_4(OH)CO_2^-$	9	8×10^9	p.r.; P.b.k. at 340 nm.	720047
1205	**Toluene**				
	·OH + $C_6H_5CH_3$ → $C_6H_5\dot{C}H_2$ + H_2O + $HOC_6H_5CH_3$	3	3.0×10^9	p.r.; P.b.k. at 313 and 309 nm; ratio of benzyl radical formn. to addn. = 0.033 [730089]	640115
1206	**4-Toluenesulfonate ion**				
	·OH + 4-$CH_3C_6H_4SO_3^-$ →		3.7×10^9	r.; C.k.; rel. to k(·OH + RNO).	720425
1207	***m*-Toluenesulfonate ion**				
	·OH + $CH_3C_6H_4SO_3^-$ →		3.8×10^9	r.; C.k.; rel. to k(·OH + RNO).	720425
1208	***o*-Toluenesulfonate ion**				
	·OH + $CH_3C_6H_4SO_3^-$ →		3.2×10^9	r.; C.k.; rel. to k(·OH + RNO).	720425
1209	***p*-Tolunitrile**				
	·OH + $CH_3C_6H_4CN$ → $CH_3C_6H_4(OH)CN$	7	1.2×10^{10}	p.r.; P.b.k. at 355 nm; 7.5% H abstr.	79A350
1210	***m*-Tolyl-β-D-glucopyranoside**				
	·OH + $GluOC_6H_4CH_3$ →		5.4×10^9	p.r.; C.k. with SCN$^-$; rel. to k(·OH + $GlucOC_6H_5$).	710056
1211	***o*-Tolyl-β-D-glucopyranoside**				
	·OH + $GluOC_6H_4CH_3$ →		4.7×10^9	p.r.; C.k. with SCN$^-$; rel. to k(·OH + $GlucOC_6H_5$).	710056
1212	***p*-Tolyl-β-D-glucopyranoside**				
	·OH + $GluOC_6H_4CH_3$ →		3.2×10^9	p.r.; C.k. with SCN$^-$; rel. to k(·OH + $GlucOC_6H_5$).	710056
1213	**Tributylamine**				
	·OH + $[CH_3(\dot{C}H_2)_3]_3N$ → H_2O + $CH_3CH_2CH_2\dot{C}HN(C_4H_9)_2$	1.0	1.7×10^{10} [a]	Fe^{2+}-H_2O_2; C.k.; obs. polymerization of methyl methacrylate; rel. to k(·OH + $H_2C{=}C(CH_3)CO_2CH_3$).	86A305
1214	**Tributyl(methyl)ammonium ion**				
	·OH + $[CH_3(CH_2)_3]_3N^+CH_3$ →		3.7×10^9	p.r.; C.k.; ave. of values rel. to k(·OH + SCN$^-$) = 1.1×10^{10} and k(·OH + $Fe(CN)_4^-$) = 1.1×10^{10}.	80A346
1215	**Tributyl phosphate**				
	·OH + $[CH_3(CH_2)_3O]_3P(O)$ →	1.2	1.0×10^{10}	γ-r.; C.k.; k/k(·OH + HNO_3) = 77; rel. to k(·OH + EtOH).	740439
1216	**2,2,2-Trichloroethanol**				
	·OH + CCl_3CH_2OH →	<2	3.2×10^8	Fenton; rel. to k(·OH + Fe^{2+}).	759067 749002
1217	**Trichloroethylene**				
	·OH + $ClCH{=}CCl_2$ → ·$CCl_2CHClOH$		*4.2 × 10^9*	Average of 2 values.	
		~6.5	4.0×10^9	p.r.; P.b.k. (condy.) (Cl^-); ($CHClOHCCl_2$ → H^+ + Cl^- + CCl_2CHO).	710709
			4.3×10^9	p.r.; C.k.; rel. to k(·OH + SCN$^-$).	710709
1218	**2,4,6-Trichlorophenyl-β-D-glucopyranoside**				
	·OH + $GluOC_6H_2Cl_3$ →		2.2×10^9	γ-r.; C.k. with RNO; rel. to k(·OH + $GlucOC_6H_5$).	710056

TABLE 8. Rate constants for reactions of hydroxyl radicals in aqueous solution—Continued

No.	Reaction	pH	k (L mol^{-1} s^{-1})	Comment	Ref.
1219	**Triethylamine** $\cdot OH + (C_2H_5)_3N \rightarrow CH_3\dot{C}HN(C_2H_5)_2 + H_2O$		1×10^{10}	p.r.; C.k.; extrapolated value from pH study; rel. to $k(\cdot OH + SCN^-)$.	710585
1220	**Triethylammonium ion** $\cdot OH + (C_2H_5)_3NH^+ \rightarrow$	3.6	3.5×10^8	p.r.; C.k.; rel. to $k(\cdot OH + SCN^-)$.	710585
1221	**Triethyl phosphate** $\cdot OH + (C_2H_5O)_3P(O) \rightarrow$	~7	2.9×10^9	γ-r.; C.k.; obs. G(inorg. phosphate); 36.0% oxidative dephosphorylation; rel. to $k(\cdot OH +$ *tert*-BuOH).	753070
1222	**2,2,2-Trifluoroethanol** $\cdot OH + CF_3CH_2OH \rightarrow$	<2	1.8×10^8	Fenton; rel. to $k(\cdot OH + Fe^{2+})$.	759067 749002
1223	**1,2,3-Trimethoxybenzene** $\cdot OH + C_6H_3(OCH_3)_3 \rightarrow HOC_6H_3(OCH_3)_3$	6.5	8.0×10^9	p.r.; P.b.k.	751171
1224	**1,2,4-Trimethoxybenzene** $\cdot OH + C_6H_3(OCH_3)_3 \rightarrow HOC_6H_3(OCH_3)_3$	6.5	8.1×10^9	p.r.; P.b.k.	751171
1225	**1,3,5-Trimethoxybenzene** $\cdot OH + C_6H_3(OCH_3)_3 \rightarrow HOC_6H_3(OCH_3)_3$	6.5	8.1×10^9	p.r.; P.b.k.	751171
1226	**2,3,4-Trimethoxybenzoate ion** $\cdot OH + 2,3,4\text{-}(CH_3O)_3C_6H_2CO_2^- \rightarrow HOC_6H_3(OCH_3)_3$	~7	1.0×10^{10}	p.r.; C.k.; rel. to $k(\cdot OH + SCN^-)$.	771007
1227	**2,4,5-Trimethoxybenzoate ion** $\cdot OH + 2,4,5\text{-}(CH_3O)_3C_6H_2CO_2^- \rightarrow HOC_6H_2(OCH_3)_3CO_2^-$	~7	7.0×10^9	p.r.; C.k.; rel. to $k(\cdot OH + SCN^-)$.	771007
1228	**2,4,6-Trimethoxybenzoate ion** $\cdot OH + 2,4,6\text{-}(CH_3O)_3C_6H_2CO_2^- \rightarrow HOC_6H_2(OCH_3)_3CO_2^-$	~7	1.2×10^{10}	p.r.; C.k.; rel. to $k(\cdot OH + SCN^-)$.	771007
1229	**3,4,5-Trimethoxybenzoate ion** $\cdot OH + 3,4,5\text{-}(CH_3O)_3C_6H_2CO_2^- \rightarrow HOC_6H_2(OCH_3)_3CO_2^-$	~7	1.3×10^{10}	p.r.; C.k.; rel. to $k(\cdot OH + SCN^-)$.	771007
1230	**Trimethylacetamide** $\cdot OH + (CH_3)_3CCONH_2 \rightarrow$	5-6	1.5×10^9	p.r.; C.k.; rel. to $k(\cdot OH + SCN^-)$.	710414
1231	**Trimethylacetate ion** $\cdot OH + (CH_3)_3CCO_2^- \rightarrow$	9	1.5×10^9	γ-r.; C.k. with RNO; rel. to $k(\cdot OH + EtOH)$.	660423
1232	**Trimethylacetic acid** $\cdot OH + (CH_3)_3CCO_2H \rightarrow$	~2	6.5×10^8	$Fe^{3+} + H_2O_2$.; Obs. effect of solute on Fe^{3+} catalyzed decomp. of hydrogen peroxide.; rel. to $k(\cdot OH + H_2O_2)$.	769406
1233	**N^6,N^6,9-Trimethyladenine** $\cdot OH + TMA \rightarrow$	7	8.4×10^9	p.r.; P.b.k. at 400 nm; $pK_a = 4.04$.	87A231
1234	**N^6,N^6,N^6-Trimethyladeninium ion** $\cdot OH + TMA^+ \rightarrow$	5.5	1.3×10^8	p.r.; P.b.k. at 350 nm; $pK_a = 6.40$.	87A231
1235	**Trimethylamine** $\cdot OH + (CH_3)_3N \rightarrow \cdot CH_2N(CH_3)_2 + H_2O + (CH_3)_3N^{\cdot +}$	12	1.3×10^{10}	p.r.; C.k.; extrapolated value from pH study; product anal. see [86A113]; rel. to $k(\cdot OH + SCN^-)$.	710585
1236	**Trimethylammonium ion** $\cdot OH + (CH_3)_3NH^+ \rightarrow \cdot CH_2NH^+(CH_3)_2 + (CH_3)_3N^{\cdot +} + H_2O$	7.5	4.0×10^8	p.r.; C.k.; product anal. see [86A113]; rel. to $k(\cdot OH + SCN^-)$.	710585

TABLE 8. Rate constants for reactions of hydroxyl radicals in aqueous solution—Continued

No.	Reaction	pH	k (L mol^{-1} s^{-1})	Comment	Ref.
1237	**1,2,3-Trimethylbenzene**				
	$\cdot OH + C_6H_3(CH_3)_3 \rightarrow HOC_6H_3(CH_3)_3$	~7	7.0×10^9	p.r.; P.b.k. at 328 nm in unbuffered soln.; 18.5% H abstr.	751009
1238	**1,2,4-Trimethylbenzene**				
	$\cdot OH + C_6H_3(CH_3)_3 \rightarrow HOC_6H_3(CH_3)_3$	~7	6.2×10^9	p.r.; P.b.k. at 328 nm in unbuffered soln.; 18.5% H abstr.	751009
1239	**2,4,6-Trimethyl-3-hydroxypyridine**				
	$\cdot OH + C_8H_{11}NO \rightarrow$	6.5	2.5×10^9	γ-r.; C.k.; rel. to $k(\cdot OH + RNO)$.	690580
1240	**2,2,4-Trimethylpentane**				
	$\cdot OH + (CH_3)_2CHCH_2C(CH_3)_3 \rightarrow$	2	6.1×10^9	Fenton; rel. to $k(\cdot OH + Ethane)$.	81M420
1241	**2,4,5-Trimethylphenyl-β-D-glucopyranoside**				
	$\cdot OH + GluOC_6H_2(CH_3)_3 \rightarrow$		3.7×10^9	γ-r.; C.k. with RNO; rel. to $k(\cdot OH + GlucOC_6H_5)$.	710056
1242	**Trimethyl phosphate**				
	$\cdot OH + (CH_3O)_3P(O) \rightarrow \cdot CH_2OPO(OCH_3)_2 + H_2O$		1.2×10^8	p.r.; C.k.; rel. to $k(\cdot OH + SCN^-)$.	723008
1243	**2,5,5-Trimethyl-1-pyrroline *N*-oxide**				
	$\cdot OH + TMPO \rightarrow$		4.8×10^9	Fenton; rel. to $k(\cdot OH + DMPO)$.	80A176
1244	**2,4,6-Trimethyl-1,3,5-trioxane**				
	$\cdot OH + C_6H_{12}O_3 \rightarrow$		2.2×10^9	p.r.; C.k.; rel. to $k(\cdot OH + SCN^-)$.	80A441
1245	**1,3,5-Trioxane**				
	$\cdot OH + C_3H_6O_3 \rightarrow$		1.5×10^9	p.r.; C.k.; rel. to $k(\cdot OH + SCN^-)$.	80A441
1246	**Tryptophan**				
	$\cdot OH + TrpH \rightarrow HO\text{-}TrpH$		*1.3×10^{10}*	Average of 3 values.	
		6.5-8.5	1.3×10^{10}	p.r.; P.b.k.; estd. that <60% addn. to pyrrole ring, <40% addn. to benzene ring.	84A093
		8.8	1.2×10^{10}	p.r.; P.b.k. at 310 nm.	690459
		6.1-6.3	1.4×10^{10}	p.r.; C.k.; rel. to $k(\cdot OH + SCN^-)$.	650388
1247	**Tryptophan, conjugate acid**				
	$\cdot OH + TrpH_2^+ \rightarrow$	1	1.2×10^{10}	p.r.; P.b.k. at 560 nm in deaerated soln.	690459
		2-2.2	1.1×10^{10}	p.r.; C.k.; $pK_a = 2.38, 9.39$; rel. to $k(\cdot OH + SCN^-)$.	650388
1248	**Tyramine, negative ion**				
	$\cdot OH + {}^-OC_6H_4CH_2CH_2NH_2 \rightarrow$	11.2	1.5×10^{10}	p.r.; C.k.; $pK_a = 9.5, 10.8$; rel. to $k(\cdot OH + SCN^-)$.	730003
1249	**Tyrosine**				
	$\cdot OH + TyrOH \rightarrow HO\text{-}TyrOH$		*1.3×10^{10}*	Average of 3 values.	
		7	1.3×10^{10}	p.r.; P.b.k.; spectral anal. showed 50% *o*-adduct, ~5% phenoxyl radical, ~35% *m*-adduct, and ~10% *p*- adduct and other products..	84A126
		5.2	1.4×10^{10}	p.r.; C.k.; rel. to $k(\cdot OH + SCN^-)$.	730003
		4.0	1.3×10^{10}	p.r.; C.k.; obs. transient at 310-320 nm; rel. to $k(\cdot OH + HCO_2^-)$.	680062
1250	**Tyrosine, conjugate acid**				
	$\cdot OH + TyrOH_2^+ \rightarrow$	2.9	8.8×10^9	p.r.; P.b.k. at 330 nm.	761202
		2-2.2	1.2×10^{10}	γ-r.; C.k.; pK_a 2.2, 9.2, 10.5; rel. to $k(\cdot OH + 5\text{-}MeU)$.	650388
1251	**Tyrosine, dianion**				
	$\cdot OH + TyrO^{2-} \rightarrow$	11.2	1.3×10^{10}	p.r.; C.k.; rel. to $k(\cdot OH + SCN^-)$.	730003
1252	**Uracil**				
	$\cdot OH + U \rightarrow U\text{-}OH$		*5.7×10^9*	Average of 7 values.	
			6.0×10^9	p.r.; P.b.k. as well as as d.k.	733016

TABLE 8. Rate constants for reactions of hydroxyl radicals in aqueous solution—Continued

No. Reaction	pH	k (L mol^{-1} s^{-1})	Comment	Ref.
1252 Uracil—Continued				
	7	6.5×10^9	p.r.; P.b.k.	720049
	7	4.8×10^9	p.r.; C.k.; rel. to k(·OH + SCN^-).	720049
	nat.	4.7×10^9	p.r.; C.k.; rel. to k(·OH + $Fe(CN)_6^{4-}$).	710578
	7	6.0×10^9	p.r.; D.k. at 270 nm.	690571
	7	6.5×10^9	p.r.; P.b.k. at 385 nm.	690571
	7.3-7.5	5.2×10^9	p.r.; C.k.; at pH 2-2.2 and 5-5.2 $k = 7.5 \times 10^9$ and 8.7×10^9; rel. to k(·OH + SCN^-).	650388
1253 Uracil dinucleotide				
·OH + Uracil dinucleotide →		*4.5 × 10⁹*	Average of 2 values.	
	7	3.8×10^9	p.r.; D.k. at 270 nm.	690571
	7	5.3×10^9	p.r.; C.k.; rate calcd. per nucleotide base; rel. to k(·OH + SCN^-).	690571
1254 Urea				
·OH + H_2NCONH_2 →		7.9×10^5	γ-r.; C.k.; rel. to k(·OH + RNO).	80F445
1255 Uric acid				
·OH + $C_5H_4N_4O_3$ →	6-7	7.2×10^9	γ-r.; C.k.; pK_a = 5.78; 10.3; rel. to k(·OH + RNO).	750294
1256 Uridine				
·OH + Ur → Ur(OH)		*4.1 × 10⁹*	Average of 2 values.	
	7	4.1×10^9	p.r.; P.b.k.; OH adduct obs. at 385 nm.	690571
	7	4.2×10^9	p.r.; C.k.; cor. for incomplete scavenging of e_{aq}^- by H_2O_2; rel. to k(·OH + SCN^-).	680316 690571
1257 Uridine 5′-monophosphate				
·OH + UMP → UMP(OH)	7	4.5×10^9	p.r.; P.b.k. at 390 nm.	731071
1258 Uridine 3′-monophosphate				
·OH + 3′-UMP →	~7	6.7×10^9	γ-r.; C.k.; obs. G(inorg. phosphate); 13.2% oxidative dephosphorylation; rel. to k(·OH + *tert*-BuOH).	753070
1259 Uridine 2′,3′-monophosphate (mixed), dianion				
·OH + 2′(3′)-UMP → UMP(OH)		*4.6 × 10⁹*	Average of 3 values.	
	7	4.0×10^9	p.r.; P.b.k.; OH adduct obs. at 385 nm.	690571
	7	5.2×10^9	p.r.; C.k.; cor. for incomplete scavenging of e_{aq}^- by H_2O_2; rel. to k(·OH + SCN^-).	680316 690571
	7	4.6×10^9	p.r.; D.k. at 270 nm.	690571
1260 Valine				
·OH + Val →		*7.6 × 10⁸*	Average of 2 values.	
	6.9	8.5×10^8	X-r.; Obs. decrease in emission from acriflavin vs. scavenger concn.; rel. to k(·OH + MeOH).	766558
	6.6	6.6×10^8	γ-r.; C.k.; rel. to k(·OH + RNO).	730548
1261 Valine, conjugate acid				
·OH + $ValH^+$ →	2-2.2	8.6×10^8	γ-r.; C.k.; pK_a 2.3, 9.7; rel. to k(·OH + 5-MeU).	650388
1262 Vinyl chloride				
·OH + $H_2C{=}CHCl$ → ·$CHClCH_2OH$	~6.5	1.2×10^{10}	p.r.; C.k.; rel. to k(·OH + SCN^-).	710709
1263 Vinylidene chloride				
·OH + $H_2C{=}CCl_2$ → $CH_2OH\dot{C}Cl_2$	~6.5	6.8×10^9	p.r.; C.k.; rel. to k(·OH + SCN^-).	710709
1264 *N*-Vinyl-2-pyrrolidinone				
·OH + Vp →		*7.8 × 10⁹*	Average of 2 values.	
		7.0×10^9	p.r.; C.k.; rel. to k(·OH + SCN^-).	81A296
		7.5×10^9	p.r.; D.k. at 350 nm.	81A296

TABLE 8. Rate constants for reactions of hydroxyl radicals in aqueous solution—Continued

No.	Reaction	pH	k (L mol^{-1} s^{-1})	Comment	Ref.
1265	**Vinyl sulfonate ion** $\cdot OH + CH_2{=}CHSO_3^- \rightarrow HOCH_2\dot{C}HSO_3^-$	7	3.5×10^9	p.r.; P.b.k. at 250 nm; product detd. by esr.	82A328
1266	**Xanthine** $\cdot OH + C_5H_4N_4O_2 \rightarrow$	7.8	5.2×10^9	p.r.; P.b.k. at 340 nm.	84A097
1267	**Xanthine monophosphate** $\cdot OH + XMP \rightarrow$	~7	1.3×10^{10}	γ-r.; C.k.; obs. G(inorg. phosphate); 4.1% oxidative dephosphorylation; rel. to k(·OH + *tert*-BuOH).	753070
1268	***m*-Xylene** $\cdot OH + C_6H_4(CH_3)_2 \rightarrow HOC_6H_4(CH_3)_2$	~7	7.5×10^9	p.r.; P.b.k. at 328 nm in unbuffered soln.; 12% H abstr.	751009
1269	***o*-Xylene** $\cdot OH + C_6H_4(CH_3)_2 \rightarrow HOC_6H_4(CH_3)_2$	~7	6.7×10^9	p.r.; P.b.k. at 326 nm in unbuffered soln.; 12% H abstr.	751009
1270	***p*-Xylene** $\cdot OH + C_6H_4(CH_3)_2 \rightarrow HOC_6H_4(CH_3)_2$	~7	7.0×10^9	p.r.; P.b.k. at 312 nm in unbuffered soln.; 12% H abstr.	751009
1271	**Xylenol Orange** $\cdot OH + C_{31}H_{32}N_2O_{13}S \rightarrow$	11	2.4×10^{10}	γ-r.; C.k.; obs. decolorization of dye; rel. to k(·OH + MeOH).	710437
1272	**D-Xylose** $\cdot OH + C_5H_{10}O_5 \rightarrow$	7	2.2×10^9	p.r.; C.k.; rel. to k(·OH + SCN^-).	79A366

[a] Unrecommended value because of deficiencies in the method. The value is included since it is the only reported data on the substrate.
[b] Discrepancy in these data. No recommendation.

TABLE 9. Rate constants for reactions of the oxide radical ion in aqueous solution

No.	Reaction	pH	k (L mol^{-1} s^{-1})	Comment	Ref.
1	**Bromide ion**				
	$O^{\bullet -} + Br^- \rightarrow$	6-7	2.2×10^8	p.r.; C.k., soln. contains N_2O and high solute concn.; rel. to $k(^{\bullet}O^- + EtOH)$.	710137
2	**Hypobromite ion**				
	$O^{\bullet -} + BrO^- \rightarrow OH^- + BrO$		*3.5 × 10^9*	Average of 2 values.	
		12-13	2.9×10^9	f.p.; D.k. of O_3^-.; rel. to $k(^{\bullet}O^- + O_2)$.	697340
		11,13	4.2×10^9	p.r.; C.k.; rel. to $k(^{\bullet}OH + CO_3^{2-})$; $I = 0.4$.	680153
3	**Bromite ion**				
	$O^{\bullet -} + BrO_2^- \rightarrow OH^- + BrO_2^{\bullet}$		*1.7 × 10^9*	Average of 2 values.	
		12-13	1.6×10^9	f.p.; D.k. of O_3^-.; rel. to $k(^{\bullet}O^- + O_2)$.	697340
		13	1.8×10^9	p.r.; C.k.; assume $k(^{\bullet}OH + BrO_2^-) = 1.9 \times 10^9$ and $pK(OH) = 11.9$; rel. to $k(^{\bullet}OH + CO_3^{2-})$; $I = 0.4$.	680153
4	**Bromate ion**				
	$O^{\bullet -} + BrO_3^- \rightarrow OH^- + BrO_3$	12-13	1.7×10^6	f.p.; D.k. of O_3^-; more than one rate involved in calcn.; may be up to 30% lower; rel. to $k(^{\bullet}O^- + O_2)$.	697340
5	**Cyanide ion**				
	$O^{\bullet -} + CN^- \rightarrow {}^{\bullet}C(O^-)=N^-$		*2.6 × 10^8*	Average of 2 values.	
		~14	2.6×10^8	p.r.; P.b.k.; 10 mol L^{-1} KOH.	761079
		14	2.6×10^8	p.r.; P.b.k. at 250 nm in N_2O-satd. soln. contg. 1 mol L^{-1} KOH, cor. for ·OH reaction; adduct protonates and rearranges to $^{\bullet}CONH_2$.	741132
6	**Thiocyanate ion**				
	$O^{\bullet -} + SCN^- \rightarrow OH^- + HOSCN^-$	6-7	1.8×10^9 [b]	p.r.; C.k. at high solute concn.; rel. to $k(^{\bullet}O^- + EtOH)$.	710137
		13	3.7×10^9 [b]	p.r.; P.b.k. at 390 nm. ($HOSCN^-$)	720126
		alk.	1.1×10^9 [b]	p.r.; P.b.k. in soln. contg. 0.36 mol L^{-1} NaOH; $k = 1.3 \times 10^9$ at 1.08 mol L^{-1} NaOH.	710137
		13.5	1.0×10^9 [b]	p.r.; P.b.k. at 500 nm in soln. contg. 0.4 mol L^{-1} KOH.	650386
7	**Cerium(III) ion**				
	$O^{\bullet -} + Ce^{3+} \rightarrow OH^- + Ce^{4+}$	2.6, 2.9	7.2×10^8	p.r.; C.k.; assuming $k(^{\bullet}O^- + H_2O) = 1 \times 10^8$ s^{-1}; rel. to $k(^{\bullet}O^- + EtOH)$.	710137
8	**Hypochlorite ion**				
	$O^{\bullet -} + ClO^- \rightarrow ClO + OH^-$	13	2.3×10^8	p.r.; C.k.; rel. to $k(^{\bullet}OH + CO_3^{2-})$.	720301
9	**Chlorite ion**				
	$O^{\bullet -} + ClO_2^- \rightarrow ClO_2^{\bullet} + OH^-$		*1.9 × 10^8*	Average of 2 values.	
		14	2.0×10^8	p.r.; P.b.k. at 360 nm	81A242
		13	1.9×10^8	p.r.; C.k.; rel. to $k(^{\bullet}OH + CO_3^{2-})$.	720301
10	**Iron(II) ion**				
	$O^{\bullet -} + Fe^{2+} \rightarrow OH^- + Fe^{3+}$	4.4-4.8	3.8×10^9	p.r.; C.k.; rel. to $k(^{\bullet}O^- + EtOH)$.	710137
11	**Hydrogen**				
	$O^{\bullet -} + H_2 \rightarrow H^{\bullet} + OH^-$	13.3	8×10^7	p.r.; Calcd. from effect of H_2 concn. (1-100 atm) on d.k. at 578 nm (e_{aq}^-).	650009
12	**Iodide ion**				
	$O^{\bullet -} + I^- \rightarrow OH^- + I^{\bullet}$		*2.6 × 10^9*	Average of 5 values.	
			2.1×10^9	p.r.; P.b.k. at 385 nm ($I_2^{\bullet -}$) in 0.4 mol L^{-1} OH^- soln.	85A037
		alk.	2.0×10^9	p.r.; P.b.k. at 0.58 mol L^{-1} NaOH; $k = 1.9 \times 10^9$ at 1.1 mol L^{-1} NaOH.	710137
			3.3×10^9	p.r.; C.k.; rel. to $k(^{\bullet}O^- + MeOH)$.	710137
		alk.	2.8×10^9	p.r.; C.k.; rel. to $k(^{\bullet}O^- + EtOH)$.	710137

TABLE 9. Rate constants for reactions of the oxide radical ion in aqueous solution—Continued

No.	Reaction	pH	k (L mol^{-1} s^{-1})	Comment	Ref.
12	**Iodide ion**—Continued				
		6-7	2.8×10^9	p.r.; C.k. in high solute concn.; rel. to $k(\cdot O^- + EtOH)$.	710137
13	**Hypoiodite ion**				
	$O\cdot^- + IO^- \rightarrow IO + OH^-$		1.7×10^9	p.r.; P.b.k. at 490 nm (IO) in 0.4 mol L^{-1} OH^- soln.	85A037
14	**Iodate ion**				
	$O\cdot^- + IO_3^- \rightarrow IO_3 + OH^-$		*2.3* $\times$ *10^9*	Average of 2 values.	
		12.0	1.6×10^9	p.r.; P.b.k. at 360 nm $(IO_3)_2\cdot^-$.	730027
		12.6	3×10^9	p.r.; P.b.k. at 360 nm; cor. for $\cdot OH$ reaction.	720017
15	**Dihydroxoperiodate ion**				
	$O\cdot^- + H_2IO_6^{3-} \rightarrow OH^- + HIO_6^{3-}$	13.3	3×10^7	p.r.; IO_4^- soln.	78A443
16	**Bis(hydroxo)tetrakis(*p*-sulfonatophenyl)porphinatomanganatemanganate(III) ion**				
	$O\cdot^- + (OH)_2MnTPPS^{5-} \rightarrow OH^- + (OH)_2MnTPPS^{4-}$	14	3.4×10^8	p.r.; D.k.;~50% oxid. to Mn^{IV}.	84A120
17	**Manganate(VI) ion**				
	$O\cdot^- + MnO_4^{2-} \rightarrow OH^- + MnO_4^-$	13	8×10^8	p.r.; Obs. spectral changes in N_2O-satd. soln.; I = 0.1.	81A057
18	**Azide ion**				
	$O\cdot^- + N_3^- \rightarrow \cdot N_3 + O^{2-}$	14	$\sim 2 \times 10^8$	p.r.; P.b.k. at 274 nm; cor. for $\cdot OH$ reaction; upper limit.	85A218
19	**Nitrite ion**				
	$O\cdot^- + NO_2^- \rightarrow \cdot NO_2 + OH^-$		*3.1* $\times$ *10^8*	Average of 2 values.	
		12	$\sim 3.6 \times 10^8$	f.p.; C.k.; obs. O_3^- at 430 nm; based on $k(\cdot OH + NO_2^-)/k(\cdot O^- + O_2) = 4.0 \pm 0.4$ and $k(\cdot OH + NO_2^-)/k(\cdot O^- + NO_2^-) \neq 40$; rel. to $k(\cdot O^- + O_2)$.	707264
		13	2.6×10^8	p.r.; C.k.; cor. for $\cdot OH$ and HCO_3^-; calcd. from measurements at pH 11 and 13; rel. to $k(\cdot OH + CO_3^{2-})$; I = 0.4.	690379
20	**Dimethylglyoximenickelate(II)**				
	$O\cdot^- + Ni(dmg)_3^{4-} \rightarrow OH^- + Ni(dmg)_3^{3-}$	>13	2.5×10^9	p.r.; P.b.k. at 440 nm in N_2O-satd. soln. contg. 5×10^{-5} mol L^{-1} $NiSO_4$, 2×10^{-4} mol L^{-1} dimethylglyoxime and 0.5 mol L^{-1} NaOH; includes oxidation of free ligand.	720584
21	**Neptunate(VI) ion**				
	$O\cdot^- + NpO_4^{2-} \rightarrow OH^- + NpO_4^-$	>12	4.2×10^7	p.r.; P.b.k. (Np^{VII}) at 412 and 620 nm in N_2O-satd. soln. contg. 0.5-1.7 mol L^{-1} LiOH; in acid soln. Np(VII) not formed.	78A463
22	**Oxygen**				
	$O\cdot^- + O_2 \rightarrow O_3\cdot^-$		**3.6 $\times$ 10^9**	**Selected value.**	
			3.8×10^9	f.p.; P.b.k. at 430 nm in periodate soln. contg. 0.2 mol L^{-1} NaOH, assumed $[O_2] = 1.15 \times 10^{-3}$ mol L^{-1}.	81A177
		~11	3.6×10^9	p.r.; P.b.k. at 430 nm.	690379
		13	2.5×10^9	p.r.; P.b.k. at 430 nm.	660001
		alk.	4×10^9	P.b.k.	660424
23	**Hydroperoxide ion**				
	$O\cdot^- + HO_2^- \rightarrow O_2\cdot^- + OH^-$	13	4×10^8	Deduced from anal. of data reported in [82A096], [690379], [680298], [687277] and [670132]; see Sect. 6.2.3.; I = 0.1.	

TABLE 9. Rate constants for reactions of the oxide radical ion in aqueous solution—Continued

No.	Reaction	pH	k (L mol^{-1} s^{-1})	Comment	Ref.
24	**Water**				
	$O^{\bullet -} + H_2O \rightarrow OH^- + {}^{\bullet}OH$	alk.	1.7×10^6	p.r.; C.k.; soln. contains ferrocyanide with methanol or ethanol and 0.366-1.11 mol L^{-1} OH^-; assumed $k(^{\bullet}O^- + Fe(CN)_6^{4-}) \leq 3 \times 10^7$, $k(^{\bullet}O^- + EtOH) = 9.8 \times 10^8$, $k(^{\bullet}O^- + MeOH) = 5.3 \times 10^8$.	710137
		11	1.7×10^6	p.r.; C.k. with CO_3^{2-}; N_2O and O_2-satd. solns.	700511
25	**Hydrogen phosphate ion**				
	$O^{\bullet -} + HPO_4^{2-} \rightarrow$	12.3	3.5×10^6	p.r.; C.k.; rel. to $k(^{\bullet}O^- + MeOH)$; $I = \sim 0.75$.	731049
26	**Ruthenate(VI) ion**				
	$O^{\bullet -} + RuO_4^{2-} \rightarrow OH^- + RuO_4^-$	>13	2.4×10^9	γ-r.; C.k.; rel. to $k(^{\bullet}O^- + NO_2^-)$.	680063
27	**Sulfite ion**				
	$O^{\bullet -} + SO_3^{2-} \rightarrow \dot{S}O_3^- + OH^-$	14	3.0×10^8	p.r.; C.k.; obs. O_3^- at 430 nm in O_2-satd. soln.; rel. to $k(^{\bullet}O^- + O_2)$.	710461
28	**Thiosulfate ion**				
	$O^{\bullet -} + S_2O_3^{2-} \rightarrow S_2O_3^{\bullet -} + OH^-$	11.2	4.3×10^8	f.p.; C.k.; rel. to $k(^{\bullet}O^- + O_2)$.	78A427
29	**Selenite(IV) ion**				
	$O^{\bullet -} + SeO_3^{2-} \rightarrow HSeO_4^{\bullet 2-} + OH^-$	13	1.1×10^7	p.r.; P.b.k. at 420 nm; calcd. from $k_{obs} = 0.60 \times 10^6$ (cor. for ·OH reaction) using $K(^{\bullet}O^- + H_2O \rightleftarrows {}^{\bullet}OH + OH^-) = 8 \times 10^{-3}$.	86A335
30	**Selenate(VI) ion**				
	$O^{\bullet -} + SeO_4^{2-} \rightarrow OH^- + SeO_4^{\bullet -}$	13.1	6.3×10^8	p.r.; C.k.; rel. to $k(^{\bullet}OH + CO_3^{2-})$.	78A259
31	**Hydrogen xenate(VII)**				
	$O^{\bullet -} + HOOXeO_2 \rightarrow HXeO_5^{2-}$	11-13	1.3×10^9	p.r.; Calcd. from p.b.k. at 320 or 600 nm in N_2O-satd. soln. and $pK(OH) = 11.9$.	82A160
32	**Acetate ion**				
	$O^{\bullet -} + CH_3CO_2^- \rightarrow OH^- + {}^{\bullet}CH_2CO_2^-$	14	5×10^7	p.r.; C.k.; rel. to $k(^{\bullet}O^- + 3\text{-HX})$.	751003
33	**Acetonitrile**				
	$O^{\bullet -} + CH_3CN \rightarrow OH^- + {}^{\bullet}CH_2CN$	14	2.1×10^8	p.r.; C.k.; rel. to $k(^{\bullet}O^- + 3\text{-HX})$.	751003
34	**Acetylenedicarboxylate ion**				
	$O^{\bullet -} + {}^-O_2CC{\equiv}CCO_2^- \rightarrow$	14	$<1 \times 10^7$	p.r.; C.k.; cor. for ·OH reactions; $k_{obs} = 4 \times 10^7$; rel. to $k(^{\bullet}O^- + 3\text{-HX})$.	751003
35	**Aconitate ion**				
	$O^{\bullet -} + {}^-O_2CCH{=}C(CO_2^-)CH_2CO_2^- \rightarrow OH^- + {}^-O_2CCH{=}C(CO_2^-)\dot{C}HCO_2^-$	14	$\sim 1 \times 10^8$	p.r.; P.b.k. (allylic radical).	751003
36	**Acrylamide**				
	$O^{\bullet -} + H_2C{=}CHCONH_2 \rightarrow$	12	6.5×10^8	p.r.; C.k.; assume $pK(^{\bullet}OH) = 11.9$; rel. to $k(^{\bullet}OH + CO_3^{2-})$; $I = 0.4$.	700052
37	**Acrylate ion**				
	$O^{\bullet -} + CH_2{=}CHCO_2^- \rightarrow$	14	1.5×10^8	p.r.; C.k.; cor. for ·OH + acrylate ion; rel. to $k(^{\bullet}O^- + 3\text{-HX})$.	751003
38	**Acrylonitrile**				
	$O^{\bullet -} + H_2C{=}CHCN \rightarrow$ H abstr.	12.9	2.0×10^9	p.r.; C.k. in N_2O-satd. soln.; rel. to $k(^{\bullet}OH + CO_3^{2-})$.	79A144
39	**Allyl alcohol**				
	$O^{\bullet -} + H_2C{=}CHCH_2OH \rightarrow H_2O + H_2C{=}CH\dot{C}HO^-$		*2.5×10^9*	Average of 2 values.	
		14	2.1×10^9	p.r.; C.k. with ethanol; rel. to $k(^{\bullet}O^- + 3\text{-HX})$.	751003
		14	2.9×10^9	p.r.; P.b.k.	731070
40	**Allylbenzene**				
	$O^{\bullet -} + C_6H_5CH_2CH{=}CH_2 \rightarrow OH^- + C_6H_5\dot{C}HCH{=}CH_2$	14	4.5×10^8	p.r.; P.b.k. (allylic radicals).	751003

TABLE 9. Rate constants for reactions of the oxide radical ion in aqueous solution—Continued

No.	Reaction	pH	k (L mol^{-1} s^{-1})	Comment	Ref.
41	**Allyl cyanide** $O^{\cdot -} + H_2C{=}CHCH_2CN \rightarrow$	14	9.7×10^8	p.r.; C.k.; rel. to $k(^{\cdot}O^- + 3\text{-HX})$.	751003
42	**Aniline** $O^{\cdot -} + C_6H_5NH_2 \rightarrow HOC_6H_5NH_2$		*2.3 × 10⁹*	Average of 3 values.	
		13.6	2.1×10^9	p.r.; P.b.k.; cor. for 2% OH present; anilino radical formed by OH^- elimination; pK_a of radical cation = 7.05.	85A428
		14	1.6×10^9	p.r.; P.b.k., cor. for ·OH; $k_{obs} = 1.7 \times 10^9$.	751002
		13.3	3.1×10^9	p.r.; P.b.k. at 300 and 400 nm.	720289
43	**9,10-Anthraquinone-2-sulfonate ion** $O^{\cdot -} + 2\text{-}SO_3AQ^- \rightarrow$	14	3.2×10^8	γ-r.; C.k.; 37% semiquinone formn.; rel. to $k(^{\cdot}O^- + EtOH)$.	771046
44	**9-Anthroate ion** $O^{\cdot -} + 9\text{-}AnCO_2^- \rightarrow 9\text{-}An(OH)CO_2^-$	14	4.8×10^8	p.r.; P.b.k. at 325 nm; cor. for ·OH.	730110
45	**Benzhydrylamine** $O^{\cdot -} + (C_6H_5)_2CHNH_2 \rightarrow (C_6H_5)_2\dot{C}NH_2 + OH^-$	14	1.5×10^9	p.r.; P.b.k. in N_2O-satd. soln. contg. 1 mol L^{-1} NaOH.	86A410
46	**Benzoate ion** $O^{\cdot -} + C_6H_5CO_2^- \rightarrow OH^- + HOC_6H_5CO_2^-$	14	$\sim 4 \times 10^7$	p.r.; P.b.k.; cor. for ·OH; $k_{obs} = 8.5 \times 10^7$.	720047 720107
47	**Benzonitrile** $O^{\cdot -} + C_6H_5CN \rightarrow$	14	7×10^7	p.r.; C.k., cor. for ·OH; $k_{obs} = 1.0 \times 10^8$; rel. to $k(^{\cdot}O^- + 3\text{-HX})$.	751003 751002
48	**Benzylamine** $O^{\cdot -} + C_6H_5CH_2NH_2 \rightarrow C_6H_5\dot{C}HNH_2 + OH^-$	14	2.3×10^9	p.r.; P.b.k. in N_2O-satd. soln. contg. 1 mol L^{-1} NaOH.	86A410
49	**Benzyltributylammonium ion** $O^{\cdot -} + C_6H_5CH_2N^+(C_4H_9)_3 \rightarrow OH^- + C_6H_5\dot{C}HN^+(C_4H_9)_3 + C_6H_5CH_2N^+(C_4H_9)_2(C_4H_8)$	14	4.6×10^8	p.r.; P.b.k. at 305 nm in N_2O-satd. soln.; 25% H abstr. at benzyl and 75% at butyl.	81A034
50	**Benzyltrimethylammonium ion** $O^{\cdot -} + C_6H_5CH_2N(CH_3)_3^+ \rightarrow OH^- + C_6H_5\dot{C}HN^+(CH_3)_3$	14	5.9×10^8	p.r.; P.b.k. at 260 and 305 nm in N_2O-satd. soln.	81A034
51	**Biphenyl-4-carboxylate ion** $O^{\cdot -} + 4\text{-}C_6H_5C_6H_4CO_2^- \rightarrow$ addn.	14	7.0×10^7	p.r.; P.b.k. at 330 nm; cor. for ·OH.	730110
52	**2,2′-Biphenyldicarboxylate ion** $O^{\cdot -} + 2,2'\text{-}{}^-O_2CC_6H_4C_6H_4CO_2^- \rightarrow {}^-O_2CC_6H_4C_6H_4(OH)CO_2^-$	14	2.9×10^7	p.r.; P.b.k. at 330 nm; cor. for ·OH.	730110
53	**4,4′-Biphenyldicarboxylate ion** $O^{\cdot -} + {}^-O_2CC_6H_4C_6H_4CO_2^- \rightarrow {}^-O_2CC_6H_4C_6H_4(OH)CO_2^-$	14	2.8×10^7	p.r.; P.b.k. at 330 nm; cor. for ·OH.	730110
54	**2-Butene-1,4-diol** $O^{\cdot -} + HOCH_2CH{=}CHCH_2OH \rightarrow OH^- + HOCH_2CH{=}CH\dot{C}HOH$	14	2.2×10^9	p.r.; C.k. with ethanol; rel. to $k(^{\cdot}O^- + 3\text{-HX})$.	751003
55	**3-Butenoate ion** $O^{\cdot -} + CH_2{=}CHCH_2CO_2^- \rightarrow OH^- + CH_2{=}CHCHCO_2^-$	14	6.5×10^8	p.r.; C.k.; rel. to $k(^{\cdot}O^- + 3\text{-HX})$.	751003
56	***tert*-Butylbenzene** $O^{\cdot -} + C_6H_5C(CH_3)_3 \rightarrow OH^- + C_6H_5C(CH_3)_2\dot{C}H_2$	13.6	$\sim 1 \times 10^9$	p.r.; P.b.k. in N_2O-satd. soln. contg. 0.6 mol L^{-1} NaOH.	79B128
57	**Butyrate ion** $O^{\cdot -} + n\text{-}C_3H_7CO_2^- \rightarrow$ H abstr.	14	6.3×10^8	p.r.; C.k.; rel. to $k(^{\cdot}O^- + 3\text{-HX})$.	751003

TABLE 9. Rate constants for reactions of the oxide radical ion in aqueous solution—Continued

No.	Reaction	pH	k (L mol^{-1} s^{-1})	Comment	Ref.
58	**Camphor**				
	$O^{\bullet-} + C_{10}H_{16}O \rightarrow$ H abstr.	13	1.6×10^9	p.r.; P.b.k. at 330 nm in N_2O-satd. soln. contg. 10^{-2} mol L^{-1} camphor.	79A191
59	**Citrate ion**				
	$O^{\bullet-}$ + citrate →	14	4.1×10^7	p.r.; C.k.; rel. to $k(^{\bullet}O^- + 3\text{-HX})$.	751003
60	**Crotonate ion**				
	$O^{\bullet-} + CH_3CH{=}CHCO_2^- \rightarrow OH^- + {}^{\bullet}CH_2CH{=}CHCO_2^-$	14	9.0×10^8	p.r.; P.b.k. at 250 nm (allylic radical).	751003
61	**Crotononitrile**				
	$O^{\bullet-} + CH_3CH{=}CHCN \rightarrow$	14	9.1×10^8	p.r.; C.k.; rel. to $k(^{\bullet}O^- + 3\text{-HX})$.	751003
62	**Cumene**				
	$O^{\bullet-} + C_6H_5CH(CH_3)_2 \rightarrow OH^- + C_6H_5\dot{C}(CH_3)_2$	13.6	$\sim 2 \times 10^9$	p.r.; P.b.k. in N_2O-satd. soln. contg. 0.6 mol L^{-1} NaOH.	79B128
63	**Cyanoacetate ion**				
	$O^{\bullet-} + CNCH_2CO_2^- \rightarrow$	14	4.0×10^8	p.r.; C.k.; rel. to $k(^{\bullet}O^- + 3\text{-HX})$.	751003
64	**4-Cyanophenoxide ion**				
	$O^{\bullet-} + 4\text{-}NCC_6H_4O^- \rightarrow OH^- +$ 4-$\dot{C}NC_6H_4O^{\bullet}$	14	6.2×10^8	p.r.; P.b.k.; cor. for $^{\bullet}OH$; $k_{obs} = 6.8 \times 10^8$.	751002
65	**Cyclopentene**				
	$O^{\bullet-} + c\text{-}C_5H_8 \rightarrow OH^- + c\text{-}C_5H_7$	14	$\sim 7 \times 10^8$	p.r.; P.b.k. at 242 nm.	741052
66	**Cytosine, negative ion**				
	$O^{\bullet-} + Cy^- \rightarrow$ addn.	13.2	1.2×10^9	p.r.; P.b.k. at 380-400 nm.	78A106
67	**2'-Deoxycytidine, negative ion**				
	$O^{\bullet-}$ + dC → addn.	13.2	2.0×10^9	p.r.; P.b.k. at 380-550 nm.	78A106
68	**Diethyl ether**				
	$O^{\bullet-} + (C_2H_5)_2O \rightarrow$	13	9.5×10^8	γ-r.; C.k.; rel. to $k(^{\bullet}O^- + 2\text{-PrOH})$.	680602
69	***N,N*-Dimethylaniline**				
	$O^{\bullet-} + C_6H_5N(CH_3)_2 \rightarrow [C_6H_5N(CH_3)_2]^{\bullet+}$		3.9×10^9	p.r.; P.b.k. at 330 nm in N_2O-satd. soln. contg. 0.6 mol L^{-1} NaOH and 0.005 mol L^{-1} amine.	82A438
70	**1,1'-Dimethyl-4,4'-bipyridinium ion**				
	$O^{\bullet-} + MV^{2+} \rightarrow$	≥13.8	1.5×10^9	p.r.; P.b.k. at 392 and 470 nm in soln. contg. 1×10^{-3} mol L^{-1} methyl viologen and 0.6 mol L^{-1} NaOH satd. with N_2O; mainly H abstraction at methyl, <10% adduct formation.	85A099
71	**Diphenylacetate ion**				
	$O^{\bullet-} + (C_6H_5)_2CHCO_2^- \rightarrow OH^- + (C_6H_5)_2\dot{C}CO_2^-$	14	6×10^7	p.r.; P.b.k. at 340 nm; cor. for $^{\bullet}OH$; $k_{obs} = 9 \times 10^7$.	720047
72	**Ethanol**				
	$O^{\bullet-} + C_2H_5OH \rightarrow H_2O + CH_3\dot{C}HO^-$		**1.2×10^9**	**Selected value.**	
		14	1.2×10^9	p.r.; C.k.; rel. to $k(^{\bullet}O^- + 3\text{-HX})$.	751003
		13.9	1.1×10^9	p.r.; P.b.k. at 360 nm	700080
		11	1.0×10^8	p.r.; C.k.; rel. to $k(^{\bullet}OH + CO_3^{2-})$.	700511
		13	1.2×10^9	p.r.; C.k.; cor. for $^{\bullet}OH$; rel. to $k(^{\bullet}O^- + O_2)$.	690002
		>13	1.3×10^9	p.r.; C.k.; rel. to $k(^{\bullet}O^- + O_2)$.	650007
73	**Ethylbenzene**				
	$O^{\bullet-} + C_6H_5C_2H_5 \rightarrow OH^- + C_6H_5\dot{C}HCH_3$	13.6	$\sim 2 \times 10^9$	p.r.; P.b.k. in N_2O-satd. soln. contg. 0.6 mol L^{-1} NaOH.	79B128
74	**Ethylenediaminetetraacetate ion**				
	$O^{\bullet-} + [CH_2N(CH_2CO_2^-)_2]_2 \rightarrow$		$\sim 1 \times 10^8$	R.M. Sellers, unpublished data.	85A051
75	**Formate ion**				
	$O^{\bullet-} + HCO_2^- \rightarrow$	11-13	1.4×10^9	p.r.; C.k.; rel. to $k(^{\bullet}OH + CO_3^{2-})$; $I = 0.4$.	690379

TABLE 9. Rate constants for reactions of the oxide radical ion in aqueous solution—Continued

No.	Reaction	pH	k (L mol^{-1} s^{-1})	Comment	Ref.
76	**Fumarate ion** $O^{\cdot-} + trans\text{-}{}^{-}O_2CCH{=}CHCO_2^{-} \rightarrow {}^{-}O_2\dot{C}C{=}CHCO_2^{-} + OH^{-}$		4×10^7	p.r.; Calcd. from pH study; p.b.k. at 280-400 nm at pH 4-10.5.	85A487
77	**Glutaconate ion** $O^{\cdot-} + {}^{-}O_2CCH_2CH{=}CHCO_2^{-} \rightarrow OH^{-} + {}^{-}O_2C\dot{C}HCH{=}CHCO_2^{-}$	14	3.0×10^8	p.r.; P.b.k. at 250-270 nm (allylic radical).	751003
78	**Glycine, negative ion** $O^{\cdot-} + H_2NCH_2CO_2^{-} \rightarrow$	14	5.4×10^8	p.r.; C.k.; rel. to $k(\cdot O^{-} + \text{3-HX})$.	751003
79	**2,4-Hexadien-1,6-dioate ion (Muconate ion)** $O^{\cdot-} + {}^{-}O_2CCH{=}CHCH{=}CHCO_2^{-} \rightarrow$	14	$\sim 2 \times 10^9$	p.r.; C.k.; rel. to $k(\cdot O^{-} + \text{3-HX})$.	751003
80	**2,4-Hexadien-1-ol** $O^{\cdot-} + CH_3(CH{=}CH)_2CH_2OH \rightarrow H_2O + CH_3CH{=}CHCHCH{=}\dot{C}HO^{-}$	14	4.3×10^9	p.r.; P.b.k.; also other H abstr. products.	731070
81	**Hexamethylbenzene** $O^{\cdot-} + C_6(CH_3)_6 \rightarrow OH^{-} + C_6(CH_3)_5(\dot{C}H_2)$	13	$\sim 2.5 \times 10^9$	p.r.; P.b.k. at 270 nm in N_2O-satd. soln. contg. 0.5 mol L^{-1} NaOH.	751009
82	**1-Hexanoate ion** $O^{\cdot-} + CH_3(CH_2)_4CO_2^{-} \rightarrow$	14	1.4×10^9	p.r.; C.k.; rel. to $k(\cdot O^{-} + \text{3-HX})$.	751003
83	**2-Hexene-1,6-dioate ion** $O^{\cdot-} + {}^{-}O_2C(CH_2)_2CH{=}CHCO_2^{-} \rightarrow OH^{-} + {}^{-}O_2CCH_2\dot{C}HCH{=}CHCO_2^{-}$	14	6.9×10^8	p.r.; P.b.k. at 250-270 nm (allylic radical).	751003
84	**3-Hexene-1,6-dioate ion (3-HX)** $O^{\cdot-} + {}^{-}O_2CCH_2CH{=}CHCH_2CO_2^{-} \rightarrow OH^{-} + {}^{-}O_2C\dot{C}HCH{=}CHCH_2CO_2^{-}$		**6.3×10^8**	**Selected value.**	
		14	6.3×10^8	p.r.; P.b.k. at 266 nm (allylic radicals); cor. for background reactions gave $k = 6.5 \times 10^8$.	751003
85	***p*-Hydroxycinnamate ion, conjugate base** $O^{\cdot-} + {}^{-}OC_6H_4CH{=}CHCO_2^{-} \rightarrow OH^{-} + \cdot OC_6H_4CH{=}CHCO_2^{-}$	14	3.1×10^8	p.r.; P.b.k. at 595 nm in N_2O-satd. soln. contg. 1 mol L^{-1} NaOH; cor. for ·OH reaction.	84A206
86	**Iminodiacetate ion** $O^{\cdot-} + HN(CH_2CO_2)_2^{2-} \rightarrow$	13	9.1×10^8	γ-r.; C.k.; obs. G(glycine); rel. to $k(\cdot O^{-} +$ *tert*-BuOH).	760243
87	**Linoleate ion** $O^{\cdot-} + LCO_2^{-} \rightarrow R$	>11	2.5×10^9	p.r.; P.b.k. at 280 nm (dienyl radical); $k_{obs} = 5 \times 10^9$ at pH 12.5.; k cor for I.	85A182
88	**Malate ion** $O^{\cdot-} + {}^{-}O_2CCH_2CHOHCO_2^{-} \rightarrow {}^{-}O_2CCH_2\dot{C}(O^{-})CO_2^{-} + OH^{-}$	1.5-14	1.2×10^8	p.r.; Calcd. from pH study; p.b.k. at 235-330 nm at pH 1.5-14.	85A487
89	**Maleate ion** $O^{\cdot-} + cis\text{-}{}^{-}O_2CCH{=}CHCO_2^{-} \rightarrow$	14	$\sim 3 \times 10^7$	p.r.; C.k.; cor. for ·OH, k_{obs} 8 $\times 10^7$; rel. to $k(\cdot O^{-} + \text{3-HX})$.	751003
90	**Malonate ion** $O^{\cdot-} + CH_2(CO_2^{-})_2 \rightarrow$	14	2.0×10^7	p.r.; C.k.; rel. to $k(\cdot O^{-} + \text{3-HX})$.	751003
91	**Mesitylene** $O^{\cdot-} + C_6H_3(CH_3)_3 \rightarrow OH^{-} + 3,5\text{-}C_6H_3(CH_3)_2(CH_2)$	13	2.4×10^9	p.r.; P.b.k. at 265 nm in N_2O-satd. soln. contg. 0.5 mol L^{-1} NaOH.	751009
92	**Methacrylate ion** $O^{\cdot-} + CH_2{=}C(CH_3)CO_2^{-} \rightarrow$	14	4.2×10^8	p.r.; C.k.; rel. to $k(\cdot O^{-} + \text{3-HX})$.	751003
93	**Methacrylonitrile** $O^{\cdot-} + H_2C{=}C(CH_3)CN \rightarrow$	14	1.7×10^9	p.r.; C.k.; rel. to $k(\cdot O^{-} + \text{3-HX})$.	751003

TABLE 9. Rate constants for reactions of the oxide radical ion in aqueous solution—Continued

No.	Reaction	pH	k (L mol^{-1} s^{-1})	Comment	Ref.
94	**Methanol**				
	$O^{\cdot -} + CH_3OH \rightarrow H_2O + {}^{\cdot}CH_2O^-$		**7.5×10^8**	**Selected value.**	
		13.92	5.8×10^8	p.r.; P.b.k. at 360 nm ($^{\cdot}CH_2O^-$).	700080
		13.1-13.6	7.5×10^8	p.r.; C.k.; cor. for ·OH; rel. to $k(^{\cdot}O^- + O_2)$.	690002
95	**α-Methylbenzylamine**				
	$O^{\cdot -} + C_6H_5CH(CH_3)NH_2 \rightarrow C_6H_5\dot{C}(CH_3)NH_2 + OH^-$	14	1.5×10^9	p.r.; P.b.k. in N_2O-satd. soln. contg. 1 mol L^{-1} NaOH.	86A410
96	**5-Methylcytosine, negative ion**				
	$O^{\cdot -}$ + 5-MeCy$^-$ → addn.	13.2	3.0×10^9	p.r.; P.b.k. at 370 and 530 nm.	78A106
97	**4-Methylphenoxide ion**				
	$O^{\cdot -}$ + 4-$CH_3C_6H_4O^-$ → OH^- + 4-$\dot{C}H_2C_6H_4O^-$ + 4-$CH_3C_6H_4O^{\cdot}$	14	1.0×10^9	p.r.; P.b.k., cor. for ·OH; ~40% formn. of phenoxy radical.	751002
98	**2-Methyl-2-propanol**				
	$O^{\cdot -} + (CH_3)_3COH \rightarrow$	13	5×10^8	p.r.; C.k.; obs. O_3^- formn. at 430 nm in soln. contg. 0.1 mol L^{-1} KOH and 1.2×10^{-3} mol L^{-1} O_2; rel. to $k(^{\cdot}O^- + O_2)$.	771084
		14	3.2×10^8	p.r.; C.k.; rel. to $k(^{\cdot}O^- + 3\text{-HX})$.	751003
99	**1-Naphthoate ion**				
	$O^{\cdot -}$ + 1-$NpCO_2^-$ → addn.	14	1.2×10^8	p.r.; P.b.k. at 330 nm; cor. for ·OH.	730110
100	**2-Naphthoate ion**				
	$O^{\cdot -}$ + 2-$NpCO_2^-$ → addn.	14	1.3×10^8	p.r.; P.b.k. at 340 nm; cor. for ·OH.	730110
101	**4-Nitrotoluene**				
	$O^{\cdot -} + CH_3C_6H_4NO_2 \rightarrow OH^- +$ p-$NO_2C_6H_4\dot{C}H_2$	14	7.6×10^8	p.r.; P.b.k.; cor. for ·OH; $k_{obs} = 8 \times 10^8$; 92% H abstr.	751002
102	**1,4-Pentadien-3-ol**				
	$O^{\cdot -} + CH_2{=}CH\dot{C}HOHCH{=}CH_2 \rightarrow$ $H_2O + CH_2{=}CH\dot{C}(O^-)CH{=}CH_2$	14	2.4×10^9	p.r.; P.b.k.	731070
103	**Pentamethylbenzene**				
	$O^{\cdot -} + C_6H(CH_3)_5 \rightarrow OH^- +$ $C_6H(CH_3)_4(\dot{C}H_2)$	~13	2.6×10^9	p.r.; P.b.k. at 269 nm in N_2O-satd. soln. contg. 0.5 mol L^{-1} NaOH.	751009
104	**1,10-Phenanthroline**				
	$O^{\cdot -}$ + phen → phenOH	13.6	7.4×10^8	p.r.; C.k.; rel. to $k(^{\cdot}O^- + HCO_2^-)$.	78A207
105	**Phenoxide ion**				
	$O^{\cdot -} + C_6H_5O^- \rightarrow OH^- + C_6H_5O^{\cdot}$	14	6.5×10^8	p.r.; P.b.k. at 402 nm (phenoxy radical; cor. for ·OH addn.; $k_{obs} = 7.1 \times 10^8$.	751001 751002
106	**4-Phenoxybenzoate ion**				
	$O^{\cdot -}$ + 4-$C_6H_5OC_6H_4CO_2^-$ → addn.	14	1.6×10^8	p.r.; P.b.k. at 337 nm (hydroxycyclohexadienyl radical); cor. for ·OH; $k_{obs} = 2.1 \times 10^8$.	751001 751002
107	**Phenylacetate ion**				
	$O^{\cdot -} + C_6H_5CH_2CO_2^- \rightarrow OH^- +$ $C_6H_5\dot{C}HCO_2^-$	14	2×10^8	p.r.; P.b.k. at 290 nm; $k_{obs} = 2.2 \times 10^8$; assume ·OH contribution is 6.2×10^7.	720047
108	**Phenylphosphate ion**				
	$O^{\cdot -} + C_6H_5OPO_3^{2-} \rightarrow$	13.3	7×10^7	p.r.; C.k. in O_2-satd. soln.; rel. to $k(^{\cdot}O^- + O_2)$; k cor. for I.	79A055
109	**Phthalate ion**				
	$O^{\cdot -}$ + 1,2-$C_6H_4(CO_2^-)_2 \rightarrow$ $^-OC_6H_4(CO_2^-)_2$	14	1.8×10^7	p.r.; P.b.k. at 330 nm; cor. for ·OH.	730110
110	**1-Propanol**				
	$O^{\cdot -} + CH_3CH_2CH_2OH \rightarrow$	14	1.5×10^9	p.r.; C.k.; rel. to $k(^{\cdot}O^- + 3\text{-HX})$.	751003
111	**2-Propanol**				
	$O^{\cdot -} + (CH_3)_2CHOH \rightarrow H_2O +$ $(CH_3)_2\dot{C}O^- + {}^{\cdot}CH_2CHO^-CH_3$		**1.2×10^9**	**Selected value.**	
		14	1.2×10^9	p.r.; C.k.; rel. to $k(^{\cdot}O^- + 3\text{-HX})$.	751003

TABLE 9. Rate constants for reactions of the oxide radical ion in aqueous solution—Continued

No.	Reaction	pH	k (L mol^{-1} s^{-1})	Comment	Ref.
112	**Propionate ion** $O^{\bullet -} + CH_3CH_2CO_2^- \rightarrow$	14	3.2×10^8	p.r.; C.k.; rel. to $k(^{\bullet}O^- + 3\text{-HX})$.	751003
113	**Propionitrile** $O^{\bullet -} + C_2H_5CN \rightarrow$	14	9.7×10^8	p.r.; C.k.; rel. to $k(^{\bullet}O^- + 3\text{-HX})$.	751003
114	**Salicylate dianion** $O^{\bullet -} + 2\text{-}(^-O)C_6H_4CO_2^- \rightarrow OH^- +$ $2\text{-}^-O_2CC_6H_4O^{\bullet}$	14	4.5×10^8	p.r.; P.b.k.; cor. for $^{\bullet}OH$; $k_{obs} = 5.1 \times 10^8$.	751002
115	**Succinate ion** $O^{\bullet -} + {}^-O_2CCH_2CH_2CO_2^- \rightarrow$	14	1.3×10^8	p.r.; C.k.; rel. to $k(^{\bullet}O^- + 3\text{-HX})$.	751003
116	**Tetrabutylammonium ion** $O^{\bullet -} + [CH_3(CH_2)_3]_4N^+ \rightarrow$	13	2.2×10^9	p.r.; C.k., cor. for $^{\bullet}OH$ reaction; rel. to $k(^{\bullet}O^- +$ 3-HX).	80A346
117	**Tetraethylammonium ion** $O^{\bullet -} + (C_2H_5)_4N^+ \rightarrow$	13	5.4×10^8	p.r.; C.k.; cor. for $^{\bullet}OH$ reaction; rel. to $k(^{\bullet}O^- +$ 3-HX).	80A346
118	**Tetramethylammonium ion** $O^{\bullet -} + (CH_3)_4N^+ \rightarrow$	13	1.4×10^8	p.r.; C.k., cor. for $^{\bullet}OH$ reaction; rel. to $k(^{\bullet}O^- +$ 3-HX).	80A346
119	**1,2,3,4-Tetramethylbenzene** $O^{\bullet -} + C_6H_2(CH_3)_4 \rightarrow OH^- +$ $C_6H_2(CH_3)_3(\dot{C}H_2)$	13	2.4×10^9	p.r.; P.b.k. at 267 nm in N_2O-satd. soln. contg. 0.5 mol L^{-1} NaOH.	751009
120	**1,2,3,5-Tetramethylbenzene** $O^{\bullet -} + C_6H_2(CH_3)_4 \rightarrow OH^- +$ $C_6H_2(CH_3)_3(\dot{C}H_2)$	13	2.6×10^9	p.r.; P.b.k. at 267 nm in N_2O-satd. soln. contg. 0.5 mol L^{-1} NaOH.	751009
121	**1,2,4,5-Tetramethylbenzene** $O^{\bullet -} + C_6H_2(CH_3)_4 \rightarrow OH^- +$ $C_6H_2(CH_3)_3(\dot{C}H_2)$	13	2.3×10^9	p.r.; P.b.k. at 271 nm in N_2O-satd. soln. contg. 0.5 mol L^{-1} NaOH.	751009
122	**2,2,6,6-Tetramethyl-4-piperidone *N*-oxyl** $O^{\bullet -} + TAN \rightarrow$	13	1.7×10^9	p.r.; C.k.; rel. to $k(^{\bullet}O^- + O_2)$.	710618
123	**Tetrapropylammonium ion** $O^{\bullet -} + (CH_3CH_2CH_2)_4N^+ \rightarrow$	13	1.9×10^9	p.r.; C.k.; obs. O_3^- at 430 nm; rel. to $k(^{\bullet}O^- +$ O_2).	761129
124	**Thymine** $O^{\bullet -} + 5\text{-MeU}^- \rightarrow OH^- + 5\text{-}\dot{C}H_2\text{-U}^-$	13	4×10^8	p.r.; P.b.k.	720047
125	***m*-Toluate ion** $O^{\bullet -} + 3\text{-}CH_3C_6H_4CO_2^- \rightarrow OH^- +$ $3\text{-}\dot{C}H_2C_6H_4CO_2^-$	14	7.5×10^8	p.r.; P.b.k.; cor. for $^{\bullet}OH$; $k_{obs} = 7.9 \times 10^8$, 90% H abstr.	751002
126	***o*-Toluate ion** $O^{\bullet -} + 2\text{-}CH_3C_6H_4CO_2^- \rightarrow OH^- +$ $2\text{-}\dot{C}H_2C_6H_4CO_2^-$	14	3.4×10^8	p.r.; P.b.k.; cor. for $^{\bullet}OH$; $k_{obs} = 3.8 \times 10^8$, 90% H abstr.	751002
127	***p*-Toluate ion** $O^{\bullet -} + 4\text{-}CH_3C_6H_4CO_2^- \rightarrow OH^- +$ $4\text{-}\dot{C}H_2C_6H_4CO_2^-$		*6.6×10^8*	Average of 2 values.	
		14	8.2×10^8	p.r.; P.b.k.; cor. for $^{\bullet}OH$; $k_{obs} = 8.6 \times 10^8$; 98% H abstr.	751002
		14	5×10^8	p.r.; P.b.k. at 280 nm; contribution of $^{\bullet}OH$ reaction $< 10\%$.	720047
128	**Toluene** $O^{\bullet -} + C_6H_5CH_3 \rightarrow OH^- + C_6H_5\dot{C}H_2$	13	2.1×10^9	p.r.; P.b.k. at 258 nm; independent of NaOH concn. (0.05-0.5 mol L^{-1}).	730089

TABLE 9. Rate constants for reactions of the oxide radical ion in aqueous solution—Continued

No.	Reaction	pH	k (L mol^{-1} s^{-1})	Comment	Ref.
129	***p*-Toluidine**				
	$O^{\bullet -} + CH_3C_6H_4NH_2 \rightarrow OH^- +$ $4\text{-}NH_2C_6H_4\dot{C}H_2 + 4\text{-}CH_3C_6H_4\dot{N}H$	14	3.0×10^9	p.r.; P.b.k.; cor. for ·OH; $k_{obs} = 3.1 \times 10^9$. assumed ratio of H abstr. from methyl and amino = 1.	751002
130	***p*-Tolunitrile**				
	$O^{\bullet -} + CH_3C_6H_4CN \rightarrow OH^- +$ $CNC_6H_4\dot{C}H_2$		*1.0 × 10⁹*	Average of 2 values.	
		13.6	1.2×10^9	p.r.; P.b.k. at 275 nm in soln. contg. 0.6 mol L^{-1} NaOH.	79A350
		14	8.8×10^8	p.r.; P.b.k.; cor. for ·OH; $k_{obs} = 9.2 \times 10^8$; 90% H abstr.	751002
131	**Tributyl(methyl)ammonium ion**				
	$O^{\bullet -} + [CH_3(CH_2)_3]_3N^+CH_3 \rightarrow$	13	1.5×10^9	p.r.; C.k., cor. for ·OH reaction; rel. to k(·O$^-$ + 3-HX).	80A346
132	**1,2,3-Trimethylbenzene**				
	$O^{\bullet -} + C_6H_3(CH_3)_3 \rightarrow OH^- +$ $C_6H_3(CH_3)_2\dot{C}H_2$	13	2.1×10^9	p.r.; P.b.k. at 263 nm in N_2O-satd. soln. contg. 0.5 mol L^{-1} NaOH.	751009
133	**1,2,4-Trimethylbenzene**				
	$O^{\bullet -} + C_6H_3(CH_3)_3 \rightarrow OH^- +$ $C_6H_3(CH_3)_2\dot{C}H_2$	13	2.1×10^9	p.r.; P.b.k. at 266 nm in N_2O-satd. soln. contg. 0.5 mol L^{-1} NaOH.	751009
134	**Vinyl sulfonate ion**				
	$O^{\bullet -} + \dot{C}H_2{=}CHSO_3^- \rightarrow$ $^-OCH_2\dot{C}HSO_3^-$	14	3.4×10^8	p.r.; D.k. at 600 nm in N_2-satd. soln.; cor. of <6% for contribution of OH; prod. detd. by esr.	82A328
135	***m*-Xylene**				
	$O^{\bullet -} + C_6H_4(CH_3)_2 \rightarrow OH^- +$ $3\text{-}CH_3C_6H_4\dot{C}H_2$	13	2.2×10^9	p.r.; P.b.k. at 262 nm in N_2O-satd. soln. contg. 0.5 mol L^{-1} NaOH.	751009
136	***o*-Xylene**				
	$O^{\bullet -} + C_6H_4(CH_3)_2 \rightarrow OH^- +$ $2\text{-}CH_3C_6H_4\dot{C}H_2$	13	1.8×10^9	p.r.; P.b.k. at 261 nm in N_2O-satd. soln. contg. 0.5 mol L^{-1} NaOH.	751009
137	***p*-Xylene**				
	$O^{\bullet -} + C_6H_4(CH_3)_2 \rightarrow OH^- +$ $4\text{-}CH_3C_6H_4\dot{C}H_2$	13	1.8×10^9	p.r.; P.b.k. at 268 nm in N_2O-satd. soln. contg. 0.5 mol L^{-1} NaOH.	751009

[a] Unrecommended value because of deficiencies in the method. The value is included since it is the only reported data on the substrate.

[b] Discrepancy in these data. No recommendation.

