Rate Constants for the Decay and Reactions of the Lowest Electronically Excited Singlet State of Molecular Oxygen in Solution. An Expanded and Revised Compilation

Cite as: Journal of Physical and Chemical Reference Data **24**, 663 (1995); https://doi.org/10.1063/1.555965
Submitted: 01 November 1994 . Published Online: 15 October 2009

Francis Wilkinson, W. Phillip Helman, and Alberta B. Ross

Rate Constants for the Decay and Reactions of the Lowest Electronically Excited Singlet State of Molecular Oxygen in Solution. An Expanded and Revised Compilation

Francis Wilkinson

Department of Chemistry, University of Technology, Loughborough, Leicestershire, LE11 3TU, United Kingdom

W. Phillip Helman and Alberta B. Ross

Radiation Chemistry Data Center, Radiation Laboratory, University of Notre Dame, Notre Dame, Indiana 46556

Received 1 November 1994; revised manuscript received 13 February 1995

An expanded and revised compilation on the reactivity of singlet oxygen, the lowest electronically excited singlet state of molecular oxygen, $^1O_2^*(^1\Delta_g)$, in fluid solution is presented, which supersedes the publication of Wilkinson and Brummer, J. Phys. Chem. Ref. Data **10**, 809 (1981). Rate constants for the chemical reaction and physical deactivation of singlet oxygen available through 1993 have been critically compiled. Solvent deactivation rates (k_d) are tabulated for 145 solvents or solvent mixtures and second-order rate constants for interaction of singlet oxygen with 1915 compounds are reported. *©1995 American Institute of Physics and American Chemical Society.*

Key words: Chemical kinetics; data compilation; decay; oxidation; photochemistry; photosensitization; quenching; rate constants; singlet oxygen; solution.

Contents

List of Tables

1. Introduction

Reactions of singlet oxygen $^1O_2^*(^1\Delta_g)$, are of much current interest because of their importance in many photooxidations of chemical and biological systems including reactions used in photo-chemotherapy. There is strong evidence for the involvement of singlet oxygen, a powerful oxidant, in many photosensitized oxidations, photodynamic inactivation of viruses and cells, in phototherapy for cancer, in photocarcinogenisis, in the photodegradation of dyes and polymers and in the dye sensitization of the photodegradation of polymers. [See Refs. 1–7 and references therein].

The ground electronic state of molecular oxygen, which has zero angular momentum about the internuclear axis and contains two unpaired p electrons, has the group theoretical symbol $^3\Sigma_g^-$. The two electronically excited singlet states which arise from this same electron configuration but with spin pairing of the two electrons are the $^1\Delta_g$ and the $^1\Sigma_g^+$ states which lie at 94 and 157 kJ mol^{-1}, respectively, above the $^3\Sigma_g^-$ ground state. The electronic transitions $^1\Delta_g \leftarrow {}^3\Sigma_g^-$ and $^1\Sigma_g^+ \leftarrow {}^3\Sigma_g^-$ although highly forbidden are readily observed in absorption and emission in the upper atmosphere with zero–zero transitions at 1,269 and 762 nm and estimated radiative lifetimes of 64 min and 10 s, respectively.[8,9] The measured lifetimes in the gas phase and in solution are very much shorter than this. In condensed media, the lifetime of $^1O_2^*(^1\Sigma_g^+)$ is short, 130 ns in carbon tetrachloride, and until recently very little was known about its properties,[10] and thus the term singlet oxygen is used throughout this review to refer to the $^1\Delta_g$ state.

In 1981 we published a critical comprehensive compilation which reported first order decay constants for 50 solvents and second order rate constants for deactivation and chemical reaction of singlet oxygen with 690 different compounds. This article updates and replaces our 1981 article.[5] It uses identical equation numbers and symbols wherever possible as did our recent compilation,[6] "Quantum Yields for the Photosensitized Formation of the Lowest Electronically Excited Singlet State of Molecular Oxygen in Solution." It covers the literature up to the end of 1993 and includes solvent deactivation rates (k_d) for 145 solvents and solvent mixtures and rate constants for chemical reaction and physical

deactivation of singlet oxygen with over 1,900 different compounds.

2. Sources of Singlet Oxygen in Solution

2.1. Direct Absorption by O_2 ($^3\Sigma_g^-$)

Generation of $^1O_2^*(^1\Delta_g)$ by direct absorption has been accomplished by irradiation with Nd:YAG lasers of Freon solutions subjected to high pressures of O_2, by Matheson and Lee[11–13] and also by Evans[14] using the simultaneous transition $2\ O_2(^3\Sigma_g, {}^3\Sigma_g) \rightarrow 2\ O_2^*(^1\Delta_g, {}^1\Delta_g)$. In addition Singh *et al.*[15] have shown that it is also possible to produce $^1O_2^*(^1\Delta_g)$ by irradiation of aerated water at 600 nm via vibrationally excited water with a yield of $\sim 3\times10^{-5}$, i.e.,

$$\text{Water} \xrightarrow{h\nu(\text{IR})} \text{Water(vib)}^* \xrightarrow{O_2} {}^1O_2^*(^1\Delta_g).$$

2.2. Production Following Absorption into O_2 ($^3\Sigma_g^-$): Organic Molecule Charge-Transfer Bands

The perturbing effect of dissolved oxygen on the uv/vis absorption spectra of organic molecules is a well known phenomenon first studied in detail by Evans[16] and subsequently discussed by Mulliken[17] and others.[18] The additional absorption bands observed include enhanced absorption of the lowest energy transition in the organic molecule, M, which corresponds to the $S_0 \rightarrow T_1$ transition of the organic molecule in intimate contact with an oxygen molecule. More intense absorption is also often observed at shorter wavelengths which is attributed to CT transitions within $^3(M..O_2)$ contact complexes, viz,

$$M + {}^3O_2 \rightarrow {}^3(M...O_2) + h\nu \rightarrow {}^3(M^+...O_2^-).$$

This effect is easily observed by comparing the absorption spectra of liquid aromatic hydrodrocarbons such as benzene, toluene, or *o*-, *m*-, or *p*-xylenes saturated with oxygen and in the absence of dissolved oxygen. The oxygen induced red shift observed, which is reversible when the oxygen is removed, has been assigned to charge transfer absorption. This assignment is supported by the broad structureless appearance of the bands. Scurlock and Ogilby[19,20] have demonstrated that irradiation of $O_2(^3\Sigma_g^-)$:organic molecule charge-transfer bands produces singlet oxygen with relatively high yields. Picosecond laser flash photolysis studies have been carried out in attempts to understand the mechanism involved.[21,22]

2.3. Photosensitized Production

The method most frequently used for producing singlet oxygen in the laboratory is photo-sensitization (see Scheme 1). Both continuous irradiation and pulsed excitation studies have made much use of this method of production which also frequently occurs in nature. In this mechanism (Scheme 1) the lowest excited singlet and triplet states of the sensitizers are represented as S_1, and T_1, respectively, and the ground electronic state by S_0. Any substrate which deactivates singlet oxygen by physical or chemical quenching is represented in Scheme 1 by M. However, when quenching is known to be mainly by chemical reaction we shall use A to represent a reactive substrate and if a second reactive substrate is employed A′ will be used. When the molecule is known to be a physical quencher with negligible reaction. Q will be used in place of M. The singlet oxygen sensitizer, even when the sensitizer quenches singlet oxygen, will be represented by S. Thus M is a general symbol in Scheme 1 which may be replaced by A, A′, Q, or S or any combination of these. In the tables we have used A throughout for all substrates irrespective of whether they were known to have little measured chemical reactivity.

Scheme 1

	Rate Constants		Quantum Yields and Fractional Probabilities
1 $S_0+h\nu\rightarrow S_1$	rate$=I_a$		
2 $S_1\rightarrow S_0+h\nu_F$	k_F	$k_{SD}=(\tau_S^0)^{-1}$	$\phi_F=\frac{k_F}{k_{SD}}$
3 $S_1\rightarrow S_0$	k_{ic}		
4 $S_1\rightarrow T_1$	k_{isc}		$\phi_T=\frac{k_{isc}}{k_{SD}}$
5 $S_1+O_2\rightarrow T_1+{}^1O_2^*$	$k_{S\Delta}^{O_2}$	$k_{SQ}^{O_2}$	$f_\Delta^S=k_{S\Delta}^{O_2}/k_{SQ}^{O_2}$
6 $S_1+O_2\rightarrow T_1+O_2$	$k_{isc}^{O_2}$		$f_T^{O_2}=(k_{S\Delta}^{O_2}+k_{isc}^{O_2})/k_{SQ}^{O_2}$
7 $S_1O_2\rightarrow S_0+{}^3O_2$	$k_{Sd}^{O_2}$		$P_S^{O_2}=k_{SQ}^{O_2}[O_2]/(k_{SD}+k_{SQ}^{O_2}[O_2])$
8 $S_1+O_2\rightarrow$ products	$k_{Sr}^{O_2}$		$1-P_S^{O_2}=1/(1+k_{SQ}^{O_2}\tau_S^0[O_2])$
			$\phi_T^{O_2}=\phi_T(1-P_S^{O_2})+f_T^{O_2}P_S^{O_2}$
9 $T_1\rightarrow S_0+h\nu_P$	k_{Tp}	$k_{TD}=(\tau_T^0)^{-1}$	
10 $T_1\rightarrow S_0$	k_{Td}		
11 $T_1+O_2\rightarrow S_0+{}^1O_2^*$	$k_{T\Delta}^{O_2}$	$k_{TQ}^{O_2}$	$f_\Delta^T=k_{T\Delta}^{O_2}/k_{TQ}^{O_2}$
12 $T_1+O_2\rightarrow S_0+{}^3O_2$	$k_{Td}^{O_2}$		
13 $T_1+O_2\rightarrow$ products	$k_{Tr}^{O_2}$		$P_T^{O_2}=k_{TQ}^{O_2}[O_2]/(k_{TD}+k_{TQ}^{O_2}[O_2])$
14 ${}^1O_2^*\rightarrow{}^3O_2+h\nu_P$	$k_{\Delta P}$	$k_\Delta=\tau_\Delta^{-1}$	$f_P^\Delta=k_{\Delta P}/(k_{\Delta P}+k_{\Delta d})$
15 ${}^1O_2^*\rightarrow{}^3O_2$	$k_{\Delta d}$		
16 ${}^1O_2^*+M\rightarrow$ products	k_r^M	k_M	$f_r^M=k_r^M/(k_r^M+k_q^M)$
17 ${}^1O_2^*+M\rightarrow{}^1M+{}^3O_2$	k_q^M		

f_Δ^S = fraction of S_1 quenched by O_2 which gives ${}^1O_2^*$
$f_T^{O_2}$=fraction of S_1 quenched by O_2 which gives T_1
f_Δ^T=fraction of T_1 quenched by O_2 which gives ${}^1O_2^*$
$P_S^{O_2}$=proportion of S_1 quenched by O_2
$P_T^{O_2}$=proportion of T_1 quenched by O_2

The quantum yield of singlet oxygen production, ϕ_Δ, via sensitization is given by the sum of contributions due to oxygen quenching of S_1 and T_1, i.e.,

$$\phi_\Delta=\phi_\Delta(S)+\phi_\Delta(T)=P_S^{O_2}f_\Delta^S+\phi_T^{O_2}P_T^{O_2}f_\Delta^T.$$

In the presence of oxygen quenching of S_1 and T_1

$$\phi_\Delta=P_S^{O_2}f_\Delta^S+\phi_T(1-P_S^{O_2})P_T^{O_2}f_\Delta^T+P_S^{O_2}f_T^{O_2}P_T^{O_2}f_\Delta^T,$$

which can be written as

$$\phi_\Delta=\phi_TP_T^{O_2}f_\Delta^T+P_S^{O_2}\{f_\Delta^S+P_T^{O_2}f_\Delta^T(f_T^{O_2}-\phi_T)\}. \quad (1)$$

Methods for determining ϕ_Δ were reviewed by us[6] and 1,600 quantum yield determinations were tabulated for 750 different chemical species.

2.4. Sensitized Production by Pulsed Radiolysis

When a high energy electron beam is passed through liquid benzene, for example, a high yield of excited states can be formed. Since the lifetimes of singlet and triplet states of benzene are only a few nanoseconds in neat benzene, quenching by dissolved oxygen does not produce much singlet oxygen. However, in the presence of a triplet energy acceptor, e.g., 10^{-2} mol L^{-1} naphthalene, energy transfer from triplet benzene occurs to give triplet naphthalene which is quenched by oxygen producing singlet oxygen. This enables the properties of singlet oxygen to be probed using the technique of pulsed radiolysis.[23]

2.5. Microwave Generation of Singlet Oxygen

When a microwave discharge is passed through oxygen gas in a gaseous flow system, singlet molecular oxygen (${}^1\Delta_g$ and ${}^1\Sigma_g^+$), oxygen atoms, and ozone are produced. The latter two oxidizing species can be removed by reaction with mercury vapor and the ${}^1O_2^*({}^1\Sigma_g^+)$ is rapidly quenched, probably to give ${}^1O_2^*({}^1\Delta_g)$ when the emerging gases are bubbled through solutions containing oxidizable substrates. Often the flow is bubbled simultaneously through two cells, one containing the substrate only and the other containing substrate

and potential singlet oxygen quencher.[24] This makes it easier to allow for variations in the concentration of dissolved singlet oxygen produced in these bubbling experiments.

2.6. Chemical Production of Singlet Oxygen

Among the reactions used to form singlet oxygen are (a) reaction of hydrogen peroxide with hypochlorite or hypobromite,[25] (b) reaction of potassium superoxide with water, and (c) thermal decomposition of aryl peroxides or of the ozonide of triphenyl phosphite.[24] Experiments are usually carried out so that a fixed amount of singlet oxygen is produced in the presence of variable amounts of reactive substrate A and/or A′ with or without added quencher, Q.

3. Methods for the Direct Study of the Kinetics of the Reactions of Singlet Oxygen

3.1. Luminescence Decay—Time Resolved Infrared Luminescence

Although the quantum yield of phosphorescence of singlet oxygen is very low in most solvents, the development of germanium photodiodes with high gain, coupled with wideband amplifiers which can give overall time responses of less than a microsecond, means that the lifetime of singlet oxygen in most solvents can be measured accurately by monitoring infrared luminescence at ~1270 nm.[26,27] If the logarithm of the phosphorescence intensity is plotted as a function of time then the slope gives the decay constant

$$k_D = k_\Delta + \Sigma k_M[M], \tag{2}$$

where M represents any molecule including the sensitizer which quenches singlet oxygen, physically or chemically. If k_D is measured as a function of the concentration of a particular quencher M, keeping all other quencher concentrations constant, the bimolecular rate constant for quenching of singlet oxygen by M, k_M can be obtained.[28,29] Measurement of k_D as a function of sensitizer concentration allows k_S to be evaluated. When a decay constant for singlet oxygen is not extrapolated to zero sensitizer concentration we shall use $k_d = (k_\Delta + k_S[S])$ for the decay constant. It is often assumed that under many experimental conditions $k_d = k_\Delta$, however this is not always the case.

3.2. Time Dependent Thermal Lensing due to Singlet Oxygen Decay

The absorption of even part of the energy in a laser pulse gives rise to local temperature changes in gases or liquids. This leads to changes in density and refractive index which causes the system to act as a diverging lens.[30] Time resolved thermal lensing (TL) due to release of energy by decaying excited states can be used to measure lifetimes of singlet oxygen in the range 0.1 to 100 μs. The probe source is a continuous laser beam which is deflected by the thermal lens. The signal gives the relative magnitudes of heat contributions (U) for fast and slow non-radiative processes relative to the acoustic transit time. The time dependence of the slow process gives rate information. The TL signal at time t is defined as

$$U(t) = \frac{V_0 - V(t)}{V_0}, \tag{3}$$

where $V(t)$ is the time dependent voltage generated by the detector. Following the sensitized production of $^1O_2^*$, the thermal buildup $\Delta U = U_{total} - U_{fast}$ decreases exponentially with the decay constant k_D given by Eq. (2).

3.3. Time Dependent Acceptor Disappearance

3.3.1. Following Pulsed Excitation of a Sensitizer

According to the mechanism given in Scheme 1, in this case with M=A, since we are discussing a reactive substrate, it follows that

$$-\frac{d[A]}{dt} = k_r^A[A][^1O_2^*].$$

Following pulsed excitation in aerated solutions most singlet and triplet states have decayed within 1 μs and then

$$-\frac{d[^1O_2^*]}{dt} = (k_d + k_A[A])[^1O_2^*]$$

and thus

$$-d[A] = k_r^A[A][^1O_2^*]_{t=0}\left[\exp-\left(k_d t + \int_0^t k_A[A]dt\right)\right]. \tag{4}$$

Equation (4) has been treated slightly differently as follows:

(a) Merkel and Kearns[31,32] assumed that [A] on the right hand side of Eq. (4) can be treated as constant (i.e., as $[A]_{av}$ since typically [A] only varies by ~10%). Taking $k_D = k_d + k_A[A]_{av}$, integration of Eq. (4) gives,

$$[A]_t - [A]_\infty = \frac{k_r^A[^1O_2^*]_{t=0}[A]_{av}}{k_D} e^{-k_D t}. \tag{5}$$

Since the change in concentration of A is proportional to ΔA, the change in absorbance by the oxidizable acceptor at some convenient wavelength, $[A]_t - [A]_\infty = \Delta A/\epsilon l$, where ϵ is the extinction coefficient and l the analyzing path-length. It follows from Eq. (5) that

$$\ln \Delta A = -k_D t + \text{const}, \tag{6}$$

and a plot of $-\ln \Delta A$ vs t should have a slope equal to $k_D = k_d + k_A[A]_{av}$. Thus by varying $[A]_{av}$ values k_d and k_A can be determined.

(b) Adams and Wilkinson[33] and Young *et al.*[34] replaced [A] by $[A]_{av}$ only in the exponential term in Eq. (4) and then integrated Eq. (4) to give

$$\ln\left[\frac{[A]}{[A]_0}\right] = \frac{(k_r^A[^1O_2^*]_{t=0}}{k_D}[e^{-k_D t} - 1] \tag{7}$$

or

$$\ln\left[\frac{[A]}{[A]_\infty}\right] = \frac{(k_r^A[^1O_2^*]_{t=0}}{k_D} e^{-k_D t}. \tag{8}$$

Experimental results were fitted to Eqs. (7) or (8) to evaluate k_D and thus values of k_d and k_A were obtained.

Comparison of the values obtained from the same data for k_D using Eqs. (5) or (7) and (8) give agreement to within $\pm 5\%$ and do not differ, within an experimental error of about $\pm 10\%$ when experiments are repeated many times, from computer treatments which do not make any assumptions about [A] being relatively constant. If k_A is partly due to physical quenching and partly due to reaction, the value of k_A obtained will be the total rate constant for quenching due to both processes.

In the presence of several possible singlet oxygen quenchers, i.e., Scheme 1 with M=A, S, and Q, we have

$$k_D = k_\Delta + k_S[S] + k_Q[Q] + k_A[A]. \quad (9)$$

Measurement of k_D as a function of [Q] keeping [S] and [A] constant allows values of k_Q to be obtained. N.B. If k_Q is only partly due to physical quenching and partly due to reaction, the value of k_Q obtained is the total rate constant for quenching due to both processes.

3.3.2. Following Pulsed Excitation of Solutions Containing High Pressures of O_2

A variation on this method has been developed by Matheson *et al.*[11,35] in which singlet oxygen is directly generated by absorption of the output at 1065 nm of a pulsed Nd-glass laser by oxygen dissolved under pressure (up to 130 atm) in 1,1,2-trichlorotrifluoroethane (Freon 113). The disappearance of the singlet oxygen acceptor 1,3-diphenylisobenzofuran (DPBF) was monitored. Because of the high concentration of oxygen present, quenching by ground state oxygen, i.e., due to the reaction,

$$^1O_2^*(^1\Delta_g) + {}^3O_2(^3\Sigma_g^-) \xrightarrow{k_q^{O_2}} 2\ {}^3O_2(^3\Sigma_g^-),$$

contributes substantially to singlet oxygen decay, and

$$k_D = k_d + k_A[A] + k_q^{O_2}[O_2]. \quad (10)$$

Under these conditions $k_q^{O_2}[O_2] \gg k_d$, therefore only values of k_A and $k_q^{O_2}$ can be obtained by measuring k_D as a function of [A] or $[O_2]$ respectively. Recent measurements suggest that k_A is pressure dependent.[36]

3.4. Kinetic Analysis to give the Decay of Singlet Oxygen by Monitoring the Decay of Triplet β-carotene Produced by Energy Transfer from Singlet Oxygen

Farmilo and Wilkinson[37] have developed a method for measuring singlet oxygen decay which monitors absorption by triplet β-carotene, $^3C^*$, formed by energy transfer from singlet oxygen in aerated solutions containing a sensitizer and a low concentration of β-carotene. Consider the mechanisms given in Scheme 1 in the presence of β-carotene, C, i.e., a mechanism involving steps *1–17* with M=Q together with steps *18–21* given below:

18 $$T_1 + C \xrightarrow{k_{TC}} S_1 + {}^3C^*,$$

19 $$^1O_2^*(^1\Delta_g) + C \xrightarrow{k_{\Delta C}} {}^3C^* + {}^3O_2(^3\Sigma_g^-),$$

20 $$^3C^* \xrightarrow{k_{dC}} C,$$

21 $$^3C^* + {}^3O_2(^3\Sigma_g^-) \xrightarrow{k_{CO}} \text{quenching}.$$

The differential rate equations which can be written for $d[T_1]/dt$, $d[^1O_2^*]/dt$, and $d[^3C^*]/dt$ can be solved without making the steady-state approximation and this gives the concentration of $[^3C^*]$ as

$$[^3C^*] = V[e^{-k_T t} - e^{-k_C t}] + W[e^{-k_D t} - e^{-k_C t}],$$

where $k_T = k_{TQ}^{O_2}[O_2] + k_{TC}[C]$; $k_C = k_{CO}[O_2] + k_{dC}$, and $k_D = k_d + k_{\Delta C}[C] + k_Q[Q]$. In aerated solutions the values of $k_{TQ}^{O_2}[O_2]$ and $k_{CO}[O_2]$ are such that after ~1 μs, $\exp(-k_T t)$ and $\exp(-k_C t)$ become negligibly small and thus

$$[^3C^*] = We^{-k_D t}, \quad (11)$$

where $W = [T_1]_{t=0}\ k_{\Delta C}[C]k_{TQ}^{O_2}[O_2]/[(k_T - k_D)(k_C - k_D)]$. W is a constant provided $[O_2]$, [C], and [Q] are constant. It is usually possible to arrange for these to be present in excess so that $[O_2] \gg [^1O_2^*]$, $[C] \gg [^3C^*]$ and any consumption of Q or O_2 must also be negligibly small. It is important to bear these conditions in mind especially for work which involves, for example, focussed, high-energy laser pulses. However, when these conditions are met it follows from Eq. (11) that the decay of triplet β-carotene after ~1 μs becomes first order with a decay constant k_D equal to that of its precursor, singlet oxygen as confirmed by Farmilo and Wilkinson.[37] Thus the decay of absorption at 520 nm due to $^3C^*$ under these conditions mirrors the singlet oxygen decay yielding values of k_D and hence values of k_d, $k_{\Delta C}$, and k_Q.

4. Methods for Obtaining Kinetic Information from Studies using Continuous Irradiation, i.e., Under Photostationary State Conditions

4.1. Luminescence Intensity Quenching

The phosphorescence intensity due to emission of singlet oxygen at ~1270 nm, I_Δ, observed when a sensitizer is continuously irradiated depends on the steady-state concentration of singlet oxygen present in a solution. When a photostationary state of singlet oxygen is produced its rate of production $I_a\phi_\Delta$ equals the rate of decay $k_d[^1O_2^*]_{ss}$ and thus

$$[^1O_2^*]_{ss} = \phi_\Delta \frac{I_a}{k_d}.$$

In the presence of a singlet oxygen quencher M the steady-state singlet oxygen concentration $[^1O_2^*]_{ss}^M$ is reduced, i.e.,

$$[^1O_2^*]_{ss}^M=\frac{\phi_\Delta I_a}{k_d+(k_r^M+k_q^M)[M]}.$$

Krasnovsky[38] and others have shown that a Stern-Volmer relationship

$$\frac{L_\Delta^0}{L_\Delta}=1+\frac{(k_r^M+k_q^M)[M]}{k_d} \tag{12}$$

holds for quenching of singlet oxygen phosphorescence by physical and chemical quenchers; from the slopes of plots of L_Δ^0/L_Δ vs [M] values of the total quenching constant $(k_r^M+k_q^M)$ can be obtained provided the singlet oxygen decay constant in the absence of the quencher M is known.

Krasnovsky[38] pioneered the use of phosphorescence intensity measurements from singlet oxygen in solution. He and other workers have used this method to derive quenching rate constants using the Stern–Volmer equation. In addition, by assuming that $k_{\Delta r}$ is independent of solvent, Turro[39] has given estimates of lifetimes relative to a standard, in this case benzene, for which a value of $k_d=4\times10^4$ s^{-1} was used.[5] Measurements were made of the decrease in fluorescence intensity of a CCl_4 solution upon addition of other solvents and it was found that the Stern–Volmer relationship was observed, i.e.,

$$\frac{I_0}{I}=\kappa x+1, \quad \text{where } \kappa=\frac{\tau_{CCl_4}}{\tau_{solvent}},$$

where x is the volume fraction. The question of the extent to which the radiative probability for phosphorescence from singlet oxygen varies with solvent is debatable.[40]

4.2. Monitoring Sensitized Photo-oxidations by Consumption of Reactants or Appearance of Products Under Steady-State Conditions

Two major classes of photosensitized oxygenations have been designated as Type I and Type II. In the former, the excited sensitizer interacts directly with the substrate resulting, for example, in either H-atom transfer or electron transfer. The radicals so produced from the sensitizer react in the presence of oxygen to regenerate the sensitizer, while radicals produced from the substrate, for example, initiate free radical chain reactions, as observed in auto-oxidations. Type II reactions involve the direct interaction of the excited sensitizer and oxygen with energy transfer to give singlet oxygen, which reacts with various substrates.[4,41]

4.2.1. Sensitized Photo-oxygenation of a Single Substrate A

Many photosensitized reactions have been carried out under conditions such that no quenching by A of the sensitizer singlet or triplet states occurs, in which case the mechanism is as given in Scheme 1, with M=A. For continuous irradiation,

$$-\frac{d[A]}{dt}=-\frac{d[O_2]}{dt}=\frac{d[P]}{dt}=k_r^A[^1O_2^*]_{ss}[A], \tag{13}$$

and the steady-state approximation can be applied to give

$$\phi_{ox}=\frac{r_{ox}}{I_a}=\frac{\phi_\Delta k_r^A[A]}{k_d+k_A[A]}, \tag{14}$$

where the rate of oxygenation (r_{ox}) may be followed by determining the rate of appearance of some product (Pa) and/or the rate of consumption of either the substrate A (Ac) and/or of oxygen (Oc). All three have been used. and this is indicated in the tables by an entry in the methods column. N.B. It follows from Eq. (14) that when $k_d \gg k_A[A]$ or $k_A[A] \gg k_d$ the rate of oxygenation will be first or zero order with respect to A, respectively. Equation (14) can be rearranged to give

$$r_{ox}^{-1}=(I_a\phi_\Delta f_r^A)^{-1}\left[1+\frac{k_d}{k_A}\frac{1}{[A]}\right], \tag{15}$$

where $f_r^A=k_r^A/k_A$ is the fraction of reactive quenching of singlet oxygen by A.

Most reactive substrates, A, react with singlet oxygen with unit stoichiometry as implied in Eqs. (13) to (15) which apply when each time a molecule of $^1O_2^*$ reacts it leads to the consumption of one molecule of A and one of O_2 and produces one molecule of the product P. If there are stoichiometry factors α different from unity, the overall reaction is given by the equation

$$\alpha_A A+\alpha_{O_2}O_2 \xrightarrow[h\nu]{S} \alpha_P P,$$

then

$$r_{ox}=-\frac{1}{\alpha_A}\frac{d[A]}{dt}=-\frac{1}{\alpha_{O_2}}\frac{d[O_2]}{dt}=\frac{1}{\alpha_P}\frac{d[P]}{dt},$$

and Eqs. (14) and (15) still apply. If, however, the rate of the reaction is monitored by observing the rate of consumption of a reactive substrate such as thiourea where $\alpha=2$ and this rate is not divided by $\alpha=2$, then αf_r^A appears in Eqs. (14) and (15). This needs to be borne in mind whenever unit stoichiometry does not apply.

According to Eq. (15) linear plots of r_{ox}^{-1} or ϕ_{ox}^{-1} vs $[A]^{-1}$ should give

$$\frac{\text{slope}}{\text{intercept}}=\frac{k_d}{k_A}=\beta_A,$$

where $\beta_A=k_d/k_A$ represents the concentration at which the decay of singlet oxygen in the solvent alone (steps *14* and *15*) equals the decay due to quenching by A (steps *16* and *17*), i.e., it is the half-quenching concentration. [N.B. Eq. (15) only predicts a linear relationship if there is (i) constant light intensity, (ii) constant absorption by the sensitizer and with no absorption by A although this could be allowed for, and (iii) a constant oxygen concentration in the solution]. Tables 2 to 17 list hundreds of β values along with the values of k_d used to derive values of k_A from these β values.

4.2.2. Photo-Auto-Oxygenation of a Single Substrate A

When a substrate acts as its own sensitizer yielding singlet oxygen one can observe Type II photo-auto-oxygenations. Good examples are rubrene (Rub) and 9,10-dimethylanthracene (DMA) and for such cases this is indicated in the *Comments* column of the tables by S=A. Since the self-sensitizer is consumed in the photo-auto-oxygenation this usually leads to a change in I_a which must be allowed for. Alternatively, a totally absorbing solution can be used and then the rate of appearance of some product or the rate of consumption of oxygen can be measured and substituted directly into Eq. (15) to obtain values of β since under these conditions I_a is effectively constant.

4.2.3. Sensitized Photo-oxygenations of a Substrate A in the Presence of a Second Substrate A′ which also Reacts with Singlet Oxygen

Consider in addition to steps *1* to *17* (Scheme 1) with M=A the further steps *22* and *23*

22 $$^1O_2^*(^1\Delta_g)+A' \xrightarrow{k_r^{A'}} A'O_2 \text{ or other products,}$$

23 $$^1O_2^*(^1\Delta_g)+A' \xrightarrow{k_q^{A'}} A'+{}^3O_2.$$

In the presence of a second substrate [A′] it follows that

$$-\frac{d[A']}{dt}=\frac{I_a\phi_\Delta k_r^{A'}[A']}{k_d+k_A[A]+k_{A'}[A'],}$$

which when $k_{A'}[A'](k_d+k_A[A])$ becomes

$$-\frac{d\ \ln[A']}{dt}=\frac{I_a\phi_\Delta k_r^{A'}}{k_d+k_A[A]}=\text{Slope}.$$

In the absence of A under identical conditions, the slope of the first order plot for the disappearance of A′

$$-\frac{d\ \ln[A']}{dt}=\frac{I_a\phi_\Delta k_r^{A'}}{k_d}=\text{Slope}_0,$$

thus

$$\frac{\text{Slope}_0}{\text{Slope}}=1+\frac{k_A}{k_d}[A]=1+\frac{[A]}{\beta_A}. \qquad (16)$$

Young and co-workers[42,43] and others[44,45] have used this Stern–Volmer equation to obtain β values using low concentrations of the highly reactive fluorescent substrate 1,3-diphenylisobenzofuran (DPBF) as A′. This substrate is more reactive than most so that it decays in a first order manner during continuous irradiation in photosensitized oxidation experiments even in the presence of other substrates. The low concentrations of DPBF are often monitored by following the decrease in its fluorescence. Note that when $k_q^A \gg k_r^A$ (i.e., if A were a physical quencher of singlet oxygen) Eq. (16) applies even for much less reactive substrates than DBPF.

One can also use measurements of the relative rates of disappearance of two substrates in the same solution. Application of the steady-state approximation to steps *1* to *17* (Scheme 1) together with *22* and *23* gives

$$\frac{d[AO_2]/dt}{d[A'O_2]/dt}=\frac{-d[A]/dt}{-d[A']/dt}=\frac{k_r^A[A]}{k_r^{A'}[A']}, \qquad (17)$$

which upon integration gives

$$\frac{\ln([A]_0/[A])}{\ln([A']_0/[A'])}=\frac{k_r^A}{k_r^{A'}}.$$

Equation (17) and its integrated forms have been used to determine values of $\beta_r = k_d/k_r^A$. Equation (17) has also been used to compare rates of oxidation of two substrates A and A′ separately irradiated under identical conditions in the same solvent and to compare the rates for the same substrate in different solvents.[42]

Alternatively, $r_{ox}^{A'}(A)$ and $r_{ox}^{0}(A)$, the rates of oxygenation of A in the presence and absence of A′ respectively, can be evaluated and these will be related by the equation,

$$\left(\frac{r_{ox}^0(A)}{r_{ox}^{A'}(A)}\right)_{t=0}=1+\frac{[A']_0/\beta_{A'}}{1+[A]_0/\beta_A}, \qquad (18)$$

provided A′ does not absorb any exciting light, quench or react with S_1 or T_1. If initial rates are measured keeping $[A]_0$ constant and varying $[A']_0$ then Eq. (18) allows values of $\beta_{A'}$ to be obtained. If $\beta_A \gg [A]_0$ the determination of $\beta_{A'}$ values is simplified.

4.2.4. Sensitized Photo-Oxygenations of a Substrate A′ in the Presence of A=Q, a Physical Quencher of Singlet Oxygen

Consider Scheme 1 with M equal to both A′ and Q, i.e., assuming for the moment that there is no chemical reaction with singlet oxygen by the quencher Q and that it does not absorb the exciting light. Application of the steady-state approximation then predicts

$$(r_{ox}^Q)^{-1}=(I_a\phi_\Delta f_r^{A'})^{-1}\left[1+[A']^{-1}\left(\beta_{A'}+\frac{k_Q[Q]}{k_{A'}}\right)\right], \qquad (19)$$

i.e., a linear relationship between $(r_{ox}^Q)^{-1}$ and $[A']^{-1}$ with

$$\frac{\text{slope}}{\text{intercept}}=\left(\beta_{A'}+\frac{k_Q[Q]}{k_{A'}}\right). \qquad (20)$$

In the absence of quencher, slope/intercept=$\beta_{A'}$ [see also Eq. (15)]. Thus

$$\frac{(\text{slope/intercept})_Q}{(\text{slope/intercept})_0}=1+\frac{k_Q[Q]}{k_d}=1+\beta_Q^{-1}[Q]. \qquad (21)$$

In the absence of quenching of excited singlet and triplet states of the sensitizer the intercepts of $(r_{ox}^Q)^{-1}$ vs $[A']^{-1}$ plots are identical and it follows from Eqs. (19) and/or (21) that

$$\frac{(\text{slope})_Q}{(\text{slope})_0}=1+\beta_Q^{-1}[Q]. \qquad (22)$$

In addition, from Eq. (19) the ratio of the rates of oxygenation in the absence and presence of Q is given by

$$\left(\frac{r_{ox}^{0}(A')}{r_{ox}^{Q}(A')}\right)_{t=0}=1+\frac{k_Q[Q]}{k_d+k_{A'}[A']_0}=1+\frac{[Q]/\beta_Q}{1+[A']_0/\beta_{A'}} \quad (23)$$

cf. Eq. (18). Alternatively if one assumes that [A] does not change appreciably (i.e., for low fractional conversions) Eq. (19) can be integrated to give the concentration of $A'O_2$ produced after time t, which equals the change in concentration of A', $\Delta[A']$, and

$$\frac{[A']_0}{[A'O_2]}=\frac{[A']_0}{\Delta[A']}=\frac{A^0}{\Delta A}$$

$$=(I_a t\phi_\Delta f_r^{A'})^{-1}\left([A']_0+\frac{k_d}{k_{A'}}+\frac{k_Q[Q]}{k_{A'}}\right), \quad (24)$$

where A^0 and ΔA represent the initial absorbance and the change in the absorbance by the reactant A'. Plots of $A^0/\Delta A$ vs [Q] have been shown to be linear and from Eq. (24) it follows that for such plots

$$k_Q=\frac{\text{slope}}{\text{intercept}}(k_d+k_{A'}[A']_0). \quad (25)$$

4.2.5. Sensitized Photo-Oxygenation of a Substrate A' in the Presence of A=Q, a Quencher of Both Singlet Oxygen and the Sensitizer Triplet

The mechanism is that given by Scheme 1 with M=A and Q, together with the reaction *24*.

$$24 \qquad T_1+Q\xrightarrow{k_{TQ}^{Q}}S_0+Q \text{ or } Q^* \text{ or products.}$$

Application of the steady-state approximation gives

$$(r_{ox}^{Q})^{-1}=(I_a\phi_\Delta f_r^{A'})^{-1}\left(\frac{k_{TQ}^{Q}[Q]}{k_{TQ}^{O_2}[O_2]}+1\right)$$

$$\times\left[1+[A']^{-1}\left(\beta_{A'}+\frac{k_Q[Q]}{k_{A'}}\right)\right]. \quad (26)$$

Note that for a plot of $(r_{ox}^{Q})^{-1}$ vs $[A']^{-1}$ the slope/intercept is still given by Eq. (20) since the extra term in Eq. (26) affects both the intercept and slope equally. The presence or absence of this change in intercept for $(r_{ox}^{Q})^{-1}$ vs $[A']^{-1}$ plots can be used as a diagnostic test for the presence of steps such as *24* which reduce the yield of singlet oxygen produced. Another test is the occurrence of a dependence on the concentration of oxygen in solution since reaction *24* competes with oxygen quenching and thus the yield of singlet oxygen becomes dependent on the pressure of oxygen above the solution. (e.g., see Refs. 45, 46).

4.2.6. Separation of k_r and k_q

Apart from Eq. (17) application of all of the equations given so far only allows values of $k_A=k_r^A+k_q^A$ or $k_Q=k_r^Q+k_q^Q$ to be obtained. Methods which have been used to separate k_r and k_q values usually involve the direct measurement of the quantum yields of oxygenation, ϕ_{ox}, for example at high concentrations of A such that $k_A[A]\gg k_d$, in which case it follows from Eq. (14) that

$$(\phi_{ox})_{[A]\to\infty}=\phi_\Delta f_r^A. \quad (27)$$

Alternatively at low values of [A] when $k_d\gg k_A[A]$ Eq. (14) gives

$$\phi_{ox}=\frac{\phi_\Delta k_r^A[A]}{k_d}, \quad (28)$$

and measurement of ϕ_{ox} together with a knowledge of ϕ_Δ, and k_d or β_A allows values of k_r^A or f_r^A to be determined.

The limiting yield of oxygenation of a very reactive acceptor e.g., α-terpinene or 2,5-dimethylfuran (2,5-DMF) for which f_r^A is close to unity (i.e., $k_r^A\gg k_q^A$) may be used as a reference substrate to give values of ϕ_Δ and whence k_r^A for other additives.[47,48]

Gollnick and Griesbeck[49] have, for example, measured the rates of oxygen consumption of various substrates relative to that of 2,5-DMF at concentrations greater than 4×10^{-5} L^{-1}. In this method $k_r^{DMF}\gg k_q^{DMF}$, $r_{ox}^{DMF}=I_a\phi_\Delta$, and

$$\frac{r_{ox}^{DMF}}{r_{ox}^{A}}=\frac{(k_r^A+k_q^A)[A]+k_S[S]+k_\Delta}{k_r^A[A]},$$

or

$$\frac{r_{ox}^{DMF}}{r_{ox}^{A}}=\left(1+\frac{k_q^A}{k_r^A}\right)+\left(\frac{k_\Delta}{k_r^A}+\frac{k_S[S]}{k_r^A}\right)\frac{1}{[A]}, \quad (29)$$

Plots of r_{ox}^{DMF}/r_{ox}^{A} versus $[A]^{-1}$ are linear and the value of k_q^A/k_r^A can be determined from the intercept. Variations in the slope of such plots with the sensitizer concentration allow values of k_S/k_r^A and k_Δ/k_r^A to be determined. If k_Δ is known then k_r^A, k_S, and k_q^A can be determined.[49]

5. Kinetic Analysis for Oxygenation by Singlet Oxygen Generated by Chemical Reaction, by Microwave Discharge, or by Direct Laser Excitation

5.1. When Singlet Oxygen is Produced Chemically

Oxygenation reactions arising from singlet oxygen produced chemically have been studied in the presence and absence of singlet oxygen quenchers. In the absence of quencher the decrease in A is given by the relative probabilities of steps *14*, *15*, and *16*, and *17* with M=A

$$-\frac{d[A]}{dt}=\frac{d[^1O_2^*]}{dt}\left[\frac{k_r^A[A]}{k_d+k_A[A]}\right], \quad (30)$$

which integrates to give

$$\beta_A \ln\left[\frac{[A]_0}{[A]_\infty}\right]+[A]_0-[A]_\infty=f_r^A[^1O_2^*]_\infty,$$

where $[^1O_2^*]_\infty$ is the total amount of singlet oxygen generated chemically. For small fractional conversions

$$\ln\left(\frac{[A]_0}{[A]_\infty}\right)=\left(\frac{[A]_0-[A]_\infty}{[A]_\infty}\right)$$

and substitution gives

$$\frac{1}{\Delta[A]}=(f_r^A[^1O_2^*]_\infty)^{-1}\left[\frac{\beta_A}{[A]_\infty}+1\right], \quad (31)$$

where $\Delta[A]=[A]_0-[A]_\infty$. Thus a plot of $\Delta[A]^{-1}$ vs $[A]^{-1}$ for small conversions has slope/intercept $=\beta_A$. In the presence of a quencher of chemically produced singlet oxygen and a substrate A′

$$\left(\beta_{A'}+\frac{k_Q[Q]}{k_{A'}}\right)\left(\ln\left(\frac{[A']_0}{[A']_\infty}\right)+\Delta[A']\right)=f_r^{A'}[^1O_2^*]_\infty, \quad (32)$$

so that if k_d and $k_{A'}$ are known, Eq. (32) allows k_Q to be evaluated from values of $[A']_0$ and $[A']_\infty$ in the presence of [Q]. With the decomposition of the ozonide $(C_6H_5O)_3P...O_3$ in the presence of pyridine, Mendenhall[50] has shown that there is quantitative generation of $^1O_2^*$ so that $[^1O_2^*]_\infty$ can be replaced by the initial concentration of $(C_6H_5O)_3PO_3$, i.e., $[^1O_2^*]_\infty=[(C_6H_5O)_3PO_3]_0$ and $f_r^{A'}$ is often assumed to be unity when A′ is rubrene.[50]

5.2. When Singlet Oxygen is Produced by Microwave Discharge in the Gas Phase

Equations (31) to (32) also apply to the disappearance of a substrate as a result of reaction of singlet oxygen generated in microwave experiments (as well as for singlet oxygen produced via photosensitization). Taking Eq. (32) for relative measurements with the same initial concentration of substrate $[A_0']$ in the presence and absence of a quencher gives

$$k_Q=\frac{k_{A'}([A']_\infty^Q-[A']_\infty^0)+k_d\ln\left(\frac{[A']_\infty^Q}{[A']_\infty^0}\right)}{[Q]\ln\left(\frac{[A']_0}{[A']_\infty^Q}\right)}, \quad (33)$$

where $[A']_\infty^Q$ and $[A']_\infty^0$ represent the final values after exposure to microwave generated singlet oxygen in the presence and absence of quencher, respectively. Equation (33) has also been used following chemical and photochemical production of $^1O_2^*$ in the absence and presence of a quencher Q (or acceptor A).

5.3. When Singlet Oxygen is Produced by Direct CW Laser Excitation of Oxygen

Evans and Tucker[14] and Matheson and co-workers[11–13,35,51] have used laser excitation of highly concentrated oxygen solutions in high pressure cells, with gaseous oxygen up to 130 atm, to give directly the $^1O_2^*(^1\Delta_g)$ state by absorption at 1065 nm from a CW Nd YAG laser and $^1O_2^*(^1\Delta_g)$ directly from the "double simultaneous transition" using He–Ne laser excitation at 632.8 nm. Evans and Tucker[14] find the quantum yields of photo-oxygenation of 9,10-dimethylanthracene and tetraphenylcyclopentadiene are twice as high for absorption of a photon in the "double simultaneous transition" as for the direct excitation of a single $^1\Delta_g$ state. Modification of Eq. (15) to account for the direct excitation by replacing ϕ_Δ by $n=1$ or 2 for excitation at 1065 nm or 633 nm, respectively, gives

$$\frac{1}{\phi_{ox}}=\frac{1}{n}\left[\frac{k_A}{k_r^A}+\frac{k_d}{k_r^A[A]}\right] \quad (34)$$

and plots of ϕ_{ox}^{-1} vs $[A]^{-1}$ can be used to give f_r^A and β_A values.

Matheson *et al.*[11–13,35,51,52] have obtained experimental pseudo first order rate constants for the disappearance of various substrates while directly producing $^1O_2^*(^1\Delta_g)$ with a CW Nd YAG laser. Since the absorption involves the process

$$2\ ^3O_2(^3\Sigma_g^-,^3\Sigma_g^-)+h\nu\rightarrow{}^1O_2^*(^1\Delta_g)+{}^3O_2(^3\Sigma_g^-)$$

Eq. (14) has been modified by them to give

$$-\frac{d[A]}{dt}=\frac{\sigma E[O_2]^2k_r^A[A]}{k_d+k_A[A]+k_{O_2}[O_2]}, \quad (35)$$

where E is the laser intensity and σ the absorption cross section for double photon absorption. At high oxygen concentration where $k_{O_2}[O_2]\gg(k_d+k_A[A])$ the observed first order rate constant k_1 is given by

$$k_1=\frac{\sigma E[O_2]k_r^A}{k_{O_2}}. \quad (36)$$

Thus from a knowledge of σ, E, and $[O_2]$ values of k_r^A relative to k_{O_2} can be obtained. In the presence of a singlet oxygen quencher at relatively high concentrations and a substrate A′

$$k_1=\frac{\sigma E[O_2]^2k_r^{A'}}{k_{O_2}[O_2]+k_Q[Q]} \quad (37)$$

and a plot of $([O_2]/k_1)$ vs $([Q]/[O_2])$ will have a slope/intercept$=k_Q/k_{O_2}$.

Values obtained using this method have often been substantially lower than those given by other workers. According to Matheson[51,52] this was due, partially at least, to an artifact with the over depletion of the acceptor concentration in the laser beam cross section so that the observed chemical reaction rate may be affected by diffusion of unreactive acceptor into the depleted region. Thus values for k_r^A determined in this way published prior to 1977 may be low by up to an order of magnitude and have been omitted from this compilation.

6. First Order Rate Constants for the Decay of Singlet Oxygen in Various Solvents—Comments on Table 1

Table 1 contains decay rates of singlet oxygen in 145 solvents and solvent mixtures. Many of the data have been reported as lifetimes (τ), the reciprocal of the decay rate, which have been tabulated. The decay rate (k_d) column contains reported values as well as values calculated from lifetimes. The values in both columns are rounded to two significant figures. When the data were reported with one significant

figure, or when the quoted error exceeded 20%, only one significant figure is given. The *Method, Comment,* and *Reference* columns (see Secs. 7.2.4–7.2.6) provide details of the measurements. Only data obtained by time-resolved methods have been included except for solvents where no such measurements have been reported but where estimates have been made from steady-state measurements.

The data for each solvent are listed in reverse chronological order, so that the most recent entries appear first. It is apparent from Table 1 that k_d values tend to decrease with year of publication especially for solvents with values $<10^2$ s^{-1}. For such solvents the presence of impurities including water and high concentrations of sensitizers can give inaccurate values. It is likely that the lower the k_d values the higher the accuracy. Usually there is good agreement between different authors for k_d values $>10^3$ s^{-1}.

The lifetime of singlet oxygen shows an enormous solvent dependence, including a large isotope effect, and variations over almost five orders of magnitude from a few microseconds in water to hundreds of milliseconds in carbon tetrachloride. The reason for this is that the nonradiative deactivation is essentially a bimolecular energy transfer reaction between $O_2^*(^1\Delta_g)$ and the solvent molecules which thereby become vibrationally excited. The first interpretation by Merkel and Kearns[32] that the electronic vibrational energy transfer was a dipole resonance transfer has been replaced by an exchange transfer mechanism following important contributions by Schuster *et al.*,[27,53] Rodgers,[54] and Schmidt *et al.*[55–58] The bimolecular rate constant for solvent deactivation k_{sol} can be obtained from

$$k_D = k_0 + k_{sol}[sol],$$

where k_0 is an intrinsic molecular rate constant probably equal to $k_{\Delta P}$, the rate constant for radiative decay, and [sol] represents the concentration of the solvent in mol L^{-1} calculated from the density and the molecular weight of the solvent; k_{sol} can be shown to depend on the availability of high energy X–Y, especially C–H and O–H, vibrations in the molecule. Thus several workers have shown that

$$k_{sol} = \sum_{XY} N_{XY} k_{XY},$$

where N_{XY} is the number of times a particular X–Y bond occurs in the molecule. In this way values for k_{XY} have been calculated, which can be used to calculate k_{sol} values for solvents for which values of k_d have not been experimentally determined. Since $k_{\Delta P}$ varies from 0.1 to 3 s^{-1}, k_0 is often negligible compared with $k_{sol}[sol]$, but for solvents containing no high energy vibrations values of $k_{\Delta P}$ have been used by Schmidt to obtain k_{XY} values from k_D, for example in CCl_4 and CS_2 which show the lowest values for k_D.

We made several attempts to calculate k_{XY} values from the k_d values in Table 1 which includes solvents with C–H, C–D, C=O, O–H, O–D, C≡N, C–F, C–Cl, C–Br, C–I, C=S, and S=O bonds. We used the formula

$$k_d/[sol] = \sum_{XY} N_{XY} k_{XY}$$

as the basis for a least squares fitting of the measured values of k_d to obtain a set of values for k_{XY}. The procedure resulted in negative values for some parameters and statistical uncertainties for many that were larger than the value of the parameter. Restricting the data set, for example by eliminating solvents containing halogens, deuterium and sulfur and measured values which deviated significantly from the average, did not eliminate this problem. Separation of C–H bonds into classes (CH_3, CH_2, CH, cycloalkyl, aromatic) and perhaps other X–Y bonds as well, and the selection of standard k_d values appear to be crucial to establishing a set of k_{XY} values.

7. Second-order Rate Constants for Reactive and Physical Quenching of Singlet Oxygen by Various Substrates—Comments on Tables 2–17

7.1. Scope of the Compilation

Second-order rate constants for quenching of singlet oxygen are given in 16 tables containing 4683 separate entries for 1915 substrates. The data have been extracted from the literature published through 1993. The papers have been selected from the bibliographic database of the Radiation Chemistry Data Center and from citations in those papers. Data reported by the same author(s) which have been clearly superseded have been omitted. For some well-studied systems many independent measurements have been made; all reported values have been included allowing the user to make comparisons based on method, similarity of values, etc. Data from dissertations and conference papers have been included only if no other measurements for the substrate in that solvent have been reported. The authors would welcome having our attention drawn to any data which have been missed.

7.2. Arrangement of Tables

Each table includes related groups of compounds, e.g., olefins, aromatic hydrocarbons, phenols, etc. In some cases choices were made based on functionality, for example tyrosine and its peptides are in Table 4 with phenols instead of Table 10 (amino acids and peptides). Benzopyranols (such as tocopherol) are in Table 4 (phenols) instead of Table 5 (furans and pyrans). Cysteine and methionine and their derivatives are in Table 11 (sulfur compounds), not Table 10 (amino acids).

Within each table the various substrates are arranged alphabetically by name, given an entry number which includes the table number (2.1, 2.2, etc.) and within each entry the arrangement is by solvent. Inverted names have been used as headings whenever possible so that substituted anthracenes, porphines, phenols, etc. are grouped. Systematic names have been used in most cases, otherwise, common names have been given. An index of chemical names and synonyms and a molecular formula index follow the tables (Secs. 13 and 14) and refer to the entry numbers in Tables 2–17.

7.2.1. Solvent

Data in each entry are grouped by solvent and listed in reverse chronological order of the year of publication. The *Solvent* column gives the solvent or mixture of solvents with the proportions (volume:volume). Micellar systems are labelled (mic), and the surfactant present is given in the *Comment*. When water or D_2O is the solvent the pH or pD is given, if reported. If the reaction was studied over a range of pH values and the k derived for a particular ionic form of the substrate no pH is given in the *Solvent* column and the pH range is given in the *Comment* column.

7.2.2. Rate Constants (k) and Beta (k_d/k) Values

The rate constants in the second column are for total quenching by chemical reaction and/or physical quenching, $k=k_r+k_q$, except where separate reactive quenching (k_r) and physical quenching (k_q) rate constants have been measured. It may be known from other studies that a particular substrate interacts with singlet oxygen totally by chemical reaction ($f_r^A = 1$) or totally by physical quenching; an example of the latter is azide ion. We have, however, only provided the labels k_r and k_q when a method was used which made the distinction. Values of β which have been reported are listed in the third column. When the ratio is k_d/k_r the label β_r is used.

Values of k and β have been rounded to two significant figures unless they were given to only one significant figure by the authors. The authors' error limits have been omitted; when the reported error is greater than 20% the values have been given to one significant figure. Upper or lower limits have been given to only one significant figure.

7.2.3. Temperature

Temperatures in Kelvin are listed whenever they have been reported. When the information has not been reported it is assumed that the temperature is ambient. If the study has been carried out over a range of temperatures the range is given in the *Comment* column.

7.2.4. Method

The *Method* column describes the method by symbols (see Sec. 9) representing the excitation technique, the measurement technique, and the equation numbers given in the previous sections which have been used for analyzing the data. For example, PL/Ld-2 represents the pulsed-laser luminescence-decay technique and refers to Eq. (2). If two measurement techniques or equations were used the symbols are combined. For example, CP/Oc,Ac-17 indicates that excitation was by continuous photolysis, oxygen consumption (Oc) and substrate consumption (Ac) were measured, and the rate constant was derived using Eq. (17).

7.2.5. Comment

Some details of the determination are given in the *Comment* column. Abbreviations and symbols are listed in Sec. 9 for chemical species which have been used as photosensitizer (S) or reference substrate (A′). The source of the $^1O_2^*$ is given when it was generated in a chemical reaction. Values for k_d which have been used by the author to calculate k from β (k_d/k) are given. The reader is referred to Table 1 to compare these values with the various measured values of k_d for a particular solvent. In some cases values of $\beta_{A'}$ for the reference substrate have been used to calculate β (or to calculate k also using a value of k_d) and those values are given in the *Comment*. Data are available for some substrates only as ratios with a reference substrate (e.g., $k_r^A/k_r^{A'}$). When a value for the rate constant for the reference substrate has been used by the author(s) to calculate k, the reference value which was used is given in the *Comment* column. When rate constants have not been calculated by the authors the ratios are given in the *Comment* column and no value appears in the k column; the ratios have been rounded to two significant figures. Since ratios of rate constants refer equally to both substrates, the reference substrates (A′) have been included in the Chemical Name Index (Sec. 14) with the entry number(s) in which ratios of rate constants with another substrate are present or can be derived. For example, Acetone azine appears in Table 15 (entry 15.3) but rate constants for another substrate relative to k_r for acetone azine are found in entry 2.40. There is no entry in the tables for 9-Acetyl-2,3,4,9-tetrahydrocarbazole but relative data are found in entries 6.2, 6.3, 6.10, 6.14, 6.18, and 6.19.

Other data are included when they have been reported: activation energy (E_a), activation volume ($\Delta V^{\ddagger}$), enthalpy of activation ($\Delta H^{\ddagger}$), entropy of activation ($\Delta S^{\ddagger}$), along with the temperature or pressure ranges of the study. For some entries where product appearance (Pa) was measured the products have been given.

7.2.6. References

The rate constants have been compiled from more than 700 references which are identified in the *Reference* column by codes from the Radiation Chemistry Data Center Bibliographic Database. The first two characters of the reference code represents the year of publication. The complete references to Tables 1–17 are listed in Sec. 12 which follows the tables.

8. Mechanism of Quenching

Two recent reviews[1,2] discuss bimolecular processes of singlet molecular oxygen in detail. Most results can be explained in terms of exciplex formation followed by competing reactions involving energy transfer (ET), charge transfer (CT) or chemical reaction as shown.

$$^1O_2^*(^1\Delta_g)+Q \rightleftarrows {}^1[Q^{\delta+}\ldots O_2^{\delta-}] \begin{cases} \xrightarrow{k_{ET}} {}^3Q^* + O_2(^3\Sigma_g^-) \\ \xrightarrow{k_{CT}} {}^1Q + O_2(^3\Sigma_g^-) \\ \xrightarrow{k_r} \text{Products.} \end{cases}$$

It is well established that quenching of singlet oxygen arises from chemical reaction and/or physical quenching or a combination of both. Physical quenching due to the spin allowed electronic energy transfer process

$$^1O_2^*(^1\Delta_g)+{}^1Q\rightarrow{}^3Q^*+O_2(^3\Sigma_g^-)$$

has been demonstrated to occur by direct observation of the triplet state of the quencher, e.g., in the case of various carotenes.[37] This type of quenching is diffusion controlled when the triplet energy of the quencher lies below 94 kJ mol^{-1} and has been proposed as the mechanism of quenching to account for the high efficiency of quenching of singlet oxygen by certain dyes and several coordination complexes.[59,60] Quenching of singlet oxygen by electronic energy transfer is the reverse of reaction *11* which is likely to be a limiting factor for finding sensitizers absorbing in the red for use in photodynamic therapy.[61] Physical quenching of singlet oxygen as discussed in Sec. 6, also arises as a result of electronic to vibrational energy transfer, where the pseudo-first order decay constant in a particular solvent depends on the availability of high energy vibrations for example O–H and C–H vibrations in the solvent molecule. This kind of process is obviously possible for all substrates but is often much less efficient than physical quenching resulting from charge transfer interactions.

Physical quenching resulting from favorable charge transfer interactions was first demonstrated with various amines.[62,63] This type of quenching may be represented as follows:

$$\begin{aligned}^1O_2^*(^1\Delta_g)+{}^1Q &\rightleftarrows {}^1[Q^{\delta+}\ldots O_2^{\delta-}]\\ &\rightleftarrows {}^3[Q^{\delta+}\ldots O_2^{\delta-}]\\ &\rightarrow {}^1Q+O_2(^3\Sigma_g^-).\end{aligned}$$

If the charge transfer complexes shown above are able to dissociate to give separated ions this constitutes chemical quenching, although the production of O_2^- (superoxide) has only been demonstrated for highly polar solvents such as water and with compounds with exceptionally low ionization potentials such as *N,N,N′,N′*-tetramethyl-*p*-phenylenediamine.[64] The temperature dependence of the rate constants observed[65] for singlet oxygen quenching by strychnine and DABCO in toluene has established complex formation during the quenching process. The efficiency of quenching by amines increases when the ionization potential of the amine decreases, which is also the case for quenching by phenols and sulfides which give similar Hammett plots.[66,67] Quenching by amines, phenols and, sulfides shows varying amounts of chemical reaction.

Chemical reactions of singlet oxgen have been discussed in detail in a number of reviews.[68–72] Alkenes react to form hydroperoxides, 1,2-dioxetanes, and endoperoxides, which are often produced in the case of other substrates, for example in the case of aromatic hydrocarbons, furans, etc. Recent research[73,74] has revealed that intermediates exist along the reaction coordinate and there has been much speculation concerning the nature of these intermediates. Since it is known that tryptophan is one of the main targets when $O_2^*(^1\Delta_g)$ reacts with protein[75,76] there has been considerable interest in studying rate constants for reaction of singlet oxgen with tryptophan in a variety of solvents. As with many other amino acids[77] reactive quenching only accounts for part of the total quenching of singlet oxygen observed. It has been shown[78] that singlet oxygen causes single-strand breaks in DNA and that guanine is the nucleoside base from which oxidative products are derived. As with all substrates it is important to establish that particular products arise as a result of reactions of singlet oxygen. It is hoped that this compilation will help with establishing the importance of singlet oxygen reactions in the photodegradation of dyes, pigments, polymers, etc, as well as in harmful and/or beneficial photooxidations in biological systems.

9. List of Abbreviations and Symbols

Excitation Methods

CL	continuous laser photolysis
CP	continuous photolysis
CR	chemical reaction
FP	flash photolysis
MD	microwave discharge
MP	modulated photolysis
PL	pulsed laser photolysis
PR	pulsed radiolysis

Measurement Methods

Ac	substrate consumption under steady-state conditions
A′c	reference substrate consumption under steady-state conditions
Ad	time resolved substrate disappearance
A′d	time resolved reference substrate disappearance
βCd	triplet beta-carotene decay as a probe for singlet oxygen decay
Ld	luminescence decay
LI	luminescence intensity under steady-state conditions
Oc	oxygen consumption under steady-state conditions
Pa	product appearance under steady-state conditions
P′a	product appearance (from reference substrate) under steady-state conditions
Pb	time-resolved product buildup
P′b	time-resolved product buildup (from reference substrate)
Tb	time-resolved thermal buildup

Other Symbols

A	primary substrate
A′	reference substrate
A″	second reference substrate
β	beta value including both β_q and β_r
β_q	beta value for physical quenching of $^1O_2^*$
β_r	beta value for chemical reaction
E_a	activation energy
$\Delta H^{\ddagger}$	enthalpy of activation

$\Delta S^{\ddagger}$	entropy of activation
$\Delta V^{\ddagger}$	activation volume
f_r^A	fraction of $^1O_2^*$ quenched by A which reacts
k	rate constant including both k_q and k_r
k_A	rate constant for primary substrate, including both k_q and k_r
$k_{A'}$	rate constant for reference substrate, including both k_q and k_r
k_d	first-order decay rate of singlet oxygen in solvent
k_Δ	first-order decay rate of singlet oxygen for [S]→0
k_Q	rate constant for reference substrate which is a physical quencher
k_q	rate constant for physical quenching of $^1O_2^*$
k_r	rate constant for chemical reaction of $^1O_2^*$
k_S	rate constant for reaction of $^1O_2^*$ with sensitizer
mic	micelles
P	product of primary substrate
P′	product of reference substrate
ϕ_Δ	quantum yield of singlet oxygen formation
ϕ_{isc}	quantum yield of intersystem crossing
ϕ_{ox}	quantum yield of oxidation of substrate
Q	reference substrate which is a physical quencher
r_{ox}	rate of oxygenation
S	sensitizer
ves	vesicles

Sensitizers, Reference Substrates, and Medium Components

Ac	Acridine
2-ACN	2-Acetonaphthone
ADC	Anthra[1,9-*bc*:4,10-*b′c′*]dichromene
ADPA	9,10-Anthracenedipropionate ion
AES	Anthracene-9,10-bis(ethanesulfate ion)
AlCl(tspc)	Chloroaluminum(III) sulfophthalocyanine
An	Anthracene
AnS	Anthracenesulfonate
AOT	Di(2-ethylhexyl) sulfosuccinate
azine	2-Pivaloyl-4-phenyl-6-diethylamino-8-methyl-quinoxal-3-one
Azo dye 10	*N*-[3-(Aminosulfonyl)phenyl]-3-[(3-cyano-5-hydroxy-1-phenylpyrazol-4-yl)azo]-4-methoxybenzenesulfonamide
BA	1,2-Benzanthracene
BChl	Bacteriochlorophyll
BDX	Benzo[1,2,3-*kl*:4,5,6-*k′l′*]dixanthene
BHMF	2,5-Bis(hydroxymethyl)furan
BHT	2,6-Di-*tert*-butyl-4-methylphenol
Biph	Biphenyl
BP	Benzophenone
BR	Bilirubin
Brij 35	Polyoxyethylene(23) dodecyl ether
BuOH	Butanol
BXP	Benoxaprofen
Car	all-*trans*-Carotene
CHD	Cyclohexadiene
Chl	Chlorophyll
Chr	Chrysene
Cor	Coronene
CQ	Camphoroquinone
CTAB	Hexadecyltrimethylammonium bromide
CTAC	Hexadecyltrimethylammonium chloride
CuTCPc	Copper(II) tetracarboxyphthalocyanine
DABCO	1,4-Diazabicyclo[2.2.2]octane
DAP	Dodecylammonium propionate
DBrA	9,10-Dibromoanthracene
DCA	9,10-Dicyanoanthracene
DClA	9,10-Dichloroanthracene
DDAB	Didodecyldimethylammonium bromide
DDM	Diazodiphenylmethane [1,1′-(Diazomethylene) bisbenzene]
DLPC	Dilauroyl phosphatidylcholine
DMA	9,10-Dimethylanthracene
DMAA	*N*,*N*-Dimethylacetamide
$DMAO_2$	9,10-Dimethylanthracene endoperoxide
DMBA	9,10-Dimethyl-1,2-benzanthracene
DMDPA	1,4-Dimethoxy-9,10-diphenylanthracene
2,5-DMF	2,5-Dimethylfuran
DMF	*N*,*N*-Dimethylformamide
DMHD	2,5-Dimethyl-2,4-hexadiene
$DMNO_2$	1,4-Dimethylnaphthalene 1,4-endoperoxide
DNT	1,8-Dinaphthalene thiophene (Diacenaphtho[1,2-*b*:1′,2′-*d*]thiophene)
DODAC	Dioctadecyldimethylammonium chloride
DPA	9,10-Diphenylanthracene
DPB	1,4-Diphenyl-1,3-butadiene
DPBF	1,3-Diphenylisobenzofuran
DPF	2,5-Diphenylfuran
DPPC	Dipalmitoyl phosphatidylcholine
DTAC	Dodecyltrimethylammonium chloride
Eos	Eosin (Tetrabromofluorescein)
Ery	Erythrosin (Tetraiodofluorescein)
ES	Ergosterol
EtOH	Ethanol
FFA	Furfuryl alcohol
Fl	Fluorene
Fl^{2-}	Fluorescein
FlN_2	9-Diazofluorene
FMN	Flavin mononucleotide (Riboflavin-5′-phosphate)
GaCl(tspc)	Chlorogallium(III) sulfophthalocyanine
GV	Gilvocarcin V
HA	Hypocrellin A
HCD	Heterocoerdianthrone
3-HF	3-Hydroxyflavone
His	Histidine
HP	Hematoporphyrin
HPD	Hematoporphyrin derivative
HYP	Hypericin
Im	Imidazole
InH	Indole
MB	Methylene Blue
2M2B	2-Methyl-2-butene
MC 540	Merocyanine 540
MCH	Methylcyclohexane
MDH	Mesodiphenylhelianthrene
MeOH	Methanol

Met Methionine
$MNPO_2$ 4-Methyl-1-naphthalenepropionate endoperoxide
8-MOP 8-Methoxypsoralen
MP Mesoporphyrin
2M2P 2-Methyl-2-pentene
MPDME Mesoporphyrin dimethyl ester
NAZ Nitrazepam
$NDPO_2$ 1,4-Naphthalenedipropionate endoperoxide
NMTA *N*-Methylthioacridone
Np Naphthalene
NT2 Octaethylpurpurin ethyl ester
i-octane 2,2,4-Trimethylpentane
OMAPB 2-Methylacetophenone biradical
PBA 1-Pyrenebutyrate ion
PBN Phenyl-*N*-*tert*-butylnitrone
PEO Polyethylene oxide
Per Perylene
Ph Pheophytin
Phen Phenanthrene
PHO Phenalen-1-one
Poly-RB Polymer supported Rose Bengal
PP Protoporphyrin
PPDME Protoporphyrin dimethyl ester
PrOH Propanol
PrPor 2,7,12,17-Tetrapropylporphycene
Pso Psoralen
Pt(DHBA)(DPA) Platinum(II) (3,4-dihydroxybenzoate) (2,2′- dipyridylamine)
Pt(phen)(BCAT) Platinum(II) (1,10-phenanthroline) (*tert*-butylcatechol)
Pt(phen)(CAT) Platinum(II) (1,10-phenanthroline) (catechol)
Pt(phen)(DMT) Platinum(II) (1,10-phenanthroline) (3,4-dimercaptotoluene)
PTSA Pyrenetetrasulfonate ion
Pur Purpurin
py Pyridine
Py Pyrene
Pz Phenazine
RB Rose Bengal (Tetrachlorotetraiodofluorescein)
RBCE Rose Bengal complexed with dicyclohexyl-18-crown-6
Ret *all-trans*-Retinal
RF Riboflavin
$RF(OAc)_4$ Riboflavin tetraacetate
Rub Rubrene (5,6,11,12-Tetraphenylnaphthacene)
Rubi Rubicene (Benz[*a*]indenol[1,2,3-*hi*]acean-thrylene)
SDS Sodium dodecylsulfate
SiNC Bis(tri-*n*-hexylsiloxy)-(2,3-naphthalocyaninato) silicon
TAN 2,2,6,6-Tetramethylpiperidone-1-oxyl
TEMP 2,2,6,6-Tetramethylpiperidine
TEMPO 2,2,6,6-Tetramethylpiperidin-1-oxyl
TEMPOH 2,2,6,6-Tetramethylpiperidin-1-ol
TEMP-4-OH 2,2,6,6-Tetramethylpiperidin-4-ol
Tetr Tetracene (Naphthacene)
Th Thionine
THF Tetrahydrofuran
TMDT 2,6,10-Trimethyl-2,6,10-dodecatriene
TME 2,3-Dimethyl-2-butene (Tetramethylethylene)
T(m-HOP)P Tetra(3-hydroxyphenyl)porphyrin
TMS α,β,β-Trimethylstyrene
TPBC *trans*-Tetraphenylbacteriochlorin
TPP Tetraphenylporphyrin
H_2TPPS^{4-} Tetra(4-sulfonatophenyl)porphyrin
Triton X-100 Polyoxyethylene(10)4-(1,1,3,3-tetramethyl-butyl)phenyl ether
TTMPP Tetra(3,4,5-trimethoxyphenyl)porphyrin
TTT Terthiophene
UP Uroporphyrin I
VD_3 Vitamin D_3
Zn(pc) Zinc(II) phthalocyanine
$Zn(pc)(py)_2$ Zinc(II) phthalocyaninebis(pyridine)
Zn(tspc) Zinc(II) sulfophthalocyanine
ZnTPP Zinc(II) tetraphenylporphyrin

10. ACKNOWLEDGMENTS

The Radiation Laboratory at the University of Notre Dame is operated under Contract DE-AC02-76ER0038 with the Department of Energy. The Radiation Chemistry Data Center is supported jointly by the Office of Basic Energy Sciences of the Department of Energy and the National Institute of Standards and Technology, Standard Reference Data. This is Radiation Laboratory Document No. NDRL-3772.

11. References to Text

[1]Lissi, E.A.; Encinas, M.V.; Lemp, E.; Rubio, M.A., *Chem. Rev.* **93**: 699-723 (1993) [93Z073]

[2]Gorman, A.A., *Adv. Photochem.* **17**: 217-74 (1992) [92Z144]

[3]Dougherty, T.J., *Adv. Photochem.* **17**: 275-311 (1992) [92Z145]

[4]Foote, C.S., *Free Radicals in Biology. Volume 2.*, W.A. Pryor (ed.), Academic Press, New York, 1976, p.85-133 [763101]

[5]Wilkinson, F.; Brummer, J.G., *J. Phys. Chem. Ref. Data* **10**: 809-999 (1981) [81Z251]

[6]Wilkinson, F.; Helman, W.P.; Ross, A.B., *J. Phys. Chem. Ref. Data* **22**: 113-262 (1993) [93Z042]

[7]Gorman, A.A.; Rodgers, M.A.J., *CRC Handbook of Organic Photochemistry, Vol. II*, J.C. Scaiano (ed.), CRC Press, Inc., Boca Raton, FL, 1989, p.229-47 [89Z221]

[8]Childs, W.H.J.; Mecke, R., *Z. Phys.* **68**: 344-61 (1931) [319004]

[9]Wallace, L.; Hunten, D.M., *J. Geophys. Res.* **73**: 4813-34 (1968) [68M108]

[10]Bodesheim, M.; Schuetz, M.; Schmidt, R., *Chem. Phys. Lett.* **221**: 7-14 (1994) [94E113]

[11]Matheson, I.B.C.; Lee, J.; Yamanashi, B.S.; Wolbarsht, M.L., *J. Am. Chem. Soc.* **96**: 3343-8 (1974) [747102]

[12]Matheson, I.B.C.; Lee, J., *J. Am. Chem. Soc.* **94**: 3310-3 (1972) [72F513]

[13]Matheson, I.B.C.; Lee, J., *Photochem. Photobiol.* **29**: 879-81 (1979) [79A112]

[14]Evans, D.F.; Tucker, J.N., *J. Chem. Soc., Faraday Trans. 2* **72**: 1661-6 (1976) [767417]

[15]Singh, A.; Koroll, G.W.; Antonsen, S.A., *J. Photochem.* **25**: 99-104 (1984) [84F190]

[16]Evans, D.F., *J. Chem. Soc.* : 1351-7 (1957) [57B004]

[17]Tsubomura, H.; Mulliken, R.S., *J. Am. Chem. Soc.* **82**: 5966 (1960) [60B009]

[18]Birks, J.B., *Photophysics of Aromatic Molecules*, Wiley-Interscience, New York, 1970, 704p. [706229]

[19]Scurlock, R.D.; Ogilby, P.R., *J. Phys. Chem.* **93**: 5493-500 (1989) [89E309]

[20]Kristiansen, M.; Scurlock, R.D.; Iu, K.-K.; Ogilby, P.R., *J. Phys. Chem.* **95**: 5190-7 (1991) [91E297]

[21]Logunov, S.L.; Rodgers, M.A.J., *J. Phys. Chem.* **97**: 5643-8 (1993) [93E220]

[22]McGarvey, D.J.; Wilkinson, F.; Worrall, D.R.; Hobley, J.; Shaikh, W., *Chem. Phys. Lett.* **202**: 528-34 (1993) [93A026]

[23]Gorman, A.A.; Lovering, G.; Rodgers, M.A.J., *J. Am. Chem. Soc.* **100**: 4527-32 (1978) [78E263]

[24]Carlsson, D.J.; Suprunchuk, T.; Wiles, D.M., *Can. J. Chem.* **52**: 3728-37 (1974) [747341]

[25]Foote, C.S., *Acc. Chem. Res.* **1**: 104-10 (1968) [68F282]

[26]Byteva, I.M.; Gurinovitch, G.P., *J. Lumin.* **21**: 17-20 (1979) [79E669]

[27]Hurst, J.R.; McDonald, J.D.; Schuster, G.B., *J. Am. Chem. Soc.* **104**: 2065-7 (1982) [82E104]

[28]Ogilby, P.R.; Foote, C.S., *J. Am. Chem. Soc.* **104**: 2069-70 (1982) [82E106]

[29]Gorman, A.A.; Hamblett, I.; Land, E.J., *J. Am. Chem. Soc.* **111**: 1876-7 (1989) [89E113]

[30]Rossbroich, G.; Garcia, N.A.; Braslavsky, S.E., *J. Photochem.* **31**: 37-48 (1985) [85E591]

[31]Merkel, P.B.; Kearns, D.R., *Chem. Phys. Lett.* **12**: 120-22 (1971) [719325]

[32]Merkel, P.B.; Kearns, D.R., *J. Am. Chem. Soc.* **94**: 7244-53 (1972) [727260]

[33]Adams, D.R.; Wilkinson, F., *J. Chem. Soc., Faraday Trans. 2* **68**: 586-93 (1972) [727126]

[34]Young, R.H.; Brewer, D.; Keller, R.A., *J. Am. Chem. Soc.* **95**: 375-9 (1973) [737014]

[35]Matheson, I.B.C.; Lightner, D.A., *Photochem. Photobiol.* **29**: 933-5 (1979) [79A113]

[36]Okamoto, M., *J. Phys. Chem.* **96**: 245-8 (1992) [92A014]

[37]Farmilo, A.; Wilkinson, F., *Photochem. Photobiol.* **18**: 447-50 (1973) [737438]

[38]Krasnovsky, A.A.,Jr., *Photochem. Photobiol.* **29**: 29-36 (1979) [79A010]

[39]Jenny, T.A.; Turro, N.J., *Tetrahedron Lett.* **23**: 2923-6 (1982) [82E329]

[40]Losev, A.P.; Nichiporovich, I.N.; Byteva, I.M.; Drozdov, N.N.; Al Jghgami, I.F., *Chem. Phys. Lett.* **181**: 45-50 (1991) [91E288]

[41]Gollnick, K., *Adv. Chem. Ser.* **77**: 78-101 (1968) [68F289]

[42]Young, R.H.; Wehrly, K.; Martin, R.L., *J. Am. Chem. Soc.* **93**: 5774-9 (1971) [717398]

[43]Young, R.H.; Martin, R.L.; Chinh, N.; Mallon, C.; Kayser, R.H., *Can. J. Chem.* **50**: 932-8 (1972) [72F510]

[44]Thomas, M.J.; Foote, C.S., *Photochem. Photobiol.* **27**: 683-93 (1978) [78A171]

[45]Greenstock, C.L.; Wiebe, R.H., *Photochem. Photobiol.* **28**: 863-7 (1978) [78N003]

[46]Foote, C.S.; Chang, Y.C.; Denny, R.W., *J. Am. Chem. Soc.* **92**: 5216-8 (1970) [707188]

[47]Schenck, G.O.; Gollnick, K.; Neumueller, O.A., *Ann. Chem.* **603**: 46-59 (1957) [57F008]

[48]Tanielian, C.; Chaineaux, J., *J. Photochem.* **9**: 19-32 (1978) [78A344]

[49]Gollnick, K.; Griesbeck, A., *Tetrahedron* **40**: 3235-50 (1984) [84F335]

[50]Carlsson, D.J.; Mendenhall, G.D.; Suprunchuk, T.; Wiles, D.M., *J. Am. Chem. Soc.* **94**: 8960-2 (1972) [727319]

[51]Matheson, I.B.C.; Toledo, M.M., *Photochem. Photobiol.* **25**: 243-8 (1977) [777129]

[52]Matheson, I.B.C., *Photochem. Photobiol.* **29**: 875-8 (1979) [79A111]

[53]Hurst, J.R.; Schuster, G.B., *J. Am. Chem. Soc.* **105**: 5756-60 (1983) [83E398]

[54]Rodgers, M.A.J., *J. Am. Chem. Soc.* **105**: 6201-5 (1983) [83A223]

[55]Schmidt, R.; Brauer, H.-D., *J. Am. Chem. Soc.* **109**: 6976-81 (1987) [87E658]

[56]Schmidt, R., *J. Am. Chem. Soc.* **111**: 6983-7 (1989) [89E388]

[57]Schmidt, R.; Afshari, E., *Ber. Bunsenges. Phys. Chem.* **96**: 788-94 (1992) [92E256]

[58]Schmidt, R., *Ber. Bunsenges. Phys. Chem.* **96**: 794-9 (1992) [92Y093]

[59]Herkstroeter, W.G., *J. Am. Chem. Soc.* **97**: 4161-7 (1975) [757247]

[60]Singh, R.J.; Feix, J.B.; Kalyanaraman, B., *Photochem. Photobiol.* **55**: 483-9 (1992) [92A123]

[61]Rihter, B.D.; Kenney, M.E.; Ford, W.E.; Rodgers, M.A.J., *J. Am. Chem. Soc.* **112**: 8064-70 (1990) [90E508]

[62]Young, R.H.; Martin, R.L., *J. Am. Chem. Soc.* **94**: 5183-5 (1972) [72F514]

[63]Monroe, B.M., *J. Phys. Chem.* **81**: 1861-4 (1977) [777486]

[64]Manring, L.E.; Foote, C.S., *J. Phys. Chem.* **86**: 1257-9 (1982) [82A080]

[65]Gorman, A.A.; Hamblett, I.; Lambert, C.; Spencer, B.; Standen, M.C., *J. Am. Chem. Soc.* **110**: 8053-9 (1988) [88A427]

[66]Young, R.H.; Brewer, D.; Kayser, R.; Martin, R.; Feriozi, D.; Keller, R.A., *Can. J. Chem.* **52**: 2889-93 (1974) [747245]

[67]Monroe, B.M., *Photochem. Photobiol.* **29**: 761-4 (1979) [79A085]

[68]Gollnick, K.; Kuhn, H.J., *Singlet Oxygen*, H.H. Wasserman and R.W. Murray (eds.), Academic Press, New York, N.Y., 1979, Vol. 40 of Organic Chemistry, p.287-427 [79Z111]

[69]Frimer, A.A., *Singlet Oxygen. Vol. II*, CRC Press, Inc., Boca Raton, FL, 1985, 284p. [85Z260]

[70]Frimer, A.A., *Singlet Oxygen. Vol. III*, CRC Press, Inc., Boca Raton, FL, 1985, 269p. [85Z261]

[71]Clennan, E.L., *Adv. Oxygenated Processes* **1**: 85-122 (1988) [88Z421]

[72]Clennan, E.L., *Tetrahedron* **47**: 1343-82 (1991) [91Z295]

[73]Hurst, J.R.; Schuster, G.B., *J. Am. Chem. Soc.* **104**: 6854-6 (1982), 105: 4501 (1983) [82A342]

[74]Gorman, A.A.; Gould, I.R.; Hamblett, I., *J. Am. Chem. Soc.* **104**: 7098-104 (1982) [82A349]

[75]Edwards, A.M.; Silva, E., *Radiat. Environ. Biophys.* **24**: 141-8 (1985) [85F114]

[76]Reddi, E.; Lambert, C.R.; Jori, G.; Rodgers, M.A.J., *Photochem. Photobiol.* **45**: 345-51 (1987) [87A064]

[77]Miskoski, S.; Garcia, N.A., *Photochem. Photobiol.* **57**: 447-52 (1993) [93R059]

[78]Sies, H.; Menck, C.F.M., *Mutat. Res.* **275**: 367-75 (1992) [92R287]

TABLE 1. Decay constants for singlet oxygen in various solvents.

No.	Solvent	k_d (s^{-1})	τ ($1/k_d$) (s)	Method	Comment	Ref.
1.1	**Acetone**					
		2.0×10^4	5.1×10^{-5}	PL/Ld-2	S = MB, TPP or PHO.	92E256
		1.9×10^4	5.4×10^{-5}	PL/Ld-2	S = HVD and PPDME.	92E274
		2.6×10^4	3.8×10^{-5}	PL/Ld-2	S = RB.	89E324
		2.3×10^4	4.3×10^{-5}	PL/Ld-2	S = TPP.	89E324
		2.4×10^4	4.1×10^{-5}	PL/Ld-2	S = MB.	89E700
		2.2×10^4	4.6×10^{-5}	PL/Ld-2	S = RB.	89E700
		2.1×10^4	4.8×10^{-5}	PL/Ld-2	S = HP.	89E700
		2.0×10^4		PL/Ld-2	S = Ac.	87E466
		1.8×10^4	5.5×10^{-5}	PL/Ld-2	S = An.	87E668
		2.1×10^4	4.7×10^{-5}	PL/Ld-2	S = An.	87E959
		2.5×10^4	4.0×10^{-5}	PL/Tb-3	S = An.	85E591
		2.1×10^4	4.7×10^{-5}	PL/Tb-3	S = ZnTPP.	85E591
		2.0×10^4	5.0×10^{-5}	PL/Ld-2	S = 2-ACN.	84E066
		4.0×10^4	2.5×10^{-5}	PL/Tb-3	S = Ery.	83A050
		3.3×10^4	3.0×10^{-5}	PL/Tb-3	S = TPP.	83A050
		2.0×10^4	5.0×10^{-5}	PL/Ld-2	S = HPDME.	83A223
		2.1×10^4	4.7×10^{-5}	PL/Ld-2	S = MPDME; no change in k at T = 192 to 295 K.	83E235 82E106
		2.0×10^4	5.1×10^{-5}	PL/Ld-2	S = Sulfo- and carboxyanthracenes.	83E844
		2.2×10^4	4.6×10^{-5}	PL/Ld-2	S = MPDME.	83F196
		2.8×10^4	3.6×10^{-5}	PL/Ad-8	S = An; A = DPBF.	82A349
		2.6×10^4	3.9×10^{-5}	PL/Ld-2	S = MB.	82E104
		2.5×10^4	4.0×10^{-5}	PL/Ld-2	S = RB.	82E104
		2.0×10^4	5.1×10^{-5}	PL/Ld-2	S = TPP.	82E104
		1.5×10^4	6.5×10^{-5}	PL/Ld-2	S = HP.	82E105
		2.6×10^4	3.9×10^{-5}	CP/LI-12	S = Benz[*de*]anthracen-7-one, phenalenone or fluorenone; rel. to $k_d = 4.0 \times 10^4$ s^{-1} in benzene.	82E329
		1.8×10^4	5.5×10^{-5}	PL/Ad-5	S = 2-ACN; A = DPBF; cor. for k_S.	81A287
		2.0×10^4	5.1×10^{-5}	PL/Ld-2	S = PdMPDME.	81E398 83E818 79E846
		2.0×10^4	5.0×10^{-5}	PL/Ld-2	S = TPP.	81E631
		2.4×10^4	4.2×10^{-5}	PL/Ad-8	S = MB, A = DPBF.	76F903
		4×10^4	3×10^{-5}	PL/Ad-5	S = MB, A = DPBF.	727260
1.2	**Acetone-d_6**					
		1.0×10^3	9.9×10^{-4}	PL/Ld-2	S = MB, TPP or PHO.	92E256
		1.6×10^3	6.4×10^{-4}	PL/Ld-2	S = RB; varied [S] and extrapolated to [S] = 0.	89E324
		8.2×10^3	1.2×10^{-4}	PL/Tb-3	S = An.	85E591
		1.7×10^3	5.8×10^{-4}	PL/Ld-2	S = HPDME.	83A223
		1.2×10^3	8.6×10^{-4}	PL/Ld-2	S = MB, RB or TPP.	83E398
		2.6×10^3	3.9×10^{-4}	PL/Ld-2	S = PdMPDME.	83E818
		1.2×10^3	8.4×10^{-4}	PL/Ld-2	S = HP.	82E105
		1.4×10^3	6.9×10^{-4}	PL/Ld-2	S = MPDME.	82E106 83E235
		1.3×10^3	7.7×10^{-4}	CP/LI-12	S = Benz[*de*]anthracen-7-one, phenalenone or fluorenone; rel. to $k_d = 4.0 \times 10^4$ s^{-1} in benzene.	82E329
		1×10^3	8×10^{-4}	PL/Ad-5	S = 2-ACN; A = Rub; cor. for k_S.	81A287

TABLE 1. Decay constants for singlet oxygen in various solvents. — Continued

No.	Solvent	k_d (s^{-1})	τ ($1/k_d$) (s)	Method	Comment	Ref.
1.3	**Acetonitrile**					
		1.4×10^4	7.1×10^{-5}	PL/Ld-2	S = DCA.	93A244
		1.3×10^4	7.7×10^{-5}	PL/Ld-2	S = Ac.	93A244
		1.4×10^4		PL/Ld-2	S = Chr; rate decreased linearly with magnetic field strength, by 4-7% at 21kG.	93E183
		1.6×10^4	6.0×10^{-5}	PL/Ld-2	S = $Ru(bpy)_3^{2+}$.	92A095
		1.3×10^4	7.7×10^{-5}	PL/Ld-2	S = MB, TPP or PHO.	92E256
		1.3×10^4	8.0×10^{-5}	PL/Ld-2	S = 1-MeNp.	91E297
		1.3×10^4		PL/Ld-2	S = Ac.	89A099
		1.3×10^4	7.5×10^{-5}	PL/Ld-2	S = OMAPB; extrapolated to zero laser dose.	89A241
		1.2×10^4	8.3×10^{-5}	PL/Ld-2	S = RB or H_2TPPS^{4-}.	89A322 93U041
		3.0×10^4	3.3×10^{-5}	PL/Tb-3	S = $(C_6H_5)_2CO$.	89E232
		1.8×10^4	5.5×10^{-5}	PL/Ld-2	S = RB.	89E324
		1.7×10^4	6.0×10^{-5}	PL/Tb-3	S = Ac.	88Z155
		1.5×10^4	6.7×10^{-5}	PL/Ld-2	S = Np, Biph, or Fl.	87E234
		1.2×10^4		PL/Ld-2	S = Ac.	87E466
		1.8×10^4	5.5×10^{-5}	PL/Ld-2	S = An.	87E668
		1.2×10^4	8.7×10^{-5}	PL/Ld-2	S = RB; from high intensity photolysis; M = $^1O_2$*.	87F333
		1.9×10^4	5.4×10^{-5}	PL/Ld-2	$^1O_2$* from 9,10-diphenylanthracene endoperoxide.	86F337
		2.1×10^4	4.8×10^{-5}	PL/Tb-3	S = An.	85E591
		1.8×10^4	5.6×10^{-5}	PL/Ld-2	S = 2-ACN.	84E066
		2.8×10^4	3.6×10^{-5}	PL/Tb-3	S = Ery.	83A050
		1.7×10^4	5.8×10^{-5}	PL/Ld-2	S = HPDME.	83A223
		1.6×10^4	6.4×10^{-5}	PL/Ld-2	S = MPDME.	83F196
		2.9×10^4	3.5×10^{-5}	PL/Ad-8	S = An; A = DPBF.	82A349
		1.6×10^4	6.1×10^{-5}	PL/Ld-2	S = RB.	82E104
		1.5×10^4	6.8×10^{-5}	PL/Ld-2	S = MB.	82E104
		1.8×10^4	5.4×10^{-5}	PL/Ld-2	S = MPDME.	82E106 83E235
		1.7×10^4	5.8×10^{-5}	CP/LI-12	S = Benz[*de*]anthracen-7-one, phenalenone or fluorenone; rel. to $k_d = 4.0 \times 10^4$ s^{-1} in benzene.	82E329
		1.1×10^4	9.2×10^{-5}	PL/Ad-5	S = 2-ACN; A = DPBF; cor. for k_S.	81A287
		1.8×10^4	5.7×10^{-5}	PL/Ad-8	S = MB, A = DPBF.	76F903
		3×10^4	3×10^{-5}	PL/Ad-5	S = MB, A = DPBF.	727260
1.4	**Acetonitrile/Water (50:50)**					
		6.7×10^4	1.5×10^{-5}	PL/Ld-2	S = 9-Anthracenemethanol.	93P069
		4.5×10^4	2.2×10^{-5}	PL/Ld-2	S = RB.	93R059
1.5	**Acetonitrile-d_3**					
		9.0×10^2	1.1×10^{-3}	PL/Ld-2	S = Chr.	93E183
		8.2×10^2	1.2×10^{-3}	PL/Ld-2	S = RB or H_2TPPS^{4-}	89A322 93U041
		6.7×10^2	1.5×10^{-3}	PL/Ld-2	S = Pz.	89E597
		1.7×10^3	6.0×10^{-4}	PL/Ld-2	S = RB; from high intensity photolysis; M = $^1O_2$*.	87F333
		9.3×10^3	1.1×10^{-4}	PL/Tb-3	S = An.	85E591
		1.6×10^3	6.2×10^{-4}	PL/Ld-2	S = HPDME.	83A223

TABLE 1. Decay constants for singlet oxygen in various solvents. — Continued

No.	Solvent	k_d (s^{-1})	$\tau(1/k_d)$ (s)	Method	Comment	Ref.
1.5	**Acetonitrile-d_3** — Continued					
		2.3×10^3	4.4×10^{-4}	PL/Ld-2	S = MB, RB or TPP.	83E398
		1.7×10^3	6.0×10^{-4}	PL/Ld-2	S = MPDME.	82E106 83E235
		1.1×10^3	9.5×10^{-4}	CP/LI-12	S = Benz[*de*]anthracen-7-one, phenalenone or fluorenone; rel. to $k_d = 4.0 \times 10^4$ s^{-1} in benzene.	82E329
		8×10^2	1×10^{-3}	PL/Ad-5	S = 2-ACN; A = Rub; cor. for k_S.	81A287
1.6	**Acetophenone**					
		3.8×10^4		PL/Ad-5	S = MB; A = DPBF.	83A371 83A006
1.7	**Benzene**					
		3.2×10^4	3.1×10^{-5}	PL/Ld-2	S = TPP; $\Delta V‡ = -8.3$ cm^3 mol^{-1}; studied from 0.1 MPa to 250 MPa.	93A017
		3.3×10^4	3.0×10^{-5}	PL/Ld-2	S = Ac.	93A244
		3.3×10^4	3.0×10^{-5}	PL/Ld-2	S = Chr.	93E183
		3.3×10^4	3.0×10^{-5}	PL/Ld-2	S = MB, TPP or PHO.	92E256
		3.3×10^4	3.0×10^{-5}	PL/Ld-2	S = TPP.	92E555
		3.4×10^4		PL/Ld-2	S = TPP.	92F251
		3.2×10^4	3.1×10^{-5}	PL/Ld-2	S = 1-MeNp.	91E297
		3.3×10^4	3.0×10^{-5}	PL/Ld-2	S = Np, Pz and BP.	90A328
		3.2×10^4	3.1×10^{-5}	PL/Ld-2	S = Por.	90E374
		3.2×10^4	3.1×10^{-5}	PL/Ld-2	S = An.	90E400
		7.4×10^4	1.4×10^{-5}	PL/Ld-2	S = CHD.	89A235
		3.3×10^4	3.0×10^{-5}	PL/Ld-2	S = TPP.	89A322 93U041
		3.9×10^4	2.6×10^{-5}	PL/Ld-2	S = Ac.	89E324
		3.2×10^4	3.1×10^{-5}	PL/Ld-2	S = TPP.	89E388
		3.1×10^4	3.2×10^{-5}	PL/Ld-2	S = TPP.	89E700
		$\sim 3.4 \times 10^4$	$\sim 2.9 \times 10^{-5}$	PL/Ld-2	S = $(C_6H_5)_2CO$.	88E452
		3.2×10^4	3.1×10^{-5}	PL/Ld-2	S = TPP.	88F503
		3.3×10^4	3.0×10^{-5}	PL/Tb-3	S = $(C_6H_5)_2CO$.	88Z155
		3.0×10^4	3.3×10^{-5}	PL/Ld-2	S = TPP.	87E055
		3.1×10^4	3.2×10^{-5}	PL/Ld-2	S = Np, Bp, or Fl.	87E234
		3.3×10^4		PL/Ld-2	S = Ac.	87E466
		3.3×10^4	3.0×10^{-5}	PL/Ld-2	S = An.	87E668
		3.6×10^4	2.8×10^{-5}	PL/Ld-2	S = An.	87E959
		2.9×10^4	3.5×10^{-5}	PL/Ld-2	S = SiNC; reversible energy transfer with sensitizer proposed.	87R032
		4.1×10^4		PL/Ad-8	S = PP; A = DPBF.	85A124
		3.4×10^4	2.9×10^{-5}	PL/Tb-3	S = ZnTPP.	85E591
		3.3×10^4	3.0×10^{-5}	PL/Tb-3	S = An.	85E591
		3.2×10^4	3.1×10^{-5}	PL/Ld-2	S = 2-ACN.	84E066
		4.0×10^4		PL/Ad-5	S = 2-ACN; A = DPBF.	84F005
		4.3×10^4	2.3×10^{-5}	PL/Tb-3	S = TPP.	83A050
		3.2×10^4	3.1×10^{-5}	PL/Ld-2	S = HPDME.	83A223
		3.1×10^4	3.2×10^{-5}	PL/Ld-2	S = MB, RB or TPP.	83E398
		3.4×10^4	2.9×10^{-5}	PL/Ld-2	S = MPDME.	83F196
		3.7×10^4	2.7×10^{-5}	PL/Ld-2	S = MPDME.	82E106 83E235

TABLE 1. Decay constants for singlet oxygen in various solvents. — Continued

No.	Solvent	k_d (s^{-1})	τ ($1/k_d$) (s)	Method	Comment	Ref.
1.7	**Benzene** — Continued					
		3.5×10^4	2.8×10^{-5}	PL/Ad-5	S = 2-ACN; A = DPBF; cor. for k_S.	81A287
		3.3×10^4	3.0×10^{-5}	PL/Ld-2	S = PdMPDME.	81E398 83E818 79E846
		4.0×10^4		PL/Ld-2	S = An.	80A143
		3.7×10^4	2.7×10^{-5}	PR/Ad-5	S = Np, A = DPBF.	78E263
		4.1×10^4		PL/βCd-11	S = An, Q = Car.	78F276
		3.7×10^4	2.7×10^{-5}	PL/Ad-8	S = MB, A = DPBF.	76F903
		4.1×10^4		PL/βCd-11	S = An, Q = Car.	737438
		3.9×10^4		PL/Ad-8	S = An, A = DPBF.	737438
		4×10^4	2×10^{-5}	PL/Ad-5	S = MB, A = DPBF.	727260
1.8	**Benzene (mic)**					
		5.0×10^4	2.0×10^{-5}	PL/Tb-3	S = Ery; reverse micelles contg. 0.04 mol L^{-1} DAP and 0.1 mol L^{-1} water.	83A050
1.9	**Benzene/Methanol (80:20)**					
		4×10^4	2.6×10^{-5}	PL/Ad-8	S = MB, A = DPBF.	737014
1.10	**Benzene-d_6**					
		1.7×10^3	5.9×10^{-4}	PL/Ld-2	S = Chr.	93E183
		1.3×10^3	7.8×10^{-4}	PL/Ld-2	S = C_{60} or C_{70}.	93E301
		1.5×10^3	6.8×10^{-4}	PL/Ld-2	S = MB, TPP or PHO.	92E256
		1.5×10^3	6.5×10^{-4}	PL/Ld-2	S = Np, Pz and BP.	90A328
		1.5×10^3	6.8×10^{-4}	PL/Ld-2	S = An.	90E400
		1.5×10^3		PL/Ld-2	S = TPP.	89A331
		1.6×10^3	6.2×10^{-4}	PR/Ld-2	S = 2-ACN.	89E113
		1.3×10^3	7.9×10^{-4}	PL/Ld-2	S = TPP.	89E388
		1.3×10^3	7.7×10^{-4}	PL/Ld-2	S = Pz.	89E597
		1.6×10^3	6.3×10^{-4}	PL/Ld-2	S = Pur.	89R044
		2.6×10^3	3.8×10^{-4}	PL/Tb-3	S = An.	85E591
		1.6×10^3	6.3×10^{-4}	PL/Ld-2	S = HPDME.	83A223
		1.4×10^3	7.0×10^{-4}	PL/Ld-2	S = MB, RB or TPP.	83E398
		3.2×10^3	3.1×10^{-4}	PL/Ld-2	S = PdMPDME.	83E818
		1.6×10^3	6.2×10^{-4}	PL/Ld-2	S = Cercosporin.	83R123
		1.8×10^3	5.5×10^{-4}	PL/Ld-2	S = MPDME.	82E106 83E235
		1.5×10^3	6.8×10^{-4}	CP/LL-12	S = Benz[*de*]anthracen-7-one, phenalenone or fluorenone; rel. to $k_d = 4.0 \times 10^4$ s^{-1} in benzene.	82E329
		1×10^3	1×10^{-3}	PL/Ad-5	S = 2-ACN; A = DPBF; cor. for k_S.	81A287
		2×10^3	7×10^{-4}	PL/Ad-5	S = 3,6-Bis(dibutylamino)phenothiazinium bromide; A = Rub.	81A287
		2.8×10^4	3.6×10^{-5}	PL/Ad-8	S = MB, A = DPBF.	76F902
1.11	**Benzene-d_6/Benzene (95:5)**					
		4.0×10^3	2.5×10^{-4}	PL/Ld-2	S = TPP.	89A322 93U041
1.12	**Benzonitrile**					
		2.5×10^4		PL/Ld-2	S = Ac.	87E466
		3.1×10^4		PL/Ad-5	S = A = Rub; .	83F075

TABLE 1. Decay constants for singlet oxygen in various solvents. — Continued

No.	Solvent	k_d (s^{-1})	τ ($1/k_d$) (s)	Method	Comment	Ref.
1.13	**Bromobenzene**					
		2.4×10^4	4.2×10^{-5}	PL/Ld-2	S = TPP.	89E388
		2.0×10^4		PL/Ld-2	S = Rub.	87E466
		2.0×10^4	5.0×10^{-5}	PL/Ld-2	S = MB, RB or TPP.	83E398
1.14	**Bromobenzene/Methanol (80:20)**					
		4.3×10^4	2.3×10^{-5}	PL/Ad-8	S = MB, A = DPBF.	737014
1.15	**Bromobenzene-d_5**					
		7.4×10^2	1.4×10^{-3}	PL/Ld-2	S = TPP.	89E388
		1.2×10^3	8.1×10^{-4}	PL/Ld-2	S = MB, RB or TPP.	83E398
1.16	**Bromoform**					
		5.9×10^3	1.7×10^{-4}	PL/Ld-2	S = PdMPDME.	81E398 83E818
		2×10^4	5×10^{-5}	PL/Ld-2	S = PdMPDME.	79E846
1.17	**Bromopentafluorobenzene**					
		46	0.022	MP/Ld-2	S = TPP.	89E388
1.18	**1-Bromopropane**					
		1×10^5	1×10^{-5}	PL/βCd-11	S = An, Q = Car.	76F902
		1×10^5	8×10^{-6}	PL/Ad-8	S = MB, A = DPBF.	76F902
1.19	**1-Butanol**					
		5.7×10^4	1.8×10^{-5}	PL/Ld-2	S = An.	87E668
		5.7×10^4	1.8×10^{-5}	PL/Ld-2	S = HPDME.	83A223
		5.2×10^4	1.9×10^{-5}	PL/Ad-8	S = MB, A = DPBF.	737014
1.20	**2-Butanol**					
		6.2×10^4	1.6×10^{-5}	PL/Ld-2	S = RB.	89E324
		5.1×10^4	2.0×10^{-5}	PL/Ld-2	S = HPDME.	83A223
1.21	**2-Butoxyethanol**					
		$\sim 3.8 \times 10^5$		MD/Ac-33	A = Rub, Q = DABCO. Assumed $k_Q = 3.4 \times 10^7$ L mol^{-1} s^{-1} and $k_A = 7.0 \times 10^7$ L mol^{-1} s^{-1}; T = 273K.	727319
1.22	**Butylbenzene**					
		4.0×10^4	2.5×10^{-5}	PL/Ld-2	S = O_2:solvent CT state.	90E220
1.23	**Carbon disulfide**					
		22	0.045	MP/Ld-2	S = MB, TPP or PHO; $k_d = 13$ s^{-1} for $[O_2] \leq 10^{-5}$ mol L^{-1}.	92E256
		34	0.029	MP/Ld-2	S = TPP.	89A400
		29	0.034	MP/Ld-2	S = TPP.	87E658
		6.6×10^2	1.5×10^{-3}	FP/Ld-2	S = Per.	82A322
		5×10^3	2×10^{-4}	PL/Ad-5	S = MB, A = DPBF, k_d cor. for 1% MeOH content.	727260
1.24	**Carbon disulfide/Methanol (98:2)**					
		4.0×10^3	2.5×10^{-4}	FP/Ad-5	S = MB, A = DPBF.	737334
1.25	**Carbon tetrachloride**					
		17	0.059	MP/Ld-2	S = MB, TPP or PHO; $k_d = 7.8$ s^{-1} for $[O_2] \leq 10^{-5}$ mol L^{-1}.	92E256
		1.3×10^3	7.7×10^{-4}	PL/Ld-2	S = TPP.	89A322 93U041

TABLE 1. Decay constants for singlet oxygen in various solvents. — Continued

No.	Solvent	k_d (s^{-1})	$\tau(1/k_d)$ · (s)	Method	Comment	Ref.
1.25	**Carbon tetrachloride** — Continued					
		36	0.028	FP/Ld-2	S = PdMP; very dilute soln.	88E018
		36	0.028	PL/Ld-2	S = TPP.	88F503
		36	0.028	PL/Ld-2	S = Ph a.	88R193
		11	0.087	MP/Ld-2	S = TPP.	87E658
		1.0×10^3	1.0×10^{-3}	PL/Ld-2	S = An.	87E668
		36	0.028	PL/Ld-2	S = TPP.	86F316
		1.1×10^3	9.0×10^{-4}	PL/Ld-2	S = TPP.	82E104
		32	0.031	CP/LI-12	S = Benz[*de*]anthracen-7-one, phenalenone or fluorenone; rel. to $k_d = 4.0 \times 10^4$ s^{-1} in benzene.	82E329
		38	0.026	PL/Ld-2	S = PdMPDME.	81E398 79E846
		38	0.026	PL/Ld-2	S = TPP.	81E631
		38	0.026	PL/Ld-2	S = PdMPDME or MPDME; decay at 1272 or 1588 nm.	80E558
		36	0.028	PL/Ld-2	S = Ret.	79F463
1.26	**Carbon tetrachloride/Methanol (98:2)**					
		3.3×10^3		PL/Ad-5	S = MB; A = DPBF.	83A006
		3.2×10^3	3.1×10^{-4}	FP/Ad-5	S = MB, A = DPBF.	78E238
1.27	**Chlorobenzene**					
		2.3×10^4	4.3×10^{-5}	PL/Ld-2	S = TPP.	89E388
		2.3×10^4		PL/Ld-2	S = Ac.	87E466
		2.2×10^4	4.5×10^{-5}	PL/Ld-2	S = An.	87E668
		2.2×10^4		PL/Ad-5	S = MB; A = DPBF.	83A371 83A006
		2.0×10^4	5.1×10^{-5}	PL/Ld-2	S = MB, RB or TPP.	83E398
		2.4×10^4	4.2×10^{-5}	PL/Ld-2	S = PdMPDME.	81E398 83E818
1.28	**Chlorobenzene-d_5**					
		8.3×10^2	1.2×10^{-3}	PL/Ld-2	S = MB, RB or TPP.	83E398
1.29	**Chloroform**					
		4.4×10^3	2.3×10^{-4}	PL/Ld-2	S = MB, TPP or PHO.	92E256
		6.0×10^3	1.7×10^{-4}	PL/Ld-2	S = HVD and PPDME.	92E274
		4.0×10^3	2.5×10^{-4}	PL/Ld-2	S = TPP.	90E731 92R076
		3.8×10^3	2.6×10^{-4}	PL/Ld-2	S = TPP.	89E700
		5.0×10^3	2.0×10^{-4}	PL/Tb-3	S = Pz.	88Z155
		4.0×10^3	2.5×10^{-4}	PL/Ld-2	S = An.	87E668
		1.6×10^4	6.2×10^{-5}	PL/Tb-3	S = TPP.	83A050
		4.0×10^3	2.5×10^{-4}	PL/Ld-2	S = MB, RB or TPP.	83E398
		6.3×10^3	1.6×10^{-4}	CP/LI-12	S = Benz[*de*]anthracen-7-one, phenalenone or fluorenone; rel. to $k_d = 4.0 \times 10^4$ s^{-1} in benzene.	82E329
		2.4×10^3	4.1×10^{-4}	PL/Ad-5	S = 2-ACN; A = DPBF; cor. for k_S.	81A287
		4.0×10^3	2.5×10^{-4}	PL/Ld-2	S = PdMPDME.	81E398 83E818 79E846
		4.2×10^3	2.4×10^{-4}	PL/Ld-2	S = PdMPDME or MPDME; decay at 1588 nm.	80E558

TABLE 1. Decay constants for singlet oxygen in various solvents. — Continued

No.	Solvent	k_d (s^{-1})	τ ($1/k_d$) (s)	Method	Comment	Ref.
1.29	**Chloroform** — Continued					
		9.0×10^3		PL/Ad-5	S = MB, A = DPBF.	78F061
		4×10^3	2×10^{-4}	PL/Ad-8	S = MB, A = DPBF.	76F903
		2×10^4	6×10^{-5}	PL/Ad-5	S = MB, A = DPBF. k_d decreases by 50% on lowering the temperature from 298 to 223K.	757088
1.30	**Chloroform/Ethanol (50:50)**					
		3.0×10^4	3.3×10^{-5}	PL/Ld-2	S = Zn(pc)(py)$_2$.	92E654
1.31	**Chloroform-*d***					
		1.4×10^2	7.0×10^{-3}	MP/Ld-2	S = MB, TPP or PHO; $k_d = 1.1 \times 10^2$ s^{-1} for $[O_2] \leq 10^{-5}$ mol L^{-1}.	92E256
		1.1×10^2	9.4×10^{-3}	MP/Ld-2	S = TPP.	87E658
		1.6×10^3	6.4×10^{-4}	PL/Ld-2	S = MB, RB or TPP.	83E398
		2.8×10^2	3.6×10^{-3}	CP/LI-12	S = Benz[*de*]anthracen-7-one, phenalenone or fluorenone; rel. to $k_d = 4.0 \times 10^4$ s^{-1} in benzene.	82E329
		2.8×10^2	3.6×10^{-3}	PL/Ld-2	S = Benz[*de*]anthracen-7-one, phenalenone or fluorenone.	82E329
		1×10^3	9×10^{-4}	PL/Ad-5	S = 2-ACN; A = Rub; cor. for k_S.	81A287
		1.2×10^3	8.4×10^{-4}	PL/Ld-2	S = PdMPDME.	81E398 83E818 79E846
		3×10^3	3×10^{-4}	PL/Ad-5	S = MB, A = DPBF.	757088
1.32	**Chloropentafluorobenzene**					
		41	0.024	MP/Ld-2	S = TPP.	89E388
1.33	**Chlorotrifluoromethane**					
		1.0×10^3	1.0×10^{-3}	PL/Ad-5	S = MB, A = DPBF, k_d cor. for 1-2% MeOH content.	757088
1.34	**Cyclohexane**					
		4.3×10^4	2.3×10^{-5}	PL/Ld-2	S = MB, TPP or PHO.	92E256
		4.3×10^4	2.3×10^{-5}	PL/Ld-2	S = 1-MeNp.	91E297
		4.2×10^4	2.4×10^{-5}	PL/Ld-2	S = 2-ACN.	90N078
		4.3×10^4	2.4×10^{-5}	PL/Ld-2	S = Np, Bp, or Fl.	87E234
		5.2×10^4		PL/Ld-2	S = Ac.	87E466
		5.0×10^4		PL/Ad-5	S = 2-ACN; A = DPBF.	84F005
		5.0×10^4	2.0×10^{-5}	PL/Tb-3	S = TPP.	83A050
		4.3×10^4	2.3×10^{-5}	PL/Ld-2	S = HPDME.	83A223
		5.0×10^4	2.0×10^{-5}	PL/Ad-8	S = An; A = DPBF.	82A349
		5.9×10^4	1.7×10^{-5}	CP/LI-12	S = Benz[*de*]anthracen-7-one, phenalenone or fluorenone; rel. to $k_d = 4.0 \times 10^4$ s^{-1} in benzene.	82E329
		4.3×10^4	2.3×10^{-5}	PL/Ld-2	S = PdMPDME.	81E398
		5.9×10^4	1.7×10^{-5}	PL/Ad-5	S = MB, A = DPBF, k_d cor. for 2% MeOH content.	727260
1.35	**Cyclohexane (mic)**					
		5.9×10^4	1.7×10^{-5}	PL/Tb-3	S = Ery; reverse micelles contg. 0.04 mol L^{-1} DAP and 0.1 mol L^{-1} water.	83A050
1.36	**Cyclohexane-d_{12}**					
		2.2×10^3	4.5×10^{-4}	PL/Ld-2	S = Chr; from high intensity photolysis; M = $^1O_2$*.	87F333

TABLE 1. Decay constants for singlet oxygen in various solvents. — Continued

No.	Solvent	k_d (s^{-1})	τ ($1/k_d$) (s)	Method	Comment	Ref.
1.36	**Cyclohexane-d_{12}** — Continued					
		3.1×10^3	3.2×10^{-4}	CP/LI-12	S = Benz[*de*]anthracen-7-one, phenalenone or fluorenone; rel. to $k_d = 4.0 \times 10^4$ s^{-1} in benzene.	82E329
1.37	**Cyclohexanol**					
		6.6×10^4	1.5×10^{-5}	PL/Ld-2	S = HPDME; T = 308K.	83A223
		6.3×10^4	1.6×10^{-5}	PL/Ad-8	S = MB, A = DPBF.	76F903
1.38	**Decane**					
		3.6×10^4	2.8×10^{-5}	PL/Ld-2	S – TPP.	83A223
1.39	**Decyl alcohol**					
		5.6×10^4	1.8×10^{-5}	PL/Ld-2	S = HPDME.	83A223
1.40	**Deuterium oxide**					
		1.8×10^4	5.5×10^{-5}	PL/Ld-2	S = $Ru(bpy)_3^{2+}$; pH = 6.8.	92A095
		1.5×10^4	6.8×10^{-5}	PL/Ld-2	S = MB, TPP or PHO.	92E256
		1.8×10^4	5.5×10^{-5}	PL/Ld-2	S = H_2TPPS^{4-}, CAPcS, $SnTPPSCl_2^{4-}$ or $ZnPCS^{3-}$; Soln. contg. 2×10^{-3} mol L^{-1} phosphate buffer and 1% NaCl wt/wt.	90A022
		1.7×10^4	6.0×10^{-5}	PL/Ld-2	S = 4-Thiouridine.	90E312
		1.4×10^4	7.0×10^{-5}	PL/Ld-2	S = RB or H_2TPPS^{4-}; pD = 3.	89A322 93U041
		1.6×10^4	6.4×10^{-5}	PL/Ld-2	S = RB, TPP or H_2TPPS^{4-}; 1.0 mol L^{-1} NaOD.	89A322 93U041
		1.5×10^4	6.8×10^{-5}	PL/Ld-2	S = MB.	89E388
		1.6×10^4	6.1×10^{-5}	PL/Ld-2	S = Chlorin e_6; pD = 8.1.	89E505
		1.5×10^4	6.5×10^{-5}	PL/Ld-2	S = HP.	89E700
		1.4×10^4	7.0×10^{-5}	PL/Ld-2	S = MB.	89E700
		1.9×10^4	5.2×10^{-5}	PL/Ld-2	S = AlCl(tspc); pH = 7.	89R092
		1.7×10^4	6.0×10^{-5}	PL/Ld-2	S = $Ru(bpy)_3^{2+}$; pH = 7; O_2 saturated.	88A105
		1.7×10^4	5.8×10^{-5}	PL/Ld-2	S = 2-AnS; pH = 7.	88A398
		1.5×10^4	6.7×10^{-5}	PL/Ld-2	S = H_2TPPS^{4-}.	88F503
		1.5×10^4	6.8×10^{-5}	PL/Ld-2	S = UP.	87E234
		1.7×10^4	6.0×10^{-5}	PL/Ld-2	S = H_2TPPS^{4-}.	87E941
		1.5×10^4	6.7×10^{-5}	PL/Ld-2	S = RF; pD = 7.	87F290
		1.7×10^4	5.9×10^{-5}	PL/Ld-2	S = H_2TPPS^{4-}; pH = 7.	86A198
		1.6×10^4	6.3×10^{-5}	PL/Ld-2	$^1O_2$* from $NDPO_2$.	86A264
		1.6×10^4	6.3×10^{-5}	PL/Ld-2	S = $C_6H_5CO_2^{\cdot}$.	86A264
		1.5×10^4	6.7×10^{-5}	PL/Ld-2	S = H_2TPPS^{4-}.	86F316
		1.5×10^4	6.8×10^{-5}	PL/Ld-2	S = H_2TMpyP^{4+}.	84E296
		1.8×10^4	5.5×10^{-5}	PL/Ld-2	S = H_2TPPS^{4-}.	83A223
		2.3×10^4	4.4×10^{-5}	PL/Ld-2	S = H_2TPPS^{4-}.	83E756
		2.3×10^4	4.4×10^{-5}	PL/Ld-2	S = $PdTPPS^{4-}$.	83E818
		1.5×10^4	6.7×10^{-5}	PL/Ld-2	S = Sulfo- and carboxyanthracenes.	83E844
		1.9×10^4	5.4×10^{-5}	PL/Ad-5	S = PBA; A = Crocetin; pD = 8.4.	82A204
		1.7×10^4	5.8×10^{-5}	PL/Ld-2	S = MB.	82E104
		1.5×10^4	6.8×10^{-5}	PL/Ld-2	S = RB or Th.	82E106 83E235
		$\sim 2.2 \times 10^4$	$\sim 4.5 \times 10^{-5}$	PL/Ld-2	S = HP.	81E704
		1.9×10^4		PL/Ad-5	S = MB; A = ADPA.	80A205