TABLE 10. Rate constants for reactions of e_{aq}^-, H and OH with macromolecules and other molecules in heterogeneous systems

No.	Radical	k (L mol^{-1} s^{-1})	pH	Method	Comment	Ref.
1	**Agarose**					
1.1	e_{aq}^-	4.7×10^7		p.r.	D.k. at 600 nm in 1% agarose gel.; (cor. for I).	80A116
1.2	·OH	1.5×10^8		p.r.	C.k. with SCN^- in N_2O-satd. 1% agarose gel.	80A116
2	**Albumin**					
2.1	e_{aq}^-	6.5×10^9	7.8	p.r.	D.k. at 650 nm in soln. contg. 10^{-3} mol L^{-1} phosphate buffer with or without 0.1 mol L^{-1} OH scavenger; $k = 1.5 \times 10^{10}$ at pH 5.8; faster reaction at lower pH probably due to positively charged groups; bovine serum albumin.	83A083
		8.2×10^9	9.0	p.r.	D.k.; contains 10^{-2} mol L^{-1} formate ion, 10^{-3} mol L^{-1} $Na_2B_4O_7$; human serum albumin; at pH 12 $k = 3.3 \times 10^9$.	700253
2.2	·OH	7.8×10^{10}	7	γ-r.	C.k., human serum albumin; rel. to k(·OH + 5-MeU).	81G199
3	**Alcohol dehydrogenase**					
3.1	e_{aq}^-	2.4×10^9	7	p.r.	D.k.	701230
3.2	·OH	1.8×10^{11}		p.r.	C.k.; enzyme from yeast; rel. to k(·OH + ND).	701230
4	**Aldolase**					
4.1	e_{aq}^-	4×10^{10}	7.2	p.r.	D.k. at 700 nm; enzyme from rabbit muscle.	753058
4.2	·OH	1.0×10^{11}	5.5	p.r.	P.b.k. at 330 nm; enzyme from rabbit muscle.	753058
5	**D-Amino acid oxidase**					
5.1	e_{aq}^-	4×10^9	8.3	p.r.	D.k. at 600 nm in deaerated soln. contg. 5×10^{-3} mol L^{-1} phosphate buffer and 0.1 mol L^{-1} *tert*-BuOH.	83A082
6	**1-Aminopyrene**					
6.1	e_{aq}^-	1.4×10^{10}			in SDS soln (micellar); review	770036
7	**Amylopectin**					
7.1	e_{aq}^-	$\sim 4.5 \times 10^7$	7	p.r.	D.k. at 650 nm; based on repeating glucose concn.	79A298
7.2	·OH	6×10^7	7	p.r.	C.k.; based on repeating glucose concn.; degree of polymerization 3000; rel. to k(·OH + SCN^-).	79A298
8	**Amylose**					
8.1	e_{aq}^-	1.7×10^7	7	p.r.	D.k. at 650 nm; based on repeating glucose unit; degree of polymerization 300.	79A298
8.2	·OH	6×10^7		p.r.	C.k.; based on repeating glucose unit concn.; degree of polymerization 300; rel. to k(·OH + SCN^-).	79A298
9	**Apomyoglobin**					
9.1	e_{aq}^-	8×10^9	7.0	p.r.	D.k. in Ar-satd. soln. contg. 0.02 mol L^{-1} *tert*-BuOH.	83A074
10	**Azurin**					
10.1	e_{aq}^-	1.0×10^{11}	7.0	p.r.	D.k. at 550 nm as well as at 625 nm (Cu^{II} ion);. mol wt. 10,000; Pseudomonas azurin.	721003
11	**Bilirubin**					
11.1	e_{aq}^-	7×10^{10}	12	p.r.	D.k. at 700 nm in N_2-satd. soln. contg. 10^{-2} mol L^{-1} NaOH, 10^{-5}-10^{-4} mol L^{-1} bilirubin and 0.3 mol L^{-1} *tert*-BuOH; complex with bovine serum albumin.	771137
12	**Carbonic anhydrase (beef blood)**					
12.1	e_{aq}^-	1.4×10^{10}	7.0	p.r.	D.k. at 650 nm.	81A299
12.2	H·	5.0×10^7	7.5	e.d.	Obs. enzyme inactivation (abs. at 280 nm decreases concurrently); apoenzyme 5 times as reactive.	753142
12.3	·OH	6.5×10^{10}	7.0	p.r.	C.k. in N_2O-satd. soln. contg. 10^{-4} mol L^{-1} KSCN; rel. to k(·OH + SCN^-).	81A299
13	**Carboxymethylcellulose ion**					
13.1	e_{aq}^-	6.5×10^6		p.r.	D.k. at 600 nm; k per equivalent ($-CH_2CO_2^-$); mol. wt. 2.5×10^5.; (cor. for I).	80A116
13.2	·OH	2.0×10^8		p.r.	P.b.k. at 310 nm in 2% CMC satd. with N_2O.	80A116

TABLE 10. Rate constants for reactions in heterogeneous systems—Continued

No.	Radical	k (L mol^{-1} s^{-1})	pH	Method	Comment	Ref.
14	**Carboxypeptidase A**					
	14.1 e_{aq}^-	2.5×10^{10}	7.8	p.r.	D.k. at 650 nm in soln. contg. borate buffer and 0.2 mol L^{-1} Na_2SO_4; M.W. 34,000.	731060
	14.2 •OH	6.9×10^{10}	7.8	p.r.	P.b.k. at 320 nm; contains ~ 15% H reaction product.	731060
15	**β-Carotene**					
	15.1 e_{aq}^-	$\sim 2 \times 10^8$		p.r.	D.k. in soln. contg. 10^{-2} mol L^{-1} Triton X-100 (nonionic micelles); *trans*-Carotene.	80N033
16	**κ-Carrageenan**					
	16.1 e_{aq}^-	2.2×10^7		p.r.	D.k. at 600 nm, matrix is a sol.; (cor. for I).	80A116
		6.1×10^7		p.r.	D.k. at 600 nm in gel, 1% carrageenan and 1% KCl.; (cor. for I).	80A116
	16.2 •OH	2.2×10^8		p.r.	C.k. with SCN^- in N_2O-satd. κ-carrageenan sol; $k = 1.65 \times 10^8$ in κ-carrageenan gel.	80A116
17	**Casein**					
	17.1 e_{aq}^-	3.6×10^9	5.9-7.5	p.r.	D.k. at 550 nm in Ar-satd. soln. contg. 10^{-3} mol L^{-1} phosphate buffer and 0.4 mol L^{-1} *tert*-BuOH; mol. wt. = 28,600.	78A057
18	**Catalase**					
	18.1 e_{aq}^-	2.0×10^{11}	6.0	p.r.	D.k.; first-order d.k. (protein) or p.b.k., $k = 18 \pm 1$ s^{-1}.	721003
		3.7×10^9	>7	p.r.	D.k. at 720 nm; mol. wt. 2.5×10^5	660499
	18.2 •OH	1.4×10^{11}		p.r.	C.k.; mol. wt. = 2.5×10^5; rel. to k(•OH + SCN^-).	660499
19	**Ceruloplasmin**					
	19.1 e_{aq}^-	9×10^{10}	6.0	p.r.	D.k. at 550 nm, as well as p.b.k. at 410 nm ($RSSR^-$) in soln. contg. *tert*-BuOH; human enzyme.	721003
20	**Chloranil**					
	20.1 e_{aq}^-	6.3×10^{10}		p.r.	D.k. at 600 nm in CTAB or DTAC (3.0×10^{10}) or SDS ($7.7\text{-}8.7 \times 10^9$) micelles.	761104
21	**Chondroitin 4-sulfate**					
	21.1 e_{aq}^-	2.6×10^7		p.r.	D.k.; rate per hexose unit; for Chondroitin 4-sulfate I; $k = 1.3 \times 10^7$ for Chondroitin 4-sulfate II.	703081
	21.2 •OH	8.0×10^8		p.r.	C.k.; concn. of polyanion in hexose units; rel. to k(•OH + SCN^-).	703081
22	**Chondroitin 6-sulfate**					
	22.1 e_{aq}^-	4.2×10^7		p.r.	D.k.; rate per hexose unit; for Chondroitin 6-sulfate I; $k = 1.1 \times 10^7$ for Chondroitin 6-sulfate II.	703081
	22.2 •OH	6.8×10^8		p.r.	C.k.; concn. in hexose units; rel. to k(•OH + SCN^-).	703081
23	**Chondromucoprotein**					
	23.1 e_{aq}^-	3.7×10^8		p.r.	D.k. at 650 nm; rate per hexose unit.	771144
	23.2 •OH	1.8×10^8		p.r.	C.k.; rel. to k(•OH + SCN^-).	771144
24	**α-Chymotrypsin**					
	24.1 e_{aq}^-	2.0×10^{10}	5.2-7.1	p.r.	D.k. at 550 nm in Ar-satd. soln. contg. 10^{-3} mol L^{-1} phosphate buffer and 0.4 mol L^{-1} *tert*-BuOH; mol. wt. = 24,300.	78A057
		2.5×10^{10}	5.8	p.r.	D.k.; pH dependent, at pH 11.5 $k = 7.0 \times 10^9$.	751080
	24.2 •OH	3.7×10^{10}	6.9	γ-r.	C.k.; rel. to k(•OH + RNO).	773021
		3.5×10^{10}	6.6	γ-r.	C.k.; rel. to k(•OH + RNO).	730548
25	**Collagen**					
	25.1 H•	$\sim 1 \times 10^{10}$		γ-r.	Estd. from increase in gelation time on addn. of scavengers, e.g. acetic acid.	723150
	25.2 •OH	4.0×10^{11}		p.r.	C.k. with SCN^-; reference rate not given; mol. wt. 360,000; Unpubl. data of E.M. Southern and J.V. Davies	683007

TABLE 10. Rate constants for reactions in heterogeneous systems—Continued

No.	Radical	k (L mol^{-1} s^{-1})	pH	Method	Comment	Ref.
26	**Concanavalin A**					
	26.1 e_{aq}^-	2.0×10^{11}	7.1	p.r.	D.k. at 650 nm; 2×10^{-2} mol L^{-1} phosphate buffer; mol. wt. 8×10^4.	78R005
	26.2 ·OH	6.1×10^{10}	7.2	p.r.	P.b.k. at 310 nm in N_2O-satd. soln.	78R005
27	**γ-Cyclodextrin**					
	27.1 e_{aq}^-	4.4×10^8		p.r.	D.k.	77R215
	27.2 ·OH	1.5×10^9		p.r.	C.k.; method of [650387]; rel. to k(·OH + SCN$^-$).	77R215
28	**5-*S*-Cysteinyldopa-melanin**					
	28.1 e_{aq}^-	3.7×10^8	7.4	p.r.	D.k. at 700 nm; melanin obtained by enzymic oxidation of Cysdopa; based on monomer unit of 150.	86A227
	28.2 ·OH	1.1×10^9	7.4	p.r.	N_2O-satd. soln.; obs. absorbance changes of melanin obtained by enzymic oxidation of Cys-dopa; based on monomer unit of 150.	86A227
29	**Cytochrome C**					
	29.1 e_{aq}^-	1.0×10^{10}	7	p.r.	D.k. at 310 to 550 nm in N_2-satd. soln. contg. 2×10^{-3} mol L^{-1} phosphate-0.16 mol L^{-1} formate buffer; cytochrome C from yeast (Hansenula anomala).	86A394
		3.0×10^{10}	~7	p.r.	D.k. at 600 nm in soln. contg. *tert*-BuOH and 1-3 x 10^{-5} mol L^{-1} cyt C.	79A312
		4.5×10^{10}	7.2	p.r.	D.k. at 650 nm, as well as d.k. at 416 nm, in soln. contg. 3.3×10^{-3} mol L^{-1} phosphate and 0.1 mol L^{-1} MeOH; at pH 11 $k \approx 8 \times 10^9$.	751113
		6.6×10^{10}	6.5	p.r.	D.k. (either reactant) in soln. contg. 0.1 mol L^{-1} *tert*-BuOH; horse heart cyt C, Ar-satd.	731145
		3.3×10^{10}	8.5	p.r.	D.k. at 700 nm, as well as p.b.k.; $k_{obs} = 2.6 \times 10^{10}$.	721002
	29.2 H·	2.8×10^{10}	2.0	p.r.	P.b.k. at 600-750 or 440-450 nm; obs. intermediate ($\epsilon_{750} \geq 3300$ L mol^{-1} cm^{-1}) which decayed producing Fe^{2+} cyt c; at higher pH conversion is to Fe^{2+} cyt c directly.	771128
		1.0×10^{10}	3.0, 6.7	p.r.	P.b.k. at 550 and 460 nm; soln. contg. *tert*-BuOH.	741183
	29.3 ·OH	1.4×10^{10}		p.r.	P.b.k. at 550 nm; radical formn. followed by intramololecular redn. → cyt C (Fe^{2+}).	721002
30	**Cytochrome C_2**					
	30.1 e_{aq}^-	6.6×10^{10}	6.5	p.r.	D.k. (either reactant) in soln. contg. 0.1 mol L^{-1} *tert*-BuOH; Ar-satd.	731145
31	**Cytochrome C_3**					
	31.1 e_{aq}^-	2×10^{10}	8.1	p.r.	D.k. in soln. contg. formate ion.	78A232
32	**Cytochrome C, acetylated**					
	32.1 e_{aq}^-	2.0×10^{10}		p.r.	D.k. at 600 nm in soln. contg. *tert*-BuOH and 1-3 × 10^{-5} mol L^{-1} Ac-cyt C.	79A312
33	**Cytochrome C, carboxymethylated**					
	33.1 e_{aq}^-	3.3×10^{10}	~7	p.r.	D.k. at 600 nm in soln. contg. *tert*-BuOH and 1-3 × 10^{-5} mol L^{-1} Cxm-cyt C.	79A312
34	**Cytochrome C (ferro)**					
	34.1 e_{aq}^-	3.0×10^{10}	7.4	p.r.	D.k. at 650 nm in Ar-satd. soln. contg. 2×10^{-3} mol L^{-1} phosphate buffer and 1.0 mol L^{-1} *tert*-BuOH; pH effect.	771009
		1.9×10^{10}	6.7	p.r.	D.k. at 600, 640 and 660 nm, 5×10^{-3} mol L^{-1} NaH_2PO_4.	741183
	34.2 H·	1.3×10^{10}	3.0	p.r.	D.k. at 330 and 340 nm; soln. contg. *tert*-BuOH.	741183
	34.3 ·OH	$>1 \times 10^{10}$	7	p.r.	D.k. in N_2O-satd. soln.; ~5% e-transfer detd. by γ-r.	81A069
35	**Cytochrome C, succinylated**					
	35.1 e_{aq}^-	4.0×10^{10}	~7	p.r.	D.k. at 600 nm in soln. contg. *tert*-BuOH and 1-3 × 10^{-5} mol L^{-1} Succ-cyt C.	79A312

TABLE 10. Rate constants for reactions in heterogeneous systems—Continued

No.	Radical	k (L mol^{-1} s^{-1})	pH	Method	Comment	Ref.
36	**Cytochrome P-450**					
36.1	e_{aq}^-	3.0×10^{10}	7.3	p.r.	D.k. at 700 nm in soln. contg. 4-5 $\times 10^{-6}$ mol L^{-1} P-450.	79A036
37	**Cytochrome c 551**					
37.1	e_{aq}^-	1.0×10^{11}	6.0	p.r.	D.k. at 550 nm; d.k. (protein) and p.b.k. gave $k = 4 \times 10^{10}$.	721003
38	**Cytochrome c TNBS**					
38.1	e_{aq}^-	8×10^{10}	6.0	p.r.	D.k. at 550 nm as well as p.b.k. (TNBS = 2,4,6-trinitrobenzenesulfonate).	721003
39	**Cytochrome c cyanide**					
39.1	e_{aq}^-	1.4×10^{10}	6.0	p.r.	D.k. at 550 nm; p.b.k. gave $k = 1 \times 10^{10}$.	721003
40	**Deoxyribonuclease I**					
40.1	·OH	$\sim 7 \times 10^{10}$		γ-r.	C.k.; from graph; mol wt. ~ 5 x 10^4; rel. to k(·OH + RNO).	76A247
41	**Deoxyribonucleic acid**					
41.1	e_{aq}^-	1×10^8	6.5	p.r.	D.k. in soln. contg. *tert*-BuOH; k per nucleotide.	751207
		1.4×10^8	7	p.r.	D.k.; k per base unit.	710375
41.2	H·	6×10^7	7-8	γ-r.	C.k.; mol. wt. = 5×10^6; k per base unit; rel. to k(·H + DCO_2^-).	683038
41.3	·OH	4×10^8	7	p.r.	P.b.k. at 340 nm; k per base unit.	731071
		5.2×10^8		p.r.	D.k. as well as p.b.k. at 400 nm; rate in terms of nucleotide concn. (mol. wt. 360).	733016
		8×10^8	7.5	p.r.	P.b.k. at 310 and 420 nm; 10^{-3} mol L^{-1} phosphate buffer; k per nucleotide base group.	690018
		6×10^8	7	p.r.	P.b.k.; obs. transients at 400 (pH = 7) and 320 (pH = 12.4) nm; assume nucleotides (mol. wt. 350) react independently; same value at pH 12.4.	680312
		$\sim 2.5 \times 10^8$		p.r.	C.k.; k based on nucleotide concn.; rel. to k(·OH + SCN^-).	680845
42	**Dextran**					
42.1	·OH	$\sim 1 \times 10^8$	7	p.r.	C.k. with SCN^-, BzO^-, RNO; k varies with chain length; k per monomer unit.	700394
43	**Dextran sulfate**					
43.1	e_{aq}^-	$< 7 \times 10^6$		p.r.	D.k.; k calcd. per hexose unit.	703081
44	**α-Dextrin**					
44.1	e_{aq}^-	$\sim 6.3 \times 10^7$	7	p.r.	D.k. at 640 nm in deaerated soln.; based on repeating unit concn.	79A298
44.2	·OH	8.8×10^8		p.r.	C.k.; based on repeating unit; rel. to k(·OH + SCN^-).	79A298
45	**β-Dextrin**					
45.1	e_{aq}^-	$\sim 9.0 \times 10^7$	7	p.r.	D.k.; based on repeating unit concn.	79A298
45.2	·OH	7.6×10^8	7	p.r.	C.k.; based on repeating unit; rel. to k(·OH + SCN^-).	79A298
46	**γ-Dextrin**					
46.1	e_{aq}^-	$\sim 9.0 \times 10^7$	7	p.r.	D.k.; based on repeating unit concn.	79A298
46.2	·OH	3.4×10^8	7	p.r.	C.k.; based on repeating unit; rel. to k(·OH + SCN^-).	79A298
47	**Di-*tert*-butylnaphthalenesulfuric acid**					
47.1	e_{aq}^-	1.7×10^9		p.r.	D.k., lecithin vesicles.	78A096
48	**Dipalmitoyl-L-α-phosphatidyl choline**					
48.1	·OH	4.1×10^8		p.r.	C.k. with SCN^-, reference rate not given; (vesicles).	78A096

TABLE 10. Rate constants for reactions in heterogeneous systems—Continued

No.	Radical	k (L mol^{-1} s^{-1})	pH	Method	Comment	Ref.
49	**β,γ-Distearoyl-L-α-phosphatidyl choline (Lecithin)**					
	49.1 ·OH	5.1×10^8		p.r.	P.b.k.; (vesicles); c.k. with $Fe(CN)_6^{4-}$ or SCN^- gave same k.	78A096
50	**Dodecyl sulfate, sodium salt**					
	50.1 e_{aq}^-	$<2 \times 10^5$	10	p.r.	D.k.; concn. 5×10^{-2} mol L^{-1}	710586
51	**Dopa-melanin**					
	51.1 e_{aq}^-	2.8×10^8	7.4	p.r.	D.k. at 700 nm; melanin obtained by autoxidation of DL-dopa; melanin by enzymic oxidation gave $k = 0.6 \times 10^8$ and natural sepia melanin gave $k = 1 \times 10^9$; based on monomer unit of 150.	86A227
	51.2 ·OH	1.5×10^9	7.4	p.r.	N_2O-satd. soln.; obs. absorbance changes of melanin obtained by autoxidation of dopa; based on monomer unit of 150.	86A227
52	**Ferredoxin, 2Fe-2S(o)**					
	52.1 e_{aq}^-	9.7×10^9	~7	p.r.	D.k. at 720 nm as well as at 420 nm (protein); ~100% efficiency; 2Fe-2S, oxidized protein from parsley in Ar-satd. soln. contg. 0.1-0.2 mol L^{-1} *tert*-BuOH and $NaClO_4$.	82A359
		9.4×10^9	7.1	p.r.	D.k. at 700 nm in N_2-purged soln. contg. 1 mol L^{-1} *tert*-BuOH and 0.01 mol L^{-1} phosphate; spinach ferredoxin; further redn. $k = 8.3 \times 10^2$ s^{-1} was obs.	81A279
53	**Ferredoxin, 8Fe-8S(oo)**					
	53.1 e_{aq}^-	4.4×10^9	~7	p.r.	D.k. at 720 nm as well as at 420 nm(protein); ~100% efficiency; 8Fe-8S oxidized protein from C. pasteurianum in Ar-satd. soln. contg. 0.1-0.2 mol L^{-1} *tert*-BuOH and $NaClO_4$.	82A359
		3.4×10^{10}		p.r.	D.k. at 720 nm, the intermediate which is formed decays to 8-$Fe_{ox.,red.}$ with $k = 1.1 \times 10^3$ s^{-1}	79A400
54	**Gelatin**					
	54.1 e_{aq}^-	6.4×10^{10}	5.97	p.r.	D.k. at 720 nm; at pH 11.12 $k = 2.6 \times 10^{10}$.	673005
	54.2 ·OH	9.1×10^{10}		p.r.	C.k. with SCN^-; reference rate not given; mol. wt. 100,000; unpubl. data of E.M. Southern and J.V. Davies	683007
55	**Glycogen**					
	55.1 e_{aq}^-	$\sim 1.1 \times 10^7$		p.r.	D.k. at 650 nm in deaerated soln.; based on repeating unit concn.	79A298
	55.2 ·OH	1.8×10^8		p.r.	C.k., based on repeating unit concn.; degree of polymerization 3000; rel. to k(·OH + SCN^-).	79A298
56	**Heme-peptide**					
	56.1 e_{aq}^-	1.5×10^{11}	6.0	p.r.	D.k.; cytochrome C deriv.; p.b.k. gave $k = 1.0 \times 10^{11}$.	721003
57	**Hemoglobin**					
	57.1 e_{aq}^-	1.6×10^{10}		p.r.		78A471
		4.3×10^{10}	6.2	p.r.	D.k. at 700 nm in soln. contg. 0.1 mol L^{-1} MeOH and 0.1 mol L^{-1} NaCl; p.b.k. at 462 nm gave $k = 5.4 \times 10^{10}$.	761034
	57.2 H·	7.6×10^{10}	6.7	γ-r.	C.k. in soln. contg. 1 mol L^{-1} KH_2PO_4 and 1% hemoglobin (1.55×10^{-5} mol L^{-1} tetramer); rel. to k(H· + EtOH).	84A463
58	**Heparin**					
	58.1 e_{aq}^-	2.2×10^7		p.r.	D.k.; rate calcd. per hexose unit; $k = 1 \times 10^7$ for desulfated heparin.	703081
	58.2 ·OH	3.7×10^8		p.r.	C.k.; concn. of polyanion in hexose units; rel. to k(·OH + SCN^-).	703081
59	**Heparin, *N*-desulfated**					
	59.1 e_{aq}^-	1×10^7		p.r.	D.k.; rate calcd. per hexose unit.	703081

TABLE 10. Rate constants for reactions in heterogeneous systems—Continued

No.	Radical	k (L mol^{-1} s^{-1})	pH	Method	Comment	Ref.
59	**Heparin, *N*-desulfated**—Continued					
	59.2 ·OH	8.0×10^8		p.r.	C.k.; concn. of polyanion in hexose units; rel. to k(·OH + SCN^-).	703081
60	**α-Hexadecyl-ω-hydroxypolyoxyethylene**					
	60.1 H·	1.4×10^8		p.r.	C.k. with Ag^+ in N_2O-contg. soln.; obs. Ag_2^+ at 310 nm; rel. to k(·H + Ag^+).	78A245
	60.2 ·OH	2.6×10^9		p.r.	C.k. with micelles; rate per tenside; rel. to k(·OH + SCN^-).	78A245
61	**Hexadecylpyridinium chloride**					
	61.1 e_{aq}^-	5.2×10^9		p.r.	D.k.; in lecithin vesicles	78A096
62	**Hexadecyltrimethylammonium bromide**					
	62.1 e_{aq}^-	$<9 \times 10^5$	10	p.r.	D.k. at 600 nm in soln. contg. 0.1 mol L^{-1} MeOH; concn. 5×10^{-2} mol L^{-1}.	710586
63	**High-potential iron-sulfur protein (Chromatium vinosum D), oxidized**					
	63.1 e_{aq}^-	1.7×10^{10}	~7	p.r.	D.k. at 720 nm as well as 420 nm (Chromatium v. high potential Fe-S protein); ~50% efficiency; Ar-satd. soln. contg. *tert*-BuOH and $NaClO_4$.	82A359
64	**High-potential iron-sulfur protein (Chromatium vinosum D), reduced**					
	64.1 e_{aq}^-	2.1×10^{10}	~7	p.r.	D.k. at 720 nm as well as 420 nm(Chromatium v. high potential Fe-S protein); ~50% efficiency; Ar-satd. soln. contg. *tert*-BuOH and $NaClO_4$.	82A359
65	**Hyaluronic acid**					
	65.1 e_{aq}^-	1.4×10^8		p.r.	D.k.; rate calcd. per hexose unit.	703081
	65.2 ·OH	7×10^8		p.r	C.k.; concn. of polyanion in hexose units; rel. to k(·OH + SCN^-).	680352 703081
66	**Hyaluronic acid, sulfated**					
	66.1 e_{aq}^-	1.7×10^7		p.r.	D.k.; rate calcd. per hexose unit.	703081
	66.2 ·OH	6.0×10^8		p.r.	C.k.; concn. of polyanion in hexose units; rel. to k(·OH + SCN^-).	703081
67	**Inulin**					
	67.1 e_{aq}^-	$\sim 1.3 \times 10^7$	7	p.r.	D.k. at 650 nm in deaerated soln.; based on repeating unit concn.	79A298
	67.2 ·OH	4.5×10^8	7	p.r.	C.k.; based on repeating unit concn.; degree of polymerization 24; rel. to k(·OH + SCN^-).	79A298
68	**Isocitrate dehydrogenase**					
	68.1 e_{aq}^-	4×10^{10}	7	p.r.	D.k. at 650 nm.	82A318
	68.2 ·OH	1.7×10^{10}		p.r.	P.b.k. at 310 nm in soln. contg. N_2O; enzyme from pig heart.	82A318
69	**Keratan sulfate**					
	69.1 e_{aq}^-	3.0×10^7		p.r.	D.k.; rate calcd. per hexose unit.	710067
	69.2 ·OH	7.8×10^8		p.r.	C.k.; rel. to k(·OH + SCN^-).	710067
70	**Laccase**					
	70.1 e_{aq}^-	1×10^{10}	6.0	p.r.	D.k. at 500-700 nm.	82A422
		8.5×10^{10}	6	p.r.	D.k. at 550 nm; contains 4 Cu^{II} ions; d.k. of Cu^{II} at 610 nm gave $k = 1.5 \times 10^8$.	721003
	70.2 ·OH	$\sim 1 \times 10^{10}$	6.0	p.r.	Transient adduct obs. in soln. contg. 0.01 mol L^{-1} potassium phosphate; addn. followed by Cu^{2+} redn.; complex kinetics.	82A422
71	**Lactate dehydrogenase**					
	71.1 e_{aq}^-	2.4×10^{11}	7.2	p.r.	D.k. at 650 nm; 48 amino acids per tetramer	771132
	71.2 ·OH	2.1×10^{11}	7.2	p.r.	P.b.k. at 340 nm in N_2O-satd. soln. contg. 3.1-12.6 $\times$ 10^{-6} mol L^{-1} tetramer.	771132
72	**Laminarin**					
	72.1 e_{aq}^-	$\sim 1.0 \times 10^7$		p.r.	D.k. at 650 nm; based on repeating unit concn.	79A298

TABLE 10. Rate constants for reactions in heterogeneous systems—Continued

No.	Radical	k (L mol^{-1} s^{-1})	pH	Method	Comment	Ref.
72	**Laminarin—Continued**					
	72.2 ·OH	4.0×10^8		p.r.	C.k.; based on repeating unit concn.; degree of polymerization 30; rel. to k(·OH + SCN$^-$).	79A298
73	**Lysine vasopressin**					
	73.1 e_{aq}^-	1.2×10^{10}	~6	p.r.	D.k., as well as p.b.k. at 420 nm in unbuffered soln. contg. 0.4 mol L^{-1} *tert*-BuOH.	741102
	73.2 H·	8.0×10^9	1.2	p.r.	P.b.k. at 340 nm in soln. contg. 1 mol L^{-1} *tert*-BuOH and 3×10^{-4} mol L^{-1} LVP, and $HClO_4$; transient attributed to H adduct of phenylalanine.	741102
	73.3 ·OH	1.4×10^{10}	~6	p.r.	P.b.k. at 325 nm in unbuffered soln. contg. 2×10^{-4} mol L^{-1} LVP.	741102
74	**Lysolecithin**					
	74.1 e_{aq}^-	3.8×10^8			Micelles.	770036
75	**Lysozyme**					
	75.1 e_{aq}^-	4.6×10^{10}	4.3 8.4	p.r.	D.k. at 550 nm in Ar-satd. soln. contg. 10^{-3} mol L^{-1} phosphate buffer and 0.4 mol L^{-1} *tert*-BuOH; mol. wt. = 13,960.	78A057
		3.1×10^{10}	7.4	p.r.	D.k. at 720 nm as well as p.b.k. at 420 nm; concn. 0.8 mg/ml.	693039
		5.2×10^{10}	5.6	p.r.	D.k. at 650 nm; mol. wt. 15,000.	680683
		7.5×10^{10}	6.2	p.r.	D.k. at 720 nm; mol. wt. 15,000; at pH 11.8 $k = 8.3 \times 10^9$.	673005
	75.2 ·OH	4.9×10^{10}	7	p.r.	P.b.k. at 350 nm.	693039
		3.4×10^{10}	7		C.k.; rel. to k(·OH + *tert*-BuOH).	693039
		5.2×10^{10}	5.6	p.r.	C.k.; mol. wt. 15,000; k is upper limit; rel. to k(·OH + SCN$^-$).	680683
76	**Methemerythrin**					
	76.1 e_{aq}^-	2.0×10^9	8.2	p.r.	D.k. at 550-600 nm in 1% *tert*-BuOH soln.; Methemerythrin from P. gouldii; $k = 3.9 \times 10^9$ for Methemerythrin from T. pyroides.	79A204
77	**Methemoglobin**					
	77.1 e_{aq}^-	1.6×10^{10}	6-7	p.r.	Obs. change in absorption at 559 nm in soln. contg. 1 mol L^{-1} MeOH and Inositol hexakisphosphate.	78A471
		4.2×10^{10}	6.2	p.r.	D.k. at 600 nm as well as p.b.k. at 430, 435 and 440 nm in Ar-satd. soln. contg. 0.1 mol L^{-1} NaCl; calcd. for tetramer.	761034
		6.5×10^{10}	6.8	p.r.	D.k. at 575 nm in soln. contg. *tert*-BuOH; calcd. for tetramer.	761137
		5.8×10^{10}	7.3	p.r.	D.k. at 650 nm as well as p.b.k. at 435 nm in soln. contg. 0.1 mol L^{-1} MeOH and 3×10^{-3} mol L^{-1} phosphate buffer; pH dependent.	743170
78	**Methemoglobin azide**					
	78.1 e_{aq}^-	4.4×10^{10}	6.2	p.r.	D.k. at 700 nm in soln. contg. 0.1 mol L^{-1} NaCl and 0.1 mol L^{-1} MeOH; p.b.k. at 438 nm gave $k = 4.1 \times 10^{10}$.	761034
79	**Methemoglobin cyanide**					
	79.1 e_{aq}^-	4.7×10^{10}	6.2	p.r.	D.k. at 700 nm in soln. contg. 0.1 mol L^{-1} MeOH and 0.1 mol L^{-1} NaCl; p.b.k. at 438 nm gave $k = 3.7 \times 10^{10}$.	761034
80	**Metmyoglobin**					
	80.1 e_{aq}^-	2.5×10^{10}	7.0	p.r.	D.k. in Ar-satd. soln. contg. 0.02 mol L^{-1} *tert*-BuOH.	83A074
		3.1×10^{10}	7.3	p.r.	D.k. (ferriMb) in Ar-satd. soln. contg. 0.1 mol L^{-1} *tert*-BuOH.	82G011
		6.0×10^{10}	8.2	p.r.	D.k. at 500-600 nm in 1% *tert*-BuOH.	79A204
		2.5×10^{10}	6.8	p.r.	D.k. at 575 nm in soln. contg. *tert*-BuOH.	761137

TABLE 10. Rate constants for reactions in heterogeneous systems—Continued

No.	Radical	k (L mol^{-1} s^{-1})	pH	Method	Comment	Ref.
80	**Metmyoglobin—Continued**					
		4.3×10^{10}	6.7	p.r.	D.k. at 650 nm as well as p.b.k. at 435 nm. pH dependent.	743170
	80.2 ·OH	$\sim 8 \times 10^{9}$	7.3	p.r.	D.k. at 560 nm in N_2O-satd. soln.	82G011
81	**Metmyohemerythrin**					
	81.1 e_{aq}^-	4.5×10^{9}	8.2	p.r.	D.k. in 1% *tert*-BuOH soln.; substrate from T. pyroides.	79A204
82	**Monomethionin-sulfoxidchymotrypsin**					
	82.1 ·OH	3.7×10^{10}	6.9	γ-r.	C.k.; rel. to k(·OH + RNO).	773021
83	**Myoglobin**					
	83.1 e_{aq}^-	1.6×10^{10}	7.0	p.r.	D.k. in Ar-satd. soln. contg. 0.02 mol L^{-1} *tert*-BuOH.	83A074
		1.3×10^{10}	~7	p.r.	D.k. at 650 nm in soln. contg. *tert*-BuOH.	76A256
84	**9-Nitroanthracene**					
	84.1 e_{aq}^-	9×10^{10}	10	p.r.	D.k. at 600 nm in CTAB micelles (0.05 mol L^{-1}); $k = 1.5 \times 10^{9}$ in SDS micelles (0.1 mol L^{-1}) and 4×10^{9} in SDS with 0.2 mol L^{-1} Na_2SO_4 added.	751074
85	**Nitrochymotrypsin**					
	85.1 ·OH	3.7×10^{10}	6.9	γ-r.	C.k.; rel. to k(·OH + RNO).	773021
86	**Nitrohexane**					
	86.1 e_{aq}^-	4×10^{9}		p.r.	D.k. at 600 nm in micellar soln.	761104
87	**Nitropyrene**					
	87.1 e_{aq}^-	2.2×10^{9}		p.r.	D.k. at 600 nm as well as p.b.k. at 420 nm in micellar soln. (PEO type).	771148
88	**Oxydiacetyldeuteroperoxidase**					
	88.1 e_{aq}^-	4×10^{10}	7.4	p.r.	D.k. at 600 nm and 420 nm as well as p.b.k. at 370 nm in soln. contg. 10^{-3} mol L^{-1} phosphate buffer, 0.1 mol L^{-1} *tert*-BuOH.	81A326
89	**Oxymyoglobin**					
	89.1 e_{aq}^-	4×10^{10}	7.4	p.r.	D.k. at 600 nm and 410 nm as well as p.b.k. at 450 nm in soln. contg. 10^{-3} mol L^{-1} phosphate buffer and 0.1 mol L^{-1} *tert*-BuOH.	81A326
	89.2 ·OH	$\sim 1 \times 10^{9}$	7.5	p.r.		79A371
90	**Oxytocin**					
	90.1 e_{aq}^-	9×10^{9}	~6	p.r.	D.k. at 720 as well as p.b.k. at 420 nm in unbuffered soln. contg. 0.2 mol L^{-1} *tert*-BuOH.	741102
	90.2 H·	8.9×10^{9}	1.2	p.r.	P.b.k. at 340 nm in soln. contg. 1 mol L^{-1} *tert*-BuOH, 3×10^{-4} mol L^{-1} oxytocin and $HClO_4$; transient attributed to RS· radical from cystine.	741102
	90.3 ·OH	1.3×10^{10}	~6	p.r.	P.b.k. at 330 nm in unbuffered soln. contg. 10^{-4} mol L^{-1} substrate.	741102
91	**Papain**					
	91.1 e_{aq}^-	4.1×10^{10}	6.4	p.r.	D.k. at 700 nm in soln. contg. isobutyl alcohol.	723042
	91.2 ·OH	4.7×10^{10}	6.4	p.r.	P.b.k. at 310-350 nm.	723042
92	**Phenothiazine, conjugate acid**					
	92.1 e_{aq}^-	$< 1 \times 10^{9}$		p.r.	In SDS micelles.	761104
93	**Platinum**					
	93.1 e_{aq}^-	7×10^{9}	5	p.r.	In colloidal Pt hydrosol stabilized by citrate ion.	82N052
94	**Polyacrylate ion**					
	94.1 ·OH	$\sim 3.5 \times 10^{8}$	8.2	p.r.	C.k. with RNO and SCN^-; k depends on chain length; at mol. wt. 9×10^{3} $k = (1 \rightarrow 3) \times 10^{8}$ as pH varies 2 → 8.	731095
95	**Polyadenylic acid**					
	95.1 e_{aq}^-	2.5×10^{8}	7	p.r.	D.k.; mol. wt. 2×10^{5}; k per base unit.	710375
	95.2 ·OH	9×10^{8}	7	p.r.	P.b.k.; $\epsilon_{340} = 2960$ L mol^{-1} cm^{-1}.	731071

TABLE 10. Rate constants for reactions in heterogeneous systems—Continued

No.	Radical	k (L mol^{-1} s^{-1})	pH	Method	Comment	Ref.
95	**Polyadenylic acid**—Continued					
		3.9×10^8	7.3	p.r.	C.k., rate in terms of nucleotide concn., also measured at pH 4.6, 5.9, and 6.3; rel. to k(·OH + SCN^-).	680845
96	**Polyadenylic + uridylic acid**					
	96.1 e_{aq}^-	1.3×10^8	7	p.r.	D.k.; mol. wt. 5×10^5; k per base unit.	710375
	96.2 ·OH	5×10^8	7	p.r.	P.b.k.; $\epsilon_{350} = 1630$ L mol^{-1} cm^{-1}.	731071
97	**Polybrene**					
	97.1 ·OH	1.4×10^9		p.r.		86A034
		1.3×10^9		p.r.	C.k.; based on monomer units; rel. to k(·OH + C_6H_5OH).	84A385
98	**Polycytidylic acid**					
	98.1 ·OH	1.2×10^9	7	p.r.	P.b.k. at 425 nm; $\epsilon = 780$ L mol^{-1} cm^{-1}; mol. wt. $> 10^5$.	731071
99	**Polyethylene oxide**					
	99.1 ·OH	$\sim 3 \times 10^8$		p.r.	C.k.; k depends on concn. and mol. wt. of polymer; n = 460, $k \rightarrow 2 \times 10^9$ with decreasing n; based on monomer concn.; rel. to ferrocyanide or I^-; rel. to k(·OH + $Fe(CN)_6^{4-}$).	731046
		$\sim 5.8 \times 10^7$	7	p.r.	C.k.; k based on monomer unit; varies with chain length; concn. 10^{-4}-10^{-3} mol L^{-1}; rel. to k(·OH + RNO).	700394
		4.0×10^8	7.3	p.r.	C.k. with cysteamine; mol. wt. 6,000; k based on monomer unit of mol. wt. 44; rel. to k(·OH + SCN^-).	690088
100	**Poly(ethylenesulfonate) ion**					
	100.1 e_{aq}^-	4.3×10^7		p.r.	D.k.	680352
	100.2 ·OH	1×10^8		p.r.	C.k.; concn. in monomer units; rel. to k(·OH + SCN^-).	680352
101	**Poly-L-lysine**					
	101.1 e_{aq}^-	7.6×10^9		p.r.	D.k. at 650 nm; k obs. at 10-83 °C; concn. 10^{-5} mol L^{-1}.	78A385
		5.0×10^9		p.r.	D.k. at 720 nm (hydrobromide); concn. based on equivalent negative sites.	682104
102	**Poly(methacrylic acid)**					
	102.1 ·OH	2×10^8	2-4	p.r.	C.k.; at pH 7-8 $k = 8 \times 10^8$; rel. to k(·OH + SCN^-).	80A121
103	**Polyoxyethylene(7.5) *p*-nonylphenyl ether**					
	103.1 ·OH	8.8×10^9		γ-r.	C.k.; rel. to k(·OH + RNO).	84U043
104	**Polyoxyethylene(9), nonylphenyl ether**					
	104.1 e_{aq}^-	1.7×10^7				770036
105	**Polyoxyethylene(10) *p*-nonylphenyl ether**					
	105.1 ·OH	7.7×10^9		γ-r.	C.k.; rel. to k(·OH + RNO).	84U043
106	**Polyoxyethylene(15), nonylphenyl ether**					
	106.1 e_{aq}^-	$< 1 \times 10^6$	10	p.r.	D.k. at 600 nm in soln. contg. 0.1 mol L^{-1} MeOH; concn. 5×10^{-2} mol L^{-1}.	710586
107	**Polyoxyethylene(20) *p*-nonylphenyl ether**					
	107.1 ·OH	1.5×10^{10}		γ-r.	C.k.; rel. to k(·OH + RNO).	84U043
108	**Polyoxyethylene(80) *p*-nonylphenyl ether**					
	108.1 ·OH	2.5×10^{10}		γ-r.	C.k.; rel. to k(·OH + RNO).	84U043
109	**Polyoxyethylene sorbitan monolaurate**					
	109.1 e_{aq}^-	$< 1 \times 10^7$	7	p.r.	D.k.	733013
110	**Poly(styrenesulfonate) ion**					
	110.1 e_{aq}^-	3.6×10^7		p.r.	D.k.	680352
	110.2 ·OH	5.3×10^8		p.r.	P.b.k. at 340 nm.	86A034

TABLE 10. Rate constants for reactions in heterogeneous systems—Continued

No.	Radical	k (L mol^{-1} s^{-1})	pH	Method	Comment	Ref.
110	**Poly(styrenesulfonate) ion—Continued**					
		3.3×10^8		p.r.	C.k.; concn. in monomer units; rel. to k(·OH + SCN^-).	680352
111	**Polyuridylic acid**					
	111.1 e_{aq}^-	7.5×10^8	7	p.r.	D.k.; mol. wt. 2×10^5; k per base unit.	710375
	111.2 H·	7×10^8	2,3	p.r.	P.b.k. at 385 nm in soln. contg. 0.1 mol L^{-1} *tert*-BuOH and $HClO_4$	84A304
	111.3 ·OH	1.5×10^9	7	p.r.	P.b.k. at 380 nm, concn. 60 mg L^{-1}.	82G251
		1.3×10^9	7	p.r.	P.b.k. at 390 nm; $\epsilon_{380} = 920$ L mol^{-1}cm^{-1}.	731071
		1.4×10^9	7	p.r.	C.k.; rate per base unit; rel. to k(·OH + SCN^-).	690571
112	**Poly(vinyl alcohol)**					
	112.1 ·OH	9.2×10^{10}		γ-r.	C.k. in oxygenated soln.; rel. to k(·OH + RNO).	82G220
113	**Poly(vinyl phthalate)**					
	113.1 e_{aq}^-	$\sim 2.4 \times 10^7$		p.r.	Concn. dependent, 1-20 $\times 10^{-3}$ mol L^{-1}.	751157
114	**Polyvinylpyrrolidinone**					
	114.1 e_{aq}^-	3.9×10^7		p.r.		751157
	114.2 ·OH	2.0×10^8		p.r.	C.k.; mol. wt. 16,000; rel. to k(·OH + SCN^-).	81A296
		1.8×10^8		p.r.	D.k. at 350 nm in N_2O-satd. soln.	81A296
		5×10^7	7	p.r.	P.b.k. at 400 nm, as well as c.k. with RNO; k varies with chain length → 2×10^8 (2000 to 100, concn. 10^{-4}-10^{-3} mol L^{-1}) and is per monomer unit.	700394
115	**Protamine sulfate**					
	115.1 e_{aq}^-	5.5×10^9		p.r.	D.k. at 720 nm (concn. based on equivalent negative sites)	682104
116	**Protoporphyrin IX-Myoglobin complex**					
	116.1 e_{aq}^-	2.0×10^{10}	7.0	p.r.	D.k. in Ar-satd. soln. contg. 0.02 mol L^{-1} *tert*-BuOH.	83A074
117	**Pyrene**					
	117.1 e_{aq}^-	7×10^7		p.r.	D.k. in lecithin vesicles	78A096
		1.5×10^{11}		p.r.	D.k.; solubilized in dioctadecyl dimethyl ammonium chloride vesicles.	78A264
		1.2×10^{10}		p.r.	D.k.; solubilized in lecithin vesicles; concn. dependent.	78A264
		9×10^8	5.4	p.r.	D.k. at 600 nm as well as p.b.k. at 495 nm in PEO micelles; $k = 4 \times 10^{10}$ in CTAB-PEO micelles.	771148
		1.2×10^{11}		p.r.	P.b.k. at 493 nm in CTAB soln. (0.2 mol L^{-1}), k concn. independent.	751017
		1.1×10^{10}		p.r.	D.k. in polyoxyethylene(23)dodecanol soln.; $k = 3.3 \times 10^{10}$ in CTAB soln.; $k < 5.0 \times 10^7$ in SDS soln.	731004
	117.2 ·OH	1.7×10^9		p.r.	P.b.k.; 5×10^{-5} mol L^{-1} pyrene in 2×10^{-3} mol L^{-1} distearoyl lecithin (vesicles); above 55 °C $k = 6.4 \times 10^{10}$; k is concn. dependent.	78A096
118	**1-Pyrenebutyrate ion**					
	118.1 e_{aq}	1.5×10^9		p.r.	D.k. at 600 nm as well as p.b.k. at 495 nm in PEO micelles.	771148
	118.2 ·OH	7.5×10^9		p.r.	P.b.k.; 10^{-4} mol L^{-1} PBA in 2×10^{-3} mol L^{-1} distearoyl lecithin (vesicles); above 55 °C $k = 2 \times 10^{10}$.	78A096
119	**1-Pyrenecarboxaldehyde**					
	119.1 e_{aq}^-	6×10^7		p.r.	D.k. in lecithin vesicles.	78A096
120	**Pyrenesulfonate ion**					
	120.1 ·OH	5.6×10^9		p.r.	P.b.k.; 10^{-4} mol L^{-1} pyrenesulfonic acid in 2×10^{-3} mol L^{-1} distearoyl lecithin (vesicles); at 55 °C $k = 1.4 \times 10^{10}$.	78A096

TABLE 10. Rate constants for reactions in heterogeneous systems—Continued

No.	Radical	k (L mol^{-1} s^{-1})	pH	Method	Comment	Ref.
121	**10-(1-Pyrenyl)dodecanoate ion**					
	121.1 e_{aq}^-	1.3×10^9		p.r.	D.k. at 600 nm as well as p.b.k. at 495 nm in PEO micelles.	771148
122	**Rennin**					
	122.1 ·OH	2.1×10^{10}	6.4	X-r.	Effects of methanol, malonate, glycerol, ethanol, glycylglycine, formate, glucose and adenine on enzyme inactivation.	733030
123	**Retinal**					
	123.1 e_{aq}^-	2.9×10^9		p.r.	D.k. at 650 nm; soln. cont. 4×10^{-2} mol L^{-1} Triton X-100; in CTAB, Triton X-100 + CTAB, and Triton X-100 + SDS, $k = 75$, 16 and 1.7×10^9, resp.	85B119
124	**Riboflavine binding protein**					
	124.1 e_{aq}^-	1.4×10^{10}	7.0	p.r.	D.k. as well as p.b.k. in soln. contg. 0.5 mol L^{-1} *tert*-BuOH and borate and phosphate buffer; products are flavin semiquinone and disulfide radical.	83R049
125	**Ribonuclease**					
	125.1 e_{aq}^-	2.1×10^{10}	4.3 8.5	p.r.	D.k. at 550 nm in Ar-satd. soln. contg. 10^{-3} mol L^{-1} phosphate buffer and 0.4 mol L^{-1} *tert*-BuOH; mol. wt. = 12,640.	78A057
		1.0×10^{10}	7.1	p.r.	D.k.	723079
		1.3×10^{10}	6.8	p.r.	D.k. at 720 nm.	673005
	125.2 H·	1.5×10^{10}	2.2-6.7	p.r.	P.b.k.	723094
	125.3 ·OH	2.4×10^{10}	~7	p.r.	P.b.k.; at pH 3.5 and 5.6 $k = 3.6 \times 10^{10}$ and 1.9×10^{10}, resp.	723079
		2.6×10^{10}		p.r.	C.k. with SCN^- at 20 and 60° C., resp.; mol. wt. 13,683; reference rate not given; at 60 °C $k = 5.2 \times 10^{10}$.	683007
126	**Ribonuclease-S-peptide**					
	126.1 H·	9.9×10^9	6.6	p.r.	P.b.k. at 320 nm in soln. contg. 0.1 mol L^{-1} *tert*-BuOH and $HClO_4$ or 0.3 mol L^{-1} $H_2PO_4^-$; at pH 2.2 $k = 6.9 \times 10^9$.	731028
127	**Ribonuclease-S-protein**					
	127.1 H·	1.5×10^{10}	2.2, 6.6	p.r.	P.b.k. at 380 nm (pH 2.2) and 335 nm (pH 6.6) in soln. contg. 0.1 mol L^{-1} *tert*-BuOH and $HClO_4$ or 0.3 mol L^{-1} $H_2PO_4^-$.	731028
128	**Ribonucleic acid**					
	128.1 e_{aq}^-	3.1×10^9	6.5	p.r.	D.k. at 650 nm in soln. contg. 10^{-2} mol L^{-1} glucose.	78A153
	128.2 ·OH	9.3×10^8	7	γ-r.	C.k.; rel. to k(·OH + RNO).	80A313
		1.9×10^9	6.5	γ-r.	C.k.; rel. to k(·OH + RNO).	690580
129	**Starch**					
	129.1 ·OH	2.9×10^7	6.5	γ-r.	C.k.; cornstarch; rel. to k(·OH + RNO).	690580
		2.5×10^7	6.5	γ-r.	C.k.; waxy starch; rel. to k(·OH + RNO).	690580
130	**Stellacyanin**					
	130.1 e_{aq}^-	2.3×10^{10}		p.r.	D.k. in Ar-satd. soln. contg. 10^{-5} mol L^{-1} Cu(II)-protein and 0.1 mol L^{-1} *tert*-BuOH.	731145
131	**Subtilisin**					
	131.1 e_{aq}^-	1.8×10^{10}	7.3	p.r.	D.k. at 600 nm in soln. contg. 10^{-1} mol L^{-1} *tert*-BuOH; subtilisin Novo does not contain sulfide bridges.	761012
132	**Subtilisin BPN'**					
	132.1 e_{aq}^-	2.1×10^{10}		f.p.	D.k.	82R106
133	**Superoxide dismutase**					
	133.1 e_{aq}^-	1.3×10^{10}	7.2	p.r.	D.k. at 650 nm; bovine enzyme; $k = 1.5 \times 10^{10}$ for human enzyme.	743081

TABLE 10. Rate constants for reactions in heterogeneous systems—Continued

No.	Radical	k (L mol^{-1} s^{-1})	pH	Method	Comment	Ref.
133	**Superoxide dismutase**—Continued					
		$\sim 1.1 \times 10^{10}$	~7	p.r.	D.k. at 600 nm in soln. contg. 0.01 mol L^{-1} sodium formate.	721007
	133.2 H·	2.1×10^{10}	3.5	p.r.	P.b.k. at 330 nm in N_2-deaerated soln.; bovine enzyme; $k = 2.0 \times 10^{10}$ for human enzyme.	743081
	133.3 ·OH	5.3×10^{10}	7.2	p.r.	P.b.k. at 330 nm; rate for bovine enzyme; human enzyme gave $k = 4.6 \times 10^{10}$.	743081
134	**1,2,4,5-Tetracyanobenzene**					
	134.1 e_{aq}^-	7.8×10^{10}		p.r.	D.k. at 600 nm in CTAB or DTAC (4.2×10^{10}) micelles or SDS ($2.6\text{-}3.0 \times 10^{10}$).	761104
135	**Transferrin, dicobaltic complex**					
	135.1 e_{aq}^-	1.6×10^{8}		p.r.	Calcd. from fraction Co(III) reduced (obs. at 450 nm) and model including competing reactions, in 0.1 mol L^{-1} *tert*-BuOH.	82A086
136	**Transferrin, dicupric complex**					
	136.1 e_{aq}^-	2.3×10^{8}		p.r.	Calcd. from fraction Cu(II) reduced (obs. at 435 nm) and model including competing reactions, in 0.1 mol L^{-1} *tert*-BuOH.	82A086
137	**Transferrin, diferric complex**					
	137.1 e_{aq}^-	6.1×10^{7}	9	p.r.	Calcd. from fraction Fe(III) reduced (obs. at 470 nm) and model including competing reactions, in 0.1 mol L^{-1} *tert*-BuOH.	82A086
138	**Transferrin, dimanganic complex**					
	138.1 e_{aq}^-	1.9×10^{8}		p.r.	Calcd. from fraction Mn(III) reduced (obs. at 420 nm) and model including competing reactions, in 0.1 mol L^{-1} *tert*-BuOH.	82A086
139	**Triton X-100**					
	139.1 e_{aq}^-	$\sim 5 \times 10^{6}$			2% micellar soln.	83N014
	139.2 ·OH	3.5×10^{9}		p.r.	2% micellar soln.; $k = 6.4 \times 10^{9}$ in 10% soln.	81N146 83N014
140	**Trypsin**					
	140.1 e_{aq}^-	3.0×10^{10}	6.0-8.5	p.r.	D.k. at 550 nm in Ar-satd. soln. contg. 10^{-3} mol L^{-1} phosphate buffer and 0.4 mol L^{-1} *tert*-BuOH; mol. wt. = 24,000; at pH 4.2-5.0 $k = 4.5 \times 10^{10}$.	78A057
		3.9×10^{10}	7-10	p.r.	D.k.	751080
		3.5×10^{10}	~7	p.r.	D.k. at 600 nm as well as p.b.k. at 430 nm.	713069
	140.2 H·	1.4×10^{9}	3	e.d.	Obs. enzyme inactivation; also decrease in abs. at 280 nm.	650068
	140.3 ·OH	8.2×10^{10}	~7	p.r.	P.b.k. at 330 nm, as well as c.k. with glucose.	713069
141	**Trypsinogen**					
	141.1 e_{aq}^-	2.5×10^{10}	~7	p.r.	D.k. at 600 nm as well as p.b.k. at 430 nm.	713069
	141.2 ·OH	1×10^{11}	7.4	p.r.	C.k.; obs. 330 nm abs.; rel. to k(·OH + glucose).	713069
142	**Uracil oligonucleotide**					
	142.1 e_{aq}^-	2.5×10^{9}	7	p.r.	at pH 12 $k = 8 \times 10^{8}$.	680316
	142.2 ·OH	4.3×10^{9}	7	p.r.	D.k. at 270 nm.	690571
		4.0×10^{9}	7	p.r.	C.k.; rate calcd. per nucleotide base; rel. to k(·OH + SCN^-).	690571
143	**Zinc-insulin complex**					
	143.1 e_{aq}^-	$\sim 1 \times 10^{10}$	6.6	p.r.	D.k. at 550 nm; based on monomer concn. at pH 9.0 $k = \sim 4 \times 10^{9}$.	80A204

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14. Indexes to Tables 5-10

14.1. Molecular Formula Index

The index refers to the entry numbers in Tables 5-10. The digit(s) before the period indicate the table number and the digits following the period indicate the entry number within the table. Thus, 6.1 is the first entry in Table 6.

Ag^+ Silver(I) ion *6.1, 7.1, 8.1*
$AgH_6N_2^+$ *Diamminesilver(I) ion 6.2, 8.2*
AlH_3O_3 Trihydroxyaluminum(III) *6.9*
$AlH_4O_4^-$ Aluminate(III) ion *6.10*
Am^{3+} Americium(III) ion 6.15, 8.3
AmO_2^+ Dioxoamericium(V) ion *6.16*
AmO_2^{2+} Dioxoamericium(VI) ion *6.17*
AsF_6^- Hexafluoroarsenate(V) ion *6.20*
$AsHO_2$ Arsenous(III) acid *7.2, 8.4*
$AsHO_4^{2-}$ Hydrogen arsenate(V) ion *6.19*
AsO_2^- Arsenite(III) ion *6.18, 8.5*
$As_2F_8O_2^{2-}$ Octafluorodi-μ-oxodiarsenate(V) ion *6.21*
$AuCl_4^-$ Tetrachloroaurate(III) ion *7.3*
BF_4^- Tetrafluoroborate(III) ion *6.25*
BH_3O_3 Boric acid *6.23, 8.8*
BH_4^- Tetrahydroborate(III) ion *8.7*
$BH_4O_4^-$ Borate ion 8.9
$B_{10}H_{14}$ Decaborane(14) *6.24*
Ba^{2+} Barium ion *6.26*
Br^- Bromide ion *7.4, 8.10, 9.1*
$BrCoH_{15}N_5^{2+}$ Pentaammine(bromo)cobalt(III) ion *6.94, 7.25*
BrHO Hypobromous acid *8.12*
$BrH_{15}N_5Ru^{2+}$ Pentaammine(bromo)ruthenium(III) ion *6.409*
BrO^- Hypobromite ion *6.29, 8.11, 9.2*
BrO_2 Bromine dioxide *5.6*
BrO_2^- Bromite ion *6.30, 8.13, 9.3*
BrO_3^- Bromate ion *6.31, 7.6, 8.14, 9.4*
BrO_4^- Perbromate ion 6.32, 8.15
Br_2 Bromine *6.27, 7.5*
Br_2^- Dibromine radical ion *5.5*
$Br_2CoH_{12}N_4^+$ Tetraamminedibromocobalt(III) ion *7.26*
$Br_2H_{12}N_4Rh^+$ Tetraamminedibromorhodium(III) ion *6.391*
Br_2Hg Mercury(II) bromide *6.236, 8.108*
Br_3^- Tribromine ion *6.28*
$CBrF_3$ Bromotrifluoromethane *6.693*
$CClF_3$ Chlorotrifluoromethane *6.757, 7.287*
CCl_2F_2 Dichlorodifluoromethane *6.831, 7.321*
CCl_3F Trichlorofluoromethane *6.1474, 7.549*
CCl_4 Carbon tetrachloride *6.716, 7.270*
CDO_2^- *d*-Formate ion *7.365*
CF_3I Trifluoroiodomethane *6.1478*
$CHCl_3$ Chloroform *6.741, 7.280, 8.442*
$CHDO_2$ Formic acid-*d* *7.367*
CHD_3O Methanol-d_3 *7.433, 8.881*
CHN Hydrogen cyanide *7.10, 8.20*
CHO_2^- Formate ion *6.954, 7.364, 8.672, 9.75*
CHO_3^- Bicarbonate ion *6.35, 7.9, 8.18*
CH_2Cl_2 Dichloromethane *6.833, 7.322, 8.528*
CH_2I_2 Diiodomethane *6.851*
$CH_2NO_2^-$ *aci*-Nitromethane anion *6.1269, 8.1002*
CH_2N_2 Cyanamide *6.777, 7.291, 8.23*
CH_2O Formaldehyde *6.952, 7.363, 8.671*
CH_2O_2 Formic acid *6.955, 7.366, 8.673*
$CH_2O_6S_2^{2-}$ Methanedisulfonate ion *8.877*
CH_3Cl Chloromethane *6.741a, 7.281*
CH_3ClO_2S Methanesulfonyl chloride *7.431*
CH_3I Iodomethane *6.1102, 7.407*
CH_3NO Formamide *6.953*
CH_3NO_2 Nitromethane *6.1268, 7.460*
$CH_3NO_2^-$ Nitromethane radical ion(1-) *5.21.1*
$CH_3O_3P^{2-}$ Methylphosphonate ion *8.951*
$CH_3O_3S^-$ Methanesulfonate ion *6.1150, 8.879*
$CH_3O_4S^-$ Methylsulfate ion *6.1226, 8.966*
$CH_3O_6S_2^-$ Methanedisulfonate ion, hydrogen *8.878*
CH_3S^- Methyl sulfide ion *8.967*
CH_4 Methane *6.1149, 7.430, 8.876*
CH_4N_2O Urea *6.1496, 7.567, 8.1254*
$CH_4N_2O_2$ Hydroxyurea *6.1083*
CH_4N_2S Thiourea *6.1457, 7.542, 8.1197*
CH_4N_2Se Selenourea *6.1398, 7.513, 8.1147*
CH_4O Methanol *6.1152, 7.432, 8.880, 9.94*
CH_4S Methanethiol *6.1151*
CH_5N Methylamine *6.1172, 8.905*
CH_5NO *N*-Methylhydroxylamine *6.1195*
O-Methylhydroxylamine 6.1197, 8.932
CH_5N_3 Guanidine *6.1038*
CH_6N^+ Methylammonium ion *6.1173, 7.435, 8.906*
CH_6NO^+ *N*-Methylhydroxylammonium ion *6.1196*
O-Methylhydroxylammonium ion *6.1198, 8.933*
CH_6N_2 Methylhydrazine *6.1192*
$CH_6N_3^+$ Guanidine, conjugate acid *7.383*
$CH_7N_2^+$ Methylhydrazinium ion *6.1193*
$CH_{14}CoN_5O^{2+}$ Tetraammineaquacyanocobalt(III) ion *6.105*
$CH_{15}CoN_6^{2+}$ Pentaammine(cyano)cobalt(III) ion *6.106, 7.42*
$CH_{15}CoN_6S^{2+}$ Pentaammine(thiocyanato-*N*)cobalt(III) ion *6.117, 7.45*
$CH_{16}CoN_5O_2^{2+}$ Pentaammine(formato)cobalt(III) ion *6.121, 7.46, 8.52*
CHgN Mercury(I) cyanide *8.106*
CN^- Cyanide ion *6.37, 8.21, 9.5*
CNO^- Cyanate ion *8.24*
CNS^- Thiocyanate ion 6.39, 7.12, 8.26, 9.6
$CN_3O_6^-$ Trinitromethyl ion *6.1487a*
CN_4O_8 Tetranitromethane *6.1440, 7.534*
CO Carbon monoxide *6.33, 7.7, 8.16*
CO_2 Carbon dioxide *6.34, 7.8, 8.17*
CO_3^{2-} Carbonate ion *6.36, 8.19*
CS_2 Carbon disulfide *6.715, 7.269, 8.427*
$C_2AgN_2^-$ Dicyanoargentate(I) ion *6.3*
C_2AuN_2 Dicyanoaurate(I) ion *6.22, 8.6*
$C_2Cl_3O_2^-$ Trichloroacetate ion *6.1472*
C_2Cl_4 Tetrachloroethylene *6.1422, 8.1167*

$C_2D_3O_2^-$ Acetate ion-d_3 *7.173*
$C_2F_3O_2^-$ Trifluoroacetate ion *6.1476*
$C_2HBrClF_3$ 1-Bromo-1-chloro-2,2,2-trifluoroethane *6.678, 7.247*
C_2HCl_3 Trichloroethylene *6.1473, 8.1217*
C_2HD_5O Ethanol-d_5 *8.638*
$C_2HO_3^-$ Glyoxylate ion *7.381*
$C_2HO_4^-$ Oxalate ion, hydrogen *6.1301, 8.1031*
C_2H_2 Acetylene *6.511, 7.179, 8.259*
$C_2H_2BrO_2^-$ Bromoacetate ion *6.673, 7.244, 8.384*
$C_2H_2ClO_2^-$ Chloroacetate ion *6.721, 7.271, 8.434*
$C_2H_2Cl_2$ 1,2-Dichloroethylene *6.832*
trans-1,2-Dichloroethylene *8.526*
Vinylidene chloride *6.1509, 8.1263*
$C_2H_2FO_2^-$ Fluoroacetate ion *6.940, 7.359, 8.665*
$C_2H_2IO_2^-$ Iodoacetate ion *6.1094*
$C_2H_2NO_3^-$ Oxamate ion *6.1303*
$C_2H_2O_2$ Glyoxal *8.754*
$C_2H_2O_3$ Glyoxylic acid *6.1037, 7.382*
$C_2H_2O_4$ Oxalic acid *6.1302, 7.466, 8.1032*
$C_2H_3BrO_2$ Bromoacetic acid *7.245*
C_2H_3Cl Vinyl chloride *6.1508, 8.1262*
$C_2H_3ClO_2$ Chloroacetic acid *6.722, 7.272, 8.435*
$C_2H_3Cl_3O$ 2,2,2-Trichloroethanol *8.1216*
$C_2H_3Cl_3O_2$ Chloral hydrate *6.720, 8.432*
$C_2H_3F_3O$ 2,2,2-Trifluoroethanol *8.1222*
$C_2H_3IO_2$ Iodoacetic acid *8.825*
C_2H_3N Acetonitrile *6.500, 7.176, 8.253, 9.33*
$C_2H_3O_2^-$ Acetate ion *6.496, 7.172, 8.249, 9.32*
$C_2H_3O_2S^-$ Mercaptoacetate ion *6.1452, 8.865*
$C_2H_3O_3^-$ Glycolate ion *6.986, 7.377, 8.715*
$C_2H_3O_3S^-$ Vinyl sulfonate ion *6.1512, 8.1265, 9.134*
C_2H_4 Ethylene *6.929, 7.353, 8.645*
$C_2H_4CdNO_2^+$ Glycinatocadmium(II) ion *6.49*
$C_2H_4CuNO_2^+$ Glycinatocopper(II) ion *6.172*
$C_2H_4D_2O$ Ethanol-d_2 *7.349*
C_2H_4INO Iodoacetamide *6.1093*
$C_2H_4NNiO_2^+$ Glycinatonickel(II) ion *6.316, 8.149*
$C_2H_4NO_2^-$ Glycine, negative ion *6.982, 8.712, 9.78*
$C_2H_4N_2$ Aminoacetonitrile *7.201*
$C_2H_4N_2O_2$ Oxamide *6.1304*
$C_2H_4N_4$ Dicyandiamide *6.834, 7.323, 8.529*
C_2H_4O Acetaldehyde *6.491, 7.169, 8.243*
Ethylene oxide *8.651*
$C_2H_4O_2$ Acetic acid *6.497, 7.174, 8.250*
Glycolaldehyde *6.984*
$C_2H_4O_2S$ Mercaptoacetic acid *7.420, 8.866*
$C_2H_4O_3$ Glycolic acid *6.987, 7.378, 8.716*
C_2H_5Br Bromoethane *6.679, 7.248*
C_2H_5BrO 2-Bromoethanol *6.680, 7.249, 8.386*
C_2H_5Cl Chloroethane *7.277*
C_2H_5ClO 2-Chloroethanol *6.739, 7.278, 8.441*
$C_2H_5ClO_2S$ Ethanesulfonyl chloride *7.347*
C_2H_5I Iodoethane *6.1100*
C_2H_5NO Acetaldoxime *6.492*
Acetamide *6.493, 7.170, 8.244*
N-Methylformamide *6.1188, 8.927*
$C_2H_5NO_2$ Glycine *6.981, 7.375, 8.710*
Glycolamide *6.985, 8.714*
Nitroethane *6.1260, 7.459*
C_2H_5NS Thioacetamide *7.537*
$C_2H_5N_2^+$ Aminoacetonitrile, conjugate acid *7.202*
$C_2H_5N_3O_2$ Biuret *6.671*
C_2H_5O 1-Hydroxyethyl *5.18*
$C_2H_5OS^-$ 2-Hydroxyethylsulfide ion *8.791*
$C_2H_5O_3S^-$ Ethanesulfonate ion *6.915, 8.636*
$C_2H_5O_4S^-$ Ethylsulfate ion *8.662*
C_2H_6 Ethane *7.346, 8.635*
$C_2H_6NO_2^+$ Glycine, conjugate acid *7.376, 8.711*
$C_2H_6NS^-$ Cysteamine, negative ion *6.798*
$C_2H_6N_2O$ 2-Aminoacetamide *6.980, 8.708*
Methylurea *8.971*
C_2H_6O Dimethyl ether *8.593*
Ethanol *7.348, 8.637, 9.72*
C_2H_6OS 2-Mercaptoethanol *6.1140, 7.421, 7.422, 7.423, 8.867*
Dimethyl sulfoxide *6.884, 7.340, 8.614*
$C_2H_6O_2$ Ethyl hydroperoxide *6.932, 8.653*
Ethylene glycol *7.355, 8.648*
$C_2H_6O_4P^-$ Dimethyl phosphate ion *8.607*
C_2H_6S Dimethyl sulfide *6.883, 8.613*
$C_2H_6S_2$ Dimethyl disulfide *8.592*
C_2H_7N Ethylamine *6.925, 8.641*
C_2H_7NO 2-Aminoethanol *6.916*
$C_2H_7NO_4P^-$ Phosphorylethanolamine *8.1075*
$C_2H_7N_2O^+$ 2-Aminoacetamide, conjugate acid *6.979, 8.709*
$C_2H_7O_4P$ Ethyl dihydrogen phosphate *7.352*
$C_2H_8CdN_2^{2+}$ Ethylenediaminecadmium(II) ion *6.42*
$C_2H_8N^+$ Ethylammonium ion *6.927, 8.642*
$C_2H_8NO^+$ 2-Aminoethanol, conjugate acid *7.206*
C_2H_8NS Cysteamine, conjugate acid *6.797, 7.309, 7.310, 8.494*
$C_2H_8N_2$ 1,1-Dimethylhydrazine *6.867, 8.596*
1,2-Dimethylhydrazine *6.868, 8.597*
Ethylenediamine *8.646*
$C_2H_8N_2Ni^{2+}$ Ethylenediaminenickel(II) ion *6.301*
$C_2H_9N_2^+$ 1,1-Dimethylhydrazinium ion *6.869, 8.598*
1,2-Dimethylhydrazinium ion *6.870, 8.599*
$C_2H_{15}Cl_3CoN_5O_2^{2+}$ Pentaammine(trichloroacetato-*O*)cobalt(III) ion *7.50*
$C_2H_{15}CoF_3N_5^{2+}$ Pentaammine(trifluoroacetato)cobalt(III) ion *7.51*
$C_2H_{16}Cl_2CoN_5O_2^{2+}$ Pentaammine(dichloroacetato-*O*)cobalt(III) ion *7.49*
$C_2H_{17}ClCoN_5O_2^{2+}$ Pentaammine(chloroacetato-*O*)cobalt(III) ion *7.48*
$C_2H_{18}CoN_5O_2^+$ (Acetato)pentaamminecobalt(III) ion *6.122, 7.47*
C_2HgN_2 Mercury(II) cyanide *6.239*
$C_2HgN_2S_2$ Mercury(II) thiocyanate *6.240*
C_2N_2 Cyanogen *6.38, 7.11, 8.22*
$C_2NpO_8^{3-}$ Bis(carbonato)dioxoneptunate(V) ion *6.323*

$C_2O_4^{2-}$ Oxalate ion *6.1300, 7.465, 8.1030*
C_3D_6O Acetone-d_6 *8.252*
$C_3HBrN_2O_2S$ 2-Bromo-5-nitrothiazole *6.682*
C_3HD_7O 2-Propanol-d_7 *7.495*
$C_3H_2NO_2^-$ Cyanoacetate ion *8.470, 9.63*
$C_3H_2N_2$ Malononitrile *6.1137, 7.419*
$C_3H_2N_2O_2S$ 4-Nitroisothiazole *6.1267*
$C_3H_2O_4^{2-}$ Malonate ion *6.1134, 8.860, 9.90*
$C_3H_2O_6P^{3-}$ Phosphoenolpyruvate ion *6.1073*
$C_3H_3F_3O$ 1,1,1-Trifluoroacetone *6.1477*
$C_3H_3F_3O_2$ Methyl trifluoroacetate *6.1228*
C_3H_3N Acrylonitrile *6.537, 7.190, 8.279, 9.38*
C_3H_3NO Pyruvonitrile *6.1382*
$C_3H_3NO_2$ Cyanoacetic acid *7.292*
C_3H_3NS Thiazole *6.1448*
$C_3H_3N_3O_2$ 1-Nitropyrazole *6.1282*
2-Nitroimidazole *6.1265*
3-Nitropyrazole *6.1283*
4-Nitroimidazole *6.1266*
5-Azauracil *6.611, 8.345*
6-Azauracil *6.612, 8.346*
$C_3H_3O_2^-$ Acrylate ion *6.535, 8.277, 9.37*
$C_3H_3O_3^-$ 2,3-Dihydroxy-2-propenal, conjugate base *8.563*
Pyruvate ion *6.1381, 8.1130*
$C_3H_3O_4^-$ Hydrogen malonate ion *6.1135*
$C_3H_4BrO_2^-$ 2-Bromopropionate ion *6.690, 7.252, 8.392*
3-Bromopropionate ion *6.691, 7.253, 8.393*
$C_3H_4ClO_2^-$ 2-Chloropropionate ion *6.754, 7.283, 8.450*
3-Chloropropionate ion *6.755, 7.284, 8.451*
$C_3H_4IO_2^-$ 2-Iodopropionate ion *6.1104*
3-Iodopropionate ion *6.1105, 8.831*
$C_3H_4NO_3^-$ *N*-Formylglycine, negative ion *6.958*
$C_3H_4N_2$ Imidazole *6.1085, 8.808*
$C_3H_4N_4O$ 5-Azacytosine *6.608, 8.342*
6-Azacytosine *6.609, 8.343*
C_3H_4O Acrolein *8.275*
Propargyl alcohol *6.1351*
$C_3H_4O_2$ Acrylic acid *6.536, 7.189, 8.278*
$C_3H_4O_3$ 2,3-Dihydroxy-2-propenal *8.564*
$C_3H_4O_4$ Malonic acid *6.1136, 7.418, 8.861*
$C_3H_4O_5$ Tartronic acid *7.523*
$C_3H_5BrO_2$ 2-Bromopropionic acid *7.254*
3-Bromopropionic acid *7.255*
$C_3H_5ClO_2$ 2-Chloropropionic acid *7.285*
3-Chloropropionic acid *7.286*
C_3H_5FO Fluoroacetone *6.941*
C_3H_5N Propionitrile *7.498, 8.1094, 9.113*
C_3H_5NO Acrylamide *6.534, 7.188, 8.276, 9.36*
$C_3H_5N_2^+$ Imidazolium ion *6.1086, 7.401, 8.809*
$C_3H_5O_2^-$ Propionate ion *7.496, 8.1092, 9.112*
$C_3H_5O_2S^-$ 2-Mercaptopropionate ion *6.1142, 8.869*
3-Mercaptopropionate ion *6.1143, 8.870*
$C_3H_5O_3^-$ Lactate ion *6.1114, 8.846*
Methoxyacetate ion *8.884*
C_3H_6 Cyclopropane *7.307*
Propylene *7.499, 8.1098*
C_3H_6ClNO 2-Chloropropionamide *6.752*
3-Chloropropionamide *6.753*
$C_3H_6NO_2^-$ Alanine, negative ion *8.296*
$C_3H_6NO_2S^-$ Cysteine, negative ion *6.801*
$C_3H_6NO_6P$ Phosphoserine *8.1076*
$C_3H_6N_2O_2$ Malonamide *6.1133*
Cycloserine *8.492*
C_3H_6O 1,2-Epoxypropane *8.632*
Acetone *6.498, 7.175, 8.251*
Allyl alcohol *6.571, 7.200, 8.303, 9.39*
Propionaldehyde *6.1352*
$C_3H_6O_2$ 1,3-Dioxolane *8.621*
2,3-Epoxypropanol *8.633*
Ethyl formate *8.652*
Methyl acetate *6.1168, 8.901*
Propionic acid *6.1354, 7.497, 8.1093*
$C_3H_6O_2S$ 3-Mercaptopropionic acid *6.1145, 7.426, 7.427*
Methyl thioglycolate *6.1227, 8.968*
Thiolactic acid *6.1144, 7.424, 7.425*
$C_3H_6O_3$ Lactic acid *6.1115, 7.412, 8.847*
Methyl hydroxyacetate *6.1194*
Trioxane *6.1488, 8.1245*
C_3H_7Br 1-Bromopropane *6.689*
C_3H_7Cl 1-Chloropropane *6.750*
$C_3H_7ClO_2$ 3-Chloro-1,2-propanediol *6.751*
$C_3H_7ClO_2S$ 1-Propanesulfonyl chloride *7.491*
C_3H_7DO 2-Propanol-2-*d* *7.494*
C_3H_7I 1-Iodopropane *6.1103*
C_3H_7N Allylamine *6.572*
C_3H_7NO Acetone oxime *6.499*
Propionamide *6.1353, 8.1091*
N,N-Dimethylformamide *6.865, 8.594*
N-Methylacetamide *6.1167, 8.900*
$C_3H_7NO_2$ β-Alanine *6.561*
1-Nitropropane *6.1281, 7.461*
2-Hydroxypropionamide *6.1082, 8.803*
Alanine *6.547, 8.294*
Methyl 2-aminoacetate *6.1174*
Sarcosine *6.1392*
$C_3H_7NO_2S$ Cysteine *6.799, 8.495*
$C_3H_7NO_3$ Serine *6.1399, 8.1148*
$C_3H_7O_6P$ Glyceraldehyde-3-phosphate *8.704*
C_3H_8 Propane *7.489, 8.1086*
$C_3H_8N^+$ Allylammonium ion *8.304*
$C_3H_8NO_2^+$ β-Alanine, conjugate acid *7.199*
Alanine, conjugate acid *7.198, 8.295*
Methyl 2-aminoacetate, conjugate acid *6.1175*
Sarcosine, conjugate acid *7.512*
$C_3H_8NO_2S^+$ Cysteine, conjugate acid *6.800, 7.311, 7.312, 7.313, 8.496*
$C_3H_8NO_3^+$ Serine, conjugate acid *7.514*
$C_3H_8N_2O$ 1,3-Dimethylurea *8.618*
$C_3H_8N_2S$ 1,3-Dimethylthiourea *8.617*
C_3H_8O 1-Propanol *7.492, 8.1089, 9.110*
2-Propanol *7.493, 8.1090, 9.111*

$C_3H_8OS_2$ Methyl methylthiomethyl sulfoxide *6.1206, 8.942*

$C_3H_8O_2$ 1,2-Propanediol *8.1087*
1,3-Propanediol *7.490, 8.1088*
2-Methoxyethanol *8.888*
Dimethoxymethane *8.579*

$C_3H_8O_3$ Glycerol *7.374, 8.705*

C_3H_9N Isopropylamine *6.1113, 8.842*
Propylamine *6.1355, 8.1096*
Trimethylamine *7.555, 8.1235*

$C_3H_9N_3S$ 2-Mercaptoethylguanidine *6.1141*

$C_3H_9O_4P$ Trimethyl phosphate *6.1487, 8.1242*

$C_3H_9O_6P$ α-Glycerophosphate, dihydrogen *8.706*
β-Glycerophosphate, dihydrogen *8.707*

$C_3H_{10}N^+$ Isopropylammonium ion *8.843*
Propylammonium ion *6.1356, 8.1097*
Trimethylammonium ion *7.556, 8.1236*

$C_3H_{10}NS^+$ 3-Aminopropanethiol, conjugate acid *6.583, 7.208, 7.209*

$C_3H_{10}N_2$ Trimethylhydrazine *6.1483*

$C_3H_{11}N_2^+$ Trimethylhydrazinium ion *6.1484*

$C_3H_{19}CoN_7^{3+}$ Pentaammine(imidazole)cobalt(III) ion *6.93, 8.47*

$C_3H_{20}CoN_5O_2^{2+}$ Pentaammine(propionato-*O*)cobalt(III) ion *7.52*

$C_3NpO_{11}^{4-}$ Tris(carbonato)dioxoneptunate(VI) ion *6.329*

$C_3O_{11}Pu^{4-}$ Tris(carbonato)dioxoplutonate(VI) ion *6.384*

$C_3O_{11}U^{4-}$ Triscarbonatodioxouranate(VI) ion *6.461*

$C_4CdN_4^{2-}$ Tetracyanocadmate(II) ion *6.48*

$C_4CrO_8^-$ *cis*-Bisoxalatochromate(III) ion *6.156*
trans-Bisoxalatochromate(III) ion *6.157*

$C_4CuN_4^{2-}$ Tetracyanocuprate(II) ion *6.171*

$C_4H_2BrO_3^-$ α-Bromotetronate ion *6.692, 8.396*

$C_4H_2N_2O_4$ Alloxan *6.570*

$C_4H_2N_3O_5^-$ 5-Nitrobarbiturate ion *6.1255, 8.994*

$C_4H_2O_4$ Acetylenedicarboxylic acid *7.180*

$C_4H_2O_4^{2-}$ Fumarate ion *6.963, 9.76*
Maleate ion *6.1129, 9.89*

$C_4H_3BrN_2O_2$ 5-Bromouracil *6.694, 7.256, 8.397*

$C_4H_3ClN_2O_2$ 5-Chlorouracil *6.758, 7.288, 8.454*

$C_4H_3FN_2O_2$ 5-Fluorouracil *6.950, 7.362, 8.669*

$C_4H_3IN_2O_2$ 5-Iodouracil *6.1107*

$C_4H_3NO_2S$ 2-Nitrothiophene *6.1287*
3-Nitrothiophene *6.1288*

$C_4H_3N_2O_2^-$ 4,6-Dihydroxypyrimidine anion *8.566*
Maleic hydrazide, conjugate base *6.1132, 8.857*
Uracil, negative ion *6.1495*

$C_4H_3N_2O_3^-$ Barbiturate ion *6.618, 7.221*

$C_4H_3N_3O_4$ 5-Nitrouracil *6.1290, 8.1015*

$C_4H_3O_3^-$ Tetronate ion *6.1443, 8.1190*

$C_4H_3O_4^-$ α-Hydroxytetronate ion *8.806*
Fumarate ion, hydrogen *7.368*
Hydrogen maleate ion *6.1130*

$C_4H_4N_2$ Pyrazine *6.1362*
Pyridazine *6.1364*
Pyrimidine *6.1377, 8.1126*
Succinonitrile *6.1409, 7.519, 8.1153*

$C_4H_4N_2O_2$ 2-Nitropyrrole *6.1284*
3-Nitropyrrole *6.1286*
4,6-Dihydroxypyrimidine *8.565*
Maleic hydrazide *8.856*
Uracil *6.1494, 7.566, 8.1252*

$C_4H_4N_2O_2S$ Thiobarbituric acid *6.1449*

$C_4H_4N_2O_3$ Barbituric acid *6.619, 7.222*

$C_4H_4N_3O^-$ Cytosine negative ion *9.66*

C_4H_4O Furan *6.966, 8.684*

$C_4H_4O_4$ Fumaric acid *7.369, 8.680*
Maleic acid *6.1131, 7.417, 8.855*

$C_4H_4O_4^{2-}$ Succinate ion *6.1405, 7.517, 9.115*

$C_4H_4O_4S^{2-}$ Thiodiacetate ion *6.1450*

$C_4H_4O_4S_2^{2-}$ 2,2′-Dithiobisacetate ion *6.900*

$C_4H_4O_5$ Oxalacetic acid *7.464*

$C_4H_4O_5^{2-}$ Malate ion *6.1127, 8.858, 9.88*

$C_4H_4O_6$ Dihydroxyfumaric acid *7.330*

$C_4H_4O_6^{2-}$ Tartrate ion *8.1164*

$C_4H_4O_8^{2-}$ Tetrahydroxysuccinate ion *8.1177*

C_4H_4S Thiophene *6.1455, 7.540, 8.1196*

$C_4H_5ClNO_3^-$ *N*-(2-Chloroacetyl)glycine, negative ion *6.723*

C_4H_5CuN Iminodiacetatocopper(II) *8.78*

C_4H_5N Allyl cyanide *8.305, 9.41*
Crotononitrile *9.61*
Methacrylonitrile *8.875, 9.93*
Pyrrole *6.1378, 8.1127*

$C_4H_5NNiO_4$ Iminodiacetatonickel(II) *8.153*

$C_4H_5NO_2$ Succinimide *6.1408*

$C_4H_5NO_4^{2-}$ Iminodiacetate ion *6.1087, 9.86*
L-Aspartate dianion *6.603*

$C_4H_5NO_6U$ Iminodiacetatodioxouranium(VI) *6.463*

$C_4H_5N_2^+$ Pyrimidine, conjugate monoacid *7.508*

$C_4H_5N_3$ 2-Aminopyrimidine *6.584, 8.321*
4-Aminopyrimidine *6.585*

$C_4H_5N_3O$ Cytosine *6.809, 7.316, 8.503*

$C_4H_5N_3O_2$ 2-Methyl-4-nitroimidazole *6.1209*
6-Azathymine *6.610, 8.344*

$C_4H_5N_3O_3$ Isouramil *8.845*

$C_4H_5O_2^-$ 3-Butenoate ion *9.55*
Crotonate ion *8.467, 9.60*
Methacrylate ion *6.1147, 8.874, 9.92*
trans-Crotonate ion *6.774*

$C_4H_5O_4^-$ Hydrogen succinate ion *6.1406*

C_4H_6 Butadiene *6.696, 7.258, 8.398*

$C_4H_6NO_3^-$ *N*-Acetylglycine, negative ion *6.512, 8.261*

$C_4H_6NO_4^-$ Aspartate monoanion *6.604, 7.219, 8.340*
Hydrogen iminodiacetate ion *8.810*

$C_4H_6N_2$ 1-Methylimidazole *6.1199, 8.934*

$C_4H_6N_2^{2+}$ Pyrazine, conjugate diacid *7.501*
Pyridazine, conjugate diacid *7.502*

$C_4H_6N_2O_2$ 5,6-Dihydrouracil *6.844, 8.551*
Glycine anhydride *6.983, 8.713*

$C_4H_6N_2S$ 2-Mercapto-1-methylimidazole *8.868*

$C_4H_6N_3O^+$ Cytosine, conjugate acid *7.317, 8.504*
$C_4H_6N_4O$ 4(5)-Aminoimidazole-5(4)-carboxamide *6.580*
C_4H_6O 1-Butene-3-one *8.408*
Crotonaldehyde *8.466*
Cyclobutanone *6.784*
$C_4H_6O_2$ 2,3-Butanedione *6.698, 7.260, 8.403*
Crotonic acid *8.468*
Cyclopropanecarboxylic acid *7.308*
Methacrylic acid *6.1148*
Methyl acrylate *6.1169*
Vinyl acetate *6.1506, 7.571*
trans-Crotonic acid *6.775*
$C_4H_6O_3$ Propylene glycol carbonate *6.1357*
$C_4H_6O_4$ Acetyl peroxide *6.520, 8.267*
Dimethyl oxalate *6.875*
Succinic acid *6.1407, 7.518, 8.1152*
$C_4H_6O_4Rh$ Rhodium(II) acetate *6.395*
$C_4H_6O_4S$ Mercaptosuccinic acid *7.428*
Thiodiacetic acid *7.538, 8.1195*
$C_4H_6O_4S_2$ Dithiodiglycolic acid *7.343*
$C_4H_6O_5$ Malic acid *6.1128, 7.416, 8.859*
$C_4H_6O_6$ Tartaric acid *7.522, 8.1163*
$C_4H_7ClO_2$ 2-(Chloromethyl)-1,3-dioxolane *8.444*
C_4H_7N 2-Methylpropionitrile *7.445*
C_4H_7NO 2-Pyrrolidone *6.1380, 8.1129*
Methacrylamide *6.1146*
trans-Crotonamide *6.773*
C_4H_7NOS Homocysteine thiolactone *6.1058, 8.776*
$C_4H_7NO_2$ Diacetamide *6.817*
$C_4H_7NO_3$ *N*-Acetylglycine *7.181*
$C_4H_7NO_4$ Aspartic acid *6.605*
Iminodiacetic acid *8.811*
$C_4H_7N_2^+$ 1-Methylimidazole, conjugate acid *6.1200, 8.935*
$C_4H_7N_2O_3^-$ Asparagine, negative ion *6.602*
Glycylglycine, negative ion *6.997, 8.725*
$C_4H_7O_2^-$ 2-Methylpropionate ion *7.443, 8.957*
Butyrate ion *7.265, 8.421, 9.57*
C_4H_8 1-Butene *7.263, 8.407*
2-Methylpropene *7.409, 8.835*
$C_4H_8CdN_2O_4$ Bis(glycinato)cadmium(II) *6.50*
$C_4H_8ClN_2O_4^-$ *N*-(2-Chloroacetyl)glycylglycine, negative ion *6.724*
$C_4H_8CuN_2O_4$ Bis(glycinato)copper(II) *8.71*
$C_4H_8NOS^-$ *N*-Acetylcysteamine, negative ion *6.508*
$C_4H_8NO_2S^-$ *S*-Methylcysteine, negative ion *6.1184, 8.923*
$C_4H_8NO_4^+$ Aspartic acid, conjugate acid *6.606, 7.220*
Iminodiacetic acid, conjugate acid *7.402*
$C_4H_8N_2NiO_4$ Bis(glycinato)nickel(II) *6.317, 8.150*
$C_4H_8N_2O_2$ Succinamide *6.1404*
N-Acetylglycinamide *6.513*
$C_4H_8N_2O_3$ Asparagine *6.601, 8.338*
Glycylglycine *6.996, 8.723*
$C_4H_8N_2O_4Pt$ *cis*-Bis(glycinato)platinum(II) *6.373, 7.135, 8.190*
trans-Bis(glycinato)platinum(II) *6.374, 7.136, 8.191*
C_4H_8O 1,2-Epoxybutane *8.631*
2-Butanone *8.406*
3-Buten-1-ol *6.700*
3-Buten-2-ol *6.701*
Butyraldehyde *8.420*
Tetrahydrofuran *7.526, 8.1173*
trans-2-Buten-1-ol *6.699*
C_4H_8OS Methional *8.882*
Tetramethylene sulfoxide *8.1183*
$C_4H_8O_2$ 1,4-Dioxane *7.341, 8.620*
2-Butene-1,4-diol *9.54*
2-Methyl-1,3-dioxolane *8.925*
2-Methylpropionic acid *7.444*
3-Hydroxy-2-butanone *6.1067, 8.781*
Butyric acid *7.266, 8.422*
Ethyl acetate *6.923, 7.350, 8.640*
Methyl propionate *6.1220, 8.956*
$C_4H_8O_3$ 2-Hydroxybutyric acid *8.782*
2-Hydroxyethyl acetate *6.1069, 8.787*
C_4H_8S Tetrahydrothiophene *8.1176*
$C_4H_8S_2$ 1,4-Dithiane *8.626*
C_4H_9Br 1-Bromobutane *6.677*
C_4H_9Cl 1-Chloro-2-methylpropane *6.742*
1-Chlorobutane *6.735*
2-Chlorobutane *6.736*
$C_4H_9ClO_2$ Chloroacetaldehyde dimethyl acetal *8.440*
C_4H_9I 1-Iodobutane *6.1099*
C_4H_9N Pyrrolidine *6.1379*
C_4H_9NO 2-Methyl-2-nitrosopropane dimer *8.944*
2-Methylpropionamide *8.836*
N,N-Dimethylacetamide *6.852, 8.583*
N-Ethylacetamide *6.922*
N-Methylpropionamide *8.955*
C_4H_9NOS *N*-Acetylcysteamine *6.507*
$C_4H_9NO_2$ 2-Aminobutyric acid *8.309*
4-Aminobutyric acid *6.577, 8.312*
Ethyl 2-aminoacetate *6.926*
$C_4H_9NO_2S$ Cysteine, methyl ester *6.802*
S-Methylcysteine *6.1183, 8.922*
$C_4H_9NO_3$ Threonine *6.1458, 8.1198*
$C_4H_9N_2O_3^+$ Asparagine, conjugate monoacid *7.218, 8.339*
Glycylglycine, conjugate acid *7.379, 8.724*
$C_4H_9N_3O_2$ Creatine *6.768*
$C_4H_9O_4S^-$ Butylsulfate ion *8.418*
C_4H_{10} 2-Methylpropane *7.408, 8.833*
Butane *7.259, 8.399*
$C_4H_{10}N^+$ Pyrrolidinium ion *8.1128*

$C_4H_{10}NO_2^+$ α-Aminoisobutyric acid, conjugate acid *7.207*
2-Aminobutyric acid, conjugate acid *7.205, 8.310*
3-Aminobutyric acid, conjugate acid *8.311*
4-Aminobutyric acid, conjugate acid *8.313*

$C_4H_{10}NO_3$ Threonine, conjugate acid *7.543, 8.1199*

$C_4H_{10}N_3O_2^+$ Glycylglycinamide, conjugate acid *6.998, 8.726*

$C_4H_{10}O$ 1-Butanol *7.261, 8.404*
2-Butanol *7.262, 8.405*
2-Methyl-1-propanol *7.441, 8.953*
2-Methyl-2-propanol *6.1219, 7.442, 8.954, 9.98*
Diethyl ether *6.838, 7.327, 8.537, 9.68*

$C_4H_{10}OS$ Diethyl sulfoxide *8.542*

$C_4H_{10}O_2$ 1,1-Dimethoxyethane *8.578*
1,2-Dimethoxyethane *8.650*
1,3-Butanediol *8.400*
1,4-Butanediol *8.401*
2,3-Butanediol *8.402*
2-Ethoxyethanol *8.639*
tert-Butyl hydroperoxide *6.708, 8.415*

$C_4H_{10}O_2S_2$ Dithiothreitol *6.902, 8.627*

$C_4H_{10}O_3$ Diethylene glycol *8.534*

$C_4H_{10}O_3S$ Di(2-hydroxyethyl) sulfoxide *8.1162*

$C_4H_{10}O_4$ Erythritol *6.910, 8.634*

$C_4H_{10}S$ 2-Methyl-2-propanethiol *6.1218*
Diethyl sulfide *8.541*

$C_4H_{10}S_2$ Diethyl disulfide *8.533*

$C_4H_{10}Tl^+$ Diethylthallium ion *6.454*

$C_4H_{11}N$ Butylamine *6.703, 8.410*
Isobutylamine *6.1110*
tert-Butylamine *6.704, 8.412*

$C_4H_{11}NO$ *N,N*-Diethylhydroxylamine *6.839, 8.538*

$C_4H_{11}NO_3$ 2-Amino-2-(hydroxymethyl)-1,3-propanediol *8.315*

$C_4H_{12}N^+$ Butylammonium ion *6.705, 8.411*
Diethylammonium ion *8.532*
Isobutylammonium ion *8.834*
Tetramethylammonium ion *6.1428, 8.1179, 9.118*
tert-Butylammonium ion *6.706, 8.413*

$C_4H_{12}NS^+$ 4-Aminobutanethiol, conjugate acid *6.576, 7.203, 7.204*

$C_4H_{12}N_2S_2$ Cystamine *6.795*

$C_4H_{13}ClN_3Pt^+$ Chloro(diethylenetriamine)platinum(II) ion *6.366, 7.133, 8.183*

$C_4H_{14}N_2S_2^{2+}$ Cystamine, conjugate diacid *6.796, 8.493*

$C_4H_{16}CdN_4^{2+}$ Bis(ethylenediamine)cadmium(II) ion *6.43*

$C_4H_{16}Cl_2CoN_4^+$ Bis(ethylenediamine)dichlorocobalt(III) ion *6.97, 8.50*
cis-Dichlorobis(ethylenediamine)-cobalt(III) ion *6.98*
trans-Dichlorobis(ethylenediamine)-cobalt(III) ion *6.99*

$C_4H_{16}Cl_2CrN_4^+$ *cis*-Dichlorobis(ethylenediamine)-chromium(III) ion *6.152*

$C_4H_{16}Cl_2N_4Pt^{2+}$ *trans*-Dichlorobis(ethylenediamine)-platinum(IV) ion *6.380, 7.138, 8.192*

$C_4H_{16}CoF_2N_4^+$ Bis(ethylenediamine)difluorocobalt(III) ion *7.36*
cis-Bis(ethylenediamine)difluorocobalt(III) ion *6.102*

$C_4H_{16}CoN_4^{3+}$ Bis(ethylenediamine)cobalt(III) ion *7.23*

$C_4H_{16}CuN_4^{2+}$ Bis(ethylenediamine)copper(II) ion *8.68*

$C_4H_{16}N_4Ni^{2+}$ Bis(ethylenediamine)nickel(II) ion *6.302*

$C_4H_{16}N_4O_2Re^+$ Bis(ethylenediamine)dioxorhenium(V) ion *6.386, 8.195*

$C_4H_{16}N_4Pt^{2+}$ Bis(ethylenediamine)platinum(II) ion *6.365, 7.132, 8.181*

$C_4H_{18}CoFN_4O^{2+}$ Aquabis(ethylenediamine) fluorocobalt(III) ion *6.101*

$C_4H_{18}CoN_5O_4^+$ Pentaammine(fumarato)cobalt(III) ion *6.123*

$C_4H_{18}N_4O_2Pt^{2+}$ *trans*-Dihydroxybis(ethylenediamine)-platinum(IV) ion *6.378, 7.137*

$C_4H_{19}ClCoN_5^{2+}$ *cis*-Amminechlorobis(ethylenediamine)-cobalt(III) ion *6.96*

$C_4H_{19}CoN_5O_4^{2+}$ Pentaammine(fumarato)cobalt(III) ion *7.56*

$C_4H_{19}CoN_6O_2^{2+}$ *cis*-Nitroamminebis(ethylenediamine)-cobalt(III) ion *6.115*

$C_4H_{22}CoN_5O_2^{2+}$ Pentaammine(butanoato-*O*)cobalt(III) ion *7.53*
Pentaammine(isobutyrato)cobalt(III) ion *7.54*

$C_4N_4Ni^{2-}$ Tetracyanonickelate(II) ion *6.315, 7.113, 8.148*

$C_4N_4Pd^{2-}$ Tetracyanopalladate(II) ion *6.359*

$C_4N_4Pt^{2-}$ Tetracyanoplatinate(II) ion *6.372, 8.189*

$C_4N_4Zn^{2-}$ Tetracyanozincate(II) ion *6.402*

$C_4O_4^{2-}$ Acetylenedicarboxylate ion *9.34*

$C_4O_{10}U^{2-}$ Bisoxalatodioxouranate(VI) ion *6.462*

$C_5ClCoN_5^{3-}$ Chloropentacyanocobaltate(III) ion *6.111*

$C_5CoIN_5^{3-}$ Pentacyanoiodocobaltate(III) ion *6.112*

$C_5CoN_5^{3-}$ Pentacyanocobaltate(II) ion *6.73*

$C_5CoN_6O^{3-}$ Pentacyano(nitrosyl)cobaltate(II) ion *6.74, 8.38*

$C_5CoN_6O_2^{3-}$ Pentacyanonitrocobaltate(III) ion *6.113*

$C_5CoN_8^{3-}$ Azidopentacyanocobaltate(III) ion *6.110*

$C_5CrN_6O^{3-}$ Pentacyano(nitrosyl)chromate(II) ion *6.142, 8.63*

C_5D_5N Pyridine-d_5 *8.1104*

$C_5FeN_6O^{2-}$ Pentacyano(nitrosyl)ferrate(III) ion *6.210, 7.85*

$C_5HBrN_2O_4^{2-}$ 5-Bromoorotate dianion *6.683*
$C_5HCoN_5^{3-}$ Pentacyanohydridocobaltate(III) ion *6.109*
$C_5HCoN_5O^{3-}$ Pentacyanohydroxycobaltate(III) ion *6.108*
$C_5HD_5N^+$ Pyridinium ion-d_5 *8.1106*
$C_5H_2BrN_2O_4^-$ 5-Bromoorotate ion *6.684, 8.389*
$C_5H_2CoN_5O^{2-}$ (Aqua)pentacyanocobaltate(III) ion *6.107*
$C_5H_2NO_5^-$ 5-Nitrofuroate ion *6.1264, 8.1000*
$C_5H_2N_3O_6^-$ 5-Nitroorotate ion *6.1271, 8.1004*
$C_5H_3BrN_2O_4$ 5-Bromoorotic acid *7.250*
$C_5H_3BrO_2$ 5-Bromofurfural *8.387*
$C_5H_3FeN_6^{3-}$ Amminepentacyanoferrate(II) ion *6.196*
$C_5H_3NO_4$ 5-Nitro-2-furaldehyde *6.1261, 8.998*
$C_5H_3N_2O_4^-$ Isoorotate ion *6.1112, 8.840*
Orotate ion *6.1298, 8.1027*
$C_5H_3O_3^-$ 2-Furoate ion *8.687*
C_5H_4BrN 2-Bromopyridine *8.394*
3-Bromopyridine *8.395*
C_5H_4ClN 2-Chloropyridine *8.452*
4-Chloropyridine *8.453*
$C_5H_4N_2O_4$ Isoorotic acid *7.411*
Nifuroxime *6.1249, 7.453, 8.986*
Orotic acid *7.463*
$C_5H_4N_4$ Purine *6.1361, 8.1101*
$C_5H_4N_4O$ 2-Hydroxypurine *8.804*
Hypoxanthine *6.1084, 8.807*
$C_5H_4N_4O_2$ Xanthine *6.1513, 8.1266*
$C_5H_4N_4O_3$ Uric acid *6.1497, 8.1255*
$C_5H_4N_4S$ 2-Mercaptopurine *8.871*
6-Thiopurine *8.872*
$C_5H_4O_2$ 2-Furaldehyde *8.682*
$C_5H_4O_4^{2-}$ Glutaconate ion *9.77*
C_5H_5N Pyridine *6.1365, 7.505, 8.1103*
C_5H_5NO 2-Pyridone *8.1115*
3-Pyridinol *8.1114*
4-Pyridone *8.1116*
Pyridine-*N*-oxide *8.1107*
$C_5H_5NO_2$ 2-Furancarboxamide *8.685*
$C_5H_5N_2O_2^-$ 4,6-Dihydroxy-2-methylpyrimidine anion *8.558*
4,6-Dihydroxy-5-methylpyrimidine anion *8.560*
Thymine, negative ion *6.1461, 9.124*
$C_5H_5N_2O_4^-$ 5,6-Dihydroorotate ion *6.842, 8.549*
$C_5H_5N_3O_4$ 5-Nitro-6-methyluracil *6.1270, 8.1003*
$C_5H_5N_5$ Adenine *6.539, 7.191, 8.280*
$C_5H_5N_5O$ Guanine *6.1039, 8.755*
Isoguanine *8.837*
$C_5H_5O_4^-$ Methyl fumarate ion *6.1189*
$C_5H_6N^+$ Pyridinium ion *7.506, 8.1105*
$C_5H_6N_2$ 2-Aminopyridine *8.319*
4-Aminopyridine *8.320*
$C_5H_6N_2O_2$ 4,6-Dihydroxy-2-methylpyrimidine *8.557*
4,6-Dihydroxy-5-methylpyrimidine *8.559*
6-Methyluracil *7.447*
Thymine *6.1460, 7.546, 8.1202*
$C_5H_6N_3O^-$ 5-Methylcytosine, conjugate base *9.96*
$C_5H_6N_3O_5^-$ 6-Hydroxy-5-nitrothymine, conjugate base *6.1077*
$C_5H_6N_4^{2+}$ Purine, conjugate diacid *7.500*
$C_5H_6N_5^+$ Adenine, conjugate acid *7.192, 8.281*
C_5H_6O 2-Methylfuran *8.928*
$C_5H_6O_2$ Furfuryl alcohol *8.686*
C_5H_6S 2-Methylthiophene *8.969*
3-Methylthiophene *8.970*
$C_5H_7NO_2$ Ethyl cyanoacetate *6.928*
N-Methylsuccinimide *6.1225*
$C_5H_7NO_3S^{2-}$ *N*-Acetylcysteine, dianion *6.510*
$C_5H_7N_3O$ 1-Methylcytosine *6.1185*
5-Methylcytosine *6.1186, 8.924*
$C_5H_7N_3O_5$ 6-Hydroxy-5-nitrothymine *6.1076*
$C_5H_7O_2^-$ β,β-Dimethylacrylate ion *6.855*
Acetylacetone, conjugate base *8.1044*
Cyclobutanecarboxylate ion *8.476*
C_5H_8 Cyclopentene *7.305, 8.491, 9.65*
$C_5H_8NO_3^-$ *N*-Acetylalanine, negative ion *6.502, 8.255*
N-Acetylsarcosine, negative ion *6.525*
$C_5H_8NO_3S^-$ *N*-Acetylcysteine, negative ion *6.509*
$C_5H_8NO_4^-$ Glutamate ion *6.975, 7.371, 8.697*
$C_5H_8N_2$ 2,3-Diazabicyclo[2.2.1]hept-2-ene *6.821*
$C_5H_8N_2O_2$ 5,6-Dihydrothymine *7.329, 8.550*
Dihydro-6-methyluracil *7.328, 8.547*
C_5H_8O 1,4-Pentadien-3-ol *8.1037, 9.102*
C_5H_8O Cyclopentanone *6.793*
$C_5H_8O_2$ 2,4-Pentanedione *7.472, 8.1043*
3,3-Dimethylacrylic acid *6.856*
Cyclobutanecarboxylic acid *7.293*
Ethyl acrylate *6.924*
Methyl methacrylate *6.1205, 7.439, 8.941*
$C_5H_8O_4$ Glutaric acid *8.701*
C_5H_9N Trimethylacetonitrile *7.554*
C_5H_9NO β,β-Dimethylacrylamide *6.854*
1-Methyl-2-pyrrolidinone *6.1223, 8.964*
N,N-Dimethylacrylamide *6.853*
$C_5H_9NO_2$ Proline *6.1345, 8.1082*
$C_5H_9NO_2S$ Dehydromethionine *6.812*
$C_5H_9NO_3$ Hydroxyproline *6.1081, 8.801*
N-Acetylalanine *7.178*
N-Acetylglycine methyl ester *6.514*
$C_5H_9NO_4$ Glutamic acid *8.698*
$C_5H_9N_2O_3$ *N*-Acetylserine *8.269*
$C_5H_9N_2O_3^-$ Glycyl-β-alanine, negative ion *6.992*
Glycylsarcosine, negative ion *6.1029, 8.746*
Sarcosylglycine, negative ion *6.1395*
$C_5H_9O_2^-$ 2-Methylbutyrate ion *7.436, 8.917*
3-Methylbutyrate ion *7.437, 8.918*
Pentanoate ion *7.473, 8.1045*
Trimethylacetate ion *7.553, 8.1231*
$C_5H_9O_8P$ Ribose-5-phosphate *6.1389, 8.1136*
C_5H_{10} Cyclopentane *7.303, 8.489*
$C_5H_{10}NO_2^+$ Proline, conjugate acid *7.488, 8.1083*
$C_5H_{10}NO_2^-$ DL-Valine, negative ion *6.1504*

$C_5H_{10}NO_3^+$ Hydroxyproline, conjugate acid *7.400, 8.802*
$C_5H_{10}NO_4^+$ Glutamic acid, conjugate acid *7.372*
$C_5H_{10}N_2O_3$ Alanylglycine *6.556, 8.299*
Glutamine *8.699*
Glycyl-β-alanine *6.991, 8.721*
Glycylalanine *6.988, 8.717*
Glycylsarcosine *6.1028, 8.745*
Sarcosylglycine *6.1394*
$C_5H_{10}N_2O_4$ Glycylserine *6.1030*
$C_5H_{10}O$ 2-Pentanone *8.1048*
3-Pentanone *8.1049*
4-Penten-2-ol *6.1310*
Tetrahydropyran *8.1175*
$C_5H_{10}O_2$ 2,2-Dimethyl-1,3-dioxolane *8.591*
3-Methylbutyric acid *8.919*
Ethyl propionate *8.660*
Isopropyl acetate *8.841*
Methyl butyrate *8.916*
Propyl acetate *8.1095*
Trimethylacetic acid *8.1232*
$C_5H_{10}O_4$ 2-Deoxy-D-ribose *6.814, 7.318, 8.512*
$C_5H_{10}O_5$ Arabinose *6.595, 7.214, 8.333*
Ribose *6.1388, 7.510, 8.1135*
D-Xylose *6.1515, 8.1272*
$C_5H_{11}NO$ Trimethylacetamide *6.1480, 8.1230*
N-Methylisobutyramide *8.940*
$C_5H_{11}NO_2$ Norvaline *8.1019*
Valine *6.1503, 7.569, 8.1260*
$C_5H_{11}NO_2S$ Methionine *6.1154, 8.883*
Penicillamine *6.1307, 7.467*
$C_5H_{11}NO_2Se$ Selenomethionine *6.1397, 8.1146*
$C_5H_{11}N_2O_3^+$ Alanylglycine, conjugate acid *8.300*
Glutamine, conjugate acid *8.700*
Glycylalanine, conjugate acid *8.718*
$C_5H_{11}N_2O_4^+$ Glycylserine, conjugate acid *8.747*
$C_5H_{11}N_3^{2+}$ Histamine, conjugate diacid *6.1052*
$C_5H_{11}N_3O_2$ Glycyl-β-alanineamide *6.990, 8.719*
C_5H_{12} 2-Methylbutane *8.914*
Pentane *7.471, 8.1041*
$C_5H_{12}NO_2^+$ Betaine, conjugate acid *7.240*
Norvaline, conjugate acid *7.462, 8.1020*
Valine, conjugate acid *7.570, 8.1261*
$C_5H_{12}NO_2S^+$ Methionine, conjugate acid *7.434*
Penicillamine, conjugate acid *7.468, 7.469, 8.1035*
$C_5H_{12}N_2O$ 1,1,3,3-Tetramethylurea *8.1187*
$C_5H_{12}N_2O_2$ Ornithine *8.1025*
$C_5H_{12}N_3O_2^+$ Glycyl-β-alanineamide, conjugate acid *6.989, 8.720*
$C_5H_{12}O$ 1-Pentanol *8.1046*
2,2-Dimethyl-1-propanol *7.338, 8.609*
2-Methyl-2-butanol *8.323*
3-Methyl-1-butanol *8.915*
3-Pentanol *8.1047*
tert-Butyl methyl ether *8.416*
$C_5H_{12}O_2$ 1,5-Pentanediol *8.1042*
Diethoxymethane *8.531*
$C_5H_{12}O_4$ Pentaerythritol *8.1038*
$C_5H_{12}O_5$ Arabinitol *6.596, 8.332*
$C_5H_{12}O_7P$ Deoxyribose 5-phosphate *8.513*
$C_5H_{13}N$ Amylamine *6.587, 8.324*
Isoamylamine *6.1109*
$C_5H_{13}N_2O_2^+$ Ornithine, conjugate acid *8.1026*
$C_5H_{14}N^+$ Amylammonium ion *6.588, 8.325*
Isoamylammonium ion *8.832*
$C_5H_{14}N_2S$ 2-[(3-Aminopropyl)amino]ethanethiol *8.318*
$C_5H_{15}NO_2$ Choline *6.760*
$C_5H_{15}NO_4P^+$ Phosphorylcholine *8.1074*
$C_5H_{16}CoN_4O_3^+$ Carbonatobis(ethylenediamine)cobalt(III) ion *6.104*
$C_5H_{20}CoN_6^{3+}$ Pentaammine(pyridine)cobalt(III) ion *8.46*
$C_5H_{24}CoN_5O_2^{2+}$ Pentaammine(pentanoato)cobalt(III) ion *7.55*
$C_5MnN_6O^{3-}$ Pentacyano(nitrosyl)manganate(II) ion *8.116*
$C_5NpO_5^{6-}$ Pentacarbonatoneptunate(IV) ion *6.322*
$C_6Cl_4O_2$ Chloranil *10.20*
$C_6CoN_6^{3-}$ Hexacyanocobaltate(III) ion *6.114, 7.43*
$C_6CoN_6S^{3-}$ Penta(cyano-*C*)(thiocyanato-*N*)cobaltate(III) ion *6.120*
$C_6CoO_{12}^{3-}$ Trioxalatocobaltate(III) ion *6.124, 7.57*
$C_6CrN_6^{3-}$ Hexacyanochromate(III) ion *6.154*
$C_6CrN_6^{4-}$ Hexacyanochromate(II) ion *6.143*
$C_6CrO_{12}^{3-}$ Trioxalatochromate(III) ion *6.158, 7.68*
$C_6D_5NO_2$ Nitrobenzene-d_5 *8.996*
C_6D_6 Benzene-d_6 *8.354*
C_6F_6 Hexafluorobenzene *6.1048, 8.764*
$C_6FeKN_6^{2-}$ Potassium hexacyanoferrate(III) ion *6.212*
$C_6FeN_6^{3-}$ Ferricyanide ion *6.211, 7.86*
$C_6FeN_6^{4-}$ Ferrocyanide ion *6.197, 7.77, 8.90*
$C_6FeO_{12}^{3-}$ Trioxalatoferrate(III) ion *7.87*
C_6HF_5 Pentafluorobenzene *6.1309, 8.1039*
$C_6HFeN_6^{3-}$ Hydrogen hexacyanoferrate(II) ion *6.198, 8.89*
$C_6H_2F_4$ 1,2,3,4-Tetrafluorobenzene *6.1426, 8.1171*
$C_6H_2F_4O_2$ Tetrafluorohydroquinone *8.1172*
$C_6H_2FeN_6^{2-}$ Dihydrogen hexacyanoferrate(II) ion *8.88*
$C_6H_2N_3O_7^-$ Picrate ion *6.1344*
$C_6H_3O_4^-$ 5-Formylfuroate ion *8.674*
$C_6H_3O_6^{3-}$ Aconitate ion *6.529, 9.35*
$C_6H_4BrN_2^+$ 4-Bromobenzenediazonium *6.675*
$C_6H_4BrO^-$ 2-Bromophenoxide ion *6.686*
3-Bromophenoxide ion *6.687*
4-Bromophenoxide ion *6.688*
$C_6H_4ClN_2^+$ 4-Chlorobenzenediazonium ion *6.731*
$C_6H_4ClO^-$ 2-Chlorophenoxide ion *6.745*
3-Chlorophenoxide ion *6.746*
4-Chlorophenoxide ion *6.747*
$C_6H_4Cl_2$ 1,2-Dichlorobenzene *6.827*
1,3-Dichlorobenzene *6.826*
1,4-Dichlorobenzene *6.828*

$C_6H_4FO^-$ 2-Fluorophenoxide ion *6.947*
3-Fluorophenoxide ion *6.948*
4-Fluorophenoxide ion *6.949*
$C_6H_4F_2$ 1,2-Difluorobenzene *6.840, 8.543*
1,4-Difluorobenzene *6.841, 8.544*
$C_6H_4NO_2^-$ 2-Pyridinecarboxylate ion *6.1367, 8.1111*
3-Pyridinecarboxylate ion *6.1247, 8.982*
4-Pyridinecarboxylate ion *6.1369, 8.1112*
$C_6H_4NO_3^-$ 2-Nitrophenoxide ion *6.1274, 8.1005*
3-Nitrophenoxide ion *6.1275, 8.1006*
3-Pyridinecarboxylate ion *N*-oxide *8.983*
4-Nitrophenoxide ion *6.1276, 8.1008*
4-Pyridinecarboxylate ion *N*-oxide *8.1113*
$C_6H_4N_2$ 3-Cyanopyridine *8.475*
$C_6H_4N_3O_2^+$ 4-Nitrobenzenediazonium ion *6.1257*
$C_6H_4N_4$ Pteridine *6.1359*
$C_6H_4N_4O_2$ Lumazine *6.1123*
$C_6H_4O_2$ 1,4-Benzoquinone *6.637, 7.233, 8.364*
$C_6H_4O_2^{2-}$ Hydroquinone dianion *6.1064*
$C_6H_4O_4^{2-}$ Muconate ion *9.79*
$C_6H_4O_8S_2^{2-}$ 4,5-Dihydroxy-*m*-benzenedisulfonate ion *8.1203*
C_6H_5Br Bromobenzene *6.674, 7.246*
C_6H_5BrO 4-Bromophenol *6.685, 7.251*
C_6H_5Cl Chlorobenzene *6.730, 7.273, 8.436*
C_6H_5ClO 2-Chlorophenol *6.744, 7.282, 8.445*
3-Chlorophenol *8.446*
4-Chlorophenol *8.447*
C_6H_5F Fluorobenzene *6.942, 7.360, 8.666*
C_6H_5I Iodobenzene *6.1095, 8.826*
C_6H_5NO Nitrosobenzene *6.1286, 8.1013*
$C_6H_5NO_2$ 3-Pyridinecarboxylic acid *8.984*
Nitrobenzene *6.1256, 7.457, 8.995*
$C_6H_5NO_2^-$ Nitrobenzene radical anion *5.20*
$C_6H_5NO_3$ 4-Nitrophenol *6.1273, 8.1007*
$C_6H_5N_2^+$ Benzenediazonium ion *6.623*
$C_6H_5N_5O$ Pterin *6.1360*
$C_6H_5O^-$ Phenoxide ion *6.1317, 8.1055, 9.105*
$C_6H_5O_3S^-$ Benzenesulfonate ion *6.625, 7.226, 8.356*
$C_6H_5O_4P^{2-}$ Phenylphosphate ion *6.1336, 8.1068, 9.108*
$C_6H_5O_7^-$ Isocitrate ion *6.1111*
$C_6H_5O_7^{3-}$ Citrate ion *6.765, 9.59*
$C_6H_5S^-$ Thiophenoxide ion *6.1456*
C_6H_6 Benzene *6.622, 7.225, 8.353*
$C_6H_6AgNO_6^{2-}$ Nitrilotriacetatoargentate(I) ion *6.4*
$C_6H_6AlNO_6$ Nitrilotriacetatoaluminum(III) *6.12*
C_6H_6ClN 2-Chloroaniline *6.727*
3-Chloroaniline *6.728*
4-Chloroaniline *6.729*
$C_6H_6CoNO_6$ Nitrilotriacetatocobaltate(III) *6.132, 7.65, 8.57*
$C_6H_6CoNO_6^-$ Nitrilotriacetatocobaltate(II) ion *6.75, 8.40*
$C_6H_6CuNO_6$ Nitrilotriacetatocuprate(II) ion *8.80*
$C_6H_6D_6$ Cyclohexane-d_6 *8.484*
$C_6H_6FeNO_6$ Nitrilotriacetatoferrate(III) *8.101*
$C_6H_6FeNO_6^-$ Nitrilotriacetatoferrate(II) ion *8.91*
$C_6H_6MnNO_6^-$ Nitrilotriacetatomanganate(II) ion *8.117*
$C_6H_6NNiO_6^-$ Nitrilotriacetatonickelate(II) ion *6.319, 8.155*
$C_6H_6NO^-$ *N*-Phenylhydroxylamine, conjugate base *6.1335*
$C_6H_6NO_2^+$ 3-Pyridinecarboxylic acid, conjugate acid *7.452*
$C_6H_6NO_3S^-$ Sulfanilate ion *6.1415, 8.1159*
$C_6H_6NO_6^{3-}$ Nitrilotriacetate ion *8.988*
$C_6H_6NO_6Zn^-$ Nitrilotriacetatozincate(II) ion *6.484, 8.240*
$C_6H_6NO_8U^-$ Nitrilotriacetatodioxouranate(VI) ion *6.464*
$C_6H_6N_2O$ 4-Pyridinealdoxime *7.503*
4-Pyridinecarboxamide *6.1368, 8.1109*
Nicotinamide *6.1244, 8.977*
$C_6H_6N_2O_2$ 4-Nitroaniline *6.1254, 8.993*
Nicotinamide-*N*-oxide *8.981*
$C_6H_6N_4$ 6-Methylpurine *8.958*
9-Methylpurine *6.1222*
$C_6H_6N_4O$ 6-Methoxypurine *8.898*
$C_6H_6N_4O_4$ 5-Nitro-2-furaldehyde semicarbazone *6.1263, 8.999*
C_6H_6O Phenol *6.1315, 7.475, 8.1054*
$C_6H_6O_2$ 2-Acetylfuran *8.260*
5-Methylfurfural *8.929*
Catechol *8.430*
Hydroquinone *7.397, 8.777*
Resorcinol *8.1131*
$C_6H_6O_3$ 5-Hydroxymethylfurfural *8.797*
$C_6H_6O_3S$ Benzenesulfonic acid *8.357*
$C_6H_6O_4^{2-}$ 2-Hexene-1,6-dioate ion *9.83*
3-Hexene-1,6-dioate ion *8.771, 9.84*
$C_6H_6O_9S^{2-}$ L-Ascorbate-2-sulfate ion *8.336*
C_6H_6S Thiophenol *7.541*
$C_6H_7BO_2$ Phenylboric acid *6.1328*
C_6H_7N 2-Methylpyridine *8.959*
3-Methylpyridine *8.960*
Aniline *6.589, 7.210, 8.326, 9.42*
C_6H_7NO 3-Methylpyridine-*N*-oxide *8.961*
4-Methylpyridine-*N*-oxide *8.962*
N-Phenylhydroxylamine *6.1334, 8.1067*
$C_6H_7NO_2$ *N*-Ethylmaleimide *6.934, 7.357, 8.656*
$C_6H_7NO_2S$ Benzenesulfonamide *6.624, 8.355*
$C_6H_7NO_3S$ Sulfanilic acid *6.1416, 7.521*
$C_6H_7NO_6^{2-}$ Nitrilotriacetate ion, conjugate acid *6.1250*
$C_6H_7N_2O^+$ Nicotinamide, conjugate acid *8.978*
Pyridine-4-carboxamide, conjugate acid *8.1110*
$C_6H_7N_2O_2^+$ 4-Nitroanilinium ion *7.456*
$C_6H_7N_5$ 2-Methyladenine *6.1170*
6-Methylaminopurine *8.902*
7-Methyladenine *6.1171*
9-Methyladenine *8.903*
$C_6H_7O_2^-$ *trans,trans*-Sorbate ion *6.1046*
$C_6H_7O_4P$ Phenylphosphoric acid *7.486*
$C_6H_7O_6^-$ Ascorbate ion *6.600, 7.216, 8.335*

C_6H_8 1,3-Cyclohexadiene ***6.787, 7.295, 8.481***
1,4-Cyclohexadiene ***6.788, 7.296, 8.482***
$C_6H_8CoN_2O_8^-$ Ethylenediaminebis(oxalato) cobaltate(III) ion ***7.58***
$C_6H_8N^+$ Anilinium ion ***7.211, 8.327***
$C_6H_8NO_3^-$ *N*-Ethylmaleamate ion ***6.933***
$C_6H_8N_2$ *p*-Phenylenediamine ***6.1331***
$C_6H_8N_2O_2$ 1,3-Dimethyluracil ***6.889***
$C_6H_8N_2O_2S$ Sulfanilamide ***6.1414, 8.1158***
$C_6H_8N_2O_4^-$ *N*-Acetylglycylglycine, negative ion ***6.516, 8.263***
$C_6H_8N_3O_2^-$ Histidine, negative ion ***6.1055***
$C_6H_8O_2$ 1-Cyclopentenecarboxylic acid ***7.306***
trans,trans-Sorbic acid ***6.1047***
$C_6H_8O_4$ Dimethyl fumarate ***6.866, 7.337***
Dimethyl maleate ***6.872***
$C_6H_8O_4S^{2-}$ 3,3′-Thiodipropionate ion ***6.1451***
$C_6H_8O_4S_2^{2-}$ 3,3′-Dithiobis(propionate ion) ***6.901***
$C_6H_8O_5^{2-}$ 2-Hydroxyadipate ion ***7.415***
$C_6H_8O_6$ Ascorbic acid ***7.217, 8.337***
D-Glucuronolactone ***8.696***
$C_6H_8O_7$ Citric acid ***7.290, 8.457***
C_6H_8S 2,5-Dimethylthiophene ***8.616***
$C_6H_9^+$ Trimethylcyclopropenium cation ***6.1481***
C_6H_9NO Polyvinylpyrrolidone ***10.114***
N-Vinylpyrrolidone ***6.1511, 8.1264***
$C_6H_9NO_3$ *N*-Ethylmaleamic acid ***7.356***
$C_6H_9NO_3^-$ *N*-Ethylmaleamate ion ***8.655***
$C_6H_9NO_6$ Nitrilotriacetic acid ***8.989***
$C_6H_9N_3O_2$ Histidine ***6.1053, 7.394, 8.774***
$C_6H_9N_3O_3$ 1-(2-Hydroxyethyl)-2-methyl-5-nitroimidazole ***6.1070, 8.789***
$C_6H_9O_2^-$ Cyclopentanecarboxylate ion ***8.490***
C_6H_{10} Cyclohexene ***6.790, 7.299, 8.487***
$C_6H_{10}Mo_2N_2O_8S_2^{2-}$ Bis(μ-oxo)bis[(cysteinato) oxomolybdate(V)] ion ***6.282***
$C_6H_{10}NO_6$ Nitrilotriacetic acid, conjugate acid ***7.454***
$C_6H_{10}N_2$ 2,3-Diazabicyclo[2.2.2]oct-2-ene ***6.822***
$C_6H_{10}N_2^{2+}$ *m*-Phenylenediamine, conjugate diacid ***7.482***
o-Phenylenediamine, conjugate diacid ***7.483***
p-Phenylenediamine, conjugate diacid ***7.484***
$C_6H_{10}N_2O_2$ Alanine anhydride ***6.548, 8.297***
Sarcosine anhydride ***6.1393, 8.1142***
$C_6H_{10}N_2O_4S_2^{2-}$ Cystine, dianion ***6.804***
$C_6H_{10}N_2O_5$ Glycylaspartic acid ***6.994***
$C_6H_{10}N_3O_2^+$ Histidine, conjugate monoacid ***6.1054, 7.396***
$C_6H_{10}N_3O_4^-$ Glycylglycylglycine, negative ion ***6.1004, 8.728***
$C_6H_{10}N_3O_6$ L-Glycylasparagine ***6.993***
$C_6H_{10}N_6O$ 5-(3,3-Dimethyl-1-triazeno)imidazole-4-carboxamide ***6.886***
$C_6H_{10}O$ 2,4-Hexadien-1-ol ***8.763, 9.80***
Cyclohexanone ***6.789***
$C_6H_{10}O_2$ Cyclopentanecarboxylic acid ***7.304***
$C_6H_{10}O_3$ Ethyl acetoacetate ***7.351***
$C_6H_{10}O_4$ Adipic acid ***8.290***
$C_6H_{10}O_5$ Amylose ***10.8***
$C_6H_{11}NO$ 1-Ethyl-2-pyrrolidinone ***8.661***
5,5-Dimethyl-1-pyrroline-1-oxyl ***6.882, 7.339, 8.612***
$C_6H_{11}N_2O_3^-$ β-Alanyl-β-alanine, negative ion ***6.564***
$C_6H_{11}N_3O_2^{2+}$ Histidine, conjugate diacid ***7.395***
$C_6H_{11}N_3O_2$ *N*-Acetylglycylglycinamide ***6.515, 8.262***
$C_6H_{11}N_3O_4$ Glycylglycylglycine ***6.1003, 8.727***
$C_6H_{11}O_2^-$ 3,3-Dimethylbutyrate ion ***8.590***
Hexanoate ion ***7.389, 8.769, 9.82***
$C_6H_{11}O_7^-$ Glucuronate ion ***6.974, 8.694***
C_6H_{12} Cyclohexane ***7.297, 8.483***
Methylcyclopentane ***8.921***
$C_6H_{12}AlN_3O_6$ Tris(glycinato)aluminum(III) ***6.11***
$C_6H_{12}CdN_3O_6^-$ Tris(glycinato)cadmate(II) ion ***6.51***
$C_6H_{12}CoN_3O_6$ Tris(glycinato)cobalt(III) ***7.62***
$C_6H_{12}CuN_3O_6^-$ Tris(glycinato)cuprate(II) ion ***6.173***
$C_6H_{12}HgN_3O_6^-$ Tris(glycinato)mercurate(II) ion ***6.241***
$C_6H_{12}MnN_3O_6^-$ Tris(glycinato)manganate(II) ion ***6.267***
$C_6H_{12}N_2$ 1,4-Diazabicyclo[2.2.2]octane ***8.520***
$C_6H_{12}N_2O_3$ β-Alanyl-β-alanine ***6.563***
β-Alanylalanine ***6.562***
4-Aminobutyrylglycine ***6.578***
Alanylalanine ***6.552***
Glycyl-α-aminobutyric acid ***8.722***
$C_6H_{12}N_2O_4$ Alanylserine ***6.560***
$C_6H_{12}N_2O_4S_2$ Cystine ***6.803, 7.314, 8.497***
$C_6H_{12}N_2O_4S_2Se$ Selenodicysteine ***8.1144***
$C_6H_{12}N_2O_4Se_2$ Selenocystine ***6.1396, 8.1145***
$C_6H_{12}N_3NiO_6^-$ Tris(glycinato)nickelate(II) ion ***6.318, 8.151***
$C_6H_{12}N_3O_4^+$ Glycylglycylglycine, conjugate acid ***7.380***
$C_6H_{12}N_3O_6Pb^-$ Tris(glycinato)plumbate(II) ion ***6.354***
$C_6H_{12}N_3O_6Zn^-$ Tris(glycinato)zincate(II) ion ***6.483***
$C_6H_{12}N_4O_2$ Diamide ***6.617, 8.350***
$C_6H_{12}O$ Vinyl isobutyl ether ***6.1510***
$C_6H_{12}O_2$ Ethyl butyrate ***8.644***
Hexanoic acid ***7.390***
Methyl trimethylacetate ***6.1229***
$C_6H_{12}O_3$ 2,4,6-Trimethyl-1,3,5-trioxane ***8.1244***
$C_6H_{12}O_5$ 2-Deoxy-D-glucose ***8.509***
Methyl α-D-arabinopyranoside ***8.907***
$C_6H_{12}O_6$ Glucose ***6.970, 7.370, 8.689***
Inositol ***8.822***
D-Fructose ***6.961, 8.676***
D-Galactose ***6.968, 8.688***
$C_6H_{12}O_7$ Glucuronic acid ***8.695***
$C_6H_{12}O_9S^-$ Glucose-3-sulfate ion ***6.972, 8.692***
Glucose-6-sulfate ion ***6.973, 8.693***
$C_6H_{13}N$ Cyclohexylamine ***6.791***
$C_6H_{13}NO$ *N,N*-Diethylacetamide ***6.837***
N-Methylpivalamide ***8.952***
N-tert-Butylacetamide ***6.702, 8.409***

$C_6H_{13}NO_2$ Isoleucine *8.838*
Leucine *6.1117, 8.849*
Nitrohexane *10.86*
Norleucine *6.1294, 8.1016*

$C_6H_{13}NO_4$ 2-Deoxy-D-galactosamine *6.967, 8.314*

$C_6H_{13}NO_5$ D-Glucosamine *6.969*
N-[Tris(hydroxymethyl)-methyl]glycine *8.780*

$C_6H_{13}NO_8S$ 2-Deoxy-2-sulfonamino-D-glucose *6.815, 8.514*

$C_6H_{13}N_2O_3$ Glycylglycine, ethyl ester, conjugate acid *6.999*

$C_6H_{13}N_2O_4S_2^+$ Cystine, conjugate acid *8.498*

$C_6H_{13}N_3O_3$ Citrulline *8.458*

$C_6H_{13}N_4O_3^+$ Glycylglycylglycinamide, conjugate acid *6.1005, 6.1006*

$C_6H_{13}O_4S^-$ Hexylsulfate ion *6.1051, 8.773*

$C_6H_{13}O_9P$ Glucose-1-phosphate *6.971, 8.690*
D-Fructose 1-phosphate, dihydrogen *8.678*
D-Fructose 6-phosphate, dihydrogen *8.679*

$C_6H_{13}O_9P^-$ Glucose-6-phosphate ion *8.691*

C_6H_{14} Hexane *7.388, 8.767*

$C_6H_{14}CuN_2O_4$ Bis(β-alaninato)cuprate(II) *8.73*
Bis(alaninato)cuprate(II) *8.72*

$C_6H_{14}N^+$ Cyclohexylammonium ion *8.488*
Hexamethyleneimine, conjugate acid *7.386*

$C_6H_{14}NO_2^+$ Isoleucine, conjugate acid *7.410, 8.839*
Leucine, conjugate acid *7.413*
Norleucine, conjugate acid *8.1017*

$C_6H_{14}N_2O_2$ Lysine *6.1126, 8.853*

$C_6H_{14}N_2O_2^+$ Lysine, conjugate acid *8.854*

$C_6H_{14}N_2O_4S_2^{2+}$ Cystine, conjugate diacid *7.315, 8.499*

$C_6H_{14}N_4O_2$ Arginine *6.597*

$C_6H_{14}O$ 1-Hexanol *7.391, 8.770*

$C_6H_{14}OS$ Di(1-methylethyl) sulfoxide *8.569*
Dipropyl sulfoxide *8.625*

$C_6H_{14}O_2$ 1,2-Diethoxyethane *8.649*
1,6-Hexanediol *8.768*
Pinacol *8.1080*

$C_6H_{14}O_6$ Mannitol *6.1139, 8.863*
Sorbitol *6.1400*

$C_6H_{14}O_6S_2$ 1,4-Butanediol dimethanesulfonate *6.697*

$C_6H_{14}O_{12}P_2$ D-Fructose 1,6-diphosphate *6.962, 8.677*

$C_6H_{14}O_{24}S_6$ *myo*-Inositol hexasulfate *8.823*

$C_6H_{14}S_2$ Di(1-methylethyl) disulfide *8.568*

$C_6H_{15}N$ Hexylamine *8.772*
Triethylamine *8.1219*

$C_6H_{15}NO_3$ 2,2′,2″-Nitrilotriethanol *8.990*

$C_6H_{15}N_4O_2^+$ Arginine, conjugate monoacid *6.598, 8.334*

$C_6H_{15}O_4P$ Triethyl phosphate *8.1221*

$C_6H_{16}CoN_4O_4^+$ Bis(ethylenediamine)oxalatocobalt(III) ion *7.59*

$C_6H_{16}CoN_6S_2^+$ *cis*-Bis(thiocyanato-*N*)bis(ethylenediamine)-cobalt(III) ion *6.118*
trans-Bis(thiocyanato-*N*)bis(ethylenediamine)-cobalt(III) ion *6.119*

$C_6H_{16}CrN_6S_2^+$ *cis*-Bis(ethylenediamine) bis(thiocyanato)-chromium(III) ion *6.155*

$C_6H_{16}N^+$ 1-Hexylammonium ion *7.392*
Triethylammonium ion *8.1220*

$C_6H_{16}NO_3^+$ 1,1′,1″-Nitrilotriethanol, conjugate acid *6.1251, 8.991*

$C_6H_{16}N_2O_2^{2+}$ Lysine, conjugate diacid *7.414*

$C_6H_{16}N_4O_2^{2+}$ Arginine, conjugate diacid *7.215*

$C_6H_{16}N_6S_2$ Bis(2-guanidinoethyl)disulfide *6.666*

$C_6H_{18}Cl_2CoN_4^+$ Dichloro(triethylenetetramine) cobalt(III) ion *7.31, 8.49*

$C_6H_{18}N_2^+$ 1,6-Hexanediamine, conjugate diacid *7.387*

$C_6H_{20}Cl_2N_2O_2Pt$ *cis*-Dichlorobis(isopropylamine)-*trans*-dihydroxyplatinum(IV) *6.379, 8.193*

$C_6H_{20}N_4O_2Re^+$ Bis(propylenediamine) dioxorhenium(V) ion *6.387*

$C_6H_{21}CoN_7O^{3+}$ Pentaammine(isonicotinamide) cobalt(III) ion *8.55*
Pentaammine(nicotinamide)cobalt(III) ion *8.54*

$C_6H_{21}N_7ORu^{2+}$ Pentaammine(isonicotinamide) ruthenium(II) ion *8.203*

$C_6H_{21}N_7ORu^{3+}$ Pentaammine(isonicotinamide) ruthenium(III) ion *6.413, 7.144, 8.204*

$C_6H_{24}CdN_6^{2+}$ Tris(ethylenediamine)cadmium(II) ion *6.44*

$C_6H_{24}CoN_6^{3+}$ Tris(ethylenediamine)cobalt(III) ion *6.84, 7.22, 8.44*

$C_6H_{24}CrN_6^{3+}$ Tris(ethylenediamine)chromium(III) ion *6.146*

$C_6H_{24}CuN_6^{2+}$ Tris(ethylenediamine)copper(II) ion *6.169*

$C_6H_{24}HgN_6^{2+}$ Tris(ethylenediamine)mercury(II) ion *6.234*

$C_6H_{24}N_6Ni^{2+}$ Tris(ethylenediamine)nickel(II) ion *6.303*

$C_6H_{24}N_6Pb^{2+}$ Tris(ethylenediamine)lead(II) ion *6.352*

$C_6H_{24}N_6Zn^{2+}$ Tris(ethylenediamine)zinc(II) ion *6.480*

$C_6MnN_6^{4-}$ Hexacyanomanganate(II) ion *6.266*

C_6N_4 Tetracyanoethylene *6.1423*

$C_6N_6Os^{4-}$ Hexacyanoosmate(II) ion *6.336, 8.165*

$C_6N_6Ru^{4-}$ Hexacyanoruthenate(II) ion *6.405, 8.202*

$C_7H_4BrO_2^-$ 4-Bromobenzoate ion *6.676, 8.385*

$C_7H_4ClO_2^-$ 2-Chlorobenzoate ion *6.732, 8.437*
3-Chlorobenzoate ion *6.733, 8.438*
4-Chlorobenzoate ion *6.734, 8.439*

$C_7H_4ClO_3$ Dichlorobenzoyl hydroperoxide *6.829*

C_7H_4FN *p*-Fluorobenzonitrile *6.946, 7.361, 8.668*

$C_7H_4FO_2$ 3-Fluorobenzoate ion *6.944*

$C_7H_4FO_2^-$ 4-Fluorobenzoate ion *6.945, 8.667*

$C_7H_4IO_2^-$ 2-Iodobenzoate ion ***6.1096, 8.827***
3-Iodobenzoate ion ***6.1097, 8.828***
4-Iodobenzoate ion ***6.1098, 8.829***
$C_7H_4NO^-$ 2-Cyanophenoxide ion ***6.780***
3-Cyanophenoxide ion ***6.781***
4-Cyanophenoxide ion ***6.782, 9.64***
$C_7H_4NO_4^-$ 4-Nitrobenzoate ion ***6.1258, 8.997***
$C_7H_4N_3^+$ 4-Cyanobenzenediazonium ion ***6.778***
$C_7H_4O_3^{2-}$ 3-Hydroxybenzoate ion, dianion ***6.1065***
4-Hydroxybenzoate ion, dianion ***6.1066***
Salicylate dianion ***9.114***
$C_7H_5ClO_2$ 2-Chlorobenzoic acid ***7.274***
3-Chlorobenzoic acid ***7.275***
4-Chlorobenzoic acid ***7.276***
$C_7H_5Cl_3$ α,α,α-Trichlorotoluene ***6.1475***
$C_7H_5EuO_3^{2+}$ Salicylatoeuropium(III) ion ***6.189***
$C_7H_5FO_2^-$ 2-Fluorobenzoate ion ***6.943***
$C_7H_5F_3$ α,α,α-Trifluorotoluene ***6.1479***
C_7H_5N Benzonitrile ***6.634, 7.231, 8.362, 9.47***
$C_7H_5NO_4$ 4-Nitrobenzoic acid ***7.458***
$C_7H_5NO_5$ *p*-Nitroperoxybenzoic acid ***6.1272***
$C_7H_5O_2^-$ 2-Hydroxybenzaldehyde, conjugate base ***8.1139***
4-Hydroxybenzaldehyde, conjugate base ***8.778***
Benzoate ion ***6.630, 7.229, 8.359, 9.46***
$C_7H_5O_3^-$ 4-Hydroxybenzoate ion ***8.779***
Salicylate ion ***6.1391, 8.1140***
$C_7H_5O_3V^{2+}$ Salicylatovanadium(III) ion ***6.467***
$C_7H_6NO_2^-$ 2-Aminobenzoate ion ***6.573, 8.306***
3-Aminobenzoate ion ***6.574, 8.307***
4-Aminobenzoate ion ***6.575, 8.308***
$C_7H_6NO_5S^-$ *p*-Nitro-*o*-toluenesulfonate ion ***8.1014***
$C_7H_6N_2O_5$ 3,5-Dinitroanisole ***6.891, 8.619***
$C_7H_6N_4O_5$ Furamazone ***6.965, 8.683***
C_7H_6O Benzaldehyde ***7.223, 8.351***
$C_7H_6O_2$ Benzoic acid ***6.632, 7.230, 8.361***
$C_7H_6O_3$ 3,4-Dihydroxybenzaldehyde ***6.846, 8.555***
4-Hydroxybenzoic acid ***7.398***
Salicylic acid ***7.511, 8.1141***
$C_7H_7^+$ Tropylium ion ***7.561***
C_7H_7Br Benzyl bromide ***6.647***
C_7H_7Cl 4-Chlorotoluene ***6.756***
Benzyl chloride ***6.648, 7.238***
C_7H_7I 4-Iodotoluene ***6.1106***
C_7H_7NO 3-Acetylpyridine ***6.524***
Benzaldoxime ***6.620***
Benzamide ***6.621, 7.224, 8.352***
$C_7H_7NO_2$ 4-Nitrotoluene ***6.1289, 9.101***
$C_7H_7N_2^+$ 4-Methylbenzenediazonium ion ***6.1176***
$C_7H_7N_2O^+$ 4-Methoxybenzenediazonium ion ***6.1158***
$C_7H_7N_5O$ 3-Methylpterin ***6.1221***
$C_7H_7O^-$ 4-Methylphenoxide ion ***9.97***
$C_7H_7O_3S^-$ 2-Toluenesulfonate ion ***8.1208***
3-Toluenesulfonate ion ***8.1207***
4-Toluenesulfonate ion ***6.1467, 8.1206***
C_7H_8 Cycloheptatriene ***6.786, 7.294, 8.480***
Toluene ***6.1466, 7.547, 8.1205, 9.128***
$C_7H_8N_4O_2$ Theobromine ***6.1445, 8.1192***
Theophylline ***6.1446, 8.1193***
C_7H_8O 2-Methylphenol ***8.462***
4-Methylphenol ***6.770, 8.463***
Anisole ***6.591, 7.212, 8.328***
Benzyl alcohol ***6.644, 7.237, 8.365***
Hydroxycycloheptatriene ***6.1068***
C_7H_8OS Methyl phenyl sulfoxide ***8.950***
$C_7H_8O_2$ 2,3-Dihydroxytoluene ***6.850, 8.567***
2-Methoxyphenol ***8.891***
3,4-Dihydroxytoluene ***7.332***
3-Methoxyphenol ***8.892***
4-Methoxyphenol ***8.893***
Methoxyphenol ***6.1163***
C_7H_8S Benzyl mercaptan ***6.651***
C_7H_9N 2,4-Dimethylpyridine ***8.610***
2,6-Dimethylpyridine ***8.611***
4-Methylaniline ***9.129***
Benzylamine ***6.645, 9.48***
$C_7H_9N_2O^+$ 1-Methylnicotinamide ***6.1208***
2-Pyridinealdoxime, *N*-methyl- ***6.1366, 7.504, 8.1108***
$C_7H_9N_5$ 6-Dimethylaminopurine ***8.584***
$C_7H_9O_6^-$ 3-*O*-Methyl-L-ascorbate ion ***8.910***
$C_7H_{10}N^+$ Benzylammonium ion ***6.646, 8.366***
$C_7H_{10}N_4O_2S$ Sulfaguanidine ***6.1413, 8.1157***
$C_7H_{10}O_2$ 1-Cyclohexenecarboxylic acid ***7.300***
3-Cyclohexene-1-carboxylic acid ***7.301***
$C_7H_{10}O_6$ 1-*O*-Methyl-L-ascorbic acid ***8.908***
2-*O*-Methyl-L-ascorbic acid ***8.909***
3-*O*-Methyl-L-ascorbic acid ***8.911***
$C_7H_{11}N_2O_3^-$ Prolylglycine, negative ion ***6.1347***
$C_7H_{11}N_3O_4$ 1-(2-Hydroxy-3-methoxypropyl)-2-nitroimidazole ***6.1071, 8.796***
$C_7H_{11}O_2^-$ Cyclohexanecarboxylate ion ***8.485***
$C_7H_{12}NO_3$ 2-Carboxy-5,5-dimethyl-1-pyrroline-1-oxyl ***8.428***
$C_7H_{12}NO_3^-$ *N*-Acetylvaline, negative ion ***8.270***
$C_7H_{12}NO_3S^-$ *N*-Acetylmethionine, negative ion ***8.266***
$C_7H_{12}N_2O_3$ Glycylproline ***6.1027***
L-Prolylglycine ***6.1346***
$C_7H_{12}N_2O_4S_2^{2-}$ Djenkolate ion ***6.903***
$C_7H_{12}N_2O_5$ Glycylglutamic acid ***6.995***
$C_7H_{12}N_3O_2^+$ *N*-Methylhistidine, conjugate acid ***6.1191***
$C_7H_{12}N_3O_4^-$ β-Alanylglycylglycine, negative ion ***6.566***
Glycylglycyl-β-alanine, negative ion ***6.1002***
$C_7H_{12}O$ Cycloheptanone ***6.785***
$C_7H_{12}O_2$ Cyclohexanecarboxylic acid ***7.298***
$C_7H_{12}O_4$ Diethyl malonate ***8.539***
Pimelic acid ***8.1079***
$C_7H_{13}DO$ Cycloheptanol-1-*d* ***8.479***
$C_7H_{13}NO$ 2,5,5-Trimethyl-1-pyrroline *N*-oxide ***8.1243***
$C_7H_{13}NO_3S$ *N*-Acetylmethionine ***7.182***
$C_7H_{13}N_2O_3^+$ Glycylproline, conjugate acid ***8.744***