TABLE 1. Decay constants for singlet oxygen in various solvents. — Continued

No.	Solvent	k_d (s^{-1})	τ ($1/k_d$) (s)	Method	Comment	Ref.
1.41	**Deuterium oxide (mic)**					
		1.6×10^4	6.1×10^{-5}	PL/Ld-2	S = Chlorin e_6; pD = 8.1; Soln. cont. 10^{-3} mol L^{-1} Triton X-100.	89E505
		2.1×10^4	4.9×10^{-5}	PL/Ad-5	S = HYP; A = DPBF; BRIJ 35 micelles.	88N343
		2.8×10^4	3.6×10^{-5}	PL/Ld-2	S = Ppb a; Triton X-100 micelles.	88R193
		2.3×10^4	4.3×10^{-5}	PL/Ld-2	S = UP; 0.5 mol L^{-1} SDS.	87E234
		1.8×10^3	5.7×10^{-5}	PL/Ld-2	S = H_2TPPS^{4-}; 10^{-2} mol L^{-1} SDS.	83N084
		1.8×10^3	5.6×10^{-5}	PL/Ld-2	S = H_2TPPS^{4-}; 10^{-2} mol L^{-1} CTAB.	83N084
		1.9×10^3	5.2×10^{-5}	PL/Ld-2	S = H_2TPPS^{4-}; 0.1 mol L^{-1} Brij.	83N084
		2.9×10^3	3.5×10^{-5}	PL/Ld-2	S = H_2TPPS^{4-}; 10^{-2} mol L^{-1} DDAB.	83N084
		1.6×10^3	6.2×10^{-5}	PL/Ld-2	S = H_2TPPS^{4-}; 10^{-5} mol L^{-1} HSA.	83N084
		3.1×10^3	3.2×10^{-5}	PL/Ld-2	S = H_2TPPS^{4-}; 20 mg/mL Triton X-100.	83N084
		2.2×10^4	4.6×10^{-5}	PL/Ad-5	S = 2-ACN; A = DPBF; vesicles (4.0×10^{-2} mol L^{-1} DDAB).	82N027
		2.3×10^4		PL/Ad-5	S = MB or MB-tetrol; A = DPBF; vesicles (4.0×10^{-2} mol L^{-1} DDAB).	82N027
		3.8×10^4	2.6×10^{-5}	PL/Ad-5	S = 2-ACN; A = DPBF; 0.1 mol L^{-1} Brij 35.	79N041
		4.7×10^4	2.2×10^{-5}	PL/Ad-5	S = 2-ACN; A = DPBF; 0.1 mol L^{-1} Igepal CO-660.	79N041
		4.3×10^4	2.4×10^{-5}	PL/Ad-5	S = MB; A = DPBF; 0.1 mol L^{-1} Igepal CO-660.	79N041
		2.1×10^4	4.8×10^{-5}	PL/Ad-5	S = 2-ACN; A = DPBF; 0.1 mol L^{-1} sodium laurate.	79N041
		1.9×10^4	5.4×10^{-5}	PL/Ad-5	S = MB; A = DPBF; 0.1 mol L^{-1} SDS.	79N041
		1.9×10^4	5.4×10^{-5}	PL/Ad-5	S = 2-ACN; A = DPBF; 0.1 mol L^{-1} SDS.	79N041
		1.9×10^4	5.4×10^{-5}	PL/Ad-5	S = MB; A = DPBF; 0.1 mol L^{-1} CTAB.	79N041
		1.7×10^4	5.7×10^{-5}	PL/Ad-5	S = 2-ACN; A = DPBF; 0.1 mol L^{-1} CTAB.	79N041
		4.2×10^4	2.4×10^{-5}	PL/Ad-5	S = 2-ACN; A = DPBF; 0.1 mol L^{-1} Igepal CO-630.	79N041
		2.8×10^4	3.6×10^{-5}	PL/Ad-8	S = MB, A = DPBF; 0.1 mol L^{-1} CTAB.	78E143
		3.0×10^4	3.3×10^{-5}	PL/Ad-8	S = MB; A = DPBF; pD = 7.1; 0.1 mol L^{-1} SDS.	78E143
		3.3×10^4		PL/Ad-5	S = 2-ACN, A = DPBF; 0.1 mol L^{-1} SDS.	78E144
1.42	**Deuterium oxide/Ethanol (95:5)**					
		$\sim 2 \times 10^4$	$\sim 6 \times 10^{-5}$	PL/Ld-2	S = Ppb a.	88R193
1.43	**Deuterium oxide/Ethanol (70:30)**					
		4.0×10^4	2.5×10^{-5}	PL/Ld-2	S = HP.	86F316
1.44	**Deuterium oxide/Ethanol (67:33)**					
		3.8×10^4	2.6×10^{-5}	PL/Ld-2	S = H_2TPPS^{4-}.	88F503
1.45	**Deuterium oxide/Methanol (50:50)**					
		9.1×10^4	1.1×10^{-5}	PL/Ad-5	S = MB, A = DPBF.	727027
1.46	**1,2-Dibromotetrafluoroethane**					
		32	0.031	MP/Ld-2	S = MB, TPP or PHO; $k_d = 9.0\ s^{-1}$ for $[O_2] \leq 10^{-5}$ mol L^{-1}.	92E256
		20	0.050	MP/Ld-2	S = TPP.	89E388
1.47	**1,1-Dichloroethane**					
		1.4×10^4	7.0×10^{-5}	PL/Ld-2	S = PdMPDME; Paper says ethylene dichloride.	81E398
		1.5×10^4		PL/Ad-5	S = MB, A = DPBF.	78F061

TABLE 1. Decay constants for singlet oxygen in various solvents. — Continued

No.	Solvent	k_d (s^{-1})	τ ($1/k_d$) (s)	Method	Comment	Ref.
1.48	**1,2-Dichloroethane**					
		1.6×10^4	6.3×10^{-5}	PL/Ld-2	S = HPDME.	83A223
		1.6×10^4	6.3×10^{-5}	PL/Ld-2	S = PdMPDME; Paper says dichloroethane.	81E398 79E846
1.49	**2,2-Dichloroethanol**					
		2×10^4	5×10^{-5}	PL/Ad-8	S = MB, A = DPBF.	76F903
1.50	**Dichloromethane**					
		1.1×10^4	9.5×10^{-5}	PL/Ld-2	S = C_{60} or C_{70}.	93E301
		1.0×10^4	9.9×10^{-5}	PL/Ld-2	S = MB, TPP or PHO.	92E256
		1.3×10^4	8.0×10^{-5}	PL/Ld-2	S = HVD and PPDME.	92E274
		1.0×10^4	1.0×10^{-4}	PL/Tb-3	S = Pz.	88Z155
		1.2×10^4	8.2×10^{-5}	PL/Ld-2	S = An.	87E668
		1.9×10^4	5.4×10^{-5}	PL/Tb-3	S = TPP.	83A050
		1.2×10^4	8.3×10^{-5}	PL/Ld-2	S = HPDME.	83A223
		1.8×10^4	5.5×10^{-5}	PL/Ld-2	S = MPDME.	83F196
		1.0×10^4	1.0×10^{-4}	PL/Ld-2	S = TPP.	82E104
		1.7×10^4	5.9×10^{-5}	CP/LI-12	S = Benz[*de*]anthracen-7-one, phenalenone or fluorenone; rel. to $k_d = 4.0 \times 10^4$ s^{-1} in benzene.	82E329
		1.1×10^4	9.1×10^{-5}	PL/Ld-2	S = PdMPDME.	81E398 79E970
		1.6×10^4		PL/Ad-5	S = MB, A = DPBF.	78F061
		7.1×10^3	1.4×10^{-4}	PL/Ad-8	S = MB, A = DPBF.	76F903
1.51	**Dichloromethane (mic)**					
		1.9×10^4	5.2×10^{-5}	PL/Tb-3	S = Ery; reverse micelles contg. 0.04 mol L^{-1} DAP and 0.1 mol L^{-1} water.	83A050
1.52	**Dichloromethane-d_2**					
		8.3×10^3	1.2×10^{-4}	CP/LI-12	S = Benz[*de*]anthracen-7-one, phenalenone or fluorenone; rel. to $k_d = 4.0 \times 10^4$ s^{-1} in benzene.	82E329
1.53	**Diethyl ether**					
		3.1×10^4	3.2×10^{-5}	PL/Ld-2	S = Ph a.	88R193
		2.7×10^4	3.7×10^{-5}	PL/Ld-2	S = An.	87E668
		3.3×10^4	3.0×10^{-5}	PL/Ld-2	S = HPDME.	83A223
		2.9×10^4	3.4×10^{-5}	PL/Ld-2	S = PdMPDME.	81E398 79E846
1.54	**1,3-Difluorobenzene**					
		1.6×10^4	6.2×10^{-5}	PL/Ld-2	S = MB, RB or TPP.	83E398
1.55	***N,N*-Dimethylacetamide**					
		6.8×10^4	1.5×10^{-5}	PL/Ld-2	S = HVD and PPDME.	92E274
1.56	***N,N*-Dimethylacetamide-d_9**					
		9.5×10^3	1.0×10^{-4}	PL/Ld-2	S = HVD and PPDME.	92E274
1.57	**Dimethyl adipate**					
		3.1×10^4	3.2×10^{-5}	PL/Ld-2	S = Pz.	89E597
1.58	**1,1-Dimethylethyl methyl ether**					
		3.4×10^4	2.9×10^{-5}	PL/Ld-2	S = TPP.	92A386
		2.9×10^4	3.5×10^{-5}	PL/Ld-2	S = HPDME.	83A223

TABLE 1. Decay constants for singlet oxygen in various solvents. — Continued

No.	Solvent	k_d (s^{-1})	τ ($1/k_d$) (s)	Method	Comment	Ref.
1.59	***N,N*-Dimethylformamide**					
		7.1×10^4	1.4×10^{-5}	PL/Ld-2	S = Chr.	93E183
		5.3×10^4	1.9×10^{-5}	PL/Ld-2	S = HVD and PPDME.	92E274
		4.0×10^4	2.5×10^{-5}	PL/Ld-2	S = An.	87E668
1.60	**Dimethyl sulfoxide**					
		$\sim 5.2 \times 10^4$		CP/Ac-16	S = RB, A = DPBF, A′ = 2M2P. Measured $\beta_{A'}$ = 0.055 mol L^{-1}, assumed $k_{A'}$ in MeOH and DMSO are the same, used $\beta_{A'} = 0.15$ and $k_d = 1.4 \times 10^5$ s^{-1} in MeOH.	766072
		$\sim 3.3 \times 10^4$	$\sim 3.0 \times 10^{-5}$		Method not reported, may be direct method given in ref. [719325].	74F643
1.61	**1,4-Dioxane**					
		4.8×10^4	2.1×10^{-5}	PL/Tb-3	S = TPP.	83A050
		3.7×10^4	2.7×10^{-5}	PL/Ld-2	S = HPDME.	83A223
		4.0×10^4	2.5×10^{-5}	PL/Ld-2	S = TPP.	82E104
		3×10^4	3×10^{-5}	PL/Ld-2	S = PdMPDME.	79E846
1.62	**Dodecane**					
		4.0×10^4	2.5×10^{-5}	PL/Ld-2	S = TPP.	83A223
1.63	**Epibromohydrin**					
		2×10^4	5×10^{-5}	PL/Ad-8	S = MB, A = DPBF.	76F903
1.64	**Ethanol**					
		7.9×10^4	1.3×10^{-5}	PL/Ld-2	S = BPhe a.	93R131
		7.1×10^4	1.4×10^{-5}	PL/Ld-2	S = HP.	89E700
		6.3×10^4	1.6×10^{-5}	PL/Ld-2	S = RB.	89E700
		7.7×10^4	1.3×10^{-5}	PL/Ld-2	S = MB.	89E700
		7.1×10^4	1.4×10^{-5}	PL/Ld-2	S = $Zn(pc)(py)_2$.	88A284
		6.7×10^4	1.5×10^{-5}	PL/Ld-2	S = H_2TPPS^{4-}.	88F503
		7.4×10^4	1.4×10^{-5}	PL/Tb-3	S = HP.	87E054
		7.2×10^4	1.4×10^{-5}	PL/Ld-2	S = An.	87E668
		8.3×10^4		PL/Ad,Pb-5	S = An; A = MDH.	87F541
		8.3×10^4	1.2×10^{-5}	PL/Tb-3	S = An.	85E591
		7.7×10^4	1.3×10^{-5}	PL/Ld-2	S = 2-ACN.	84E066
		9.1×10^4	1.1×10^{-5}	PL/Tb-3	S = Ery.	83A050
		6.5×10^4	1.5×10^{-5}	PL/Ld-2	S = HPDME.	83A223
		1.0×10^5	9.6×10^{-6}	PL/Ld-2	S = PdMPDME.	81E398 83E818 79E846
		$\sim 9.1 \times 10^4$	$\sim 1.1 \times 10^{-5}$	PL/Ld-2	S = HP.	81E704
		1.0×10^5	1.0×10^{-5}	PL/Ad-8	S = MB, A = DPBF.	76F902
		5.3×10^4	1.9×10^{-5}	PL/Ad-8	S = MB, A = DPBF.	76F903
		8×10^4	1×10^{-5}	PL/Ad-5	S = MB, A = DPBF.	727260
1.65	**Ethanol/Water (95:5)**					
		2×10^5	5×10^{-6}	PL/βCd-11	S = An, Q = Car.	76F902
1.66	**Ethanol-*d***					
		3.2×10^4	3.1×10^{-5}	PL/Ld-2	S = $Zn(pc)(py)_2$.	88A284
		3.3×10^4	3.0×10^{-5}	PL/Ld-2	S = HP.	87E054
		3.4×10^4	2.9×10^{-5}	PL/Tb-3	S = HP.	87E054

TABLE 1. Decay constants for singlet oxygen in various solvents. — Continued

No.	Solvent	k_d (s^{-1})	τ ($1/k_d$) (s)	Method	Comment	Ref.
1.67	**Ethanol-d_6**					
		5×10^3	2×10^{-4}	PL/Tb-3	S = HP.	87E054
		4.3×10^3	2.3×10^{-4}	PL/Ld-2	S = PdMPDME.	81E398 83E818
1.68	**Ethyl acetate**					
		2.2×10^4	4.5×10^{-5}	PL/Ld-2	S = HVD and PPDME.	92E274
		2×10^4	5×10^{-5}	PL/Ad-8	S = MB, A = DPBF.	76F903
1.69	**Ethylbenzene**					
		3.8×10^4	2.6×10^{-5}	PL/Ld-2	S = O_2:solvent CT state.	90E220
		3.8×10^4	2.6×10^{-5}	PL/Ld-2	S = An; 5% decrease in lifetime as T increased 298 to 353K.	89E597
		4.0×10^4		PL/Ad-5	S = MB; A = DPBF.	83A371 83A006
1.70	**Ethylene glycol**					
		1.3×10^5	7.5×10^{-6}	PL/Ld-2	S = HPDME.	83A223
1.71	**Ethylene glycol/Methanol (50:50)**					
		1.2×10^5		PL/Ad-8	S = MB or RB, A = DPBF, $k_D = 1.6 \times 10^5\ s^{-1}$ when [DPBF] = 1.9×10^{-5} mol L^{-1} and $\beta = 6.3 \times 10^{-5}$ mol L^{-1}.	737014
1.72	**Fluorobenzene**					
		2.3×10^4	4.3×10^{-5}	PL/Ld-2	S = TPP.	89E388
		2.2×10^4		PL/Ld-2	S = Ac.	87E466
		2.0×10^4	4.9×10^{-5}	PL/Ld-2	S = MB, RB or TPP.	83E398
1.73	**Fluorobenzene-d_5**					
		9.1×10^2	1.1×10^{-3}	PL/Ld-2	S = MB, RB or TPP.	83E398
1.74	**2-Fluoroethanol**					
		6×10^4	2×10^{-5}	PL/Ad-8	S = MB, A = DPBF.	76F903
1.75	**Formamide**					
		1.5×10^5	6.7×10^{-6}	PL/Ld-2	S = An.	87E668
1.76	**Furan**					
		8.3×10^4	1.2×10^{-5}	PL/Ld-2	S = PdMPDME.	80E549
1.77	**Heptane**					
		3.4×10^4		PL/Ld-2	S = 3-HF.	89E365
		3.4×10^4	2.9×10^{-5}	PL/Ld-2	S = An.	87E668
		3.4×10^4	3.0×10^{-5}	PL/Ld-2	S = TPP.	83A223
		3.6×10^4	2.8×10^{-5}	PL/Ld-2	S = PdMPDME.	81E398
1.78	**Heptane/Water (mic)**					
		3.4×10^4		PL/Ld-2	S = RB; reverse micelles contg. AOT.	83N171
1.79	**1-Heptanol**					
		5.5×10^4	1.8×10^{-5}	PL/Ld-2	S = HPDME.	83A223
1.80	**Hexadecane**					
		4.1×10^4	2.4×10^{-5}	PL/Ld-2	S = TPP.	83A223
1.81	**Hexafluorobenzene**					
		2×10^2	5×10^{-3}	PL/Ld-2	S = C_{60} or C_{70}.	93E301

TABLE 1. Decay constants for singlet oxygen in various solvents. — Continued

No.	Solvent	k_d (s^{-1})	τ ($1/k_d$) (s)	Method	Comment	Ref.
1.81	**Hexafluorobenzene** — Continued					
		48	0.021	MP/Ld-2	S = MB, TPP or PHO; $k_d = 33\ s^{-1}$ for $[O_2] \leq 10^{-5}$ mol L^{-1}.	92E256
		40	0.025	MP/Ld-2	S = TPP.	87E658
		2.9×10^2	3.4×10^{-3}	PL/Ld-2	S = Chr; from high intensity photolysis; M = $^1O_2$*.	87F333
		2.6×10^2	3.9×10^{-3}	PL/Ld-2	S = MB, RB or TPP.	83E398
		1.1×10^2	9.4×10^{-3}	CP/LI-12	S = Benz[*de*]anthracen-7-one, phenalenone or fluorenone; rel. to $k_d = 4.0 \times 10^4\ s^{-1}$ in benzene.	82E329
		2×10^3	6×10^{-4}	PL/Ad-5	S = MB, A = DPBF, k_d cor. for 1-2% MeOH content.	757088
1.82	**1,1,1,3,3,3-Hexafluoro-2-propanol**					
		1.9×10^4	5.2×10^{-5}	PL/Ld-2	S = RB.	89E324
1.83	**Hexane**					
		3.2×10^4	3.1×10^{-5}	PL/Ld-2	S = An.	87E668
		3.2×10^4	3.1×10^{-5}	PL/Ld-2	S = TPP.	83A223
		3.3×10^4	3.0×10^{-5}	PL/Ld-2	S = PdMPDME.	81E398
1.84	**1-Hexanol**					
		5.6×10^4	1.8×10^{-5}	PL/Ld-2	S = HPDME.	83A223
1.85	**Iodobenzene**					
		2.5×10^4	3.9×10^{-5}	PL/Ld-2	S = TPP.	89E388
		4.2×10^4		PL/Ld-2	S = Rub.	87E466
		2.9×10^4	3.5×10^{-5}	PL/Ld-2	S = MB, RB or TPP.	83E398
1.86	**Iodobenzene-d_5**					
		3.6×10^3	2.8×10^{-4}	PL/Ld-2	S = MB, RB or TPP.	83E398
1.87	**Iodoethane**					
		2.9×10^4	3.4×10^{-5}	PL/Ld-2	S = PdMPDME.	81E398 79E846
1.88	**Iodomethane**					
		2.7×10^4	3.7×10^{-5}	PL/Ld-2	S = PdMPDME.	81E398 79E846
1.89	**Iodopentafluorobenzene**					
		66	0.015	MP/Ld-2	S = TPP.	89E388
1.90	**3-Iodotoluene**					
		3.4×10^4	2.9×10^{-5}	PL/Ld-2	S = PdMPDME.	81E398 83E818
1.91	**Mesitylene**					
		6.4×10^4	1.6×10^{-5}	PL/Ld-2	S = TPP; $\Delta V^{\ddagger} = -20.7\ cm^3\ mol^{-1}$; studied from 0.1 MPa to 250 MPa.	93A017
		6.7×10^4	1.5×10^{-5}	PL/Ld-2	S = An.	90E400
1.92	**Methanol**					
		1.1×10^5	9.5×10^{-6}	PL/Ld-2	S = MB, TPP or PHO.	92E256
		8.9×10^4	1.1×10^{-5}	PL/Ld-2	S = T(m-HOP)P.	90R164
		9.8×10^4	1.0×10^{-5}	PL/Ld-2	S = RB or H_2TPPS^{4-}.	89A322 93U041
		1.1×10^5	9.0×10^{-6}	PL/Ld-2	S = MB and RF.	88A165

TABLE 1. Decay constants for singlet oxygen in various solvents. — Continued

No.	Solvent	k_d (s^{-1})	τ ($1/k_d$) (s)	Method	Comment	Ref.
1.92	**Methanol** — Continued					
		1.0×10^5	9.7×10^{-6}	PL/Ld-2	S = $C_6H_5CO_2^-$.	86A264
		1.0×10^5	1.0×10^{-5}	PL/Ld-2	$^1O_2$* from $NDPO_2$.	86A264
		1.0×10^5		PL/Ad-5	S = 2-ACN; A = DPBF.	84F005
		1.1×10^5	9.0×10^{-6}	PL/Tb-3	S = Ery.	83A050
		9.6×10^4	1.0×10^{-5}	PL/Ld-2	S = HPDME.	83A223
		1.0×10^5	1.0×10^{-5}	PL/Ad-8	S = An; A = DPBF.	82A349
		$\sim 1 \times 10^5$	$\sim 7 \times 10^{-6}$	PL/Ld-2	S = HP.	81E704
		8.3×10^4	1.2×10^{-5}	PL/Tb-3	S = $CH_3COCOCH_3$; A = 2,5-DMF.	80E606
		1.1×10^5		PL/Ad-5	S = MB, A = DPBF.	78F061
		1×10^5	9×10^{-6}	PL/Ad-8	S = MB, A = DPBF.	76F902
		9.7×10^4	1.0×10^{-5}	PL/Ad-8	S = RB, A = DPBF.	737014
		8.8×10^4	1.1×10^{-5}	PL/Ad-8	S = MB, A = DPBF.	737014
		1×10^5	7×10^{-6}	PL/Ad-5	S = MB, A = DPBF.	719325
1.93	**Methanol/Water (50:50)**					
		3×10^5		PL/Ad-8	S = MB or RB, A = DPBF, $k_D = 3.7 \times 10^5\ s^{-1}$ when [DPBF] = 1.7×10^{-5} mol L^{-1} and $\beta = 5.5 \times 10^{-5}$ mol L^{-1}.	737014
		2.9×10^5	3.5×10^{-6}	PL/Ad-5	S = MB, A = DPBF.	727027
1.94	**Methanol-*d***					
		4.1×10^3	2.5×10^{-4}	PL/Ld-2	S = RB or H_2TPPS^{4-}.	89A322 93U041
		3.4×10^4	2.9×10^{-5}	PL/Ld-2	S = MB and RF.	88A165
		3.6×10^4	2.8×10^{-5}	PL/Ld-2	S = $SnPPCl_2$.	88R194
		3.1×10^4	3.2×10^{-5}	PL/Tb-3	S = HP.	88Z155
		2.5×10^4	4.0×10^{-5}	PL/Tb-3	S = Ery.	83A050
		4.1×10^4	2.5×10^{-5}	PL/Ld-2	S = MPDME.	83F196
		2.7×10^4	3.7×10^{-5}	PL/Ld-2	S = MB.	82E104
1.95	**Methanol-d_4**					
		3.7×10^3	2.7×10^{-4}	PL/Ld-2	S = RB.	93A326
		4.2×10^3	2.4×10^{-4}	PL/Ld-2	S = RB.	92F063
		3.8×10^3		PL/Ld-2	S = H_2TPPS^{4-}.	89A331
		4.4×10^3	2.3×10^{-4}	PL/Ld-2	S = MB and RF.	88A165
		4.4×10^3	2.3×10^{-4}	PL/Ld-2	S = HPDME.	83A223
1.96	**2-Methoxyethanol**					
		9.3×10^4	1.0×10^{-5}	PL/Ad-5	A = DPBF; S = MB.	87E690
1.97	**Methyl benzoate**					
		3×10^4	4×10^{-5}	PL/Ad-8	S = MB, A = DPBF.	76F903
1.98	**3-Methyl-1-butanol**					
		5.4×10^4	1.8×10^{-5}	PL/Ld-2	S = An.	87E668
1.99	**3-Methylpentane**					
		3.1×10^4	3.2×10^{-5}	PL/Ld-2	S = HPDME.	83A223
1.100	**2-Methyl-1-propanol**					
		4.7×10^4	2.1×10^{-5}	PL/Ld-2	S = An.	87E668
		4.7×10^4	2.1×10^{-5}	PL/Ld-2	S = HPDME.	83A223

TABLE 1. Decay constants for singlet oxygen in various solvents. — Continued

No.	Solvent	k_d (s^{-1})	τ ($1/k_d$) (s)	Method	Comment	Ref.
1.101	**2-Methyl-2-propanol**					
		3.2×10^4	3.1×10^{-5}	PL/Ld-2	S = HPDME.	83A223
		3.0×10^4	3.4×10^{-5}	PL/Ad-8	S = MB, A = DPBF.	737014
1.102	**Methyl propionate**					
		2.7×10^4	3.7×10^{-5}	PL/Ld-2	S = Chr.	93E183
		2.6×10^4	3.8×10^{-5}	PL/Ld-2	S = An; 5% decrease in lifetime as T increased 298 to 353K.	89E597
1.103	**Nonane**					
		4.2×10^4	2.4×10^{-5}	PL/Ld-2	S = TPP.	83A223
1.104	**1-Nonanol**					
		5.4×10^4	1.9×10^{-5}	PL/Ld-2	S = HPDME.	83A223
1.105	**1-Octanol**					
		5.4×10^4	1.9×10^{-5}	PL/Ld-2	S = HPDME.	83A223
1.106	**Oxygen**					
		2.3×10^4		PL/Ld-2	k_d in $^{18}O_2 = 50\ s^{-1}$. $T = 77K$.	84E289
1.107	**Pentachloroethane**					
		2.1×10^3	4.8×10^{-4}	PL/Ld-2	S = PdMPDME.	81E398
		2.2×10^3	4.5×10^{-4}	PL/Ld-2	S = PdMPDME or MPDME; decay at 1588 nm.	80E558
1.108	**Pentafluorobenzene**					
		3.2×10^3	3.2×10^{-4}	PL/Ld-2	S = MB, RB or TPP.	83E398
1.109	**Pentane**					
		2.9×10^4	3.5×10^{-5}	PL/Ld-2	S = MB, TPP or PHO.	92E256
		2.9×10^4	3.5×10^{-5}	PL/Ld-2	S = TPP.	83A223
		4.5×10^4	2.2×10^{-5}	PL/Ld-2	S = PdMPDME.	81E398
1.110	**1-Pentanol**					
		5.6×10^4	1.8×10^{-5}	PL/Ld-2	S = HPDME.	83A223
1.111	**Perfluorodecalin**					
		17	0.059	MP/Ld-2	S = MB, TPP or PHO; $k_d = 3.2\ s^{-1}$ for $[O_2] \leq 10^{-5}$ mol L^{-1}.	92E256
1.112	**Perfluoroethyl ether**					
		9.1×10^2	1.1×10^{-3}	CP/LI-12	S = Benz[*de*]anthracen-7-one, phenalenone or fluorenone; rel. to $k_d = 4.0 \times 10^4\ s^{-1}$ in benzene.	82E329
1.113	**Perfluorohexane**					
		15	0.068	MP/Ld-2	S = MB, TPP or PHO; $k_d = 4.7\ s^{-1}$ for $[O_2] \leq 10^{-5}$ mol L^{-1}.	92E256
		20		PL/Ld-2	S = Phen; from delayed fluorescence of phenanthrene attributed to singlet(oxygen)-triplet(Phen) annihilation; $T = 200K$.	88E775
		10	0.096	MP/Ld-2	S = TPP.	87E658
1.114	**Perfluorohexyl iodide**					
		40	0.025	MP/Ld-2	S = MB, TPP or PHO; $k_d = 19\ s^{-1}$ for $[O_2] \leq 10^{-5}$ mol L^{-1}.	92E256
		27	0.036	MP/Ld-2	S = TPP.	89E388

TABLE 1. Decay constants for singlet oxygen in various solvents. — Continued

No.	Solvent	k_d (s^{-1})	τ ($1/k_d$) (s)	Method	Comment	Ref.
1.115	**1-Phenylethanol**					
		4.6×10^4		PL/Ad-5	S = MB; A = DPBF.	83A371 83A006
1.116	**1-Propanol**					
		5.7×10^4	1.8×10^{-5}	PL/Ld-2	S = An.	87E668
		6.1×10^4	1.6×10^{-5}	PL/Ld-2	S = HPDME.	83A223
1.117	**2-Propanol**					
		4.5×10^4	2.2×10^{-5}	PL/Ld-2	S = RB.	89E324
		4.9×10^4		PL/Ld-2	S = Ac.	87E466
		4.0×10^4	2.5×10^{-5}	PL/Ld-2	S = An.	87E668
		4.5×10^4	2.2×10^{-5}	PL/Ld-2	S = HPDME.	83A223
1.118	**Propylene carbonate**					
		3.3×10^4	3.0×10^{-5}	PL/Ad-5	A = DPBF; S = MB.	87E690
1.119	**Pyridine**					
		1.8×10^5	5.7×10^{-6}	PL/Ld-2	S = RB or H_2TPPS^{4-}.	89A322 93U041
		6.5×10^4	1.5×10^{-5}	PL/Ld-2	S = Chlorin e_6.	89E505
		7.7×10^4	1.3×10^{-5}	PL/Ld-2	S = An.	87E959
		7.1×10^4	1.4×10^{-5}	PL/Tb-3	S = TPP.	83A050
		5.9×10^4	1.7×10^{-5}	PL/Tb-3	S = Ery.	83A050
		6.3×10^4	1.6×10^{-5}	PL/Ld-2	S = PdMPDME.	81E398 79E846
		6×10^4	2×10^{-5}	PL/Ad-8	S = RB, A = DPBF.	76F903
1.120	**1,1,2,2-Tetrachloro-1,2-difluoroethane**					
		24	0.042	CP/LI-12	S = Benz[*de*]anthracen-7-one, phenalenone or fluorenone; rel. to $k_d = 4.0 \times 10^4$ s^{-1} in benzene.	82E329
1.121	**1,1,2,2-Tetrachloroethane**					
		8.3×10^3		PL/Ad-5	S = MB, A = DPBF.	78F061
1.122	**Tetrachloroethylene**					
		8.3×10^2	1.2×10^{-3}	PL/Ld-2	S = PdMPDME.	81E398
		7.7×10^2	1.3×10^{-3}	PL/Ld-2	S = PdMPDME or MPDME; decay at 1588 nm.	80E558
1.123	**Tetradecane**					
		4.0×10^4	2.5×10^{-5}	PL/Ld-2	S = TPP.	83A223
1.124	**1,2,4,5-Tetrafluorobenzene**					
		6.5×10^3	1.6×10^{-4}	PL/Ld-2	S = MB, RB or TPP.	83E398
1.125	**Tetrahydrofuran**					
		4.8×10^4		PL/Ld-2	S = RB.	87E466
		4.3×10^4	2.3×10^{-5}	PL/Ld-2	S = An.	87E668
		5.4×10^4	1.9×10^{-5}	PL/Tb-3	S = An.	85E591
		5.0×10^4	2.0×10^{-5}	PL/Ld-2	S = TPP.	82E104
		3.3×10^4	3.0×10^{-5}	PL/Ld-2	S = PdMPDME.	81E398
		4.3×10^4	2.3×10^{-5}	PL/Ad-8	S = RB, A = DPBF.	76F903
1.126	**Toluene**					
		3.4×10^4	2.9×10^{-5}	PL/Ld-2	S = TPP; $\Delta V^{\ddagger} = -10.0$ cm^3 mol^{-1}; studied from 0.1 MPa to 250 MPa.	93A017

TABLE 1. Decay constants for singlet oxygen in various solvents. — Continued

No.	Solvent	k_d (s^{-1})	τ ($1/k_d$) (s)	Method	Comment	Ref.
1.126	**Toluene** — Continued					
		3.5×10^4	2.9×10^{-5}	PL/Ld-2	S = Ac.	93A017
		3.4×10^4	2.9×10^{-5}	PL/Ld-2	S = O_2:solvent CT state.	90E220
		3.6×10^4	2.8×10^{-5}	PL/Ld-2	S = An.	90E400
		3.4×10^4	2.9×10^{-5}	PL/Ld-2	S = 2-ACN; $\Delta H\ddagger$ = -1.7 kJ mol^{-1}; studied at 203-333 K.	88A427
		3.5×10^4		PL/Ld-2	S = Ac.	87E466
		3.4×10^4	2.9×10^{-5}	PL/Ld-2	S = An.	87E668
		4.0×10^4	2.5×10^{-5}	PL/Ld-2	S = 2-ACN.	84E066
		4.0×10^4	2.5×10^{-5}	PL/βCd-11	S = An.	82A349
		3.8×10^4	2.6×10^{-5}	PL/Ad-8	S = An; A = DPBF.	82A349
		3.2×10^4		PL/Ad-5	S = A = Rub; .	82E072
		3.7×10^4	2.7×10^{-5}	CP/LI-12	S = Benz[*de*]anthracen-7-one, phenalenone or fluorenone; rel. to $k_d = 4.0 \times 10^4$ s^{-1} in benzene.	82E329
		3.4×10^4	2.9×10^{-5}	PL/Ld-2	S = PdMPDME.	81E398 83E818 79E846
		4.3×10^4	2.3×10^{-5}	CP/Ac-14	S = TPP; A = TME; Used $k_A = 4 \times 10^7$ L mol^{-1} s^{-1}.	80C002
		4.0×10^4		PR/Ad-5	S = Np; A = DPBF; E_a = ~2 kJ mol^{-1}; studied at 222 to 333K.	79A106 78E263
		5×10^4	2×10^{-5}	CP/Ac-16	S = A = DMA; compared with $\beta = 1.2 \times 10^{-3}$ mol L^{-1} in benzene where τ = 24 μs.	79F148
1.127	**Toluene-d_8**					
		3.5×10^3	2.8×10^{-4}	PL/Ld-2	S = Pz.	89E597
		3.2×10^3	3.1×10^{-4}	CP/LI-12	S = Benz[*de*]anthracen-7-one, phenalenone or fluorenone; rel. to $k_d = 4.0 \times 10^4$ s^{-1} in benzene.	82E329
		3.1×10^3	3.2×10^{-4}	PL/Ld-2	S = PdMPDME.	81E398 83E818 79E846
1.128	**2,2,2-Trichloroethanol**					
		2×10^4	5×10^{-5}	PL/Ad-8	S = MB, A = DPBF.	76F903
1.129	**Trichloroethylene**					
		4.0×10^3	2.5×10^{-4}	PL/Ld-2	S = MB, TPP or PHO.	92E256
		4.5×10^3	2.2×10^{-4}	PL/Ld-2	S = PdMPDME.	81E398
		4.8×10^3	2.1×10^{-4}	PL/Ld-2	S = PdMPDME or MPDME; decay at 1588 nm.	80E558
1.130	**Trichlorofluoromethane**					
		9.1	0.11	MP/Ld-2	S = TPP.	89E388
		42	0.024	MP/Ld-2	S = TPP.	87E658
1.131	**1,1,2-Trichlorotrifluoroethane**					
		14	0.072	MP/Ld-2	S = MB, TPP or PHO; $k_d = 7.5$ s^{-1} for $[O_2] \leq 10^{-5}$ mol L^{-1}.	92E256
		10	0.099	MP/Ld-2	S = TPP.	87E658
		51	0.020	FP/Ld-2	S = Per.	82A322
		24	0.042	CP/LI-12	S = Benz[*de*]anthracen-7-one, phenalenone or fluorenone; rel. to $k_d = 4.0 \times 10^4$ s^{-1} in benzene.	82E329

TABLE 1. Decay constants for singlet oxygen in various solvents. — Continued

No.	Solvent	k_d (s^{-1})	τ ($1/k_d$) (s)	Method	Comment	Ref.
1.132	**1,1,2-Trichlorotrifluoroethane/Ethanol (99:1)**					
		7.1×10^2	1.4×10^{-3}	PL/Ld-2	S = HP.	81E704
1.133	**1,1,2-Trichlorotrifluoroethane/Ethanol (90:10)**					
		6.7×10^3	1.5×10^{-4}	PL/Ld-2	S = HP.	81E704
1.134	**1,3,5-Trifluorobenzene**					
		1.0×10^4	9.9×10^{-5}	PL/Ld-2	S = MB, RB or TPP.	83E398
1.135	**2,2,2-Trifluoroethanol**					
		4.1×10^4	2.4×10^{-5}	PL/Ld-2	S = RB.	89E324
		3.1×10^4		PL/Ld-2	S = RB; not extrapolated to [S] = 0.	87E466
		2×10^4	4×10^{-5}	PL/Ad-8	S = MB, A = DPBF.	76F903
1.136	**α,α,α-Trifluorotoluene**					
		1.6×10^4		PL/Ld-2	S = Ac.	87E466
1.137	**2,4,4-Trimethyl-1-pentanol**					
		4.1×10^4	2.4×10^{-5}	PL/Ld-2	S = HPDME.	83A223
1.138	**2,2,4-Trimethylpentane**					
		2.7×10^4	3.8×10^{-5}	PL/Ld-2	S = HPDME.	83A223
		2.7×10^4		PL/Ld-2	S = RB; reverse micelles contg. AOT.	83N171
1.139	***n*-Undecane**					
		4.0×10^4	2.5×10^{-5}	PL/Ld-2	S = TPP.	83A223
1.140	**Water**					
		2.4×10^5	4.2×10^{-6}	PL/Ld-2	S = MB or PHO.	92E256
		3.2×10^5	3.1×10^{-6}	PL/Ld-2	S = H_2TPPS^{4-}; Nonmonotonic change in lifetime over 283-368 K; τ_Δ = 4.8 μs at 368 K.	91A478
		2.4×10^5	4.1×10^{-6}	PL/Ld-2	S = RB or H_2TPPS^{4-}; 1.0 mol L^{-1} NaOH.	89A322 93U041
		2.4×10^5	4.2×10^{-6}	PL/Ld-2	S = MB.	89E388
		3.2×10^5	3.1×10^{-6}	PL/Ld-2	S = H_2TPPS^{4-}; pH = 8; oxygen pressure 1-15 atm.	89E585
		2.5×10^5	4.0×10^{-6}	PL/Ld-2	S = H_2TPPS^{4-}; pH = 7.	86A198
		2.4×10^5	4.1×10^{-6}	PL/Ld-2	S = $C_6H_5CO_2^-$.	86A264
		3.1×10^5	3.2×10^{-6}	PL/Ld-2	S = H_2TMpyP^{4+}.	84E296
		2.4×10^5	4.2×10^{-6}	PL/Ld-2	S = H_2TPPS^{4-}.	83A223
		2.9×10^5	3.5×10^{-6}	PL/Ld-2	S = $PdTPPS^{4-}$.	83E818
		3.2×10^5	3.1×10^{-6}	PL/Ld-2	S = Sulfo- and carboxyanthracenes.	83E844
1.141	**Water (mic)**					
		2.2×10^5	4.6×10^{-6}	PL/Ld-2	S = H_2TPPS^{4-}; 1% Triton X-100.	91A478
		3.4×10^5	2.9×10^{-6}	PL/Ac-5	S = MB; A = DPBF; BRIJ 35 micelles.	88N343
		5.0×10^4		PL/Ld-2	S = RB; 0-1 mol L^{-1} SDS.	83N171
		4.0×10^4		PL/Ld-2	S = RB; 0-0.5 mol L^{-1} CTAB.	83N171
		2.5×10^5	4.0×10^{-6}	PL/Ad-5	S = 2-ACN; A = DPBF; 0.1 mol L^{-1} CTAB; extrapolated from D_2O/H_2O mixtures to 100% water.	79N041
		2.9×10^5	3.5×10^{-6}	PL/Ad-5	S = 2-ACN; A = DPBF; 0.1 mol L^{-1} Igepal CO-630; extrapolated from D_2O/H_2O mixtures to 100% water.	79N041
		3.3×10^5		PL/Ad-5	S = 2-ACN, A = DPBF; 0.1 mol L^{-1} SDS.	78E144

TABLE 1. Decay constants for singlet oxygen in various solvents. — Continued

No.	Solvent	k_d (s^{-1})	τ ($1/k_d$) (s)	Method	Comment	Ref.
1.142	**Water/Methanol (80:20)**					
		2.0×10^5	4.9×10^{-6}	PL/Ld-2	$^1O_2$* from $NDPO_2$.	86A264
1.143	***m*-Xylene**					
		4.0×10^4	2.5×10^{-5}	PL/Ld-2	S = TPP; $\Delta V‡ = -13.0$ cm^3 mol^{-1}; studied from 0.1 MPa to 250 MPa.	93A017
1.144	***o*-Xylene**					
		4.4×10^4	2.3×10^{-5}	PL/Ld-2	S = TPP; $\Delta V‡ = -14.2$ cm^3 mol^{-1}; studied from 0.1 MPa to 250 MPa.	93A017
		5.3×10^4	1.9×10^{-5}	PL/Ld-2	S = An.	90E400
1.145	***p*-Xylene**					
		5.0×10^4	2.0×10^{-5}	PL/Ld-2	S = TPP; $\Delta V‡ = -19.2$ cm^3 mol^{-1}; studied from 0.1 MPa to 250 MPa.	93A017

TABLE 2. Rate constants for interaction of singlet oxygen with olefins.

No.	Solvent	k ($L\ mol^{-1}\ s^{-1}$)	β (k_d/k) ($mol\ L^{-1}$)	T (K)	Method	Comment	Ref.
2.1	**Acrolein (Propenal)**						
	MeOH	1.6×10^3	89	263	CP/Oc-15	S = MB; used $k_d = 1.4 \times 10^5\ s^{-1}$.	737479
2.2	**Adamantane, 2-(hydroxymethylene)-, acetate**						
	CD_3COCD_3	3.4×10^4			PL/Ld-2	S = MB.	83A026
	CD_3OD	2.1×10^4			PL/Ld-2	S = MB.	83A026
2.3	**Benzvalene**						
	C_6H_6		1.1 (β_r)	286	CP/Oc-29	S = TPP; A′ = 2,5-DMF; meas. $1 + k_q/k_r = 1$.	84F065
	CCl_4		0.059 (β_r)	286	CP/Oc-29	S = TPP; A′ = 2,5-DMF; meas. $1 + k_q/k_r = 1$.	84F065
	CH_2Cl_2		4.9×10^{-3} (β_r)	286	CP/Oc-29	S = TPP; A′ = 2,5-DMF; meas. $1 + k_q/k_r = 1$.	84F065
	CH_3CN		4.0×10^{-3} (β_r)	286	CP/Oc-29	S = RB; A′ = 2,5-DMF; meas. $1 + k_q/k_r = 1$.	84F065
	CH_3COCH_3		7.2×10^{-3} (β_r)	286	CP/Oc-29	S = RB; A′ = 2,5-DMF; meas. $1 + k_q/k_r = 1$.	84F065
	$CHCl_3$		0.020 (β_r)	286	CP/Oc-29	S = TPP; A′ = 2,5-DMF; meas. $1 + k_q/k_r = 1$.	84F065
	MeOH		0.019 (β_r)	286	CP/Oc-29	S = RB; A′ = 2,5-DMF; meas. $1 + k_q/k_r = 1$.	84F065
2.4	**Bicyclo[2.2.1]hepta-2,5-diene (Norbornadiene)**						
	$CHCl_3$	1.7×10^4			CR/A′c-33	A′ = Rub; used $k_d = 1.7 \times 10^4\ s^{-1}$, $k_{A'} = 5.3 \times 10^7$ $L\ mol^{-1}\ s^{-1}$; $^1O_2$* from $DMNO_2$.	81E003
2.5	**Bicyclo[2.2.1]hepta-2,5-diene, 7,7-dimethyl-2-(trimethylsiloxy)- [Norbornadiene, 7,7-dimethyl-2-(trimethylsiloxy)-]**						
	$CDCl_3$				CP/Ac,A′c-17	S = TPP; A′ = 7,7-Dimethyl-2-(trimethylsiloxy)norborn-2-ene; meas. $k_r/k_r^{A'}$ = 4.2.	78F290
2.6	**Bicyclo[2.2.1]hepta-2,5-diene, 2-methyl- (Norbornadiene, 2-methyl-)**						
	CH_3CN			273	CP/Ac,A′c-17	S = MB; A′ = 5-Methylene-2-norbornene; meas. $k_r/k_r^{A'} = 34$.	78F149
2.7	**Bicyclo[2.2.1]hepta-2,5-diene, 2-(trimethylsiloxy)-**						
	$CDCl_3$				CP/Ac,A′c-17	S = TPP; A′ = 7,7-Dimethyl-2-(trimethylsiloxy)norborn-2-ene; meas. $k_r/k_r^{A'}$ = 0.17.	78F290
2.8	**Bicyclo[2.2.1]heptane, 2,3-bis(methylene)- (Norbornane, 2,3-dimethylene-)**						
	CD_3COCD_3	3.6×10^5		195	CP/A′c-16	S = RB; A′ = DPBF; k_d not given.	87A368
2.9	**Bicyclo[2.2.1]heptane, 7,7-dimethyl-2-methylene-**						
	CH_3CN			273	CP/Ac,A′c-17	S = MB; A′ = 2,7,7-Trimethylnorborn-2-ene; meas. $k_r/k_r^{A'} = 3.4$.	78F149
	CH_3CN				CP/Ac,A′c-17	S = MB; A′ = 2-Methylenenorbornane; meas. $k_r/k_r^{A'} = 0.26$.	74F647
2.10	**Bicyclo[2.2.1]heptane, 2,3-dioxymethyl-7-tricyclo[3.3.1.1^{3,7}]decylidene- (*exo,exo*)**						
	C_6H_5Cl/ 2-PrOH (90:10)	1.8×10^6		273	CR/LI-12	used $k_d = 4.1 \times 10^4\ s^{-1}$; $^1O_2$* from hydrotrioxide, e.g. $(CH_3)_2C(OH)OOOH$.	90M125
2.11	**Bicyclo[2.2.1]heptane, 2-methylene- (Norbornane, 2-methylene-)**						
	CH_3CN			273	CP/Ac,A′c-17	S = MB; A′ = 5-Methylene-2-norbornene; meas. $k_r/k_r^{A'} = 4.3$.	78F149
	CH_3CN			273	CP/Ac,A′c-17	S = MB; A′ = 2,7,7-Trimethylnorborn-2-ene; meas. $k_r/k_r^{A'} = 13$.	78F149
	CH_3CN				?	S = MB; A′ = c-$C_6H_9CH_3$; meas. $k_A/k_{A'} = 0.065$.	73F664
2.12	**Bicyclo[2.2.1]heptane, 2,3-(2^1-oxatrimethylene)-7-tricyclo[3.3.1.1^{3,7}]decylidene- (*exo,exo*)**						
	C_6H_5Cl/ 2-PrOH (90:10)	1.2×10^6		273	CR/LI-12	used $k_d = 4.1 \times 10^4\ s^{-1}$; $^1O_2$* from hydrotrioxide, e.g. $(CH_3)_2C(OH)OOOH$.	90M125

TABLE 2. Rate constants for interaction of singlet oxygen with olefins. — Continued

No.	Solvent	k (L mol^{-1} s^{-1})	β (k_d/k) (mol L^{-1})	T (K)	Method	Comment	Ref.
2.13	**Bicyclo[2.2.1]heptane-2-*d*, 3-methylene-, *endo*-**						
	CH_3CN				CP/Ac,A'c-17	S = MB; A' = 2-Methylenenorbornane; meas. $k_r/k_r^{A'} = 1.0$.	74F647
2.14	**Bicyclo[2.2.1]heptane-2-*d*, 3-methylene-, *exo*-**						
	CH_3CN				CP/Ac,A'c-17	S = MB; A' = 2-Methylenenorbornane; meas. $k_r/k_r^{A'} = 1.1$.	74F647
2.15	**Bicyclo[2.2.1]heptane-2,3-dicarboxylic acid, 7-tricyclo[3.3.1.1^{3,7}]decylidene-, anhydride (*endo,endo*)**						
	$CHCl_3$	2.8×10^4		295	CL/LI-12	S = An; used $k_d = 4.9 \times 10^3$ s^{-1}.	90F473
2.16	**Bicyclo[2.2.1]heptane-2,3-dicarboxylic acid, 7-tricyclo[3.3.1.1^{3,7}]decylidene-, anhydride (*exo,exo*)**						
	$CHCl_3$	1.0×10^4		295	CL/LI-12	S = An; used $k_d = 4.9 \times 10^3$ s^{-1}.	90F473
2.17	**Bicyclo[2.2.1]heptane-2,3-dicarboxylic acid, 7-tricyclo[3.3.1.1^{3,7}]decylidene-, dimethyl ester (*endo,endo*)**						
	$CHCl_3$	3.1×10^4		295	CL/LI-12	S = An; used $k_d = 4.9 \times 10^3$ s^{-1}.	90F473
2.18	**Bicyclo[2.2.1]heptane-2,3-dicarboxylic acid, 7-tricyclo[3.3.1.1^{3,7}]decylidene-, dimethyl ester (*exo,exo*)**						
	$CHCl_3$	1.5×10^4		295	CL/LI-12	S = An; used $k_d = 4.9 \times 10^3$ s^{-1}.	90F473
2.19	**Bicyclo[2.2.1]hept-2-ene, 5,6-bis(methylene)- [Norborn-2-ene, 5,6-bis(methylene)-]**						
	CH_2Cl_2			253	CP/Ac-17	S = TPP; A' = 2,3-Dimethylenebicyclo[2.2.1]heptane; meas. $k_r/k_r^{A'} = 0.12$.	82F450
2.20	**Bicyclo[2.2.1]hept-2-ene, 2-methoxy- (Norborn-2-ene, 2-methoxy-)**						
	c-C_6H_{12}	$<1.0 \times 10^4$			PL/A'd-8	S = An; A' = DPBF.	82A349
	$C_6H_5CH_3$	1.1×10^4			PL/A'd-8	S = An; A' = DPBF.	82A349
	CH_3CN	6.2×10^5			PL/A'd-8	S = An; A' = DPBF; $\Delta H‡ = -1.3$ kJ mol^{-1}; $\Delta S‡ = -141$ J K^{-1} mol^{-1}; studied at 250-273 K.	82A349
	CH_3COCH_3	2.5×10^5			PL/A'd-8	S = An; A' = DPBF.	82A349
	MeOH	6.2×10^5			PL/A'd-8	S = An; A' = DPBF; $\Delta H‡ = -0.8$ kJ mol^{-1}; $\Delta S‡ = -130$ J K^{-1} mol^{-1}; studied at 250-273 K.	82A349
2.21	**Bicyclo[2.2.1]hept-2-ene, 2-methyl- (Norborn-2-ene, 2-methyl-)**						
	CH_3CN			273	CP/Ac,A'c-17	S = MB; A' = 5-Methylene-2-norbornene; meas. $k_r/k_r^{A'} = 14$.	78F149
	CH_3CN				CP/Ac,A'c-17	S = MB; A' = 2-Methylenenorbornane; meas. $k_r/k_r^{A'} = 3.1$.	74F647
	CH_3CN				?	S = MB; A' = *c*-$C_6H_9CH_3$; meas. $k_A/k_{A'} = 0.14$.	73F664
2.22	**Bicyclo[2.2.1]hept-2-ene, 5-methylene-**						
	CH_3CN			273	CP/Ac,A'c-17	S = MB; A' = *c*-$C_5H_7CH_3$; meas. $k_r/k_r^{A'} = 2.0 \times 10^{-3}$.	78F149
2.23	**Bicyclo[2.2.1]hept-2-ene, 2,7,7-trimethyl-**						
	CH_3CN			273	CP/Ac,A'c-17	S = MB; A' = 2-Methylnorborn-2-ene; meas. $k_r/k_r^{A'} = 0.025$.	78F149
	CH_3CN				CP/Ac,A'c-17	S = MB; A' = 2-Methylenenorbornane; meas. $k_r/k_r^{A'} = 0.077$.	74F647
2.24	**Bicyclo[2.2.1]hept-2-ene, 2-(trimethylsiloxy)-**						
	$CDCl_3$				CP/Ac,A'c-17	S = TPP; A' = 7,7-Dimethyl-2-(trimethylsiloxy)norborn-2-ene; meas. $k_r/k_r^{A'} = 8.4$.	78F290
2.25	**Bicyclo[3.1.1]hept-2-ene, 2-ethenyl-6,6-dimethyl- (Nopadiene)**						
	MeOH		~2.0	293	CP/Oc-15	S = RB; $E_a = 16$ kJ mol^{-1}.	68F288

TABLE 2. Rate constants for interaction of singlet oxygen with olefins. — Continued

No	Solvent	k ($L\ mol^{-1}\ s^{-1}$)	β (k_d/k) ($mol\ L^{-1}$)	T (K)	Method	Comment	Ref.
2.26	**Bicyclo[4.1.0]hept-2-ene, 3,7,7-trimethyl- (Δ^2-Carene)**						
	MeOH		0.17		?	Method not reported.	68F289
2.27	**Bicyclo[4.1.0]hept-2-ene, 4,7,7-trimethyl- (Δ^4-Carene)**						
	MeOH		0.21		?	Method not reported.	68F289
2.28	**Bicyclo[4.1.0]hept-3-ene, 3,7,7-trimethyl- (Δ^3-Carene)**						
	MeOH		0.40		?	Method not reported.	68F289
2.29	**Bicyclo[2.2.0]hexa-2,5-diene, hexamethyl-**						
	$CHCl_3$	1.1×10^7			CP/A'c-33	S = A' = Rub; used $k_d = 1.7 \times 10^4\ s^{-1}$, $k_{A'} = 5.3 \times 10^7\ L\ mol^{-1}\ s^{-1}$.	78A005
2.30	**Bicyclo[3.1.0]hex-2-ene, 4-methyl-1-(1-methylethyl)-, (1*R*)- (α-Thujene)**						
	CD_3OD	1.8×10^6 (k_r) $<10^4$ (k_q)		295	CP/Oc-15,28	S = RB; used $k_d = 4.0 \times 10^3\ s^{-1}$; used ϕ_Δ(RB) = 0.76.	91F332
2.31	**Bicyclo[3.2.2]nonane, 6,7-bis(methylene)-**						
	CD_3COCD_3	1.7×10^6		195	CP/A'c-16	S = RB; A' = DPBF; k_d not given.	87A368
2.32	**Bicyclo[4.2.0]octa-2,4-diene, 7,8-dibromo- (Cyclooctatetraene dibromide)**						
	MeOH		~0.30	293	CP/Oc-15	S = RB; E_a = 11 kJ mol^{-1}.	68F288
2.33	**Bicyclo[2.2.2]octane, 2,3-bis(methylene)-**						
	CD_3COCD_3	1.7×10^6		195	CP/A'c-16	S = RB; A' = DPBF; k_d not given.	87A368
2.34	**Bicyclo[7.2.0]undec-4-ene, 4,11,11-trimethyl-8-methylene-, [*1R-(1R*,4E,9S*)*]- (β-Caryophyllene)**						
	MeOH/ C_6H_6 (50:50)			293	CP/Ac,A'c-17	S = BP, triphenylene, quinoline, Np, Py, RB, MB; A' = γ-Caryophyllene; meas. $k_r/k_r^{A'} = 5.1$.	70F735
2.35	**1,3-Butadiene, 1,4-di(4,4'-dimethoxyphenyl)-**						
	CCl_4	1.1×10^6 (k_r)			CP/Pa,P'a-17	S = TPP; A' = DPB; used $k_r^{A'} = 2.1 \times 10^5\ L\ mol^{-1}\ s^{-1}$; P = 1,4-Di(4,4'-dimethoxyphenyl)-1,3-butadiene endoperoxide.	90F292
2.36	**1,3-Butadiene, 1,4-di(1,1-dimethylethoxy)-, (*E,E*)-**						
	CH_2Cl_2	8.5×10^7			CP/A'c-16	S = MPDME; A' = DPBF; used $k_d = 1.0 \times 10^4\ s^{-1}$.	85A261 86A159
	CH_3CN	2.0×10^8			CP/A'c-16	S = MPDME; A' = DPBF; k_d not given.	86A159
	CH_3COCH_3	9.1×10^7			CP/A'c-16	S = MPDME; A' = DPBF; used $k_d = 2.2 \times 10^4\ s^{-1}$.	85A261 86A159
	CH_3COCH_3	9.6×10^7 (k_r)	2.3×10^{-3} (β_r)		CP/Ac,A'c-17	S = MPDME; A' = (Z,Z)-1,4-Di(*tert*-butoxy)-1,3-butadiene; used $k_d = 2.2 \times 10^4\ s^{-1}$; β_r meas. rel. to β_r(TME) = $1.2 \times 10^{-3}\ mol\ L^{-1}$.	86A159
	THF	1.1×10^8			CP/A'c-16	S = MPDME; A' = DPBF; k_d not given.	86A159
2.37	**1,3-Butadiene, 1,4-di(1,1-dimethylethoxy)-, (*E,Z*)-**						
	CH_2Cl_2	5.3×10^7			CP/A'c-16	S = MPDME; A' = DPBF; used $k_d = 1.0 \times 10^4\ s^{-1}$.	85A261 86A159
	CH_3CN	1.1×10^8			CP/A'c-16	S = MPDME; A' = DPBF; k_d not given.	86A159
	CH_3COCH_3	5.7×10^7			CP/A'c-16	S = MPDME; A' = DPBF; used $k_d = 2.2 \times 10^4\ s^{-1}$.	85A261 86A159
	THF	5.5×10^7			CP/A'c-16	S = MPDME; A' = DPBF; k_d not given.	86A159
2.38	**1,3-Butadiene, 1,4-di(1,1-dimethylethoxy)-, (*Z,Z*)-**						
	CH_2Cl_2	2.0×10^7			CP/A'c-16	S = MPDME; A' = DPBF; used $k_d = 1.0 \times 10^4\ s^{-1}$.	85A261 86A159
	CH_3CN	3.8×10^7			CP/A'c-16	S = MPDME; A' = DPBF; k_d not given.	86A159

TABLE 2. Rate constants for interaction of singlet oxygen with olefins. — Continued

No.	Solvent	k ($L\ mol^{-1}\ s^{-1}$)	β (k_d/k) ($mol\ L^{-1}$)	T (K)	Method	Comment	Ref.
2.38	**1,3-Butadiene, 1,4-di(1,1-dimethylethoxy)-, (Z,Z)-** — Continued						
	CH_3COCH_3	1.5×10^7			CP/A'c-16	S = MPDME; A' = DPBF; used $k_d = 2.2 \times 10^4\ s^{-1}$.	85A261 86A159
	CH_3COCH_3	1.4×10^7 (k_r)	1.6×10^{-3} (β_r)		CP/Ac,A'c-17	S = MPDME; A' = TME; used $k_d = 2.2 \times 10^4\ s^{-1}$, $\beta_r^{A'} = 1.2 \times 10^{-3}\ mol\ L^{-1}$.	85A261 86A159
	THF	1.9×10^7			CP/A'c-16	S = MPDME; A' = DPBF; k_d not given.	86A159
2.39	**1,3-Butadiene, 2,3-dimethyl-**						
	$CHCl_3$	7.8×10^4			CP/A'c-33	S = A' = Rub; used $k_d = 1.7 \times 10^4\ s^{-1}$, $k_{A'} = 5.3 \times 10^7\ L\ mol^{-1}\ s^{-1}$.	81F445
2.40	**1,3-Butadiene, 1,4-diphenyl- (DPB)**						
	CCl_4	2.1×10^5	6.9×10^{-3}		CP/Pa-15	S = TPP; used $k_d = 1.4 \times 10^3\ s^{-1}$; P = 1,4-Diphenyl-1,3-butadiene endoperoxide.	90F292
	CCl_4			273	CP/Pa-17	S = TPP; A' = Acetone azine; meas. $k_r/k_r^{A'} = 3.5$.	79F278
	C_6F_6			273	CP/Pa-17	S = TPP; A' = Acetone azine; meas. $k_r/k_r^{A'} = 3.6$.	79F278
	$CDCl_3$			253	CP/Pa-17	S = MB; A' = Acetone azine; meas. $k_r/k_r^{A'} = 3.3$.	79F278
	$CDCl_3$			253	CP/Pa-17	S = TPP; A' = Acetone azine; meas. $k_r/k_r^{A'} = 4.5$.	79F278
	$CDCl_3$			253	CP/Pa-17	S = Poly-RB; A' = Acetone azine; meas. $k_r/k_r^{A'} = 3.6$.	79F278
	CH_3CN	6.0×10^5	0.056		CP/Pa-15	S = RB; used $k_d = 3.3 \times 10^4\ s^{-1}$; P = 1,4-Diphenyl-1,3-butadiene endoperoxide.	90F292
2.41	**1,3-Butadiene, 2-ethyl-**						
	$CHCl_3$	7.2×10^4			CP/A'c-33	S = A' = Rub; used $k_d = 1.7 \times 10^4\ s^{-1}$, $k_{A'} = 5.3 \times 10^7\ L\ mol^{-1}\ s^{-1}$.	81F445
2.42	**1,3-Butadiene, 2-methyl- (Isoprene)**						
	C_6H_5Cl/ 2-PrOH (90:10)	3×10^4		273	CR/LI-12	used $k_d = 4.1 \times 10^4\ s^{-1}$; $^1O_2$* from hydrotrioxide, e.g. $(CH_3)_2C(OH)OOOH$.	90M125
	$CHCl_3$	3.7×10^4			CP/A'c-33	S = A' = Rub; used $k_d = 1.7 \times 10^4\ s^{-1}$, $k_{A'} = 5.3 \times 10^7\ L\ mol^{-1}\ s^{-1}$.	81F445
2.43	**1,3-Butadiene, 2-(phenylmethyl)-**						
	C_6H_6		7.3	277	CP/Oc-14	S = TPP.	81F582
	CCl_4		0.82	277	CP/Oc-14	S = TPP.	81F582
	$CH_3COCH_2CH_3$		5.7	277	CP/Oc-14	S = RB.	81F582
	$CHCl_3$		3.4	277	CP/Oc-14	S = TPP.	81F582
	EtOH		11	277	CP/Oc-14	S = RB.	81F582
2.44	**(*E*)-2-Butenal (Crotonaldehyde)**						
	MeOH	2.2×10^3	65	263	CP/Oc-15	S = MB; used $k_d = 1.4 \times 10^5\ s^{-1}$.	737479
2.45	**1-Butene, 2,3-dimethyl-**						
	MeOH			288	CP/Ac,A'c-17	S = MB; A' = c-C_6H_{10}; meas. $k_r/k_r^{A'} = 1.7$.	65F028
2.46	**2-Butene**						
	MeOH		13	293	CP/Oc-15	S = RB; $E_a = 42\ kJ\ mol^{-1}$.	68F288
2.47	**2-Butene, (*E*)**						
	CCl_4/ MeOH (96:4)	2×10^3			PL/A'd-8	S = MB; A' = DPBF.	777162
	CS_2	7.2×10^3		298	PL/Ld-2	S = TPP; $\Delta H‡ = 1\ kJ\ mol^{-1}$; $\Delta S‡ = -176\ J\ K^{-1}\ mol^{-1}$; studied at 183-310 K.	85A167
2.48	**2-Butene, (Z)**						
	CCl_3F			193	CP/Ac-17	S = MPDME; A' = (*E*)-2-Butene; meas. $k_r/k_r^{A'} = 18$.	90F111

TABLE 2. Rate constants for interaction of singlet oxygen with olefins. — Continued

No.	Solvent	k ($L\ mol^{-1}\ s^{-1}$)	β (k_d/k) ($mol\ L^{-1}$)	T (K)	Method	Comment	Ref.
2.48	**2-Butene, (Z) — Continued**						
	CCl_4/ MeOH (96:4)	6×10^3			PL/A'd-8	S = MB; A' = DPBF.	777162
	CS_2	4.8×10^4		298	PL/Ld-2	S = TPP; $\Delta H‡ = 7$ kJ mol^{-1}; $\Delta S‡ = -134$ J K^{-1} mol^{-1}; studied at 183-310 K.	85A167
2.49	**2-Butene, 2-cyclopropyl-, (E)**						
	CH_3COCH_3				CP/Ac,A'c-17	S = Eos; A' = (Dicyclopropylmethylidene)cyclobutane; meas. $k_t/k_r^{A'} = 0.53$.	78F430
2.50	**2-Butene, 2-cyclopropyl-3-methyl-**						
	CH_3CN			283	CP/Ac,A'c-17	S = MB; A' = TME; meas. $k_t/k_r^{A'} = 1.0$; C.k. with 1,2-dimethylcyclohexene.	79F646
	CH_3COCH_3				CP/Ac,A'c-17	S = Eos; A' = (Dicyclopropylmethylidene)cyclobutane; meas. $k_t/k_r^{A'} = 0.76$.	78F430
2.51	**2-Butene, 2,3-dimethyl- (TME)**						
	1-BuOH		4.4×10^{-3}	296	CP/A'c-16	S = MB; A' = DPBF.	717398
	tert-BuOH		2.9×10^{-3}	296	CP/A'c-16	S = MB; A' = DPBF.	717398
	C_5H_5N	$\sim 9 \times 10^6$		286	?	S = Poly-RB; value from graph; method not reported.	81F534
	C_5H_5N		1.3×10^{-3}	285	CP/Pa-20	S = Th, MB, DMA; A' = DMA.	737202
	C_5H_5N			~283	CP/A'c-17	S = A' = DPBF; meas. $k_t/k_r^{A'} = 0.026$.	66F041
	c-C_6H_{12} (mic)	1×10^7			PL/Tb-3	S = Ery; reverse micelles contg. 0.04 mol L^{-1} DAP and 0.1 mol L^{-1} water.	83A050
	$C_6H_5CH_3$	3.6×10^7			PL/Ld-2	S = 2-ACN; $\Delta H‡ = -3$ kJ mol^{-1}; $\Delta S‡ = -126$ J K^{-1} mol^{-1}; $E_a = -1$ kJ mol^{-1}; studied at 183-363 K; pre-exciplex-equilibrium limit activation parameters.	88A427
	$C_6H_5CH_3$		1.1×10^{-3}		CP/Ac-14	S = TPP.	80C002
	$C_6H_5CH_3$	4.2×10^7			PR/A'd-5	S = Np; A' = DPBF.	78E263
	C_6H_5Cl/ 2-PrOH (90:10)	2.6×10^7		273	CR/LI-12	used $k_d = 4.1 \times 10^4\ s^{-1}$; $^1O_2$* from hydrotrioxide, e.g. $(CH_3)_2C(OH)OOOH$.	90M125
	C_6H_6		1.3×10^{-3} (β_r)	286	CP/Oc-29	S = TPP; A' = 2,5-DMF; meas. $1 + k_q/k_r = 1$.	84F065
	C_6H_6	1.8×10^7	2.2×10^{-3}		CP/Oc-19	S = Chl (os); Q = Chl (os); used $k_d = 4.0 \times 10^4\ s^{-1}$; Chl (os) is a commercial mixture contg. a small % of chlorophyll.	81F321
	C_6H_6	$\sim 8 \times 10^6$		286	?	S = Poly-RB; value from graph; method not reported.	81F534
	C_6H_6		1.2×10^{-3}	298	CP/A'c-23	S = A' = Tetr; used $\beta_{A'} = 1.7 \times 10^{-3}$ mol L^{-1}.	706079
	C_6H_6		7.1×10^{-4}	298	CP/A'c-23	S = A' = Rub; used $\beta_{A'} = 3.0 \times 10^{-4}$ mol L^{-1}.	706079
	C_6H_6		1.2×10^{-3}	298	CP/A'c-23	S = A' = DMBA; used $\beta_{A'} = 7.1 \times 10^{-4}$ mol L^{-1}.	706079
	C_6H_6		7.7×10^{-4}	298	CP/A'c-23	S = A' = DMA; used $\beta_{A'} = 3.0 \times 10^{-4}$ mol L^{-1}.	706079
	CCl_4		1.0×10^{-4} (β_r)	286	CP/Oc-29	S = TPP; A' = 2,5-DMF; meas. $1 + k_q/k_r = 1$.	84F065
	CCl_4	$\sim 5 \times 10^5$		286	?	S = Poly-RB; value from graph; method not reported.	81F534
	CH_2Cl_2	5.2×10^7			PL/Ld-2	S = MoO_5.	93F368
	CH_2Cl_2		4.0×10^{-4} (β_r)	286	CP/Oc-29	S = TPP; A' = 2,5-DMF; meas. $1 + k_q/k_r = 1$.	84F065
	CH_2Cl_2	4×10^7			PL/Tb-3	S = TPP.	83A050
	CH_2Cl_2	$\sim 2 \times 10^6$		286	?	S = Poly-RB; value from graph; method not reported.	81F534
	CH_3CN	3.7×10^7		300	PL/P'b-5	S = MB; A' = FlN_2; P' = 9-Fluorenone oxide.	85A206

TABLE 2. Rate constants for interaction of singlet oxygen with olefins. — Continued

No.	Solvent	k (L mol^{-1} s^{-1})	β (k_d/k) (mol L^{-1})	T (K)	Method	Comment	Ref.
2.51	**2-Butene, 2,3-dimethyl- (TME) — Continued**						
	CH_3CN	3.5×10^7		300	PL/P'b-5	S = MB; A' = DDM; P' = Benzophenone oxide.	84A339
	CH_3CN		7.6×10^{-4} (β_r)	286	CP/Oc-29	S = RB; A' = 2,5-DMF; meas. $1 + k_q/k_r = 1$.	84F065
	CH_3CN	$\sim 7 \times 10^6$		286	?	S = Poly-RB; value from graph; method not reported.	81F534
	CH_3COCH_3		1.2×10^{-3} (β_r)	286	CP/Oc-29	S = RB; A' = 2,5-DMF; meas. $1 + k_q/k_r = 1$.	84F065
	CH_3COCH_3	3×10^7			PL/Ld-2	S = MPDME.	83E235
	CH_3COCH_3		6.3×10^{-4} 7.7×10^{-4}	294 206	CP/A'c-16	S = MPDME; A' = DPBF.	83E235
	CH_3COCH_3	$\sim 10^7$		286	?	S = Poly-RB; value from graph; method not reported.	81F534
	CH_3COCH_3	5.4×10^7	7.2×10^{-4}	288	CP/A'c-16	S = RB; A' = DPBF; used $k_d = 3.8 \times 10^4$ s^{-1}.	77F876
	$CHCl_3$		3.6×10^{-4} (β_r)	286	CP/Oc-29	S = TPP; A' = 2,5-DMF; meas. $1 + k_q/k_r = 1$.	84F065
	$CHCl_3$	5.6×10^7			CP/A'c-33	S = A' = Rub; used $k_d = 1.7 \times 10^4$ s^{-1}, $k_{A'} = 5.3 \times 10^7$ L mol^{-1} s^{-1}.	81E003
	$CHCl_3$	5.4×10^7			CR/A'c-33	A' = Rub; used $k_d = 1.7 \times 10^4$ s^{-1}, $k_{A'} = 5.3 \times 10^7$ L mol^{-1} s^{-1}; $^1O_2$* from $DMNO_2$.	81E003
	$CHCl_3$	$\sim 5 \times 10^6$		286	?	S = Poly-RB; value from graph; method not reported.	81F534
	$CHCl_3$	5.8×10^7			CP/A'c-33	S = A' = Rub; used $k_d = 1.7 \times 10^4$ s^{-1}, $k_{A'} = 5.3 \times 10^7$ L mol^{-1} s^{-1}.	78A005
	CS_2	2.2×10^7		298	PL/Ld-2	S = TPP; $\Delta H\ddagger = 2$ kJ mol^{-1}; $\Delta S\ddagger = -96$ J K^{-1} mol^{-1}; studied at 183-310 K.	85A167
	CS_2	$\sim 8 \times 10^5$		286	?	S = Poly-RB; value from graph; method not reported.	81F534
	EtOH		0.56		CP/Ac-15	S = MB; Reported values are suspect since r_{ox} depends on [O_2] and β value was determined from nonlinear data plots.	767041
	EtOH	1.6×10^7			CP/Oc-23	S = RB; A' = Hexamethylenedithiocarbamate; used $k_d = 1.0 \times 10^4$ s^{-1}, $k_{A'} = 1.5 \times 10^8$ L mol^{-1} s^{-1}; meas. $k/(k_d + k_{A'}[A']) = 270$ at [A'] $= 2.8 \times 10^{-4}$ mol L^{-1}.	727116
	H_2O pH = 7.0	1.1×10^8 (k_r)		292	MP/Ac,A'c-17	S = RB; A' = FFA; used $k_r^{A'} = 1.2 \times 10^8$ L mol^{-1} s^{-1}.	87A180
	MeOH		4.0×10^{-3} (β_r)	286	CP/Oc-29	S = RB; A' = 2,5-DMF; meas. $1 + k_q/k_r = 1$.	84F065
	MeOH	3×10^7			PL/Tb-3	S = Ery.	83A050
	MeOH	1.3×10^7		286	?	S = Poly-RB; value from graph; method not reported.	81F534
	MeOH		4.6×10^{-3}	296	CP/A'c-16	S = MB; A' = DPBF.	717398
	MeOH	4×10^7			PL/A'd-5	S = MB; A' = DPBF.	719325
	MeOH		6.2×10^{-3}	293	CP/Oc-15	S = RB; $E_a = 2.1$ kJ mol^{-1}.	68F288
	MeOH		3.0×10^{-3}		?	Method not reported.	68F289
	MeOH/ *tert*-BuOH (50:50)		2.3×10^{-3}		CP/A'c-16	S = RB; A' = DPBF.	717398
2.52	**2-Butene, 2,3-dimethyl-d_6, (*E*)-**						
	CD_3COCD_3			263	CP/Pa-17	S = RB; A' = TME; meas. $k_r/k_r^{A'} = 0.71$.	79F155
2.53	**2-Butene, 2,3-dimethyl-d_6, (*Z*)-**						
	CD_3COCD_3			263	CP/Pa-17	S = RB; A' = TME; meas. $k_r/k_r^{A'} = 0.91$.	79F155

TABLE 2. Rate constants for interaction of singlet oxygen with olefins. — Continued

No.	Solvent	k (L mol^{-1} s^{-1})	β (k_d/k) (mol L^{-1})	T (K)	Method	Comment	Ref.
2.84	**2-Butene, 2,3-dimethyl-, (d_{12})-**						
	$C_6H_5CH_3$	3.2×10^7			PL/Ld-2	S = 2-ACN; $\Delta H‡ = -3$ kJ mol^{-1}; $\Delta S‡ = -126$ J K^{-1} mol^{-1}; $E_a = -0.2$ kJ mol^{-1}; studied at 183-363 K; pre-exciplex-equilibrium limit activation parameters.	88A427
2.85	**2-Butene, 2-methoxy-**						
	c-C_6H_{12}	2.5×10^6			PL/A'd-8	S = An; A' = DPBF; $\Delta H‡ = 4$ kJ mol^{-1}; $\Delta S‡ = -103$ J K^{-1} mol^{-1}; studied at 290-340 K.	82A349
	$C_6H_5CH_3$	1.2×10^7			PL/A'd-8	S = An; A' = DPBF; $\Delta H‡ = -1$ kJ mol^{-1}; $\Delta S‡ = -115$ J K^{-1} mol^{-1}; studied at 250-340 K.	82A349
	CH_3CN	2.4×10^7			PL/A'd-8	S = An; A' = DPBF; $\Delta H‡ = -3$ kJ mol^{-1}; $\Delta S‡ = -114$ J K^{-1} mol^{-1}; studied at 250-340 K.	82A349
	CH_3COCH_3	1.1×10^7			PL/A'd-8	S = An; A' = DPBF; $\Delta H‡ = -2.5$ kJ mol^{-1}; $\Delta S‡ = -119$ J K^{-1} mol^{-1}; studied at 240-320 K.	82A349
	MeOH	1.3×10^7			PL/A'd-8	S = An; A' = DPBF; $\Delta H‡ = -2$ kJ mol^{-1}; $\Delta S‡ = -116$ J K^{-1} mol^{-1}; studied at 250-310 K.	82A349
2.86	**2-Butene, 2-methyl- (2M2B)**						
	C_6H_6		0.035 (β_r)	286	CP/Oc-29	S = TPP; A' = 2,5-DMF; meas. $1 + k_q/k_r = 1$.	84F065
	CCl_4		1.5×10^{-3} (β_r)	286	CP/Oc-29	S = TPP; A' = 2,5-DMF; meas. $1 + k_q/k_r = 1$.	84F065
	CD_3COCD_3	1.3×10^6		298	PL/Ld-2	S = TPP; $\Delta H‡ = 5$ kJ mol^{-1}; $\Delta S‡ = -113$ J K^{-1} mol^{-1}; studied at 183-310 K.	85A167
	CD_3OD	9.4×10^5			CP/LI-12	S = RB; used $k_d = 4.0 \times 10^3$ s^{-1}.	92A386
	CH_2Cl_2		5.8×10^{-3} (β_r)	286	CP/Oc-29	S = TPP; A' = 2,5-DMF; meas. $1 + k_q/k_r = 1$.	84F065
	$(CH_3)_3CCH_2OCH_3$	1.1×10^6			CP/LI-12	S = TPP; used $k_d = 3.5 \times 10^4$ s^{-1}.	92A386
	CH_3CN		0.011 (β_r)	286	CP/Oc-29	S = RB; A' = 2,5-DMF; meas. $1 + k_q/k_r = 1$.	84F065
	CH_3COCH_3		0.020 (β_r)	286	CP/Oc-29	S = RB; A' = 2,5-DMF; meas. $1 + k_q/k_r = 1$.	84F065
	$CHCl_3$		7.2×10^{-3} (β_r)	286	CP/Oc-29	S = TPP; A' = 2,5-DMF; meas. $1 + k_q/k_r = 1$.	84F065
	$CHCl_3$	1.5×10^6			CP/A'c-33	S = A' = Rub; used $k_d = 1.7 \times 10^4$ s^{-1}, $k_{A'} = 5.3 \times 10^7$ L mol^{-1} s^{-1}.	81E003
	$CHCl_3$	2.3×10^6			CR/A'c-33	A' = Rub; used $k_d = 1.7 \times 10^4$ s^{-1}, $k_{A'} = 5.3 \times 10^7$ L mol^{-1} s^{-1}; $^1O_2$* from $DMNO_2$.	81E003
	$CHCl_3$	2.3×10^6			CP/A'c-33	S = A' = Rub; used $k_d = 1.7 \times 10^4$ s^{-1}, $k_{A'} = 5.3 \times 10^7$ L mol^{-1} s^{-1}.	78A005
	CS_2	7.2×10^5		298	PL/Ld-2	S = TPP; $\Delta H‡ = 3$ kJ mol^{-1}; $\Delta S‡ = -125$ J K^{-1} mol^{-1}; studied at 183-310 K.	85A167
	EtOH		1.6		CP/Ac-15	S = MB; Reported values are suspect since r_{ox} depends on [O_2] and β value was determined from nonlinear data plots.	767041
	MeOH		0.096 (β_r)	286	CP/Oc-29	S = RB; A' = 2,5-DMF; meas. $1 + k_q/k_r = 1$.	84F065
	MeOH	1.1×10^6		286	?	S = Poly-RB; method not reported.	81F534
	MeOH	1.1×10^6	0.10		?	used $k_d = 1.1 \times 10^5$ s^{-1}; Unpublished data.	79F074
	MeOH		0.060	293	CP/Oc-15	S = $FlCl_4^{2-}$; $E_a = 6.7$ kJ mol^{-1}.	68F288
	MeOH		0.030	293	CP/Oc-15	S = DNT; $E_a = 5.9$ kJ mol^{-1}.	68F288
	MeOH		0.60	293	CP/Oc-15	S = RB; $E_a = 6.7$ kJ mol^{-1}.	68F288
	MeOH		0.055	293	CP/Oc-15	S = $FlBr_4Cl_4^{2-}$; $E_a = 6.3$ kJ mol^{-1}.	68F288
	MeOH		0.10	293	CP/Oc-15	S = MB; $E_a = 9.2$ kJ mol^{-1}.	68F288
	MeOH		0.055		?	Method not reported.	68F289
	MeOH/ *tert*-BuOH (50:50)				CP/Ac,A'c-17	S = RB; A' = TME; meas. $k_t/k_r^{A'} = 0.045$.	68F292
	MeOH/ *tert*-BuOH (50:50)				CR/Ac,A'c-17	A' = TME; meas. $k_t/k_r^{A'} = 0.043$; $^1O_2$* from $H_2O_2/Ca(OCl)_2$.	68F292

TABLE 2. Rate constants for interaction of singlet oxygen with olefins. — Continued

No.	Solvent	k (L mol^{-1} s^{-1})	β (k_d/k) (mol L^{-1})	T (K)	Method	Comment	Ref.
2.56	**2-Butene, 2-methyl- (2M2B)** — Continued						
	MeOH/ *tert*-BuOH (50:50)				CR/Ac,A'c-17	A' = TME; meas. $k_r/k_r^{A'} = 0.067$; $^1O_2$* from H_2O_2/NaOCl.	68F292
	MeOH/ *tert*-BuOH (50:50)			303	CP/Pa,P'a-17	S = RB; A' = TME; meas. $k_r/k_r^{A'} = 0.024$.	68F292
	MeOH/ *tert*-BuOH (50:50)			298	CR/Pa,P'a-17	A' = TME; meas. $k_r/k_r^{A'} = 0.029$; $^1O_2$* from H_2O_2/NaOCl,.	68F292
2.57	**(*E*)-2-Butenoic acid (Crotonic acid)**						
	C_6D_6	3.3×10^3			PL/Ld-2	S = TPP.	89A331
2.58	**2-Butenoic acid, 2-methyl-, (*E*)**						
	C_6D_6	6.8×10^3			PL/Ld-2	S = TPP.	89A331
2.59	**3-Butenoic acid**						
	C_6D_6	4.0×10^3			PL/Ld-2	S = TPP.	89A331
2.60	**2-Buten-1-ol, 3-methyl-**						
	MeOH/ H_2O (95:5)		0.14		CP/Oc-15	S = RB; Soln. contg. 1% sodium acetate.	79F137
2.61	**1-Buten-3-one, 1-(2,6,6-trimethyl-1-cyclohexen-1-yl)- (β-Ionone)**						
	C_6H_6	1.6×10^6			PL/A'd-5	S = A; A' = DPBF.	85E293
2.62	**β-*apo*-8'-Carotenal**						
	C_6H_6	1.4×10^{10}			PL/βCd-11	S = An.	78F276
	CH_2Cl_2	3.1×10^9		298	CP/P'a-19	S = Chl a; A' = Soybean oil; used $k_{A'} = 1.0 \times 10^5$ L mol^{-1} s^{-1}; meas. $k_A/k_{A'} = 3.0 \times 10^4$; obs. peroxide formation.	91U180
2.63	**α-Carotene**						
	$C_6H_5CH_3$	8.2×10^9			PL/Ld-2	S = Pz.	91E465
	$CHCl_3$/ EtOH (50:50)	6×10^9		310	CR/LI-12	$^1O_2$* from $NDPO_2$; reported $k = 1.9 \times 10^{10}$ L mol^{-1} s^{-1} using $k_d = 1 \times 10^5$ s^{-1}, recalcd. using $k_d = 3.0 \times 10^4$ s^{-1} [92E654].	89R188 90E622
2.64	**9-*cis*-β-Carotene**						
	$C_6H_5CH_3$	9×10^9			PL/Ld-2	S = Pz.	91E465
	C_6H_6	1.1×10^{10}			PL/Ld-2	S = Pz.	91E465
2.65	**15,15'-(Z)-β-Carotene**						
	$C_6H_5CH_3$	1.2×10^{10}			PL/Ld-2	S = Pz.	91E465
	C_6H_6	1.1×10^{10}			PL/Ld-2	S = Pz.	91E465
2.66	**β-Carotene**						
	1-BuOH		5.5×10^{-6}		CP/A'c-16	S = RB; A' = DPF.	717398
	tert-BuOH		3.8×10^{-6}		CP/A'c-16	S = RB; A' = DPF.	717398
	C_5H_5N	6.5×10^9			CP/A'c-23	S = A' = Rub; used $k_d = 6.0 \times 10^4$ s^{-1}, $k_{A'} = 4 \times 10^7$ L mol^{-1} s^{-1}.	743112
	C_6D_6	2.1×10^{10}			PL/Ld-2	S = Pur.	89R044
	n-C_6H_{14}	1.4×10^{10}			PL/Ld-2	S = Pz.	91E465
	n-C_6H_{14}	3.7×10^7 (k_r)			CP/Ac-?	S = A' = An; used $k_d = 6 \times 10^4$ s^{-1}; calcd. using $k_A = 3 \times 10^{10}$ L mol^{-1} s^{-1}.	80F169
	C_6H_5Br	3.4×10^9		273	MD/A'c-33	A' = Rub; used $k_d = 1.3 \times 10^4$ s^{-1}, $k_{A'} = 4.0 \times 10^7$ L mol^{-1} s^{-1}; meas. $k/[(k_d/[A']) + k_{A'}] = 33.7$ at $[A'] = 1.5 \times 10^{-4}$ mol L^{-1}.	737333
	$C_6H_5CH_3$	1.4×10^{10}			PL/Ld-2	S = Pz.	91E465

TABLE 2. Rate constants for interaction of singlet oxygen with olefins. — Continued

No.	Solvent	k ($L\ mol^{-1}\ s^{-1}$)	β (k_d/k) ($mol\ L^{-1}$)	T (K)	Method	Comment	Ref.
1.66	**β-Carotene** — Continued						
	$C_6H_5CH_3$	1.1×10^{10}			PL/Ld-2	S = 2-ACN; $\Delta H‡ = 2$ (5) kJ mol^{-1}; $\Delta S‡ = -60$ (–50) J K^{-1} mol^{-1}; $E_a = 4$ (7) kJ mol^{-1}; studied at 183-363 K; pre-exciplex-equilibrium limit (and diffusion limit).	88A427
	$C_6H_5CH_3$	1×10^{10}			CP/A'c-20	S = A' = MDH; used $k_d = 4.0 \times 10^4\ s^{-1}$.	83F406
	$C_6H_5CH_3$	3.0×10^{10}			CP/A'c-25	S = A' = Rub; used $k_d = 1 \times 10^5\ s^{-1}$, $k_{A'} = 1.7 \times 10^8\ L\ mol^{-1}\ s^{-1}$.	752063
	C_6H_6	1.3×10^{10}			PL/Ld-2	S = Pz.	91E465
	C_6H_6	1.3×10^{10} 2.0×10^6 (k_r) 1.2×10^{10} (k_q)		298	CP/Ac,A'c-23	S = A' = Rub; used $k_d = 4.2 \times 10^4\ s^{-1}$, $k_{A'} = 4.2 \times 10^7\ L\ mol^{-1}\ s^{-1}$.	90F360
	C_6H_6	1.5×10^{10}		303	CP/P'a-19	S = A' = Rub; k_d not given.	87A107
	C_6H_6	1.2×10^{10}			PL/βCd-11	S = An.	78F276
	C_6H_6	1.3×10^{10}		298	PL/A'd-8	S = An; A' = DPBF.	737438
	C_6H_6	1.1×10^{10}		298	PL/βCd-11	S = An.	737438
	C_6H_6	2×10^{10}			PL/A'd-5	S = MB; A' = DPBF; Solvent contained 2% MeOH.	727260
	C_6H_6/ EtOH (67:33)	1.6×10^{10}			CP/A'c-19	S = RB; A' = Chl a; used $k_d = 1 \times 10^5\ s^{-1}$.	78F404
	C_6H_6/ EtOH (89:11)	1.3×10^{10}		295	CP/P'a-19	S = RB; A' = TEMP-4-OH; used $k_d = 3 \times 10^4\ s^{-1}$; P' = TEMPOL.	757445
	C_6H_6/ MeOH (60:40)	2.3×10^{10}	4.3×10^{-6}		CP/A'c-22	S = MB; A' = Rub; used $k_d = 1.0 \times 10^5\ s^{-1}$.	747042
	C_6H_6/ MeOH (80:20)	9.7×10^9	3.9×10^{-6}		CP/A'c-16	S = RB; A' = DPF; used $k_d = 3.8 \times 10^4\ s^{-1}$.	717398
	C_6H_6/ MeOH (80:20)			298	CP/P'a-20	S = MB; A' = 2M2P; meas. $k_A/k_{A'} = 1.5 \times 10^4$.	70F734
	CCl_4	9.9×10^9			PL/Ld-2	S = Pz.	91E465
	CCl_4	1.0×10^{10}		296	CR/LI-12	used $k_d = 1.7 \times 10^3\ s^{-1}$; $^1O_2$* from $DMNO_2$.	90F069
	CCl_4	5.9×10^9			CP/LI-12	S = PHO; used $k_d = 35\ s^{-1}$.	88E479
	CCl_4	3.8×10^6 (k_r)			CP/Ac-14,27	S = TPP; A' = Tetr; k_r derived using $k_A = 7 \times 10^9$ $L\ mol^{-1}\ s^{-1}$.	83A336
	CCl_4	7.0×10^9			MP/LI-12	S = TPP; used $k_d = 36\ s^{-1}$.	83A336 78E892
	CCl_4	6.5×10^9		295	PL/Ld-2	S = PdMPDME or MPDME; decay at 1588 nm; decay at 1272 nm gave 7×10^9 $L\ mol^{-1}\ s^{-1}$.	80E558
	CCl_4	8.0×10^9			MP/LI-12	S = Ret; used $k_d = 36\ s^{-1}$.	79F463 78F700
	CCl_4	7×10^9			MP/LI-12	S = PP, Ph a, or BChl a; used $k_d = 35\ s^{-1}$.	77E617 78E881 79A010
	CCl_4/ $CHCl_3$ (90:10)	6.2×10^9			CP/A'c-23	S = A' = Rub; used $k_d = 1.4 \times 10^3\ s^{-1}$, $k_{A'} = 7 \times 10^7\ L\ mol^{-1}\ s^{-1}$; meas. $k/(k_{A'}[A'] + k_d) = 3.5 \times 10^6\ L\ mol^{-1}$ at $[A'] = 5 \times 10^{-6}\ mol\ L^{-1}$.	74F645
	CD_3OD	1.4×10^9			CP/LI-12	S = RB; used $k_d = 4.4 \times 10^3\ s^{-1}$.	88E479
	CD_3OD	1.5×10^9			CP/LI-12	S = PHO; used $k_d = 4.4 \times 10^3\ s^{-1}$.	88E479
	CH_2Cl_2	4.6×10^9		298	CP/P'a-19	S = Chl a; A' = Soybean oil; used $k_{A'} = 1.0 \times 10^5$ $L\ mol^{-1}\ s^{-1}$; obs. peroxide formation.	91U180
	CH_2Cl_2	1.3×10^{10}			PL/Tb-3	S = TPP.	83A050
	CH_2Cl_2	1.3×10^{10}		298	CP/A'c-23	S = A' = Rub; used $k_d = 8.0 \times 10^3\ s^{-1}$, $k_{A'} = 7.3 \times 10^7\ L\ mol^{-1}\ s^{-1}$.	747341

TABLE 2. Rate constants for interaction of singlet oxygen with olefins. — Continued

No.	Solvent	k (L mol^{-1} s^{-1})	β (k_d/k) (mol L^{-1})	T (K)	Method	Comment	Ref.
2.66	**β-Carotene** — Continued						
	CH_2Cl_2	8.5×10^9			CP/A'c-23	S = A' = Rub; used $k_d = 7.3 \times 10^3$ s^{-1}, $k_{A'} = 7 \times 10^7$ L mol^{-1} s^{-1}.	732066
	$CHCl_3$	5×10^9			CR/LI-12	used $k_d = 3.0 \times 10^4$ s^{-1}; $^1O_2$* from $NDPO_2$.	92R054
	$CHCl_3$	1.1×10^{10}			PL/Ld-2	S = Pz.	91E465
	$CHCl_3$	6.5×10^9			PL/Ld-2	S = MPDEE or PdMPDEE.	81E472
	$CHCl_3$/ EtOH (50:50)	1.2×10^{10}			PL/Ld-2	S = Pz; Soln. cont. 1% H_2O.	91E465
	$CHCl_3$/ EtOH (50:50)	4×10^9		310	CR/LI-12	$^1O_2$* from $NDPO_2$; reported $k = 1.4 \times 10^{10}$ L mol^{-1} s^{-1} using $k_d = 1 \times 10^5$ s^{-1}, recalcd. using $k_d = 3.0 \times 10^4$ s^{-1} [92E654].	89R188 90E622
	CS_2		1.5×10^{-7}		CP/P'a-20	S = TPP; A' = 2M2P.	727028
	$ClCF_2CCl_2F$	1.1×10^{10}		303	CR/P'a-32	A' = Rub; $^1O_2$* from $DMNO_2$; $k_{A'}$ and k_d not given.	87A107
	$ClCF_2CCl_2F$/ CH_2Cl_2 (96:4)	9.5×10^9			PL/Tb-3	S = TPP.	83A050
	EtOH/ H_2O (95:5)	2×10^9			CR/LI-12	$^1O_2$* from pyrogallol autooxidation by O_2/KOH; k_d not given.	78F605
	MeOH	9.3×10^8		297	CR/P'a-31	A' = TEMP; formn. of TEMPO monitored by esr; soln. cont. MeONa and $CoCl_2$, $^1O_2$* from autoxidation of adrenaline; k_d not given.	92D227
	MeOH		6.1×10^{-6}		CP/A'c-16	S = RB.	717398
	MeOH/ H_2O (95:5)	6.3×10^9		310	CR/LI-12	used $k_d = 1.8 \times 10^5$ s^{-1}; soln. cont. 0.05 mol L^{-1} MeONa and 5×10^{-4} mol L^{-1} $CoCl_2$, $^1O_2$* from autoxidation of oxytetracycline.	92M228
2.67	**β,β-Carotene, 3'-(acetyloxy)-6',7'-didehydro-5,6-epoxy-5,5',6,6',7,8-hexahydro-3,3',5'-trihydroxy-8-oxo-, (3*S*,3'*S*,5*R*,5'*R*,6*S*,6'*R*)- (Fucoxanthin)**						
	CCl_4	2.6×10^5 (k_r)			CP/Ac-14,27	S = TPP; A' = Tetr; k_r derived using $k_A = 7 \times 10^8$ L mol^{-1} s^{-1}.	83A336
	CCl_4	7.0×10^8			MP/LI-12	S = TPP; used $k_d = 36$ s^{-1}.	83A336
2.68	**ψ-Carotene, 3,4-didehydro-1,2,7',8'-tetrahydro-1-methoxy- (*all-E*)- (Spheroidene)**						
	C_6D_6	1.6×10^{10}			PL/Ld-2	S = Pur.	89R044
2.69	**ψ-Carotene, 3,4-didehydro-1,2,7',8'-tetrahydro-1-methoxy-2-oxo- (*all-E*)- (Spheroidenone)**						
	C_6D_6	1.9×10^{10}			PL/Ld-2	S = Pur.	89R044
2.70	**ψ-Carotene, 7,8-dihydro- (*all-E*)- (Neurosporene)**						
	C_6D_6	1.7×10^{10}			PL/Ld-2	S = Pur.	89R044
2.71	**ψ-Carotene, 3,3',4,4'-tetradehydro-1,1',2,2'-tetrahydro-1,1'-dimethoxy- (*all-E*)- (Spirilloxanthin)**						
	C_6D_6	1.3×10^{10}			PL/Ld-2	S = Pur.	89R044
2.72	**ψ-Carotene, 7,8,11,12-tetrahydro- (ζ-Carotene)**						
	C_6D_6	3.5×10^9			PL/Ld-2	S = MPDME.	89R044
2.73	**ψ,ψ-Carotene, 7,7',8,8',11,12-hexahydro-, 15-*cis*- (15-*cis*-Phytofluene)**						
	$CHCl_3$	$<1 \times 10^7$			CR/LI-12	used $k_d = 3.0 \times 10^4$ s^{-1}; $^1O_2$* from $NDPO_2$.	92R054
	C_6H_6/ MeOH (60:40)	$\leq 1.0 \times 10^8$	$\geq 1.0 \times 10^{-3}$		CP/A'c-22	S = MB; A' = Rub; used $k_d = 1.0 \times 10^5$ s^{-1}.	747042
2.74	**15(*Z*)-ψ-Carotene, 7,7',8,8',11,11',12,12'-octahydro- (15-*cis*-Phytoene)**						
	$CHCl_3$	$<1 \times 10^7$			CR/LI-12	used $k_d = 3.0 \times 10^4$ s^{-1}; $^1O_2$* from $NDPO_2$.	92R054
	C_6H_6/ MeOH (60:40)	$\leq 1.9 \times 10^7$	$\geq 5.3 \times 10^{-3}$		CP/A'c-22	S = MB; A' = Rub; used $k_d = 1.0 \times 10^5$ s^{-1}.	747042

TABLE 2. Rate constants for interaction of singlet oxygen with olefins. — Continued

No.	Solvent	k (L mol^{-1} s^{-1})	β (k_d/k) (mol L^{-1})	T (K)	Method	Comment	Ref.
1.75	**(*E*)-β,ε-Carotene, 3,3'-dihydroxy- (3*R*,3'*R*,6'*R*)- (Lutein)**						
	C_6H_6/ MeOH (60:40)	2.1×10^{10}	4.8×10^{-6}		CP/A'c-22	S = MB; A' = Rub; used $k_d = 1.0 \times 10^5$ s^{-1}.	747042
	CH_2Cl_2	5.7×10^9	1.8×10^{-6}	293	CP/Oc-19	S = Chl a; A' = Soybean oil; used $k_d = 1.0 \times 10^4$ s^{-1}.	90R128
	$CHCl_3$	1.6×10^{10}			PL/Ld-2	S = Pz; Contains ~5% zeaxanthin.	91E465
	$CHCl_3$/ EtOH (50:50)	2×10^9		310	CR/LI-12	$^1O_2$* from $NDPO_2$; reported $k = 8 \times 10^9$ L mol^{-1} s^{-1} using $k_d = 1 \times 10^5$ s^{-1}, recalcd. using $k_d = 3.0 \times 10^4$ s^{-1} [92E654].	89R188 90E622
1.76	**γ-Carotene**						
	$CHCl_3$/ EtOH (50:50)	7×10^9		310	CR/LI-12	$^1O_2$* from $NDPO_2$; reported $k = 2.5 \times 10^{10}$ L mol^{-1} s^{-1} using $k_d = 1 \times 10^5$ s^{-1}, recalcd. using $k_d = 3.0 \times 10^4$ s^{-1} [92E654].	89R188 90E622
	$CHCl_3$	8.3×10^8			PL/Ld-2	S = Pz.	91E465
1.77	**Carotene analog, C-30**						
	C_6H_6/ MeOH (80:20)				CP/Pa-20	S = MB; A' = 2M2P; meas. $k/k_{A'} = (57 \pm 86)$.	707188
1.78	**Carotene analog, C-35**						
	C_6H_6/ MeOH (80:20)				CP/P'a-20	S = MB; A' = 2M2P; meas. $k/k_{A'} = 1900 \pm 2850$.	707188
1.79	**β,β-Carotene-3,3'-diol, (3*R*,3'*R*)- (Zeaxanthin)**						
	C_6H_6	1.2×10^{10}			PL/Ld-2	S = Pz.	91E465
	C_6H_6	2.8×10^9			PL/βCd-2	S = An.	80A143
	CCl_4	7.0×10^9			MP/LI-12	S = TPP; used $k_d = 36$ s^{-1}.	83A336
	CCl_4	3.4×10^6 (k_r)			CP/Ac-27	S = TPP, A' = Tetr, k_r derived using $k_A = 7 \times 10^9$ L mol^{-1} s^{-1}.	83A336
	CH_2Cl_2	6.8×10^9	1.5×10^{-6}	293	CP/Oc-19	S = Chl a; A' = Soybean oil; used $k_d = 1.0 \times 10^4$ s^{-1}.	90R128
	$CHCl_3$/ EtOH (50:50)	3×10^9		310	CR/LI-12	$^1O_2$* from $NDPO_2$; reported $k = 1.0 \times 10^{10}$ L mol^{-1} s^{-1} using $k_d = 1 \times 10^5$ s^{-1}, recalcd. using $k_d = 3.0 \times 10^4$ s^{-1} [92E654].	89R188 90E622
1.80	**β,β-Carotene-3,3'-diol, 5,6:5',6'-diepoxy-5,5',6,6'-tetrahydro- (*all-E*) (Violaxanthin)**						
	C_6H_6	1.6×10^{10}			PL/Ld-2	S = Pz.	91E465
1.81	**β,β-Carotene-4,4'-diol, *all-E*- (Isozeaxanthin)**						
	C_6H_6/ MeOH (60:40)	2.9×10^{10}	3.4×10^{-6}		CP/A'c-22	S = MB; A' = Rub; used $k_d = 1.0 \times 10^5$ s^{-1}.	747042
	CH_2Cl_2	7.4×10^9	1.3×10^{-6}	293	CP/Oc-19	S = Chl a; A' = Soybean oil; used $k_d = 1.0 \times 10^4$ s^{-1}.	90R128
1.82	**β-Carotene-4,4'-dione, 3,3'-dihydroxy- (Astaxanthin)**						
	C_6H_6	1.4×10^{10}			PL/Ld-2	S = Pz.	91E465
	CH_2Cl_2	9.8×10^9	1.0×10^{-6}	293	CP/Oc-19	S = Chl a; A' = Soybean oil; used $k_d = 1.0 \times 10^4$ s^{-1}.	90R128
	$CHCl_3$/ EtOH (50:50)	7×10^9		310	CR/LI-12	$^1O_2$* from $NDPO_2$; reported $k = 2.4 \times 10^{10}$ L mol^{-1} s^{-1} using $k_d = 1 \times 10^5$ s^{-1}, recalcd. using $k_d = 3.0 \times 10^4$ s^{-1} [92E654].	89R188 90E622
1.83	**β,β-Carotene-4,4'-dione (Canthaxanthin)**						
	$C_6H_5CH_3$	1.3×10^{10}			PL/Ld-2	S = Pz.	91E465
	C_6H_6	1.8×10^{10}			PL/βCd-2	S = An.	80A143
	C_6H_6	1.4×10^{10}			PL/βCd-11	S = An.	78F276

TABLE 2. Rate constants for interaction of singlet oxygen with olefins. — Continued

No.	Solvent	k ($L\ mol^{-1}\ s^{-1}$)	β (k_d/k) ($mol\ L^{-1}$)	T (K)	Method	Comment	Ref.
2.83	**β,β-Carotene-4,4'-dione (Canthaxanthin)** — Continued						
	CCl_4	1.0×10^{10}			CP/LI-12	S = PHO; used $k_d = 35\ s^{-1}$.	88E479
	CD_3OD	1.2×10^{10}			CP/LI-12	S = PHO; used $k_d = 4.4 \times 10^3\ s^{-1}$.	88E479
	CH_2Cl_2	1.1×10^{10}			CP/P'a-19	S = Chl a; A' = Soybean oil; used $k_{A'} = 1.0 \times 10^5$ $L\ mol^{-1}\ s^{-1}$; obs. peroxide formation.	91U180
	$CHCl_3$/ EtOH (50:50)	6×10^9		310	CR/LI-12	$^1O_2$* from $NDPO_2$; reported $k = 2.1 \times 10^{10}$ L $mol^{-1}\ s^{-1}$ using $k_d = 1 \times 10^5\ s^{-1}$, recalcd. using $k_d = 3.0 \times 10^4\ s^{-1}$ [92E654].	89R188
2.84	**κ,κ-Carotene-6,6'-dione, 2,2'-dihydroxy- (2*S*,2'*S*,5*R*,5'*R*) (C_{40}-Epiisocapsorubin)**						
	$CHCl_3$	8×10^9			CR/LI-12	used $k_d = 3.0 \times 10^4\ s^{-1}$; $^1O_2$* from $NDPO_2$.	92R054
2.85	**β-*apo*-8-Carotenoic acid, ethyl ester**						
	C_6H_6	1.2×10^{10}			PL/βCd-11	S = An.	78F276
2.86	**β-*apo*-8'-Carotenol**						
	C_6H_6/ MeOH (80:20)				CP/P'a-20	S = MB; A' = 2M2P; meas. $k_A/k_{A'} = -1.9 \times 10^3$.	707188
	C_6H_6/ MeOH (80:20)	1.2×10^{10}		298	CP/P'a-20	S = MB; A' = 2M2P; used $k_d = 1.0 \times 10^5\ s^{-1}$, $\beta_{A'}$ = 0.04 $mol\ L^{-1}$.	70F734
2.87	**β,β-Caroten-3-ol (Cryptoxanthin)**						
	$CHCl_3$/ EtOH (50:50)	2×10^9		310	CR/LI-12	$^1O_2$* from $NDPO_2$; reported $k = 6 \times 10^9$ L mol^{-1} s^{-1} using $k_d = 1 \times 10^5\ s^{-1}$, recalcd. using $k_d = 3.0 \times 10^4\ s^{-1}$ [92E654].	89R188 90E622
2.88	**β,β-Caroten-4-one (Echinenone)**						
	C_6H_6	1.1×10^{10}			PL/βCd-2	S = An.	80A143
2.89	**3,5-Cholestadiene**						
	$CHCl_3$	7.4×10^5			CP/A'c-33	S = A' = Rub; used $k_d = 1.7 \times 10^4\ s^{-1}$, $k_{A'} = 5.3 \times 10^7$ L $mol^{-1}\ s^{-1}$.	81F445
2.90	**4-Cholesten-3-one, 4-methyl-**						
			$>2 \times 10^2$		CP/Ac-18	S = Poly-RB or RB or MB; A' = Linalool; used $\beta_{A'} = 0.18\ mol\ L^{-1}$; Solvent is CH_2Cl_2 or MeOH or C_6H_6.	80F111
2.91	**(*E*)-Cinnamic acid**						
	CD_3OD	3.4×10^3		293	PL/Ld-2	S = HP.	90F411
2.92	**Coumarin, 3,4,5,6,7,8-hexahydro-**						
	CD_3COCD_3	1.0×10^6 (k_r) 5.5×10^5 (k_r)		296 241	CP/Ac,P'a-17	S = MB; A' = 2M2P; used $k_r^{A'} = 8.1 \times 10^5$ L $mol^{-1}\ s^{-1}$; $\Delta H‡ = 4.6\ kJ\ mol^{-1}$; $\Delta S‡ = -130\ J\ K^{-1}$ mol^{-1}.	86F219
	CD_3COCD_3	1.1×10^6		296	PL/Ld-2	S = MB.	86F219
2.93	**Crocetin**						
	D_2O pD = 8.4	6×10^8		293	PL/Ad,A'd-5	S = PBA; A' = DPBF; used $k_{A'} = 1.0 \times 10^9$ L $mol^{-1}\ s^{-1}$.	82A204
	D_2O pD = 8.4	2.5×10^9		293	PL/Ad-5	S = PBA.	82A204
	DMF	$<5 \times 10^6$ (k_r) $\sim 7 \times 10^9$ (k_q)		308	CR/Ac-?	used $k_d = 1.4 \times 10^5\ s^{-1}$; $^1O_2$* from $MNPO_2$.	87A318
	DMSO	$<5 \times 10^6$ (k_r) $\sim 2 \times 10^9$ (k_q)		308	CR/Ac-?	used $k_d = 4.2 \times 10^4\ s^{-1}$; $^1O_2$* from $MNPO_2$.	87A318
	H_2O pH = 7.8	2.5×10^8 (k_r) 5.5×10^9 (k_q)		308	CR/Ac-?	used $k_d = 4.2 \times 10^4\ s^{-1}$; $^1O_2$* from $MNPO_2$.	87A318

TABLE 2. Rate constants for interaction of singlet oxygen with olefins. — Continued

No.	Solvent	k (L mol^{-1} s^{-1})	β (k_d/k) (mol L^{-1})	T (K)	Method	Comment	Ref.
2.94	**Cyclobutane, (1-cyclopropylethylidene)-**						
	CH_3COCH_3				CP/Ac,A'c-17	S = Eos; A' = (Dicyclopropylmethylidene)cyclobutane; meas. $k_r/k_r^{A'} = 0.70$.	78F430
2.95	**Cyclobutane, (cyclopropylmethylene)-**						
	CH_3COCH_3				CP/Ac,A'c-17	S = Eos; A' = (Dicyclopropylmethylidene)cyclobutane; meas. $k_r/k_r^{A'} = 0.59$.	78F430
2.96	**Cyclobutane, (dicyclopropylmethylidene)-**						
	C_2H_5I				CP/Ac,A'c-17	S = TPP; A' = TMS; meas. $k_r/k_r^{A'} = 0.21$.	78F430
	C_6H_6				CP/Ac,A'c-17	S = TPP; A' = TMS; meas. $k_r/k_r^{A'} = 0.25$.	78F430
	CH_2Cl_2				CP/Ac,A'c-17	S = MB; A' = TMS; meas. $k_r/k_r^{A'} = 0.21$.	78F430
	CH_3COCH_3				CP/Ac,A'c-17	S = Eos; A' = TMS; meas. $k_r/k_r^{A'} = 0.26$.	78F430
	CS_2				CP/Ac,A'c-17	S = TPP; A' = TMS; meas. $k_r/k_r^{A'} = 0.22$.	78F430
	MeOH				CP/Ac,A'c-17	S = Eos; A' = TMS; meas. $k_r/k_r^{A'} = 0.21$.	78F430
2.97	**Cyclobutene, 1-*tert*-butyl-**						
	CH_3CN			273	CP/Ac,A'c-17	S = MB; A' = 1-*tert*-Butylcyclohexene; meas. $k_r/k_r^{A'} = 5.8$.	81F018
2.98	**Cyclobutene, 1-methyl-**						
	CH_3CN			273	CP/Ac,A'c-17	S = MB; A' = 1-*tert*-Butylcyclohexene; meas. $k_r/k_r^{A'} = 9.3$.	81F018
2.99	**1,3-Cycloheptadiene**						
	$CHCl_3$	1.1×10^6			CP/A'c-33	S = A' = Rub; used $k_d = 1.7 \times 10^4$ s^{-1}, $k_{A'} = 5.3 \times 10^7$ L mol^{-1} s^{-1}.	81F445
2.100	**Cycloheptane, ethylidene-**						
	$CHCl_3$	4.8×10^6			CP/A'c-33	S = A' = Rub; used $k_d = 1.7 \times 10^4$ s^{-1}, $k_{A'} = 5.3 \times 10^7$ L mol^{-1} s^{-1}.	81F445
2.101	**Cycloheptane, methylene-**						
	CH_3CN			273	CP/Ac,A'c-17	S = MB; A' = Methylenecyclohexane; meas. $k_r/k_r^{A'} = 62$.	81F018
2.102	**Cycloheptene, 1-methyl-**						
	CH_3CN			273	CP/Ac,A'c-17	S = MB; A' = 1-*tert*-Butylcyclohexene; meas. $k_r/k_r^{A'} = 17$.	81F018
	$CHCl_3$	2.4×10^6			CP/A'c-33	S = A' = Rub; used $k_d = 1.7 \times 10^4$ s^{-1}, $k_{A'} = 5.3 \times 10^7$ L mol^{-1} s^{-1}.	81F445
2.103	**1,3-Cyclohexadiene**						
	C_6H_6		0.015 (β_r)	286	CP/Oc-29	S = TPP; A' = 2,5-DMF; meas. $1 + k_q/k_r = 1$.	84F065
	CCl_4		4.4×10^{-4} (β_r)	286	CP/Oc-29	S = TPP; A' = 2,5-DMF; meas. $1 + k_q/k_r = 1$.	84F065
	CCl_4	1.8×10^6			CP/Ac-14	S = TPP; used $k_d = 1.4 \times 10^3$ s^{-1}.	80C002
	CH_2Cl_2		3.2×10^{-3} (β_r)	286	CP/Oc-29	S = TPP; A' = 2,5-DMF; meas. $1 + k_q/k_r = 1$.	84F065
	CH_3CN		9.4×10^{-3} (β_r)	286	CP/Oc-29	S = RB; A' = 2,5-DMF; meas. $1 + k_q/k_r = 1$.	84F065
	CH_3COCH_3		0.013 (β_r)	286	CP/Oc-29	S = RB; A' = 2,5-DMF; meas. $1 + k_q/k_r = 1$.	84F065
	$CHCl_3$		4.3×10^{-3} (β_r)	286	CP/Oc-29	S = TPP; A' = 2,5-DMF; meas. $1 + k_q/k_r = 1$.	84F065
	$CHCl_3$	7.1×10^6			CP/A'c-33	S = A' = Rub; used $k_d = 1.7 \times 10^4$ s^{-1}, $k_{A'} = 5.3 \times 10^7$ L mol^{-1} s^{-1}.	81F445
	MeOH		0.037 (β_r)	286	CP/Oc-29	S = RB; A' = 2,5-DMF; meas. $1 + k_q/k_r = 1$.	84F065
	MeOH		0.025	293	CP/Oc-15	S = $FlBr_4Cl_4^{2-}$; $E_a = 5.4$ kJ mol^{-1}.	68F288

TABLE 2. Rate constants for interaction of singlet oxygen with olefins. — Continued

No.	Solvent	k ($L\ mol^{-1}\ s^{-1}$)	β (k_d/k) ($mol\ L^{-1}$)	T (K)	Method	Comment	Ref.
2.103	**1,3-Cyclohexadiene — Continued**						
	MeOH		0.011	293	CP/Oc-15	S = DNT; E_a = 5.9 kJ mol^{-1}.	68F288
	MeOH		0.040	293	CP/Oc-15	S = $FlCl_4^{2-}$; E_a = 5.9 kJ mol^{-1}.	68F288
	MeOH		0.073	293	CP/Oc-15	S = MB; E_a = 5.0 kJ mol^{-1}.	68F288
	MeOH		0.045	293	CP/Oc-15	S = RB; E_a = 5.0 kJ mol^{-1}.	68F288
	MeOH/ *tert*-BuOH (50:50)				CR/Ac,A'c-17	A' = TME; meas. $k_t/k_r^{A'}$ = 0.33; $^1O_2$* from $H_2O_2/Ca(OCl)_2$.	68F292
	MeOH/ *tert*-BuOH (50:50)				CP/Ac,A'c-17	S = RB; A' = TME; meas. $k_t/k_r^{A'}$ = 0.077.	68F292
	2-PrOH	7.3×10^5		273	CR/LI-12	used $k_d = 4.1 \times 10^4\ s^{-1}$; $^1O_2$* from hydrotrioxide, e.g. $(CH_3)_2C(OH)OOOH$.	90M125
2.104	**1,3-Cyclohexadiene, 5,6-bis(1-methylethylidene)- (Tetramethyl-*o*-xylylene)**						
	CH_3CN	3.2×10^8			PL/Ld-2	S = Pz.	92A325
2.105	**1,3-Cyclohexadiene, 1-methyl-4-(1-methylethyl)- (α-Terpinene)**						
	$CHCl_3$	1×10^8			CP/A'c-33	S = A' = Rub; used $k_d = 1.7 \times 10^4\ s^{-1}$, $k_{A'} = 5.3 \times 10^7\ L\ mol^{-1}\ s^{-1}$.	81F445
	MeOH		4.0×10^{-3}	293	CP/Oc-15	S = MB; E_a = 1.7 kJ mol^{-1}; studied at 173-293 K.	68F288
	MeOH		1.3×10^{-3}	293	CP/Oc-15	S = Acridine Orange; E_a = 1.7 kJ mol^{-1}.	68F288
	MeOH		3.3×10^{-3}	293	CP/Oc-15	S = $FlBr_4Cl_4^{2-}$; E_a = 1.3 kJ mol^{-1}.	68F288
	MeOH		1.4×10^{-3}	293	CP/Oc-15	S = DNT; E_a = 1.3 kJ mol^{-1}.	68F288
	MeOH		6.0×10^{-3}	293	CP/Oc-15	S = $FlCl_4^{2-}$; E_a = 0.84 kJ mol^{-1}.	68F288
	MeOH		3.1×10^{-3}	293	CP/Oc-15	S = RB; E_a = 1.7 kJ mol^{-1}.	68F288
	MeOH		0.010	288	CP/Oc-15	S = RB.	587004
2.106	**1,3-Cyclohexadiene, 2-methyl-5-(1-methylethyl)-**						
	$CHCl_3$	3.2×10^7			CP/A'c-33	S = A' = Rub; used $k_d = 1.7 \times 10^4\ s^{-1}$, $k_{A'} = 5.3 \times 10^7\ L\ mol^{-1}\ s^{-1}$.	81F445
	MeOH		0.010	293	CP/Oc-15	S = RB; E_a = 4.2 kJ mol^{-1}.	68F288
2.107	**1,4-Cyclohexadiene, 1-methyl-**						
	$CHCl_3$	2.0×10^5			CP/A'c-33	S = A' = Rub; used $k_d = 1.7 \times 10^4\ s^{-1}$, $k_{A'} = 5.3 \times 10^7\ L\ mol^{-1}\ s^{-1}$.	81F445
2.108	**2,4-Cyclohexadien-1-one, 6,6-dimethyl-**						
	MeOH		~1.9	293	CP/Oc-15	S = RB; E_a = 15 kJ mol^{-1}.	68F288
2.109	**Cyclohexane, cyclohexylidene-**						
	MeOH		0.030	293	CP/Oc-15	S = RB; E_a = 5.4 kJ mol^{-1}.	68F288
	MeOH		0.056		?	Method not reported.	627005
2.110	**Cyclohexane, ethylidene-**						
	$CHCl_3$	8.6×10^5			CP/A'c-33	S = A' = Rub; used $k_d = 1.7 \times 10^4\ s^{-1}$, $k_{A'} = 5.3 \times 10^7\ L\ mol^{-1}\ s^{-1}$.	81F445 78A005
2.111	**Cyclohexane, (hydroxymethylene)-, acetate**						
	CD_3COCD_3	7.5×10^4			PL/Ld-2	S = MB.	83A026
	CD_3OD	4.8×10^4			PL/Ld-2	S = MB.	83A026
2.112	**Cyclohexane, methylene-**						
	CD_3COCD_3	6.1×10^3		298	PL/Ld-2	S = TPP; $\Delta H‡ = -0.8$ kJ mol^{-1}; $\Delta S‡ = -176$ J K^{-1} mol^{-1}; studied at 183-310 K.	85A167
	CH_3CN	$<1 \times 10^3$ (k_r)			?	S = MB; A' = c-$C_6H_9CH_3$.	73F664