$C_7H_{13}N_3O_4$ β-Alanylglycylglycine *6.565*
Glycylglycyl-β-alanine *6.1001*
Glycylglycyl-L-alanine *6.1000*
C_7H_{14} Cycloheptane *8.477*
Methylcyclohexane *8.920*
$C_7H_{14}N_2O_3$ Glycylnorvaline *8.741*
Glycylvaline *6.1036, 8.752*
Valylglycine *6.1505*
$C_7H_{14}N_2O_3S$ Glycylmethionine *6.1023, 8.738*
Methionylglycine *6.1155*
$C_7H_{14}O$ Cycloheptanol *8.478*
$C_7H_{14}O_6$ α-Methylglucoside *8.931*
Methylgalactoside *8.930*
$C_7H_{15}Cl_2N_2O_2P$ Cyclophosphamide *6.794*
$C_7H_{15}NO$ *N,N*-Dimethylpivalamide *6.881, 8.608*
$C_7H_{15}N_2O_3^+$ Glycylvaline, conjugate acid *8.753*
$C_7H_{15}N_2O_3S^+$ Glycylmethionine, conjugate acid *8.739*
C_7H_{16} 3-Ethylpentane *8.657*
Heptane *8.759*
$C_7H_{16}NO_2^+$ Acetylcholine *8.258*
$C_7H_{16}O$ 1-Heptanol *8.760*
$C_7H_{18}CoN_7O_6^{2+}$ Pentaammine(2,4-dinitrobenzoato)cobalt(III) ion *6.128*
Pentaammine(3,5-dinitrobenzoato)cobalt(III) ion *6.129*
$C_7H_{18}N^+$ Butyltrimethylammonium ion *8.419*
$C_7H_{19}CoN_6O_4^{2+}$ Pentaammine(2-nitrobenzoato)cobalt(III) ion *6.125*
Pentaammine(3-nitrobenzoato)cobalt(III) ion *6.126*
Pentaammine(4-nitrobenzoato)cobalt(III) ion *6.127, 7.61*
$C_7H_{20}CoN_5O_2^{2+}$ Pentaammine(benzoato)cobalt(III) ion *7.60, 8.53*
$C_8H_{26}Br_2CoN_6^+$ *cis*-Dibromobis(diethylenetriamine) cobalt(III) ion *7.27*
$C_8H_2N_4S$ 2,1,3-Benzothiadiazole-4,7-dicarbonitrile *6.638*
$C_8H_4NO_2^-$ 4-Cyanobenzoate ion *6.779*
$C_8H_4N_2$ 1,2-Dicyanobenzene *7.324*
1,3-Dicyanobenzene *7.325*
1,4-Dicyanobenzene *6.635, 7.326, 8.530*
$C_8H_4N_5O_6^-$ 5,5′-Nitrilodibarbiturate ion *8.987*
$C_8H_4O_4^{2-}$ Phthalate ion *6.1339, 8.1077, 9.109*
m-Phthalate ion *6.1341*
p-Phthalate ion *6.1342, 8.1078*
$C_8H_5NO_3$ 2-Nitrobenzofuran *6.1259*
$C_8H_5NO_4$ 4-Hydroxy-2-nitrobenzofuran *6.1072*
5-Hydroxy-2-nitrobenzofuran *6.1073*
6-Hydroxy-2-nitrobenzofuran *6.1074*
7-Hydroxy-2-nitrobenzofuran *6.1075*
$C_8H_5N_3O_4$ 2,3-Dihydro-5-nitro-1,4-phthalazinedione *8.548*
$C_8H_5O_4^-$ Phthalate ion, hydrogen *6.1340*
C_8H_6BrN 5-Bromoindole *8.388*
C_8H_6ClN 5-Chloroindole *8.443*
$C_8H_6ClO_2^-$ 2-Chloro-2-phenylacetate ion *6.748*
$C_8H_6NO_4^-$ 4-Nitrophenylacetate ion *6.1277*
$C_8H_6N_2$ Phthalazine *6.1343*
Quinoxaline *6.1383*
$C_8H_6N_2O_2$ 5-Nitroindole *8.1001*
$C_8H_6N_2O_3$ 2,3-Dihydro-5-hydroxy-1,4-phthalazinedione *8.545*
$C_8H_6N_4O_5$ Furadantin *6.964, 8.681*
$C_8H_6S_2$ 2,2′-Bithiophene *8.383*
C_8H_7N 4-Tolunitrile *6.1468, 7.548, 8.1209, 9.130*
Indole *6.1089, 7.403, 8.815*
C_8H_7NO 5-Hydroxyindole *8.792*
$C_8H_7NO_3$ 4-Nitroacetophenone *6.1253, 7.455, 8.992*
C_8H_7NS Benzyl thiocyanate *6.655*
$C_8H_7N_2O_3^-$ Nicotinurate ion *6.1248, 8.985*
$C_8H_7N_3O_2$ Luminol *8.852*
$C_8H_7O_2^-$ Phenylacetate ion *6.1319, 7.478, 8.1057, 9.107*
m-Toluate ion *6.1463, 9.125*
o-Toluate ion *6.1464, 9.126*
p-Toluate ion *6.1465, 8.1204, 9.127*
$C_8H_7O_3^-$ 2-Methoxybenzoate ion *8.885*
3-Methoxybenzoate ion *8.886*
4-Methoxybenzoate ion *8.887*
$C_8H_7O_4^-$ 2-Hydroxy-5-methoxybenzoate ion *8.793*
4-Hydroxy-3-methoxybenzoate ion *8.794*
C_8H_8 Styrene *6.1403, 7.515, 7.516, 8.1150*
$C_8H_8NO_2^-$ Phenylglycine, negative ion *6.1333*
$C_8H_8N_2$ 5-Aminoindole *8.316*
C_8H_8O Acetophenone *6.501, 7.177, 8.254*
$C_8H_8O_2$ 2,5-Dimethyl-1,4-benzoquinone *6.859*
Benzyl formate *6.649*
Phenyl acetate *7.477*
Phenylacetic acid *7.479*
$C_8H_8O_3$ 2,4-Dihydroxyacetophenone *8.552*
2,5-Dihydroxyacetophenone *8.553*
3,4-Dihydroxyacetophenone *6.845, 8.554*
$C_8H_8O_8$ Succinyl peroxide *6.1410, 8.1154*
C_8H_9BrO 1-(*p*-Bromophenyl)ethanol *8.390*
C_8H_9Cl (2-Chloroethyl)benzene *6.740, 7.279*
C_8H_9DO 1-Phenylethanol-1-*d* *8.1063*
C_8H_9N Indoline *8.819*
C_8H_9NO Acetanilide *7.171, 8.248*
$C_8H_9NO_2$ Acetaminophen *8.247*
C_8H_{10} Ethylbenzene *8.643, 9.73*
m-Xylene *7.572, 8.1268, 9.135*
o-Xylene *7.573, 8.1269, 9.136*
p-Xylene *7.574, 8.1270, 9.137*
$C_8H_{10}CoN_2O_8^-$ Bis(iminodiacetato)cobaltate(III) ion *6.131, 8.56*
$C_8H_{10}CoN_2O_8^{2-}$ Bis(iminodiacetato)cobaltate(II) ion *8.39*
$C_8H_{10}CuN_2O_8^{2-}$ Bis(iminodiacetato)cuprate(II) ion *8.79*
$C_8H_{10}NO^-$ Tyramine, negative ion *6.1491, 8.1248*
$C_8H_{10}NO_6P$ Pyridoxal 5-phosphate *6.1370, 8.1117*
$C_8H_{10}N_2NiO_8^{2-}$ Bis(iminodiacetato)nickelate(II) ion *8.154*

$C_8H_{10}N_2O$ *N,N*-Dimethyl-4-nitrosoaniline ***6.874, 8.603***
$C_8H_{10}N_2O_3S$ Sulfacetamide ***6.1412, 8.1156***
$C_8H_{10}N_3^+$ 4-(Dimethylamino)benzenediazonium ion ***6.857***
$C_8H_{10}N_4O_2$ Caffeine ***6.709, 8.423***
$C_8H_{10}O$ 1-Phenylethanol ***8.1062***
Benzyl methyl ether ***8.368***
Phenethyl alcohol ***8.1052***
$C_8H_{10}OS$ Ethyl phenyl sulfoxide ***8.659***
$C_8H_{10}O_2$ 1,2-Dimethoxybenzene ***7.333, 8.570***
1,3-Dimethoxybenzene ***7.334, 8.571***
1,4-Dimethoxybenzene ***7.335, 8.572***
$C_8H_{10}O_3$ 2,3-Dimethoxyphenol ***8.580***
2,6-Dimethoxyphenol ***8.581***
3,5-Dimethoxyphenol ***8.582***
$C_8H_{10}O_4$ *cis*-4-Cyclohexene-1,2-dicarboxylic acid ***7.302***
$C_8H_{11}N$ α-Methylbenzylamine ***6.1177, 9.95***
Benzylmethylamine ***6.1179***
Phenethylamine ***6.1314***
N,N-Dimethylaniline ***8.586, 9.69***
$C_8H_{11}NO$ 2,4,6-Trimethyl-3-hydroxypyridine ***8.1239***
4-Ethyl-5-hydroxy-2-methylpyridine ***8.654***
$C_8H_{11}NO_3$ Pyridoxine ***6.1371, 8.1119***
$C_8H_{11}N_3O_6$ 6-Azauridine ***6.613, 8.347***
$C_8H_{11}N_4O_3^-$ Glycylhistidine, negative ion ***6.1019, 8.733***
$C_8H_{11}N_5$ N^6,N^6,9-Trimethyladenine ***8.1233***
$C_8H_{12}N^+$ α-Methylbenzylammonium ion ***6.1178, 8.912***
Phenethylammonium ion ***8.1053***
N,N-Dimethylanilinium ion ***8.587***
N-Methylbenzylammonium ion ***6.1180, 8.913***
$C_8H_{12}NO^+$ Tyramine, conjugate acid ***6.1490***
$C_8H_{12}NO_2$ Norpseudopelletierine *N*-oxyl ***6.1295, 8.1018***
$C_8H_{12}NO_2^+$ Dopamine, conjugate acid ***8.562***
$C_8H_{12}N_2$ *N,N*-Dimethyl-*p*-phenylenediamine ***6.876***
$C_8H_{12}N_2O_2$ 2,4-Diethoxypyrimidine ***6.836***
$C_8H_{12}N_2O_3S$ 6-Aminopenicillanic acid ***6.582***
$C_8H_{12}N_3O_5^-$ *N*-Acetylglycylglycylglycine, negative ion ***6.517, 8.264***
$C_8H_{12}N_4O_3$ Glycylhistidine ***6.1017***
$C_8H_{12}N_4O_5$ 5-Azacytidine ***6.607, 8.341***
$C_8H_{12}N_5^+$ N^6,N^6,N^6-Trimethyladeninium ***8.1234***
$C_8H_{12}O_6$ 2,3-Di-*O*-methyl-L-ascorbic acid ***8.586***
$C_8H_{13}N_2O_5P$ Pyridoxamine-5-phosphate ***8.1118***
$C_8H_{13}N_4O_3^+$ Glycylhistidine, conjugate acid ***6.1018, 8.732***
$C_8H_{13}N_4O_5^-$ Glycylglycylglycylglycine, negative ion ***6.1007***
$C_8H_{13}O_2S_2^-$ Lipoate ion ***6.1122***
$C_8H_{14}NO_3^-$ *N*-Acetylleucine, negative ion ***8.265***
$C_8H_{14}N_4O_5$ Glycylglycylglycylglycine ***8.731***
$C_8H_{14}O$ Cyclooctanone ***6.792***
$C_8H_{14}O_2$ 2,5-Dimethyl-3-hexyne-2,5-diol ***8.595***
$C_8H_{14}O_4$ Diethyl succinate ***8.540***
Hexane-1,6-dicarboxylic acid ***8.1151***
$C_8H_{15}NO_6$ 2-Acetamido-2-deoxy-α-D-glucopyranose ***6.495, 8.246***
2-Acetamido-2-deoxy-D-galactopyranose ***6.494, 8.245***
$C_8H_{15}N_5O_4$ Glycylglycylglycylglycinamide ***8.729***
$C_8H_{16}CuN_2O_2$ Bis(2-aminoisobutyrato)copper(II) ***8.75***
$C_8H_{16}CuN_2O_4$ Bis(2-aminobutyrato)copper(II) ***8.74***
Bis(3-aminobutyrato)copper(II) ***8.76***
Bis(4-aminobutyrato)copper(II) ***8.77***
$C_8H_{16}N_2O_3$ Glycylisoleucine ***6.1020, 8.734***
Glycylleucine ***6.1021, 8.736***
Glycylnorleucine ***8.740***
DL-Leucylglycine ***6.1119***
$C_8H_{16}N_2O_3S$ Alanylmethionine ***6.559***
$C_8H_{16}N_2O_4S_2$ Homocystine ***6.1059***
$C_8H_{16}N_5O_4^+$ Glycylglycylglycylglycinamide, conjugate acid ***6.1008, 8.730***
$C_8H_{17}N_2O_3^+$ Glycylisoleucine, conjugate acid ***8.735***
Glycylleucine, conjugate acid ***8.737***
$C_8H_{17}O_4S^-$ Octylsulfate ion ***6.1296, 8.1024***
C_8H_{18} 2,2,4-Trimethylpentane ***8.1240***
Octane ***8.1021***
$C_8H_{18}N_2O_4S$ 4-(2-Hydroxyethyl)-1-piperazineethanesulfonic acid ***8.790***
$C_8H_{18}N_2O_4S_2^{2+}$ Cystine, dimethyl ester, conjugate acid ***6.805***
$C_8H_{18}O$ 1-Octanol ***8.1022***
$C_8H_{18}OS$ Di(*tert*-butyl) sulfoxide ***8.525***
Dibutyl sulfoxide ***8.524***
$C_8H_{18}O_2$ Di-*tert*-butyl peroxide ***6.825***
$C_8H_{18}O_3$ Diethylene glycol diethyl ether ***8.535***
$C_8H_{18}S_2$ Di-*tert*-butyl disulfide ***8.522***
$C_8H_{19}CoN_5O_4^+$ Pentaammine(terephthalato)cobalt(III) ion ***6.130***
$C_8H_{19}N$ Dibutylamine ***8.521***
n-Octylamine ***8.1023***
$C_8H_{19}NO_5$ 2,2-Bis(hydroxymethyl)-2,2′,2″-nitrilotriethanol ***6.668, 8.382***
$C_8H_{20}N^+$ Tetraethylammonium ion ***6.1425, 8.1170, 9.117***
$C_8H_{22}CrN_4O_2S^+$ (2-Mercapto-2-methylpropionato-*O,S*)bis(ethylenediamine)chromium(III) ion ***8.65***
$C_8H_{26}Br_2CoN_6^+$ *trans*-Dibromobis(diethylenetriamine)-cobalt(III) ion ***7.28***
$C_8H_{26}Cl_2CoN_6^+$ *cis*-Dichlorobis(diethylenetriamine)-cobalt(III) ion ***7.32***
trans-Dichlorobis(diethylenetriamine)-cobalt(III) ion ***7.33***
$C_8H_{26}CoF_2N_6^+$ *trans*-Bis(diethylenetriamine)-difluorocobalt(III) ion ***7.37***
$C_8H_{26}CoN_6^{3+}$ Bis(diethylenetriamine)cobalt(III) ion ***6.85, 8.45***
$C_8H_{30}CoN_6O_2^{3+}$ Bisaquabis(diethylenetriamine) cobalt(III) ion ***7.24***

$C_8H_{34}Co_2N_9O_2^{4+}$ μ-Amido-μ-superoxidotetrakis-(ethylenediamine)dicobalt(III) ion *6.137*

$C_8MoN_8^{4-}$ Octacyanomolybdate(IV) ion *6.280, 8.123*

$C_9H_3O_6^{3-}$ 1,3,5-Benzenetricarboxylate ion *6.626*

$C_9H_6N_2$ 5-Cyanoindole *8.471*

$C_9H_6O_2$ Coumarin *6.767, 8.461*

$C_9H_6O_3^{2-}$ *p*-Hydroxycinnamate ion, conjugate base *9.85*

$C_9H_6O_6$ 1,3,5-Benzenetricarboxylic acid *7.227*

$C_9H_7INO_3^-$ *o*-Iodohippurate ion *6.1101, 8.830*

$C_9H_7NO_4$ 5-Methoxy-2-nitrobenzofuran *6.1161*
7-Methoxy-2-nitrobenzofuran *6.1162*

$C_9H_7O_2^-$ Cinnamate ion *6.763, 8.456*

$C_9H_7O_3^-$ *p*-Hydroxycinnamate ion *8.783*

$C_9H_7O_4^-$ 3,4-Dihydroxycinnamate ion *8.556*

$C_9H_8INO_3$ *o*-Iodohippuric acid *7.406*

$C_9H_8N_2O_2$ 2,3-Dihydro-5-methyl-1,4-phthalazinedione *8.546*

$C_9H_8O_2$ Vinyl benzoate *6.1507*
trans-Cinnamic acid *6.764*

$C_9H_8O_3^{2-}$ 3-(*p*-Hydroxyphenyl)propionate dianion *6.1080, 8.799*

C_9H_9N 1-Methylindole *8.936*
2-Methylindole *6.1201, 8.937*
3-Methylindole *6.1202, 8.938*
5-Methylindole *8.939*

C_9H_9NO 1-(*p*-Cyanophenyl)ethanol *8.473*
5-Methoxyindole *6.1159, 8.889*
trans-Cinnamamide *6.762*

$C_9H_9NO_2$ 2-(*N*-Formylamino)acetophenone *6.956*

$C_9H_9NO_3$ Hippuric acid *7.393*

$C_9H_9NO_3^{2-}$ Tyrosine, dianion *6.1493, 8.1251*

$C_9H_9NO_7$ 5-Nitro-2-furaldehyde diacetate *6.1262*

$C_9H_9N_2O_2^+$ 4-(Ethoxycarbonyl)benzenediazonium ion *6.918*

$C_9H_9N_2O_8P^{2-}$ Uridine monophosphate, 2′,3′-cyclic dianion *6.1500*

$C_9H_9N_3O_2S_2$ Sulfathiazole *6.1418, 8.1161*

$C_9H_9O_2^-$ 3-Phenylpropionate ion *6.1337*

$C_9H_9O_3^-$ 3-(*p*-Hydroxyphenyl)propionate ion *6.1079, 8.800*

$C_9H_9O_4^-$ 2,3-Dimethoxybenzoate ion *8.573*
2,4-Dimethoxybenzoate ion *8.574*
2,6-Dimethoxybenzoate ion *8.575*
3,4-Dimethoxybenzoate ion *8.576*
3,5-Dimethoxybenzoate ion *8.577*

$C_9H_9O_5^-$ 4-Hydroxy-3,5-dimethoxybenzoate ion *8.784*

C_9H_{10} α-Methylstyrene *6.1224, 7.446, 8.965*
Allylbenzene *9.40*

$C_9H_{10}NO_2^-$ Phenylalanine, negative ion *6.1322, 8.1059*

$C_9H_{10}NO_3$ 4-(2-Amino-2-carboxyethyl)phenoxy *5.23*

$C_9H_{10}N_2$ 5,6-Dimethylbenzimidazole *6.858*

$C_9H_{10}N_2O_4$ α,*p*-Dinitrocumene *6.892*

$C_9H_{10}N_2O_9P^{3-}$ Uridine monophosphate, trianion *6.1502*

$C_9H_{10}O$ Phenylacetone *6.1320*

$C_9H_{10}O_2$ Benzyl acetate *6.643*
Hydrocinnamic acid *6.1338*

$C_9H_{10}O_3$ 3-(*p*-Hydroxyphenyl)propionic acid *7.399*

$C_9H_{11}NO_2$ Phenylalanine *6.1321, 7.480, 8.1058*

$C_9H_{11}NO_3$ Adrenalone *6.544, 8.293*
Tyrosine *6.1492, 7.564, 8.1249*

$C_9H_{11}NO_4$ 3-(3,4-Dihydroxyphenyl)-L-alanine *6.849*

$C_9H_{11}N_2O_6^-$ Uridine, negative ion *6.1499*

$C_9H_{11}N_2O_9P^{2-}$ Uridine monophosphate, dianion *6.1501*

$C_9H_{11}N_3O_7P^-$ Cytidine 2′,3′-cyclicmonophosphate ion *6.807*

C_9H_{12} 1,2,3-Trimethylbenzene *7.558, 8.1237, 9.132*
1,2,4-Trimethylbenzene *7.559, 8.1238, 9.133*
1,3,5-Trimethylbenzene *7.429, 8.873, 9.91*
Cumene *8.469, 9.62*

$C_9H_{12}NO_2^+$ Phenylalanine, conjugate acid *7.481*

$C_9H_{12}NO_3^+$ Tyrosine, conjugate acid *7.565, 8.1250*

$C_9H_{12}N_2O$ Phenylalanine amide *6.1323*

$C_9H_{12}N_2O_6$ Uridine *6.1498, 8.1256*

$C_9H_{12}O$ 1-Phenyl-1-propanol *8.1069*
1-Phenyl-2-propanol *8.1070*
2-Phenyl-2-propanol *8.1071*

$C_9H_{12}OS$ Isopropyl phenyl sulfoxide *8.844*

$C_9H_{12}O_2$ Cumene hydroperoxide *6.776*

$C_9H_{12}O_3$ 1,2,3-Trimethoxybenzene *7.550, 8.1223*
1,2,4-Trimethoxybenzene *7.551, 8.1224*
1,3,5-Trimethoxybenzene *7.552, 8.1225*

$C_9H_{13}HgN_2O_8P$ Deoxyuridine 5′-monophosphate, mercurated *6.816*

$C_9H_{13}N$ *N,N*-Dimethylbenzylamine *6.860*

$C_9H_{13}NO$ Norephedrine *6.1293*

$C_9H_{13}NO_3$ Adrenaline *6.542, 8.291*

$C_9H_{13}N_2O^+$ Phenylalanine amide, conjugate acid *6.1324*

$(C_9H_{13}N_2O_9P)_x$ Oligouridylic acid *10.142*

$C_9H_{13}N_2O_9P$ 3′-Uridine monophosphate *8.1258*
Uridine 2′(3′)-monophosphate (mixed) *8.1259*
Uridine 5′-monophosphate *7.568, 8.1257*

$C_9H_{13}N_3O_4$ 2′-Deoxycytidine *8.507, 9.67*

$C_9H_{13}N_3O_5$ Cytidine *6.806, 8.500*

$C_9H_{13}N_4O_3^-$ β-Alanylhistidine, negative ion *6.569, 8.302*

$C_9H_{14}CuN_4O_3$ β-Alanylhistidinecopper(II) complex *6.175*

$C_9H_{14}N^+$ Trimethylanilinium ion *7.557*
N,N-Dimethylbenzylammonium ion *6.861*

$C_9H_{14}NO_3^+$ Adrenaline, conjugate acid *6.543, 7.196, 8.292*

$C_9H_{14}N_3O_7P$ 2′-Deoxycytidine-5′-monophosphate *8.508*

$C_9H_{14}N_3O_8P$ Cytidine 3′-monophosphate *8.502*
Cytidine 5′-monophosphate *6.808, 8.501*

$C_9H_{14}N_4O_3$ β-Alanylhistidine ***6.567***
$C_9H_{14}P^+$ Trimethylphenylphosphonium ion ***6.1486, 7.560***
$C_9H_{15}N_2O_2$ 3-Carbamoyl-2,2,5,5-tetramethyl-3-pyrrolin-1-yloxy ***6.713, 7.267, 8.426***
$C_9H_{15}N_3O_4$ Glycylglycylproline ***6.1014***
$C_9H_{15}N_4O_3^+$ β-Alanylhistidine, conjugate acid ***6.568, 8.301***
$C_9H_{16}NO_2$ 2,2,6,6-Tetramethyl-4-piperidone *N*-oxyl ***6.1437, 7.533, 8.1186, 9.122***
$C_9H_{16}NO_5^-$ Pantothenate ion ***6.1305, 8.1034***
$C_9H_{16}O_4$ Azelaic acid ***8.348***
$C_9H_{17}N_2O_2$ 3-Carbamoyl-2,2,5,5-tetramethylpyrrolidin-1-yloxy ***6.712, 7.268, 8.425***
$C_9H_{17}N_3O_4$ Alanylalanylalanine ***6.553***
$C_9H_{18}CoN_3O_6$ Tris(alaninato)cobalt(III) ***7.63***
$C_9H_{18}NO$ 2,2,6,6-Tetramethylpiperidine-*N*-oxyl ***6.1436, 7.532, 8.1185***
$C_9H_{18}N_2O_3$ Alanylleucine ***6.557***
L-Leucyl-L-alanine ***6.1118***
$C_9H_{18}N_4Pt^{2+}$ Diethylenetriamine(pyridine)platinum(II) ion ***8.182***
$C_9H_{19}N_3O_3$ Alanyllysine ***6.558***
$C_9H_{22}N_4Ni^{2+}$ 1,4,7,10-Tetraazacyclotridecanenickel(II) ion ***6.304, 8.137***
$C_{10}Co_2N_{10}O_2^{5-}$ Decakis(cyano)-μ-superoxidodicobaltate(III) ion ***6.136***
$C_{10}H_2N_4$ 1,2,4,5-Tetracyanobenzene ***10.134***
$C_{10}H_4O_4^{2-}$ 5,8-Dihydroxy-1,4-naphthoquinone, conjugate dibase ***6.848***
$C_{10}H_5O_5S^-$ 1,2-Naphthoquinone-4-sulfonate ion ***6.1239***
1,4-Naphthoquinone-2-sulfonate ion ***6.1240, 7.450***
$C_{10}H_6Br_2$ 1,4-Dibromonaphthalene ***6.824***
$C_{10}H_6O_4$ 5,8-Dihydroxy-1,4-naphthoquinone ***6.847, 7.331***
$C_{10}H_7Br$ 1-Bromonaphthalene ***6.681***
$C_{10}H_7Cl$ 1-Chloronaphthalene ***6.743***
$C_{10}H_7O$ 2-Naphthoxy ***5.19***
$C_{10}H_7O^-$ 1-Naphthoxide ion ***6.1242***
2-Naphthoxide ion ***6.1243***
$C_{10}H_7O_3S^-$ 2-Naphthalenesulfonate ion ***6.1234***
$C_{10}H_8$ Naphthalene ***6.1233, 7.448, 8.973***
$C_{10}H_8ClN_3O_3$ 5-(2-Chloroacetamido)-2,3-dihydro-1,4-phthalazinedione ***8.433***
$C_{10}H_8CoN_2^{2+}$ 2,2′-Bipyridinecobalt(II) ion ***6.66***
$C_{10}H_8NO_2^-$ Indole-3-acetate ion ***6.1090, 8.817***
Indole-5-acetate ion ***8.816***
$C_{10}H_8NO_3S^-$ 1-Aminonaphthalene-4-sulfonate ion ***6.581, 8.317***
$C_{10}H_8N_2$ 2,2′-Bipyridine ***6.662, 8.380***
4,4′-Bipyridine ***6.663, 8.381***
$C_{10}H_8O$ 2-Naphthol ***7.449***
2-Phenylfuran ***8.1064***
$C_{10}H_8O_8S_2$ 4,5-Dihydroxy-2,7-naphthalenedisulfonic acid ***8.561***
$C_{10}H_9N$ 2-Naphthylamine ***6.1241***
$C_{10}H_9NO_2$ Indole-3-acetic acid ***7.404***
$C_{10}H_9N_3$ 2,2′-Dipyridylamine ***6.899***
$C_{10}H_9O_4^-$ 4-Hydroxy-3-methoxycinnamate ion ***8.795***
$C_{10}H_{10}NO_3^-$ *N*-Acetylphenylglycine, negative ion ***6.523***
$C_{10}H_{10}N_2^{2+}$ 2,2′-Bipyridinium ***7.242***
4,4′-Bipyridine, conjugate diacid ***7.243***
$C_{10}H_{11}N$ 1,2-Dimethylindole ***8.600***
1,3-Dimethylindole ***8.601***
2,3-Dimethylindole ***8.602***
$C_{10}H_{11}NO_2$ 2-(*N*-Acetylamino)acetophenone ***6.505***
2-(*N*-Formyl-*N*-methylamino)acetophenone ***6.960***
$C_{10}H_{11}O_2^-$ Phenylbutyrate ion ***6.1330***
$C_{10}H_{11}O_5^-$ 2,3,4-Trimethoxybenzoate ion ***8.1226***
2,4,5-Trimethoxybenzoate ion ***8.1227***
2,4,6-Trimethoxybenzoate ion ***8.1228***
3,4,5-Trimethoxybenzoate ion ***8.1229***
$C_{10}H_{12}AgN_2O_8^{3-}$ Ethylenediaminetetraacetatoargentate(I) ion ***6.5***
$C_{10}H_{12}AlN_2O_8^-$ Ethylenediaminetetraacetatoaluminate(III) ion ***6.14***
$C_{10}H_{12}CdN_2O_8^{2-}$ Ethylenediaminetetraacetatocadmate(II) ion ***6.53***
$C_{10}H_{12}CeN_2O_8^-$ Ethylenediaminetetraacetatocerate(III) ion ***6.58***
$C_{10}H_{12}CoN_2O_8^-$ Ethylenediaminetetraacetatocobaltate(III) ion ***6.133, 8.58***
$C_{10}H_{12}CoN_2O_8^{2-}$ Ethylenediaminetetraacetatocobaltate(II) ion ***6.77, 8.41***
$C_{10}H_{12}CrN_2O_8^-$ Ethylenediaminetetraacetatochromate(III) ion ***6.159***
$C_{10}H_{12}CuN_2O_8^{2-}$ Ethylenediaminetetraacetatocuprate(II) ion ***6.178, 8.81***
$C_{10}H_{12}DyN_2O_8^-$ Ethylenediaminetetraacetatodysprosate(III) ion ***6.185***
$C_{10}H_{12}ErN_2O_8^-$ Ethylenediaminetetraacetatoerbate(III) ion ***6.187***
$C_{10}H_{12}EuN_2O_8^-$ Ethylenediaminetetraacetatoeuropate(III) ion ***6.190***
$C_{10}H_{12}FeN_2O_8^-$ Ethylenediaminetetraacetatoferrate(III) ion ***6.213***
$C_{10}H_{12}FeN_2O_8^{2-}$ Ethylenediaminetetraacetatoferrate(II) ion ***6.199, 8.92***
$C_{10}H_{12}GaN_2O_8^-$ Ethylenediaminetetraacetatogallate(III) ion ***6.227***
$C_{10}H_{12}GdN_2O_8^-$ Ethylenediaminetetraacetatogadolinate(III) ion ***6.229***
$C_{10}H_{12}HgN_2O_8^{2-}$ Ethylenediaminetetraacetatomercurate(II) ion ***6.243***
$C_{10}H_{12}HoN_2O_8^-$ Ethylenediaminetetraacetatoholmate(III) ion ***6.245***
$C_{10}H_{12}InN_2O_8^-$ Ethylenediaminetetraacetatoindate(III) ion ***6.256***
$C_{10}H_{12}LaN_2O_8^-$ Ethylenediaminetetraacetatolanthanate(III) ion ***6.262***
$C_{10}H_{12}LuN_2O_8^-$ Ethylenediaminetetraacetatolutetate(III) ion ***6.264***

$C_{10}H_{12}MnN_2O_8^{2-}$ Ethylenediaminetetraacetatomanganate(II) ion ***6.269, 8.118***
$C_{10}H_{12}Mo_2N_2O_{12}^{2-}$ Bis(μ-oxo)(ethylenediaminetetraacetato)-bis[oxomolybdate(V)] ion ***6.281***
$C_{10}H_{12}N_2NdO_8^-$ Ethylenediaminetetraacetatoneodymate(III) ion ***6.298***
$C_{10}H_{12}N_2NiO_8^{2-}$ Ethylenediaminetetraacetatonickelate(II) ion ***6.321, 8.156***
$C_{10}H_{12}N_2O_2$ 2-(*N*-Formylamino)-3′-aminopropiophenone ***6.957***
$C_{10}H_{12}N_2O_5S$ 7-Aminocephalosporanic acid ***6.579***
$C_{10}H_{12}N_2O_8$ Orotidine ***6.1299, 8.1028***
$C_{10}H_{12}N_2O_8^{4-}$ Ethylenediaminetetraacetate ion ***6.931, 9.74***
$C_{10}H_{12}N_2O_8Pb^{2-}$ Ethylenediaminetetraacetatoplumbate(II) ion ***6.356***
$C_{10}H_{12}N_2O_8Pr^-$ Ethylenediaminetetraacetatopraseodymate(III) ion ***6.363***
$C_{10}H_{12}N_2O_8Sc^-$ Ethylenediaminetetraacetatoscandate(III) ion ***6.425***
$C_{10}H_{12}N_2O_8Sm^-$ Ethylenediaminetetraacetatosamarate(III) ion ***6.433***
$C_{10}H_{12}N_2O_8Sn^{2-}$ Ethylenediaminetetraacetatostannate(II) ion ***6.435***
$C_{10}H_{12}N_2O_8Tb^-$ Ethylenediaminetetraacetatoterbate(III) ion ***6.444***
$C_{10}H_{12}N_2O_8Tm^-$ Ethylenediaminetetraacetatothulate(III) ion ***6.456***
$C_{10}H_{12}N_2O_8Y^-$ Ethylenediaminetetraacetatoyttrate(III) ion ***6.473***
$C_{10}H_{12}N_2O_8Yb^-$ Ethylenediaminetetraacetatoytterbate(III) ion ***6.475***
$C_{10}H_{12}N_2O_8Zn^{2-}$ Ethylenediaminetetraacetatozincate(II) ion ***6.486, 8.241***
$C_{10}H_{12}N_4O_4$ Thymine dimer ***6.1462***
$C_{10}H_{12}N_4O_5$ Inosine ***8.820***
$C_{10}H_{12}O$ 1,2,3,4-Tetrahydro-1-naphthol ***8.1174***
$C_{10}H_{12}O_2$ 2-Methoxy-4-propenylphenol ***8.896***
4-*tert*-Butyl-1,2-benzoquinone ***6.707, 7.264***
Duroquinone ***6.906***
$C_{10}H_{12}O_5$ Propyl 3,4,5-trihydroxybenzoate ***8.1099***
$C_{10}H_{13}CuN_2O_9^{3-}$ Ethylenediaminetetraacetato(hydroxy)-copper(II) ion ***6.179***
$C_{10}H_{13}DO$ 2-Methyl-1-phenyl-1-propanol-1-*d* ***8.948***
$C_{10}H_{13}N_2O_8P$ 2′-Deoxyuridine 5′-monophosphate ***8.516***
$C_{10}H_{13}N_2O_{11}P$ Orotidine monophosphate ***8.1029***
$C_{10}H_{13}N_4O_7P$ 2′-Deoxyinosine 5′-monophosphate ***8.511***
$C_{10}H_{13}N_4O_8P$ Inosine monophosphate ***8.821***
$C_{10}H_{13}N_4O_9P$ Xanthine monophosphate ***8.1267***
$C_{10}H_{13}N_5O_3$ 2′-Deoxyadenosine ***6.813, 8.505***
$C_{10}H_{13}N_5O_4$ Adenosine ***6.540, 7.193, 8.282***
$C_{10}H_{13}N_5O_5$ Guanosine ***6.1040, 8.756***
$C_{10}H_{14}$ 1,2,3,4-Tetramethylbenzene ***7.528, 8.1180, 9.119***
1,2,3,5-Tetramethylbenzene ***7.529, 8.1181, 9.120***
1,2,4,5-Tetramethylbenzene ***7.530, 8.1182, 9.121***
tert-Butylbenzene ***9.56***
$C_{10}H_{14}FeN_2O_8$ Ethylenediaminetetraacetatoferrate(III) ***8.102***
$C_{10}H_{14}N_2O$ α-(2-Pyridyl)-*tert*-butyl nitrone ***6.1372, 8.1120***
α-(3-Pyridyl)-*tert*-butyl nitrone ***6.1373, 8.1121***
α-(4-Pyridyl)-*tert*-butyl nitrone ***6.1374, 8.1122***
$C_{10}H_{14}N_2O_2$ α-(3-Pyridyl 1-oxide)-*N*-*tert*-butylnitrone ***6.1375, 8.1124***
α-(4-Pyridyl 1-oxide)-*N*-*tert*-butylnitrone ***6.1376, 7.507, 8.1125***
$C_{10}H_{14}N_2O_4S$ Methylpenicillin ***6.1215***
$C_{10}H_{14}N_2O_5$ Thymidine ***7.544, 8.1200***
$C_{10}H_{14}N_2O_8^{2-}$ Ethylenediaminetetraacetate ion, dihydrogen ***8.647***
$C_{10}H_{14}N_2O_2$ α-(2-Pyridyl 1-oxide)-*N*-*tert*-butylnitrone ***8.1123***
$C_{10}H_{14}N_3O_8$ Convicine ***8.460***
$C_{10}H_{14}N_5O_4^+$ Adenosine, conjugate acid ***7.194, 8.283***
$C_{10}H_{14}N_5O_6P$ 2′-Deoxyadenosine 5′-monophosphate ***8.506***
$C_{10}H_{14}N_5O_7P$ Adenosine 3′-monophosphate ***8.288***
Adenosine 5′-monophosphate ***6.541, 7.195, 8.286***
Deoxyguanosine 5′-monophosphate ***8.510***
$C_{10}H_{14}N_5O_8P$ Guanosine 3′-monophosphate ***8.757***
Guanosine 5′-monophosphate ***8.758***
$C_{10}H_{14}O$ 1-(*p*-Ethylphenyl)ethanol ***8.658***
1-Phenyl-3-butanol ***8.1060***
2-Methyl-1-phenyl-1-propanol ***8.947***
2-Methyl-1-phenyl-2-propanol ***8.949***
4-*tert*-Butylphenol ***8.417***
$C_{10}H_{14}O_2$ 4-*tert*-Butyl-1,2-dihydroxybenzene ***8.414***
Camphoroquinone ***6.711***
$C_{10}H_{14}O_4$ 1,2,4,5-Tetramethoxybenzene ***7.527, 8.1178***
$C_{10}H_{15}NO$ *l*-Ephedrine ***6.909, 8.630***
$C_{10}H_{15}N_2O_3S^-$ Biotin, anion ***6.660***
$C_{10}H_{15}N_2O_7P$ Deoxythymidine 5′-monophosphate ***8.515***
$C_{10}H_{15}N_2O_8P$ Thymidine 5′-monophosphate ***6.1459, 7.545, 8.1201***
$C_{10}H_{15}N_5O_7P^+$ Adenosine 5′-monophosphate, conjugate acid ***8.287***
$C_{10}H_{15}N_5O_{10}P_2$ Adenosine diphosphate ***8.284***
$C_{10}H_{16}N^+$ Benzyltrimethylammonium ion ***6.656, 7.239, 8.372, 9.50***
$C_{10}H_{16}NO^+$ Ephedrine, conjugate acid ***6.908***
$C_{10}H_{16}N_2$ *N,N,N′,N′*-Tetramethyl-*p*-phenylenediamine ***6.1433, 8.1184***
$C_{10}H_{16}N_2O_3S$ Biotin ***8.375***

$C_{10}H_{16}N_5O_6^-$ Glycylglycylglycylglycylglycine, negative ion *6.1010*
$C_{10}H_{16}N_5O_{13}P_3$ Adenosine triphosphate *8.289*
$C_{10}H_{16}O$ Camphor *6.710, 8.424, 9.58*
$C_{10}H_{16}O_2$ Ascaridole *6.599*
$C_{10}H_{17}N_3O_6S$ Glutathione *6.977, 8.702*
$C_{10}H_{17}N_5O_6$ Glycylglycylglycylglycylglycylglycine *6.1009*
$C_{10}H_{18}N_2^{2+}$ *N,N,N',N'*-Tetramethyl-*p*-phenylenediamine, conjugate diacid *7.531*
$C_{10}H_{18}N_2O_7$ 2-Hydroxyethylethylenediaminetriacetic acid *8.788*
$C_{10}H_{18}N_2O_8^{2+}$ Ethylenediaminetetraacetic acid, conjugate diacid *7.354*
$C_{10}H_{18}O_4$ Sebacic acid *8.1143*
$C_{10}H_{19}N_3O_4$ Glycylglycylleucine *6.1011*
Leucylglycylglycine *6.1120*
$C_{10}H_{20}N_2O_3S$ Methionylvaline *6.1157*
$C_{10}H_{20}N_2O_4S_2$ Penicillamine disulfide *6.1308*
$C_{10}H_{21}O_4S^-$ Decylsulfate ion *6.811*
$C_{10}H_{22}N_2O_4S_2^{2+}$ Pencillamine disulfide, conjugate diacid *8.1036*
$C_{10}H_{24}CdN_4^{2+}$ 1,4,8,11-Tetraazacyclotetradecanecadmium(II) ion *6.45, 8.29*
$C_{10}H_{24}HgN_4^{2+}$ 1,4,8,11-Tetraazacyclotetradecanemercury(II) ion *6.235, 8.107*
$C_{10}H_{24}N_4Ni^{2+}$ 1,4,8,11-Tetraazacyclotetradecanenickel(II) ion *6.305, 8.138*
$C_{10}H_{24}N_4Zn^{2+}$ 1,4,8,11-Tetraazacyclotetradecanezinc(II) ion *6.481, 8.239*
$C_{11}H_7N$ 1-Naphthonitrile *6.1237*
2-Naphthonitrile *6.1238*
$C_{11}H_7O_2^-$ 1-Naphthoate ion *6.1235, 8.974, 9.99*
2-Naphthoate ion *6.1236, 8.975, 9.100*
$C_{11}H_8I_3N_2O_4^-$ Diatrizoate ion *6.820, 8.519*
Iothalamate ion *6.1108*
$C_{11}H_8O_2$ 2-Methyl-1,4-naphthoquinone *6.1207, 7.440, 8.943*
5-Phenylfurfural *8.1065*
$C_{11}H_8O_3$ 4',5'-Dihydropsoralen *6.843*
$C_{11}H_9FeO_2^-$ Carboxyferrocene ion(1-) *8.93*
$C_{11}H_{10}NO_2^-$ Indole-3-propionate ion *6.1091, 8.818*
$C_{11}H_{11}ClNO_3^-$ *N*-(2-Chloroacetyl)phenylalanine, negative ion *6.725*
$C_{11}H_{11}NO_2$ Indole-3-propionic acid *7.405*
$C_{11}H_{11}N_4O_5$ 6-Methoxypurine-9-riboside *8.899*
$C_{11}H_{11}O_5^-$ 4-Hydroxy-3,5-dimethoxycinnamate ion *8.785*
$C_{11}H_{12}NO_3^-$ *N*-Acetylphenylalanine, negative ion *6.522*
$C_{11}H_{12}N_2O_2$ Tryptophan *6.1489, 7.562, 8.1246*
$C_{11}H_{12}N_2O_2^-$ Tryptophan radical cation *5.22*
$C_{11}H_{12}N_2O_4$ *N*-Formylkynurenine *6.959, 8.675*
$C_{11}H_{13}NO_2$ 2-(*N*-Acetyl-*N*-methylamino)acetophenone *6.518*
$C_{11}H_{13}NO_3$ *N*-Acetylphenylalanine *7.183*
$C_{11}H_{13}N_2O_2^+$ Tryptophan, conjugate acid *7.563, 8.1247*
$C_{11}H_{14}N_2O_2$ *N*-Acetylphenylalanine amide *6.521, 7.184*
$C_{11}H_{14}N_2O_3$ 4-Nitrophenyl-*N*-*tert*-butylnitrone *6.1278, 8.1009*
Glycylphenylalanine *6.1024, 8.742*
$C_{11}H_{14}N_2O_4$ Glycyltyrosine *6.1035, 8.749*
$C_{11}H_{15}NO$ 4-Phenyl-*N*-*tert*-butylnitrone *6.1329, 8.1061*
$C_{11}H_{15}N_2O_3^+$ Glycylphenylalanine, conjugate acid *8.743*
$C_{11}H_{15}N_2O_4^+$ Glycyltyrosine, conjugate acid *8.750*
$C_{11}H_{15}N_2O_8P$ Nicotinamide mononucleotide *8.980*
$C_{11}H_{15}N_5O_4$ 6-Methylaminopurine riboside *8.904*
$C_{11}H_{15}N_5O_5$ 1-Methylguanosine *6.1190*
$C_{11}H_{16}$ Pentamethylbenzene *7.470, 8.1040, 9.103*
$C_{11}H_{16}O$ 1-Methoxy-2-methyl-1-phenylpropane *8.890*
2,2-Dimethyl-1-phenyl-1-propanol *8.606*
2-Methyl-4-phenyl-2-butanol *8.945*
$C_{11}H_{17}N_2O^+$ 4-(*N*-Methylpyridinium)-*tert*-butylnitrone *8.963*
$C_{11}H_{18}N_3O_5^-$ *N*-Acetylalanylalanylalanine, negative ion *6.503, 8.256*
N-Acetylsarcosylsarcosylsarcosine, negative ion *6.526, 8.268*
$C_{11}H_{19}NO_9$ *N*-Acetylneuraminic acid *6.519*
$C_{11}H_{22}N_2O_3S$ Methionylisoleucine *6.1156*
$C_{11}H_{26}N_4Ni^{2+}$ 1,4,8,12-Tetraazacyclopentadecanenickel(II) ion *6.306, 8.139*
$C_{11}H_{27}N_5Ni^{2+}$ 1,4,7,10,13-Pentaazacyclohexadecanenickel(II) ion *8.144*
$C_{12}H_7Cl_2NO_2.Na$ 2,6-Dichloroindophenol *8.527*
$C_{12}H_8N_2$ 1,10-Phenanthroline *6.1312, 8.1050, 9.104*
$C_{12}H_8O_4$ 8-Methoxypsoralen *6.1165, 8.897*
$C_{12}H_9NO$ 2-Benzoylpyridine *6.640*
3-Benzoylpyridine *6.641*
4-Benzoylpyridine *6.642*
$C_{12}H_9NS$ Phenothiazine *6.1316, 7.476*
$C_{12}H_9N_2^+$ 1,10-Phenanthroline, conjugate monoacid *7.474, 8.1051*
$C_{12}H_9O_2^-$ 1-Naphthylacetate ion *8.976*
$C_{12}H_{10}$ Biphenyl *6.661, 7.241, 8.376*
$C_{12}H_{10}NO^+$ 2-Benzoylpyridine, conjugate acid *7.234*
3-Benzoylpyridine, conjugate acid *7.235*
4-Benzoylpyridine, conjugate acid *7.236*
$C_{12}H_{10}NS^+$ Phenothiazine, conjugate acid *10.92*
$C_{12}H_{10}N_2$ *syn*-Azobenzene *6.616*
$C_{12}H_{10}N_3S^+$ Thionine cation *6.1453, 7.539*
$C_{12}H_{10}N_4O_2$ Lumichrome *6.1124*
$C_{12}H_{10}OS$ Diphenyl sulfoxide *8.624*
$C_{12}H_{10}O_2$ 1-Naphthylacetic acid *7.451*
2,3-Dimethylnaphthoquinone *6.873*
$C_{12}H_{11}FeO_2^-$ Ferrocenylacetate ion *8.94*
$C_{12}H_{11}N$ Diphenylamine *6.896, 8.623*
$C_{12}H_{11}NO_2$ 5-Methyl-1,2-trimethyleneisoindole-4,7-dione *6.1230*

$C_{12}H_{11}N_3S$ Leuco Thionine ***6.1454***
$C_{12}H_{12}CdN_2O_{12}^{4-}$ Bis(nitrilotriacetato)cadmate(II) ion ***6.52***
$C_{12}H_{12}CoN_2O_{12}^{4-}$ Bis(nitrilotriacetato)cobaltate(II) ion ***6.76***
$C_{12}H_{12}CuN_2O_{12}^{4-}$ Bis(nitrilotriacetato)cuprate(II) ion ***6.177***
$C_{12}H_{12}HgN_2O_{12}^{4-}$ Bis(nitrilotriacetato)mercurate(II) ion ***6.242***
$C_{12}H_{12}MnN_2O_{12}^{4-}$ Bis(nitrilotriacetato)manganate(II) ion ***6.268***
$C_{12}H_{12}N_2^{2+}$ 1,1′-Ethylene-2,2′-bipyridinium ***6.930***
$C_{12}H_{12}N_2NiO_{12}^{4-}$ Bis(nitrilotriacetato)nickelate(II) ion ***6.320***
$C_{12}H_{12}N_2O_{12}Pb^{4-}$ Bis(nitrilotriacetato)plumbate(II) ion ***6.355***
$C_{12}H_{12}N_2O_{12}Sn^{2-}$ Bis(nitrilotriacetato)stannate(IV) ion ***6.442***
$C_{12}H_{12}N_2O_{12}Zn^{4-}$ Bis(nitrilotriacetato)zincate(II) ion ***6.485***
$C_{12}H_{12}N_3O_2$ 3-Methyl-7,8-bis,nor-5-deazalumiflavin ***6.1181***
$C_{12}H_{12}N_4$ 2,4-Diaminoazobenzene ***6.819, 7.320***
$C_{12}H_{13}Cl_3O_6$ 2,4,6-Trichlorophenyl-β-D-glucopyranoside ***8.1218***
$C_{12}H_{13}NO_2$ 1,2,3,5-Tetramethylisoindole-4,7-dione ***6.1432***
$C_{12}H_{14}AlN_2O_{12}^{3-}$ Bis(nitrilotriacetato)aluminate(III) ion ***6.13***
$C_{12}H_{14}N_2^{2+}$ 1,1′-Dimethyl-4,4′-bipyridinium ***6.862, 7.336, 8.589, 9.70***
$C_{12}H_{14}N_2O$ 4-Cyanophenyl-*N*-*tert*-butylnitrone ***6.783, 8.472***
$C_{12}H_{15}BrO_6$ *m*-Bromophenyl-β-D-glucopyranoside ***8.391***
$C_{12}H_{15}ClO_6$ *m*-Chlorophenyl-β-D-glucopyranoside ***8.448***
p-Chlorophenyl-β-D-glucopyranoside ***6.749, 8.449***
$C_{12}H_{15}NO_8$ *m*-Nitrophenyl-β-D-glucopyranoside ***8.1010***
o-Nitrophenyl-β-D-glucopyranoside ***6.1279, 8.1011***
p-Nitrophenyl-β-D-glucopyranoside ***6.1280, 8.1012***
$C_{12}H_{15}N_6O_3^-$ Histidylhistidine, negative ion ***6.1057***
$C_{12}H_{16}CuN_6O_4$ Histidinecopper(II) complex ***6.176***
$C_{12}H_{16}N_4O_4$ *cis,syn*-1,3-Dimethyluracil dimer ***6.890***
$C_{12}H_{16}N_6O_3$ Histidylhistidine ***6.1056, 8.775***
$C_{12}H_{16}O_6$ Phenyl-β-D-glucopyranoside ***6.1332, 7.485, 8.1066***
$C_{12}H_{16}O_7$ *p*-Hydroxyphenyl-β-D-glucopyranoside ***6.1078, 8.798***
$C_{12}H_{17}NO$ 4-Methylphenyl-*N*-*tert*-butylnitrone ***6.1216, 8.946***
$C_{12}H_{17}NO_2$ 4-Methoxyphenyl-*N*-*tert*-butylnitrone ***6.1164, 8.894***
$C_{12}H_{17}N_4OS^+$ Thiamine cation ***6.1447, 7.536, 8.1194***
$C_{12}H_{17}N_5O_4$ N^6,N^6-Dimethyladenosine ***8.585***
$C_{12}H_{18}$ Hexamethylbenzene ***8.765, 9.81***
$C_{12}H_{18}Cl_2N_6O_6P$ *cis*-[Dichlorobis(1-(2-hydroxyethyl)-2-methyl-5-nitroimidazole-N^3)] ***6.370, 8.187***
$C_{12}H_{18}N_6NiO_6^{4-}$ Tris(dimethylglyoximato)nickelate(II) ion ***9.20***
$C_{12}H_{22}N_4O_5$ Alanylalanylalanylalanine ***6.554***
$C_{12}H_{22}O_{11}$ Lactose ***6.1116, 8.848***
Maltose ***6.1138, 8.862***
Melibiose ***8.864***
Sucrose ***6.1411, 7.520, 8.1155***
D-Cellobiose ***8.431***
$C_{12}H_{24}N_2^+$ 1,6-Diazabicyclo[4.4.4]tetradecane radical cation ***5.17***
$C_{12}H_{24}N_2O_3$ L-Leucyl-L-leucine ***6.1121***
$C_{12}H_{25}O_4S^-$ Dodecylsulfate ion ***6.905, 7.344, 8.628***
$C_{12}H_{26}O_4S$ Dodecyl sulfate, sodium salt ***10.50***
$C_{12}H_{27}N$ Tributylamine ***8.1213***
$C_{12}H_{27}O_4P$ Tributyl phosphate ***8.1215***
$C_{12}H_{28}N^+$ Tetrapropylammonium ion ***6.1442, 8.1189, 9.123***
$C_{12}H_{29}ClN_3Pt^+$ Chloro(tetraethyldiethylenetriamine) platinum(II) ion ***6.367, 7.134, 8.184***
$C_{12}H_{30}N_8Rh^{3+}$ 1,3,6,8,10,13,16,19-Octaazabicyclo[6.6.6]eicosane-rhodium(III) ion ***6.398***
$C_{12}O_{10}N_2$ *anti*-Azobenzene ***6.615***
$C_{13}H_8O$ 9-Fluorenone ***6.938, 7.358***
$C_{13}H_9N$ Acridine ***6.530***
$C_{13}H_9O_2^-$ Biphenyl-4-carboxylate ion ***8.377, 9.51***
$C_{13}H_9O_3^-$ 4-Phenoxybenzoate ion ***8.1056, 9.106***
$C_{13}H_{10}$ Fluorene ***6.937***
$C_{13}H_{10}N^+$ Acridinium ion ***6.531, 7.187***
$C_{13}H_{10}O$ Benzophenone ***6.635, 7.232, 8.363***
$C_{13}H_{11}Cl$ Chlorodiphenylmethane ***6.738***
$C_{13}H_{11}FeO_2^-$ Ferrocenylacrylate ion ***6.204***
$C_{13}H_{11}N_3$ 3,6-Diaminoacridine ***6.818, 8.518***
$C_{13}H_{12}ClN_2O_3^-$ *N*-(2-Chloroacetyl)tryptophan, negative ion ***6.726***
$C_{13}H_{12}NO^+$ 3-Benzoyl-*N*-methylpyridinium ion ***6.639***
$C_{13}H_{12}N_3^+$ 3,6-Diaminoacridine, conjugate monoacid ***7.319***
$C_{13}H_{12}N_4O_2$ 1-Methyllumichrome ***6.1203***
3-Methyllumichrome ***6.1204***
$C_{13}H_{13}FeO_2$ 2-Carboxyethylferrocenium ***6.201***
$C_{13}H_{13}FeO_2^-$ 2-Carboxyethylferrocene ion(1-) ***8.95***
$C_{13}H_{13}N$ Aminodiphenylmethane ***6.627, 9.45***
$C_{13}H_{13}NO_2$ 1,5-Dimethyl-2,3-trimethyleneisoindole-4,7-dione ***6.888***
$C_{13}H_{13}N_3O_5S_2$ Sulfasuccidine ***6.1417, 8.1160***
$C_{13}H_{14}N^+$ Benzhydrylammonium ion ***6.628, 8.358***
$C_{13}H_{14}N_2^{2+}$ 1,1′-Trimethylene-2,2′-bipyridinium ***6.1482***
$C_{13}H_{14}N_3O_3^-$ Glycyltryptophan, negative ion ***6.1032***
$C_{13}H_{15}NO_6$ *p*-Cyanophenyl-β-D-glucopyranoside ***8.474***
$C_{13}H_{15}N_3O_3$ Glycyltryptophan ***6.1031, 8.748***

$C_{13}H_{16}N_3O_4^-$ Glycylglycylphenylalanine, negative ion *6.1013*
Glycylphenylalanylglycine, negative ion *6.1026*
L-Phenylalanylglycylglycine, negative ion *6.1326*
$C_{13}H_{17}N_2O_2$ 2,2,5,5-Tetramethyl-4-phenyl-3-imidazolin-1-oxyl 3-oxide *6.1434*
$C_{13}H_{17}N_3O_4$ L-Glycylphenylalanylglycine *6.1025*
L-Phenylalanylglycylglycine *6.1325*
$C_{13}H_{17}N_3O_5$ Glycyltyrosylglycine *8.751*
$C_{13}H_{18}O_6$ β-Benzylglucoside *6.650, 8.367*
m-Tolyl-β-D-glucopyranoside *6.1469, 8.1210*
o-Tolyl-β-D-glucopyranoside *6.1470, 8.1211*
p-Tolyl-β-D-glucopyranoside *6.1471, 8.1212*
$C_{13}H_{18}O_7$ *p*-Methoxyphenyl-β-D-glucopyranoside *8.895*
$C_{13}H_{30}N^+$ Tributyl(methyl)ammonium ion *8.1214, 9.131*
$C_{13}N_{17}N_3O_4$ Glycylglycylphenylalanine *6.1012*
$C_{14}H_6Cl_4O_4$ Dichlorobenzoyl peroxide *6.830*
$C_{14}H_7O_5S^-$ 9,10-Anthraquinone-1-sulfonate ion *6.592, 8.329*
9,10-Anthraquinone-2-sulfonate ion *6.593, 7.213, 8.330, 9.43*
$C_{14}H_8O_4^{2-}$ 2,2′-Biphenyldicarboxylate ion *8.378, 9.52*
4,4′-Biphenyldicarboxylate ion *8.379, 9.53*
$C_{14}H_9NO_2$ 9-Nitroanthracene *10.84*
$C_{14}H_{10}$ Phenanthrene *6.1311*
$C_{14}H_{10}O$ Anthrone *6.594*
$C_{14}H_{10}O_2$ Benzil *6.629, 7.228*
$C_{14}H_{11}O_2^-$ Diphenylacetate ion *8.622, 9.71*
$C_{14}H_{12}$ 1,1-Diphenylethylene *6.898, 7.342*
$C_{14}H_{12}O_2$ Benzoin *6.633*
$C_{14}H_{13}NO$ 6-Hydroxy-1,4-dimethylcarbazole *8.786*
$C_{14}H_{14}N_3^+$ 3,6-Diamino-10-methylacridinium *6.533, 8.274*
$C_{14}H_{14}N_4O_2$ 1,3-Dimethyllumichrome *6.871*
$C_{14}H_{15}FeO_2$ 3-Carboxypropylferrocenium *6.202*
$C_{14}H_{16}N_2^{2+}$ 1,1′-Tetramethylene-2,2′-bipyridinium *6.1430*
4,4′-Dimethyl-1,1′-ethylene-2,2′-bipyridinium *6.864*
$C_{14}H_{16}P^+$ Dimethyldiphenylphosphonium ion *6.863*
$C_{14}H_{17}O_4^-$ 6-Hydroxy-2,5,7,8-tetramethylchroman-2-carboxylate ion *8.805*
$C_{14}H_{18}CdN_2O_8^{2-}$ Cyclohexanediaminetetraacetato-cadmate(II) ion *6.54*
$C_{14}H_{18}N_2O_2^{2+}$ 1,1′-Bis(2-hydroxyethyl)-4,4′-bipyridinium *6.667*
$C_{14}H_{18}N_2PbO_8^{2-}$ Cyclohexanediaminetetraacetato-plumbate(II) ion *6.357*
$C_{14}H_{20}O_6$ 2,4-Dimethylphenyl-β-D-glucopyranoside *6.877, 8.604*
3,4-Dimethylphenyl-β-D-glucopyranoside *8.605*
$C_{14}H_{22}N_2O_8$ *trans*-1,2-Cyclohexanediamine-*N,N,N′,N′*-tetraacetic acid *8.486*
$C_{14}H_{23}N_3O_{10}$ Diethylenetriaminepentaacetic acid *8.536*
$C_{14}H_{24}CoN_4^{2+}$ (2,3,9,10-Tetramethyl-1,4,8,11-tetraazacyclotetradeca-1,3,8,10-tetraene)cobalt(II) ion *6.72*
$C_{14}H_{26}CoN_4O_2^+$ Dihydroxy(2,3,9,10-tetramethyl-1,4,8,11-tetraazacyclotetradeca-1,3,8,10-tetraene)cobalt(III) ion *6.89*
$C_{14}H_{27}CoN_4O_2^{2+}$ (Aqua)hydroxy(2,3,9,10-tetramethyl-1,4,8,11-tetraazacyclotetradeca-1,3,8,10-tetraene)cobalt(III) ion *6.88*
$C_{14}H_{32}N_4Ni^{2+}$ 1,4,8,11-Tetramethyl-1,4,8,11-tetraazacyclotetradecanenickel(II) ion *6.307*
$C_{14}H_{34}N_8Pt^{4+}$ 1,8-Diamino-3,6,10,13,16,19-hexaazabicyclo[6.6.6]icosane-platinum(IV) ion *6.377*
$C_{15}H_9O_2^-$ 9-Anthroate ion *8.331, 9.44*
$C_{15}H_{11}N_4O_2^-$ Lumiflavin-3-acetate ion *6.1125*
$C_{15}H_{12}NO_2S^-$ Metiazinic acid, conjugate base *6.1232, 8.972*
$C_{15}H_{13}NO$ 9-(*N*-Acetylamino)fluorene *6.506*
$C_{15}H_{14}O$ 1,3-Diphenylacetone *6.895*
$C_{15}H_{15}NO_4$ 1-Ethoxycarbonyl-5-methyl-2,3-trimethyleneisoindole-4,7-dione *6.921*
$C_{15}H_{17}FeO_2$ 4-Carboxybutylferrocenium *6.203*
$C_{15}H_{17}N_4O_4^-$ Glycylglycyltryptophan, negative ion *6.1016*
Glycyltryptophanylglycine, negative ion *6.1034*
$C_{15}H_{18}N_2^{2+}$ 4,4′-Dimethyl-1,1′-trimethylene-2,2′-bipyridinium *6.887*
$C_{15}H_{18}N_4O_4$ Glycylglycyltryptophan *6.1015*
Glycyltryptophanylglycine *6.1033*
$C_{15}H_{19}N_4Ni^{2+}$ α-2,12-Dimethyl-3,7,11,17-tetraazabicyclo[11.3.1]heptadeca-1(17),2,6,11,13,15-hexaenenickel(II) ion *6.312, 8.147*
$C_{15}H_{20}N_2O_3S$ Benzylpenicilloic acid *6.654, 8.370*
$C_{15}H_{22}CoN_4^{2+}$ α-2,12-Dimethyl-3,7,11,17-tetraazabicyclo[11.3.1]heptadeca-1(17),2,11,13,15-pentaenecobalt(II) ion *8.37*
2,12-Dimethyl-3,7,11,17-tetraazabicyclo[11.3.1]heptadeca-1(17),2,11,13,15-pentaenecobalt(III) ion *8.48*
$C_{15}H_{22}CuN_4^{2+}$ α-2,12-Dimethyl-3,7,11,17-tetraazabicyclo[11.3.1]heptadeca-1(17),2,11,13,15-pentaenecopper(II) ion *8.70*

$C_{15}H_{22}N_4Ni^{2+}$ α-2,12-Dimethyl-3,7,11,17-tetraazabicyclo[11.3.1]heptadeca-1(17),2,11,13,15-pentaenenickel(II) ion *6.311, 8.146*

$C_{15}H_{22}O_6$ 2,4,6-Trimethylphenyl-β-D-glucopyranoside *8.1241*

$C_{15}H_{23}N_3O_{10}$ L-γ-Glutamylglutamylglutamate ion *6.976*

$C_{15}H_{23}N_5O_{14}P_2$ Adenosine 5′-diphosphoribose *8.285*

$C_{15}H_{24}CoO_6$ Tris(acetylacetonato)cobalt(III) *6.134, 7.66, 8.59*

$C_{15}H_{26}N_4Ni^{2+}$ α-2,12-Dimethyl-3,7,11,17-tetraazabicyclo[11.3.1]heptadeca-1(17),13,15-trienenickel(II) ion *6.310, 8.145*

$C_{15}H_{27}N_5O_6$ Alanylalanylalanylalanylalanine *6.555*

$C_{15}H_{30}CoN_3O_6$ Tris(L-2-aminopentanoato)cobalt(III) *7.64*

$C_{16}H_8N_2O_{14}S_4^{4-}$ Indigotetrasulfonate ion *6.1088, 8.814*

$C_{16}H_8N_2O_8S_2^{2-}$ Indigodisulfonate ion *8.812*

$C_{16}H_9NO_2$ Nitropyrene *10.87*

$C_{16}H_9N_2O_5S^-$ Indigomonosulfonate ion *8.813*

$C_{16}H_9O_3S^-$ Pyrenesulfonate ion *6.1363*

$C_{16}H_{10}$ Pyrene *10.117*

$C_{16}H_{10}O_3S$ Pyrenesulfonic acid *10.120*

$C_{16}H_{11}N$ 1-Aminopyrene *10.6*

$C_{16}H_{12}NO_3S^-$ 8-Anilino-1-naphthalenesulfonate ion *6.590*

$C_{16}H_{12}N_2O_5$ Psoralen-thymine 4′,5′-adduct *6.1358*

$C_{16}H_{12}N_2O_{12}S_3^{3-}$ Acid Chrome Blue trianion *6.528, 7.185*

$C_{16}H_{13}NO_2$ 1,2-Dimethyl-3-phenylisoindole-4,7-dione *6.878*

2,5-Dimethyl-3-phenylisoindole-4,7-dione *6.879*

$C_{16}H_{14}N_2O_6S$ Thalamyd *6.1444, 8.1191*

$C_{16}H_{16}N_2O_6S_2$ Cephalothin *6.719*

$C_{16}H_{18}N_2O_4^{2+}$ 1,1′-Bis(carboxyethyl)-4,4′-bipyridinium *6.664*

$C_{16}H_{18}N_2O_4S$ Benzylpenicillin *6.652, 8.369*

$C_{16}H_{18}N_2O_5S$ Phenoxymethylpenicillin *6.1318*

$C_{16}H_{18}N_3S^+$ Methylene Blue cation *6.1187, 7.438, 8.926*

$C_{16}H_{19}N_3O_4S$ Ampicillin *6.586*

$C_{16}H_{20}N_2$ *N,N,N′,N′*-Tetramethylbenzidine *6.1429*

$C_{16}H_{20}N_2^{2+}$ 4,4′-Dimethyl-1,1′-tetramethylene-2,2′-bipyridinium *6.885*

4,5,4′,5′-Tetramethyl-1,1′-ethylene-2,2′-bipyridinium *6.1431*

$C_{16}H_{20}N_2O_6S_2$ 1,1′-Bis(3-sulfonatopropyl)-4,4′-bipyridinium *6.669*

$C_{16}H_{21}N_3O_8S$ Cephalosporin C *6.718*

$C_{16}H_{22}N_2^+$ 1,1′,2,2′,6,6′-Hexamethyl-4,4′-bipyridinium *7.385*

$C_{16}H_{28}N_4Ni^{2+}$ 5,7,7,12,14,14-Hexamethyl-1,4,8,11-tetraazacyclotetradeca-1,4,8,11-tetraenenickel(II) ion *8.143*

$C_{16}H_{31}O_2^-$ Hexadecanoate ion *6.1043*

$C_{16}H_{32}CoN_4^{2+}$ 5,7,7,12,12,14-Hexamethyl-1,4,8,11-tetraazacyclotetradeca-4,14-dienecobalt(II) ion *6.71, 7.17, 8.36*

5,7,7,12,14,14-Hexamethyl-1,4,8,11-tetraazacyclotetradeca-4,11-dienecobalt(II) ion *6.70*

$C_{16}H_{32}CuN_4^{2+}$ 5,7,7,12,14,14-Hexamethyl-1,4,8,11-tetraazacyclotetradeca-4,11-dienecopper(II) ion *6.170, 7.73, 8.69*

$C_{16}H_{32}N_4$ 5,7,7,12,14,14-Hexamethyl-1,4,8,11-tetraazacyclotetradeca-4,11-diene *6.1050*

$C_{16}H_{32}N_4Ni^{2+}$ 5,7,7,12,14,14-Hexamethyl-1,4,8,11-tetraazacyclotetradeca-4,11-dienenickel(II) ion *6.309, 7.112, 8.142*

$C_{16}H_{34}CoN_4O_2^+$ 5,7,7,12,14,14-Hexamethyl-1,4,8,11-tetraazacyclotetradeca-4,11-dienedihydroxycobalt(III) ion *6.87*

$C_{16}H_{34}N_4^{2+}$ 5,7,7,12,14,14-Hexamethyl-1,4,8,11-tetraazacyclotetradeca-4,11-diene, conjugate diacid *6.1049, 8.766*

$C_{16}H_{35}CoN_4O_2^{2+}$ Aqua(5,7,7,12,14,14-hexamethyl-1,4,8,11-tetraazacyclotetradeca-4,11-diene)hydroxycobalt(III) ion *6.86*

$C_{16}H_{36}N^+$ Tetrabutylammonium ion *6.1421, 8.1165, 9.116*

$C_{16}H_{36}N_4Ni^{2+}$ β-*rac*-(5,7,7,12,12,14-Hexamethyl-1,4,8,11-tetraazacyclotetradecane)nickel(II) ion *8.141*

5,7,7,12,14,14-Hexamethyl-1,4,8,11-tetraazacyclotetradecanenickel(II) ion *6.308, 7.111, 8.140*

$C_{16}H_{36}P^+$ Tetrabutylphosphonium *7.524, 8.1166*

$C_{16}N_{17}NO_5$ 1-Ethoxycarbonyl-6-methoxy-5-methyl-2,3-trimethyleneisoindole-4,7-dione *6.920*

$C_{17}H_{10}O$ 1-Pyrenecarboxaldehyde *10.119*

$C_{17}H_{13}FeO_2^-$ Ferrocenylbenzoate ion *6.205*

$C_{17}H_{15}NO_2$ 1,2,5-Trimethyl-3-phenylisoindole-4,7-dione *6.1485*

$C_{17}H_{18}N_2O_6S$ Carbenicillin *6.714*

$C_{17}H_{19}N_3$ 3,6-Bis(dimethylamino)acridine *6.532, 8.273*

$C_{17}H_{20}ClN_2S^+$ Chlorpromazine, conjugate acid *6.759, 8.455*

$C_{17}H_{20}N_2O_4S$ Benzylpenicillin, methyl ester *6.653*

$C_{17}H_{20}N_2O_6S$ Methicillin *6.1153*

$C_{17}H_{20}N_3^+$ Acridine Orange, conjugate monoacid *7.186*

$C_{17}H_{20}N_4O_6$ Riboflavine *6.1387, 7.509, 8.1134*

$C_{17}H_{21}N_2S^+$ Promazine, conjugate acid *6.1348, 8.1084*

Promethazine, conjugate acid *6.1349, 8.1085*

$C_{17}H_{22}N_2^{2+}$ 4,5,4′,5′-Tetramethyl-1,1′-trimethylene-2,2′-bipyridinium *6.1439*