TABLE 2. Rate constants for interaction of singlet oxygen with olefins. — Continued

No.	Solvent	k ($L\ mol^{-1}\ s^{-1}$)	β (k_d/k)· ($mol\ L^{-1}$)	T (K)	Method	Comment	Ref.
2.112	**Cyclohexane, methylene-** — Continued						
	CS_2	5.2×10^3		298	PL/Ld-2	S = TPP; $\Delta H‡ = -0.4$ kJ mol^{-1}; $\Delta S‡ = -176$ J K^{-1} mol^{-1}; studied at 183-310 K.	85A167
2.113	**Cyclohexanol, 2-(cyclohexylidene)-**						
	MeOH		0.44		?	Method not reported.	627005
2.114	**Cyclohexanone, 2-cyclohexylidene-**						
			0.34		CP/Ac-18	S = Poly-RB or RB; A′ = Linalool; used $\beta_{A'}$ = 0.18 mol L^{-1}; Solvent is CH_2Cl_2 or MeOH.	80F111
	MeOH		0.35	293	CP/Oc-15	S = RB; E_a = 11.7 kJ mol^{-1}.	68F288
	MeOH		0.37		?	Method not reported.	627005
2.115	**Cyclohexanone, 5-methyl-2-(1-methylethenyl)- (Pulegone)**						
			0.12		CP/Ac-18	S = Poly-RB or RB or MB; A′ = Linalool; used $\beta_{A'}$ = 0.18 mol L^{-1}; Solvent is CH_2Cl_2 or MeOH or C_6H_6.	80F111
	$CHCl_3$	6.1×10^5			CP/A′c-33	S = A′ = Rub; used $k_d = 1.7 \times 10^4\ s^{-1}$, $k_{A'} = 5.3 \times 10^7$ L $mol^{-1}\ s^{-1}$.	81F445
2.116	**Cyclohexene**						
	C_5H_5N	~10^4 (k_r)		286	?	S = Poly-RB; method not reported; value from graph.	81F534
	C_6H_6	~8×10^3 (k_r)		286	?	S = Poly-RB; method not reported; value from graph.	81F534
	C_6H_6/ MeOH (75:25)	2.0×10^4	3.1	298	CP/Pa-15	S = RB; used $k_d = 6.3 \times 10^4\ s^{-1}$.	79A457 78F586
	CCl_4	~5×10^2 (k_r)		286	?	S = Poly-RB; method not reported; value from graph.	81F534
	CH_2Cl_2	~7×10^3 (k_r)		286	?	S = Poly-RB; method not reported; value from graph.	81F534
	CH_3CN	~10^4 (k_r)		286	?	S = Poly-RB; method not reported; value from graph.	81F534
	CH_3COCH_3	~2×10^4 (k_r)		286	?	S = Poly-RB; method not reported; value from graph.	81F534
	$CHCl_3$	~9×10^3 (k_r)		286	?	S = Poly-RB; method not reported; value from graph.	81F534
	CS_2	~10^3 (k_r)		286	?	S = Poly-RB; method not reported; value from graph.	81F534
	MeOH	2.7×10^4 (k_r)		286	?	S = Poly-RB; method not reported; value from graph.	81F534
	MeOH			288	CP/Ac,A′c-17	S = MB; A′ = $CH_3CH_2CH_2CH{=}CHCH_3$; meas. $k_r/k_r^{A'}$ = 0.12.	65F028
	MeOH		26		?	Method not reported.	68F289
	MeOH/ *tert*-BuOH (50:50)			303	CP/Pa,P′a-17	S = RB; A′ = $(CH_3)_2CHCH{=}CHCH_3$; meas. $k_r/k_r^{A'}$ = 0.19.	68F292
2.117	**Cyclohexene, 1,2-dimethyl-**						
	$CHCl_3$	3.0×10^7			CP/A′c-33	S = A′ = Rub; used $k_d = 1.7 \times 10^4\ s^{-1}$, $k_{A'} = 5.3 \times 10^7$ L $mol^{-1}\ s^{-1}$.	78A005
	MeOH	3.9×10^6		286	?	S = Poly-RB; method not reported.	81F534
	MeOH	1×10^7			PL/A′d-5	S = MB; A′ = DPBF.	727260
	MeOH			288	CP/Ac,A′c-17	S = MB; A′ = TME; meas. $k_r/k_r^{A'}$ = 0.53.	65F028
	MeOH		0.030		?	Method not reported.	68F289

TABLE 2. Rate constants for interaction of singlet oxygen with olefins. — Continued

No.	Solvent	k ($L\ mol^{-1}\ s^{-1}$)	β (k_d/k) ($mol\ L^{-1}$)	T (K)	Method	Comment	Ref.
2.118	**Cyclohexene, 1,3-dimethyl-**						
	$CHCl_3$	5.1×10^5			CP/A'c-33	S = A' = Rub; used $k_d = 1.7 \times 10^4\ s^{-1}$, $k_{A'} = 5.3 \times 10^7\ L\ mol^{-1}\ s^{-1}$.	81F445
2.119	**Cyclohexene, 1,4-dimethyl-**						
	$CHCl_3$	4.0×10^5			CP/A'c-33	S = A' = Rub; used $k_d = 1.7 \times 10^4\ s^{-1}$, $k_{A'} = 5.3 \times 10^7\ L\ mol^{-1}\ s^{-1}$.	81F445
2.120	**Cyclohexene, 2,3-dimethyl-**						
	MeOH			288	CP/Ac,A'c-17	S = MB; A' = c-$C_6H_9CH_3$; meas. $k_t/k_r^{A'} = 1.1$.	65F028
2.121	**Cyclohexene, 4-(1-hydroxy-1-methylethyl)-1-methyl- (Terpinolene)**						
	MeOH		~0.050	293	CP/Oc-15	S = RB; $E_a = 1.7\ kJ\ mol^{-1}$.	68F288
2.122	**Cyclohexene, 1-methyl**						
	C_6H_6		0.15	298	CP/A'c-23	S = A' = Rub; used $\beta_{A'} = 3.0 \times 10^{-4}\ mol\ L^{-1}$.	706079
	C_6H_6		0.14	298	CP/A'c-23	S = A' = Tetr; used $\beta_{A'} = 1.7 \times 10^{-3}\ mol\ L^{-1}$.	706079
	C_6H_6		0.13	298	CP/A'c-23	S = A' = DMA; used $\beta_{A'} = 3.0 \times 10^{-4}\ mol\ L^{-1}$.	706079
	C_6H_6		0.12	298	CP/A'c-23	S = A' = DMBA; used $\beta_{A'} = 7.1 \times 10^{-4}\ mol\ L^{-1}$.	706079
	CH_3CN			273	CP/Ac,A'c-17	S = MB; A' = 1-*tert*-Butylcyclohexene; meas. $k_t/k_r^{A'} = 2.3$.	81F018
	CH_3COCH_3	2.1×10^5 (k_r)		281	?	S = ?; A' = 1,4-Dioxene; used $k_{A'} = 2.2 \times 10^5\ L\ mol^{-1}\ s^{-1}$; meas. $k_A/k_{A'} = 0.96$.	70F733
	$CHCl_3$	3.3×10^5			CR/A'c-33	A' = Rub; used $k_d = 1.7 \times 10^4\ s^{-1}$, $k_{A'} = 5.3 \times 10^7\ L\ mol^{-1}\ s^{-1}$; $^1O_2$* from $DMNO_2$.	81E003
	$CHCl_3$	3.4×10^5			CP/A'c-33	S = A' = Rub; used $k_d = 1.7 \times 10^4\ s^{-1}$, $k_{A'} = 5.3 \times 10^7\ L\ mol^{-1}\ s^{-1}$.	81E003
	$CHCl_3$	3.6×10^5			CP/A'c-33	S = A' = Rub; used $k_d = 1.7 \times 10^4\ s^{-1}$, $k_{A'} = 5.3 \times 10^7\ L\ mol^{-1}\ s^{-1}$.	81F445 78A005
	MeOH	2.0×10^5		286	?	S = Poly-RB; method not reported.	81F534
	MeOH			288	CP/Ac,A'c-17	S = MB; A' = c-$C_5H_7CH_3$; meas. $k_t/k_r^{A'} = 0.12$.	65F028
	MeOH			288	CP/Ac,A'c-17	S = Ery; A' = c-$C_5H_7CH_3$; meas. $k_t/k_r^{A'} = 0.11$.	65F028
	MeOH			288	CP/Ac,A'c-17	S = HP; A' = c-$C_5H_7CH_3$; meas. $k_t/k_r^{A'} = 0.11$.	65F028
	MeOH			288	CP/Ac,A'c-17	S = RB; A' = c-$C_5H_7CH_3$; meas. $k_t/k_r^{A'} = 0.087$.	65F028
	MeOH			288	CP/Ac,A'c-17	S = Eos; A' = c-$C_5H_7CH_3$; meas. $k_t/k_r^{A'} = 0.093$.	65F028
	MeOH		1.2		?	Method not reported.	68F289
	MeOH/ *tert*-BuOH (50:50)				CR/Ac,A'c-17	A' = 2M2B; meas. $k_t/k_r^{A'} = 0.050$; $^1O_2$* from $H_2O_2/Ca(OCl)_2$.	68F292
	MeOH/ *tert*-BuOH (50:50)			276	CR/Pa,P'a-17	A' = 2M2P; meas. $k_t/k_r^{A'} = 0.26$; $^1O_2$* from $H_2O_2/NaOCl$,.	68F292
	MeOH/ *tert*-BuOH (50:50)			303	CP/Pa,P'a-17	S = RB; A' = 2M2P; meas. $k_t/k_r^{A'} = 0.22$.	68F292
	MeOH/ *tert*-BuOH (50:50)				CP/Ac,A'c-17	S = RB; A' = 2M2B; meas. $k_t/k_r^{A'} = 0.043$.	68F292
2.123	**Cyclohexene, 4-methyl-**						
	MeOH			288	CP/Ac,A'c-17	S = MB; A' = c-C_6H_{10}; meas. $k_t/k_r^{A'} = 0.67$.	65F028
2.124	**Cyclohexene, 1-methyl-4-(1-methylethenyl)-, (*R*)- (Limonene)**						
	CH_3COCH_3	1.7×10^5			PL/Ld-2	S = RB.	92F225
	MeOH		1.7	293	CP/Oc-15	S = MB; $E_a = 8.4\ kJ\ mol^{-1}$.	68F288
	MeOH		1.7		?	Method not reported.	627005
2.125	**Cyclohexene, 1-methyl-4-(1-methylethyl)- (Carvomenthene)**						
	MeOH		~1.0	293	CP/Oc-15	S = MB; $E_a = 13\ kJ\ mol^{-1}$.	68F288

TABLE 2. Rate constants for interaction of singlet oxygen with olefins. — Continued

No.	Solvent	k ($L\ mol^{-1}\ s^{-1}$)	β (k_d/k) ($mol\ L^{-1}$)	T (K)	Method	Comment	Ref.
2.126	**Cyclohexen-1-ol, 6,6-dimethyl-, acetate**						
	CD_3COCD_3	8×10^3 (k_r)		296	CP/Pa-17	S = MB; A′ = Adamantylidenemethyl acetate; used $k_r^{A'} = 2.7 \times 10^4$ L mol^{-1} s^{-1}.	86F219
2.127	**2-Cyclohexen-1-one, 2-ethyl-3-methyl-**						
			$>2 \times 10^2$		CP/Ac-18	S = Poly-RB or RB; A′ = Linalool; used $\beta_{A'}$ = 0.18 mol L^{-1}; Solvent is CH_2Cl_2 or MeOH.	80F111
2.128	**2-Cyclohexen-1-one, 2-hydroxy-3-methyl-**						
	MeOH	$\sim 4 \times 10^7$ (k_r)		273	CP/Pa,P′a-17	S = RB; A′ = TME; $k_r^{A'}$ not given.	85F150
2.129	**1,3-Cyclooctadiene**						
	$CHCl_3$	6.5×10^4			CP/A′c-33	S = A′ = Rub; used $k_d = 1.7 \times 10^4$ s^{-1}, $k_{A'} = 5.3 \times 10^7$ L mol^{-1} s^{-1}.	81F445
2.130	**1,4-Cyclooctadiene, 6-hydroperoxy-**						
	$CHCl_3$	2.9×10^4	0.58		CP/A′c-33	S = A′ = Rub; used $k_d = 1.7 \times 10^4$ s^{-1}, $k_{A'} = 5.3 \times 10^7$ L mol^{-1} s^{-1}.	89F349
2.131	**1,4-Cyclooctadiene, 6-methoxy-**						
	MeOH	7.2×10^5	0.14		CP/A′c-33	S = A′ = Rub; used $k_d = 1.0 \times 10^5$ s^{-1}, $k_{A'} = 3.1 \times 10^7$ L mol^{-1} s^{-1}.	89F349
2.132	**1,4-Cyclooctadiene, 6-(trimethylsiloxy)-**						
	$CHCl_3$	6.2×10^4	0.28		CP/A′c-33	S = A′ = Rub; used $k_d = 1.7 \times 10^4$ s^{-1}, $k_{A'} = 5.3 \times 10^7$ L mol^{-1} s^{-1}.	89F349
2.133	**1,5-Cyclooctadiene**						
	$CHCl_3$	3.3×10^4	0.53		CP/A′c-33	S = A′ = Rub; used $k_d = 1.7 \times 10^4$ s^{-1}, $k_{A'} = 5.3 \times 10^7$ L mol^{-1} s^{-1}.	89F349
	MeOH	4.6×10^5		293	CP/Ac-14	S = MB; used $k_d = 2.0 \times 10^5$ s^{-1}.	89F358
	MeOH	3.1×10^5		293	CP/Ac-14	S = HP; used $k_d = 2.0 \times 10^5$ s^{-1}.	89F358
	MeOH	2.7×10^5		293	CP/Ac-14	S = RB; used $k_d = 2.0 \times 10^5$ s^{-1}.	89F358
	MeOH	4.9×10^5		293	CP/Ac-14	S = HA; used $k_d = 2.0 \times 10^5$ s^{-1}.	89F358
2.134	**2,5-Cyclooctadien-1-ol**						
	$CHCl_3$	8.6×10^4	0.20		CP/A′c-33	S = A′ = Rub; used $k_d = 1.7 \times 10^4$ s^{-1}, $k_{A'} = 5.3 \times 10^7$ L mol^{-1} s^{-1}.	89F349
	MeOH	1.9×10^5	0.54		CP/A′c-33	S = A′ = Rub; used $k_d = 1.0 \times 10^5$ s^{-1}, $k_{A'} = 3.1 \times 10^7$ L mol^{-1} s^{-1}.	89F349
2.135	**Cyclooctane, ethylidene-**						
	$CHCl_3$	4.9×10^6			CP/A′c-33	S = A′ = Rub; used $k_d = 1.7 \times 10^4$ s^{-1}, $k_{A'} = 5.3 \times 10^7$ L mol^{-1} s^{-1}.	81F445
2.136	**1,3,5,7-Cyclooctatetraene**						
	C_6H_5Cl/ 2-PrOH (90:10)	1.3×10^5		273	CR/LI-12	used $k_d = 4.1 \times 10^4$ s^{-1}; $^1O_2$* from hydrotrioxide, e.g. $(CH_3)_2C(OH)OOOH$.	90M125
2.137	**Cyclooctene**						
	$CHCl_3$	4.8×10^4			CR/A′c-33	A′ = Rub; used $k_d = 1.7 \times 10^4$ s^{-1}, $k_{A'} = 5.3 \times 10^7$ L mol^{-1} s^{-1}; $^1O_2$* from $DMNO_2$.	81E003
	EtOH				CP/Ac,A′c-17	S = MB; A′ = 1,5-Cyclooctadiene; meas. $k_t/k_r^{A'}$ = 0.14.	71F581
2.138	**Cyclooctene, 1-methyl-**						
	CH_3CN			273	CP/Ac,A′c-17	S = MB; A′ = 1-*tert*-Butylcyclohexene; meas. $k_t/k_r^{A'} = 4.7$.	81F018

TABLE 2. Rate constants for interaction of singlet oxygen with olefins. — Continued

No.	Solvent	k ($L\ mol^{-1}\ s^{-1}$)	β (k_d/k) ($mol\ L^{-1}$)	T (K)	Method	Comment	Ref.
2.138	**Cyclooctene, 1-methyl-** — Continued						
	$CHCl_3$	5.3×10^5			CP/A'c-33	S = A' = Rub; used $k_d = 1.7 \times 10^4\ s^{-1}$, $k_{A'} = 5.3 \times 10^7\ L\ mol^{-1}\ s^{-1}$.	81F445
2.139	**Cyclooctyne**						
	$CHCl_3$	2×10^5			CR/A'c-33	A' = Rub; used $k_d = 1.7 \times 10^4\ s^{-1}$, $k_{A'} = 5.3 \times 10^7\ L\ mol^{-1}\ s^{-1}$; $^1O_2$* from $DMNO_2$.	81E003
2.140	**Cyclopentadiene**						
	$C_6H_5CH_3$	3.9×10^7			PR/A'd-5	S = Np; A' = DPBF; $\Delta H‡ = 0\ kJ\ mol^{-1}$; $\Delta S‡ = -108\ J\ K^{-1}\ mol^{-1}$; studied at 223-353 K.	79A106
	CH_2Cl_2			253	CP/Ac-17	S = TPP; A' = 2,3-Dimethylenebicyclo[2.2.1]heptane; meas. $k_r/k_r^{A'}$ = >10.	82F450
	$CHCl_3$	1×10^8			CP/A'c-33	S = A' = Rub; used $k_d = 1.7 \times 10^4\ s^{-1}$, $k_{A'} = 5.3 \times 10^7\ L\ mol^{-1}\ s^{-1}$.	81F445
	MeOH		4.4×10^{-3}	293	CP/Oc-15	S = RB; $E_a = 1.3\ kJ\ mol^{-1}$.	68F288
	MeOH		4.1×10^{-3}	293	CP/Oc-15	S = MB; $E_a = 0.84\ kJ\ mol^{-1}$.	68F288
	MeOH/ *tert*-BuOH (50:50)				CR/Ac,A'c-17	A' = TME; meas. $k_r/k_r^{A'} = 0.7$; $^1O_2$* from $H_2O_2/Ca(OCl)_2$.	68F292
	MeOH/ *tert*-BuOH (50:50)				CR/Ac,A'c-17	A' = TME; meas. $k_r/k_r^{A'} = 2.0$; $^1O_2$* from H_2O_2/NaOCl.	68F292
	MeOH/ *tert*-BuOH (50:50)				CP/Ac,A'c-17	S = RB; A' = TME; meas. $k_r/k_r^{A'} = 1.2$.	68F292
2.141	**1,3-Cyclopentadiene, 1,4-bis(4-chlorophenyl)-**						
	CH_2Cl_2	6.5×10^7			CP/A'c-33	S = A' = Rub; used $k_d = 1 \times 10^4\ s^{-1}$, $k_{A'} = 3.3 \times 10^7\ L\ mol^{-1}\ s^{-1}$.	84F477
2.142	**1,3-Cyclopentadiene, 1,4-bis(4-fluorophenyl)-**						
	CH_2Cl_2	7.6×10^7			CP/A'c-33	S = A' = Rub; used $k_d = 1 \times 10^4\ s^{-1}$, $k_{A'} = 3.3 \times 10^7\ L\ mol^{-1}\ s^{-1}$.	84F477
2.143	**1,3-Cyclopentadiene, 1,4-bis(4-methoxyphenyl)-**						
	CH_2Cl_2	1.3×10^8			CP/A'c-33	S = A' = Rub; used $k_d = 1 \times 10^4\ s^{-1}$, $k_{A'} = 3.3 \times 10^7\ L\ mol^{-1}\ s^{-1}$.	84F477
2.144	**1,3-Cyclopentadiene, 1,4-bis(4-methylphenyl)-**						
	CH_2Cl_2	1.0×10^8			CP/A'c-33	S = A' = Rub; used $k_d = 1 \times 10^4\ s^{-1}$, $k_{A'} = 3.3 \times 10^7\ L\ mol^{-1}\ s^{-1}$.	84F477
2.145	**1,3-Cyclopentadiene, 1-(4-chlorophenyl)-4-(4-methoxyphenyl)-**						
	CH_2Cl_2	8.8×10^7			CP/A'c-33	S = A' = Rub; used $k_d = 1 \times 10^4\ s^{-1}$, $k_{A'} = 3.3 \times 10^7\ L\ mol^{-1}\ s^{-1}$.	84F477
2.146	**1,3-Cyclopentadiene, 1-(4-chlorophenyl)-4-phenyl-**						
	CH_2Cl_2	6.8×10^7			CP/A'c-33	S = A' = Rub; used $k_d = 1 \times 10^4\ s^{-1}$, $k_{A'} = 3.3 \times 10^7\ L\ mol^{-1}\ s^{-1}$.	84F477
2.147	**1,3-Cyclopentadiene, 1,4-diphenyl-**						
	CH_2Cl_2	8.7×10^7			CP/A'c-33	S = A' = Rub; used $k_d = 1 \times 10^4\ s^{-1}$, $k_{A'} = 3.3 \times 10^7\ L\ mol^{-1}\ s^{-1}$.	84F477
2.148	**1,3-Cyclopentadiene, 1-(4-methoxyphenyl)-4-phenyl-**						
	CH_2Cl_2	1.1×10^8			CP/A'c-33	S = A' = Rub; used $k_d = 1 \times 10^4\ s^{-1}$, $k_{A'} = 3.3 \times 10^7\ L\ mol^{-1}\ s^{-1}$.	84F477
2.149	**1,3-Cyclopentadiene, 5-(1-methylethylidene)- (6,6-Dimethylfulvene)**						
	MeOH		6.0×10^{-3}	293	CP/Oc-15	S = RB; $E_a = 1.3\ kJ\ mol^{-1}$.	68F288

TABLE 2. Rate constants for interaction of singlet oxygen with olefins. — Continued

No.	Solvent	k (L mol^{-1} s^{-1})	β (k_d/k) (mol L^{-1})	T (K)	Method	Comment	Ref.
2.150	**1,3-Cyclopentadiene, 5-(1-methylethylidene)-, endoperoxide**						
	MeOH		~2.5	293	CP/Oc-15	S = RB; E_a = 14 kJ mol^{-1}.	68F288
2.151	**Cyclopentane, (dicyclopropylmethylidene)-**						
	CH_3COCH_3				CP/Ac,A'c-17	S = Eos; A' = (Dicyclopropylmethylidene)cyclobutane; meas. $k_t/k_r^{A'}$ = 0.90.	78F430
2.152	**Cyclopentane, ethylidene-**						
	$CHCl_3$	8.7×10^6			CP/A'c-33	S = A' = Rub; used $k_d = 1.7 \times 10^4$ s^{-1}, $k_{A'} = 5.3 \times 10^7$ L mol^{-1} s^{-1}.	81F445 78A005
2.153	**Cyclopentane, methylene-**						
	CH_3CN			273	CP/Ac,A'c-17	S = MB; A' = Methylenecyclohexane; meas. $k_t/k_r^{A'} = 1.5 \times 10^2$.	81F018
	CH_3CN			273	CP/Ac,A'c-17	S = MB; A' = 5-Methylene-2-norbornene; meas. $k_t/k_r^{A'}$ = 16.	78F149
	CH_3CN				?	S = MB; A' = c-$C_6H_9CH_3$; meas. $k_A/k_{A'}$ = 0.23.	73F664
2.154	**Cyclopentanone, 2-cyclopentylidene-**						
			0.06		CP/Ac-18	S = Poly-RB or RB; A' = Linalool; used $\beta_{A'}$ = 0.18 mol L^{-1}; Solvent is CH_2Cl_2 or MeOH.	80F111
2.155	**Cyclopentanone, 2-(1-methylethenyl)-**						
			0.25		CP/Ac-18	S = Poly-RB or RB; A' = Linalool; used $\beta_{A'}$ = 0.18 mol L^{-1}; Solvent is CH_2Cl_2 or MeOH.	80F111
2.156	**Cyclopentene**						
	CS_2	5.8×10^4		298	PL/Ld-2	S = TPP; $\Delta H‡$ = 5 kJ mol^{-1}; $\Delta S‡$ = −134 J K^{-1} mol^{-1}; studied at 183-310 K.	85A167
	MeOH	2.2×10^5		286	?	S = Poly-RB; method not reported.	81F534
	MeOH			288	CP/Ac,A'c-17	S = MB; A' = 1,6-Dimethylcyclohexene; meas. $k_t/k_r^{A'}$ = 0.33.	65F028
2.157	**Cyclopentene, 1-*tert*-butyl-**						
	CH_3CN			273	CP/Ac,A'c-17	S = MB; A' = 1-*tert*-Butylcyclohexene; meas. $k_t/k_r^{A'}$ = 14.	81F018
2.158	**Cyclopentene, 1,2-dimethyl-**						
	MeOH	9.5×10^6		286	?	S = Poly-RB; method not reported.	81F534
2.159	**Cyclopentene, 1,5-dimethyl-**						
	$CHCl_3$	1.5×10^6			CP/A'c-33	S = A' = Rub; used $k_d = 1.7 \times 10^4$ s^{-1}, $k_{A'} = 5.3 \times 10^7$ L mol^{-1} s^{-1}.	81F445
2.160	**Cyclopentene, 1-methoxy-**						
	c-C_6H_{12}	2.4×10^6			PL/A'd-8	S = An; A' = DPBF; $\Delta H‡$ = −3 kJ mol^{-1}; $\Delta S‡$ = −134 J K^{-1} mol^{-1}; studied at 290-340 K.	82A349
	$C_6H_5CH_3$	1.2×10^7			PL/A'd-8	S = An; A' = DPBF; $\Delta H‡$ = −4 kJ mol^{-1}; $\Delta S‡$ = −125 J K^{-1} mol^{-1}; studied at 250-340 K.	82A349
	CH_3CN	2.5×10^7			PL/A'd-8	S = An; A' = DPBF; $\Delta H‡$ = −2 kJ mol^{-1}; $\Delta S‡$ = −112 J K^{-1} mol^{-1}; studied at 250-340 K.	82A349
	CH_3COCH_3	1.6×10^7			PL/A'd-8	S = An; A' = DPBF; $\Delta H‡$ = −3 kJ mol^{-1}; $\Delta S‡$ = −119 J K^{-1} mol^{-1}; studied at 240-320 K.	82A349
	MeOH	1.3×10^7			PL/A'd-8	S = An; A' = DPBF; $\Delta H‡$ = −1 kJ mol^{-1}; $\Delta S‡$ = −114 J K^{-1} mol^{-1}; studied at 250-310 K.	82A349
2.161	**Cyclopentene, 1-methyl-**						
	C_6H_6		0.018	298	CP/A'c-23	S = A' = DMA; used $\beta_{A'} = 3.0 \times 10^{-4}$ mol L^{-1}.	706079

TABLE 2. Rate constants for interaction of singlet oxygen with olefins. — Continued

No.	Solvent	k (L mol^{-1} s^{-1})	β (k_d/k) (mol L^{-1})	T (K)	Method	Comment	Ref.
2.161	**Cyclopentene, 1-methyl-** — Continued						
	C_6H_6		0.018	298	CP/A'c-23	S = A' = Rub; used $\beta_{A'} = 3.0 \times 10^{-4}$ mol L^{-1}.	706079
	C_6H_6		0.016	298	CP/A'c-23	S = A' = DMBA; used $\beta_{A'} = 7.1 \times 10^{-4}$ mol L^{-1}.	706079
	C_6H_6		0.018	298	CP/A'c-23	S = A' = Tetr; used $\beta_{A'} = 1.7 \times 10^{-3}$ mol L^{-1}.	706079
	CH_3CN			273	CP/Ac,A'c-17	S = MB; A' = 1-*tert*-Butylcyclohexene; meas. $k_t/k_r^{A'} = 17$.	81F018
	CH_3CN				?	S = MB; A' = *c*-$C_6H_9CH_3$; meas. $k_A/k_{A'} = 7.7$.	73F664
	$CHCl_3$	2.7×10^6			CP/A'c-33	S = A' = Rub; used $k_d = 1.7 \times 10^4$ s^{-1}, $k_{A'} = 5.3 \times 10^7$ L mol^{-1} s^{-1}.	81F445 78A005
	MeOH	9.2×10^5		286	?	S = Poly-RB; method not reported.	81F534
	MeOH			288	CP/Ac,A'c-17	S = MB; A' = 1,2-Dimethylcyclohexene; meas. $k_t/k_r^{A'} = 0.13$.	65F028
	MeOH/ *tert*-BuOH (50:50)				CR/Ac,A'c-17	A' = 2M2B; meas. $k_t/k_r^{A'} = 0.63$; $^1O_2$* from $H_2O_2/Ca(OCl)_2$.	68F292
	MeOH/ *tert*-BuOH (50:50)				CP/Ac,A'c-17	S = RB; A' = 2M2B; meas. $k_t/k_r^{A'} = 1.0$.	68F292
2.162	**2-Cyclopenten-1-one, 3-methyl-2-pentyl-**						
			$>2 \times 10^2$		CP/Ac-18	S = Poly-RB or RB; A' = Linalool; used $\beta_{A'} = 0.18$ mol L^{-1}; Solvent is CH_2Cl_2 or MeOH.	80F111
2.163	**2-Cyclopenten-1-one, 2-acetoxy-3-methyl-**						
	CD_3COCD_3	2.9×10^4			PL/Ld-2	S = Ac.	89F079
2.164	**2-Cyclopenten-1-one, 3-acetoxy-2-methyl-**						
	CD_3COCD_3	3.6×10^4			PL/Ld-2	S = Ac.	89F079
2.165	**2-Cyclopenten-1-one, 2,3-dimethyl-**						
	CD_3COCD_3	7.8×10^4			PL/Ld-2	S = Ac.	89F079
2.166	**2-Cyclopenten-1-one, 2-ethyl-3-methyl-**						
	CD_3COCD_3	1.8×10^5			PL/Ld-2	S = Ac.	89F079
2.167	**2-Cyclopenten-1-one, 3-methoxy-2-methyl-**						
	CD_3COCD_3	7.5×10^4			PL/Ld-2	S = Ac.	89F079
2.168	**Cyclopropane, (dicyclopropylmethylidene)-**						
	CH_3CN			293	CP/Ac-17	S = RB; A' = TME; meas. $k_t/k_r^{A'} = 2.1 \times 10^{-3}$; c.k. with 1-methylcyclohexene.	79F119
	CH_3COCH_3				CP/Ac,A'c-17	S = Eos; A' = (Dicyclopropylmethylidene)cyclobutane; meas. $k_t/k_r^{A'} = 1.0$.	78F430
2.169	**Cyclopropane, 1,1',1''-(1-ethenyl-2-ylidene)tris-**						
	CH_3COCH_3				CP/Ac,A'c-17	S = Eos; A' = (Dicyclopropylmethylidene)cyclobutane; meas. $k_t/k_r^{A'} = 0.40$.	78F430
2.170	**Cyclopropane, (1-methylethylidene)-**						
	CH_3CN			293	CP/Ac-17	S = RB; A' = TME; meas. $k_t/k_r^{A'} = 5.6 \times 10^{-3}$; c.k. with 1-methylcyclohexene.	79F119
2.171	**1,6-Decadiene, 2,6,9-trimethyl-, (*E*)-**						
	EtOH/ 2-PrOH (50:50)		0.080 (β_r)	292	CP/Oc-14,27	S = RB; A' = 2,5-DMF.	78F464

TABLE 2. Rate constants for interaction of singlet oxygen with olefins. — Continued

No.	Solvent	k (L mol^{-1} s^{-1})	β (k_d/k) (mol L^{-1})	T (K)	Method	Comment	Ref.
2.172	**1,6-Decadiene, 2,6,9-trimethyl-, (Z)-**						
	EtOH/ 2-PrOH (50:50)		0.11 (β_r)	292	CP/Oc-14,27	S = RB; A′ = 2,5-DMF.	78F464
2.173	**8,8'-Diapo-ψ-carotendioic acid, bis(6-*O*-β-D-glucopyranosyl-β-D-glucopyranosyl) ester (Crocin)**						
	$CHCl_3$/ EtOH (50:50)	3×10^8		310	CR/LI-12	$^1O_2$* from $NDPO_2$; reported $k = 1.1 \times 10^9$ L mol^{-1} s^{-1} using $k_d = 1 \times 10^5$ s^{-1}, recalcd. using $k_d = 3.0 \times 10^4$ s^{-1} [92E654].	89R188 90E622
	H_2O pH = 7.4	5.6×10^7 (k_r) 1.8×10^9 (k_q)		308	CR/Ac-?	used $k_d = 3.3 \times 10^5$ s^{-1}; $^1O_2$* from $MNPO_2$.	87A318
2.174	**6,6'-Diapo-Ψ,Ψ-carotenedioic acid (*trans*-Norbixin)**						
	DMF	8×10^9		308	CR/A′c-16	A′ = DPBF; used $k_d = 1.4 \times 10^5$ s^{-1}; $^1O_2$* from $MNPO_2$.	90A437
	DMF	8×10^5 (k_r) 3×10^9 (k_q)		308	CR/A′c-?	used $k_d = 1.4 \times 10^5$ s^{-1}; $^1O_2$* from $MNPO_2$.	90A437
	DMSO	4×10^9		308	CR/A′c-16	A′ = DPBF; used $k_d = 5.2 \times 10^4$ s^{-1}; $^1O_2$* from $MNPO_2$.	90A437
	DMSO	9×10^5 (k_r) 3×10^9 (k_q)		308	CR/A′c-?	used $k_d = 5.2 \times 10^4$ s^{-1}; $^1O_2$* from $MNPO_2$.	90A437
2.175	**6,6'-Diapo-Ψ,Ψ-carotenedioic acid, dimethyl ester (*trans*-Methylbixin)**						
	DMF	9×10^9		308	CR/A′c-16	A′ = DPBF; used $k_d = 1.4 \times 10^5$ s^{-1}; $^1O_2$* from $MNPO_2$.	90A437
	DMF	2×10^6 (k_r) 6×10^9 (k_q)		308	CR/A′c-?	used $k_d = 1.4 \times 10^5$ s^{-1}; $^1O_2$* from $MNPO_2$.	90A437
	DMSO	4×10^9		308	CR/A′c-16	A′ = DPBF; used $k_d = 5.2 \times 10^4$ s^{-1}; $^1O_2$* from $MNPO_2$.	90A437
	DMSO	8×10^5 (k_r) 4×10^9 (k_q)		308	CR/A′c-?	used $k_d = 5.2 \times 10^4$ s^{-1}; $^1O_2$* from $MNPO_2$.	90A437
2.176	**6,6'-Diapo-Ψ,Ψ-carotenedioic acid, dimethyl ester, 9-*cis*- (Methylbixin)**						
	DMF	1.6×10^{10}		308	CR/A′c-16	A′ = DPBF; used $k_d = 1.4 \times 10^5$ s^{-1}; $^1O_2$* from $MNPO_2$.	90A437
	DMF	2×10^6 (k_r) 3×10^{10} (k_q)		308	CR/A′c-?	used $k_d = 1.4 \times 10^5$ s^{-1}; $^1O_2$* from $MNPO_2$.	90A437
	DMSO	2.2×10^{10}		308	CR/A′c-16	A′ = DPBF; used $k_d = 5.2 \times 10^4$ s^{-1}; $^1O_2$* from $MNPO_2$.	90A437
	DMSO	1×10^6 (k_r) 1×10^{10} (k_q)		308	CR/A′c-?	used $k_d = 5.2 \times 10^4$ s^{-1}; $^1O_2$* from $MNPO_2$.	90A437
2.177	**6,6'-Diapo-Ψ,Ψ-carotenedioic acid, monomethyl ester, 9-*cis*- (Bixin)**						
	$CHCl_3$	9.2×10^9			PL/Ld-2	S = Pz.	91E465
	$CHCl_3$/ EtOH (50:50)	4×10^9		310	CR/LI-12	$^1O_2$* from $NDPO_2$; reported $k = 1.4 \times 10^{10}$ L mol^{-1} s^{-1} using $k_d = 1 \times 10^5$ s^{-1}, recalcd. using $k_d = 3.0 \times 10^4$ s^{-1} [92E654].	89R188 90E622
	DMF	2.0×10^{10}		308	CR/A′c-16	A′ = DPBF; used $k_d = 1.4 \times 10^5$ s^{-1}; $^1O_2$* from $MNPO_2$.	90A437
	DMF	2×10^6 (k_r) 2×10^{10} (k_q)		308	CR/A′c-?	used $k_d = 1.4 \times 10^5$ s^{-1}; $^1O_2$* from $MNPO_2$.	90A437
	DMSO	1.5×10^{10}		308	CR/A′c-16	A′ = DPBF; used $k_d = 5.2 \times 10^4$ s^{-1}; $^1O_2$* from $MNPO_2$.	90A437
	DMSO	1×10^6 (k_r) 2×10^{10} (k_q)		308	CR/A′c-?	used $k_d = 5.2 \times 10^4$ s^{-1}; $^1O_2$* from $MNPO_2$.	90A437
	H_2O pH = 7.8	9×10^7 (k_r) 2×10^{10} (k_q)		308	CR/Ac-?	used $k_d = 2.4 \times 10^5$ s^{-1}; $^1O_2$* from $MNPO_2$.	90A437

TABLE 2. Rate constants for interaction of singlet oxygen with olefins. — Continued

No.	Solvent	k ($L\ mol^{-1}\ s^{-1}$)	β (k_d/k) ($mol\ L^{-1}$)	T (K)	Method	Comment	Ref.
2.177	**6,6'-Diapo-Ψ,Ψ-carotenedioic acid, monomethyl ester, 9-*cis*- (Bixin)** — Continued						
	H_2O (mic) pH = 7.8	7×10^9		308	CR/A'c-16	A' = DPBF; used $k_d = 2.4 \times 10^5\ s^{-1}$; 0.1 mol L^{-1} SDS; $^1O_2$* from $MNPO_2$.	90A437
	H_2O (mic) pH = 7.8	7×10^7 (k_r) 1×10^{10} (k_q)		308	CR/A'c-?	used $k_d = 2.4 \times 10^5\ s^{-1}$; 0.1 mol L^{-1} SDS; $^1O_2$* from $MNPO_2$.	90A437
2.178	**8,8'-Diapocarotenedioic acid, mono(6-*O*-β-D-glucopyranosyl-β-D-glucopyranosyl) ester (emi-Crocin)**						
	H_2O pH = 7.4	1.3×10^8 (k_r) 5.1×10^9 (k_q)		308	CR/Ac-?	used $k_d = 3.3 \times 10^5\ s^{-1}$; $^1O_2$* from $MNPO_2$.	87A318
2.179	**9-*cis*-6,6'-Diapo-Ψ,Ψ-carotenedioic acid (Norbixin)**						
	DMF	1.7×10^{10}		308	CR/A'c-16	A' = DPBF; used $k_d = 1.4 \times 10^5\ s^{-1}$; $^1O_2$* from $MNPO_2$.	90A437
	DMF	2×10^6 (k_r) 1×10^{10} (k_q)		308	CR/A'c-?	used $k_d = 1.4 \times 10^5\ s^{-1}$; $^1O_2$* from $MNPO_2$.	90A437
	DMSO	9×10^9		308	CR/A'c-16	A' = DPBF; used $k_d = 5.2 \times 10^4\ s^{-1}$; $^1O_2$* from $MNPO_2$.	90A437
	DMSO	2×10^6 (k_r) 2×10^{10} (k_q)		308	CR/A'c-?	used $k_d = 5.2 \times 10^4\ s^{-1}$; $^1O_2$* from $MNPO_2$.	90A437
	H_2O pH = 7.8	2×10^8 (k_r) 2×10^{10} (k_q)		308	CR/Ac-?	used $k_d = 2.4 \times 10^5\ s^{-1}$; $^1O_2$* from $MNPO_2$.	90A437
	H_2O (mic) pH = 7.8	6×10^9		308	CR/Ac-16	A' = DPBF; used $k_d = 2.4 \times 10^5\ s^{-1}$; 0.1 mol L^{-1} SDS; $^1O_2$* from $MNPO_2$.	90A437
	H_2O (mic) pH = 7.8	8×10^7 (k_r) 9×10^9 (k_q)		308	CR/Ac-?	used $k_d = 2.4 \times 10^5\ s^{-1}$; 0.1 mol L^{-1} SDS; $^1O_2$* from $MNPO_2$.	90A437
2.180	**4*a*,9*a*:9,10-Diethenoanthracene, 1,4,9,10-tetrahydro-5,8-dimethoxy-**						
	CH_2Cl_2	2.5×10^4			PR/A'd-8	S = An; A' = DPBF.	79A457
2.181	**4*a*,9*a*:9,10-Diethenoanthracene, 1,4,9,10-tetrahydro-**						
	CH_2Cl_2	1.0×10^6			PR/A'd-8	S = An; A' = DPBF.	79A457
2.182	**2,3-Dioxabicyclo[2.2.2]oct-5-ene (3,6-Endoperoxycyclohexene)**						
	MeOH		1.5×10^2	293	CP/Oc-15	S = RB; $E_a = 26\ kJ\ mol^{-1}$.	68F288
2.183	**1,4-Dioxene**						
	CH_3COCH_3	2.2×10^5	0.18	288	CP/A'c-16	S = RB; A' = DPBF; used $k_d = 3.8 \times 10^4\ s^{-1}$.	77F876
	CH_3COCH_3	3.6×10^5		281	?	S = ?; A' = Car; used $k_{A'} = 3 \times 10^{10}\ L\ mol^{-1}\ s^{-1}$; meas. $k_A/k_{A'} = 1.2 \times 10^{-5}$.	70F733
2.184	**1,4-Dioxene, 2-(4-cyanophenyl)-3-(4-dimethylaminophenyl)-**						
	CD_3COCD_3	2.3×10^7 (k_r)			CP/Ac,A'c-17	S = TPP or RB; A' = TME; used $k_r^{A'} = 5.5 \times 10^7\ L\ mol^{-1}\ s^{-1}$.	80F007
2.185	**1,4-Dioxene, 2,3-di(4-acetaminophenyl)-**						
	CD_3COCD_3/ CD_3SOCD_3 (95:5)	1.5×10^7 (k_r)			CP/Ac,A'c-17	S = TPP or RB; A' = TME; used $k_r^{A'} = 5.5 \times 10^7\ L\ mol^{-1}\ s^{-1}$.	80F007
2.186	**1,4-Dioxene, 2,3-di(3-chlorophenyl)-**						
	CH_3COCH_3	3.6×10^6 (k_r)			CP/Ac,A'c-17	S = TPP or RB; A' = TME; used $k_r^{A'} = 5.5 \times 10^7\ L\ mol^{-1}\ s^{-1}$.	80F007
2.187	**1,4-Dioxene, 2,3-di(4-chlorophenyl)-**						
	CH_3CN	1.9×10^7 (k_r)			CP/Ac,A'c-17	S = TPP or RB; A' = TME; used $k_r^{A'} = 1.1 \times 10^8\ L\ mol^{-1}\ s^{-1}$.	80F007
	CH_3COCH_3	7.5×10^6 (k_r)			CP/Ac,A'c-17	S = TPP or RB; A' = TME; used $k_r^{A'} = 5.5 \times 10^7\ L\ mol^{-1}\ s^{-1}$.	80F007

TABLE 2. Rate constants for interaction of singlet oxygen with olefins. — Continued

	Solvent	k ($L\ mol^{-1}\ s^{-1}$)	β (k_d/k) ($mol\ L^{-1}$)	T (K)	Method	Comment	Ref.
2.188	**1,4-Dioxene, 2,3-di(4-dimethylaminophenyl)-**						
	CD_3COCD_3	3.7×10^8 (k_r)			CP/Ac,A'c-17	S = TPP or RB; A' = TME; used $k_r^{A'} = 5.5 \times 10^7$ $L\ mol^{-1}\ s^{-1}$.	80F007
2.189	**1,4-Dioxene, 2,3-di(4-hydroxyphenyl)-**						
	CD_3COCD_3	6.5×10^7 (k_r)			CP/Ac,A'c-17	S = TPP or RB; A' = TME; used $k_r^{A'} = 5.5 \times 10^7$ $L\ mol^{-1}\ s^{-1}$.	80F007
2.190	**1,4-Dioxene, 2,3-di(3-methoxyphenyl)-**						
	CH_3COCH_3	1.0×10^7 (k_r)			CP/Ac,A'c-17	S = TPP or RB; A' = TME; used $k_r^{A'} = 5.5 \times 10^7$ $L\ mol^{-1}\ s^{-1}$.	80F007
2.191	**1,4-Dioxene, 2,3-di(4-methoxyphenyl)-**						
	CD_3CN	1.3×10^8 (k_r)			CP/Ac,A'c-17	S = TPP or RB; A' = TME; used $k_r^{A'} = 1.1 \times 10^8$ $L\ mol^{-1}\ s^{-1}$.	80F007
	CH_3COCH_3	4.8×10^7 (k_r)			CP/Ac,A'c-17	S = TPP or RB; A' = TME; used $k_r^{A'} = 5.5 \times 10^7$ $L\ mol^{-1}\ s^{-1}$.	80F007
2.192	**1,4-Dioxene, 2-(4-dimethylaminophenyl)-3-phenyl-**						
	CD_3COCD_3	7.5×10^7 (k_r)			CP/Ac,A'c-17	S = TPP or RB; A' = TME; used $k_r^{A'} = 5.5 \times 10^7$ $L\ mol^{-1}\ s^{-1}$.	80F007
2.193	**1,4-Dioxene, 2,3-di(4-methylphenyl)-**						
	CH_3COCH_3	2.9×10^7 (k_r)			CP/Ac,A'c-17	S = TPP or RB; A' = TME; used $k_r^{A'} = 5.5 \times 10^7$ $L\ mol^{-1}\ s^{-1}$.	80F007
2.194	**1,4-Dioxene, 2,3-diphenyl-**						
	CH_3CN	1.7×10^7		298	PL/Ld-2	S = DCA.	91A311
	CH_3COCH_3	1.6×10^7 (k_r)			CP/Ac,A'c-17	S = TPP or RB; A' = TME; used $k_r^{A'} = 5.5 \times 10^7$ $L\ mol^{-1}\ s^{-1}$.	80F007
	CH_3COCH_3	1.3×10^7 (k_r)		281	?	S = ?; A' = 1,4-Dioxene; used $k_{A'} = 2.2 \times 10^5$ $L\ mol^{-1}\ s^{-1}$; meas. $k_A/k_{A'} = 58$.	70F733
2.195	**1,4-Dioxene, 2-(4-methoxyphenyl)-3-phenyl-**						
	CH_3COCH_3	2.7×10^7 (k_r)			CP/Ac,A'c-17	S = TPP or RB; A' = TME; used $k_r^{A'} = 5.5 \times 10^7$ $L\ mol^{-1}\ s^{-1}$.	80F007
2.196	**1,4-Dioxene, 2,3,5,6-tetraphenyl-**						
	C_6H_6	1.5×10^7 (k_r)			CP/Pa-17	S = A; A' = TME; used $k_r^{A'} = 4 \times 10^7$ $L\ mol^{-1}\ s^{-1}$; P = Benzil.	79A241
2.197	**1,3-Dioxolane, 4,5-diethylidene-2,2-dimethyl-, (*E*,*Z*)**						
	CH_2Cl_2	2.3×10^7			CP/A'c-16	S = MPDME; A' = DPBF; used $k_d = 1 \times 10^4\ s^{-1}$.	87A035
2.198	**1,3-Dioxolane, 4,5-diethylidene-2,2-dimethyl-, (*Z*,*Z*)**						
	CH_2Cl_2	3.2×10^7			CP/A'c-16	S = MPDME; A' = DPBF; used $k_d = 1 \times 10^4\ s^{-1}$.	87A035
2.199	**1,3-Dioxole**						
	CH_3COCH_3	1.2×10^7	3.3×10^{-3}	288	CP/A'c-16	S = RB; A' = DPBF; used $k_d = 3.8 \times 10^4\ s^{-1}$.	77F876
2.200	**Docosahexaenoic acid**						
	CCl_4	1.5×10^5			MP/LI-12	S = TPP; used $k_d = 42\ s^{-1}$.	83E425 83F151
2.201	**4,8-Dodecadiene, 4,8-dimethyl-**						
	MeOH	6.9×10^5 (k_r)		253	CP/Oc-14,27	S = RB; A' = α-Terpinene; used $k_d = 1.1 \times 10^5\ s^{-1}$.	78A344

TABLE 2. Rate constants for interaction of singlet oxygen with olefins. — Continued

No.	Solvent	k (L mol^{-1} s^{-1})	β (k_d/k) (mol L^{-1})	T (K)	Method	Comment	Ref.
2.202	**4,8-Dodecadiene, 4,8-dimethyl-, (*E,E*)-**						
	MeOH	1.1×10^6 (k_r)		253	CP/Oc-14,27	S = RB; A′ = α-Terpinene; used $k_d = 1.1 \times 10^5$ s^{-1}.	78A344
2.203	**4,8-Dodecadiene, hydroperoxy-4,8-dimethyl-**						
	MeOH	3.8×10^5 (k_r)		253	CP/Oc,Ac,Pa-14,27	S = RB; A′ = α-Terpinene; used $k_d = 1.1 \times 10^5$ s^{-1}.	78A344
2.204	**(*E,E*)-8,10-Dodecadienol**						
	C_6H_5Cl/ 2-PrOH (90:10)	5.7×10^5		273	CR/LI-12	used $k_d = 4.1 \times 10^4$ s^{-1}; $^1O_2$* from hydrotrioxide, e.g. $(CH_3)_2C(OH)OOOH$.	90M125
2.205	**2,4,6,8,10-Dodecapentaene-1,12-dione, 1,12-bis(3-hydroxy-1,2,2-trimethylcyclopentyl)-4,7-dimethyl- [1*R*-[1α[2*E*,4*E*,6*E*,8*E*,10*E*,12(1*R**,3*R**)],3α]- (C_{30}-Capsorubin)**						
	$CHCl_3$	$<1 \times 10^7$			CR/LI-12	used $k_d = 3.0 \times 10^4$ s^{-1}; $^1O_2$* from $NDPO_2$.	92R054
2.206	**2,4,6,8,10-Dodecapentaene-1,12-dione, 1,12-bis(3-hydroxy-1,2,2-trimethylcyclopentyl)-4,7-dimethyl- [1*R*-[1α[2*E*,4*E*,6*E*,8*E*,10*E*,12(1*R**,3*R**)],3β]- (C_{30}-Epiisocapsorubin)**						
	$CHCl_3$	$<1 \times 10^7$			CR/LI-12	used $k_d = 3.0 \times 10^4$ s^{-1}; $^1O_2$* from $NDPO_2$.	92R054
2.207	**2,4,6,8,10-Dodecapentaene-1,12-dione, 1,12-bis(4-hydroxy-1,2,2-trimethylcyclopentyl)-4,7-dimethyl- [1*R*-[1α[2*E*,4*E*,6*E*,8*E*,10*E*,12(1*R**,4*R**)],4β]- (C_{30}-Isocapsorubin)**						
	$CHCl_3$	$<1 \times 10^7$			CR/LI-12	used $k_d = 3.0 \times 10^4$ s^{-1}; $^1O_2$* from $NDPO_2$.	92R054
2.208	**2,6,10-Dodecatriene, dihydroperoxy-2,6,10-trimethyl-**						
	MeOH	6×10^5 (k_r)		253	CP/Oc,Pa-17	S = RB; A′ = TMDT; used $k_r^{A'} = 2.0 \times 10^6$ L mol^{-1} s^{-1}.	83A078
2.209	**2,6,10-Dodecatriene, hydroperoxy-2,6,10-trimethyl-**						
	MeOH	1.2×10^6 (k_r)		253	CP/Oc,Pa-17	S = RB; A′ = TMDT; used $k_r^{A'} = 2.0 \times 10^6$ L mol^{-1} s^{-1}.	83A078
2.210	**2,6,10-Dodecatriene, 2,6,10-trimethyl- (TMDT)**						
	MeOH	2.0×10^6	0.055	253	CP/Oc,Pa-15	S = RB; used $k_d = 1.1 \times 10^5$ s^{-1}.	83A078
2.211	**4,6,8,10,12,14,16-Eicosaheptacne-3,18-dione, 8,13-dimethyl-2,2,19,19-tetramethoxy- (*all-E*) (C_{22}-Polyene-tetrone-diacetal)**						
	$CHCl_3$	$\sim 2 \times 10^9$			CR/LI-12	used $k_d = 3.0 \times 10^4$ s^{-1}; $^1O_2$* from $NDPO_2$.	92R054
2.212	**5,8,11,14-Eicosatetraenoic acid (Arachidonic acid)**						
	CCl_4	1×10^5			MP/LI-12	S = TPP; used $k_d = 42$ s^{-1}.	83E425 83F151
2.213	**5,8,11,14-Eicosatetraenoic acid, methyl ester (Methyl arachidonate)**						
	C_5H_5N	2.4×10^5 (k_r)			CP/Ac,A′c-17	S = PP; A′ = Cholesterol; used $k_d = 6 \times 10^4$ s^{-1}; meas. $k_r/k_r^{A'} = 3.5$, $\beta_{A'} = 0.89$ mol L^{-1}.	743115
2.214	**5,8,11,14-Eicosatetraenoic acid, phenyl ester (Phenyl arachidonate)**						
	CD_3OD	1.2×10^5			PL/Ld-2	S = MB and RF.	88A165
2.215	**Ethanol, 2-cyclododecylidene-**						
	MeOH/ H_2O (95.5)		0.34		CP/Oc-15	S = RB; Soln. contg. 1% sodium acetate.	79F137
2.216	**Ethanol, 2-cyclohexylidene-**						
	MeOH/ H_2O (95:5)		0.43		CP/Oc-15	S = RB; Soln. contg. 1% sodium acetate.	79F137
2.217	**Ethanol, 2-cyclooctylidene-**						
	MeOH/ H_2O (95:5)		0.06		CP/Oc-15	S = RB; Soln. contg. 1% sodium acetate.	79F137
2.218	**Ethanol, 2-cyclopentylidene-**						
	MeOH/ H_2O (95:5)		0.02		CP/Oc-15	S = RB; Soln. contg. 1% sodium acetate.	79F137

TABLE 2. Rate constants for interaction of singlet oxygen with olefins. — Continued

No.	Solvent	k ($L\ mol^{-1}\ s^{-1}$)	β (k_d/k) ($mol\ L^{-1}$)	T (K)	Method	Comment	Ref.
2.219	**Ethanol, 1-(2-methylene-3,5-cyclohexadienylidene)- (2-Methylacetophenone enol)**						
	CH_3CN	$\sim 10^9$			PL/Ld	S = OMAPB; estd. from obs. lifetimes for different laser doses.	89A241
2.220	**Ethanol, 1-tricyclo[3.3.1.1^{3,7}]decylidene-, acetate (1-Adamantylideneethyl acetate)**						
	CD_3COCD_3	4.5×10^4		296	PL/Ld-2	S = MB.	86F219
2.221	**Ethene, 1,1-diethoxy-**						
	C_6H_6	2.6×10^5	0.15	288	CP/A'c-16	S = RBCE; A' = DPBF; used $k_d = 4.2 \times 10^4\ s^{-1}$.	77F876
	CH_3COCH_3	$<1 \times 10^4$ (k_r)		279	CP/Ac,A'c-17	S = RB; A' = 1,4-Dioxene; No measurable reaction of A.	77F876
	CH_3COCH_3	4.6×10^5	0.083	288	CP/A'c-16	S = RB; A' = DPBF; used $k_d = 3.8 \times 10^4\ s^{-1}$.	77F876
2.222	**Ethene, 1,2-diethoxy-, (*E*)-**						
	CH_3COCH_3	2.6×10^7 (k_r)		279	CP/Ac,A'c-17	S = RB; A' = (Z)-1,2-Diethoxyethene; used $k_r^{A'} = 5.7 \times 10^7\ L\ mol^{-1}\ s^{-1}$; meas. $k_r/k_r^{A'} = 0.46$.	77F876
	CH_3COCH_3	4.7×10^7	8.1×10^{-4}	288	CP/A'c-16	S = RB; A' = DPBF; used $k_d = 3.8 \times 10^4\ s^{-1}$.	77F876
	CH_3COCH_3	1.0×10^7 (k_r)		281	?	S = ?; A' = 1,4-Dioxene; used $k_{A'} = 2.2 \times 10^5\ L\ mol^{-1}\ s^{-1}$; meas. $k_A/k_{A'} = 46$.	70F733
2.223	**Ethene, 1,2-diethoxy-, (*Z*)-**						
	CH_3COCH_3	4.4×10^7	8.6×10^{-4}	288	CP/A'c-16	S = RB; A' = DPBF; used $k_d = 3.8 \times 10^4\ s^{-1}$.	77F876
	CH_3COCH_3	5.7×10^7 (k_r)		279	CP/Ac,A'c-17	S = RB; A' = TME; used $k_r^{A'} = 5.4 \times 10^7\ L\ mol^{-1}\ s^{-1}$; meas. $k_r/k_r^{A'} = 1.1$; Found $k_r \gg k_q$.	77F876
	CH_3COCH_3	3.3×10^7 (k_r)		281	?	S = ?; A' = 1,4-Dioxene; used $k_{A'} = 2.2 \times 10^5\ L\ mol^{-1}\ s^{-1}$; meas. $k_A/k_{A'} = 1.5 \times 10^2$.	70F733
2.224	**Ethene, ethoxy-**						
	C_6H_6	2.3×10^5	0.18	288	CP/A'c-16	S = RBCE; A' = DPBF; used $k_d = 4.2 \times 10^4\ s^{-1}$.	77F876
	CH_3COCH_3	3.1×10^4 (k_r)		279	CP/Ac,A'c-17	S = RB; A' = 1,4-Dioxene; used $k_r^{A'} = 2.2 \times 10^5\ L\ mol^{-1}\ s^{-1}$; meas. $k_r/k_r^{A'} = 0.14$; Found $k_r \gg k_q$.	77F876
	CH_3COCH_3	4.3×10^4	0.88	288	CP/A'c-16	S = RB; A' = DPBF; used $k_d = 3.8 \times 10^4\ s^{-1}$.	77F876
	CH_3COCH_3	5.7×10^4 (k_r)		281	?	S = ?; A' = 1,4-Dioxene; used $k_{A'} = 2.2 \times 10^5\ L\ mol^{-1}\ s^{-1}$; meas. $k_A/k_{A'} = 0.26$.	70F733
2.225	**Ethene, tetraethoxy-**						
	C_6H_6	7.4×10^7	5.7×10^{-4}	288	CP/A'c-16	S = RBCE; A' = DPBF; used $k_d = 4.2 \times 10^4\ s^{-1}$.	77F876
	CH_3CN	4.3×10^7	7.7×10^{-4}	288	CP/A'c-16	S = RB; A' = DPBF; used $k_d = 3.3 \times 10^4\ s^{-1}$.	77F876
	CH_3COCH_3	4.6×10^7 (k_r)		279	CP/Ac,A'c-17	S = RB; A' = TME; used $k_r^{A'} = 5.4 \times 10^7\ L\ mol^{-1}\ s^{-1}$; meas. $k_r/k_r^{A'} = 0.85$; Found $k_r \gg k_q$.	77F876
	CH_3COCH_3	4.5×10^7	8.5×10^{-4}	288	CP/A'c-16	S = RB; A' = DPBF; used $k_d = 3.8 \times 10^4\ s^{-1}$.	77F876
	$CHCl_3$	7.6×10^7	2.2×10^{-4}	288	CP/A'c-16	S = MB; A' = DPBF; used $k_d = 1.7 \times 10^4\ s^{-1}$; Solvent contained 1% EtOH.	77F876
2.226	**Ethene, 1,1,2-triethoxy-**						
	CH_3COCH_3	1.2×10^8	3.1×10^{-4}	288	CP/A'c-16	S = RB; A' = DPBF; used $k_d = 3.8 \times 10^4\ s^{-1}$.	77F876
2.227	**2-Furanone, 3-(1-methylethylidene)-**						
			0.65		CP/Ac-18	S = Poly-RB or RB; A' = Linalool; used $\beta_{A'} = 0.18\ mol\ L^{-1}$; Solvent is CH_2Cl_2 or MeOH.	80F111
2.228	**1-Heptene**						
	CCl_4/ MeOH (96:4)	2×10^3			PL/A'd-8	S = MB; A' = DPBF.	777162
2.229	**(Z)-2-Heptene**						
	MeOH	1.3×10^5		286	?	S = Poly-RB; method not reported.	81F534

TABLE 2. Rate constants for interaction of singlet oxygen with olefins. — Continued

No.	Solvent	k ($L\ mol^{-1}\ s^{-1}$)	β (k_d/k) ($mol\ L^{-1}$)	T (K)	Method	Comment	Ref.
2.230	**(*all-E*)-1,3,5,7,9,11,13,15,17,19,21,23,25-Hexacosatridecaene, 3,7,11,16,20,24-hexamethyl-1,26-bis(2,6,6-trimethyl-1-cyclohexyl- (Decapreno-β-carotene)**						
	$C_6H_5CH_3$	2.1×10^{10}			PL/Ld-2	S = Pz.	91E465
	C_6H_6	2.0×10^{10}			PL/Ld-2	S = Pz.	91E465
	C_6H_6	2.2×10^{9}			PL/βCd-2	S = An.	80A143
2.231	**2,4,6,8,10,12,14-Hexadecaheptaene-1,16-dione, 1,16-bis(3-hydroxy-1,2,2-trimethylcyclopentyl)-6,11-dimethyl- [1*R*-[1α[2*E*,4*E*,6*E*,8*E*,10*E*,12*E*,14*E*,16(1*R**,3*S**)],3β]- (C_{34}-Capsorubin)**						
	$CHCl_3$	$\sim 2 \times 10^{9}$			CR/LI-12	used $k_d = 3.0 \times 10^4\ s^{-1}$; $^1O_2$* from $NDPO_2$.	92R054
2.232	**2,4,6,8,10,12,14-Hexadecaheptaene-1,16-dione, 1,16-bis(4-hydroxy-1,2,2-trimethylcyclopentyl)-6,11-dimethyl- [1*R*-[1α[2*E*,4*E*,6*E*,8*E*,10*E*,12*E*,14*E*,16(1*R**,4*S**)],4β]- (C_{34}-Epiisocapsorubin)**						
	$CHCl_3$	$\sim 2 \times 10^{9}$			CR/LI-12	used $k_d = 3.0 \times 10^4\ s^{-1}$; $^1O_2$* from $NDPO_2$.	92R054
2.233	**4,6,8,10,12-Hexadecapentaene-3,14-dione, 6,11-dimethyl-2,2,15,15-tetramethoxy- (*all-E*) (C_{18}-Polyene-tetrone-diacetal)**						
	$CHCl_3$	$< 1 \times 10^{7}$			CR/LI-12	used $k_d = 3.0 \times 10^4\ s^{-1}$; $^1O_2$* from $NDPO_2$.	92R054
2.234	**4,6,8,10,12-Hexadecapentaene-2,3,14,15-tetraone, 6,11-dimethyl- (*all-E*) (C_{18}-Polyene-tetrone)**						
	$CHCl_3$	$\sim 1 \times 10^{7}$			CR/LI-12	used $k_d = 3.0 \times 10^4\ s^{-1}$; $^1O_2$* from $NDPO_2$.	92R054
2.235	**2,6,10,14-Hexadecatetraene, 2,6,10,14-tetramethyl-**						
	MeOH	2.2×10^{6}	0.05	253	CP/Oc,Pa-15	S = RB; used $k_d = 1.1 \times 10^5\ s^{-1}$.	83A078
2.236	**2-Hexadecene, 1-ethoxy-3,7,11,15-tetramethyl- (Ethyl phytyl ether)**						
	EtOH		3.0 (β_r)		CP/Pa,P'a-17	S = RB; A' = *c*-$C_6H_9CH_3$; used $\beta_r^{A'} = 1.5 \times 10^{-3}$ mol L^{-1}.	86F091
2.237	**2-Hexadecene, 1-methoxy-3,7,11,15-tetramethyl- (Methyl phytyl ether)**						
	EtOH		3.7 (β_r)		CP/Pa,P'a-17	S = RB; A' = *c*-$C_6H_9CH_3$; used $\beta_r^{A'} = 1.5 \times 10^{-3}$ mol L^{-1}.	86F091
2.238	**2-Hexadecen-1-ol, 3,7,11,15-tetramethyl- (Phytol)**						
	EtOH		1.3 (β_r)		CP/Pa,P'a-17	S = RB; A' = *c*-$C_6H_9CH_3$; used $\beta_r^{A'} = 1.5 \times 10^{-3}$ mol L^{-1}.	86F091
2.239	**2-Hexadecen-1-ol, 3,7,11,15-tetramethyl-, acetate (Phytyl acetate)**						
	EtOH		7.8 (β_r)		CP/Pa,P'a-17	S = RB; A' = *c*-$C_6H_9CH_3$; used $\beta_r^{A'} = 1.5 \times 10^{-3}$ mol L^{-1}.	86F091
2.240	**1,5-Hexadiene**						
	CCl_4/ MeOH (96:4)	2×10^{3}			PL/A'd-8	S = MB; A' = DPBF.	777162
2.241	**(*E*,*E*)-2,4-Hexadiene**						
	CCl_4/ MeOH (96:4)	2×10^{4}			PL/A'd-8	S = MB; A' = DPBF.	777162
	$CHCl_3$	2.4×10^{5}			CP/A'c-33	S = A' = Rub; used $k_d = 1.7 \times 10^4\ s^{-1}$, $k_{A'} = 5.3 \times 10^7\ L\ mol^{-1}\ s^{-1}$.	81F445
2.242	**(*E*,*Z*)-2,4-Hexadiene**						
	$CHCl_3$	1.0×10^{5}			CP/A'c-33	S = A' = Rub; used $k_d = 1.7 \times 10^4\ s^{-1}$, $k_{A'} = 5.3 \times 10^7\ L\ mol^{-1}\ s^{-1}$.	81F445
2.243	**2,4-Hexadiene, 2,5-dimethyl- (DMHD)**						
	C_6H_6	1.8×10^5 (k_r) 1.8×10^6 (k_q)	0.24 (β_r)	286	CP/Oc-29	S = TPP; A' = 2,5-DMF; used $k_d = 4.2 \times 10^4\ s^{-1}$; meas. $k_q/k_r = 9.74$: for formation of products (2) 3,3-dimethyl-2-(2-methyl-1-propenyl)-1,2-dioxetane, (3) 2,5-dimethyl-3-hydroperoxy-1,4-hexadiene, (4) 1,2-dioxa-3,3,6,6-tetramethyl-4-cyclohexene, (5) *trans*-2,5-dimethyl-5-hydroperoxy-1,3-hexadiene, $k_r = 0.05$, 0.59, 0.34 and $0.81 \times 10^5\ L\ mol^{-1}\ s^{-1}$, resp.	84F335

TABLE 2. Rate constants for interaction of singlet oxygen with olefins. — Continued

No.	Solvent	k (L mol^{-1} s^{-1})	β (k_d/k) (mol L^{-1})	T (K)	Method	Comment	Ref.
1343	**2,4-Hexadiene, 2,5-dimethyl- (DMHD)** — Continued						
	C_6H_6	4×10^6			PL/Ld-2	S = MPDME.	83F195 83F196
	C_6H_6	$<2.5 \times 10^5$ (k_r)		295	CP/Ac-17	S = RB; A′ = 2M2P; used $k_r^{A'} = 7.2 \times 10^5$ L mol^{-1} s^{-1}; for formation of 3-hydroperoxy-2,5-dimethyl-1,4-diene $k_r = 1.4 \times 10^5$ L mol^{-1} s^{-1}.	83F196
	CCl_4	1.0×10^5 (k_r) 9.8×10^5 (k_q)	0.014 (β_r)	286	CP/Oc-29	S = TPP; A′ = 2,5-DMF; used $k_d = 1.4 \times 10^3$ s^{-1}; meas. $k_q/k_r = 9.81$; for formation of products (2) 3,3-dimethyl-2-(2-methyl-1-propenyl)-1,2-dioxetane, (3) 2,5-dimethyl-3-hydroperoxy-1,4-hexadiene, (4) 1,2-dioxa-3,3,6,6-tetramethyl-4-cyclohexene, (5) *trans*-2,5-dimethyl-5-hydroperoxy-1,3-hexadiene, $k_r = 0.07$, 0.25, 0.23 and 0.42×10^5 L mol^{-1} s^{-1}, resp.	84F335
	CH_2Cl_2	8.6×10^5 (k_r) 1.9×10^6 (k_q)	0.011 (β_r)	286	CP/Oc-29	S = TPP; A′ = 2,5-DMF; used $k_d = 9.5 \times 10^3$ s^{-1}; meas. $k_q/k_r = 2.21$; for formation of products (2) 3,3-dimethyl-2-(2-methyl-1-propenyl)-1,2-dioxetane, (3) 2,5-dimethyl-3-hydroperoxy-1,4-hexadiene, (4) 1,2-dioxa-3,3,6,6-tetramethyl-4-cyclohexene, (5) *trans*-2,5-dimethyl-5-hydroperoxy-1,3-hexadiene, $k_r = 0.26$, 5.5, 0.34 and 2.5×10^5 L mol^{-1} s^{-1}, resp.	84F335
	CH_2Cl_2	5×10^6			PL/Ld-2	S = MPDME.	83F195 83F196
	CH_2Cl_2	1×10^6 (k_r)		295	CP/Ac-17	S = RB; A′ = 2M2P; used $k_r^{A'} = 9.7 \times 10^5$ L mol^{-1} s^{-1}; for formation of 3-hydroperoxy-2,5-dimethyl-1,4-diene $k_r = 1.3 \times 10^6$ L mol^{-1} s^{-1}.	83F196
	CH_2Cl_2				CP/Pa,P′a-17	S = ?; A′ = *c*-$C_6H_9CH_3$; meas. $k_r/k_r^{A'} = 5.0$.	73F662
	CH_3CN	1.4×10^6 (k_r) 1.3×10^6 (k_q)	0.024 (β_r)	286	CP/Oc-29	S = TPP; A′ = 2,5-DMF; used $k_d = 3.3 \times 10^4$ s^{-1}; meas. $k_q/k_r = 0.91$; for formation of products (2) 3,3-dimethyl-2-(2-methyl-1-propenyl)-1,2-dioxetane, (3) 2,5-dimethyl-3-hydroperoxy-1,4-hexadiene, (4) 1,2-dioxa-3,3,6,6-tetramethyl-4-cyclohexene, (5) *trans*-2,5-dimethyl-5-hydroperoxy-1,3-hexadiene, $k_r = 0.41$, 12.3, 0.55 and 0.55×10^5 L mol^{-1} s^{-1}, resp.	84F335
	CH_3CN	5.2×10^6	0.029		CP/A′c-16	S = RB; A′ = DPBF; used $k_d = 1.5 \times 10^5$ s^{-1}.	83F195
	CH_3CN	6.3×10^6			PL/Ld-2	S = MPDME.	83F195 83F196
	CH_3CN	1.6×10^6 (k_r)		295	CP/Ac-17	S = RB; A′ = 2M2P; used $k_r^{A'} = 1.2 \times 10^6$ L mol^{-1} s^{-1}; for formation of 3-hydroperoxy-2,5-dimethyl-1,4-diene $k_r = 1.7 \times 10^6$ L mol^{-1} s^{-1}.	83F196
	CH_3CN				CP/Pa,P′a-17	S = ?; A′ = *c*-$C_6H_9CH_3$; meas. $k_r/k_r^{A'} = 6.3$.	73F662
	CH_3COCH_3	7.4×10^5 (k_r) 1.1×10^6 (k_q)	0.051 (β_r)	286	CP/Oc-29	S = TPP; A′ = 2,5-DMF; used $k_d = 3.8 \times 10^4$ s^{-1}; meas. $k_q/k_r = 1.44$; for formation of products (2) 3,3-dimethyl-2-(2-methyl-1-propenyl)-1,2-dioxetane, (3) 2,5-dimethyl-3-hydroperoxy-1,4-hexadiene, (4) 1,2-dioxa-3,3,6,6-tetramethyl-4-cyclohexene, (5) *trans*-2,5-dimethyl-5-hydroperoxy-1,3-hexadiene, $k_r = 0.59$, 6.2, 0.22 and 0.37×10^5 L mol^{-1} s^{-1}, resp.	84F335
	CH_3COCH_3	3.9×10^6		295	PL/Ld-2	S = MPDME.	83F195 83F196

TABLE 2. Rate constants for interaction of singlet oxygen with olefins. — Continued

No.	Solvent	k (L mol^{-1} s^{-1})	β (k_d/k) (mol L^{-1})	T (K)	Method	Comment	Ref.
2.243	**2,4-Hexadiene, 2,5-dimethyl- (DMHD) — Continued**						
	CH_3COCH_3	7×10^5 (k_r)		295	CP/Ac-17	S = RB; A′ = 2M2P; used $k_r^{A'} = 8.1 \times 10^5$ L mol^{-1} s^{-1}; $\Delta H‡ = -0.96$ kJ mol^{-1}; $\Delta S‡ = -138$ J K^{-1} mol^{-1}; studied at 195-295 K; for formation of 3-hydroperoxy-2,5-dimethyl-1,4-diene k_r = 3.4, 2.5 and 3.2×10^5 L mol^{-1} s^{-1} at 295, 241 and 195 K, resp. and $\Delta H‡ = 1.7$ kJ mol^{-1} and $\Delta S‡ = -146$ J K^{-1} mol^{-1}.	83F196
	CH_3COCH_3				CP/Pa,P′a-17	S = ?; A′ = c-$C_6H_9CH_3$; meas. $k_r/k_r^{A'} = 3.2$.	73F662
	CH_3COCH_3/ H_2O (75:25)				CP/Pa,P′a-17	S = ?; A′ = c-$C_6H_9CH_3$; meas. $k_r/k_r^{A'} = 13$.	73F662
	$CHCl_3$	4.8×10^5 (k_r) 9.0×10^5 (k_q)	8.3×10^{-3} (β_r)	286	CP/Oc-29	S = TPP; A′ = 2,5-DMF; used $k_d = 4.0 \times 10^3$ s^{-1}; meas. $k_q/k_r = 1.86$; for formation of products (2) 3,3-dimethyl-2-(2-methyl-1-propenyl)-1,2-dioxetane, (3) 2,5-dimethyl-3-hydroperoxy-1,4-hexadiene, (4) 1,2-dioxa-3,3,6,6-tetramethyl-4-cyclohexene, (5) *trans*-2,5-dimethyl-5-hydroperoxy-1,3-hexadiene, k_r = 0.14, 2.98, 0.29 and 1.45×10^5 L mol^{-1} s^{-1}, resp.	84F335
	$CHCl_3$	5.3×10^6			CP/A′c-33	S = A′ = Rub; used $k_d = 1.7 \times 10^4$ s^{-1}, $k_{A'} = 5.3 \times 10^7$ L mol^{-1} s^{-1}.	81F445
	MeOD	2.6×10^6			PL/Ld-2	S = MPDME.	83F196
	MeOH	2.4×10^6 (k_r) 1.1×10^6 (k_q)	0.059 (β_r)	286	CP/Oc-29	S = TPP; A′ = 2,5-DMF; used $k_d = 1.4 \times 10^5$ s^{-1}; meas. $k_q/k_r = 0.45$; for formation of products (2) 3,3-dimethyl-2-(2-methyl-1-propenyl)-1,2-dioxetane, (3) 2,5-dimethyl-3-hydroperoxy-1,4-hexadiene, (4) 1,2-dioxa-3,3,6,6-tetramethyl-4-cyclohexene, (5) *trans*-2,5-dimethyl-5-hydroperoxy-1,3-hexadiene, (6) *trans*-2,5-dimethyl-1-hydroperoxy-5-methoxy-3-hexene, k_r = 12.8, 5.1, 0.96, 0.48 and 4.8×10^5 L mol^{-1} s^{-1}, resp.	84F335
	MeOH	2.6×10^6	0.042		CP/A′c-16	S = RB; A′ = DPBF; used $k_d = 1.1 \times 10^5$ s^{-1}.	83F195 83F196
	MeOH	3×10^6 (k_r)		295	CP/Ac-17	S = RB; A′ = 2M2P; used $k_r^{A'} = 2.0 \times 10^5$ L mol^{-1} s^{-1}; $\Delta H‡ = 2.7$ kJ mol^{-1}; $\Delta S‡ = -115$ J K^{-1} mol^{-1}; studied at 195-295 K; for formation of 3-hydroperoxy-2,5-dimethyl-1,4-diene k_r = 2.9, 1.0 and 0.28×10^5 L mol^{-1} s^{-1} at 295, 241 and 195 K, resp. and $\Delta H‡ = 9.2$ kJ mol^{-1} and $\Delta S‡ = -113$ J K^{-1} mol^{-1}.	83F196
	MeOH	2×10^6			PL/A′d-5	S = MB; A′ = DPBF.	727260
	MeOH				CP/Pa,P′a-17	S = ?; A′ = c-$C_6H_9CH_3$; meas. $k_r/k_r^{A'} = 28$.	73F662
	MeOH/ H_2O (88:13)				CP/Pa,P′a-17	S = ?; A′ = c-$C_6H_9CH_3$; meas. $k_r/k_r^{A'} = 29$.	73F662
2.244	**2-Hexene**						
	MeOH			288	CP/Ac,A′c-17	S = MB; A′ = c-C_5H_8; meas. $k_r/k_r^{A'} = 0.56$.	65F028
2.245	**(*E*)-3-Hexene**						
	CS_2	7.7×10^3		298	PL/Ld-2	S = TPP; $\Delta H‡ = 2$ kJ mol^{-1}; $\Delta S‡ = -163$ J K^{-1} mol^{-1}; studied at 183-310 K.	85A167
2.246	**(*Z*)-3-Hexene**						
	$CHCl_3$	3.5×10^4 3.1×10^4 (k_r) 4×10^3 (k_q)	0.14		CP/Oc-14,27	S = MB; used $k_d = 4.4 \times 10^3$ s^{-1}; obs. rate of oxygen consumption as a ratio with TME; calcn. involves k_q(MB) = 6.4×10^6 L mol^{-1} s^{-1}.	88A026
	CS_2	3.9×10^4		298	PL/Ld-2	S = TPP; $\Delta H‡ = 8$ kJ mol^{-1}; $\Delta S‡ = -130$ J K^{-1} mol^{-1}; studied at 183-310 K.	85A167

TABLE 2. Rate constants for interaction of singlet oxygen with olefins. — Continued

No.	Solvent	k (L mol^{-1} s^{-1})	β (k_d/k) (mol L^{-1})	T (K)	Method	Comment	Ref.
2.247	**Indole, 1-methyl-3-(β-methoxyvinyl)- (*E*)**						
	CD_2Cl_2			195	CP/Pa,P'a-17	S = TPP; A' = *E*-1-(Phenylsulfonyl)-3-(β-methoxylvinyl)indole; meas. $k_r/k_r^{A'} = 5$.	93F367
2.248	**Indole, 1-methyl-3-(β-methoxyvinyl)- (*Z*)**						
	CD_2Cl_2			195	CP/Pa,P'a-17	S = TPP; A' = *E*-1-Methyl-3-(β-methoxylvinyl)indole; meas. $k_r/k_r^{A'} = 4.1$.	93F367
2.249	**Indole, 1-(phenylsulfonyl)-3-(β-methoxyvinyl)- (*Z*)**						
	CD_2Cl_2			195	CP/Pa,P'a-17	S = TPP; A' = *E*-1-(Phenylsulfonyl)-3-(β-methoxylvinyl)indole; meas. $k_r/k_r^{A'} = 5.2$.	93F367
2.250	**Lycopene, (*all-E*)-**						
	n-C_6H_{14}	1.9×10^{10}			PL/Ld-2	S = Pz.	91E465
	$C_6H_5CH_3$	1.8×10^{10}			PL/Ld-2	S = Pz.	91E465
	C_6H_6	1.7×10^{10}			PL/Ld-2	S = Pz.	91E465
	C_6H_6/ MeOH (80:20)				CP/P'a-20	S = MB; A' = 2M2P; meas. $k_A/k_{A'} = 1.5 \times 10^4$.	707188
	CCl_4	1.4×10^{10}			PL/Ld-2	S = Pz.	91E465
	CH_2Cl_2	6.9×10^9	1.4×10^{-6}	293	CP/Oc-19	S = Chl a; A' = Soybean oil; used $k_d = 1.0 \times 10^4$ s^{-1}.	90R128
	$CHCl_3$	9×10^9			CR/LI-12	used $k_d = 3.0 \times 10^4$ s^{-1}; $^1O_2$* from $NDPO_2$.	92R054
	$CHCl_3$	1.9×10^{10}			PL/Ld-2	S = Pz.	91E465
	$CHCl_3$/ EtOH (50:50)	1.8×10^{10}			PL/Ld-2	S = Pz; Soln. cont. 1% H_2O.	91E465
	$CHCl_3$/ EtOH (50:50)	9×10^9		310	CR/LI-12	$^1O_2$* from $NDPO_2$; reported $k = 3.1 \times 10^{10}$ L mol^{-1} s^{-1} using $k_d = 1 \times 10^5$ s^{-1}, recalcd. using $k_d = 3.0 \times 10^4$ s^{-1} [92E654].	89R188 90E622
2.251	**Lycopene, dihydroxy-**						
	C_6H_6	5.1×10^9			PL/βCd-11	S = An.	80A143
2.252	**Methacrylic acid**						
	C_6D_6	4.7×10^3			PL/Ld-2	S = TPP.	89A331
2.253	**2,5-Methano-1,3-dithiolo[4,5-*d*][1,3]dithiin, dihydro-2,3a,5-trimethyl-7-methylene-**						
	$CHCl_3$	1.2×10^5		295	CL/LI-12	S = An; used $k_d = 4.9 \times 10^3$ s^{-1}.	90F473
2.254	**4,7-Methanoindene, 4,5,6,7-tetrahydro- (Isodicyclopentadiene)**						
	CD_3COCD_3	1.5×10^8		195	CP/A'c-16	S = RB; A' = DPBF; k_d not given.	87A368
2.255	**Methanol, cyclohexylidene-, acetate**						
	CD_3COCD_3	7.5×10^4		298	PL/Ld-2	S = MB.	85A167
	CD_3OD	4.8×10^4		298	PL/Ld-2	S = MB.	85A167
2.256	**Methanol, 1-tricyclo[3.3.1.1^{3,7}]decylidene-, acetate (Adamantylidenemethyl acetate)**						
	CD_3COCD_3	3.4×10^4		296	PL/Ld-2	S = MB.	86F219 85A167
	CD_3COCD_3	2.7×10^4 (k_r)		296	CP/Pa-17	S = MB; A' = 2M2P; used $k_r^{A'} = 8.1 \times 10^5$ L mol^{-1} s^{-1}.	86F219
	CD_3OD	2.1×10^4		298	PL/Ld-2	S = MB.	85A167
2.257	**1,4-Methanonaphthalene, 5,8-dimethoxy-1,2,3,4-tetrahydro-9-isopropylidene-**						
	CH_2Cl_2	4.3×10^6			PL/A'd-8	S = An; A' = DPBF.	81A437
2.258	**1,4-Methanonaphthalene, 5,6,7,8-tetrachloro-1,2,3,4-tetrahydro-9-isopropylidene-**						
	CH_2Cl_2	9.6×10^4			PL/A'd-8	S = An; A' = DPBF.	81A437

TABLE 2. Rate constants for interaction of singlet oxygen with olefins. — Continued

No.	Solvent	k ($L\ mol^{-1}\ s^{-1}$)	β (k_d/k) ($mol\ L^{-1}$)	T (K)	Method	Comment	Ref.
2.259	**1,4-Methanonaphthalene, 5,6,7,8-tetrafluoro-1,2,3,4-tetrahydro-9-isopropylidene-**						
	CH_2Cl_2	5.2×10^4			PL/A'd-8	S = An; A' = DPBF.	81A437
2.260	**1,4-Methanonaphthalene, 1,2,3,4-tetrahydro-9-isopropylidene-**						
	CH_2Cl_2	1.4×10^5			PL/A'd-8	S = An; A' = DPBF.	81A437
2.261	**Naphthalene, 1,2,3,4,5,6,7,8-octahydro- ($\Delta^{9,10}$-Octalin)**						
	$CHCl_3$	5.0×10^6			CP/A'c-33	S = A' = Rub; used $k_d = 1.7 \times 10^4\ s^{-1}$, $k_{A'} = 5.3 \times 10^7\ L\ mol^{-1}\ s^{-1}$.	78A005
2.262	**2,4,6,8-Nonatetraenoic acid, 9-(4-methoxy-2,3,6-trimethylphenyl)-3,7-dimethyl-, ethyl ester, (*all-E*)-**						
	CCl_4	2×10^7			CL/LI-12	S = TPP; used $k_d = 1 \times 10^3\ s^{-1}$.	85F667
2.263	**1-Nonene**						
	MeOH			288	CP/Ac,A'c-17	S = MB; A' = c-C_6H_{10}; meas. $k_r/k_r^{A'} = 0.1$.	65F028
2.264	**9,12-Octadecadienoic acid (Linolcic acid)**						
	C_6D_6	7.3×10^4			PL/Ld-2	S = TPP.	89A331
	CCl_4	4.2×10^4			MP/LI-12	S = TPP; used $k_d = 42\ s^{-1}$.	83E425 83F151
	CD_3OD	7.9×10^4			PL/Ld-2	S = H_2TPPS^{4-}.	89A331
	CH_3CN	2.8×10^5		298	CP/Ac-14	S = RF(OAc)$_4$; used $k_d = 3.3 \times 10^4\ s^{-1}$.	89F484
2.265	**9,12-Octadecadienoic acid, methyl ester (Methyl linoleate)**						
	C_5H_5N	1.3×10^5 (k_r)			CP/Ac,A'c-17	S = PP; A' = Cholesterol; used $k_d = 6 \times 10^4\ s^{-1}$; meas. $k_r/k_r^{A'} = 2.0$, $\beta_{A'} = 0.89\ mol\ L^{-1}$.	743115
	$CHCl_3$	3.8×10^4 (k_r) 9.5×10^3 (k_q)	0.12 (β_r)	293	CP/Oc-14,27	S = MB; used $k_d = 4.4 \times 10^3\ s^{-1}$; meas. $k_q/k_r = 0.26$; obs. $\phi_{ox}^{TME}/\phi_{ox}^{A}$; cor. for k_q(MB).	94R058
	EtOH		0.36	293	CP/Pa-15	S = MB; P = Methyl linoleate monohydroperoxide.	777378
2.266	**9,12-Octadecadienoic acid, phenyl ester (Phenyl linoleate)**						
	MeOD	5.5×10^4			PL/Ld-2	S = MB and RF.	88A165
	MeOD	5.4×10^4		298	PL/Ld-2	S = Ery, MB, RF and HP.	87R138
2.267	**9,12,15-Octadecatrienoic acid (Linolenic acid)**						
	C_6D_6	1.0×10^5			PL/Ld-2	S = TPP.	89A331
	CCl_4	8×10^4			MP/LI-12	S = TPP; used $k_d = 42\ s^{-1}$.	83E425 83F151
	CH_3CN	6.4×10^5		298	CP/Ac-14	S = RF(OAc)$_4$; used $k_d = 3.3 \times 10^4\ s^{-1}$.	89F484
2.268	**9,12,15-Octadecatrienoic acid, ethyl ester (*all-Z*)- (Ethyl linolenate)**						
	$CHCl_3$	5.3×10^4 (k_r) 1.1×10^4 (k_q)	0.082 (β_r)	293	CP/Oc-14,27	S = MB; used $k_d = 4.4 \times 10^3\ s^{-1}$; meas. $k_q/k_r = 0.51$; obs. $\phi_{ox}^{TME}/\phi_{ox}^{A}$; cor. for k_q(MB).	94R058
2.269	**9,12,15-Octadecatrienoic acid, methyl ester (Methyl linolenate)**						
	C_5H_5N	1.6×10^5			CP/A'c-23	S = A' = Rub; used $k_d = 6.0 \times 10^4\ s^{-1}$, $k_{A'} = 4.0 \times 10^7\ L\ mol^{-1}\ s^{-1}$.	743115
	C_5H_5N	1.9×10^5 (k_r)			CP/Ac,A'c-17	S = PP; A' = Cholesterol; used $k_d = 6 \times 10^4\ s^{-1}$; meas. $k_r/k_r^{A'} = 2.9$, $\beta_{A'} = 0.89\ mol\ L^{-1}$.	743115
	EtOH		0.27	293	CP/Pa-15	S = MB.	777378
2.270	**9,12,15-Octadecatrienoic acid, phenyl ester (Phenyl linolenate)**						
	CD_3OD	8.3×10^4			PL/Ld-2	S = MB and RF.	88A165
2.271	**9-Octadecenoic acid (Oleic acid)**						
	C_6D_6	5.3×10^4			PL/Ld-2	S = TPP.	89A331

TABLE 2. Rate constants for interaction of singlet oxygen with olefins. — Continued

No.	Solvent	k ($L\ mol^{-1}\ s^{-1}$)	β (k_d/k) ($mol\ L^{-1}$)	T (K)	Method	Comment	Ref.
2.271	**9-Octadecenoic acid (Oleic acid)** — Continued						
	CCl_4	1.7×10^4			MP/LI-12	S = TPP; used $k_d = 42\ s^{-1}$.	83E425 83F151
	CH_3CN	1.6×10^5		298	CP/Ac-14	S = RF(OAc)$_4$; used $k_d = 3.3 \times 10^4\ s^{-1}$.	89F484
2.272	**9-Octadecenoic acid, methyl ester (Methyl oleate)**						
	C_5H_5N	7.4×10^4 (k_r)			CP/Ac,A'c-17	S = PP; A' = Cholesterol; used $k_d = 6 \times 10^4\ s^{-1}$; meas. $k_r/k_r^{A'} = 1.1$, $\beta_{A'} = 0.89\ mol\ L^{-1}$.	743115
	$CHCl_3$	2.4×10^4 (k_r) 1.2×10^4 (k_q)	0.18 (β_r)	293	CP/Oc-14,27	S = MB; used $k_d = 4.4 \times 10^3\ s^{-1}$; meas. $k_q/k_r = 0.20$; obs. $\phi_{ox}^{TME}/\phi_{ox}^{A}$; cor. for k_q(MB).	94R058
	EtOH		0.63	293	CP/Pa-15	S = MB; P = Methyl oleate monohydroperoxide.	777378
2.273	**9-Octadecenoic acid, phenyl ester (Phenyl oleate)**						
	MeOD	2.4×10^4			PL/Ld-2	S = MB and RF.	88A165
	MeOD	2.4×10^4		298	PL/Ld-2	S = Ery, MB, RF and HP.	87R138
2.274	**2,5-Octadiene, 7-hydroperoxy-2,7-dimethyl-**						
	MeOH	4.2×10^5 (k_r)	0.27 (β_r)	253	CP/Oc,Ac,Pa-14,27	S = RB; A' = α-Terpinene; used $k_d = 1.1 \times 10^5\ s^{-1}$; $k(P_1) = 1.9 \times 10^5$, $k(P_2) = 2.3 \times 10^5\ L\ mol^{-1}\ s^{-1}$; P_1 = 2,7-dimethyl-2,7-dihydroperoxy-3,5-octadiene, P_2 = 2,7-dimethyl-2,6-dihydroperoxy-3,7-octadiene.	78A357
2.275	**2,6-Octadiene, 2,6-dimethyl-, (*E*)**						
	MeOH	1.9×10^6 (k_r)		253	CP/Oc-14,27	S = RB; A' = α-Terpinene; used $k_d = 1.1 \times 10^5\ s^{-1}$.	78A344
2.276	**2,6-Octadiene, 2,6-dimethyl-, (*Z*)**						
	MeOH	1.1×10^6 (k_r)		253	CP/Oc-14,27	S = RB; A' = α-Terpinene; used $k_d = 1.1 \times 10^5\ s^{-1}$.	78A344
2.277	**2,6-Octadiene, 2,7-dimethyl-**						
	MeOH	1.7×10^6 (k_r)	0.065 (β_r)	253	CP/Oc,Pa,Ac-14,27	S = RB; A' = α-Terpinene; used $k_d = 1.1 \times 10^5\ s^{-1}$; $k(P_1) = 9.0 \times 10^5$, $k(P_2) = 8.1 \times 10^5\ L\ mol^{-1}\ s^{-1}$; P_1 = 2,7-dimethyl-7-hydroperoxy-2,6-octadiene, P_2 = 2,7-dimethyl-6-hydroperoxy-2,7-octadiene.	78A357
2.278	**2,6-Octadiene, hydroperoxy-2,6-dimethyl-**						
	MeOH	7.4×10^5 (k_r)		253	CP/Oc,Pa,Ac-14,27	S = RB; A' = α-Terpinene; used $k_d = 1.1 \times 10^5\ s^{-1}$; Mixture of all monohydroperoxides obtained from oxygenation of *trans*-2,6-dimethyl-2,6-octadiene.	78A344
2.279	**2,7-Octadiene, 6-hydroperoxy-2,7-dimethyl-**						
	MeOH	6.0×10^5 (k_r)	0.19 (β_r)		CP/Oc,Pa,Ac-14,27	S = RB; A' = α-Terpinene; used $k_d = 1.1 \times 10^5\ s^{-1}$; P_1 = 2,7-dimethyl-2,6-dihydroperoxy-3,7-octadiene, P_2 = 2,7-dimethyl-3,6-dihydroperoxy-1,7-octadiene, $k(P_1) = 1.9 \times 10^5$, $k(P_2) = 4.1 \times 10^5\ L\ mol^{-1}\ s^{-1}$.	78A357
2.280	**1,6-Octadien-3-ol, 3,7-dimethyl- (Linalool)**						
	CH_2Cl_2				CR/Ac,A'c-17	A' = 2,6-[$(CH_3)_3C]_2C_6H_3OH$; meas. $k_r/k_r^{A'} = 24$; $^1O_2$* from $(PhO)_3PO_3$.	72F520
	MeOH				CP/Ac,A'c-17	S = RB; A' = 2,6-[$(CH_3)_3C]_2C_6H_3OH$; meas. $k_r/k_r^{A'} = 14$.	72F520
2.281	**2,6-Octadien-1-ol, 3,7-dimethyl-, (*E*) (Geraniol)**						
	MeOH	5.9×10^5 (k_r)	0.19 (β_r)	253	CP/Oc-14,27	S = RB; A' = α-Terpinene; used $k_d = 1.1 \times 10^5\ s^{-1}$.	80A430

TABLE 2. Rate constants for interaction of singlet oxygen with olefins. — Continued

No.	Solvent	k ($L\ mol^{-1}\ s^{-1}$)	β (k_d/k) ($mol\ L^{-1}$)	T (K)	Method	Comment	Ref.
2.282	**2,7-Octadien-1-ol, 3,7-dimethyl-, (*E*)-**						
	MeOH/ H_2O (95:5)		0.15		CP/Oc-15	S = RB; Soln. contg. 1% sodium acetate.	79F137
2.283	**2,7-Octadien-1-ol, 3,7-dimethyl-, (Z)-**						
	MeOH/ H_2O (95:5)		0.21		CP/Oc-15	S = RB; Soln. contg. 1% sodium acetate.	79F137
2.284	**2,7-Octadien-1-ol, 6-hydroperoxy-3,7-dimethyl- (Monohydroperoxygeraniol)**						
	MeOH	2.8×10^4 (k_r)		253	CP/Oc-14,27	S = RB; A′ = α-Terpinene; used $k_d = 1.1 \times 10^5$ s^{-1}; mixture with 7-hydroperoxy-3,7-dimethyl-2,5-octadien-1-ol.	80A430
2.285	**2,4,6-Octatriene, 2,6-dimethyl- (Alloocimine)**						
	MeOH		0.070	293	CP/Oc-15	S = RB; $E_a = 8.4$ kJ mol^{-1}.	68F288
2.286	**3-Octene, 5-hydroperoxy-4-methyl-**						
	MeOH	2.5×10^4 (k_r)		253	CP/Oc-14,27	S = RB; A′ = α-Terpinene; used $k_d = 1.1 \times 10^5$ s^{-1}.	80A430
2.287	**(*E*)-4-Octene**						
	CH_3CN	2.5×10^4 1×10^4 (k_r) 2×10^4 (k_q)			CP/Oc-14,27	S = MB; used $k_d = 1.7 \times 10^4\ s^{-1}$; meas. k_q/k_r = 1.5; obs. rate of oxygen consumption as a ratio with TME; cor for $k_S[S] = 0.28$.	88A026
	$CHCl_3$	2.2×10^4 4×10^3 (k_r) 2×10^4 (k_q)			CP/Oc-14,27	S = MB; used $k_d = 4.4 \times 10^3\ s^{-1}$; meas. k_q/k_r = 4.5; obs. rate of oxygen consumption as a ratio with TME; cor for $k_S[S] = 0.2$.	88A026
2.288	**(*Z*)-4-Octene**						
	$CHCl_3$	2.7×10^4 2.2×10^4 (k_r) 5×10^3 (k_q)	0.20 (β_r)		CP/Oc-14,27	S = MB; used $k_d = 4.4 \times 10^3\ s^{-1}$; meas. k_q/k_r = 0.22; obs. rate of oxygen consumption as a ratio with TME; calcn. involves k_q(MB) = 6.4×10^6 L $mol^{-1}\ s^{-1}$.	88A026 89A254
2.289	**4-Octene, 4-methyl-**						
	MeOH		0.27 (β_r)	253	CP/Oc-14,27	S = RB; A′ = α-Terpinene; 46% *trans*,54% *cis*.	76F909
	MeOH		0.29 (β_r)	253	CP/Oc-14,27	S = RB; A′ = α-Terpinene; 25% *trans*, 75% *cis*.	76F909
2.290	**4-Octene, 4-methyl-, (*E*)-**						
	MeOH	5.6×10^5 (k_r)	0.20 (β_r)	253	CP/Oc-14,27	S = RB; A′ = α-Terpinene; used $k_d = 1.1 \times 10^5$ s^{-1}.	79F074
2.291	**4-Octene, 4-methyl-, (*Z*)-**						
	$CHCl_3$	1.6×10^5 1.6×10^5 (k_r) $<8 \times 10^3$ (k_q)	0.027		CP/Oc-14/27	S = MB: used $k_d = 4.4 \times 10^3\ s^{-1}$; meas. k_q/k_r = <0.05; obs. rate of oxygen consumption as a ratio with TME; calcn. involves k_q(MB) = 6.4×10^6 L $mol^{-1}\ s^{-1}$.	85F148 89A254
	MeOH	3.3×10^5 (k_r)	0.34 (β_r)	253	CP/Oc-14,27	S = RB; A′ = α-Terpinene; used $k_d = 1.1 \times 10^5$ s^{-1}.	79F074
2.292	**2-Octen-1-ol, 3,7-dimethyl-, (*E*)-**						
	MeOH/ H_2O (95:5)		0.14		CP/Oc-15	S = RB; Soln. contg. 1% sodium acetate.	79F137
2.293	**2-Octen-1-ol, 3,7-dimethyl-, (Z)-**						
	MeOH/ H_2O (95:5)		0.23		CP/Oc-15	S = RB; Soln. contg. 1% sodium acetate.	79F137
2.294	**6-Octen-1-ol, 3,7-dimethyl- (β-Citronellol)**						
	1-BuOH		0.12	293	CP/Pa-15	S = Eos.	627005
	1-BuOH		0.11	293	CP/Pa-15	S = RB.	627005
	CD_3OD	7.8×10^5		295	CL/LI-12	S = RB; used $k_d = 4.0 \times 10^3\ s^{-1}$.	91F332

TABLE 2. Rate constants for interaction of singlet oxygen with olefins. — Continued

No.	Solvent	k ($L\ mol^{-1}\ s^{-1}$)	β (k_d/k). ($mol\ L^{-1}$)	T (K)	Method	Comment	Ref.
2.294	**6-Octen-1-ol, 3,7-dimethyl- (β-Citronellol) — Continued**						
	CD_3OD	7.3×10^5 (k_r) 1×10^4 (k_q)		295	CP/Oc-15,28	S = RB; used $k_d = 4.0 \times 10^3\ s^{-1}$; used ϕ_Δ(RB) = 0.76.	91F332
	MeOH		0.16	293	CP/Pa-15	S = Ery.	627005
	MeOH		0.15	293	CP/Pa-15	S = Eos.	627005
	MeOH		0.16	293	CP/Pa-15	S = RB.	627005
	MeOH/ H_2O (70:30)		0.060	293	CP/Pa-15	S = RB or Eos.	627005
2.295	**7-Oxabicyclo[2.2.1]heptane, 2,3-bis(methylene)-**						
	CH_2Cl_2			253	CP/Ac-17	S = TPP; A′ = 2,3-Dimethylenebicyclo[2.2.1]heptane; meas. $k_t/k_r^{A'}$ = 0.07.	82F450
2.296	**7-Oxabicyclo[2.2.1]heptane, 2,3,5,6-tetrakis(methylene)-**						
	CH_2Cl_2			253	CP/Ac-17	S = TPP; A′ = 2,3-Dimethylenebicyclo[2.2.1]heptane; meas. $k_t/k_r^{A'}$ = 0.02.	82F450
2.297	**7-Oxabicyclo[2.2.1]hept-2-ene, 5,6-bis(methylene)-**						
	CH_2Cl_2			253	CP/Ac-17	S = TPP; A′ = 2,3-Dimethylenebicyclo[2.2.1]heptane; meas. $k_t/k_r^{A'}$ = $<1 \times 10^{-3}$.	82F450
2.298	**P-422 (8 conjugated bonds)**						
	C_6H_6/ MeOH (60:40)	1.2×10^{10}	8.3×10^{-6}		CP/A′c-22	S = MB; A′ = Rub; used $k_d = 1.0 \times 10^5\ s^{-1}$.	747042
2.299	**P-438 (9 conjugated bonds)**						
	C_6H_6/ MeOH (60:40)	3.1×10^{10}	3.2×10^{-6}		CP/A′c-22	S = MB; A′ = Rub; used $k_d = 1.0 \times 10^5\ s^{-1}$.	747042
2.300	**1,3-Pentadiene, 4-methyl-**						
	$CHCl_3$	1.6×10^5			CP/A′c-33	S = A′ = Rub; used $k_d = 1.7 \times 10^4\ s^{-1}$, $k_{A'} = 5.3 \times 10^7\ L\ mol^{-1}\ s^{-1}$.	81F445
2.301	**1,3-Pentadiene, 1-phenyl-, (*E,E*)-**						
	C_6H_6		1.5	277	CP/Oc-14	S = TPP.	81F582
	CCl_4		0.24	277	CP/Oc-14	S = TPP.	81F582
	$CH_3COCH_2CH_3$		1.2	277	CP/Oc-14	S = RB.	81F582
	$CHCl_3$		0.33	277	CP/Oc-14	S = TPP.	81F582
	EtOH		2.9	277	CP/Oc-14	S = RB.	81F582
2.302	**1-Pentene**						
	CCl_4/ MeOH (96:4)	1×10^3			PL/A′d-8	S = MB; A′ = DPBF.	777162
2.303	**1-Pentene, 2,3,4-trimethyl-**						
	CH_3CN			283	CP/Ac-17	S = MB; A′ = TME; meas. $k_t/k_r^{A'}$ = 0.88; C.k. with 1,2-dimethylcyclohexene.	79F646
2.304	**(*E*)-2-Pentene**						
	CCl_4/ MeOH (96:4)	2×10^3			PL/A′d-8	S = MB; A′ = DPBF.	777162
	$CHCl_3$	2.1×10^4 7×10^3 (k_r) 1×10^4 (k_q)			CP/Oc-14,27	S = MB; used $k_d = 4.4 \times 10^3\ s^{-1}$; meas. k_q/k_r = 2.3; obs. r_{ox} as a ratio with TME; cor. for k_S[S] = 0.2.	88A026

TABLE 2. Rate constants for interaction of singlet oxygen with olefins. — Continued

No.	Solvent	k ($L\ mol^{-1}\ s^{-1}$)	β (k_d/k) ($mol\ L^{-1}$)	T (K)	Method	Comment	Ref.
2.305	**(Z)-2-Pentene**						
	CCl_4	4.1×10^4 3.8×10^4 (k_r) 3×10^3 (k_q)			CP/Oc-14,27	S = TPP; used $k_d = 1.1 \times 10^3\ s^{-1}$; meas. k_q/k_r = 0.08; obs. r_{ox} as a ratio with TME; cor. for $k_S[S]$ = 1.4.	88A026
	CCl_4/ MeOH (96:4)	4×10^3			PL/A'd-8	S = MB; A' = DPBF.	777162
	$CHCl_3$	3.8×10^4 4×10^3 (k_q)			CP/Oc-14,27	S = MB; used $k_d = 4.4 \times 10^3\ s^{-1}$; obs. r_{ox} as a ratio with TME; cor. for $k_S[S] = 0.2$.	88A026
2.306	**2-Pentene, 2,4-dimethyl-**						
	$CHCl_3$	4.3×10^5			CP/A'c-33	S = A' = Rub; used $k_d = 1.7 \times 10^4\ s^{-1}$, $k_{A'} = 5.3 \times 10^7\ L\ mol^{-1}\ s^{-1}$.	78A005
	MeOH		1.3		?	Method not reported.	68F289
2.307	**2-Pentene, 2-methyl- (2M2P)**						
	tert-BuOH		0.081	298	CP/A'c-16	S = RB; A' = DPBF.	717398
	tert-BuOH		0.051	303	CP/Ac-14	S = RB.	68F292
	C_2H_5I		0.1	298	CP/Pa-15	S = ZnTPP.	717356
	C_5H_5N		0.043		CP/Oc-15	S = RB.	757166
	C_5H_5N		0.050	298	CP/Pa-15	S = RB.	717356
	c-$C_6H_{11}OH$		0.070	298	CP/Pa-15	S = RB.	717356
	1,3-$C_6H_4(OCH_3)_2$		0.2	298	CP/Pa-15	S = ZnTPP.	717356
	C_6H_5Br		0.05	298	CP/Pa-15	S = ZnTPP.	717356
	$C_6H_5OCH_3$		0.13	298	CP/Pa-15	S = ZnTPP.	717356
	C_6H_6		0.049		CP/Oc-14	S = TPP, Chl a, Chl b, Phe b, ZnTPP, MgTPP, PPDME.	88R136
	C_6H_6	8.7×10^5	0.046		CP/Oc-14	S = RB; used $k_d = 4.0 \times 10^4\ s^{-1}$.	84F191
	C_6H_6	7.2×10^5		295	PL/Ld-2	S = MPDME; $k_r \gg k_q$.	83F196
	C_6H_6	9.2×10^5	0.044		CP/Oc-19	S = Chl (os); Q = Chl (os); used $k_d = 4.0 \times 10^4\ s^{-1}$; Chl (os) is a commercial mixture contg. a small % of chlorophyll.	81F321
	C_6H_6		0.53		CP/Oc-15	S = azine.	757166
	C_6H_6		0.10	298	CP/Pa-15	S = ZnTPP.	717356
	C_6H_6		0.2		CP/Pa-15	S = ZnTPP.	71F580
	C_6H_6/ MeOH (80:20)		0.050		CP/Pa-15	S = MB.	717356
	CH_2Cl_2	9.7×10^5		295	PL/Ld-2	S = MPDME; $k_r \gg k_q$.	83F196
	CH_3CN	1.2×10^6	0.014		CP/Oc-14	S = RB; used $k_d = 1.7 \times 10^4\ s^{-1}$.	84F191
	CH_3CN	1.2×10^6		295	PL/Ld-2	S = MPDME; $k_r \gg k_q$.	83F196
	CH_3CN		0.018		CP/Oc-15	S = RB.	757166
	CH_3CN		0.014		CP/Pa-15	S = RB.	71F580
	$CH_3CO_2CH_3$		0.04	298	CP/Pa-15	S = RB.	717356
	CH_3COCH_3	8.1×10^5		295	PL/Ld-2	S = MPDME; $k_r \gg k_q$.	83F196
	CH_3COCH_3	4.0×10^5 (k_r) 2.8×10^5 (k_r)		241 195	CP/Pa-17	S = RB; $\Delta H‡ = 3\ kJ\ mol^{-1}$; $\Delta S‡ = -122\ J\ K^{-1}\ mol^{-1}$; P = 50:50 mixture of 2-methyl-3-penten-2-ol and 2-methyl-1-penten-3-ol; rel. to value at 295K from luminescence decay; $k_q \ll k_r$.	83F196
	CH_3COCH_3		0.080	298	CP/Pa-15	S = RB.	717356
	$CHCl_3$	7.6×10^5			PL/Ld-2	S = TPP.	92F103
	$CHCl_3$	5.1×10^5	8.5×10^{-3}		CP/Oc-15	S = MB; used $k_d = 4.4 \times 10^3\ s^{-1}$; cor. for k_S.	85F148
	$CHCl_3$	1.9×10^6			CP/A'c-33	S = A' = Rub; used $k_d = 1.7 \times 10^4\ s^{-1}$, $k_{A'} = 5.3 \times 10^7\ L\ mol^{-1}\ s^{-1}$.	78A005

TABLE 2. Rate constants for interaction of singlet oxygen with olefins. — Continued

	Solvent	k ($L\ mol^{-1}\ s^{-1}$)	β (k_d/k) ($mol\ L^{-1}$)	T (K)	Method	Comment	Ref.
307	**2-Pentene, 2-methyl- (2M2P)** — Continued						
	CS_2		0.080	273	CP/Pa-15	S = ZnTPP.	717356
	DMSO		0.055		CP/A'c-16	S = RB; A' = DPBF.	766072
	DMSO		0.070	298	CP/Pa-15	S = RB.	717356
	MeOH	6.9×10^5	0.16		CP/Oc-14	S = RB; used $k_d = 1.1 \times 10^5\ s^{-1}$.	84F191
	MeOH	4.0×10^5 (k_r) 2.0×10^5 (k_r)		241 195	CP/Pa-17	S = RB; $\Delta H‡ = 3.9 \pm 3.5$ kJ mol^{-1}; $\Delta S‡ = -121 \pm 15$ J K^{-1} mol^{-1}; rel. to $k_A = 6.7 \times 10^5$ L mol^{-1} s^{-1} at 298 K; $k_q \ll k_r$.	83F196
	MeOH	6.2×10^5	0.18		CP/Oc-14	S = RB; used $k_d = 1.1 \times 10^5\ s^{-1}$.	81F321
	MeOH		0.13	298	CP/Pa-15	S = Chl b.	717356
	MeOH		0.2	298	CP/Pa-15	S = Chl a.	717356
	MeOH		0.16	298	CP/Pa-15	S = RB.	717356
	MeOH		0.15	298	CP/A'c-16	S = RB; A' = DPBF.	717398
	MeOH		0.2		CP/Pa-15	S = ZnTPP.	71F580
	MeOH		0.13	293	CP/Oc-15	S = RB; $E_a = 8.4$ kJ mol^{-1}.	68F288
	MeOH		0.18		?	Method not reported.	68F289
	MeOH/ *tert*-BuOH (50:50)		0.12		CP/A'c-16	S = RB; A' = DPBF.	717398
	MeOH/ *tert*-BuOH (50:50)			303	CP/Pa,P'a-17	S = RB; A' = 2M2B; meas. $k_t/k_r^{A'} = 0.76$.	68F292
	MeOH/ *tert*-BuOH (50:50)			298	CR/Pa,P'a-17	A' = 2M2B; meas. $k_t/k_r^{A'} = 0.78$; $^1O_2$* from H_2O_2/NaOCl.	68F292
	MeOH/ *tert*-BuOH (50:50)		0.2	298	CR/Ac-14	$^1O_2$* from H_2O_2/NaOCl.	68F292
	MeOH/ *tert*-BuOH (50:50)		0.13	298	CP/Ac-14	S = RB.	68F292
2.308	**2-Pentene, 3-methyl-**						
	C_6H_5Cl	1.0×10^6	0.016	298	CP/Ac-15	S = TPP; used $k_d = 1.6 \times 10^4\ s^{-1}$; *cis,trans* mixt.	747341
2.309	**2-Pentene, 3-methyl-, (*E*)-**						
	$CHCl_3$	2×10^6			CP/A'c-33	S = A' = Rub; used $k_d = 1.7 \times 10^4\ s^{-1}$, $k_{A'} = 5.3 \times 10^7$ L mol^{-1} s^{-1}.	78A005
	EtOH/ 2-PrOH (50:50)		0.060 (β_r)	292	CP/Oc-14,27	S = RB; A' = 2,5-DMF.	78F464
	MeOH	9.3×10^5 (k_r)	0.12 (β_r)	253	CP/Oc-14,27	S = RB; A' = α-Terpinene; used $k_d = 1.1 \times 10^5\ s^{-1}$.	79F074
	MeOH/ *tert*-BuOH (50:50)				CP/Ac,A'c-17	S = RB; A' = 2M2B; meas. $k_t/k_r^{A'} = 0.83$.	68F292
	MeOH/ *tert*-BuOH (50:50)				CR/Ac,A'c-17	A' = *c*-$C_6H_9CH_3$; meas. $k_t/k_r^{A'} = 7$; $^1O_2$* from H_2O_2/$Ca(OCl)_2$.	68F292
	MeOH/ *tert*-BuOH (50:50)				CR/Ac,A'c-17	A' = 2M2B; meas. $k_t/k_r^{A'} = 0.71$; $^1O_2$* from H_2O_2/$Ca(OCl)_2$.	68F292
	MeOH/ *tert*-BuOH (50:50)				CP/Ac,A'c-17	S = RB; A' = *c*-$C_6H_9CH_3$; meas. $k_t/k_r^{A'} = 22$.	68F292
2.310	**2-Pentene, 3-methyl-, (*Z*)-**						
	$CHCl_3$	2.9×10^5	0.015		CP/Oc-15	S = MB; used $k_d = 4.4 \times 10^3\ s^{-1}$; cor. for quenching by MB.	85F148
	$CHCl_3$	2.0×10^6			CP/A'c-33	S = A' = Rub; used $k_d = 1.7 \times 10^4\ s^{-1}$, $k_{A'} = 5.3 \times 10^7$ L mol^{-1} s^{-1}.	78A005
	EtOH/ 2-PrOH (50:50)		0.050 (β_r)	292	CP/Oc-14,27	S = RB; A' = 2,5-DMF.	78F464

TABLE 2. Rate constants for interaction of singlet oxygen with olefins. — Continued

No.	Solvent	k ($L\ mol^{-1}\ s^{-1}$)	β (k_d/k) ($mol\ L^{-1}$)	T (K)	Method	Comment	Ref.
2.310	**2-Pentene, 3-methyl-, (Z)-** — Continued						
	MeOH	5.8×10^5 (k_r)	0.19 (β_r)	253	CP/Oc-14,27	S = RB; A′ = α-Terpinene; used $k_d = 1.1 \times 10^5$ s^{-1}.	79F074
	MeOH/ *tert*-BuOH (50:50)				CR/Ac,A′c-17	A′ = 2M2B; meas. $k_r/k_r^{A'} = 0.40$; $^1O_2$* from $H_2O_2/Ca(OCl)_2$.	68F292
	MeOH/ *tert*-BuOH (50:50)				CR/Ac,A′c-17	A′ = TME; meas. $k_r/k_r^{A'} = 0.040$; $^1O_2$* from H_2O_2/NaOCl.	68F292
	MeOH/ *tert*-BuOH (50:50)				CP/Ac,A′c-17	S = RB; A′ = 2M2B; meas. $k_r/k_r^{A'} = 0.55$.	68F292
	MeOH/ *tert*-BuOH (50:50)				CP/Ac,A′c-17	S = RB; A′ = TME; meas. $k_r/k_r^{A'} = 0.028$.	68F292
2.311	**2-Pentene, 4-methyl-, (E)-**						
	MeOH/ *tert*-BuOH (50:50)			276	CR/Pa,P′a-17	A′ = 2M2P; meas. $k_r/k_r^{A'} = 2.0 \times 10^{-3}$; $^1O_2$* from H_2O_2/NaOCl.	68F292
	MeOH/ *tert*-BuOH (50:50)			303	CP/Pa,P′a-17	S = RB; A′ = 2M2P; meas. $k_r/k_r^{A'} = 2.5 \times 10^{-3}$.	68F292
2.312	**2-Pentene, 4-methyl-, (Z)-**						
	MeOH/ *tert*-BuOH (50:50)		8.0		CP/A′c-16	S = RB; A′ = DPBF.	717398
	MeOH/ *tert*-BuOH (50:50)			276	CR/Pa,P′a-17	A′ = 2M2P; meas. $k_r/k_r^{A'} = 0.011$; $^1O_2$* from H_2O_2/NaOCl.	68F292
	MeOH/ *tert*-BuOH (50:50)			303	CP/Pa,P′a-17	S = RB; A′ = 2M2P; meas. $k_r/k_r^{A'} = 0.014$.	68F292
2.313	**2-Pentene, 2,3,4-trimethyl-**						
	$CHCl_3$	3.9×10^7			CP/A′c-33	S = A′ = Rub; used $k_d = 1.7 \times 10^4\ s^{-1}$, $k_{A'} = 5.3 \times 10^7\ L\ mol^{-1}\ s^{-1}$.	78A005
2.314	**2-Pentene, 2,4,4-trimethyl-**						
	MeOH		4.2		?	Method not reported.	68F289
2.315	**4-Pentenoic acid**						
	C_6D_6	4.9×10^3			PL/Ld-2	S = TPP.	89A331
2.316	**2-Penten-1-ol, 3,4-dimethyl-, (E)-**						
	MeOH/ H_2O (95:5)		0.14		CP/Oc-15	S = RB; Soln. contg. 1% sodium acetate.	79F137
2.317	**2-Penten-1-ol, 3,4-dimethyl-, (Z)-**						
	MeOH/ H_2O (95:5)		0.23		CP/Oc-15	S = RB; Soln. contg. 1% sodium acetate.	79F137
2.318	**2-Penten-1-ol, 3-ethyl-**						
	MeOH/ H_2O (95:5)		0.25		CP/Oc-15	S = RB; Soln. contg. 1% sodium acetate.	79F137
2.319	**2-Penten-1-ol, 3-methyl-, (E)-**						
	MeOH/ H_2O (95:5)		0.13		CP/Oc-15	S = RB; Soln. contg. 1% sodium acetate.	79F137
2.320	**2-Penten-1-ol, 3-methyl-, (Z)-**						
	MeOH/ H_2O (95:5)		0.19		CP/Oc-15	S = RB; Soln. contg. 1% sodium acetate.	79F137
2.321	**2-Penten-1-ol, 3,4,4-trimethyl-, (E)-**						
	MeOH/ H_2O (95:5)		0.09		CP/Oc-15	S = RB; Soln. contg. 1% sodium acetate.	79F137
2.322	**2-Penten-1-ol, 3,4,4-trimethyl-, (Z)-**						
	MeOH/ H_2O (95:5)		0.95		CP/Oc-15	S = RB; Soln. contg. 1% sodium acetate.	79F137
2.323	**2-Penten-4-ol, 2-methyl-**						
	MeOH		8.4 (β_r)	253	CP/Oc-14,27	S = RB; A′ = α-Terpinene.	76F909

TABLE 2. Rate constants for interaction of singlet oxygen with olefins. — Continued

No.	Solvent	k ($L\ mol^{-1}\ s^{-1}$)	β (k_d/k) ($mol\ L^{-1}$)	T (K)	Method	Comment	Ref.
2.324	**3-Penten-2-one, 3,4-dimethyl-**						
			28		CP/Ac-18	S = Poly-RB or RB; A′ = Linalool; used $\beta_{A'}$ = 0.18 $mol\ L^{-1}$; Solvent is CH_2Cl_2 or MeOH.	80F111
2.325	**1-Phenanthrenecarboxylic acid, 1,2,3,4,4a,4b,5,6,10,10a-decahydro-1,4a-dimethyl-7-(1-methylethyl)-, [1*R*-(1α,4aβ,4bβ,10aα)]- (Abietic acid)**						
	$CHCl_3$	3.8×10^6			CP/A′c-33	S = A′ = Rub; used $k_d = 1.7 \times 10^4\ s^{-1}$, $k_{A'} = 5.3 \times 10^7\ L\ mol^{-1}\ s^{-1}$.	81F445
2.326	**α-Pinene**						
	CH_3CN				?	S = MB; A′ = c-$C_6H_9CH_3$; meas. $k_A/k_{A'} = 0.25$.	73F664
	CH_3COCH_3	4.3×10^4			PL/Ld-2	S = RB.	92F225
	MeOH		7.0	293	CP/Oc-15	S = MB; $E_a = 20\ kJ\ mol^{-1}$.	68F288
	MeOH		5.0	293	CP/Oc-15	S = RB; $E_a = 19\ kJ\ mol^{-1}$.	68F288
	MeOH		2.8	293	CP/Oc-15	S = DNT; $E_a = 21\ kJ\ mol^{-1}$.	68F288
	MeOH		0.50	293	CP/Oc-15	S = $FlCl_4^{2-}$; $E_a = 17\ kJ\ mol^{-1}$.	68F288
	MeOH		3.8	293	CP/Oc-15	S = $FlBr_4Cl_4^{2-}$; $E_a = 17\ kJ\ mol^{-1}$.	68F288
	MeOH		8.2		?	Method not reported.	68F289
2.327	**β-Pinene**						
	CH_3CN				CP/Ac,A′c-17	S = MB; A′ = c-$C_6H_9CH_3$; meas. $k_r/k_r^{A'} = 0.19$.	73F664
	MeOH		~1.0	293	CP/Oc-15	S = RB; $E_a = 21\ kJ\ mol^{-1}$.	68F288
2.328	**(*E*)-Piperylene ((*E*)-1,3-Pentadiene)**						
	$CHCl_3$	2.4×10^4			CP/A′c-33	S = A′ = Rub; used $k_d = 1.7 \times 10^4\ s^{-1}$, $k_{A'} = 5.3 \times 10^7\ L\ mol^{-1}\ s^{-1}$.	81F445
2.329	**(*Z*)-Piperylene ((*Z*)-1,3-Pentadiene)**						
	$CHCl_3$	9×10^3			CP/A′c-33	S = A′ = Rub; used $k_d = 1.7 \times 10^4\ s^{-1}$, $k_{A'} = 5.3 \times 10^7\ L\ mol^{-1}\ s^{-1}$.	81F445
2.330	**Polybutadiene**						
	CH_2Cl_2	3.4×10^5			PL/Ld-2	S = An.	86E809 86E884
	$CHCl_3$	2.3×10^4 1.7×10^4 (k_r) 6×10^3 (k_q)	0.26		CP/Oc-14,27	S = MB; used $k_d = 4.4 \times 10^3\ s^{-1}$; meas. k_q/k_r = 0.35; obs. rate of oxygen consumption as a ratio with TME or 2,5-DMF; calcn. involves k_q(MB) = $6.4 \times 10^6\ L\ mol^{-1}\ s^{-1}$.	89A254
2.331	**Polyisoprene**						
	CH_2Cl_2	5.5×10^5			PL/Ld-2	S = An.	86E809
	$CHCl_3$	1.2×10^5 1.2×10^5 (k_r) $<6 \times 10^3$ (k_q)	0.035		CP/Oc-14,27	S = MB; used $k_d = 4.4 \times 10^3\ s^{-1}$; obs. rate of oxygen consumption as a ratio with TME or 2,5-DMF; calcn. involves k_q(MB) = 6.4×10^6 L $mol^{-1}\ s^{-1}$.	89A254 85F148
2.332	**Propene, 1,1-bis(cyclobutyl)-2-methyl-**						
	CH_3CN			283	CP/Ac-17	S = MB; A′ = TME; meas. $k_r/k_r^{A'} = 0.40$; C.k. with 1,2-dimethylcyclohexene.	79F646
2.333	**Propene, 1,1-bis(cyclopropyl)-**						
	CH_3COCH_3				CP/Ac,A′c-17	S = Eos; A′ = (Dicyclopropylmethylidene)cyclobutane; meas. $k_r/k_r^{A'} = 0.50$.	78F430
2.334	**Propene, 1,1-bis(cyclopropyl)-2-methyl-**						
	CH_3CN			283	CP/Ac-17	S = MB; A′ = TME; meas. $k_r/k_r^{A'} = 0.33$; C.k. with 1,2-dimethylcyclohexene.	79F646

TABLE 2. Rate constants for interaction of singlet oxygen with olefins. — Continued

No.	Solvent	k ($L\ mol^{-1}\ s^{-1}$)	β (k_d/k) ($mol\ L^{-1}$)	T (K)	Method	Comment	Ref.
2.334	**Propene, 1,1-bis(cyclopropyl)-2-methyl-** — Continued						
	CH_3COCH_3				CP/Ac,A'c-17	S = Eos; A' = (Dicyclopropylmethylidene)cyclobutane; meas. $k_r/k_r^{A'} = 0.65$; meas. $k_H/k_D = 1$ for 2-(methyl-d_3) isomer.	78F430
2.335	**Propene, 1-cyclopropyl-2-methyl-**						
	CH_3COCH_3				CP/Ac,A'c-17	S = Eos; A' = (Dicyclopropylmethylidene)cyclobutane; meas. $k_r/k_r^{A'} = 0.66$.	78F430
2.336	**Propene, 1-ethoxy-2-methyl-**						
	c-C_6H_{12}	1.6×10^7			PL/A'd-8	S = An; A' = DPBF; $\Delta H‡ = -2$ kJ mol^{-1}; $\Delta S‡ = -120$ J K^{-1} mol^{-1}; studied at 290-340 K.	82A349
	$C_6H_5CH_3$	3.1×10^7			PL/A'd-8	S = An; A' = DPBF; $\Delta H‡ = 0.8$ kJ mol^{-1}; $\Delta S‡ = -98$ J K^{-1} mol^{-1}; studied at 250-340 K.	82A349
	CH_3CN	3.9×10^7			PL/A'd-8	S = An; A' = DPBF; $\Delta H‡ = -1$ kJ mol^{-1}; $\Delta S‡ = -101$ J K^{-1} mol^{-1}; studied at 250-340 K.	82A349
	CH_3COCH_3	4.2×10^7			PL/A'd-8	S = An; A' = DPBF; $\Delta H‡ = -2.5$ kJ mol^{-1}; $\Delta S‡ = -108$ J K^{-1} mol^{-1}; studied at 240-320 K.	82A349
	MeOH	2.3×10^7			PL/A'd-8	S = An; A' = DPBF; $\Delta H‡ = 0.8$ kJ mol^{-1}; $\Delta S‡ = -96$ J K^{-1} mol^{-1}; studied at 250-310 K.	82A349
2.337	**Propene, 2-methyl-**						
	CS_2	4.0×10^3		298	PL/Ld-2	S = TPP; $\Delta H‡ = 0$ kJ mol^{-1}; $\Delta S‡ = -180$ J K^{-1} mol^{-1}; studied at 183-310 K.	85A167
	MeOH		1.6	293	CP/Oc-15	S = RB; $E_a = 24$ kJ mol^{-1}.	68F288
2.338	**Propene, 2-methyl-1-(phenylsulfinyl)-**						
	C_6H_6		$>1 \times 10^2$ (β_r)		CP/Ac-17	S = TPP; A' = Linalool; used $\beta_r^{A'} = 0.18$ mol L^{-1}.	89F400
2.339	**11-(*Z*)-Retinal**						
	CCl_4	10^6			MP/LI-12	S = PP; used $k_d = 36\ s^{-1}$.	79F463
2.340	**13-(*Z*)-Retinal**						
	CCl_4	3.6×10^5			MP/LI-12	S = PP; used $k_d = 36\ s^{-1}$.	79F463 78F700
2.341	**(*all-E*)-Retinal**						
	CCl_4	3.7×10^6			MP/LI-12	S = PP; used $k_d = 36\ s^{-1}$.	79F463 78F700 83A336
	CCl_4	7.5×10^5 (k_r) 3.7×10^6 (k_q)			CP/Ac-27	S = PP; A' = Tetr; meas. $k_q/k_r = 0.2 \pm 0.05$; used ϕ_Δ(S) and $k_A = 3.7 \times 10^6$ L mol^{-1} s^{-1}.	79F463 78F700 83A336
	CH_3CN	6.5×10^7			PL/A'd-8	S = MB; A' = DPBF.	83F256
	$HCONHCH_3$	1.7×10^8			PL/A'd-8	S = MB; A' = DPBF.	83F256
2.342	**(*all-E*)-Retinoic acid**						
	$CHCl_3$/ EtOH (50:50)			310	CR/LI-12	$^1O_2$* from $NDPO_2$; no quenching.	89R188
2.343	**(*all-E*)-Retinol**						
	c-C_6H_{12}	$\leq 2 \times 10^6$			PL/A'd-8	S = Rub; A' = DPBF.	83F256
	n-C_6H_{14}	$\leq 1.5 \times 10^7$			PL/A'd-8	S = Rub; A' = DPBF.	83F256
	C_6H_6	4×10^6		296	PL/A'd-5	S = A; A' = DPBF.	85E190
	C_6H_6	$\leq 1.2 \times 10^7$			PL/A'd-8	S = Rub; A' = DPBF.	83F256

TABLE 2. Rate constants for interaction of singlet oxygen with olefins. — Continued

No.	Solvent	k ($L\ mol^{-1}\ s^{-1}$)	β (k_d/k) ($mol\ L^{-1}$)	T (K)	Method	Comment	Ref.
1.343	***(all-E)*-Retinol** — Continued						
	C_6H_6/ MeOH (80:20)				CP/P'a-20	S = MB; A' = 2M2P; meas. $k_A/k_{A'} = \leq 9$.	707188
	CH_3CN	2.6×10^7			PL/A'd-8	S = MB; A' = DPBF.	83F256
	CH_3COCH_3	1×10^7			PL/A'd-8	S = MB; A' = DPBF.	83F256
	$HCONHCH_3$	8.5×10^7			PL/A'd-8	S = MB; A' = DPBF.	83F256
	MeOH	6.0×10^6		296	PL/A'd-5	S = A; A' = DPBF.	85E190
	2-PrOH	1.7×10^7			PL/A'd-8	S = MB; A' = DPBF.	83F256
1.344	**Retinyl acetate**						
	CCl_4	7×10^5			MP/LI-12	S = PP; used $k_d = 36\ s^{-1}$.	79F463 78F700
1.345	**Spirocyclopropane[4,7]methanoindene, 4,5,6,7-tetrahydro-**						
	CD_3COCD_3	1.3×10^8		195	CP/A'c-16	S = RB; A' = DPBF; k_d not given.	87A368
1.346	**Squalene**						
	EtOH	4.2×10^6		298	CP/Ac-14	S = TTT; used $k_d = 8.3 \times 10^4\ s^{-1}$; $E_a = 11.2$ kJ mol^{-1}; studied at 271-326 K.	93F327
	MeOH	3.6×10^6	0.031	253	CP/Oc-15	S = RB; used $k_d = 1.1 \times 10^5\ s^{-1}$.	83A078
1.347	**4,6,8,10,12,14,16,18,20-Tetracosanonaene-3,22-dione, 6,10,15,19-tetramethyl-2,2,23,23-tetramethoxy- (*all-E*) (C_{28}-Polyene-tetrone-diacetal)**						
	$CHCl_3$	9×10^9			CR/LI-12	used $k_d = 3.0 \times 10^4\ s^{-1}$; $^1O_2$* from $NDPO_2$.	92R054
1.348	**4,6,8,10,12,14,16,18,20-Tetracosanonaene-2,3,22,23-tetraone, 6,10,15,19-tetramethyl- (*all-E*) (C_{28}-Polyene-tetrone)**						
	$CHCl_3$	1.6×10^{10}			CR/LI-12	used $k_d = 3.0 \times 10^4\ s^{-1}$; $^1O_2$* from $NDPO_2$.	92R054
1.349	**(*Z*)-9-Tricosene**						
	$CHCl_3$	2.4×10^4 1×10^4 (k_r) 1×10^4 (k_q)	0.37	293	CP/Oc-14,27	S = MB; used $k_d = 4.4 \times 10^3\ s^{-1}$; meas. k_q/k_r = 1.0; obs. rate of oxygen consumption as a ratio with TME; calcn. involves k_q(MB) = 6.4×10^6 L $mol^{-1}\ s^{-1}$.	88A026 83A394
1.350	**Tricyclo[3.3.1.1^{3,7}]decane, 2-(3-chlorophenoxymethylene)- [2-(3-Chlorophenoxymethylidene)adamantane]**						
	C_6H_6			283	CP/Pa-17	S = TPP; A' = 2-(Phenoxymethylidene)adamantane; meas. $k_r/k_r^{A'}$ = 0.1.	84F474
	CH_2Cl_2			283	CP/Pa-17	S = MB; A' = 2-(Phenoxymethylidene)adamantane; meas. $k_r/k_r^{A'}$ = 0.4.	84F474
1.351	**Tricyclo[3.3.1.1^{3,7}]decane, 2-(4-chlorophenoxymethylene)- [2-(4-Chlorophenoxymethylidene)adamantane]**						
	C_6H_6			283	CP/Pa-17	S = TPP; A' = 2-(Phenoxymethylidene)adamantane; meas. $k_r/k_r^{A'}$ = 0.2.	84F474
	CH_2Cl_2			283	CP/Pa-17	S = MB; A' = 2-(Phenoxymethylidene)adamantane; meas. $k_r/k_r^{A'}$ = 0.6.	84F474
1.352	**Tricyclo[3.3.1.1^{3,7}]decane, 2-(4-methoxyphenoxymethylene)- [2-(4-Methoxyphenoxymethylidene)adamantane]**						
	C_6H_6			283	CP/Pa-17	S = TPP; A' = 2-(Phenoxymethylidene)adamantane; meas. $k_r/k_r^{A'}$ = 5.	84F474
	CH_2Cl_2			283	CP/Pa-17	S = MB; A' = 2-(Phenoxymethylidene)adamantane; meas. $k_r/k_r^{A'}$ = 2.	84F474

TABLE 2. Rate constants for interaction of singlet oxygen with olefins. — Continued

No.	Solvent	k ($L\ mol^{-1}\ s^{-1}$)	β (k_d/k) ($mol\ L^{-1}$)	T (K)	Method	Comment	Ref.
2.352	**Tricyclo[3.3.1.1^{3,7}]decane, 2-(4-methoxyphenoxymethylene)- [2-(4-Methoxyphenoxymethylidene)adamantane]** — Continued						
	CH_3CN			283	CP/Pa-17	S = MB; A′ = 2-(Phenoxymethylidene)adamantane; meas. $k_t/k_r^{A'}$ = 2.	84F474
	$CH_3CO_2C_2H_5$			283	CP/Pa-17	S = TPP; A′ = 2-(Phenoxymethylidene)adamantane; meas. $k_t/k_r^{A'}$ = 6.	84F474
	CH_3COCH_3			283	CP/Pa-17	S = MB; A′ = 2-(Phenoxymethylidene)adamantane; meas. $k_t/k_r^{A'}$ = 2.	84F474
	EtOH			283	CP/Pa-17	S = MB; A′ = 2-(Phenoxymethylidene)adamantane; meas. $k_t/k_r^{A'}$ = 2.	84F474
	MeOH			283	CP/Pa-17	S = MB; A′ = 2-(Phenoxymethylidene)adamantane; meas. $k_t/k_r^{A'}$ = 2.	84F474
	1-PrOH			283	CP/Pa-17	S = MB; A′ = 2-(Phenoxymethylidene)adamantane; meas. $k_t/k_r^{A'}$ = 2.	84F474
	THF			283	CP/Pa-17	S = TPP; A′ = 2-(Phenoxymethylidene)adamantane; meas. $k_t/k_r^{A'}$ = 6.	84F474
2.353	**Tricyclo[3.3.1.1^{3,7}]decane, (1-methylethylene)- (2-Isopropylideneadamantane)**						
	C_6H_6				CP/Pa-17	S = TPP; A′ = 1,1-Di-*tert*-butyl-2-methoxyethene; meas. $k_t/k_r^{A'}$ = 7.	82F102
	CH_2Cl_2				CP/Pa-17	S = MB; A′ = 1,1-Di-*tert*-butyl-2-methoxyethene; meas. $k_t/k_r^{A'}$ = 3.6.	82F102
	CH_3CN				CP/Pa-17	S = MB; A′ = 1,1-Di-*tert*-butyl-2-methoxyethene; meas. $k_t/k_r^{A'}$ = 3.	82F102
	CH_3COCH_3				CP/Pa-17	S = MB; A′ = 1,1-Di-*tert*-butyl-2-methoxyethene; meas. $k_t/k_r^{A'}$ = 7.	82F102
	EtOH				CP/Pa-17	S = MB; A′ = 1,1-Di-*tert*-butyl-2-methoxyethene; meas. $k_t/k_r^{A'}$ = 2.5.	82F102
	MeOH				CP/Pa-17	S = MB; A′ = 1,1-Di-*tert*-butyl-2-methoxyethene; meas. $k_t/k_r^{A'}$ = 1.9.	82F102
	2-PrOH				CP/Pa-17	S = MB; A′ = 1,1-Di-*tert*-butyl-2-methoxyethene; meas. $k_t/k_r^{A'}$ = 2.5.	82F102
2.354	**Tricyclo[3.3.1.1^{3,7}]decane, 2-(4-methylphenoxymethylene)- [2-(4-Methylphenoxymethylidene)adamantane]**						
	C_6H_6			283	CP/Pa-17	S = TPP; A′ = 2-(Phenoxymethylidene)adamantane; meas. $k_t/k_r^{A'}$ = 2.	84F474
	CH_2Cl_2			283	CP/Pa-17	S = MB; A′ = 2-(Phenoxymethylidene)adamantane; meas. $k_t/k_r^{A'}$ = 1.5.	84F474
2.355	**Tricyclo[3.3.1.1^{3,7}]decane, (2-methylpropylidene)- [2-Isobutylideneadamantane]**						
	C_6H_6				CP/Pa-17	S = TPP; A′ = 1,1-Di-*tert*-butyl-2-methoxyethene; meas. $k_t/k_r^{A'}$ = 2.	82F102
	CH_2Cl_2				CP/Pa-17	S = MB; A′ = 1,1-Di-*tert*-butyl-2-methoxyethene; meas. $k_t/k_r^{A'}$ = 1.	82F102
	CH_3CN				CP/Pa-17	S = MB; A′ = 1,1-Di-*tert*-butyl-2-methoxyethene; meas. $k_t/k_r^{A'}$ = 0.7.	82F102
	CH_3COCH_3				CP/Pa-17	S = MB; A′ = 1,1-Di-*tert*-butyl-2-methoxyethene; meas. $k_t/k_r^{A'}$ = 1.2.	82F102

TABLE 2. Rate constants for interaction of singlet oxygen with olefins. — Continued

No.	Solvent	k ($L\ mol^{-1}\ s^{-1}$)	β (k_d/k) ($mol\ L^{-1}$)	T (K)	Method	Comment	Ref.
2.355	**Tricyclo[3.3.1.1^{3,7}]decane, (2-methylpropylidene)- [2-Isobutylideneadamantane]** — Continued						
	EtOH				CP/Pa-17	S = MB; A′ = 1,1-Di-*tert*-butyl-2-methoxyethene; meas. $k_r/k_r^{A'} = 0.53$.	82F102
	MeOH				CP/Pa-17	S = MB; A′ = 1,1-Di-*tert*-butyl-2-methoxyethene; meas. $k_r/k_r^{A'} = 0.45$.	82F102
	2-PrOH				CP/Pa-17	S = MB; A′ = 1,1-Di-*tert*-butyl-2-methoxyethene; meas. $k_r/k_r^{A'} = 0.5$.	82F102
2.356	**Tricyclo[3.3.1.1^{3,7}]decane, tricyclo[3.3.1.1^{3,7}]decylidene- (Adamantylideneadamantane)**						
	C_6H_5Cl/ 2-PrOH (90:10)	2.2×10^5		273	CR/LI-12	used $k_d = 4.1 \times 10^4\ s^{-1}$; $^1O_2$* from hydrotrioxide, e.g. $(CH_3)_2C(OH)OOOH$.	90M125
	$CHCl_3$	4.7×10^5		295	CL/LI-12	S = An; used $k_d = 4.9 \times 10^3\ s^{-1}$.	90F473
	$CHCl_3$	9.0×10^5			CR/A′c-33	A′ = Rub; used $k_d = 1.7 \times 10^4\ s^{-1}$, $k_{A'} = 5.3 \times 10^7$ $L\ mol^{-1}\ s^{-1}$; $^1O_2$* from $DMNO_2$.	81E003
	$CHCl_3$	1.0×10^6	0.016	288	CP/A′c-16	S = MB; A′ = DPBF; used $k_d = 1.7 \times 10^4\ s^{-1}$; Solvent contained 1% EtOH.	77F876
2.357	**8,9,11-Trioxatetracyclo[4.2.2.1.0^{5,6}]undec-5-ene, 2,3-bis(methylene)-**						
	CH_2Cl_2			253	CP/Ac-17	S = TPP; A′ = 2,3-Dimethylenebicyclo[2.2.1]heptane; meas. $k_r/k_r^{A'} = <1 \times 10^{-3}$.	82F450
2.358	***(all-E)*-1,3,5,7,9,11,13,15,17,19,21,23,25,27,29,31,33-Tritriacontaheptadecaene, 3,7,11,15,20,24,28,32-octamethyl-1,34-bis(2,6,6-trimethyl-1-cyclohexen-1-yl)- (Dodecapreno-β-carotene)**						
	$C_6H_5CH_3$	2.9×10^{10}			PL/Ld-2	S = Pz.	91E465
	C_6H_6	2.3×10^{10}			PL/Ld-2	S = Pz.	91E465
2.359	**1,6-Undecadiene, 2,6-dimethyl-, (*E*)-**						
	EtOH/ 2-PrOH (50:50)		0.10 (β_r)	292	CP/Oc-14,27	S = RB; A′ = 2,5-DMF.	78F464
2.360	**1,6-Undecadiene, 2,6-dimethyl-, (*Z*)-**						
	EtOH/ 2-PrOH (50:50)		0.13 (β_r)	292	CP/Oc-14,27	S = RB; A′ = 2,5-DMF.	78F464
2.361	**Vitamin D_3**						
	C_6H_6	4.0×10^5			PL/Ld-2	S = A.	90E030

TABLE 3. Rate constants for interaction of singlet oxygen with aromatic substrates.

No.	Solvent	k ($L\ mol^{-1}\ s^{-1}$)	β (k_d/k) ($mol\ L^{-1}$)	T (K)	Method	Comment	Ref.
3.1	**2'-Acetonaphthone (2-ACN)**						
	$CDCl_3$	2×10^6			PL/A'd-5	S = A; A' = Rub.	81A287
3.2	**Acetophenone**						
	CCl_4/ MeOH (98:2)	2.7×10^3		293	PL/A'd-8	S = MB; A' = DPBF.	83A371
3.3	**Anthracene**						
	n-C_6H_{14}	3×10^5			CP/A'c-?	S = A; Q = Car; used $k_d = 6 \times 10^4\ s^{-1}$, $k_Q = 3 \times 10^{10}\ L\ mol^{-1}\ s^{-1}$.	80F169
	C_6H_5Br		0.12		CP/Ac-15	S = A.	59F003
	C_6H_6	1.6×10^5	0.27	298	CP/A'c-20	S = A' = Rub; used $k_d = 4.2 \times 10^4\ s^{-1}$, $\beta_{A'} = 1.0 \times 10^{-3}\ mol\ L^{-1}$.	747312
	C_6H_6		0.047		CP/Ac-15	S = DNT.	727028
	C_6H_6		0.57		CP/Ac-15	S = A.	59F003
	C_6H_6		0.42		CP/Pa-15	S = A; studied at 263-317 K.	55F004
	CCl_4	3.5×10^5			CP/Ac-15	S = A; used $k_d = 1.4 \times 10^3\ s^{-1}$.	80F718
	CCl_4		4.0×10^{-3}		CP/Oc-15	S = A.	537004
	$CHCl_3$	5.4×10^5			CP/A'c-33	S = A' = Rub; used $k_d = 1.7 \times 10^4\ s^{-1}$, $k_{A'} = 5.3 \times 10^7\ L\ mol^{-1}\ s^{-1}$.	78A005
	$CHCl_3$		0.036		CP/Pa-15	S = A; studied at 263-317 K.	55F004
	$CHCl_3$		0.014		CP/Oc-15	S = A.	537004
	CS_2		2.6×10^{-3}		CP/Ac-15	S = DNT.	727028
	CS_2		3.6×10^{-3}		CP/Oc-15	S = A.	537004
	CS_2/ C_6H_6 (99:1)		0.015		CP/Oc-15	S = A; solvent in mole %.	537004
	CS_2/ C_6H_6 (96:4)		0.027		CP/Ac-15	S = DNT; solvent in mole %.	727028
	CS_2/ C_6H_6 (95:5)		0.038		CP/Oc-15	S = A; solvent in mole %.	537004
	CS_2/ C_6H_6 (93:7)		0.052		CP/Ac-15	S = DNT; solvent in mole %.	727028
	CS_2/ C_6H_6 (90:10)		0.062		CP/Oc-15	S = A; solvent in mole %.	537004
	CS_2/ C_6H_6 (75:25)		0.094		CP/Ac-15	S = TPP; solvent in mole %.	727028
	CS_2/ C_6H_6 (50:50)		0.077		CP/Ac-15	S = TPP; solvent in mole %.	727028
3.4	**Anthracene, 1-chloro-**						
	CCl_4		4.1×10^{-3}		CP/Oc-15	S = A.	537004
	$CHCl_3$		0.045		CP/Oc-15	S = A.	537004
	CS_2		4.9×10^{-3}		CP/Oc-15	S = A.	537004
3.5	**Anthracene, 9-chloro-**						
	CCl_4		3.2×10^{-3}		CP/Oc-15	S = A.	537004
	$CHCl_3$		0.024		CP/Oc-15	S = A.	537004
	CS_2		3.0×10^{-3}		CP/Oc-15	S = A.	537004
3.6	**Anthracene, 1-chloro-9,10-diphenyl-**						
	$CHCl_3$	2×10^6			CP/A'c-33	S = A' = Rub; used $k_d = 1.7 \times 10^4\ s^{-1}$, $k_{A'} = 5.3 \times 10^7\ L\ mol^{-1}\ s^{-1}$.	78A005
3.7	**Anthracene, 9,10-dichloro- (DClA)**						
	CCl_4		0.010		CP/Oc-15	S = A.	537004
	$CHCl_3$		0.060		CP/Oc-15	S = A.	537004
	CS_2		0.017		CP/Oc-15	S = A.	537004
3.8	**Anthracene, 9,10-dimethoxy-**						
	C_6H_6	1.4×10^7 (k_r)		298	CP/Ac,A'c-17	S = A' = Rub; used $k_r^{A'} = 4.2 \times 10^7\ L\ mol^{-1}\ s^{-1}$; meas. $k_r/k_r^{A'} = 0.33$.	747312

TABLE 3. Rate constants for interaction of singlet oxygen with aromatic substrates. — Continued

No.	Solvent	k ($L\ mol^{-1}\ s^{-1}$)	β (k_d/k) ($mol\ L^{-1}$)	T (K)	Method	Comment	Ref.
3.9	**Anthracene, 1,4-dimethoxy-9,10-diphenyl- (DMDPA)**						
	$(C_2H_5)_2O$		2×10^{-4}		CP/Ac-15	S = A.	84F197
	$C_6H_5CH_3$	1.3×10^{8}			PL/Ld-2	S = A.	93F207
	$CH_3CO_2C_2H_5$		9.3×10^{-5}		CP/Ac-15	S = A.	84F197
	$CHCl_3$	3.2×10^{8}			CP/A'c-33	S = A' = Rub; used $k_d = 1.7\times10^{4}\ s^{-1}$, $k_{A'} = 5.3\times10^{7}\ L\ mol^{-1}\ s^{-1}$.	78A005
3.10	**Anthracene, 9,10-dimethyl- (DMA)**						
	C_5H_5N		1.0×10^{-3}	285	CP/Pa-20	S = MB; A' = TME.	737202
	C_5H_5N		1.4×10^{-3}	285	CP/Pa-20	S = A; A' = TME.	737202
	C_5H_5N		1.4×10^{-3}	285	CP/Pa-20	S = ThCl; A' = TME.	737202
	C_5H_5N				CP/Ac-17	S = MB; A' = TME; meas. $k_r/k_r^{A'} = 1.0$.	66F041
	c-C_6H_{12}	1.2×10^{7}	5×10^{-3}	297	CP/Ac-15	S = A; used $k_d = 5.9\times10^{4}\ s^{-1}$.	747207
	C_6H_5Br				CP/Ac-17	S = MB; A' = TME; meas. $k_r/k_r^{A'} = 1.0$.	66F041
	$C_6H_5CH_3$		2×10^{-3}		CP/Ac-15	S = A.	84F197
	$C_6H_5CH_3$		1.5×10^{-3}	298	CP/Ac-16	S = A; A' = Leucomalachite Green.	79F148
	C_6H_6	2.5×10^{7}		293	CP/Ac-15	S = Rub; used $k_d = 4.2\times10^{4}\ s^{-1}$.	85N293
	C_6H_6		1.2×10^{-3}	298	CP/Ac-?	S = A.	767422
	C_6H_6	2.1×10^{7}	2×10^{-3}	298	CP/Ac-15	S = A; used $k_d = 4.2\times10^{4}\ s^{-1}$.	747312
	C_6H_6		3.0×10^{-4}	298	CP/Ac-15	S = A, Rub, Tetr.	706079
	C_6H_6		3.0×10^{-4}	298	CP/Ac-?	S = Per and An.	69F388
	C_6H_6/ MeOH (60:40)	4.8×10^{7}			CP/A'c-33	S = A' = Rub; k_d and $k_{A'}$ not given; 6×10^{-3} mol L^{-1} KOH.	88F650
	CCl_4	7.0×10^{6} (k_r)		297	CP/Ac,A'c-17	S = A' = Rub; used $k_r^{A'} = 1.4\times10^{7}\ L\ mol^{-1}\ s^{-1}$; meas. $k_r/k_r^{A'} = 0.5$.	747207
	CH_3CN	1.7×10^{8}	2×10^{-4}		CP/Ac-15	S = MB; used $k_d = 3.3\times10^{4}\ s^{-1}$.	777113
	$CHCl_3$	2.9×10^{7}			PL/Ld-2	S = MB.	93A050
	$CHCl_3$	3.2×10^{7}	5.2×10^{-4}		CP/Pa-14	S = 1,5-Diamino-4,8-dihydroxyanthraquinone; used $k_d = 1.7\times10^{4}\ s^{-1}$; P = 9,10-Dimethylanthracene endoperoxide.	80E446
	$CHCl_3$	9.3×10^{7}	2×10^{-4}		CP/Ac-15	S = MB; used $k_d = 1.7\times10^{4}\ s^{-1}$.	777113
	$CHCl_3$	2.7×10^{7} (k_r)		297	CP/Ac,A'c-17	S = A' = Rub; used $k_r^{A'} = 4.2\times10^{7}\ L\ mol^{-1}\ s^{-1}$; meas. $k_r/k_r^{A'} = 0.64$.	747207
	CS_2	1.6×10^{7}		295	MP/Ld-2	S = TPP.	89A400
	CS_2		2×10^{-6}	295	CP/Ac-14	S = A.	89A400
	CS_2	1.3×10^{7} (k_r)		297	CP/Ac,A'c-17	S = A' = Rub; used $k_r^{A'} = 2.5\times10^{7}\ L\ mol^{-1}\ s^{-1}$; meas. $k_r/k_r^{A'} = 0.5$.	747207
	$ClCF_2CCl_2F$		1×10^{-6}	295	CP/Ac-14	S = A; [DMA] = (4-11) $\times10^{-5}$ mol L^{-1}.	89A400
	$ClCF_2CCl_2F$		2×10^{-5}	295	CP/Ac-14	S = A; [DMA] = (3-9) $\times10^{-6}$ mol L^{-1}.	89A400
	D_2O (mic)	7.4×10^{8}	6.8×10^{-5}	298	CP/Ac-15	S = MB; used $k_d = 5.0\times10^{4}\ s^{-1}$; A solubilized in DTAC micelles.	78F061
	D_2O (ves)	3.1×10^{8}			CP/Ac-14	S = RB; used $k_d = 1.8\times10^{4}\ s^{-1}$; used ϕ_{isc} (RB) = 0.76; 0.05% egg yolk lecithin.	86N104
	EtOH	4.6×10^{7}		293	CP/Ac-15	S = MB; used $k_d = 8.3\times10^{4}\ s^{-1}$.	85N293
	EtOH	3.9×10^{7}	2.1×10^{-3}	298	CP/Ac-15	S = MB; used $k_d = 8.3\times10^{4}\ s^{-1}$.	78F061
	EtOH	4.4×10^{7}	1.9×10^{-3}	298	CP/Ac-15	S = Eos; used $k_d = 8.3\times10^{4}\ s^{-1}$.	78F061
	EtOH	1.2×10^{7}	7.2×10^{-3}	297	CP/Ac-15	S = A; used $k_d = 8.3\times10^{4}\ s^{-1}$.	747207
	EtOH/ H_2O (50:50)	2.0×10^{8}		293	CP/Ac-15	S = MB; used $k_d = 2\times10^{5}\ s^{-1}$.	85N293
	H_2O (mic)	5×10^{7}		293	CP/Ac-15	S = MB; used $k_d = 2.5\times10^{5}\ s^{-1}$; 0.015 mol L^{-1} CTAB.	85N293

TABLE 3. Rate constants for interaction of singlet oxygen with aromatic substrates. — Continued

No.	Solvent	k ($L\ mol^{-1}\ s^{-1}$)	β (k_d/k) ($mol\ L^{-1}$)	T (K)	Method	Comment	Ref.
3.10	**Anthracene, 9,10-dimethyl- (DMA)** — Continued						
	H_2O (mic)	5.4×10^7		293	CP/Ac-15	S = MB; used $k_d = 2.4 \times 10^5\ s^{-1}$; 0.1 mol L^{-1} SDS.	85N293
	H_2O (mic)	7.5×10^8	6.6×10^{-4}	298	CP/Ac-15	S = MB; used $k_d = 5.0 \times 10^5\ s^{-1}$; A solubilized in DTAC micelles.	78F061
	H_2O (mic)	9.1×10^8	5.5×10^{-4}	298	CP/Ac-15	S = Eos; used $k_d = 5.0 \times 10^5\ s^{-1}$; S and A solubilized in DTAC micelles.	78F061
	H_2O (ves)	3.2×10^8			CP/Ac-14	S = RB; used $k_d = 2.5 \times 10^5\ s^{-1}$; used $\phi_{isc}(RB) = 0.76$; 0.05% egg yolk lecithin.	86N104
	MeOH	6.9×10^7		293	CP/Ac-15	S = MB; used $k_d = 1 \times 10^5\ s^{-1}$.	85N293
	MeOH	4.8×10^7	3×10^{-3}		CP/Ac-15	S = MB; used $k_d = 1.4 \times 10^5\ s^{-1}$.	777113
	MeOH	2.4×10^7	8.0×10^{-3}	297	CP/Ac-15	S = A; used $k_d = 1.4 \times 10^5\ s^{-1}$.	747207
	MeOH/ H_2O (80:20)	2.0×10^8		293	CP/Ac-15	S = MB; used $k_d = 1.8 \times 10^5\ s^{-1}$.	85N293
3.11	**Anthracene, 9,10-diphenyl- (DPA)**						
	C_5H_5N				CP/Ac-17	S = A; A′ = TME; meas. $k_r/k_r^{A'} = 0.18$.	66F041
	$C_6H_5CH_3$	7.8×10^5			PL/Ld-2	S = A.	93F207
	$C_6H_5CH_3$		0.031	293	CP/Ac-16	S = A′ = Rub.	83F335
	C_6H_6	1.2×10^6	0.04	298	CP/A′c-20	S = A′ = Rub; used $k_d = 4.2 \times 10^4\ s^{-1}$, $\beta_{A'} = 1.0 \times 10^{-3}$ mol L^{-1}.	747312
	C_6H_6		0.040	298	CP/Ac-15	S = A.	727196
	C_6H_6		0.060		CP/Ac-20	S = ZnTPP; A′ = $(C_2H_5)_2S$.	71F580
	C_6H_6		0.045		CP/Ac-15	S = A.	59F003
	C_6H_6		0.057		CP/Ac-15	S = A.	55F004
	CCl_4	6×10^5			CP/Ac-14	S = TPP; used $k_d = 1.4 \times 10^3\ s^{-1}$.	80C002
	CCl_4		6.0×10^{-4}		CP/Oc-15	S = A.	537004
	CH_2Cl_2	4.2×10^6 (k_r) 8×10^6 (k_q)	1×10^{-3}		CR/Ac-31	used $k_d = 1.2 \times 10^4\ s^{-1}$; $^1O_2$* from triphenyl phosphite ozonide; $f_r^A = 0.3$.	85M406
	$CHCl_3$	3.0×10^6			CP/A′c-33	S = A′ = Rub; used $k_d = 1.7 \times 10^4\ s^{-1}$, $k_{A'} = 5.3 \times 10^7$ L $mol^{-1}\ s^{-1}$.	78A005
	$CHCl_3$		4.0×10^{-3}		CP/Oc-15	S = A.	537004
	CS_2		5×10^{-5}	295	CP/Ac-14	S = A.	89A400
	CS_2	8.5×10^5		295	MP/Ld-2	S = TPP.	89A400
	CS_2		3.2×10^{-3}		CP/Oc-15	S = A.	537004
	$ClCF_2CCl_2F$		1×10^{-4}	295	CP/Ac-14	S = A.	89A400
3.12	**Anthracene, 9-methoxy-**						
	C_6H_6	2.5×10^6 (k_r)		298	CP/Ac,A′c-17	S = A′ = Tetr; used $k_r^{A'} = 1.2 \times 10^7$ L $mol^{-1}\ s^{-1}$; meas. $k_r/k_r^{A'} = 0.21$.	747312
3.13	**Anthracene, 9-methyl-**						
	C_6H_6	2.3×10^6		293	CP/Ac-15	S = Rub; used $k_d = 4.2 \times 10^4\ s^{-1}$.	85N293
	C_6H_6	3.2×10^6	0.01	298	CP/A′c-20	S = A′ = Rub; used $k_d = 4.2 \times 10^4\ s^{-1}$, $\beta_{A'} = 1.0 \times 10^{-3}$ mol L^{-1}.	747312
	CCl_4		3.3×10^{-3}		CP/Oc-15	S = A.	537004
	$CHCl_3$	8.1×10^6			CP/A′c-33	S = A′ = Rub; used $k_d = 1.7 \times 10^4\ s^{-1}$, $k_{A'} = 5.3 \times 10^7$ L $mol^{-1}\ s^{-1}$.	78A005
	$CHCl_3$		1.2×10^{-3}		CP/Oc-15	S = A.	537004
	EtOH	2×10^6		293	CP/Ac-15	S = MB; used $k_d = 8.3 \times 10^4\ s^{-1}$.	85N293
	EtOH/ H_2O (50:50)	1.7×10^7		293	CP/Ac-15	S = MB; used $k_d = 2 \times 10^5\ s^{-1}$.	85N293
	H_2O	3.8×10^7		293	CP/Ac-15	S = MB; 0.068 mol L^{-1} PEO; k_d not given.	85N293

TABLE 3. Rate constants for interaction of singlet oxygen with aromatic substrates. — Continued

No.	Solvent	k ($L\ mol^{-1}\ s^{-1}$)	β (k_d/k) ($mol\ L^{-1}$)	T (K)	Method	Comment	Ref.
3.13	**Anthracene, 9-methyl-** — Continued						
	H_2O	9.6×10^7		293	CP/Ac-15	S = MB; used $k_d = 3 \times 10^5\ s^{-1}$.	85N293
	H_2O (mic)	1.7×10^7		293	CP/Ac-15	S = MB; used $k_d = 2.4 \times 10^5\ s^{-1}$; 0.1 mol L^{-1} SDS.	85N293
	H_2O (mic)	1.4×10^7		293	CP/Ac-15	S = MB; used $k_d = 2.5 \times 10^5\ s^{-1}$; 0.015 mol L^{-1} CTAB.	85N293
	MeOH	2×10^6		293	CP/Ac-15	S = MB; used $k_d = 1 \times 10^5\ s^{-1}$.	85N293
3.14	**Anthracene, 9-phenyl-**						
	C_6H_6	4.2×10^5	0.10	298	CP/A'c-20	S = A' = Rub; used $k_d = 4.2 \times 10^4\ s^{-1}$, $\beta_{A'} = 1.0 \times 10^{-3}$ mol L^{-1}.	747312
	CCl_4		7.4×10^{-4}		CP/Oc-15	S = A.	537004
	$CHCl_3$		7.2×10^{-3}		CP/Oc-15	S = A.	537004
	CS_2		8.4×10^{-4}		CP/Oc-15	S = A.	537004
3.15	**9,10-Anthracenediethanesulfonate ion (AES)**						
	D_2O/ H_2O (80:20) pH = 7.4		1.1×10^{-3}	310	CR/Pa-31	$^1O_2$* from $NDPO_2$.	89M097
	H_2O pH = 7.4		7.7×10^{-3}	310	CR/Pa-31	$^1O_2$* from $NDPO_2$.	89M097
	H_2O pH = 7.4		8×10^{-3}	310	CR/Pa-31	$^1O_2$* from $NaOCl/H_2O_2$.	89M097
	H_2O	4.7×10^7 (k_r)			CR/Ac,Pa-31	$^1O_2$* from H_2O_2/OCl^-; counter ion Na^+; meas. $k_q/k_r = 0.35$; used $k_d = 2.5 \times 10^5\ s^{-1}$.	85A176
	H_2O/ D_2O (62:38) pH = 7.4		3×10^{-3}	310	CR/Pa-31	$^1O_2$* from $NaOCl/H_2O_2$.	89M097
3.16	**9,10-Anthracenedipropionate ion (ADPA)**						
	D_2O	8.2×10^7			PL/Ad-5	S = MB.	80A205
	H_2O pH = 6.8	1×10^8		295	CP/Ac-14	S = $Ru(bpy)_3^{2+}$; used $k_d = 2.5 \times 10^4\ s^{-1}$.	92A095
3.17	**1,5-Anthracenedisulfonate ion**						
	H_2O	7.0×10^6	0.070	303	CP/Ac-15	S = A; used $k_d = 5.0 \times 10^5\ s^{-1}$.	78A275
	H_2O	$\leq 10^7$		301	CP/P'a-23	S = A; A' = KI; Q = NaN_3; P' = I_3^-. No measurable effect.	777074
3.18	**1-Anthracenesulfonate ion**						
	H_2O	5.4×10^7	9.2×10^{-3}	303	CP/Ac-15	S = A; used $k_d = 5.0 \times 10^5\ s^{-1}$.	78A275
	H_2O	5.0×10^8		301	CP/P'a-23	S = A; A' = KI; Q = NaN_3; used $k_d = 5.0 \times 10^5\ s^{-1}$, $k_Q = 2.2 \times 10^8\ L\ mol^{-1}\ s^{-1}$; P' = I_3^-.	777074
3.19	**2-Anthracenesulfonate ion**						
	H_2O	4.5×10^7	0.011	303	CP/Ac-15	S = A; used $k_d = 5.0 \times 10^5\ s^{-1}$.	78A275
	H_2O	3.0×10^8		301	CP/P'a-23	S = A; A' = KI; Q = NaN_3; used $k_d = 5.0 \times 10^5\ s^{-1}$, $k_Q = 2.2 \times 10^8\ L\ mol^{-1}\ s^{-1}$; P' = I_3^-.	777074
3.20	**Anthra[1,9-*bc*:4,10-*b'c'*]dichromene**						
	$C_6H_5CH_3$	5×10^8	1×10^{-4}		CP/Ac-15	S = A; used $k_d = 5 \times 10^4\ s^{-1}$.	84F197 82F068
	CS_2	3.4×10^8		295	MP/Ld-2	S = TPP.	89A400
3.21	**9-Anthroate ion**						
	H_2O	2.0×10^7			PL/P'a-16	S = Ery; A' = TMPD; used $k_d = 3.3 \times 10^5\ s^{-1}$; P' = $[TMPD]^{\cdot+}$.	82A080

TABLE 3. Rate constants for interaction of singlet oxygen with aromatic substrates. — Continued

No.	Solvent	k (L mol^{-1} s^{-1})	β (k_d/k) · (mol L^{-1})	T (K)	Method	Comment	Ref.
3.22	**Benzamide, 4-(bromomethyl)-*N*-(diphenylmethyl)-**						
	CH_2Cl_2	$<10^5$			PL/Ld-2	S = MPDME.	91E134
3.23	**Benz[*a*]anthracene**						
	C_6H_6	4.8×10^4 (k_r)		298	CP/Ac,A'c-17	S = A' = An; used $k_r^{A'} = 1.6\times10^5$ L mol^{-1} s^{-1}; meas. $k_r/k_r^{A'} = 0.30$.	747312
3.24	**Benz[*a*]anthracene, 9,10-dimethyl-**						
	C_6H_6		1.6×10^{-3}	298	CP/Ac-?	S = A.	767422
	C_6H_6	1.4×10^7 (k_r)		298	CP/Ac,A'c-17	S = A' = Rub; used $k_r^{A'} = 4.2\times10^7$ L mol^{-1} s^{-1}; meas. $k_r/k_r^{A'} = 0.33$.	747312
	C_6H_6		7.1×10^{-4}	298	CP/Ac-15	S = A or Tetr.	706079
	C_6H_6		8.3×10^{-4}	298	CP/Ac-15	S = Rub.	706079
	C_6H_6		7.4×10^{-4}	298	CP/Ac-?	S = Per and An.	69F388
	H_2O (mic)	2.5×10^9	4.0×10^{-4}		CP/Ac-15	S = MB; used $k_d = 1\times10^6$ s^{-1}; A solubilized in CTAB micelles.	78N003
3.25	**Benzanthrone**						
	EtOH	9.6×10^8			CP/Ac-14	S = A; used $k_d = 6.7\times10^4$ s^{-1}.	92D048
3.26	**Benzene**						
	C_6D_6	2.7×10^3			PL/Ld-2	S = TPP.	83E398
	CCl_4	3.9×10^3		298	CP/LI-12	S = Benz[*de*]anthracen-7-one, phenalenone or fluorenone; used $k_d = 32$ s^{-1}.	82E329
	CCl_4	2×10^3			PL/A'd-8	S = MB; A' = DPBF.	76F903
	CCl_4/ MeOH (96:4)	5×10^2			PL/A'd-8	S = MB; A' = DPBF.	777162
3.27	**Benzene-d_6**						
	CCl_4	1.3×10^2		298	CP/LI-12	S = Benz[*de*]anthracen-7-one, phenalenone or fluorenone; used $k_d = 32$ s^{-1}.	82E329
3.28	**Benzene, 1,5-bis(1,1-dimethylethyl)-2,4-dimethoxy-**						
	MeOH				CP/Pa,P'a-17	S = RB; A' = TME; meas. $k_r/k_r^{A'} = 2.3\times10^{-3}$.	70F454
	MeOH				CR/Pa,P'a-17	A' = TME; meas. $k_r/k_r^{A'} = 3.0\times10^{-3}$; $^1O_2$* from H_2O_2/NaOCl.	70F454
3.29	**Benzene, 1,3-bis(1,1-dimethylethyl)-2-methoxy-5-methyl-**						
	MeOH	5.9×10^5	0.20		CP/A'c-16	S = MB; A' = DPF; used $k_d = 1.2\times10^5$ s^{-1}.	78A171
3.30	**Benzene, bromo-**						
	CCl_4	2×10^3			PL/A'd-8	S = MB; A' = DPBF.	76F903
3.31	**Benzene, chloro-**						
	CCl_4/ MeOH (98:2)	2.1×10^3		293	PL/A'd-8	S = MB; A' = DPBF.	83A371
3.32	**Benzene, 2-chloro-1,4-dimethoxy-**						
	CH_3CN	4.7×10^5			PL/Ld-2	S = RB.	91A341
	dioxane	$<1\times10^4$			PL/Ld-2	S = ZnTPP.	91A341
3.33	**Benzene, 5-chloro-1,3-dimethoxy-**						
	CH_3CN	5.6×10^5			PL/Ld-2	S = RB.	91A341
	dioxane	6.1×10^5			PL/Ld-2	S = ZnTPP.	91A341
3.34	**Benzene, 1-chloro-2-methoxy-**						
	MeOH	$<10^4$			CP/Ac-23	S = A' = Rub; used $k_d = 1.4\times10^5$ s^{-1}, $k_{A'} = 5\times10^7$ L mol^{-1} s^{-1}; 0.01 mol L^{-1} KOH.	90F518

TABLE 3. Rate constants for interaction of singlet oxygen with aromatic substrates. — Continued

	Solvent	k ($L\ mol^{-1}\ s^{-1}$)	β (k_d/k) ($mol\ L^{-1}$)	T (K)	Method	Comment	Ref.
1135	**Benzene, 1,3-dichloro-**						
	C_6H_6/ MeOH (60:40)	$<10^4$			CP/A'c-33	S = A' = Rub; k_d and $k_{A'}$ not given; 6×10^{-3} mol L^{-1} KOH.	88F650
1136	**Benzene, 1,4-dichloro-**						
	C_6H_6/ MeOH (60:40)	$<10^4$			CP/A'c-33	S = A' = Rub; k_d and $k_{A'}$ not given; 6×10^{-3} mol L^{-1} KOH.	88F650
1137	**Benzene, 2,6-dichloro-1-methoxy-**						
	C_6H_6/ MeOH (60:40)	$<10^4$			CP/A'c-33	S = A' = Rub; k_d and $k_{A'}$ not given; 6×10^{-3} mol L^{-1} KOH.	88F650
1138	**Benzene, 1,2-dimethoxy-**						
	MeOH	$\leq 5 \times 10^6$ (k_r)		293	CP/Ac,A'c-17	S = RB and MB; A' = 1,2,4,5-$C_6H_2(CH_3O)_4$; No measurable effect.	72A020
1139	**Benzene, 1,3-dimethoxy-**						
	MeOH	$\leq 5 \times 10^6$ (k_r)		293	CP/Ac,A'c-17	S = MB and RB; A' = 1,2,4,5-$C_6H_2(CH_3O)_4$; No measurable effect.	72A020
1140	**Benzene, 1,4-dimethoxy-**						
	MeOH	$\leq 5 \times 10^6$ (k_r)		293	CP/Ac,A'c-17	S = MB and RB; A' = 1,2,4,5-$C_6H_2(CH_3O)_4$; No measurable effect.	72A020
1141	**Benzene, ethyl-**						
	CCl_4	1.3×10^5		296	CR/LI-12	used $k_d = 1.7 \times 10^3\ s^{-1}$; $^1O_2$* from $DMNO_2$.	90F069
	CCl_4/ MeOH (98:2)	3.6×10^3		293	PL/A'd-8	S = MB; A' = DPBF.	83A371
	CCl_4/ MeOH (96:4)	5×10^2			PL/A'd-8	S = MB; A' = DPBF.	777162
1142	**Benzene, hexamethoxy-**						
	MeOH			293	CP/Ac,A'c-17	S = MB and RB; A' = 1,2,4,5-$C_6H_2(CH_3O)_4$; meas. $k_t/k_r^{A'} = 0.031$.	72A020
1143	**Benzene, methoxy-**						
	C_6H_6/ MeOH (60:40)	$<10^4$			CP/A'c-33	S = A' = Rub; k_d and $k_{A'}$ not given; 6×10^{-3} mol L^{-1} KOH.	88F650
	CCl_4	2.0×10^5		296	CR/LI-12	used $k_d = 1.7 \times 10^3\ s^{-1}$; $^1O_2$* from $DMNO_2$.	90F069
	MeOH	$\leq 5 \times 10^6$ (k_r)		293	CP/Ac,A'c-17	S = RB and MB; A' = 1,2,4,5-$C_6H_2(CH_3O)_4$; No measurable effect.	72A020
1144	**Benzene, 1-methoxy-2-nitro-**						
	MeOH/ C_6H_6 (60:40)	$<10^3$			CP/Ac-23	S = A' = Rub; used $k_d = 1 \times 10^5\ s^{-1}$, $k_{A'} = 5 \times 10^7$ $L\ mol^{-1}\ s^{-1}$; 0.01 mol L^{-1} KOH.	90F518
1145	**Benzene, (3-methyl-2-butenyl)-**						
	MeOH		0.15	293	CP/Oc-15	S = RB; $E_a = 9.6\ kJ\ mol^{-1}$.	68F288
	MeOH		0.13		?	Method not given.	627005
1146	**Benzene, 1,1'-(2-methyl-1-propenylidene)bis-**						
	CH_3CN	5.0×10^6			PL/Ld-2	S = $(C_6H_5)_2CO$.	91E697
1147	**Benzene, nitro-**						
	CH_2Cl_2	5.0×10^3			PL/Ld-2	S = MPDME.	91E134
1148	**Benzene, pentamethoxy-**						
	MeOH			293	CP/Ac,A'c-17	S = MB and RB; A' = 1,2,4,5-$C_6H_2(CH_3O)_4$; meas. $k_t/k_r^{A'} = 0.19$.	72A020

TABLE 3. Rate constants for interaction of singlet oxygen with aromatic substrates. — Continued

No.	Solvent	k ($L\ mol^{-1}\ s^{-1}$)	β (k_d/k) ($mol\ L^{-1}$)	T (K)	Method	Comment	Ref.
3.49	**Benzene, 1,2,3,4-tetramethoxy-**						
	MeOH	$\leq 5 \times 10^6$ (k_r)		293	CP/Ac,A'c-17	S = MB and RB; A' = 1,2,4,5-$C_6H_2(CH_3O)_4$; No measurable effect.	72A020
3.50	**Benzene, 1,2,3,5-tetramethoxy-**						
	MeOH			293	CP/Ac,A'c-17	S = MB and RB; A' = 1,2,4,5-$C_6H_2(CH_3O)_4$; meas. $k_r/k_r^{A'} = 0.15$.	72A020
3.51	**Benzene, 1,2,4,5-tetramethoxy-**						
	MeOH			293	CP/Ac,A'c-17	S = MB and RB; A' = 1,2,4-$C_6H_3(OCH_3)_3$; meas. $k_r/k_r^{A'} = 12$.	72A020
3.52	**Benzene, 1,2,3-trimethoxy-**						
	MeOH	$\leq 5 \times 10^6$ (k_r)		293	CP/Ac,A'c-17	S = MB and RB; A' = 1,2,4,5-$C_6H_2(CH_3O)_4$; No measurable effect.	72A020
3.53	**Benzene, 1,2,4-trimethoxy-**						
	MeOH	1.8×10^7	6.4×10^{-3}		CP/A'c-16	S = MB; A' = DPF; used $k_d = 1.2 \times 10^5\ s^{-1}$.	78A171
3.54	**Benzene, 1,3,5-trimethoxy-**						
	MeOH	$\leq 5 \times 10^6$ (k_r)		293	CP/Ac,A'c-17	S = MB and RB; A' = 1,2,4,5-$C_6H_2(CH_3O)_4$; No measurable effect.	72A020
3.55	**Benzenemethanol, α-methyl-**						
	CCl_4/ MeOH (98:2)	4.1×10^3		293	PL/A'd-8	S = MB; A' = DPBF.	83A371
3.56	**Benzo[1,2,3-*kl*:4,5,6-*k'l'*]dixanthene (BDX)**						
	$C_6H_5CH_3$	1.0×10^8	5.1×10^{-4}		CP/Ac-15	S = A; used $k_d = 5 \times 10^4\ s^{-1}$.	84F197 82F068
	CS_2	7.2×10^7		295	MP/Ld-2	S = TPP.	89A400
3.57	**Benzoic acid, methyl ester**						
	CCl_4	3×10^3			PL/A'd-8	S = MB; A' = DPBF.	76F903
3.58	**Benzophenone (BP)**						
	C_6H_6	$<3 \times 10^4$ (k_r)			CP/A'c-17	S = A' = Rub; $k_{A'}[A']/(k_{A'}[A'] + k[BP]) > 0.95$ when [BP] = 0.1 mol L^{-1} and [A'] = 5×10^{-4} mol L^{-1}.	81F364
	$ClCF_2CCl_2F$	4×10^3		298	FP/Ld-2	S = Per.	82A322
3.59	**Biphenyl, 2-methoxy-**						
	EtOH	2.3×10^6			PL/Ld-2	S = RB; 7.5×10^{-3} mol L^{-1} KOH.	93E536
3.60	**Cyclopentadienone, tetraphenyl-**						
	Dibutyl terephthalate				CP/Ac-17	S = *N*-[2-[(2-Bromo-4,6-dinitrophenyl)azo]-5-[(2-cyanoethyl)(2-hydroxyethyl)amino]-4-methoxyphenyl]acetamide; A' = BRH_2; meas. $k_r/k_r^{A'} = 1.0$.	81F609
	$C_6H_5CHOHCH_3$				CP/Ac-17	S = *N*-[2-[(2-Bromo-4,6-dinitrophenyl)azo]-5-[(2-cyanoethyl)(2-hydroxyethyl)amino]-4-methoxyphenyl]acetamide; A' = BRH_2; meas. $k_r/k_r^{A'} = 0.6$.	81F609
	C_6H_6	1×10^8 (k_r) 2.2×10^8 (k_q)	1.0×10^{-4}	298	CP/Ac-15,27	S = Cor; used $k_d = 3.7 \times 10^4\ s^{-1}$; meas. k_q/k_r = 1.6.	82A179
	C_6H_6			298	CP/Ac-17	S = A' = DPBF; meas. $k_r/k_r^{A'} = 3.8$.	82A179
	CH_2Cl_2	5×10^7 (k_r) 6×10^7 (k_q)	1×10^{-4}		CR/Ac-31	used $k_d = 1.2 \times 10^4\ s^{-1}$; $^1O_2$* from triphenyl phosphite ozonide; $f_r^A = 0.46$.	85M406
	CH_3CN	6×10^7 (k_r) 4×10^8 (k_q)		298	CP/Ac-15,27	S = Cor; used $k_d = 1.8 \times 10^4\ s^{-1}$; meas. k_q/k_r = 6.2.	82A179

TABLE 3. Rate constants for interaction of singlet oxygen with aromatic substrates. — Continued

No.	Solvent	k ($L\ mol^{-1}\ s^{-1}$)	β (k_d/k) ($mol\ L^{-1}$)	T (K)	Method	Comment	Ref.
3.60	**Cyclopentadienone, tetraphenyl- — Continued**						
	$CHCl_3$				CP/Ac-17	S = *N*-[2-[(2-Bromo-4,6-dinitrophenyl)azo]-5-[(2-cyanoethyl)(2-hydroxyethyl)amino]-4-methoxyphenyl]acetamide; A′ = BRH_2; meas. $k_r^A = \ll 0.06 \times k_r^A$ in dibutyl terephthalate.	81F609
	$(C_6H_5)_2$/ $(C_6H_5)_2O$ (25:75)				CP/Ac-17	S = *N*-[2-[(2-Bromo-4,6-dinitrophenyl)azo]-5-[(2-cyanoethyl)(2-hydroxyethyl)amino]-4-methoxyphenyl]acetamide; A′ = BRH_2; meas. $k_t/k_r^{A'} = 0.6$.	81F609
	MeOH		2.5×10^{-4}		CP/Ac,A′c-18	S = MB; A′ = DPBF; used $\beta_{A'} = 7.3 \times 10^{-5}$ mol L^{-1}.	90F251
	dioxane		1.6×10^{-4}		CP/Ac-14	S = *O*-Methyl Rose Bengal methyl ester; used $\phi_\Delta(S) = 0.70$; 10^{-3} mol L^{-1} HCl.	90F251
3.61	**Dibenz[*a,h*]anthracene**						
	c-C_6H_{12}	9.5×10^3 (k_r)		298	CP/Ac,A′c-17	S = A′ = An; used $k_r^{A'} = 1.6 \times 10^5$ L $mol^{-1}\ s^{-1}$; meas. $k_t/k_r^{A'} = 0.59$.	747312
3.62	**Dibenzo[*fg,uv*]naphtho[2,3-*c*]pentaphene-9,19-dione, 1,2,3,4,11,12,13,14-octahydro-**						
	C_6H_6	4.3×10^8	9.7×10^{-5}	298	CP/Ac-14	S = A; used $k_d = 4.2 \times 10^4\ s^{-1}$.	93F128
3.63	**Dibenzo[*a,j*]perylene**						
	C_6H_6	$>2 \times 10^8$			CP/Ac-14	S = A; used $k_d = 4.2 \times 10^4\ s^{-1}$.	79F473
3.64	**Dibenzo[*a,o*]perylene, 7,16-diphenyl- (Mesodiphenylhelianthrene, MDH)**						
	n-C_5H_{12}	4×10^9	7×10^{-6}		CP/Pa-14	S = A; used $k_d = 2.9 \times 10^4\ s^{-1}$.	87F480
	c-C_6H_{12}	7.5×10^9	6.7×10^{-6}		CP/Ac-23	S = A; Q = Car; used $k_d = 5.0 \times 10^4\ s^{-1}$.	83F406
	$C_6H_5CH_2OH$	2.6×10^9 8×10^8 (k_r)	3×10^{-5}		CP/Pa-14	S = MB; used $k_d = 7.1 \times 10^4\ s^{-1}$; meas. $f_r^A = 0.35$.	87F479
	$C_6H_5CH_3$	7.3×10^9	5.5×10^{-6}		CP/Ac-23	S = A; Q = Car; used $k_d = 4.0 \times 10^4\ s^{-1}$.	83F406
	$C_6H_5CH_3$/ MeOH (99:1)	5×10^9 1.5×10^9 (k_r)	8.2×10^{-6}		CP/Pa-14	S = MB; used $k_d = 4.0 \times 10^4\ s^{-1}$; meas. $f_r^A = 0.29$.	87F479
	CH_3COCH_3	5×10^9 1.4×10^9 (k_r)	5.2×10^{-6}		CP/Pa-14	S = MB; used $k_d = 2.5 \times 10^4\ s^{-1}$.	87F479
	CH_3COCH_3	5.7×10^9	3.9×10^{-6}		CP/Ac-23	S = A; Q = Car; used $k_d = 2.2 \times 10^4\ s^{-1}$.	83F406
	$CHCl_3$	3.4×10^9	1.2×10^{-6}		CP/Ac-23	S = A; Q = Car; used $k_d = 4.1 \times 10^3\ s^{-1}$.	83F406
	CS_2	2.0×10^9		295	MP/Ld-2	S = TPP.	89A400
	CS_2	1.1×10^9	6×10^{-7}		CP/Ac-23	S = A; Q = Car; used $k_d = 1.1 \times 10^3\ s^{-1}$.	83F406
	EtOH	7.0×10^9		293	PL/Ad,Pb-5	S = An.	87F541
	MeOH/ $C_6H_5CH_3$ (97:3)	4×10^9 1.3×10^9 (k_r)	2.6×10^{-5}		CP/Pa-14	S = MB; used $k_d = 1.1 \times 10^5\ s^{-1}$; meas. $f_r^A = 0.27$.	87F479
3.65	**Diindeno[5,6-*a*:5′,6′-*j*]perylene-8,17-dione, 1,2,3,10,11,12-hexahydro-**						
	C_6H_6	5.1×10^8	8.2×10^{-5}	298	CP/Ac-14	S = A; used $k_d = 4.2 \times 10^4\ s^{-1}$.	93F128
3.66	**Fluorene, 9-(fluoren-9-ylidene)-**						
	CH_2Cl_2				CP/Ac,A′c-17	S = MB; A′ = TME; meas. $k_t/k_r^{A'} = 0.034$.	70F200
	dioxane/ MeOH (80:20)				CR/Ac,A′c-17	A′ = TME; meas. $k_t/k_r^{A'} = 0.034$; $^1O_2$* from H_2O_2/NaOCl.	70F200
3.67	**Helianthrene (Dibenzo[*a,o*]perylene)**						
	n-C_5H_{12}	4×10^9	8×10^{-6}		CP/Pa-14	S = A; used $k_d = 2.9 \times 10^4\ s^{-1}$.	87F480
	$C_6H_5CH_2OH$	2×10^9 (k_r)	3×10^{-5} (β_r)		CP/Pa-14	S = MB; used $k_d = 7.1 \times 10^4\ s^{-1}$; meas. $f_r^A = 0.99$.	87F479
	$C_6H_5CH_3$/ MeOH (99:1)	4.7×10^9 (k_r)	8.6×10^{-6} (β_r)		CP/Pa-14	S = MB; used $k_d = 4.0 \times 10^4\ s^{-1}$; meas. $f_r^A = \sim 1.0$.	87F479

TABLE 3. Rate constants for interaction of singlet oxygen with aromatic substrates. — Continued

No.	Solvent	k (L mol^{-1} s^{-1})	β (k_d/k) (mol L^{-1})	T (K)	Method	Comment	Ref.
3.67	**Helianthrene (Dibenzo[*a*,*o*]perylene) — Continued**						
	CH_3COCH_3	4.6×10^9 (k_r)	5.5×10^{-6} (β_r)		CP/Pa-14	S = MB; used $k_d = 2.5 \times 10^4$ s^{-1}; $f_r^A = \sim 1.0$.	87F479
	MeOH/ $C_6H_5CH_3$ (97:3)	5.1×10^9 (k_r)	2.2×10^{-5} (β_r)		CP/Pa-14	S = MB; used $k_d = 1.1 \times 10^5$ s^{-1}; meas. $f_r^A = \sim 1.0$.	87F479
3.68	**Heterocoerdianthrone (Dibenzoperylene-3,9-quinone, HCD)**						
	1,2,4-$C_6H_3Cl_3$	4×10^7	5×10^{-4}	298	CP/Ac-15	S = A; k estimated using $k_d(C_6H_5Br) = 2 \times 10^4$ s^{-1}.	767570
	$C_6H_5CH_3$	6.8×10^7	5.9×10^{-4}		CP/Ac-15	S = A; used $k_d = 4.0 \times 10^4$ s^{-1}.	80F151
	C_6H_6	3.6×10^8	1.2×10^{-4}	298	CP/Ac-14	S = A; used $k_d = 4.2 \times 10^4$ s^{-1}.	93F128
	C_6H_6	7×10^7	6×10^{-4}	298	CP/Ac-15	S = A; used $k_d = 4.2 \times 10^4$ s^{-1}.	767570 777176
	CCl_4	7×10^7	2×10^{-5}	298	CP/Ac-15	S = A; used $k_d = 1.4 \times 10^3$ s^{-1}.	767570
	$CHCl_3$	7×10^7	3×10^{-4}	298	CP/Ac-15	S = A; used $k_d = 1.7 \times 10^4$ s^{-1}.	767570
	CS_2	6.6×10^7		295	MP/Ld-2	S = TPP.	89A400
	CS_2	8×10^7	6×10^{-5}	298	CP/Ac-15	S = A; used $k_d = 5.0 \times 10^3$ s^{-1}.	767570 777176
3.69	**Indene**						
	MeOH		2.0	293	CP/Oc-15	S = MB; $E_a = 11$ kJ mol^{-1}.	68F288
	MeOH		1.5	293	CP/Oc-15	S = RB; $E_a = 13$ kJ mol^{-1}.	68F288
3.70	**Indene, 1,2-diphenyl-**						
	CH_3COCH_3	8.2×10^5 8.4×10^5		248 224	PL/Ld-2	S = MPDME.	83F195
3.71	**Indene, 1-methyl-2-phenyl-**						
	CH_3COCH_3	2×10^6 1.0×10^6		298 223	PL/Ld-2	S = MPDME.	83F195
	CH_3COCH_3	2×10^5 (k_r) 1×10^6 (k_r)		298 195	CP/Ac-17	S = RB; A′ = 2M2P; used $k_r^{A'} = 8.1 \times 10^5$ L mol^{-1} s^{-1}.	83F195
3.72	**1,4-Methanonaphthalene, 1,2,3,4-tetrahydro-**						
	CH_2Cl_2	3.9×10^4			PR/A′d-8	S = An; A′ = DPBF.	79A457
3.73	**1,4-Methanonaphthalene, 1,2,3,4-tetrahydro-5,8-dimethoxy-**						
	C_6H_6/ MeOH (75:25)	6×10^6		298	CP/A′c-20	S = RB; A′ = c-C_6H_{10}; used $k_d = 6.3 \times 10^4$ s^{-1}, $\beta_{A'} = 3.1$ mol L^{-1}.	78F586
	CH_2Cl_2	1.3×10^7			PR/A′d-8	S = An; A′ = DPBF.	79A457
3.74	**Naphthalene**						
	1-BuOH	5.2×10^8	1.0×10^{-4}	293	CP/Ac-15	S = MB; used $k_d = 5.2 \times 10^4$ s^{-1}.	78A266
3.75	**Naphthalene, 1,2-dimethyl-**						
	CH_3CN			288	CP/Oc-17	S = MB; A′ = 1,5-Np$(CH_3)_2$; meas. $k_r/k_r^{A'} = 3.3$.	80F204
3.76	**Naphthalene, 1,3-dimethyl-**						
	CH_3CN			288	CP/Oc-17	S = MB; A′ = 1,5-Np$(CH_3)_2$; meas. $k_r/k_r^{A'} = 1.0$.	80F204
3.77	**Naphthalene, 1,4-dimethyl-**						
	c-C_6H_{12}	1.2×10^4 (k_r)		298	CP/Ac,A′c-17	S = A′ = An; used $k_r^{A'} = 1.6 \times 10^5$ L mol^{-1} s^{-1}; meas. $k_r/k_r^{A'} = 0.075$.	747312
	CH_3CN			288	CP/Oc-17	S = MB; A′ = 1,5-Np$(CH_3)_2$; meas. $k_r/k_r^{A'} = 10$.	80F204
	EtOH/ H_2O (86:14)	1.3×10^5 (k_r)		278	CP/A′c-14,27	S = RB; A′ = α-Terpinene; used $k_d = 8.8 \times 10^4$ s^{-1}.	86A216
	MeOH	4.2×10^4 (k_r)		278	CP/A′c-14,27	S = RB; A′ = α-Terpinene; used $k_d = 9.5 \times 10^4$ s^{-1}.	86A216

TABLE 3. Rate constants for interaction of singlet oxygen with aromatic substrates. — Continued

No.	Solvent	k ($L\ mol^{-1}\ s^{-1}$)	β (k_d/k) ($mol\ L^{-1}$)	T (K)	Method	Comment	Ref.
3.77	**Naphthalene, 1,4-dimethyl-** — Continued						
	MeOH/ H_2O (80:20)	3.7×10^5 (k_r)		278	CP/A'c-14,27	S = RB; A' = α-Terpinene; used $k_d = 1.3 \times 10^5$ s^{-1}.	86A216
	1-PrOH/ H_2O (73:27)	2.4×10^5 (k_r)		278	CP/A'c-14,27	S = RB; A' = α-Terpinene; used $k_d = 1.1 \times 10^5$ s^{-1}.	86A216
3.78	**Naphthalene, 1,6-dimethyl-**						
	CH_3CN			288	CP/Oc-17	S = MB; A' = 1,5-Np$(CH_3)_2$; meas. $k_r/k_r^{A'} = 0.52$.	80F204
3.79	**Naphthalene, 1,7-dimethyl-**						
	CH_3CN			288	CP/Oc-17	S = MB; A' = 1,5-Np$(CH_3)_2$; meas. $k_r/k_r^{A'} = 0.54$.	80F204
3.80	**Naphthalene, 1,8-dimethyl-**						
	CH_3CN			288	CP/Oc-17	S = MB; A' = 1,5-Np$(CH_3)_2$; meas. $k_r/k_r^{A'} = 4.4$.	80F204
3.81	**Naphthalene, 2,3-dimethyl-**						
	CH_3CN			288	CP/Oc-17	S = MB; A' = 1,5-Np$(CH_3)_2$; meas. $k_r/k_r^{A'} = 0.22$.	80F204
3.82	**Naphthalene, 2,6-dimethyl-**						
	CH_3CN			288	CP/Oc-17	S = MB; A' = 1,5-Np$(CH_3)_2$; meas. $k_r/k_r^{A'} = 0.12$.	80F204
3.83	**Naphthalene, 2,7-dimethyl-**						
	CH_3CN			288	CP/Oc-17	S = MB; A' = 1,5-Np$(CH_3)_2$; meas. $k_r/k_r^{A'} = 0.12$.	80F204
3.84	**Naphthalene, 1,1'-(1,2-dimethyl-1,2-diethenyl)bis-, (Z)-**						
	CCl_4				CP/Ac,A"c,Pa-17	S = TPP; A' = (*E*)-2,3-Di(α-naphthyl)-2-butene; meas. $k_r/k_r^{A'} = 9.4$; A" = TME.	79F051
3.85	**Naphthalene, 2,2'-(1,2-dimethyl-1,2-diethenyl)bis-, (Z)-**						
	CCl_4				CP/Ac,A"c,Pa-17	S = TPP; A' = (*E*)-2,3-Di(β-naphthyl)-2-butene; meas. $k_r/k_r^{A'} = 9.1$; A" = TME.	79F051
3.86	**Naphthalene, 1-methyl-**						
	CH_3CN			288	CP/Oc-17	S = MB; A' = 1,5-Np$(CH_3)_2$; meas. $k_r/k_r^{A'} = 0.39$.	80F204
3.87	**Naphthalene, 1-(2-methylpropenyl)-**						
	C_6H_6		1.9	277	CP/Oc-14	S = TPP.	81F582
	CCl_4		0.14	277	CP/Oc-14	S = TPP.	81F582
	$CH_3COCH_2CH_3$		1.0	277	CP/Oc-14	S = RB.	81F582
	$CHCl_3$		0.23	277	CP/Oc-14	S = TPP.	81F582
	EtOH		3.3	277	CP/Oc-14	S = RB.	81F582
3.88	**1,4-Naphthalenedipropionate ion (NDP)**						
	EtOH/ H_2O (86:14)	6.0×10^4 (k_r)		278	CP/A'c-14,27	S = RB; A' = α-Terpinene; used $k_d = 8.8 \times 10^4$ s^{-1}; counter ion Na^+.	86A216
	H_2O pH = 9.5-11.5		0.16	293	CR/Ac-31	$^1O_2$* from MoO_4^{2-}/H_2O_2.	89M015
	H_2O	1.4×10^6 (k_r)		278	CP/A'c-17	S = RB; A' = Rubrene-2,3,8,9-tetracarboxylate ion; used $k_d = 2.4 \times 10^5\ s^{-1}$, $\beta_{A'} = 1.5 \times 10^{-3}$ mol L^{-1}; counter ion Na^+.	86A216
	MeOH	1.0×10^4 (k_r)		278	CP/A'c-14,27	S = RB; A' = α-Terpinene; used $k_d = 9.6 \times 10^4$ s^{-1}; counter ion Na^+.	86A216
	MeOH/ H_2O (80:20)	5.8×10^4 (k_r)		278	CP/A'c-14,27	S = RB; A' = α-Terpinene; used $k_d = 1.3 \times 10^5$ s^{-1}; counter ion Na^+.	86A216
	1-PrOH/ H_2O (73:27)	1.3×10^5 (k_r)		278	CP/A'c-14,27	S = RB; A' = α-Terpinene; used $k_d = 1.1 \times 10^5$ s^{-1}; counter ion Na^+.	86A216

TABLE 3. Rate constants for interaction of singlet oxygen with aromatic substrates. — Continued

No.	Solvent	k (L mol^{-1} s^{-1})	β (k_d/k) (mol L^{-1})	T (K)	Method	Comment	Ref.
3.89	**1,3-Naphthalenedipropionic acid, 4-methyl-**						
	CH_3CN	2×10^7		263	CP/Ac-15	S = MB; used $k_d = 1.8 \times 10^4$ s^{-1}.	93F361
3.90	**1,3-Naphthalenedipropionic acid, 4-methyl-, dimethyl ester**						
	CH_3CN	1×10^8		263	CP/Ac-15	S = MB; used $k_d = 1.8 \times 10^4$ s^{-1}.	93F361
3.91	**1-Naphthalenepropionate ion, 4-methyl-**						
	H_2O pH = 9.5-11.5		0.07	293	CR/Pa-31	$^1O_2$* from MoO_4^{2-}/H_2O_2.	89M015
3.92	**1-Naphthalenepropionate ion, 4-methyl-, endoperoxide ($MNPO_2$)**						
	H_2O	9.0×10^8 (k_q)		308	CR/A'c-32	A' = BR^{2-}; used $k_d = 3 \times 10^5$ s^{-1}; $^1O_2$* from A.	83A317
3.93	**1-Naphthalenepropionic acid, 4-methyl-, endoperoxide**						
	CH_2Cl_2	8.5×10^7 (k_q)		308	CR/A'c-32	A' = BRH_2; used $k_d = 1 \times 10^4$ s^{-1}; $^1O_2$* from A.	83A317
3.94	**Naphtho[1,8-*bc*:5,4-*b'*,*c'*]dipyran (1,6-Dioxapyrene)**						
	CD_3OD	5.8×10^7			PL/Ld-2	S = HP.	93R310
3.95	**Naphtho[1,2,3,4-*rst*]pentaphene-5,8-dione, 3,10-dimethyl- (Dimethylhomocoerdianthrone, HOCD)**						
	$C_6H_5CH_3$		9×10^{-5}		CP/Ac-15	S = DBrA.	82F446 84F197
	CS_2	3.4×10^8		295	MP/Ld-2	S = TPP.	89A400
3.96	**Pentacene**						
	C_6H_6	4.2×10^9 (k_r)		298	CP/Ac,A'c-17	S = A; A' = DPBF; used $k_r^{A'} = 7.0 \times 10^8$ L mol^{-1} s^{-1}; meas. $k_r/k_r^{A'} = 6.0$.	747312
3.97	**Phenalen-1-one (PHO)**						
	Perfluorodecalin	3.2×10^4		295	PL/Ld-2	S = A.	91E427
3.98	**1,1'-Spirobi[indene]-5,5',6,6'-tetracarboxylic acid, 2,2',3,3'-tetrahydro-3,3,3',3'-tetramethyl-, tetramethyl ester**						
	MeOH	9.0×10^7			CP/A'c-16	S = MB; A' = DPBF; used $k_d = 1.8 \times 10^5$ s^{-1}.	91F516
	MeOH	2.0×10^7 (k_r)			CP/Ac,A'c-17	S = MB; A' = DPBF; used $k_r^{A'} = 8 \times 10^8$ L mol^{-1} s^{-1}.	91F516
3.99	**Stilbene (*Z*)-**						
	CCl_4/ MeOH (96:4)	3×10^3			PL/A'd-8	S = MB; A' = DPBF.	777162
3.100	**Stilbene, 4,4'-dimethoxy-**						
	CH_3CN		1.4		CP/Oc-18	S = RB; A' = 2,5-DMF; $\beta_r^{A'}$ not given.	93A103
3.101	**Stilbene, α,β-dimethoxy-**						
	CH_3COCH_3	9.7×10^6 (k_r)		281	?	S = ?; A' = 1,4-Dioxene; used $k_{A'} = 2.2 \times 10^5$ L mol^{-1} s^{-1}; meas. $k_A/k_{A'} = 44$.	70F733
3.102	**Stilbene, α,α'-dimethyl-, (*E*)-**						
	CH_3CN	1.0×10^6			PL/Ld-2	S = $(C_6H_5)_2CO$.	91E697
	CH_3CN		0.11	286	CP/Oc-14	S = RB.	86A099
3.103	**Stilbene, α,α'-dimethyl-, (*Z*)-**						
	CCl_4				CP/Ac,A''c-Pa-17	S = TPP; A' = *trans*-α,α'-Dimethylstilbene; meas. $k_t/k_t^{A'} = 9.0$; A'' = TME; c.k. with TME.	79F051
	CH_3CN		0.014	286	CP/Oc-14	S = RB.	86A099
3.104	**Stilbene, α-methyl-, (*E*)-**						
	CCl_4/ MeOH (96:4)	3×10^3			PL/A'd-8	S = MB; A' = DPBF.	777162

TABLE 3. Rate constants for interaction of singlet oxygen with aromatic substrates. — Continued

No.	Solvent	k (L mol^{-1} s^{-1})	β (k_d/k) (mol L^{-1})	T (K)	Method	Comment	Ref.
3.105	**Stilbene, α-methyl-, (*Z*)-**						
	CCl_4/ MeOH (96:4)	6×10^3			PL/A'd-8	S = MB; A' = DPBF.	777162
3.106	**Stilbene-2,2'-disulfonate ion, 4,4'-diacetamido-**						
	H_2O	2×10^5			CP/A'c-23	S = MB, RB; A' = InH; used $k_{A'} = 7.7 \times 10^5$ L mol^{-1} s^{-1}; counter ion Na^+.	87F554
3.107	**Stilbene-2,2'-disulfonate ion, 4,4'-diamino-**						
	H_2O	1.9×10^6			CP/A'c-23	S = MB, RB; A' = InH; used $k_{A'} = 7.7 \times 10^5$ L mol^{-1} s^{-1}; counter ion Na^+.	87F554
3.108	**Styrene**						
	CCl_4/ MeOH (96:4)	5×10^3			PL/A'd-8	S = MB; A' = DPBF.	777162
3.109	**Styrene, 3-chloro-α,β,β-trimethyl-**						
	MeOH/ *tert*-BuOH (50:50)				CR/Pa,P'a-17	A' = 4,α,β,β-Tetramethylstyrene; meas. $k_t/k_r^{A'}$ = 0.44; $^1O_2$* from H_2O_2/NaOCl.	71F577
	MeOH/ C_5H_5N (98:2)				CP/Pa,P'a-17	S = RB; A' = 4,α,β,β-Tetramethylstyrene; meas. $k_t/k_r^{A'}$ = 0.38.	71F577
3.110	**Styrene, 4-chloro-α,β,β-trimethyl-**						
	MeOH				CP/Pa,P'a-17	S = RB; A' = 2M2B; meas. $k_t/k_r^{A'}$ = 2.2.	71F577
3.111	**Styrene, 3-cyano-α,β,β-trimethyl-**						
	MeOH/ *tert*-BuOH (50:50)				CR/Pa,P'a-17	A' = 4,α,β,β-Tetramethylstyrene; meas. $k_t/k_r^{A'}$ = 0.25; $^1O_2$* from H_2O_2/NaOCl.	71F577
	MeOH/ C_5H_5N (98:2)				CP/Pa,P'a-17	S = RB; A' = 4,α,β,β-Tetramethylstyrene; meas. $k_t/k_r^{A'}$ = 0.20.	71F577
3.112	**Styrene, 4-cyano-α,β,β-trimethyl-**						
	MeOH/ *tert*-BuOH (50:50)				CR/Pa,P'a-17	A' = 4,α,β,β-Tetramethylstyrene; meas. $k_t/k_r^{A'}$ = 0.15; $^1O_2$* from H_2O_2/NaOCl.	71F577
	MeOH/ *tert*-BuOH (98:2)				CP/Pa,P'a-17	S = RB; A' = 4,α,β,β-Tetramethylstyrene; meas. $k_t/k_r^{A'}$ = 0.17.	71F577
3.113	**Styrene, α-cyclopropyl-β,β-trimethyl-**						
	CH_3COCH_3				CP/Ac,A'c-17	S = Eos; A' = (Dicyclopropylmethylidene)cyclobutane; meas. $k_t/k_r^{A'}$ = 0.79.	78F430
3.114	**Styrene, β,β-dimethyl-**						
	C_6H_6		0.33	277	CP/Oc-14	S = TPP.	81F582
	CCl_4		0.05	277	CP/Oc-14	S = TPP.	81F582
	$CH_3COCH_2CH_3$		0.25	277	CP/Oc-14	S = RB.	81F582
	$CHCl_3$		0.08	277	CP/Oc-14	S = TPP.	81F582
	EtOH		0.40	277	CP/Oc-14	S = RB.	81F582
3.115	**Styrene, 4-(dimethylamino)-α,β,β-trimethyl-**						
	MeOH/ *tert*-BuOH (50:50)				CR/Pa,P'a-17	A' = 4-$CH_3OC_6H_4C(CH_3)=C(CH_3)_2$; meas. $k_t/k_r^{A'}$ = 2.9; $^1O_2$* from H_2O_2/NaOCl.	71F577
	MeOH/ C_5H_5N (98:2)				CP/Pa,P'a-17	S = RB; A' = 4-$CH_3OC_6H_4C(CH_3)=C(CH_3)_2$; meas. $k_t/k_r^{A'}$ = 2.0.	71F577
3.116	**Styrene, 4-methoxy-β-methyl-**						
	MeOH		~0.010	293	CP/Oc-15	S = RB; E_a = 17 kJ mol^{-1}.	68F288
3.117	**Styrene, 3-methoxy-α,β,β-trimethyl-**						
	MeOH/ *tert*-BuOH (50:50)				CR/Pa,P'a-17	A' = 4,α,β,β-Tetramethylstyrene; meas. $k_t/k_r^{A'}$ = 0.72; $^1O_2$* from H_2O_2/NaOCl.	71F577

TABLE 3. Rate constants for interaction of singlet oxygen with aromatic substrates. — Continued

No.	Solvent	k ($L\ mol^{-1}\ s^{-1}$)	β (k_d/k) ($mol\ L^{-1}$)	T (K)	Method	Comment	Ref.
3.117	**Styrene, 3-methoxy-α,β,β-trimethyl- — Continued**						
	MeOH/ C_5H_5N (98:2)				CP/Pa,P'a-17	S = RB; A' = 4,α,β,β-Tetramethylstyrene; meas. $k_t/k_r^{A'} = 0.67$.	71F577
3.118	**Styrene, 4-methoxy-α,β,β-trimethyl-**						
	MeOH/ *tert*-BuOH (50:50)				CR/Pa,P'a-17	A' = 4,α,β,β-Tetramethylstyrene; meas. $k_t/k_r^{A'}$ = 1.3; $^1O_2$* from H_2O_2/NaOCl.	71F577
	MeOH/ C_5H_5N (98:2)				CP/Pa,P'a-17	S = RB; A' = 4,α,β,β-Tetramethylstyrene; meas. $k_t/k_r^{A'} = 1.4$.	71F577
3.119	**Styrene, β-methyl-, (*E*)-**						
	CCl_4/ MeOH (96:4)	2×10^3			PL/A'd-8	S = MB; A' = DPBF.	777162
3.120	**Styrene, β-methyl-, (*Z*)-**						
	CCl_4/ MeOH (96:4)	5×10^3			PL/A'd-8	S = MB; A' = DPBF.	777162
3.121	**Styrene, 3,α,β,β-tetramethyl-**						
	MeOH/ *tert*-BuOH (50:50)				CR/Pa,P'a-17	A' = *p*-Chloro-α,β,β-trimethylstyrene; meas. $k_t/k_r^{A'} = 1.4$; $^1O_2$* from H_2O_2/NaOCl.	71F577
	MeOH/ C_5H_5N (98:2)				CP/Pa,P'a-17	S = RB; A' = *p*-Chloro-α,β,β-trimethylstyrene; meas. $k_t/k_r^{A'} = 1.5$.	71F577
3.122	**Styrene, 4,α,β,β-tetramethyl-**						
	MeOH/ *tert*-BuOH (50:50)				CR/Pa,P'a-17	A' = *p*-Chloro-α,β,β-trimethylstyrene; meas. $k_t/k_r^{A'}$ = 1.9; $^1O_2$* from H_2O_2/NaOCl.	71F577
	MeOH/ C_5H_5N (98:2)				CP/Pa,P'a-17	S = RB; A' = *p*-Chloro-α,β,β-trimethylstyrene; meas. $k_t/k_r^{A'} = 2.2$.	71F577
3.123	**Styrene, α,β,β-trimethyl- (TMS)**						
	MeOH/ *tert*-BuOH (50:50)				CR/Pa,P'a-17	A' = 4,α,β,β-Tetramethylstyrene; meas. $k_t/k_r^{A'}$ = 0.83; $^1O_2$* from H_2O_2/NaOCl.	71F577
	MeOH/ *tert*-BuOH (50:50)				CR/Pa,P'a-17	A' = 4-$CH_3OC_6H_4C(CH_3)$=$C(CH_3)_2$; meas. $k_t/k_r^{A'} = 0.57$; $^1O_2$* from H_2O_2/NaOCl.	71F577
	MeOH/ C_5H_5N (98:2)				CP/Pa,P'a-17	S = RB; A' = 4-$CH_3OC_6H_4C(CH_3)$=$C(CH_3)_2$; meas. $k_t/k_r^{A'} = 0.51$.	71F577
3.124	**Tetracene**						
	C_6H_6		2.4×10^{-3}	298	CP/Ac-?	S = A.	767422
	C_6H_6	1.2×10^7 (k_t)		298	CP/Ac,A'c-17	S = A' = Rub; used $k_r^{A'} = 4.2 \times 10^7\ L\ mol^{-1}\ s^{-1}$; meas. $k_t/k_r^{A'} = 0.29$.	747312
	C_6H_6			298	CP/Pa,P'a-17	S = A; A' = DMA; meas. $k_t/k_r^{A'} = 0.18$.	706079
	C_6H_6		1.7×10^{-3}	298	CP/Ac-15	S = A.	706079
	C_6H_6			298	CP/Pa,P'a-17	S = A; A' = DMBA; meas. $k_t/k_r^{A'} = 0.46$.	706079
	CCl_4	6.9×10^6 (k_t)			CP/Ac-14,27	S = PP; used $k_d = 36\ s^{-1}$.	82A421
	CCl_4	5×10^6 (k_t)			CP/Ac-27,28	S = Ph a; used $k_d = 36\ s^{-1}$; $f_r^A = 1$.	79A010
	CCl_4	5×10^6			MP/LI-12	S = PP, Ph a or BChl a; used $k_d = 36\ s^{-1}$.	78E881 79A010
	CCl_4	7×10^6			MP/LI-12	S = TPP; used $k_d = 36\ s^{-1}$.	78E892
	CCl_4	5×10^6			MP/LI-12	S = Ret; used $k_d = 36\ s^{-1}$.	78F700
	CH_2Cl_2	1.8×10^7	4.0×10^{-4}		CP/Ac-14	S = A; used $k_d = 7.3 \times 10^3\ s^{-1}$.	75F654
3.125	**Tetracene, 5,6,11,12-tetraphenyl- (Rubrene)**						
	C_5H_5N				CP/Ac-17	S = A; A' = TME; meas. $k_t/k_r^{A'} = 2.1$.	66F041
	C_5H_5N				CP/Ac-17	S = MB; A' = TME; meas. $k_t/k_r^{A'} = 2.4$.	66F041
	C_6D_6	4.3×10^7			PL/Ad-5	S = 3,6-Bis(dibutylamino)phenothiazinium bromide.	81A287

TABLE 3. Rate constants for interaction of singlet oxygen with aromatic substrates. — Continued

No.	Solvent	k (L mol^{-1} s^{-1})	β (k_d/k) (mol L^{-1})	T (K)	Method	Comment	Ref.
3.125	**Tetracene, 5,6,11,12-tetraphenyl- (Rubrene)** — Continued						
	c-C_6H_{12}	1.5×10^7	4.0×10^{-3}	297	CP/Ac-15	S = A; used $k_d = 5.9 \times 10^4$ s^{-1}.	747207
	1,2,3-$C_6H_3Cl_3$	5.0×10^7	4×10^{-4}	298	CP/Ac-15	S = A; used $k_d = 2.0 \times 10^4$ s^{-1}.	756223
	C_6H_5Br	1.6×10^7	8×10^{-4}	297	CP/Ac-15	S = A; used $k_d = 1.3 \times 10^4$ s^{-1}.	747207
	$C_6H_5CH_3$	2.5×10^7		293	PL/Ad-5	S = A.	82E072
	$C_6H_5CH_3$	5.5×10^7	9×10^{-4}	298	CP/Ac-15	S = A; used $k_d = 5.0 \times 10^4$ s^{-1}.	756223
	C_6H_5CN	1.3×10^8			PL/Ad-5	S = A.	83F075
	C_6H_6	3.4×10^7			CP/Ac-15	S = A; used $k_d = \geq 3.3 \times 10^4$ s^{-1}.	87E142
	C_6H_6		1.0×10^{-3}	298	CP/Ac-?	S = A.	767422
	C_6H_6	4.7×10^7	9×10^{-4}	298	CP/Ac-15	S = A; used $k_d = 4.2 \times 10^4$ s^{-1}.	756223
	C_6H_6	4.2×10^7	1.0×10^{-3}	298	CP/Ac-15	S = A; used $k_d = 4.2 \times 10^4$ s^{-1}.	747312
	C_6H_6	4.3×10^7 (k_r)		298	CP/Ac,A'c-17	S = A; A' = 1,2-Dithiolane-3-pentanoic acid; used $k_r^{A'} = 1.0 \times 10^8$ L mol^{-1} s^{-1}; meas. $k_r/k_r^{A'} = 0.43$; β derived assuming $f_r^{A'} = 2$.	74F641
	C_6H_6		9×10^{-4}	298	CP/Ac-23	S = A; A' = 1,2-Dithiolane-3-pentanoic acid.	74F641
	C_6H_6		3.0×10^{-4}	298	CP/Ac-15	S = A.	706079
	C_6H_6			298	CP/Pa,P'a-17	S = A; A' = DMA; meas. $k_r/k_r^{A'} = 1.0$.	706079
	C_6H_6			298	CP/Pa,P'a-17	S = A; A' = DMBA; meas. $k_r/k_r^{A'} = 2.8$.	706079
	C_6H_6		1.7×10^{-3}		CP/Ac-15	S = A.	55F004
	CCl_4	2.3×10^7	6×10^{-5}	298	CP/Ac-15	S = A; used $k_d = 1.4 \times 10^3$ s^{-1}.	756223
	CCl_4	1.4×10^7	1×10^{-4}	297	CP/Ac-15	S = A; used $k_d = 1.4 \times 10^3$ s^{-1}.	747207
	CD_3CN	8.0×10^7			PL/Ad-5	S = 2-ACN.	81A287
	CD_3COCD_3	2.8×10^7			PL/Ad-5	S = 2-ACN.	81A287
	$CDCl_3$	3.9×10^7			PL/Ad-5	S = 2-ACN.	81A287
	CH_2Cl_2	5.4×10^7 (k_r)	2.2×10^{-4} (β_r)		CR/Ac-31	used $k_d = 1.2 \times 10^4$ s^{-1}; $^1O_2$* from triphenyl phosphite ozonide; $f_r^A = 1$.	85M406
	$CHCl_3$	5.3×10^7	3.1×10^{-4}		CP/Ac-15	S = A; used $k_d = 1.7 \times 10^4$ s^{-1}.	777486
	$CHCl_3$	5.9×10^7	3×10^{-4}	298	CP/Ac-15	S = A; used $k_d = 1.7 \times 10^4$ s^{-1}.	756223
	$CHCl_3$	4.3×10^7	4×10^{-4}	297	CP/Ac-15	S = A; used $k_d = 1.7 \times 10^4$ s^{-1}.	747207
	CS_2	4.4×10^7		295	MP/Ld-2	S = TPP.	89A400
	CS_2		1×10^{-6}	295	CP/Ac-14	S = A; [Rub] = (8-16) $\times 10^{-6}$ mol L^{-1}.	89A400
	CS_2		9×10^{-6}	295	CP/Ac-14	S = A; [Rub] = (6-15) $\times 10^{-5}$ mol L^{-1}.	89A400
	CS_2	5.6×10^7	9×10^{-5}	298	CP/Ac-15	S = A; used $k_d = 5.0 \times 10^3$ s^{-1}.	756223
	CS_2	2.5×10^7	2×10^{-4}	297	CP/Ac-15	S = A; used $k_d = 5.0 \times 10^3$ s^{-1}.	747207
	EtOH	2.3×10^7	3.6×10^{-3}	297	CP/Ac-15	S = A; used $k_d = 8.3 \times 10^4$ s^{-1}.	747207
	MeOH	3.1×10^7	4×10^{-3}	297	CP/Ac-15	S = A; used $k_d = 1.4 \times 10^5$ s^{-1}.	747207
3.126	**Tetracene-2,3,8,9-tetracarboxylate, 5,6,11,12-tetraphenyl- (Rubrene-2,3,8,9-tetracarboxylate)**						
	D_2O		9×10^{-5}		CL/Ac-15	S = A.	81F043
	H_2O pH = 10.5		1.6×10^{-3}	298	CR/Pa-31	$^1O_2$* from MoO_4^{2-}/H_2O_2.	88M109
	H_2O		1.5×10^{-3}		CL/Ac-15	S = A.	81F043
3.127	**Toluene**						
	CCl_4	3.9×10^3		298	CP/LI-12	S = Benz[*de*]anthracen-7-one, phenalenone or fluorenone; used $k_d = 32$ s^{-1}.	82E329
3.128	**Toluene-d_8**						
	CCl_4	3.4×10^2		298	CP/LI-12	S = Benz[*de*]anthracen-7-one, phenalenone or fluorenone; used $k_d = 32$ s^{-1}.	82E329

TABLE 3. Rate constants for interaction of singlet oxygen with aromatic substrates. — Continued

No.	Solvent	k ($L\ mol^{-1}\ s^{-1}$)	β (k_d/k) ($mol\ L^{-1}$)	T (K)	Method	Comment	Ref.
3.129	**Tribenzo[*a,f,j*]perylene, 9,18-diphenyl- (Mesodiphenylbenzhelianthrene)**						
	$C_6H_5CH_2OH$	4×10^9 1.0×10^8 (k_r)	2×10^{-5}		CL/Ac-14	S = RB; used $k_d = 7.1 \times 10^4\ s^{-1}$; meas. f_r^A = 0.028.	87F479
	$C_6H_5CH_3$/ MeOH (99:1)	7×10^9 1.7×10^8 (k_r)	6.2×10^{-6}		CL/Ac-14	S = RB; used $k_d = 4.0 \times 10^4\ s^{-1}$; meas. f_r^A = 0.025.	87F479
	MeOH/ $C_6H_5CH_3$ (97:3)	6.2×10^9 1.6×10^8 (k_r)	2×10^{-5}		CL/Ac-14	S = RB; used $k_d = 1.1 \times 10^5\ s^{-1}$; meas. f_r^A = 0.026.	87F479

TABLE 4. Rate constants for interaction of singlet oxygen with phenols and naphthols.