$C_{17}H_{25}N_3O_5$ Glycylleucyltyrosine *6.1022*

$C_{18}H_{11}N_5O_9S$ *p*-Sulfodiphenylpicrylhydrazyl *6.1419*

$C_{18}H_{15}NO_2$ 5-Methyl-1-phenyl-2,3-trimethyleneisoindole-4,7-dione *6.1217*
$C_{18}H_{17}NO_2$ 1,2,5,6-Tetramethyl-3-phenylisoindole-4,7-dione *6.1435*
$C_{18}H_{18}N_4O_6S_4^{2-}$ 2,2′-Azinobis(3-ethylbenzothiazoline-6-sulfonate ion) *6.614, 8.349*
$C_{18}H_{20}N_2O_3$ L-Phenylalanyl-L-phenylalanine *6.1327*
$C_{18}H_{22}N_2O_4S$ Phenethicillin *6.1313*
$C_{18}H_{22}O_4$ Nordihydroguaiaretic acid *8.615*
$C_{18}H_{23}O_3S^-$ Di-*tert*-butylnaphthalenesulfonate ion *8.523*
$C_{18}H_{24}N_2^{2+}$ 4,5,4′,5′-Tetramethyl-1,1′-tetramethylene-2,2′-bipyridinium *6.1438*
$C_{18}H_{24}O_2$ Estradiol *6.912*
$C_{18}H_{24}O_3$ Estriol *6.913*
$C_{18}H_{24}O_4S$ Di-*tert*-butylnaphthalenesulfuric acid *10.47*
$C_{18}H_{29}O_2^-$ Linolenate ion *8.851*
$C_{18}H_{29}O_4^-$ 13-Hydroperoxylinolenate ion *6.1062*
9-Hydroperoxylinolenate ion *6.1063*
$C_{18}H_{31}O_2^-$ Linoleate ion *8.850, 9.87*
$C_{18}H_{31}O_4^-$ 13-Hydroperoxylinoleate ion *6.1060*
9-Hydroperoxylinoleate ion *6.1061*
$C_{18}H_{33}N_5O_7^+$ Alanylalanylalanylalanylalanylalanine, conjugate acid *8.298*
$C_{18}H_{33}O_2^-$ Oleate ion *6.1297*
$C_{18}H_{35}O_2^-$ Stearate ion *6.1402*
$C_{18}H_{36}N_4Ni^{2+}$ 1,4,5,7,7,8,11,12,14,14-Decamethyl-1,4,8,11-tetraazacyclotetradecane-nickel(II) ion *6.313*
$C_{19}H_8P^+$ Methyltriphenylphosphonium ion *6.1231*
$C_{19}H_{10}Br_4O_5S$ Bromphenol Blue *6.695, 7.257*
$C_{19}H_{17}NO_2$ 5,6-Dimethyl-3-phenyl-1,2-trimethyleneisoindole-4,7-dione *6.880*
$C_{19}H_{17}NO_4$ 1-Ethoxycarbonyl-2,5-dimethyl-3-phenylisoindole-4,7-dione *6.919*
$C_{19}H_{17}N_3O_4S_2$ Cephaloridine *6.717*
$C_{19}H_{18}ClN_3O_5S$ Cloxacillin *6.766*
$C_{19}H_{19}N_7O_6$ Folic acid *6.951, 8.670*
$C_{19}H_{22}N_2O_6S$ Penamecillin *6.1306*
$C_{19}H_{34}N^+$ Benzyltributylammonium ion *8.371, 9.49*
$C_{19}H_{42}BrN$ Hexadecyltrimethylammonium bromide *6.1045, 7.384, 8.762, 10.62*
$C_{20}H_6Br_4O_5^{2-}$ Eosin dianion *6.907, 8.629*
$C_{20}H_6I_4O_5^{2-}$ Erythrosin dianion *6.911, 7.345*
$C_{20}H_{10}O_5^{2-}$ Fluorescein dianion *6.939, 8.664*
$C_{20}H_{12}$ Benzo[*a*]pyrene *6.636*
$C_{20}H_{12}I_6N_2O_6^{2-}$ Iodipamide dianion *6.1092, 8.824*
$C_{20}H_{16}CoN_4^{2+}$ Bis(2,2′-bipyridine)cobalt(II) ion *6.67*
$C_{20}H_{16}N_3O_4^+$ 3,8-Dinitro-5-methyl-6-phenylphenanthridium ion *6.893*
$C_{20}H_{17}O_2$ 1-Pyrenebutanoic acid *10.118, 8.1102*
$C_{20}H_{19}ClN_4$ Safranine T *6.1390, 8.1137*
$C_{20}H_{20}ClN_4^+$ Safranine T, conjugate acid *8.1138*
$C_{20}H_{22}N_4O_2Rh^+$ Bis(2,2′-bipyridine)dihydroxy-rhodium(III) ion *6.396*
$C_{20}H_{22}O_4^{2-}$ Crocetin dianion *6.771*
$C_{20}H_{24}O_2$ 17α-Ethynylestradiol *6.935*
$C_{20}H_{24}O_4$ Crocetin *8.464*
$C_{20}H_{27}NO_{11}$ D-Amygdalin *8.322*
$C_{20}H_{28}O$ Retinal *10.123*
$C_{20}H_{32}N_6O_{12}S_2$ Glutathione, oxidized *6.978, 7.373, 8.703*
$C_{20}H_{33}N_6O_8^-$ *N*-Acetylalanylalanylalanylalanylalanyl-alanyl-alanine, negative ion *6.504, 8.257*
$C_{20}H_{41}NaO_7S$ α-Tetradecyl-ω-(sodiumsulfonato)-tri(oxyethylene) *8.1169*
$C_{21}H_{16}$ 3-Methylcholanthrene *6.1182*
$C_{21}H_{18}O_5S$ Cresol Red *6.769*
$C_{21}H_{19}N_3$ 3,6-Diamino-2,7-dimethyl-9-phenylacridine *6.631, 8.360*
$C_{21}H_{20}N_3^+$ Ethidium *6.917*
$C_{21}H_{20}N_3O_3S^+$ 9-(2-Methoxy-4-methylsulfonyl-aminoanilino)acridinium *6.1160*
$C_{21}H_{26}N_7O_{13}P_2^+$ Nicotinamide adenine dinucleotide *6.1245, 8.979*
$C_{21}H_{29}N_7O_{14}P$ Nicotinamide adenine dinucleotide, reduced *6.1246*
$C_{21}H_{36}N_7O_{16}P_3S$ Coenzyme A *8.459*
$C_{21}H_{38}N^+$ Hexadecylpyridinium ion *6.1044, 8.761, 10.61*
$C_{22}H_{16}N_6Ru$ Bis(2,2′-bipyridine)bis(cyano) ruthenium(II) *6.403*
$C_{22}H_{17}N_3O_6S^-$ Acid Blue 40 monoanion *6.527, 8.271*
$C_{22}H_{18}N_2^{2+}$ 1,1′-Diphenyl-4,4′-bipyridinium *6.897*
$C_{22}H_{20}O_{13}$ Carmine *8.429*
$C_{22}H_{25}N_2O_8^+$ Tetracycline, conjugate acid *6.1424, 7.525, 8.1168*
$C_{22}H_{25}N_2O_9^+$ Oxytetracycline, conjugate acid *8.1033*
$C_{23}H_{36}N_2^{2+}$ Dodecylmethylviologen *6.904*
$C_{24}H_{16}N_4^{2+}$ 1,1′-Bis(4-cyanophenyl)-4,4′-bipyridinium *6.665*
$C_{24}H_{18}N_{12}Ru^{2+}$ Tris(2,2′-bipyrazine)ruthenium(II) ion *6.404*
$C_{24}H_{20}N_2O_6S_2$ 1,1′-Bis(4-sulfonatotolyl)-4,4′-bipyridyldiylium *6.670*
$C_{24}H_{20}P$ Tetraphenylphosphonium ion *6.1441, 7.535, 8.1188*
$C_{24}H_{21}N_3O_9S_3^{2-}$ Acid Red 265 dianion *8.272*
$C_{24}H_{22}N_2^{2+}$ 1,1′-Dibenzyl-4,4′-bipyridinium *6.823*
$C_{24}H_{26}N_4^{4+}$ 1,1′′-Ethanediylbis(1′-methyl-4,4′-bipyridinium) *6.914*
$C_{24}H_{42}O_{21}$ Stachyose *6.1401, 8.1149*
$C_{24}H_{57}N_8O_9$ Alanine octapeptide *6.551*
$C_{25}H_{22}P^+$ Benzyltriphenylphosphonium ion *6.657*
$C_{25}H_{28}N_4^{4+}$ 1,1′′-Propanediylbis(1′-methyl-4,4′-bipyridinium) *6.1350*
$C_{25}H_{45}FeN_6O_8$ Ferrioxamine B *8.103*
$C_{25}H_{48}N_6O_8$ Desferrioxamine B *8.517*
$C_{26}H_{44}NO_7S^-$ Taurocholate ion *6.1420*
$C_{27}H_{28}NO_{11}^-$ Adriamycin, negative ion *6.545*
$C_{27}H_{29}NO_{10}$ Daunomycin *6.810*
$C_{27}H_{29}NO_{10}^-$ Daunomycin, radical anion *5.16*
$C_{27}H_{30}NO_{11}^+$ Adriamycin, conjugate acid *6.546, 7.197*
$C_{27}H_{33}N_9O_5P_2$ Flavine mononucleotide *6.936, 8.663*

$C_{27}H_{35}N_3^{2+}$ Methyl Green dication ***6.1166***
$C_{28}H_{31}ClN_2O_3$ Rhodamine 6G ***6.1386, 8.1133***
Rhodamine B ***6.1384, 8.1132***
$C_{28}H_{31}NO_{10}$ 7-*con*-*O*-Methylnogarol ***6.1212***
7-*dis*-*O*-Methylnogarol ***6.1213***
$C_{28}H_{32}O_2$ 10-(1-Pyrenyl)dodecanoic acid ***10.121***
$C_{29}H_{48}N_2^{2+}$ 1-Methyl-1′-octadecyl-4,4′-bipyridinium ***6.1214***
$C_{30}H_{24}CoN_6^{2+}$ Tris(2,2′-bipyridine)cobalt(II) ion ***6.68***
$C_{30}H_{24}CoN_6^{3+}$ Tris(2,2′-bipyridine)cobalt(III) ion ***6.90***
$C_{30}H_{24}CrN_6^{3+}$ Tris(2,2′-bipyridine)chromium(III) ion ***8.64***
$C_{30}H_{24}FeN_6^{2+}$ Tris(2,2′-bipyridine)iron(II) ion ***8.86***
$C_{30}H_{24}FeN_6^{3+}$ Tris(2,2′-bipyridine)iron(III) ion ***7.83, 8.96***
$C_{30}H_{24}IrN_6^{3+}$ 2,2′-Bipyrid-3-ylium-C^3,N'-bis(2,2′-bipyridine-N,N')hydroxyiridium(III) ***6.257***
$C_{30}H_{24}N_6Os^{2+}$ Tris(2,2′-bipyridine)osmium(II) ion ***8.164***
$C_{30}H_{24}N_6Rh^{3+}$ Tris(2,2′-bipyridine)rhodium(III) ion ***6.397, 7.139***
$C_{30}H_{24}N_6Ru^{2+}$ Tris(2,2′-bipyridine)ruthenium(II) ion ***6.402, 7.140, 8.201***
$C_{30}H_{24}N_6Ru^{3+}$ Tris(2,2′-bipyridine)ruthenium(III) ion ***6.414, 7.143***
$C_{30}H_{33}NO_{12}$ 7-*con*-*O*-Methylnogalarol ***6.1210***
7-*dis*-*O*-Methylnogalarol ***6.1211***
$C_{30}H_{35}ClN_2O_3$ Rhodamine 3B ***6.1385***
$C_{31}H_{32}N_2O_{13}S$ Xylenol Orange ***6.1514, 8.1271***
$C_{31}H_{54}O_8$ Polyoxyethylene(7.5) *p*-nonylphenyl ether ***10.103***
$C_{32}H_{12}CuN_8O_{12}S_4^{4-}$ 3,10,17,24-Tetrasulfophthalocyaninecopper(II) ion ***8.82***
$C_{32}H_{15}MnN_8O_{14}S_4^{4-}$ (Aqua)hydroxy(3,10,17,24-tetrasulfophthalocyanine)manganese(III) ion ***8.122***
$C_{32}H_{48}Cu_4N_{16}^{4+}$ Tetra(glycylhistidine)tetracopper(II) complex ***6.181***
$C_{33}H_{32}N_4O_6^{2-}$ Biliverdin dianion ***6.659, 8.374***
$C_{33}H_{34}N_4O_6^{2-}$ Bilirubin dianion ***6.658, 8.373***
$C_{33}H_{36}N_4O_6$ Bilirubin ***10.11***
$C_{33}H_{60}O_{10}$ Polyoxyethylene(9) *p*-nonylphenyl ether ***10.104***
$C_{34}H_{32}ClFeN_4O_4$ Hemin ***6.222, 7.88***
$C_{34}H_{34}FeN_4O_4$ Iron(II) protoporphyrin ***6.200***
$C_{34}H_{38}N_4O_6$ Hematoporphyrin IX ***6.1042***
$C_{35}H_{64}O_{11}$ Polyoxyethylene(10) *p*-nonylphenyl ether ***10.105***
$C_{36}H_{24}CoN_6^{3+}$ Tris(1,10-phenanthroline)cobalt(III) ion ***6.92***
$C_{36}H_{24}FeN_6^{2+}$ Tris(1,10-phenanthroline)iron(II) ion ***6.195, 8.87***
$C_{36}H_{24}FeN_6^{3+}$ Tris(1,10-phenanthroline)iron(III) ion ***7.84, 8.97***
$C_{36}H_{38}N_4O_4$ Protoporphyrin IX, dimethyl ester ***8.1100***
$C_{36}H_{97}N_{12}O_{13}$ Alanine dodecapeptide ***6.549***
$C_{37}H_{47}NO_{14}$ *dis*-Nogamycin ***6.1292***
$C_{39}H_{49}NO_{16}$ Nogalamycin ***6.1291***
$C_{40}H_{24}MnN_8^{+}$ Tetrakis(pyridyl)porphinato-manganese(III) ion ***6.273, 8.119***
$C_{40}H_{28}N_8Sn^{2+}$ Tetrakis(4-pyridyl)porphinatotin(IV) ion ***6.436***
$C_{40}H_{30}N_{10}O_6^{2+}$ Nitro Blue Tetrazolium ***6.1252***
$C_{40}H_{46}ClFeN_6O_8S_2$ Hemin c ***6.223***
$C_{40}H_{56}$ β-Carotene ***10.15***
$C_{40}H_{80}NO_8P^{+}$ Dipalmitoyl-L-α-phosphatidyl choline ***10.48***
$C_{42}H_{36}CrN_6^{3+}$ Tris(4,7-dimethyl-1,10-phenanthroline)chromium(III) ion ***6.148***
$C_{44}H_{24}AgN_4O_{12}S_4^{3-}$ Tetrakis(*p*-sulfonatophenyl)-porphinatoargentate(III) ion ***6.8***
$C_{44}H_{24}AgN_4O_{12}S_4^{4-}$ Tetrakis(*p*-sulfonatophenyl)-porphinatoargentate(II) ion ***6.7***
$C_{44}H_{24}CdN_4O_{12}S_4^{4-}$ Tetrakis(*p*-sulfonatophenyl)-porphinatocadmate(II) ion ***6.56***
$C_{44}H_{24}CoN_4O_2S_4^{4-}$ Tetrakis(*p*-sulfonatophenyl)-porphinatocobaltate(II) ion ***6.78***
$C_{44}H_{24}CuN_4O_{12}S_4^{4-}$ Tetrakis(*p*-sulfonatophenyl)-porphinatocuprate(II) ion ***6.183***
$C_{44}H_{24}FeN_4O_{12}S_4^{3-}$ Tetrakis(*p*-sulfonatophenyl)-porphinatoferrate(III) ion ***6.217, 8.100***
$C_{44}H_{24}MnN_4O_{12}S_4^{3-}$ 5,10,15,20-Tetrakis(*p*-sulfonatophenyl)-porphinatomanganate(III) io ***6.277***
$C_{44}H_{24}MnN_4O_{12}S_4^{4-}$ Tetrakis(*p*-sulfonatophenyl)-porphinatomanganate(II) ion ***6.271***
$C_{44}H_{24}N_4O_{12}PdS_4^{4-}$ Tetrakis(*p*-sulfonatophenyl)-porphinatopalladate(II) ion ***6.361***
$C_{44}H_{24}N_4O_{12}S_4Sn^{2-}$ Tetrakis(*p*-sulfonatophenyl)-porphinatostannate(IV) ion ***6.439***
$C_{44}H_{24}N_4O_{12}S_4Zn^{4-}$ Tetrakis(*p*-sulfonatophenyl)-porphinatozincate(II) ion ***6.489, 7.168, 8.242***
Tetrakis(*p*-sulfonatophenyl)-porphinato-zincate(II) ion, triplet state ***5.15, 5.15.2***
$C_{44}H_{25}CoN_4O_3S_4^{5-}$ Hydroxytetrakis(*p*-sulfonato-phenyl)-porphinatocobaltate(II) ion ***6.79***
$C_{44}H_{26}MnN_4O_{14}S_2^{5-}$ Bis(hydroxy)tetrakis(*p*-sulfonatophenyl)-porphinato-manganate(III) ion ***8.121, 9.16***
$C_{44}H_{26}N_4O_{12}S_4^{4-}$ Tetrakis(*p*-sulfonatophenyl)porphine ***6.1427***
$C_{44}H_{26}N_4O_{14}RhS_4^{5-}$ Dihydroxytetrakis(*p*-sulfonatophenyl)-porphinerhodate(III) ion ***6.399***
$C_{44}H_{36}AgN_8^{4+}$ Tetrakis(4-*N*-methylpyridyl)-porphinatosilver(II) ion ***6.6***
$C_{44}H_{36}CdN_8^{4+}$ Tetrakis(4-*N*-methylpyridyl)-porphinatocadmium(II) ion ***6.55***
$C_{44}H_{36}CuN_8^{4+}$ Tetrakis(4-*N*-methylpyridyl)-porphinatocopper(II) ion ***6.182***

$C_{44}H_{36}FeN_8^{5+}$ Tetrakis(4-*N*-methylpyridyl)-porphinatoiron(III) ion ***6.215, 8.99***

$C_{44}H_{36}MnN_8^{4+}$ Tetrakis(4-*N*-methylpyridyl)-porphinatomanganese(II) ion ***6.270***

$C_{44}H_{36}MnN_8^{5+}$ Tetrakis(4-*N*-methylpyridyl)-porphinatomanganese(III) ion ***6.274***

$C_{44}H_{36}N_8Pb^{4+}$ Tetrakis(4-*N*-methylpyridyl)-porphinatolead(II) ion ***6.353***

$C_{44}H_{36}N_8Pd^{4+}$ Tetrakis(4-*N*-methylpyridyl)-porphinatopalladium(II) ion ***6.360***

$C_{44}H_{36}N_8Sn^{6+}$ Tetrakis(4-*N*-methylpyridyl)-porphinatotin(IV) ion ***6.437***

$C_{44}H_{36}N_8Zn^{4+}$ Tetrakis(4-*N*-methylpyridyl)-porphinatozinc(II) ion ***6.488***

$C_{44}H_{38}MnN_8O_2^{3+}$ Bis(hydroxo)tetrakis(4-*N*-methylpyridyl)porphinato-manganese(III) ion ***6.275, 8.120***

$C_{44}H_{38}N_8O_2Sn^{4+}$ Bis(hydroxo)tetrakis(4-*N*-methylpyridyl)-porphinatotin(IV) ion ***6.436***

$C_{44}H_{64}O_{24}$ Crocin ***6.772, 8.465***

$C_{44}H_{88}NO_8P^+$ β,γ-Distearoyl-L-α-phosphatidyl choline ***10.49***

$C_{45}H_{33}CoN_9^{3+}$ Tris(2,2′,6′,2″-terpyridine)cobalt(III) ion ***6.91***

$C_{45}H_{84}O_{16}$ Polyoxyethylene(15) *p*-nonylphenyl ether ***10.106, 7.487, 8.1081***

$C_{46}H_{36}FeN_{10}^{3+}$ Dicyanotetrakis(4-*N*-methylpyridyl)porphineiron(III) ion ***6.216***

$C_{46}H_{82}N_2^{2+}$ Octadecylviologen ***6.894***

$C_{48}H_{40}FeN_8O_4^{5+}$ α,α,α,β-Tetrakis(*N*-methylisonicotinamido-phenyl)porphinatoiron(III) ion ***6.219***

$C_{48}H_{40}MnN_8O_4^{5+}$ α,α,α,β-Tetrakis(*N*-methylisonicotinamido-phenyl)porphinatomanganese(III) ion ***6.276***

$C_{48}H_{80}O_{40}$ γ-Cyclodextrin ***10.27***

$C_{50}H_{40}FeN_{10}O_4^{3+}$ Dicyano-α,α,α,β-tetrakis(*N*-methylisonicotin-amidophenyl)porphinatoiron(III) ion ***6.220***

$C_{52}H_{48}N_8O_{12}S_4Zn$ Tetrakis[4-*N*-(3-sulfonatopropyl)pyridyl]porphinato-zinc(II) ***6.490***

$C_{54}H_{30}CrN_6^{3+}$ Tris(5-phenyl-1,10-phenanthroline)chromium(III) ion ***6.149***

$C_{55}H_{104}O_{21}$ Polyoxyethylene(20) *p*-nonylphenyl ether ***10.107***

$C_{56}H_{52}FeN_{16}O_4^{3+}$ Bis(1-methylimidazole)-α,α,α,β-tetrakis(*N*-methylisonicotinamido-phenyl)porphinatoiron(III) ion ***6.221***

$C_{56}H_{60}FeN_8^{5+}$ Tetrakis-4-(*N,N,N*-trimethylammonio) phenylporphinatoiron(III) ion ***6.214, 8.98***

$C_{56}H_{60}MnN_8^{5+}$ Tetrakis-4-(*N,N,N*-trimethylammonio) phenylporphinatomanganese(III) ion ***6.272***

$C_{56}H_{60}N_8Zn^{4+}$ Tetrakis-4-(*N,N,N*-trimethylammonio) phenylporphinezinc(II) ion ***6.487***

$C_{58}H_{118}O_{22}$ α-Hexadecyl-ω-hydroxypolyoxyethylene ***10.60***

$C_{60}H_{177}N_{20}O_{21}$ Alanine eicosapeptide ***6.550***

$C_{62}H_{86}N_{12}O_{16}$ Actinomycin D ***6.538***

$C_{62}H_{91}CoN_{13}O_{15}P$ Hydroxocob(III)alamin ***6.139, 8.60***

$C_{63}H_{90}CoN_{14}O_{14}P$ Cyanocob(III)alamin ***6.138, 8.61***

$C_{64}H_{24}CoN_{16}O_{24}S_8^{8-}$ 3,10,17,24-Tetrasulfophthalocyaninecobalt(II) ion dimer ***6.80, 8.42***

$C_{66}H_{48}CrN_6^{3+}$ Tris(4,4′-diphenyl-2,2′-bipyridine)chromium(III) ion ***6.147***

$C_{72}H_{48}CrN_6^{3+}$ Tris(4,7-diphenyl-1,10-phenanthroline)chromium(III) ion ***6.150***

$C_{72}H_{100}CoN_{18}O_{17}P$ Coenzyme B_{12} ***6.140***

$C_{88}H_{48}Fe_2N_8O_{25}S_8^{8-}$ Iron(III) tetrakis(*p*-sulfonato-phenyl)porphyrin dimer ***6.218***

Cd^+ Cadmium(I) ions ***8.27***

Cd^{2+} Cadmium(II) ion ***6.40, 7.13, 8.28***

$CdCl^+$ Chlorocadmium(II) ion ***6.46***

$CdH_{12}N_4^{2+}$ Tetraamminecadmium(II) ion ***6.41***

CdI_4^{2-} Tetraiodocadmate(II) ion ***6.47***

Ce^{3+} Cerium(III) ion ***6.57, 8.30, 9.7***

Ce^{4+} Cerium(IV) ion ***7.14***

Cf^{3+} Californium(III) ion ***6.59***

Cl^- Chloride ion ***6.60, 7.16, 8.31***

$ClCoH_{15}N_5^{2+}$ Pentaammine(chloro)cobalt(III) ion ***6.95, 7.29***

$ClCrH_{15}N_5^{2+}$ Pentaammine(chloro)chromium(III) ion ***6.151***

$ClFe^{2+}$ Chloroiron(III) ion ***7.81***

$ClH_{10}O_5Rh^{2+}$ Pentaaqua(chloro)rhodium(III) ion ***8.196***

$ClH_{15}N_5Os^{2+}$ Pentaammine(chloro)osmium(III) ion ***6.337, 7.121***

$ClH_{15}N_5Rh^{2+}$ Pentaammine(chloro)rhodium(III) ion ***6.392***

$ClH_{15}N_5Ru^{2+}$ Chloropentaammineruthenium(III) ion ***6.411***

ClHg Mercury(I) chloride ***8.105***

ClO^- Hypochlorite ion ***6.61, 8.32, 9.8***

ClO_2 Chlorine dioxide ***5.8***

ClO_2^- Chlorite ion ***6.62, 8.33, 9.9***

ClO_3^- Chlorate ion ***6.63, 8.34***

ClO_4^- Perchlorate ion ***6.64***

$ClRh^{2+}$ Chlororhodium(III) ion ***6.393***

$ClTl^{2+}$ Chlorothallium(III) ion ***7.161***

Cl_2^- Dichlorine radical ion ***5.7***

$Cl_2CoH_{12}N_4^+$ Tetraamminedichlorocobalt(III) ion ***7.30***

$Cl_2H_6N_2Pt$ *trans*-Dichlorodiammineplatinum(II) ***6.369, 8.186***

Cl_2Hg Mercury(II) chloride ***6.237, 7.92***

Cl_2Ti^+ Dichlorotitanium(III) ion ***7.162***

Cl_3^- Trichlorine anion *7.15*
Cl_3Rh Trichlororhodium(III) *8.198*
Cl_3Ru Ruthenium(III) chloride *6.410*
Cl_3Tl Thallium(III) chloride *7.163*
Cl_4Pd^{2-} Tetrachloropalladate(II) ion *6.358, 8.178*
Cl_4Pt^{2-} Tetrachloroplatinate(II) ion *6.371, 8.188*
Cl_4Tl^- Tetrachlorothallate(III) ion *7.164*
$Cl_5H_2OOs^-$ (Aqua)pentachloroosmate(IV) ion *6.338, 8.166*
$Cl_5H_2ORh^{2-}$ (Aqua)pentachlororhodate(III) ion *8.197*
Cl_5Rh^{2-} Pentachlororhodate(III) ion *6.394*
Cl_6Ir^{2-} Hexachloroiridate(IV) ion *6.259, 7.98*
Cl_6Ir^{3-} Hexachloroiridate(III) ion *6.258, 8.114*
Cl_6Pt^{2-} Hexachloroplatinate(IV) ion *6.381*
Cl_6Ru^{2-} Hexachlororuthenate(IV) ion *7.145*
Co^{2+} Cobalt(II) ion *6.65, 8.35*
$CoFH_{15}N_5^{2+}$ Pentaammine(fluoro)cobalt(III) ion *6.100, 7.34*
$CoF_2H_{12}N_4^+$ Tetraamminedifluorocobalt(III) ion *7.35*
$CoH_9N_6O_6$ Trinitrotrisamminecobalt(III) *7.40*
$CoH_{12}N_4^{3+}$ Tetraamminecobalt(III) ion *6.83, 7.21*
$CoH_{15}IN_5^{2+}$ Pentaammine(iodo)cobalt(III) ion *7.38*
$CoH_{15}N_5^{3+}$ Pentaamminecobalt(III) ion *6.82, 7.19*
$CoH_{15}N_5O_4P$ Pentaammine(phosphato)cobalt(III) *7.44*
$CoH_{15}N_6O_2^{2+}$ Pentaammine(nitrito-*N*)cobalt(III) ion *7.41*
$CoH_{15}N_8^{2+}$ Pentaammine(azido)cobalt(III) ion *6.103, 7.39, 8.51*
$CoH_{16}N_5O^{2+}$ Pentaammine(hydroxy)cobalt(III) ion *7.20*
$CoH_{18}N_6^{3+}$ Hexaamminecobalt(III) ion *6.81, 7.18, 8.43*
$CoN_6O_{12}^{3-}$ Hexanitrocobaltate(III) ion *6.116*
$Co_2H_{30}N_{10}O_2^{5+}$ Decaammine-μ-(superoxido)dicobalt(III) ion *6.135*
Cr^{2+} Chromium(II) ion *6.141, 7.67, 8.62*
CrF_6^{3-} Hexafluorochromate(III) ion *6.153*
$CrHO_4^-$ Chromate(VI) ion, hydrogen *6.160*
CrO_2^- Chromate(III) ion *6.145*
CrO_4^{2-} Chromate(VI) ion *6.161, 7.69*
CrO_4^{3-} Chromate(V) ion *8.66*
$Cr_2O_7^{2-}$ Dichromate(VI) ion *6.163, 7.70*
$Cr_4O_{12}^{3-}$ Trichromatochromate(III) ion *6.162*
Cs^+ Cesium(I) ion *6.164*
Cu^+ Copper(I) ion *6.165, 7.71*
Cu^{2+} Copper(II) ion *6.166, 7.72, 8.67*
$CuH_{12}N_4^{2+}$ Tetraamminecopper(II) ion *6.168*
D_2 Deuterium *7.74, 8.83*
Dy^{3+} Dysprosium(III) ion *6.184*
Er^{3+} Erbium(III) ion *6.186*
Eu^{2+} Europium(II) ion *8.84*
Eu^{3+} Europium(III) ion *6.188*
$EuO_{36}W_{10}^{9-}$ Europium(III) decatungstate *6.468*
F^- Fluoride ion *6.191, 7.75*
FFe^{2+} Fluoroiron(III) ion *7.82*
FH Hydrofluoric acid *6.192*
FNi^+ Fluoronickel(II) ion *6.314*
F_2H^- Hydrogen difluoride ion *6.193*
F_6Fe^{3-} Hexafluoroferrate(III) ion *6.209*
F_6S Sulfur hexafluoride *6.418*
F_6Si^{2-} Hexafluorosilicate(IV) ion *6.431*
F_6Sn^{2-} Hexafluorostannate(IV) ion *6.441*
F_6Ti^{2-} Hexafluorotitanate(IV) ion *6.452*
Fe^{2+} Iron(II) ion *6.194, 7.76, 8.85, 9.10*
Fe^{3+} Iron(III) ion *6.206, 7.78*
$FeHO^{2+}$ Hydroxoiron(III) ion *7.79*
$FeH_2O_2^+$ Dihydroxyiron(III) ion *6.207*
FeO_4^{2-} Ferrate(VI) ion *6.224*
FeO_4S^+ Sulfatoiron(III) ion *6.208, 7.80*
Ga^{3+} Gallium(III) ion *6.225*
Gd^{3+} Gadolinium(III) ion *6.228*
H Hydrogen atom *5.2, 5.2.1, 5.2.2, 5.2.3, 5.5.2, 5.7.1, 5.9.2, 5.10.2, 5.15.1, 5.17.2, 5.19.1, 7., 10.12.2, 10.25.1, 10.29.2, 10.34.2, 10.41.2, 10.57.2, 10.60.1, 10.73.2, 10.90.2, 10.111.2, 10.125.2, 10.126.1, 10.127.1, 10.133.2, 10.140.2*
H^+ Hydrogen ion *6.230*
HIO Hypoiodous acid *6.249, 8.111*
$HInO^{2+}$ Hydroxyindium(III) ion *6.254*
HNO_2 Nitrous acid *7.107*
$HNO_7S_2^{2-}$ Hydroxylaminedisulfonate ion *6.291, 8.131*
HN_3 Hydrogen azide *6.285, 7.102, 8.126*
$HNpO_3^+$ Hydroxydioxoneptunium(VI) ion *6.327*
HO Hydroxyl *5.3, 5.3.1, 5.3.2, 5.3.3, 5.3.4, 5.3.5, 5.6.1, 5.7.2, 5.8.1, 5.10.3, 5.11.1, 5.12.1, 5.17.3, 8., 10.1.2, 10.2.2, 10.3.2, 10.4.2, 10.7.2, 10.8.2, 10.12.3, 10.13.2, 10.14.2, 10.16.2, 10.18.2, 10.21.2, 10.22.2, 10.23.2, 10.24.2, 10.25.2, 10.26.2, 10.27.2, 10.28.2, 10.29.3, 10.34.3, 10.40.1, 10.41.3, 10.42.1, 10.44.2, 10.45.2, 10.46.2, 10.48.1, 10.49.1, 10.51.2, 10.54.2, 10.55.2, 10.58.2, 10.59.2, 10.60.2, 10.65.2, 10.66.2, 10.67.2, 10.68.2, 10.69.2, 10.70.2, 10.71.2, 10.72.2, 10.73.3, 10.75.2, 10.80.2, 10.82.1, 10.85.1, 10.89.2, 10.90.3, 10.91.2, 10.94.1, 10.95.2, 10.96.2, 10.97.1, 10.98.1, 10.99.1, 10.100.2, 10.102.1, 10.103.1, 10.105.1, 10.107.1, 10.108.1, 10.110.2, 10.111.3, 10.112.1, 10.114.2, 10.117.2, 10.118.2, 10.120.1, 10.122.1, 10.125.3, 10.128.2, 10.129.1, 10.133.3, 10.139.2, 10.140.3, 10.141.2, 10.142.2*
HO^- Hydroxide ion *7.117, 8.161*
$HOTi^{2+}$ Hydroxytitanium(III) ion *6.451*
HOU^{3+} Hydroxyuranium(IV) ion *6.458*
HO_2^- Hydroperoxide ion *6.333, 8.160, 9.23*
HO_3P^{2-} Hydrogen phosphite ion *7.124, 8.169*
HO_3S^- Hydrogen sulfite ion *8.207*
HO_3Se^- Hydrogen selenite(IV) ion *6.428, 7.150, 8.218*
HO_3U^+ Hydroxydioxouranium(VI) ion *6.460*
HO_4P^{2-} Hydrogen phosphate ion *6.344, 7.127, 8.172, 9.25*

HO_4S^- Hydrogen sulfate ion *8.209*
HO_4Se^- Hydrogen selenate(VI) ion *7.152*
HO_4Xe Hydrogen xenate(VII) *9.31*
HO_4Xe^- Hydrogen xenate(VI) ion *8.235*
HO_5P^{2-} Hydrogen peroxophosphate ion *6.349, 8.176*
HO_5S^- Hydrogen peroxysulfate ion *6.423, 8.212*
HO_6Xe^{3-} Hydrogen perxenate(VIII) ion *6.471, 8.236*
$HO_8P_2^{3-}$ Hydrogen peroxodiphosphate ion *6.347*
$HO_{62}P_2W_{18}^{6-}$ Diphosphooctadecatungstate ion(7-), conjugate acid *8.232*
HS^- Bisulfide ion *6.416, 8.206*
HSe^- Hydroselenide ion *6.427, 8.216*
H_2 Hydrogen *6.231, 8.104, 9.11*
H_2HgO_2 Mercury(II) dihydroxide *6.232, 7.91*
$H_2IO_6^{3-}$ Dihydrogen periodate ion *9.15*
$H_2NO_3S^-$ Sulfamate ion *6.290*
H_2O Water *6.334, 7.116, 9.24*
H_2O_2 Hydrogen peroxide *6.332, 7.118*
$H_2O_2P^-$ Phosphinic acid, ion(1-) *6.339, 8.167*
$H_2O_3P^-$ Dihydrogen phosphite ion *6.341, 8.168*
H_2O_3Se Selenious acid *7.149, 8.217*
$H_2O_4P^-$ Dihydrogen phosphate ion *6.343, 7.126, 8.173*
H_2O_5S Peroxysulfuric acid *7.148*
$H_2O_8P_2^{2-}$ Dihydrogen peroxodiphosphate ion *6.346*
H_2S Hydrogen sulfide *6.415, 8.205*
H_2Se Hydrogen selenide *6.426, 8.215*
H_3NO Hydroxylamine *6.288, 8.129*
H_3O_2P Hypophosphorous acid *7.122*
H_3O_3P Phosphorous acid *7.123*
$H_3O_3Zn^-$ Trihydroxyzincate(II) ion *6.477*
H_3O_4P Phosphoric acid *6.342, 7.125, 8.174*
H_4N^+ Ammonium ion *7.103*
H_4NO^+ Hydroxylammonium ion *6.289, 8.130*
H_4N_2 Hydrazine *6.286, 8.127*
$H_4O_4Zn^{2-}$ Tetrahydroxozincate(II) ion *6.478*
$H_5N_2^+$ Hydrazinium ion *6.287, 7.104, 8.128*
$H_6Cl_2N_2Pt$ *cis*-Dichlorodiammineplatinum(II) *6.368, 8.185*
H_6O_6Te Telluric acid *6.447*
$H_8O_{20}P_8Pt_2^{4-}$ Octahydrogen tetrakis(diphosphito)diplatinate(II) ion *6.375*
$H_{12}N_4Ni^{2+}$ Tetraamminenickel(II) ion *6.300*
$H_{12}N_4Pt^{2+}$ Tetraammineplatinum(II) ion *6.364, 7.131, 8.180*
$H_{12}N_4Zn^{2+}$ Tetraamminezinc(II) ion *6.479*
$H_{14}N_4O_2Pt^{2+}$ *trans*-Tetraamminebis(hydroxy) platinum(IV) ion *6.376*
$H_{15}IN_5Ru^{2+}$ Pentaammine(iodo)ruthenium(III) ion *6.412*
$H_{15}N_6ORu^{3+}$ Pentaammine(nitroso)ruthenium(III) ion *6.408, 7.142*
$H_{15}N_7Os^{2+}$ Pentaammine(nitrogeno)osmium(II) ion *8.163*
$H_{15}N_7Ru^{2+}$ Pentaammine(dinitrogen)ruthenium(II) ion *6.400, 8.199*
$H_{15}N_8Rh^{2+}$ Pentaammine(azido)rhodium(III) ion *6.390*
$H_{16}N_5ORu^{2+}$ Hydroxopentammineruthenium(III) ion *6.407*
$H_{17}N_5ORh^{3+}$ Pentaammine(aqua)rhodium(III) ion *6.389*
$H_{18}N_6Ru^{3+}$ Hexaammineruthenium(III) ion *6.406, 7.141*
$H_{30}N_{12}Ru_2^{4+}$ Decaammine(dinitrogen)diruthenium(II) ion *6.401, 8.200*
Hg^{2+} Mercury(II) ion *7.90*
HgI_2 Mercury(II) iodide *6.238, 7.93*
Hg_2^{2+} Mercury(I) dimer ion *7.89*
Ho^{3+} Holmium(III) ion *6.244*
I^- Iodide ion *6.246, 7.96, 8.109, 9.12*
IO^- Hypoiodite ion *6.250, 9.13*
IO_3^- Iodate ion *6.251, 8.112, 9.14*
IO_4^- Periodate ion *6.252*
I_2 Iodine *6.248, 7.94, 8.110*
I_2^- Diiodine radical ion *5.9*
I_3^- Triiodine ion *6.247, 7.95*
In^{2+} Indium(II) ion *8.113*
In^{3+} Indium(III) ion *6.253, 7.97*
InO_4S^+ Sulfatoindium(III) ion *6.255*
K^+ Potassium ion *6.260*
La^{3+} Lanthanum(III) ion *6.261*
Lu^{3+} Lutetium(III) ion *6.263*
Mn^{2+} Manganese(II) ion *6.265, 7.99, 8.115*
MnO_4^- Permanganate ion *6.279, 7.100*
MnO_4^{2-} Manganate(VI) ion *6.278, 9.17*
MoO_4^{2-} Molybdate(VI) ion *6.283*
NH_3 Ammonia *8.124*
NO Nitric oxide *5.10*
NO_2 Nitrogen dioxide *5.11*
NO_2^- Nitrite ion *6.294, 7.108, 8.133, 9.19*
NO_3^- Nitrate ion *6.295, 7.109*
$NO_7S_2^{2-}$ Nitrosyldisulfonate ion *6.292, 7.105, 8.132*
N_2O Nitrous oxide *6.293, 7.106*
N_3^- Azide ion *6.284, 7.101, 8.125, 9.18*
Na^+ Sodium ion *6.296*
NaO_3P Sodium metaphosphate *6.340, 8.170*
Nd^{3+} Neodymium(III) ion *6.297*
$NdO_{36}W_{10}^{9-}$ Neodymium(III) decatungstate *6.469*
Ni^+ Nickel(I) ion *8.134*
Ni^{2+} Nickel(II) ion *6.299, 7.110, 8.135*
NpO_2^+ Dioxoneptunium(V) ion *6.324, 7.114, 8.158, 8.159*
NpO_2^{2+} Dioxoneptunium(VI) ion *6.326, 7.115*
NpO_4^{2-} Neptunate(VI) ion *9.21*
O^- Oxide radical ion *5.4, 5.4.1, 5.4.2, 5.8.2, 5.12.1, 9.*
OSb^+ Antimony(III) ion *8.214*
OV^{2+} Vanadyl(IV) ion *6.465, 8.230*
O_2 Oxygen *6.331, 7.119, 9.22*
O_2Pu^{2+} Dioxoplutonium(VI) ion *6.382*
O_2U^{2+} Uranyl(VI) ion *6.459, 7.165*
O_3 Ozone *6.335, 7.120, 8.162*
O_3^- Ozonide ion *5.12*

O_3P^{2-} Phosphite radical ion *5.13*
O_3S^- Sulfite radical ion *5.14*
O_3S^{2-} Sulfite ion *6.417, 8.208, 9.27*
$O_3S_2^{2-}$ Thiosulfate ion *6.420, 7.146, 8.210, 9.28*
O_3Sb^- Antimonate(V) ion *6.424*
O_3Se^{2-} Selenite(IV) ion *6.429, 7.151, 8.219, 9.29*
O_3Sn^{2-} Stannate(IV) ion *6.440*
O_3Te^{2-} Tellurite(IV) ion *6.446, 7.155, 8.224*
O_3V^- Vanadate(V) ion *6.466*
O_3Xe Xenon(VI) trioxide *8.234*
O_4P^{3-} Phosphate ion *8.171*
O_4Re^- Perrhenate(VII) ion *6.388*
O_4Ru^{2-} Ruthenate(VI) ion *9.26*
O_4S^{2-} Sulfate ion *6.419*
O_4STh^{2+} Sulfatothorium(IV) ion *6.450*
O_4Se^{2-} Selenate(VI) ion *6.430, 7.153, 8.220, 9.30*
O_4Tc^- Technetate(VII) ion *6.445, 7.154*
O_4Tc^{2-} Technetate(VI) ion *8.223*
O_4Te^{2-} Tellurate(VI) ion *6.448, 7.156*
O_5S^{2-} Peroxomonosulfate ion *8.211*
$O_6S_4^{2-}$ Tetrathionate ion *6.421*
$O_7P_2^{4-}$ Pyrophosphate ion *6.345, 8.175*
$O_8P_2^{4-}$ Peroxodiphosphate ion *6.348*
$O_8S_2^{2-}$ Peroxydisulfate ion *6.422, 7.147, 8.213*
$O_{62}P_2W_{18}^{6-}$ Diphosphooctadecatungstate ion(6-) *6.470, 8.233*
$O_{62}P_2W_{18}^{7-}$ Diphosphooctadecatungstate ion(7-) *8.231*
Pb^+ Lead(I) ions *7.128*
Pb^{2+} Lead(II) ions *6.350, 7.129, 8.177*
Pr^{3+} Praseodymium(III) ion *6.362, 7.130, 8.179*
Pt Platinum *10.93*
Pu^{3+} Plutonium(III) ion *8.194*
Sm^{2+} Samarium(II) ion *8.221*
Sm^{3+} Samarium(III) ion *6.432*
Sn^{2+} Tin(II) ion *8.222*
Tb^{3+} Terbium(III) ion *6.443*
Th^{4+} Thorium(IV) ion *6.449*
Ti^{3+} Titanium(III) ions *7.157, 8.225*
Ti^{4+} Titanium(IV) ion *7.158*
Tl^+ Thallium(I) ion *6.453, 7.159, 8.226*
Tl^{3+} Thallium(III) ion *7.160*
Tm^{2+} Thulium(II) ion *8.227*
Tm^{3+} Thulium(III) ion *6.455*
U^{3+} Uranium(III) ion *8.228*
U^{4+} Uranium(IV) ion *6.457, 8.229*
Y^{3+} Yttrium(III) ion *6.472*
Yb^{2+} Ytterbium(II) ion *8.237*
Yb^{3+} Ytterbium(III) ions *6.474*
Zn^+ Zinc(I) ion *7.166*
Zn^{2+} Zinc(II) ion *6.476, 7.167, 8.238*

14.2. Chemical Name Index

The index refers to the entries in Tables 5-10. The digit(s) before the period indicate the table number and the digits following the period indicate the entry number within the table. Thus, 6.100 is the one-hundredth entry in Table 6.

ABTS *6.614, 8.349*
ATCC 9760 *10.75*
Acetaldehyde *6.491, 7.169, 8.243*
Acetaldehyde dimethyl acetal *8.578*
Acetaldoxime *6.492*
Acetamide *6.493, 7.170, 8.244*
Acetamide, *N,N*-dimethyl- *6.852, 8.583*
Acetamide, *N*-(2-mercaptoethyl)- *6.507*
Acetamide, *N*-methyl- *6.1167, 8.900*
Acetamide, *N*,2,2,2-tetramethyl- *8.952*
Acetamidoacetic acid *7.181*
2-Acetamido-2-deoxy-D-galactopyranose *6.494, 8.245*
2-Acetamido-2-deoxy-α-D-glucopyranose *6.495, 8.246*
4-Acetamidophenol *8.247*
Acetaminophen *8.247*
Acetanilide *7.171, 8.248*
Acetate ion *6.496, 7.172, 8.249, 9.32*
Acetate ion-d_3 *7.173*
(Acetato)pentaamminecobalt(III) ion *6.122, 7.47*
Acetic acid *6.497, 7.174, 8.250*
Acetoacetic ester *7.351*
Acetoin *6.1067, 8.781*
Acetone *6.498, 7.175, 8.251*
Acetone-d_6 *8.252*
Acetone oxime *6.499*
Acetonitrile *6.500, 7.176, 8.253, 9.33*
Acetophenone *6.501, 7.177, 8.254*
Acetophenone, 2-(*N*-acetylamino)- *6.505*
Acetophenone, 2-(*N*-acetyl-*N*-methylamino)- *6.518*
Acetophenone, 3,4-dihydroxy-α-(methylamino)- *6.544, 8.293*
Acetophenone, 2-(*N*-formylamino)- *6.956*
Acetophenone, 2-(*N*-formyl-*N*-methylamino)- *6.960*
Acetophenone, α-hydroxy-α-phenyl- *6.633*
Acetophenone, 4-nitro- *6.1253, 7.455, 8.992*
Aceturic acid *7.181*
Acetylacetone *7.472, 8.1043*
Acetylacetone, conjugate base *8.1044*
N-Acetylalanine, negative ion *6.502, 8.255*
N-Acetylalanine *7.178*
N-Acetylalanylalanylalanine, negative ion *6.503, 8.256*
N-Acetylalanylalanylalanylalanylalanylalanylalanine, negative ion *6.504, 8.257*
2-(*N*-Acetylamino)acetophenone *6.505*
5-Acetylamino-3,5-dideoxy-D-glycero-D-galacto-2-nonulosonic acid *6.519*
9-(*N*-Acetylamino)fluorene *6.506*
4-[(4-(Acetylamino)phenyl]amino]-1-amino-9,10-anthraquinone-2-sulfonate *6.527, 8.271*
Acetylcholine *8.258*
N-Acetylcysteamine, negative ion *6.508*
N-Acetylcysteamine *6.507*
N-Acetylcysteine, dianion *6.510*
N-Acetylcysteine, negative ion *6.509*
Acetylcytochrome C *10.32*
N-Acetyldiglycinamide *6.515, 8.262*
Acetylene *6.511, 7.179, 8.259*
Acetylenedicarboxylate ion *9.34*
Acetylenedicarboxylic acid *7.180*
2-Acetylfuran *8.260*
N-Acetyl-D-galactosamine *6.494, 8.245*
N-Acetyl-α-D-glucosamine *6.495, 8.246*
N-Acetylglycinamide *6.513*
N-Acetylglycine, negative ion *6.512, 8.261*
N-Acetylglycine *7.181*
N-Acetylglycine methyl ester *6.514*
N-Acetylglycylglycinamide *6.515, 8.262*
N-Acetylglycylglycine, negative ion *6.516, 8.263*
N-Acetylglycylglycylglycine, negative ion *6.517, 8.264*
N-Acetylhexaalanine, negative ion *6.504, 8.257*
N-Acetylleucine, negative ion *8.265*
N-Acetylmethionine, negative ion *8.266*
N-Acetylmethionine *7.182*
2-(*N*-Acetyl-*N*-methylamino)acetophenone *6.518*
Acetyl methyl carbinol *6.1067, 8.781*
N-Acetylneuraminic acid *6.519*
Acetyl peroxide *6.520, 8.267*
N-(2-Acetylphenyl)acetamide *6.505*
N-Acetylphenylalanine, negative ion *6.522*
N-Acetylphenylalanine *7.183*
N-Acetylphenylalanine amide *6.521, 7.184*
N-(2-Acetylphenyl)formamide *6.956*
N-Acetylphenylglycine, negative ion *6.523*
N-(2-Acetylphenyl)-*N*-methylacetamide *6.518*
N-(2-Acetylphenyl)-*N*-methylformamide *6.960*
3-Acetylpyridine *6.524*
N-Acetylsarcosine, negative ion *6.525*
N-Acetylsarcosylsarcosylsarcosine, negative ion *6.526, 8.268*
N-Acetylserine *8.269*
4-(2-Acetylsulfamyl)phthalanilic acid *6.1444, 8.1191*
N'-Acetylsulfanilamide *6.1412, 8.1156*
N-Acetyltrialanine, negative ion *6.503, 8.256*
N-Acetyltriglycine, negative ion *6.517, 8.264*
N-Acetyltrisarcosine, negative ion *6.526, 8.268*
N-Acetylvaline, negative ion *8.270*
Acid Blue 40 monoanion *6.527, 8.271*
Acid Chrome Blue trianion *6.528, 7.185*
Acid Red 265 dianion *8.272*
Aconitate ion *6.529, 9.35*
Acridine *6.530*
Acridine, conjugate acid *6.531, 7.187*
Acridine, 3,6-bis(dimethylamino)- *6.532, 8.273*
Acridine, 3,6-bis(dimethylamino)-, conjugate monoacid *7.186*
Acridine, 3,6-diamino-, conjugate monoacid *7.319*
Acridine, 3,6-diamino- *6.818, 8.518*
Acridine, 3,6-diamino-2,7-dimethyl-9-phenyl- *6.631, 8.360*
Acridine Orange, conjugate monoacid *7.186*
Acridine Orange free base *6.532, 8.273*
Acridinium, 3,6-diamino-10-methyl- *6.533, 8.274*

Acridinium ion *6.531, 7.187*
Acriflavine cation *6.533, 8.274*
Acrolein *8.275*
Acrylamide *6.534, 7.188, 8.276, 9.36*
Acrylate ion *6.535, 8.277, 9.37*
Acrylic acid *6.536, 7.189, 8.278*
Acrylonitrile *6.537, 7.190, 8.279, 9.38*
Actinomycin D *6.538*
Adenine *6.539, 7.191, 8.280*
Adenine, conjugate acid *7.192, 8.281*
Adenosine *6.540, 7.193, 8.282*
Adenosine, conjugate acid *7.194, 8.283*
Adenosine diphosphate *8.284*
Adenosine 5′-diphosphoribose *8.285*
Adenosine 3′-monophosphate *8.288*
Adenosine 5′-monophosphate *6.541, 7.195, 8.286*
Adenosine 5′-monophosphate, conjugate acid *8.287*
Adenosine triphosphate *8.289*
5′-Adenylic acid, conjugate acid *8.287*
3′-Adenylic acid *8.288*
5′-Adenylic acid *6.541, 7.195, 8.286*
Adipic acid *8.290*
Adrenaline *6.542, 8.291*
Adrenaline, conjugate acid *6.543, 7.196, 8.292*
Adrenalone *6.544, 8.293*
Adriamycin, conjugate acid *6.546, 7.197*
Adriamycin, negative ion *6.545*
Agarose *10.1*
Alanine *6.547, 8.294*
Alanine, conjugate acid *7.198, 8.295*
β-Alanine, conjugate acid *7.199*
β-Alanine, *N*-(2,4-dihydroxy-3,3-dimethyl-1-oxobutyl)-, ion(1-), *6.1305, 8.1034*
Alanine, negative ion *8.296*
Alanine anhydride *6.548, 8.297*
β-Alanine *6.561*
Alanine dodecapeptide *6.549*
Alanine eicosapeptide *6.550*
Alanine octapeptide *6.551*
Alanylalanine *6.552*
β-Alanyl-β-alanine, negative ion *6.564*
β-Alanylalanine *6.562*
β-Alanyl-β-alanine *6.563*
Alanylalanylalanine *6.553*
Alanylalanylalanylalanine *6.554*
Alanylalanylalanylalanylalanine *6.555*
Alanylalanylalanylalanylalanylalanine, conjugate acid *8.298*
Alanylglycine *6.556, 8.299*
Alanylglycine, conjugate acid *8.300*
β-Alanylglycylglycine, negative ion *6.566*
β-Alanylglycylglycine *6.565*
β-Alanylhistidine, conjugate acid *6.568, 8.301*
β-Alanylhistidine, negative ion *6.569, 8.302*
β-Alanylhistidine *6.567*
β-Alanylhistidinecopper(II) complex *6.175*
Alanylleucine *6.557*
Alanyllysine *6.558*
Alanylmethionine *6.559*
Alanylserine *6.560*
Albumin (serum) *10.2*
Alcohol dehydrogenase *10.3*
Aldolase (rabbit muscle) *10.4*
Alloxan *6.570*
Allyl alcohol *6.571, 7.200, 8.303, 9.39*
Allylamine *6.572*
Allylammonium ion *8.304*
Allylbenzene *9.40*
Allyl cyanide *8.305, 9.41*
Aluminate(III) ion *6.10*
Americium(III) ion *6.15, 8.3*
N-Amidinosarcosine *6.768*
μ-Amido-μ-superoxidotetrakis(ethylenediamine)-dicobalt(III) ion *6.137*
2-Aminoacetamide, conjugate acid *6.979, 8.709*
2-Aminoacetamide *6.980, 8.708*
Aminoacetonitrile *7.201*
Aminoacetonitrile, conjugate acid *7.202*
D-Amino acid oxidase *10.5*
4-Aminobenzenesulfonamide *6.1414, 8.1158*
4-Aminobenzenesulfonate ion *6.1415, 8.1159*
4-Aminobenzenesulfonic acid *6.1416, 7.521*
2-Aminobenzoate ion *6.573, 8.306*
3-Aminobenzoate ion *6.574, 8.307*
4-Aminobenzoate ion *6.575, 8.308*
4-Aminobutanethiol, conjugate acid *6.576, 7.203, 7.204*
2-Aminobutyric acid, conjugate acid *7.205, 8.310*
3-Aminobutyric acid, conjugate acid *8.311*
4-Aminobutyric acid, conjugate acid *8.313*
2-Aminobutyric acid *8.309*
4-Aminobutyric acid *6.577, 8.312*
4-Aminobutyrylglycine *6.578*
2-Aminocarbonylfuran *8.685*
3-Aminocarbonyl-1-methylpyridinium ion *6.1208*
4-(2-Amino-2-carboxyethyl)phenoxy *5.23*
7-Aminocephalosporanic acid *6.579*
2-Amino-2-deoxy-D-galactose *6.967, 8.314*
5-Amino-2,3-dihydro-1,4-phthalazinedione *8.852*
Aminodiphenylmethane *6.627, 9.45*
2-Aminoethanol, conjugate acid *7.206*
2-Aminoethanol, phosphate *8.1075*
2-Aminoethanol *6.916*
erythro-α-(1-Aminoethyl)benzyl alcohol *6.1293*
4-(2-Aminoethyl)phenol, conjugate acid *6.1490*
4-(2-Aminoethyl)phenoxide ion *6.1491, 8.1248*
2-Aminoethylsulfide ion *6.798*
α-Amino-2-(formylamino)-γ-oxobenzenebutanoic acid *6.959, 8.675*
6-Amino-5-(β-D-glucopyranosyloxy)-2,4-pyrimidinedione *8.460*
2-Amino-D-glucose *6.969*
2-Aminohexanoic acid, conjugate acid *8.1017*
2-Aminohexanoic acid *6.1294, 8.1016*
2-Amino-3-hydroxybutanoic acid *6.1458, 8.1198*
2-Amino-2-(hydroxymethyl)-1,3-propanediol *8.315*
2-Amino-3-hydroxypropionic acid *6.1399, 8.1148*
2-Amino-6-hydroxypurine *6.1039, 8.755*

6-Amino-2-hydroxypurine *8.837*
6-Amino-5-hydroxyuracil *8.845*
5-Amino-6-hydroxyuracil 6-glucoside *8.460*
4(5)-Aminoimidazole-5(4)-carboxamide *6.580*
5-Aminoindole *8.316*
6-Aminoisobarbituric acid *8.845*
α-Aminoisobutyric acid, conjugate acid *7.207*
4-Amino-3-isoxazolidinone *8.492*
2-Amino-3-methylbutanoic acid *6.1503, 7.569, 8.1260*
4-(Aminomethyl)-5-hydroxy-6-methyl-3-pyridinemethanol 5-phosphate *8.1118*
2-Amino-3-methylpentanoic acid *8.838*
2-Amino-4-methylpentanoic acid *6.1117, 8.849*
2-Amino-2-methylpropionic acid, conjugate acid *7.207*
4-Amino-1-methyl-2-pyrimidinone *6.1185*
4-Amino-5-methyl-2-pyrimidinone *6.1186, 8.924*
4-Amino-5-methyl-2(1*H*)-pyrimidinone ion (1-) *9.96*
3-[(4-Amino-2-methyl-5-pyrimidinyl)methyl]-5-(2-hydroxyethyl)-4-methylthiazolium *6.1447, 7.536, 8.1194*
2-Amino-4-(methylthio)butanoic acid *6.1154, 8.883*
2-Aminonaphthalene *6.1241*
1-Aminonaphthalene-4-sulfonate ion *6.581, 8.317*
N-[2-(3-Amino-1-oxopropyl)phenyl]formamide *6.957*
6-Aminopenicillanic acid *6.582*
2-Aminopentanedioate ion *6.975, 7.371, 8.697*
2-Aminopentanedioic acid *8.698*
2-Aminopentanoic acid, conjugate acid *7.462, 8.1020*
2-Aminopentanoic acid *8.1019*
3-Aminophthalhydrazide *8.852*
3-Aminopropanethiol, conjugate acid *6.583, 7.208, 7.209*
2-[(3-Aminopropyl)amino]ethanethiol *8.318*
2-Amino-4-[3*H*]pteridinone *6.1360*
6-Aminopurine *6.539, 7.191, 8.280*
1-Aminopyrene *10.6*
2-Aminopyridine *8.319*
4-Aminopyridine *8.320*
2-Aminopyrimidine *6.584, 8.321*
4-Aminopyrimidine *6.585*
4-Amino-2-pyrimidinone *6.809, 7.316, 8.503*
2-Amino-5-ureidovaleric acid *8.458*
cis-Amminechlorobis(ethylenediamine)cobalt(III) ion *6.96*
Amminepentacyanoferrate(II) ion *6.196*
Ammonia *8.124*
Ammonium ion *7.103*
Ampicillin *6.586*
D-Amygdalin *8.322*
tert-Amyl alcohol *8.323*
Amylamine *6.587, 8.324*
Amylammonium ion *6.588, 8.325*
Amylopectin *10.7, 10.129*
Amylose *10.8*
Aniline *6.589, 7.210, 8.326, 9.42*
Aniline, *N,N*-dimethyl- *8.586, 9.69*
Aniline, *N,N*-dimethyl-4-nitroso- *6.874, 8.603*
Anilinium ion *7.211, 8.327*
8-Anilino-1-naphthalenesulfonate ion *6.590*
Anisole *6.591, 7.212, 8.328*
Anisole, 3,5-dinitro- *6.891, 8.619*
Anthracene, 9-nitro- *10.84*
9-Anthracenecarboxylate ion *8.331, 9.44*
Anthranilate ion *6.573, 8.306*
9,10-Anthraquinone-2-carboxylic acid, 7-α-D-glucopyranosyl-3,5,6,8-tetrahydroxy-1-methyl- *8.429*
9,10-Anthraquinone-2-sulfonate, 4-[(4-(acetylamino)phenyl]amino]-1-amino- *6.527, 8.271*
9,10-Anthraquinone-1-sulfonate ion *6.592, 8.329*
9,10-Anthraquinone-2-sulfonate ion *6.593, 7.213, 8.330, 9.43*
9-Anthroate ion *8.331, 9.44*
Anthrone *6.594*
Antimonate(V) ion *6.424*
Antimony(III) ion *8.214*
Apomyoglobin *10.9*
Aquabis(ethylenediamine)fluorocobalt(III) ion *6.101*
Aqua(5,7,7,12,14,14-hexamethyl-1,4,8,11-tetraazacyclotetradeca-4,11-diene)hydroxycobalt(III) ion *6.86*
(Aqua)hydroxy(2,3,9,10-tetramethyl-1,4,8,11-tetraazacyclotetradeca-1,3,8,10-tetraene)cobalt(III) ion *6.88*
(Aqua)hydroxy(3,10,17,24-tetrasulfophthalocyanine)manganese(III) ion *8.122*
(Aqua)pentachloroosmate(IV) ion *6.338, 8.166*
(Aqua)pentachlororhodate(III) ion *8.197*
(Aqua)pentacyanocobaltate(III) ion *6.107*
Arabinitol *6.596, 8.332*
Arabinose *6.595, 7.214, 8.333*
Arabitol *6.596, 8.332*
Arginine *6.597*
Arginine, conjugate diacid *7.215*
Arginine, conjugate monoacid *6.598, 8.334*
Arsenite(III) ion *6.18, 8.5*
Arsenous(III) acid *7.2, 8.4*
Ascaridole *6.599*
Ascorbate ion *6.600, 7.216, 8.335*
L-Ascorbate ion, 3-*O*-methyl- *8.910*
L-Ascorbate-2-sulfate ion *8.336*
Ascorbic acid *7.217, 8.337*
L-Ascorbic acid, 1-*O*-methyl- *8.908*
L-Ascorbic acid, 2-*O*-methyl- *8.909*
L-Ascorbic acid, 3-*O*-methyl- *8.911*
Asparagine *6.601, 8.338*
Asparagine, conjugate monoacid *7.218, 8.339*
Asparagine, negative ion *6.602*
L-Aspartate dianion *6.603*
Aspartate monoanion *6.604, 7.219, 8.340*
Aspartic acid *6.605*
Aspartic acid, conjugate acid *6.606, 7.220*
5-Azacytidine *6.607, 8.341*
5-Azacytosine *6.608, 8.342*
6-Azacytosine *6.609, 8.343*
6-Azathymine *6.610, 8.344*
5-Azauracil *6.611, 8.345*
6-Azauracil *6.612, 8.346*

6-Azauridine *6.613, 8.347*
Azelaic acid *8.348*
Azide ion *6.284, 7.101, 8.125, 9.18*
Azidomethemoglobin *10.78*
Azidopentacyanocobaltate(III) ion *6.110*
2,2′-Azinobis(3-ethylbenzothiazoline-6-sulfonate ion) *6.614, 8.349*
anti-Azobenzene *6.615*
syn-Azobenzene *6.616*
1,1′-Azobis(*N,N*-dimethylformamide) *6.617, 8.350*
Azomycin *6.1265*
Azurin *10.10*
Barbiturate ion *6.618, 7.221*
Barbituric acid *6.619, 7.222*
Barium ion *6.26*
Basic Orange 2 *6.819, 7.320*
Basic Red 1 *6.1386, 8.1133*
Basic Violet 10 *6.1384, 8.1132*
Benzaldehyde *7.223, 8.351*
Benzaldoxime *6.620*
Benzamide *6.621, 7.224, 8.352*
Benzenamine, 4-methyl- *9.129*
Benzenamine, 4-nitro- *6.1254, 8.993*
Benzenaminium, 4-[[4-(dimethylamino)phenyl][4-(dimethyliminio)-2,5-cyclohexadien-1-ylidene]methyl]... *6.1166*
Benzene *6.622, 7.225, 8.353*
Benzene, *tert*-butyl- *9.56*
Benzene, chloro- *6.730, 7.273, 8.436*
Benzene, cyano- *6.634, 7.231, 8.362, 9.47*
Benzene, 1,2-dicyano- *7.324*
Benzene, 1,3-dicyano- *7.325*
Benzene, 1,4-dicyano- *6.835, 7.326, 8.530*
Benzene, 1,2-dihydroxy- *8.430*
Benzene, 1,3-dihydroxy- *8.1131*
Benzene, 1,4-dihydroxy- *7.397, 8.777*
Benzene, 1,3-dimethoxy- *7.334, 8.571*
Benzene, 1,4-dimethoxy- *7.335, 8.572*
Benzene, fluoro- *6.942, 7.360, 8.666*
Benzene, methoxy- *6.591, 7.212, 8.328*
Benzene, (1-methylethenyl)- *6.1224, 7.446, 8.965*
Benzene, nitro- *6.1256, 7.457, 8.995*
Benzene, 1,2,4,5-tetracyano- *10.134*
Benzene-d_6 *8.354*
Benzenebutanoic acid, α-amino-2-(formylamino)-γ-oxo- *6.959, 8.675*
1,4-Benzenediamine *6.1331*
Benzenediazonium ion *6.623*
1,2-Benzenedicarboxylate ion *6.1339, 8.1077, 9.109*
1,4-Benzenedicarboxylate ion *6.1342, 8.1078*
1,4-Benzenediol ion(2-) *6.1064*
Benzenemethamine, *N,N*-dimethyl-, conjugate acid *6.861*
Benzenemethamine, *N*-methyl-, conjugate acid *6.1180, 8.913*
Benzenemethanamine, α-methyl-, conjugate acid *6.1178, 8.912*
Benzenemethanamine, α-phenyl-, conjugate acid *6.628, 8.358*
Benzenesulfonamide *6.624, 8.355*
Benzenesulfonamide, 4-amino- *6.1414, 8.1158*
Benzenesulfonate ion *6.625, 7.226, 8.356*
Benzenesulfonate ion, 4-amino- *6.1415, 8.1159*
Benzenesulfonic acid *8.357*
Benzenesulfonic acid, 4-amino- *6.1416, 7.521*
1,2,4,5-Benzenetetracarbonitrile *10.134*
Benzenethiol *7.541*
1,3,5-Benzenetricarboxylate ion *6.626*
1,3,5-Benzenetricarboxylic acid *7.227*
Benzhydrylamine *6.627, 9.45*
Benzhydrylammonium ion *6.628, 8.358*
Benzhydryl chloride *6.738*
Benzidine, *N,N,N′,N′*-tetramethyl- *6.1429*
Benzil *6.629, 7.228*
Benzoate ion *6.630, 7.229, 8.359, 9.46*
Benzoate ion, 4-amino- *6.575, 8.308*
Benzoate ion, 4-bromo- *6.676, 8.385*
Benzoate ion, 4-chloro- *6.734, 8.439*
Benzoate ion, 4-cyano- *6.779*
Benzoate ion, 2,3-dimethoxy- *8.573*
Benzoate ion, 2,4-dimethoxy- *8.574*
Benzoate ion, 2,6-dimethoxy- *8.575*
Benzoate ion, 3,4-dimethoxy- *8.576*
Benzoate ion, 3,5-dimethoxy- *8.577*
Benzoate ion, 3,3′-[(1,6-dioxo-1,6-hexanediyl)diimino]bis[2,4,6-triiodo- *6.1092, 8.824*
Benzoate ion, 2-hydroxy- *6.1391, 8.1140*
Benzoate ion, 4-hydroxy- *8.779*
Benzoate ion, 2-methoxy- *8.885*
Benzoate ion, 3-methoxy- *8.886*
Benzoate ion, 4-methoxy- *8.887*
Benzoate ion, 4-methyl- *6.1465, 8.1204, 9.127*
Benzoate ion, 4-nitro- *6.1258, 8.997*
Benzoate ion, 4-phenoxy- *8.1056, 9.106*
Benzoflavine *6.631, 8.360*
Benzofuran, 5-hydroxy-2-nitro- *6.1073*
Benzofuran, 7-hydroxy-2-nitro- *6.1075*
Benzofuran, 5-methoxy-2-nitro- *6.1161*
Benzofuran, 7-methoxy-2-nitro- *6.1162*
Benzofuran, 2-nitro- *6.1259*
Benzoic acid *6.632, 7.230, 8.361*
Benzoic acid, 2-hydroxy- *7.511, 8.1141*
Benzoic acid, 4-hydroxy- *7.398*
Benzoic acid, 4-nitro- *7.458*
Benzoin *6.633*
Benzonitrile *6.634, 7.231, 8.362, 9.47*
Benzonitrile, 4-fluoro- *6.946, 7.361, 8.668*
Benzonitrile, 4-methyl- *6.1468, 7.548, 8.1209, 9.130*
Benzophenone *6.635, 7.232, 8.363*
Benzo[*g*]pteridine-2,4(1*H*,3*H*)-dione, 7,8-dimethyl- *6.1124*
Benzo[*g*]pteridine-2,4(1*H*,3*H*)-dione, 1,3,7,8-tetramethyl- *6.871*
Benzo[*g*]pteridine-2,4(1*H*,3*H*)-dione, 1,7,8-trimethyl- *6.1203*
Benzo[*g*]pteridine-2,4(1*H*,3*H*)-dione, 3,7,8-trimethyl- *6.1204*
1,2-Benzopyrene *6.636*

3,4-Benzopyrene *6.636*
Benzo[*a*]pyrene *6.636*
1,2-Benzopyrone *6.767, 8.461*
1,4-Benzoquinone, 2,5-dimethyl- *6.859*
1,4-Benzoquinone, tetrachloro- *10.20*
1,4-Benzoquinone, tetramethyl- *6.906*
1,4-Benzoquinone *6.637, 7.233, 8.364*
2,1,3-Benzothiadiazole-4,7-dicarbonitrile *6.638*
Benzotrichloride *6.1475*
Benzotrifluoride *6.1479*
3-Benzoyl-*N*-methylpyridinium ion *6.639*
2-Benzoylpyridine, conjugate acid *7.234*
3-Benzoylpyridine, conjugate acid *7.235*
4-Benzoylpyridine, conjugate acid *7.236*
2-Benzoylpyridine *6.640*
3-Benzoylpyridine *6.641*
4-Benzoylpyridine *6.642*
Benzyl acetate *6.643*
Benzyl alcohol *6.644, 7.237, 8.365*
Benzyl alcohol, α-(1-methylaminoethyl)- *6.909, 8.630*
Benzylamine *6.645, 9.48*
Benzyl-6-aminopenicillinic acid *6.652, 8.369*
Benzylammonium ion *6.646, 8.366*
Benzyl bromide *6.647*
Benzyl chloride *6.648, 7.238*
Benzyldimethylamine *6.860*
Benzyl formate *6.649*
β-Benzylglucoside *6.650, 8.367*
Benzyl mercaptan *6.651*
Benzylmethylamine *6.1179*
Benzyl methyl ether *8.368*
Benzylpenicillin *6.652, 8.369*
Benzylpenicillin, methyl ester *6.653*
Benzylpenicillin acetoxymethyl ester *6.1306*
Benzylpenicilloic acid *6.654, 8.370*
Benzyl thiocyanate *6.655*
Benzyltributylammonium ion *8.371, 9.49*
Benzyltrimethylammonium ion *6.656, 7.239, 8.372, 9.50*
Benzyltriphenylphosphonium ion *6.657*
Benzyl viologen *6.823*
Betaine, conjugate acid *7.240*
Biacetyl *6.698, 7.260, 8.403*
Bicarbonate ion *6.35, 7.9, 8.18*
Bicyclo[2.2.1]heptan-2-one, 1,7,7-trimethyl- *6.710, 8.424, 9.58*
21*H*-Biline-8,12-dipropanoate ion, 2,17-diethenyl-1,10,19,22,23,24-hexahydro-3,7,13,17-tetramethyl-1,19-dioxo- *6.658, 8.373*
21*H*-Biline-8,12-dipropanoate ion, 3,18-diethenyl-1,19,22,24-tetrahydro-2,7,13,17-tetramethyl-1,19-dioxo- *6.659, 8.374*
21*H*-Biline-8,12-dipropanoic acid, 2,17-diethenyl-1,10,19,22,23,24-hexahydro-3,7,13,17-tetramethyl-1,19-dioxo- *10.11*
Bilirubin *10.11*
Bilirubin dianion *6.658, 8.373*
Biliverdin dianion *6.659, 8.374*
Biotin *8.375*
Biotin, anion *6.660*
Biphenyl *6.661, 7.241, 8.376*
Biphenyl-4-carboxylate ion *8.377, 9.51*
2,2′-Biphenyldicarboxylate ion *8.378, 9.52*
4,4′-Biphenyldicarboxylate ion *8.379, 9.53*
2,2′-Bipyridine, conjugate diacid *7.242*
4,4′-Bipyridine, conjugate diacid *7.243*
2,2′-Bipyridine *6.662, 8.380*
4,4′-Bipyridine *6.663, 8.381*
2,2′-Bipyridinecobalt(II) ion *6.66*
2,2′-Bipyridinium *7.242*
2,2′-Bipyridinium, 1,1′-tetramethylene- *6.1430*
2,2′-Bipyridinium, 1,1′-trimethylene- *6.1482*
4,4′-Bipyridinium, 1,1′-bis(carboxyethyl)- *6.664*
4,4′-Bipyridinium, 1,1′-bis(4-cyanophenyl)- *6.665*
4,4′-Bipyridinium, 1,1′-bis(2-hydroxyethyl)- *6.667*
4,4′-Bipyridinium, 1,1′-bis(3-sulfonatopropyl)- *6.669*
4,4′-Bipyridinium, 1,1′-dibenzyl- *6.823*
4,4′-Bipyridinium, 1,1′-dimethyl- *6.862, 7.336, 8.589, 9.70*
2,2′-Bipyridinium, 4,4′-dimethyl-1,1′-tetramethylene- *6.885*
2,2′-Bipyridinium, 4,4′-dimethyl-1,1′-trimethylene- *6.887*
4,4′-Bipyridinium, 1,1′-diphenyl- *6.897*
2,2′-Bipyridinium, 1,1′-ethylene- *6.930*
4,4′-Bipyridinium, 1,1′,2,2′,6,6′-hexamethyl *7.385*
4,4′-Bipyridyldiylium, 1,1′-bis(4-sulfonatotolyl)- *6.670*
2,2′-Bipyrid-3-ylium-C^3,N'-bis(2,2′-bipyridine-N,N')hydroxyiridium(III) ion *6.257*
3,5-Bis(acetylamino)-2,4,6-triiodobenzoate ion *6.820, 8.519*
Bis(alaninato)cuprate(II) *8.72*
Bis(β-alaninato)cuprate(II) *8.73*
Bis(2-aminobutyrato)copper(II) *8.74*
Bis(3-aminobutyrato)copper(II) *8.76*
Bis(4-aminobutyrato)copper(II) *8.77*
7,12-Bis[1-[1-(2-amino-2-carboxyethyl)thio]ethyl]-3,8,13,17-tetramethyl- *6.223*
Bis(2-aminoisobutyrato)copper(II) *8.75*
Bisaquabis(diethylenetriamine)cobalt(III) ion *7.24*
Bis(2,2′-bipyridine)bis(cyano)ruthenium(II) *6.403*
Bis(2,2′-bipyridine)cobalt(II) ion *6.67*
Bis(2,2′-bipyridine)dihydroxyrhodium(III) ion *6.396*
Bis(carbonato)dioxoneptunate(V) ion *6.323*
1,1′-Bis(carboxyethyl)-4,4′-bipyridinium *6.664*
1,1′-Bis(4-cyanophenyl)-4,4′-bipyridinium *6.665*
Bis(1,2-diaminoethane)dioxorhenium(V) ion *6.386, 8.195*
Bis(1,3-diaminopropane)dioxorhenium(V) ion *6.387*
3,3′-Bis[*N*,*N*-di(carboxymethyl)aminomethyl]-*o*-cresolsulfonephthalein *6.1514, 8.1271*
3,6-Bis(diethylamino)-9-[2-(ethoxycarbonyl)phenyl]xanthylium chloride *6.1385*
Bis(diethylenetriamine)cobalt(III) ion *6.85, 8.45*
trans-Bis(diethylenetriamine)difluorocobalt(III) ion *7.37*
3,6-Bis(dimethylamino)acridine, conjugate monoacid *7.186*