No.	Solvent	k ($L\ mol^{-1}\ s^{-1}$)	β (k_d/k) (mol L^{-1})	T (K)	Method	Comment	Ref.
4.1	**L-Alanine, glycyl-L-tyrosyl-**						
	EtOH/ CH_3CN (80:20)	3.0×10^7 (k_r)			CP/Ac,A'c-17	S = RB; A' = DMA; used $k_r^{A'} = 8.2 \times 10^8$ L mol^{-1} s^{-1}; 0.01 mol L^{-1} KOH.	93F413
	EtOH/ CH_3CN (80:20)	2.0×10^8			PL/Ld-2	S = RB; 0.01 mol L^{-1} KOH.	93F413
	H_2O pH = 11.5	2.0×10^9			CP/Ac-15	S = RB; used $k_d = 2.5 \times 10^5$ s^{-1}.	93F413
	H_2O pH = 11.5	1.0×10^8 (k_r)			CP/Oc-17	S = RB; A' = FFA; used $k_r^{A'} = 1.2 \times 10^8$ L mol^{-1} s^{-1}.	93F413
4.2	**Anthrone, 1,8-dihydroxy- (Anthralin)**						
	C_6D_6	2.8×10^4			PL/Ld-2	S = TPP.	90A300
	C_6H_6	$\sim 4 \times 10^4$			PL/Ld-2	S = PPDME.	89E158
4.3	**Anthrone, 1,8-dihydroxy-, conjugate base**						
	CH_3CN	3.1×10^8	5.9×10^{-5}	295	CP/Ac-15	S = RB; used $k_d = 1.8 \times 10^4$ s^{-1}.	90A300
	CH_3CN	2×10^8 (k_r)			CP/Ac-17	S = RB; A' = TME; used $k_r^{A'} = 3.0 \times 10^7$ L mol^{-1} s^{-1}; meas. $k_r/k_r^{A'} = 6$.	90A300
	D_2O pD = 9.4-11.4	3×10^8			PL/Ld-2	S = RB.	90A300
4.4	**1,2-Benzenediol (Catechol)**						
	CD_3OD	1.7×10^6		293	PL/Ld-2	S = HP.	90F411
	CH_3CN	2.9×10^6			PL/Ld-2	S = RB.	91A341
	D_2O	5.4×10^7			PL/Ld-2	S = RB.	91A341
	dioxane	1.4×10^6			PL/Ld-2	S = ZnTPP.	91A341
4.5	**1,2-Benzenediol, 4-(2-aminoethyl)- (Dopamine)**						
	D_2O	2.5×10^7			PL/Ld-2	S = MB.	91R251
	MeOH	1.0×10^6	0.092		CP/A'c-16	S = RB; A' = DPBF; used $k_d = 9 \times 10^4$ s^{-1}.	86F226
4.6	**1,2-Benzenediol, 4-(2-amino-1-hydroxyethyl)- (Noradrenaline)**						
	MeOH	1.6×10^6	0.055		CP/A'c-16	S = RB; A' = DPBF; used $k_d = 9 \times 10^4$ s^{-1}.	86F226
4.7	**1,2-Benzenediol, 3,5-bis(1,1-dimethylethyl)-**						
	CD_3OD	2.5×10^7		293	PL/Ld-2	S = HP.	90F411
	CD_3COCD_3	1.3×10^7			PL/Ld-2	S = MPDME.	87F676
4.8	**1,2-Benzenediol, 4-(1,1-dimethylethyl)-**						
	CH_2Cl_2	4×10^6			PL/Tb-3	S = TPP.	83A050
4.9	**1,2-Benzenediol, 4-(2-methylamino-1-hydroxy)ethyl- (Adrenaline)**						
	MeOH	2.3×10^6	0.040		CP/A'c-16	S = RB; A' = DPBF; used $k_d = 9 \times 10^4$ s^{-1}.	86F226
4.10	**1,3-Benzenediol (Resorcinol)**						
	CD_3OD	6.5×10^5		293	PL/Ld-2	S = HP.	90F411
	CH_3CN	3.9×10^6			PL/Ld-2	S = RB.	91A341
	CH_3CN	2×10^5 (k_r)			CP/Ac,A'c-17	S = MPDME; A' = DMA; used $k_r^{A'} = 1.3 \times 10^8$ L mol^{-1} s^{-1}.	91A341
	D_2O	2×10^7			PL/Ld-2	S = RB.	91A341
	H_2O	2×10^7 (k_r)		293	CP/Oc-17	S = Eos; A' = His; used $k_r^{A'} = 7 \times 10^7$ L mol^{-1} s^{-1}.	91A341
	dioxane	5.5×10^5			PL/Ld-2	S = ZnTPP.	91A341
4.11	**1,3-Benzenediol, 4-chloro-**						
	CH_3CN	1.9×10^7			PL/Ld-2	S = RB.	91A341

TABLE 4. Rate constants for interaction of singlet oxygen with phenols and naphthols. — Continued

No.	Solvent	k ($L\ mol^{-1}\ s^{-1}$)	β (k_d/k) ($mol\ L^{-1}$)	T (K)	Method	Comment	Ref.
4.11	**1,3-Benzenediol, 4-chloro-** — Continued						
	CH_3CN	5×10^5 (k_r)			CP/Ac,A'c-17	S = MPDME; A' = DMA; used $k_r^{A'} = 1.3 \times 10^8$ L $mol^{-1}\ s^{-1}$.	91A341
	D_2O	2.2×10^7			PL/Ld-2	S = RB.	91A341
	H_2O	2.1×10^7 (k_r)		293	CP/Oc-17	S = Eos; A' = His; used $k_r^{A'} = 7 \times 10^7$ L mol^{-1} s^{-1}.	91A341
	dioxane	6.5×10^5			PL/Ld-2	S = ZnTPP.	91A341
4.12	**1,4-Benzenediol (Hydroquinone)**						
	C_5H_5N	6.9×10^7			CP/A'c-23	S = A' = Rub; used $k_d = 6.0 \times 10^4\ s^{-1}$, $k_{A'} = 4 \times 10^7$ L $mol^{-1}\ s^{-1}$.	743112
	C_6H_6/ MeOH (80:20)	7×10^7		298	CP/P'a-20	S = MB; A' = 2M2P; used $k_d = 1.0 \times 10^5\ s^{-1}$, $\beta_{A'} = 0.04$ mol L^{-1}.	70F734
	CD_3OD	1.4×10^7		293	PL/Ld-2	S = HP.	90F411
	CH_3CN	5×10^5 (k_r)			CP/Ac,A'c-17	S = MPDME; A' = DMA; used $k_r^{A'} = 1.3 \times 10^8$ L $mol^{-1}\ s^{-1}$.	91A341
	CH_3CN	2.8×10^7			PL/Ld-2	S = RB.	91A341
	D_2O	2.9×10^8			PL/Ld-2	S = RB.	91A341
	EtOH	1.4×10^7		308	CR/A'c-16	A' = DPBF; used $k_d = 8.3 \times 10^4\ s^{-1}$; $^1O_2$* from $MNPO_2$.	93M161
	EtOH/ H_2O (95:5)	~6×10^6			CR/LI-12	$^1O_2$* from pyrogallol autooxidation by O_2/KOH; k_d not given.	78F605
	H_2O	2.5×10^7 (k_r)		293	CP/Oc-17	S = Eos; A' = His; used $k_r^{A'} = 7 \times 10^7$ L mol^{-1} s^{-1}.	91A341
	H_2O	~4×10^7 (k_r)		300	MP/Ac,A'c-17	S = RB; A' = FFA; used $k_r^{A'} = 1.2 \times 10^8$ L mol^{-1} s^{-1}; reported $k = (3.8 \pm 5.5) \times 10^7$ L $mol^{-1}\ s^{-1}$.	91F300
	dioxane	1.9×10^7			PL/Ld-2	S = ZnTPP.	91A341
4.13	**1,4-Benzenediol, conjugate dibase (Hydroquinone dianion)**						
	H_2O pH = 10.6	5.6×10^7		310	CR/LI-12	used $k_d = 3.2 \times 10^5\ s^{-1}$; soln. cont. 5×10^{-4} mol L^{-1} $CoCl_2$, $^1O_2$* from autoxidation of oxytetracycline.	92M228
4.14	**1,4-Benzenediol, 2,5-bis(1,1-dimethylethyl)-**						
	CD_3OD	1.9×10^8		293	PL/Ld-2	S = HP.	90F411
	MeOH	6.2×10^7	2.9×10^{-3}		CP/A'c-16	S = RB; A' = DPBF; used $k_d = 1.8 \times 10^5\ s^{-1}$.	88F440
4.15	**1,4-Benzenediol, 2,6-bis(1,1-dimethylethyl)-, 4-propanoate**						
	MeOH	2.2×10^5	0.53		CP/A'c-16	S = MB; A' = DPF; used $k_d = 1.2 \times 10^5\ s^{-1}$.	78A171
4.16	**1,4-Benzenediol, 2,5-bis(2,2-dimethylpropyl)-**						
	MeOH	6.9×10^7	2.6×10^{-3}		CP/A'c-16	S = RB; A' = DPBF; used $k_d = 1.8 \times 10^5\ s^{-1}$.	88F440
4.17	**1,4-Benzenediol, 2,5-bis-*sec*-dodecyl-**						
	MeOH	6.4×10^7	2.8×10^{-3}		CP/A'c-16	S = RB; A' = DPBF; used $k_d = 1.8 \times 10^5\ s^{-1}$.	88F440
4.18	**1,4-Benzenediol, 2,5-bis-*sec*-hexadecyl-**						
	MeOH	6.6×10^7	2.7×10^{-3}		CP/A'c-16	S = RB; A' = DPBF; used $k_d = 1.8 \times 10^5\ s^{-1}$.	88F440
4.19	**1,4-Benzenediol, 2,5-bis-*sec*-octyl-**						
	MeOH	6.8×10^7	2.6×10^{-3}		CP/A'c-16	S = RB; A' = DPBF; used $k_d = 1.8 \times 10^5\ s^{-1}$.	88F440
4.20	**1,4-Benzenediol, chloro-**						
	CH_3CN	1.6×10^7			PL/Ld-2	S = RB.	91A341
	CH_3CN	3×10^5 (k_r)			CP/Ac,A'c-17	S = MPDME; A' = DMA; used $k_r^{A'} = 1.3 \times 10^8$ L $mol^{-1}\ s^{-1}$.	91A341

TABLE 4. Rate constants for interaction of singlet oxygen with phenols and naphthols. — Continued

No.	Solvent	k ($L\ mol^{-1}\ s^{-1}$)	β (k_d/k) ($mol\ L^{-1}$)	T (K)	Method	Comment	Ref.
4.30	**1,4-Benzenediol, chloro-** — Continued						
	D_2O	6×10^7			PL/Ld-2	S = RB.	91A341
	H_2O	1.7×10^7 (k_r)		293	CP/Oc-17	S = Eos; A′ = His; used $k_r^{A'} = 7 \times 10^7$ L mol^{-1} s^{-1}.	91A341
	dioxane	9.7×10^6			PL/Ld-2	S = ZnTPP.	91A341
4.31	**1,4-Benzenediol, 2,3-dimethoxy-5-methyl-**						
	EtOH	9.3×10^7		308	CR/A′c-16	A′ = DPBF; used $k_d = 8.3 \times 10^4$ s^{-1}; $^1O_2$* from $MNPO_2$.	93M161
4.32	**1,4-Benzenediol, 2,3-dimethyl-**						
	EtOH	8.5×10^7		308	CR/A′c-16	A′ = DPBF; used $k_d = 8.3 \times 10^4$ s^{-1}; $^1O_2$* from $MNPO_2$.	93M161
4.33	**1,4-Benzenediol, 2,5-dimethyl-**						
	EtOH	9.9×10^7		308	CR/A′c-16	A′ = DPBF; used $k_d = 8.3 \times 10^4$ s^{-1}; $^1O_2$* from $MNPO_2$.	93M161
4.34	**1,4-Benzenediol, 2,6-dimethyl-**						
	EtOH	5.4×10^7		308	CR/A′c-16	A′ = DPBF; used $k_d = 8.3 \times 10^4$ s^{-1}; $^1O_2$* from $MNPO_2$.	93M161
4.35	**1,4-Benzenediol, 2-(3,7,11,15,19,23-hexamethyl-2,6,10,14,18,22-tetracosahexaenyl)-5,6-dimethoxy-3-methyl- (*all-E*) (Ubiquinol 10)**						
	EtOH	1.6×10^8		308	CR/A′c-16	A′ = DPBF; used $k_d = 8.3 \times 10^4$ s^{-1}; $^1O_2$* from $MNPO_2$.	93M161
4.36	**1,4-Benzenediol, 2-(3-hydroxy-3,7,11,15-tetramethylhexadecyl)-3,6-dimethyl- (β-Tocopherol hydroquinone)**						
	EtOH	1.2×10^8		308	CR/A′c-16	A′ = DPBF; used $k_d = 8.3 \times 10^4$ s^{-1}; $^1O_2$* from $MNPO_2$.	93M161
4.37	**1,4-Benzenediol, 2-(3-hydroxy-3,7,11,15-tetramethylhexadecyl)-5,6-dimethyl- (γ-Tocopherol hydroquinone)**						
	EtOH	1.2×10^8		308	CR/A′c-16	A′ = DPBF; used $k_d = 8.3 \times 10^4$ s^{-1}; $^1O_2$* from $MNPO_2$.	93M161
4.38	**1,4-Benzenediol, 2-(3-hydroxy-3,7,11,15-tetramethylhexadecyl)-3,5,6-trimethyl- (α-Tocopherol hydroquinone)**						
	EtOH	1.3×10^8		308	CR/A′c-16	A′ = DPBF; used $k_d = 8.3 \times 10^4$ s^{-1}; $^1O_2$* from $MNPO_2$.	93M161
4.39	**1,4-Benzenediol, 2-methyl-**						
	EtOH	4.4×10^7		308	CR/A′c-16	A′ = DPBF; used $k_d = 8.3 \times 10^4$ s^{-1}; $^1O_2$* from $MNPO_2$.	93M161
4.40	**1,4-Benzenediol, phenyl- (2,5-Dihydroxybiphenyl)**						
	H_2O pH = 8.0	2.4×10^7 (k_r)			CP/Oc-17	S = RB; A′ = Met; used $k_r^{A'} = 2 \times 10^7$ L mol^{-1} s^{-1}.	93E536
4.41	**1,4-Benzenediol, trimethyl-**						
	EtOH	1.2×10^8		308	CR/A′c-16	A′ = DPBF; used $k_d = 8.3 \times 10^4$ s^{-1}; $^1O_2$* from $MNPO_2$.	93M161
4.42	**Benzenemethanol, 3,5-bis(1,1-dimethylethyl)-4-hydroxy-**						
	C_6H_6	4.1×10^5			CP/P′a-19	S = ZnTPP; A′ = 2M2P; used $k_{A'} = 7.5 \times 10^5$ L mol^{-1} s^{-1}; meas. $k_A/k_{A'} = 0.55$.	78A171
	MeOH	1.5×10^6	0.079		CP/A′c-16	S = MB; A′ = DPF; used $k_d = 1.2 \times 10^5$ s^{-1}.	78A171
4.43	**3-Benzenepropanoic acid, 3,5-bis(1,1-dimethylethyl)-4-hydroxy-, octadecyl ester**						
	CCl_4/ MeOH (98:2)	4.6×10^5			FP/A′d-5	S = MB; A′ = DPBF.	78E238
	i-octane	$<1 \times 10^6$			CP/A′c-23	S = A′ = Rub; No measurable effect.	732066

TABLE 4. Rate constants for interaction of singlet oxygen with phenols and naphthols. — Continued

No.	Solvent	k ($L\ mol^{-1}\ s^{-1}$)	β (k_d/k) ($mol\ L^{-1}$)	T (K)	Method	Comment	Ref.
4.34	**3-Benzenepropanoic acid, 4-hydroxy-**						
	D_2O/ EtOH (75:25)	2.4×10^7		295	PL/Ld-2	S = RB.	94A113
4.35	**Benzoate ion, 2-hydroxy- (Salicylate ion)**						
	H_2O (ves) pH = 7.5	1.4×10^5 (k_r)		310	CP/Oc-17	S = RB; A′ = His; used $k_r^{A'} = 2.8 \times 10^7$ L mol^{-1} s^{-1}; DLPC liposomes.	93F231
	H_2O (ves) pH = 7.5	1.6×10^7	0.016	310	CP/Oc-14	S = AlCl(tspc); used $k_d = 2.5 \times 10^5\ s^{-1}$; DLPC liposomes.	93F231
	H_2O (ves) pH = 7.5	2.0×10^7	0.012	310	CP/Oc-14	S = MC 540; used $k_d = 2.5 \times 10^5\ s^{-1}$; DLPC liposomes.	93F231
	H_2O (ves) pH = 7.5	2.5×10^5 (k_r)		310	CP/Oc-17	S = MC 540; A′ = His; used $k_r^{A'} = 2.8 \times 10^7$ L mol^{-1} s^{-1}; DLPC liposomes.	93F231
	H_2O (ves) pH = 7.5	2.1×10^5 (k_r)		310	CP/Oc-17	S = AlCl(tspc); A′ = His; used $k_r^{A'} = 2.8 \times 10^7$ L mol^{-1} s^{-1}; DLPC liposomes.	93F231
	H_2O (ves) pH = 7.5	1.1×10^7	0.022	310	CP/Oc-14	S = RB; used $k_d = 2.5 \times 10^5\ s^{-1}$; DLPC liposomes.	93F231
4.36	**Benzofuran-5-ol, 2,3-dihydro-2,2,4,6,7-pentamethyl-**						
	EtOH	3.6×10^8		308	CR/A′c-16	A′ = DPBF; used $k_d = 8.3 \times 10^4\ s^{-1}$; $^1O_2$* from $MNPO_2$.	91F285
4.37	**Benzofuran-5-ol, 2,3-dihydro-2,4,6,7-tetramethyl-**						
	EtOH	2.5×10^8		308	CR/A′c-16	A′ = DPBF; used $k_d = 8.3 \times 10^4\ s^{-1}$; $^1O_2$* from $MNPO_2$.	91F285
4.38	**Benzoic acid, 3,5-bis(1,1-dimethylethyl)-4-hydroxy-, 2,4-bis(1,1-dimethylethyl)phenyl ester**						
	C_6H_5Br	$<1 \times 10^6$		273	MD/A′c-33	A′ = Rub; No measurable effect.	737333
	i-octane	$<1 \times 10^6$			CP/A′c-23	S = A′ = Rub; No measurable effect.	732066
4.39	**Benzoic acid, 3,5-bis(1,1-dimethylethyl)-4-hydroxy-, methyl ester**						
	1-BuOH	9.2×10^5		293	CP/A′c-23	S = MB; A′ = Np; used $k_d = 5.2 \times 10^4\ s^{-1}$, $k_{A'} = 5.2 \times 10^8$ L mol^{-1} s^{-1}.	78A266
4.40	**Benzoic acid, 2-hydroxy-, methyl ester (Methyl salicylate)**						
	H_2O	$<2 \times 10^6$ (k_r)		292	MP/Ac,A′c-17	S = RB; A′ = FFA; used $k_r^{A'} = 1.2 \times 10^8$ L mol^{-1} s^{-1}; estd. using $pK_a = 9.8$.	87A180
4.41	**Benzoic acid, 2-hydroxy-, methyl ester, conjugate base**						
	H_2O pH = 10.0	1.6×10^8 (k_r)		292	MP/Ac,A′c-17	S = RB; A′ = FFA; used $k_r^{A'} = 1.2 \times 10^8$ L mol^{-1} s^{-1}; estd. using $pK_a = 9.8$.	87A180
4.42	**Benzophenone, 4-dodecyloxy-2-hydroxy-**						
	CCl_4/ MeOH (98:2)	$<2 \times 10^5$			FP/A′d-5	S = MB; A′ = DPBF.	78E238
	i-octane	$<1 \times 10^6$			CP/A′c-23	S = A′ = Rub; No measurable effect.	732066
4.43	**Benzophenone, 2-hydroxy-4-octyloxy-**						
	C_6H_5Br	$<1 \times 10^6$		273	MD/A′c-33	A′ = Rub; No measurable effect.	737333
	CCl_4/ $CHCl_3$ (90:10)	1.0×10^4			CP/A′c-23	S = A′ = Rub; used $k_d = 1.4 \times 10^3\ s^{-1}$, $k_{A'} = 7 \times 10^7$ L mol^{-1} s^{-1}; Measured $k/(k_{A'}[A'] + k_d) = 10.0$ L mol^{-1} at $[A'] = 5 \times 10^{-6}$ mol L^{-1}.	74F645
4.44	**1-Benzopyran-2-carboxylate ion, 3,4-dihydro-6-hydroxy-2,5,7,8-tetramethyl- (Trolox C anion)**						
	CD_3OD	1.2×10^8		293	PL/Ld-2	S = HP.	90F411
	D_2O/ EtOH (50:50)	4.7×10^8		310	CR/LI-12	used $k_d = 1 \times 10^5\ s^{-1}$; $^1O_2$* from $NDPO_2$.	90A184
	EtOH	8.1×10^7		308	CR/A′c-16	A′ = DPBF; used $k_d = 8.3 \times 10^4\ s^{-1}$; $^1O_2$* from $MNPO_2$.	91F285

TABLE 4. Rate constants for interaction of singlet oxygen with phenols and naphthols. — Continued

No.	Solvent	k (L mol^{-1} s^{-1})	β (k_d/k) (mol L^{-1})	T (K)	Method	Comment	Ref.
4.43	**1-Benzopyran-6-ol, 5,7-diethyl-3,4-dihydro-2-methyl-2-(4,8,12-trimethyltridecyl)-**						
	EtOH	9.5×10^7		308	CR/A'c-16	A' = DPBF; used $k_d = 8.3 \times 10^4$ s^{-1}; $^1O_2$* from $MNPO_2$.	91F285
4.44	**1-Benzopyran-6-ol, 3,4-dihydro-2,8-dimethyl-2-(4,8,12-trimethyltridecyl)- (δ-Tocopherol)**						
	n-$C_{16}H_{34}$	5.0×10^6		298	MD/A'c-33	A' = Rub; used $k_d = 9 \times 10^4$ s^{-1}, $k_{A'} = 7.3 \times 10^7$ L mol^{-1} s^{-1}.	88F415
	$CHCl_3$/ EtOH (50:50)	1.6×10^8 1.7×10^6 (k_r)		310	CR/LI,Ac-12,31	used $k_d = 1 \times 10^5$ s^{-1}; $^1O_2$* from $NDPO_2$.	90A184
	EtOH	5.3×10^7		308	CR/A'c-16	A' = DPBF; used $k_d = 8.3 \times 10^4$ s^{-1}; $^1O_2$* from $MNPO_2$.	91F285
	EtOH	1.0×10^8	8.3×10^{-4}	293	CP/P'a-22	S = MB; used $k_d = 8.3 \times 10^4$ s^{-1}; A' = Methyl linoleate; P' = Methyl linoleate hydroperoxide.	77F858
	EtOH	7×10^5 (k_r)		293	CP/P'a,Ac-17	S = MB; used $k_r^{A'} = 7.3 \times 10^4$ L mol^{-1} s^{-1}; meas. $k_r/k_r^{A'} = 11$; A' = Methyl linoleate; P' = Methyl linoleate hydroperoxide.	77F858
	MeOH	1×10^8	1×10^{-3}	298	CP/Ac-15	S = MB; used $k_d = 1 \times 10^5$ s^{-1}.	72A019
4.47	**1-Benzopyran-6-ol, 3,4-dihydro-2-methyl-5,7-di(1-methylethyl)-2-(4,8,12-trimethyltridecyl)-**						
	EtOH	1.1×10^8		308	CR/A'c-16	A' = DPBF; used $k_d = 8.3 \times 10^4$ s^{-1}; $^1O_2$* from $MNPO_2$.	91F285
4.48	**1-Benzopyran-6-ol, 3,4-dihydro-1-methyl-1-(4,8,12-trimethyltridecyl)- (Tocol)**						
	EtOH	2.8×10^7		308	CR/A'c-16	A' = DPBF; used $k_d = 8.3 \times 10^4$ s^{-1}; $^1O_2$* from $MNPO_2$.	91F285
4.49	**1-Benzopyran-6-ol, 3,4-dihydro-2,2,5,7,8-pentamethyl-**						
	c-C_6H_{12}	2.4×10^7			PL/A'd-8	S = 2-ACN; A' = DPBF; $\Delta H‡ = -8.8$ kJ mol^{-1}; $\Delta S‡ = -130$ J K^{-1} mol^{-1}; studied at 278-357 K.	84E492
	$C_6H_5CH_3$	1.5×10^8			PL/A'd-8	S = 2-ACN; A' = DPBF; $\Delta H‡ = -15$ kJ mol^{-1}; $\Delta S‡ = -138$ J K^{-1} mol^{-1}; studied at 230-385 K.	84E492
	CH_3CN	5.7×10^8			PL/A'd-8	S = 2-ACN; A' = DPBF; $\Delta H‡ = -15$ kJ mol^{-1}; $\Delta S‡ = -130$ J K^{-1} mol^{-1}; studied at 230-357 K.	84E492
	CH_3COCH_3	2.6×10^8			PL/A'd-8	S = 2-ACN; A' = DPBF; $\Delta H‡ = -8.4$ kJ mol^{-1}; $\Delta S‡ = -109$ J K^{-1} mol^{-1}; studied at 250-328 K.	84E492
	D_2O (mic) pD = 7.4	4.1×10^8			PL/A'd-5	S = MB; A' = DPBF; 0.1 mol L^{-1} CTAB.	81N048
	D_2O (mic) pD = 7.4	4.0×10^8			PL/A'd-5	S = MB; A' = DPBF; 0.1 mol L^{-1} SDS.	81N048
	EtOH	2.0×10^8		308	CR/A'c-16	A' = DPBF; used $k_d = 8.3 \times 10^4$ s^{-1}; $^1O_2$* from $MNPO_2$.	91F285
	MeOH	4.0×10^7 (k_r)			CP/Ac,A'c-17	S = MB; A' = DPBF; used $k_r^{A'} = 8 \times 10^8$ L mol^{-1} s^{-1}.	91F516
	MeOH	1.6×10^8			CP/A'c-16	S = MB; A' = DPBF; used $k_d = 1.8 \times 10^5$ s^{-1}.	91F516
	MeOH	3.4×10^8			PL/A'd-8	S = 2-ACN; A' = DPBF; $\Delta H‡ = -5.9$ kJ mol^{-1}; $\Delta S‡ = -100$ J K^{-1} mol^{-1}; studied at 250-328 K.	84E492
4.50	**1-Benzopyran-6-ol, 3,4-dihydro-2,5,7,8-tetramethyl-2-(4,8,12-trimethyltridecyl)- (α-Tocopherol)**						
	n-$C_{16}H_{34}$	4.2×10^7		298	MD/A'c-33	A' = Rub; used $k_d = 9 \times 10^4$ s^{-1}, $k_{A'} = 7.3 \times 10^7$ L mol^{-1} s^{-1}.	88F415
	c-C_6H_{12}	8.4×10^7			PL/A'd-8	S = 2-ACN; A' = DPBF.	84E492
	c-C_6H_{12}	1.1×10^6 (k_r)		298	CP/Ac,A'c-17	S = A' = DPA; used $k_r^{A'} = 1.2 \times 10^6$ L mol^{-1} s^{-1}; meas. $k_r/k_r^{A'} = 0.9$.	743114
	c-C_6H_{12}	9.0×10^7	6.8×10^{-4}	298	CP/A'c-23	S = A' = Rub; used $k_d = 5.9 \times 10^4$ s^{-1}, $\beta_{A'} = 1.4 \times 10^{-3}$ mol L^{-1}.	743114

TABLE 4. Rate constants for interaction of singlet oxygen with phenols and naphthols. — Continued

No.	Solvent	k ($L\ mol^{-1}\ s^{-1}$)	β (k_d/k) ($mol\ L^{-1}$)	T (K)	Method	Comment	Ref.
4.50	**1-Benzopyran-6-ol, 3,4-dihydro-2,5,7,8-tetramethyl-2-(4,8,12-trimethyltridecyl)- (α-Tocopherol)** — Continued						
	C_5H_5N	2.5×10^8			CP/A'c-23	S = A' = Rub; used $k_d = 6.0 \times 10^4\ s^{-1}$, $k_{A'} = 4 \times 10^7\ L\ mol^{-1}\ s^{-1}$.	743112
	C_5H_5N	2.1×10^6 (k_r)			CP/Ac-14,28	S = PP; A' = Cholesterol; used $k_d = 6.0 \times 10^4\ s^{-1}$, $\beta_{A'} = 0.9\ mol\ L^{-1}$; used $k_A = 2.5 \times 10^8\ L\ mol^{-1}\ s^{-1}$.	743112
	$C_6H_5CH_3$	2.2×10^8			PL/A'd-8	S = 2-ACN; A' = DPBF; $\Delta H‡ = -14\ kJ\ mol^{-1}$; $\Delta S‡ = -138\ J\ K^{-1}\ mol^{-1}$; studied at 230-385 K.	84E492
	C_6H_6	1×10^8 2.1×10^6 (k_r) 1.4×10^8 (k_q)		298	CP/Ac,A'c-23	S = A' = Rub; used $k_d = 4.2 \times 10^4\ s^{-1}$, $k_{A'} = 4.2 \times 10^7\ L\ mol^{-1}\ s^{-1}$.	90F360
	C_6H_6	1.7×10^8	2.7×10^{-4}	298	CP/A'c-23	S = A' = Rub; used $k_d = 4.2 \times 10^4\ s^{-1}$, $\beta_{A'} = 1.0 \times 10^{-3}\ mol\ L^{-1}$.	743114
	CCl_4	5.2×10^7			CL/LI-12	S = TPP; used $k_d = 1 \times 10^3\ s^{-1}$.	85F667
	CCl_4	1×10^8			MP/LI-12	S = PP, TPP, Ph a or BPh a; used $k_d = 36\ s^{-1}$.	79A010 78E892
	CCl_4	10^8			MP/LI-12	S = Ret; used $k_d = 36\ s^{-1}$.	79F463 78F700
	CH_2Cl_2	2.7×10^7		298	CP/P'a or Oc-19	S = Chl a; A' = Soybean oil; used $k_{A'} = 1.0 \times 10^5\ L\ mol^{-1}\ s^{-1}$; meas. $k_A/k_{A'} = 2.6 \times 10^2$; measured peroxide formation.	91U128
	CH_3CN	5.9×10^8			PL/A'd-8	S = 2-ACN; A' = DPBF; $\Delta H‡ = -11\ kJ\ mol^{-1}$; $\Delta S‡ = -138\ J\ K^{-1}\ mol^{-1}$; studied at 230-357 K.	84E492
	CH_3COCH_3	4.3×10^8			PL/A'd-8	S = 2-ACN; A' = DPBF; $\Delta H‡ = -12\ kJ\ mol^{-1}$; $\Delta S‡ = -122\ J\ K^{-1}\ mol^{-1}$; studied at 250-328 K.	84E492
	$CHCl_3$	1.1×10^8			CP/A'c-16	S = MB; A' = DPBF; used $k_d = 4.4 \times 10^3\ s^{-1}$.	83A394
	$CHCl_3$/ EtOH (50:50)	2.8×10^8 3.6×10^6 (k_r)		310	CR/LI,Ac-12,31	used $k_d = 1 \times 10^5\ s^{-1}$; $^1O_2$* from $NDPO_2$.	90A184
	$ClCF_2CCl_2F$	3×10^7		298	FP/Ld-2	S = Per.	82A322
	D_2O/ EtOH (50:50)	4.5×10^8		310	CR/LI-12	used $k_d = 1 \times 10^5\ s^{-1}$; $^1O_2$* from $NDPO_2$.	90A184
	D_2O (mic)	6.4×10^8			PL/A'd-5	S = 2-ACN; A' = DPBF; 0.1 mol L^{-1} SDS.	78E144
	EtOH		3.3×10^{-3}	298	CP/Ac-15	S = 8-MOP.	92F192
	EtOH	2.1×10^8		308	CR/A'c-16	A' = DPBF; used $k_d = 8.3 \times 10^4\ s^{-1}$; $^1O_2$* from $MNPO_2$.	91F285
	EtOH	1×10^8			CP/A'c-19	S = RB; A' = Chl a; used $k_d = 1 \times 10^5\ s^{-1}$.	78F404
	EtOH	2.6×10^8	3.2×10^{-4}	293	CP/P'a-22	S = MB; used $k_d = 8.3 \times 10^4\ s^{-1}$; A' = Methyl linoleate; P' = Methyl linoleate hydroperoxide.	77F858
	EtOH	6.6×10^6 (k_r)		293	CP/P'a,Ac-17	S = MB; used $k_r^{A'} = 7.3 \times 10^4\ L\ mol^{-1}\ s^{-1}$; meas. $k_r/k_r^{A'} = 91$; A' = Methyl linoleate; P' = Methyl linoleate hydroperoxide.	77F858
	MeOH	4.5×10^8		297	CR/P'a-16	A' = TEMP; k_d not given; formn. of TEMPO monitored by esr; soln. cont. MeONa and $CoCl_2$, $^1O_2$* from autoxidation of adrenaline.	92D227
	MeOH	3.8×10^8	4.8×10^{-4}		CP/A'c-16	S = RB; A' = DPBF; used $k_d = 1.8 \times 10^5\ s^{-1}$.	88F440
	MeOH	3.0×10^8			PL/A'd-8	S = 2-ACN; A' = DPBF; $\Delta H‡ = -8\ kJ\ mol^{-1}$; $\Delta S‡ = -109\ J\ K^{-1}\ mol^{-1}$; studied at 250-328 K.	84E492
	MeOH	5×10^7 (k_r)			CP/Ac,A'c-17	S = MB; A' = DPF; used $k_r^{A'} = 1.6 \times 10^8\ L\ mol^{-1}\ s^{-1}$; meas. $k_r/k_r^{A'} = 0.29$.	743113
	MeOH	6.7×10^8	2.1×10^{-4}		CP/A'c-16	S = MB; A' = DPBF; used $k_d = 1.4 \times 10^5\ s^{-1}$.	743113
	MeOH	1×10^9	1×10^{-4}	298	CP/Ac-15	S = MB; used $k_d = 1 \times 10^5\ s^{-1}$.	72A019
	MeOH/ H_2O (95:5)	2.6×10^9		310	CR/LI-12	used $k_d = 1.8 \times 10^5\ s^{-1}$; soln. cont. 0.05 mol L^{-1} MeONa and 5×10^{-4} mol L^{-1} $CoCl_2$, $^1O_2$* from autoxidation of oxytetracycline.	92M228

TABLE 4. Rate constants for interaction of singlet oxygen with phenols and naphthols. — Continued

	Solvent	k ($L\ mol^{-1}\ s^{-1}$)	β (k_d/k) ($mol\ L^{-1}$)	T (K)	Method	Comment	Ref.
4.50	**1-Benzopyran-6-ol, 3,4-dihydro-2,5,7,8-tetramethyl-2-(4,8,12-trimethyltridecyl)- (α-Tocopherol) — Continued**						
	i-octane	1×10^8			CP/A'c-23	S = A' = Rub; used $k_{A'} = 4 \times 10^7$ L mol^{-1} s^{-1}; k_d not given.	743112
4.51	**1-Benzopyran-6-ol, 3,4-dihydro-2,5,7-trimethyl-2-(4,8,12-trimethyltridecyl)-**						
	EtOH	9.7×10^7		308	CR/A'c-16	A' = DPBF; used $k_d = 8.3 \times 10^4$ s^{-1}; $^1O_2$* from $MNPO_2$.	91F285
4.52	**1-Benzopyran-6-ol, 3,4-dihydro-2,5,8-trimethyl-2-(4,8,12-trimethyltridecyl)- (β-Tocopherol)**						
	n-$C_{16}H_{34}$	2.3×10^7		298	MD/A'c-33	A' = Rub; used $k_d = 9 \times 10^4$ s^{-1}, $k_{A'} = 7.3 \times 10^7$ L mol^{-1} s^{-1}.	88F415
	$CHCl_3$/ EtOH (50:50)	2.7×10^8 2.3×10^5 (k_r)		310	CR/LI,Ac-12,31	used $k_d = 1 \times 10^5$ s^{-1}; $^1O_2$* from $NDPO_2$.	90A184
	EtOH	1.5×10^8		308	CR/A'c-16	A' = DPBF; used $k_d = 8.3 \times 10^4$ s^{-1}; $^1O_2$* from $MNPO_2$.	91F285
	MeOH	3.6×10^8	2.8×10^{-4}	298	CP/Ac-15	S = MB; used $k_d = 1 \times 10^5$ s^{-1}.	72A019
4.53	**1-Benzopyran-6-ol, 3,4-dihydro-2,7,8-trimethyl-2-(4,8,12-trimethyltridecyl)- (γ-Tocopherol)**						
	n-$C_{16}H_{34}$	1.1×10^7		298	MD/A'c-33	A' = Rub; used $k_d = 9 \times 10^4$ s^{-1}, $k_{A'} = 7.3 \times 10^7$ L mol^{-1} s^{-1}.	88F415
	$CHCl_3$/ EtOH (50:50)	2.3×10^8 2.8×10^6 (k_r)		310	CR/LI,Ac-12,31	used $k_d = 1 \times 10^5$ s^{-1}; $^1O_2$* from $NDPO_2$.	90A184
	EtOH	1.4×10^8		308	CR/A'c-16	A' = DPBF; used $k_d = 8.3 \times 10^4$ s^{-1}; $^1O_2$* from $MNPO_2$.	91F285
	EtOH	2.6×10^6 (k_r)		293	CP/P'a,Ac-17	S = MB; used $k_r^{A'} = 7.3 \times 10^4$ L mol^{-1} s^{-1}; meas. $k_r/k_r^{A'} = 36$; A' = Methyl linoleate; P' = Methyl linoleate hydroperoxide.	77F858
	EtOH	1.8×10^8	4.5×10^{-4}	293	CP/P'a-22	S = MB; used $k_d = 8.3 \times 10^4$ s^{-1}; A' = Methyl linoleate; P' = Methyl linoleate hydroperoxide.	77F858
	MeOH	1.9×10^8	5.4×10^{-4}	298	CP/Ac-15	S = MB; used $k_d = 1 \times 10^5$ s^{-1}.	72A019
4.54	**1-Benzopyran-6-ol, 7-(1,1-dimethylethyl)-3,4-dihydro-2,2-dimethyl-**						
	MeOH	4.7×10^7 (k_r)			CP/Ac,A'c-17	S = MB; A' = DPBF; used $k_r^{A'} = 8 \times 10^8$ L mol^{-1} s^{-1}.	91F516
	MeOH	1.9×10^8			CP/A'c-16	S = MB; A' = DPBF; used $k_d = 1.8 \times 10^5$ s^{-1}.	91F516
4.55	**1-Benzopyran-6-ol, 7-(1,1-dimethylethyl)-3,4-dihydro-2-methyl-2-(4,8,12-trimethyltridecyl)-**						
	EtOH	1.2×10^8		308	CR/A'c-16	A' = DPBF; used $k_d = 8.3 \times 10^4$ s^{-1}; $^1O_2$* from $MNPO_2$.	91F285
4.56	**1-Benzopyran-6-ol, 8-(1,1-dimethylethyl)-3,4-dihydro-2-methyl-2-(4,8,12-trimethyltridecyl)-**						
	EtOH	1.6×10^8		308	CR/A'c-16	A' = DPBF; used $k_d = 8.3 \times 10^4$ s^{-1}; $^1O_2$* from $MNPO_2$.	91F285
4.57	**1-Benzopyran-4-one, 2-[3,4-bis(2-hydroxyethoxy)phenyl]-3-[6-*O*-(6-deoxy-α-L-mannopyranosyl-β-D-glycopyranosyl]oxy]-5-hydroxy-7-(2-hydroxyethoxy)- (Troxerutin)**						
	CD_3OD	7.0×10^4			CP/LI-12	S = RB; used $k_d = 3.7 \times 10^3$ s^{-1}.	93A326
	MeOD	1.0×10^4 (k_r)			CP/Ac-14	S = RB; used $k_d = 1 \times 10^5$ s^{-1}; MDH as actinometer.	93A326
4.58	**1-Benzopyran-4-one, 3-[[6-*O*-(6-deoxy-α-mannopyranosyl)-β-glucopyranosyl]oxy]-2-(3,4-dihydroxyphenyl)-5,7-dihydroxy- (Rutin)**						
	CD_3OD	1.6×10^6			CP/LI-12	S = RB; used $k_d = 4.0 \times 10^3$ s^{-1}.	93A326
	MeOD	1.1×10^5 (k_r)			CP/Ac-14	S = RB; used $k_d = 1 \times 10^5$ s^{-1}; MDH as actinometer.	93A326
4.59	**1-Benzopyran-4-one, 2-(2,3-dihydroxyphenyl)-2,3-dihydro-5,7-dihydroxy-, (Eriodictyol)**						
	CD_3OD	1.4×10^6			CP/LI-12	S = RB; used $k_d = 3.7 \times 10^3$ s^{-1}.	93A326

TABLE 4. Rate constants for interaction of singlet oxygen with phenols and naphthols. — Continued

No.	Solvent	k ($L\ mol^{-1}\ s^{-1}$)	β (k_d/k) ($mol\ L^{-1}$)	T (K)	Method	Comment	Ref.
4.60	**1-Benzopyran-4-one, 2-(3,4-dihydroxyphenyl)-5,7-dihydroxy- (Luteolin)**						
	CD_3OD	1.3×10^6			CP/LI-12	S = RB; used $k_d = 3.7 \times 10^3\ s^{-1}$.	93A326
	MeOD	1.8×10^4 (k_r)			CP/Ac-14	S = RB; used $k_d = 1 \times 10^5\ s^{-1}$; MDH as actinometer.	93A326
4.61	**1-Benzopyran-4-one, 2-(3,4-dihydroxyphenyl)-3,5,7-trihydroxy- (Quercetin)**						
	CH_3CN	9.3×10^3 (k_r)		295	CP/Ac,A'c-17	S = A' = An; used $k_r^{A'} = 2.8 \times 10^5\ L\ mol^{-1}\ s^{-1}$.	87A371
	CH_3COCH_3	3.1×10^5		295	PL/Ld-2	S = An.	87A371
	CD_3OD	2.4×10^6			CP/LI-12	S = RB; used $k_d = 4.0 \times 10^3\ s^{-1}$.	93A326
	MeOD	8.9×10^5 (k_r)			CP/Ac-14	S = RB; used $k_d = 1 \times 10^5\ s^{-1}$; MDH as actinometer.	93A326
4.62	**1-Benzopyran-4-one, 5,6,7,8-tetramethoxy-2-(4-methoxyphenyl)- (Tangeretin)**						
	CD_3OD	2.4×10^5			CP/LI-12	S = RB; used $k_d = 3.7 \times 10^3\ s^{-1}$.	93A326
	MeOD	1.0×10^4 (k_r)			CP/Ac-14	S = RB; used $k_d = 1 \times 10^5\ s^{-1}$; MDH as actinometer.	93A326
4.63	**1-Benzopyran-4-one, 2,3-dihydro-3,5,7-trihydroxy-2-(3,4-dihydroxyphenyl)- (Taxifolin)**						
	CD_3OD	1.1×10^6			CP/LI-12	S = RB; used $k_d = 3.7 \times 10^3\ s^{-1}$.	93A326
4.64	**1-Benzopyran-4-one, 3,5,7-trihydroxy-2-(4-hydroxyphenyl)- (Kaempferol)**						
	CD_3OD	7.1×10^5			CP/LI-12	S = RB; used $k_d = 3.7 \times 10^3\ s^{-1}$.	93A326
	MeOD	4.8×10^5 (k_r)			CP/Ac-14	S = RB; used $k_d = 1 \times 10^5\ s^{-1}$; MDH as actinometer.	93A326
4.65	**1-Benzopyran-4-one, 3,5,7-trihydroxy-2-phenyl- (Galangin)**						
	CD_3OD	1.2×10^6			CP/LI-12	S = RB; used $k_d = 3.7 \times 10^3\ s^{-1}$.	93A326
	MeOD	7.4×10^5 (k_r)			CP/Ac-14	S = RB; used $k_d = 1 \times 10^5\ s^{-1}$; MDH as actinometer.	93A326
4.66	**Benzopyran-2-propanoic acid, 3,4-dihydro-6-hydroxy-2,5,7,8-tetramethyl-**						
	EtOH	1.8×10^8		308	CR/A'c-16	A' = DPBF; used $k_d = 8.3 \times 10^4\ s^{-1}$; $^1O_2$* from $MNPO_2$.	91F285
4.67	**1-Benzopyran-3,5,7-triol, 2-(3,4-dihydroxyphenyl)-3,4-dihydro- (2*R-trans*)- (Catechin)**						
	CD_3OD	5.8×10^6			CP/LI-12	S = RB: used $k_d = 3.7 \times 10^3\ s^{-1}$.	93A326
4.68	**Cinnamic acid, 3,4-dihydroxy-**						
	CD_3OD	5.4×10^5		293	PL/Ld-2	S = HP.	88R236 90F411
4.69	**Cinnamic acid, 2-hydroxy-**						
	CD_3OD	2.1×10^4		293	PL/Ld-2	S = HP.	90F411
4.70	**Cinnamic acid, 4-hydroxy-3-methoxy-**						
	CD_3OD	3.5×10^5		293	PL/Ld-2	S = HP.	88R236 90F411
4.71	**5-*S*-Cysteinyldopa**						
	D_2O	2.9×10^7			PL/Ld-2	S = MB.	91R251
4.72	**Flavanone, 4',5,7-trihydroxy- (Naringenin)**						
	CD_3OD	5.0×10^4			CP/LI-12	S = RB; used $k_d = 3.7 \times 10^3\ s^{-1}$.	93A326
4.73	**Flavone, 5,7-dihydroxy- (Chrysin)**						
	CD_3OD	2.4×10^5			CP/LI-12	S = RB; used $k_d = 3.7 \times 10^3\ s^{-1}$.	93A326
	MeOD	6×10^3 (k_r)			CP/Ac-14	S = RB; used $k_d = 1 \times 10^5\ s^{-1}$; MDH as actinometer.	93A326

TABLE 4. Rate constants for interaction of singlet oxygen with phenols and naphthols. — Continued

No.	Solvent	k ($L\ mol^{-1}\ s^{-1}$)	β (k_d/k) ($mol\ L^{-1}$)	T (K)	Method	Comment	Ref.
4.74	**Flavone, 3-hydroxy-**						
	C_5H_5N	7.5×10^7			PL/Ld-2	S = RB, TPP or H_2TPPS^{4-}.	93U041 89A322
	C_6D_6	1.6×10^4			PL/Ld-2	S = RB, TPP or H_2TPPS^{4-}; 95%-*d*.	93U041 89A322
	C_6H_6	1.9×10^4			PL/Ld-2	S = RB, TPP or H_2TPPS^{4-}.	93U041 89A322
	CCl_4	1.7×10^4			PL/Ld-2	S = RB, TPP or H_2TPPS^{4-}.	93U041 89A322
	CD_3CN	1.1×10^5			PL/Ld-2	S = RB, TPP or H_2TPPS^{4-}.	93U041 89A322
	CD_3OD	9.0×10^4			PL/Ld-2	S = RB or H_2TPPS^{4-}.	93U041 89A322
	CH_3CN	1.1×10^5			PL/Ld-2	S = RB or H_2TPPS^{4-}.	93U041 89A322
	D_2O pD = 3	2.5×10^5			PL/Ld-2	S = RB or H_2TPPS^{4-}.	93U041 89A322
	D_2O pD = 12	1.9×10^8			PL/Ld-2	S = RB or H_2TPPS^{4-}.	93U041 89A322
	H_2O pH = 12	2.3×10^8			PL/Ld-2	S = RB or H_2TPPS^{4-}.	93U041 89A322
	MeOH	2.3×10^5			PL/Ld-2	S = RB or H_2TPPS^{4-}.	93U041 89A322
4.75	**Flavone, 3,3',4',7-tetrahydroxy- (Fisetin)**						
	CD_3OD	3.1×10^6			CP/LI-12	S = RB; used $k_d = 4.0 \times 10^3\ s^{-1}$.	93A326
	MeOD	1.1×10^6 (k_r)			CP/Ac-14	S = RB; used $k_d = 1 \times 10^5\ s^{-1}$; MDH as actinometer.	93A326
4.76	**Glycine, L-tyrosyl-**						
	EtOH/ CH_3CN (80:20)	4.3×10^6			PL/Ld-2	S = ZnTPP.	91A252
	EtOH/ CH_3CN (80:20)	2.1×10^6 (k_r)			CP/Ac,A'c-14,28	S = ZnTPP; A' = DMA; used $k_d = 5.3 \times 10^4\ s^{-1}$; used $k_A = 4.3 \times 10^6\ L\ mol^{-1}\ s^{-1}$.	91A252
	EtOH/ CH_3CN (80:20)	1.2×10^8			PL/Ld-2	S = ZnTPP; 0.01 mol L^{-1} KOH.	91A252
	EtOH/ CH_3CN (80:20)	1×10^7 (k_r)			CP/Ac,A'c-14,28	S = ZnTPP; A' = DMA; used $k_d = 5.3 \times 10^4\ s^{-1}$; used $k_A = 1.2 \times 10^8\ L\ mol^{-1}\ s^{-1}$; 0.01 mol L^{-1} KOH.	91A252
	EtOH/ CH_3CN (80:20)	4.2×10^6			PL/Ld-2	S = ZnTPP; 0.01 mol L^{-1} HCl.	91A252
	EtOH/ CH_3CN (80:20)	$<5 \times 10^4$ (k_r)			CP/Ac,A'c-14,28	S = ZnTPP; A' = DMA; used $k_d = 5.3 \times 10^4\ s^{-1}$; used $k_A = 4.2 \times 10^6\ L\ mol^{-1}\ s^{-1}$; 0.01 mol L^{-1} HCl.	91A252
	H_2O pH = 10	3×10^7 (k_r)			CP/Oc-17	S = RB; A' = Met; used $k_r^{A'} = 2 \times 10^7\ L\ mol^{-1}\ s^{-1}$.	91A252
	H_2O pH = 11.5	4.3×10^7 (k_r)			CP/Oc-17	S = Eos; A' = Met; used $k_r^{A'} = 2 \times 10^7\ L\ mol^{-1}\ s^{-1}$.	91A252
4.77	**1,6-Heptadiene-3,5-dione, 1,7-bis(4-hydroxy-3-methoxyphenyl)- (Curcumin)**						
	C_6D_6	2.5×10^5		295	CP/LI-12	S = TPP; used $k_d = 1.5 \times 10^3\ s^{-1}$.	94E153
	CH_3CN	$<7 \times 10^6$			CP/LI-12	S = RB; used $k_d = 1.7 \times 10^4\ s^{-1}$.	94F069
4.78	**Melanin (from DOPA)**						
	D_2O pD = 7.5-8.1	1×10^8			PL/Ld-2	S = ?; rate per monomer unit.	87R227

TABLE 4. Rate constants for interaction of singlet oxygen with phenols and naphthols. — Continued

No.	Solvent	k ($L\ mol^{-1}\ s^{-1}$)	β (k_d/k) ($mol\ L^{-1}$)	T (K)	Method	Comment	Ref.
4.78	**Melanin (from DOPA)** — Continued						
	D_2O pD = 7.6 ?	$\leq 2 \times 10^7$	$>6.7 \times 10^{-3}$	296	CP/Oc-15	S = RB; used $k_d = 1.9 \times 10^4\ s^{-1}$; based on monomer unit of MW 150.	84F330
4.79	**5,12-Naphthacenedione, 8-acetyl-10[(3-amino-2,3,6-trideoxy-hexopyranosyloxy]-tetrahydro-6,8,11-trihydroxy-1-methoxy- (Daunomycin)**						
	D_2O pH = 7.4	$\sim 10^8$			PL/Ld-2	S = AlCl(tspc); cor. for aggregation of substrate.	89B024
	H_2O pH = 7.8	2×10^7 (k_r) 1×10^9 (k_q)		308	CR/Ac-31	used $k_d = 2.4 \times 10^5\ s^{-1}$; $^1O_2$* from $MNPO_2$; 15% dimer.	89M096
	H_2O (mic) pH = 7.8	1.7×10^9		308	CP/Ac-16	S = ?; A′ = DPBF; used $k_d = 2.4 \times 10^5\ s^{-1}$; 15% dimer; 0.1 mol L^{-1} CTAB.	89M096
4.80	**5,12-Naphthacenedione, 10-[(3-amino-2,3,6-trideoxy-α-L-*lyxo*-hexopyranosyl)oxy]-7,8,9,10-tetrahydro-6,8,11-trihydroxy-8-(hydroxyacetyl)-1-methoxy- (Adriamycin)**						
	D_2O pH = 7.4	$\sim 10^8$			PL/Ld-2	S = AlCl(tspc); cor. for aggregation of substrate.	89B024
	H_2O pH = 7.8	2×10^7 (k_r) 9×10^8 (k_q)		308	CR/Ac-31	used $k_d = 2.4 \times 10^5\ s^{-1}$; $^1O_2$* from $MNPO_2$; 15% dimer.	89M096
	H_2O (mic) pH = 7.8	2.1×10^9		308	CP/Ac-16	S = ?; A′ = DPBF; used $k_d = 2.4 \times 10^5\ s^{-1}$; 15% dimer; 0.1 mol L^{-1} CTAB.	89M096
4.81	**12-Naphthaceneone, 8-acetyl-10[(3-amino-2,3,6-trideoxyhexopyranosyloxy]-tetrahydro-6,7,11-trihydroxy-5-imino-1-methoxy-**						
	D_2O pH = 7.4	$\sim 10^7$			PL/Ld-2	S = AlCl(tspc).	89B024
	H_2O pH = 7.8	2×10^7 (k_r) 3×10^9 (k_q)		308	CR/Ac-31	used $k_d = 2.4 \times 10^5\ s^{-1}$; $^1O_2$* from $MNPO_2$; 15% dimer.	89M096
	H_2O (mic) pH = 7.8	3.5×10^9		308	CP/Ac-16	S = ?; A′ = DPBF; used $k_d = 2.4 \times 10^5\ s^{-1}$; 15% dimer; 0.1 mol L^{-1} CTAB.	89M096
4.82	**Naphthalene, 1,5-dihydroxy-**						
	CD_3OD	6.1×10^6 1.6×10^6 (k_r)			CP/LI,Pa-12,28	S = RB; used $k_d = 4.4 \times 10^3\ s^{-1}$; P = 5-Hydroxy-1,4-naphthoquinone.	90F065
4.83	**Naphthalene, 1,6-dihydroxy-**						
	CD_3OD	3.2×10^6 1.2×10^6 (k_r)			CP/LI,Pa-12,28	S = RB; used $k_d = 4.4 \times 10^3\ s^{-1}$; P = 6-Hydroxy-1,4-naphthoquinone.	90F065
4.84	**Naphthalene, 1,7-dihydroxy-**						
	CD_3OD	3.6×10^6 6.8×10^5 (k_r)			CP/LI,Pa-12,28	S = RB; used $k_d = 4.4 \times 10^3\ s^{-1}$; P = 6-Hydroxy-1,4-naphthoquinone.	90F065
4.85	**Naphthalene, 1,8-dihydroxy-**						
	CD_3OD	5.3×10^7 3.0×10^7 (k_r)			CP/LI,Pa-12,28	S = RB; used $k_d = 4.4 \times 10^3\ s^{-1}$; P = 5-Hydroxy-1,4-naphthoquinone.	90F065
4.86	**Naphthalene, 2,6-dihydroxy-**						
	CD_3OD	1.9×10^6			CP/LI-12	S = RB; used $k_d = 4.4 \times 10^3\ s^{-1}$.	90F065
4.87	**Naphthalene, 2,7-dihydroxy-**						
	CD_3OD	2.1×10^6			CP/LI-12	S = RB; used $k_d = 4.4 \times 10^3\ s^{-1}$.	90F065
4.88	**1-Naphthol**						
	1-BuOH	7.6×10^6		293	PL/A′d-8	S = PP; A′ = DPBF.	88F462
	1-BuOH	3.2×10^7		293	CP/A′c-23	S = MB; A′ = Np; used $k_d = 5.2 \times 10^4\ s^{-1}$, $k_{A'} = 5.2 \times 10^8\ L\ mol^{-1}\ s^{-1}$.	78A266
	C_6H_6	$\leq 5 \times 10^5$		293	PL/A′d-8	S = PP; A′ = DPBF.	88F462 85A124

TABLE 4. Rate constants for interaction of singlet oxygen with phenols and naphthols. — Continued

	Solvent	k ($L\ mol^{-1}\ s^{-1}$)	β (k_d/k) ($mol\ L^{-1}$)	T (K)	Method	Comment	Ref.
4.89	**2-Naphthol**						
	1-BuOH	3.2×10^7		293	PL/A'd-8	S = PP; A' = DPBF.	88F462
	1-BuOH	7.6×10^6		293	CP/A'c-23	S = MB; A' = Np; used $k_d = 5.2 \times 10^4\ s^{-1}$, $k_{A'} = 5.2 \times 10^8\ L\ mol^{-1}\ s^{-1}$.	78A266
	C_6H_5Cl	3.9×10^4		295	PL/Ld-2	S = Zn(pc).	87A371
	C_6H_6	$\leq 1 \times 10^5$		293	PL/A'd-8	S = PP; A' = DPBF.	88F462 85A124
	C_6H_6	1.8×10^4		295	PL/Ld-2	S = Zn(pc).	87A371
	CH_3CN	9.3×10^4		295	PL/Ld-2	S = Zn(pc).	87A371
	CH_3COCH_3	4.0×10^4		295	PL/Ld-2	S = Zn(pc).	87A371
	$CHCl_3$	7.1×10^4		295	PL/Ld-2	S = Zn(pc).	87A371
	2-PrOH	3.5×10^4		295	PL/Ld-2	S = Zn(pc).	87A371
4.90	**1,4-Naphthoquinone, 5-hydroxy-**						
	CD_3OD	1.8×10^7			CP/LI-12	S = RB; used $k_d = 4.4 \times 10^3\ s^{-1}$.	90F065
4.91	**1,4-Naphthoquinone, 6-hydroxy-**						
	CD_3OD	5.9×10^6			CP/LI-12	S = RB; used $k_d = 4.4 \times 10^3\ s^{-1}$.	90F065
4.92	**Phenol**						
	C_6H_6/ MeOH (60:40)	$<10^4$			CP/A'c-23	S = A' = Rub; k_d and $k_{A'}$ not given.	88F650
	CD_3OD	2.5×10^4		293	PL/Ld-2	S = HP.	88R236 90F411
	D_2O	1.3×10^6			PL/Ld-2	S = HP or H_2TPPS^{4-}; calcd. from pH dependence (7-14) and pK_a.	90F411
	H_2O				CP/Oc-17	S = RB; A' = Met; used $k_r^{A'} = 2 \times 10^7\ L\ mol^{-1}\ s^{-1}$.	93E536
	pH = 8.0	1×10^6 (k_r)					
	pH = 9.0	1.6×10^6 (k_r)					
	pH = 10.0	5.0×10^7 (k_r)					
	H_2O	$\sim 3 \times 10^6$ (k_r)		300	MP/Ac,A'c-17	S = RB; A' = FFA; used $k_r^{A'} = 1.2 \times 10^8\ L\ mol^{-1}\ s^{-1}$; calcd. from pH dependence and pK_a; reported $k = (2.6 \pm 4.0) \times 10^6\ L\ mol^{-1}\ s^{-1}$.	91F300
	H_2O	$<10^6$ (k_r)		292	MP/Ac,A'c-17	S = RB; A' = FFA; used $k_r^{A'} = 1.2 \times 10^8\ L\ mol^{-1}\ s^{-1}$; calcd. from pH dependence (8-11.5) and $pK_a = 9.9$.	87A180
	H_2O				CP/Ac-15	S = RB; used $k_d = 5 \times 10^5\ s^{-1}$.	82A464
	pH = 8	2.0×10^7	0.026				
	pH = 9	6.1×10^7	8.2×10^{-3}				
	pH = 10.3	2.7×10^8	1.9×10^{-3}				
4.93	**Phenol, 4-acetyl-**						
	H_2O	1.5×10^6 (k_r)		300	MP/Ac,A'c-17	S = RB; A' = FFA; used $k_r^{A'} = 1.2 \times 10^8\ L\ mol^{-1}\ s^{-1}$; calcd. from pH dependence and pK_a.	91F300
4.94	**Phenol, 4-acetyl-2,6-bis(1,1-dimethylethyl)-**						
	1-BuOH	1.0×10^6		293	CP/A'c-23	S = MB; A' = Np; used $k_d = 5.2 \times 10^4\ s^{-1}$, $k_{A'} = 5.2 \times 10^8\ L\ mol^{-1}\ s^{-1}$.	78A266
4.95	**Phenol, 4-amino-**						
	D_2O pH = 7	1×10^8			PL/Ld-2	S = AlCl(tspc).	89R092
4.96	**Phenol, 2-(benzotriazol-2-yl)-4,6-bis(1,1-dimethylpropyl)-**						
	i-octane	$<1 \times 10^6$			CP/A'c-23	S = A' = Rub; No measurable effect.	732066

TABLE 4. Rate constants for interaction of singlet oxygen with phenols and naphthols. — Continued

No.	Solvent	k ($L\ mol^{-1}\ s^{-1}$)	β (k_d/k) ($mol\ L^{-1}$)	T (K)	Method	Comment	Ref.
4.97	**Phenol, 2-(benzotriazol-2-yl)-6-chloro-4-(1,1-dimethylethyl)-**						
	CCl_4/ $CHCl_3$ (90:10)	1.0×10^4			CP/A'c-23	S = A' = Rub; used $k_d = 1.4 \times 10^3\ s^{-1}$, $k_{A'} = 7 \times 10^7\ L\ mol^{-1}\ s^{-1}$; Measured $k/(k_{A'}[A'] + k_d) = 10.0\ L\ mol^{-1}\ s^{-1}$ at $[A'] = 5 \times 10^{-6}\ mol\ L^{-1}$.	74F645
4.98	**Phenol, 2-benzyl-**						
	C_6H_6/ MeOH (80:20)	1.4×10^5			PL/Ld-2	S = PrPor.	93E536
	C_6H_6	4.3×10^4			PL/Ld-2	S = PrPor.	93E536
	EtOH	2.0×10^5			PL/Ld-2	S = RB.	93E536
4.99	**Phenol, 2,6-bis(1,1-dimethylethyl)-**						
	1-BuOH	1.7×10^6		293	CP/A'c-23	S = MB; A' = Np; used $k_d = 5.2 \times 10^4\ s^{-1}$, $k_{A'} = 5.2 \times 10^8\ L\ mol^{-1}\ s^{-1}$.	78A266
	C_6H_6	2.0×10^4 (k_r)			CP/Ac,A'c-17	S = HA; A' = BHT; used $k_r^{A'} = 1.2 \times 10^5\ L\ mol^{-1}\ s^{-1}$.	89F350
	C_6H_6	3.2×10^4			CP/P'a-20	S = ZnTPP; A' = 2M2P; used $k_d = 4.2 \times 10^4\ s^{-1}$, $\beta_{A'} = 0.053\ mol\ L^{-1}$; Measured $(k[A] + k_d)/k_{A'} = 6.17 \times 10^{-2}\ mol\ L^{-1}$ at $[A] = 0.22\ mol\ L^{-1}$.	78A171
	CD_3OD	2.6×10^5		293	PL/Ld-2	S = HP.	88R236 90F411
	CH_2Cl_2	7.5×10^5			CP/A'c-33	S = A' = Rub; used $k_{A'} = 7.3 \times 10^7\ L\ mol^{-1}\ s^{-1}$; k_d not given.	84F199
	MeOH	3.0×10^4 (k_r)			CP/Ac,A'c-17	S = HA; A' = BHT; used $k_r^{A'} = 2.2 \times 10^5\ L\ mol^{-1}\ s^{-1}$.	89F350
	MeOH	1.0×10^6	0.12		CP/A'c-16	S = MB; A' = DPF; used $k_d = 1.2 \times 10^5\ s^{-1}$.	78A171
4.100	**Phenol, 2,4-bis(1,1-dimethylethyl)-5-methoxy-**						
	MeOH				CR/Pa,P'a-17	A' = TME; meas. $k_r/k_r^{A'} = 6.7 \times 10^{-3}$; $^1O_2$* from H_2O_2/NaOCl.	70F454
	MeOH				CP/Pa,P'a-17	S = RB; A' = TME; meas. $k_r/k_r^{A'} = 7.0 \times 10^{-3}$.	70F454
4.101	**Phenol, 3,5-bis(1,1-dimethylethyl)-4-methoxy-**						
	1-BuOH	2.6×10^7		293	CP/Ac-15	S = MB; used $k_d = 5.2 \times 10^4\ s^{-1}$.	78A266
	1-BuOH	2.7×10^7		293	CP/A'c-23	S = MB; A' = Np; used $k_d = 5.2 \times 10^4\ s^{-1}$, $k_{A'} = 5.2 \times 10^8\ L\ mol^{-1}\ s^{-1}$.	78A266
4.102	**Phenol, 2,6-bis(1,1-dimethylethyl)-4-methyl- (BHT)**						
	1-BuOH	7.6×10^6		293	CP/A'c-23	S = MB; A' = Np; used $k_d = 5.2 \times 10^4\ s^{-1}$, $k_{A'} = 5.2 \times 10^8\ L\ mol^{-1}\ s^{-1}$.	78A266
	C_6H_6	1.3×10^6 4×10^5 (k_r) 7.7×10^5 (k_q)		298	CP/Ac,A'c-23	S = A' = Rub; used $k_d = 4.2 \times 10^4\ s^{-1}$, $k_{A'} = 4.2 \times 10^7\ L\ mol^{-1}\ s^{-1}$.	90F360
	C_6H_6	6.6×10^5			CP/P'a-20	S = ZnTPP; A' = 2M2P; used $k_{A'} = 7.5 \times 10^5\ L\ mol^{-1}\ s^{-1}$; meas. $k_A/k_{A'} = 0.88$.	78A171
	C_6H_6	2.5×10^6	0.016		CP/A'c-16	S = ZnTPP; A' = DPF; used $k_d = 4.2 \times 10^4\ s^{-1}$.	78A171
	C_6H_6	1.2×10^5 (k_r)			CP/Pa,P'a-17	S = ZnTPP; A' = 2M2P; used $k_r^{A'} = 7.5 \times 10^5\ L\ mol^{-1}\ s^{-1}$; meas. $k_r/k_r^{A'} = 0.16$.	78A171
	C_6H_6	8.2×10^5			CP/Pa-20	S = ZnTPP; A' = Car; used $k_{A'} = 1.2 \times 10^{10}\ L\ mol^{-1}\ s^{-1}$; Measured $(k_{A'}/k_A) = 1.46$.	78A171
	C_6H_6	6.1×10^5	0.06		CP/Pa-15	S = ZnTPP; used $k_d = 4.2 \times 10^4\ s^{-1}$.	78A171
	CCl_4	3.7×10^7			CL/LI-12	S = TPP; used $k_d = 1 \times 10^3\ s^{-1}$.	85F667
	CCl_4	9.8×10^6 (k_r)			CP/Ac-17	S = A' = An; used $k_r^{A'} = 3.5 \times 10^5\ L\ mol^{-1}\ s^{-1}$.	80F718
	$CHCl_3$	6.5×10^6			PL/Ld-2	S = MPDEE or PdMPDEE.	81A327

TABLE 4. Rate constants for interaction of singlet oxygen with phenols and naphthols. — Continued

No.	Solvent	k ($L\ mol^{-1}\ s^{-1}$)	β (k_d/k) ($mol\ L^{-1}$)	T (K)	Method	Comment	Ref.
4.102	**Phenol, 2,6-bis(1,1-dimethylethyl)-4-methyl- (BHT) — Continued**						
	EtOH	3.4×10^6		308	CR/A'c-16	A' = DPBF; used $k_d = 8.3 \times 10^4\ s^{-1}$; $^1O_2$* from $MNPO_2$.	91F285
	MeOH	5.0×10^6	0.036		CP/A'c-16	S = RB; A' = DPBF; used $k_d = 1.8 \times 10^5\ s^{-1}$.	88F440
	MeOH	2.2×10^5 (k_r)			CP/Pa,P'a-17	S = MB; A' = 2M2P; used $k_r^{A'} = 6.3 \times 10^5$ L $mol^{-1}\ s^{-1}$; meas. $k_r/k_r^{A'} = 0.36$.	78A171
	MeOH	5.6×10^6	0.021		CP/A'c-16	S = MB; A' = DPF; used $k_d = 1.2 \times 10^5\ s^{-1}$.	78A171
	MeOH	4.2×10^6	0.03		CP/Pa-15	S = MB; used $k_d = 1.2 \times 10^5\ s^{-1}$.	78A171
4.103	**Phenol, 2,6-bis(1,1-dimethylethyl)-4-phenyl-**						
	1-BuOH	3.9×10^6		293	CP/A'c-23	S = MB; A' = Np; used $k_d = 5.2 \times 10^4\ s^{-1}$, $k_{A'} = 5.2 \times 10^8$ L $mol^{-1}\ s^{-1}$.	78A266
	MeOH	7.9×10^6	0.015		CP/A'c-16	S = MB; A' = DPF; used $k_d = 1.2 \times 10^5\ s^{-1}$.	78A171
4.104	**Phenol, 2,6-bis(1,1-dimethylethyl)-4-(phenylmethyl)-**						
	MeOH	3.8×10^6	0.031		CP/A'c-16	S = MB; A' = DPF; used $k_d = 1.2 \times 10^5\ s^{-1}$.	78A171
4.105	**Phenol, 4-bromo-2,6-bis(1,1-dimethylethyl)-**						
	1-BuOH	1.5×10^6		293	CP/A'c-23	S = MB; A' = Np; used $k_d = 5.2 \times 10^4\ s^{-1}$, $k_{A'} = 5.2 \times 10^8$ L $mol^{-1}\ s^{-1}$.	78A266
	MeOH	8.4×10^5	0.14		CP/A'c-16	S = MB; A' = DPF; used $k_d = 1.2 \times 10^5\ s^{-1}$.	78A171
4.106	**Phenol, 2-chloro-**						
	H_2O	$\sim 9 \times 10^6$ (k_r)		300	MP/Ac,A'c-17	S = RB; A' = FFA; used $k_r^{A'} = 1.2 \times 10^8$ L $mol^{-1}\ s^{-1}$; calcd. from pH dependence and pK_a; reported $k = (9.2 \pm 9.4) \times 10^6$ L $mol^{-1}\ s^{-1}$.	91F300
4.107	**Phenol, 3-chloro-**						
	H_2O	5.4×10^6 (k_r)		300	MP/Ac,A'c-17	S = RB; A' = FFA; used $k_r^{A'} = 1.2 \times 10^8$ L $mol^{-1}\ s^{-1}$; calcd. from pH dependence and pK_a.	91F300
4.108	**Phenol, 4-chloro-**						
	H_2O	$\sim 6 \times 10^6$ (k_r)		300	MP/Ac,A'c-17	S = RB; A' = FFA; used $k_r^{A'} = 1.2 \times 10^8$ L $mol^{-1}\ s^{-1}$; calcd. from pH dependence and pK_a.	91F300
4.109	**Phenol, 2-(5-chlorobenzotriazol-2-yl)-4,6-bis(1,1-dimethylethyl)-**						
	C_6H_5Br	2.6×10^6		273	MD/A'c-33	A' = Rub; used $k_d = 1.3 \times 10^4\ s^{-1}$, $k_{A'} = 4.0 \times 10^7$ L $mol^{-1}\ s^{-1}$; Measured $k/(k_d/[A'] + k_{A'}) = 2.0 \times 10^{-2}$ at $[A'] = 1.5 \times 10^{-4}$ mol L^{-1}.	737333
4.110	**Phenol, 4-chloro-2,6-di(1,1-dimethylethyl)-**						
	1-BuOH	3.2×10^6		293	CP/A'c-23	S = MB; A' = Np; used $k_d = 5.2 \times 10^4\ s^{-1}$, $k_{A'} = 5.2 \times 10^8$ L $mol^{-1}\ s^{-1}$.	78A266
4.111	**Phenol, 3-chloro-5-methoxy-**						
	CH_3CN	1.2×10^7			PL/Ld-2	S = RB.	91A341
	H_2O	$<1 \times 10^3$ (k_r)		293	CP/Oc-17	S = Eos; A' = His; used $k_r^{A'} = 7 \times 10^7$ L $mol^{-1}\ s^{-1}$.	91A341
	dioxane	5.3×10^5			PL/Ld-2	S = ZnTPP.	91A341
4.112	**Phenol, 4-cyano-**						
	H_2O	$\sim 2 \times 10^5$ (k_r)		300	MP/Ac,A'c-17	S = RB; A' = FFA; used $k_r^{A'} = 1.2 \times 10^8$ L $mol^{-1}\ s^{-1}$; calcd. from pH dependence and pK_a; reported $k = (2.4 \pm 4.4) \times 10^5$ L $mol^{-1}\ s^{-1}$.	91F300
4.113	**Phenol, 2,4-dichloro-**						
	C_6H_6/ MeOH (60:40)	$<10^4$			CP/A'c-23	S = A' = Rub.	88F650

TABLE 4. Rate constants for interaction of singlet oxygen with phenols and naphthols. — Continued

No.	Solvent	k ($L\ mol^{-1}\ s^{-1}$)	β (k_d/k) ($mol\ L^{-1}$)	T (K)	Method	Comment	Ref.
4.113	**Phenol, 2,4-dichloro-** — Continued						
	H_2O	$\sim 5 \times 10^6$ (k_r)		300	MP/Ac,A'c-17	S = RB; A' = FFA; used $k_r^{A'} = 1.2 \times 10^8$ L mol^{-1} s^{-1}; calcd. from pH dependence and pK_a; reported $k = (5.1 \pm 4.7) \times 10^6$ L mol^{-1} s^{-}.	91F300
	H_2O	$<5 \times 10^5$ (k_r)		292	MP/Ac,A'c-17	S = RB; A' = FFA; used $k_r^{A'} = 1.2 \times 10^8$ L mol^{-1} s^{-1}; calcd. over range of pH = 5.5 to 9.6; pK_a = 7.8.	87A180
4.114	**Phenol, 2,6-dichloro-**						
	C_6H_6/ MeOH (60:40)	$<10^4$			CP/A'c-23	S = A' = Rub.	88F650
4.115	**Phenol, 2,6-dimethoxy-**						
	H_2O	3.6×10^7 (k_r)		300	MP/Ac,A'c-17	S = RB; A' = FFA; used $k_r^{A'} = 1.2 \times 10^8$ L mol^{-1} s^{-1}; calcd. from pH dependence and pK_a,.	91F300
4.116	**Phenol, 2,4-dimethyl-**						
	C_6H_6	3.4×10^4 (k_r)			CP/Ac,A'c-17	S = HA; A' = BHT; used $k_r^{A'} = 1.2 \times 10^5$ L mol^{-1} s^{-1}.	89F350
	MeOH	5.0×10^4 (k_r)			CP/Ac,A'c-17	S = HA; A' = BHT; used $k_r^{A'} = 2.2 \times 10^5$ L mol^{-1} s^{-1}.	89F350
4.117	**Phenol, 2,6-dimethyl-**						
	C_6H_6	8×10^3 (k_r)			CP/Ac,A'c-17	S = HA; A' = BHT; used $k_r^{A'} = 1.2 \times 10^5$ L mol^{-1} s^{-1}.	89F350
	MeOH	1.0×10^4 (k_r)			CP/Ac,A'c-17	S = HA; A' = BHT; used $k_r^{A'} = 2.2 \times 10^5$ L mol^{-1} s^{-1}.	89F350
4.118	**Phenol, 3,4-dimethyl-**						
	C_6H_6	2.2×10^4 (k_r)			CP/Ac,A'c-17	S = HA; A' = BHT; used $k_r^{A'} = 1.2 \times 10^5$ L mol^{-1} s^{-1}.	89F350
	MeOH	3.9×10^4 (k_r)			CP/Ac,A'c-17	S = HA; A' = BHT; used $k_r^{A'} = 2.2 \times 10^5$ L mol^{-1} s^{-1}.	89F350
4.119	**Phenol, 4-(1,1-dimethylethoxy)-2,6-bis(1,1-dimethylethyl)-**						
	1-BuOH	2.4×10^7		293	CP/A'c-23	S = MB; A' = Np; used $k_d = 5.2 \times 10^4$ s^{-1}, $k_{A'} = 5.2 \times 10^8$ L mol^{-1} s^{-1}.	78A266
4.120	**Phenol, 2-(1,1-dimethylethyl)-**						
	CD_3OD	2.6×10^5		293	PL/Ld-2	S = HP.	88R236 90F411
4.121	**Phenol, 4-(1,1-dimethylethyl)-**						
	H_2O	$\sim 10^7$ (k_r)		300	MP/Ac,A'c-17	S = RB; A' = FFA; used $k_r^{A'} = 1.2 \times 10^8$ L mol^{-1} s^{-1}; calcd. from pH dependence and pK_a; reported $k = (1.2 \pm 1.3) \times 10^7$ L mol^{-1} s^{-1}.	91F300
4.122	**Phenol, 3-(1,1-dimethylethyl)-4-methoxy-**						
	CD_3OD	2.2×10^7		293	PL/Ld-2	S = HP.	88R236 90F411
4.123	**Phenol, 2,4-dinitro-**						
	C_6H_6	$<1.4 \times 10^6$ (k_r)			CP/A'c-23	S = A' = Rub; used $k_d = \geq 3.3 \times 10^4$ s^{-1}, $k_{A'} = 3.4 \times 10^7$ L mol^{-1} s^{-1}.	87E142
4.124	**Phenol, 2,5-dinitro-**						
	C_6H_6	$<1.6 \times 10^6$			CP/A'c-23	S = A' = Rub; used $k_d = \geq 3.3 \times 10^4$ s^{-1}, $k_{A'} = 3.4 \times 10^7$ L mol^{-1} s^{-1}.	87E142

TABLE 4. Rate constants for interaction of singlet oxygen with phenols and naphthols. — Continued

No.	Solvent	k ($L\ mol^{-1}\ s^{-1}$)	β (k_d/k) ($mol\ L^{-1}$)	T (K)	Method	Comment	Ref.
4.125	**Phenol, 2,6-dinitro-**						
	C_6H_6	$<2.0 \times 10^6$			CP/A'c-23	S = A' = Rub; used $k_d = \geq 3.3 \times 10^4\ s^{-1}$, $k_{A'} = 3.4 \times 10^7\ L\ mol^{-1}\ s^{-1}$.	87E142
4.126	**Phenol, 4-ethoxy-2,3,5,6-tetramethyl-**						
	MeOH	7.3×10^7	1.6×10^{-3}		CP/A'c-16	S = MB; A' = DPF; used $k_d = 1.2 \times 10^5\ s^{-1}$.	78A171
4.127	**Phenol, 4-[(1-hydroxy-2,2-dimethyl)propyl]-2-methoxy-**						
	$CH_3CH(OCH_3)_2$	8.5×10^5	0.037		MP/Pa-15	S = 4-HOC_6H_3(3-OCH_3)$COCH_3$; used $k_d = 3.1 \times 10^4\ s^{-1}$.	84F194
	$CH_3CH(OCH_3)_2$	1.1×10^8			CP/Ac-32	S = 4-$CH_3OC_6H_4COC_2H_5$; Q = Car; used $k_d = 3.1 \times 10^4\ s^{-1}$, $k_Q = 1.3 \times 10^{10}\ L\ mol^{-1}\ s^{-1}$.	84F194
	$CH_3CH(OCH_3)_2$	1.2×10^6	0.025		MP/Ac-15	S = 4-HOC_6H_3(3-OCH_3)$COCH_3$; used $k_d = 3.1 \times 10^4\ s^{-1}$.	84F194
	$CH_3CH(OCH_3)_2$	3.4×10^5	0.16		MP/Ac-16	S = 4-HOC_6H_3(3-OCH_3)$COCH_3$; A' = DABCO; used $k_d = 3.1 \times 10^4\ s^{-1}$; unexplained discrepancy in these data.	84F194
4.128	**Phenol, 2-(2-hydroxyphenyl)- (2,2'-Dihydroxybiphenyl)**						
	D_2O pD = 8.5	2.7×10^7			PL/Ld-2	S = RB.	93E536
	EtOH	7.5×10^6			PL/Ld-2	S = RB.	93E536
4.129	**Phenol, 2-methoxy-**						
	H_2O	$\sim 6 \times 10^6$ (k_r)		300	MP/Ac,A'c-17	S = RB; A' = FFA; used $k_r^{A'} = 1.2 \times 10^8\ L\ mol^{-1}\ s^{-1}$; calcd. from pH dependence and pK_a; reported $k = (0.6 \pm 1.8) \times 10^7\ L\ mol^{-1}\ s^{-1}$.	91F300
4.130	**Phenol, 3-methoxy-**						
	H_2O	$\sim 1 \times 10^7$ (k_r)		300	MP/Ac,A'c-17	S = RB; A' = FFA; used $k_r^{A'} = 1.2 \times 10^8\ L\ mol^{-1}\ s^{-1}$; calcd. from pH dependence and pK_a; reported $k = (1.3 \pm 1.0) \times 10^7\ L\ mol^{-1}\ s^{-1}$.	91F300
4.131	**Phenol, 4-methoxy-**						
	CD_3OD	5.8×10^6		293	PL/Ld-2	S = HP.	88R236 90F411
	H_2O	$\sim 2 \times 10^7$ (k_r)		300	MP/Ac,A'c-17	S = RB; A' = FFA; used $k_r^{A'} = 1.2 \times 10^8\ L\ mol^{-1}\ s^{-1}$; calcd. from pH dependence and pK_a; reported $k = (2.2 \pm 2.2) \times 10^7\ L\ mol^{-1}\ s^{-1}$.	91F300
4.132	**Phenol, 4-methoxy-2,6-dimethyl-**						
	EtOH	2.5×10^7		308	CR/A'c-16	A' = DPBF; used $k_d = 8.3 \times 10^4\ s^{-1}$; $^1O_2$* from $MNPO_2$.	91F285
4.133	**Phenol, 4-methoxy-2,3,5,6-tetramethyl-**						
	EtOH	1.4×10^7		308	CR/A'c-16	A' = DPBF; used $k_d = 8.3 \times 10^4\ s^{-1}$; $^1O_2$* from $MNPO_2$.	91F285
4.134	**Phenol, 4-methoxy-2,3,6-trimethyl-**						
	EtOH	6.8×10^7		308	CR/A'c-16	A' = DPBF; used $k_d = 8.3 \times 10^4\ s^{-1}$; $^1O_2$* from $MNPO_2$.	91F285
4.135	**Phenol, 4-methyl-**						
	D_2O/ EtOH (75:25)	2.4×10^7		295	PL/Ld-2	S = RB.	94A113
	H_2O	1×10^7 (k_r)		300	MP/Ac,A'c-17	S = RB; A' = FFA; used $k_r^{A'} = 1.2 \times 10^8\ L\ mol^{-1}\ s^{-1}$; calcd. from pH dependence and pK_a.	91F300
	H_2O	$<5 \times 10^6$ (k_r)		292	MP/Ac,A'c-17	S = RB; A' = FFA; used $k_r^{A'} = 1.2 \times 10^8\ L\ mol^{-1}\ s^{-1}$; calcd. over the range pH = 8.3 to 11.5; pK_a = 10.2.	87A180

TABLE 4. Rate constants for interaction of singlet oxygen with phenols and naphthols. — Continued

No.	Solvent	k ($L\ mol^{-1}\ s^{-1}$)	β (k_d/k) ($mol\ L^{-1}$)	T (K)	Method	Comment	Ref.
4.136	**Phenol, 2,2'-methylenebis(6-*tert*-butyl-4-methyl-**						
	MeOH	2.6×10^7	7.0×10^{-3}		CP/A'c-16	S = RB; A' = DPBF; used $k_d = 1.8 \times 10^5\ s^{-1}$.	88F440
4.137	**Phenol, 2-nitro-**						
	H_2O	$\sim 1 \times 10^6$ (k_r)		300	MP/Ac,A'c-17	S = RB; A' = FFA; used $k_r^{A'} = 1.2 \times 10^8\ L\ mol^{-1}\ s^{-1}$; calcd. from pH dependence and pK_a; reported $k = (1.3 \pm 1.1) \times 10^6\ L\ mol^{-1}\ s^{-1}$.	91F300
4.138	**Phenol, 3-nitro-**						
	H_2O	$\sim 3 \times 10^6$ (k_r)		300	MP/Ac,A'c-17	S = RB; A' = FFA; used $k_r^{A'} = 1.2 \times 10^8\ L\ mol^{-1}\ s^{-1}$; calcd. from pH dependence and pK_a; reported $k = (2.7 \pm 1.8) \times 10^6\ L\ mol^{-1}\ s^{-1}$.	91F300
4.139	**Phenol, 4-nitro-**						
	H_2O	$\sim 3 \times 10^5$ (k_r)		300	MP/Ac,A'c-17	S = RB; A' = FFA; used $k_r^{A'} = 1.2 \times 10^8\ L\ mol^{-1}\ s^{-1}$; calcd. from pH dependence and pK_a; reported $k = (2.6 \pm 2.3) \times 10^5\ L\ mol^{-1}\ s^{-1}$.	91F300
4.140	**Phenol, pentachloro-**						
	H_2O	$\sim 2 \times 10^5$ (k_r)		300	MP/Ac,A'c-17	S = RB; A' = FFA; used $k_r^{A'} = 1.2 \times 10^8\ L\ mol^{-1}\ s^{-1}$; calcd. from pH dependence and pK_a; reported $k = (0.2 \pm 5.5) \times 10^6\ L\ mol^{-1}\ s^{-1}$.	91F300
4.141	**Phenol, 2-phenyl- (2-Hydroxybiphenyl)**						
	C_6H_6/ MeOH (60:40)	7.3×10^4			PL/Ld-2	S = PrPor.	93E536
	C_6H_6	2.3×10^4			PL/Ld-2	S = PrPor.	93E536
4.142	**Phenol, 3-(phenylamino)-**						
	CH_3CN/ H_2O (96:4)	3.0×10^7	1.1×10^{-3}		CP/Pa-14	S = MB; used $k_d = 3.3 \times 10^4\ s^{-1}$.	80F427
4.143	**Phenol, 2,3,5,6-tetrafluoro-**						
	CD_3OD	3.0×10^4		293	PL/Ld-2	S = HP.	88R236 90F411
4.144	**Phenol, 4-(1,1,3,3-tetramethylbutyl)-, salicylate**						
	i-octane	$<1 \times 10^6$			CP/A'c-23	S = A' = Rub; No measurable effect.	732066
4.145	**Phenol, 2,2'-thiobis[4-(1,1,3,3-tetramethylbutyl)-**						
	i-octane	$<1.0 \times 10^6$			CP/A'c-23	S = A' = Rub; No measurable effect.	732066
4.146	**Phenol, 2,4,6-trichloro-**						
	C_6H_6/ MeOH (60:40)	$<10^4$			CP/A'c-16	S = A' = Rub.	88F650
	H_2O	2×10^7 (k_r)		300	MP/Ac,A'c-17	S = RB; A' = FFA; used $k_r^{A'} = 1.2 \times 10^8\ L\ mol^{-1}\ s^{-1}$; calcd. from pH dependence and pK_a.	91F300
	H_2O	$<5 \times 10^5$ (k_r)		292	MP/Ac,A'c-17	S = RB; A' = FFA; used $k_r^{A'} = 1.2 \times 10^8\ L\ mol^{-1}\ s^{-1}$; calcd. over the range pH = 4.2 to 9.0; pK_a = 6.1.	87A180
4.147	**Phenol, 2,4,6-tri(1,1-dimethylethyl)-**						
	1-BuOH	3.7×10^6		293	CP/A'c-23	S = MB; A' = Np; used $k_d = 5.2 \times 10^4\ s^{-1}$, $k_{A'} = 5.2 \times 10^8\ L\ mol^{-1}\ s^{-1}$.	78A266
	c-C_6H_{12}	5.8×10^5			PL/A'd-8	S = 2-ACN; A' = DPBF; $\Delta H‡ = -0.8\ kJ\ mol^{-1}$; $\Delta S‡ = -147\ J\ K^{-1}\ mol^{-1}$; studied at 278-357 K.	84E492
	$C_6H_5CH_3$	1.4×10^6			PL/A'd-8	S = 2-ACN; A' = DPBF.	84E492
	C_6H_6	2.6×10^5			CP/P'a-19	S = ZnTPP; A' = 2M2P; used $k_{A'} = 7.5 \times 10^5\ L\ mol^{-1}\ s^{-1}$; meas. $k_A/k_{A'} = 0.34$.	78A171

TABLE 4. Rate constants for interaction of singlet oxygen with phenols and naphthols. — Continued

No.	Solvent	k ($L\ mol^{-1}\ s^{-1}$)	β (k_d/k) ($mol\ L^{-1}$)	T (K)	Method	Comment	Ref.
4.147	**Phenol, 2,4,6-tri(1,1-dimethylethyl)- — Continued**						
	C_6H_6	1.4×10^6	0.030		CP/A'c-16	S = ZnTPP; A' = DPF; used $k_d = 4.2 \times 10^4\ s^{-1}$.	78A171
	CH_3CN	2.5×10^6			PL/A'd-8	S = 2-ACN; A' = DPBF.	84E492
	CH_3COCH_3	2.4×10^6			PL/A'd-8	S = 2-ACN; A' = DPBF.	84E492
	MeOH	2.8×10^6			PL/A'd-8	S = 2-ACN; A' = DPBF; $\Delta H‡ = -3.4\ kJ\ mol^{-1}$; $\Delta S‡ = -135\ J\ K^{-1}\ mol^{-1}$; studied at 250-328 K.	84E492
	MeOH	3.4×10^6	0.034		CP/A'c-16	S = MB; A' = DPF; used $k_d = 1.2 \times 10^5\ s^{-1}$.	78A171
	MeOH	6.3×10^4 (k_r)			CP/Pa,P'a-17	S = RB; A' = BHT; used $k_r^{A'} = 2.2 \times 10^5\ L\ mol^{-1}\ s^{-1}$; meas. $k_r/k_r^{A'} = 0.29$.	78A171
4.148	**Phenol, 2,4,6-trimethyl-**						
	EtOH	3.8×10^6		308	CR/A'c-16	A' = DPBF; used $k_d = 8.3 \times 10^4\ s^{-1}$; $^1O_2$* from $MNPO_2$.	91F285
4.149	**Phenol, 2,4,6-triphenyl-**						
	C_6H_6	2.2×10^7	1.9×10^{-3}		CP/A'c-16	S = ZnTPP; A' = DPF; used $k_d = 4.2 \times 10^4\ s^{-1}$.	78A171
	CH_3CN	1.5×10^7	2.3×10^{-3}		CP/A'c-16	S = MB; A' = DPF; used $k_d = 3.3 \times 10^4\ s^{-1}$.	78A171
	MeOH	2.5×10^8	4.6×10^{-4}		CP/A'c-16	S = MB; A' = DPF; used $k_d = 1.2 \times 10^5\ s^{-1}$.	78A171
4.150	**Phenoxide ion**						
	C_6H_6/ MeOH (60:40)	7.0×10^7			CP/A'c-23	S = A' = Rub; k_d and $k_{A'}$ not given; 6×10^{-3} mol L^{-1} KOH.	88F650
	D_2O	2.8×10^8			PL/Ld-2	S = HP or H_2TPPS^{4-}; calcd. from pH dependence (7-14) and pK_a.	90F411
	H_2O	1.6×10^8 (k_r)		300	MP/Ac,A'c-17	S = RB; A' = FFA; used $k_r^{A'} = 1.2 \times 10^8\ L\ mol^{-1}\ s^{-1}$; calcd. from pH dependence and pK_a.	91F300
	H_2O	1.8×10^8 (k_r)		292	MP/Ac,A'c-17	S = RB; A' = FFA; used $k_r^{A'} = 1.2 \times 10^8\ L\ mol^{-1}\ s^{-1}$; calcd. over the range pH = 8.0 to 11.5.	87A180
4.151	**Phenoxide ion, 4-acetyl-**						
	H_2O	2.4×10^7 (k_r)		300	MP/Ac,A'c-17	S = RB; A' = FFA; used $k_r^{A'} = 1.2 \times 10^8\ L\ mol^{-1}\ s^{-1}$; calcd. from pH dependence and pK_a.	91F300
4.152	**Phenoxide ion, 2-benzyl-**						
	EtOH	1.6×10^8			PL/Ld-2	S = RB; 7.5×10^{-3} mol L^{-1} KOH.	93E536
	H_2O pH = 11	4.4×10^7 (k_r)			CP/Oc-17	S = RB; A' = Met; used $k_r^{A'} = 2 \times 10^7\ L\ mol^{-1}\ s^{-1}$.	93E536
4.153	**Phenoxide ion, 4-bromo-**						
	$C_6H_5COCH_3$/ MeOH (50:50)	6×10^7		295	CP/A'c-23	S = A' = Rub; used $k_d = 3 \times 10^4\ s^{-1}$; $k_{A'}$ not given; 0.01 mol L^{-1} KOH.	93F328
	C_6H_6/ MeOH (80:20)	1.5×10^7 (k_r)		295	CP/Ac,A'c-17	S = Rub; A' = DMA; used $k_r^{A'} = 1.2 \times 10^7\ L\ mol^{-1}\ s^{-1}$; 0.01 mol L^{-1} KOH.	93F328
	C_6H_6/ MeOH (80:20)	1.5×10^7		295	CP/A'c-23	S = A' = Rub; used $k_d = 3.8 \times 10^4\ s^{-1}$; $k_{A'}$ not given; 0.01 mol L^{-1} KOH.	93F328
	CH_3CN/MeOH	6×10^7			CP/A'c-16	S = A' = Rub; used $k_d = 3 \times 10^5\ s^{-1}$; 0.01 mol L^{-1} KOH.	94F095
	H_2O pH = 11	1.1×10^9			CP/Ac-14	S = Eos; used $k_d = 2.5 \times 10^5\ s^{-1}$.	94F095
	H_2O pH = 11	1.5×10^8 (k_r)			CP/Ac,A'c-17	S = RB; A' = His; used $k_r^{A'} = 8.8 \times 10^7\ L\ mol^{-1}\ s^{-1}$.	94F095
	H_2O pH = 11	1.5×10^8 (k_r)		295	CP/Oc-17	S = Eos; A' = Met; used $k_r^{A'} = 2.0 \times 10^7\ L\ mol^{-1}\ s^{-1}$.	93F328
	H_2O pH = 11	1.1×10^9		295	CP/Oc-15	S = Eos; used $k_d = 2.5 \times 10^5\ s^{-1}$.	93F328

TABLE 4. Rate constants for interaction of singlet oxygen with phenols and naphthols. — Continued

No.	Solvent	k (L mol^{-1} s^{-1})	β (k_d/k) (mol L^{-1})	T (K)	Method	Comment	Ref.
4.153	**Phenoxide ion, 4-bromo-** — Continued						
	MeOH/ C_6H_6 (60:40)	1.6×10^7 (k_r)			CP/Ac,A'c-17	S = RB; A' = DMA; used $k_r^{A'} = 1.2 \times 10^7$ L mol^{-1} s^{-1}; 0.01 mol L^{-1} KOH.	94F095
	MeOH/ C_6H_6 (60:40)	1.5×10^7			CP/A'c-16	S = A' = Rub; used $k_d = 1 \times 10^5$ s^{-1}; 0.01 mol L^{-1} KOH.	94F095
4.154	**Phenoxide ion, 4-bromo-2,6-dimethyl-**						
	CH_3CN/MeOH	2.1×10^8			CP/A'c-16	S = A' = Rub; used $k_d = 3 \times 10^5$ s^{-1}; 0.01 mol L^{-1} KOH.	94F095
	H_2O pH = 11	2.6×10^9			CP/Ac-14	S = Eos; used $k_d = 2.5 \times 10^5$ s^{-1}.	94F095
	H_2O pH = 11	3.9×10^8 (k_r)			CP/Ac,A'c-17	S = RB; A' = His; used $k_r^{A'} = 8.8 \times 10^7$ L mol^{-1} s^{-1}.	94F095
	MeOH/ C_6H_6 (60:40)	8×10^7			CP/A'c-16	S = A' = Rub; used $k_d = 1 \times 10^5$ s^{-1}; 0.01 mol L^{-1} KOH.	94F095
	MeOH/ C_6H_6 (60:40)	5×10^7 (k_r)			CP/Ac,A'c-17	S = RB; A' = DMA; used $k_r^{A'} = 1.2 \times 10^7$ L mol^{-1} s^{-1}; 0.01 mol L^{-1} KOH.	94F095
4.155	**Phenoxide ion, 2-chloro-**						
	H_2O	1.9×10^8 (k_r)		300	MP/Ac,A'c-17	S = RB; A' = FFA; used $k_r^{A'} = 1.2 \times 10^8$ L mol^{-1} s^{-1}; calcd. from pH dependence and pK_a.	91F300
	H_2O pH = 11.5	1.7×10^7 (k_r)			CP/Oc-17	S = RB; A' = His; used $k_r^{A'} = 8.8 \times 10^7$ L mol^{-1} s^{-1}.	90F518
	H_2O pH = 11.5	2.3×10^8			CP/Ac,Oc-14	S = Eos; used $k_d = 2.5 \times 10^5$ s^{-1}.	90F518
	MeOH	5.0×10^7			CP/A'c-23	S = A' = Rub; used $k_d = 1.4 \times 10^5$ s^{-1}, $k_{A'} = 5 \times 10^7$ L mol^{-1} s^{-1}; 0.01 mol L^{-1} KOH.	90F518
4.156	**Phenoxide ion, 3-chloro-**						
	H_2O	1.6×10^8 (k_r)		300	MP/Ac,A'c-17	S = RB; A' = FFA; used $k_r^{A'} = 1.2 \times 10^8$ L mol^{-1} s^{-1}; calcd. from pH dependence and pK_a.	91F300
	H_2O pH = 11.5	1.5×10^7 (k_r)			CP/Oc-17	S = RB; A' = His; used $k_r^{A'} = 8.8 \times 10^7$ L mol^{-1} s^{-1}.	90F518
	H_2O pH = 11.5	1.1×10^9			CP/Ac,Oc-14	S = Eos; used $k_d = 2.5 \times 10^5$ s^{-1}.	90F518
	MeOH	1.5×10^7			CP/A'c-23	S = A' = Rub; used $k_d = 1.4 \times 10^5$ s^{-1}, $k_{A'} = 5 \times 10^7$ L mol^{-1} s^{-1}; 0.01 mol L^{-1} KOH.	90F518
4.157	**Phenoxide ion, 4-chloro-**						
	$C_6H_5COCH_3$/ MeOH (50:50)	6×10^7		295	CP/A'c-23	S = A' = Rub; used $k_d = 3 \times 10^4$ s^{-1}; $k_{A'}$ not given; 0.01 mol L^{-1} KOH.	93F328
	C_6H_6/ MeOH (80:20)	3×10^7		295	CP/A'c-23	S = A' = Rub; used $k_d = 3.8 \times 10^4$ s^{-1}; $k_{A'}$ not given; 0.01 mol L^{-1} KOH.	93F328
	C_6H_6/ MeOH (80:20)	3×10^7 (k_r)		295	CP/Ac,A'c-17	S = Rub; A' = DMA; used $k_r^{A'} = 1.2 \times 10^7$ L mol^{-1} s^{-1}; 0.01 mol L^{-1} KOH.	93F328
	H_2O pH = 11	8.0×10^8		295	CP/Oc-15	S = Eos; used $k_d = 2.5 \times 10^5$ s^{-1}.	93F328
	H_2O pH = 11	1.0×10^8 (k_r)		295	CP/Oc-17	S = Eos; A' = Met; used $k_r^{A'} = 2.0 \times 10^7$ L mol^{-1} s^{-1}.	93F328
	H_2O	1.9×10^8 (k_r)		300	MP/Ac,A'c-17	S = RB; A' = FFA; used $k_r^{A'} = 1.2 \times 10^8$ L mol^{-1} s^{-1}; calcd. from pH dependence and pK_a.	91F300
	H_2O pH = 11.5	3.1×10^7 (k_r)			CP/Oc-17	S = RB; A' = His; used $k_r^{A'} = 8.8 \times 10^7$ L mol^{-1} s^{-1}.	90F518
	H_2O pH = 11.5	4×10^8			CP/Ac,Oc-14	S = Eos; used $k_d = 2.5 \times 10^5$ s^{-1}.	90F518

TABLE 4. Rate constants for interaction of singlet oxygen with phenols and naphthols. — Continued

No.	Solvent	k ($L\ mol^{-1}\ s^{-1}$)	β (k_d/k) ($mol\ L^{-1}$)	T (K)	Method	Comment	Ref.
4.157	**Phenoxide ion, 4-chloro-** — Continued						
	MeOH	3.3×10^7			CP/A'c-23	S = A' = Rub; used $k_d = 1.4 \times 10^5\ s^{-1}$, $k_{A'} = 5 \times 10^7\ L\ mol^{-1}\ s^{-1}$; 0.01 mol L^{-1} KOH.	90F518
4.158	**Phenoxide ion, 4-cyano-**						
	H_2O	6.2×10^6 (k_r)		300	MP/Ac,A'c-17	S = RB; A' = FFA; used $k_r^{A'} = 1.2 \times 10^8\ L\ mol^{-1}\ s^{-1}$; calcd. from pH dependence and pK_a.	91F300
4.159	**Phenoxide ion, 2,4-dichloro-**						
	C_6H_6/ MeOH (60:40)	5.7×10^7			CP/A'c-23	S = A' = Rub; k_d and $k_{A'}$ not given; 6×10^{-3} mol L^{-1} KOH;.	88F650
	C_6H_6/ MeOH (60:40)	4.5×10^6 (k_r)			CP/Ac,A'c-17	S = Eos; A' = DMA; used $k_r^{A'} = 4.8 \times 10^7\ L\ mol^{-1}\ s^{-1}$; meas. $k_q/k_r = 11.5$; 6×10^{-3} mol L^{-1} KOH.	88F650
	H_2O	1.7×10^8 (k_r)		300	MP/Ac,A'c-17	S = RB; A' = FFA; used $k_r^{A'} = 1.2 \times 10^8\ L\ mol^{-1}\ s^{-1}$; calcd. from pH dependence and pK_a.	91F300
	H_2O	1.2×10^8 (k_r)		292	MP/Ac,A'c-17	S = RB; A' = FFA; used $k_r^{A'} = 1.2 \times 10^8\ L\ mol^{-1}\ s^{-1}$; calcd. over the range pH = 5.5 to 9.6.	87A180
	H_2O pH = 10	3.1×10^9			CP/Ac-14	S = RB; used $k_d = 5 \times 10^5\ s^{-1}$.	87F537
	H_2O pH = 10	2.1×10^9			CP/Ac,Oc-14	S = Eos; used $k_d = 5 \times 10^5\ s^{-1}$.	87F537
	H_2O pH = 10	1.1×10^8 (k_r) 2.0×10^9 (k_q)			CP/Oc-17	S = Eos; A' = Met; used $k_r^{A'} = 5 \times 10^6\ L\ mol^{-1}\ s^{-1}$; used $k_A = 2.1 \times 10^9\ L\ mol^{-1}\ s^{-1}$.	87F537
4.160	**Phenoxide ion, 2,6-dichloro-**						
	C_6H_6/ MeOH (60:40)	3.7×10^6 (k_r)			CP/Ac,A'c-17	S = Eos; A' = DMA; used $k_r^{A'} = 4.8 \times 10^7\ L\ mol^{-1}\ s^{-1}$; meas. $k_q/k_r = 14.5$; 6×10^{-3} mol L^{-1} KOH.	88F650
	C_6H_6/ MeOH (60:40)	5.4×10^7			CP/A'c-23	S = A' = Rub; k_d and $k_{A'}$ not given; 6×10^{-3} mol L^{-1} KOH.	88F650
	H_2O pH = 10	1×10^9			CP/Ac-14	S = Eos; used $k_d = 5 \times 10^5\ s^{-1}$.	87F537
	H_2O pH = 10	2×10^9			CP/Ac-14	S = RB; used $k_d = 5 \times 10^5\ s^{-1}$.	87F537
	H_2O pH = 10	1.5×10^9			CP/Oc-14	S = Eos; used $k_d = 5 \times 10^5\ s^{-1}$.	87F537
	H_2O pH = 10	5.7×10^7 (k_r) 1.4×10^9 (k_q)			CP/Oc-17	S = Eos; A' = Met; used $k_r^{A'} = 5 \times 10^6\ L\ mol^{-1}\ s^{-1}$; used $k_A = 1.5 \times 10^9\ L\ mol^{-1}\ s^{-1}$.	87F537
4.161	**Phenoxide ion, 2,6-dimethoxy-**						
	H_2O	8.6×10^8 (k_r)		300	MP/Ac,A'c-17	S = RB; A' = FFA; used $k_r^{A'} = 1.2 \times 10^8\ L\ mol^{-1}\ s^{-1}$; calcd. from pH dependence and pK_a.	91F300
4.162	**Phenoxide ion, 2,6-dimethyl-**						
	CH_3CN/MeOH	2×10^8			CP/A'c-16	S = A' = Rub; used $k_d = 3 \times 10^5\ s^{-1}$; 0.01 mol L^{-1} KOH.	94F095
	H_2O pH = 11	2.8×10^9			CP/Ac-14	S = Eos; used $k_d = 2.5 \times 10^5\ s^{-1}$.	94F095
	H_2O pH = 11	2.0×10^8 (k_r)			CP/Ac,A'c-17	S = RB; A' = His; used $k_r^{A'} = 8.8 \times 10^7\ L\ mol^{-1}\ s^{-1}$.	94F095
	MeOH/ C_6H_6 (60:40)	3×10^7			CP/A'c-16	S = A' = Rub; used $k_d = 1 \times 10^5\ s^{-1}$; 0.01 mol L^{-1} KOH.	94F095
	MeOH/ C_6H_6 (60:40)	1.2×10^7 (k_r)			CP/Ac,A'c-17	S = RB; A' = DMA; used $k_r^{A'} = 1.2 \times 10^7\ L\ mol^{-1}\ s^{-1}$; 0.01 mol L^{-1} KOH.	94F095

TABLE 4. Rate constants for interaction of singlet oxygen with phenols and naphthols. — Continued

No.	Solvent	k ($L\ mol^{-1}\ s^{-1}$)	β (k_d/k) ($mol\ L^{-1}$)	T (K)	Method	Comment	Ref.
4.163	**Phenoxide ion, 4-(1,1-dimethylethyl)-**						
	H_2O	3.6×10^8 (k_r)		300	MP/Ac,A'c-17	S = RB; A' = FFA; used $k_r^{A'} = 1.2 \times 10^8$ L mol^{-1} s^{-1}; calcd. from pH dependence and pK_a.	91F300
4.164	**Phenoxide ion, 2,4-dinitro-**						
	H_2O	4×10^5 (k_r)		300	MP/Ac,A'c-17	S = RB; A' = FFA; used $k_r^{A'} = 1.2 \times 10^8$ L mol^{-1} s^{-1}; pK_a of 2,4-dinitrophenol = 4.07.	91F300
4.165	**Phenoxide ion, 4-fluoro-**						
	C_6H_6/ MeOH (80:20)	2.0×10^8		295	CP/A'c-23	S = A' = Rub; used $k_d = 3.8 \times 10^4$ s^{-1}; $k_{A'}$ not given; *0.01 mol L^{-1} KOH.*	93F328
	C_6H_6/ MeOH (80:20)	5.7×10^7 (k_r)		295	CP/Ac,A'c-17	S = Rub; A' = DMA; used $k_r^{A'} = 1.2 \times 10^7$ L mol^{-1} s^{-1}; 0.01 mol L^{-1} KOH.	93F328
	H_2O pH = 11	2.5×10^9		295	CP/Oc-15	S = Eos; used $k_d = 2.5 \times 10^5$ s^{-1}.	93F328
	H_2O pH = 11	3.5×10^8 (k_r)		295	CP/Oc-17	S = Eos; A' = Met; used $k_r^{A'} = 2.0 \times 10^7$ L mol^{-1} s^{-1}.	93F328
4.166	**Phenoxide ion, 2-(2-hydroxyphenyl)- (2,2'-Dihydroxybiphenyl, conjugate base)**						
	D_2O pD = 11.8	1.2×10^8			PL/Ld-2	S = RB.	93E536
	EtOH	7×10^6 (k_r)			CP/Oc,A'c-17	S = RB; A' = DMA; used $k_r^{A'} = 4.4 \times 10^7$ L mol^{-1} s^{-1}; 7.5×10^{-3} mol L^{-1} KOH.	93E536
	EtOH	1.1×10^8			PL/Ld-2	S = RB; 7.5×10^{-3} mol L^{-1} KOH.	93E536
	EtOH	9.4×10^7			PL/Ld-2	S = RB; 7.5×10^{-3} mol L^{-1} KOH.	93E536
	H_2O pH = 11	2.2×10^7 (k_r)			CP/Oc-17	S = RB; A' = Met; used $k_r^{A'} = 2 \times 10^7$ L mol^{-1} s^{-1}.	93E536
4.167	**Phenoxide ion, 5-hydroxy-2-phenyl- (2,5-Dihydroxybiphenyl, conjugate base)**						
	EtOH	9.9×10^7			PL/Ld-2	S = RB; 7.5×10^{-3} mol L^{-1} KOH.	93E536
4.168	**Phenoxide ion, 4-iodo-**						
	C_6H_6/ MeOH (80:20)	1.4×10^7		295	CP/A'c-23	S = A' = Rub; used $k_d = 3.8 \times 10^4$ s^{-1}; $k_{A'}$ not given; *0.01 mol L^{-1} KOH.*	93F328
	C_6H_6/ MeOH (80:20)	1.0×10^7 (k_r)		295	CP/Ac,A'c-17	S = Rub; A' = DMA; used $k_r^{A'} = 1.2 \times 10^7$ L mol^{-1} s^{-1}; 0.01 mol L^{-1} KOH.	93F328
	H_2O pH = 11	8×10^7 (k_r)		295	CP/Oc-17	S = Eos; A' = Met; used $k_r^{A'} = 2.0 \times 10^7$ L mol^{-1} s^{-1}.	93F328
	H_2O pH = 11	1.0×10^9		295	CP/Oc-15	S = Eos; used $k_d = 2.5 \times 10^5$ s^{-1}.	93F328
4.169	**Phenoxide ion, 2-methoxy-**						
	H_2O	4.4×10^8 (k_r)		300	MP/Ac,A'c-17	S = RB; A' = FFA; used $k_r^{A'} = 1.2 \times 10^8$ L mol^{-1} s^{-1}; calcd. from pH dependence and pK_a.	91F300
4.170	**Phenoxide ion, 3-methoxy-**						
	H_2O	2.9×10^8 (k_r)		300	MP/Ac,A'c-17	S = RB; A' = FFA; used $k_r^{A'} = 1.2 \times 10^8$ L mol^{-1} s^{-1}; calcd. from pH dependence and pK_a.	91F300
4.171	**Phenoxide ion, 4-methoxy-**						
	H_2O	6.7×10^8 (k_r)		300	MP/Ac,A'c-17	S = RB; A' = FFA; used $k_r^{A'} = 1.2 \times 10^8$ L mol^{-1} s^{-1}; calcd. from pH dependence and pK_a.	91F300
4.172	**Phenoxide ion, 4-methyl-**						
	H_2O	3.5×10^8 (k_r)		300	MP/Ac,A'c-17	S = RB; A' = FFA; used $k_r^{A'} = 1.2 \times 10^8$ L mol^{-1} s^{-1}; calcd. from pH dependence and pK_a.	91F300
	H_2O	3.7×10^8 (k_r)		292	MP/Ac,A'c-17	S = RB; A' = FFA; used $k_r^{A'} = 1.2 \times 10^8$ L mol^{-1} s^{-1}; calcd. over the range pH = 8.3 to 11.5.	87A180

TABLE 4. Rate constants for interaction of singlet oxygen with phenols and naphthols. — Continued

No.	Solvent	k ($L\ mol^{-1}\ s^{-1}$)	β (k_d/k) ($mol\ L^{-1}$)	T (K)	Method	Comment	Ref.
4.173	**Phenoxide ion, 2-methyl-4,6-dinitro-**						
	H_2O	1.3×10^5 (k_r)		300	MP/Ac,A'c-17	S = RB; A' = FFA; used $k_r^{A'} = 1.2 \times 10^8$ L mol^{-1} s^{-1}; pK_a of 2-methyl-4,6-dinitrophenol = 4.7.	91F300
4.174	**Phenoxide ion, 4-methyl-2,6-dinitro-**						
	H_2O	1.4×10^7 (k_r)		300	MP/Ac,A'c-17	S = RB; A' = FFA; used $k_r^{A'} = 1.2 \times 10^8$ L mol^{-1} s^{-1}; pK_a of 4-methyl-2,6-dinitrophenol = 4.23.	91F300
4.175	**Phenoxide ion, 4-methyl-2-nitro-**						
	CH_3CN/H_2O (90:10)	6×10^7 (k_r)			CP/Ac,A'c-17	S = RB; A' = 9-Anthracenemethanol; $k_r^{A'}$ not given; 0.01 mol L^{-1} KOH.	92N330
	CH_3CN/H_2O (90:10)	3.4×10^8			PL/Ld-2	S – RB; 0.01 mol L^{-1} KOH.	92N330
	C_6H_6/ MeOH (60:40)	2.9×10^7 (k_r)			CP/Ac,A'c-17	S = RB; A' = DMA; $k_r^{A'}$ not given; 0.01 mol L^{-1} KOH.	92N330
	C_6H_6/ MeOH (60:40)	4.5×10^7			PL/Ld-2	S = RB; 0.01 mol L^{-1} KOH.	92N330
	H_2O pH = 10	2.8×10^7 (k_r)			CP/Oc-17	S = RB; A' = His; used $k_r^{A'} = 8.8 \times 10^7$ L mol^{-1} s^{-1}.	90F518 94F095
	H_2O pH = 10	4.3×10^9			CP/Ac,Oc-14	S = Eos; used $k_d = 2.5 \times 10^5$ s^{-1}.	90F518 94F095
	MeOH/ C_6H_6 (60:40)	2.9×10^7 (k_r)			CP/Ac,A'c-17	S = RB; A' = DMA; used $k_r^{A'} = 1.2 \times 10^7$ L mol^{-1} s^{-1}; 0.01 mol L^{-1} KOH.	94F095
	MeOH/ C_6H_6 (60:40)	4.5×10^7			CP/A'c-23	S = A' = Rub; used $k_d = 1 \times 10^5$ s^{-1}, $k_{A'} = 5 \times 10^7$ L mol^{-1} s^{-1}; 0.01 mol L^{-1} KOH; cor. for quenching of singlet rubrene by A.	90F518 94F095
4.176	**Phenoxide ion, 2-nitro-**						
	CH_3CN/H_2O (90:10)	3.3×10^7			PL/Ld-2	S = RB; 0.01 mol L^{-1} KOH.	92N330
	CH_3CN/H_2O (90:10)	5.8×10^6 (k_r)			CP/Ac,A'c-17	S = RB; A' = 9-Anthracenemethanol; $k_r^{A'}$ not given; 0.01 mol L^{-1} KOH.	92N330
	C_6H_6/ MeOH (60:40)	3.2×10^6 (k_r)			CP/Ac,A'c-17	S = RB; A' = DMA; $k_r^{A'}$ not given; 0.01 mol L^{-1} KOH.	92N330
	C_6H_6/ MeOH (60:40)	3.1×10^6			PL/Ld-2	S = RB; 0.01 mol L^{-1} KOH.	92N330
	H_2O	3.4×10^7 (k_r)		300	MP/Ac,A'c-17	S = RB; A' = FFA; used $k_r^{A'} = 1.2 \times 10^8$ L mol^{-1} s^{-1}; calcd. from pH dependence and pK_a.	91F300
	H_2O pH = 10	1.5×10^9			CP/Ac,Oc-14	S = Eos; used $k_d = 2.5 \times 10^5$ s^{-1}.	90F518 94F095
	H_2O pH = 10	1.6×10^7 (k_r)			CP/Oc-17	S = RB; A' = His; used $k_r^{A'} = 8.8 \times 10^7$ L mol^{-1} s^{-1}.	90F518 94F095
	MeOH/ C_6H_6 (60:40)	3×10^6 (k_r)			CP/Ac,A'c-17	S = RB; A' = DMA; used $k_r^{A'} = 1.2 \times 10^7$ L mol^{-1} s^{-1}; 0.01 mol L^{-1} KOH.	94F095
	MeOH/ C_6H_6 (60:40)	3.0×10^6			CP/A'c-23	S = A' = Rub; used $k_d = 1 \times 10^5$ s^{-1}, $k_{A'} = 5 \times 10^7$ L mol^{-1} s^{-1}; 0.01 mol L^{-1} KOH; cor. for quenching of singlet rubrene by A.	90F518
4.177	**Phenoxide ion, 3-nitro-**						
	H_2O	6.1×10^7 (k_r)		300	MP/Ac,A'c-17	S = RB; A' = FFA; used $k_r^{A'} = 1.2 \times 10^8$ L mol^{-1} s^{-1}; calcd. from pH dependence and pK_a.	91F300
	H_2O pH = 10	1.0×10^7 (k_r)			CP/Oc-17	S = RB; A' = His; used $k_r^{A'} = 8.8 \times 10^7$ L mol^{-1} s^{-1}.	90F518
	H_2O pH = 10	2.0×10^9			CP/Ac,Oc-14	S = Eos; used $k_d = 2.5 \times 10^5$ s^{-1}.	90F518

TABLE 4. Rate constants for interaction of singlet oxygen with phenols and naphthols. — Continued

No.	Solvent	k ($L\ mol^{-1}\ s^{-1}$)	β (k_d/k) ($mol\ L^{-1}$)	T (K)	Method	Comment	Ref.
4.177	**Phenoxide ion, 3-nitro-** — Continued						
	MeOH/ C_6H_6 (60:40)	9.0×10^6			CP/A'c-23	S = A' = Rub; used $k_d = 1 \times 10^5\ s^{-1}$, $k_{A'} = 5 \times 10^7$ $L\ mol^{-1}\ s^{-1}$; 0.01 mol L^{-1} KOH; cor. for quenching of singlet rubrene by A.	90F518
4.178	**Phenoxide ion, 4-nitro-**						
	H_2O	5.1×10^6 (k_r)		300	MP/Ac,A'c-17	S = RB; A' = FFA; used $k_r^{A'} = 1.2 \times 10^8$ $L\ mol^{-1}\ s^{-1}$; calcd. from pH dependence and pK_a.	91F300
	H_2O pH = 10	6×10^8			CP/Ac,Oc-14	S = Eos; used $k_d = 2.5 \times 10^5\ s^{-1}$.	90F518
	H_2O pH = 10	3×10^6 (k_r)			CP/Oc-17	S = RB; A' = His; used $k_r^{A'} = 8.8 \times 10^7$ $L\ mol^{-1}\ s^{-1}$.	90F518
	H_2O pH = 8.8	3×10^6 (k_r)		292	MP/Ac,A'c-17	S = RB; A' = FFA; used $k_r^{A'} = 1.2 \times 10^8$ $L\ mol^{-1}\ s^{-1}$; pK_a of 2-nitrophenol = 7.2.	87A180
	MeOH/ C_6H_6 (60:40)	$<10^3$			CP/A'c-23	S = A' = Rub; used $k_d = 1 \times 10^5\ s^{-1}$, $k_{A'} = 5 \times 10^7$ $L\ mol^{-1}\ s^{-1}$; 0.01 mol L^{-1} KOH; cor. for quenching of singlet rubrene by A.	90F518
4.179	**Phenoxide ion, pentachloro-**						
	H_2O	9.4×10^7 (k_r)		300	MP/Ac,A'c-17	S = RB; A' = FFA; used $k_r^{A'} = 1.2 \times 10^8$ $L\ mol^{-1}\ s^{-1}$; calcd. from pH dependence and pK_a.	91F300
4.180	**Phenoxide ion, 2-phenyl- (2-Hydroxybiphenyl, conjugate base)**						
	D_2O				PL/Ld-2	S = RB.	93E536
	pD = 9.0	2×10^7					
	pD = 10.0	3.8×10^7					
	pD = 11.8	2.3×10^8					
	EtOH	2.2×10^8			PL/Ld-2	S = RB; 7.5×10^{-3} mol L^{-1} KOH.	93E536
	EtOH	4.3×10^7 (k_r)			CP/Oc,A'c-17	S = RB; A' = DMA; used $k_r^{A'} = 4.4 \times 10^7$ $L\ mol^{-1}\ s^{-1}$; 7.5×10^{-3} mol L^{-1} KOH.	93E536
	H_2O				CP/Oc-17	S = RB; A' = Met; used $k_r^{A'} = 2 \times 10^7$ $L\ mol^{-1}\ s^{-1}$.	93E536
	pH = 8.0	3.2×10^5 (k_r)					
	pH = 9.0	3.2×10^6 (k_r)					
	pH = 10.0	5.9×10^6 (k_r)					
	pH = 11	4.4×10^7 (k_r)					
4.181	**Phenoxide ion, 4-phenyl- (4-Hydroxybiphenyl, conjugate base)**						
	C_6H_6/ MeOH (80:20)	1×10^7 (k_r)		295	CP/Ac,A'c-17	S = Rub; A' = DMA; used $k_r^{A'} = 1.2 \times 10^7$ $L\ mol^{-1}\ s^{-1}$; 0.01 mol L^{-1} KOH.	93F328
	C_6H_6/ MeOH (80:20)	4×10^7		295	CP/A'c-23	S = A' = Rub; used $k_d = 3.8 \times 10^4\ s^{-1}$; $k_{A'}$ not given; 0.01 mol L^{-1} KOH.	93F328
	D_2O pD = 11.8	7.8×10^7			PL/Ld-2	S = RB.	93E536
	D_2O pD = 11.8	8×10^7		295	CP/Oc-15	S = Eos; used $k_d = 2.5 \times 10^5\ s^{-1}$.	93F328
	EtOH	1.3×10^8			PL/Ld-2	S = RB; 7.5×10^{-3} mol L^{-1} KOH.	93E536
	H_2O pH = 11	3.8×10^7 (k_r)			CP/Oc-17	S = RB; A' = Met; used $k_r^{A'} = 2 \times 10^7$ $L\ mol^{-1}\ s^{-1}$.	93E536
	H_2O pH = 11	4×10^7 (k_r)		295	CP/Oc-17	S = Eos; A' = Met; used $k_r^{A'} = 2.0 \times 10^7$ $L\ mol^{-1}\ s^{-1}$.	93F328
4.182	***Phenoxide ion, 2,4,6-trichloro-***						
	C_6H_6/ MeOH (60:40)	4.0×10^6 (k_r)			CP/Ac,A'c-17	S = Eos; A' = DMA; used $k_r^{A'} = 4.8 \times 10^7$ $L\ mol^{-1}\ s^{-1}$; meas. $k_q/k_r = 4.5$; 6×10^{-3} mol L^{-1} KOH.	88F650
	C_6H_6/ MeOH (60:40)	2.2×10^7			CP/A'c-23	S = A' = Rub; k_d and $k_{A'}$ not given; 6×10^{-3} mol L^{-1} KOH.	88F650

TABLE 4. Rate constants for interaction of singlet oxygen with phenols and naphthols. — Continued

No.	Solvent	k ($L\ mol^{-1}\ s^{-1}$)	β (k_d/k) ($mol\ L^{-1}$)	T (K)	Method	Comment	Ref.
4.183	**Phenoxide ion, 2,4,6-trichloro-** — Continued						
	H_2O	1.7×10^8 (k_r)		300	MP/Ac,A'c-17	S = RB; A' = FFA; used $k_r^{A'} = 1.2 \times 10^8$ L mol^{-1} s^{-1}; calcd. from pH dependence and pK_a.	91F300
	H_2O	1.2×10^8 (k_r)		292	MP/Ac,A'c-17	S = RB; A' = FFA; used $k_r^{A'} = 1.2 \times 10^8$ L mol^{-1} s^{-1}; calcd. over the range pH = 4.2 to 9.0.	87A180
	H_2O pH = 10	6×10^8			CP/Ac-14	S = Eos; used $k_d = 5 \times 10^5$ s^{-1}.	87F537
	H_2O pH = 10	4×10^8			CP/Ac-14	S = RB; used $k_d = 5 \times 10^5$ s^{-1}.	87F537
	H_2O pH = 10	7.0×10^8			CP/Oc-14	S = Eos; used $k_d = 5 \times 10^5$ s^{-1}.	87F537
	H_2O pH = 10	5.9×10^7 (k_r) 6.4×10^8 (k_q)			CP/Oc-17	S = Eos; A' = Met; used $k_r^{A'} = 5 \times 10^6$ L mol^{-1} s^{-1}; used $k_A = 7.0 \times 10^8$ L mol^{-1} s^{-1}.	87F537
4.184	**L-Phenylalanine, 3,4-dihydroxy- (DOPA)**						
	D_2O	2.2×10^7			PL/Ld-2	S = MB.	91R251
	D_2O pD = 7.6	3×10^7	6×10^{-4}	296	CP/Oc-15	S = HP; used $k_d = 1.8 \times 10^4$ s^{-1}.	84F075
	H_2O	9×10^8	5.6×10^{-4}		CP/Ac-15	S = MB; used $k_d = 5 \times 10^5$ s^{-1}.	79F314
	MeOH/ H_2O (58:42)		1.2×10^{-3}	293	CP/Ac-15	S = NAZ.	79F315
	MeOH/ H_2O (58:42)		1.3×10^{-3}		CP/Ac-15	S = 5,8-DMOP.	81R052
	MeOH/ H_2O (58:42)		1.1×10^{-3}		CP/Ac-15	S = 5-MOP.	81R052
	MeOH/ H_2O (58:42)		1.3×10^{-3}		CP/Ac-15	S = Pso.	81R052
	MeOH/ H_2O (58:42)		1.3×10^{-3}		CP/Ac-15	S = TMPs.	81R052
	MeOH/ H_2O (58:42)		1×10^{-3}		CP/Ac-15	S = 8-MOP.	79F314
	MeOH/ H_2O (58:42)		1.2×10^{-3}		CP/Ac-15	S = MB.	79F314
4.185	**2,2'-Spirobi[1-benzopyran]-6,6'-diol, 7,7'-bis(1,1-dimethylethyl)-3,3',4,4'-tetrahydro-4,4,4',4'-tetramethyl-**						
	MeOH	9.2×10^7			CP/A'c-16	S = MB; A' = DPBF; used $k_d = 1.8 \times 10^5$ s^{-1}.	91F516
	MeOH	2.2×10^7 (k_r)			CP/Ac,A'c-17	S = MB; A' = DPBF; used $k_r^{A'} = 8 \times 10^8$ L mol^{-1} s^{-1}.	91F516
	MeOH	9.8×10^7	1.8×10^{-3}		CP/A'c-16	S = RB; A' = DPBF; used $k_d = 1.8 \times 10^5$ s^{-1}.	88F440
4.186	**2,2'-Spirobi[1-benzopyran]-6,6'-diol, 3,3',4,4'-tetrahydro-4,4,4',4',7,7'-hexamethyl-**						
	MeOH	1.2×10^8			CP/A'c-16	S = MB; A' = DPBF; used $k_d = 1.8 \times 10^5$ s^{-1}.	91F516
	MeOH	3.1×10^7 (k_r)			CP/Ac,A'c-17	S = MB; A' = DPBF; used $k_r^{A'} = 8 \times 10^8$ L mol^{-1} s^{-1}.	91F516
	MeOH	9.2×10^7	2.0×10^{-3}		CP/A'c-16	S = RB; A' = DPBF; used $k_d = 1.8 \times 10^5$ s^{-1}.	88F440
4.187	**Tyramine**						
	D_2O/ EtOH (75:25)	5×10^6		295	PL/Ld-2	S = RB.	94A113
	H_2O pH = 10	2.8×10^8 2.4×10^8 (k_r)		298	CP/Ac-?	S = MB; A' = N_3^-; k and k_r by computer fit of rate parameters to experimental ϕ_{ox} versus [A].	777489
4.188	**Tyrosine**						
	D_2O pD = 8.4	8×10^6 (k_r)		293	CL/Ad-35	used $k_d = 2.9 \times 10^4$ s^{-1}; high pressure O_2 (0.195 mol L^{-1}); statistical error of 30% and systematic error of the same order.	79A112

TABLE 4. Rate constants for interaction of singlet oxygen with phenols and naphthols. — Continued

No.	Solvent	k ($L\ mol^{-1}\ s^{-1}$)	β (k_d/k) ($mol\ L^{-1}$)	T (K)	Method	Comment	Ref.
4.187	**Tyrosine — Continued**						
	D_2O/ EtOH (75:25)	$\sim 2 \times 10^6$		295	PL/Ld-2	S = RB.	94A113
	EtOH/ CH_3CN (80:20)	6.2×10^6			PL/Ld-2	S = ZnTPP.	91A252
	EtOH/ CH_3CN (80:20)	3.1×10^6 (k_r)			CP/Ac,A'c-14,28	S = ZnTPP; A' = DMA; used $k_d = 5.3 \times 10^4\ s^{-1}$; used $k_A = 6.2 \times 10^6\ L\ mol^{-1}\ s^{-1}$.	91A252
	EtOH/ CH_3CN (80:20)	5.5×10^6			PL/Ld-2	S = ZnTPP; 0.01 mol L^{-1} HCl.	91A252
	EtOH/ CH_3CN (80:20)	$<5 \times 10^4$ (k_r)			CP/Ac,A'c-14,28	S = ZnTPP; A' = DMA; used $k_d = 5.3 \times 10^4\ s^{-1}$, $k_{A'} = 3 \times 10^7\ L\ mol^{-1}\ s^{-1}$; used $k_A = 5.5 \times 10^6\ L\ mol^{-1}\ s^{-1}$; 0.01 mol L^{-1} HCl.	91A252
	EtOH/ CH_3CN (80:20)	1.8×10^8			PL/Ld-2	S = ZnTPP; 0.01 mol L^{-1} KOH.	91A252
	EtOH/ CH_3CN (80:20)	3×10^7 (k_r)			CP/Ac,A'c-14,28	S = ZnTPP; A' = DMA; used $k_d = 5.3 \times 10^4\ s^{-1}$; used $k_A = 1.8 \times 10^8\ L\ mol^{-1}\ s^{-1}$; 0.01 mol L^{-1} KOH.	91A252
	H_2O pH = 10	3.8×10^7 (k_r)			CP/Oc-17	S = RB; A' = Met; used $k_r^{A'} = 2 \times 10^7\ L\ mol^{-1}\ s^{-1}$	91A252
	H_2O pH = 11.5	5.2×10^7 (k_r)			CP/Oc-17	S = Eos; A' = Met; used $k_r^{A'} = 2 \times 10^7\ L\ mol^{-1}\ s^{-1}$.	91A252
	H_2O pH = 7.0		0.017	283	CP/Oc-15	S = MB; The mechanism of oxidation is not clear.	65F029
4.188	**L-Tyrosine, *N*-acetyl-, ethyl ester**						
	D_2O/ EtOH (75:25)	8×10^6		295	PL/Ld-2	S = RB.	94A113
4.189	**Tyrosine, glycyl-**						
	D_2O/ EtOH (75:25)	1.1×10^7		295	PL/Ld-2	S = RB.	94A113
	EtOH/ CH_3CN (80:20)	3.5×10^6			PL/Ld-2	S = ZnTPP.	91A252
	EtOH/ CH_3CN (80:20)	3×10^5 (k_r)			CP/Ac,A'c-14,28	S = ZnTPP; A' = DMA; used $k_d = 5.3 \times 10^4\ s^{-1}$; used $k_A = 3.5 \times 10^6\ L\ mol^{-1}\ s^{-1}$.	91A252
	EtOH/ CH_3CN (80:20)	9.4×10^7			PL/Ld-2	S = ZnTPP; 0.01 mol L^{-1} KOH.	91A252
	EtOH/ CH_3CN (80:20)	2.7×10^6 (k_r)			CP/Ac,A'c-14,28	S = ZnTPP; A' = DMA; used $k_d = 5.3 \times 10^4\ s^{-1}$; used $k_A = 9.4 \times 10^7\ L\ mol^{-1}\ s^{-1}$; 0.01 mol L^{-1} KOH.	91A252
	EtOH/ CH_3CN (80:20)	5.5×10^6			PL/Ld-2	S = ZnTPP; 0.01 mol L^{-1} HCl.	91A252
	EtOH/ CH_3CN (80:20)	$<5 \times 10^4$ (k_r)			CP/Ac,A'c-14,28	S = ZnTPP; A' = DMA; used $k_d = 5.3 \times 10^4\ s^{-1}$; used $k_A = 5.5 \times 10^6\ L\ mol^{-1}\ s^{-1}$; 0.01 mol L^{-1} HCl.	91A252
	H_2O pH = 10	1.4×10^7 (k_r)			CP/Oc-17	S = RB; A' = Met; used $k_r^{A'} = 2 \times 10^7\ L\ mol^{-1}\ s^{-1}$.	91A252
	H_2O pH = 11.5	1.9×10^7 (k_r)			CP/Oc-17	S = Eos; A' = Met; used $k_r^{A'} = 2 \times 10^7\ L\ mol^{-1}\ s^{-1}$.	91A252
4.190	**Tyrosine, methyl ester**						
	D_2O/ EtOH (75:25)	5×10^6		295	PL/Ld-2	S = RB.	94A113

TABLE 5. Rate constants for interaction of singlet oxygen with furans, pyrans and other heterocyclic oxygen compounds.

No.	Solvent	k ($L\ mol^{-1}\ s^{-1}$)	β (k_d/k) ($mol\ L^{-1}$)	T (K)	Method	Comment	Ref.
1.1	**Angelicin**						
	CCl_4	6.5×10^3			MP/LI-12	S = TPP; used $k_d = 39\ s^{-1}$.	83E813
1.2	**Benzo[1,2-*b*:4,3-*b'*]dipyran, 1,2,3,8,9,10-hexahydro-3,3,5,6,8,8-hexamethyl-**						
	EtOH	2.8×10^8		308	CR/A'c-16	A' = DPBF; used $k_d = 8.3 \times 10^4\ s^{-1}$; $^1O_2$* from $MNPO_2$.	91F285
1.3	**Benzo[1,2-*b*:4,5-*b'*]dipyran, 2,3,4,7,8,9-hexahydro-2,2,5,7,7,10-hexamethyl-**						
	EtOH	3.4×10^8		308	CR/A'c-16	A' = DPBF; used $k_d = 8.3 \times 10^4\ s^{-1}$; $^1O_2$* from $MNPO_2$.	91F285
1.4	**1-Benzopyran, 3,4-dihydro-6-methoxy-2,5,7,8-tetramethyl-2-(4,8,12-trimethyltridecyl)- (α-Tocopherol methyl ether)**						
	$CHCl_3$/ EtOH (50:50)	9.4×10^5 (k_r)		310	CR/Ac-31	used $k_d = 1 \times 10^5\ s^{-1}$; $^1O_2$* from $NDPO_2$.	90A184
1.5	**1-Benzopyran, 6-ethoxy-3,4-dihydro-2,5,7,8-tetramethyl-2-(4,8,12-trimethyltridecyl)- (α-Tocopherol ethyl ether)**						
	$CHCl_3$/ EtOH (50:50)	1.6×10^5 (k_r)		310	CR/Ac-31	used $k_d = 1 \times 10^5\ s^{-1}$; $^1O_2$* from $NDPO_2$.	90A184
1.6	**Coumarin, 7-(diethylamino)-**						
	C_6H_6	9×10^5			CP/A'c-33	S = A' = Rub; used $k_d = 3.7 \times 10^4\ s^{-1}$; $k_{A'}$ not given.	87F569
1.7	**Coumarin, 7-(diethylamino)-4-methyl-**						
	C_6H_6	9×10^5			CP/A'c-33	S = A' = Rub; used $k_d = 3.7 \times 10^4\ s^{-1}$; $k_{A'}$ not given.	87F569
1.8	**Cyclopenta[*b*][1]benzopyran, 2-phenyl-**						
	C_6H_6	7.8×10^5	0.054		CP/Ac-15	S = A; used $k_d = 4.2 \times 10^4\ s^{-1}$.	78F438
1.9	**2-Furaldehyde**						
	CH_2Cl_2	5.1×10^4			CP/A'c-33	S = A' = Rub; used $k_d = 1 \times 10^4\ s^{-1}$, $k_{A'} = 3.3 \times 10^7\ L\ mol^{-1}\ s^{-1}$.	84F477
	EtOH			293	CP/Oc-17	S = RB; A' = FFA; meas. $k_r/k_r^{A'} = 0.22$.	86F510
	MeOH	8.4×10^4 (k_r)	1.7 (β_r)	286	CP/Oc-14	S = RB or TPP; used $k_d = 1.4 \times 10^5\ s^{-1}$.	85F145
	MeOH		0.080		CP/A'c-16	S = MB; A' = DPBF.	72F510
	MeOH		0.60	293	CP/Oc-15	S = RB; $E_a = 21\ kJ\ mol^{-1}$.	68F288
1.10	**2-Furaldehyde, 5-(2-hydroxyethoxy)methyl-**						
	EtOH			293	CP/Oc-17	S = RB; A' = FFA; meas. $k_r/k_r^{A'} = 0.43$.	86F510
1.11	**2-Furaldehyde, 5-(hydroxymethyl)-**						
	EtOH			293	CP/Oc-17	S = RB; A' = FFA; meas. $k_r/k_r^{A'} = 0.38$.	86F510
1.12	**2-Furaldehyde, 5-(methoxymethyl)-**						
	EtOH			293	CP/Oc-17	S = RB; A' = FFA; meas. $k_r/k_r^{A'} = 0.35$.	86F510
1.13	**2-Furaldehyde, 5-methyl-**						
	CH_2Cl_2	5.3×10^5			CP/A'c-33	S = A' = Rub; used $k_d = 1 \times 10^4\ s^{-1}$, $k_{A'} = 3.3 \times 10^7\ L\ mol^{-1}\ s^{-1}$.	84F477
	EtOH			293	CP/Oc-17	S = RB; A' = FFA; meas. $k_r/k_r^{A'} = 0.59$.	86F510
	MeOH	1.7×10^6 (k_r)	0.084 (β_r)	286	CP/Oc-14	S = RB or TPP; used $k_d = 1.4 \times 10^5\ s^{-1}$.	85F145
1.14	**Furan**						
	$C_6H_5CH_3$	1.1×10^7			PR/A'd-5	S = Np; A' = DPBF; $\Delta H‡ = 0\ kJ\ mol^{-1}$; $\Delta S‡ = -118\ J\ K^{-1}\ mol^{-1}$; studied at 223-353 K.	79A106
	CH_2Cl_2	1.4×10^7			CP/A'c-16	S = MPDME; A' = DPBF; used $k_d = 1 \times 10^4\ s^{-1}$.	84F477
	CH_2Cl_2	1.2×10^7			CP/A'c-33	S = A' = Rub; used $k_d = 1 \times 10^4\ s^{-1}$, $k_{A'} = 3.3 \times 10^7\ L\ mol^{-1}\ s^{-1}$.	84F477

TABLE 5. Rate constants for interaction of singlet oxygen with furans, pyrans and other heterocyclic oxygen compounds. — Continued

No.	Solvent	k ($L\ mol^{-1}\ s^{-1}$)	β (k_d/k) ($mol\ L^{-1}$)	T (K)	Method	Comment	Ref.
5.14	**Furan** — Continued						
	EtOH			293	CP/Oc-17	S = RB; A′ = FFA; meas. $k_r/k_r^{A'} = 1$.	86F510
	MCH			298	PL/A′d-8	S = An; A′ = DPBF; $\Delta V‡ = -17\ cm^3\ mol^{-1}$; studied at 0.1-400 MPa.	92A014
	MeOH	8.9×10^6 (k_r)	0.016 (β_r)	286	CP/Oc-14	S = RB or TPP; used $k_d = 1.4 \times 10^6\ s^{-1}$.	85F145
	MeOH		2.6×10^{-3}		CP/A′c-16	S = MB; A′ = DPBF.	72F510
	MeOH		4.5×10^{-3}	293	CP/Oc-15	S = RB; $E_a = 0.84\ kJ\ mol^{-1}$.	68F288
5.15	**Furan, 2-acetyl-**						
	MeOH		0.022		CP/A′c-16	S = MB; A′ = DPBF.	72F510
5.16	**Furan, 2,5-bis(4-bromophenyl)-**						
	CH_2Cl_2	2.5×10^7			CP/A′c-33	S = A′ = Rub; used $k_d = 1 \times 10^4\ s^{-1}$, $k_{A'} = 3.3 \times 10^7\ L\ mol^{-1}\ s^{-1}$.	84F477
5.17	**Furan, 2,5-bis(4-chlorophenyl)-**						
	$C_6H_5CH_3$	5.8×10^7			PR/A′d-5	S = Np; A′ = DPBF; $\Delta H‡ = 0\ kJ\ mol^{-1}$; $\Delta S‡ = -105\ J\ K^{-1}\ mol^{-1}$; studied at 223-353 K.	79A106
	CH_2Cl_2	2.9×10^7			CP/A′c-33	S = A′ = Rub; used $k_d = 1 \times 10^4\ s^{-1}$, $k_{A'} = 3.3 \times 10^7\ L\ mol^{-1}\ s^{-1}$.	84F477
5.18	**Furan, 2,5-bis(hydroxymethyl)- (BMHF)**						
	EtOH			293	CP/Oc-17	S = RB; A′ = FFA; meas. $k_r/k_r^{A'} = 1.2$.	86F510
	H_2O pH = 7		4.0×10^{-3}		CP/Ac-15	S = RB.	*92N305*
5.19	**Furan, 2,5-bis(4-methoxyphenyl)-**						
	CH_2Cl_2	9.9×10^7			CP/A′c-33	S = A′ = Rub; used $k_d = 1 \times 10^4\ s^{-1}$, $k_{A'} = 3.3 \times 10^7\ L\ mol^{-1}\ s^{-1}$.	84F477
5.20	**Furan, 2,5-bis(4-methylphenyl)-**						
	CH_2Cl_2	7.0×10^7			CP/A′c-33	S = A′ = Rub; used $k_d = 1 \times 10^4\ s^{-1}$, $k_{A'} = 3.3 \times 10^7\ L\ mol^{-1}\ s^{-1}$.	84F477
5.21	**Furan, 2-bromo-**						
	CH_2Cl_2	6.7×10^5			CP/A′c-33	S = A′ = Rub; used $k_d = 1 \times 10^4\ s^{-1}$, $k_{A'} = 3.3 \times 10^7\ L\ mol^{-1}\ s^{-1}$.	84F477
5.22	**Furan, 2-(4-bromophenyl)-**						
	CH_2Cl_2	1.0×10^7			CP/A′c-33	S = A′ = Rub; used $k_d = 1 \times 10^4\ s^{-1}$, $k_{A'} = 3.3 \times 10^7\ L\ mol^{-1}\ s^{-1}$.	84F477
5.23	**Furan, 3-(4-bromophenyl)-**						
	MeOH		4.4×10^{-3}		CP/A′c-16	S = MB; A′ = DPBF.	72F510
5.24	**Furan, 2-*tert*-butyl-**						
	CH_2Cl_2	6.1×10^7			CP/A′c-33	S = A′ = Rub; used $k_d = 1 \times 10^4\ s^{-1}$, $k_{A'} = 3.3 \times 10^7\ L\ mol^{-1}\ s^{-1}$.	84F477
	CH_2Cl_2	6.4×10^7			CP/A′c-16	S = MPDME; A′ = DPBF; used $k_d = 1 \times 10^4\ s^{-1}$.	84F477
5.25	**Furan, 2-(4-chlorophenyl)-**						
	1-BuOH		3.4×10^{-3} (β_r)	298	CP/Ac,A′c-17	S = RB; A′ = DPF; used $\beta_r^{A'} = 9.5 \times 10^{-4}\ mol\ L^{-1}$; meas. $\beta_r^A/\beta_r^{A'}(MeOH) = 3.58$.	717398
	tert-BuOH		0.035 (β_r)	298	CP/Ac,A′c-17	S = RB; A′ = DPF; used $\beta_r^{A'} = 9.5 \times 10^{-4}\ mol\ L^{-1}$; meas. $\beta_r^A/\beta_r^{A'}(MeOH) = 36.8$.	717398
	CH_2Cl_2	1.0×10^7			CP/A′c-33	S = A′ = Rub; used $k_d = 1 \times 10^4\ s^{-1}$, $k_{A'} = 3.3 \times 10^7\ L\ mol^{-1}\ s^{-1}$.	84F477
	MeOH		2.9×10^{-3}		CP/A′c-16	S = MB; A′ = DPBF.	72F510

TABLE 5. Rate constants for interaction of singlet oxygen with furans, pyrans and other heterocyclic oxygen compounds. — Continued

No.	Solvent	k ($L\ mol^{-1}\ s^{-1}$)	β (k_d/k) ($mol\ L^{-1}$)	T (K)	Method	Comment	Ref.
1.26	**Furan, 2-(4-chlorophenyl)- — Continued**						
	MeOH		2.7×10^{-3} (β_r)	298	CP/Ac,A'c-17	S = RB; A' = DPF; used $\beta_r^{A'} = 9.5 \times 10^{-4}$ mol L^{-1}.	717398
1.26	**Furan, 2-(4-cyanophenyl)-**						
	CH_2Cl_2	4×10^6			CP/A'c-33	S = A' = Rub; used $k_d = 1 \times 10^4\ s^{-1}$, $k_{A'} = 3.3 \times 10^7\ L\ mol^{-1}\ s^{-1}$.	84F477
1.27	**Furan, 2,5-dibromo-**						
	CH_2Cl_2	2.0×10^6			CP/A'c-33	S = A' = Rub; used $k_d = 1 \times 10^4\ s^{-1}$, $k_{A'} = 3.3 \times 10^7\ L\ mol^{-1}\ s^{-1}$.	84F477
1.28	**Furan, 2,5-di-(1,1-dimethylethyl)-**						
	$C_6H_5CH_3$	2.3×10^8			PR/A'd-5	S = Np; A' = DPBF; $\Delta H‡ = 0\ kJ\ mol^{-1}$; $\Delta S‡ = -94.1\ J\ K^{-1}\ mol^{-1}$; studied at 223-353 K.	79A106
	CH_2Cl_2	1.5×10^8			CP/A'c-16	S = MPDME; A' = DPBF; used $k_d = 1 \times 10^4\ s^{-1}$.	84F477
	CH_2Cl_2	9.4×10^7			CP/A'c-33	S = A' = Rub; used $k_d = 1 \times 10^4\ s^{-1}$, $k_{A'} = 3.3 \times 10^7\ L\ mol^{-1}\ s^{-1}$.	84F477
1.29	**Furan, 2,3-dihydro-**						
	C_6H_6	2.1×10^6 (k_r)	0.020 (β_r)	286	CP/Oc-29	S = RB or TPP; A' = 2,5-DMF; used $k_d = 4.2 \times 10^4\ s^{-1}$; meas. $k_q/k_r = \leq 0.1$; 32% [2+2] cycloaddition.	91F163
	CCl_4	1.6×10^6 (k_r)	9.2×10^{-4} (β_r)	286	CP/Oc-29	S = TPP; A' = 2,5-DMF; used $k_d = 1.4 \times 10^3\ s^{-1}$; meas. $k_q/k_r = \leq 0.1$; 24% [2+2] cycloaddition.	91F163
	CH_2Cl_2	3.2×10^6 (k_r)	3.0×10^{-3} (β_r)	286	CP/Oc-29	S = TPP; A' = 2,5-DMF; used $k_d = 9.3 \times 10^5\ s^{-1}$; meas. $k_q/k_r = \leq 0.1$; 74% [2+2] cycloaddition.	91F163
	CH_3CN	4.7×10^6 (k_r)	7.1×10^{-3} (β_r)	286	CP/Oc-29	S = RB; A' = 2,5-DMF; used $k_d = 3.3 \times 10^4\ s^{-1}$; meas. $k_q/k_r = \leq 0.1$; 70% [2+2] cycloaddition.	91F163
	CH_3COCH_3	2.8×10^6 (k_r)	0.014 (β_r)	286	CP/Oc-29	S = RB; A' = 2,5-DMF; used $k_d = 3.8 \times 10^4\ s^{-1}$; meas. $k_q/k_r = \leq 0.1$; 71% [2+2] cycloaddition.	91F163
	$CHCl_3$	1.0×10^6 (k_r)	3.9×10^{-3} (β_r)	286	CP/Oc-29	S = TPP; A' = 2,5-DMF; used $k_d = 4.0 \times 10^3\ s^{-1}$; meas. $k_q/k_r = \leq 0.1$; 73% [2+2] cycloaddition.	91F163
	MeOH	2.5×10^6 (k_r)	0.058 (β_r)	286	CP/Oc-29	S = RB; A' = 2,5-DMF; used $k_d = 1.4 \times 10^5\ s^{-1}$; meas. $k_q/k_r = \leq 0.1$.	91F163
1.30	**Furan, 2,3-dihydro-4,5-dimethyl-**						
	MeOH	1.1×10^8 (k_r)		286	CP/Oc-29	S = RB; A' = 2,5-DMF; used $k_d = 1.4 \times 10^5\ s^{-1}$; meas. $k_q/k_r = \leq 0.1$; 80% [2+2] cycloaddition.	91F163
1.31	**Furan, 2,3-dihydro-5-methyl-**						
	C_6H_6	1.5×10^7 (k_r)	2.9×10^{-3} (β_r)	286	CP/Oc-29	S = RB or TPP; A' = 2,5-DMF; used $k_d = 4.2 \times 10^4\ s^{-1}$; meas. $k_q/k_r = \leq 0.1$; 52% [2+2] cycloaddition.	91F163
	CH_3CN	3.4×10^7 (k_r)	9.7×10^{-4} (β_r)	286	CP/Oc-29	S = RB; A' = 2,5-DMF; used $k_d = 3.3 \times 10^4\ s^{-1}$; meas. $k_q/k_r = \leq 0.1$; 85% [2+2] cycloaddition.	91F163
	CH_3COCH_3	2.8×10^7 (k_r)	1.4×10^{-3} (β_r)	286	CP/Oc-29	S = RB; A' = 2,5-DMF; used $k_d = 3.8 \times 10^4\ s^{-1}$; meas. $k_q/k_r = \leq 0.1$; 78% [2+2] cycloaddition.	91F163
	MeOH	1.4×10^7 (k_r)	0.010 (β_r)	286	CP/Oc-29	S = RB; A' = 2,5-DMF; used $k_d = 1.4 \times 10^5\ s^{-1}$; meas. $k_q/k_r = \leq 0.1$.	91F163
1.32	**Furan, 2-(dimethoxymethyl)-5-(methoxymethyl)-**						
	EtOH			293	CP/Oc-17	S = RB; A' = FFA; meas. $k_r/k_r^{A'} = 1.0$.	86F510
1.33	**Furan, 2,4-dimethyl-**						
	MeOH		2.0×10^{-3}	293	CP/Oc-15	S = RB; $E_a = 6.3\ kJ\ mol^{-1}$.	68F288

TABLE 5. Rate constants for interaction of singlet oxygen with furans, pyrans and other heterocyclic oxygen compounds. — Continued

No.	Solvent	k ($L\ mol^{-1}\ s^{-1}$)	β (k_d/k) ($mol\ L^{-1}$)	T (K)	Method	Comment	Ref.
5.34	**Furan, 2,5-dimethyl- (2,5-DMF)**						
	$C_6H_5CH_3$	6.3×10^8			PR/A'd-5	S = Np; A' = DPBF; $\Delta H‡ = 0\ kJ\ mol^{-1}$; $\Delta S‡ = -84.5\ J\ K^{-1}\ mol^{-1}$; studied at 223-353 K.	79A106
	CH_2Cl_2	2.6×10^8			CP/A'c-16	S = MPDME; A' = DPBF; used $k_d = 1 \times 10^4\ s^{-1}$.	84F477
	CH_2Cl_2	1.3×10^8			CP/A'c-33	S = A' = Rub; used $k_d = 1 \times 10^4\ s^{-1}$, $k_{A'} = 3.3 \times 10^7\ L\ mol^{-1}\ s^{-1}$.	84F477
	CH_3COCH_3	2.1×10^8	1.8×10^{-4}		CP/Oc-?	S = MB; used $k_d = 3.8 \times 10^4\ s^{-1}$.	75F652
	EtOH			293	CP/Oc-17	S = RB; A' = FFA; meas. $k_t/k_r^{A'} = 1.3$.	86F510
	EtOH	2.6×10^8			CP/Oc-20	S = BXP; Q = DABCO; used $k_d = 8.3 \times 10^4\ s^{-1}$, $k_Q = 1.3 \times 10^7\ L\ mol^{-1}\ s^{-1}$; soln. contg. TEMPO.	83F323
	EtOH	3.8×10^8	2.2×10^{-4}	298	CP/Ac-15	S = MB; used $k_d = 8.3 \times 10^4\ s^{-1}$.	78F061
	EtOH		1.5×10^{-4}		CP/Ac-15	S = MB.	78F201
	EtOH		1.6×10^{-4}		CP/Ac-15	S = Ret.	78F201
	EtOH		3.3×10^{-3}	273	CP/Oc-20	S = MB; A' = 1-Cyclohexylamino-4-phenylaminobenzene.	72F518
	H_2O pH = 7.0	8.2×10^8 (k_r)		292	MP/Ac,A'c-17	S = RB; A' = FFA; used $k_r^{A'} = 1.2 \times 10^8\ L\ mol^{-1}\ s^{-1}$.	87A180
	H_2O	1.1×10^9			PL/P'a-16	S = Ery; A' = TMPD; used $k_d = 3.3 \times 10^5\ s^{-1}$; P' = $[TMPD]^{\cdot+}$.	82A080
	H_2O		3.3×10^{-4} (β_r)		CP/Ac-14	S = *N*-[5-Hydroxy-8-[[2-(methylsulfonyl)-4-nitrophenyl]azo]-1-naphthalenyl-1,3-benzenedisulfonamide, conjugate base.	79F412
	H_2O		5.5×10^{-4}	298	CR/Oc-15	$^1O_2$* from H_2O_2/NaOCl.	78A227
	H_2O	1.6×10^9	3.2×10^{-4}	298	CP/Ac-15	S = MB; used $k_d = 5.0 \times 10^5\ s^{-1}$.	78F061
	H_2O	1.6×10^9	3.1×10^{-4}	298	CP/Ac-15	S = MB; used $k_d = 5.0 \times 10^5\ s^{-1}$.	747044
	MeOH	1.8×10^8 (k_r)		286	CP/Oc-14	S = RB; used $k_d = 1.4 \times 10^5\ s^{-1}$.	91F163
	MeOH	3.8×10^8			PL/Tb-3	S = Ery.	83A050
	MeOH	9×10^7			PL/Tb-3	S = $CH_3COCOCH_3$.	80E606
	MeOH	3.9×10^8	2.8×10^{-4}	298	CP/Ac-15	S = MB; used $k_d = 1.1 \times 10^5\ s^{-1}$.	78F061
	MeOH	1.4×10^8	1.0×10^{-3}		CP/Oc-?	S = RB; used $k_d = 1.4 \times 10^5\ s^{-1}$.	75F652
	MeOH	4×10^8			PL/A'd-5	S = MB; A' = DPBF.	727260
	MeOH		2.8×10^{-4}		CP/A'c-16	S = MB; A' = DPBF.	72F510 717398
	MeOH		$\sim 2 \times 10^{-4}$	293	CP/Oc-15	S = RB; $E_a = 4.2\ kJ\ mol^{-1}$.	68F288
	MeOH/ *tert*-BuOH (50:50)		1.6×10^{-4}		CP/A'c-16	S = RB; A' = DPBF.	717398
	MeOH/ *tert*-BuOH (50:50)				CP/Ac,A'c-17	S = RB; A' = TME; meas. $k_t/k_r^{A'} = 2.4$.	68F292
	MeOH/ *tert*-BuOH (50:50)				CR/Ac,A'c-17	A' = TME; meas. $k_t/k_r^{A'} = 1.5$; $^1O_2$* from $H_2O_2/Ca(OCl)_2$.	68F292
	MeOH/ *tert*-BuOH (50:50)				CR/Ac,A'c-17	A' = TME; meas. $k_t/k_r^{A'} = 5.2$; $^1O_2$* from H_2O_2/NaOCl.	68F292
5.35	**Furan, 2-[(1,1-dimethylethoxy)methyl]-**						
	EtOH			293	CP/Oc-17	S = RB; A' = FFA; meas. $k_t/k_r^{A'} = 1.0$.	86F510
5.36	**Furan, 2-[2-(1,3-dioxolanyl)-**						
	EtOH			293	CP/Oc-17	S = RB; A' = FFA; meas. $k_t/k_r^{A'} = 0.94$.	86F510
5.37	**Furan, 2,3-diphenyl-**						
	$C_6H_5CH_3$	6.2×10^7			PR/A'd-5	S = Np; A' = DPBF; $\Delta H‡ = 0\ kJ\ mol^{-1}$; $\Delta S‡ = -104\ J\ K^{-1}\ mol^{-1}$; studied at 223-353 K.	79A106

TABLE 5. Rate constants for interaction of singlet oxygen with furans, pyrans and other heterocyclic oxygen compounds. — Continued

No.	Solvent	k ($L\ mol^{-1}\ s^{-1}$)	β (k_d/k) ($mol\ L^{-1}$)	T (K)	Method	Comment	Ref.
138	**Furan, 2,5-diphenyl-**						
	1-BuOH	5.0×10^7	1.0×10^{-3}		CP/A'c-16	S = MB; A' = DPBF; used $k_d = 5.2 \times 10^4\ s^{-1}$; Solvent contained 1% MeOH.	74F646
	1-BuOH		9.8×10^{-4} (β_r)	298	CP/Ac-17	S = RB; meas. β_r/β_r(MeOH) = 1.03, used β_r(MeOH) = 9.5×10^{-4} mol L^{-1}.	717398
	tert-BuOH	3.6×10^7	8.3×10^{-4}		CP/A'c-16	S = MB; A' = DPBF; used $k_d = 3.0 \times 10^4\ s^{-1}$; Solvent contained 1% MeOH.	74F646
	tert-BuOH		8.0×10^{-4} (β_r)	298	CP/Ac-17	S = RB; meas. β_r/β_r(MeOH) = 0.842, used β_r(MeOH) = 9.5×10^{-4} mol L^{-1}.	717398
	C_5H_5N	6.1×10^7	9.9×10^{-4}		CP/A'c-16	S = MB; A' = DPBF; used $k_d = 6.0 \times 10^4\ s^{-1}$; Solvent contained 1% MeOH.	74F646
	c-$C_6H_{11}OH$	5.3×10^7	1.2×10^{-3}		CP/A'c-16	S = MB; A' = DPBF; used $k_d = 6.2 \times 10^4\ s^{-1}$; Solvent contained 1% MeOH.	74F646
	$C_6H_5CH_3$	1.0×10^8			PR/A'd-5	S = Np: A' = DPBF; $\Delta H‡ = 0$ kJ mol^{-1}; $\Delta S‡ = -100$ J K^{-1} mol^{-1}; studied at 223-353 K.	79A106
	$C_6H_5CO_2CH_3$	4.1×10^7	6.1×10^{-4}		CP/A'c-16	S = MB; A' = DPBF; used $k_d = 2.5 \times 10^4\ s^{-1}$; Solvent contained 1% MeOH.	74F646
	CH_2Cl_2	7.0×10^7			CP/A'c-16	S = MPDME; A' = DPBF; used $k_d = 1 \times 10^4\ s^{-1}$.	84F477
	CH_2Cl_2	5.2×10^7			CP/A'c-33	S = A' = Rub; used $k_d = 1 \times 10^4\ s^{-1}$, $k_{A'} = 3.3 \times 10^7$ L $mol^{-1}\ s^{-1}$.	84F477
	CH_2Cl_2	5.1×10^7	1.4×10^{-4}		CP/A'c-16	S = MB; A' = DPBF; used $k_d = 7.1 \times 10^3\ s^{-1}$.	74F646
	CH_3CN	3.7×10^8	8.3×10^{-5}	293	CP/Pa-18	S = MB; A' = DPBF; used $k_d = 3 \times 10^4\ s^{-1}$, $\beta_{A'} = 1.3 \times 10^{-5}$ mol L^{-1}; P = 2,5-Diphenylfuran endoperoxide.	87F440
	CH_3CN	1.4×10^8	1.3×10^{-4}		CP/A'c-16	S = MB; A' = DPBF; used $k_d = 1.8 \times 10^4\ s^{-1}$.	74F646
	$CH_3CO_2C_2H_5$	3.0×10^7	6.9×10^{-4}		CP/A'c-16	S = MB; A' = DPBF; used $k_d = 2.1 \times 10^4\ s^{-1}$.	74F646
	CH_3COCH_3	1.4×10^8	1.7×10^{-4}		CP/A'c-16	S = MB; A' = DPBF; used $k_d = 2.4 \times 10^4\ s^{-1}$.	74F646
	$CHCl_3$	2.2×10^7	2.0×10^{-4}		CP/A'c-16	S = MB; A' = DPBF; used $k_d = 4.4 \times 10^3\ s^{-1}$.	74F646
	D_2O		7.7×10^{-5} (β_r)	296	CP/Ac-17	S = MB; meas. $\beta_r/\beta_r(H_2O) = 0.115$, used $\beta_r(H_2O) = 4.6 \times 10^{-4}$ mol L^{-1}.	74R214
	D_2O pD = 7.1		1.2×10^{-4} (β_r)	296	CP/Ac-17	S = MB; meas. $\beta_r/\beta_r(H_2O) = 0.182$, used $\beta_r(H_2O) = 4.6 \times 10^{-4}$ mol L^{-1}.	74R214
	D_2O pD = 7.1		1.4×10^{-4} (β_r)	296	CP/Ac-17	S = MB; meas. $\beta_r/\beta_r(H_2O) = 0.206$, used $\beta_r(H_2O) = 4.6 \times 10^{-4}$ mol L^{-1}. Solvent contains 960 µM H_2O_2.	74R214
	D_2O pD = 7.1		1.1×10^{-4} (β_r)	296	CP/Ac-17	S = MB; meas. $\beta_r/\beta_r(H_2O) = 0.165$, used $\beta_r(H_2O) = 4.6 \times 10^{-4}$ mol L^{-1}. 1 µl/ml of catalase present in reaction medium.	74R214
	H_2O		4.6×10^{-4} (β_r)		CP/Ac-17	S = RB; meas. β_r/β_r(MeOH) = 0.481, used β_r(MeOH) = 9.5×10^{-4} mol L^{-1}.	717398
	$HOCH_2CH_2OH$		3.5×10^{-4} (β_r)		CP/Ac-17	S = RB; meas. β_r/β_r(MeOH) = 0.366, used β_r(MeOH) = 9.5×10^{-4} mol L^{-1}.	717398
	MeOH	1.0×10^8	8.8×10^{-4}		CP/A'c-16	S = MB; A' = DPBF; used $k_d = 9.0 \times 10^4\ s^{-1}$.	74F646
	MeOH	4.6×10^7			PL/A'd-8	S = RB; A' = DPBF.	737014
	MeOH	~5×10^5 (k_r)			CP/Ac-14	S = RB; used $k_d = 1.4 \times 10^5\ s^{-1}$; used ϕ_{isc}(RB) = 0.76.	73F660
	MeOH		9.5×10^{-4}	298	CP/A'c-16	S = RB; A' = DPBF.	717398
	MeOH/ H_2O (12:88)		4.2×10^{-4} (β_r)		CP/Ac-17	S = RB; meas. β_r/β_r(MeOH)) = 0.439, used β_r(MeOH) = 9.5×10^{-4} mol L^{-1}; solvent mixt. in mole %.	717398
	MeOH/ H_2O (40:60)		4.2×10^{-4} (β_r)		CP/Ac-17	S = RB; meas. β_r/β_r(MeOH) = 0.446, used β_r(MeOH) = 9.5×10^{-4} mol L^{-1}; solvent mixt. in mole %.	717398

TABLE 5. Rate constants for interaction of singlet oxygen with furans, pyrans and other heterocyclic oxygen compounds. — Continued

No.	Solvent	k (L mol^{-1} s^{-1})	β (k_d/k) (mol L^{-1})	T (K)	Method	Comment	Ref.
5.38	**Furan, 2,5-diphenyl-** — Continued						
	MeOH/ H_2O (66:34)		5.9×10^{-4} (β_r)		CP/Ac-17	S = RB; meas. β_r/β_r(MeOH) = 0.621, used β_r(MeOH) = 9.5×10^{-4} mol L^{-1}; solvent mixt. in mole %.	717398
	MeOH/ H_2O (81:19)		7.7×10^{-4} (β_r)		CP/Ac-17	S = RB; meas. β_r/β_r(MeOH) = 0.806, used β_r(MeOH) = 9.5×10^{-4} mol L^{-1}; solvent mixture in mole %.	717398
	MeOH/ $HOCH_2CH_2OH$ (75:25)		5.5×10^{-4} (β_r)		CP/Ac-17	S = RB; meas. β_r/β_r(MeOH) = 0.578, used β_r(MeOH) = 9.5×10^{-4} mol L^{-1}.	717398
	MeOH/ $HOCH_2CH_2OH$ (50:50)		3.4×10^{-4} (β_r)		CP/Ac-17	S = RB; meas. β_r/β_r(MeOH) = 0.355, used β_r(MeOH) = 9.5×10^{-4} mol L^{-1}.	717398
	MeOH/ $HOCH_2CH_2OH$ (25:75)		2.6×10^{-4} (β_r)		CP/Ac-17	S = RB; meas. β_r/β_r(MeOH) = 0.278, used β_r(MeOH) = 9.5×10^{-4} mol L^{-1}.	717398
	2-PrOH	4.8×10^7	1.0×10^{-3}		CP/A'c-16	S = MB; A' = DPBF; used $k_d = 5.0 \times 10^4$ s^{-1}; Solvent contained 1% MeOH.	74F646
	THF	7.5×10^7	5.9×10^{-4}		CP/A'c-16	S = RB; A' = DPBF; used $k_d = 4.3 \times 10^4$ s^{-1}.	74F646
	dioxane	2.7×10^7	1.1×10^{-3}		CP/A'c-16	S = RB; A' = DPBF; used $k_d = 2.9 \times 10^4$ s^{-1}.	74F646
5.39	**Furan, 3,4-diphenyl-**						
	MeOH		1.7×10^{-3}		CP/A'c-16	S = RB or MB; A' = DPBF.	72F510
5.40	**Furan, 2-[(4-ethoxycarbonyl)phenyl]**						
	CH_2Cl_2	7×10^6			CP/A'c-33	S = A' = Rub; used $k_d = 1 \times 10^4$ s^{-1}, $k_{A'} = 3.3 \times 10^7$ L mol^{-1} s^{-1}.	84F477
5.41	**Furan, 3-(4-fluorophenyl)-**						
	MeOH		3.4×10^{-3}		CP/A'c-16	S = MB; A' = DPBF.	72F510
5.42	**Furan, 2-methoxy-**						
	CH_2Cl_2	1.6×10^8			CP/A'c-16	S = MPDME; A' = DPBF; used $k_d = 1 \times 10^4$ s^{-1}.	84F477
	CH_2Cl_2	1.2×10^8			CP/A'c-33	S = A' = Rub; used $k_d = 1 \times 10^4$ s^{-1}, $k_{A'} = 3.3 \times 10^7$ L mol^{-1} s^{-1}.	84F477
	MeOH	1.6×10^8 (k_r)	9.2×10^{-4} (β_r)	286	CP/Oc-14	S = RB or TPP; used $k_d = 1.4 \times 10^5$ s^{-1}.	85F145
	MeOH		4.0×10^{-4}		CP/A'c-16	S = MB; A' = DPBF.	72F510
5.43	**Furan, 2-(methoxymethyl)-**						
	MeOH		3.4×10^{-3}	293	CP/Oc-15	S = RB; E_a = 5.0 kJ mol^{-1}.	68F288
5.44	**Furan, 2-(4-methoxyphenyl)-**						
	1-BuOH		1.9×10^{-3} (β_r)		CP/Ac,A'c-17	S = RB or MB; A' = DPF; used $\beta_r^{A'} = 9.5 \times 10^{-4}$ mol L^{-1}; meas. $\beta_r^A/\beta_r^{A'}$(MeOH) = 2.0.	72F510
	CH_2Cl_2	3.7×10^7			CP/A'c-33	S = A' = Rub; used $k_d = 1 \times 10^4$ s^{-1}, $k_{A'} = 3.3 \times 10^7$ L mol^{-1} s^{-1}.	84F477
	H_2O		5.9×10^{-4} (β_r)		CP/Ac,A'c-17	S = MB or RB; A' = DPF; used $\beta_r^{A'} = 9.5 \times 10^{-4}$ mol L^{-1}; meas. $\beta_r^A/\beta_r^{A'}$(MeOH) = 0.618.	72F510
	$HOCH_2CH_2OH$		3.4×10^{-4} (β_r)		CP/Ac,A'c-17	S = MB or RB; A' = DPF; used $\beta_r^{A'} = 9.5 \times 10^{-4}$ mol L^{-1}; meas. $\beta_r^A/\beta_r^{A'}$(MeOH) = 0.36.	72F510
	MeOH				CP/Ac,A'c-17	S = MB or RB; A' = DPF; meas. $k_r/k_r^{A'} = 0.92$.	72F510
5.45	**Furan, 3-(4-methoxyphenyl)-**						
	MeOH		1.9×10^{-3}		CP/A'c-16	S = MB; A' = DPBF.	72F510
5.46	**Furan, 2-methyl-**						
	1-BuOH		1.2×10^{-3}	296	CP/A'c-16	S = MB; A' = DPBF.	717398

TABLE 5. Rate constants for interaction of singlet oxygen with furans, pyrans and other heterocyclic oxygen compounds. — Continued

No.	Solvent	k ($L\ mol^{-1}\ s^{-1}$)	β (k_d/k) ($mol\ L^{-1}$)	T (K)	Method	Comment	Ref.
5.46	**Furan, 2-methyl-** — Continued						
	tert-BuOH		6.9×10^{-4}	296	CP/A′c-16	S = MB; A′ = DPBF.	717398
	C_6H_5Cl/ 2-PrOH (90:10)	1.3×10^8		273	CR/LI-12	used $k_d = 4.1 \times 10^4\ s^{-1}$; $^1O_2$* from hydrotrioxide, e.g. $(CH_3)_2C(OH)OOOH$.	90M125
	CH_2Cl_2	6.2×10^7			CP/A′c-33	S = A′ = Rub; used $k_d = 1 \times 10^4\ s^{-1}$, $k_{A'} = 3.3 \times 10^7\ L\ mol^{-1}\ s^{-1}$.	84F477
	CH_2Cl_2	8.4×10^7			CP/A′c-16	S = MPDME; A′ = DPBF; used $k_d = 1 \times 10^4\ s^{-1}$.	84F477
	EtOH			293	CP/Oc-17	S = RB; A′ = FFA; meas. $k_r/k_r^{A'} = 1.2$.	86F510
	H_2O pH = 7.0	6.0×10^7			CP/Oc-19	S = HP; Q = N_3^-; used $k_Q = 2 \times 10^8\ L\ mol^{-1}\ s^{-1}$.	78A278
	H_2O (mic) pH = 7.0	1.0×10^8			CP/Oc-19	S = Chl a; Q = N_3^-; used $k_Q = 2 \times 10^8\ L\ mol^{-1}\ s^{-1}$; 1, 2, or 5% Triton X-100.	78A278
	H_2O (mic) pH = 7.0	7.0×10^7			CP/Oc-19	S = HP; Q = N_3^-; used $k_Q = 2 \times 10^8\ L\ mol^{-1}\ s^{-1}$; 1% Triton X-100.	78A278
	MeOH	9.9×10^7 (k_r)	1.4×10^{-3} (β_r)	286	CP/Oc-14	S = RB or TPP; used $k_d = 1.4 \times 10^5\ s^{-1}$.	85F145
	MeOH		1.1×10^{-3}	296	CP/A′c-16	S = MB; A′ = DPBF.	72F510 717398
	MeOH		3.8×10^{-3}	293	CP/Oc-15	S = RB; $E_a = 1.7\ kJ\ mol^{-1}$.	68F288
5.47	**Furan, 2-(4-methylphenyl)-**						
	CH_2Cl_2	2.4×10^7			CP/A′c-33	S = A′ = Rub; used $k_d = 1 \times 10^4\ s^{-1}$, $k_{A'} = 3.3 \times 10^7\ L\ mol^{-1}\ s^{-1}$.	84F477
	MeOH				CP/Ac,A′c-17	S = MB or RB; A′ = DPF; meas. $k_r/k_r^{A'} = 0.68$.	72F510
5.48	**Furan, 3-(4-methylphenyl)-**						
	MeOH		2.4×10^{-3}		CP/A′c-16	S = RB or MB; A′ = DPBF.	72F510
5.49	**Furan, 2-(4-nitrophenyl)-**						
	CH_2Cl_2	2.4×10^7			CP/A′c-33	S = A′ = Rub; used $k_d = 1 \times 10^4\ s^{-1}$, $k_{A'} = 3.3 \times 10^7\ L\ mol^{-1}\ s^{-1}$.	84F477
5.50	**Furan, 2-phenyl-**						
	1-BuOH		2.0×10^{-3} (β_r)	298	CP/Ac,A′c-17	S = RB; A′ = DPF; used $\beta_r^{A'} = 9.5 \times 10^{-4}$ mol L^{-1}; meas. $\beta_r^A/\beta_r^{A'}$(MeOH) = 2.1.	717398
	tert-BuOH		3.4×10^{-3} (β_r)	298	CP/Ac,A′c-17	S = RB; A′ = DPF; used $\beta_r^{A'} = 9.5 \times 10^{-4}$ mol L^{-1}; meas. $\beta_r^A/\beta_r^{A'}$(MeOH) = 3.58.	717398
	CH_2Cl_2	1.8×10^7			CP/A′c-33	S = A′ = Rub; used $k_d = 1 \times 10^4\ s^{-1}$, $k_{A'} = 3.3 \times 10^7\ L\ mol^{-1}\ s^{-1}$.	84F477
	MeOH		1.7×10^{-3}	298	CP/Ac,A′c-17	S = MB or RB; A′ = DPF; used $\beta_{A'} = 9.5 \times 10^{-4}$ mol L^{-1}.	72F510 717398
5.51	**Furan, 3-phenyl-**						
	MeOH		2.8×10^{-3}		CP/A′c-16	S = MB; A′ = DPBF.	72F510
5.52	**Furan, tetraphenyl-**						
	$C_6H_5CH_3$	2.8×10^8			PR/A′d-5	S = Np; A′ = DPBF; $\Delta H‡ = 0\ kJ\ mol^{-1}$; $\Delta S‡ = -91.2\ J\ K^{-1}\ mol^{-1}$; studied at 223-353 K.	79A106
	C_6H_5Cl/ 2-PrOH (90:10)	3.6×10^8		273	CR/LI-12	used $k_d = 4.1 \times 10^4\ s^{-1}$; $^1O_2$* from hydrotrioxide, e.g. $(CH_3)_2C(OH)OOOH$.	90M125
	MeOH		~0.030	293	CP/Oc-15	S = RB; $E_a = 4.2\ kJ\ mol^{-1}$.	68F288
5.53	**Furan, 2-vinyl-**						
	MeOH		1.8×10^{-3}	293	CP/Oc-15	S = RB; $E_a = 3.8\ kJ\ mol^{-1}$.	68F288
5.54	**2-Furancarboxylic acid**						
	MeOH		0.012		CP/A′c-16	S = MB; A′ = DPBF.	72F510

TABLE 5. Rate constants for interaction of singlet oxygen with furans, pyrans and other heterocyclic oxygen compounds. — Continued

No.	Solvent	k ($L\ mol^{-1}\ s^{-1}$)	β (k_d/k) ($mol\ L^{-1}$)	T (K)	Method	Comment	Ref.
5.55	**2-Furancarboxylic acid, 5-bromo-, ethyl ester**						
	CH_2Cl_2	1.5×10^4			CP/A'c-33	S = A' = Rub; used $k_d = 1 \times 10^4\ s^{-1}$, $k_{A'} = 3.3 \times 10^7\ L\ mol^{-1}\ s^{-1}$.	84F477
5.56	**2-Furancarboxylic acid, ethyl ester**						
	CH_2Cl_2	1.3×10^5			CP/A'c-33	S = A' = Rub; used $k_d = 1 \times 10^4\ s^{-1}$, $k_{A'} = 3.3 \times 10^7\ L\ mol^{-1}\ s^{-1}$.	84F477
5.57	**2-Furancarboxylic acid, methyl ester**						
	CH_2Cl_2	8.5×10^4			CP/A'c-33	S = A' = Rub; used $k_d = 1 \times 10^4\ s^{-1}$, $k_{A'} = 3.3 \times 10^7\ L\ mol^{-1}\ s^{-1}$.	84F477
5.58	**3-Furancarboxylic acid, 4,5-dihydro-2-methyl-, methyl ester**						
	C_6H_6	2.0×10^5 (k_r)	0.21 (β_r)	286	CP/Oc-29	S = RB or TPP; A' = 2,5-DMF; used $k_d = 4.2 \times 10^4\ s^{-1}$; meas. $k_q/k_r = \leq 0.1$; 4% [2+2] cycloaddition.	91F163
	CCl_4	2.0×10^5 (k_r)	7.2×10^{-3} (β_r)	286	CP/Oc-29	S = TPP; A' = 2,5-DMF; used $k_d = 1.4 \times 10^3\ s^{-1}$; meas. $k_q/k_r = \leq 0.1$; 3% [2+2] cycloaddition.	91F163
	CH_2Cl_2	2.4×10^5 (k_r)	0.041 (β_r)	286	CP/Oc-29	S = TPP; A' = 2,5-DMF; used $k_d = 9.5 \times 10^3\ s^{-1}$; meas. $k_q/k_r = \leq 0.1$; 32% [2+2] cycloaddition.	91F163
	CH_3CN	8.8×10^5 (k_r)	0.038 (β_r)	286	CP/Oc-29	S = RB; A' = 2,5-DMF; used $k_d = 3.3 \times 10^4\ s^{-1}$; meas. $k_q/k_r = \leq 0.1$; 44% [2+2] cycloaddition.	91F163
	CH_3COCH_3	6.1×10^5 (k_r)	0.063 (β_r)	286	CP/Oc-29	S = RB; A' = 2,5-DMF; used $k_d = 3.8 \times 10^4\ s^{-1}$; meas. $k_q/k_r = \leq 0.1$; 39% [2+2] cycloaddition.	91F163
	$CHCl_3$	7.0×10^4 (k_r)	0.057 (β_r)	286	CP/Oc-29	S = TPP; A' = 2,5-DMF; used $k_d = 4.0 \times 10^3\ s^{-1}$; meas. $k_q/k_r = \leq 0.1$; 36% [2+2] cycloaddition.	91F163
	MeOH	7.3×10^5 (k_r)	0.19 (β_r)	286	CP/Oc-29	S = RB; A' = 2,5-DMF; used $k_d = 1.4 \times 10^5\ s^{-1}$; meas. $k_q/k_r = \leq 0.1$; 29% [2+2] cycloaddition.	91F163
5.59	**2,5-Furandicarboxaldehyde**						
	CH_2Cl_2	2.4×10^6			CP/A'c-33	S = A' = Rub; used $k_d = 1 \times 10^4\ s^{-1}$, $k_{A'} = 3.3 \times 10^7\ L\ mol^{-1}\ s^{-1}$.	84F477
5.60	**2,5-Furandicarboxylic acid, diethyl ester**						
	CH_2Cl_2	4.5×10^4			CP/A'c-33	S = A' = Rub; used $k_d = 1 \times 10^4\ s^{-1}$, $k_{A'} = 3.3 \times 10^7\ L\ mol^{-1}\ s^{-1}$.	84F477
5.61	**2,5-Furandicarboxylic acid, dimethyl ester**						
	CH_2Cl_2	2.0×10^4			CP/A'c-33	S = A' = Rub; used $k_d = 1 \times 10^4\ s^{-1}$, $k_{A'} = 3.3 \times 10^7\ L\ mol^{-1}\ s^{-1}$.	84F477
5.62	**3,4-Furandicarboxylic acid, diethyl ester**						
	MeOH		~0.20	293	CP/Oc-15	S = RB; $E_a = 12.6\ kJ\ mol^{-1}$.	68F288
5.63	**2-Furanitrile**						
	CH_2Cl_2	1.1×10^4			CP/A'c-33	S = A' = Rub; used $k_d = 1 \times 10^4\ s^{-1}$, $k_{A'} = 3.3 \times 10^7\ L\ mol^{-1}\ s^{-1}$.	84F477
5.64	**2-Furanitrile, 5-methyl-**						
	CH_2Cl_2	1.5×10^5			CP/A'c-33	S = A' = Rub; used $k_d = 1 \times 10^4\ s^{-1}$, $k_{A'} = 3.3 \times 10^7\ L\ mol^{-1}\ s^{-1}$.	84F477
5.65	**2-Furanmethanamine, *N*-methyl-**						
	MeOH		0.013	293	CP/Oc-15	S = RB; $E_a = 4.2\ kJ\ mol^{-1}$.	68F288
5.66	**2-Furanmethanediol, diacetate**						
	C_6H_5Cl/ 2-PrOH (90:10)	2.3×10^6		273	CR/LI-12	used $k_d = 4.1 \times 10^4\ s^{-1}$; $^1O_2$* from hydrotrioxide, e.g. $(CH_3)_2C(OH)OOOH$.	90M125

TABLE 5. Rate constants for interaction of singlet oxygen with furans, pyrans and other heterocyclic oxygen compounds. — Continued

No.	Solvent	k (L mol^{-1} s^{-1})	β (k_d/k) (mol L^{-1})	T (K)	Method	Comment	Ref.
5.67	**2-Furanmethanol, α,α-diphenyl-**						
	MeOH	9.9×10^6	9.2×10^{-3}	298	CP/A'c-16	S = RB; A' = DPBF; used $k_d = 9.0 \times 10^4$ s^{-1}.	72F519
5.68	**2-Furanmethanol, α-(diphenylmethyl)-**						
	MeOH	1.1×10^7	8.0×10^{-3}	298	CP/A'c-16	S = RB; A' = DPBF; used $k_d = 9.0 \times 10^4$ s^{-1}.	72F519
5.69	**2-Furanmethanol, α-methyl-**						
	MeOH	1.0×10^8	8.7×10^{-4}	298	CP/A'c-16	S = RB; A' = DPBF; used $k_d = 9.0 \times 10^4$ s^{-1}.	72F519
5.70	**2-Furanmethanol, α-phenyl-**						
	MeOH	5.2×10^6	0.018	298	CP/A'c-16	S = RB; A' = DPBF; used $k_d = 9.0 \times 10^4$ s^{-1}.	72F519
5.71	**2-Furanmethanol, α-(2-phenylethyl)-**						
	MeOH	2.5×10^7	3.6×10^{-3}	298	CP/A'c-16	S = RB; A' = DPBF; used $k_d = 9.0 \times 10^4$ s^{-1}.	72F519
5.72	**2-Furanmethanol, α-(phenylmethyl)-**						
	MeOH	1.1×10^7	8.3×10^{-3}	298	CP/A'c-16	S = RB; A' = DPBF; used $k_d = 9.0 \times 10^4$ s^{-1}.	72F519
5.73	**2-Furanmethanol, α-(3-phenylpropyl)-**						
	MeOH	8.9×10^8	1.0×10^{-4}	298	CP/A'c-16	S = RB; A' = DPBF; used $k_d = 9.0 \times 10^4$ s^{-1}.	72F519
5.74	**3-Furanmethanol, 5-(phenylmethyl)-**						
	MeOH	3.0×10^7		298	CP/Oc-15	S = RB; $\Delta S‡ = -102.7$ J K^{-1} mol^{-1}; $E_a = \sim 0$ kJ mol^{-1}; studied at 293-308 K; k_d not given.	92F465
	MeOH/ H_2O (50:50)	1.6×10^8		298	CP/Oc-15	S = RB; $\Delta S‡ = -87.2$ J K^{-1} mol^{-1}; $E_a = \sim 0$ kJ mol^{-1}; studied at 293-308 K; k_d not given.	92F465
5.75	**3-Furanmethanol, 5-(phenylmethyl)-, acetate**						
	MeOH	6.4×10^7		298	CP/Oc-15	S = RB; $\Delta S‡ = -96.5$ J K^{-1} mol^{-1}; $E_a = \sim 0$ kJ mol^{-1}; studied at 293-308 K; k_d not given.	92F465
	MeOH/ H_2O (50:50)	8.2×10^8		298	CP/Oc-15	S = RB; $\Delta S‡ = -74.8$ J K^{-1} mol^{-1}; $E_a = \sim 0$ kJ mol^{-1}; studied at 293-308 K; k_d not given.	92F465
5.76	**3-Furanmethanol, 5-(phenylmethyl)-, ester with 2,2-dimethyl-3-(2-methyl-1-propenyl)cyclopropanecarboxylic acid (Bioresmethrin)**						
	MeOH	5.3×10^7		298	CP/Oc-15	S = RB; $\Delta S‡ = -97.9$ J K^{-1} mol^{-1}; $E_a = \sim 0$ kJ mol^{-1}; studied at 293-308 K; k_d not given.	92F465
5.77	**[2,2](2,5)Furanophane**						
	MeOH	1.6×10^8	5.5×10^{-4}		CP/A'c-16	S = RB; A' = DPBF; used $k_d = 9.0 \times 10^4$ s^{-1}.	72F519
5.78	**Furfuryl alcohol (FFA)**			298			
	CD_3OD	3.0×10^7 (k_r) $<10^4$ (k_q)		295	CP/Oc-15,27	S = RB; used $k_d = 4.0 \times 10^3$ s^{-1}.	91F332
	H_2O	1.4×10^8 (k_r)		298	CP/Oc-14	S = H_2TPPS^{4-}; used $k_d = 2.5 \times 10^5$ s^{-1}; $E_a = 22.7$ kJ mol^{-1}; log(A) = 12.1; studied at 288-318 K; phosphate buffer contg. 1.6% NaCl.	91R053
	H_2O pH = 10.0, 11.5	1.2×10^8 (k_r)		292	MP/Ac-17	S = RB; rel. to k(FFA) = 1.2×10^8 L mol^{-1} s^{-1} in H_2O at pH = 7.0.	87A180
	H_2O		3.0×10^{-3}	295	CP/Oc-14	S = HPD; 0.9% NaCl.	85F332
	H_2O	1.2×10^8	2.3×10^{-3}	295	CP/Oc-15	S = RB; used $k_d = 2.5 \times 10^5$ s^{-1}.	84F381
	H_2O pH = 3.0, 8.0		1.8×10^{-3}	310	CP/Oc-14	S = PF.	617008
	MeOH		4.7×10^{-3}		CP/A'c-16	S = MB; A' = DPBF.	72F510
	MeOH		3.3×10^{-3}	293	CP/Oc-15	S = RB; $E_a = 2.9$ kJ mol^{-1}.	68F288
5.79	**Furfurylamine**						
	MeOH		0.030		CP/A'c-16	S = MB; A' = DPBF.	72F510

TABLE 5. Rate constants for interaction of singlet oxygen with furans, pyrans and other heterocyclic oxygen compounds. — Continued

No.	Solvent	k ($L\ mol^{-1}\ s^{-1}$)	β (k_d/k) ($mol\ L^{-1}$)	T (K)	Method	Comment	Ref.
5.79	**Furfurylamine** — Continued						
	MeOH		9.0×10^{-3}	293	CP/Oc-15	S = RB; E_a = 2.9 kJ mol^{-1}.	68F288
5.80	**Isobenzofuran**						
	MeOH	9.2×10^7	9.8×10^{-4}		CP/A'c-16	S = MB; A' = DPBF; used $k_d = 9.0 \times 10^4\ s^{-1}$.	72F517
5.81	**Isobenzofuran, 1,3-bis[4-(11-carboxynonyl)phenyl]-4,7-dihydro-5,6-dimethyl-, dianion**						
	D_2O/ H_2O (95:5) pH = 10	3×10^8 (k_r)			CP/Ac,A'c-17	S = HP; A' = His; used $k_r^{A'} = 5 \times 10^7\ L\ mol^{-1}\ s^{-1}$.	82F379
	H_2O pH = 10	7.1×10^7 (k_r)			CP/Ac,A'c-17	S = HP; A' = His; used $k_r^{A'} = 5 \times 10^7\ L\ mol^{-1}\ s^{-1}$.	82F379
5.82	**Isobenzofuran, 5,6-dimethyl-1,3-diphenyl-**						
	MeOH	5.2×10^8 (k_r)			CP/Ac-14	S = RB; used $k_d = 1.4 \times 10^5\ s^{-1}$; used ϕ_{isc}(RB) = 0.76.	73F660
5.83	**Isobenzofuran, 1,3-diphenyl- (DPBF)**						
	$C_6H_5COCH_3$	9.0×10^8		293	PL/Ad-8	S = MB.	83A006 83A371
	1-BuOH	8.3×10^8 (k_r)			CP/Ac,A'c-17	S = MB; A' = DPF; used $k_r^{A'} = 5.0 \times 10^7\ L\ mol^{-1}\ s^{-1}$; meas. $k_r/k_r^{A'} = 17$; Solvent contained 1% MeOH.	74F646
	1-BuOH	8×10^8	7×10^{-5}		CP/Ac-15	S = MB; used $k_d = 5.2 \times 10^4\ s^{-1}$; Solvent contained 1% MeOH.	74F646
	1-BuOH	8×10^8			PL/Ad-8	S = MB.	737014
	1-BuOH		7.1×10^{-5} (β_r)	298	CP/Ac,A'c-17	S = RB; A' = DPF; used $\beta_r^{A'} = 9.5 \times 10^{-4}$ mol L^{-1}; meas. $\beta_r/\beta_r^{A'}$(MeOH) = 0.075.	717398
	tert-BuOH	6.2×10^8 (k_r)			CP/Ac,A'c-17	S = MB; A' = DPF; used $k_r^{A'} = 3.6 \times 10^7\ L\ mol^{-1}\ s^{-1}$; meas. $k_r/k_r^{A'} = 17$; Solvent contained 1% MeOH.	74F646
	tert-BuOH	2.3×10^8	1×10^{-4}		CP/Ac-15	S = MB; used $k_d = 3.0 \times 10^4\ s^{-1}$; Solvent contained 1% MeOH.	74F646
	tert-BuOH	5.7×10^8			PL/Ad-8	S = MB; Solvent contained 1% MeOH.	737014
	tert-BuOH		4.9×10^{-5} (β_r)	298	CP/Ac,A'c-17	S = RB; A' = DPF; used $\beta_r^{A'} = 9.5 \times 10^{-4}$ mol L^{-1}; meas. $\beta_r/\beta_r^{A'}$(MeOH) = 0.052.	717398
	Epibromohydrin	7.8×10^8			PL/Ad-8	S = MB.	74F646
	Propylene carbonate	1×10^9		293	PL/Ad-5	S = MB.	87E690
	C_5H_5N	6.5×10^8 (k_r)	9.1×10^{-5} (β_r)	298	CP/Ac-14	S = A; used $k_d = 5.9 \times 10^4\ s^{-1}$.	84F240
	C_5H_5N	4.8×10^8 (k_r)			CP/Ac,A'c-17	S = RB; A' = DPF; used $k_r^{A'} = 6.1 \times 10^7\ L\ mol^{-1}\ s^{-1}$; meas. $k_r/k_r^{A'} = 7.9$; Solvent contained 1% MeOH.	74F646
	C_5H_5N	5×10^8			PL/Ad-8	S = RB; Solvent contained 1% MeOH.	74F646
	C_5H_5N	2.1×10^9			PL/Ad-8	S = MB.	737014
	C_5H_5N				CP/Ac,A'c-17	S = A' = Rub; meas. $k_r/k_r^{A'} = 22$.	66F041
	c-$C_6H_{11}OH$	6.5×10^8 (k_r)			CP/Ac,A'c-17	S = MB; A' = DPF; used $k_r^{A'} = 5.3 \times 10^7\ L\ mol^{-1}\ s^{-1}$; meas. $k_r/k_r^{A'} = 12$; Solvent contained 1% MeOH.	74F646
	c-$C_6H_{11}OH$	1×10^8			PL/Ad-8	S = MB; Solvent contained 1% MeOH.	74F646
	c-$C_6H_{11}OH$	2×10^8	3×10^{-4}		CP/Ac-15	S = MB; used $k_d = 6.3 \times 10^4\ s^{-1}$; Solvent contained 1% MeOH.	74F646
	c-C_6H_{12}	3.4×10^8			PL/Ad-5	S = 2-ACN; used $k_d = 5.0 \times 10^4\ s^{-1}$.	84F005
	c-C_6H_{12}	5.0×10^8 (k_r)	1.2×10^{-4} (β_r)	298	CP/Ac-14	S = A; used $k_d = 5.9 \times 10^4\ s^{-1}$.	84F240
	c-C_6H_{12}	5.4×10^8 (k_r)	1.1×10^{-4} (β_r)	298	CP/Ac-14	S = A; used $k_d = 5.9 \times 10^4\ s^{-1}$.	84P629

TABLE 5. Rate constants for interaction of singlet oxygen with furans, pyrans and other heterocyclic oxygen compounds. — Continued

No.	Solvent	k ($L\ mol^{-1}\ s^{-1}$)	β (k_d/k) ($mol\ L^{-1}$)	T (K)	Method	Comment	Ref.
1.1.1	**Isobenzofuran, 1,3-diphenyl- (DPBF)** — Continued						
	c-C_6H_{12}	4.5×10^8			PL/Ad-8	S = An.	82A349
	c-C_6H_{12}	5.3×10^8		303	CP/Ac-20	S = Py; used $k_d = 5.9 \times 10^5\ s^{-1}$.	79N020
	c-C_6H_{12} (mic)	5.3×10^8			PL/Tb-3	S = Ery; reverse micelles contg. 0.04 mol L^{-1} DAP and 0.1 mol L^{-1} water.	83A050
	c-C_6H_{12} (mic)	5.3×10^8			CP/Ac-14	S = Fl^{2-}; used $k_d = 5.9 \times 10^4\ s^{-1}$; DAP reverse micelles.	80N021
	n-C_6H_{14}	2.6×10^8		298	PL/Ad-8	S = An; $\Delta V‡ = -14\ cm^3\ mol^{-1}$; studied at 0.1-400 MPa.	92A014 90A018
	n-C_6H_{14}	4.4×10^8 (k_r)	1.4×10^{-4} (β_r)	298	CP/Ac-14	S = A; used $k_d = 6.3 \times 10^4\ s^{-1}$.	84F240
	n-C_6H_{14}	1.2×10^9			CP/Ac-14	S = An; used $k_d = 3 \times 10^4\ s^{-1}$.	80E761
	n-C_6H_{14}		1.5×10^{-5}		CP/Pa-15	S = I_2.	72F521
	C_6H_5Br	6×10^8	2×10^{-5}		CP/Ac-15	S = MB; used $k_d = 1.3 \times 10^4\ s^{-1}$; Solvent contained 1% MeOH.	74F646
	C_6H_5Br	5×10^8			PL/Ad-8	S = MB; Solvent contained 1% MeOH.	74F646
	C_6H_5Br/ MeOH (80:20)	7.0×10^8			PL/Ad-8	S = MB.	737014
	C_6H_5Br/ MeOH (80:20)	5×10^8	9×10^{-5}		CP/Ac-15	S = MB; used $k_d = 4.3 \times 10^4\ s^{-1}$.	74F646
	$C_6H_5CH_2CH_3$	6.7×10^8		293	PL/Ad-8	S = MB.	83A006 83A371
	$C_6H_5CH_3$	8.9×10^8			PL/Ld-2	S = PPDME; $\Delta H‡ = -5$ (4) kJ mol^{-1}; $\Delta S‡ = -109$ (−70) J K^{-1} mol^{-1}; $E_a = -3$ (7) kJ mol^{-1}; studied at 183-363 K; pre-exciplex-equilibrium limit (and diffusion limit).	88A427
	$C_6H_5CH_3$		4×10^{-5}		CP/Ac-15	S = Tetr.	84F197
	$C_6H_5CH_3$	4.3×10^8 (k_r)	1.2×10^{-4} (β_r)	298	CP/Ac-14	S = A; used $k_d = 5.0 \times 10^4\ s^{-1}$.	84F240
	$C_6H_5CH_3$	6.7×10^8			PL/Ad-8	S = An.	82A349
	$C_6H_5CH_3$	8.1×10^8			PR/Ad-5	S = Np; $\Delta H‡ = 0$ kJ mol^{-1}; $\Delta S‡ = -82.4$ J K^{-1} mol^{-1}; studied at 223-353 K.	79A106
	$C_6H_5CHOHCH_3$	1.0×10^9		293	PL/Ad-8	S = MB.	83A006 83A371
	$C_6H_5CO_2CH_3$	2.8×10^8	8.9×10^{-5}		CP/Ac-15	S = MB; used $k_d = 2.5 \times 10^4\ s^{-1}$; Solvent contained 1% MeOH.	74F646
	$C_6H_5CO_2CH_3$	4×10^8			PL/Ad-8	S = MB; Solvent contained 1% MeOH.	74F646
	C_6H_5Cl	7.0×10^8		293	PL/Ad-8	S = MB.	83A006 83A371
	C_6H_5Cl/ 2-PrOH (90:10)	7×10^8		273	CR/LI-12	used $k_d = 4.1 \times 10^4\ s^{-1}$; $^1O_2$* from hydrotrioxide, e.g. $(CH_3)_2C(OH)OOOH$.	90M125
	C_6D_6	2.8×10^7			PL/Ad-5	S = 2-ACN.	81A287
	C_6H_6	8.0×10^8			PL/Ad-5	S = 2-ACN; used $k_d = 4.0 \times 10^4\ s^{-1}$.	84F005
	C_6H_6		6.0×10^{-5}		CP/Ac-15	S = HCD.	84F197
	C_6H_6	7.0×10^8 (k_r)	6.0×10^{-5} (β_r)	298	CP/Ac-14	S = A; used $k_d = 4.2 \times 10^4\ s^{-1}$.	84F240
	C_6H_6	6.7×10^8			PL/Ad-5	S = 2-ACN.	81A287
	C_6H_6		4.0×10^{-5}		CP/Ac-15	S = Rub.	78E036
	C_6H_6	9.4×10^8			PR/Ad-5	S = Np, An, BP, Benzil.	78E263
	C_6H_6	7.0×10^8 (k_r)	6.0×10^{-5}	298	CP/Ac,A'c-17	S = A' = Rub; used $k_r^{A'} = 4.2 \times 10^7\ L\ mol^{-1}\ s^{-1}$; meas. $k_r/k_r^{A'} = 17$.	747312
	C_6H_6	5×10^8	8×10^{-5}		CP/Ac-15	S = MB; used $k_d = 3.8 \times 10^4\ s^{-1}$; Solvent contained 1% MeOH.	74F646
	C_6H_6	4×10^8			PL/Ad-8	S = MB; Solvent contained 1% MeOH.	74F646

TABLE 5. Rate constants for interaction of singlet oxygen with furans, pyrans and other heterocyclic oxygen compounds. — Continued

No.	Solvent	k ($L\ mol^{-1}\ s^{-1}$)	β (k_d/k) ($mol\ L^{-1}$)	T (K)	Method	Comment	Ref.
5.83	**Isobenzofuran, 1,3-diphenyl- (DPBF)** — Continued						
	C_6H_6		6.0×10^{-5}	298	CP/Ac-15	S = A.	74F649
	C_6H_6		6.0×10^{-5} (β_r)	298	CP/Ac,A'c-17	S = A' = Rub; meas. $k_r/k_r^{A'} = 17$; used $\beta_r^{A'} = 1.0 \times 10^{-3}$ mol L^{-1}.	74F649
	C_6H_6	2×10^9		298	PL/Ad-8	S = An.	737438
	C_6H_6/ MeOH (80:20)	2×10^9	2×10^{-5}		CP/Ac-15	S = MB; used $k_d = 3.8 \times 10^4\ s^{-1}$.	74F646
	C_6H_6/ MeOH (80:20)	1.0×10^9 (k_r)			CP/Ac,A'c-17	S = MB; A' = DPF; $k_r^{A'}$ not given.	74F646
	C_6H_6/ MeOH (80:20)	9×10^8			PL/Ad-8	S = MB.	737014
	CCl_3CH_2OH	3×10^8			PL/Ad-8	S = MB; Solvent contained 1% MeOH.	74F646
	CCl_4	8×10^8			MP/LI-12	S = PP, Ph a or BPh a; used $k_d = 36\ s^{-1}$.	79A010
	CCl_4	8.0×10^8			MP/LI-12	S = Ret; used $k_d = 36\ s^{-1}$.	79F463 78F700
	CCl_4	1.1×10^8	1.2×10^{-5}	298	CP/Ac-15	S = MB; used $k_d = 1.4 \times 10^3\ s^{-1}$.	78F061
	CCl_4	2.6×10^8			PL/Ad-8	S = MB; Solvent contained 1% MeOH.	74F646
	CCl_4/ MeOH (99:1)	7.3×10^8		298	FP/Ad-5	S = MB.	78E238
	CCl_4/ MeOH (98:2)	2.9×10^8		293	PL/Ad-8	S = MB.	83A006 83A371
	CCl_4/ MeOH (98:2)	4.8×10^8		298	FP/Ad-5	S = MB.	78E238
	CCl_4/ MeOH (97:3)	5.4×10^8		298	FP/Ad-5	S = MB.	78E238
	CCl_4/ MeOH (96:4)	5.2×10^8		298	FP/Ad-5	S = MB.	78E238
	CCl_4/ MeOH (95:5)	6.0×10^8		298	FP/Ad-5	S = MB.	78E238
	CCl_4/ MeOH (94:6)	2.5×10^8			PL/Ad-8	S = MB.	74F646
	CCl_4/ MeOH (90:10)	3×10^8			PL/Ad-8	S = MB.	74F646
	CCl_4/ MeOH (86:14)	2.6×10^8			PL/Ad-8	S = MB.	74F646
	CCl_4/ MeOH (83:17)	2.6×10^8			PL/Ad-8	S = MB.	74F646
	CF_3CH_2OH	1.2×10^8 (k_r)			CP/Ac,A'c-17	S = MB; A' = DPF; $k_r^{A'}$ not given. Solvent contained 1% MeOH.	74F646
	CF_3CH_2OH	2×10^8	1×10^{-4}		CP/Ac-15	S = MB; used $k_d = 2.3 \times 10^4\ s^{-1}$; Solvent contained 1% MeOH.	74F646
	CF_3CH_2OH	6×10^8			PL/Ad-8	S = MB; Solvent contained 1% MeOH.	74F646
	CH_2Cl_2	1.6×10^9	1.0×10^{-5}	298	CP/Ac-15	S = MB; used $k_d = 1.6 \times 10^4\ s^{-1}$.	78F061
	CH_2Cl_2	1.1×10^9		298	PL/Ad-5	S = MB.	78F061
	CH_2Cl_2	8×10^8			PL/Ad-8	S = MB.	74F646
	CH_2Cl_2	6.3×10^8 (k_r)			CP/Ac,A'c-17	S = MB; A' = DPF; used $k_r^{A'} = 8.6 \times 10^7$ L mol^{-1} s^{-1}; meas. $k_r/k_r^{A'} = 7.3$.	74F646
	$CH_2FCH_2I_2OH$	5×10^8			PL/Ad-8	S = MB; Solvent contained 1% MeOH.	74F646
	CH_3CHCl_2	6.0×10^8		298	PL/Ad-5	S = MB.	78F061
	CH_3CHCl_2	1.0×10^9	1.5×10^{-5}	298	CP/Ac-15	S = MB; used $k_d = 1.5 \times 10^4\ s^{-1}$.	78F061
	CH_3CN	1.4×10^9		298	PL/Ad-8	S = An; $\Delta V_{\ddagger} = -15\ cm^3\ mol^{-1}$; studied at 0.1-400 MPa.	92A014 90A018
	CH_3CN		1.3×10^{-5}	293	CP/Ac-14	S = MB.	87F440
	CH_3CN	1.1×10^9			PL/Ad-8	S = An.	82A349
	CH_3CN	1.3×10^9			PL/Ad-5	S = 2-ACN.	81A287
	CH_3CN	1×10^9	2×10^{-5}		CP/Ac-15	S = MB; used $k_d = 1.8 \times 10^4\ s^{-1}$.	74F646

TABLE 5. Rate constants for interaction of singlet oxygen with furans, pyrans and other heterocyclic oxygen compounds. — Continued

No.	Solvent	k ($L\ mol^{-1}\ s^{-1}$)	β (k_d/k) ($mol\ L^{-1}$)	T (K)	Method	Comment	Ref.
141	**Isobenzofuran, 1,3-diphenyl- (DPBF)** — Continued						
	CH_3CN	6.6×10^8			PL/Ad-8	S = MB.	74F646
	CH_3CN	1.1×10^9 (k_r)			CP/Ac,A'c-17	S = MB; A' = DPF; used $k_r^{A'} = 2.0 \times 10^8$ L mol^{-1} s^{-1}; meas. $k_r/k_r^{A'} = 5.6$.	74F646
	$CH_3CO_2C_2H_5$	8×10^8			PL/Ad-8	S = MB.	74F646
	$CH_3CO_2C_2H_5$	3.5×10^8 (k_r)			CP/Ac,A'c-17	S = MB; A' = DPF; used $k_r^{A'} = 3.0 \times 10^7$ L mol^{-1} s^{-1}; meas. $k_r/k_r^{A'} = 12$.	74F646
	CH_3COCH_3	4.1×10^8 (k_r)	9.4×10^{-5} (β_r)	298	CP/Ac-14	S = A; used $k_d = 3.9 \times 10^4$ s^{-1}.	84F240
	CH_3COCH_3	6.4×10^8			PL/Ad-8	S = An.	82A349
	CH_3COCH_3	1.0×10^9			PL/Ad-5	S = 2-ACN.	81A287
	CH_3COCH_3	5×10^8	5×10^{-5}		CP/Ac-15	S = MB; used $k_d = 2.4 \times 10^4$ s^{-1}.	74F646
	CH_3COCH_3	6×10^8			PL/Ad-8	S = MB.	74F646
	CH_3COCH_3	1.7×10^9 (k_r)			CP/Ac,A'c-17	S = MB; A' = DPF; used $k_r^{A'} = 1.8 \times 10^8$ L mol^{-1} s^{-1}; meas. $k_r/k_r^{A'} = 9.4$.	74F646
	$CHCl_3$	4.9×10^8			PL/Ad-5	S = 2-ACN.	81A287
	$CHCl_3$	9.0×10^8	1.0×10^{-5}	298	CP/Ac-15	S = MB; used $k_d = 9.0 \times 10^3$ s^{-1}.	78F061
	$CHCl_3$	7.0×10^8		298	PL/Ad-5	S = MB.	78F061
	$CHCl_3$	1.4×10^8 (k_r)			CP/Ac,A'c-17	S = MB; A' = DPF; used $k_r^{A'} = 4.9 \times 10^7$ L mol^{-1} s^{-1}; meas. $k_r/k_r^{A'} = 2.9$.	74F646
	$CHCl_3$	3.6×10^8			PL/Ad-8	S = MB.	74F646
	$CHCl_3$/ MeOH (90:10)	5×10^8	8×10^{-5}		CP/Ac-15	S = RB; used $k_d = 3.9 \times 10^4$ s^{-1}.	753071
	$CHCl_3$/ MeOH (90:10)	5×10^8 (k_r)			CP/Ac-14	S = RB; k_r derived using $\phi_{isc}(RB) = 0.66$ and $k_A = 5 \times 10^8$ L mol^{-1} s^{-1}.	753071
	CS_2		7.5×10^{-6}		CP/Ac-15	S = Rub.	84F197
	CS_2/ MeOH (98:2)	3.0×10^8			FP/Ad-5	S = MB.	737334
	Cl_2CHCH_2OH	5.7×10^8			PL/Ad-8	S = MB.	74F646
	$Cl_2CHCHCl_2$	4.4×10^8		298	PL/Ad-5	S = MB.	78F061
	$Cl_2CHCHCl_2$	5.9×10^8	1.4×10^{-5}	298	CP/Ac-15	S = MB; used $k_d = 8.3 \times 10^3$ s^{-1}.	78F061
	$ClCF_2CCl_2F$	9×10^8		293	PL/Ad-10	high pressure O_2.	79A113
	$ClCF_2CCl_2F$	5×10^8 (k_r)		293	CL/Ad-36	high pressure O_2; used $k_{O2} = 2.5 \times 10^3$ L mol^{-1} s^{-1}.	79A113
	D_2O (mic)	1.0×10^9			PL/Ad-5	S = HYP; BRIJ 35 micelles.	88N343
	D_2O (mic)	6.2×10^8		295	PL/Ad-5	S = 2-ACN; 4.0×10^{-2} mol L^{-1} DDAB.	82N027
	D_2O (mic) pD = 7.4	1.0×10^9			PL/Ad-5	S = MB; 0.1 mol L^{-1} SDS.	81N048
	D_2O (mic) pD = 7.4	6.7×10^8			PL/Ad-5	S = MB; 0.1 mol L^{-1} CTAB.	81N048
	D_2O (mic)	1.3×10^9		293	PL/Ad-8	S = MB; 0.1 mol L^{-1} SDS.	80N018
	D_2O (mic)	6.7×10^8			PL/Ad-5	S = MB; 0.1 mol L^{-1} CTAB.	79N041
	D_2O (mic)	6.3×10^8			PL/Ad-5	S = 2-ACN; 0.1 mol L^{-1} Igepal CO-630.	79N041
	D_2O (mic)	6.6×10^8			PL/Ad-5	S = MB; 0.1 mol L^{-1} Igepal CO-660.	79N041
	D_2O (mic)	9.8×10^8			PL/Ad-5	S = 2-ACN; 0.05 mol L^{-1} sodium laurate.	79N041
	D_2O (mic)	6.6×10^8			PL/Ad-5	S = 2-ACN; 0.1 mol L^{-1} Brij 35.	79N041
	D_2O (mic)	1.0×10^9			PL/Ad-5	S = MB; 0.1 mol L^{-1} SDS.	79N041
	D_2O (mic)	1.1×10^9			PL/Ad-5	S = 2-ACN; 0.1 mol L^{-1} SDS.	79N041
	D_2O (mic)	6.5×10^8			PL/Ad-5	S = 2-ACN; 0.1 mol L^{-1} Igepal CO-660.	79N041
	D_2O (mic)	6.2×10^8			PL/Ad-5	S = 2-ACN; 0.1 mol L^{-1} CTAB.	79N041
	D_2O (mic)	8.4×10^8			PL/Ad-5	S = 2-ACN; 0.1 mol L^{-1} SDS.	78E144

TABLE 5. Rate constants for interaction of singlet oxygen with furans, pyrans and other heterocyclic oxygen compounds. — Continued

No.	Solvent	k ($L\ mol^{-1}\ s^{-1}$)	β (k_d/k) ($mol\ L^{-1}$)	T (K)	Method	Comment	Ref.
5.83	**Isobenzofuran, 1,3-diphenyl- (DPBF)** — Continued						
	D_2O (ves) pD = 7	2.3×10^{10}	1.1×10^{-6}	293	CP/Ac-15	S = HYP; used $k_d = 2.5 \times 10^4\ s^{-1}$; 5×10^{-4} mol L^{-1} DPPC.	92N201
	DMF	1.1×10^9			CP/Ac-15	S = HPDME; used $k_d = 1.0 \times 10^5\ s^{-1}$.	92F505
	DMF		2.0×10^{-5} (β_r)		CP/Ac-14	S = RB.	79F412
	DMSO	$\geq 2.8 \times 10^8$	1.2×10^{-4}		CP/Ac-15	S = CuTCPc; used $k_d = 3.3 \times 10^4\ s^{-1}$.	89F260
	DMSO/ H_2O (75:25)	6.9×10^8			CP/Ac-15	S = MB; used $k_d = 1.2 \times 10^5\ s^{-1}$.	86R210
	EtOH	8.8×10^8			PL/Ad-5	S = HP.	91R206
	EtOH	1×10^9		291	CP/A'c-15	S = Zn(pc)$(py)_2$; used $k_d = 7.1 \times 10^4\ s^{-1}$.	88A284
	EtOH	1.1×10^9		291	PL/Ld-2	S = Zn(pc)$(py)_2$.	88A284
	EtOH	4.3×10^8 (k_r)	1.2×10^{-4} (β_r)	298	CP/Ac-14	S = A; used $k_d = 5.3 \times 10^4\ s^{-1}$.	84F240
	EtOH	1.3×10^9	6.5×10^{-5}	298	CP/Ac-15	S = Eos; used $k_d = 8.3 \times 10^4\ s^{-1}$.	78F061
	EtOH	1.0×10^9			PL/Ad-8	S = MB.	74F646
	EtOH		2×10^{-4}		CP/Ac-15	S = MB.	74F646
	H_2O (mic)	6.2×10^9		303	CP/Ac-20	S = HA; Q = N_3^-; used $k_d = 5.0 \times 10^5\ s^{-1}$; 2.3×10^{-4} mol L^{-1} TDPB.	92N179
	H_2O (mic)	2.3×10^9		303	CP/Ac-20	S = HA; Q = N_3^-; used $k_d = 5.0 \times 10^5\ s^{-1}$; 2.2×10^{-4} mol L^{-1} Triton X-100.	92N179
	H_2O (mic)	5.1×10^9		303	CP/Ac-20	S = HA; Q = N_3^-; used $k_d = 5.0 \times 10^5\ s^{-1}$; 2.9×10^{-4} mol L^{-1} SDS.	92N179
	H_2O (mic)	2.2×10^{10}		313	CP/Ac-23	S = Py; Q = N_3^-; used $k_d = 5.0 \times 10^5\ s^{-1}$; S and A' solubilized in SDS micelles.	78A174
	H_2O (mic)	2.8×10^{10}		313	CP/Ac-23	S = Py; Q = N_3^-; used $k_d = 5.0 \times 10^5\ s^{-1}$; S and A' solubilized in DTAC micelles.	78A174
	H_2O (mic)	4.2×10^9	1.2×10^{-4}	298	CP/Ac-15	S = Eos; used $k_d = 5.0 \times 10^5\ s^{-1}$; A solubilized in SDS micelles.	78F061
	H_2O (mic)	4.7×10^9	1.1×10^{-4}	298	CP/Ac-15	S = MB; used $k_d = 5.0 \times 10^5\ s^{-1}$; S and A solubilized in SDS micelles.	78F061
	H_2O (mic)	5.2×10^9	9.7×10^{-5}		CP/Ac-15	S = MB; used $k_d = 5 \times 10^5\ s^{-1}$; A solubilized in SDS micelles.	767247
	H_2O (ves) pH = 7	2.5×10^{10}	1×10^{-5}	293	CP/Ac-15	S = HYP; used $k_d = 2.5 \times 10^5\ s^{-1}$; 5×10^{-4} mol L^{-1} DPPC.	92N201
	H_2O (ves)	$>3 \times 10^6$		291	PL/Ld-2	S = Zn(pc)$(py)_2$; unilamellar DPPC vesicles.	88A284
	H_2O (ves)	1×10^7		291	CP/A'c-15	S = Zn(pc)$(py)_2$; used $k_d = 2.5 \times 10^5\ s^{-1}$; unilamellar DPPC vesicles.	88A284
	$HCONH_2$/ D_2O (90:10)	1.1×10^9			PL/Ad-6	S = HP.	83E667
	HMN	3.9×10^8		298	PL/Ad-8	S = An; $\Delta V^{\ddagger} = -6\ cm^3\ mol^{-1}$; studied at 0.1-400 MPa.	92A014
	$HOCH_2CH_2OH$	1.5×10^9	3.2×10^{-4}		PL/Ad-8,16	S = MB or RB; k derived using β and $k_D = 5.1 \times 10^{-5}\ s^{-1}$ at [DPBF] = 1.7×10^{-5} mol L^{-1}.	737014
	MCH	3.7×10^8		298	PL/Ad-8	S = An; $\Delta V^{\ddagger} = -19\ cm^3\ mol^{-1}$; studied at 0.1-400 MPa.	92A014 90A018
	MeOH	7.2×10^8		298	PL/Ad-8	S = An; $\Delta V^{\ddagger} = -20\ cm^3\ mol^{-1}$; studied at 0.1-400 MPa.	92A014 90A018
	MeOH		8.0×10^{-5}		CP/Ac-14	S = MB.	90F157
	MeOH		7.8×10^{-5}		CP/Ac-14	S = RB.	90F157
	MeOH	9×10^8		293	PL/Ad-5	S = MB.	87E690
	MeOH		7×10^{-5}		CP/Ac-14	S = A; $f_r^A = -1.0$.	87F479
	MeOH	8.1×10^8			PL/Ad-5	S = 2-ACN.	84F005

TABLE 5. Rate constants for interaction of singlet oxygen with furans, pyrans and other heterocyclic oxygen compounds. — Continued

Solvent	k ($L\ mol^{-1}\ s^{-1}$)	β (k_d/k) ($mol\ L^{-1}$)	T (K)	Method	Comment	Ref.
Isobenzofuran, 1,3-diphenyl- (DPBF) — Continued						
MeOH	6.0×10^8 (k_r)	2.4×10^{-4} (β_r)	298	CP/Ac-14	S = A; used $k_d = 1.4 \times 10^5\ s^{-1}$.	84F240
MeOH	8.3×10^8			PL/Tb-3	S = Ery.	83A050
MeOH	8.1×10^8			PL/Ad-8	S = An.	82A349
MeOH	7.8×10^8			CP/Ac-14	S = Fl^{2-}; used $k_d = 1.4 \times 10^5\ s^{-1}$.	80N021
MeOH		8.0×10^{-5} (β_r)		CP/Ac-14	S = *N*-[5-Hydroxy-8-[[2-(methylsulfonyl)-4-nitrophenyl]azo]-1-naphthalenyl-1,3-benzenedisulfonamide, conjugate base.	79F412
MeOH	7.8×10^8			CP/Ac-23	S = Py; Q = N_3^-; used $k_d = 1.4 \times 10^5\ s^{-1}$.	78A174
MeOH	1.6×10^9	7.1×10^{-5}	298	CP/Ac-15	S = Ery; used $k_d = 1.1 \times 10^5\ s^{-1}$.	78F061
MeOH	1.6×10^9		298	PL/Ad-5	S = MB.	78F061
MeOH	1.6×10^9	6.8×10^{-5}	298	CP/Ac-15	S = MB; used $k_d = 1.1 \times 10^5\ s^{-1}$.	78F061
MeOH	1.0×10^9	1.1×10^{-4}	293	CP/Ac-14	S = Acridine Orange; used $k_d = 1.1 \times 10^5\ s^{-1}$; Complicated kinetic treatment.	767105
MeOH		6.4×10^{-5}		CP/Ac-15	S = MB.	767247
MeOH	1.3×10^9	7×10^{-5}		CP/Ac-15	S = MB; used $k_d = 9.0 \times 10^4\ s^{-1}$.	74F646
MeOH	1.4×10^9 (k_r)			CP/Ac,A'c-17	S = MB; A' = DPF; used $k_r^{A'} = 1.1 \times 10^8\ L\ mol^{-1}\ s^{-1}$; meas. $k_r/k_r^{A'} = 12$.	74F646
MeOH	1×10^9			PL/Ad-8	S = RB.	737014
MeOH	1.3×10^9			PL/Ad-8	S = MB.	737014
MeOH	6.1×10^8 (k_r)	2.3×10^{-4} (β_r)		CP/Ac-14	S = RB; used $k_d = 1.4 \times 10^5\ s^{-1}$; used $\phi_{isc}(RB) = 0.76$.	73F660
MeOH	8×10^8			PL/Ad-5	S = MB.	727260
MeOH		7.3×10^{-5} (β_r)	298	CP/Ac,A'c-17	S = RB; A' = DPF; used $\beta_r^{A'} = 9.5 \times 10^{-4}\ mol\ L^{-1}$.	717398
MeOH	7.0×10^8			PL/Ad-5	S = MB.	719325
MeOH/ D_2O (90:10)	1.6×10^9			PL/Ad-6	S = HP.	83E667
MeOH/ H_2O (50:50)	5.1×10^9	5.5×10^{-5}		PL/Ad-8,16	S = RB or MB; k derived from β and $k_D = (3.7 \pm 1.2) \times 10^{-5}\ s^{-1}$ at $[DPBF] = 1.7 \times 10^{-5}\ mol\ L^{-1}$.	737014
MeOH/ $HOCH_2CH_2OH$ (50:50)	1.9×10^9	6.3×10^{-5}		PL/Ad-8,16	S = MB or RB; k derived from β and $k_D = 1.6 \times 10^{-5}\ s^{-1}$ at $[DPBF] = 1.9 \times 10^{-5}\ mol\ L^{-1}$.	737014
$CH_3OCH_2CH_2OH$	1.2×10^9		293	PL/Ad-5	S = MB.	87E690
2-PrOH	6.1×10^8 (k_r)			CP/Ac,A'c-17	S = MB; A' = DPF; used $k_r^{A'} = 4.8 \times 10^7\ L\ mol^{-1}\ s^{-1}$; meas. $k_r/k_r^{A'} = 13$; Solvent contained 1% MeOH.	74F646
2-PrOH	5×10^8	1×10^{-4}		CP/Ac-15	S = MB; used $k_d = 5.0 \times 10^4\ s^{-1}$; Solvent contained 1% MeOH.	74F646
2-PrOH	1.5×10^8			PL/Ad-8	S = MB; Solvent contained 1% MeOH.	74F646
THF	5.2×10^8 (k_r)	8.4×10^{-5} (β_r)	298	CP/Ac-14	S = A; used $k_d = 4.4 \times 10^4\ s^{-1}$.	84F240
THF	8.3×10^8 (k_r)			CP/Ac,A'c-17	S = RB; A' = DPF; used $k_r^{A'} = 7.5 \times 10^7\ L\ mol^{-1}\ s^{-1}$; meas. $k_r/k_r^{A'} = 11$.	74F646
THF	5×10^8			PL/Ad-8	S = RB.	74F646
dioxane	3.1×10^8 (k_r)			CP/Ac,A'c-17	S = RB; A' = DPF; used $k_r^{A'} = 2.7 \times 10^7\ L\ mol^{-1}\ s^{-1}$; meas. $k_r/k_r^{A'} = 11$.	74F646
dioxane	8.4×10^8			PL/Ad-8	S = RB.	74F646
dioxane	1.2×10^9			PL/Ad-8	S = MB.	737014
i-octane	4.4×10^8 (k_r)	1.2×10^{-4} (β_r)	298	CP/Ac-14	S = A; used $k_d = 5.0 \times 10^4\ s^{-1}$.	84F240

TABLE 5. Rate constants for interaction of singlet oxygen with furans, pyrans and other heterocyclic oxygen compounds. — Continued

No.	Solvent	k ($L\ mol^{-1}\ s^{-1}$)	β (k_d/k) ($mol\ L^{-1}$)	T (K)	Method	Comment	Ref.
5.84	**Isobenzofuran, hexaphenyl-**						
	MeOH	6.9×10^8 (k_r)			CP/Ac-14	S = RB; used $k_d = 1.4 \times 10^5\ s^{-1}$; used ϕ_{isc}(RB) = 0.76.	73F660
5.85	**Isobenzofuran, 1,3,4,7-tetraphenyl-**						
	MeOH	6.6×10^8 (k_r)			CP/Ac-14	S = RB; used $k_d = 1.4 \times 10^5\ s^{-1}$; used ϕ_{isc}(RB) = 0.76.	73F660
5.86	**Psoralen**						
	CCl_4	5.6×10^3			MP/LI-12	S = TPP; used $k_d = 39\ s^{-1}$.	83E813
5.87	**Psoralen, 8-methoxy-**						
	CCl_4	9.4×10^3			MP/LI-12	S = TPP; used $k_d = 39\ s^{-1}$.	83E813
	H_2O	2×10^9			CP/Ac-14	S = A; used $k_d = 2.6 \times 10^5\ s^{-1}$.	83F188
5.88	**Pyran, 5-acetyl-3,4-dihydro-6-methyl-**						
	CCl_4	1.2×10^5		283	CP/A'c-33	S = A' = Rub; used $k_d = 1.1 \times 10^3\ s^{-1}$; $k_{A'}$ not given.	90F329
	CH_3CN	6.8×10^5		283	CP/A'c-33	S = MB; A' = DPBF; used $k_d = 1.9 \times 10^4\ s^{-1}$; $k_{A'}$ not given.	90F329
	$CHCl_3$	1.5×10^5		298	CP/A'c-33	S = A' = Rub; used $k_d = 7.1 \times 10^3\ s^{-1}$; $\Delta H‡ = -22.6\ kJ\ mol^{-1}$; $\Delta S‡ = -221.6\ J\ K^{-1}\ mol^{-1}$; studied at 283-323 K; $k_{A'}$ not given.	90F329
5.89	**Pyran, 5-benzoyl-3,4-dihydro-6-phenyl-**						
	CH_3CN	1.9×10^3		283	CP/A'c-33	S = MB; A' = DPBF; used $k_d = 7.1 \times 10^3\ s^{-1}$.	90F329
5.90	**Pyran, 3,4-dihydro-**						
	CCl_4	7.9×10^4		283	CP/A'c-33	S = A' = Rub; used $k_d = 1.1 \times 10^3\ s^{-1}$; $k_{A'}$ not given.	90F329
	CH_3CN	1.8×10^5		283	CP/A'c-33	S = MB; A' = DPBF; used $k_d = 7.1 \times 10^3\ s^{-1}$; $k_{A'}$ not given.	90F329
	CH_3COCH_3	7.2×10^4 (k_r)		281	?	S = RB; A' = 1.4-Dioxene; used $k_{A'} = 2.2 \times 10^5\ L\ mol^{-1}\ s^{-1}$; meas. $k_A/k_{A'} = 0.33$.	70F733
	$CHCl_3$	7.1×10^4 6.1×10^4		298 323	CP/A'c-33	S = A' = Rub; used $k_d = 7.1 \times 10^3\ s^{-1}$; $k_{A'}$ not given.	90F329
5.91	**Pyran, 3,4-dihydro-5,6-dimethyl-**						
	MeOH	7.2×10^7 (k_r)		286	CP/Oc-29	S = RB; A' = 2,5-DMF; used $k_d = 1.4 \times 10^5\ s^{-1}$, $k_{A'} = 1.8 \times 10^8\ L\ mol^{-1}\ s^{-1}$; meas. $k_q/k_r = \leq 0.1$; 24% [2+2] cycloaddition.	91F163
5.92	**Pyran-4-*d*, 2,3-dihydro-4-methyl-**						
	C_6H_6				?	S = TPP; A' = 2,3-Dihydro-4-methylpyran; meas. $k_r^{A'}/k_r = 1.087$.	777645
	CH_3CN				?	S = MB; A' = 2,3-Dihydro-4-methylpyran; meas. $k_r^{A'}/k_r = 1.787$.	777645
5.93	**Pyran-4-*t*, 2,3-dihydro-4-methyl-**						
	C_6H_6				CP/Ac,A'c-17	S = TPP; A' = 2,3-Dihydro-4-methylpyran; meas. $k_r^{A'}/k_r = 1.335$.	777645
	CH_3CN				Ac,A'c-17	S = MB; A' = 2,3-Dihydro-4-methylpyran; meas. $k_r^{A'}/k_r = 1.211$.	777645
5.94	**Pyran-5-*t*, 2,3-dihydro-4,4-dimethyl-**						
	C_6H_6				CP/Ac,A'c-17	S = TPP; A' = 2,3-Dihydro-4,4-dimethylpyran; meas. $k_r^{A'}/k_r = 0.897$.	777645
	CH_3CN				CP/Ac,A'c-17	S = MB; A' = 2,3-Dihydro-4,4-dimethylpyran; meas. $k_r^{A'}/k_r = 0.897$.	777645

TABLE 5. Rate constants for interaction of singlet oxygen with furans, pyrans and other heterocyclic oxygen compounds. — Continued

No.	Solvent	k ($L\ mol^{-1}\ s^{-1}$)	β (k_d/k) ($mol\ L^{-1}$)	T (K)	Method	Comment	Ref.
5.95	**Pyran-5-*t*, 2,3-dihydro-4-methyl-**						
	C_6H_6				CP/Ac,A'c-17	S = TPP; A' = 2,3-Dihydro-4-methylpyran; meas. $k_r^{A'}/k_r = 0.908$.	777645
	CH_3CN				CP/Ac,A'c-17	S = MB; A' = 2,3-Dihydro-4-methylpyran; meas. $k_r^{A'}/k_r = 0.866$.	777645
5.96	**Pyran-6-*t*, 2,3-dihydro-4,4-dimethyl-**						
	C_6H_6				CP/Ac,A'c-17	S = TPP; A' = 2,3-Dihydro-4,4-dimethylpyran; meas. $k_r^{A'}/k_r = 0.994$.	777645
	CH_3CN				CP/Ac,A'c-17	S = MB; A' = 2,3-Dihydro-4,4-dimethylpyran; meas. $k_r^{A'}/k_r = 1.0$.	777645
5.97	**Pyran-6-*t*, 2,3-dihydro-4-methyl-**						
	C_6H_6				CP/Ac,A'c-17	S = TPP; A' = 2,3-Dihydro-4-methylpyran; meas. $k_r^{A'}/k_r = 0.98$.	777645
	CH_3CN				CP/Ac,A'c-17	S = MB; A' = 2,3-Dihydro-4-methylpyran; meas. $k_r^{A'}/k_r = 1.07$.	777645
5.98	**Pyran-5-carboxylic acid, 3,4-dihydro-6-methyl-, ethyl ester**						
	C_6D_6	4.3×10^4		298	CP/Oc-17	S = TPP; A' = DPBF; rel. to $k_A = 1 \times 10^5\ L\ mol^{-1}\ s^{-1}$ measured in CH_3CN.	90F329
	C_6H_6	2.4×10^4		298	CP/Oc-17	S = TPP; A' = DPBF; rel. to $k_A = 1 \times 10^5\ L\ mol^{-1}\ s^{-1}$ measured in CH_3CN.	90F329
	CCl_4	3.9×10^4		298	CP/A'c-33	S = A' = Rub; used $k_d = 1.1 \times 10^3\ s^{-1}$; $\Delta H‡ = -22.6\ kJ\ mol^{-1}$; $\Delta S‡ = -191.5\ J\ K^{-1}\ mol^{-1}$; studied at 283-323 K; $k_{A'}$ not given.	90F329
	CCl_4	4.3×10^4		298	CP/Oc-17	S = TPP; A' = DPBF; rel. to $k_A = 1 \times 10^5\ L\ mol^{-1}\ s^{-1}$ measured in CH_3CN.	90F329
	CD_3CN	1.1×10^5		298	CP/Oc-17	S = MB; A' = DPBF; rel. to $k_A = 1 \times 10^5\ L\ mol^{-1}\ s^{-1}$ measured in CH_3CN.	90F329
	CH_2Cl_2	5.4×10^4		298	CP/Oc-17	S = TPP; A' = DPBF; rel. to $k_A = 1 \times 10^5\ L\ mol^{-1}\ s^{-1}$ measured in CH_3CN.	90F329
	CH_3CN	1.0×10^5		298	CP/A'c-33	S = MB; A' = DPBF; used $k_d = 1.9 \times 10^4\ s^{-1}$; $\Delta H‡ = -22.8\ kJ\ mol^{-1}$; $\Delta S‡ = -222.5\ J\ K^{-1}\ mol^{-1}$; studied at 283-323 K; $k_{A'}$ not given.	90F329
	$CHCl_3$	4.0×10^4		298	CP/A'c-33	S = A' = Rub; used $k_d = 7.1 \times 10^3\ s^{-1}$; $\Delta H‡ = -19.1\ kJ\ mol^{-1}$; $\Delta S‡ = -220.9\ J\ K^{-1}\ mol^{-1}$; studied at 283-323 K; $k_{A'}$ not given.	90F329 91F497
5.99	**Pyran-5-carboxylic acid, 3,4-dihydro-6-(1-methylethyl)-, ethyl ester**						
	CCl_4	5.5×10^3		298	CP/A'c-33	S = A' = Rub; k_d and $k_{A'}$ not given.	91F497
	CH_3CN	1.1×10^5		298	CP/A'c-33	S = MB; A' = DPBF; k_d and $k_{A'}$ not given.	91F497
	$CHCl_3$	4.3×10^4		298	CP/A'c-33	S = A' = Rub; $\Delta H‡ = -17.4\ kJ\ mol^{-1}$; $\Delta S‡ = -215\ J\ K^{-1}\ mol^{-1}$; studied at 273-323 K; k_d and $k_{A'}$ not given.	91F497
5.100	**Pyran-5-carboxylic acid, 3,4-dihydro-6-phenyl-, ethyl ester**						
	CCl_4	2.8×10^4		283	CP/A'c-33	S = A' = Rub; used $k_d = 1.1 \times 10^3\ s^{-1}$; $k_{A'}$ not given.	90F329
	CH_3CN	1.1×10^5		283	CP/A'c-33	S = MB; A' = DPBF; used $k_d = 1.9 \times 10^4\ s^{-1}$; $k_{A'}$ not given.	90F329
	$CHCl_3$	1.2×10^4		298	CP/A'c-33	S = A' = Rub; used $k_d = 7.1 \times 10^3\ s^{-1}$; $k_{A'}$ not given.	90F329 91F497
5.101	**Pyran-5-carboxylic acid, 6-ethyl-3,4-dihydro-, ethyl ester**						
	CH_3CN	4.1×10^4		298	CP/A'c-33	S = MB; A' = DPBF; k_d and $k_{A'}$ not given.	91F497

TABLE 5. Rate constants for interaction of singlet oxygen with furans, pyrans and other heterocyclic oxygen compounds. — Continued

No.	Solvent	k (L mol^{-1} s^{-1})	β (k_d/k) (mol L^{-1})	T (K)	Method	Comment	Ref.
5.101	**Pyran-5-carboxylic acid, 6-ethyl-3,4-dihydro-, ethyl ester** — Continued						
	$CHCl_3$	2.7×10^4		298	CP/A'c-33	S = A' = Rub; $\Delta H‡ = -12.9$ kJ mol^{-1}; $\Delta S‡ = -204.7$ J K^{-1} mol^{-1}; studied at 273-323 K; k_d and $k_{A'}$ not given.	91F497
5.102	**Sydnone, 3,4-diphenyl-**						
	C_6H_6	5.3×10^6		296	PL/A'd-5	S = NMTA; A' = DPBF.	86A203
	MeOH	2.8×10^6		296	PL/A'd-5	S = NMTA; A' = DPBF.	86A203
5.103	**Sydnone, 4-methyl-3-(4-methylphenyl)-**						
	c-C_6H_{12}	$\sim 1.0 \times 10^7$		296	PL/A'd-5	S = CQ; A' = DPBF.	86A203
	C_6H_6	4.0×10^7		296	PL/A'd-5	S = NMTA; A' = DPBF.	86A203
	CCl_4	1.8×10^7		296	PL/A'd-5	S = CQ; A' = DPBF.	86A203
	CH_3CN	4.9×10^7		296	PL/A'd-5	S = CQ; A' = DPBF.	86A203
	CH_3COCH_3	4.2×10^7		296	PL/A'd-5	S = NMTA; A' = DPBF.	86A203
	MeOH	1.7×10^7		296	PL/A'd-5	S = NMTA; A' = DPBF.	86A203
5.104	**Sydnone, 3-(4-methylphenyl)-**						
	C_6H_6	$\leq 5 \times 10^5$		296	PL/A'd-5	S = CQ; A' = DPBF.	86A203
	MeOH	$\leq 5 \times 10^5$		296	PL/A'd-5	S = NMTA; A' = DPBF.	86A203
5.105	**Sydnone, 3-methyl-4-phenyl-**						
	C_6H_6	2.7×10^6		296	PL/A'd-5	S = NMTA; A' = DPBF.	86A203
	MeOH	2.2×10^6		296	PL/A'd-5	S = NMTA; A' = DPBF.	86A203
5.106	**Sydnone, 3-(4-methylphenyl)-4-phenyl-**						
	C_6H_6	5.4×10^6		296	PL/A'd-5	S = NMTA; A' = DPBF.	86A203
	MeOH	3.5×10^6		296	PL/A'd-5	S = NMTA; A' = DPBF.	86A203
5.107	**Sydnone, 3-phenyl-**						
	C_6H_6	$\leq 5 \times 10^5$		296	PL/A'd-5	S = CQ; A' = DPBF.	86A203
	MeOH	$\leq 5 \times 10^5$		296	PL/A'd-5	S = NMTA; A' = DPBF.	86A203

TABLE 6. Rate constants for interaction of singlet oxygen with pyrroles, oxazoles, pyridines and other heterocyclic nitrogen compounds.