3,6-Bis(dimethylamino)acridine *6.532, 8.273*
3,7-Bis(dimethylamino)phenothiazin-5-ium *6.1187, 7.438, 8.926*
Bis(1,1-dimethylethyl) peroxide *6.825*
Bis(2-ethoxyethyl) ether *8.535*
cis-Bis(ethylenediamine)bis(thiocyanato-*N*)chromium(III) ion *6.155*
Bis(ethylenediamine)cadmium(II) ion *6.43*
Bis(ethylenediamine)cobalt(III) ion *7.23*
Bis(ethylenediamine)copper(II) ion *8.68*
Bis(ethylenediamine)dichlorocobalt(III) ion *6.97, 8.50*
Bis(ethylenediamine)difluorocobalt(III) ion *7.36*
cis-Bis(ethylenediamine)difluorocobalt(III) ion *6.102*
Bis(ethylenediamine)dioxorhenium(V) ion *6.386, 8.195*
Bis(ethylenediamine)nickel(II) ion *6.302*
Bis(ethylenediamine)oxalatocobalt(III) ion *7.59*
Bis(ethylenediamine)platinum(II) ion *6.365, 7.132, 8.181*
Bis(glycinato)cadmium(II) *6.50*
Bis(glycinato)copper(II) *8.71*
Bis(glycinato)nickel(II) *6.317, 8.150*
cis-Bis(glycinato)platinum(II) *6.373, 7.135, 8.190*
trans-Bis(glycinato)platinum(II) *6.374, 7.136, 8.191*
Bis(2-guanidinoethyl)disulfide *6.666*
Bis(hydroxo)tetrakis(4-*N*-methylpyridyl) porphinatomanganese(III) ion *6.275, 8.120*
1,1′-Bis(2-hydroxyethyl)-4,4′-bipyridinium *6.667*
Bis(2-hydroxyethyl)iminotris(hydroxymethyl)methane *6.668, 8.382*
2,2-Bis(hydroxymethyl)-2,2′,2′′-nitrilotriethanol *6.668, 8.382*
2,2-Bis(hydroxymethyl)-1,3-propanediol *8.1038*
Bis(hydroxy)tetrakis(*p*-sulfonatophenyl) porphinatomanganate(III) ion *8.121, 9.16*
Bis(iminodiacetato)cobaltate(II) ion *8.39*
Bis(iminodiacetato)cobaltate(III) ion *6.131, 8.56*
Bis(iminodiacetato)cuprate(II) ion *8.79*
Bis(iminodiacetato)nickelate(II) ion *8.154*
Bis(1-methylimidazole)-α,α,α,β-tetrakis(*N*-methylisonicotinamidophenyl)porphinatoiron(III) ion *6.221*
Bis(nitrilotriacetato)aluminate(III) ion *6.13*
Bis(nitrilotriacetato)cadmate(II) ion *6.52*
Bis(nitrilotriacetato)cobaltate(II) ion *6.76*
Bis(nitrilotriacetato)cuprate(II) ion *6.177*
Bis(nitrilotriacetato)manganate(II) ion *6.268*
Bis(nitrilotriacetato)mercurate(II) ion *6.242*
Bis(nitrilotriacetato)nickelate(II) ion *6.320*
Bis(nitrilotriacetato)plumbate(II) ion *6.355*
Bis(nitrilotriacetato)stannate(IV) ion *6.442*
Bis(nitrilotriacetato)zincate(II) ion *6.485*
Bis(octa-μ-oxo-μ5-oxopentaoxopentatungstate)octa-μ-oxoeuropate *6.468*
Bis(octa-μ-oxo-μ5-oxopentaoxopentatungstate)octa-μ-oxoneodymate *6.469*
cis-Bisoxalatochromate(III) ion *6.156*
trans-Bisoxalatochromate(III) ion *6.157*
Bisoxalatodioxouranate(VI) ion *6.462*
Bis(μ-oxo)bis[(cysteinato)oxomolybdate(V)] ion *6.282*
Bis(μ-oxo)(ethylenediaminetetraacetato) bis[oxomolybdate(V)] ion *6.281*
Bis(propylenediamine)dioxorhenium(V) ion *6.387*
1,1′-Bis(3-sulfonatopropyl)-4,4′-bipyridinium *6.669*
1,1′-Bis(4-sulfonatotolyl)-4,4′-bipyridyldiylium *6.670*
cis-Bis(thiocyanato-*N*)bis(ethylenediamine)cobalt(III) ion *6.118*
trans-Bis(thiocyanato-*N*)bis(ethylenediamine)cobalt(III) ion *6.119*
Bistris *6.668, 8.382*
Bisulfate ion *8.209*
Bisulfide ion *6.416, 8.206*
2,2′-Bithiophene *8.383*
Biuret *6.671*
Bleomycin *6.672*
Borate ion *8.9*
Boric acid *6.23, 8.8*
2,3-Bornanedione *6.711*
Bromate ion *6.31, 7.6, 8.14, 9.4*
Bromide ion *7.4, 8.10, 9.1*
Bromine *6.27, 7.5*
Bromine dioxide *5.6*
Bromite ion *6.30, 8.13, 9.3*
Bromoacetate ion *6.673, 7.244, 8.384*
Bromoacetic acid *7.245*
Bromobenzene *6.674, 7.246*
4-Bromobenzenediazonium *6.675*
4-Bromobenzoate ion *6.676, 8.385*
1-Bromobutane *6.677*
1-Bromo-1-chloro-2,2,2-trifluoroethane *6.678, 7.247*
3-Bromo-2,6-dioxopyrimidine-4-carboxylate ion *6.684 8.389*
Bromoethane *6.679, 7.248*
2-Bromoethanol *6.680, 7.249, 8.386*
3-Bromo-2,4-furandione, conjugate base *6.692, 8.396*
5-Bromofurfural *8.387*
5-Bromoindole *8.388*
4-Bromo-α-methylbenzyl alcohol *8.390*
1-Bromonaphthalene *6.681*
2-Bromo-5-nitrothiazole *6.682*
5-Bromoorotate dianion *6.683*
5-Bromoorotate ion *6.684, 8.389*
5-Bromoorotic acid *7.250*
Bromopentaammineruthenium(III) ion *6.409*
4-Bromophenol *6.685, 7.251*
2-Bromophenoxide ion *6.686*
3-Bromophenoxide ion *6.687*
4-Bromophenoxide ion *6.688*
1-(*p*-Bromophenyl)ethanol *8.390*
m-Bromophenyl-β-D-glucopyranoside *8.391*
4-Bromophenyl methyl carbinol *8.390*
1-Bromopropane *6.689*
2-Bromopropionate ion *6.690, 7.252, 8.392*
3-Bromopropionate ion *6.691, 7.253, 8.393*
2-Bromopropionic acid *7.254*
3-Bromopropionic acid *7.255*
2-Bromopyridine *8.394*
3-Bromopyridine *8.395*
α-Bromotetronate ion *6.692, 8.396*

α-Bromotoluene *6.647*
Bromotrifluoromethane *6.693*
5-Bromouracil *6.694, 7.256, 8.397*
Bromphenol Blue *6.695, 7.257*
Busulfan *6.697*
Butadiene *6.696, 7.258, 8.398*
1,3-Butadiene *6.696, 7.258, 8.398*
Butanal *8.420*
Butane *7.259, 8.399*
1-Butaneamine *6.703, 8.410*
Butanedioic acid *6.1407, 7.518, 8.1152*
1,3-Butanediol *8.400*
1,4-Butanediol *8.401*
2,3-Butanediol *8.402*
1,4-Butanediol dimethanesulfonate *6.697*
2,3-Butanedione *6.698, 7.260, 8.403*
1-Butanol *7.261, 8.404*
2-Butanol *7.262, 8.405*
2-Butanone *8.406*
2-Butenal *8.466*
1-Butene *7.263, 8.407*
2-Butene-1,4-diol *9.54*
3-Butenenitrile *8.305, 9.41*
1-Butene-3-one *8.408*
2-Butenoate ion *8.467, 9.60*
3-Butenoate ion *9.55*
2-Butenoic acid *8.468*
trans-2-Butenoic acid *6.775*
trans-2-Buten-1-ol *6.699*
3-Buten-1-ol *6.700*
3-Buten-2-ol *6.701*
N-*tert*-Butylacetamide *6.702, 8.409*
Butyl alcohol *7.261, 8.404*
sec-Butyl alcohol *7.262, 8.405*
tert-Butyl alcohol *6.1219, 7.442, 8.954, 9.98*
Butylamine *6.703, 8.410*
tert-Butylamine *6.704, 8.412*
Butylammonium ion *6.705, 8.411*
tert-Butylammonium ion *6.706, 8.413*
tert-Butylbenzene *9.56*
4-*tert*-Butyl-1,2-benzoquinone *6.707, 7.264*
n-Butyl bromide *6.677*
4-*tert*-Butylcatechol *8.414*
n-Butyl chloride *6.735*
sec-Butyl chloride *6.736*
4-*tert*-Butyl-1,2-dihydroxybenzene *8.414*
tert-Butyl disulfide *8.522*
1,1′-Butylene-2,2′-bipyridinium *6.1430*
α-Butylene oxide *8.631*
tert-Butyl hydroperoxide *6.708, 8.415*
Butyl iodide *6.1099*
tert-Butyl mercaptan *6.1218*
tert-Butyl methyl ether *8.416*
4-*tert*-Butylphenol *8.417*
N-*tert*-Butyl-α-phenylnitrone *6.1329, 8.1061*
Butylsulfate ion *8.418*
Butyl sulfoxide *8.524*
Butyltrimethylammonium ion *8.419*
Butyraldehyde *8.420*
Butyrate ion *7.265, 8.421, 9.57*
Butyric acid *7.266, 8.422*
C.I. 45160 *6.1386, 8.1133*
C.I. 45170 *6.1384, 8.1132*
C.I. 50240 *6.1390, 8.1137*
Cadmium(II) ion *6.40, 7.13, 8.28*
Cadmium(II) tetrakis(4-*N*-methylpyridyl)porphyrin *6.55*
Cadmium(II) tetrakis(*p*-sulfonatophenyl)porphyrin *6.56*
Cadmium(I) ions *8.27*
Caffeate ion *8.556*
Caffeine *6.709, 8.423*
Californium(III) ion *6.59*
Camphor *6.710, 8.424, 9.58*
Camphoroquinone *6.711*
Caproic acid *7.390*
Capryl alcohol *8.1022*
Carbenicillin *6.714*
Carbonate hydrolyase *10.12*
Carbonate ion *6.36, 8.19*
Carbonatobis(ethylenediamine)cobalt(III) ion *6.104*
Carbon dioxide *6.34, 7.8, 8.17*
Carbon disulfide *6.715, 7.269, 8.427*
Carbonic anhydrase *10.12*
Carbon monoxide *6.33, 7.7, 8.16*
Carbon tetrachloride *6.716, 7.270*
3-Carboxamido-2,2,5,5-tetramethyl-3-pyrrolin-1-yloxy *6.713, 7.267, 8.426*
3-Carboxamido-2,2,5,5-tetramethylpyrrolidin-1-yloxy *6.712, 7.268, 8.425*
Carboxybenzylpenicillin *6.714*
4-Carboxybutylferrocenium *6.203*
2-Carboxy-5,5-dimethyl-1-pyrroline-1-oxyl *8.428*
2-Carboxyethylferrocene ion(1-) *8.95*
2-Carboxyethylferrocenium *6.201*
Carboxyferrocene ion(1-) *8.93*
Carboxymethylcellulose ion *10.13*
Carboxymethylcytochrome C *10.33*
N-(Carboxymethyl)glycine, dianion *6.1087, 9.86*
N-Carboxymethyl-*N*′-(2-hydroxyethyl)-*N*,*N*′-ethylene diglycine *8.788*
(Carboxymethylimino)bis(ethylenenitrilo)tetraacetic acid *8.536*
Carboxypeptidase A *10.14*
N-[9-(2-Carboxyphenyl)-6-(diethylamino)-3*H*-xanthen-3-ylidene]-*N*-ethylethanaminium chloride *6.1384, 8.1132*
3-Carboxypropylferrocenium *6.202*
Carmine *8.429*
β-Carotene *10.15*
κ-Carrageenan *10.16*
Casein *10.17*
Catalase *10.18*
Catechol *8.430*
D-Cellobiose *8.431*
Cellosolve *8.639*
Cephaloridine *6.717*
Cephalosporin C *6.718*

Cephalothin *6.719*
Cerium(III) ion *6.57, 8.30, 9.7*
Cerium(IV) ion *7.14*
Ceruloplasmin *10.19*
Cesium(I) ion *6.164*
Cetyltrimethylammonium bromide *10.62, 6.1045, 7.384, 8.762*
Chip *6.379, 8.193*
Chloral hydrate *6.720, 8.432*
Chloranil *10.20*
Chlorate ion *6.63, 8.34*
Chloride ion *6.60, 7.16, 8.31*
Chlorine dioxide *5.8*
Chlorite ion *6.62, 8.33, 9.9*
Chloroacetaldehyde dimethyl acetal *8.440*
5-(2-Chloroacetamido)-2,3-dihydro-1,4-phthalazinedione *8.433*
Chloroacetate ion *6.721, 7.271, 8.434*
Chloroacetic acid *6.722, 7.272, 8.435*
N-(2-Chloroacetyl)glycine, negative ion *6.723*
N-(2-Chloroacetyl)glycylglycine, negative ion *6.724*
N-(2-Chloroacetyl)phenylalanine, negative ion *6.725*
N-(2-Chloroacetyl)tryptophan, negative ion *6.726*
2-Chloroaniline *6.727*
3-Chloroaniline *6.728*
4-Chloroaniline *6.729*
Chlorobenzene *6.730, 7.273, 8.436*
4-Chlorobenzenediazonium ion *6.731*
2-Chlorobenzoate ion *6.732, 8.437*
3-Chlorobenzoate ion *6.733, 8.438*
4-Chlorobenzoate ion *6.734, 8.439*
2-Chlorobenzoic acid *7.274*
3-Chlorobenzoic acid *7.275*
4-Chlorobenzoic acid *7.276*
1-Chlorobutane *6.735*
2-Chlorobutane *6.736*
Chlorocadmium(II) ion *6.46*
Chloro(diethylenetriamine)platinum(II) ion *6.366, 7.133, 8.183*
Chlorodifluoromethane *6.737*
2-Chloro-1,1-dimethoxyethane *8.440*
2-Chloro-10-dimethylaminopropylphenothiazine, conjugate acid *6.759, 8.455*
Chlorodiphenylmethane *6.738*
Chloroethane *7.277*
2-Chloroethanol *6.739, 7.278, 8.441*
(2-Chloroethyl)benzene *6.740, 7.279*
Chloroethylene *6.1508, 8.1262*
Chloroform *6.741, 7.280, 8.442*
5-Chloroindole *8.443*
Chloroiron(III) ion *7.81*
Chloromercury(I) *8.105*
Chloromethane *6.741a, 7.281*
2-(Chloromethyl)-1,3-dioxolane *8.444*
1-Chloro-2-methylpropane *6.742*
1-Chloronaphthalene *6.743*
Chloropentaammineruthenium(III) ion *6.411*
Chloropentacyanocobaltate(III) ion *6.111*
2-Chlorophenol *6.744, 7.282, 8.445*
3-Chlorophenol *8.446*
4-Chlorophenol *8.447*
2-Chlorophenoxide ion *6.745*
3-Chlorophenoxide ion *6.746*
4-Chlorophenoxide ion *6.747*
2-Chloro-2-phenylacetate ion *6.748*
m-Chlorophenyl-β-D-glucopyranoside *8.448*
p-Chlorophenyl-β-D-glucopyranoside *6.749, 8.449*
1-Chloropropane *6.750*
3-Chloro-1,2-propanediol *6.751*
2-Chloropropionamide *6.752*
3-Chloropropionamide *6.753*
2-Chloropropionate ion *6.754, 7.283, 8.450*
3-Chloropropionate ion *6.755, 7.284, 8.451*
2-Chloropropionic acid *7.285*
3-Chloropropionic acid *7.286*
Chloroprotoferrihaem IX *6.222, 7.88*
2-Chloropyridine *8.452*
4-Chloropyridine *8.453*
5-Chloro-2,4-pyrimidinedione *6.758, 7.288, 8.454*
Chlororhodium(III) ion *6.393*
Chloro(tetraethyldiethylenetriamine)platinum(II) ion *6.367, 7.134, 8.184*
Chlorothallium(III) ion *7.161*
4-Chlorotoluene *6.756*
α-Chlorotoluene *6.648, 7.238*
Chlorotrifluoromethane *6.757, 7.287*
5-Chlorouracil *6.758, 7.288, 8.454*
Chlorpromazine, conjugate acid *6.759, 8.455*
Choline *6.760*
Chondroitin 4-sulfate *10.21*
Chondroitin 6-sulfate *10.22*
Chondromucoprotein *10.23*
Chromagen *6.761, 7.289*
Chromate(III) ion *6.145*
Chromate(VI) ion *6.161, 7.69*
Chromate(VI) ion, hydrogen *6.160*
Chromate(V) ion *8.66*
Chromium(III) ion *6.144*
Chromium(III) tris(4,7-dimethyl-1,10-phenanthroline) *6.148*
Chromium(III) tris(4,4′-diphenyl-2,2′-bipyridine) *6.147*
Chromium(III) tris(4,7-diphenyl-1,10-phenanthroline) *6.150*
Chromium(III) tris(5-phenyl-1,10-phenanthroline) *6.149*
Chromium(II) ion *6.141, 7.67, 8.62*
Chromium(II) tris(2,2′-bipyridine) *8.64*
Chromotropic acid *8.561*
Chrysoidin *6.819, 7.320*
α-Chymotrypsin *10.24*
trans-Cinnamamide *6.762*
Cinnamate ion *6.763, 8.456*
trans-Cinnamic acid *6.764*
Citrate ion *6.765, 9.59*
Citric acid *7.290, 8.457*
Citrulline *8.458*
Cleland's Reagent, *6.902, 8.627*
Cloxacillin *6.766*

Cobalt(II) ion *6.65, 8.35*
Cobalt(II), 5,7,7,12,12,14-hexamethyl-1,4,8,11-tetraazacyclotetradeca-4,14-diene *6.71, 7.17, 8.36*
Cobalt(II), 5,7,7,12,14,14-hexamethyl-1,4,8,11-tetraazacyclotetradeca-4,11-diene *6.70*
Cobalt(II), hydroxytetrakis(*p*-sulfonatophenyl)porphyrin *6.79*
Cobalt(III) tris(2,2′-bipyridine) *6.90*
Cobalt(III) tris(1,10-phenanthroline) *6.92*
Cobalt(III) tris(2,2′,6′,2″-terpyridine) *6.91*
Cobalt(II) 2,2′-bipyridine *6.66*
Cobalt(II) bis(2,2′-bipyridine) *6.67*
Cobalt(II) tetrakis(*p*-sulfonatophenyl)porphyrin *6.78*
Cobalt(II) tris(2,2′-bipyridine) *6.68*
Cobamide *6.140*
Coenzyme A *8.459*
Coenzyme B_{12} *6.140*
Collagen *10.25*
Concanavalin A *10.26*
Convicine *8.460*
Copper(I) ion *6.165, 7.71, 8.66a*
Copper(II) ion *6.166, 7.72, 8.67*
Copper(II), β-alanylhistidine complex *6.175*
Copper(II), 5,7,7,12,14,14-hexamethyl-1,4,8,11-tetraazacyclotetradeca-4,11-diene *6.170, 7.73, 8.69*
Copper(II), histidine complex *6.176*
Copper(II) glutathione disulfide *6.180*
Copper(II) iminodiacetate *8.78*
Copper(II) tetrakis(4-*N*-methylpyridyl)porphyrin *6.182*
Copper(II) tetrakis(*p*-sulfonatophenyl)porphyrin *6.183*
Copper(II) tetrasulfophthalocyanine *8.82*
Copper oxidase *10.70*
Coumarin *6.767, 8.461*
Creatine *6.768*
Cresol Red *6.769*
o-Cresol *8.462*
p-Cresol *6.770, 8.463*
o-Cresolsulfonephthalein *6.769*
α-Crocetin *8.464*
Crocetin dianion *6.771*
Crocin *6.772, 8.465*
Crotonaldehyde *8.466*
trans-Crotonamide *6.773*
Crotonate ion *8.467, 9.60*
trans-Crotonate ion *6.774*
Crotonic acid *8.468*
trans-Crotonic acid *6.775*
Crotononitrile *9.61*
Cumene *8.469, 9.62*
Cumene hydroperoxide *6.776*
Cumyl alcohol *8.1071*
Cyanamide *6.777, 7.291, 8.23*
Cyanate ion *8.24*
Cyanide ion *6.37, 8.21, 9.5*
Cyanoacetate ion *8.470, 9.63*
Cyanoacetic acid *7.292*
4-Cyanobenzenediazonium ion *6.778*
4-Cyanobenzoate ion *6.779*
Cyanocob(III)alamin *6.138, 8.61*
Cyanogen *6.38, 7.11, 8.22*
Cyanoguanidine *6.834, 7.323, 8.529*
5-Cyanoindole *8.471*
Cyanomethemoglobin *10.79*
1-Cyanonaphthalene *6.1237*
2-Cyanonaphthalene *6.1238*
2-Cyanophenoxide ion *6.780*
3-Cyanophenoxide ion *6.781*
4-Cyanophenoxide ion *6.782, 9.64*
4-Cyanophenyl-*N*-*tert*-butylnitrone *6.783, 8.472*
1-(*p*-Cyanophenyl)ethanol *8.473*
p-Cyanophenyl-β-D-glucopyranoside *8.474*
3-Cyanopyridine *8.475*
Cyclobutanecarboxylate ion *8.476*
Cyclobutanecarboxylic acid *7.293*
Cyclobutanone *6.784*
γ-Cyclodextrin *10.27*
Cycloheptane *8.477*
Cycloheptanol *8.478*
Cycloheptanol-1-*d* *8.479*
Cycloheptanone *6.785*
Cycloheptatriene *6.786, 7.294, 8.480*
1,3-Cyclohexadiene *6.787, 7.295, 8.481*
1,4-Cyclohexadiene *6.788, 7.296, 8.482*
2,4-Cyclohexadien-1-one, 2,6-dichloro-4-[-(4-hydroxyphenyl)imino]-, sodium salt *8.527*
Cyclohexane *7.297, 8.483*
Cyclohexanecarboxylate ion *8.485*
Cyclohexanecarboxylic acid *7.298*
Cyclohexane-d_6 *8.484*
Cyclohexanediaminetetraacetatocadmate(II) ion *6.54*
Cyclohexanediaminetetraacetatoplumbate(II) ion *6.357*
trans-1,2-Cyclohexanediamine-*N*,*N*,*N*′,*N*′-tetraacetic acid *8.486*
Cyclohexanone *6.789*
Cyclohexene *6.790, 7.299, 8.487*
1-Cyclohexenecarboxylic acid *7.300*
3-Cyclohexene-1-carboxylic acid *7.301*
cis-4-Cyclohexene-1,2-dicarboxylic acid *7.302*
Cyclohexylamine *6.791*
Cyclohexylammonium ion *8.488*
1,2-Cyclohexylenedinitriloacetic acid *8.486*
Cyclooctaamylose *10.27*
Cyclooctanone *6.792*
Cyclopentane *7.303, 8.489*
Cyclopentanecarboxylate ion *8.490*
Cyclopentanecarboxylic acid *7.304*
Cyclopentanone *6.793*
Cyclopentene *7.305, 8.491, 9.65*
1-Cyclopentenecarboxylic acid *7.306*
Cyclophosphamide *6.794*
Cyclopropane *7.307*
Cyclopropanecarboxylic acid *7.308*
Cycloserine *8.492*
Cystamine *6.795*
Cystamine, conjugate diacid *6.796, 8.493*
Cysteamine, conjugate acid *6.797, 7.309, 7.310, 8.494*
Cysteamine, negative ion *6.798*
Cysteine *6.799, 8.495*

Cysteine, *N*-acetyl-, dianion *6.510*
L-Cysteine, *N*-acetyl-, negative ion *6.509*
Cysteine, conjugate acid *6.800, 7.311, 7.312, 7.313, 8.496*
Cysteine, *S*-methyl-, negative ion *6.1184, 8.923*
Cysteine, *S*-methyl- *6.1183, 8.922*
Cysteine, methyl ester *6.802*
Cysteine, negative ion *6.801*
5-*S*-Cysteinyldopa-melanin *10.28*
Cystine *6.803, 7.314, 8.497*
Cystine, conjugate acid *8.498*
Cystine, conjugate diacid *7.315, 8.499*
Cystine, dianion *6.804*
Cystine, dimethyl ester, conjugate acid *6.805*
Cytidine *6.806, 8.500*
Cytidine 2',3'-cyclicmonophosphate ion *6.807*
Cytidine monophosphate *6.808, 8.501*
Cytidine 3'-monophosphate *8.502*
Cytidine 5'-monophosphate *6.808, 8.501*
3'-Cytidylic acid *8.502*
5'-Cytidylic acid *6.808, 8.501*
Cytochrome C *10.29*
Cytochrome C_3 *10.31*
Cytochrome C, acetylated *10.32*
Cytochrome C, carboxymethylated *10.33*
Cytochrome C, succinylated *10.35*
Cytochrome C (ferro) *10.34*
Cytochrome C (horse heart muscle) *10.29*
Cytochrome P-450 *10.36*
Cytochrome c 551 *10.37*
Cytochrome c_2 (R. rubrum) *10.30*
Cytochrome c TNBS *10.38*
Cytochrome m *10.36*
Cytosine *6.809, 7.316, 8.503*
Cytosine, conjugate acid *7.317, 8.504*
Cytosine, conjugate base *9.66*
Cytosine negative ion *9.66*
DABCO *8.520*
DTBP *6.825*
Dactinomycin *6.538*
Daunomycin *6.810*
Daunomycin, radical anion *5.16*
Daunorubicin *6.810*
Daunorubicin, radical anion *5.16*
Decaammine(dinitrogen)diruthenium(II) ion *6.401, 8.200*
Decaammine-μ-(superoxido)dicobalt(III) ion *6.135*
Decaborane(14) *6.24*
Decakis(cyano)-μ-superoxidodicobaltate(III) ion *6.136*
1,4,5,7,7,8,11,12,14,14-Decamethyl-1,4,8,11-tetraazacyclotetradecanenickel(II) ion *6.313*
Decylsulfate ion *6.811*
Dehydromethionine *6.812*
2'-Deoxyadenosine *6.813, 8.505*
2'-Deoxyadenosine 5'-monophosphate *8.506*
Deoxyadenosine monophosphate *8.506*
5'-Deoxyadenosylcobalamine *6.140*
Deoxyadenylic acid *8.506*
2'-Deoxy-5'-adenylic acid *8.506*
2'-Deoxycytidine *8.507, 9.67*
2'-Deoxycytidine-5'-monophosphate *8.508*
Deoxycytidine monophosphate *8.508*
Deoxycytidylic acid *8.508*
2'-Deoxy-5'-cytidylic acid *8.508*
2-Deoxy-D-galactosamine *6.967, 8.314*
2-Deoxy-D-glucose *8.509*
Deoxyguanosine 5'-monophosphate *8.510*
Deoxyguanylic acid *8.510*
Deoxyhemoglobin *10.57*
2'-Deoxyinosine 5'-monophosphate *8.511*
Deoxyinosine monophosphate *8.511*
2'-Deoxy-5'-inosinic acid *8.511*
Deoxymyoglobin *10.83*
Deoxyribonuclease I *10.40*
Deoxyribonucleic acid *10.41*
Deoxyribose *6.814, 7.318, 8.512*
2-Deoxy-D-ribose *6.814, 7.318, 8.512*
Deoxyribose 5-phosphate *8.513*
2-Deoxy-2-sulfonamino-D-glucose *6.815, 8.514*
Deoxythymidine 5'-monophosphate *8.515*
2'-Deoxyuridine 5'-monophosphate *8.516*
Deoxyuridine 5'-monophosphate, mercurated *6.816*
Deoxyuridine monophosphate *8.516*
2'-Deoxy-5'-uridylic acid *8.516*
Desferal *8.517*
Desferrioxamine B *8.517*
Desoxyribose *6.814, 7.318, 8.512*
Deuterium *7.74, 8.83*
Dextran *10.42*
Dextran sulfate *10.43*
α-Dextrin *10.44*
β-Dextrin *10.45*
γ-Dextrin *10.46*
Diacetamide *6.817*
Diacetyl *6.698, 7.260, 8.403*
Diacetyl peroxide *6.520, 8.267*
Diamide *6.617, 8.350*
3,6-Diaminoacridine, conjugate monoacid *7.319*
3,6-Diaminoacridine *6.818, 8.518*
2,4-Diaminoazobenzene *6.819, 7.320*
3,6-Diamino-2,7-dimethyl-9-phenylacridine *6.631, 8.360*
3,7-Diamino-2,8-dimethyl-5-phenylphenazinium chloride *6.1390, 8.1137*
3,8-Diamino-5-ethyl-6-phenylphenanthridium *6.917*
1,8-Diamino-3,6,10,13,16,19-hexaazabicyclo[6.6.6]icosaneplatinum(IV) ion *6.377*
2,6-Diaminohexanoic acid *6.1126, 8.853*
3,6-Diamino-10-methylacridinium *6.533, 8.274*
2,5-Diaminopentanoic acid, conjugate acid *8.1026*
2,5-Diaminopentanoic acid *8.1025*
3,7-Diamino-5-phenothiazinium *6.1453, 7.539*
Diamminesilver(I) ion *6.2, 8.2*
8,8'-Diapo-ψ,ψ-carotendioic acid, bis(6-*O*-β-D-glucopyranosyl-β-D-glucopyranosyl) ester *6.772, 8.465*
8,8'-Diapocarotenedioate ion *6.771*
8,8'-Diapocarotenedioic acid *8.464*

Diatrizoate ion *6.820, 8.519*
2,3-Diazabicyclo[2.2.1]hept-2-ene *6.821*
1,4-Diazabicyclo[2.2.2]octane *8.520*
2,3-Diazabicyclo[2.2.2]oct-2-ene *6.822*
1,6-Diazabicyclo[4.4.4]tetradecane radical cation *5.17*
1,4-Diazanaphthalene *6.1383*
2,3-Diazanaphthalene *6.1343*
4,5-Diazaphenanthrene *6.1312, 8.1050, 9.104*
1,1′-Dibenzyl-4,4′-bipyridinium *6.823*
Dibenzylsulfonate viologen *6.670*
Dibromine radical ion *5.5*
cis-Dibromobis(diethylenetriamine)cobalt(III) ion *7.27*
trans-Dibromobis(diethylenetriamine)cobalt(III) ion *7.28*
1,4-Dibromonaphthalene *6.824*
Dibutylamine *8.521*
Di-*n*-butylamine *8.521*
Di-*tert*-butyl disulfide *8.522*
Di-*tert*-butylnaphthalenesulfonate ion *8.523*
Di-*tert*-butylnaphthalenesulfuric acid *10.47*
Di-*tert*-butyl peroxide *6.825*
Dibutyl sulfoxide *8.524*
Di(*tert*-butyl) sulfoxide *8.525*
Dichlorine radical ion *5.7*
1,2-Dichlorobenzene *6.827*
1,3-Dichlorobenzene *6.826*
1,4-Dichlorobenzene *6.828*
Dichlorobenzoyl hydroperoxide *6.829*
Dichlorobenzoyl peroxide *6.830*
cis-Dichlorobis(diethylenetriamine)cobalt(III) ion *7.32*
trans-Dichlorobis(diethylenetriamine)cobalt(III) ion *7.33*
cis-Dichlorobis(ethylenediamine)chromium(III) ion *6.152*
cis-Dichlorobis(ethylenediamine)cobalt(III) ion *6.98*
trans-Dichlorobis(ethylenediamine)cobalt(III) ion *6.99*
trans-Dichlorobis(ethylenediamine)platinum(IV) ion *6.380, 7.138, 8.192*
cis-[Dichlorobis(1-(2-hydroxyethyl)-2-methyl-5-nitroimidazole-N^3)]platinum(II) *6.370, 8.187*
cis-Dichlorobis(isopropylamine)-*trans*-dihydroxyplatinum(IV) *6.379, 8.193*
cis-Dichlorodiammineplatinum(II) *6.368, 8.185*
trans-Dichlorodiammineplatinum(II) *6.369, 8.186*
Dichlorodifluoromethane *6.831, 7.321*
1,1-Dichloroethylene *6.1509, 8.1263*
1,2-Dichloroethylene *6.832*
trans-1,2-Dichloroethylene *8.526*
2,6-Dichloroindophenol *8.527*
Dichloromethane *6.833, 7.322, 8.528*
Dichlorotitanium(III) ion *7.162*
Dichloro(triethylenetetramine)cobalt(III) ion *7.31, 8.49*
Dichromate(VI) ion *6.163, 7.70*
Dicyandiamide *6.834, 7.323, 8.529*
Dicyanoargentate(I) ion *6.3*
Dicyanoaurate(I) ion *6.22, 8.6*
1,2-Dicyanobenzene *7.324*
1,3-Dicyanobenzene *7.325*
1,4-Dicyanobenzene *6.835, 7.326, 8.530*
Dicyano-α,α,α,β-tetrakis(*N*-methylisonicotinamidophenyl)porphinatoiron(III) ion *6.220*
Dicyanotetrakis(4-*N*-methylpyridyl)porphinatoiron(III) ion *6.216*
Di(1,1-dimethylethyl) disulfide *8.522*
Di(1,1-dimethylethyl) sulfoxide *8.525*
2,17-Diethenyl-1,10,19,22,23,24-hexahydro-3,7,13,17-tetramethyl-1,19-dioxo-21*H*-biline-8,12-dipropanoic acid *10.11*
2,17-Diethenyl-1,10,19,22,23,24-hexahydro-3,7,13,17-tetramethyl-1,19-dioxo-21*H*-biline-8,12-dipropanoate ion *6.658, 8.373*
3,18-Diethenyl-1,19,22,24-tetrahydro-2,7,13,17-tetramethyl-1,19-dioxo-21*H*-biline-8,12-dipropanoate ion *6.659, 8.374*
1,2-Diethoxyethane *8.649*
Diethoxymethane *8.531*
2,4-Diethoxypyrimidine *6.836*
N,*N*-Diethylacetamide *6.837*
N-[6-(Diethylamino)-9-[2-(ethoxycarbonyl)phenyl]-3*H*-xanth-3-ylidene]-*N*-ethylethanaminium chloride *6.1385*
Diethylammonium ion *8.532*
Diethyl disulfide *8.533*
Diethylene glycol *8.534*
Diethylene glycol diethyl ether *8.535*
Diethylenetriaminepentaacetic acid *8.536*
Diethylenetriamine(pyridine)platinum(II) ion *8.182*
Diethyl ether *6.838, 7.327, 8.537, 9.68*
N,*N*-Diethylhydroxylamine *6.839, 8.538*
Diethyl ketone *8.1049*
Diethyl malonate *8.539*
Diethyl succinate *8.540*
Diethyl sulfide *8.541*
Diethyl sulfoxide *8.542*
7,12-Diethyl-3,8,13,17-tetramethyl-21*H*,23*H*-porphine-2,18-dipropanoatoferrate(II) *6.200*
Diethylthallium ion *6.454*
1,2-Difluorobenzene *6.840, 8.543*
1,4-Difluorobenzene *6.841, 8.544*
7,8-Dihydro-2,12-dimethyl-6*H*-dipyrido[1,2-*a*:2′,1′-*c*][1,4]diazepinediium *6.887*
6,7-Dihydro-2,11-dimethyldipyrido[1,2-*a*:2′,1′-*c*]pyrazinediium *6.864*
7,8-Dihydrodipyrido[1,2-*a*:2′,1′-*c*][1,4]diazepinediium *6.1482*
6,7-Dihydrodipyrido[1,2-*a*:2′,1′-*c*]pyrazinediium *6.930*
2,3-Dihydro-7*H*-furobenzopyran-7-one *6.843*
Dihydrogen hexacyanoferrate(II) ion *8.88*
Dihydrogen periodate ion *9.15*
Dihydrogen peroxodiphosphate ion *6.346*
Dihydrogen phosphate ion *6.343, 7.126, 8.173*
Dihydrogen phosphite ion *6.341, 8.168*
2,3-Dihydro-5-hydroxy-1,4-phthalazinedione *8.545*
2,3-Dihydroindole *8.819*
1,2-Dihydro-3-methylbenz[*j*]aceanthrylene *6.1182*
2,3-Dihydro-5-methyl-1,4-phthalazinedione *8.546*
Dihydro-6-methyluracil *7.328, 8.547*
2,3-Dihydro-5-nitro-1,4-phthalazinedione *8.548*

5,6-Dihydroorotate ion *6.842, 8.549*
4′,5′-Dihydropsoralen *6.843*
3,7-Dihydropurine-2,6-dione *6.1513, 8.1266*
1,3-Dihydro-2*H*-purine-2-thione *8.871*
1,7-Dihydro-2*H*-purine-6-thione *8.872*
1,2-Dihydro-3,6-pyridazinedione *8.856*
6,7-Dihydro-2,3,10,11-tetramethyldipyrido[1,2-*a*:2′,1′-*c*]pyrazinediium *6.1431*
7,8-Dihydro-2,3,11,12-tetramethyldipyrido[1,2-*a*:2′,1′-*c*][1,4]diazepinediium *6.1439*
5,6-Dihydrothymine *7.329, 8.550*
5,6-Dihydrouracil *6.844, 8.551*
3,4-Dihydroxy-2(5H)-furanone, ion(1-) *8.806*
2,4-Dihydroxyacetophenone *8.552*
2,5-Dihydroxyacetophenone *8.553*
3,4-Dihydroxyacetophenone *6.845, 8.554*
3,4-Dihydroxybenzaldehyde *6.846, 8.555*
1,2-Dihydroxybenzene *8.430*
1,3-Dihydroxybenzene *8.1131*
1,4-Dihydroxybenzene *7.397, 8.777*
4,5-Dihydroxy-*m*-benzenedisulfonate ion *8.1203*
1,4-Dihydroxybenzene ion(2-) *6.1064*
trans-Dihydroxybis(ethylenediamine)platinum(IV) ion *6.378, 7.137*
2,3-Dihydroxy-1,4-butanedithiol *6.902, 8.627*
3,4-Dihydroxycinnamate ion *8.556*
2,5-Dihydroxy-2,5-dimethyl-3-hexyne *8.595*
Di(2-hydroxyethyl) sulfoxide *8.1162*
Dihydroxyfumaric acid *7.330*
Dihydroxyiron(III) ion *6.207*
3,4-Dihydroxy-α-(methylamino)acetophenone *6.544, 8.293*
l-3,4-Dihydroxy-α-(methylaminomethyl)benzyl alcohol *6.542, 8.291*
2,4-Dihydroxy-5-methylpyrimidine *6.1460, 7.546, 8.1202*
2,4-Dihydroxy-5-methylpyrimidine anion *6.1461, 9.124*
2,4-Dihydroxy-6-methylpyrimidine *7.447*
4,6-Dihydroxy-2-methylpyrimidine *8.557*
4,6-Dihydroxy-2-methylpyrimidine anion *8.558*
4,6-Dihydroxy-5-methylpyrimidine *8.559*
4,6-Dihydroxy-5-methylpyrimidine anion *8.560*
4,5-Dihydroxy-2,7-naphthalenedisulfonic acid *8.561*
5,8-Dihydroxy-1,4-naphthoquinone, conjugate dibase *6.848*
5,8-Dihydroxy-1,4-naphthoquinone *6.847, 7.331*
3-(3,4-Dihydroxyphenyl)-L-alanine *6.849*
2,3-Dihydroxy-2-propenal, conjugate base *8.563*
2,3-Dihydroxy-2-propenal *8.564*
3,6-Dihydroxypyridazine *8.856*
4,6-Dihydroxypyrimidine *8.565*
4,6-Dihydroxypyrimidine anion *8.566*
2,4-Dihydroxypyrimidine-5-carboxylic acid *7.411*
Dihydroxytetrakis(4-*N*-methylpyridyl)porphinatotin(IV) ion *6.438*
Dihydroxytetrakis(*p*-sulfonatophenyl) porphinatomanganate(III) ion *6.275, 8.120*
Dihydroxytetrakis(*p*-sulfonatophenyl) porphinatorhodate(III) ion *6.399*
Dihydroxy(2,3,9,10-tetramethyl-1,4,8,11-tetraazacyclotetradeca-1,3,8,10-tetraene)cobalt(III) ion *6.89*
2,3-Dihydroxytoluene *6.850, 8.567*
3,4-Dihydroxytoluene *7.332*
Diiodine radical ion *5.9*
Diiodomethane *6.851*
Diisopropyl disulfide *8.568*
Diisopropyl sulfoxide *8.569*
threo-1,4-Dimercapto-2,3-butanediol *6.902, 8.627*
6-(2,6-Dimethoxybenzamido)penicillanic acid *6.1153*
1,2-Dimethoxybenzene *7.333, 8.570*
1,3-Dimethoxybenzene *7.334, 8.571*
1,4-Dimethoxybenzene *7.335, 8.572*
2,3-Dimethoxybenzoate ion *8.573*
2,4-Dimethoxybenzoate ion *8.574*
2,6-Dimethoxybenzoate ion *8.575*
3,4-Dimethoxybenzoate ion *8.576*
3,5-Dimethoxybenzoate ion *8.577*
1,1-Dimethoxyethane *8.578*
1,2-Dimethoxyethane *8.650*
Dimethoxymethane *8.579*
2,3-Dimethoxyphenol *8.580*
2,6-Dimethoxyphenol *8.581*
3,5-Dimethoxyphenol *8.582*
Dimethyl acetal *8.578*
N,N-Dimethylacetamide *6.852, 8.583*
N,N-Dimethylacrylamide *6.853*
β,β-Dimethylacrylamide *6.854*
β,β-Dimethylacrylate ion *6.855*
3,3-Dimethylacrylic acid *6.856*
β,β-Dimethylacrylic acid *6.856*
N^6,N^6-Dimethyladenine *8.584*
N^6,N^6-Dimethyladenosine *8.585*
7,8-Dimethylalloxazine *6.1124*
4-(Dimethylamino)benzenediazonium ion *6.857*
10[(*N,N*-Dimethylamino)propyl]phenothiazine, conjugate acid *6.1348, 8.1084*
6-Dimethylaminopurine *8.584*
N,N-Dimethylaniline *6.586, 9.69*
N,N-Dimethylanilinium ion *8.587*
2,3-Di-*O*-methyl-L-ascorbic acid *8.588*
5,6-Dimethylbenzimidazole *6.858*
2,5-Dimethyl-1,4-benzoquinone *6.859*
α,α-Dimethylbenzyl alcohol *8.1071*
N,N-Dimethylbenzylamine *6.860*
N,N-Dimethylbenzylammonium ion *6.861*
4,4′-Dimethyl-2,2′-bipyridinecobalt(II) ion *6.69*
1,1′-Dimethyl-4,4′-bipyridinium *6.862, 7.336, 8.589, 9.70*
2,3-Dimethyl-2,3-butanediol *8.1080*
3,3-Dimethylbutyrate ion *8.590*
1,5-Dimethyl-1,5-diazaundecamethylene polymethobromide *10.97*
2,2-Dimethyl-1,3-dioxolane *8.591*
Dimethyldiphenylphosphonium ion *6.863*
Dimethyl disulfide *8.592*
1,1-Dimethylethanethiol *6.1218*
1,1-Dimethylethanol *6.1219, 7.442, 8.954, 9.98*

Dimethyl ether *8.593*
4-(1,1-Dimethylethyl)-1,2-dihydroxybenzene *8.414*
Di(1-methylethyl) disulfide *8.568*
4,4′-Dimethyl-1,1′-ethylene-2,2′-bipyridinium *6.864*
Di(1-methylethyl) sulfoxide *8.569*
N,N-Dimethylformamide *6.865, 8.594*
Dimethyl fumarate *6.866, 7.337*
2,5-Dimethyl-3-hexyne-2,5-diol *8.595*
1,1-Dimethylhydrazine *6.867, 8.596*
1,2-Dimethylhydrazine *6.868, 8.597*
1,1-Dimethylhydrazinium ion *6.869, 8.598*
1,2-Dimethylhydrazinium ion *6.870, 8.599*
1,2-Dimethylindole *8.600*
1,3-Dimethylindole *8.601*
2,3-Dimethylindole *8.602*
1,3-Dimethyllumichrome *6.871*
Dimethyl maleate *6.872*
2,3-Dimethylnaphthoquinone *6.873*
N,N-Dimethyl-4-nitrosoaniline *6.874, 8.603*
Dimethyl oxalate *6.875*
N,N-Dimethyl-*p*-phenylenediamine *6.876*
2,4-Dimethylphenyl-β-D-glucopyranoside *6.877, 8.604*
3,4-Dimethylphenyl-β-D-glucopyranoside *8.605*
1,2-Dimethyl-3-phenylisoindole-4,7-dione *6.878*
2,5-Dimethyl-3-phenylisoindole-4,7-dione *6.879*
2,2-Dimethyl-1-phenyl-1-propanol *8.606*
5,6-Dimethyl-3-phenyl-1,2-trimethyleneisoindole-4,7-dione *6.880*
Dimethyl phosphate ion *8.607*
1,4-Dimethyl-2,5-piperazinedione *6.1393, 8.1142*
N,N-Dimethylpivalamide *6.881, 8.608*
1,1-Dimethyl-1-propanol *8.323*
2,2-Dimethyl-1-propanol *7.338, 8.609*
2,2-Dimethylpropionic acid *8.1232*
2,4-Dimethylpyridine *8.610*
2,6-Dimethylpyridine *8.611*
1,3-Dimethyl-2,4-pyrimidinedione *6.889*
5,5-Dimethyl-1-pyrroline-1-oxyl *6.882, 7.339, 8.612*
Dimethyl sulfide *6.883, 8.613*
Dimethyl sulfoxide *6.884, 7.340, 8.614*
α-2,12-Dimethyl-3,7,11,17-tetraazabicyclo[11.3.1]heptadeca-1(17),2,11,13,15-pentaenecobalt(II) ion *8.37*
2,12-Dimethyl-3,7,11,17-tetraazabicyclo[11.3.1]heptadeca-1(17),2,11,13,15-pentaenecobalt(III) ion *8.48*
α-2,12-Dimethyl-3,7,11,17-tetraazabicyclo[11.3.1]heptadeca-1(17),2,11,13,15-pentaenecopper(II) ion *8.70*
α-2,12-Dimethyl-3,7,11,17-tetraazabicyclo[11.3.1]heptadeca-1(17),2,11,13,15-pentaenenickel(II) ion *6.311, 8.146*
α-2,12-Dimethyl-3,7,11,17-tetraazabicyclo[11.3.1]heptadeca-1(17),2,6,11,13,15-hexaenenickel(II) ion *6.312, 8.147*
α-2,12-Dimethyl-3,7,11,17-tetraazabicyclo[11.3.1]heptadeca-1(17),13,15-trienenickel(II) ion *6.310, 8.145*
4,4′-Dimethyl-1,1′-tetramethylene-2,2′-bipyridinium *6.885*
4,4′-(2,3-Dimethyltetramethylene)dipyrocatechol *8.615*
2,5-Dimethylthiophene *8.616*
1,3-Dimethylthiourea *8.617*
N,N′-Dimethylthiourea *8.617*
5-(3,3-Dimethyl-1-triazeno)imidazole-4-carboxamide *6.886*
4,4′-Dimethyl-1,1′-trimethylene-2,2′-bipyridinium *6.887*
1,5-Dimethyl-2,3-trimethyleneisoindole-4,7-dione *6.888*
1,3-Dimethyluracil *6.889*
cis,syn-1,3-Dimethyluracil dimer *6.890*
1,3-Dimethylurea *8.618*
3,5-Dinitroanisole *6.891, 8.619*
α,*p*-Dinitrocumene *6.892*
3,8-Dinitro-5-methyl-6-phenylphenanthridium ion *6.893*
Dioxane *7.341, 8.620*
1,4-Dioxane *7.341, 8.620*
Dioxoamericium(VI) ion *6.17*
Dioxoamericium(V) ion *6.16*
3,3′-[(1,6-Dioxo-1,6-hexanediyl)diimino]bis[2,4,6-triiodobenzoate ion] *6.1092, 8.824*
1,3-Dioxolane *8.621*
1,3-Dioxolan-2-one, 4-methyl- *6.1357*
Dioxoneptunium(VI) ion *6.326, 7.115*
Dioxoneptunium(V) ion *6.324, 7.114, 8.158, 8.159*
Dioxoplutonium(VI) ion *6.382*
2,4-Dioxo-1*H*,3*H*-pyrimidine-5-carboxylate ion *6.1112, 8.840*
2,6-Dioxo-1,2,3,6-tetrahydro-4-pyrimidinecarboxylic acid *7.463*
Dipalmitoyl-L-α-phosphatidyl choline *10.48*
Diphenate ion *8.378, 9.52*
Diphenylacetate ion *8.622, 9.71*
1,3-Diphenylacetone *6.895*
Diphenylamine *6.896, 8.623*
1,1′-Diphenyl-4,4′-bipyridinium *6.897*
1,1-Diphenylethylene *6.898, 7.342*
1,3-Diphenyl-2-propanone *6.895*
Diphenyl sulfoxide *8.624*
Diphosphooctadecatungstate ion(6-) *6.470, 8.233*
Diphosphooctadecatungstate ion(7-) *8.231*
Diphosphooctadecatungstate ion(7-), conjugate acid *8.232*
Dipropyl sulfoxide *8.625*
6*H*-Dipyrido[1,2-*a*:2′,1′-*c*][1,4]diazepinediium, 7,8-dihydro-2,12-dimethyl- *6.887*
Dipyrido[1,2-*a*:2′,1′-*c*][1,4]diazepinediium, 7,8-dihydro- *6.1482*
Dipyrido[1,2-*a*:2′,1′-*c*][1,4]diazepinediium, 7,8-dihydro-2,3,11,12-tetramethyl- *6.1439*
Dipyrido[1,2-*a*:2′,1′-*c*][1,4]diazocinediium, 6,7,8,9-tetrahydro-2,13-dimethyl- *6.885*
Dipyrido[1,2-*a*:2′,1′-*c*][1,4]diazocinediium, 6,7,8,9-tetrahydro- *6.1430*
Dipyrido[1,2-*a*:2′,1′-*c*][1,4]diazocinediium, 6,7,8,9-tetrahydro-2,3,12,13-tetramethyl- *6.1438*

Dipyrido[1,2-*a*:2′,1′-*c*][1,4]pyrazinediium, 6,7-dihydro- *6.930*
Dipyrido[1,2-*a*:2′,1′-*c*]pyrazinediium, 6,7-dihydro-2,11-dimethyl- *6.864*
Dipyrido[1,2-*a*:2′,1′-*c*]pyrazinediium, 6,7-dihydro-2,3,10,11-tetramethyl- *6.1431*
2,2′-Dipyridyl *6.662, 8.380*
4,4′-Dipyridyl *6.663, 8.381*
2,2′-Dipyridylamine *6.899*
Diquat *6.930*
3,3′-Diselenobisalanine *6.1396, 8.1145*
β,γ-Distearoyl-L-α-phosphatidyl choline *10.49*
1,4-Dithiacyclohexane *8.626*
1,4-Dithiane *8.626*
2.2′-Dithiobisacetate ion *6.900*
3,3′-Dithiobis(2-amino-3-methylbutyric acid) *6.1308*
2,2′-Dithiobis(ethylamine) *6.795*
3,3′-Dithiobis(propionate ion) *6.901*
2,2′-Dithiodiacetic acid *7.343*
Dithiodiglycolic acid *7.343*
1,2-Dithiolane-3-pentanoate ion *6.1122*
Dithiothreitol *6.902, 8.627*
Djenkolate ion *6.903*
1-Dodecyl-1′-methyl-4,4′-bipyridinium *6.904*
Dodecylmethylviologen *6.904*
Dodecyl sulfate, sodium salt *10.50*
Dodecylsulfate ion *6.905, 7.344, 8.628*
Dopa-melanin *10.51*
Dopamine, conjugate acid *8.562*
Doxorubicin, conjugate acid *6.546, 7.197*
Doxorubicin, negative ion *6.545*
Durene *7.530, 8.1182, 9.121*
Duroquinone *6.906*
Dysprosium(III) ion *6.184*
E.C. 1.1.1.42 *10.68*
E.C. 1.14.18.1 *10.70*
E.C. 1.16.3.1 *10.19*
E.C. 1.4.3.3 *10.5*
E.C. 2.7.7.16 *10.125*
E.C. 3.1.4.5 *10.40*
E.C. 3.4.4.10 *10.91*
E.C. 3.4.4.4 *10.140*
E.C. 4.1.2.13 *10.4*
E.C. 4.2.1.1 *10.12*
Electron adduct of nitrobenzene *5.20*
Eosin dianion *6.907, 8.629*
Ephedrine, conjugate acid *6.908*
l-Ephedrine *6.909, 8.630*
Epinephrine *6.542, 8.291*
Epinephrine, conjugate acid *6.543, 7.196, 8.292*
1,2-Epoxybutane *8.631*
1,2-Epoxypropane *8.632*
2,3-Epoxypropanol *8.633*
Erbium(III) ion *6.186*
Erythritol *6.910, 8.634*
Erythrosin dianion *6.911, 7.345*
Estradiol *6.912*
Estriol *6.913*
Ethane *7.346, 8.635*
Ethanedinitrile *6.38, 7.11, 8.22*
1,1′′-Ethanediylbis(1′-methyl-4,4′-bipyridinium) *6.914*
Ethanesulfonate ion *6.915, 8.636*
Ethanesulfonyl chloride *7.347*
Ethanethiol, 2-acetylamino- *6.507*
Ethanethiol, 2-acetylamino-, conjugate base *6.508*
Ethanethiol, 2-amino-, conjugate acid *6.797, 7.309, 7.310, 8.494*
Ethanethiol, 2-amino-, conjugate base *6.798*
Ethanol *7.348, 8.637, 9.72*
Ethanolamine *6.916*
Ethanolamine, conjugate acid *7.206*
Ethanolamine, phosphate *8.1075*
Ethanol-d_2 *7.349*
Ethanol-d_5 *8.638*
Ethenyl 2-methylpropyl ether *6.1510*
Ether *6.838, 7.327, 8.537, 9.68*
Ethidium *6.917*
4-(Ethoxycarbonyl)benzenediazonium ion *6.918*
1-Ethoxycarbonyl-2,5-dimethyl-3-phenylisoindole-4,7-dione *6.919*
1-Ethoxycarbonyl-6-methoxy-5-methyl-2,3-trimethyleneisoindole-4,7-dione *6.920*
1-Ethoxycarbonyl-5-methyl-2,3-trimethyleneisoindole-4,7-dione *6.921*
2-Ethoxyethanol *8.639*
2-Ethoxyethyl ether *8.535*
N-Ethylacetamide *6.922*
Ethyl acetate *6.923, 7.350, 8.640*
Ethyl acetoacetate *7.351*
Ethyl acrylate *6.924*
Ethyl alcohol *7.348, 8.637, 9.72*
Ethylamine *6.925, 8.641*
Ethyl 2-aminoacetate *6.926*
4-(Ethylamino)-4-oxo-2-butenoic acid *7.356*
Ethylammonium ion *6.927, 8.642*
Ethylbenzene *8.643, 9.73*
α-Ethylbenzyl alcohol *8.1069*
Ethyl bromide *6.679, 7.248*
Ethyl butyrate *8.644*
Ethyl chloride *7.277*
Ethyl cyanoacetate *6.928*
Ethyl dihydrogen phosphate *7.352*
Ethyl disulfide *8.533*
Ethylene *6.929, 7.353, 8.645*
Ethylene, 1,1-diphenyl- *6.898, 7.342*
1,1′-Ethylene-2,2′-bipyridinium *6.930*
Ethylene bromohydrin *6.680, 7.249, 8.386*
Ethylene chlorohydrin *6.739, 7.278, 8.441*
Ethylenediamine *8.646*
Ethylenediaminebis(oxalato)cobaltate(III) ion *7.58*
Ethylenediaminecadmium(II) ion *6.42*
Ethylenediaminenickel(II) ion *6.301, 8.136*
Ethylenediaminetetraacetate ion *6.931, 9.74*
Ethylenediaminetetraacetate ion, dihydrogen *8.647*
Ethylenediaminetetraacetatoaluminate(III) ion *6.14*
Ethylenediaminetetraacetatoargentate(I) ion *6.5*
Ethylenediaminetetraacetatocadmate(II) ion *6.53*
Ethylenediaminetetraacetatocerate(III) ion *6.58*

Ethylenediaminetetraacetatochromate(III) ion *6.159*
Ethylenediaminetetraacetatocobaltate(II) ion *6.77, 8.41*
Ethylenediaminetetraacetatocobaltate(III) ion *6.133, 8.58*
Ethylenediaminetetraacetatocuprate(II) ion *6.178, 8.81*
Ethylenediaminetetraacetatodysprosate(III) ion *6.185*
Ethylenediaminetetraacetatoerbate(III) ion *6.187*
Ethylenediaminetetraacetatoeuropate(III) ion *6.190*
Ethylenediaminetetraacetatoferrate(II) ion *6.199, 8.92*
Ethylenediaminetetraacetatoferrate(III) *8.102*
Ethylenediaminetetraacetatoferrate(III) ion *6.213*
Ethylenediaminetetraacetatogadolinate(III) ion *6.229*
Ethylenediaminetetraacetatogallate(III) ion *6.227*
Ethylenediaminetetraacetatoholmate(III) ion *6.245*
Ethylenediaminetetraacetato(hydroxy)copper(II) ion *6.179*
Ethylenediaminetetraacetatoindate(III) ion *6.256*
Ethylenediaminetetraacetatolanthanate(III) ion *6.262*
Ethylenediaminetetraacetatolutetate(III) ion *6.264*
Ethylenediaminetetraacetatomanganate(II) ion *6.269, 8.118*
Ethylenediaminetetraacetatomercurate(II) ion *6.243*
Ethylenediaminetetraacetatoneodymate(III) ion *6.298*
Ethylenediaminetetraacetatonickelate(II) ion *6.321, 8.156*
Ethylenediaminetetraacetatoplumbate(II) ion *6.356*
Ethylenediaminetetraacetatopraseodymate(III) ion *6.363*
Ethylenediaminetetraacetatosamarate(III) ion *6.433*
Ethylenediaminetetraacetatoscandate(III) ion *6.425*
Ethylenediaminetetraacetatostannate(II) ion *6.435*
Ethylenediaminetetraacetatoterbate(III) ion *6.444*
Ethylenediaminetetraacetatothulate(III) ion *6.456*
Ethylenediaminetetraacetatoytterbate(III) ion *6.475*
Ethylenediaminetetraacetatoyttrate(III) ion *6.473*
Ethylenediaminetetraacetatozincate(II) ion *6.486, 8.241*
Ethylenediaminetetraacetic acid, conjugate diacid *7.364*
Ethylene glycol *7.355, 8.648*
Ethylene glycol diethyl ether *8.649*
Ethylene glycol dimethyl ether *8.650*
Ethylene glycol ethyl ether *8.639*
Ethylene oxide *8.651*
Ethyl ether *6.838, 7.327, 8.537, 9.68*
Ethyl formate *8.652*
Ethyl hydroperoxide *6.932, 8.653*
4-Ethyl-5-hydroxy-2-methylpyridine *8.654*
Ethyl iodide *6.1100*
N-Ethylmaleamate ion *6.933, 8.655*
N-Ethylmaleamic acid *7.356*
N-Ethylmaleimide *6.934, 7.357, 8.656*
3-Ethylpentane *8.657*
1-(*p*-Ethylphenyl)ethanol *8.658*
Ethyl phenyl sulfoxide *8.659*
Ethyl propionate *8.660*
1-Ethyl-2-pyrrolidinone *8.661*
Ethylsulfate ion *8.662*
Ethyl sulfide *8.541*
17α-Ethynylestradiol *6.935*
17α-Ethynylestra-1,3,5(10)-triene-3,17β-diol *6.935*
Europium(III) decatungstate *6.468*
Europium(III) ion *6.188*
Europium(III) salicylate *6.189*
Europium(II) ion *8.84*
Ferrate(VI) ion *6.224*
Ferredoxin, 2Fe-2S(o) *10.52*
Ferredoxin, 8Fe-8S(oo) *10.53*
Ferricyanide ion *6.211, 7.86*
Ferricytochrome C *10.29*
Ferriheme chloride *6.222, 7.88*
Ferrimyoglobin *10.80*
Ferrioxamine B *8.103*
Ferrocenylacetate ion *8.94*
Ferrocenylacrylate ion *6.204*
Ferrocenylbenzoate ion *6.205*
3-Ferrocenylpropionate ion *8.95*
Ferrocyanide ion *6.197, 7.77, 8.90*
Ferrocytochrome C *10.34*
Ferromyoglobin *10.83*
Ferroxidase *10.19*
Ferulate ion *8.795*
Flagyl *6.1070, 8.789*
Flavine mononucleotide *6.936, 8.663*
Fluorene *6.937*
9-Fluorenone *6.938, 7.358*
Fluorescein, 2′,4′,5′,7′-tetrabromo-, dianion *6.907, 8.629*
Fluorescein, tetraiodo-, dianion *6.911, 7.345*
Fluorescein dianion *6.939, 8.664*
Fluoride ion *6.191, 7.75*
Fluoroacetate ion *6.940, 7.359, 8.665*
Fluoroacetone *6.941*
Fluorobenzene *6.942, 7.360, 8.666*
2-Fluorobenzoate ion *6.943*
3-Fluorobenzoate ion *6.944*
4-Fluorobenzoate ion *6.945, 8.667*
4-Fluorobenzonitrile *6.946, 7.361, 8.668*
p-Fluorobenzonitrile *6.946, 7.361, 8.668*
Fluoroiron(III) ion *7.82*
Fluoronickel(II) ion *6.314*
2-Fluorophenoxide ion *6.947*
3-Fluorophenoxide ion *6.948*
4-Fluorophenoxide ion *6.949*
5-Fluoro-2,4(1*H*,3*H*)-pyrimidinedione *6.950, 7.362, 8.669*
5-Fluorouracil *6.950, 7.362, 8.669*
Folic acid *6.951, 8.670*
Formaldehyde *6.952, 7.363, 8.671*
Formaldehyde dimethyl acetal *8.579*
Formamide *6.953*
Formate ion *6.954, 7.364, 8.672, 9.75*
d-Formate ion *7.365*
Formic acid *6.955, 7.366, 8.673*
Formic acid-*d* *7.367*
2-(*N*-Formylamino)acetophenone *6.956*
2-(*N*-Formylamino)-3′-aminopropiophenone *6.957*

5-Formylfuroate ion *8.674*
N-Formylglycine, negative ion *6.958*
N-Formylkynurenine *6.959, 8.675*
2-(*N*-Formyl-*N*-methylamino)acetophenone *6.960*
Fremy's salt *6.292, 7.105, 8.132*
Freon 11 *6.1474, 7.549*
Freon 12 *6.831, 7.321*
Freon 13 *6.757, 7.287*
Freon 22 *6.737*
D-Fructose *6.961, 8.676*
D-Fructose 1,6-diphosphate *6.962, 8.677*
D-Fructose 1-phosphate, dihydrogen *8.678*
D-Fructose 6-phosphate, dihydrogen *8.679*
Fumarate ion *6.963, 9.76*
Fumarate ion, hydrogen *7.368*
Fumaric acid *7.369, 8.680*
Fungal laccase *10.70*
Furadantin *6.964, 8.681*
2-Furaldehyde , 5-nitro-, semicarbazone *6.1263, 8.999*
2-Furaldehyde *8.682*
Furamazone *6.965, 8.683*
Furan *6.966, 8.684*
2-Furancarboxamide *8.685*
2,4-Furandione, 3-bromo-, conjugate base *6.692, 8.396*
2,4-Furandione, 3-hydroxy-, conjugate base *8.806*
2,4-Furanedione, conjugate base *6.1443, 8.1190*
Furfural *8.682*
Furfuryl alcohol *8.686*
2-Furoate ion *8.687*
Furyl methyl ketone *8.260*
Gadolinium(III) ion *6.228*
6-α-D-Galactopyranosyl-D-glucopyranose *8.864*
D-Galactose *6.968, 8.688*
α-D-Galactosyl-α-D-galactosyl-α-D-glucosyl-β-D-fructose *6.1401, 8.1149*
Gallium(III) ion *6.225*
Gallium(III) ions *6.226*
Gelatin *10.54*
Glucitol *6.1400*
4-β-D-Glucopyranosyl-D-glucopyranose *8.431*
7-α-D-Glucopyranosyl-3,5,6,8-tetrahydroxy-1-methyl-9,10-anthraquinone-2-carboxylic acid *8.429*
D-Glucosamine *6.969*
Glucose *6.970, 7.370, 8.689*
Glucosephosphate *8.691*
D-Glucose 6-phosphate, dihydrogen *8.691*
Glucose-1-phosphate *6.971, 8.690*
Glucose-6-phosphate ion *8.691*
Glucose-3-sulfate ion *6.972, 8.692*
Glucose-6-sulfate ion *6.973, 8.693*
Glucuronate ion *6.974, 8.694*
Glucuronic acid *8.695*
D-Glucurono-3,6-lactone *8.696*
D-Glucuronolactone *8.696*
Glutaconate ion *9.77*
Glutamate ion *6.975, 7.371, 8.697*
Glutamic acid *8.698*
L-Glutamic acid, N-[4-[[(2-amino-1,4-dihydro-4-oxo-6-pteridinyl)methyl]amino]benzoyl]- *6.951, 8.670*
Glutamic acid, conjugate acid *7.372*
Glutamine *8.699*
Glutamine, conjugate acid *8.700*
γ-L-Glutamyl-L-cysteinylglycine *6.977, 8.702*
L-γ-Glutamylglutamylglutamate ion *6.976*
Glutaric acid *8.701*
Glutathione *6.977, 8.702*
Glutathione, oxidized *6.978, 7.373, 8.703*
Glutathionecopper(II), oxidized *6.180*
Glutathione disulfide *6.978, 7.373, 8.703*
Glutathione disulfide copper(II) complex *6.180*
Glyceraldehyde-3-phosphate *8.704*
Glycerol *7.374, 8.705*
α-Glycerophosphate, dihydrogen *8.706*
β-Glycerophosphate, dihydrogen *8.707*
Glycidol *8.633*
Glycinate ion *6.982, 8.712, 9.78*
Glycinatocadmium(II) ion *6.49*
Glycinatocopper(II) ion *6.172*
Glycinatonickel(II) ion *6.316, 8.149*
Glycinatonickel(II) ion *8.152*
Glycine *6.981, 7.375, 8.710*
Glycine, *N*-acetyl-, negative ion *6.512, 8.261*
Glycine, *N*-acetyl- *7.181*
Glycine, conjugate acid *7.376, 8.711*
Glycine, ethyl ester *6.926*
Glycine, methyl ester, conjugate acid *6.1175*
Glycine, negative ion *6.982, 8.712, 9.78*
Glycine amide *6.980, 8.708*
Glycine amide, conjugate acid *6.979, 8.709*
Glycine anhydride *6.983, 8.713*
Glycine ion(1-) *6.982, 8.712, 9.78*
Glycine methyl ester *6.1174*
Glycogen *10.55*
Glycolaldehyde *6.984*
Glycolamide *6.985, 8.714*
Glycolate ion *6.986, 7.377, 8.715*
Glycolic acid *6.987, 7.378, 8.716*
α-D-Glycopyranoside, β-D-fructofuranosyl *6.1411, 7.520, 8.1155*
Glycylalanine *6.988, 8.717*
Glycylalanine, conjugate acid *8.718*
Glycyl-β-alanine, negative ion *6.992*
Glycyl-β-alanineamide, conjugate acid *6.989, 8.720*
Glycyl-β-alanineamide *6.990, 8.719*
Glycyl-β-alanine *6.991, 8.721*
Glycyl-α-aminobutyric acid *8.722*
L-Glycylasparagine *6.993*
Glycylaspartic acid *6.994*
Glycylglutamic acid *6.995*
Glycylglycinamide, conjugate acid *6.998, 8.726*
Glycylglycine *6.996, 8.723*
Glycylglycine, conjugate acid *7.379, 8.724*
Glycylglycine, ethyl ester, conjugate acid *6.999*
Glycylglycine, negative ion *6.997, 8.725*
Glycylglycyl-L-alanine *6.1000*
Glycylglycyl-β-alanine *6.1001*
Glycylglycyl-β-alanine, negative ion *6.1002*