No.	Solvent	k ($L\ mol^{-1}\ s^{-1}$)	β (k_d/k) ($mol\ L^{-1}$)	T (K)	Method	Comment	Ref.
4.1	**1,8-Acridinedione, 3,4,6,7,9,10-hexahydro-3,3,6,6-tetramethyl-**						
	$CHCl_3$	2.0×10^6			PL/Ld-2	S = MPDEE or PdMPDEE.	81A327
4.2	**Carbazole, 2,3,4,9-tetrahydro-9-methyl-**						
	MeOH			293	CP/Ac-17	S = RB; A′ = 9-Acetyl-2,3,4,9-tetrahydrocarbazole; meas. $k_r/k_r^{A'} = 59$.	79F434
4.3	**Carbazole, 2,3,4,9-tetrahydro-9-methyl-6-nitro-**						
	MeOH			293	CP/Ac-17	S = RB; A′ = 9-Acetyl-2,3,4,9-tetrahydrocarbazole; meas. $k_r/k_r^{A'} = 4.8$.	79F434
4.4	**Cyclopenta[*b*]quinoline, 4-methyl-1,2-diphenyl-**						
	C_6H_6	3.0×10^6	0.014		CP/Ac-15	S = A; used $k_d = 4.2 \times 10^4\ s^{-1}$.	78F438
4.5	**Histamine**						
	H_2O pH = 7.1	2.8×10^7		298	CP/Oc-19	S = Phenosafranine; Q = N_3^-; used $k_Q = 2 \times 10^8$ L $mol^{-1}\ s^{-1}$.	78A360
	H_2O	2.0×10^8	2.5×10^{-3}	298	CP/Ac-15	S = MB; used $k_d = 5.0 \times 10^5\ s^{-1}$.	78F061
4.6	**Imidazole**						
	D_2O pD = 7	2×10^7			PL/Ld-2	S = Carboxyanthracene.	92E225
	D_2O/ EtOH (75:25)	1.4×10^7 (k_r)		295	CP/Ac-14,28	S = RB; used $k_d = 4.8 \times 10^4\ s^{-1}$; DMA as actinometer, used $k_A = 2.4 \times 10^7$ L $mol^{-1}\ s^{-1}$.	94A113
	D_2O/ EtOH (75:25)	2.4×10^7		295	PL/Ld-2	S = RB.	94A113
	H_2O	3.4×10^7 (k_r)		298	CP/Oc-14	S = H_2TPPS^{4-}; used $k_d = 2.5 \times 10^5\ s^{-1}$; $E_a = 30.2$ kJ mol^{-1}; log(A) = 12.8; studied at 288-318 K; phosphate buffer contg. 1.6% NaCl.	91R053
	H_2O pH = 7.0	3.4×10^7			CP/Oc-19	S = HP; Q = N_3^-; used $k_Q = 2 \times 10^8$ L $mol^{-1}\ s^{-1}$.	78A278
	H_2O pH = 7.1	4×10^7		298	CP/Oc-19	S = Phenosafranine; Q = N_3^-; used $k_Q = 2 \times 10^8$ L $mol^{-1}\ s^{-1}$.	78A360
	H_2O (mic) pH = 7.0	2.0×10^7			CP/Oc-19	S = Chl a; Q = N_3^-; used $k_Q = 2 \times 10^8$ L $mol^{-1}\ s^{-1}$; 1% Triton X-100; $k = 2.9 \times 10^7$ and 3.9×10^7 L $mol^{-1}\ s^{-1}$ in 2% and 5% Triton X-100, resp.	78A278
	H_2O (mic) pH = 7.0	3.6×10^7			CP/Oc-19	S = HP; Q = N_3^-; used $k_Q = 2 \times 10^8$ L $mol^{-1}\ s^{-1}$; 1% Triton X-100.	78A278
4.7	**Imidazole, 4-methyl-**						
	D_2O/ EtOH (75:25)	1.3×10^8		295	PL/Ld-2	S = RB.	94A113
	D_2O/ EtOH (75:25)	1.1×10^8 (k_r)		295	CP/Ac-14,28	S = RB; used $k_d = 4.8 \times 10^4\ s^{-1}$; DMA as actinometer, used $k_A = 1.3 \times 10^8$ L $mol^{-1}\ s^{-1}$.	94A113
4.8	**Indole**						
	$C_6H_5CH_3$	7.7×10^5			PR/A′d-5	S = Np; A′ = DPBF; $\Delta H‡ = 0$ kJ mol^{-1}; $\Delta S‡ = -141$ J K^{-1} mol^{-1}; studied at 223-353 K.	79A106
	CH_3CN	$<10^4$ (k_r)			CP/Ac,A′c-17	S = ZnTPP; A′ = An; used $k_r^{A'} = 1.2 \times 10^6$ L $mol^{-1}\ s^{-1}$.	90F347
	CH_3CN	2.5×10^6			PL/Ld-2	S = ZnTPP.	90F347
	D_2O/ EtOH (75:25)	1.9×10^7		295	PL/Ld-2	S = RB.	94A113
	D_2O/ EtOH (75:25)	9×10^6 (k_r)		295	CP/Ac-14,28	S = RB; used $k_d = 4.8 \times 10^4\ s^{-1}$; DMA as actinometer, used $k_A = 1.9 \times 10^7$ L $mol^{-1}\ s^{-1}$.	94A113
	H_2O pH = 7.2	7×10^7			CP/Ac-14	S = RB; used $k_d = 2.5 \times 10^5\ s^{-1}$.	88A385
4.9	**Indole, 5,6-dimethoxy-**						
	$CHCl_3$	4.3×10^7	2.3×10^{-4}		CP/A′c-16	S = A′ = Rub; used $k_d = 1 \times 10^4\ s^{-1}$.	84F670

TABLE 6. Rate constants for interaction of singlet oxygen with pyrroles, oxazoles, pyridines and other heterocyclic nitrogen compounds. — Continued

No.	Solvent	k ($L\ mol^{-1}\ s^{-1}$)	β (k_d/k) ($mol\ L^{-1}$)	T (K)	Method	Comment	Ref.
6.10	**Indole, 1,3-dimethyl-**						
	MeOH			293	CP/Ac-17	S = RB; A′ = 9-Acetyl-2,3,4,9-tetrahydrocarbazole; meas. $k_r/k_r^{A'} = 13$.	79F434
6.11	**Indole, 2,3-dimethyl-**						
	$C_6H_5CH_3$	1.0×10^8			PR/A′d-5	S = Np; A′ = DPBF; $\Delta H‡ = 0$ kJ mol^{-1}; $\Delta S‡ = -99.2$ J K^{-1} mol^{-1}; studied at 223-353 K.	79A106
	D_2O (ves)	4.8×10^7		295	PL/A′d-5	S = 2-ACN; A′ = DPBF; 4.0×10^{-2} mol L^{-1} DDAB.	82N027
	D_2O (mic) pD = 7.4	7.0×10^8			PL/A′d-5	S = MB; A′ = DPBF; 0.1 mol L^{-1} SDS.	81N048
	D_2O (mic) pD = 7.4	4.4×10^8			PL/A′d-5	S = MB; A′ = DPBF; 0.1 mol L^{-1} CTAB.	81N048
6.12	**Indole, 5-hydroxy-**						
	$CHCl_3$	$<2 \times 10^5$	>0.05		CP/A′c-16	S = A′ = Rub; used $k_d = 1 \times 10^4\ s^{-1}$.	84F670
6.13	**Indole, 5-methoxy-**						
	$CHCl_3$	$<2 \times 10^5$	>0.05		CP/A′c-16	S = A′ = Rub; used $k_d = 1 \times 10^4\ s^{-1}$.	84F670
6.14	**Indole, 5-methoxy-1,2,3-trimethyl-**						
	MeOH			293	CP/Ac-17	S = RB; A′ = 9-Acetyl-2,3,4,9-tetrahydrocarbazole; meas. $k_r/k_r^{A'} = 98$.	79F434
6.15	**Indole, 1-methyl-**						
	CH_3CN	3.7×10^6			PL/Ld-2	S = ZnTPP.	90F347
	CH_3CN	$<10^4$ (k_r)			CP/Ac,A′c-17	S = ZnTPP; A′ = An; used $k_r^{A'} = 1.2 \times 10^6$ L $mol^{-1}\ s^{-1}$.	90F347
6.16	**Indole, 3-methyl-**						
	$C_6H_5CH_3$	9.2×10^6			PR/A′d-5	S = Np; A′ = DPBF; $\Delta H‡ = 0$ kJ mol^{-1}; $\Delta S‡ = -120$ J K^{-1} mol^{-1}; studied at 223-353 K.	79A106
	CH_2Cl_2	6×10^6			PL/Tb-3	S = TPP.	83A050
	CH_3CN	6.8×10^7			PL/Ld-2	S = ZnTPP.	90F347
	CH_3CN	2.3×10^6 (k_r)			CP/Ac,A′c-17	S = ZnTPP; A′ = An; used $k_r^{A'} = 1.2 \times 10^6$ L $mol^{-1}\ s^{-1}$.	90F347
	D_2O/ EtOH (75:25)	1.6×10^8		295	PL/Ld-2	S = RB.	94A113
	D_2O/ EtOH (75:25)	1.2×10^8 (k_r)		295	CP/Ac-14,28	S = RB; used $k_d = 4.8 \times 10^4\ s^{-1}$; DMA as actinometer, used $k_A = 1.6 \times 10^8$ L $mol^{-1}\ s^{-1}$.	94A113
6.17	**Indole, 3-methyl-2-phenyl-**						
	$C_6H_5CH_3$	2.1×10^7			PR/A′d-5	S = Np; A′ = DPBF; $\Delta H‡ = 0$ kJ mol^{-1}; $\Delta S‡ = -113$ J K^{-1} mol^{-1}; studied at 223-353 K.	79A106
6.18	**Indole, 1,2,3-trimethyl-**						
	MeOH			293	CP/Ac-17	S = RB; A′ = 9-Acetyl-2,3,4,9-tetrahydrocarbazole; meas. $k_r/k_r^{A'} = 70$.	79F434
6.19	**Indole, 1,2,3-trimethyl-5-nitro-**						
	MeOH			293	CP/Ac-17	S = RB; A′ = 9-Acetyl-2,3,4,9-tetrahydrocarbazole; meas. $k_r/k_r^{A'} = 5.0$	79F434
6.20	**Indole-3-acetate ion**						
	H_2O pH = 7	9.2×10^7 (k_r)			CP/Oc,A′c-17	S = RB; A′ = His; used $k_r^{A'} = 8.8 \times 10^7$ L $mol^{-1}\ s^{-1}$.	91F359
	H_2O pH = 7.0	1.0×10^9	1.0×10^{-4}		CP/Ac-18	S = FMN; Q = N_3^-; used $k_d = 1.0 \times 10^5\ s^{-1}$.	86A406

TABLE 6. Rate constants for interaction of singlet oxygen with pyrroles, oxazoles, pyridines and other heterocyclic nitrogen compounds. — Continued

No.	Solvent	k ($L\ mol^{-1}\ s^{-1}$)	β (k_d/k) ($mol\ L^{-1}$)	T (K)	Method	Comment	Ref.
6.21	**Indole-3-acetic acid**						
	CH_3CN	4.6×10^5 (k_r)			CP/Ac-29	S = ZnTPP; A′ = An; used $k_{A'} = 1.2 \times 10^6$ L $mol^{-1}\ s^{-1}$; meas. $k_q/k_r = 40 \pm 6$; Used $k_A = 1.9 \times 10^7$ L $mol^{-1}\ s^{-1}$.	90F347
	CH_3CN	1.9×10^7			PL/Ld-2	S = ZnTPP.	90F347
	D_2O/ EtOH (75:25)	7.8×10^7		295	PL/Ld-2	S = RB.	94A113
	H_2O pH = 4				CP/A′c-29	S = RB; A′ = Met; used $k_{A'} = 2.0 \times 10^7$ L $mol^{-1}\ s^{-1}$; meas. $k_q/k_r = \geq 12 \pm 5$.	90F347
	H_2O pH = 4.5	7.7×10^8	1.3×10^{-4}		CP/Ac-18	S = FMN; Q = N_3^-; used $k_d = 1.0 \times 10^5\ s^{-1}$.	86A406
	H_2O pH = 3.0	5.9×10^8	1.7×10^{-4}		CP/Ac-18	S = FMN; Q = N_3^-; used $k_d = 1.0 \times 10^5\ s^{-1}$.	86A406
6.22	**Indole-3-butyrate ion**						
	H_2O pH = 7	7.2×10^7 (k_r)			CP/Oc-17	S = RB; A′ = His; used $k_r^{A'} = 8.8 \times 10^7$ L $mol^{-1}\ s^{-1}$.	91F359
6.23	**3-Indolebutyric acid**						
	CH_3CN	1.3×10^6 (k_r)			CP/A′c-29	S = ZnTPP; A′ = An; used $k_{A'} = 1.2 \times 10^6$ L $mol^{-1}\ s^{-1}$; meas. $k_q/k_r = 32 \pm 3$; Used $k_A = 4.5 \times 10^7$ L $mol^{-1}\ s^{-1}$.	90F347
	CH_3CN	4.5×10^7			PL/Ld-2	S = ZnTPP.	90F347
	H_2O pH = 4				CP/A′c-29	S = RB; A′ = Met; used $k_{A'} = 2.0 \times 10^7$ L $mol^{-1}\ s^{-1}$; meas. $k_q/k_r = 11 \pm 5$.	90F347
6.24	**Indole-3-carbinol**						
	CH_3CN	6.1×10^5 (k_r)			CP/Ac,A′c-17	S = ZnTPP; A′ = An; used $k_r^{A'} = 1.2 \times 10^6$ L $mol^{-1}\ s^{-1}$.	90F347
	CH_3CN	1.7×10^7			PL/Ld-2	S = ZnTPP.	90F347
6.25	**Indole-2-carboxylic acid**						
	CH_3CN	$<10^4$ (k_r)			CP/Ac,A′c-17	S = ZnTPP; A′ = An; used $k_r^{A'} = 1.2 \times 10^6$ L $mol^{-1}\ s^{-1}$.	90F347
	CH_3CN	3.6×10^5			PL/Ld-2	S = ZnTPP.	90F347
6.26	**Indole-3-carboxylate ion**						
	H_2O pH = 7	1.4×10^7 (k_r)			CP/Oc,A′c-17	S = RB; A′ = His; used $k_r^{A'} = 8.8 \times 10^7$ L $mol^{-1}\ s^{-1}$.	91F359
6.27	**Indole-3-carboxylic acid**						
	CH_3CN	1.3×10^5 (k_r)			CP/Ac,A′c-17	S = ZnTPP; A′ = An; used $k_r^{A'} = 1.2 \times 10^6$ L $mol^{-1}\ s^{-1}$.	90F347
	CH_3CN	5.2×10^5			PL/Ld-2	S = ZnTPP.	90F347
6.28	**Indole-3-propionamide**						
	D_2O/ EtOH (75:25)	7.7×10^7		295	PL/Ld-2	S = RB.	94A113
6.29	**Indole-3-propionate ion**						
	H_2O pH = 7	7.3×10^7 (k_r)			CP/Oc-17	S = RB; A′ = His; used $k_r^{A'} = 8.8 \times 10^7$ L $mol^{-1}\ s^{-1}$.	91F359
6.30	**Indole-3-propionic acid**						
	CH_3CN	6.1×10^5 (k_r)			CP/A′c-29	S = ZnTPP; A′ = An; used $k_{A'} = 1.2 \times 10^6$ L $mol^{-1}\ s^{-1}$; meas. $k_q/k_r = 54 \pm 8$; Used $k_A = 3.3 \times 10^7$ L $mol^{-1}\ s^{-1}$.	90F347
	CH_3CN	3.3×10^7			PL/Ld-2	S = ZnTPP.	90F347
	D_2O/ EtOH (75:25)	6.6×10^7 (k_r)		295	CP/Ac-14,28	S = RB; used $k_d = 4.8 \times 10^4\ s^{-1}$; DMA as actinometer, used $k_A = 9.8 \times 10^7$ L $mol^{-1}\ s^{-1}$.	94A113

TABLE 6. Rate constants for interaction of singlet oxygen with pyrroles, oxazoles, pyridines and other heterocyclic nitrogen compounds. — Continued

No.	Solvent	k (L mol^{-1} s^{-1})	β (k_d/k) (mol L^{-1})	T (K)	Method	Comment	Ref.
6.30	**Indole-3-propionic acid** — Continued						
	D_2O/ EtOH (75:25)	9.8×10^7		295	PL/Ld-2	S = RB.	94A113
	H_2O pH = 4				CP/A'c-29	S = RB; A' = Met; used $k_{A'} = 2.0 \times 10^7$ L mol^{-1} s^{-1}; meas. $k_q/k_r = 15 \pm 4$.	90F347
6.31	**Oxazole, 2,5-diphenyl-**						
	H_2O/ D_2O (50:50 (mic))	1.6×10^8	2.2×10^{-3}	298	CP/Ac-15	S = MB; used $k_d = 2.8 \times 10^5$ s^{-1}; A solubilized in DTAC micelles; solvent mixt. in mole %.	78F061
	H_2O/ D_2O/ MeOH (20:50:30)	1.6×10^8	1.6×10^{-3}	298	CP/Ac-15	S = MB; used $k_d = 2.6 \times 10^5$ s^{-1}; solvent mixt. in mole %.	78F061
6.32	**Oxazole, 2,5-diphenyl-4-methyl-**						
	C_6H_6	3.9×10^7	2.0×10^{-3}		CP/Ac-14	S = ?; used $k_d = 8.0 \times 10^4$ s^{-1}.	81F622
	$CH_3(CH_2)_4OH$		3.0×10^{-3}		CP/Ac-14	S = ?.	81F622
	DMSO		1.5×10^{-3}		CP/Ac-14	S = ?.	81F622
	EtOH	3.3×10^7	5.5×10^{-3}		CP/Ac-14	S = ?; used $k_d = 1.8 \times 10^5$ s^{-1}.	81F622
	MeOH	3.5×10^7	5.8×10^{-3}		CP/Ac-14	S = ?; used $k_d = 2.0 \times 10^5$ s^{-1}.	81F622
	dioxane	1.6×10^7	1.8×10^{-3}		CP/Ac-14	S = ?; used $k_d = 2.9 \times 10^4$ s^{-1}.	81F622
6.33	**Oxazole, 4-methyl-2-(3-chlorophenyl)-5-phenyl-**						
	MeOH	1.7×10^7	0.012		CP/Ac-14	S = ?; used $k_d = 2.0 \times 10^5$ s^{-1}.	81F622
6.34	**Oxazole, 4-methyl-2-(4-chlorophenyl)-5-phenyl-**						
	MeOH	1.9×10^7	0.010		CP/Ac-14	S = ?; used $k_d = 2.0 \times 10^5$ s^{-1}.	81F622
6.35	**Oxazole, 4-methyl-2-(4-methoxyphenyl)-5-phenyl-**						
	MeOH	5.3×10^7	3.8×10^{-3}		CP/Ac-14	S = ?; used $k_d = 2.0 \times 10^5$ s^{-1}.	81F622
6.36	**Oxazole, 4-methyl-2-(4-methylphenyl)-5-phenyl-**						
	MeOH	3.7×10^7	5.3×10^{-3}		CP/Ac-14	S = ?; used $k_d = 2.0 \times 10^5$ s^{-1}.	81F622
6.37	**Oxazole, 4-methyl-2-(4-nitrophenyl)-5-phenyl-**						
	MeOH	1.2×10^7	0.017		CP/Ac-14	S = ?; used $k_d = 2.0 \times 10^5$ s^{-1}.	81F622
6.38	**Phenoxazine**						
	C_6H_5Br/ MeOH (67:33)	1.0×10^7			CP/A'c-23	S = A' = Rub; used $k_d = 4.9 \times 10^4$ s^{-1}, $k_{A'} = 4 \times 10^7$ L mol^{-1} s^{-1}.	777240
6.39	**Pyrazolo[1',2':2,3][1,2,3]triazolo[4,5-*a*]phenazin-4-ium, 1,3-dimethyl-**						
	c-C_6H_{12}	4.5×10^7 (k_r)			CP/Ac-14	S = A; used $k_d = 5.9 \times 10^4$ s^{-1}.	80F548
	$CHCl_3$	3.7×10^7 (k_r)			CP/Ac-14	S = A; used $k_d = 1.7 \times 10^4$ s^{-1}.	80F548
	$CHCl_3$/ MeOH (80:20)	6.3×10^7 (k_r)			CP/Ac-14	S = RB; used $k_d = 5.4 \times 10^4$ s^{-1}; Used ϕ_A for RB = 0.76.	80F548
	$CHCl_3$/ MeOH (80:20)	4.2×10^7 (k_r)			CP/Ac-17	S = RB; A' = DPBF; used $k_r^{A'} = 8 \times 10^8$ L mol^{-1} s^{-1}.	80F548
	$CHCl_3$/ MeOH (80:20)	6.4×10^7 (k_r)			CP/Ac-14	S = A; used $k_d = 5.8 \times 10^4$ s^{-1}.	80F548
6.40	**Pyridine**						
	CCl_4	2×10^3			PL/A'd-8	S = MB; A' = DPBF.	76F903
6.41	**Pyridine, 3,5-diacetyl-1,4-dihydro-**						
	$CHCl_3$	4.7×10^6			PL/Ld-2	S = MPDEE or PdMPDEE.	81A327
6.42	**Pyridine, 3,5-diacetyl-1,4-dihydro-2,6-dimethyl-**						
	$CHCl_3$	5.1×10^6			PL/Ld-2	S = MPDEE or PdMPDEE.	81A327

TABLE 6. Rate constants for interaction of singlet oxygen with pyrroles, oxazoles, pyridines and other heterocyclic nitrogen compounds. — Continued

No.	Solvent	k ($L\ mol^{-1}\ s^{-1}$)	β (k_d/k) ($mol\ L^{-1}$)	T (K)	Method	Comment	Ref.
6.43	**Pyridine, 3,5-dibenzoyl-1,4-dihydro-2,6-dimethyl-**						
	$CHCl_3$	3.8×10^6			PL/Ld-2	S = MPDEE or PdMPDEE.	81A327
6.44	**Pyridine-3,5-dicarboxamide, 1,4-dihydro-2,6-dimethyl-*N*,*N*-diphenyl-**						
	$CHCl_3$	7.5×10^7			PL/Ld-2	S = MPDEE or PdMPDEE.	81A327
6.45	**Pyridine-3,5-dicarboxamide, 1,4-dihydro-2,4,6-trimethyl-*N*,*N*-diphenyl-**						
	$CHCl_3$	6.5×10^6			PL/Ld-2	S = MPDEE or PdMPDEE.	81A327
6.46	**Pyridine-3,5-dicarboxylic acid, 1,4-dihydro-2,6-dimethyl-, dicyclohexyl ester**						
	$CHCl_3$	6.0×10^6			PL/Ld-2	S = MPDEE or PdMPDEE.	81A327
6.47	**Pyridine-3,5-dicarboxylic acid, 1,4-dihydro-2,6-dimethyl-, diethyl ester**						
	$CHCl_3$	3.4×10^6			PL/Ld-2	S = MPDEE or PdMPDEE.	81A327
6.48	**Pyridine-3,5-dicarboxylic acid, 1,4-dihydro-2,6-dimethyl-, dihexyl ester**						
	$CHCl_3$	5.0×10^6			PL/Ld-2	S = MPDEE or PdMPDEE.	81A327
6.49	**Pyridine-3,5-dicarboxylic acid, 1,4-dihydro-2,6-dimethyl-, di(1-methylethyl) ester**						
	$CHCl_3$	6.6×10^6			PL/Ld-2	S = MPDEE or PdMPDEE.	81A327
6.50	**Pyridine-3,5-dicarboxylic acid, 1,4-dihydro-2,6-diphenyl-, diethyl ester**						
	$CHCl_3$	$<10^5$			PL/Ld-2	S = MPDEE or PdMPDEE.	81A327
6.51	**Pyridine-3,5-dicarboxylic acid, 1,4-dihydro-2,4,6-trimethyl-, diethyl ester**						
	$CHCl_3$	$<10^5$			PL/Ld-2	S = MPDEE or PdMPDEE.	81A327
6.52	**Pyridine-3,5-dicarboxylic acid, 2,6-dimethyl-, diethyl ester**						
	$CHCl_3$	$<10^5$			PL/Ld-2	S = MPDEE or PdMPDEE.	81A327
6.53	**Pyridinium, 2,3-dihydro-1-methyl-4-phenyl-**						
	D_2O	1.7×10^6			PL/Ld-2	S = MB.	91R251
6.54	**Pyridinium, 1-methyl-**						
	D_2O	6.5×10^5			PL/Ld-2	S = MB.	91R251
6.55	**Pyridinium, 1-methyl-4-phenyl-**						
	D_2O	8.9×10^5			PL/Ld-2	S = MB.	91R251
6.56	**Pyrido[4,3-*b*]indole, 2,3,4,4a,5,9b-hexahydro-2,8-dimethyl-, *cis*-(-), (Stobadine)**						
	D_2O pD = 7.4	1.3×10^8		310	CR/LI-12	used $k_d = 1.9 \times 10^4\ s^{-1}$; $^1O_2$* from $NDPO_2$.	92A252
6.57	**Pyrido[4,3-*b*]indole, *N*-acetyl-2,3,4,4a,5,9b-hexahydro-2,8-dimethyl-**						
	D_2O pD = 7.4	1×10^6		310	CR/LI-12	used $k_d = 1.9 \times 10^4\ s^{-1}$; $^1O_2$* from $NDPO_2$.	92A252
6.58	**Pyrido[4,3-*b*]indole, 1,2,3,4-tetrahydro-2,8-dimethyl- (Dehydrostobadine)**						
	D_2O pD = 7.4	1.7×10^8		310	CR/LI-12	used $k_d = 1.9 \times 10^4\ s^{-1}$; $^1O_2$* from $NDPO_2$.	92A252
6.59	**Pyrrole**						
	C_5H_5N	1.4×10^9		295	PL/Ld-2	S = An.	93E684
	C_5H_5N	2×10^8			CP/A′c-18	S = TPBC; A′ = Tetr; used $k_d = 6.3 \times 10^4\ s^{-1}$, $k_{A'} = 7 \times 10^6\ L\ mol^{-1}\ s^{-1}$; cor. for $k_q(S) = 10^8\ L\ mol^{-1}\ s^{-1}$.	86F670
	$1,2\text{-}C_6H_4(CH_3)_2$	1.8×10^8		295	PL/Ld-2	S = An.	93E684
	$C_6H_5CH_3$	1.7×10^8		295	PL/Ld-2	S = An.	93E684
	C_6H_5CN	2.1×10^8		295	PL/Ld-2	S = An.	93E684

TABLE 6. Rate constants for interaction of singlet oxygen with pyrroles, oxazoles, pyridines and other heterocyclic nitrogen compounds. — Continued

No.	Solvent	k (L mol^{-1} s^{-1})	β (k_d/k) (mol L^{-1})	T (K)	Method	Comment	Ref.
6.59	**Pyrrole** — Continued						
	C_6H_6	1.5×10^8		295	PL/Ld-2	S = An.	93E684
	C_6H_6	$<1 \times 10^6$			CP/A'c-18	S = TPBC; A' = Tetr; used $k_d = 3.3 \times 10^4$ s^{-1}, $k_{A'} = 7 \times 10^6$ L mol^{-1} s^{-1}; cor. for $k_q(S) = 10^8$ L mol^{-1} s^{-1}.	86F670
	CH_3COCH_3	5.4×10^8		295	PL/Ld-2	S = An.	93E684
	CH_3COCH_3	6×10^7			CP/A'c-18	S = TPBC; A' = Tetr; used $k_d = 2.0 \times 10^4$ s^{-1}, $k_{A'} = 7 \times 10^6$ L mol^{-1} s^{-1}; cor. for $k_q(S) = 10^8$ L mol^{-1} s^{-1}.	86F670
6.60	**Pyrrole, 2,5-dimethyl-**						
	MeOH		0.16	293	CP/Oc-15	S = RB; $E_a = 7.1$ kJ mol^{-1}.	68F288
6.61	**Pyrrole, 1-(1,1-dimethylethyl)-**						
	MeOH	1.2×10^8	1.2×10^{-4}		CP/Oc-?	S = RB; used $k_d = 1.4 \times 10^5$ s^{-1}.	75F652
	CH_3COCH_3	3.9×10^7	9.7×10^{-4}		CP/Oc-?	S = MB; used $k_d = 3.8 \times 10^4$ s^{-1}.	75F652
6.62	**Pyrrole, 2-(1,1-dimethylethyl)-**						
	CH_3COCH_3	4.2×10^7	9.0×10^{-4}		CP/Oc-?	S = MB; used $k_d = 3.8 \times 10^4$ s^{-1}.	75F652
	MeOH	1.5×10^8	9.3×10^{-4}		CP/Oc-?	S = RB; used $k_d = 1.4 \times 10^5$ s^{-1}.	75F652
6.63	**Pyrrole, 3-(1,1-dimethylethyl)-**						
	CH_3COCH_3	2.9×10^7	1.3×10^{-3}		CP/Oc-?	S = MB; used $k_d = 3.8 \times 10^4$ s^{-1}.	75F652
	MeOH	1.8×10^8	7.8×10^{-4}		CP/Oc-?	S = RB; used $k_d = 1.4 \times 10^5$ s^{-1}.	75F652
6.64	**Pyrrole, 1-methyl-**						
	C_6H_6	3.7×10^8		295	PL/Ld-2	S = An.	93E684
	CCl_4	1×10^9	5.5×10^{-8}		CP/LI-12	S = PdTPP; used $k_d = 55$ s^{-1}.	87A202
	CH_3COCH_3	2.9×10^8		295	PL/Ld-2	S = An.	93E684
6.65	**Pyrrole-2,4-dicarboxylic acid, 5,5'-methylenebis[3-methyl-, tetraethyl ester**						
	CCl_4	2×10^6	2.8×10^{-5}		CP/LI-12	S = PdTPP; used $k_d = 55$ s^{-1}.	87A202
6.66	**Pyrrole-3,5-dicarboxylic acid, 2,4-dimethyl-, diethyl ester**						
	CCl_4	3×10^6	1.8×10^{-5}		CP/LI-12	S = PdTPP; used $k_d = 55$ s^{-1}.	87A202
6.67	**Pyrrolo[2,3,4-*k,l*]acridine-10-one, 1-(4-bromophenyl)-2,3,5,7,8,9-hexahydro-4,4,8,8-tetramethyl-**						
	$CHCl_3$	2.6×10^8			PL/Ld-2	S = MPDEE.	89F368
6.68	**Pyrrolo[2,3,4-*k,l*]acridine-10-one, 2,3,5,7,8,9-hexahydro-1-(4-methoxyphenyl)-4,4,8,8-tetramethyl-**						
	$CHCl_3$	2.5×10^8			PL/Ld-2	S = MPDEE.	89F368
6.69	**Pyrrolo[2,3,4-*k,l*]acridine-10-one, 2,3,5,7,8,9-hexahydro-4,4,8,8-tetramethyl-1-phenyl-**						
	$CHCl_3$	4.2×10^8			PL/Ld-2	S = MPDEE.	89F368
6.70	**Pyrrolo[3',2':3,4]cyclopenta[1,2-*b*]pyridine, 2-(4-ethoxycarbonylphenyl)-1,8-dihydro- (EPCP)**						
	CH_2Cl_2	3.6×10^8 (k_r)			CP/Ac-14	S = Rubi; used $k_d = 1 \times 10^4$ s^{-1}; used ϕ_Δ(Rubi) = 0.31.	92F270
	CH_2Cl_2	4.0×10^8			PL/Ld-2	S = MB.	92F270
6.71	**Quinoline**						
	EtOH	$<1 \times 10^9$		273	CP/Oc-23	S = MB; A' = 2,5-DMF; No measurable effect.	72F518
6.72	**Quinoline, 1,2-dihydro-2,2,4-trimethyl-, homopolymer (Permanax 45)**						
	EtOH	9.6×10^8		273	CP/Oc-23	S = MB; A' = 2,5-DMF; used $k_d = 7.9 \times 10^4$ s^{-1}, $k_{A'} = 5.3 \times 10^8$ L mol^{-1} s^{-1}; k calcd. in [81Z251].	72F518

TABLE 6. Rate constants for interaction of singlet oxygen with pyrroles, oxazoles, pyridines and other heterocyclic nitrogen compounds. — Continued

No.	Solvent	k ($L\ mol^{-1}\ s^{-1}$)	β (k_d/k) ($mol\ L^{-1}$)	T (K)	Method	Comment	Ref.
4.73	**Quinoline, 8-hydroxy-**						
	$CHCl_3$	1.1×10^8	9.5×10^{-5}		CP/A'c-16	S = A' = Rub; used $k_d = 1 \times 10^4\ s^{-1}$.	84F670
4.74	**Quinoline, 6-methoxy-**						
	$CHCl_3$	$<2 \times 10^5$	>0.05		CP/A'c-16	S = A' = Rub; used $k_d = 1 \times 10^4\ s^{-1}$.	84F670

TABLE 7. Rate constants for the interaction of singlet oxygen with porphyrins, phthalocyanines and polypyrroles.

No.	Solvent	k ($L\ mol^{-1}\ s^{-1}$)	β (k_d/k) ($mol\ L^{-1}$)	T (K)	Method	Comment	Ref.
7.1	**Bacteriochlorophyll *a***						
	$(C_2H_5)_2O$	2.2×10^8			PL/Ld-2	S = A.	90E324
	$(C_2H_5)_2O$				CL/Ac,A'c-17	S = A' = Rub; meas. $k_r/k_r^{A'} = 0.035$.	84F193
	C_5H_5N	5.9×10^8			PL/Ld-2	S = A.	90E324
	C_5H_5N				CL/Ac,A'c-17	S = A' = Rub; meas. $k_r/k_r^{A'} = 0.1$.	84F193
	C_6H_6				CL/Ac,A'c-17	S = A' = Rub; meas. $k_r/k_r^{A'} = 0.82$.	84F193
	CCl_4	9×10^8 3×10^7 (k_r)			MP/LI-12,27	S = TPP; A' = Tetr; used $k_d = 39\ s^{-1}$.	85F517
	CCl_4	2×10^7 (k_r)			CP/Ac,A'c-14,27	S = TPP, TPBC or MP; A' = Tetr; k_r derived using $k_A = 1 \times 10^9\ L\ mol^{-1}\ s^{-1}$, $f_r^{A'} = 1$.	82A421
	CCl_4	10^9			MP/LI-12	S = PP or Ph a; used $k_d = 36\ s^{-1}$; also see [78E881, 79A010].	77E617
	CH_2Cl_2				CL/Ac,A'c-17	S = A' = Rub; meas. $k_r/k_r^{A'} = 1.1$.	84F193
	CH_3CN				CL/Ac,A'c-17	S = A' = Rub; meas. $k_r/k_r^{A'} = 1.0$.	84F193
	CH_3COCH_3				CL/Ac,A'c-17	S = A' = Rub; meas. $k_r/k_r^{A'} = 0.41$.	84F193
	THF				CL/Ac,A'c-17	S = A' = Rub; meas. $k_r/k_r^{A'} = 0.015$.	84F193
	dioxane				CL/Ac,A'c-17	S = A' = Rub; meas. $k_r/k_r^{A'} = 0.044$.	84F193
7.2	**Bacteriochlorophyll *b***						
	$(C_2H_5)_2O$	5.8×10^8			PL/Ld-2	S = A.	90E324
	C_5H_5N	1×10^9			PL/Ld-2	S = A.	90E324
	CCl_4	2×10^9 2×10^8 (k_r)			MP/LI-12,27	S = TPP; A' = Tetr; used $k_d = 39\ s^{-1}$.	85F517
7.3	**Biline-1,19-dione, 3,8,12,17-tetraethyl-22,24-dihydro-2,7,13,18-tetramethyl- (Etiobiliverdin-IVγ)**						
	$CHCl_3$	1.8×10^9 4.3×10^6 (k_r)			CP/Ac-15	S = RBCE; used $k_d = 1.7 \times 10^4\ s^{-1}$; k_r derived using $\phi_{isc}(S) = 0.36$.	78F701
	MeOH	5.5×10^9 3.5×10^6 (k_r)			CP/Ac-15	S = RB; used $k_d = 1.4 \times 10^5\ s^{-1}$; k_r derived using $\phi_{isc}(S) = 0.76$.	78F701
7.4	**Biline-1,19-dione, 3,8,12,17-tetraethyl-10,22,23,24-tetrahydro-2,7,13,18-tetramethyl- (Etiobilirubin-IVγ)**						
	$CHCl_3$	3.0×10^9 2.3×10^9 (k_r)			CP/Ac-15	S = RBCE; used $k_d = 1.7 \times 10^4\ s^{-1}$; k_r derived using $\phi_{isc}(S) = 0.36$.	78F701 79F104
	MeOH/ $CHCl_3$ (90:10)	2.2×10^9 8.5×10^8 (k_r)			CP/Ac-15	S = RB; used $k_d = 1.4 \times 10^5\ s^{-1}$; k_r derived using $\phi_{isc}(S) = 0.76$.	78F701 79F104
7.5	**Biline-8,12-dipropanoic acid, 2,17-diethenyl-1,10,19,22,23,24-hexahydro-3,7,13,18-tetramethyl-1,19-dioxo- (Bilirubin, BR)**						
	$C_6H_5CHOHCH_3$				CP/Ac-17	S = *N*-[2-[(2-Bromo-4,6-dinitrophenyl)azo]-5-[(2-cyanoethyl)(2-hydroxyethyl)amino]-4-methoxyphenyl]acetamide; $k_A = 0.5$ rel. to k_A in dibutyl terephthalate.	81F609
	o-Terphenyl/ $(C_6H_5)_2O$ (50:50)				CP/Ac-17	S = *N*-[2-[(2-Bromo-4,6-dinitrophenyl)azo]-5-[(2-cyanoethyl)(2-hydroxyethyl)amino]-4-methoxyphenyl]acetamide; $k_A = 0.47$ rel. to k_A in dibutyl terephthalate.	81F609
	$(C_6H_5)_2$/ $(C_6H_5)_2O$ (25:75)				CP/Ac-17	S = *N*-[2-[(2-Bromo-4,6-dinitrophenyl)azo]-5-[(2-cyanoethyl)(2-hydroxyethyl)amino]-4-methoxyphenyl]acetamide; $k_A = 0.3$ rel. to k_A in dibutyl terephthalate.	81F609
	C_6H_6	2×10^8 (k_r)			CP/A'c-17	S = A' = Rub; used $k_r^{A'} = 4.2 \times 10^7\ L\ mol^{-1}\ s^{-1}$; meas. $k_r/k_r^{A'} = 4$.	763011
	CCl_4	2×10^8 (k_r)			CP/A'c-17	S = A' = Rub; used $k_r^{A'} = 4.2 \times 10^7\ L\ mol^{-1}\ s^{-1}$; meas. $k_r/k_r^{A'} = 4$.	763011
	CCl_4	2×10^8 (k_r) 2×10^9 (k_q)			CP/A'c-24	S = A' = Rub; used $k_{A'} = 4.2 \times 10^7\ L\ mol^{-1}\ s^{-1}$; k_r and k_q derived using $(k/k_{A'}) = 54$, $(k_r/k_r^{A'}) = 4$.	763011

TABLE 7. Rate constants for the interaction of singlet oxygen with porphyrins, phthalocyanines and polypyrroles. — Continued

Solvent	k ($L\ mol^{-1}\ s^{-1}$)	β (k_d/k) ($mol\ L^{-1}$)	T (K)	Method	Comment	Ref.
7.4 Biline-8,12-dipropanoic acid, 2,17-diethenyl-1,10,19,22,23,24-hexahydro-3,7,13,18-tetramethyl-1,19-dioxo- (Bilirubin, BR) — Continued						
$CHCl_3$	2.8×10^9 3.8×10^8 (k_r)			CP/Ac-15	S = RBCE; k_r derived using $\phi_{isc}(S) = 0.36$.	79F104
$CHCl_3$	2.1×10^8 (k_r)			CP/Ac,A'c-17	S = MB; A' = DPBF; used $k_r^{A'} = 7 \times 10^8$ L mol^{-1} s^{-1}; meas. $k_r/k_r^{A'} = 0.30$.	753071
$CHCl_3$	1.3×10^9	8×10^{-6}	296	CP/Ac-15	S = MB; used $k_d = 1.0 \times 10^4$ s^{-1}.	753071
$CHCl_3$	1.5×10^9	6.7×10^{-6}		CP/A'c-16	S = MB; A' = DPBF; used $k_d = 1.0 \times 10^4$ s^{-1}.	753071
$CHCl_3$	4.3×10^8 (k_r)			CP/Ac,P'a-17	S = MB; A' = TME; used $k_r^{A'} = 4.8 \times 10^7$ L mol^{-1} s^{-1}; meas. $k_r/k_r^{A'} = 9.0$.	753071
$CHCl_3$/ MeOH (90:10)	1.3×10^9	3.1×10^{-5}	296	CP/Ac-15	S = RB; used $k_d = 3.9 \times 10^4$ s^{-1}.	753071
$CHCl_3$/ MeOH (90:10)	4.3×10^8 (k_r)			CP/Ac-14	S = RB; k_r derived using $k_A = 2.5 \times 10^9$ L mol^{-1} s^{-1} and $\phi_{isc}(S) = 0.66$.	753071
CH_2Cl_2	5.0×10^8 (k_r) 5.0×10^9 (k_q)		308	CR/Ac-19	A' = $MNPO_2$; used $k_d = 1 \times 10^4$ s^{-1}, $k_{A'} = 8.5 \times 10^7$ L mol^{-1} s^{-1}; $^1O_2$* from $MNPO_2$.	83A317
$ClCF_2CCl_2F$	1×10^8 (k_r)			CL/Ad-36	high pressure O_2; k_r derived using $k_{O2} = 2.7 \times 10^3$ L mol^{-1} s^{-1}; Previous value by same workers [747103] low due to overdepletion of A in solution exposed directly to laser beam.	777129
D_2O pD = 8.4	1.3×10^9		293	PL/Ad-5	S = RB.	79A111
D_2O pD = 8.4	$<4 \times 10^8$ (k_r)		293	CP/Ac,A'c-17	S = RB; A' = DPBF; used $k_r^{A'} = 8 \times 10^8$ L mol^{-1} s^{-1}; meas. $k_r/k_r^{A'} = 0.4$.	79A111
D_2O (mic) pD = 8.4			293	CP/Ac,A'c-17	S = RB; A' = DPBF; meas. $k_r/k_r^{A'} = 0.44$; 0.1 mol L^{-1} SDS.	80N018
D_2O (mic) pD = 8.4			293	CL/Ad-37	A' = DPBF; meas. $k_A/k_{A'} = 0.13$; high pressure oxygen (0.195 mol L^{-1}); 0.1 mol L^{-1} SDS.	80N018
D_2O/EtOH	3.2×10^9		310	CR/LI-12	used $k_d = 1 \times 10^5$ s^{-1}; $^1O_2$* from $NDPO_2$.	89R188
H_2O	1×10^9 (k_r) 4.7×10^9 (k_q)		308	CR/Ac-19	A' = $MNPO_2$; used $k_d = 3 \times 10^5$ s^{-1}, $k_{A'} = 9.0 \times 10^8$ L mol^{-1} s^{-1}; $^1O_2$* from $MNPO_2$; in the presence of excess albumin $k_q = 1.9 \times 10^9$ and $k_r = 8.4 \times 10^8$ L mol^{-1} s^{-1}.	83A317
MeOH	2.1×10^9 2.8×10^8 (k_r)			CP/Ac-15	S = RB; used $k_d = 1.4 \times 10^5$ s^{-1}; k_r derived using $\phi_{isc}(S) = 0.76$.	79F104
7.6 Biline-8,12-dipropanoic acid, 2,17-diethenyl-1,10,19,22,23,24-hexahydro-3,7,13,18-tetramethyl-1,19-dioxo-, dimethyl ester (Bilirubin IX dimethyl ester)						
$CHCl_3$	1.8×10^9 6.7×10^8 (k_r)			CP/Ac-15	S = RBCE; used $k_d = 1.7 \times 10^4$ s^{-1}; k_r derived using $\phi_{isc}(S) = 0.36$.	78F701
MeOH	2.3×10^9 5.5×10^8 (k_r)			CP/Ac-15	S = RB; used $k_d = 1.4 \times 10^5$ s^{-1}; k_r derived using $\phi_{isc}(S) = 0.76$.	78F701
7.7 Biline-8,12-dipropanoic acid, 2,17-diethenyl-1,19,22,24-tetrahydro-3,7,13,18-tetramethyl-1,19-dioxo- (Biliverdin)						
CH_2Cl_2	4.6×10^9		308	CR/Ac-19	A' = BRH_2; used $k_d = 1 \times 10^4$ s^{-1}, $k_{A'} = 5.0 \times 10^8$ L mol^{-1} s^{-1}; $^1O_2$* from $MNPO_2$.	83A317
$CHCl_3$	1.7×10^9 1.9×10^6 (k_r)			CP/Ac-15	S = RBCE; used $k_d = 1.7 \times 10^4$ s^{-1}; k_r derived using $\phi_{isc}(S) = 0.36$.	78F701
$CHCl_3$	$\leq 3 \times 10^6$ (k_r)			CP/Ac,A'c-17	S = A' = Rub; used $k_r^{A'} = 4.2 \times 10^7$ L mol^{-1} s^{-1}; meas. $k_r/k_r^{A'} = \leq 0.07$.	763011
$CHCl_3$	3.3×10^9	5×10^{-6}		CP/A'c-23	S = A' = Rub; used $k_d = 1.4 \times 10^4$ s^{-1}.	763011
D_2O pD = 11.2	9.1×10^8		310	CR/A'c-32	A' = DPBF; used $k_d = 1.5 \times 10^4$ s^{-1}; $^1O_2$* from Dopamine/H_2O_2.	89M038
D_2O pD = 11.2	1.1×10^9		310	CR/A'c-32	A' = DPBF; used $k_d = 1.5 \times 10^4$ s^{-1}; $^1O_2$* from DOPA/H_2O_2.	89M038

TABLE 7. Rate constants for the interaction of singlet oxygen with porphyrins, phthalocyanines and polypyrroles. — Continued

No.	Solvent	k ($L\ mol^{-1}\ s^{-1}$)	β (k_d/k) ($mol\ L^{-1}$)	T (K)	Method	Comment	Ref.
7.7	**Biline-8,12-dipropanoic acid, 2,17-diethenyl-1,19,22,24-tetrahydro-3,7,13,18-tetramethyl-1,19-dioxo- (Biliverdin)** — Continued						
	D_2O pD = 8.4	5.1×10^{10}			CL/A'd-16	A' = BR^{2-}; used $k_d = 5.0 \times 10^4\ s^{-1}$; high pressure O_2.	777129
	D_2O pD = 8.4	3.0×10^8 (k_r)			CL/Ad-35	used $k_d = 5.0 \times 10^4\ s^{-1}$; high pressure O_2; k_r derived using $k_A = 5.1 \times 10^{10}\ L\ mol^{-1}\ s^{-1}$.	777129
	D_2O pD = 13.4	5×10^8 (k_r)			CL/Ad-35	used $k_d = 5.0 \times 10^4\ s^{-1}$; high pressure O_2; k_r derived using $k_A = 1.5 \times 10^{10}\ L\ mol^{-1}\ s^{-1}$.	777129
	D_2O pD = 13.4	1.5×10^{10}			CL/A'd-16	A' = BR^{2-}; used $k_d = 5.0 \times 10^4\ s^{-1}$; high pressure O_2.	777129
	D_2O pD = 11.8	4.0×10^8 (k_r)			CL/Ad-35	used $k_d = 5.0 \times 10^4\ s^{-1}$; high pressure O_2; k_r derived using $k_A = 6 \times 10^{10}\ L\ mol^{-1}\ s^{-1}$.	777129
	D_2O pD = 11.8	6×10^{10}			CL/A'd-16	A' = BR^{2-}; used $k_d = 5.0 \times 10^4\ s^{-1}$; high pressure O_2.	777129
	D_2O/EtOH	2.3×10^9		310	CR/LI-12	used $k_d = 1 \times 10^5\ s^{-1}$; $^1O_2$* from $NDPO_2$.	89R188
	H_2O pH = 10.5	5×10^9			CR/LI-12	used $k_d = 5 \times 10^4\ s^{-1}$; $^1O_2$* from $NaOCl/H_2O_2$.	87M341
	MeOH	8.4×10^9 2.4×10^6 (k_r)			CP/Ac-15	S = RB; used $k_d = 1.4 \times 10^5\ s^{-1}$; k_r derived using $\phi_{isc}(S) = 0.76$.	78F701
	MeOH/ H_2O (95:5)	4×10^9		310	CR/LI-12	used $k_d = 1.8 \times 10^5\ s^{-1}$; soln. cont. 0.05 mol L^{-1} MeONa and 5×10^{-4} mol L^{-1} $CoCl_2$, $^1O_2$* from autoxidation of oxytetracycline.	92M228
7.8	**Biline-8,12-dipropanoic acid, 2,17-diethenyl-1,19,22,24-tetrahydro-3,7,13,18-tetramethyl-1,19-dioxo-, dimethyl ester (Biliverdin dimethyl ester)**						
	$CHCl_3$	1.4×10^9 1.2×10^6 (k_r)			CP/Ac-15	S = RBCE; used $k_d = 1.7 \times 10^4\ s^{-1}$; k_r derived using $\phi_{isc}(S) = 0.36$.	78F701
	$ClCF_2CCl_2F$	6×10^5 (k_r) 8×10^8 (k_q)			CL/A'd-35	A' = BRH_2; high pressure O_2; k derived using $k_{O2} = 2.7 \times 10^3\ L\ mol^{-1}\ s^{-1}$.	777129
	$ClCF_2CCl_2F$	9×10^8			CL/A'd-16	A' = BRH_2; high pressure O_2; k derived using $k_{O2} = 2.7 \times 10^3\ L\ mol^{-1}\ s^{-1}$.	777129
	MeOH	3.3×10^9 1.6×10^6 (k_r)			CP/Ac-15	S = RB; used $k_d = 1.4 \times 10^5\ s^{-1}$; k_r derived using $\phi_{isc}(S) = 0.76$.	78F701
7.9	**Biline-8,12-dipropanoic acid, 2,17-diethyl-1,10,19,22,23,24-hexahydro-3,7,13,18-tetramethyl-1,19-dioxo- (Mesobilirubin)**						
	$CHCl_3$	2.8×10^9 5.9×10^8 (k_r)			CP/Ac-15	S = RBCE; used $k_d = 1.7 \times 10^4\ s^{-1}$; k_r derived using $\phi_{isc}(S) = 0.36$.	78F701
	MeOH	2.5×10^9 7.9×10^8 (k_r)			CP/Ac-15	S = RB; used $k_d = 1.4 \times 10^5\ s^{-1}$; Soln. contg. 2% NH_4OH; k_r derived using $\phi_{isc}(S) = 0.76$.	78F701
7.10	**Bilirubin ditaurate**						
	D_2O/EtOH	1.2×10^9		310	CR/LI-12	used $k_d = 1 \times 10^5\ s^{-1}$; $^1O_2$* from $NDPO_2$.	89R188
7.11	**Chlorophyll *a***						
	$(C_2H_5)_2O$	1×10^8			PL/Ld-2	S = A.	90E324
	C_5D_5N	9×10^7			PL/Ld-2	S = A.	90E324
	C_5H_5N	5×10^7	0.02	293	CP/Oc-15	S = A; used $k_d = 1 \times 10^5\ s^{-1}$.	75F669
	C_6H_6	2.0×10^8			PL/Ld-2	S = TPP.	93R231
	C_6H_6	7.3×10^8			CP/Oc-18	S = A; A' = 2M2P; used $k_d = 4 \times 10^4\ s^{-1}$, $\beta_{A'} = 0.049\ mol\ L^{-1}$.	88R136
	C_6H_6/ EtOH (67:33)	1.2×10^7			CP/Ac-19	S = RB; A' = Car; used $k_d = 1 \times 10^5\ s^{-1}$.	78F404
	CCl_4	2×10^6 (k_r)			CP/Ac,A'c-14,27	S = TPP, TPBC or MP; A' = Tetr; k_r derived using $k_A = 7 \times 10^8\ L\ mol^{-1}\ s^{-1}$, $f_r^{A'} = 1$.	82A421
	CCl_4	4×10^6 (k_r)			CP/Ac,A'c-14,27	S = A; A' = Tetr; k_r derived using $k_A = 7 \times 10^8\ L\ mol^{-1}\ s^{-1}$, $f_r^{A'} = 1$, $\phi_\Delta = 0.55$.	79A010

TABLE 7. Rate constants for the interaction of singlet oxygen with porphyrins, phthalocyanines and polypyrroles. — Continued

No.	Solvent	k ($L\ mol^{-1}\ s^{-1}$)	β (k_d/k) ($mol\ L^{-1}$)	T (K)	Method	Comment	Ref.
7.11	**Chlorophyll *a* — Continued**						
	CCl_4	7×10^8			MP/LI-12	S = PP, TPP, Ph a or BChl a; used $k_d = 36\ s^{-1}$; also see [78E881, 78E892, 79A010].	77E617
	EtOH	2.0×10^7	5.0×10^{-3}		CP/Ac-15	S = RB; used $k_d = 1 \times 10^5\ s^{-1}$.	78F404
7.12	**Chlorophyll *b***						
	C_6H_6	4.2×10^8			CP/Oc-18	S = A; A′ = 2M2P; used $k_d = 4 \times 10^4\ s^{-1}$, $\beta_{A'} = 0.049\ mol\ L^{-1}$.	88R136
	CCl_4	6×10^5 (k_r)			CP/Ac,A′c-14,27	S = TPP, TPBC or MP; A′ = Tetr; k_r derived using $k_A = 3 \times 10^8\ L\ mol^{-1}\ s^{-1}$, $f_r^{A'} = 1$.	82A421
7.13	**Cyanohemoglobin**						
	H_2O pH = 7.0	1.2×10^9			CP/Oc-19	S = MB; Q = N_3^-; used $k_Q = 5 \times 10^8\ L\ mol^{-1}\ s^{-1}$; $k = 1.1 \times 10^9\ L\ mol^{-1}\ s^{-1}$ for subunit α and $2.0 \times 10^9\ L\ mol^{-1}\ s^{-1}$ for subunit β.	83A395
7.14	**Hematoporphyrin derivative**						
	MeOH	5.1×10^8			CP/Oc-16	S = A; A′ = FFA; used $k_d = 9.6 \times 10^4\ s^{-1}$.	88R142
7.15	**Hematoporphyrin-human serum albumin complex**						
	D_2O pH = 7.4	7×10^8			PL/Ld-2	S = A.	87A064
7.16	**Methyl acetal of oxidized octaethylpurpurin ethyl ester**						
	MeOH	1.2×10^8			PL/Ld-2	S = A.	90E491
7.17	**Naphthalocyanine, bis(tribenzylsiloxy)silicon**						
	CH_2Cl_2	1.5×10^8			PL/Ld-2	S = A.	93E520
7.18	**Naphthalocyanine, bis(trihexyloxysiloxy)silicon**						
	C_6H_6	1.1×10^{10}			PL/Ld-2	S = A.	88E657
	$CHCl_3$	3.9×10^8			PL/Ld-2	S = TPP.	90E731 92R076
7.19	**Naphthalocyanine, bis(trihexylsiloxy)tin**						
	$CHCl_3$	5.3×10^9			PL/Ld-2	S = TPP.	90E731 92R076
7.20	**Naphthalocyanine, bis(triisobutylsiloxy)silicon**						
	CH_2Cl_2	1.5×10^8			PL/Ld-2	S = A.	93E520
7.21	**Naphthalocyanine, 1,6,10,15,19,24,28,33-octabutoxy-, palladium(II)**						
	C_6H_6	8.8×10^9		295	PL/Ld-2	S = PPDME; energy transfer.	93A380
7.22	**Naphthalocyanine, 2,11,20,29-tetrakis(1,1-dimethylethyl)-**						
	$CHCl_3$	1.0×10^{10}			PL/Ld-2	S = TPP.	90E731 92R076
7.23	**Naphthalocyanine, 1,10,19,28-tetraphenyl-, hydroxyaluminum(III)**						
	$CHCl_3$	2.0×10^9			PL/Ld-2	S = TPP.	90E731 92R076
7.24	**Naphthalocyanine, trihexylsiloxyaluminum**						
	$CHCl_3$	3.3×10^9			PL/Ld-2	S = TPP.	90E731 92R076
7.25	**Naphthalocyanine, trihexylsiloxygallium**						
	$CHCl_3$	1.1×10^{10}			PL/Ld-2	S = TPP.	90E731 92R076

TABLE 7. Rate constants for the interaction of singlet oxygen with porphyrins, phthalocyanines and polypyrroles. — Continued

No.	Solvent	k ($L\ mol^{-1}\ s^{-1}$)	β (k_d/k) ($mol\ L^{-1}$)	T (K)	Method	Comment	Ref.
7.26	**Pheophytin *a***						
	C_6H_6	7.4×10^7			CP/Oc-18	S = A; A′ = 2M2P; used $k_d = 4 \times 10^4\ s^{-1}$, $\beta_{A'} = 0.049\ mol\ L^{-1}$.	88R136
	CCl_4	1.4×10^4 (k_r)			CP/Ac,A′c-14,27	S = TPP, TPBC or MP; A′ = Tetr; k_r derived using $k_A = 2 \times 10^7\ L\ mol^{-1}\ s^{-1}$, $f_r^{A'} = 1$.	82A421
	CCl_4	1×10^4 (k_r)			CP/Ac,A′c-14,27	S = A; A′ = Tetr; k_r derived using $k_A = 2 \times 10^7\ L\ mol^{-1}\ s^{-1}$, $f_r^{A'} = 1$.	79A010
	CCl_4	2×10^7			MP/LI-12	S = PP or BChl a; used $k_d = 36\ s^{-1}$; also see [78E881, 79A010].	77E617
7.27	**Pheophytin *b***						
	C_6H_6	3.0×10^7			CP/Oc-18	S = A; A′ = 2M2P; used $k_d = 4 \times 10^4\ s^{-1}$, $\beta_{A'} = 0.049\ mol\ L^{-1}$.	88R136
	CCl_4	10^3 (k_r)			CP/Ac,A′c-14,27	S = TPP, TPBC or MP; A′ = Tetr; k_r derived using $k_A = 5 \times 10^6\ L\ mol^{-1}\ s^{-1}$, $f_r^{A'} = 1$.	82A421
7.28	**20-Phorbinecarboxylic acid, 3,4-didehydro-3,4,8,9,13,14,18,19-octaethyl-18,19-dihydro-, ethyl ester (NT2H2)**						
	MeOH	1.5×10^8			PL/Ld-2	S = A.	90E491
7.29	**20-Phorbinecarboxylic acid, 3,4-didehydro-3,4,8,9,13,14,18,19-octaethyl-18,19-dihydro-, ethyl ester, dichlorotin(IV)**						
	MeOH	1×10^7			PL/Ld-2	S = A.	90E491
7.30	**20-Phorbinecarboxylic acid, 3,4,20,21-tetradehydro-3,4,8,9,13,14,18,19-octaethyl-18,19-dihydro-, ethyl ester (NT2)**						
	C_6H_6	$\sim 6 \times 10^7$			PL/Ld-2	S = A.	88R200
	MeOH	5×10^7			PL/Ld-2	S = A.	90E491
7.31	**20-Phorbinecarboxylic acid, 3,4,20,21-tetradehydro-4,9,14,19-tetraethyl-18,19-dihydro-3,8,13,18-tetramethyl-, ethyl ester, zinc(II) (ZnET2)**						
	C_6H_6	5.4×10^8			PL/Ld-2	S = A.	88R200
7.32	**3-Phorbinepropanoic acid, 9-acetyl-14-ethyl-13,14-dihydro-21-(methoxycarbonyl)-4,8,13,18-tetramethyl-20-oxo-, 3,7,11,15-tetramethyl-2-hexadecenyl ester (Bacteriopheophytin *a*)**						
	$(C_2H_5)_2O$	3×10^7			PL/Ld-2	S = A.	90E324
	CCl_4	3×10^4 (k_r)			CP/Ac,A′c-14,27	S = TPP; A′ = Tetr; k_r derived using $k_A = 1.2 \times 10^7\ L\ mol^{-1}\ s^{-1}$, $f_r^{A'} = 1$.	85F517
	CCl_4	1.2×10^7			MP/LI-12	S = TPP; used $k_d = 39\ s^{-1}$.	85F517
	CCl_4	10^7			MP/LI-12	S = PP, Ph a or BChl a; used $k_d = 36\ s^{-1}$; also see [78E881, 79A010].	77E617
7.33	**3-Phorbinepropanoic acid, 9-acetyl-14-ethylidene-13,14-dihydro-21-(methoxycarbonyl)-4,8,13,18-tetramethyl-20-oxo-, 3,7,11,15-tetramethyl-2-hexadecenyl ester (Bacteriopheophytin *b*)**						
	$(C_2H_5)_2O$	1.9×10^8			PL/Ld-2	S = A.	90E324
	C_5H_5N	2.8×10^8			PL/Ld-2	S = A.	90E324
	CCl_4	3×10^6 (k_r)			CP/Ac,A′c-14,27	S = TPP; A′ = Tetr; k_r derived using $k_A = 2 \times 10^8\ L\ mol^{-1}\ s^{-1}$, $f_r^{A'} = 1$.	85F517
	CCl_4	2×10^8			MP/LI-12,27	S = TPP; used $k_d = 39\ s^{-1}$.	85F517
7.34	**3-Phorbinepropanoic acid, 3,4-didehydro-4,9-diethenyl-14-ethyl-21-(methoxycarbonyl)-4,8,13,18-tetramethyl-20-oxo-, magnesium(II), 3,7,11,15-tetramethyl-2-hexadecenyl ester (4-Vinylprotochlorophyll)**						
	CCl_4	$\leq 3 \times 10^5$ (k_r)			CP/Ac,A′c-14,27	S = TPP, TPBC or MP; A′ = Tetr; k_r derived using $k_A = \leq 1 \times 10^8\ L\ mol^{-1}\ s^{-1}$, $f_r^{A'} = 1$.	82A421
7.35	**3-Phorbinepropanoic acid, 3,4-didehydro-4,9-diethenyl-14-ethyl-21-(methoxycarbonyl)-4,8,13,18-tetramethyl-20-oxo-, 3,7,11,15-tetramethyl-2-hexadecenyl ester (4-Vinylprotopheophytin)**						
	CCl_4	$\sim 2 \times 10^5$ (k_r)				S = TPP, TPBC or MP; A′ = Tetr; k_r derived using $k_A - 2 \times 10^8\ L\ mol^{-1}\ s^{-1}$, $f_r^{A'} = 1$.	82A421

TABLE 7. Rate constants for the interaction of singlet oxygen with porphyrins, phthalocyanines and polypyrroles. — Continued

No.	Solvent	k (L mol^{-1} s^{-1})	β (k_d/k) (mol L^{-1})	T (K)	Method	Comment	Ref.
7.36	**3-Phorbinepropanoic acid, 3,4-didehydro-9-ethenyl-14-ethyl-21-(methoxycarbonyl)-4,8,13,18-tetramethyl-20-oxo-, 2-amino-2-(methoxycarbonyl)ethyl ester, magnesium(II),**						
	C_6H_6	2.4×10^8			PL/Ld-2	S = TPP.	93R231
	D_2O	1.0×10^8			PL/Ld-2	S = $Ru(bpy)_3^{2+}$.	93R231
7.37	**3-Phorbinepropanoic acid, 3,4-didehydro-9-ethenyl-14-ethyl-21-(methoxycarbonyl)-4,8,13,18-tetramethyl-20-oxo-, magnesium(II) (protochlorophyllide)**						
	C_6H_6	2.0×10^8			PL/Ld-2	S = TPP.	93R231
	D_2O	1.6×10^8			PL/Ld-2	S = $Ru(bpy)_3^{2+}$.	93R231
7.38	**3-Phorbinepropanoic acid, 3,4-didehydro-9-ethenyl-14-ethyl-21-(methoxycarbonyl)-4,8,13,18-tetramethyl-20-oxo-, 3,7,11,15-tetramethyl-2-hexadecenyl ester (Protopheophytin)**						
	CCl_4	$\sim 10^8$ (k_r)			CP/Ac,A'c-14,27	S = A; A' = Tetr; k_r derived using $k_A = 2 \times 10^8$ L mol^{-1} s^{-1}, $f_r^{A'} = 1$.	79A010
	CCl_4	2×10^8			MP/LI-12	S = PP, Ph a or BChl a; used $k_d = 36$ s^{-1}; also see [78E881, 79A010].	77E617
7.39	**3-Phorbinepropanoic acid, 3,4-didehydro-9-ethenyl-14-ethyl-21-(methoxycarbonyl)-4,8,13,18-tetramethyl-20-oxo-, magnesium(II), 3,7,11,15-tetramethyl-2-hexadecenyl ester (Protochlorophyll)**						
	CCl_4	$\leq 10^6$ (k_r)			CP/Ac,A'c-14,27	S = A; A' = Tetr; k_r derived using $k_A = \leq 1 \times 10^8$ L mol^{-1} s^{-1}, $f_r^{A'} = 1$.	79A010
	CCl_4	$\leq 10^8$			MP/LI-12	S = PP, Ph a or BChl a; used $k_d = 36$ s^{-1}; also see [78E881, 79A010].	77E617
7.40	**Phthalocyanine, bis(tribenzylsiloxy)silicon**						
	CH_2Cl_2	1.4×10^7			PL/Ld-2	S = A.	93E520
7.41	**Phthalocyanine, bis(tripropylsiloxy)silicon**						
	CH_2Cl_2	1.6×10^7			PL/Ld-2	S = A.	93E520
7.42	**Phthalocyanine, 1,4,8,11,15,18,22,25-octabutoxy-**						
	$CHCl_3$	5.9×10^9			PL/Ld-2	S = TPP.	90E731 92R076
7.43	**Phthalocyanine, sulfo-, chloroaluminum(III) [AlCl(tspc)]**						
	D_2O pH = 7	$<10^8$			PL/Ld-2	S = A; No measurable effect; soln. contg. 2×10^{-3} mol L^{-1} phosphate buffer and 1% NaCl wt/wt.	90A022
7.44	**Phthalocyanine, sulfo-, zinc(II)**						
	D_2O pH = 7	$<10^8$			PL/Ld-2	S = A; No measurable effect; soln. contg. 2×10^{-3} mol L^{-1} phosphate buffer and 1% NaCl wt/wt.	90A022
7.45	**Phthalocyanine, tetracarboxy-, copper(II)**						
	DMSO	$\geq 1.4 \times 10^9$			CP/Ac-16	S = A; A' = DPBF; used $k_d = 3.3 \times 10^4$ s^{-1}.	89F260
7.46	**Phthalocyanine, 2,9,16,23-tetra(1,1-dimethylethyl)-**						
	C_6F_6	2×10^8			PL/Ld-2	S = Fullerene-C_{70}.	93E301
	$CHCl_3$	2.9×10^8			PL/Ld-2	S = TPP.	90E731 92R076
7.47	**Porphine, (acetato)-5,10,15,20-tetraphenyl-, iron(III)**						
	CCl_4	$<10^4$ (k_r)			CP/Ac,A'c-14,27	S = TPP, TPBC or MP; A' = Tetr; k_r derived using $k_A = 1.5 \times 10^9$ L mol^{-1} s^{-1}, $f_r^{A'} = 1$.	82A421
	CCl_4	1.5×10^9			MP/LI-12	S = TPP; used $k_d = 36$ s^{-1}.	78E892 79A010 80E548

TABLE 7. Rate constants for the interaction of singlet oxygen with porphyrins, phthalocyanines and polypyrroles. — Continued

No.	Solvent	k ($L\ mol^{-1}\ s^{-1}$)	β (k_d/k) ($mol\ L^{-1}$)	T (K)	Method	Comment	Ref.
7.48	**Porphine, (acetato)-5,10,15,20-tetraphenyl-, manganese(III)**						
	CCl_4	2.5×10^8			MP/LI-12	S = TPP; used $k_d = 36\ s^{-1}$.	80E548
7.49	**Porphine, (chloro)-5,10,15,20-tetraphenyl-, iron(III)**						
	CCl_4	1×10^9			MP/LI-12	S = TPP; used $k_d = 36\ s^{-1}$.	80E548
7.50	**Porphine, 2,3-dihydro-5,10,15,20-tetraphenyl- (Tetraphenylchlorin)**						
	CCl_4	1.2×10^2 (k_r)			CP/Ac,A'c-14,27	S = TPP, TPBC or MP; A' = Tetr; k_r derived using $k_A = 2 \times 10^6\ L\ mol^{-1}\ s^{-1}$, $f_r^{A'} = 1$.	82A421
	CCl_4	2×10^6			MP/LI-12	S = TPP; used $k_d = 36\ s^{-1}$.	79F824
7.51	**Porphine, 2,3-dihydro-5,10,15,20-tetraphenyl-, cadmium(II)**						
	CCl_4	7×10^9			MP/LI-12	S = TPP; used $k_d = 36\ s^{-1}$.	79F824
7.52	**Porphine, 2,3-dihydro-5,10,15,20-tetraphenyl-, copper(II)**						
	CCl_4	2×10^7			MP/LI-12	S = TPP; used $k_d = 36\ s^{-1}$.	79F824
7.53	**Porphine, 2,3-dihydro-5,10,15,20-tetraphenyl-, zinc(II)**						
	C_5H_5N	6×10^8 $<1 \times 10^5$ (k_r)			CP/A'c-16,17	S = TPBC; A' = Tetr; used $k_d = 6.3 \times 10^4\ s^{-1}$. $k_{A'} = 7 \times 10^6\ L\ mol^{-1}\ s^{-1}$.	86F610
	C_6H_6	6×10^9 2.5×10^7 (k_r)			CP/A'c-16,17	S = TPBC; A' = Tetr; used $k_d = 3.3 \times 10^4\ s^{-1}$, $k_{A'} = 7 \times 10^6\ L\ mol^{-1}\ s^{-1}$.	86F610
	CCl_4	4×10^9 2×10^8 (k_r)			CP/A'c-16,17	S = TPBC; A' = Tetr; used $k_d = 36\ s^{-1}$, $k_{A'} = 7 \times 10^6\ L\ mol^{-1}\ s^{-1}$.	86F610
	CCl_4	2×10^8 (k_r)			CP/Ac,A'c-14,27	S = TPP, TPBC or MP; A' = Tetr; k_r derived using $k_A = 4.0 \times 10^9\ L\ mol^{-1}\ s^{-1}$, $f_r^{A'} = 1$.	82A421
	CCl_4	2×10^8 (k_r)			CP/Ac,A'c-14,27	S = PP, Ph a or BChl a; A' = Tetr; used $k_d = 36\ s^{-1}$, $k_{A'} = 5 \times 10^6\ L\ mol^{-1}\ s^{-1}$; k_r derived using $k_A = 4.0 \times 10^9\ L\ mol^{-1}\ s^{-1}$, $f_r^{A'} = 1$.	79A010
	CCl_4	4×10^9			CP/LI-12	S = PP, TPP, Ph a or BChl a; used $k_d = 36\ s^{-1}$.	78E892 79A010
	CH_3COCH_3	1×10^9 8×10^5 (k_r)			CP/A'c-16,17	S = TPBC; A' = Tetr; used $k_d = 2.0 \times 10^4\ s^{-1}$, $k_{A'} = 7 \times 10^6\ L\ mol^{-1}\ s^{-1}$.	86F610
7.54	**Porphine, 7,8,17,18-tetrahydro-5,10,15,20-tetraphenyl-, (*E*) (Tetraphenylbacteriochlorin-*trans*, TPBC)**						
	CCl_4	1×10^8			MP/LI-12	S = PP, TPP, Ph a or BChl a; used $k_d = 36\ s^{-1}$; also see [78E892, 79A010].	78E881
	CCl_4	1.5×10^5 (k_r)			CP/Ac,A'c-14,27	S = TPP, TPBC or MP; A' = Tetr; k_r derived using $k_A = 1 \times 10^8\ L\ mol^{-1}\ s^{-1}$, $f_r^{A'} = 1$.	82A421
	CCl_4	2×10^5 (k_r)			CP/Ac,A'c-14,27	S = PP, Ph a or BChl a; A' = Tetr; k_r derived using $k_A = 1 \times 10^8\ L\ mol^{-1}\ s^{-1}$, $f_r^{A'} = 1$.	78E892 79A010
7.55	**Porphine, 5,10,15,20-tetrakis(4-iodophenyl)-, copper(II)**						
	CCl_4	2×10^7			MP/LI-12	S = TPP; used $k_d = 36\ s^{-1}$.	79F824
7.56	**Porphine, 5,10,15,20-tetrakis(4-methoxyphenyl)-, copper(II)**						
	CCl_4	2×10^7			MP/LI-12	S = TPP; used $k_d = 36\ s^{-1}$.	79F824
7.57	**Porphine, 5,10,15,20-tetrakis(4-sulfonatophenyl)- (H_2TPPS^{4-})**						
	D_2O pH = 7	$<10^8$			PL/Ld-2	S = A; No measurable effect; soln. contg. $2 \times 10^{-3}\ mol\ L^{-1}$ phosphate buffer and 1% NaCl wt/wt.	90A022
7.58	**Porphine, 5,10,15,20-tetrakis(4-sulfonatophenyl)-, dichlorotin(IV)**						
	D_2O pH = 7	$<10^8$			PL/Ld-2	S = A; No measurable effect; soln. contg. $2 \times 10^{-3}\ mol\ L^{-1}$ phosphate buffer and 1% NaCl wt/wt.	90A022

TABLE 7. Rate constants for the interaction of singlet oxygen with porphyrins, phthalocyanines and polypyrroles. — Continued

No.	Solvent	k ($L\ mol^{-1}\ s^{-1}$)	β (k_d/k) ($mol\ L^{-1}$)	T (K)	Method	Comment	Ref.
7.59	**Porphine, 5,10,15,20-tetraphenyl- (TPP)**						
	C_6D_6	6×10^7			PL/Ld-2	S = MPDME.	83E235
	C_6H_6	4.4×10^7			CP/Oc-18	S = A; A′ = 2M2P; used $k_d = 4 \times 10^4\ s^{-1}$, $\beta_{A'} = 0.049\ mol\ L^{-1}$.	88R136
	CCl_4	9×10^6		286	CP/Oc-29	S = A; A′ = 2,3-Dihydrofuran; used $k_{A'} = 1.5 \times 10^6\ L\ mol^{-1}\ s^{-1}$; meas. $k_A/k_{A'} = 6.0$.	91F163
	CCl_4	2.9×10^7		286	CP/Oc-29	S = A; A′ = TME; used $k_d = 1.4 \times 10^3\ s^{-1}$, $\beta_{A'} = 1.0 \times 10^{-4}\ mol\ L^{-1}$.	84F065
	CCl_4	2.2×10^7		286	CP/Oc-29	S = A; A′ = DMHD; meas. $k_A/k_r^{A'} = 220$, used $k_r^{A'} = 1.0 \times 10^5\ L\ mol^{-1}\ s^{-1}$.	84F335
	CCl_4	30 (k_r)			CP/Ac,A′c-14,27	S = TPP, TPBC or MP; A′ = Tetr; k_r derived using $k_A = 9 \times 10^5\ L\ mol^{-1}\ s^{-1}$, $f_r^{A'} = 1$.	82A421
	CCl_4	10^6			MP/LI-12	S = PP, TPP, Ph a or BChl a; used $k_d = 36\ s^{-1}$; also see [78E892, 79A010].	78E881
	CCl_4	3×10^2 (k_r)			CP/Ac,A′c-14,27	S = A; A′ = Tetr; used $k_d = 36\ s^{-1}$; k_r derived using $k_A = 1 \times 10^6\ L\ mol^{-1}\ s^{-1}$, $f_r^{A'} = 1$.	78E892 79A010
	CH_2Cl_2	1.4×10^7		286	CP/Oc-29	S = A; A′ = 2,3-Dihydrofuran; used $k_{A'} = 3.2 \times 10^6\ L\ mol^{-1}\ s^{-1}$; meas. $k_A/k_{A'} = 4.5$.	91F163
	CH_2Cl_2	1.7×10^7		286	CP/Oc-29	S = A; A′ = TME; used $k_d = 9.5 \times 10^3\ s^{-1}$, $\beta_{A'} = 4.0 \times 10^{-4}\ mol\ L^{-1}$.	84F065
	CH_2Cl_2	2.4×10^7		286	CP/Oc-29	S = A; A′ = DMHD; meas. $k_A/k_{A'} = 8$; meas. $k_A/k_r^{A'} = 28$, used $k_r^{A'} = 8.6 \times 10^5\ L\ mol^{-1}\ s^{-1}$.	84F335
	$CHCl_3$	2.1×10^7		286	CP/Oc-29	S = A; A′ = 2,3-Dihydrofuran; used $k_{A'} = 1.0 \times 10^6\ L\ mol^{-1}\ s^{-1}$; meas. $k_A/k_{A'} = 20$.	91F163
	$CHCl_3$	3.0×10^7		286	CP/Oc-29	S = A; A′ = TME; used $k_d = 1.7 \times 10^4\ s^{-1}$, $\beta_{A'} = 3.6 \times 10^{-4}\ mol\ L^{-1}$.	84F065
	$CHCl_3$	1.9×10^7		286	CP/Oc-29	S = A; A′ = DMHD; meas. $k_A/k_r^{A'} = 40$, used $k_r^{A'} = 4.5 \times 10^5\ L\ mol^{-1}\ s^{-1}$.	84F335
7.60	**Porphine, 5,10,15,20-tetraphenyl-, cadmium(II)**						
	CCl_4	3×10^6 (k_r)			CP/Ac,A′c-14,27	S = TPP, TPBC or MP; A′ = Tetr; k_r derived using $k_A = 6.0 \times 10^8\ L\ mol^{-1}\ s^{-1}$, $f_r^{A'} = 1$.	82A421
	CCl_4	6×10^8			MP/LI-12	S = TPP; used $k_d = 36\ s^{-1}$.	79F824
7.61	**Porphine, 5,10,15,20-tetraphenyl-, chloroaluminum(III)**						
	CCl_4	1×10^7			MP/LI-12	S = TPP; used $k_d = 36\ s^{-1}$.	80E548
7.62	**Porphine, 5,10,15,20-tetraphenyl-, cobalt(II)**						
	CCl_4	$<10^4$ (k_r)			CP/Ac,A′c-14,27	S = TPP, TPBC or MP; A′ = Tetr; k_r derived using $k_A = 2.0 \times 10^9\ L\ mol^{-1}\ s^{-1}$, $f_r^{A'} = 1$.	82A421
	CCl_4	2×10^9			MP/LI-12	S = PP, Ph a or BChl a; used $k_d = 36\ s^{-1}$.	79A010
	CCl_4	2×10^9			MP/LI-12	S = TPP; used $k_d = 36\ s^{-1}$.	78E892
	CH_3COCH_3/H_2O (95:5)	3×10^8			PL/Ld-2	S = PdMP.	82A412
7.63	**Porphine, 5,10,15,20-tetraphenyl-, copper(II)**						
	CCl_4	<40 (k_r)			CP/Ac,A′c-14,27	S = TPP, TPBC or MP; A′ = Tetr; k_r derived using $k_A = 4 \times 10^6\ L\ mol^{-1}\ s^{-1}$, $f_r^{A'} = 1$.	82A421
	CCl_4	5×10^6			MP/LI-12	S = PP, TPP, Ph a or BChl a; used $k_d = 36\ s^{-1}$.	78E892 79A010
7.64	**Porphine, 5,10,15,20-tetraphenyl-, dichlorotin(IV)**						
	CCl_4	2×10^6			MP/LI-12	S = TPP; used $k_d = 36\ s^{-1}$.	80E548

TABLE 7. Rate constants for the interaction of singlet oxygen with porphyrins, phthalocyanines and polypyrroles. — Continued

No.	Solvent	k ($L\ mol^{-1}\ s^{-1}$)	β (k_d/k) ($mol\ L^{-1}$)	T (K)	Method	Comment	Ref.
7.65	**Porphine, 5,10,15,20-tetraphenyl-, magnesium(II)**						
	C_6H_6	5.0×10^8			CP/Oc-18	S = A; A′ = 2M2P; used $k_d = 4 \times 10^4\ s^{-1}$, $\beta_{A'} = 0.049\ mol\ L^{-1}$.	88R136
	C_6H_6	1.2×10^9			MP/Ac-33	S = A; used $k_d = 4.2 \times 10^4\ s^{-1}$, $k_{A'} = 1.7 \times 10^8\ L\ mol^{-1}\ s^{-1}$; A′ = α-Tocopherol.	80F020
	CCl_4	6×10^6 (k_r)			CP/Ac,A′c-14,27	S = TPP, TPBC or MP; A′ = Tetr; k_r derived using $k_A = 8.0 \times 10^8\ L\ mol^{-1}\ s^{-1}$, $f_r^{A'} = 1$.	82A421
	CCl_4	8×10^8			MP/LI-12	S = TPP; used $k_d = 36\ s^{-1}$.	79F824
	CH_2Cl_2	1×10^8			MP/Ac-14	S = A; used $k_d = 9.5 \times 10^3\ s^{-1}$.	80F020
	CH_2Cl_2	2.3×10^9			MP/Ac-33	S = A; Q = Car; used $k_d = 9.5 \times 10^3\ s^{-1}$, $k_Q = 8.5 \times 10^9\ L\ mol^{-1}\ s^{-1}$.	80F020
	CH_2Cl_2	4×10^7 (k_r)			MP/Ac-17	S = A; A′ = TME; used $k_r^{A'} = 4.8 \times 10^7\ L\ mol^{-1}\ s^{-1}$; meas. $k_r/k_r^{A'} = 0.8$.	80F020
7.66	**Porphine, 5,10,15,20-tetraphenyl-, manganese(III)**						
	CCl_4	2.5×10^9			PL/Ld-2	S = PdMP.	82A412
7.67	**Porphine, 5,10,15,20-tetraphenyl-, nickel(II)**						
	CCl_4	$<10^4$ (k_r)			CP/Ac,A′c-14,27	S = TPP, TPBC or MP; A′ = Tetr; k_r derived using $k_A = 1.5 \times 10^9\ L\ mol^{-1}\ s^{-1}$, $f_r^{A'} = 1$.	82A421
	CCl_4	2×10^9			MP/LI-12	S = PP, TPP, Ph a or BChl a; used $k_d = 36\ s^{-1}$.	78E892 79A010
7.68	**Porphine, 5,10,15,20-tetraphenyl-, zinc(II)**						
	C_6H_6	1.5×10^8			CP/Oc-18	S = A; A′ = 2M2P; used $k_d = 4 \times 10^4\ s^{-1}$, $\beta_{A'} = 0.049\ mol\ L^{-1}$.	88R136
	CCl_4	8×10^3 (k_r)			CP/Ac,A′c-14,27	S = TPP, TPBC or MP; A′ = Tetr; k_r derived using $k_A = 4 \times 10^7\ L\ mol^{-1}\ s^{-1}$, $f_r^{A'} = 1$.	82A421
	CCl_4	4×10^7			MP/LI-12	S = PP, TPP, Ph a or BChl a; used $k_d = 36\ s^{-1}$; see also [78E892, 79A010].	78E881
	CCl_4	1×10^4 (k_r)			CP/Ac,A′c-14,27	S = PP, Ph a or BChl a; A′ = Tetr; used $k_d = 36\ s^{-1}$; k_r derived using $k_A = 4 \times 10^7\ L\ mol^{-1}\ s^{-1}$, $f_r^{A'} = 1$.	79A010
7.69	**Porphine, 5,10,15,20-tetraphenyl[μ-oxobis-, iron(II)**						
	CCl_4	4×10^7			MP/LI-12	S = TPP; used $k_d = 36\ s^{-1}$.	80E548
7.70	**Porphine, 5,10,15,20-tetraphenyl(thiocyanato-*S*)-, iron(III)**						
	CCl_4	1×10^9			MP/LI-12	S = TPP; used $k_d = 36\ s^{-1}$.	80E548
7.71	**Porphine, zinc(II)**						
	CCl_4	3×10^7			MP/LI-12	S = TPP; used $k_d = 36\ s^{-1}$.	79F824
7.72	**Porphine-2,18-dipropanoic acid, 7,12-bis(1-hydroxyethyl)-3,8,13,17-tetramethyl- (Hematoporphyrin)**						
	MeOH	7.7×10^8			CP/Oc-16	S = A; A′ = FFA; used $k_d = 9.6 \times 10^4\ s^{-1}$.	88R142
	MeOH/ H_2O (90:10)	8.0×10^8			CP/Oc-16	S = A; A′ = FFA; used $k_d = 1.7 \times 10^5\ s^{-1}$.	88R142
7.73	**Porphine-2,18-dipropanoic acid, 7,12-diethenyl-3,8,13,17-tetramethyl- (Protoporphyrin, PP)**						
	DMAA	1.1×10^7			PL/Ld-2	S = A.	92E274
7.74	**Porphine-2,18-dipropanoic acid, 7,12-diethenyl-3,8,13,17-tetramethyl-, acetatoferrate(III), dimethyl ester [FeMPDME(OAc)]**						
	C_5H_5N	1×10^9			CP/LI-12	S = TPP; used $k_d = 3.3 \times 10^4\ s^{-1}$.	80E548
	CCl_4	1×10^9			MP/LI-12	S = TPP; used $k_d = 36\ s^{-1}$.	80E548
7.75	**Porphine-2,18-dipropanoic acid, 7,12-diethenyl-3,8,13,17-tetramethyl-, cadmium(II) (CdPP)**						
	CCl_4	4×10^8			MP/LI-12	S = TPP; used $k_d = 36\ s^{-1}$.	79F824

TABLE 7. Rate constants for the interaction of singlet oxygen with porphyrins, phthalocyanines and polypyrroles. — Continued

No.	Solvent	k ($L\ mol^{-1}\ s^{-1}$)	β (k_d/k) ($mol\ L^{-1}$)	T (K)	Method	Comment	Ref.
7.76	**Porphine-2,18-dipropanoic acid, 7,12-diethenyl-3,8,13,17-tetramethyl-, cobalt(II) (CoPP)**						
	CCl_4	3.0×10^9			PL/Ld-2	S = PdMP.	82A412
	CCl_4	3×10^9			MP/LI-12	S = TPP; used $k_d = 36\ s^{-1}$.	78E892
7.77	**Porphine-2,18-dipropanoic acid, 7,12-diethenyl-3,8,13,17-tetramethyl-, copper(II) (CuPP)**						
	CCl_4	5×10^6			MP/LI-12	S = TPP; used $k_d = 36\ s^{-1}$.	79F824
7.78	**Porphine-2,18-dipropanoic acid, 7,12-diethenyl-3,8,13,17-tetramethyl-, dimethyl ester (PPDME)**						
	C_6H_5Cl	1.0×10^9			PL/Ld-2	S = TPP.	88A507
	C_6H_6	9.1×10^7			CP/Oc-18	S = A; A′ = 2M2P; used $k_d = 4 \times 10^4\ s^{-1}$, $\beta_{A'} = 0.049\ mol\ L^{-1}$.	88R136
	CCl_4	5×10^3 (k_r)			CP/Ac,A′c-14,27	S = TPP, TPBC or MP; A′ = Tetr; k_r derived using $k_A = 5 \times 10^5\ L\ mol^{-1}\ s^{-1}$, $f_r^{A'} = 1$.	82A421
	CCl_4	5×10^5			MP/LI-12	S = TPP; used $k_d = 36\ s^{-1}$.	79F824
	CH_2Cl_2	3.0×10^6			PL/Ld-2	S = A.	92E274
	CH_2Cl_2	8.6×10^5			MP/Pa-25	S = A; A′ = Cholesterol; used $k_d = 1.4 \times 10^4\ s^{-1}$, $k_{A'} = 6.7 \times 10^4\ L\ mol^{-1}\ s^{-1}$; P = Dimethyl 7-(formylmethylene)-7,8-dihydro-8-hydroxy-3,8,13,17 tetramethyl-12-vinyl-2,18-porphinedipropionate; and Dimethyl 7-ethenyl-13-hydroxy-3,8,13,17-tetramethyl-12-(oxoethylidene)porphine-2,18-dipropionate.	82F018
	CH_2Cl_2	8.3×10^5			MP/Pa-25	S = A; A′ = DABCO; used $k_d = 1.4 \times 10^4\ s^{-1}$, $k_{A'} = 3.3 \times 10^7\ L\ mol^{-1}\ s^{-1}$; see above.	82F018
	CH_3CN	1.5×10^7 (k_r)			CP/Ac,A′c-17	S = MB; A′ = DPBF; used $k_r^{A'} = 1.1 \times 10^9\ L\ mol^{-1}\ s^{-1}$.	88A507
	CH_3CN	4.7×10^8			PL/Ld-2	S = TPP.	88A507
	$CH_3CO_2C_2H_5$	6.7×10^6			PL/Ld-2	S = A.	92E274
	CH_3COCH_3	6.3×10^6			PL/Ld-2	S = A.	92E274
	$CHCl_3$	3.9×10^6			PL/Ld-2	S = A.	92E274
	DMAA	1.2×10^7			PL/Ld-2	S = A.	92E274
	DMF	1.2×10^7			PL/Ld-2	S = A.	92E274
	2-PrOH	3.9×10^8			PL/Ld-2	S = TPP.	88A507
7.79	**Porphine-2,18-dipropanoic acid, 7,12-diethenyl-3,8,13,17-tetramethyl-, dimethyl ester, nickel(II) (NiPPDME)**						
	CCl_4	2×10^9			MP/LI-12	S = TPP; used $k_d = 36\ s^{-1}$.	78E892
7.80	**Porphine-2,18-dipropanoic acid, 7,12-diethenyl-3,8,13,17-tetramethyl-, nickel(II) (NiPP)**						
	CCl_4	2.0×10^9			PL/Ld-2	S = PdMP.	82A412
	CCl_4	10^9			MP/LI-12	S = TPP; used $k_d = 36\ s^{-1}$.	79F824
7.81	**Porphine-2,18-dipropanoic acid, 7,12-diethenyl-3,8,13,17-tetramethyl-, zinc(II) (ZnPP)**						
	CCl_4	2×10^3 (k_r)			CP/Ac,A′c-14,27	S = TPP, TPBC or MP; A′ = Tetr; k_r derived using $k_A = 2 \times 10^7\ L\ mol^{-1}\ s^{-1}$, $f_r^{A'} = 1$.	82A421
	CCl_4	2×10^7			MP/LI-12	S = TPP; used $k_d = 36\ s^{-1}$.	79F824
7.82	**Porphine-2,18-dipropanoic acid, 7,12-diethyl-3,8,13,17-tetramethyl-, cobalt(II) (CoMP)**						
	CCl_4	3.0×10^9			PL/Ld-2	S = PdMP.	82A412
	CH_3COCH_3/ H_2O (95:5)	1.5×10^9			PL/Ld-2	S = PdMP.	82A412
	$CHCl_3$	3.0×10^9			PL/Ld-2	S = MPDEE or PdMPDEE.	81E472
	$CHCl_3$	2×10^9			PL/Ld-2	S = PdMP.	82A412

TABLE 7. Rate constants for the interaction of singlet oxygen with porphyrins, phthalocyanines and polypyrroles. — Continued

No.	Solvent	k ($L\ mol^{-1}\ s^{-1}$)	β (k_d/k) ($mol\ L^{-1}$)	T (K)	Method	Comment	Ref.
7.83	**Porphine-2,18-dipropanoic acid, 7,12-diethyl-3,8,13,17-tetramethyl-, di[4-(diphenylmethylaminocarbonyl-2-nitrophenylmethyl] ester (MP-Nbb-NO_2)**						
	CH_2Cl_2	2.0×10^7			PL/Ld-2	S = Zn(pc)(py)$_2$.	91E134
	CH_2Cl_2	1.9×10^7			PL/Ld-2	S = A.	91E134
7.84	**Porphine-2,18-dipropanoic acid, 7,12-diethyl-3,8,13,17-tetramethyl-, diethyl ester, manganese(III) (MnMPDEE)**						
	CH_3COCH_3/ H_2O (95:5)	1.5×10^9			PL/Ld-2	S = PdMP.	82A412
7.85	**Porphine-2,18-dipropanoic acid, 7,12-diethyl-3,8,13,17-tetramethyl-, dimethyl ester (MPDME)**						
	CCl_4	4×10^2 (k_r)			CP/Ac,A'c-14,27	S = TPP, TPBC or MP; A' = Tetr; k_r derived using $k_A = 2 \times 10^6\ L\ mol^{-1}\ s^{-1}$, $f_r^{A'} = 1$.	82A421
	CCl_4	3×10^6			MP/LI-12	S = PP, Ph a or BChl a; used $k_d = 36\ s^{-1}$.	79A010
	CCl_4	2×10^6			MP/LI-12	S = TPP; used $k_d = 36\ s^{-1}$.	78E892
	CD_3CN	2.2×10^7			PL/Ld-2	S = A.	83E235
	CD_3COCD_3	1×10^7			PL/Ld-2	S = A.	83E235
	CH_2Cl_2	1.4×10^7			PL/Ld-2	S = Zn(pc)(py)$_2$.	91E134
	CH_3CN	2.5×10^7			PL/Ld-2	S = A.	83E235
	CH_3COCH_3	4×10^7			PL/Ld-2	S = A.	83E235
	$DCON(CD_3)_2$	1.0×10^7			PL/Ld-2	S = A.	92E274
	DMAA-d_9	1.4×10^7			PL/Ld-2	S = A.	92E274
7.86	**Porphine-2,18-dipropanoic acid, 7,12-diethyl-3,8,13,17-tetramethyl-, dimethyl ester, cobalt(II) (CoMPDME)**						
	CCl_4	3.0×10^9		295	PL/Ld-2	S = PdMPDME or MPDME; decay at 1588 nm; decay at 1272 nm gave 3.5×10^9.	80E558
7.87	**Porphine-2,18-dipropanoic acid, 7,12-diethyl-3,8,13,17-tetramethyl-, nickel(II) (NiMP)**						
	CCl_4	2.0×10^9			PL/Ld-2	S = PdMP.	82A412
	CCl_4	2×10^9			MP/LI-12	S = TPP; used $k_d = 36\ s^{-1}$.	78E892
	CH_3COCH_3/ H_2O (95:5)	1.0×10^9			PL/Ld-2	S = PdMP.	82A412
7.88	**Porphine-2,18-dipropanoic acid, 7-[2-(dimethylamino)-2-oxoethyl]-8-ethyl-7,8-dihydro-3,7,12,17-tetramethyl, dimethyl ester, (Z) (CHLII)**						
	$CHCl_3$	2×10^7			CL/LI-12	S = A; used $k_d = 4.8 \times 10^3\ s^{-1}$.	90R006
7.89	**Porphine-2,18-dipropanoic acid, 7-[2-(dimethylamino)-2-oxoethyl]-8-ethylidene-7,8-dihydro-3,7,12,17-tetramethyl, dimethyl ester (CHLI)**						
	$CDCl_3$	2.7×10^8			CL/LI-12	S = A; used $k_d = 1.1 \times 10^2\ s^{-1}$.	90R006
	$CHCl_3$	3.2×10^8			CL/LI-12	S = A; used $k_d = 4.8 \times 10^3\ s^{-1}$.	90R006
7.90	**Porphine-2,18-dipropanoic acid, 8-ethenyl-13-ethyl-3,7,12,17-tetramethyl- (EVD)**						
	DMAA	2.3×10^7			PL/Ld-2	S = A.	92E274
	DMAA-d_9	2.2×10^7			PL/Ld-2	S = A.	92E274
7.91	**Porphine-2,18-dipropanoic acid, 8-ethenyl-13-ethyl-3,7,12,17-tetramethyl-, dimethyl ester (EVDDME)**						
	DMAA	2.2×10^7			PL/Ld-2	S = A.	92E274
7.92	**Porphine-2,18-dipropanoic acid, 7-ethenyl-12-(1-hydroxyethyl)-3,8,13,17-tetramethyl- (HVD)**						
	$CH_3CO_2C_2H_5$	9.7×10^6			PL/Ld-2	S = A.	92E274
	CH_3COCH_3	9.2×10^6			PL/Ld-2	S = A.	92E274
	DMAA	1.4×10^7			PL/Ld-2	S = A.	92E274
	DMAA-d_9	1.4×10^7			PL/Ld-2	S = A.	92E274
	DMF	1.3×10^7			PL/Ld-2	S = A.	92E274
7.93	**Porphine-2,18-dipropanoic acid, 7-ethenyl-3,8,13,17-tetramethyl- (VD)**						
	DMAA	1.7×10^7			PL/Ld-2	S = A.	92E274

TABLE 7. Rate constants for the interaction of singlet oxygen with porphyrins, phthalocyanines and polypyrroles. — Continued

No.	Solvent	k ($L\ mol^{-1}\ s^{-1}$)	β (k_d/k) ($mol\ L^{-1}$)	T (K)	Method	Comment	Ref.
7.94	**Porphine-2,18-dipropanoic acid, 3,7,12,17-tetramethyl-, dimethyl ester (DPDME)**						
	CD_3COCD_3	6.9×10^6			PL/Ld-2	S = A.	92E274
	$CDCl_3$	1.7×10^7			PL/Ld-2	S = A.	92E274
	DMAA-d_9	1.1×10^7			PL/Ld-2	S = A.	92E274
7.95	**Porphine-2,18-dipropanoic acid, 3,7,12,17-tetramethyl-, nickel(II) (NiDP)**						
	CCl_4	2.0×10^9			PL/Ld-2	S = MP.	82A412
7.96	**Porphine-2,18-dipropanoic acid, 3,7,12,17-tetramethyl-, nickel(II), bis(piperidine)**						
	CCl_4/ *c*-$C_5H_{10}NH$ (80:20)	2.0×10^8			PL/Ld-2	S = MP.	82A412
7.97	**5-Porphinepropenoic acid, octaethyl-, ethyl ester (NTW)**						
	MeOH	4.6×10^8			PL/Ld-2	S = A.	90E491
7.98	**[22]Porphyrin-(2.2.2.2), octaethyl-, (di-*trans*)**						
	C_6H_6	8×10^9			PL/Ld-2	S = A; reversible energy transfer, $k_{reverse} = 1.9 \times 10^9\ L\ mol^{-1}\ s^{-1}$.	92E555
7.99	**[26] Porphyrin**						
	$CHCl_3$	4.2×10^8			CL/LI-12	S = A; used $k_d = 4.8 \times 10^3\ s^{-1}$.	90E530
7.100	**[26]Porphyrin-(2.4.2.4), 2,3,10,11,16,17,24,25-octaethyl-5,6,7,8,19,20,21,22-octadehydro-**						
	C_6H_6	1.2×10^{10}			PL/Ld-2	S = ZnTPP.	92E555
7.101	**Pyrrol-2-one, 3,4-diethyl-1,5-dihydro-5-[(5-methylpyrrol-2-yl)methylene]-**						
	$CHCl_3$	1.5×10^9 8.0×10^8 (k_r)			CP/Ac-15	S = RBCE; used $k_d = 1.7 \times 10^4\ s^{-1}$; k_r derived using $\phi_{isc}(S) = 0.36$.	79F104
	MeOH	8×10^8 2.1×10^8 (k_r)			CP/Ac-15	S = RB; used $k_d = 1.4 \times 10^5\ s^{-1}$; k_r derived using $\phi_{isc}(S) = 0.76$.	79F104
7.102	**Pyrrol-2-one, 3,4-diethyl-5-[(4-ethyl-3,5-dimethylpyrrol-2-yl)methylene]-1,5-dihydro-**						
	$CHCl_3$	4.2×10^9 3.2×10^9 (k_r)			CP/Ac-15	S = RBCE; used $k_d = 1.7 \times 10^4\ s^{-1}$; k_r derived using $\phi_{isc}(S) = 0.36$.	78F701 79F104
	$ClCF_2CCl_2F$	7.5×10^8 (k_r)	293		CL/Ad-36	high pressure O_2; used $k_{O2} = 2.5 \times 10^3\ L\ mol^{-1}\ s^{-1}$.	79A113
	$ClCF_2CCl_2F$	6.6×10^8	293		PL/Ad-5	high pressure O_2.	79A113
	MeOH	2.7×10^9 1.4×10^9 (k_r)			CP/Ac-15	S = RB; used $k_d = 1.4 \times 10^5\ s^{-1}$; k derived using $\phi_{isc}(S) = 0.76$.	78F701 79F104
7.103	**Pyrrol-2-one, 5-[(3,5-dimethylpyrrol-2-yl)methylene]-4-ethyl-1,5-dihydro-3-methyl-**						
	$CHCl_3$	2.4×10^9 1.6×10^9 (k_r)			CP/Ac-15	S = RBCE; used $k_d = 1.7 \times 10^4\ s^{-1}$; k_r derived using $\phi_{isc}(S) = 0.36$.	79F104
	MeOH	1.1×10^9 6×10^8 (k_r)			CP/Ac-15	S = RB; used $k_d = 1.4 \times 10^5\ s^{-1}$; k_r derived using $\phi_{isc}(S) = 0.76$.	79F104
7.104	**Pyrrol-2-one, 5-[(4,5-dimethylpyrrol-2-yl)methylene]-4-ethyl-1,5-dihydro-3-methyl-**						
	$CHCl_3$	2.5×10^9 1.7×10^9 (k_r)			CP/Ac-15	S = RBCE; used $k_d = 1.7 \times 10^4\ s^{-1}$; k_r derived using $\phi_{isc}(S) = 0.36$.	79F104
	MeOH	2.3×10^9 9×10^8 (k_r)			CP/Ac-15	S = RB; used $k_d = 1.4 \times 10^5\ s^{-1}$; k_r derived using $\phi_{isc}(S) = 0.76$.	79F104
7.105	**Pyrrol-2-one, 3-ethenyl-5-[(4-ethyl-3,5-dimethylpyrrol-2-yl)methylene]-1,5-dihydro-4-methyl-**						
	$CHCl_3$	2.2×10^9 1.9×10^9 (k_r)			CP/Ac-15	S = RBCE; k_r derived using $\phi_{isc}(S) = 0.36$.	79F104
	MeOH	3.1×10^9 1.2×10^9 (k_r)			CP/Ac-15	S = RB; used $k_d = 1.4 \times 10^5\ s^{-1}$.	79F104

TABLE 7. Rate constants for the interaction of singlet oxygen with porphyrins, phthalocyanines and polypyrroles. — Continued

No.	Solvent	k ($L\ mol^{-1}\ s^{-1}$)	β (k_d/k) ($mol\ L^{-1}$)	T (K)	Method	Comment	Ref.
7.106	**Pyrrol-2-one, 4-ethenyl-5-[(4-ethyl-3,5-dimethylpyrrol-2-yl)methylene]-1,5-dihydro-3-methyl-**						
	$ClCF_2CCl_2F$	6.7×10^8 (k_r)		293	CL/Ad-36	high pressure O_2; used $k_{O2} = 2.5 \times 10^3\ L\ mol^{-1}\ s^{-1}$.	79A113
	$ClCF_2CCl_2F$	1×10^9		293	PL/Ad-5	high pressure O_2.	79A113
7.107	**Pyrrol-2-one, 4-ethyl-1,5-dihydro-3-methyl-5-[(5-methylpyrrol-2-yl)methylene]-**						
	$ClCF_2CCl_2F$	3.4×10^8 (k_r)		293	CL/Ad-36	high pressure O_2; used $k_{O2} = 2.5 \times 10^3\ L\ mol^{-1}\ s^{-1}$.	79A113
7.108	**Pyrrol-2-one, 5-[(4-ethyl-3,5-dimethylpyrrol-2-yl)methylene]-1,5-dihydro-**						
	$CHCl_3$	4.4×10^9 3.0×10^9 (k_r)			CP/Ac-15	S = RBCE; used $k_d = 1.7 \times 10^4\ s^{-1}$; k_r derived using $\phi_{isc}(S) = 0.36$.	79F104
	$ClCF_2CCl_2F$	7×10^8		293	PL/Ad-5	high pressure O_2.	79A113
	$ClCF_2CCl_2F$	7×10^8 (k_r)		293	CL/Ad-36	high pressure O_2; used $k_{O2} = 2.5 \times 10^3\ L\ mol^{-1}\ s^{-1}$.	79A113
	MeOH	2×10^8 1×10^8 (k_r)			CP/Ac-15	S = RB; used $k_d = 1.4 \times 10^5\ s^{-1}$; k_r derived using $\phi_{isc}(S) = 0.76$.	79F104

TABLE 8. Rate constants for the interaction of singlet oxygen with aliphatic and alicyclic amines.

No.	Solvent	k ($L\ mol^{-1}\ s^{-1}$)	β (k_d/k) ($mol\ L^{-1}$)	T (K)	Method	Comment	Ref.
8.1	**8-Azabicyclo[3.2.1]octan-3-ol, 8-methyl-, α-(hydroxymethyl)benzeneacetate (Atropine)**						
	$CHCl_3$	4.3×10^7	2.3×10^{-4}		CP/A'c-16	S = A' = Rub; used $k_d = 1 \times 10^4\ s^{-1}$.	84F670
8.2	**Benzeneethanol, β-phenyl-α-pyrrolidinyl-**						
	C_6H_6	1.4×10^5			CP/Pa-16	S = RB; A' = DPBF; used $k_d = 4 \times 10^4\ s^{-1}$; P = Benzaldehyde.	89F238
	CD_3OD	6.5×10^6			PL/Ld-2	Unpublished data, E. Oliveros, M.T. Maurette and A. Braun.	89F238
8.3	**[1]Benzopyrano[6,7,8-*ij*]quinolizin-11-one, 2,3,6,7-tetrahydro-**						
	C_6H_6	8×10^6			CP/A'c-33	S = A' = Rub; used $k_d = 3.7 \times 10^4\ s^{-1}$; $k_{A'}$ not given.	87F569
8.4	**[1]Benzopyrano[6,7,8-*ij*]quinolizin-11-one, 2,3,6,7-tetrahydro-9-methyl-**						
	C_6H_6	8×10^6			CP/A'c-33	S = A' = Rub; used $k_d = 3.7 \times 10^4\ s^{-1}$; $k_{A'}$ not given.	87F569
8.5	**Benzenemethanamine (Benzylamine)**						
	CH_3CN	1.7×10^6			PL/Ld-2	S = RB.	89E324
	EtOH	$<1 \times 10^9$		273	CP/Oc-23	S = MB; A' = 2,5-DMF; No measurable effect.	72F518
	MeOH	2.6×10^5	0.34		CP/A'c-16	S = RB; A' = DPBF; used $k_d = 9.0 \times 10^4\ s^{-1}$.	736061
	2-PrOH	9.6×10^4			PL/Ld-2	S = RB.	89E324
8.6	**Benzenemethanamine, *N,N*-di(phenylmethyl)- (Tribenzylamine)**						
	MeOH/ C_6H_6 (67:33)		1.4×10^{-5} (β_r)	298	CR/A'c-17	A' = Rub; used $\beta_r^{A'} = 1.4 \times 10^{-3}$ mol L^{-1}; $^1O_2$* from $(PhO)_3PO_3$.	80M378
8.7	**1,1'-Bipiperidine**						
	C_6H_6	1.7×10^7			PL/Ld-2	S = Ac.	90E297
	CF_3CH_2OH	2.4×10^5			PL/Ld-2	S = RB.	90E297
	CH_3CN	2.8×10^7			PL/Ld-2	S = RB.	90E297
	2-PrOH	3.2×10^6			PL/Ld-2	S = RB.	90E297
8.8	**1,1'-Bipyrrolidine**						
	C_6H_6	7.2×10^8			PL/Ld-2	S = Ac.	90E297
	CF_3CH_2OH	2.2×10^6			PL/Ld-2	S = RB.	90E297
	CH_3CN	3.5×10^8			PL/Ld-2	S = RB.	90E297
	2-PrOH	1.8×10^8			PL/Ld-2	S = RB.	90E297
8.9	**Brucine**						
	$CHCl_3$	3.9×10^8	2.6×10^{-5}		CP/A'c-16	S = A' = Rub; used $k_d = 1 \times 10^4\ s^{-1}$.	84F670
8.10	**1,4-Butanediamine, *N*-(3-aminopropyl)- (Spermidine)**						
	C_5H_5N	1.0×10^7 (k_r)			CP/A'c-17	S = A' = Rub; rel. to $k = 2.5 \times 10^7\ L\ mol^{-1}\ s^{-1}$ for DABCO.	92R313
8.11	**1,4-Butanediamine, *N,N*-bis(3-aminopropyl)- (Spermine)**						
	C_5H_5N	1.2×10^7 (k_r)			CP/A'c-17	S = A' = Rub; rel. to $k = 2.5 \times 10^7\ L\ mol^{-1}\ s^{-1}$ for DABCO.	92R313
8.12	**Butylamine**						
	$CHCl_3$	2.4×10^5			CP/A'c-33	S = A' = Rub; used $k_d = 1.7 \times 10^4\ s^{-1}$, $k_{A'} = 5.3 \times 10^7\ L\ mol^{-1}\ s^{-1}$.	777486
	EtOH	$<1 \times 10^9$		73	CP/Oc-23	S = MB; A' = 2,5-DMF; No measurable effect.	72F518
8.13	**Butylamine, *N,N*-dibutyl-**						
	c-C_6H_{12}	3×10^7			PL/Ld-2	S = 2-ACN.	90N078

TABLE 8. Rate constants for the interaction of singlet oxygen with aliphatic and alicyclic amines. — Continued

No.	Solvent	k ($L\ mol^{-1}\ s^{-1}$)	β (k_d/k) ($mol\ L^{-1}$)	T (K)	Method	Comment	Ref.
8.13	**Butylamine, *N,N*-dibutyl- — Continued**						
	$CHCl_3$	5.8×10^7			CP/A'c-33	S = A' = Rub; used $k_d = 1.7 \times 10^4\ s^{-1}$, $k_{A'} = 5.3 \times 10^7\ L\ mol^{-1}\ s^{-1}$.	777486
	EtOH	$<1 \times 10^9$		273	CP/Oc-23	S = MB; A' = 2,5-DMF; No measurable effect.	72F518
8.14	**Butylamine, *N,N*-dimethyl-**						
	C_6H_6	4.4×10^8			PL/Ld-2	S = Ac.	89E324
	CF_3CH_2OH	1.9×10^5			PL/Ld-2	S = RB.	89E324
	CH_3CN	2.7×10^8			PL/Ld-2	S = RB.	89E324
	CH_3COCH_3	3.5×10^8			PL/Ld-2	S = RB.	89E324
	2-PrOH	4.5×10^7			PL/Ld-2	S = RB.	89E324
8.15	***tert*-Butylamine**						
	MeOH	6.6×10^5	0.14		CP/A'c-16	S = RB; A' = DPBF; used $k_d = 9.0 \times 10^4\ s^{-1}$.	736061
8.16	**Chimasorb 944**						
	C_6H_6/ MeOH (80:20)	2.2×10^6			PL/A'd-8	S = MB; A' = DPBF; k calcd. for repeating unit.	84A167
	$CHCl_3$	3.2×10^6		293	CP/A'c-33	S = A' = Rub; used $k_d = 1.7 \times 10^4\ s^{-1}$, $k_{A'} = 5.3 \times 10^7\ L\ mol^{-1}\ s^{-1}$.	91P158
8.17	**Cyclohexylamine**						
	c-C_6H_{12} (mic)	4.6×10^7		313	CP/A'c-16	S = Fl^{2-}; A' = DPBF; used $k_d = 5.9 \times 10^4\ s^{-1}$; DAP reverse micelles.	80N021
	MeOH	2.9×10^7		313	CP/A'c-16	S = Fl^{2-}; A' = DPBF; used $k_d = 1.4 \times 10^5\ s^{-1}$.	80N021
	MeOH	8.0×10^4	1.1		CP/A'c-16	S = RB; A' = DPBF; used $k_d = 9.0 \times 10^4\ s^{-1}$.	736061
8.18	**2,3-Diazabicyclo[2.2.1]heptane, 2,3-dimethyl-**						
	CH_3CN	5.5×10^8			PL/Ld-2	S = RB.	90E297
8.19	**1,4-Diazabicyclo[2.2.2]octane (DABCO)**						
	1-BuOH	4.5×10^6	0.012		CP/A'c-16	S = RB; A' = DPBF; used $k_d = 5.2 \times 10^4\ s^{-1}$.	72F514
	$C_2H_5CO_2CH_3$	2.5×10^8		293	PL/Ld-2	S = Pz and 2-ACN.	92E220
	C_5H_5N	3×10^8			CP/A'c-23	S = A' = Rub; used $k_d = 6.0 \times 10^4\ s^{-1}$, $k_{A'} = 4 \times 10^7\ L\ mol^{-1}\ s^{-1}$.	743112
	C_5H_5N		3.2×10^{-4}		CP/Oc-20	S = RB; A' = $(C_2H_5)_3N$.	72F512
	C_5H_5N		2.3×10^{-4}		CP/Oc-21	S = RB; A' = 2M2P.	72F512
	c-C_6H_{12}	2.1×10^7			PL/Ld-2	S = 2-ACN.	90N078
	c-C_6H_{12} (mic)	5.0×10^8		313	CP/A'c-16	S = Fl^{2-}; A' = DPBF; used $k_d = 5.9 \times 10^4\ s^{-1}$; DAP reverse micelles.	80N021
	1,2-$C_6H_4Cl_2$				MD/A'c-23	A' = Rub; meas. $\beta_A/\beta_{A'} = 6.2$.	68F285
	C_6H_5Br	2.6×10^7		273	MD/A'c-33	A' = Rub; used $k_d = 1.3 \times 10^4\ s^{-1}$, $k_{A'} = 4.0 \times 10^7\ L\ mol^{-1}\ s^{-1}$; meas. $k/[k_d/[A'] + k_{A'}] = 0.2$ at [A'] $= 1.5 \times 10^{-4}\ mol\ L^{-1}$.	737333
	C_6H_5Br				MD/A'c-23	A' = DPBF; meas. $\beta_A/\beta_{A'} = 0.68$.	68F285
	$C_6H_5CH_3$	2.4×10^8		293	PL/Ld-2	S = Pz and 2-ACN.	92E220
	$C_6H_5CH_3$	2.2×10^8		298	PL/Ld-2	S = TPP; $\Delta V^{\ddagger} = -17\ cm^3\ mol^{-1}$; studied at 0.1-120 MPa.	91A271
	$C_6H_5CH_3$	2.1×10^8			PL/Ld-2	S = 2-ACN; $\Delta H^{\ddagger} = -7\ kJ\ mol^{-1}$; $\Delta S^{\ddagger} = -126\ J\ K^{-1}\ mol^{-1}$; $E_a = -4\ kJ\ mol^{-1}$; studied at 183-363 K; pre-exciplex-equilibrium limit activation parameters.	88A427 84E066
	$C_6H_5CH_3$	6.7×10^8			CP/A'c-25	S = A' = Rub; used $k_d = 1 \times 10^5\ s^{-1}$, $k_{A'} = 1.7 \times 10^8\ L\ mol^{-1}\ s^{-1}$.	752063

TABLE 8. Rate constants for the interaction of singlet oxygen with aliphatic and alicyclic amines. — Continued

No.	Solvent	k ($L\ mol^{-1}\ s^{-1}$)	β (k_d/k) ($mol\ L^{-1}$)	T (K)	Method	Comment	Ref.
419	**1,4-Diazabicyclo[2.2.2]octane (DABCO) — Continued**						
	$C_6H_5CH_3$				CP/A'c-23	S = A' = Rub; meas. $\beta_A/\beta_{A'} = 0.23$.	68F285
	C_6H_5CN	3.7×10^8		298	PL/Ld-2	S = MB; $\Delta V‡ = -10\ cm^3\ mol^{-1}$; studied at 0.1-120 MPa.	91A271
	C_6H_6	2.9×10^8			PL/Ld-2	S = 2-ACN.	93N051
	C_6H_6	2.9×10^8			PL/Ld-2	S = TPP and ZnTPP.	92F251
	C_6H_6	2.6×10^8 2.7×10^8 (k_q)		298	CP/Ac,A'c-23	S = A' = Rub; used $k_d = 4.2 \times 10^4\ s^{-1}$, $k_{A'} = 4.2 \times 10^7\ L\ mol^{-1}\ s^{-1}$.	90F360
	C_6H_6	2.6×10^8			PL/Ld-2	S = 2-ACN.	84E066
	C_6H_6	1.4×10^7	2.9×10^{-3}		CP/Ac-16	S = A' = 1,2-Diphenyl-4-methylcyclopenta[*b*]quinoline; used $k_d = 4.2 \times 10^4\ s^{-1}$.	78F438
	C_6H_6		9.6×10^{-4}		CP/P'a-20	S = ZnTPP; A' = 2M2P.	727028
	C_6H_6/ MeOH (80:20)	1.6×10^7		298	CP/P'a-20	S = MB; A' = 2M2P; used $k_d = 1.0 \times 10^4\ s^{-1}$, $\beta_{A'} = 0.040\ mol\ L^{-1}$.	70F734
	CCl_4	4.7×10^7		295	PL/Ld-2	S = PdMPDME or MPDME; decay at 1588 nm; decay at 1272 nm gave $5 \times 10^7\ L\ mol^{-1}\ s^{-1}$.	80E558
	CCl_4	7×10^6			MP/LI-12	S = PP, Ph a or BPh a; used $k_d = 36\ s^{-1}$.	79A010
	CCl_4	6.6×10^6			MP/LI-12	S = Ret; used $k_d = 36\ s^{-1}$.	79F463 78F700
	CF_3CH_2OH	4.4×10^4			PL/Ld-2	S = RB.	89E324
	CH_2Cl_2	8.3×10^7		298	PL/Ld-2	S = MB; $\Delta V‡ = -15\ cm^3\ mol^{-1}$; studied at 0.1-120 MPa.	91A271
	CH_2Cl_2/ MeOH/ C_5H_5N (90:5:5)	3.3×10^7		298	CR/A'c-32	A' = Rub; used $k_d = 8 \times 10^3\ s^{-1}$, $k_{A'} = 7.3 \times 10^7\ L\ mol^{-1}\ s^{-1}$; $^1O_2$* from $(PhO)_3PO_3$.	747341
	CH_2Cl_2/ MeOH/ C_5H_5N (94:3:3)	3.3×10^7		298	CR/A'c-32	A' = Rub; used $k_d = 7.3 \times 10^3\ s^{-1}$, $k_{A'} = 7 \times 10^7\ L\ mol^{-1}\ s^{-1}$; $^1O_2$* from $(PhO)_3PO_3$.	727319
	CH_3CN	4.0×10^8		298	PL/Ld-2	S = MB; $\Delta V‡ = -11\ cm^3\ mol^{-1}$; studied at 0.1-120 MPa.	91A271
	CH_3CN	5.5×10^8		298	CP/P'a-17	S = DCA; A' = 2,3-Diphenyl-1,4-dioxene; used $k_r^{A'} = 1.7 \times 10^7\ L\ mol^{-1}\ s^{-1}$.	91A311
	CH_3CN	4.9×10^8			PL/Ld-2	S = RB.	89E324
	CH_3CN	4.0×10^8			PL/Ld-2	S = 2-ACN.	84E066
	CH_3COCH_3	1.8×10^8		298	PL/Ld-2	S = MB; $\Delta V‡ = -15\ cm^3\ mol^{-1}$; studied at 0.1-120 MPa.	91A271
	CH_3COCH_3	3.8×10^8			PL/Ld-2	S = 2-ACN.	84E066
	CH_3COCH_3	4.5×10^8			PL/Ld-2	S = MPDME.	83E235
	$CHCl_3$	3.5×10^7		298	PL/Ld-2	S = MB; $\Delta V‡ = -19\ cm^3\ mol^{-1}$; studied at 0.1-120 MPa.	91A271
	$CHCl_3$	1.8×10^7			CP/A'c-33	S = A' = Rub; used $k_d = 1.7 \times 10^4\ s^{-1}$, $k_{A'} = 5.3 \times 10^7\ L\ mol^{-1}\ s^{-1}$.	88P313
	$CHCl_3$	5.8×10^7	1.7×10^{-4}		CP/A'c-16	S = A' = Rub; used $k_d = 1 \times 10^4\ s^{-1}$.	84F670
	$CHCl_3$	2.0×10^7			PL/Ld-2	S = MPDEE or PdMPDEE.	81A327
	$CHCl_3$	4.7×10^7			PL/Ld-2	S = MPDEE or PdMPDEE.	81E472
	$CHCl_3$	5.2×10^7			CP/A'c-33	S = A' = Rub; used $k_d = 1.7 \times 10^4\ s^{-1}$, $k_{A'} = 5.3 \times 10^7\ L\ mol^{-1}\ s^{-1}$.	777486
	CS_2		1.7×10^{-4}		CP/P'a-20	S = ZnTPP; A' = 2M2P.	727028
	$ClCF_2CCl_2F$	2.1×10^7		298	FP/Ld-2	S = Per.	82A322
	D_2O (mic) pD = 7.4	1.4×10^6		294	PL/A'd-5	S = 2-ACN; A' = DPBF; 0.1 mol L^{-1} SDS or CTAB.	81N048
	EtOH	5.0×10^6			PL/Ld-2	S = 2-ACN.	84E066

TABLE 8. Rate constants for the interaction of singlet oxygen with aliphatic and alicyclic amines. — Continued

No.	Solvent	k ($L\ mol^{-1}\ s^{-1}$)	β (k_d/k) ($mol\ L^{-1}$)	T (K)	Method	Comment	Ref.
8.19	**1,4-Diazabicyclo[2.2.2]octane (DABCO)** — Continued						
	EtOH	6.4×10^6			CP/P'a-19	S = RB; A' = 2,2,6,6-Tetramethyl-4-piperidinol; used $k_{A'} = 8 \times 10^5$ L mol^{-1} s^{-1}; meas. $k_A/k_{A'} = 8$; P' = 2,2,6,6-Tetramethyl-4-hydroxypiperidine-1-oxyl detected by esr.	80D076
	EtOH	3.1×10^7			CP/A'c-19	S = RB; A' = Chl a; used $k_d = 1 \times 10^5$ s^{-1}.	78F404
	EtOH	5.3×10^6			CP/Ac-23	S = RB; A' = Hexamethylenedithiocarbamate; used $k_d = 1 \times 10^4$ s^{-1}, $k_{A'} = 1.5 \times 10^8$ L mol^{-1} s^{-1}; meas. $k_{A'}/(k_d + k[A]) = 58$ at $[A] = 4.48 \times 10^{-4}$ mol L^{-1}.	727116
	H_2O pH = 8	2.8×10^8			CP/P'a-19	S = RB; A' = 2,2,6,6-Tetramethyl-4-piperidinol; meas. $k_A/k_{A'} = 7$; P' = 2,2,6,6-Tetramethyl-4-hydroxypiperidine-1-oxyl detected by esr.	80D076
	i-octane/ MeOH/ C_5H_5N (90:5:5)	3.9×10^7		298	CR/A'c-32	A' = Rub; used $k_d = 4.7 \times 10^4$ s^{-1}, $k_{A'} = 7.3 \times 10^7$ L mol^{-1} s^{-1}; $^1O_2$* from $(PhO)_3PO_3$.	747341
	i-octane/ MeOH/ C_5H_5N (94:3:3)	3.5×10^7		298	CR/A'c-32	A' = Rub; used $k_d = 5.0 \times 10^4$ s^{-1}, $k_{A'} = 7 \times 10^7$ L mol^{-1} s^{-1}; $^1O_2$* from $(PhO)_3PO_3$.	727319
	MeOH	5.4×10^8		313	CP/A'c-16	S = Fl^{2-}; A' = DPBF; used $k_d = 1.4 \times 10^5$ s^{-1}.	80N021
	MeOH		6.5×10^{-3}		CP/P'a-20	S = ZnTPP; A' = 2M2P.	727028
	MeOH	7.3×10^6	0.012		CP/A'c-16	S = RB; A' = DPBF; used $k_d = 9.0 \times 10^4$ s^{-1}.	72F514
	2-PrOH	3.6×10^6			PL/Ld-2	S = RB.	89E324
	i-octane	3.0×10^7		298	CP/A'c-23	S = A' = Rub; used $k_d = 4.7 \times 10^4$ s^{-1}, $k_{A'} = 7.3 \times 10^7$ L mol^{-1} s^{-1}.	747341
8.20	**Dibenzo[*de,g*]quinoline-2,9-diol, 5,6,6a,7-tetrahydro-1,10-dimethoxy-6-methyl- (Boldine)**						
	$CHCl_3$	2.4×10^7	4.2×10^{-4}		CP/A'c-16	S = A' = Rub; used $k_d = 1 \times 10^4$ s^{-1}.	84F670
8.21	**Dibenzo[*de,g*]quinoline-2,9-diol, 5,6,6a,7-tetrahydro-1,2,9,10-tetramethoxy-6-methyl- (Glaucine)**						
	$CHCl_3$	3.1×10^7	3.2×10^{-4}		CP/A'c-16	S = A' = Rub; used $k_d = 1 \times 10^4$ s^{-1}.	84F670
8.22	**1,9:3,5-Dimethanocyclopenta[*d*]cyclopenta[3,4][1,2]diazeto[1,2-*a*]pyridazine, decahydro-**						
	CH_3CN	2.8×10^8			PL/Ld-2	S = RB.	90E297
8.23	**Ethanol, 2-(diethylamino)-**						
	$CHCl_3$	3.0×10^7			CP/A'c-33	S = A' = Rub; used $k_d = 1.7 \times 10^4$ s^{-1}, $k_{A'} = 5.3 \times 10^7$ L mol^{-1} s^{-1}.	777486
8.24	**Ethylamine, *N,N*-diethyl-**						
	C_5H_5N	2.5×10^7 (k_r)			CP/A'c-17	S = A' = Rub; rel. to $k = 2.5 \times 10^7$ L mol^{-1} s^{-1} for DABCO.	92R313
	C_5H_5N		2.7×10^{-3} (β_r)		CP/Oc-14,27	S = RB; A' = 2M2P.	72F512
	C_5H_5N		2.9×10^{-4} (β_q)		CP/Oc-14,27	S = RB; A' = 2M2P.	72F512
	C_5H_5N		4.2×10^{-4}		CP/Oc-20	S = RB; A' = 2M2P.	72F512
	c-C_6H_{12} (mic)	6.5×10^8		313	CP/A'c-16	S = Fl^{2-}; A' = DPBF; used $k_d = 5.9 \times 10^4$ s^{-1}; DAP reverse micelles.	80N021
	n-C_6H_{14}	4.8×10^7			CP/A'c-16	S = A' = Rub; k_d not given.	87F639
	C_6H_6	1.8×10^8			CP/A'c-16	S = A' = Rub; used $k_d = 4.2 \times 10^4$ s^{-1}.	87F639
	CF_3CH_2OH	1.7×10^4			PL/Ld-2	S = RB.	89E324
	CH_3CN	3.3×10^8			PL/Ld-2	S = RB.	89E324
	CH_3CN	2.0×10^8			CP/A'c-16	S = RB; A' = DMA; used $k_d = 3.3 \times 10^4$ s^{-1}.	87F639
	CH_3COCH_3	3.1×10^8			CP/A'c-16	S = RB; A' = DMA; used $k_d = 3.8 \times 10^4$ s^{-1}.	87F639
	$CHCl_3$	7.4×10^7			CP/A'c-16	S = RB; A' = DMA; k_d not given.	87F639
	$CHCl_3$	6.5×10^7			CP/A'c-33	S = A' = Rub; used $k_d = 1.7 \times 10^4$ s^{-1}, $k_{A'} = 5.3 \times 10^7$ L mol^{-1} s^{-1}.	777486

TABLE 8. Rate constants for the interaction of singlet oxygen with aliphatic and alicyclic amines. — Continued

No.	Solvent	k ($L\ mol^{-1}\ s^{-1}$)	β (k_d/k) ($mol\ L^{-1}$)	T (K)	Method	Comment	Ref.
8.24	**Ethylamine, *N,N*-diethyl-** — Continued						
	EtOH	2.7×10^6 (k_r)	0.31 (β_r)		CP/Oc-19	S = RB; used $k_d = 8.3 \times 10^4\ s^{-1}$; used ($k_q/k_r$) = 9.3.	75F655
	$HCONH_2$	7.9×10^6			CP/A'c-16	S = RB; A' = DMA; k_d not given.	87F639
	MeOH	1.3×10^7			CP/A'c-16	S = RB; A' = DMA; used $k_d = 2.0 \times 10^4\ s^{-1}$.	87F639
	MeOH	4.0×10^8		313	CP/A'c-16	S = Fl^{2-}; A' = DPBF; used $k_d = 1.4 \times 10^5\ s^{-1}$.	80N021
	MeOH	9.3×10^6	9.7×10^{-3}		CP/A'c-16	S = RB; A' = DPBF; used $k_d = 9.0 \times 10^4\ s^{-1}$.	736061
	MeOH	1.2×10^7	7.6×10^{-3}		CP/A'c-16	S = RB; A' = DPBF; used $k_d = 9.0 \times 10^4\ s^{-1}$.	72F514
	MeOH/ C_6H_6 (67:33)		4.9×10^{-4} (β_r)	298	CR/A'c-17	A' = Rub; used $\beta_r^{A'} = 1.4 \times 10^{-3}\ mol\ L^{-1}$; $^1O_2$* from $(PhO)_3PO_3$.	80M378
	2-PrOH	3.6×10^7			PL/Ld-2	S = RB.	89E324
8.25	**Ethylamine, *N,N*-diethyl-2-methoxy-**						
	$CHCl_3$	3.8×10^7			CP/A'c-33	S = A' = Rub; used $k_d = 1.7 \times 10^4\ s^{-1}$, $k_{A'} = 5.3 \times 10^7\ L\ mol^{-1}\ s^{-1}$.	777486
8.26	**Ethylamine, 1,1-dimethyl-*N,N*-bis(2-hydroxyethyl)-**						
	$CHCl_3$	1.1×10^6			CP/A'c-33	S = A' = Rub; used $k_d = 1.7 \times 10^4\ s^{-1}$, $k_{A'} = 5.3 \times 10^7\ L\ mol^{-1}\ s^{-1}$.	777486
8.27	**Ethylamine, *N*-ethyl-**						
	C_5H_5N	5×10^6 (k_r)			CP/A'c-17	S = A' = Rub; rel. to $k = 2.5 \times 10^7\ L\ mol^{-1}\ s^{-1}$ for DABCO.	92R313
	c-C_6H_{12} (mic)	3.1×10^8		313	CP/A'c-16	S = Fl^{2-}; A' = DPBF; used $k_d = 5.9 \times 10^4\ s^{-1}$; DAP reverse micelles.	80N021
	n-C_6H_{14}	4.8×10^6			CP/A'c-16	S = A' = Rub; k_d not given.	87F639
	C_6H_6	4.6×10^7			CP/A'c-16	S = A' = Rub; used $k_d = 4.2 \times 10^4\ s^{-1}$.	87F639
	C_6H_6/ MeOH (75:25)	2.4×10^6		298	CP/A'c-20	S = RB; A' = c-C_6H_{10}; used $k_d = 6.3 \times 10^4\ s^{-1}$, $\beta_{A'} = 3.1\ mol\ L^{-1}$.	78F586
	CH_3CN	1.5×10^8			PL/Ld-2	S = RB.	89E324
	CH_3CN	8.6×10^7			CP/A'c-16	S = RB; A' = DMA; used $k_d = 3.3 \times 10^4\ s^{-1}$.	87F639
	CH_3COCH_3	1.0×10^8			CP/A'c-16	S = RB; A' = DMA; used $k_d = 3.8 \times 10^4\ s^{-1}$.	87F639
	$CHCl_3$	1.2×10^7			CP/A'c-16	S = RB; A' = DMA; k_d not given.	87F639
	$CHCl_3$	1.5×10^7			CP/A'c-33	S = A' = Rub; used $k_d = 1.7 \times 10^4\ s^{-1}$, $k_{A'} = 5.3 \times 10^7\ L\ mol^{-1}\ s^{-1}$.	777486
	$HCONH_2$	2.3×10^6			CP/A'c-16	S = RB; A' = DMA; k_d not given.	87F639
	MeOH	2.2×10^6			CP/A'c-16	S = RB; A' = DMA; used $k_d = 2.0 \times 10^4\ s^{-1}$.	87F639
	MeOH	1.7×10^8		313	CP/A'c-16	S = Fl^{2-}; A' = DPBF; used $k_d = 1.4 \times 10^5\ s^{-1}$.	80N021
	MeOH	1.9×10^6	0.048		CP/A'c-16	S = RB; A' = DPBF; used $k_d = 9.0 \times 10^4\ s^{-1}$.	736061
	MeOH/ C_6H_6 (67:33)		4.0×10^{-4} (β_r)	298	CR/A'c-17	A' = Rub; used $\beta_r^{A'} = 1.4 \times 10^{-3}$ mol L^{-1}; $^1O_2$* from $(PhO)_3PO_3$.	80M378
	2-PrOH	3.8×10^6			PL/Ld-2	S = RB.	89E324
8.28	**Ethylamine, 1-methyl-**						
	MeOH	4.6×10^4	1.9		CP/A'c-16	S = RB; A' = DPBF; used $k_d = 9.0 \times 10^4\ s^{-1}$.	736061
8.29	**Ethylamine, 1-methyl-*N,N*-(1-methylethyl)-**						
	c-C_6H_{12}	8.8×10^5			PL/Ld-2	S = 2-ACN.	90N078
	$CHCl_3$	1.8×10^6			CP/A'c-33	S = A' = Rub; used $k_d = 1.7 \times 10^4\ s^{-1}$, $k_{A'} = 5.3 \times 10^7\ L\ mol^{-1}\ s^{-1}$.	777486
8.30	**Ethynediamine, tetraethyl-**						
	$CHCl_3$	3×10^8			CR/A'c-33	A' = Rub; used $k_d = 1.7 \times 10^4\ s^{-1}$, $k_{A'} = 5.3 \times 10^7\ L\ mol^{-1}\ s^{-1}$; $^1O_2$* from $DMNO_2$.	81E003