Glycylglycylglycinamide, conjugate acid *6.1005, 6.1006*
Glycylglycylglycinatocopper complex *6.174*
Glycylglycylglycine *6.1003, 8.727*
Glycylglycylglycine, conjugate acid *7.380*
Glycylglycylglycine, negative ion *6.1004, 8.728*
Glycylglycylglycylglycinamide *8.729*
Glycylglycylglycylglycylglycinamide, conjugate acid *6.1008, 8.730*
Glycylglycylglycylglycylglycine *8.731*
Glycylglycylglycylglycylglycine, negative ion *6.1007*
Glycylglycylglycylglycylglycylglycine *6.1009*
Glycylglycylglycylglycylglycylglycine, negative ion *6.1010*
Glycylglycylleucine *6.1011*
Glycylglycylphenylalanine *6.1012*
Glycylglycylphenylalanine, negative ion *6.1013*
Glycylglycylproline *6.1014*
Glycylglycyltryptophan *6.1015*
Glycylglycyltryptophan, negative ion *6.1016*
Glycylhistidine *6.1017*
Glycylhistidine, conjugate acid *6.1018, 8.732*
Glycylhistidine, negative ion *6.1019, 8.733*
Glycylisoleucine *6.1020, 8.734*
Glycylisoleucine, conjugate acid *8.735*
Glycylleucine *6.1021, 8.736*
Glycylleucine, conjugate acid *8.737*
Glycylleucyltyrosine *6.1022*
Glycylmethionine *6.1023, 8.738*
Glycylmethionine, conjugate acid *8.739*
Glycylnorleucine *8.740*
Glycylnorvaline *8.741*
Glycylphenylalanine *6.1024, 8.742*
Glycylphenylalanine, conjugate acid *8.743*
Glycylphenylalanylglycine, negative ion *6.1026*
L-Glycylphenylalanylglycine *6.1025*
Glycylproline *6.1027*
Glycylproline, conjugate acid *8.744*
Glycylsarcosine *6.1028, 8.745*
Glycylsarcosine, negative ion *6.1029, 8.746*
Glycylserine *6.1030*
Glycylserine, conjugate acid *8.747*
Glycyltryptophan *6.1031, 8.748*
Glycyltryptophan, negative ion *6.1032*
Glycyltryptophanylglycine *6.1033*
Glycyltryptophanylglycine, negative ion *6.1034*
Glycyltyrosine *6.1035, 8.749*
Glycyltyrosine, conjugate acid *8.750*
Glycyltyrosylglycine *8.751*
Glycylvaline *6.1036, 8.752*
Glycylvaline, conjugate acid *8.753*
Glyoxal *8.754*
Glyoxylate ion *7.381*
Glyoxylic acid *6.1037, 7.382*
Guaiacol *8.891*
Guanidine *6.1038*
Guanidine, conjugate acid *7.383*
N'-(2-Guanidinyl)sulfanilamide *6.1413, 8.1157*
Guanine *6.1039, 8.755*
Guanosine *6.1040, 8.756*
Guanosine monophosphate *8.758*
Guanosine 3'-monophosphate *8.757*
Guanosine 5'-monophosphate *8.758*
3'-Guanylic acid *8.757*
5'-Guanylic acid *8.758*
HEPES *8.790*
Haemin *6.222, 7.88*
Halothane *6.678, 7.247*
Hematoporphyrin IX *6.1042*
Heme-free myoglobin *10.9*
Heme-peptide *10.56*
Hemimillitene *7.558, 8.1237, 9.132*
Hemin *6.222, 7.88*
Hemin c *6.223*
Hemoglobin *10.57*
Heparamine *10.59*
Heparin *10.58*
Heparin, *N*-desulfated *10.59*
Heptane *8.759*
Heptanedioic acid *8.1079*
1-Heptanol *8.760*
Heptyl alcohol *8.760*
Hexaalanine, conjugate acid *8.298*
Hexaamminecobalt(III) ion *6.81, 7.18, 8.43*
Hexaammineruthenium(III) ion *6.406, 7.141*
Hexachloroiridate(III) ion *6.258, 8.114*
Hexachloroiridate(IV) ion *6.259, 7.98*
Hexachloroplatinate(IV) ion *6.381*
Hexachlororuthenate(IV) ion *7.145*
Hexacyanochromate(III) ion *6.154*
Hexacyanochromate(II) ion *6.143*
Hexacyanocobaltate(III) ion *6.114, 7.43*
Hexacyanoferrate(III) ion *6.211, 7.86*
Hexacyanoferrate(II) ion *6.197, 7.77, 8.90*
Hexacyanomanganate(II) ion *6.266*
Hexacyanoosmate(II) ion *6.336, 8.165*
Hexacyanoruthenate(II) ion *6.405, 8.202*
Hexadecanoate ion *6.1043*
α-Hexadecyl-ω-hydroxypolyoxyethylene *10.60*
Hexadecylpyridinium ion *6.1044, 8.761, 10.61*
Hexadecyltrimethylammonium bromide *6.1045, 7.384, 8.762, 10.62*
2,4-Hexadienedioate ion *9.79*
trans,trans-2,4-Hexadienoate ion *6.1046*
trans,trans-2,4-Hexadienoic acid *6.1047*
2,4-Hexadien-1-ol *8.763, 9.80*
Hexadimethrine bromide *10.97*
Hexafluoroarsenate(V) ion *6.20*
Hexafluorobenzene *6.1048, 8.764*
Hexafluorochromate(III) ion *6.153*
Hexafluoroferrate(III) ion *6.209*
Hexafluorosilicate(IV) ion *6.431*
Hexafluorostannate(IV) ion *6.441*
Hexafluorotitanate(IV) ion *6.452*
Hexahydrobenzoic acid *7.298*
Hexahydro-2,6-dioxopyrimidine-4-carboxylate ion *6.842, 8.549*
Hexahydro-5-methyl-2,4-pyrimidinedione *7.329, 8.550*

Hexahydro-2-oxothieno[3,4,*d*]imidazole-4-pentanoate ion *6.660*
Hexahydro-2-oxothieno[3,4,*d*]imidazole-4-pentanoic acid *8.375*
Hexamethylbenzene *8.765, 9.81*
1,1′,2,2′,6,6′-Hexamethyl-4,4′-bipyridinium *7.385*
Hexamethyleneimine, conjugate acid *7.386*
5,7,7,12,12,14-Hexamethyl-1,4,8,11-tetraazacyclotetradeca-4,14-dienecobalt(II) ion *6.71, 7.17, 8.36*
5,7,7,12,14,14-Hexamethyl-1,4,8,11-tetraazacyclotetradeca-4,11-diene *6.1050*
5,7,7,12,14,14-Hexamethyl-1,4,8,11-tetraazacyclotetradeca-4,11-diene, conjugate diacid *6.1049, 8.766*
5,7,7,12,14,14-Hexamethyl-1,4,8,11-tetraazacyclotetradeca-4,11-dienecobalt(II) ion *6.70*
5,7,7,12,14,14-Hexamethyl-1,4,8,11-tetraazacyclotetradeca-4,11-dienecopper(II) ion *6.170, 7.73, 8.69*
5,7,7,12,14,14-Hexamethyl-1,4,8,11-tetraazacyclotetradeca-4,11-dienedihydroxycobalt(III) ion *6.87*
5,7,7,12,14,14-Hexamethyl-1,4,8,11-tetraazacyclotetradeca-4,11-dienenickel(II) ion *6.309, 7.112, 8.142*
β-*rac*-(5,7,7,12,12,14-Hexamethyl-1,4,8,11-tetraazacyclotetradecane)nickel(II) ion *8.141*
5,7,7,12,14,14-Hexamethyl-1,4,8,11-tetraazacyclotetradecanenickel(II) ion *6.308, 7.111, 8.140*
5,7,7,12,14,14-Hexamethyl-1,4,8,11-tetraazacyclotetradeca-1,4,8,11-tetraenenickel(II) ion *8.143*
Hexane *7.388, 8.767*
1,6-Hexanediamine, conjugate diacid *7.387*
Hexane-1,6-dicarboxylic acid *8.1151*
1,6-Hexanediol *8.768*
Hexanitrocobaltate(III) ion *6.116*
Hexanoate ion *7.389, 8.769, 9.82*
Hexanoic acid *7.390*
1-Hexanol *7.391, 8.770*
2-Hexene-1,6-dioate ion *9.83*
3-Hexene-1,6-dioate ion *8.771, 9.84*
Hexyl alcohol *7.391, 8.770*
Hexylamine *8.772*
1-Hexylammonium ion *7.392*
Hexylsulfate ion *6.1051, 8.773*
High-potential iron-sulfur protein (Chromatium vinosum D), oxidized *10.63*
High-potential iron-sulfur protein (Chromatium vinosum D), reduced *10.64*
Hippuric acid *7.393*
Histamine, conjugate diacid *6.1052*
Histidine *6.1053, 7.394, 8.774*
Histidine, conjugate diacid *7.395*
Histidine, conjugate monoacid *6.1054, 7.396*
Histidine, negative ion *6.1055*
Histidinecopper(II) complex *6.176*
Histidylhistidine *6.1056, 8.775*
Histidylhistidine, negative ion *6.1057*
Holmium(III) ion *6.244*
Homocysteine thiolactone *6.1058, 8.776*
Homocystine *6.1059*
Hyaluronic acid *10.65*
Hyaluronic acid, sulfated *10.66*
Hydrated electron *5.1, 5.1.1, 5.1.2, 5.1.3, 5.1.4, 5.1.5, 5.5.1, 5.9.1, 5.10.1, 5.13.1, 5.14.1, 5.16.1, 5.17.1, 5.18.1, 5.20.1, 5.21, 5.22, 5.23.1, 5.24.1, 6., 10.1.1, 10.2.1, 10.3.1, 10.4.1, 10.5.1, 10.6.1, 10.7.1, 10.8.1, 10.9.1, 10.10.1, 10.11.1, 10.12.1, 10.13.1, 10.14.1, 10.15.1, 10.16.1, 10.17.1, 10.18.1, 10.19.1, 10.20.1, 10.21.1, 10.22.1, 10.23.1, 10.24.1, 10.26.1, 10.27.1, 10.28.1, 10.29.1, 10.30.1, 10.31.1, 10.32.1, 10.33.1, 10.34.1, 10.35.1, 10.36.1, 10.37.1, 10.38.1, 10.39.1, 10.41.1, 10.43.1, 10.44.1, 10.45.1, 10.46.1, 10.47.1, 10.50.1, 10.51.1, 10.52.1, 10.53.1, 10.54.1, 10.55.1, 10.56.1. 10.57.1. 10.58.1. 10.59.1. 10.61.1. 10.62.1. 10.63.1, 10.64.1, 10.65.1, 10.66.1, 10.67.1, 10.68.1, 10.69.1, 10.70.1, 10.71.1, 10.72.1, 10.73.1, 10.74.1, 10.75.1, 10.76.1, 10.77.1, 10.78.1, 10.79.1, 10.80.1, 10.81.1, 10.83.1, 10.84.1, 10.86.1, 10.87.1, 10.88.1, 10.89.1, 10.90.1, 10.91.1, 10.92.1, 10.93.1, 10.95.1, 10.96.1, 10.100.1, 10.101.1, 10.104.1, 10.106.1, 10.109.1, 10.110.1, 10.111.1, 10.113.1, 10.114.1, 10.115.1, 10.116.1, 10.117.1, 10.118.1, 10.119.1, 10.121.1, 10.123.1, 10.124.1, 10.125.1, 10.128.1, 10.130.1, 10.131.1, 10.132.1, 10.133.1, 10.134.1, 10.135.1, 10.136.1, 10.137.1, 10.138.1, 10.139.1, 10.140.1, 10.141.1, 10.142.1, 10.143.1*
Hydrazine *6.286, 8.127*
Hydrazinium ion *6.287, 7.104, 8.128*
Hydrazoic acid *6.285, 7.102, 8.126*
Hydrocinnamate ion *6.1337*
Hydrocinnamic acid *6.1338*
Hydrofluoric acid *6.192*
Hydrogen *6.231, 8.104, 9.11*
Hydrogen arsenate(V) ion *6.19*
Hydrogen atom *5.2, 5.2.1, 5.2.2, 5.2.3, 5.5.2, 5.7.1, 5.9.2, 5.10.2, 5.15.1, 5.17.2, 5.19.1, 7., 10.12.2, 10.25.1, 10.29.2, 10.34.2, 10.41.2, 10.57.2, 10.60.1, 10.73.2, 10.90.2, 10.111.2, 10.125.2, 10.126.1, 10.127.1, 10.133.2, 10.140.2*
Hydrogen azide *6.285, 7.102, 8.126*
Hydrogen cyanide *7.10, 8.20*
Hydrogen difluoride ion *6.193*
Hydrogen fumarate ion *7.368*
Hydrogen hexacyanoferrate(II) ion *6.198, 8.89*
Hydrogen hypoiodite *6.249, 8.111*
Hydrogen iminodiacetate ion *8.810*
Hydrogen ion *6.230*
Hydrogen maleate ion *6.1130*
Hydrogen malonate ion *6.1135*
Hydrogen oxalate ion *6.1301, 8.1031*
Hydrogen peroxide *6.332, 7.118*
Hydrogen peroxodiphosphate ion *6.347*
Hydrogen peroxomonophosphate ion *6.349, 8.176*
Hydrogen peroxomonosulfate ion *6.423, 8.212*

Hydrogen perxenate(VIII) ion *6.471, 8.236*
Hydrogen phosphate ion *6.344, 7.127, 8.172, 9.25*
Hydrogen phosphite ion *7.124, 8.169*
Hydrogen selenate(VI) ion *7.152*
Hydrogen selenide *6.426, 8.215*
Hydrogen selenite(IV) ion *6.428, 7.160, 8.218*
Hydrogen succinate ion *6.1406*
Hydrogen sulfate ion *8.209*
Hydrogen sulfide *6.415, 8.205*
Hydrogen sulfite ion *8.207*
Hydrogen xenate(VII) *9.31*
Hydrogen xenate(VI) ion *8.235*
Hydroorotate ion *6.842, 8.549*
Hydroperoxide ion *6.333, 8.160, 9.23*
13-Hydroperoxylinoleate ion *6.1060*
9-Hydroperoxylinoleate ion *6.1061*
13-Hydroperoxylinolenate ion *6.1062*
9-Hydroperoxylinolenate ion *6.1063*
13-Hydroperoxy-9,12-octadecadienoate ion *6.1060*
9-Hydroperoxy-9,12-octadecadienoate ion *6.1061*
13-Hydroperoxy-9,12,15-octadecatrienoate ion *6.1062*
9-Hydroperoxy-9,12,15-octadecatrienoate ion *6.1063*
Hydroquinone *7.397, 8.777*
Hydroquinone dianion *6.1064*
Hydroquinone dimethyl ether *7.335, 8.572*
Hydroselenide ion *6.427, 8.216*
Hydroxide ion *7.117, 8.161*
Hydroxocob(III)alamin *6.139, 8.60*
Hydroxoiron(III) ion *7.79*
Hydroxopentammineruthenium(III) ion *6.407*
2-Hydroxyacetaldehyde *6.984*
2-Hydroxyacetamide *6.985, 8.714*
p-Hydroxyacetanilide *8.247*
Hydroxyacetic acid *6.987, 7.378, 8.716*
2-Hydroxyadipate ion *7.415*
2-Hydroxybenzaldehyde, conjugate base *8.1139*
4-Hydroxybenzaldehyde, conjugate base *8.778*
2-Hydroxybenzoate ion, dianion *9.114*
3-Hydroxybenzoate ion, dianion *6.1065*
4-Hydroxybenzoate ion, dianion *6.1066*
2-Hydroxybenzoate ion *6.1391, 8.1140*
4-Hydroxybenzoate ion *8.779*
2-Hydroxybenzoic acid *7.511, 8.1141*
4-Hydroxybenzoic acid *7.398*
N-[2-Hydroxy-1,1-bis(hydroxymethyl)ethyl]glycine *8.780*
3-Hydroxy-2-butanone *6.1067, 8.781*
2-Hydroxybutyric acid *8.782*
p-Hydroxycinnamate ion, conjugate base *9.85*
p-Hydroxycinnamate ion *8.783*
Hydroxycycloheptatriene *6.1068*
4-Hydroxy-3,5-dimethoxybenzoate ion *8.784*
4-Hydroxy-3,5-dimethoxycinnamate ion *8.785*
6-Hydroxy-1,4-dimethylcarbazole *8.786*
Hydroxydioxoneptunium(VI) ion *6.327*
Hydroxydioxouranium(VI) ion *6.460*
1-Hydroxyethyl *5.18*
2-Hydroxyethyl acetate *6.1069, 8.787*
2-Hydroxyethylammonium ion *7.206*
2-Hydroxyethyl ether *8.534*
2-Hydroxyethylethylenediaminetriacetic acid *8.788*
1-(2-Hydroxyethyl)-2-methyl-5-nitroimidazole *6.1070, 8.789*
4-(2-Hydroxyethyl)-1-piperazineethanesulfonic acid *8.790*
2-Hydroxyethylsulfide ion *8.791*
(2-Hydroxyethyl)trimethylammonium *6.760*
3-Hydroxy-5-(hydroxymethyl)-2-methyl-4-pyridinecarboxaldehyde 5-phosphate *6.1370, 8.1117*
2-Hydroxyiminomethyl-1-methylpyridinium *6.1366, 7.504, 8.1108*
Hydroxyindium(III) ion *6.254*
5-Hydroxyindole *8.792*
Hydroxyl *5.3, 5.3.1, 5.3.2, 5.3.3, 5.3.4, 5.3.5, 5.6.1, 5.7.2, 5.8.1, 5.10.3, 5.11.1, 5.12.1, 5.17.3, 8., 10.1.2, 10.2.2, 10.3.2, 10.4.2, 10.7.2, 10.8.2, 10.12.3, 10.13.2, 10.14.2, 10.16.2, 10.18.2, 10.21.2, 10.22.2, 10.23.2, 10.24.2, 10.25.2, 10.26.2, 10.27.2, 10.28.2, 10.29.3, 10.34.3, 10.40.1, 10.41.3, 10.42.1, 10.44.2, 10.45.2, 10.46.2, 10.48.1, 10.49.1, 10.51.2, 10.54.2, 10.55.2, 10.58.2, 10.59.2, 10.60.2, 10.65.2, 10.66.2, 10.67.2, 10.68.2, 10.69.2, 10.70.2, 10.71.2, 10.72.2, 10.73.3, 10.75.2, 10.80.2, 10.82.1, 10.85.1, 10.89.2, 10.90.3, 10.91.2, 10.94.1, 10.95.2, 10.96.2, 10.97.1, 10.98.1, 10.99.1, 10.100.2, 10.102.1, 10.103.1, 10.105.1, 10.107.1, 10.108.1, 10.110.2, 10.111.3, 10.112.1, 10.114.2, 10.117.2, 10.118.2, 10.120.1, 10.122.1, 10.125.3, 10.128.2, 10.129.1, 10.133.3, 10.139.2, 10.140.3, 10.141.2, 10.142.2*
Hydroxylamine *6.288, 8.129*
Hydroxylaminedisulfonate ion *6.291, 8.131*
Hydroxylammonium ion *6.289, 8.130*
Hydroxymalonic acid *7.523*
2-Hydroxy-5-methoxybenzoate ion *8.793*
4-Hydroxy-3-methoxybenzoate ion *8.794*
4-Hydroxy-3-methoxycinnamate ion *8.795*
1-(2-Hydroxy-3-methoxypropyl)-2-nitroimidazole *6.1071, 8.796*
5-Hydroxymethylfurfural *8.797*
4-Hydroxy-3-[(2-methylphenyl)azo]-5-[[(4-methylphenyl)sulfonyl]amino-2,7-naphthalenedisulfonate *8.272*
5-Hydroxy-6-methyl-3,4-pyridinedimethanol *6.1371, 8.1119*
4-Hydroxy-2-nitrobenzofuran *6.1072*
5-Hydroxy-2-nitrobenzofuran *6.1073*
6-Hydroxy-2-nitrobenzofuran *6.1074*
7-Hydroxy-2-nitrobenzofuran *6.1075*
6-Hydroxy-5-nitrothymine, conjugate base *6.1077*
6-Hydroxy-5-nitrothymine *6.1076*
α-Hydroxy-α-phenylacetophenone *6.633*
p-Hydroxyphenyl-β-D-glucopyranoside *6.1078, 8.798*
3-(*p*-Hydroxyphenyl)propionate dianion *6.1080, 8.799*
3-(*p*-Hydroxyphenyl)propionate ion *6.1079, 8.800*
3-(*p*-Hydroxyphenyl)propionic acid *7.399*
Hydroxyproline *6.1081, 8.801*
Hydroxyproline, conjugate acid *7.400, 8.802*
2-Hydroxypropionamide *6.1082, 8.803*

2-Hydroxypropionate ion *6.1114, 8.846*
2-Hydroxypropionic acid *6.1115, 7.412, 8.847*
2-Hydroxypurine *8.804*
3-Hydroxypyridine *8.1114*
4-Hydroxy-2-pyrrolidinecarboxylic acid *6.1081, 8.801*
4-Hydroxy-2-pyrrolidinecarboxylic acid, conjugate acid *7.400, 8.802*
Hydroxysuccinate ion *6.1127, 8.858, 9.88*
Hydroxysuccinic acid *6.1128, 7.416, 8.859*
Hydroxytetrakis(*p*-sulfonatophenyl) porphinatocobaltate(II) ion *6.79*
6-Hydroxy-2,5,7,8-tetramethylchroman-2-carboxylate ion *8.805*
α-Hydroxytetronate ion *8.806*
Hydroxyuranium(IV) ion *6.458*
Hydroxyurea *6.1083*
Hypobromite ion *6.29, 8.11, 9.2*
Hypobromous acid *8.12*
Hypochlorite ion *6.61, 8.32, 9.8*
Hypoiodite ion *6.250, 9.13*
Hypoiodous acid *6.249, 8.111*
Hypophosphite ion(2-) *7.124, 8.169*
Hypophosphorous acid *7.122*
Hypoxanthine *6.1084, 8.807*
Igepal CO-630 *10.104*
Igepal CO-730 *10.106, 7.487, 8.1081*
Imidazole *6.1085, 8.808*
Imidazole, 2-mercapto-1-methyl- *8.868*
Imidazole, 2-methyl-4-nitro- *6.1209*
Imidazole, 2-nitro- *6.1265*
Imidazole, 4-nitro- *6.1266*
Imidazole-1-ethanol, α-(methoxymethyl)-2-nitro- *6.1071, 8.796*
Imidazole-1-ethanol, 2-methyl-5-nitro- *6.1070, 8.789*
2,4-Imidazolidinedione, 1-[(5-nitro-2-furanyl)methylene]amino]- *6.964, 8.681*
Imidazolium ion *6.1086, 7.401, 8.809*
Iminodiacetate ion *6.1087, 9.86*
Iminodiacetatocopper(II) *8.78*
Iminodiacetatodioxouranium(VI) *6.463*
Iminodiacetatonickel(II) *8.153*
Iminodiacetic acid *8.811*
Iminodiacetic acid, conjugate acid *7.402*
Indigodisulfonate ion *8.812*
Indigomonosulfonate ion *8.813*
Indigotetrasulfonate ion *6.1088, 8.814*
Indium(III) ion *6.253, 7.97*
Indium(II) ion *8.113*
Indole *6.1089, 7.403, 8.815*
Indole, 5-bromo- *8.388*
Indole, 5-chloro- *8.443*
Indole, 5-methoxy- *6.1159, 8.889*
Indole, 1-methyl- *8.936*
Indole, 2-methyl- *6.1201, 8.937*
Indole, 3-methyl- *6.1202, 8.938*
Indole, 5-methyl- *8.939*
Indole, 5-nitro- *8.1001*
Indole-3-acetate ion *6.1090, 8.817*
Indole-5-acetate ion *8.816*
Indole-3-acetic acid *7.404*
5-Indolecarbonitrile *8.471*
Indole-3-propionate ion *6.1091, 8.818*
Indole-3-propionic acid *7.405*
Indoline *8.819*
5-Indolol *8.792*
Inosine *8.820*
Inosine monophosphate *8.821*
Inosine 5′-phosphate *8.821*
5′-Inosinic acid *8.821*
Inositol *8.822*
myo-Inositol hexasulfate *8.823*
Inulin *10.67*
Iodate ion *6.251, 8.112, 9.14*
Iodide ion *6.246, 7.96, 8.109, 9.12*
Iodine *6.248, 7.94, 8.110*
Iodipamide dianion *6.1092, 8.824*
Iodoacetamide *6.1093*
Iodoacetate ion *6.1094*
Iodoacetic acid *8.825*
Iodobenzene *6.1095, 8.826*
2-Iodobenzoate ion *6.1096, 8.827*
3-Iodobenzoate ion *6.1097, 8.828*
4-Iodobenzoate ion *6.1098, 8.829*
1-Iodobutane *6.1099*
Iodoethane *6.1100*
o-Iodohippurate ion *6.1101, 8.830*
o-Iodohippuric acid *7.406*
Iodomethane *6.1102, 7.407*
1-Iodopropane *6.1103*
2-Iodopropionate ion *6.1104*
3-Iodopropionate ion *6.1105, 8.831*
4-Iodotoluene *6.1106*
5-Iodouracil *6.1107*
Iothalamate ion *6.1108*
Iridium(III) tris(2,2′-bipyridine), ortho-metallated complex *6.257*
Iron(II) ion *6.194, 7.76, 8.85, 9.10*
Iron(III) ion *6.206, 7.78*
Iron(III), chloro(7,12-bis[1-[1-(2-amino-2-carboxyethyl)thio]ethyl]-3,8,13,17-tetramethyl- *6.223*
Iron(III), dicyano-α,α,α,β-tetrakis(*N*-methylisonicotinamidophenyl)porphyrin *6.220*
Iron(III) dicyanotetrakis(4-*N*-methylpyridyl)porphyrin *6.216*
Iron(III) α,α,α,β-tetrakis(*N*-methylisonicotinamidophenyl)porphyrin *6.219*
Iron(III) tetrakis(4-*N*-methylpyridyl)porphyrin *6.215, 8.99*
Iron(III) tetrakis(*p*-sulfonatophenyl)porphyrin *6.217, 8.100*
Iron(III) tetrakis(*p*-sulfonatophenyl)porphyrin dimer *6.218*
Iron(III) tetrakis-4-(*N,N,N*-trimethylamino)phenylporphyrin *6.214, 8.98*
Iron(III) tris(2,2′-bipyridine) *7.83, 8.96*
Iron(III) tris(1,10-phenanthroline) *7.84, 8.97*
Iron(II) protoporphyrin *6.200*

Iron(II) tris(2,2'-bipyridine) *8.86*
Iron(II) tris(1,10-phenanthroline) *6.195, 8.87*
Isoamyl alcohol *8.915*
Isoamylamine *6.1109*
Isoamylammonium ion *8.832*
Isobutane *7.408, 8.833*
Isobutyl alcohol *7.441, 8.953*
Isobutylamine *6.1110*
Isobutylammonium ion *8.834*
Isobutyl chloride *6.742*
Isobutylene *7.409, 8.835*
Isobutyl vinyl ether *6.1510*
Isobutyramide *8.836*
Isobutyrate ion *7.443, 8.957*
Isobutyric acid *7.444*
Isobutyronitrile *7.445*
Isocitrate dehydrogenase *10.68*
Isocitrate ion *6.1111*
Isodurene *7.529, 8.1181, 9.120*
Isoeugenol *8.896*
Isoguanine *8.837*
Isoindole-4,7-dione, 1,2-dimethyl-3-phenyl- *6.878*
Isoindole-4,7-dione, 5,6-dimethyl-3-phenyl-1,2-trimethylene- *6.880*
Isoindole-4,7-dione, 1-ethoxycarbonyl-2,5-dimethyl-3-phenyl- *6.919*
Isoindole-4,7-dione, 1-ethoxycarbonyl-5-methyl-2,3-trimethylene- *6.921*
Isoindole-4,7-dione, 1-ethoxycarbonyl-6-methoxy-5-methyl-2,3-trimethylene- *6.920*
Isoindole-4,7-dione, 5-methyl-1,2-trimethylene- *6.1230*
Isoindole-4,7-dione, 1,2,3,5-tetramethyl- *6.1432*
Isoindole-4,7-dione, 1,2,5,6-tetramethyl-3-phenyl- *6.1435*
Isoindole-4,7-dione, 1,2,5-trimethyl-3-phenyl- *6.1485*
Isoleucine *8.838*
Isoleucine, conjugate acid *7.410, 8.839*
Isonicotinamide *6.1368, 8.1109*
Isonicotinamide, conjugate acid *8.1110*
Isonicotinate ion *6.1369, 8.1112*
Isonicotinate ion *N*-oxide *8.1113*
Isooctane *8.1240*
Isoorotate ion *6.1112, 8.840*
Isoorotic acid *7.411*
Isopentane *8.914*
Isopentylamine *6.1109*
Isophthalonitrile *7.325*
Isopropanol *7.493, 8.1090, 9.111*
Isopropyl acetate *8.841*
Isopropyl alcohol *7.493, 8.1090, 9.111*
Isopropylamine *6.1113, 8.842*
Isopropylammonium ion *8.843*
Isopropylbenzene *8.469, 9.62*
Isopropyl cyanide *7.445*
Isopropyl disulfide *8.568*
Isopropyl phenyl sulfoxide *8.844*
Isouramil *8.845*
Isovalerate ion *7.437, 8.918*
Isovaleric acid *8.919*
Keratan sulfate *10.69*
Laccase *10.70*
Lactamide *6.1082, 8.803*
Lactate dehydrogenase *10.71*
Lactate ion *6.1114, 8.846*
Lactic acid *6.1115, 7.412, 8.847*
Lactose *6.1116, 8.848*
Laminaran *10.72*
Laminarin *10.72*
Lanthanum(III) ion *6.261*
Lead(I) ions *7.128*
Lead(II) ions *6.350, 7.129, 8.177*
Lead(II) tetrakis(4-*N*-methylpyridyl)porphyrin *6.353*
Leucine *6.1117, 8.849*
Leucine, *N*-acetyl, negative ion *8.265*
Leucine, conjugate acid *7.413*
Leuco Thionine *6.1454*
L-Leucyl-L-alanine *6.1118*
DL-Leucylglycine *6.1119*
Leucylglycylglycine *6.1120*
L-Leucyl-L-leucine *6.1121*
Linoleate ion *8.850, 9.87*
Linolenate ion *8.851*
Lipoate ion *6.1122*
Lumazine *6.1123*
Lumichrome *6.1124*
Lumiflavin-3-acetate ion *6.1125*
Luminol *8.852*
Lutetium(III) ion *6.263*
2,4-Lutidine *8.610*
2,6-Lutidine *8.611*
Lysine *6.1126, 8.853*
Lysine, conjugate acid *8.854*
Lysine, conjugate diacid *7.414*
Lysine decarboxylase (*B. cadaveris*) *10.75*
Lysine vasopressin *10.73*
Lysolecithin *10.74*
Lysozyme *10.75*
Malate ion *6.1127, 8.858, 9.88*
Maleate ion *6.1129, 9.89*
Maleic acid *6.1131, 7.417, 8.855*
Maleic hydrazide *8.856*
Maleic hydrazide, conjugate base *6.1132, 8.857*
Malic acid *6.1128, 7.416, 8.859*
Malonamic acid, *N*-(2-carboxy-3,3-dimethyl-7-oxo-4-thia-1-azabicyclo[3.2.0]hept-6-yl)-2-phenyl- *6.714*
Malonamide *6.1133*
Malonate ion *6.1134, 8.860, 9.90*
Malonic acid *6.1136, 7.418, 8.861*
Malonodiamide *6.1133*
Malononitrile *6.1137, 7.419*
Maltose *6.1138, 8.862*
Manganate(VI) ion *6.278, 9.17*
Manganese(III), bis(hydroxo)tetrakis(*p*-sulfonatophenyl)porphyrin *6.275, 8.120*
Manganese(III) aqua(hydroxy)tetrasulfophthalocyanine *8.122*
Manganese(III) dihydroxytetrakis(*p*-sulfonatophenyl)porphyrin *8.121, 9.16*

Manganese(III) α,α,α,β-tetrakis(*N*-methylisonicotinamidophenyl)porphyrin ***6.276***
Manganese(III) tetrakis(4-*N*-methylpyridyl)porphyrin ***6.274***
Manganese(III) tetrakis(pyridyl)porphyrin ***6.273, 8.119***
Manganese(III) tetrakis(*p*-sulfonatophenyl)porphyrin ***6.277***
Manganese(III) tetrakis-4-(*N,N,N*-trimethylamino)phenylporphyrin ***6.272***
Manganese(II) ion ***6.265, 7.99, 8.115***
Manganese(II) tetrakis(4-*N*-methylpyridyl)porphyrin ***6.270***
Manganese(II) tetrakis(*p*-sulfonatophenyl)porphyrin ***6.271***
Mannitol ***6.1139, 8.863***
Melibiose ***8.864***
Menadione ***6.1207, 7.440, 8.943***
Menaquinone ***6.1207, 7.440, 8.943***
Mercaptoacetate ion ***6.1452, 8.865***
Mercaptoacetic acid ***7.420, 8.866***
2-Mercaptoethanol, negative ion ***8.791***
2-Mercaptoethanol ***6.1140, 7.421, 7.422, 7.423, 8.867***
2-Mercaptoethylguanidine ***6.1141***
2-Mercapto-1-methylimidazole ***8.868***
(2-Mercapto-2-methylpropionato-*O,S*)bis(ethylenediamine)chromium(III) ion ***8.65***
2-Mercaptopropionate ion ***6.1142, 8.869***
3-Mercaptopropionate ion ***6.1143, 8.870***
2-Mercaptopropionic acid ***6.1144, 7.424, 7.425***
3-Mercaptopropionic acid ***6.1145, 7.426, 7.427***
2-Mercaptopurine ***8.871***
6-Mercaptopurine ***8.872***
Mercaptosuccinic acid ***7.428***
Mercuric bromide ***6.236, 8.108***
Mercurous chloride ***8.105***
Mercurous cyanide ***8.106***
Mercury(II) bromide ***6.236, 8.108***
Mercury(II) chloride ***6.237, 7.92***
Mercury(II) cyanide ***6.239***
Mercury(II) dihydroxide ***6.232, 7.91***
Mercury(II) iodide ***6.238, 7.93***
Mercury(II) ion ***7.90***
Mercury(II) thiocyanate ***6.240***
Mercury(I) chloride ***8.105***
Mercury(I) cyanide ***8.106***
Mercury(I) dimer ion ***7.89***
Mesitylene ***7.429, 8.873, 9.91***
Mesyl chloride ***7.431***
Methacrylamide ***6.1146***
Methacrylate ion ***6.1147, 8.874, 9.92***
Methacrylic acid ***6.1148***
Methacrylonitrile ***8.875, 9.93***
Methanaminium, trimethyl- ***6.1428, 8.1179, 9.118***
Methane ***6.1149, 7.430, 8.876***
Methane, tetrachloro- ***6.716, 7.270***
Methanedisulfonate ion ***8.877***
Methanedisulfonate ion, hydrogen ***8.878***
Methanesulfonate ion ***6.1150, 8.879***
Methanesulfonyl chloride ***7.431***
Methanethiol ***6.1151***
Methanol ***6.1152, 7.432, 8.880, 9.94***
Methanol-d_3 ***7.433, 8.881***
Methemerythrin ***10.76***
Methemoglobin ***10.77***
Methicillin ***6.1153***
Methimazole ***8.868***
Methional ***8.882***
Methionine ***6.1154, 8.883***
Methionine, *N*-acetyl, negative ion ***8.266***
Methionine, *N*-acetyl- ***7.182***
Methionine, conjugate acid ***7.434***
Methionylglycine ***6.1155***
Methionylisoleucine ***6.1156***
Methionylvaline ***6.1157***
Methocillin S ***6.766***
Methoxsalen ***6.1165, 8.897***
Methoxyacetate ion ***8.884***
Methoxybenzene ***6.591, 7.212, 8.328***
4-Methoxybenzenediazonium ion ***6.1158***
2-Methoxybenzoate ion ***8.885***
3-Methoxybenzoate ion ***8.886***
4-Methoxybenzoate ion ***8.887***
1-Methoxy-3,5-dinitrobenzene ***6.891, 8.619***
2-Methoxyethanol ***8.888***
9-Methoxy-7*H*-furo[3,2-*g*][1]benzopyran-7-one ***6.1165, 8.897***
5-Methoxyindole ***6.1159, 8.889***
1-Methoxy-2-methyl-1-phenylpropane ***8.890***
9-(2-Methoxy-4-methylsulfonylaminoanilino) acridinium ***6.1160***
5-Methoxy-2-nitrobenzofuran ***6.1161***
7-Methoxy-2-nitrobenzofuran ***6.1162***
Methoxyphenol ***6.1163***
2-Methoxyphenol ***8.891***
3-Methoxyphenol ***8.892***
4-Methoxyphenol ***8.893***
4-Methoxyphenyl-*N*-*tert*-butylnitrone ***6.1164, 8.894***
p-Methoxyphenyl-β-D-glucopyranoside ***8.895***
2-Methoxy-4-propenylphenol ***8.896***
8-Methoxypsoralen ***6.1165, 8.897***
6-Methoxypurine ***8.898***
6-Methoxypurine-9-riboside ***8.899***
5-Methoxysalicylate ion ***8.793***
Methyl Green dication ***6.1166***
N-Methylacetamide ***6.1167, 8.900***
Methyl acetate ***6.1168, 8.901***
Methyl acrylate ***6.1169***
2-Methyladenine ***6.1170***
7-Methyladenine ***6.1171***
9-Methyladenine ***8.903***
N^6-Methyladenine ***8.902***
N^6-Methyladenosine ***8.904***
Methylal ***8.579***
2-Methylalanine, conjugate acid ***7.207***
Methyl alcohol ***6.1152, 7.432, 8.880, 9.94***
Methylamine ***6.1172, 8.905***
Methyl 2-aminoacetate, conjugate acid ***6.1175***
Methyl 2-aminoacetate ***6.1174***

α-(1-Methylaminoethyl)benzyl alcohol *6.909, 8.630*
2-Methylamino-1-hydroxy-1-phenylpropanol *6.909, 8.630*
2-Methylamino-1-phenyl-1-propanol, conjugate acid *6.908*
6-Methylaminopurine *8.902*
6-Methylaminopurine riboside *8.904*
Methylammonium ion *6.1173, 7.435, 8.906*
4-Methylaniline *9.129*
Methyl α-D-arabinopyranoside *8.907*
Methylarabinoside *8.907*
3-*O*-Methyl-L-ascorbate ion *8.910*
1-*O*-Methyl-L-ascorbic acid *8.908*
2-*O*-Methyl-L-ascorbic acid *8.909*
3-*O*-Methyl-L-ascorbic acid *8.911*
4-Methylbenzenediazonium ion *6.1176*
2-Methylbenzoate ion *6.1464, 9.126*
3-Methylbenzoate ion *6.1463, 9.125*
4-Methylbenzoate ion *6.1465, 8.1204, 9.127*
4-Methylbenzonitrile *6.1468, 7.548, 8.1209, 9.130*
α-Methylbenzyl alcohol *8.1062*
N-Methylbenzylamine *6.1179*
α-Methylbenzylamine *6.1177, 9.95*
N-Methylbenzylammonium ion *6.1180, 8.913*
α-Methylbenzylammonium ion *6.1178, 8.912*
3-Methyl-7,8-bis,nor-5-deazalumiflavin *6.1181*
2-Methylbutane *8.914*
2-Methyl-2-butanol *8.323*
3-Methyl-1-butanol *8.915*
3-Methyl-2-butenoate ion *6.855*
3-Methyl-2-butenoic acid *6.856*
Methyl butyrate *8.916*
2-Methylbutyrate ion *7.436, 8.917*
3-Methylbutyrate ion *7.437, 8.918*
3-Methylbutyric acid *8.919*
3-Methylcatechol *6.850, 8.567*
4-Methylcatechol *7.332*
Methyl chloride *6.741a, 7.281*
20-Methylcholanthrene *6.1182*
3-Methylcholanthrene *6.1182*
2-Methyl-*N*-[4-cyanophenyl)methylene]-2-propanamine *6.783, 8.472*
Methylcyclohexane *8.920*
Methylcyclopentane *8.921*
S-Methylcysteine, negative ion *6.1184, 8.923*
S-Methylcysteine *6.1183, 8.922*
5-Methylcytosine, conjugate base *9.96*
1-Methylcytosine *6.1185*
5-Methylcytosine *6.1186, 8.924*
10-(2-Methyl-2-dimethylaminoethyl)phenothiazine, conjugate acid *6.1349, 8.1085*
5-Methyl-3,8-dinitro-6-phenylphenanthridium ion *6.893*
2-Methyl-1,3-dioxolane *8.925*
4-Methyl-1,3-dioxolan-2-one *6.1357*
Methyl disulfide *8.592*
Methylene Blue cation *6.1187, 7.430, 8.926*
Methylene chloride *6.833, 7.322, 8.528*
3,3′-Methylenedithiobis(2-aminopropionate ion) *6.903*
Methylene iodide *6.851*
Methyl ethyl ketone *8.406*
1-Methylethyl phenyl sulfoxide *8.844*
N-Methylformamide *6.1188, 8.927*
Methyl fumarate ion *6.1189*
2-Methylfuran *8.928*
5-Methylfurfural *8.929*
Methylgalactoside *8.930*
α-Methyl-D-glucopyranoside *8.931*
α-Methylglucoside *8.931*
N-Methylglycine, conjugate acid *7.512*
Methyl glycolate *6.1194*
1-Methylguanosine *6.1190*
N-Methylhistidine, conjugate acid *6.1191*
Methylhydrazine *6.1192*
Methylhydrazinium ion *6.1193*
Methyl hydroxyacetate *6.1194*
N-Methylhydroxylamine *6.1195*
O-Methylhydroxylamine *6.1197, 8.932*
N-Methylhydroxylammonium ion *6.1196*
O-Methylhydroxylammonium ion *6.1198, 8.933*
1-Methylimidazole, conjugate acid *6.1200, 8.935*
1-Methylimidazole *6.1199, 8.934*
1-Methylindole *8.936*
2-Methylindole *6.1201, 8.937*
3-Methylindole *6.1202, 8.938*
5-Methylindole *8.939*
Methyl iodide *6.1102, 7.407*
N-Methylisobutyramide *8.940*
1-Methylisothiazolidine-3-carboxylic acid *6.812*
1-Methyllumichrome *6.1203*
3-Methyllumichrome *6.1204*
Methyl mercaptoacetate *6.1227, 8.968*
Methyl methacrylate *6.1205, 7.439, 8.941*
2-Methyl-*N*-[(4-methoxyphenyl)methylene]-2-propanamine *6.1164, 8.894*
1-Methyl-4-(1-methylethyl)-2,3-dioxabicyclo[2.2.2]oct-5-ene *6.599*
2-Methyl-*N*-[(4-methylphenyl)methylene]-2-propanamine *6.1216, 8.946*
Methyl methylthiomethyl sulfoxide *6.1206, 8.942*
2-Methyl-1,4-naphthoquinone *6.1207, 7.440, 8.943*
1-Methylnicotinamide *6.1208*
2-Methyl-4-nitroimidazole *6.1209*
2-Methyl-5-nitroimidazole *6.1209*
2-Methyl-*N*-[4-nitrophenyl)methylene]-2-propanamine *6.1276, 8.1009*
6-Methyl-5-nitro-2,4-pyrimidinedione *6.1270, 8.1003*
2-Methyl-2-nitrosopropane dimer *8.944*
7-*con*-*O*-Methylnogalarol *6.1210*
7-*dis*-*O*-Methylnogalarol *6.1211*
7-*con*-*O*-Methylnogarol *6.1212*
7-*dis*-*O*-Methylnogarol *6.1213*
1-Methyl-1′-octadecyl-4,4′-bipyridinium *6.1214*
Methylpenicillin *6.1215*
α-Methylphenethyl alcohol *8.1070*
2-Methylphenol *8.462*
4-Methylphenol *6.770, 8.463*
10-Methylphenothiazin-2-ylacetate ion *6.1232, 8.972*

4-Methylphenoxide ion *9.97*
2-Methyl-4-phenyl-2-butanol *8.945*
4-Methylphenyl-*N*-*tert*-butylnitrone *6.1216, 8.946*
1-Methyl-1-phenylethylene *6.1224, 7.446, 8.965*
2-Methyl-*N*-phenylmethylene-2-propanamine *N*-oxyl *6.1329, 8.1061*
2-Methyl-1-phenyl-1-propanol *8.947*
2-Methyl-1-phenyl-1-propanol-1-*d* *8.948*
2-Methyl-1-phenyl-2-propanol *8.949*
Methyl phenyl sulfoxide *8.950*
5-Methyl-1-phenyl-2,3-trimethyleneisoindole-4,7-dione *6.1217*
Methylphosphonate ion *8.951*
N-Methylpivalamide *8.952*
Methyl pivalate *6.1229*
2-Methylpropane *7.408, 8.833*
2-Methyl-2-propaneamine, conjugate acid *6.706, 8.413*
2-Methyl-2-propaneamine *6.704, 8.412*
2-Methyl-2-propanethiol *6.1218*
2-Methyl-1-propanol *7.441, 8.953*
2-Methyl-2-propanol *6.1219, 7.442, 8.954, 9.98*
2-Methylpropene *7.409, 8.835*
2-Methylpropionamide *8.836*
N-Methylpropionamide *8.955*
Methyl propionate *6.1220, 8.956*
2-Methylpropionate ion *7.443, 8.957*
2-Methylpropionic acid *7.444*
2-Methylpropionitrile *7.445*
Methyl propyl ketone *8.1048*
3-Methylpterin *6.1221*
6-Methylpurine *8.958*
9-Methylpurine *6.1222*
2-Methylpyridine *8.959*
3-Methylpyridine *8.960*
3-Methylpyridine-*N*-oxide *8.961*
4-Methylpyridine-*N*-oxide *8.962*
4-(*N*-Methylpyridinium)-*tert*-butylnitrone *8.963*
2-Methyl-4,6-pyrimidinediol *8.557*
1-Methyl-2-pyrrolidinone *6.1223, 8.964*
α-Methylstyrene *6.1224, 7.446, 8.965*
N-Methylsuccinimide *6.1225*
Methylsulfate ion *6.1226, 8.966*
Methyl sulfide *6.883, 8.613*
Methyl sulfide ion *8.967*
Methyl sulfoxide *6.884, 7.340, 8.614*
Methyl thioglycolate *6.1227, 8.968*
2-Methylthiophene *8.969*
3-Methylthiophene *8.970*
3-Methylthiopropionaldehyde *8.882*
Methyl trifluoroacetate *6.1228*
Methyl trimethylacetate *6.1229*
5-Methyl-1,2-trimethyleneisoindole-4,7-dione *6.1230*
Methyltriphenylphosphonium ion *6.1231*
5-Methyluracil *6.1460, 7.546, 8.1202*
6-Methyluracil *7.447*
Methylurea *8.971*
Methyl vinyl ketone *8.408*
Methyl viologen *6.862, 7.336, 8.589, 9.70*
Metiazinic acid, conjugate base *6.1232, 8.972*
Metmyoglobin *10.80*
Metmyohemerythrin *10.81*
Metronidazole *6.1070, 8.789*
Misonidazole *6.1071, 8.796*
Molybdate(V), bis[cysteinato]di-μ-oxodioxodi- *6.282*
Molybdate(VI) ion *6.283*
Monoethyl phosphate *7.352*
Monomethionin-sulfoxidchymotrypsin *10.82*
Muconate ion *9.79*
Murexide ion *8.987*
Myoglobin *10.83*
NAD *6.1245, 8.979*
NBT *6.1252*
NSC 70845 *6.1291*
Nagarse *10.132*
2-Naphthacenecarboxamide, 4-(dimethylamino)-1,4,4a,5,5a,6,11,12a-octahydro-3,5,6,10,12,12a-hexahydroxy-6-methyl-1,11-dioxo- *8.1033*
2-Naphthacenecarboxamide, 4-(dimethylamino)-1,4,4a,5,5a,6,11,12a-octahydro-3,6,10,12,12a-pentahydroxy-6-methyl-1,11-dioxo- *6.1424, 7.525, 8.1168*
5,12-Naphthacenedione, 8-acetyl-10[(3-amino-2,3,6-trideoxy-hexopyranosyloxy]-tetrahydro-6,8,11-trihydroxy-1-methoxy- *6.810*
5,12-Naphthacenedione, 10-[(3-amino-2,3,6-trideoxy-hexopyranosyl)oxy]-tetrahydro-6,8,11-trihydroxy-8-(hydroxyacetyl)-1-methoxy- *6.546, 7.197*
2-Naphthalenamine *6.1241*
Naphthalene *6.1233, 7.448, 8.973*
Naphthalene, 2-amino- *6.1241*
Naphthalene, 1-bromo- *6.681*
Naphthalene, 1-chloro- *6.743*
Naphthalene, 1-cyano- *6.1237*
Naphthalene, 1,4-dibromo- *6.824*
Naphthalene, 2-hydroxy- *7.449*
1-Naphthaleneacetic acid *7.451*
1-Naphthalenecarboxylate ion *6.1235, 8.974, 9.99*
2-Naphthalenecarboxylate ion *6.1236, 8.975, 9.100*
2,7-Naphthalenedisulfonate, 4,5-dihydroxy-3-[(2-hydroxy-5-sulfophenyl)azo]- *6.528, 7.185*
2,7-Naphthalenedisulfonate, 4-hydroxy-3-[(2-methylphenyl)azo]-5-[[(4-methylphenyl)sulfonyl]amino- *8.272*
2,7-Naphthalenedisulfonic acid, 4,5-dihydroxy- *8.561*
Naphthalene-4-sulfonate ion, 1-amino- *6.581, 8.317*
2-Naphthalenesulfonate ion *6.1234*
Naphthazarin *6.847, 7.331*
Naphthazarin, conjugate dibase *6.848*
1-Naphthoate ion *6.1235, 8.974, 9.99*
2-Naphthoate ion *6.1236, 8.975, 9.100*
2-Naphthol *7.449*
1-Naphtholate ion *6.1242*
2-Naphtholate ion *6.1243*
β-Naphthol *7.449*
1-Naphthonitrile *6.1237*
2-Naphthonitrile *6.1238*
α-Naphthonitrile *6.1237*
β-Naphthonitrile *6.1238*

1,4-Naphthoquinone, 5,8-dihydroxy- *6.847, 7.331*
Naphthoquinone, 2,3-dimethyl- *6.873*
1,4-Naphthoquinone, 2-methyl- *6.1207, 7.440, 8.943*
1,2-Naphthoquinone-4-sulfonate ion *6.1239*
1,4-Naphthoquinone-2-sulfonate ion *6.1240, 7.450*
1-Naphthoxide ion *6.1242*
2-Naphthoxide ion *6.1243*
2-Naphthoxy *5.19*
1-Naphthylacetate ion *8.976*
1-Naphthylacetic acid *7.451*
2-Naphthylamine *6.1241*
Neodymium(III) decatungstate *6.469*
Neodymium(III) ion *6.297*
Neopentyl alcohol *7.338, 8.609*
Neptunate(VI) ion *9.21*
Neptunium(IV) *8.157*
Neptunium(V) *6.325*
Neptunium(VI) *6.328*
Neptunium(VII) *6.330*
Niacin *8.984*
Nickel(II), 1,4,5,7,7,8,11,12,14,14-decamethyl-1,4,8,11-tetraazacyclotetradecane *6.313*
Nickel(II), α-2,12-dimethyl-3,7,11,17-tetraazabicyclo[11.3.1]heptadeca-1(17),2,6,11,13,15-hexaene *6.312, 8.147*
Nickel(II), α-2,12-dimethyl-3,7,11,17-tetraazabicyclo[11.3.1]heptadeca-1(17),13,15-triene *6.310, 8.145*
Nickel(II), 5,7,7,12,14,14-hexamethyl-1,4,8,11-tetraazacyclotetradeca-4,11-diene *6.309, 7.112, 8.142*
Nickel(II), 5,7,7,12,14,14-hexamethyl-1,4,8,11-tetraazacyclotetradecane *6.308, 7.111, 8.140*
Nickel(II), 5,7,7,12,14,14-hexamethyl-1,4,8,11-tetraazacyclotetradeca-1,4,8,11-tetraene *8.143*
Nickel(II), 1,4,7,10,13-pentaazacyclohexadecane *8.144*
Nickel(II), 1,4,8,11-tetraazacyclotetradecane *6.305, 8.138*
Nickel(II), 1,4,7,10-tetraazacyclotridecane *6.304, 8.137*
Nickel(II), 1,4,8,11-tetramethyl-1,4,8,11-tetraazacyclotetradecane *6.307*
Nickel(II) iminodiacetate *8.153*
Nickel(II) ion *6.299, 7.110, 8.135*
Nickel(I) ion *8.134*
Nicotinamide *6.1244, 8.977*
Nicotinamide, conjugate acid *8.978*
Nicotinamide adenine dinucleotide *6.1245, 8.979*
Nicotinamide adenine dinucleotide, reduced *6.1246*
Nicotinamide mononucleotide *8.980*
Nicotinamide-*N*-oxide *8.981*
Nicotinate ion *6.1247, 8.982*
Nicotinate ion *N*-oxide *8.983*
Nicotinic acid *8.984*
Nicotinic acid, conjugate acid *7.452*
Nicotinonitrile *8.475*
Nicotinurate ion *6.1248, 8.985*
Nicotinylglycine *6.1248, 8.985*
Nifuroxime *6.1249, 7.453, 8.986*
Nitrate ion *6.295, 7.109*
Nitric oxide *5.10*
5,5′-Nitrilodibarbiturate ion *8.987*
Nitrilotriacetate ion *8.988*
Nitrilotriacetate ion, conjugate acid *6.1250*
Nitrilotriacetatoaluminum(III) *6.12*
Nitrilotriacetatoargentate(I) ion *6.4*
Nitrilotriacetatocobaltate(II) ion *6.75, 8.40*
Nitrilotriacetatocobaltate(III) *6.132, 7.65, 8.57*
Nitrilotriacetatocuprate(II) ion *8.80*
Nitrilotriacetatodioxouranate(VI) ion *6.464*
Nitrilotriacetatoferrate(II) ion *8.91*
Nitrilotriacetatoferrate(III) *8.101*
Nitrilotriacetatomanganate(II) ion *8.117*
Nitrilotriacetatonickelate(II) ion *6.319, 8.155*
Nitrilotriacetatozincate(II) ion *6.484, 8.240*
Nitrilotriacetic acid *8.989*
Nitrilotriacetic acid, conjugate acid *7.454*
1,1′,1″-Nitrilotriethanol, conjugate acid *6.1251, 8.991*
2,2′,2″-Nitrilotriethanol *8.990*
Nitrite ion *6.294, 7.108, 8.133, 9.19*
4-Nitroacetophenone *6.1253, 7.455, 8.992*
cis-Nitroamminebis(ethylenediamine)cobalt(III) ion *6.115*
4-Nitroaniline *6.1254, 8.993*
4-Nitroanilinium ion *7.456*
9-Nitroanthracene *10.84*
5-Nitrobarbiturate ion *6.1255, 8.994*
Nitrobenzene *6.1256, 7.457, 8.995*
Nitrobenzene-d_5 *8.996*
4-Nitrobenzenediazonium ion *6.1257*
Nitrobenzene radical anion *5.20*
4-Nitrobenzoate ion *6.1258, 8.997*
4-Nitrobenzoato(pentaammine)cobalt(III) ion *6.127, 7.61*
2-Nitrobenzofuran *6.1259*
4-Nitrobenzoic acid *7.458*
Nitro Blue Tetrazolium *6.1252*
Nitrochymotrypsin *10.85*
5-Nitro-2,6-dioxo-1,2,3,4-tetrahydropyrimidine-4-carboxylate ion *6.1271, 8.1004*
Nitroethane *6.1260, 7.459*
Nitroform anion *6.1487a*
5-Nitro-2-furaldehyde *6.1261, 8.998*
5-Nitro-2-furaldehyde diacetate *6.1262*
5-Nitro-2-furaldehyde semicarbazone *6.1263, 8.999*
anti-5-Nitro-2-furaldoxime *6.1249, 7.453, 8.986*
Nitrofurantoin *6.964, 8.681*
1-[(5-Nitro-2-furanyl)methylene]amino]-2,4-imidazolidinedione *6.964, 8.681*
[(5-Nitro-2-furanyl)methylene]hydrazide of aminooxoacetic acid *6.965, 8.683*
Nitrofurazone *6.1263, 8.999*
5-Nitrofurfural *6.1261, 8.998*
N-(5-Nitro-2-furfurylidene)-1-aminohydantoin *6.964, 8.681*
5-Nitrofurfurylidene diacetate *6.1262*
5-Nitrofuroate ion *6.1264, 8.1000*
Nitrogen dioxide *5.11*
Nitrohexane *10.86*

2-Nitroimidazole *6.1265*
4-Nitroimidazole *6.1266*
5-Nitroindole *8.1001*
4-Nitroisothiazole *6.1267*
Nitromethane *6.1268, 7.460*
aci-Nitromethane anion *6.1269, 8.1002*
Nitromethane radical ion(1-) *5.21.1*
5-Nitro-6-methyluracil *6.1270, 8.1003*
5-Nitroorotate ion *6.1271, 8.1004*
p-Nitroperoxybenzoic acid *6.1272*
4-Nitrophenol *6.1273, 8.1007*
2-Nitrophenoxide ion *6.1274, 8.1005*
3-Nitrophenoxide ion *6.1275, 8.1006*
4-Nitrophenoxide ion *6.1276, 8.1008*
4-Nitrophenylacetate ion *6.1277*
4-Nitrophenyl-*N*-*tert*-butylnitrone *6.1278, 8.1009*
m-Nitrophenyl-β-D-glucopyranoside *8.1010*
o-Nitrophenyl-β-D-glucopyranoside *6.1279, 8.1011*
p-Nitrophenyl-β-D-glucopyranoside *6.1280, 8.1012*
1-Nitropropane *6.1281, 7.461*
1-Nitropyrazole *6.1282*
3-Nitropyrazole *6.1283*
Nitropyrene *10.87*
5-Nitro-2,4-pyrimidinedione *6.1290, 8.1015*
2-Nitropyrrole *6.1284*
3-Nitropyrrole *6.1285*
Nitrosobenzene *6.1286, 8.1013*
Nitroso-*tert*-butane *8.944*
4-Nitroso-*N,N*-dimethylaniline *6.874, 8.603*
Nitrosyldisulfonate ion *6.292, 7.105, 8.132*
2-Nitrothiophene *6.1287*
3-Nitrothiophene *6.1288*
4-Nitrotoluene *6.1289, 9.101*
p-Nitro-*o*-toluenesulfonate ion *8.1014*
5-Nitrouracil *6.1290, 8.1015*
Nitrous acid *7.107*
Nitrous oxide *6.293, 7.106*
Nogalamycin *6.1291*
dis-Nogamycin *6.1292*
Nonanedioic acid *8.348*
Nordihydroguaiaretic acid *8.615*
Norephedrine *6.1293*
Norleucine *6.1294, 8.1016*
Norleucine, conjugate acid *8.1017*
Norpseudopelletierine *N*-oxyl *6.1295, 8.1018*
Norvaline *8.1019*
Norvaline, conjugate acid *7.462, 8.1020*
1,3,6,8,10,13,16,19-Octaazabicyclo[6.6.6]eicosanerhodium(III) ion *6.398*
Octacyanomolybdate(IV) ion *6.280, 8.123*
9,12-Octadecadienoate ion *8.850, 9.87*
1,3,5,7,9,11,13,15,17-Octadecanonaene, (*all-E*)-3,7,12,16-tetramethyl-1,18-bis(2,6,6-trimethyl-1-cyclohexen-1-yl)- *10.15*
9-Octadecenoate ion *6.1297*
Octadecylviologen *6.894*
Octafluorodi-μ-oxodiarsenate(V) ion *6.21*
Octahydrogen tetrakis(diphosphito)diplatinate(II) ion *6.375*
Octane *8.1021*
Octanedioic acid *8.1151*
1-Octanol *8.1022*
Octyl alcohol *8.1022*
n-Octylamine *8.1023*
Octylsulfate ion *6.1296, 8.1024*
Oleate ion *6.1297*
Oligouridylic acid *10.142*
Ornithine *8.1025*
Ornithine, N^5-(aminocarbonyl)- *8.458*
Ornithine, conjugate acid *8.1026*
Orotate ion *6.1298, 8.1027*
Orotic acid *7.463*
Orotidine *6.1299, 8.1028*
Orotidine monophosphate *8.1029*
Orthophosphoric acid *6.342, 7.125, 8.174*
Osmium(II) tris(2,2′-bipyridine) *8.164*
Oxalacetic acid *7.464*
Oxalate ion *6.1300, 7.465, 8.1030*
Oxalate ion, hydrogen *6.1301, 8.1031*
Oxalic acid *6.1302, 7.466, 8.1032*
Oxamate ion *6.1303*
Oxamide *6.1304*
Oxide radical ion *5.4, 5.4.1, 5.4.2, 5.8.2, 5.12.1, 9.*
(Oxidized glutathione)copper(II) complex *6.180*
Oxirane *8.651*
3-Oxo-9-azabicyclo[3.3.1]non-9-yloxy *6.1295, 8.1018*
2-Oxobutanedioic acid *7.464*
2-Oxopropionate ion *6.1381, 8.1130*
4-Oxo-2,2,6,6-tetramethylpiperidinooxy free radical *6.1437, 7.533, 8.1186, 9.122*
Oxydiacetyldeuteroperoxidase *10.88*
2,2′-Oxydiethanol *8.534*
Oxygen *6.331, 7.119, 9.22*
Oxygenase, monophenol mono- *10.70*
Oxymyoglobin *10.89*
Oxytetracycline, conjugate acid *8.1033*
Oxytocin *10.90*
Oxyvanadium(IV) ion *6.465, 8.230*
Ozone *6.335, 7.120, 8.162*
Ozonide ion *5.12*
2-PAM *6.1366, 7.504, 8.1108*
PNBPA *6.127, 7.61*
trans-PDD *6.369, 8.186*
Palladium(II) tetrakis(4-*N*-methylpyridyl)porphyrin *6.360*
Palladium(II) tetrakis(*p*-sulfonatophenyl)porphyrin *6.361*
Pantetheine-adenosine triphosphate *8.459*
Pantothenate ion *6.1305, 8.1034*
Papain *10.91*
Paraldehyde *8.1244*
Paraquat *6.862, 7.336, 8.589, 9.70*
Penamecillin *6.1306*
Pencillamine disulfide, conjugate diacid *8.1036*
Penicillamine *6.1307, 7.467*
Penicillamine, conjugate acid *7.468, 7.469, 8.1035*
Penicillamine disulfide *6.1308*
Penicillin, (2,6-dimethoxyphenyl)- *6.1153*

Penicillin, phenoxymethyl- *6.1318*
Penicillin G *6.652, 8.369*
Penicillin G, hydroxymethyl ester, acetate *6.1306*
Penicillin G, methyl ester *6.653*
Penicillin V *6.1318*
Penilloic acid *6.654, 8.370*
Pentaalanine *6.555*
Pentaammine(aqua)rhodium(III) ion *6.389*
Pentaammine(azido)cobalt(III) ion *6.103, 7.39, 8.51*
Pentaammine(azido)rhodium(III) ion *6.390*
Pentaammine(benzoato)cobalt(III) ion *7.60, 8.53*
Pentaammine(bromo)cobalt(III) ion *6.94, 7.25*
Pentaammine(butanoato-*O*)cobalt(III) ion *7.53*
Pentaammine(chloroacetato-*O*)cobalt(III) ion *7.48*
Pentaammine(chloro)chromium(III) ion *6.151*
Pentaammine(chloro)cobalt(III) ion *6.95, 7.29*
Pentaammine(chloro)osmium(III) ion *6.337, 7.121*
Pentaammine(chloro)rhodium(III) ion *6.392*
Pentaamminecobalt(III) ion *6.82, 7.19*
Pentaammine(cyano)cobalt(III) ion *6.106, 7.42*
Pentaammine(dichloroacetato-*O*)cobalt(III) ion *7.49*
Pentaammine(2,4-dinitrobenzoato)cobalt(III) ion *6.128*
Pentaammine(3,5-dinitrobenzoato)cobalt(III) ion *6.129*
Pentaammine(dinitrogen)ruthenium(II) ion *6.400, 8.199*
Pentaammine(fluoro)cobalt(III) ion *6.100, 7.34*
Pentaammine(formato)cobalt(III) ion *6.121, 7.46, 8.52*
Pentaammine(fumarato)cobalt(III) ion *6.123, 7.56*
Pentaammine(hydroxy)cobalt(III) ion *7.20*
Pentaammine(imidazole)cobalt(III) ion *6.93, 8.47*
Pentaammine(iodo)cobalt(III) ion *7.38*
Pentaammine(iodo)ruthenium(III) ion *6.412*
Pentaammine(isobutyrato)cobalt(III) ion *7.54*
Pentaammine(isonicotinamide)cobalt(III) ion *8.55*
Pentaammine(isonicotinamide)ruthenium(II) ion *8.203*
Pentaammine(isonicotinamide)ruthenium(III) ion *6.413, 7.144, 8.204*
Pentaammine(2-methylpropionato)cobalt(III) ion *7.54*
Pentaammine(nicotinamide)cobalt(III) ion *8.54*
Pentaammine(nitrito-*N*)cobalt(III) ion *7.41*
Pentaammine(2-nitrobenzoato)cobalt(III) ion *6.125*
Pentaammine(3-nitrobenzoato)cobalt(III) ion *6.126*
Pentaammine(4-nitrobenzoato)cobalt(III) ion *6.127, 7.61*
Pentaammine(nitrogeno)osmium(II) ion *8.163*
Pentaammine(nitroso)ruthenium(III) ion *6.408, 7.142*
Pentaammine(pentanoato)cobalt(III) ion *7.55*
Pentaammine(phosphato)cobalt(III) *7.44*
Pentaammine(propionato-*O*)cobalt(III) ion *7.52*
Pentaammine(pyridine)cobalt(III) ion *8.46*
Pentaammine(terephthalato)cobalt(III) ion *6.130*
Pentaammine(thiocyanato-*N*)cobalt(III) ion *6.117, 7.45*
Pentaammine(trichloroacetato-*O*)cobalt(III) ion *7.50*
Pentaammine(trifluoroacetato)cobalt(III) ion *7.51*
Pentaaqua(chloro)rhodium(III) ion *8.196*
1,4,7,10,13-Pentaazacyclohexadecanenickel(II) ion *8.144*
Pentacarbonatoneptunate(IV) ion *6.322*
Pentachlororhodate(III) ion *6.394*
Pentacyanocobaltate(II) ion *6.73*
Pentacyanohydridocobaltate(III) ion *6.109*
Pentacyanohydroxycobaltate(III) ion *6.108*
Pentacyanoiodocobaltate(III) ion *6.112*
Pentacyanonitrocobaltate(III) ion *6.113*
Pentacyano(nitrosyl)chromate(II) ion *6.142, 8.63*
Pentacyano(nitrosyl)cobaltate(II) ion *6.74, 8.38*
Pentacyano(nitrosyl)ferrate(III) ion *6.210, 7.85*
Pentacyano(nitrosyl)manganate(II) ion *8.116*
Penta(cyano-*C*)(thiocyanato-*N*)cobaltate(III) ion *6.120*
1,4-Pentadien-3-ol *8.1037, 9.102*
Pentaerythritol *8.1038*
Pentafluorobenzene *6.1309, 8.1039*
Pentaglycine *6.1009*
Pentaglycine, negative ion *6.1010*
Pentamethylbenzene *7.470, 8.1040, 9.103*
Pentamethylene glycol *8.1042*
Pentane *7.471, 8.1041*
1-Pentaneamine *6.587, 8.324*
Pentanedioic acid *8.701*
1,5-Pentanediol *8.1042*
2,4-Pentanedione *7.472, 8.1043*
2,4-Pentanedione ion(1-) *8.1044*
Pentanoate ion *7.473, 8.1045*
1-Pentanol *8.1046*
3-Pentanol *8.1047*
2-Pentanone *8.1048*
3-Pentanone *8.1049*
4-Penten-2-ol *6.1310*
Perbromate ion *6.32, 8.15*
Perchlorate ion *6.64*
Periodate ion *6.252*
Permanganate ion *6.279, 7.100*
Peroxodiphosphate ion *6.348*
Peroxodisulfate ion *6.422, 7.147, 8.213*
Peroxomonosulfate ion *8.211*
Peroxomonosulfuric acid *7.148*
Perrhenate(VII) ion *6.388*
Phenanthrene *6.1311*
1,10-Phenanthroline, conjugate monoacid *7.474, 8.1051*
1,10-Phenanthroline *6.1312, 8.1050, 9.104*
o-Phenanthroline *6.1312, 8.1050, 9.104*
Phenethicillin *6.1313*
Phenethyl alcohol *8.1052*
Phenethylamine *6.1314*
Phenethylammonium ion *8.1053*
Phenethyl chloride *6.740, 7.279*
Phenol *6.1315, 7.475, 8.1054*
Phenol, 4,4′-93*H*-2,1-benzoxathiol-3-ylidene)bis[2,6-dibromo-, *S*, *6.695, 7.257*
Phenol, 4-chloro- *8.447*
Phenol, 2-methoxy- *8.891*
Phenol, 3-methoxy- *8.892*
Phenol, 4-methoxy- *8.893*
Phenol, 2-methyl- *8.462*
Phenol, 4-methyl- *6.770, 8.463*
Phenolate ion *6.1317, 8.1055, 9.105*
Phenopenicillin *6.1318*

Phenothiazine *6.1316, 7.476*
Phenothiazine, 2-chloro-10-dimethylaminopropyl-, conjugate acid *6.759, 8.455*
Phenothiazine, conjugate acid *10.92*
Phenothiazine, 10-(2-methyl-2-dimethylaminoethyl)-. conjugate acid *6.1349, 8.1085*
Phenothiazine-2-acetate ion, 10-methyl- *6.1232, 8.972*
10*H*-Phenothiazine-3,7-diamine *6.1454*
Phenothiazin-5-ium, 3,7-bis(dimethylamino)- *6.1187, 7.438, 8.926*
5-Phenothiazinium, 3,7-diamino- *6.1453, 7.539*
Phenoxide ion *6.1317, 8.1055, 9.105*
Phenoxide ion, 4-bromo- *6.688*
Phenoxide ion, 4-chloro- *6.747*
Phenoxide ion, 2-cyano- *6.780*
Phenoxide ion, 3-cyano- *6.781*
Phenoxide ion, 4-cyano- *6.782, 9.64*
Phenoxide ion, 4-fluoro- *6.949*
Phenoxide ion, 4-hydroxy-, conjugate base *6.1064*
Phenoxide ion, 4-methyl- *9.97*
Phenoxide ion, 4-nitro- *6.1276, 8.1008*
6-(Phenoxyacetamido)penicillanic acid *6.1318*
4-Phenoxybenzoate ion *8.1056, 9.106*
Phenoxymethylpenicillin *6.1318*
Phenylacetamidopenicillanic acid *6.652, 8.369*
6-(Phenylacetamido)penicillin *6.653*
Phenyl acetate *7.477*
Phenylacetate ion *6.1319, 7.478, 8.1057, 9.107*
Phenylacetic acid *7.479*
Phenylacetone *6.1320*
Phenylalanine *6.1321, 7.480, 8.1058*
Phenylalanine, conjugate acid *7.481*
L-Phenylalanine, 3,4-dihydroxy- *6.849*
Phenylalanine, negative ion *6.1322, 8.1059*
Phenylalanine amide *6.1323*
Phenylalanine amide, conjugate acid *6.1324*
L-Phenylalanylglycylglycine *6.1325*
L-Phenylalanylglycylglycine, negative ion *6.1326*
L-Phenylalanyl-L-phenylalanine *6.1327*
4-(Phenylazo)-*m*-phenylenediamine *6.819, 7.320*
Phenylboric acid *6.1328*
1-Phenyl-3-butanol *8.1060*
4-Phenyl-*N*-*tert*-butylnitrone *6.1329, 8.1061*
Phenylbutyrate ion *6.1330*
m-Phenylenediamine, conjugate diacid *7.482*
o-Phenylenediamine, conjugate diacid *7.483*
p-Phenylenediamine *6.1331*
p-Phenylenediamine, conjugate diacid *7.484*
p-Phenylenediamine, *N,N*-dimethyl- *6.876*
m-Phenylenediamine, 4-(phenylazo)- *6.819, 7.320*
p-Phenylenediamine, *N,N,N',N'*-tetramethyl- *6.1433, 8.1184*
p-Phenylenediamine, *N,N,N',N'*-tetramethyl, conjugate diacid *7.531*
1-Phenylethanol *8.1062*
1-Phenylethanol-1-*d* *8.1063*
2-Phenylethylamine *6.1314*
α-Phenylethylamine *6.1177, 9.95*
2-Phenylfuran *8.1064*
5-Phenylfurfural *8.1065*
Phenyl-β-D-glucopyranoside *6.1332, 7.485, 8.1066*
Phenylglycine, negative ion *6.1333*
N-Phenylhydroxylamine, conjugate base *6.1335*
N-Phenylhydroxylamine *6.1334, 8.1067*
Phenylphosphate ion *6.1336, 8.1068, 9.108*
Phenylphosphoric acid *7.486*
1-Phenyl-1-propanol *8.1069*
1-Phenyl-2-propanol *8.1070*
2-Phenyl-2-propanol *8.1071*
Phenyl propanolamine *6.1293*
Phenyl-2-propanone *6.1320*
3-Phenylpropionate ion *6.1337*
3-Phenylpropionic acid *6.1338*
Phenyl 2-pyridyl ketone *6.640*
Phenyl 3-pyridyl ketone *6.641*
Phenyl 4-pyridyl ketone *6.642*
Phenyl sulfoxide *8.624*
Phloroglucinol dimethyl ether *8.582*
Phosphate ion *8.171*
Phosphatidic acid esters *8.1072*
Phosphinic acid *7.122*
Phosphinic acid, ion(1-) *6.339, 8.167*
Phosphite radical ion *5.13*
Phosphoenolpyruvate ion *8.1073*
Phosphonate ion, hydrogen *7.124, 8.169*
Phosphonic acid *7.123*
Phosphoric acid *6.342, 7.125, 8.174*
Phosphoric acid, monoethyl ester *7.352*
Phosphorous acid *7.123*
Phosphorylcholine *8.1074*
Phosphorylethanolamine *8.1075*
Phosphoserine *8.1076*
Phthalate ion *6.1339, 8.1077, 9.109*
Phthalate ion, hydrogen *6.1340*
m-Phthalate ion *6.1341*
p-Phthalate ion *6.1342, 8.1078*
Phthalazine *6.1343*
1,4-Phthalazinedione, 5-(2-chloroacetamido)-2,3-dihydro- *8.433*
Phthalonitrile *7.324*
Picolinate ion *6.1367, 8.1111*
2-Picoline *8.959*
3-Picoline *8.960*
3-Picoline-*N*-oxide *8.961*
4-Picoline-*N*-oxide *8.962*
Picrate ion *6.1344*
Pimelic acid *8.1079*
Pinacol *8.1080*
2,5-Piperazinedione *6.983, 8.713*
Pivalamide *6.1480, 8.1230*
Pivalate ion *7.553, 8.1231*
Pivalic acid *8.1232*
Pivalonitrile *7.554*
Platinum *10.93*
Plutonium(III) ion *8.194*
Plutonium(VI) *6.383*
Plutonium(VII) *6.385*
Polyacrylate ion *10.94*

Polyadenylic acid *10.95*
Polyadenylic + uridylic acid *10.96*
Polybrene *10.97*
Polycytidylic acid *10.98*
Poly[(dimethyliminio)-1,3-propanediyl (dimethyliminio)-1,6-hexanediyl dibromide] *10.97*
Polyethylene oxide *10.99*
Poly(ethylenesulfonate) ion *10.100*
Poly-L-lysine *10.101*
Poly(methacrylic acid) *10.102*
Poly(oxy-1,2-ethanediyl), α-[4-(1,1,3,3-tetramethylbutyl)phenyl]-ω-hydroxy- *10.139*
Polyoxyethylene(10) *p*-nonylphenyl ether *10.105*
Polyoxyethylene(15) *p*-nonylphenyl ether *10.106, 7.487, 8.1081*
Polyoxyethylene(20) *p*-nonylphenyl ether *10.107*
Polyoxyethylene(7.5) *p*-nonylphenyl ether *10.103*
Polyoxyethylene(80) *p*-nonylphenyl ether *10.108*
Polyoxyethylene(9) *p*-nonylphenyl ether *10.104*
Polyoxyethylene sorbitan monolaurate *10.109*
Poly(styrenesulfonate) ion *10.110*
Polyuridylic acid *10.111*
Poly(vinyl alcohol) *10.112*
Poly(vinyl phthalate) *10.113*
Polyvinylpyrrolidone *10.114*
Porphine, tetrakis(*p*-sulfonatophenyl)- *6.1427*
[4,4′,4″,4‴-(21*H*,23*H*-Porphine-5,10,15,20-tetrayl)tetrakis[1-methylpyridiniumato] manganese(III) ion *6.274*
Potassium hexacyanoferrate(III) ion *6.212*
Potassium ion *6.260*
Praseodymium(III) ion *6.362, 7.130, 8.179*
19-*nor*-17α-Pregna-1,3,5(10)-trien-20-yne-3,17-diol *6.935*
Prehnitene *7.528, 8.1180, 9.119*
Proflavine *6.818, 8.518*
Proflavine, conjugate monoacid *7.319*
Proline *6.1345, 8.1082*
Proline, conjugate acid *7.488, 8.1083*
Prolylglycine, negative ion *6.1347*
L-Prolylglycine *6.1346*
Promazine, conjugate acid *6.1348, 8.1084*
Promethazine, conjugate acid *6.1349, 8.1085*
2-Propanamine, 2-methyl-*N*-(2-pyridylmethylene)-, *N*-oxyl *6.1372, 8.1120*
2-Propanamine, 2-methyl-*N*-(3-pyridylmethylene)-, *N*-oxyl *6.1373, 8.1121*
2-Propanamine, 2-methyl-*N*-(4-pyridylmethylene)-, *N*-oxyl *6.1374, 8.1122*
Propane *7.489, 8.1086*
1,2-Propanediol *8.1087*
1,3-Propanediol *7.490, 8.1088*
1,2-Propanediol cyclic carbonate *6.1357*
1,1$'$'-Propanediylbis(1$'-methyl-4,4$'-bipyridinium) *6.1350*
1-Propanesulfonyl chloride *7.491*
1-Propanol, 1-hydroxy-2-methylamino-1-phenyl *6.909, 8.630*
1-Propanol, 2-methylamino-1-phenyl-, conjugate acid *6.908*
1-Propanol *7.492, 8.1089, 9.110*
2-Propanol *7.493, 8.1090, 9.111*
2-Propanol-2-*d* *7.494*
2-Propanol-d_7 *7.495*
Propargyl alcohol *6.1351*
2-Propenal, 2,3-dihydroxy- *8.564*
1-Propene-1,2,3-tricarboxylate ion *6.529, 9.35*
2-Propen-1-ol *6.571, 7.200, 8.303, 9.39*
Propionaldehyde *6.1352*
Propionamide *6.1353, 8.1091*
Propionate ion *7.496, 8.1092, 9.112*
Propionate ion, 2,2-dimethyl- *7.553, 8.1231*
Propionic acid *6.1354, 7.497, 8.1093*
Propionic acid, 2,2-dimethyl- *8.1232*
Propionitrile *7.498, 8.1094, 9.113*
Propiophenone, 2-(*N*-formylamino)-3′-amino- *6.957*
Propyl acetate *8.1095*
Propyl alcohol *7.492, 8.1089, 9.110*
Propylamine *6.1355, 8.1096*
Propylammonium ion *6.1356, 8.1097*
n-Propyl bromide *6.689*
n-Propyl chloride *6.750*
Propylene *7.499, 8.1098*
1,1′-Propylene-2,2′-bipyridinium *6.1482*
Propylene carbonate *6.1357*
Propylene glycol *8.1087*
Propylene glycol carbonate *6.1357*
Propylene oxide *8.632*
Propyl gallate *8.1099*
Propyl iodide *6.1103*
Propyl 3,4,5-trihydroxybenzoate *8.1099*
2-Propyn-1-ol *6.1351*
Protamine sulfate *10.115*
Protease Type VII *10.132*
Protocatechualdehyde *6.846, 8.555*
Protoporphyrin IX, dimethyl ester *8.1100*
Protoporphyrin IX-Myoglobin complex *10.116*
Protoporphyrin iron(II) complex *6.200*
Pseudocumene *7.559, 8.1238, 9.133*
Psoralen, 4′,5′-dihydro- *6.843*
Psoralen, 8-methoxy- *6.1165, 8.897*
Psoralen-thymine 4′,5′-adduct *6.1358*
Pteridine *6.1359*
2,4-Pteridinedione *6.1123*
4-[3*H*]Pteridinone, 2-amino- *6.1360*
Pterin *6.1360*
Pteroylglutamic acid *6.951, 8.670*
Purine *6.1361, 8.1101*
Purine, conjugate diacid *7.500*
Purine, 2,6,8-trihydroxy- *6.1497, 8.1255*
Purine-2,6-dione, 3,7-dihydro- *6.1513, 8.1266*
1*H*-Purine-2,6-dione, 3,7-dihydro-1,3,7-trimethyl- *6.709, 8.423*
2*H*-Purine-6-thione, 1,7-dihydro- *8.872*
Purin-6-one, 2-amino-1,7-dihydro- *6.1039, 8.755*
Purin-6(1*H*)-one, 9-β-D-ribofuranosyl- *8.820*
Purin-6(1*H*)-one *6.1084, 8.807*

Purpurate ion *8.987*
Pyrazine *6.1362*
Pyrazine, conjugate diacid *7.501*
1-Pyrenamine *10.6*
Pyrene *10.117*
1-Pyrenebutanoic acid *10.118, 8.1102*
1-Pyrenecarboxaldehyde *10.119*
Pyrenesulfonate ion *6.1363*
Pyrenesulfonic acid *10.120*
10-(1-Pyrenyl)dodecanoic acid *10.121*
Pyridazine *6.1364*
Pyridazine, conjugate diacid *7.502*
Pyridazine-3,6-diol *8.856*
Pyridine *6.1365, 7.505, 8.1103*
Pyridine, 2-amino- *8.319*
Pyridine, 4-amino- *8.320*
Pyridine, 2-benzoyl- *6.640*
Pyridine, 3-benzoyl- *6.641*
Pyridine, 4-benzoyl- *6.642*
2-Pyridinealdoxime, *N*-methyl- *6.1366, 7.504, 8.1108*
4-Pyridinealdoxime *7.503*
4-Pyridinecarboxaldehyde, 3-hydroxy-5-(hydroxymethyl)-2-methyl-, 5-phosphate *6.1370, 8.1117*
Pyridine-4-carboxamide, conjugate acid *8.1110*
3-Pyridinecarboxamide *6.1244, 8.977*
4-Pyridinecarboxamide *6.1368, 8.1109*
2-Pyridinecarboxylate ion *6.1367, 8.1111*
3-Pyridinecarboxylate ion *6.1247, 8.982*
4-Pyridinecarboxylate ion *6.1369, 8.1112*
3-Pyridinecarboxylate ion *N*-oxide *8.983*
4-Pyridinecarboxylate ion *N*-oxide *8.1113*
3-Pyridinecarboxylic acid, conjugate acid *7.452*
3-Pyridinecarboxylic acid *8.984*
Pyridine-d_5 *8.1104*
3,4-Pyridinedimethanol, 5-hydroxy-6-methyl- *6.1371, 8.1119*
3-Pyridinemethanol , 4-(aminomethyl)-5-hydroxy-6-methyl-, 5-phosphate *8.1118*
Pyridine-*N*-oxide *8.1107*
Pyridinium, 1-[[2-carboxy-8-oxo-7-[(2-thienylacetyl) amino]-5-thia-1-azabicyclo[4.2.0]oct-2-en-3-yl] methyl]-, hydroxide *6.717*
Pyridinium ion *7.506, 8.1105*
Pyridinium ion, 3-aminocarbonyl-1-methyl- *6.1208*
Pyridinium ion-d_5 *8.1106*
3-Pyridinol *8.1114*
2-Pyridone *8.1115*
4-Pyridone *8.1116*
Pyridoxal 5-phosphate *6.1370, 8.1117*
Pyridoxamine-5-phosphate *8.1118*
Pyridoxine *6.1371, 8.1119*
α-(2-Pyridyl)-*tert*-butyl nitrone *6.1372, 8.1120*
α-(3-Pyridyl)-*tert*-butyl nitrone *6.1373, 8.1121*
α-(4-Pyridyl)-*tert*-butyl nitrone *6.1374, 8.1122*
α-(2-Pyridyl 1-oxide)-*N*-*tert*-butylnitrone *8.1123*
α-(3-Pyridyl 1-oxide)-*N*-*tert*-butylnitrone *6.1375, 8.1124*
α-(4-Pyridyl 1-oxide)-*N*-*tert*-butylnitrone *6.1376, 7.507, 8.1125*
Pyrimidine *6.1377, 8.1126*
Pyrimidine, 2-amino- *6.584, 8.321*
Pyrimidine, conjugate monoacid *7.508*
Pyrimidine, 5,6-dihydro-2,4,6-trihydroxy-5-methyl-5-nitro- *6.1076*
Pyrimidine, 5,6-dihydro-2,4,6-trihydroxy-5-methyl-5-nitro-, conjugate base *6.1077*
Pyrimidine, 2,4-dihydroxy-5-methyl- *6.1460, 7.546, 8.1202*
Pyrimidine, 2,4,6-trihydroxy-, conjugate base *6.618, 7.221*
Pyrimidine-4-carboxylate ion, 3-bromo-2,6-dioxo- *6.684, 8.389*
Pyrimidine-4-carboxylate ion, hexahydro-2,6-dioxo- *6.842, 8.549*
4-Pyrimidinecarboxylic acid, *7.250*
4-Pyrimidinecarboxylic acid, 2,6-dioxo-1,2,3,6-tetrahydro- *7.463*
5-Pyrimidinecarboxylic acid, 2,6-dioxo-1,2,3,6-tetrahydro- *7.411*
4,6-Pyrimidinediol *8.565*
2,4-Pyrimidinedione, 6-amino-5-(β-D-glucopyranosyloxy)- *8.460*
2,4-Pyrimidinedione, 5-bromo- *6.694, 7.256, 8.397*
2,4-Pyrimidinedione, 5-chloro- *6.758, 7.288, 8.454*
2,4-Pyrimidinedione, hexahydro-5-methyl- *7.329, 8.550*
2,4-Pyrimidinedione, 5-nitro- *6.1290, 8.1015*
2,4(1*H*,3*H*)-Pyrimidinedione *6.1494, 7.566, 8.1252*
2,4,5,6-Pyrimidinetetrone *6.570*
2,4,6-Pyrimidinetrione, 5-[(hexahydro-2,4,6-trioxo-5-pyrimidinyl)imino] ion (1-) *8.987*
2-Pyrimidinone, 4-amino- *6.809, 7.316, 8.503*
2-Pyrimidinone, 4-amino-1-methyl- *6.1185*
2-Pyrimidinone, 5-amino-1-methyl- *6.1186, 8.924*
Pyrocatechol *8.430*
Pyrophosphate ion *6.345, 8.175*
Pyrrole *6.1378, 8.1127*
Pyrrolidine *6.1379*
2-Pyrrolidinecarboxylic acid *6.1345, 8.1082*
2-Pyrrolidinecarboxylic acid, 4-hydroxy- *6.1081, 8.801*
Pyrrolidinium ion *8.1128*
Pyrrolidone, *N*-vinyl- *6.1511, 8.1264*
2-Pyrrolidone *6.1380, 8.1129*
1-Pyrroline-1-oxyl, 2-carboxy-5,5-dimethyl- *8.428*
1-Pyrroline-1-oxyl, 5,5-dimethyl- *6.882, 7.339, 8.612*
1*H*-Pyrrolo[2,1,*a*]isoindole-6,9-dione, 2,3-dihydro-7-methyl-5-phenyl- *6.1217*
1*H*-Pyrrolo[2,1,*a*]isoindole-6,9-dione, 2,3-dihydro-5,8-dimethyl- *6.888*
1*H*-Pyrrolo[2,1,*a*]isoindole-6,9-dione, 2,3-dihydro-5-ethoxycarbonyl-7-methyl- *6.921*
1*H*-Pyrrolo[2,1,*a*]isoindole-6,9-dione, 2,3-dihydro-5-ethoxycarbonyl-7-methyl-8-methoxy- *6.920*
Pyruvate ion *6.1381, 8.1130*
Pyruvonitrile *6.1382*
Quinone *6.637, 7.233, 8.364*

Quinoxaline *6.1383*
RNO *6.874, 8.603*
Rennin *10.122*
Resorcinol *8.1131*
Resorcinol dimethyl ether *7.334, 8.571*
Retinal *10.123*
Rhodamine, tetraethyl- *6.1384, 8.1132*
Rhodamine B *6.1384, 8.1132*
Rhodamine 3B *6.1385*
Rhodamine 6G *6.1386, 8.1133*
Rhodium(III) chloride *8.198*
Rhodium(III) dihydroxybis(2,2′-bipyridine) *6.396*
Rhodium(III) tris(2,2′-bipyridine) *6.397, 7.139*
Rhodium(II) acetate *6.395*
Riboflavin 5′-(dihydrogen phosphate) *6.936, 8.663*
Riboflavine *6.1387, 7.509, 8.1134*
Riboflavine binding protein *10.124*
9-β-D-Ribofuranosylpurin-6(1*H*)-one *8.820*
2-β-D-Ribofuranosyl-*as*-triazine-3,5(2*H*,4*H*)-dione *6.613, 8.347*
Ribonuclease *10.125*
Ribonuclease-S-peptide *10.126*
Ribonuclease-S-protein *10.127*
Ribonucleic acid *10.128*
Ribose *6.1388, 7.510, 8.1135*
Ribose monophosphate *6.1389, 8.1136*
Ribose-5-phosphate *6.1389, 8.1136*
Rubidomycin *6.810*
Ruthenate(VI) ion *9.26*
Ruthenium(III) chloride *6.410*
Ruthenium(III) tris(2,2′-bipyridine) *6.414, 7.143*
Ruthenium(II) dicyanobis(2,2′-bipyridine) *6.403*
Ruthenium(II) tris(2,2′-bipyridine) *6.402, 7.140, 8.201*
Saccharose *6.1411, 7.520, 8.1155*
Safranine O *6.1390, 8.1137*
Safranine T *6.1390, 8.1137*
Safranine T, conjugate acid *8.1138*
Salicylaldehyde anion *8.1139*
Salicylate dianion *9.114*
Salicylate ion *6.1391, 8.1140*
Salicylatoeuropium(III) ion *6.189*
Salicylatovanadium(III) ion *6.467*
Salicylic acid *7.511, 8.1141*
Samarium(III) ion *6.432*
Samarium(II) ion *8.221*
Sarcosine *6.1392*
Sarcosine, conjugate acid *7.512*
Sarcosine anhydride *6.1393, 8.1142*
Sarcosylglycine *6.1394*
Sarcosylglycine, negative ion *6.1395*
γ-Schardinger dextrin *10.27*
Sebacic acid *8.1143*
Selenate(VI) ion *6.430, 7.153, 8.220, 9.30*
Selenious acid *7.149, 8.217*
Selenite(IV) ion *6.429, 7.151, 8.219, 9.29*
Selenocystine *6.1396, 8.1145*
Selenodicysteine *8.1144*
Selenomethionine *6.1397, 8.1146*
Selenourea *6.1398, 7.513, 8.1147*
Senecioic acid *6.856*
Serine *6.1399, 8.1148*
Serine, *N*-acetyl- *8.269*
Serine, conjugate acid *7.514*
Silver(II) tetrakis(4-*N*-methylpyridyl)porphyrin *6.6*
Silver(II) tetrakis(*p*-sulfonatophenyl)porphyrin *6.7*
Silver(III) tetrakis(*p*-sulfonatophenyl)porphyrin *6.8*
Silver(I) ion *6.1, 7.1, 8.1*
Sinapinate ion *8.785*
Skatole *6.1202, 8.938*
Sodium ion *6.296*
Sodium lauryl sulfate *10.50*
Sodium metaphosphate *6.340, 8.170*
Sodium polyphosphite *6.340, 8.170*
trans,trans-Sorbate ion *6.1046*
trans,trans-Sorbic acid *6.1047*
Sorbitol *6.1400*
Spiro[isobenzofuran-1(3*H*),9′-[9*H*]xanthen-3-one, 3′,7′-dihydroxy-, ion(1-) *6.939, 8.664*
Spiroisobenzofuran-1(3*H*),9′[9*H*]xanthen-3-one, 3′,6′-dihydroxy-2′,4′,5′,7′-tetraiodo-, ion(2-) *6.911, 7.345*
Spiroisobenzofuran-1(3*H*),9′[9*H*]xanthen-3-one, 2′,4′,5′,7′-tetrabromo-3′,6′-dihydroxy- *6.907, 8.629*
Stachyose *6.1401, 8.1149*
Stannate(IV) ion *6.440*
Starch, waxy *10.7, 10.129*
Stearate ion *6.1402*
Stellacyanin *10.130*
Styrene *6.1403, 7.515, 7.516, 8.1150*
Suberic acid *8.1151*
Subtilisin *10.131*
Subtilisin B *10.132*
Subtilisin BPN′ *10.132*
Subtilisin Novo *10.132*
Succinamide *6.1404*
Succinate ion *6.1405, 7.517, 9.115*
Succinic acid *6.1407, 7.518, 8.1152*
Succinic diamide *6.1404*
Succinimide *6.1408*
Succinonitrile *6.1409, 7.519, 8.1153*
Succinylcytochrome C *10.35*
Succinyl peroxide *6.1410, 8.1154*
Sucrose *6.1411, 7.520, 8.1155*
Sulfacetamide *6.1412, 8.1156*
Sulfaguanidine *6.1413, 8.1157*
Sulfamate ion *6.290*
Sulfanilamide *6.1414, 8.1158*
Sulfanilamide, *N*′-acetyl- *6.1412, 8.1156*
Sulfanilamide, *N*′-(2-guanidinyl)- *6.1413, 8.1157*
Sulfanilate ion *6.1415, 8.1159*
Sulfanilic acid *6.1416, 7.521*
Sulfasuccidine *6.1417, 8.1160*
Sulfasuxidine *6.1417, 8.1160*
Sulfate(1-), trioxo- *5.14*
Sulfate ion *6.419*
Sulfathiazole *6.1418, 8.1161*
Sulfatoindium(III) ion *6.255*
Sulfatoiron(III) ion *6.208, 7.80*

Sulfatothorium(IV) ion *6.450*
Sulfinylbisbenzene *8.624*
1,1′-Sulfinylbisbutane *8.524*
1,1′-Sulfinylbisethane *8.542*
Sulfinylbismethane *6.884, 7.340, 8.614*
2,2′-Sulfinylbis(2-methylpropane) *8.525*
1,1′-Sulfinylbispropane *8.625*
2,2′-Sulfinylbispropane *8.569*
2,2′-Sulfinyldiethanol *8.1162*
Sulfite ion *6.417, 8.208, 9.27*
Sulfite radical ion *5.14*
p-Sulfodiphenylpicrylhydrazyl *6.1419*
Sulfur hexafluoride *6.418*
Superoxide dismutase *10.133*
Syringate ion *8.784*
TMPD *6.1433, 8.1184*
Tartaric acid *7.522, 8.1163*
Tartrate ion *8.1164*
Tartronic acid *7.523*
Taurocholate ion *6.1420*
Technetate(VII) ion *6.445, 7.154*
Technetate(VI) ion *8.223*
Tellurate(VI) ion *6.448, 7.156*
Telluric acid *6.447*
Tellurite(IV) ion *6.446, 7.155, 8.224*
Terbium(III) ion *6.443*
Terephthalate ion *6.1342, 8.1078*
Terephthalonitrile *6.835, 7.326, 8.530*
Tetraammineaquacyanocobalt(III) ion *6.105*
trans-Tetraamminebis(hydroxy)platinum(IV) ion *6.376*
Tetraamminecadmium(II) ion *6.41*
Tetraamminecobalt(III) ion *6.83, 7.21*
Tetraamminecopper(II) ion *6.168*
Tetraamminedibromocobalt(III) ion *7.26*
Tetraamminedibromorhodium(III) ion *6.391*
Tetraamminedichlorocobalt(III) ion *7.30*
Tetraamminedifluorocobalt(III) ion *7.35*
Tetraamminenickel(II) ion *6.300*
Tetraammineplatinum(II) ion *6.364, 7.131, 8.180*
Tetraamminezinc(II) ion *6.479*
1,4,8,12-Tetraazacyclopentadecanenickel(II) ion *6.306, 8.139*
1,4,8,11-Tetraazacyclotetradecanecadmium(II) ion *6.45, 8.29*
1,4,8,11-Tetraazacyclotetradecanemercury(II) ion *6.235, 8.107*
1,4,8,11-Tetraazacyclotetradecanenickel(II) ion *6.305, 8.138*
1,4,8,11-Tetraazacyclotetradecanezinc(II) ion *6.481, 8.239*
1,4,7,10-Tetraazacyclotridecanenickel(II) ion *6.304, 8.137*
2′,4′,5′,7′-Tetrabromofluorescein dianion *6.907, 8.629*
3′,3″,5′,5″-Tetrabromophenolsulfonephthalein *6.695, 7.257*
Tetrabutylammonium ion *6.1421, 8.1165, 9.116*
Tetrabutylphosphonium *7.524, 8.1166*
Tetrachloroaurate(III) ion *7.3*
Tetrachloro-1,4-benzoquinone *10.20*
Tetrachloroethylene *6.1422, 8.1167*
Tetrachloropalladate(II) ion *6.358, 8.178*
Tetrachloroplatinate(II) ion *6.371, 8.188*
Tetrachlorothallate(III) ion *7.164*
1,2,4,5-Tetracyanobenzene *10.134*
Tetracyanocadmate(II) ion *6.48*
Tetracyanocuprate(II) ion *6.171*
Tetracyanoethylene *6.1423*
Tetracyanonickelate(II) ion *6.315, 7.113, 8.148*
Tetracyanopalladate(II) ion *6.359*
Tetracyanoplatinate(II) ion *6.372, 8.189*
Tetracyanozincate(II) ion *6.482*
Tetracycline, conjugate acid *6.1424, 7.525, 8.1168*
α-Tetradecyl-ω-(sodiumsulfonato)tri(oxyethylene) *8.1169*
Tetraethylammonium ion *6.1425, 8.1170, 9.117*
1,2,3,4-Tetrafluorobenzene *6.1426, 8.1171*
Tetrafluoroborate(III) ion *6.25*
Tetrafluorohydroquinone *8.1172*
Tetraglycinamide *8.729*
Tetraglycinamide, conjugate acid *6.1008, 8.730*
Tetraglycine *8.731*
Tetraglycine, negative ion *6.1007*
Tetra(glycylhistidine)tetracopper(II) complex *6.181*
1,2,3,6-Tetrahydrobenzoic acid *7.301*
Tetrahydroborate(III) ion *8.7*
6,7,8,9-Tetrahydro-2,13-dimethyldipyrido[1,2-*a*:2′,1′-*c*][1,4]diazocinediium *6.885*
6,7,8,9-Tetrahydrodipyrido[1,2-*a*:2′,1′-*c*][1,4]diazocinediium *6.1430*
Tetrahydrofuran *7.526, 8.1173*
1,2,3,4-Tetrahydro-1-naphthol *8.1174*
Tetrahydropyran *8.1175*
6,7,8,9-Tetrahydro-2,3,12,13-tetramethyldipyrido[1,2-*a*:2′,1′-*c*][1,4]diazocinediium *6.1438*
Tetrahydrothiophene *8.1176*
Tetrahydrothiophene oxide *8.1183*
Tetrahydroxozincate(II) ion *6.478*
Tetrahydroxysuccinate ion *8.1177*
Tetraiodocadmate(II) ion *6.47*
Tetraiodofluorescein dianion *6.911, 7.345*
α,α,α,β-Tetrakis(*N*-methylisonicotinamidophenyl) porphinatoiron(III) ion *6.219*
α,α,α,β-Tetrakis(*N*-methylisonicotinamidophenyl) porphinatomanganese(III) ion *6.276*
Tetrakis(4-*N*-methylpyridyl)porphinatocadmium(II) ion *6.55*
Tetrakis(4-*N*-methylpyridyl)porphinatocopper(II) ion *6.182*
Tetrakis(4-*N*-methylpyridyl)porphinatoiron(III) ion *6.215, 8.99*
Tetrakis(4-*N*-methylpyridyl)porphinatolead(II) ion *6.353*
Tetrakis(4-*N*-methylpyridyl)porphinatomanganese(III) ion *6.274*
Tetrakis(4-*N*-methylpyridyl)porphinatomanganese(II) ion *6.270*
Tetrakis(4-*N*-methylpyridyl)porphinatopalladium(II) ion *6.360*

Tetrakis(4-*N*-methylpyridyl)porphinatosilver(II) ion *6.6*
Tetrakis(4-*N*-methylpyridyl)porphinatotin(IV) ion *6.437*
Tetrakis(4-*N*-methylpyridyl)porphinatozinc(II) ion *6.488*
Tetrakis(4-pyridyl)porphinatomanganese(III) ion *6.273, 8.119*
Tetrakis(4-pyridyl)porphinatotin(IV) ion *6.436*
Tetrakis(*p*-sulfonatophenyl)porphinatoargentate(II) ion *6.7*
Tetrakis(*p*-sulfonatophenyl)porphinatoargentate(III) ion *6.8*
Tetrakis(*p*-sulfonatophenyl)porphinatocadmate(II) ion *6.56*
Tetrakis(*p*-sulfonatophenyl)porphinatocobaltate(II) ion *6.78*
Tetrakis(*p*-sulfonatophenyl)porphinatocuprate(II) ion *6.183*
Tetrakis(*p*-sulfonatophenyl)porphinatoferrate(III) ion *6.217, 8.100*
Tetrakis(*p*-sulfonatophenyl)porphinatomanganate(II) ion *6.271*
Tetrakis(*p*-sulfonatophenyl)porphinatomanganate(III) ion *6.277*
Tetrakis(*p*-sulfonatophenyl)porphinatopalladate(II) ion *6.361*
Tetrakis(*p*-sulfonatophenyl)porphinatostannate(IV) ion *6.439*
Tetrakis(*p*-sulfonatophenyl)porphinatozincate(II) ion *6.489, 7.168, 8.242*
Tetrakis(*p*-sulfonatophenyl)porphinatozincate(II) ion, triplet state *5.15, 5.15.2*
Tetrakis(*p*-sulfonatophenyl)porphine *6.1427*
Tetrakis[4-*N*-(3-sulfonatopropyl)pyridyl] porphinatozinc(II) *6.490*
Tetrakis-4-(*N,N,N*-trimethylammonio) phenylporphinezinc(II) ion *6.487*
Tetrakis-4-(*N,N,N*-trimethylammonio) phenylporphinatomanganese(III) ion *6.272*
Tetrakis-4-(*N,N,N*-trimethylammonio) phenylporphinatoiron(III) ion *6.214, 8.98*
α-Tetralol *8.1174*
1,2,4,5-Tetramethoxybenzene *7.527, 8.1178*
N,2,2,2-Tetramethylacetamide *8.952*
Tetramethylammonium ion *6.1428, 8.1179, 9.118*
1,2,3,4-Tetramethylbenzene *7.528, 8.1180, 9.119*
1,2,3,5-Tetramethylbenzene *7.529, 8.1181, 9.120*
1,2,4,5-Tetramethylbenzene *7.530, 8.1182, 9.121*
N,N,N',N'-Tetramethylbenzidine *6.1429*
1,3,7,8-Tetramethylbenzo[*g*]pteridine-2,4(1*H*,3*H*)-dione *6.871*
Tetramethyl-1,4-benzoquinone *6.906*
2,2,5,5-Tetramethyl-3-carbamidopyrrolidin-1-oxyl *6.712, 7.268, 8.425*
2,2,5,5-Tetramethyl-3-carbamidopyrroline-1-oxyl *6.713, 7.267, 8.426*
N,N,N',N'-Tetramethyl-1,2-diazenedicarboxamide *6.617, 8.350*
1,3,5,8-Tetramethyl-2,4-divinylporphine-6,7-dipropionic acid ferrichloride *6.222, 7.88*
1,1'-Tetramethylene-2,2'-bipyridinium *6.1430*
Tetramethylene sulfide *8.1176*
Tetramethylene sulfoxide *8.1183*
4,5,4',5'-Tetramethyl-1,1'-ethylene-2,2'-bipyridinium *6.1431*
1,2,3,5-Tetramethylisoindole-4,7-dione *6.1432*
N,N,N',N'-Tetramethyl-*p*-phenylenediamine *6.1433, 8.1184*
N,N,N',N'-Tetramethyl-*p*-phenylenediamine, conjugate diacid *7.531*
2,2,5,5-Tetramethyl-4-phenyl-3-imidazolin-1-oxyl 3-oxide *6.1434*
1,2,5,6-Tetramethyl-3-phenylisoindole-4,7-dione *6.1435*
2,2,6,6-Tetramethylpiperidine-*N*-oxyl *6.1436, 7.532, 8.1185*
2,2,6,6-Tetramethyl-4-piperidone *N*-oxyl *6.1437, 7.533, 8.1186, 9.122*
(2,3,9,10-Tetramethyl-1,4,8,11-tetraazacyclotetradeca-1,3,8,10-tetraene)cobalt(II) ion *6.72*
1,4,8,11-Tetramethyl-1,4,8,11-tetraazacyclotetradecanenickel(II) ion *6.307*
4,5,4',5'-Tetramethyl-1,1'-tetramethylene-2,2'-bipyridinium *6.1438*
4,5,4',5'-Tetramethyl-1,1'-trimethylene-2,2'-bipyridinium *6.1439*
1,1,3,3-Tetramethylurea *8.1187*
Tetranitromethane *6.1440, 7.534*
Tetraphenylphosphonium ion *6.1441, 7.535, 8.1188*
Tetrapropylammonium ion *6.1442, 8.1189, 9.123*
Tetraquat *6.1430*
3,10,17,24-Tetrasulfophthalocyaninecobalt(II) ion dimer *6.80, 8.42*
3,10,17,24-Tetrasulfophthalocyaninecopper(II) ion *8.82*
Tetrathionate ion *6.421*
Tetronate ion *6.1443, 8.1190*
Thalamyd *6.1444, 8.1191*
Thallium(III) chloride *7.163*
Thallium(III) ion *7.160*
Thallium(I) ion *6.453, 7.159, 8.226*
Theobromine *6.1445, 8.1192*
Theophylline *6.1446, 8.1193*
4-Thia-1-azabicyclo[3.2.0]heptane-2-carboxylic acid, 6-(acetylamino)-3,3-dimethyl-7-oxo- *6.1215*
4-Thia-1-azabicyclo[3.2.0]heptane-2-carboxylic acid, 6-[(carboxyphenylacetyl)amino]-3,3-dimethyl-7-oxo- *6.714*
4-Thia-1-azabicyclo[3.2.0]heptane-2-carboxylic acid, 6-[(2,6-dimethoxybenzoyl)amino]-3,3-dimethyl-7-oxo- *6.1153*
4-Thia-1-azabicyclo[3.2.0]heptane-2-carboxylic acid, 3,3-dimethyl-7-oxo-6-[(phenylacetyl)amino]- *6.652, 8.369*
4-Thia-1-azabicyclo[3.2.0]heptane-2-carboxylic acid, 6-[[[3-(2-chlorophenyl)-5-methyl-4-isoxazolyl]carbonyl]amino]-3,3-dimethyl- *6.766*

4-Thia-1-azabicyclo[3.2.0]heptane-2-carboxylic acid, 3,3-dimethyl-7-oxo-6-[(phenylacetyl)amino]-, methyl ester *6.653*
4-Thia-1-azabicyclo[3.2.0]heptane-2-carboxylic acid, 3,3-dimethyl-7-oxo-6-[(phenoxyacetyl)amino]-, *6.1318*
4-Thia-1-azabicyclo[3.2.0]heptane-2-carboxylic acid, 3,3-dimethyl-7-oxo-6-[(phenylacetyl)amino]-, (acetyloxy)methyl ester *6.1306*
5-Thia-1-azabicyclo[4.2.0]oct-2-ene-2-carboxylic acid, 3-[(acetyloxy)methyl]-8-oxo-7-[(2-thienylacetyl)amino]- *6.719*
5-Thia-1-azabicyclo[4.2.0]oct-2-ene-2-carboxylic acid, 3-[(acetyloxy)methyl]-7-[(5-amino-5-carboxy-1-oxopentyl)amino]-8-oxo- *6.718*
5-Thia-1-azabicyclo[4.2.0]oct-2-ene-2-carboxylic acid, 3-[(acetyloxy)methyl]-7-amino-8-oxo- *6.579*
Thiamine cation *6.1447, 7.536, 8.1194*
Thiazole *6.1448*
4-Thiazolidinecarboxylic acid, 5,5-dimethyl-2-[[(phenylacetyl)amino]methyl]- *6.654, 8.370*
Thiazolium, 3-[(4-amino-2-methyl-5-pyrimidinyl)methyl]-5-(2-hydroxyethyl)-4-methyl- *6.1447, 7.536, 8.1194*
(4-Thiazolylsulfamoyl)succinanilic acid *6.1417, 8.1160*
N'-(2-Thiazolyl)sulfanilamide *6.1418, 8.1161*
Thieno[3,4,*d*]imidazole-4-pentanoic acid, hexahydro-2-oxo- *8.375*
7-(2-Thienylacetamido)cephalosporanic acid *6.719*
Thioacetamide *7.537*
Thiobarbituric acid *6.1449*
Thiocyanate ion *6.39, 7.12, 8.26, 9.6*
Thiodiacetate ion *6.1450*
Thiodiacetic acid *7.538, 8.1195*
Thiodiglycolic acid *7.538, 8.1195*
3,3'-Thiodipropionate ion *6.1451*
Thioglycolate ion *6.1452, 8.865*
Thioglycolic acid *7.420, 8.866*
Thiolactate ion *6.1142, 8.869*
Thiolactic acid *6.1144, 7.424, 7.425*
Thiomalic acid *7.428*
Thionine, neutral *6.1454*
Thionine cation *6.1453, 7.539*
Thiophene *6.1455, 7.540, 8.1196*
Thiophene, 2-nitro- *6.1287*
7-(Thiophene-2-acetamido)cephalosporin *6.719*
Thiophenol *7.541*
Thiophenoxide ion *6.1456*
6-Thiopurine *8.872*
Thiosulfate ion *6.420, 7.146, 8.210, 9.28*
Thiourea *6.1457, 7.542, 8.1197*
Thorium(IV) ion *6.449*
Threonine *6.1458, 8.1198*
Threonine, conjugate acid *7.543, 8.1199*
Thulium(III) ion *6.455*
Thulium(II) ion *8.227*
Thymidine *7.544, 8.1200*
Thymidine 5'-monophosphate *6.1459, 7.545, 8.1201*
5'-Thymidylic acid *6.1459, 7.545, 8.1201*
Thymine *6.1460, 7.546, 8.1202*
Thymine, negative ion *6.1461, 9.124*
Thymine dimer *6.1462*
Tin(II) ion *8.222*
Tin(IV) tetrakis(4-*N*-methylpyridyl)porphyrin *6.437*
Tin(IV) tetrakis(4-pyridyl)porphyrin *6.436*
Tin(IV) tetrakis(*p*-sulfonatophenyl)porphyrin *6.439*
Tiron dianion *8.1203*
Titanium(III) ions *7.157, 8.225*
Titanium(IV) ion *7.158*
m-Toluate ion *6.1463, 9.125*
o-Toluate ion *6.1464, 9.126*
p-Toluate ion *6.1465, 8.1204, 9.127*
Toluene *6.1466, 7.547, 8.1205, 9.128*
Toluene, 2,3-dihydroxy- *6.850, 8.567*
Toluene, 3,4-dihydroxy- *7.332*
Toluene, α,α,α-trifluoro- *6.1479*
2-Toluenesulfonate ion *8.1208*
3-Toluenesulfonate ion *8.1207*
4-Toluenesulfonate ion *6.1467, 8.1206*
α-Toluenethiol *6.651*
p-Toluidine *9.129*
4-Tolunitrile *6.1468, 7.548, 8.1209, 9.130*
m-Tolyl-β-D-glucopyranoside *6.1469, 8.1210*
o-Tolyl-β-D-glucopyranoside *6.1470, 8.1211*
p-Tolyl-β-D-glucopyranoside *6.1471, 8.1212*
Transferrin, dicobaltic complex *10.135*
Transferrin, dicupric complex *10.136*
Transferrin, diferric complex *10.137*
Transferrin, dimanganic complex *10.138*
as-Triazine-3,5(2*H*,4*H*)-dione *6.612, 8.346*
Tribromine ion *6.28*
Tributylamine *8.1213*
Tributyl(methyl)ammonium ion *8.1214, 9.131*
Tributyl phosphate *8.1215*
Trichlorine anion *7.15*
Trichloroacetate ion *6.1472*
2,2,2-Trichloroethanol *8.1216*
Trichloroethylene *6.1473, 8.1217*
Trichlorofluoromethane *6.1474, 7.549*
2,4,6-Trichlorophenyl-β-D-glucopyranoside *8.1218*
Trichlororhodium(III) *8.198*
α,α,α-Trichlorotoluene *6.1475*
Trichromatochromate(III) ion *6.162*
Tricine *8.780*
Triethanolamine *8.990*
Triethylamine *8.1219*
Triethylammonium ion *8.1220*
Triethylenediamine *8.520*
Triethyl phosphate *8.1221*
Trifluoroacetate ion *6.1476*
1,1,1-Trifluoroacetone *6.1477*
2,2,2-Trifluoroethanol *8.1222*
Trifluoroiodomethane *6.1478*
Trifluoromethylbenzene *6.1479*
α,α,α-Trifluorotoluene *6.1479*
Trihydroxyaluminum(III) *6.9*
2,6,8-Trihydroxypurine *6.1497, 8.1255*

2,4,6-Trihydroxypyrimidine, conjugate base *6.618, 7.221*
Trihydroxyzincate(II) ion *6.477*
Triiodine ion *6.247, 7.95*
Trimesate ion *6.626*
Trimesic acid *7.227*
1,2,3-Trimethoxybenzene *7.550, 8.1223*
1,2,4-Trimethoxybenzene *7.551, 8.1224*
1,3,5-Trimethoxybenzene *7.552, 8.1225*
2,3,4-Trimethoxybenzoate ion *8.1226*
2,4,5-Trimethoxybenzoate ion *8.1227*
2,4,6-Trimethoxybenzoate ion *8.1228*
3,4,5-Trimethoxybenzoate ion *8.1229*
Trimethylacetamide *6.1480, 8.1230*
Trimethylacetate ion *7.553, 8.1231*
Trimethylacetic acid *8.1232*
Trimethylacetonitrile *7.554*
N^6,N^6,9-Trimethyladenine *8.1233*
N^6,N^6,N^6-Trimethyladeninium *8.1234*
Trimethylamine *7.555, 8.1235*
Trimethylammonioacetic acid *7.240*
Trimethylammonium ion *7.556, 8.1236*
Trimethylanilinium ion *7.557*
1,2,3-Trimethylbenzene *7.558, 8.1237, 9.132*
1,2,4-Trimethylbenzene *7.559, 8.1238, 9.133*
1,3,5-Trimethylbenzene *7.429, 8.873, 9.91*
1,7,8-Trimethylbenzo[*g*]pteridine-2,4(1*H*,3*H*)-dione *6.1203*
3,7,8-Trimethylbenzo[*g*]pteridine-2,4(1*H*,3*H*)-dione *6.1204*
1,7,7-Trimethylbicyclo[2.2.1]heptan-2-one *6.710, 8.424, 9.58*
Trimethylcyclopropenium cation *6.1481*
1,1′-Trimethylene-2,2′-bipyridinium *6.1482*
Trimethylene glycol *7.490, 8.1088*
Trimethylhydrazine *6.1483*
Trimethylhydrazinium ion *6.1484*
2,4,6-Trimethyl-3-hydroxypyridine *8.1239*
2,2,4-Trimethylpentane *8.1240*
2,4,6-Trimethylphenyl-β-D-glucopyranoside *8.1241*
1,2,5-Trimethyl-3-phenylisoindole-4,7-dione *6.1485*
Trimethylphenylphosphonium ion *6.1486, 7.560*
Trimethyl phosphate *6.1487, 8.1242*
2,5,5-Trimethyl-1-pyrroline *N*-oxide *8.1243*
2,4,6-Trimethyl-1,3,5-trioxane *8.1244*
Trinitromethyl ion *6.1487a*
2,4,6-Trinitrophenoxide ion *6.1344*
Trinitrotrisamminecobalt(III) *7.40*
Triose reductone *8.564*
Triose reductone, conjugate base *8.563*
Triose reductone monoanion *8.563*
Trioxalatochromate(III) ion *6.158, 7.68*
Trioxalatocobaltate(III) ion *6.124, 7.57*
Trioxalatoferrate(III) ion *7.87*
Trioxane *6.1488, 8.1245*
1,3,5-Trioxane *6.1488, 8.1245*
Triquat *6.1482*
Tris *8.315*
Tris(acetylacetonato)cobalt(III) *6.134, 7.66, 8.59*
Tris(alaninato)cobalt(III) *7.63*
Tris(L-2-aminopentanoato)cobalt(III) *7.64*
Tris(2,2′-bipyrazine)ruthenium(II) ion *6.404*
Tris(2,2′-bipyridine)chromium(III) ion *8.64*
Tris(2,2′-bipyridine)cobalt(III) ion *6.90*
Tris(2,2′-bipyridine)cobalt(II) ion *6.68*
Tris(2,2′-bipyridine)iron(III) ion *7.83, 8.96*
Tris(2,2′-bipyridine)iron(II) ion *8.86*
Tris(2,2′-bipyridine)osmium(II) ion *8.164*
Tris(2,2′-bipyridine)rhodium(III) ion *6.397, 7.139*
Tris(2,2′-bipyridine)ruthenium(II) ion *6.402, 7.140, 8.201*
Tris(2,2′-bipyridine)ruthenium(III) ion *6.414, 7.143*
Tris(carbonato)dioxoneptunate(VI) ion *6.329*
Tris(carbonato)dioxoplutonate(VI) ion *6.384*
Triscarbonatodioxouranate(VI) ion *6.461*
Tris(dimethylglyoximato)nickelate(II) ion *9.20*
Tris(4,7-dimethyl-1,10-phenanthroline)chromium(III) ion *6.148*
Tris(4,4′-diphenyl-2,2′-bipyridine)chromium(III) ion *6.147*
Tris(4,7-diphenyl-1,10-phenanthroline)chromium(III) ion *6.150*
Tris(ethylenediamine)cadmium(II) ion *6.44*
Tris(ethylenediamine)chromium(III) ion *6.146*
Tris(ethylenediamine)cobalt(III) ion *6.84, 7.22, 8.44*
Tris(ethylenediamine)copper(II) ion *6.169*
Tris(ethylenediamine)lead(II) ion *6.352*
Tris(ethylenediamine)mercury(II) ion *6.234*
Tris(ethylenediamine)nickel(II) ion *6.303*
Tris(ethylenediamine)zinc(II) ion *6.480*
Tris(glycinato)aluminum(III) *6.11*
Tris(glycinato)cadmate(II) ion *6.51*
Tris(glycinato)cobalt(III) *7.62*
Tris(glycinato)cuprate(II) ion *6.173*
Tris(glycinato)manganate(II) ion *6.267*
Tris(glycinato)mercurate(II) ion *6.241*
Tris(glycinato)nickelate(II) ion *6.318, 8.151*
Tris(glycinato)plumbate(II) ion *6.354*
Tris(glycinato)zincate(II) ion *6.483*
Tris(2-hydroxyethyl)ammonium ion *6.1251, 8.991*
Tris(hydroxymethyl)aminomethane *8.315*
N-[Tris(hydroxymethyl)-methyl]glycine *8.780*
Tris(1,10-phenanthroline)cobalt(III) ion *6.92*
Tris(1,10-phenanthroline)iron(III) ion *7.84, 8.97*
Tris(1,10-phenanthroline)iron(II) ion *6.195, 8.87*
Tris(5-phenyl-1,10-phenanthroline)chromium(III) ion *6.149*
Tris(2,2′,6′,2″-terpyridine)cobalt(III) ion *6.91*
Tris(L-valinato)cobalt(III) *7.64*
Triton X-100 *10.139*
Trolox C anion *8.805*
Tropylium ion *7.561*
Trypaflavine cation *6.533, 8.274*
Trypsin *10.140*
Trypsinogen *10.141*
Tryptophan *6.1489, 7.562, 8.1246*
Tryptophan, conjugate acid *7.563, 8.1247*
Tryptophan radical cation *5.22*

18-Tungstodiphosphate ion(7-), conjugate acid *8.232*
18-Tungstodiphosphate ion(6-) *6.470, 8.233*
18-Tungstodiphosphate ion(7-) *8.231*
Tungstophosphate *8.231*
Tween 20 *10.109*
Tyramine, conjugate acid *6.1490*
Tyramine, negative ion *6.1491, 8.1248*
Tyrosine *6.1492, 7.564, 8.1249*
Tyrosine, conjugate acid *7.565, 8.1250*
Tyrosine, dianion *6.1493, 8.1251*
Tyrosine radical *5.23*
Uracil *6.1494, 7.566, 8.1252*
Uracil, 1,3-dimethyl- *6.889*
Uracil, negative ion *6.1495*
Uracil-5-carboxylic acid *7.411*
Uracil dinucleotide *8.1253*
Uranium(III) ion *8.228*
Uranium(IV) ion *6.457, 8.229*
Uranyl(VI) iminodiacetate *6.463*
Uranyl(VI) ion *6.459, 7.165*
Urea *6.1496, 7.567, 8.1254*
Uric acid *6.1497, 8.1255*
Uridine *6.1498, 8.1256*
Uridine, negative ion *6.1499*
Uridine monophosphate *7.568, 8.1257*
Uridine monophosphate, 2′,3′-cyclic dianion *6.1500*
Uridine monophosphate, dianion *6.1501*
Uridine monophosphate, trianion *6.1502*
3′-Uridine monophosphate *8.1258*
Uridine 5′-monophosphate *7.568, 8.1257*
Uridine 2′(3′)-monophosphate (mixed) *8.1259*
2′(3′)-Uridylic acid *8.1259*
3′-Uridylic acid *8.1258*
5′-Uridylic acid *7.568, 8.1257*
Valerate ion *7.473, 8.1045*
Valine *6.1503, 7.569, 8.1260*
Valine, *N*-acetyl, negative ion *8.270*
Valine, conjugate acid *7.570, 8.1261*
DL-Valine, negative ion *6.1504*
Valylglycine *6.1505*
Vanadate(V) ion *6.466*
Vanadium(III) salicylate *6.467*
Vanadyl(IV) ion *6.465, 8.230*
Veratrole *7.333, 8.570*
Vinyl acetate *6.1506, 7.571*
Vinyl benzoate *6.1507*
Vinyl chloride *6.1508, 8.1262*
Vinylidene chloride *6.1509, 8.1263*
Vinyl isobutyl ether *6.1510*
N-Vinylpyrrolidone *6.1511, 8.1264*
Vinyl sulfonate ion *6.1512, 8.1265, 9.134*
Vitamin B_2 *6.1387, 7.509, 8.1134*
Vitamin B_6 *6.1371, 8.1119*
Vitamin B12 *6.138, 8.61*
Vitamin B12a *6.139, 8.60*
Vitamin Bc *6.951, 8.670*
Vitamin C *7.217, 8.337*
Vitamin M *6.951, 8.670*
WR-1065 *8.318*
Water *6.334, 7.116, 9.24*
Xanthine *6.1513, 8.1266*
Xanthine monophosphate *8.1267*
Xanthotoxin *6.1165, 8.897*
5′-Xanthylic acid *8.1267*
Xanthylium, 9-(2-carboxyphenyl)-3,6-bis(diethylamino)-, chloride *6.1384, 8.1132*
Xanthylium, 9-[2-(ethoxycarbonyl)phenyl]-3,6-bis(ethylamino)-2,7-dimethyl-, chloride *6.1386, 8.1133*
Xenon(VI) trioxide *8.234*
m-Xylene *7.572, 8.1268, 9.135*
o-Xylene *7.573, 8.1269, 9.136*
p-Xylene *7.574, 8.1270, 9.137*
Xylenol Orange *6.1514, 8.1271*
D-Xylose *6.1515, 8.1272*
Ytterbium(III) ions *6.474*
Ytterbium(II) ion *8.237*
Yttrium(III) ion *6.472*
Zinc(II), tetrakis[4-*N*-(3-sulfonatopropyl)pyridyl]-porphyrin *6.490*
Zinc(II), tetrakis[4-*N*-(3-sulfonatopropyl)pyridyl]-porphyrin, triplet state *5.15.1, 5.15.2*
Zinc(II) ion *6.476, 7.167, 8.238*
Zinc(II) tetrakis(4-*N*-methylpyridyl)porphyrin *6.488*
Zinc(II) tetrakis(*p*-sulfonatophenyl)porphyrin *6.489, 7.168, 8.242*
Zinc(II) tetrakis(trimethylaminophenyl)porphyrin *6.487*
Zinc(I) ion *7.166*
Zinc-insulin complex *10.143*

Appendix A. Additional references for e_{aq}^- reactions

Reported data which have not been included in Table 8 for reactions of e_{aq}^- with various substrates may be found in the following references. The references are included in Section 13 along with references to Tables 4-10.

Silver(I) ion 680436
Hydrogen arsenate(V) ion 650047
Gold(III) ion 83A085
Bromate ion 690567
Carbon monoxide 640048
Pentaammineaquacobalt(III) ion 670098
Pentaammine(pyridine)cobalt(III) ion 79A213
Hexacyanocobaltate(III) ion 650047
Cobalticinium 79G322
Chromium(III) ion 751215
Chromate ion, hydrogen 81A118
Pentacyanonitrosylchromate(II) ion 82G156
Copper(II) ions 700512
Pentacyanonitrosylferrate(III) ion 82G156
Hydrogen ion 640091 650044 680010 690567 700056 700243 710475 717393 731004 731008 751178 771157 80A116
Periodate ion 771105
Indium(III) ion 680062
Manganese(II) ions 650044
Ethylenediaminetetraacetatomanganate(II) ion 77A252 670299
Permanganate ion 690567
Pentacyanonitrosylmanganate(II) ion 82G156
Octacyanomolybdate(IV) ion 697385
Azide ion 707004
Ammonium ion 620021
Hydrazinium ion 690598
Nitrous oxide 640091 650494 680159 707116 717393 737673 741115 747466 81A382 82A110
Nitrite ion 630041 670098 690567 717393 750403 79G364
Nitrate ion 640044 640046 670032 670098 710166 717393 727158
Nickel(II) ions 700512 720380 680295 667190
Hydrogen peroxide 720102 690567 650494 707116 640091
Oxygen 640091 766117 650494 690582 727036
Hexaammineosmium(III) ion 670560
Dihydrogen phosphate ion 720380 680295 667190
Chloro(tetraethyldiethylenetriamine)palladium(II) ion 670560
Tetracyanopalladate(III) ion 650047
Tetrachloroplatinate(II) ion 670063
Tetrachloroplatinate(II) ion 670063 650047
Tetracyanoplatinate(II) ion 650047
Hexaamminerhodium(III) ion 670560
Tris(2,2'-bipyridine)ruthenium(III) ion 720462
Hydrogen sulfide 650013
Sulfite ion 687072 727008
Sulfur hexafluoride 717395
Thiosulfate ion 700242 690567 720611
Dithionite ion 720611
Dithionate ion 720611
Trithionate ion 720611
Tetrathionate ion 720611
Peroxodisulfate ion 650044 640046
Scandium(III) ion 731057
Tellurite(IV) ion 640045 650073
Ethylenediaminetetraacetatotitanate(III) ion 660825
Octacyanotungstate(IV) ion 697385
Tetrahydroxozincate(II) ion 79A404
Acetamide 670298
Acetic acid 720057 751104
Acetone 710247 680159 766558
Acetonitrile 730364
N-Acetylalanine 670310 680006
N-Acetylglycinamide 731146
Acrylamide 690567 717345
Acrylonitrile 717345
Adenine 680316
Adenosine 650388 640044 640094
Adenosine monophosphate 640094
Alanine 670310 741086
β-Alanine 660011
4-Aminobenzoate ion 650739
Aniline 767434
Benzene 710475 700211 640138
Benzenesulfonate ion 670098
Benzoate ion 660160 670098
Benzoic acid 650018 730094
Benzonitrile 640138
Benzophenone 680727
1,4-Benzoquinone 710619 700198
Benzyl alcohol 640138 670098
Benzyl chloride 84A132 640138
Benzyltrimethylammonium ion 680205
4-Bromophenol 690567 670098 720027
5-Bromouracil 690567
Carbon tetrachloride 771041 630073
Chloroacetate ion 670098
2-Chlorobenzoate ion 740167
3-Chlorobenzoate ion 740167
4-Chlorobenzoate ion 740167
2-Chloroethanol 650015
Chlorpromazine, conjugate acid 78A437
Cinnamate ion 650018
Cyclohexanone 670098
Cysteamine 730276 760333
Cysteine 660011 680002 700015 717525 730286
Cystine 660011 717525
Cytidine 640044
1,4-Diazabicyclo[2.2.2]octane 78R103
1,1'-Dibenzyl-4,4'-bipyridinium 761169
5,5-Dimethyl-1-pyrroline-*N*-oxide 82D167
Dithiothreitol 80G056
N-Ethylmaleimide 690562
Fluorescein 676053
Formamide 670098

Formic acid 720057
Fumarate ion 660160
D-Glucose-6-phosphate 78A146
Glutathione, oxidized 660011 717525
Glycine 721012 670310 741086
Glycylglycine 670310
Glycylglycylglycine 670310
Imidazole 650018
2-Mercaptoethanol 690553 730286
Methacrylate ion 640044 717345
Methanethiol 640151
Methanol 707116
Methyl methacrylate 717345
Nitrobenzene 710580 690567 640044
Nitromethane 670180
4-Nitrophenol 680303
3-Nitrophenoxide ion 660160
p-Nitrophenyl-β-D-glucopyranoside 710480
Oxalacetate ion 660160
Oxalate ion 81A148 690646
Oxamate ion 670298
2-Oxoglutarate ion 660160
Penicillamine 730286
Phenylacetate ion 650018 670098
Phenylalanine 670098 717350 80A064
3-Phenylpropionate ion 80A064
Phthalate ion 660160 670098
Phthalic acid 730094
Propionitrile 730364
Pyridine 690567 670098
Pyruvate ion 660160
Rhodamine B 676053
Ribose 640048
Salicylate ion 640138 660160
Styrene 640044
Succinate ion 660160 720027
Succinimide 650018
Sulfanilamide 730015
Sulfanilate ion 730270
2,2,6,6-Tetramethylpiperidine *N*-oxyl 81A051
2,2,6,6-Tetramethylpiperidone *N*-oxyl 81A051
4-Toluenesulfonate ion 710932 78G329
Tryptophan 660011 640132 717350 767101
Tyrosine 660011 717350
Uracil 640044
2-Vinylpyridine 680678
N-Vinyl-2-pyrrolidinone 717345

Appendix B. Additional references for ·H reactions

Reported data which have not been included in Table 7 for reactions of ·H with various substrates may be found in the following references. The references are included in Section 13 along with references to Tables 4-10.

Silver(I) ion 670550 680436 78A410
Arsenenous(III) acid 620018
Bromine 670008
Hexaamminecobalt(III) ion 650014 650085
Pentaamminebromocobalt(III) ion 650014
Pentaamminechlorocobalt(III) ion 650014
Pentaamminefluorocobalt(III) ion 650014 650085
Pentaammineiodocobalt(III) ion 650014 650085
Pentaammine(formato)cobalt(III) ion 79A250
Copper(I) ion 84G172
Copper(II) ion 560012 640095 650192 660138 720264
Fluoride ion 670099
Iron(II) ion 630047 640049 580004 570009 740151
Mercury(I) ion dimer 720290
Hydrazinium ion 550004
Nitrite ion 660010 650192 630041 640095 620017
Nitrate ion 720264 680343 660147 650192 630041 640095 660114
Hydroxide ion 650192 680693 630049 720039
Hydrogen peroxide 720264 630043
Oxygen 710618
trans-Tetraamminebis(hydroxy)platinum(IV) ion 82A074
Thallium(I) ion 84A192
Acetophenone 720025 660500
Acrylic acid 741052
Adenine 720039 710040 683038
Adenosine 683038
Allyl alcohol 680525
Aniline 720025 720039
Anilinium ion 720025
Ascorbic acid 84A192 703023
Benzene 700211
Benzoic acid 720025 710003
Benzonitrile 720025 700657 660500
1,4-Benzoquinone 650192 580009 560012
Bromoacetic acid 680525
Chloroacetate ion 629008
Cysteamine 730241
1,1'-Dimethyl-4,4'-bipyridinium 84A009 83A043
Dioxane 660422
Ethanol 710017 710003 690051 680525 670550 670041 670094 660010 650192 630041 640095 620022 620087
Ethylene 670041
Formate ion 620024 620022
Formic acid 620022 620033
Glucose 680525
Glycerol 84A192 680525 620017 620024
Maleic acid 710040
Methanol 720039 710003 710017 690051 690001 680525 670550 650393 630041 620024
2-Methyl-2-propanol 771012 710003 630041 640095
Naphthalene 78A025
Nitrobenzene 660500
Orotic acid 700567

Phenol 660500 720025
Phenylacetic acid 720025 720541
1-Propanol 670550
2-Propanol 710003 710017 680525 670041 670550 640095 620017 620024
2-Propanol-d_7 760011
Pyridinium ion 720025 670251
Succinic acid 730053 710003 710017
Thionine 84A192
Thymine 680359 683038
Tryptophan 680343 710040
Tyrosine 680343 710040
Uracil 690571 640095 720039 720049 710040

Appendix C. Additional references for ·OH reactions

Reported data which have not been included in Table 8 for reactions of ·OH with various substrates may be found in the following references. The references are included in Section 13 along with references to Tables 4-10.

Silver(II) ion 700512
Arsenite(III) ion 650356
Hypobromite ion 697340
Bromide ion 82A326 760371 720148 710137 690279 697340 680602 660118 660423 660425 670131 650099 650247 650356 650382 640131 640294 630076 620053
Hydrogen cyanide 730364
Cyanide ion 650356
Cyanate ion 766558
Thiocyanate ion 84A349 84M264 82A326 81A410 697218 680316 680375 680494 670461 670555 650190 640131
Bicarbonate ion 85A427 81A177 81A180 771053 731031 690379 690052 660139
Carbonate ion 83A389 81A177 697218 660001 650099
Carbon monoxide 637005
Cerium(III) ion 720094 640294 600099
Chlorite ion 85A039
Chloride ion 82A326 731089 710931 690647 69D278 680313 670555 650133 650356 640149
Cobalt(II) ion 751027
Chromium(III) ion 650052 630197
Copper(II) ion 81A370 710775
Nitrilotriacetocuprate(II) ion 78A320
Ethylenediaminetetraacetatocuprate(II) ion 80A153 730078
Europium(II) ion 650799
Iron(II) ion 660019 670555 660645 670504 640090 600099 519004
Tris(2,2'-bipyridine)iron(II) ion 757415
Ferrocyanide ion 766558 650007 650010 650356 650099
Ethylenediaminetetraacetatoferrate(II) ion 78M052
Ferrocenylacetate ion 83A126
2-Carboxyethylferrocene ion(1-) 83A126
Pentacyanonitrosylferrate(III) ion 690052
Hydrogen 640212 627001 590028 590054 610100 630004 580004 570014 579007 520004
Iodide ion 82A326 79A411 761105 710931 701226 690279 680209 680310 680375 680602 650099 650356
Periodate ion 78A443 710274 710335
Iodate ion 730027 720017
Manganese(II) ion 650395
Octacyanomolybdate(IV) ion 731031
Ammonia 720109 720460
Azide ion 650356 766558
Nitrite ion 79A411 680209 680310 670032 660118 650356 640294
5,7,7,12,14-Hexamethyl-1,4,8,11-tetraazacyclotetradecanenickel(II) ion 79A038
5,7,7,12,14-Hexamethyl-1,4,8,11-tetraazacyclotetradeca-4,11-dienenickel(II) ion 79A038
5,7,7,12,14-Hexamethyl-1,4,8,11-tetraazacyclotetradeca-1,4,8,11-tetraenenickel(II) ion 79A038
Ethylenediaminetetraacetatonickelate(II) ion 78A436 720173
Hydroxide ion 650007 650219 620057
Hydrogen peroxide 740052 737575 690379 640092 690156 620052
Hydroperoxide ion 737575 720404
Ozone 84A346 81M433 72M256
Dihydrogen phosphate ion 731049 650010
Hydrogen phosphate ion 731049 700302
Pyrophosphate ion 700302
Hypophosphite ion 79A378
Sulfite ion 84G092 79A411
Hydrogen sulfate ion 731030 690279 660029 650052 630048 630197 627001 570003
Thiosulfate ion 78A427 710927
Hydrogen peroxomonosulfate ion 690158
Selenite(IV) ion 650190
Telluric acid 680356 670553
Dioxalato(oxo)titanate(IV) ion 740521
Thallium(I) ion 83N092 82A326 747625 660029 577001 560004
Vanadyl(IV) ion 660029
Acetamide 710645 660423
Acetate ion 660423 650099 650356
Acetic acid 750201 759067 739341 729162 69D278 670461
Acetone 759067 739341 670461 670555 660423 669002 650099
Acetone-d_6 739341
Acetonitrile 730364 660423
Acetophenone 660441
Acrylamide 670171 650099
Acrylic acid 739341
Acrylonitrile 729162
Adenine 79A411 76A247 750294 680316

Adenosine 79A411 76A247
Adenosine diphosphate 80A313
Adenosine 5'-monophosphate 80A313 76A247
753070 670555
Adenosine triphosphate 80A313
Adipic acid 490002
Alanine 730548 741086 490002
Allyl alcohol 650387
Aniline 766558 690573 660441 650099
Anilinium ion 83A316
Anisole 690280 680304 660441
Anthracene 82G236 84G104
9,10-Anthraquinone-2-sulfonate ion 771046 760037
Arginine 730548
Aspartate ion 730548
Benz[*a*]anthracene 82G236 84G104
Benzene 82G236 84G104 749006 690280
680602 670555 660645 650010 650099
650387 650388 670461 640115 490003
Benzenesulfonate ion 660441
Benzoate ion 730094 690280 660441
Benzoic acid 760311 650099 490003
Benzonitrile 700657 660441 650099
Benzo[*a*]pyrene 82G236 84G104 81G247
Benzyl alcohol 690280
Benzyltrimethylammonium ion 680205
Biotin 763015
5-Bromouracil 670555
1,2-Butanediol 490002
1,3-Butanediol 660423
1,4-Butanediol 660423
2,3-Butanediol 730126 490002
1-Butanol 82M234 766558 747465 730126
735253 690522 670461 660423
2-Butanol 82M234 690522 670461 660423
2-*tert*-Butyl-3-hydroxypyridine 81G199
2-*tert*-Butyl-6-methyl-3-hydroxypyridine 81G199
Butyric acid 490002
Chloral hydrate 490002
Chloroacetate ion 660423
Chloroacetic acid 729162 670461
4-Chlorobenzoate ion 740167 660441
2-Chloronaphthalene 82G230 84G104 81G247
Chloroquine 83R031
Chrysene 82G236 84G104 81G247
Citric acid 670461
p-Cresol 760371 72G837
Crotonic acid 739341
Cyclopentane 81M420
Cysteamine 69D278
Cysteine 84A342 69D278 670461
Cystine 630127
Cytidine 76A247
Cytidine monophosphate 753070
Cytosine 76A247 750294
2'-Deoxycytidine-5'-monophosphate 753070
Deoxyguanosine monophosphate 753070
2-Deoxy-D-ribose 80A313 76A247
1,4-Diazabicyclo[2.2.2]octane 81A036
Diethylenetriaminepentaacetate ion 82R170 720169
Diethyl ether 680602 670461 660423 490002
Dihydro-6-methyluracil 741085
5,6-Dihydrothymine 750294 700567 680312
5,6-Dihydrouracil 741085 700567 690571
Dimethoxymethane 660423
N,N-Dimethylacetamide 759067
N,N-Dimethylaniline 660441
1,1'-Dimethyl-4,4'-bipyridinium 771177
N,N-Dimethylformamide 759067
2,6-Dimethyl-3-hydroxypyridine 81G199
N,N-Dimethyl-4-nitrosoaniline 680066 650356
5,5-Dimethyl-1-pyrroline-*N*-oxide 83D024 80A102
80A176
Dimethyl sulfide 670186
Dimethyl sulfoxide 766558 759087
Dioxane 82A326 766558 745144
660423 650388 670461
Eosin 680309
Erythritol 660423
Ethane 660265
Ethanol 83G153 80A441 766558 759067 747265
730126 737575 710081 719132 700338
69D278 680209 680602 650010 650247
650356 650388 670461 640131 620023
490002
Ethyl acetate 670461 490002
Ethylenediaminetetraacetate ion 766558 737575
670555
Ethylenediaminetetraacetic acid 720056 729162
Ethylene glycol 766558 730126 670461 660423
490002
N-Ethylmaleimide 690562
Fluorescein 680172
Folic acid 82A326
Formamide 700098
Formate ion 83D024 83G153 766558 690379
680602 670461 650099 650247 650356
620023
Formic acid 720094 69D278 680602 670461
620023
Fructose-1,6-diphosphate 76A252 753070
Fructose-1-phosphate 76A252
Fructose-6-phosphate 76A252
Furan 83A335 730301
Glucose 766558 700251 690580 670461 650247
Glucose-1-phosphate 753070 690580
Glucose-6-phosphate 753070
Glutathione 82A028 69D278
Glycerol 766558 670461 660423 650356
Glycine 750201 730548 660423 650247 650099
620023 490002
Glycolate ion 660423
Glycylalanine 760148
Glycylglycine 760148 700099
Glycylglycylglycine 760148
Glycylglycylglycine 760148
Guaiacol 72G837
Guanosine monophosphate 86G012 753070
2,4-Hexadienoate ion 80A388
Histidine 766558 730548

Hydroquinone 766558 72G837
4-Hydroxybenzoate ion 72G837 660441
1-(2-Hydroxyethyl)-2-methyl-5-nitroimidazole 74R216
Hypoxanthine 750294
Iminodiacetate ion 760243
Indole 766558 720541 710556
Indoline 710556
Inositol 690580
Iodoethane 771002
Iodomethane 690019
Isoorotate ion 750294
Isopropyl acetate 490002
Lactate ion 741007
Lactic acid 750201 670461 490002
Lactose 690580
Leucine 766558 730548
Linoleate ion 83N253
Maleic acid 739341
Malonate ion 660423
Mannitol 79A240
2-Mercaptoethanol 690553 650387
Methane 81M420
Methanethiol 690553
Methanol 82M234 81G199 759067 740112
747465 730126 730289 736068 719132
69D278 680209 680310 680602 670041
670555 670461 660019 660423 650010
650099 650247 650356 650375 650388
490002
Methionine 81A124 766558 730548
4-Methoxybenzoate ion 660441
2-Methoxynaphthalene 82G236 84G104
4-Methoxyphenol 72G837
Methyl acetate 660423 490002
Methylamine 660423
Methylammonium ion 660423
5-Methylcytosine 750294 703069
2-Methylindole 710556
3-Methylindole 710556
Methyl methylthiomethyl sulfoxide 82A275
1-Methylnaphthalene 82G236 84G104
2-Methylnaphthalene 82G236 84G104
2-Methyl-5-phenyl-2-pentanol 749006
2-Methyl-2-propanethiol 690553
2-Methyl-1-propanol 82M234 759067 670461
660423
2-Methyl-2-propanol 82M234 766558 759067
745144 747465 749006 730126 739105
719132 670461 660423 650388 490002
α-Methylstyrene 751198
Naphthalene 82G236 84G104 81G247
2-Naphthoate ion 84G104 81G247
2-Naphthol 82G236 81G247
1-Naphthylamine 82G236 84G104
Nicotinamide 82A326 80A313 690280
Nicotinate ion 690280
Nitrilotriacetate ion 760344
Nitrobenzene 83A316 690280 680157 660441
650099 490003
4-Nitrobenzoate ion 660441
5-Nitro-2-furaldehyde 83A335
Nitromethane 660423
1-Nitronaphthalene 82G236 84G104
p-Nitrophenyl-β-D-glucopyranoside 710056
Oxalate ion 730020 701050 670131 650356
Oxalic acid 750201 710542 670461 670131
Pantothenate ion 82A326
1-Pentanol 747465 670461 660423
Perylene 82G236 84G104
Phenanthrene 82G236 84G104 81G247
Phenol 83A316 81S090 779101 760311 760371
759193 72G837 680602 660441 650099
Phenoxide ion 82A169
Phenyl acetate 660441
Phenylacetate ion 720541 660441
Phenylacetic acid 490003
Phenylalanine 730548 690156
Phosphorylcholine 753070
Phthalate ion 730094
p-Phthalate ion 80G077
Pinacol 490002
Procaine 83R171
1,2-Propanediol 670461 660423
1-Propanol 82M234 759067 747265 730126
735253 690522 670461 660423 490002
2-Propanol 84G138 82A326 82M234 766558
759067 747265 730126 736068 720094
710081 719132 700104 690156 680209
670461 660019 660234 660423 650247
650356 650387 650388 490002
2-Propanol-d_6 719132
2-Propanol-2-*d* 719132 660423
Pyrene 82G236 84G104
Pyridine 690280
4-Pyridinecarboxamide 690280
Pyridinium ion 490002
2-Pyridone 690280
4-Pyridone 690280
Pyridoxine 82A326
α-(4-Pyridyl 1-oxide)-*N*-*tert*-butylnitrone 80A176
Ribose 766558 690580 670555
Ribose-5-phosphate 79A366 76A247 753070
Salicylate ion 72G837 650099 650356
Serine 730548
Stachyose 79A366
Succinic acid 490002
Sucrose 670461
Sulfanilamide 710128
Sulfanilic acid 730270 710128
Tetrahydrofuran 80A441 759067
Thiamine 82A326
Thymidine 703069
Thymidine monophosphate 753070
Thymine 86A268 82A326 79A411 750294
703069 69D278 680359 680597 670461
670555 650133
Tiron 80R092
p-Toluate ion 660441
Toluene 730089
Triethylamine 710590

Triethylammonium ion 710590 490002
2,4,6-Trimethyl-1,3,5-trioxane 80A441
1,3,5-Trioxane 80A441
Tryptophan 82A326 79A411 773021 730548
Tyrosine 730548
Uracil 86A268 750294 703069 650356
Urea 650356
Uridine 703069 690580
Uridine monophosphate 80A313 753070 703069
690580 761229
Xanthine 750294
Xylose 766558