TABLE 8. Rate constants for the interaction of singlet oxygen with aliphatic and alicyclic amines. — Continued

No.	Solvent	k ($L\ mol^{-1}\ s^{-1}$)	β (k_d/k) ($mol\ L^{-1}$)	T (K)	Method	Comment	Ref.
8.31	**1,7-Heptanediamine, *N,N*-diethyl-**						
	$CHCl_3$	6.1×10^7			CP/A'c-33	S = A' = Rub; used $k_d = 1.7 \times 10^4\ s^{-1}$, $k_{A'} = 5.3 \times 10^7\ L\ mol^{-1}\ s^{-1}$.	777486
8.32	**Hexamethylenetetramine**						
	MeOH	1.9×10^5	0.46		CP/A'c-16	S = RB; A' = DPBF; used $k_d = 9.0 \times 10^4\ s^{-1}$.	736061
8.33	**Hydrazine, 1,2-diethyl-1,2-dimethyl-**						
	CH_3CN	6.8×10^7			PL/Ld-2	S = RB.	90E297
8.34	**Hydrazine, 1,2-dimethyl-1,2-dibutyl-**						
	C_6H_6	3.9×10^7			PL/Ld-2	S = Ac.	90E297
	CH_3CN	3.9×10^7			PL/Ld-2	S = RB.	90E297
8.35	**Hydrazine, 1,1-dimethyl-2,2-di(2,2-dimethylpropyl)-**						
	CH_3CN	1.3×10^6			PL/Ld-2	S = RB.	90E297
8.36	**Hydrazine, 1,2-dimethyl-1,2-di(2,2-dimethylpropyl)-**						
	CH_3CN	5.3×10^6			PL/Ld-2	S = RB.	90E297
8.37	**Hydrazine, 1,1-dimethyl-2,2-di(2-methylpropyl)-**						
	CH_3CN	2.2×10^7			PL/Ld-2	S = RB.	90E297
8.38	**Hydrazine, 1,2-dimethyl-1,2-di(2-methylpropyl)-**						
	C_6H_6	5.9×10^6			PL/Ld-2	S = Ac.	90E297
	CH_3CN	1.3×10^7			PL/Ld-2	S = RB.	90E297
8.39	**Hydrazine, 1,2-dimethyl-1,2-dipentyl-**						
	C_6H_6	9.3×10^6			PL/Ld-2	S = Ac.	90E297
	CH_3CN	4.7×10^7			PL/Ld-2	S = RB.	90E297
8.40	**Hydrazine, 1,2-dimethyl-1,2-dipropyl-**						
	CH_3CN	4.4×10^7			PL/Ld-2	S = RB.	90E297
8.41	**Hydrazine, tetramethyl-**						
	C_6H_6	1.8×10^8			PL/Ld-2	S = Ac.	90E297
	CF_3CH_2OH	1.2×10^6			PL/Ld-2	S = RB.	90E297
	CH_3CN	1.9×10^8			PL/Ld-2	S = RB.	90E297
	2-PrOH	2.1×10^7			PL/Ld-2	S = RB.	90E297
8.42	**Hydrazine, tetra(methyl-d_3)-**						
	CH_3CN	1.9×10^8			PL/Ld-2	S = RB.	90E297
8.43	**Hydrazine, tetra(2-methylpropyl)-**						
	CH_3CN	3.0×10^5			PL/Ld-2	S = RB.	90E297
8.44	**Hydrazine, 1,1,2-trimethyl-2-(2,2-dimethylpropyl)-**						
	CH_3CN	1.1×10^8			PL/Ld-2	S = RB.	90E297
8.45	**Hydrazine, 1,1,2-trimethyl-2-(2-methylpropyl)-**						
	C_6H_6	6.8×10^7			PL/Ld-2	S = Ac.	90E297
	CH_3CN	9.6×10^7			PL/Ld-2	S = RB.	90E297
8.46	**Methylamine, *N,N*-bis(2-hydroxyethyl)-**						
	$CHCl_3$	2.1×10^7			CP/A'c-33	S = A' = Rub; used $k_d = 1.7 \times 10^4\ s^{-1}$, $k_{A'} = 5.3 \times 10^7\ L\ mol^{-1}\ s^{-1}$.	777486

TABLE 8. Rate constants for the interaction of singlet oxygen with aliphatic and alicyclic amines. — Continued

	Solvent	k ($L\ mol^{-1}\ s^{-1}$)	β (k_d/k) ($mol\ L^{-1}$)	T (K)	Method	Comment	Ref.
8.47	**Methylamine, *N,N*-dimethyl-**						
	MeOH	1.3×10^7	6.7×10^{-3}		CP/A'c-16	S = MB; A' = DPBF; used $k_d = 9.0 \times 10^4\ s^{-1}$.	72F519
8.48	**Phenethylamine**						
	c-C_6H_{12} (mic)	4.0×10^7		313	CP/A'c-16	S = Fl^{2-}; A' = DPBF; used $k_d = 5.9 \times 10^4\ s^{-1}$; DAP reverse micelles.	80N021
	MeOH	5.3×10^7		313	CP/A'c-16	S = Fl^{2-}; A' = DPBF; used $k_d = 1.4 \times 10^5\ s^{-1}$.	80N021
	MeOH		1.5		CP/A'c-16	S = RB; A' = DPBF.	736061
8.49	**4-Phenylbutylamine**						
	MeOH		0.98		CP/A'c-16	S = RB; A' = DPBF.	736061
8.50	**3-Phenylpropylamine**						
	MeOH		1.3		CP/A'c-16	S = RB; A' = DPBF.	736061
8.51	**Piperazine**						
	c-C_6H_{12}	1.7×10^6			PL/Ld-2	S = 2-ACN.	90N078
	MeOH	1.2×10^6	0.073		CP/A'c-16	S = RB; A' = DPBF; used $k_d = 9.0 \times 10^4\ s^{-1}$.	736061
8.52	**1-Piperidinamine, *N,N*-dimethyl-**						
	CH_3CN	1.6×10^8			PL/Ld-2	S = RB.	90E297
8.53	**Piperidine**						
	2-BuOH	1.0×10^6			PL/Ld-2	S = RB.	89E324
	C_6H_6/ MeOH (80:20)	3.5×10^6			PL/A'd-8	S = MB; A' = DPBF.	84A167
	CF_3CH_2OH	6.5×10^3			PL/Ld-2	S = RB.	89E324
	CH_3CN	5.6×10^7			PL/Ld-2	S = RB.	89E324
	CH_3COCH_3	7.8×10^7			PL/Ld-2	S = RB.	89E324
	$CHCl_3$	3.6×10^6			PL/Ld-2	S = TPP.	89E324
	$CHCl_3$	5.8×10^6			CP/A'c-33	S = A' = Rub; used $k_d = 1.7 \times 10^4\ s^{-1}$, $k_{A'} = 5.3 \times 10^7\ L\ mol^{-1}\ s^{-1}$.	777486
	MeOH	9.2×10^5	0.098		CP/A'c-16	S = RB; A' = DPBF; used $k_d = 9.0 \times 10^4\ s^{-1}$.	736061
	2-PrOH	9.1×10^5			PL/Ld-2	S = RB.	89E324
8.54	**Piperidine, 4-amino-2,2,6,6-tetramethyl-**						
	C_6H_6/ MeOH (80:20)	1.8×10^6			PL/A'd-8	S = MB; A' = DPBF.	84A167
8.55	**Piperidine, 1-butoxy-2,2,6,6-tetramethyl-**						
	CH_2Cl_2	3×10^5			CP/A'c-18	S = A' = Rub; used $k_d = 7.3 \times 10^3\ s^{-1}$, $k_{A'} = 7 \times 10^7\ L\ mol^{-1}\ s^{-1}$.	88F059
8.56	**Piperidine, 1-cyclohexyl-**						
	MeOH	4.5×10^7	2.0×10^{-3}		CP/A'c-16	S = MB; A' = DPBF; used $k_d = 9.0 \times 10^4\ s^{-1}$.	72F519
8.57	**Piperidine, 1,2-dimethyl-**						
	C_6H_6/ MeOH (80:20)	2.8×10^7			PL/A'd-8	S = MB; A' = DPBF.	84A167
8.58	**Piperidine, 2,6-dimethyl-**						
	C_6H_6/ MeOH (80:20)	1.2×10^6			PL/A'd-8	S = MB; A' = DPBF.	84A167
	$CHCl_3$	3.0×10^6			CP/A'c-33	S = A' = Rub; used $k_d = 1.7 \times 10^4\ s^{-1}$, $k_{A'} = 5.3 \times 10^7\ L\ mol^{-1}\ s^{-1}$.	777486

TABLE 8. Rate constants for the interaction of singlet oxygen with aliphatic and alicyclic amines. — Continued

No.	Solvent	k (L mol^{-1} s^{-1})	β (k_d/k) (mol L^{-1})	T (K)	Method	Comment	Ref.
8.59	**Piperidine, 2-methyl-**						
	C_6H_6/ MeOH (80:20)	1.5×10^6			PL/A'd-8	S = MB; A' = DPBF.	84A167
8.60	**Piperidine, *N*-methyl-**						
	C_6H_6/ MeOH (80:20)	2.9×10^7			PL/A'd-8	S = MB; A' = DPBF.	84A167
	$CHCl_3$	5.3×10^7			CP/A'c-33	S = A' = Rub; used $k_d = 1.7 \times 10^4$ s^{-1}, $k_{A'} = 5.3 \times 10^7$ L mol^{-1} s^{-1}.	777486
8.61	**Piperidine, 1,2,2,6,6-pentamethyl-**						
	C_6H_6/ MeOH (80:20)	6.0×10^7			PL/A'd-8	S = MB; A' = DPBF.	84A167
8.62	**Piperidine, 1-(1-pyrrolidinyl)-**						
	CH_3CN	2.6×10^8			PL/Ld-2	S = RB.	90E297
8.63	**Piperidine, 2,2,6,6-tetramethyl-**						
	C_6H_6/ MeOH (80:20)	4.0×10^6			PL/A'd-8	S = MB; A' = DPBF.	84A167
	C_6H_6	5.3×10^5	0.061		CP/Pa-15	S = HA; used $k_d = 3.2 \times 10^4$ s^{-1}; P = 2,2,6,6-Tetramethylpiperidine-*N*-oxyl; P monitored by esr.	90R162
	CH_2Cl_2	3.9×10^5			PL/Ld-2	S = TPP.	93E090
	CH_2Cl_2	3.8×10^5			CP/A'c-33	S = A' = Rub; used $k_{A'} = 7.3 \times 10^7$ L mol^{-1} s^{-1}; k_d not given.	84F199
	EtOH	1.6×10^5	0.51		CP/Pa-15	S = BXP; used $k_d = 8.3 \times 10^4$ s^{-1}; P = TEMPO monitored by esr.	83F323
	CH_2Cl_2	4×10^5			CP/A'c-18	S = A' = Rub; used $k_d = 7.3 \times 10^3$ s^{-1}, $k_{A'} = 7 \times 10^7$ L mol^{-1} s^{-1}.	88F059
8.64	**Piperidine, 2,2,6,6-tetramethyl-4,4'-[1,6-hexanediaminyl]bis-**						
	C_6H_6/ MeOH (80:20)	8.0×10^6			PL/A'd-8	S = MB; A' = DPBF.	84A167
8.65	**Piperidine, 2,2,6,6-tetramethyl-4,4'-[1,6-hexanediaminyl]bis-, polymer**						
	C_6H_6/ MeOH (80:20)	3.6×10^7			PL/A'd-8	S = MB; A' = DPBF; k calcd. for repeating unit.	84A167
8.66	**1-Piperidineethanol, diester with [[3,5-bis(1,1-dimethylethyl)-4-hydroxyphenyl]methyl]butylpropanedioic acid**						
	C_6H_6/ MeOH (80:20)	4.3×10^6			PL/A'd-8	S = MB; A' = DPBF.	84A167
8.67	**1-Piperidineethanol, 4-hydroxy-2,2,6,6-tetramethyl-, polymer with butanedioic acid (Tinuvin 622)**						
	C_6H_6/ MeOH (80:20)	$<1 \times 10^5$			PL/A'd-8	S = MB; A' = DPBF; k calcd. for repeating unit.	84A167
	$CHCl_3$	2×10^5		293	CP/A'c-33	S = A' = Rub; used $k_d = 1.7 \times 10^4$ s^{-1}, $k_{A'} = 5.3 \times 10^7$ L mol^{-1} s^{-1}.	91P158
8.68	**1-Piperidineethanol, 2,2,6,6-tetramethyl-**						
	$CHCl_3$	$<2 \times 10^5$			CP/A'c-33	S = A' = Rub; No measurable effect.	777486
8.69	**1-Piperidineethanol, 2,2,6,6-tetramethyl-, acetate (ester)**						
	$CHCl_3$	$<2 \times 10^5$			CP/A'c-33	S = A' = Rub; No measurable effect.	777486
8.70	**Piperidin-3-ol, 1-methyl-**						
	C_6H_6/ MeOH (80:20)	2.5×10^7			PL/A'd-8	S = MB; A' = DPBF.	84A167

TABLE 8. Rate constants for the interaction of singlet oxygen with aliphatic and alicyclic amines. — Continued

No.	Solvent	k (L mol^{-1} s^{-1})	β (k_d/k) (mol L^{-1})	T (K)	Method	Comment	Ref.
8.71	**Piperidin-4-ol, 1-methyl-**						
	C_6H_6/ MeOH (80:20)	2.0×10^7			PL/A'd-8	S = MB; A' = DPBF.	84A167
8.72	**Piperidin-4-ol, 1,2,2,6,6-pentamethyl-**						
	C_6H_6/ MeOH (80:20)	6.0×10^7			PL/A'd-8	S = MB; A' = DPBF.	84A167
	C_6H_6/ EtOH (89:11)	2.3×10^3 (k_r)		295	CP/Pa,A'c-17	S = RB; A' = Tetr; used $k_r^{A'} = 7 \times 10^7$ L mol^{-1} s^{-1}; meas. $k_r/k_r^{A'} = 3.3 \times 10^{-5}$; P = nitroxide radical.	757445
	CH_2Cl_2	5×10^7		295	?	Method not given.	757445
	CH_2Cl_2	5.2×10^7	1.4×10^{-4}		CP/A'c-19	S = A' = Tetr; used $k_d = 7.3 \times 10^3$ s^{-1}.	75F654
	$CHCl_3$	3.3×10^7			CP/A'c-33	S = A' = Rub; used $k_d = 1.7 \times 10^4$ s^{-1}, $k_{A'} = 5.3 \times 10^7$ L mol^{-1} s^{-1}.	88P313
	$CHCl_3$	9.2×10^7			CP/A'c-33	S = A' = Rub; used $k_d = 1.7 \times 10^4$ s^{-1}, $k_{A'} = 5.3 \times 10^7$ L mol^{-1} s^{-1}.	777486
8.73	**Piperidin-4-ol, 1,2,2,6,6-pentamethyl-, diester with [[3,5-*bis*(1,1-dimethylethyl)-4-hydroxyphenyl]methyl]butylpropanedioic acid (Tinuvin 144)**						
	C_6H_6/ MeOH (80:20)	1.5×10^8			PL/A'd-8	S = MB; A' = DPBF.	84A167
8.74	**Piperidin-4-ol, 1,2,2,6,6-pentamethyl-, diester with 1,10-decanedioic acid**						
	$CHCl_3$	1.8×10^8			CP/A'c-33	S = A' = Rub; used $k_d = 1.7 \times 10^4$ s^{-1}, $k_{A'} = 5.3 \times 10^7$ L mol^{-1} s^{-1}.	88P313
8.75	**Piperidin-4-ol, 1,2,2,6,6-pentamethyl-, triester with nitrilotriacetic acid**						
	$CHCl_3$	2.4×10^8			CP/A'c-33	S = A' = Rub; used $k_d = 1.7 \times 10^4$ s^{-1}, $k_{A'} = 5.3 \times 10^7$ L mol^{-1} s^{-1}.	88P313
8.76	**Piperidin-4-ol, 1,2,2,6-tetramethyl-, phenylacetate ester (Eucatropine)**						
	$CHCl_3$	2×10^6	5.3×10^{-3}		CP/A'c-16	S = A' = Rub; used $k_d = 1 \times 10^4$ s^{-1}.	84F670
8.77	**Piperidin-4-ol, 2,2,6,6-tetramethyl- (TEMP-4-OH)**						
	C_6H_6/ EtOH (50:50)	$<1.0 \times 10^5$			PL/A'd-8	S = MB; A' = DPBF.	84A167
	C_6H_6/ EtOH (89:11)	2.9×10^3 (k_r)		295	CP/Pa,A'c-17	S = RB; A' = Tetr; used $k_r^{A'} = 7 \times 10^7$ L mol^{-1} s^{-1}; meas. $k_r/k_r^{A'} = 4.1 \times 10^{-5}$; P = TEMPOL.	757445
	C_6H_6/ EtOH (89:11)	5×10^5		295	CP/A'c-23	S = RB; A' = Tetr; used $k_d = 3 \times 10^4$ s^{-1}, $k_{A'} = 7 \times 10^7$ L mol^{-1} s^{-1}.	757445
	$CHCl_3$	2.6×10^5			CP/A'c-33	S = A' = Rub; used $k_d = 1.7 \times 10^4$ s^{-1}, $k_{A'} = 5.3 \times 10^7$ L mol^{-1} s^{-1}.	88P313
	$CHCl_3$	$<2.0 \times 10^5$			CP/A'c-33	S = A' = Rub; No measurable effect.	777486
	DMF	5.0×10^7			CP/Pa-15	S = Pt(phen)$(N_3)_2$; P = 4-Hydroxy-2,2,6,6-tetramethylpiperidine *N*-oxyl; k_d not given.	90F196
	DMF	5.0×10^7			MP/Pa-15	S = HP; used $k_d = 1.4 \times 10^5$ s^{-1}; P = 4-Hydroxy-2,2,6,6-tetramethylpiperidine *N*-oxyl; esr detection.	89F311
	DMSO	5.2×10^6	0.01		CP/Pa-15	S = GV; used $k_d = 5.2 \times 10^4$ s^{-1}; P = 4-Hydroxy-2,2,6,6-tetramethylpiperidine *N*-oxyl; esr detection.	89D112
	EtOH	8×10^5			CP/Pa-15	S = RB; used $k_d = 8 \times 10^4$ s^{-1}; P = 4-Hydroxy-2,2,6,6-tetramethylpiperidine *N*-oxyl; detected by esr.	80D076
	H_2O pH = 8	4×10^7			CP/Pa-19	S = RB; Q = N_3^-; used $k_Q = 2 \times 10^9$ L mol^{-1} s^{-1}; meas. $k_A/k_{A'} = 0.025$; P = 4-Hydroxy-2,2,6,6-tetramethylpiperidine *N*-oxyl; detected by esr.	80D076

TABLE 8. Rate constants for the interaction of singlet oxygen with aliphatic and alicyclic amines. — Continued

No.	Solvent	k ($L\ mol^{-1}\ s^{-1}$)	β (k_d/k) ($mol\ L^{-1}$)	T (K)	Method	Comment	Ref.
8.78	**Piperidin-4-ol, 2,2,6,6-tetramethyl-, diester with 1,10-decanedioic acid (Tinuvin 770)**						
	C_6H_6/ MeOH (80:20)	$<1 \times 10^5$			PL/A′d-8	S = MB; A′ = DPBF.	84A167
	$CHCl_3$	2×10^5		293	CP/A′c-33	S = A′ = Rub; used $k_d = 1.7 \times 10^4\ s^{-1}$, $k_{A'} = 5.3 \times 10^7\ L\ mol^{-1}\ s^{-1}$.	91P158
	$CHCl_3$	1.5×10^5			CP/A′c-33	S = A′ = Rub; used $k_d = 1.7 \times 10^4\ s^{-1}$, $k_{A'} = 5.3 \times 10^7\ L\ mol^{-1}\ s^{-1}$.	88P313
8.79	**Piperidin-4-ol, 2,2,6,6-tetramethyl-, ester with copolymer of styrene + methacrylic acid**						
	$CHCl_3$	8.2×10^5		293	CP/A′c-33	S = A′ = Rub; used $k_d = 1.7 \times 10^4\ s^{-1}$, $k_{A'} = 5.3 \times 10^7\ L\ mol^{-1}\ s^{-1}$.	91P158
8.80	**Piperidin-4-ol, 2,2,6,6-tetramethyl-, triester with nitrilotriacetic acid**						
	$CHCl_3$	1.9×10^6			CP/A′c-33	S = A′ = Rub; used $k_d = 1.7 \times 10^4\ s^{-1}$, $k_{A'} = 5.3 \times 10^7\ L\ mol^{-1}\ s^{-1}$.	88P313
8.81	**Propanenitrile, 3-(diethylamino)-**						
	$CHCl_3$	2.7×10^7			CP/A′c-33	S = A′ = Rub; used $k_d = 1.7 \times 10^4\ s^{-1}$, $k_{A'} = 5.3 \times 10^7\ L\ mol^{-1}\ s^{-1}$.	777486
8.82	**1-Propanol, 3-(dimethylamino)-**						
	C_6H_6	6.8×10^7			PL/Ld-2	S = Ac.	89E324
	CF_3CH_2OH	1.8×10^5			PL/Ld 2	S = RB.	89E324
	CH_3CN	1.4×10^8			PL/Ld-2	S = RB.	89E324
	CH_3COCH_3	1.9×10^8			PL/Ld-2	S = RB.	89E324
8.83	**1-Propen-1-amine, *N,N*,2-trimethyl-**						
	C_6H_6	4.8×10^8 (k_r)			CP/Ac,A′c-17	S = ZnTPP; A′ = TME; used $k_r^{A'} = 4.8 \times 10^7\ L\ mol^{-1}\ s^{-1}$; meas. $k_r/k_r^{A'} = 10$.	75F656
	C_6H_6/ CH_3CN (5:95)				CP/Ac,A′c-17	S = ZnTPP; A′ = TME; meas. $k_r/k_r^{A'} = 9.4$.	75F656
	C_6H_6/ CH_3CN (80:20)				CP/Ac,A′c-17	S = ZnTPP; A′ = TME; meas. $k_r/k_r^{A'} = 7.8$.	75F656
	C_6H_6/ DMSO (20:80)				CP/Ac,A′c-17	S = ZnTPP; A′ = TME; meas. $k_r/k_r^{A'} = 9.1$.	75F656
	C_6H_6/ DMSO (60:40)				CP/Ac,A′c-17	S = ZnTPP; A′ = TME; meas. $k_r/k_r^{A'} = 7.6$.	75F656
	C_6H_6/ DMSO (80:20)				CP/Ac,A′c-17	S = ZnTPP; A′ = TME; meas. $k_r/k_r^{A'} = 11$.	75F656
	C_6H_6/ MeOH (30:70)				CP/Ac,A′c-17	S = ZnTPP; A′ = TME; meas. $k_r/k_r^{A'} = 2.9$.	75F656
	C_6H_6/ MeOH (5:95)				CP/Ac,A′c-17	S = ZnTPP; A′ = TME; meas. $k_r/k_r^{A'} = 2.2$.	75F656
	C_6H_6/ *n*-C_5H_{12} (5:95)				CP/Ac,A′c-17	S = ZnTPP; A′ = TME; meas. $k_r/k_r^{A'} = 7.1$.	75F656
8.84	**Propylamine**						
	$CHCl_3$	2.3×10^5			CP/A′c-33	S = A′ = Rub; used $k_d = 1.7 \times 10^4\ s^{-1}$, $k_{A'} = 5.3 \times 10^7\ L\ mol^{-1}\ s^{-1}$.	777486
8.85	**Propylamine, 2-methyl-**						
	$CHCl_3$	4.1×10^5			CP/A′c-33	S = A′ = Rub; used $k_d = 1.7 \times 10^4\ s^{-1}$, $k_{A'} = 5.3 \times 10^7\ L\ mol^{-1}\ s^{-1}$.	777486
8.86	**Propylamine, *N*-propyl-**						
	c-C_6H_{12}	9.7×10^6			PL/Ld-2	S = 2-ACN.	90N078

TABLE 8. Rate constants for the interaction of singlet oxygen with aliphatic and alicyclic amines. — Continued

	Solvent	k (L mol^{-1} s^{-1})	β (k_d/k) (mol L^{-1})	T (K)	Method	Comment	Ref.
8.86	**Propylamine, *N*-propyl-** — Continued						
	$CHCl_3$	1.8×10^7			CP/A'c-33	S = A' = Rub; used $k_d = 1.7 \times 10^4$ s^{-1}, $k_{A'} = 5.3 \times 10^7$ L mol^{-1} s^{-1}.	777486
8.87	**Propyn-1-amine, *N,N*-diethyl-**						
	$CHCl_3$	2×10^8			CR/A'c-33	A' = Rub; used $k_d = 1.7 \times 10^4$ s^{-1}, $k_{A'} = 5.3 \times 10^7$ L mol^{-1} s^{-1}; $^1O_2$* from $DMNO_2$.	81E003
8.88	**Pyrazolo[1,2-*a*][1,2]diazepine, hexahydro-**						
	CH_3CN	7.1×10^8			PL/Ld-2	S = RB.	90E297
8.89	**Pyrazolo[1,2-*a*]pyrazole, tetrahydro-**						
	CH_3CN	7.7×10^8			PL/Ld-2	S = RB.	90E297
8.90	**Pyrazolo[1,2-*a*]pyrazole, tetrahydro-2,2,6,6-tetramethyl-**						
	C_6H_6	1.8×10^9			PL/Ld-2	S = Ac.	90E297
	CH_3CN	1.3×10^9			PL/Ld-2	S = RB.	90E297
8.91	**Pyridazine, hexahydro-1,2-dimethyl-**						
	CH_3CN	4.6×10^8			PL/Ld-2	S = RB.	90E297
8.92	**Pyridazino[1,2-*a*]pyridazine, octahydro-**						
	C_6H_6	2.8×10^8			PL/Ld-2	S = Ac.	90E297
	CF_3CH_2OH	2.5×10^6			PL/Ld-2	S = RB.	90E297
	CH_3CN	2.9×10^8			PL/Ld-2	S = RB.	90E297
	2-PrOH	7.4×10^7			PL/Ld-2	S = RB.	90E297
8.93	**Pyridine, 3-(1-methyl-2-pyrrolidinyl)- (Nicotine)**						
	CH_3CN/D_2O (80:20)	5.9×10^7 (k_q)			PL/A'd-5	S = 2-ACN; A' = DPBF; $k_r = 0$ estd. from lack of formation of O_2^-, detd. from buildup of radical anion in soln. contg. (2-20) $\times 10^{-5}$ mol L^{-1} 1,4-benzoquinone in CH_3CN/D_2O (1:4).	81A191
	$CHCl_3$	3.8×10^7	2.6×10^{-4}		CP/A'c-16	S = A' = Rub; used $k_d = 1 \times 10^4$ s^{-1}.	84F670
	MeOH		0.23	288	CP/Oc-?	S = RB; A' = α-Terpinene; meas. $k_q/k_r = 5.4$.	587004
8.94	**Pyridine, 1,2,3,6-tetrahydro-1-methyl-4-phenyl-**						
	D_2O	3.1×10^4			PL/Ld-2	S – MB; P – *N*-Methyl-4-phenyl-2,3-dihydropyridinium.	91R251
8.95	**1-Pyrrolidinamine, *N,N*-dimethyl-**						
	CH_3CN	5.6×10^8			PL/Ld-2	S = RB.	90E297
8.96	**Pyrrolidine**						
	c-C_6H_{12} (mic)	1.9×10^8		313	CP/A'c-16	S = Fl^{2-}; A' = DPBF; used $k_d = 5.9 \times 10^4$ s^{-1}; DAP reverse micelles.	80N021
	CF_3CH_2OH	1.5×10^4			PL/Ld-2	S = RB.	89E324
	CH_3CN	1.4×10^8			PL/Ld-2	S = RB.	89E324
	MeOH	6.5×10^7		313	CP/A'c-16	S = Fl^{2-}; A' = DPBF; used $k_d = 1.4 \times 10^5$ s^{-1}.	80N021
	MeOH	2.1×10^6	0.042		CP/A'c-16	S = RB; A' = DPBF; used $k_d = 9.0 \times 10^4$ s^{-1}.	736061
	2-PrOH	2.2×10^6			PL/Ld-2	S = RB.	89E324
8.97	**Quinuclidine**						
	MeOH	1.8×10^6	0.051		CP/A'c-16	S = RB; A' = DPBF; used $k_d = 9.0 \times 10^4$ s^{-1}.	736061
8.98	**Reserpine**						
	$CHCl_3$	2.7×10^7	3.8×10^{-4}		CP/A'c-16	S = A' = Rub; used $k_d = 1 \times 10^4$ s^{-1}.	84F670

TABLE 8. Rate constants for the interaction of singlet oxygen with aliphatic and alicyclic amines. — Continued

No.	Solvent	k (L mol^{-1} s^{-1})	β (k_d/k) (mol L^{-1})	T (K)	Method	Comment	Ref.
8.99	**Strychnine**						
	C_6D_6	8.8×10^8			PR/Ld-2	S = 2-ACN.	89E113
	$C_6H_5CH_3$	9.3×10^8			PL/Ld-2	S = 2-ACN; $\Delta H‡ = 4$ kJ mol^{-1}; $\Delta S‡ = -77$ J K^{-1} mol^{-1}; $E_a = 7$ kJ mol^{-1}; studied at 183-363 K.	88A427 84E066
	C_6H_6	9.0×10^8			PL/Ld-2	S = 2-ACN.	93E248
	C_6H_6	1.0×10^9 (k_q)			PL/Ld-2	S = 2-ACN; comparison with TME shows strychnine 10 times less reactive, therefore k is at least 99% k_q.	84E066
	CH_3CN	6.4×10^8			PL/Ld-2	S = 2-ACN.	84E066
	CH_3COCH_3	9.4×10^8			PL/Ld-2	S = 2-ACN.	84E066
	$CHCl_3$	2.4×10^8	4.3×10^{-5}		CP/A'c-16	S = A' = Rub; used $k_d = 1 \times 10^4$ s^{-1}.	84F670
	EtOH	1.1×10^8			PL/Ld-2	S = 2-ACN.	84E066
8.100	**Vincamine**						
	$CHCl_3$	4.3×10^7	2.3×10^{-4}		CP/A'c-16	S = A' = Rub; used $k_d = 1 \times 10^4$ s^{-1}.	84F670
8.101	**Yohasan-17-oic acid, 19,20-dihydro-3-oxo-, methyl ester, (20α) (Dregamine)**						
	C_6H_6		1.5×10^{-3}		CP/Ac-15	S = ZnTPP.	78F474
	MeOH/ C_6H_6 (67:33)		2.0×10^{-3}		CP/Ac-15	S = ZnTPP.	78F474

TABLE 9. Rate constants for the interaction of singlet oxygen with aromatic amines.

No.	Solvent	k ($L\ mol^{-1}\ s^{-1}$)	β (k_d/k) ($mol\ L^{-1}$)	T (K)	Method	Comment	Ref.
9.1	**Aniline**						
	EtOH				CP/A'c-20	S = Eos,Ery, or RB; A' = TME; meas. $k_A/k_{A'}$ = 3.0.	717299
	EtOH				CP/A'c-20	S = A; A' = TME; meas. $k_A/k_{A'} = 2.7$.	717299
	c-C_6H_{12} (mic)	3.9×10^7			CP/A'c-16	S = Fl^{2-}; A' = DPBF; used $k_d = 5.9 \times 10^4\ s^{-1}$; DAP reverse micelles.	80N021
	MeOH	2.0×10^9			CP/A'c-16	S = Fl^{2-}; A' = DPBF; used $k_d = 1.4 \times 10^5\ s^{-1}$.	80N021
	MeOH/ C_6H_6 (67:33)		1.5×10^{-4}	298	CR/A'c-17	A' = Rub; used $\beta_{A'} = 1.4 \times 10^{-3}\ mol\ L^{-1}$; $^1O_2$* from $(PhO)_3PO_3$.	80M378
9.2	**Aniline, 4-bromo-*N,N*-dimethyl-**						
	MeOH	2×10^7			PL/A'd-8	S = MB; A' = DPBF.	74F640
	MeOH		3×10^{-3}		CP/A'c-16	S = RB; A' = DPBF.	736061
9.3	**Aniline, 3-chloro-*N,N*-dimethyl-**						
	MeOH	1.1×10^7			PL/A'd-8	S = MB; A' = DPBF.	74F640
	MeOH		7.1×10^{-3}		CP/A'c-16	S = RB; A' = DPBF.	736061
9.4	**Aniline, 4-chloro-*N,N*-dimethyl-**						
	MeOH/ H_2O (50:50)	3.6×10^7		308	CR/A'c-16	A' = DPBF; used $k_d = 2.8 \times 10^5\ s^{-1}$; $^1O_2$* from $MNPO_2$.	83A094
9.5	**Aniline, 3,4-dimethoxy-*N,N*-dimethyl-**						
	MeOH/ H_2O (50:50)	8.8×10^8		308	CR/A'c-16	A' = DPBF; used $k_d = 2.8 \times 10^5\ s^{-1}$; $^1O_2$* from $MNPO_2$.	83A094
9.6	**Aniline, *N,N*-dimethyl-**						
	C_5H_5N	1.0×10^8	5.9×10^{-4}		CP/Oc-20	S = RB; A' = 2M2P; used $k_d = 3.1 \times 10^4\ s^{-1}$, $\beta_{A'}$ = 0.043 $mol\ L^{-1}$.	757166
	c-C_6H_{12} (mic)	3.3×10^7			CP/A'c-16	S = Fl^{2-}; A' = DPBF; used $k_d = 5.9 \times 10^4\ s^{-1}$; DAP reverse micelles.	80N021
	CH_3CN	4.8×10^8			PL/Ld-2	S = RB.	89E324
	MeOH	1.2×10^9			CP/A'c-16	S = Fl^{2-}; A' = DPBF; used $k_d = 1.4 \times 10^5\ s^{-1}$.	80N021
	MeOH		0.029		CP/A'c-?	S = RB; A' = 2,5-DMF; solvent ?.	777055
	MeOH	1.2×10^8	7.6×10^{-4}		CP/A'c-16	S = RB; A' = DPBF; used $k_d = 9.0 \times 10^4\ s^{-1}$.	736061
	MeOH	7.3×10^7			PL/A'd-8	S = MB; A' = DPBF.	737014
	MeOH/ C_6H_6 (67:33)		2.2×10^{-3}	298	CR/A'c-17	A' = Rub; used $\beta_{A'} = 1.4 \times 10^{-3}\ mol\ L^{-1}$; $^1O_2$* from $(PhO)_3PO_3$.	80M378
	MeOH/ H_2O (50:50)	3.6×10^7		308	CR/A'c-16	A' = DPBF; used $k_d = 2.8 \times 10^5\ s^{-1}$; $^1O_2$* from $MNPO_2$.	83A094
	2-PrOH	1.7×10^7			PL/Ld-2	S = RB.	89E324
9.7	**Aniline, *N,N*-dimethyl-4-nitroso-**						
	H_2O	6.8×10^7 (k_r)		298	CP/Ac-14	S = H_2TPPS^{4-}; used $k_d = 2.5 \times 10^5\ s^{-1}$; E_a = 15.9 $kJ\ mol^{-1}$; log(A) = 10.6; studied at 288-318 K; used $\phi_\Delta(S) = 0.7$, phosphate buffer contg. 1.6% NaCl.	91R053
9.8	**Aniline, *N,N*-diphenyl- (Triphenylamine)**						
	$C_6H_5CH_3$	1.6×10^5		293	PL/Ld-2	S = RBEE(Bu_3N); Pz also used as S.	92E220
9.9	**Aniline, 4-(ethoxycarbonyl)- (Ethyl 4-aminobenzoate)**						
	$CHCl_3$	8×10^4			CP/A'c-33	S = A' = Rub; used $k_d = 1.7 \times 10^4\ s^{-1}$, $k_{A'} = 5.3 \times 10^7\ L\ mol^{-1}\ s^{-1}$.	80A041

TABLE 9. Rate constants for the interaction of singlet oxygen with aromatic amines. — Continued

No.	Solvent	k ($L\ mol^{-1}\ s^{-1}$)	β (k_d/k) ($mol\ L^{-1}$)	T (K)	Method	Comment	Ref.
9.10	**Aniline, 4-formyl-*N,N*-dimethyl- (4-(Dimethylamino)benzaldehyde)**						
	$CHCl_3$	1.1×10^6			CP/A'c-33	S = A' = Rub; used $k_d = 1.7 \times 10^4\ s^{-1}$, $k_{A'} = 5.3 \times 10^7\ L\ mol^{-1}\ s^{-1}$.	80A041
	MeOH	1×10^6			PL/A'd-8	S = MB; A' = DPBF.	74F640
	MeOH		0.037		CP/A'c-16	S = RB; A' = DPBF.	736061
9.11	**Aniline, 2-methoxy-*N,N*-dimethyl-**						
	MeOH/ H_2O (50:50)	3.2×10^8		308	CR/A'c-16	A' = DPBF; used $k_d = 2.8 \times 10^5\ s^{-1}$; $^1O_2$* from $MNPO_2$.	83A094
9.12	**Aniline, 3-methoxy-*N,N*-dimethyl-**						
	MeOH	4.8×10^7			PL/A'd-8	S = MB; A' = DPBF.	74F640
	MeOH		2×10^{-3}		CP/A'c-16	S = RB; A' = DPBF.	736061
	MeOH/ H_2O (50:50)	8.4×10^7		308	CR/A'c-16	A' = DPBF; used $k_d = 2.8 \times 10^5\ s^{-1}$; $^1O_2$* from $MNPO_2$.	83A094
9.13	**Aniline, 4-methoxy-*N,N*-dimethyl-**						
	MeOH	2×10^8			PL/A'd-8	S = MB; A' = DPBF.	74F640
	MeOH		5×10^{-4}		CP/A'c-16	S = RB; A' = DPBF.	736061
	MeOH/ H_2O (50:50)	4.4×10^8	6.2×10^{-4}	308	CR/A'c-16	A' = DPBF; used $k_d = 2.8 \times 10^5\ s^{-1}$; $^1O_2$* from $MNPO_2$.	83A094
9.14	**Aniline, *N*-methyl-**						
	c-C_6H_{12} (mic)	5.5×10^7			CP/A'c-16	S = Fl^{2-}; A' = DPBF; used $k_d = 5.9 \times 10^4\ s^{-1}$; DAP reverse micelles.	80N021
	MeOH	8.0×10^8			CP/A'c-16	S = Fl^{2-}; A' = DPBF; used $k_d = 1.4 \times 10^5\ s^{-1}$.	80N021
	MeOH	2.7×10^7	3.4×10^{-3}		CP/A'c-16	S = RB; A' = DPBF; used $k_d = 9.0 \times 10^4\ s^{-1}$.	736061
	MeOH/ C_6H_6 (67:33)		5.3×10^{-4}	298	CR/A'c-17	A' = Rub; used $\beta_{A'} = 1.4 \times 10^{-3}\ mol\ L^{-1}$; $^1O_2$* from $(PhO)_3PO_3$.	80M378
9.15	**Aniline, *N,N*,2,4,6-pentamethyl-**						
	MeOH/ H_2O (50:50)	1.5×10^8		308	CR/A'c-16	A' = DPBF; used $k_d = 2.8 \times 10^5\ s^{-1}$; $^1O_2$* from $MNPO_2$.	83A094
9.16	**Aniline, *N*-phenyl- (Diphenylamine)**						
	MeOH	6.1×10^6	0.015		CP/A'c-16	S = RB; A' = DPBF; used $k_d = 9.0 \times 10^4\ s^{-1}$.	736061
	MeOH/ C_6H_6 (67:33)		5.4×10^{-5}	298	CR/A'c-17	A' = Rub; used $\beta_{A'} = 1.4 \times 10^{-3}\ mol\ L^{-1}$; $^1O_2$* from $(PhO)_3PO_3$.	80M378
9.17	**Aniline, *N,N*,2,4-tetramethyl-**						
	MeOH/ H_2O (50:50)	1.3×10^8		308	CR/A'c-16	A' = DPBF; used $k_d = 2.8 \times 10^5\ s^{-1}$; $^1O_2$* from $MNPO_2$.	83A094
9.18	**Aniline, 4-(1,1,3,3-tetramethylbutyl)-*N*-[4-(1,1,3,3-tetramethylbutyl)phenyl]-**						
	C_6H_6/ EtOH (89:11)	2.6×10^4 (k_r)		295	CP/Pa,A'c-17	S = RB; A' = Tetr; used $k_r^{A'} = 7 \times 10^7\ L\ mol^{-1}\ s^{-1}$; meas. $k_r/k_r^{A'} = 3.7 \times 10^{-4}$; P = nitroxide radicals.	757445
	C_6H_6/ EtOH (89:11)	7.3×10^6		295	CP/A'c-23	S = RB; A' = Tetr; used $k_d = 3 \times 10^4\ s^{-1}$, $k_{A'} = 7 \times 10^7\ L\ mol^{-1}\ s^{-1}$; A'' = Ni(II) dibutyldithiocarbamate. used $k_{A''} = 1.6 \times 10^9\ L\ mol^{-1}\ s^{-1}$.	757445
9.19	**Aniline, *N,N*,4-trimethyl-**						
	MeOH	1×10^8			PL/A'd-8	S = MB; A' = DPBF.	74F640
	MeOH		5.5×10^{-4}		CP/A'c-16	S = RB; A' = DPBF.	736061
	MeOH/ H_2O (50:50)	1.1×10^8		308	CR/A'c-16	A' = DPBF; used $k_d = 2.8 \times 10^5\ s^{-1}$; $^1O_2$* from $MNPO_2$.	83A094

TABLE 9. Rate constants for the interaction of singlet oxygen with aromatic amines. — Continued

No.	Solvent	k ($L\ mol^{-1}\ s^{-1}$)	β (k_d/k) ($mol\ L^{-1}$)	T (K)	Method	Comment	Ref.
9.20	**Anthracenamine, *N*-methyl-9,10-diphenyl-**						
	C_6H_6	3.5×10^8	1.2×10^{-4}	298	CP/Ac-16	S = A; A′ = 1,2-Dithiolane-3-pentanoic acid; used $k_d = 4.2 \times 10^4\ s^{-1}$.	757558
9.21	**Benzoic acid, 4-(dimethylamino)-, ethyl ester**						
	$CHCl_3$	6×10^6			CP/A′c-33	S = A′ = Rub; used $k_d = 1.7 \times 10^4\ s^{-1}$, $k_{A'} = 5.3 \times 10^7\ L\ mol^{-1}\ s^{-1}$.	80A041
9.22	**Benzonitrile, 4-(dimethylamino)-**						
	MeOH	5.7×10^5			PL/A′d-8	S = MB; A′ = DPBF.	74F640
	MeOH		0.050		CP/A′c-16	S = RB; A′ = DPBF.	736061
9.23	**Biphenyl, 4,4′-diamino-**						
	EtOH	3.0×10^9		273	CP/Oc-23	S = MB; A′ = 2,5-DMF; used $k_d = 7.9 \times 10^4\ s^{-1}$, $k_{A'} = 5.3 \times 10^8\ L\ mol^{-1}\ s^{-1}$; k calcd. in [81Z251].	72F518
9.24	**Naphthalene, 2-amino-**						
	EtOH	9.6×10^8		273	CP/Oc-23	S = MB; A′ = 2,5-DMF; used $k_d = 7.9 \times 10^4\ s^{-1}$, $k_{A'} = 5.3 \times 10^8\ L\ mol^{-1}\ s^{-1}$; k calcd. in [81Z251].	72F518
9.25	***o*-Phenylenediamine**						
	EtOH	3.4×10^9		273	CP/Oc-23	S = MB; A′ = 2,5-DMF; used $k_d = 7.9 \times 10^4\ s^{-1}$, $k_{A'} = 5.3 \times 10^8\ L\ mol^{-1}\ s^{-1}$; k calcd. in [81Z251].	72F518
9.26	***o*-Phenylenediamine, *N,N,N′,N′*-tetramethyl-**						
	MeOH/ H_2O (50:50)	1.1×10^9		308	CR/A′c-16	A′ = DPBF; used $k_d = 2.8 \times 10^5\ s^{-1}$; $^1O_2$* from $MNPO_2$.	83A094
9.27	***m*-Phenylenediamine, *N,N,N′,N′*-tetramethyl-**						
	MeOH/ H_2O (50:50)	7.4×10^8		308	CR/A′c-16	A′ = DPBF; used $k_d = 2.8 \times 10^5\ s^{-1}$; $^1O_2$* from $MNPO_2$.	83A094
9.28	***p*-Phenylenediamine, *N*-cyclohexyl-*N′*-phenyl-**						
	EtOH	5.9×10^9		273	CP/Oc-20	S = MB; A′ = 2,5-DMF; used $k_d = 7.9 \times 10^4\ s^{-1}$, $k_{A'} = 5.3 \times 10^8\ L\ mol^{-1}\ s^{-1}$; k calcd. in [81Z251].	72F518
	EtOH	1.1×10^{10}		273	CP/Oc-20	S = MB; A′ = 2,5-DMF; used $k_{A'} = 2.3 \times 10^8\ L\ mol^{-1}\ s^{-1}$; meas. $k_A/k_{A'} = 47$; k calcd. in [81Z251].	72F518
9.29	***p*-Phenylenediamine, *N,N′*-diphenyl-**						
	EtOH/ $CHCl_3$ (50:50)	2.2×10^8		310	CR/LI-12	used $k_d = 1 \times 10^5\ s^{-1}$; $^1O_2$* from $NDPO_2$.	90A184
9.30	***p*-Phenylenediamine, *N*-(1-methylethyl)-*N′*-phenyl-**						
	n-$C_{16}H_{34}$	4.0×10^8		298	MD/A′c-33	A′ = Rub; used $k_d = 9.0 \times 10^4\ s^{-1}$, $k_{A'} = 7.3 \times 10^7\ L\ mol^{-1}\ s^{-1}$.	747341
	EtOH	6.7×10^9		273	CP/Oc-23	S = MB; A′ = 2,5-DMF; used $k_d = 7.9 \times 10^4\ s^{-1}$, $k_{A'} = 5.3 \times 10^8\ L\ mol^{-1}\ s^{-1}$; k calcd. in [81Z251].	72F518
	i-octane	2.1×10^8		298	CP/A′c-23	S = A′ = Rub; used $k_d = 4.7 \times 10^4\ s^{-1}$, $k_{A'} = 7.3 \times 10^7\ L\ mol^{-1}\ s^{-1}$.	747341
	i-octane	3.3×10^8			CP/A′c-23	S = A′ = Rub; used $k_d = 4 \times 10^4\ s^{-1}$, $k_{A'} = 7 \times 10^7\ L\ mol^{-1}\ s^{-1}$.	732066
9.31	***p*-Phenylenediamine, *N,N,N′,N′*-tetramethyl-**						
	H_2O	~3×10^9 (k_r)			PL/Pa-14	S = Ery; used $k_d = 3.3 \times 10^5\ s^{-1}$; P = $[TMPD]^{\cdot+}$; used ϕ_Δ(Ery) = 0.68.	82A080
	MeOH	1×10^9			PL/A′d-8	S = MB; A′ = DPBF.	74F640
	MeOH		1.5×10^{-4}		CP/A′c-16	S = RB; A′ = DPBF.	736061

TABLE 9. Rate constants for the interaction of singlet oxygen with aromatic amines. — Continued

No.	Solvent	k (L mol^{-1} s^{-1})	β (k_d/k) (mol L^{-1})	T (K)	Method	Comment	Ref.
9.31	***p*-Phenylenediamine, *N,N,N′,N′*-tetramethyl-** — Continued						
	MeOH/ H_2O (50:50)	1.8×10^9	1.5×10^{-4}	308	CR/A′c-16	A′ = DPBF; used $k_d = 2.8 \times 10^5$ s^{-1}; $^1O_2$* from $MNPO_2$.	83A094
9.32	**Phenylhydrazine**						
	C_5H_5N	1.4×10^8 (k_r)			PL/Ld-2	S = TPP, MPDEE or PdMP; meas. $\phi_{ox} = \phi_\Delta$.	80A398
	CCl_4	8.6×10^6			PL/Ld-2	S = MPDEE.	80A398
	CH_3COCH_3	9×10^7 (k_r)			PL/Ld-2	S = TPP, MPDEE or PdMP; meas. $\phi_{ox} = \phi_\Delta$.	80A398
	$CHCl_3$	7.5×10^6			PL/Ld-2	S = TPP, MPDEE or PdMP.	80A398
9.33	**Phthalazine-1,4-dione, 5-amino-2,3-dihydro-**						
	H_2O pH = 10.1	9.3×10^8			CL/LI-12	S = RB; used $k_d = 2.4 \times 10^5$ s^{-1}.	90F502
	H_2O pH = 7.1	1.4×10^9			CL/LI-12	S = RB; used $k_d = 2.4 \times 10^5$ s^{-1}.	90F502

TABLE 10. Rate constants for the interaction of singlet oxygen with amino acids, peptides and proteins.

No.	Solvent	k ($L\ mol^{-1}\ s^{-1}$)	β (k_d/k) ($mol\ L^{-1}$)	T (K)	Method	Comment	Ref.
10.1	**Alanine**						
	D_2O pD = 8.4	2×10^6 (k_r)		293	CL/Ad-35	used $k_d = 2.9 \times 10^4\ s^{-1}$; high pressure O_2 (0.195 $mol\ L^{-1}$).	79A112
	D_2O pD = 8.1	1.3×10^6		295	CL/A'd-22	A' = BR^{2-}; used $k_d = 2.9 \times 10^4\ s^{-1}$; high pressure O_2; recalc. [79A112].	757147
	H_2O pH = 10.6	3.0×10^7		310	CR/LI-12	used $k_d = 3.2 \times 10^5\ s^{-1}$; soln. cont. 5×10^{-4} mol L^{-1} $CoCl_2$, $^1O_2$* from autoxidation of oxytetracycline.	92M228
	H_2O/ MeOH (50:50)	$\leq 1 \times 10^7$			PL/A'd-5	S = MB; A' = DPBF.	72F516
10.2	**β-Alanine**						
	H_2O pH = 7.0			283	CP/A'c-17	S = RB; A' = BHMF; meas. $k_r/k_r^{A'} = 0.82$; sensitizer immobilized on glass beads.	88R064
10.3	**β-Alanine, L-histidyl-**						
	H_2O pH = 7.0			283	CP/A'c-17	S = RB; A' = BHMF; meas. $k_r/k_r^{A'} = 0.77$; sensitizer immobilized on glass beads.	88R064
10.4	**Albumin**						
	D_2O	2×10^8			PL/Ld-2	S = RF, water-sol. TPP derivs., or Chl a in micelles contg. Triton X-100; average for bovine or human serum albumin.	86F149
	D_2O pH = 7	5×10^8			PL/Ld-2	S = $SnTPPSCl_2^{4-}$; Soln. contg. 2×10^{-3} mol L^{-1} phosphate buffer and 1% NaCl wt/wt; human serum albumin.	90A022
10.5	**Aposuperoxide dismutase**						
	D_2O pD = 8.1	1.1×10^9		295	CP/A'd-22	S = MB; A' = BR^{2-}; used $k_d = 5.0 \times 10^4\ s^{-1}$.	757147
	D_2O pD = 8.1	2.5×10^9		295	CL/A'd-22	A' = BR^{2-}; used $k_d = 5.0 \times 10^4\ s^{-1}$; high pressure O_2.	757147
10.6	**Arginine**						
	H_2O pH = 7.1	$\leq 1 \times 10^6$		298	CP/Oc-19	S = Phenosafranine; No measurable effect.	78A360
10.7	**Carbonic anhydrase**						
	D_2O pD = 8.1	8.0×10^8		295	CL/A'd-22	A' = BR^{2-}; used $k_d = 5.0 \times 10^4\ s^{-1}$; high pressure O_2.	757147
	D_2O pD = 8.1	6.5×10^8		295	CP/A'd-22	S = MB; A' = BR^{2-}; used $k_d = 5.0 \times 10^4\ s^{-1}$.	757147
10.8	**Cytochrome b**						
	H_2O pH = 7.4	1.4×10^8			CP/Ac,Oc-18	S = RB; A' = His; used $k_d = 4.5 \times 10^5\ s^{-1}$, $k_{A'} = 1 \times 10^8\ L\ mol^{-1}\ s^{-1}$; in submitochondria particles.	90R212
10.9	**Cytochrome C (ferro)**						
	CH_3CN/ D_2O (80:20)	4.9×10^8			PL/A'd-5	S = 2-ACN: A' = DPBF.	80R072
	H_2O pH = 7.4	5.6×10^8			CP/Ac,Oc-18	S = RB; A' = His; used $k_d = 4.5 \times 10^5\ s^{-1}$, $k_{A'} = 1 \times 10^8\ L\ mol^{-1}\ s^{-1}$; in submitochondria particles.	90R212
10.10	**Cytochrome C oxidase**						
	H_2O pH = 7.4	1.0×10^8			CP/Ac,Oc-18	S = RB; A' = His; used $k_d = 4.5 \times 10^5\ s^{-1}$, $k_{A'} = 1 \times 10^8\ L\ mol^{-1}\ s^{-1}$; in submitochondria particles.	90R212
10.11	**Dehydrogenase, 3-hydroxybutyrate**						
	H_2O pH = 7.4	6.1×10^8			CP/Ac,Oc-18	S = RB; A' = His; used $k_d = 4.5 \times 10^5\ s^{-1}$, $k_{A'} = 1 \times 10^8\ L\ mol^{-1}\ s^{-1}$; in submitochondria particles.	90R212

TABLE 10. Rate constants for the interaction of singlet oxygen with amino acids, peptides and proteins. — Continued

No.	Solvent	k (L mol^{-1} s^{-1})	β (k_d/k) (mol L^{-1})	T (K)	Method	Comment	Ref.
10.11	**Dehydrogenase, 3-hydroxybutyrate** — Continued						
	H_2O pH = 7.2	1.2×10^9		295	CP/Ac,A'c-16	S = AlCl(tspc); A' = DPBF; estd. [$^1O_2$*] from DPBF consumption in MeOH; k_d not given; enzyme inactivation rate in suspension of sub-mitochondria particles.	87R074
10.12	**Dehydrogenase, nicotinamide adenine dinucleotide (reduced)**						
	H_2O pH = 7.4	1.7×10^8			CP/Ac,Oc-18	S = RB; A' = His; used $k_d = 4.5 \times 10^5$ s^{-1}, $k_{A'} = 1 \times 10^8$ L mol^{-1} s^{-1}; in submitochondria particles.	90R212
10.13	**Dehydrogenase, succinate**						
	H_2O pH = 7.4	1.4×10^9			CP/Ac,Oc-18	S = RB; A' = His; used $k_d = 4.5 \times 10^5$ s^{-1}, $k_{A'} = 1 \times 10^8$ L mol^{-1} s^{-1}; in submitochondria particles.	90R212
10.14	**Dismutase, superoxide**						
	D_2O pD = 8.1	8.2×10^8		295	CP/A'd-22	S = MB; A' = BR^{2-}; used $k_d = 5.0 \times 10^4$ s^{-1}.	757147
	D_2O pD = 8.1	2.6×10^9		295	CL/A'd-22	A' = BR^{2-}; used $k_d = 5.0 \times 10^4$ s^{-1}; high pressure O_2.	757147
	H_2O pH = 7.1	2.7×10^9			CL/LI-12	S = RB; used $k_d = 2.4 \times 10^5$ s^{-1}.	90F502
10.15	**Glycine**						
	D_2O/ EtOH (75:25)	$<1 \times 10^5$		295	PL/Ld-2	S = RB.	94A113
10.16	**Glycine, glycyl-**						
	D_2O/ EtOH (75:25)	$<1 \times 10^5$		295	PL/Ld-2	S = RB.	94A113
10.17	**Glycine, glycylglycyl-**						
	D_2O/ EtOH (75:25)	$<1 \times 10^5$		295	PL/Ld-2	S = RB.	94A113
10.18	**Glycine, glycylglycylglycyl-**						
	D_2O/ EtOH (75:25)	$<1 \times 10^5$		295	PL/Ld-2	S = RB.	94A113
10.19	**Glycine, glycyl-L-histidyl-**						
	D_2O/ EtOH (75:25)	4.9×10^7		295	PL/Ld-2	S = RB.	94A113
10.20	**Glycine, histidyl-**						
	CH_3CN/ H_2O (50:50)	1.4×10^7			PL/Ld-2	S = RB or Eos.	93R059
	CH_3CN/ H_2O (50:50)	7.4×10^6 (k_r)			CP/Ac,A'c-17	S = RB; A' = DMA; $k_r^{A'}$ not given.	93R059
	D_2O/ EtOH (75:25)	5.2×10^7		295	PL/Ld-2	S = RB.	94A113
	H_2O pH – 7	6.5×10^7			CP/A'c-18	S = RB; A' = TrpH; used $k_d = 2.5 \times 10^5$ s^{-1}, $k_{A'} = 6 \times 10^8$ L mol^{-1} s^{-1}.	93R059
	H_2O pH = 7	6.6×10^7 (k_r)			CP/Oc-17	S = RB; A' = FFA; used $k_r^{A'} = 1.2 \times 10^8$ L mol^{-1} s^{-1}.	93R059
10.21	**Glycine, tryptophyl-**						
	EtOH/ CH_3CN (80:20)	1.0×10^7			PL/Ld-2	S = ZnTPP.	91A252
	EtOH/ CH_3CN (80:20)	7.4×10^5 (k_r)			CP/A'c-18	S = ZnTPP; A' = DMA; used $k_d = 5.3 \times 10^4$ s^{-1}, $k_{A'} = 3 \times 10^7$ L mol^{-1} s^{-1}; used $k_A = 1.0 \times 10^7$ L mol^{-1} s^{-1}.	91A252
	H_2O pH = 7	3.3×10^7 (k_r)			CP/Oc-17	S = RB; A' = Met; used $k_r^{A'} = 2 \times 10^7$ L mol^{-1} s^{-1}.	91A252

TABLE 10. Rate constants for the interaction of singlet oxygen with amino acids, peptides and proteins. — Continued

No.	Solvent	k (L mol^{-1} s^{-1})	β (k_d/k) (mol L^{-1})	T (K)	Method	Comment	Ref.
10.22	**Glycine, L-tryptophylglycyl-**						
	D_2O/ EtOH (75:25)	1.7×10^7 (k_r)		295	CP/Ac-14,28	S = RB; used $k_d = 4.8 \times 10^4$ s^{-1}; DMA as actinometer, k_r derived using $k_A = 3.1 \times 10^7$ L mol^{-1} s^{-1}.	94A113
	D_2O/ EtOH (75:25)	3.1×10^7		295	PL/Ld-2	S = RB.	94A113
10.23	**Histidine**						
	D_2O/ EtOH (75:25)	4.6×10^7		295	PL/Ld-2	S = RB.	94A113
	D_2O/ EtOH (75:25)	3.4×10^7 (k_r)		295	CP/Ac-14,28	S = RB; used $k_d = 4.8 \times 10^4$ s^{-1}; DMA as actinometer, k_r derived using $k_A = 4.6 \times 10^7$ L mol^{-1} s^{-1}.	94A113
	CH_3CN/ H_2O (50:50)	1.6×10^7			PL/Ld-2	S = RB or Eos.	93R059
	CH_3CN/ H_2O (50:50)	8.1×10^6 (k_r)			CP/Ac,A'c-17	S = RB; A' = DMA; $k_r^{A'}$ not given.	93R059
	D_2O pD = 7	4×10^7			PL/Ld-2	S = Carboxyanthracene.	92E225
	D_2O pH = ~7	4.4×10^7		293	PL/Ld-2	S = H_2TPPS^{4-}.	86A198
	D_2O pD = 7.4	6.1×10^7			PL/A'd-5	S = MB; A' = ADPA.	81N048 80A205
	D_2O pD = 8.4	1.0×10^8 (k_r)		293	CL/Ad-35	used $k_d = 2.9 \times 10^4$ s^{-1}; high pressure O_2 (0.195 mol L^{-1}); unreactive at pH <7.	79A112
	D_2O pD = 8.1	1.0×10^8		295	CL/A'd-22	A' = BR^{2-}; used $k_d = 2.9 \times 10^4$ s^{-1}; high pressure O_2; recalc. [79A112].	757147
	D_2O pD = 11.2	2.8×10^8		310	CR/A'c-32	A' = DPBF; used $k_d = 1.5 \times 10^4$ s^{-1}; $^1O_2$* from DOPA/H_2O_2.	89M038
	D_2O pD = 11.2	9.3×10^8		310	CR/A'c-32	A' = DPBF; used $k_d = 1.5 \times 10^4$ s^{-1}; $^1O_2$* from Dopamine/H_2O_2.	89M038
	D_2O (mic) pD = 9.3	6.7×10^7			PL/A'd-5	S = 2-ACN; A' = DPBF; in vesicles (4.0×10^{-2} mol L^{-1} DDAB).	82N027
	D_2O (mic) pD = 7.4	5.9×10^7			PL/A'd-5	S = 2-ACN; A' = DPBF; micellar soln. 0.1 mol L^{-1} SDS or CTAB.	81N048
	H_2O pH = 10.6	5.7×10^7		310	CR/LI-12	used $k_d = 3.2 \times 10^5$ s^{-1}; soln. cont. 5×10^{-4} mol L^{-1} $CoCl_2$, $^1O_2$* from autoxidation of oxytetracycline.	92M228
	H_2O pH = 7	9.0×10^7			CP/A'c-18	S = RB; A' = TrpH; used $k_d = 2.5 \times 10^5$ s^{-1}, $k_{A'} = 6 \times 10^8$ L mol^{-1} s^{-1}.	93R059
	H_2O pH = 7	9.0×10^7 (k_r)			CP/Oc-17	S = RB; A' = FFA; used $k_r^{A'} = 1.2 \times 10^8$ L mol^{-1} s^{-1}.	93R059
	H_2O pH = 7.0			283	CP/A'c-17	S = RB; A' = BHMF; meas. $k_r/k_r^{A'} = 0.94$; sensitizer immobilized on glass beads.	88R064
	H_2O pH = 7.0			283	CP/A'c-17	S = RB; A' = BHMF; meas. $k_r/k_r^{A'} = 0.92$.	88R064
	H_2O pH = 7.1	3.2×10^7		298	CP/Oc-19	S = Phenosafranine; Q = NaN_3; used $k_Q = 2.0 \times 10^8$ L mol^{-1} s^{-1}.	78A360
	H_2O	5.4×10^9	9.2×10^{-5}	298	CP/Ac-15	S = MB; used $k_d = 5.0 \times 10^5$ s^{-1}.	78F061
	H_2O pH = 7.0		3.4×10^{-3}	283	CP/Oc-15	S = MB; The mechanism of oxidation is not clear.	65F029
	H_2O pH = 8.0		2.9×10^{-3}		CP/Oc-15	S = PF.	617008
	H_2O (mic)	6.7×10^7			CP/A'c-16	S = 2-ACN; A' = DPBF; DDDAB liposomes.	85R008
	H_2O/ MeOH (50:50)	7×10^6 (k_r)			CP/Ac,A'c-17	S = MB; A' = DPBF; used $k_r^{A'} = 8 \times 10^8$ L mol^{-1} s^{-1}; $k_r^{A'}$ in MeOH; k_r derived using $k_{TQ}^{A} = 1 \times 10^6$ L mol^{-1} s^{-1} and $k_A = 5 \times 10^7$ L mol^{-1} s^{-1}.	72F516

TABLE 10. Rate constants for the interaction of singlet oxygen with amino acids, peptides and proteins. — Continued

No.	Solvent	k ($L\ mol^{-1}\ s^{-1}$)	β (k_d/k) ($mol\ L^{-1}$)	T (K)	Method	Comment	Ref.
10.23	**Histidine** — Continued						
	H_2O/ MeOH (50:50)	5×10^7			PL/A'd-5	S = MB; A' = DPBF.	72F516
	MeOH	1.1×10^7		297	CR/P'a-16	A' = TEMP; k_d not given; formn. of TEMPO monitored by esr; soln. cont. MeONa and $CoCl_2$, $^1O_2$* from autoxidation of adrenaline.	92D227
10.24	**L-Histidine, β-alanyl- (Carnosine)**						
	D_2O pD = 7	3×10^7			PL/Ld-2	S = Carboxyanthracene.	92E225
	H_2O pH = 7.0			283	CP/A'c-17	S = RB; A' = BHMF; meas. $k_r/k_r^{A'} = 0.72$.	88R064
	H_2O pH = 7.0			283	CP/A'c-17	S = RB; A' = BHMF; meas. $k_r/k_r^{A'} = 0.76$; sensitizer immobilized on glass beads.	88R064
10.25	**Histidine, β-alanyl-1-methyl- (Anserine)**						
	D_2O pD = 7	3×10^7			PL/Ld-2	S = Carboxyanthracene.	92E225
10.26	**L-Histidine, *N*-(4-amino-1-oxobutyl)- (Homocarnosine)**						
	H_2O pH = 7.0			283	CP/A'c-17	S = RB; A' = BHMF; meas. $k_r/k_r^{A'} = 0.91$.	88R064
	H_2O pH = 7.0			283	CP/A'c-17	S = RB; A' = BHMF; meas. $k_r/k_r^{A'} = 1.0$; sensitizer immobilized on glass beads.	88R064
10.27	**Histidine, glycyl-**						
	CH_3CN/ H_2O (50:50)	9.2×10^6 (k_r)			CP/Ac,A'c-17	S = RB; A' = DMA; $k_r^{A'}$ not given.	93R059
	CH_3CN/ H_2O (50:50)	3.8×10^7			PL/Ld-2	S = RB or Eos.	93R059
	H_2O pH = 7	2.3×10^8			CP/A'c-18	S = RB; A' = TrpH; used $k_d = 1.5 \times 10^5\ s^{-1}$, $k_{A'} = 6 \times 10^8\ L\ mol^{-1}\ s^{-1}$.	93R059
	H_2O pH = 7	8.3×10^7 (k_r)			CP/Oc-17	S = RB; A' = FFA; used $k_r^{A'} = 1.2 \times 10^8\ L\ mol^{-1}\ s^{-1}$.	93R059
10.28	**L-Histidine, glycylglycyl-**						
	D_2O/ EtOH (75:25)	5.6×10^7		295	PL/Ld-2	S = RB.	94A113
10.29	**Luciferase**						
	H_2O pH = 8.0	1.9×10^9 (k_r)		277	CP/Ac-17	S = RB; A' = His; used $k_r^{A'} = 2.8 \times 10^7\ L\ mol^{-1}\ s^{-1}$; sensitizer immobilized on glass beads.	86R129
10.30	**Lysozyme**						
	D_2O pD = 5.9	4.7×10^7 (k_r) 5.9×10^8 (k_q)		293	CP/Ac-14,28	S = Acridine Orange; used $k_d = 5.0 \times 10^4\ s^{-1}$.	767105
	D_2O pD = 8.1	1.5×10^9		295	CL/A'd-22	A' = BR^{2-}; used $k_d = 5.0 \times 10^4\ s^{-1}$; high pressure O_2.	757147
	D_2O	1.3×10^9	4.0×10^{-5}	291	CP/Ac-15	S = 8-MOP; used $k_d = 5.0 \times 10^4\ s^{-1}$.	757485
	D_2O	2.5×10^8 (k_r)			CP/Ac-28	S = Eos; used $k_d = 5.0 \times 10^4\ s^{-1}$.	733045
	H_2O pH = 5.9	2.9×10^7 (k_r) 4.1×10^8 (k_q)		293	CP/Ac-14,28	S = Acridine Orange; used $k_d = 5.0 \times 10^5\ s^{-1}$.	767105
	H_2O	1.3×10^8 (k_r)			CP/Ac-28	S = Eos; used $k_d = 5.0 \times 10^5\ s^{-1}$.	733045
10.31	**Phenylalanine**						
	D_2O/ EtOH (75:25)	7×10^5		295	PL/Ld-2	S = RB.	94A113

TABLE 10. Rate constants for the interaction of singlet oxygen with amino acids, peptides and proteins. — Continued

No.	Solvent	k ($L\ mol^{-1}\ s^{-1}$)	β (k_d/k) ($mol\ L^{-1}$)	T (K)	Method	Comment	Ref.
10.32	**Subtilisin BPN'**						
	D_2O pH = 7.0	3×10^7 (k_r)			CP/Ac-14,27	S = HP; used $k_d = 1.5 \times 10^4\ s^{-1}$; k_r estimated using ϕ_Δ(HP) = 0.75.	83R008
10.33	**Trypsin**						
	H_2O pH = 7.0	8×10^9		298	CP/LI-12	S = Ret; used $k_d = 3.5 \times 10^5\ s^{-1}$.	80R116
	H_2O pH = 8.0	7.1×10^9	7.0×10^{-5}	288	CP/Pa-15	S = MB and FMN; used $k_d = 5.0 \times 10^5\ s^{-1}$; β calculated from data reported in [66F197].	73F659
10.34	**Tryptamine**						
	D_2O/ EtOH (75:25)	2.7×10^7 (k_r)		295	CP/Ac-14,28	S = RB; used $k_d = 4.8 \times 10^4\ s^{-1}$; DMA as actinometer, k_r derived using $k_A = 5.2 \times 10^7$ L $mol^{-1}\ s^{-1}$.	94A113
	D_2O/ EtOH (75:25)	5.2×10^7		295	PL/Ld-2	S = RB.	94A113
	H_2O pH = 7	7.8×10^9 (k_r)			CP/Oc-17	S = RB; A' = FFA; used $k_r^{A'} = 1.2 \times 10^8$ L $mol^{-1}\ s^{-1}$.	93F191
	MeOH/ H_2O (50:50)	9×10^6 (k_r)			CP/A'c-17	S = RB; A' = DPBF; used $k_r^{A'} = 8 \times 10^8$ L $mol^{-1}\ s^{-1}$; derived $k_q = 4.6 \times 10^7$ L $mol^{-1}\ s^{-1}$ using $k_A = 5.5 \times 10^7$ L $mol^{-1}\ s^{-1}$.	82A291
	MeOH/ H_2O (50:50)	5.5×10^7			CP/Ac-15	S = RB; used $k_d = 2.8 \times 10^5\ s^{-1}$.	82A291
10.35	**Tryptamine, *N*-methoxycarbonyl-**						
	MeOH/ H_2O (50:50)	3.2×10^7		308	CR/Ac-31	used $k_d = 2.8 \times 10^5\ s^{-1}$; $^1O_2$* from $MNPO_2$.	82A291
	MeOH/ H_2O (50:50)	3.2×10^7			CP/Ac-15	S = RB; used $k_d = 2.8 \times 10^5\ s^{-1}$.	82A291
	MeOH/ H_2O (50:50)	1.3×10^7 (k_r)		308	CR/A'c-17,31	A' = DPBF; used $k_r^{A'} = 8 \times 10^8$ L $mol^{-1}\ s^{-1}$; $^1O_2$* from $MNPO_2$; derived $k_q = 1.9 \times 10^7$ L $mol^{-1}\ s^{-1}$ using $k_A = 3.2 \times 10^7$ L $mol^{-1}\ s^{-1}$.	82A291
	MeOH/ H_2O (50:50)	7×10^6 (k_r)			CP/A'c-17	S = RB; A' = DPBF; used $k_r^{A'} = 8 \times 10^8$ L $mol^{-1}\ s^{-1}$; derived $k_q = 2.5 \times 10^7$ L $mol^{-1}\ s^{-1}$ using $k_A = 3.2 \times 10^7$ L $mol^{-1}\ s^{-1}$.	82A291
10.36	**Tryptophan**						
	n-C_7H_{16}/H_2O (mic)	$\sim 3 \times 10^7$			PL/Ld-2	S = RB; reverse micelles contg. 0.25 mol L^{-1} AOT.	84N114
	MeOH/ D_2O (90:10)	1.3×10^7		293	PL/Ld-2	S = HP.	84F327
	MeOH/ H_2O (50:50)	3.8×10^7 1.0×10^7 (k_r) 2.8×10^7 (k_q)			CP/Ac,Oc-14,29	S = RB; A' = 2,5-DMF; used $k_d = 2.9 \times 10^5\ s^{-1}$; meas. $k_q/k_r = 2.8$.	83A397
	D_2O pH = ~7	5.6×10^7		293	PL/Ld-2	S = H_2TPPS^{4-}.	86A198
	D_2O	$\sim 5 \times 10^7$			PL/Ld-2	S = RF, H_2TPPS^{4-}, or Chl in Triton X-100 micelles.	86F149
	D_2O	3.6×10^7 (k_r)		293	CP/Ac-14	S = HP; k_d not given; used ϕ_Δ(HP) = 0.41.	84F327
	D_2O pD = 7.4	7.2×10^7		293	PL/Ld-2	S = HP.	84F327
	D_2O pD = 7.4	6.1×10^7			PL/A'd-5	S = MB; A' = ADPA.	81N048
	D_2O pD = 8.4	3×10^7 (k_r)		293	CL/Ad-35	used $k_d = 2.9 \times 10^4\ s^{-1}$; high pressure O_2 (0.195 mol L^{-1}).	79A112
	D_2O pD = 8.1	5.1×10^7		295	CL/A'd-22	A' = BR^{2-}; used $k_d = 2.9 \times 10^4\ s^{-1}$; high pressure O_2; recalc. [79A112].	757147

TABLE 10. Rate constants for the interaction of singlet oxygen with amino acids, peptides and proteins. — Continued

No.	Solvent	k ($L\ mol^{-1}\ s^{-1}$)	β (k_d/k) ($mol\ L^{-1}$)	T (K)	Method	Comment	Ref.
10.36	**Tryptophan** — Continued						
	D_2O/ MeOH (70:30)	6.0×10^7		293	PL/Ld-2	S = HP.	84F327
	D_2O/ $HCONH_2$ (70:30)	5.2×10^7		293	PL/Ld-2	S = HP.	84F327
	D_2O (mic) pD = 7.4	4.2×10^7			PL/A'd-5	S = 2-ACN; A' = DPBF; 0.1 mol L^{-1} CTAB.	81N048
	D_2O (mic) pD = 7.4	4.0×10^7			PL/A'd-5	S = 2-ACN; A' = DPBF; 0.1 mol L^{-1} SDS.	81N048
	D_2O/ EtOH (75:25)	1.3×10^7 (k_r)		295	CP/Ac-14,28	S = RB; used $k_d = 4.8 \times 10^4\ s^{-1}$; DMA as actinometer, k_r derived using $k_A = 3.2 \times 10^7$ L $mol^{-1}\ s^{-1}$.	94A113
	D_2O/ EtOH (75:25)	3.2×10^7		295	PL/Ld-2	S = RB.	94A113
	EtOH	$\leq 5.0 \times 10^6$			PL/A'd-5	S = MB; A' = DPBF.	78A338
	EtOH/ CH_3CN (80:20)	6.3×10^6			PL/Ld-2	S = ZnTPP.	91A252
	EtOH/ CH_3CN (80:20)	4.8×10^5 (k_r)			CP/Ac,A'c-14,28	S = ZnTPP; A' = DMA; used $k_d = 5.3 \times 10^4\ s^{-1}$, $k_{A'} = 3 \times 10^7$ L $mol^{-1}\ s^{-1}$; k_r derived using $k_A = 6.3 \times 10^6$ L $mol^{-1}\ s^{-1}$.	91A252
	H_2O pH = 10.6	2.6×10^7		310	CR/LJ-12	used $k_d = 3.2 \times 10^5\ s^{-1}$; soln. cont. 5×10^{-4} mol L^{-1} $CoCl_2$, $^1O_2$* from autoxidation of oxytetracycline.	92M228
	H_2O pH = 7	3.2×10^7 (k_r)			CP/Oc-17	S = RB; A' = Met; used $k_r^{A'} = 2 \times 10^7$ L $mol^{-1}\ s^{-1}$.	91A252
	H_2O	5.9×10^7 (k_r)		298	CP/Ac-14	S = H_2TPPS^{4-}; used $k_d = 2.5 \times 10^5\ s^{-1}$; $E_a = 15.9$ kJ mol^{-1}; log(A) = 10.6; studied at 288-318 K; used $\phi_\Delta(S) = 0.7$, phosphate buffer contg. 1.6% NaCl.	91R053
	H_2O pH = 7	6.0×10^7 5×10^6 (k_r)			CP/Pa-14	S = GaCl(tspc); used $k_d = 2.4 \times 10^5\ s^{-1}$; P = Hydroperoxytryptophan; k_r estd. assuming $\phi_\Delta(S) = 0.5$.	87F104
	H_2O pH = 7.4	6.6×10^7 (k_r)		293	CP/Ac-14	S = HP; used $k_d = 2.5 \times 10^5\ s^{-1}$; k_d not given; used $\phi_\Delta(HP) = 0.41$.	84F327
	H_2O pH = 7.0		1.8×10^{-3}	283	CP/Oc-15	S = MB; The mechanism of oxidation is not clear.	65F029
	H_2O/ MeOH (50:50)	9.0×10^7			CP/Pa-14	S = RB or GaCl(tspc); used $k_d = 2.8 \times 10^5\ s^{-1}$; P = Hydroperoxytryptophan.	87F104
	H_2O/ MeOH (50:50) pH = 10				CP/A'c-17	S = RB; A' = His; meas. $k_r/k_r^{A'} = 0.6$; sensitizer immobilized on glass beads.	83F166
	H_2O/ MeOH (50:50)	7.1×10^7			CP/Ac-15	S = RB; used $k_d = 2.8 \times 10^5\ s^{-1}$.	82A291
	H_2O/ MeOH (50:50)	3×10^6 (k_r)			CP/A'c-17	S = RB; A' = DPBF; used $k_r^{A'} = 8 \times 10^8$ L $mol^{-1}\ s^{-1}$; derived $k_q = 6.8 \times 10^7$ L $mol^{-1}\ s^{-1}$ using $k_A = 7.1 \times 10^7$ L $mol^{-1}\ s^{-1}$.	82A291
	H_2O/ MeOH (50:50)	2.1×10^7		308	CR/Ac-31	used $k_d = 2.8 \times 10^5\ s^{-1}$; $^1O_2$* from $MNPO_2$.	82A291
	H_2O/ MeOH (50:50)	5×10^6 (k_r)		308	CR/A'c-17,31	A' = DPBF; used $k_r^{A'} = 8 \times 10^8$ L $mol^{-1}\ s^{-1}$; $^1O_2$* from $MNPO_2$; derived $k_q = 1.6 \times 10^7$ L $mol^{-1}\ s^{-1}$, using $k_A = 2.1 \times 10^7$ L $mol^{-1}\ s^{-1}$.	82A291
	H_2O/ MeOH (50:50)	3.0×10^7			PL/A'd-5	S = MB; A' = DPBF.	78A338
	H_2O/ MeOH (50:50)	4×10^7			PL/A'd-5	S = MB; A' = DPBF.	72F516

TABLE 10. Rate constants for the interaction of singlet oxygen with amino acids, peptides and proteins. — Continued

	Solvent	k ($L\ mol^{-1}\ s^{-1}$)	β (k_d/k) ($mol\ L^{-1}$)	T (K)	Method	Comment	Ref.
10.36	**Tryptophan — Continued**						
	H_2O/ MeOH (50:50)	4×10^6 (k_r)			CP/Ac,A'c-17	S = MB; A' = DPBF; used $k_r^{A'} = 8 \times 10^8$ L mol^{-1} s^{-1}; $k_r^{A'}$ in MeOH; k_r derived using $k_{TQ}^{A} = 2.0 \times 10^9$ L mol^{-1} s^{-1} and $k_A = 4 \times 10^7$ L mol^{-1} s^{-1}.	72F516
	$HCONH_2$/ D_2O (90:10)	8.7×10^7		293	PL/Ld-2	S = HP.	84F327
	$HCONHCH_3$	1.3×10^8			PL/A'd-5	S = MB; A' = DPBF.	78A338
	MeOH	6×10^6			PL/A'd-5	S = MB; A' = DPBF.	78A338
10.37	**Tryptophan, *N*-acetyl-**						
	D_2O/ EtOH (75:25)	4.2×10^7		295	PL/Ld-2	S = RB.	94A113
10.38	**Tryptophan, *N*-acetyl-, methyl ester**						
	D_2O/ EtOH (75:25)	3.2×10^7		295	PL/Ld-2	S = RB.	94A113
	MeOH/ H_2O (50:50)	6×10^6 (k_r)		308	CR/A'c 17,31	A' = DPBF; used $k_r^{A'} = 8 \times 10^8$ L mol^{-1} s^{-1}; $^1O_2$* from $MNPO_2$; derived $k_q = 1.8 \times 10^7$ L mol^{-1} s^{-1}, using $k_A = 2.4 \times 10^7$ L mol^{-1} s^{-1}.	82A291
	MeOH/ H_2O (50:50)	4×10^6 (k_r)			CP/A'c-17	S = RB; A' = DPBF; used $k_r^{A'} = 8 \times 10^8$ L mol^{-1} s^{-1}; derived $k_q = 5.9 \times 10^7$ L mol^{-1} s^{-1} using $k_A = 6.3 \times 10^7$ L mol^{-1} s^{-1}.	82A291
	MeOH/ H_2O (50:50)	2.4×10^7		308	CR/Ac-31	used $k_d = 2.8 \times 10^5$ s^{-1}; $^1O_2$* from $MNPO_2$.	82A291
	MeOH/ H_2O (50:50)	6.3×10^7			CP/Ac-15	S = RB; used $k_d = 2.8 \times 10^5$ s^{-1}.	82A291
10.39	**L-Tryptophan, L-alanyl-**						
	D_2O/ EtOH (75:25)	2.7×10^7 (k_r)		295	CP/Ac-14,28	S = RB; used $k_d = 4.8 \times 10^4$ s^{-1}; DMA as actinometer, k_r derived using $k_A = 4.0 \times 10^7$ L mol^{-1} s^{-1}.	94A113
	D_2O/ EtOH (75:25)	4.0×10^7		295	PL/Ld-2	S = RB.	94A113
10.40	**L-Tryptophan, ethyl ester**						
	D_2O/ EtOH (75:25)	3.1×10^7		295	PL/Ld-2	S = RB.	94A113
10.41	**Tryptophan, glycyl-**						
	EtOH/ CH_3CN (80:20)	1.2×10^7			PL/Ld-2	S = ZnTPP.	91A252
	EtOH/ CH_3CN (80:20)	9.8×10^5 (k_r)			CP/Ac,A'c-14,28	S = ZnTPP; A' = DMA; used $k_d = 5.3 \times 10^4$ s^{-1}, $k_{A'} = 3 \times 10^7$ L mol^{-1} s^{-1}; k_r derived using $k_A = 1.2 \times 10^7$ L mol^{-1} s^{-1}.	91A252
	H_2O pH = 7	5.1×10^7 (k_r)			CP/Oc-17	S = RB; A' = Met; used $k_r^{A'} = 2 \times 10^7$ L mol^{-1} s^{-1}.	91A252
	H_2O pH = 7	~2×10^8	2×10^{-3}		CP/LI-12	S = Ery; used $k_d = 3 \times 10^5$ s^{-1}.	90F511
10.42	**Tryptophan, methyl ester**						
	MeOH/ H_2O (50:50)	4×10^6 (k_r)			CP/A'c-17	S = RB; A' = DPBF; used $k_r^{A'} = 8 \times 10^8$ L mol^{-1} s^{-1}; derived $k_q = 3.5 \times 10^7$ using $k_A = 3.9 \times 10^7$ L mol^{-1} s^{-1}.	82A291
	MeOH/ H_2O (50:50)	3.9×10^7			CP/Ac-15	S = RB; used $k_d = 2.8 \times 10^5$ s^{-1}.	82A291
10.43	**Tryptophanamide**						
	D_2O/ EtOH (75:25)	3.1×10^7		295	PL/Ld-2	S = RB.	94A113
10.44	**L-Tryptophanamide, *N*-acetyl-**						
	D_2O/ EtOH (75:25)	3.1×10^7		295	PL/Ld-2	S = RB.	94A113

TABLE 11. Rate constants for the interaction of singlet oxygen with diazo compounds and dyes.

No.	Solvent	k ($L\ mol^{-1}\ s^{-1}$)	β (k_d/k) ($mol\ L^{-1}$)	T (K)	Method	Comment	Ref.
11.1	**Acridine, 3,6-diamino- (Proflavine)**						
	D_2O pH = 5.9	3×10^8			CP/A'c-25	S = A; A' = Lysozyme; used $k_d = 5 \times 10^4\ s^{-1}$, $k_{A'} = 6.4 \times 10^8\ L\ mol^{-1}\ s^{-1}$; Authors suggest that values are high due to quenching of sensitizer triplet.	81R011
	H_2O pH = 5.9	7×10^8			CP/A'c-25	S = A; A' = Lysozyme; used $k_d = 5 \times 10^5\ s^{-1}$, $k_{A'} = 4.4 \times 10^8\ L\ mol^{-1}\ s^{-1}$.	81R011
11.2	**Acridinium, 3,6-diamino-10-methyl- (Acriflavine)**						
	D_2O pH = 5.9	3×10^8			CP/A'c-25	S = A; A' = Lysozyme; used $k_d = 5 \times 10^4\ s^{-1}$, $k_{A'} = 6.4 \times 10^8\ L\ mol^{-1}\ s^{-1}$.	81R011
	H_2O pH = 5.9	9×10^8			CP/A'c-25	S = A; A' = Lysozyme; used $k_d = 5 \times 10^5\ s^{-1}$, $k_{A'} = 4.4 \times 10^8\ L\ mol^{-1}\ s^{-1}$.	81R011
11.3	**9,10-Anthraquinone, 1-amino-**						
	2-PrOH/ H_2O (83:17)			295	CR/Ac-32	A' = 1,2-AQ$(NH_2)_2$; meas. $k_A/k_{A'} = 0.02$; $^1O_2$* from $NaOCl/H_2O_2$.	88F582
11.4	**9,10-Anthraquinone, 2-amino-**						
	2-PrOH/ H_2O (83:17)			295	CR/Ac-32	A' = 1,2-AQ$(NH_2)_2$; meas. $k_A/k_{A'} = 0.15$; $^1O_2$* from $NaOCl/H_2O_2$.	88F582
11.5	**9,10-Anthraquinone, 1-amino-4-hydroxy-**						
	CCl_4	4×10^6 $<10^5$ (k_r)			MP/LI-12,27	S = TPP; used $k_d = 36\ s^{-1}$.	82A384
	CH_3COCH_3			294	CP/Ac-19	S = A; A' = $[(CH_3)_2NCS_2]_2Ni$; meas. $k_A/k_{A'} = 0.061$.	80F634
	2-PrOH/ H_2O (83:17)			295	CR/Ac-32	A' = 1,2-AQ$(NH_2)_2$; meas. $k_A/k_{A'} = 0.55$; $^1O_2$* from $NaOCl/H_2O_2$.	88F582
11.6	**9,10-Anthraquinone, 1-amino-2-methyl-**						
	CCl_4	1×10^5 $<10^5$ (k_r)			MP/LI-12,27	S = TPP; used $k_d = 36\ s^{-1}$.	82A384
11.7	**9,10-Anthraquinone, 1,4-bis(methylamino)-**						
	CH_3COCH_3			294	CP/Ac-19	S = A; A' = $[(CH_3)_2NCS_2]_2Ni$; meas. $k_A/k_{A'} = 0.12$.	80F634
11.8	**9,10-Anthraquinone, 1,4-diamino-**						
	C_5H_5N	1.4×10^9			PL/Ld-2	S = An.	87E959
	C_5H_5N	2×10^9			CP/A'c-16	S = TPBC; A' = Tetr; used $k_d = 1.6 \times 10^5\ s^{-1}$.	85F675
	C_6H_6	2.0×10^8			PL/Ld-2	S = An.	87E959
	C_6H_6	3×10^8			CP/A'c-16	S = TPBC; A' = Tetr; used $k_d = 3.0 \times 10^5\ s^{-1}$.	85F675
	CCl_4	1×10^8 $<10^5$ (k_r)			MP/LI-12,27	S = TPP; used $k_d = 36\ s^{-1}$.	82A384
	CH_3COCH_3	6.2×10^8			PL/Ld-2	S = An.	87E959
	CH_3COCH_3	9×10^8			CP/A'c-16	S = TPBC; A' = Tetr; used $k_d = 5.1 \times 10^5\ s^{-1}$.	85F675
	2-PrOH/ H_2O (83:17)			295	CR/Ac-32	A' = 1,2-AQ$(NH_2)_2$; meas. $k_A/k_{A'} = 0.04$; $^1O_2$* from $NaOCl/H_2O_2$.	88F582
11.9	**9,10-Anthraquinone, 1,5-diamino-**						
	2-PrOH/ H_2O (83:17)			295	CR/Ac-32	A' = 1,2-AQ$(NH_2)_2$; meas. $k_A/k_{A'} = 0.15$; $^1O_2$* from $NaOCl/H_2O_2$.	88F582
11.10	**9,10-Anthraquinone, 1,8-diamino-**						
	2-PrOH/ H_2O (83:17)			295	CR/Ac-32	A' = 1,2-AQ$(NH_2)_2$; meas. $k_A/k_{A'} = 0.13$; $^1O_2$* from $NaOCl/H_2O_2$.	88F582

TABLE 11. Rate constants for the interaction of singlet oxygen with diazo compounds and dyes. — Continued

No.	Solvent	k ($L\ mol^{-1}\ s^{-1}$)	β (k_d/k) ($mol\ L^{-1}$)	T (K)	Method	Comment	Ref.
11.11	**9,10-Anthraquinone, 2,6-diamino-**						
	2-PrOH/ H_2O (83:17)			295	CR/Ac-32	A′ = 1,2-AQ$(NH_2)_2$; meas. $k_A/k_{A'} = 0.33$; $^1O_2$* from $NaOCl/H_2O_2$.	88F582
11.12	**9,10-Anthraquinone, 1,5-diaminobromo-4,8-dihydroxy-**						
	CCl_4	1×10^7 $<10^5$ (k_r)			MP/LI-12,27	S = TPP; used $k_d = 36\ s^{-1}$.	82A384
11.13	**9,10-Anthraquinone, 1,4-diamino-2-methoxy-**						
	CCl_4	1×10^8 $<10^5$ (k_r)			MP/LI-12,27	S = TPP; used $k_d = 36\ s^{-1}$.	82A384
	2-PrOH/ H_2O (83:17)			295	CR/Ac-32	A′ = 1,2-AQ$(NH_2)_2$; meas. $k_A/k_{A'} = 0.05$; $^1O_2$* from $NaOCl/H_2O_2$.	88F582
11.14	**9,10-Anthraquinone, 1,4,5,8-tetraamino-**						
	2-PrOH/ H_2O (83:17)			295	CR/Ac-32	A′ = 1,2-AQ$(NH_2)_2$; meas. $k_A/k_{A'} = 0.14$; $^1O_2$* from $NaOCl/H_2O_2$.	88F582
11.15	**Benzene, 1-bromo-4-(diazophenylmethyl)-**						
	CH_3CN	9.1×10^8 (k_r)			CP/Ac,A′c-17	S = MB; A′ = DDM; used $k_r^{A'} = 1.4 \times 10^9$ L $mol^{-1}\ s^{-1}$; meas. $k_t/k_r^{A'} = 0.65$.	777113
11.16	**Benzene, 1,1'-(diazomethylene)bis- (Diazodiphenylmethane, DDM)**						
	CH_3CN	$\sim 6 \times 10^8$		300	PL/Pb-5	S = MB; P = Benzophenone oxide.	84A339
	CH_3CN	1.1×10^9	2.9×10^{-5}		CP/Ac-15	S = MB; used $k_d = 3.3 \times 10^4\ s^{-1}$.	777113
	CH_3CN	1.4×10^9 (k_r)			CP/Ac,A′c-17	S = MB; A′ = DMA; used $k_r^{A'} = 1.7 \times 10^8$ L $mol^{-1}\ s^{-1}$; meas. $k_t/k_r^{A'} = 8.0$.	777113
	CH_3CN	2.4×10^9 (k_r)			CR/Ac,A′c-17	A′ = DMA; used $k_r^{A'} = 1.7 \times 10^8$ L $mol^{-1}\ s^{-1}$; meas. $k_t/k_r^{A'} = 14$; $^1O_2$* from $(PhO)_3PO_3$.	777113
	$CHCl_3$	1.1×10^9 (k_r)			CR/Ac,A′c-17	A′ = DMA; used $k_r^{A'} = 9.3 \times 10^7$ L $mol^{-1}\ s^{-1}$; meas. $k_t/k_r^{A'} = 12$; $^1O_2$* from $(PhO)_3PO_3$.	777113
	$CHCl_3$	8.3×10^8	2×10^{-5}		CP/Ac-15	S = MB; used $k_d = 1.7 \times 10^4\ s^{-1}$.	777113
	MeOH	6.7×10^8	2.1×10^{-4}		CP/Ac-15	S = MB; used $k_d = 1.4 \times 10^4\ s^{-1}$.	777113
11.17	**Benzene, 1,1'-(diazomethylene)bis[4-chloro-**						
	CH_3CN	7.3×10^8 (k_r)			CP/Ac,A′c-17	S = MB; A′ = DMA; used $k_r^{A'} = 1.7 \times 10^8$ L $mol^{-1}\ s^{-1}$; meas. $k_t/k_r^{A'} = 4.3$.	777113
	CH_3CN	6.6×10^8	5×10^{-5}		CP/Ac-15	S = MB; used $k_d = 3.3 \times 10^4\ s^{-1}$.	777113
	CH_3CN	7.5×10^8 (k_r)			CP/Ac,A′c-17	S = MB; A′ = DDM; used $k_r^{A'} = 1.4 \times 10^9$ L $mol^{-1}\ s^{-1}$; meas. $k_t/k_r^{A'} = 0.54$.	777113
	MeOH	3.8×10^8 (k_r)			CP/Ac,A′c-17	S = MB; A′ = DDM; used $k_r^{A'} = 6.7 \times 10^8$ L $mol^{-1}\ s^{-1}$; meas. $k_t/k_r^{A'} = 0.58$.	777113
11.18	**Benzene, 1,1'-(diazomethylene)bis[4-methyl-**						
	CH_3CN	2.3×10^9 (k_r)			CP/Ac,A′c-17	S = MB; A′ = DDM; used $k_r^{A'} = 1.4 \times 10^9$ L $mol^{-1}\ s^{-1}$; meas. $k_t/k_r^{A'} = 1.6$.	777113
	MeOH	9.4×10^8 (k_r)			CP/Ac,A′c-17	S = MB; A′ = DDM; used $k_r^{A'} = 6.7 \times 10^8$ L $mol^{-1}\ s^{-1}$; meas. $k_t/k_r^{A'} = 1.4$.	777113
11.19	**Benzene, 1,1'-(diazomethylene)bis[2,4,6-trimethyl-**						
	CH_3CN	1.2×10^7			PL/Pb-5	S = MB; P = 2,4,6,2',4',6'-Hexamethylbenzophenone oxide.	89A105
11.20	**Benzene, 1-methoxy-4-(diazophenylmethyl)-**						
	CH_3CN	2.0×10^9 (k_r)			CP/Ac,A′c-17	S = MB; A′ = DDM; used $k_r^{A'} = 1.4 \times 10^9$ L $mol^{-1}\ s^{-1}$; meas. $k_t/k_r^{A'} = 1.4$.	777113

TABLE 11. Rate constants for the interaction of singlet oxygen with diazo compounds and dyes. — Continued

No.	Solvent	k (L mol^{-1} s^{-1})	β (k_d/k) (mol L^{-1})	T (K)	Method	Comment	Ref.
11.21	**1,4-Benzenediamine, N^4-(6-amino-3-phenylpyrazolo[5,1-*c*]-1,2,4-triazol-7-ylidene)-N^1,N^1-diethyl-3-methyl-**						
	EtOH	4.3×10^5 (k_r)			CP/Ac-17	S = AlCl(tspc); A′ = Azo dye 10; used $k_r^{A'} = 2.4 \times 10^6$ L mol^{-1} s^{-1}; values from graph.	91A448
11.22	**1,4-Benzenediamine, N^1,N^1-diethyl-3-methyl-N^4-(6-methyl-3-phenylpyrazolo[5,1-*c*]-1,2,4-triazol-7-ylidene)-**						
	EtOH	3.5×10^5 (k_r)			CP/Ac-17	S = AlCl(tspc); A′ = Azo dye 10; used $k_r^{A'} = 2.4 \times 10^6$ L mol^{-1} s^{-1}; values from graph.	91A448
11.23	**1,4-Benzenediamine, N^1,N^1-diethyl-3-methyl-N^4-[6-(phenylamino)-3-phenylpyrazolo[5,1-*c*]-1,2,4-triazol-7-ylidene]-**						
	EtOH	8.5×10^5 (k_r)			CP/Ac-17	S = AlCl(tspc); A′ = Azo dye 10; used $k_r^{A'} = 2.4 \times 10^6$ L mol^{-1} s^{-1}; values from graph.	91A448
11.24	**1,4-Benzenediamine, N^1,N^1-diethyl-3-methyl-N^4-(3-phenylpyrazolo[5,1-*c*]-1,2,4-triazol-7-ylidene)-**						
	EtOH	2.7×10^5 (k_r)			CP/Ac-17	S = AlCl(tspc); A′ = Azo dye 10; used $k_r^{A'} = 2.4 \times 10^6$ L mol^{-1} s^{-1}; values from graph.	91A448
11.25	**1,4-Benzenediamine, N^1,N^1-diethyl-3-methyl-N^4-[3-phenyl-6-(2-thienyl)pyrazolo[5,1-*c*]-1,2,4-triazol-7-ylidene]-**						
	EtOH	3.2×10^5 (k_r)			CP/Ac-17	S = AlCl(tspc); A′ = Azo dye 10; used $k_r^{A'} = 2.4 \times 10^6$ L mol^{-1} s^{-1}; values from graph.	91A448
11.26	**Benzenepropanamide, α-[[(4-diethylamino)-2,6-dimethylphenyl]imino]-β-oxo-*N*-phenyl-**						
	C_5H_5N	6.3×10^7			CP/Oc-20	S = RB; A′ = 2M2P; used $k_d = 3.1 \times 10^4$ s^{-1}, $\beta_{A'}$ = 0.043 mol L^{-1}; No evidence of chemical reaction.	757166
11.27	**Benzenepropanamide, α-[[(4-diethylamino)-2-methylphenyl]imino]-β-oxo-*N*-phenyl-**						
	C_5H_5N	7.9×10^6			CP/Oc-20	S = RB; A′ = 2M2P; used $k_d = 3.1 \times 10^4$ s^{-1}, $\beta_{A'}$ = 0.043 mol L^{-1}; No evidence of chemical reaction.	757166
11.28	**Benzenepropanamide, α-[[(4-diethylamino)phenyl]imino]-β-oxo-*N*-phenyl-**						
	C_5H_5N	4.0×10^6			CP/Oc-20	S = RB; A′ = 2M2P; used $k_d = 3.1 \times 10^4$ s^{-1}, $\beta_{A'}$ = 0.043 mol L^{-1}; No evidence of chemical reaction.	757166
	C_5H_5N	1.6×10^7			CP/Oc-20	S = RB; A′ = 2M2P; used $k_d = 3.1 \times 10^4$ s^{-1}, $\beta_{A'}$ = 0.043 mol L^{-1}; No evidence of chemical reaction.	757166
11.29	**Benz[*e*]indolium, 2-[7-(1,3-dihydro-1,1-dimethyl-3-(sulfobutyl)benz[*e*]indol-2-ylidene]-1,3,5-heptatrienyl]-1,1-dimethyl-3-(sulfobutyl)-, hydroxide, inner salt, Na salt**						
	DMSO	2.5×10^5 (k_r)	0.061	295	CL/Ac-15	S = Th; used $k_d = 1.3 \times 10^4$ s^{-1}; k_r derived using $\phi_\Delta(S) = 0.87$.	82F531
	MeOH	1.5×10^6 (k_r)	0.11	295	CL/Ac-15	S = Th; used $k_d = 1.4 \times 10^5$ s^{-1}; k_r derived using $\phi_\Delta(S) = 0.87$.	82F531
11.30	**Benz[*e*]indolium, 2-[2-[3-[[1,3-dihydro-1,1-dimethyl-3-(3-sulfopropyl)benz[*e*]indol-2-ylidene]ethylidene]-2-[4-(ethoxycarbonyl)-1-piperidinyl]-1-cyclopenten-1-yl]ethenyl[-1,1-dimethyl-3-(3-sulfopropyl)-, hydroxide, inner salt, compound with triethyl**						
	DMSO	1.7×10^6 (k_r)	9×10^{-3}	295	CL/Ac-15	S = Th; used $k_d = 1.3 \times 10^4$ s^{-1}; k_r derived using $\phi_\Delta(S) = 0.87$.	82F531
	MeOH	1.0×10^7 (k_r)	0.016	295	CL/Ac-15	S = Th; used $k_d = 1.4 \times 10^5$ s^{-1}; k_r derived using $\phi_\Delta(S) = 0.87$.	82F531
11.31	**1-Benzopyrylium, 8-[5-(6,7-dihydro-2,4-diphenyl-1-benzopyran-8-yl)-2,4-pentadienylidene]-5,6,7,8-tetrahydro-2,4-diphenyl-, perchlorate**						
	CH_3CN	3×10^{10}			PL/A′d-5	S = MB; A′ = DPBF.	727260
11.32	**Benzothiazolium, 2-[[2-butoxy-3-[(3-ethyl-2-benzothiazolylidene)methyl]-4-oxo-2-cyclobuten-1-ylidene]methyl]-3-ethyl-**						
	$CHCl_3$	1.4×10^9		293	CP/Pa-20	S = A; Q = Ni[$S_2C_2(C_6H_5)_2$]$_2$; used $k_d = 1.7 \times 10^4$ s^{-1}.	90F554

TABLE 11. Rate constants for the interaction of singlet oxygen with diazo compounds and dyes. — Continued

No.	Solvent	k ($L\ mol^{-1}\ s^{-1}$)	β (k_d/k) ($mol\ L^{-1}$)	T (K)	Method	Comment	Ref.
11.33	**Benzothiazolium, 5-chloro-2-[2-[3-[(5-chloro-3-ethyl-2-benzothiazolylidene)ethylidene]-2-(diphenylamino)-1-cyclopenten-1-yl)ethenyl]-3-ethyl-, perchlorate**						
	Propylene carbonate	9.8×10^9 (k_q)		293	PL/A'd-5	S = MB; A' = DPBF; Measured $k_q + k_r$, k_q calcd. knowing k_r from $k_r/k_r^{A'}$.	87E690
	Propylene carbonate	1.6×10^8 (k_r)		293	PL/A'd-17	S = MB; A' = DPBF; used $k_r^{A'} = 1.0 \times 10^9$ L $mol^{-1}\ s^{-1}$.	87E690
	DMSO	3.8×10^6 (k_r)	3.9×10^{-3}	295	CL/Ac-15	S = Th; used $k_d = 1.3 \times 10^4\ s^{-1}$; k_r derived using $\phi_\Delta(S) = 0.87$.	82F531
	MeOH	1.4×10^7 (k_r)	0.011	295	CL/Ac-15	S = Th; used $k_d = 1.4 \times 10^5\ s^{-1}$; k_r derived using $\phi_\Delta(S) = 0.87$.	82F531
11.34	**Benzothiazolium, 2-[7-(5-chloro-1,3,3-trimethyl-2-indolylidene)-1-(1,3,5-heptatrienyl)-3-methyl-, iodide**						
	Propylene carbonate	$<1 \times 10^7$ (k_q)		293	PL/A'd-5	S = MB; A' = DPBF; Measured $k_q + k_r$, k_q calcd. knowing k_r from $k_r/k_r^{A'}$.	87E690
	Propylene carbonate	3×10^7 (k_r)		293	PL/A'd-17	S = MB; A' = DPBF; used $k_r^{A'} = 1.0 \times 10^9$ L $mol^{-1}\ s^{-1}$.	87E690
11.35	**Benzothiazolium, 2-[7-(5-fluoro-1,3,3-trimethyl-2-indolylidene)-1-(1,3,5-heptatrienyl)-3-methyl-, iodide**						
	Propylene carbonate	7×10^7 (k_r)		293	PL/A'd-17	S = MB; A' = DPBF; used $k_r^{A'} = 1.0 \times 10^9$ L $mol^{-1}\ s^{-1}$.	87E690
	Propylene carbonate	2.0×10^8 (k_q)		293	PL/A'd-5	S = MB; A' = DPBF; Measured $k_q + k_r$, k_q calcd. knowing k_r from $k_r/k_r^{A'}$.	87E690
11.36	**Benzothiazolium, 2-[7-(5-methoxy-1,3,3-trimethyl-2-indolylidene)-1-(1,3,5-heptatrienyl)-3-methyl-, iodide**						
	Propylene carbonate	1.2×10^9 (k_q)		293	PL/A'd-5	S = MB; A' = DPBF; Measured $k_q + k_r$, k_q calcd. knowing k_r from $k_r/k_r^{A'}$.	87E690
	Propylene carbonate	1.7×10^8 (k_r)		293	PL/A'd-17	S = MB; A' = DPBF; used $k_r^{A'} = 1.0 \times 10^9$ L $mol^{-1}\ s^{-1}$.	87E690
11.37	**Benzothiazolium, 3-methyl-2-[7-(1,3,3-trimethyl-2-indol-2-ylidene)-1,3,5-heptatrienyl]-, iodide**						
	Propylene carbonate	1.7×10^8 (k_r)		293	PL/A'd-17	S = MB; A' = DPBF; used $k_r^{A'} = 1.0 \times 10^9$ L $mol^{-1}\ s^{-1}$.	87E690
	Propylene carbonate	2.2×10^9 (k_q)		293	PL/A'd-5	S = MB; A' = DPBF; Measured $k_q + k_r$, k_q calcd. knowing k_r from $k_r/k_r^{A'}$.	87E690
11.38	**Benzothiazolium, 2-[7-(1,3,3,5-tetramethyl-2-indolylidene)-1-(1,3,5-heptatrienyl)-3-methyl-, iodide**						
	Propylene carbonate	2.5×10^8 (k_q)		293	PL/A'd-5	S = MB; A' = DPBF; Measured $k_q + k_r$, k_q calcd. knowing k_r from $k_r/k_r^{A'}$.	87E690
	Propylene carbonate	6×10^7 (k_r)		293	PL/A'd-17	S = MB; A' = DPBF; used $k_r^{A'} = 1.0 \times 10^9$ L $mol^{-1}\ s^{-1}$.	87E690
11.39	**3-Benzoxazolepropanesulfonic acid, 2-[4-(1,3-dibutyltetrahydro-4,6-dioxo-2-thioxo-5-pyrimidinylidene)-2-butenylidene]-, sodium salt (Merocyanine 540)**						
	CD_3OD	2.1×10^9		294	PL/Ld-2	S = An.	91R017
	D_2O (ves)	5.6×10^9			CP/Ac-15	S = A; used $k_d = 4.0 \times 10^4\ s^{-1}$; soln. contg. DLPC.	92A123
	H_2O/ MeOH (50:50)	3.0×10^7 (k_r)			CP/Ac,A'c-17	S = A; A' = DPBF; $k_r^{A'}$ not given.	92A123
	H_2O/ MeOH (50:50)	4.5×10^9			CP/Ac-15	S = A; used $k_d = 9.1 \times 10^4\ s^{-1}$.	92A123
	H_2O (ves)	9.3×10^7 (k_r)			CP/Ac,A'c-17	S = A; A' = DPBF; $k_r^{A'}$ not given; soln. contg. DLPC.	92A123
	H_2O (ves)	5.8×10^9			CP/Ac-15	S = A; used $k_d = 4.0 \times 10^4\ s^{-1}$; soln. contg. DLPC.	92A123
11.40	**2,3'-Biindolium, 1,1,3-trimethyl-2'-[2-(1,3,3-trimethylindolylidene)methyl]-, iodide**						
	MeOH	$\leq 3.0 \times 10^4$ (k_r)			CP/Ac-15	S = 2-ACN; used $k_d = 1.9 \times 10^5\ s^{-1}$; k_r derived using $\phi_\Delta(S) = 0.75$.	767071

TABLE 11. Rate constants for the interaction of singlet oxygen with diazo compounds and dyes. — Continued

No.	Solvent	k ($L\ mol^{-1}\ s^{-1}$)	β (k_d/k) ($mol\ L^{-1}$)	T (K)	Method	Comment	Ref.
11.41	**2,2'-Carbocyanine, 1,1'-diethyl-, chloride**						
	MeOH	3.4×10^7 (k_r)			CP/Ac-15	S = 2-ACN; used $k_d = 1.9 \times 10^5\ s^{-1}$; k_r derived using $\phi_\Delta(S) = 0.75$.	767071
11.42	**4,4'-Carbocyanine, 1,1'-diethyl-**						
	MeOH	2.0×10^9			PL/Ld-2	S = T(m-HOP)P.	90R164
11.43	**4,4'-Carbocyanine, 1,1'-diethyl-, toluenesulfonate**						
	CD_3OD	1.6×10^8 (k_r)			CP/Ac-15	S = 2-ACN; used $k_d = 1.3 \times 10^4\ s^{-1}$; k_r derived using $\phi_\Delta(S) = 0.75$.	767071
	MeOH	1.1×10^8 (k_r)			CP/Ac-15	S = 2-ACN, RB, Py, and fluorenone; used $k_d = 1.9 \times 10^5\ s^{-1}$; k_r derived using ϕ_Δ for each S, k_r is an average for the 4 sensitizers.	767071
11.44	**Crystal Violet**						
	CH_3CN		5.8		CP/Ac-15	S = A.	82F525
11.45	**2,2'-Cyanine, 1,1'-diethyl-, iodide**						
	MeOH	4.0×10^5 (k_r)			CP/Ac-15	S = 2-ACN; used $k_d = 1.9 \times 10^5\ s^{-1}$; k_r derived using $\phi_\Delta(S) = 0.75$.	767071
11.46	**Cyclobutendiylium, 1,3-bis[4-(diethylamino)-2-hydroxyphenyl]-2,4-dihydroxy-**						
	$CHCl_3$	1.2×10^9	1.4×10^{-5}	293	CP/Pa-20	S = A; A' = $Ni[S_2C_2(C_6H_5)_2]_2$; used $k_d = 1.7 \times 10^4\ s^{-1}$.	90F554
11.47	**Cyclobutendiylium, 1,3-bis[4-(dimethylamino)-2-methylphenyl]-2,4-dihydroxy-**						
	$CHCl_3$	2.2×10^9		293	CP/Pa-20	S = A; A' = $Ni[S_2C_2(C_6H_5)_2]_2$; used $k_d = 1.7 \times 10^4\ s^{-1}$.	90F554
11.48	**Cyclobutendiylium, 1,3-bis[4-(*N*-methyl-*N*-octadecylamino)-2-methylphenyl]-2,4-dihydroxy-**						
	$CHCl_3$	1.4×10^9		293	CP/Pa-20	S = A; A' = $Ni[S_2C_2(C_6H_5)_2]_2$; used $k_d = 1.7 \times 10^4\ s^{-1}$.	90F554
11.49	**2,5-Cyclohexadien-1-one, 4-[[4-(diethylamino)-2,5-dimethylphenyl]imino]-3,5-dimethyl-**						
	C_5H_5N	1.0×10^9			CP/Oc-20	S = RB; A' = 2M2P; used $k_d = 3.1 \times 10^4\ s^{-1}$, $\beta_{A'} = 0.043\ mol\ L^{-1}$; No evidence of chemical reaction.	757166
11.50	**Diazene, 1-[4-*N*-(2-cyanoethyl)-*N*-ethylaminophenyl]-2-(4-methoxyphenyl)-**						
	CH_2Cl_2	2.7×10^4 (k_r)			CP/Ac,A'c-17	S = MB; A' = DMA; used $k_r^{A'} = 2.1 \times 10^7$ L $mol^{-1}\ s^{-1}$ in benzene [747312].	89F024
	CH_2Cl_2	2×10^6			PL/Ld-2	S = TPP.	89F024
11.51	**Diazene, 1-[4-*N*-(2-cyanoethyl)-*N*-ethylaminophenyl]-2-phenyl-**						
	CH_2Cl_2	2×10^6			PL/Ld-2	S = TPP.	89F024
	CH_2Cl_2	2.9×10^4 (k_r)			CP/Ac,A'c-17	S = MB; A' = DMA; used $k_r^{A'} = 2.1 \times 10^7$ L $mol^{-1}\ s^{-1}$ in benzene [747312].	89F024
11.52	**Diazene, 1-(4-diethylaminophenyl)-2-(2,4-dinitrophenyl)-**						
	CH_2Cl_2	1×10^6			PL/Ld-2	S = MB.	89F024
11.53	**Diazene, 1-(4-diethylaminophenyl)-2-(4-methoxyphenyl)-**						
	CD_3OD				CP/Ac-17	S = MB; A' = 4-(Diethylamino)azobenzene; meas. $k_t/k_r^{A'} = 14$; Rel. to A' in MeOH.	84F350
	CD_3OD/ D_2O (80:20)				CP/Ac-17	S = MB; A' = 4-(Diethylamino)azobenzene; meas. $k_t/k_r^{A'} = 74$; Rel. to A' in MeOH.	84F350
	CH_2Cl_2	1.3×10^4 (k_r)			CP/Ac,A'c-17	S = MB; A' = DMA; used $k_r^{A'} = 2.1 \times 10^7$ L $mol^{-1}\ s^{-1}$ in benzene [747312].	89F024
	CH_2Cl_2	1.0×10^7			PL/Ld-2	S = TPP.	89F024

TABLE 11. Rate constants for the interaction of singlet oxygen with diazo compounds and dyes. — Continued

No.	Solvent	k (L mol^{-1} s^{-1})	β (k_d/k) (mol L^{-1})	T (K)	Method	Comment	Ref.
11.53	**Diazene, 1-(4-diethylaminophenyl)-2-(4-methoxyphenyl)-** — Continued						
	MeOH/ H_2O (80:20)				CP/Ac-17	S = MB; A′ = 4-(Diethylamino)azobenzene; meas. $k_t/k_r^{A'} = 6$; Rel. to A′ in MeOH.	84F350
	MeOH/ H_2O (50:50)				CP/Ac-17	S = MB; A′ = 4-(Diethylamino)azobenzene; meas. $k_t/k_r^{A'} = 22$; Rel. to A′ in MeOH.	84F350
	MeOH				CP/Ac-17	S = MB; A′ = 4-(Diethylamino)azobenzene; meas. $k_t/k_r^{A'} = 1$.	84F350
11.54	**Diazene, 1-(4-diethylaminophenyl)-2-(3-nitrophenyl)-**						
	CH_2Cl_2	3×10^6			PL/Ld-2	S = TPP.	89F024
11.55	**Diazene, 1-(4-diethylaminophenyl)-2-(4-nitrophenyl)-**						
	CH_2Cl_2	4×10^6			PL/Ld-2	S = MB.	89F024
	CH_2Cl_2	1.7×10^4 (k_r)			CP/Ac,A′c-17	S = MB; A′ = DMA; used $k_r^{A'} = 2.1 \times 10^7$ L mol^{-1} s^{-1} in benzene [747312].	89F024
11.56	**Diazene, 1-(4-diethylaminophenyl)-2-phenyl-**						
	CD_3OD				CP/Ac-17	S = MB; k_r^A/k_t^A(MeOH) = 11.	84F350
	CD_3OD/ D_2O (80:20)				CP/Ac-17	S = MB; k_r^A/k_t^A(MeOH) = 44.	84F350
	CH_2Cl_2	1.1×10^4 (k_r)			CP/Ac,A′c-17	S = MB; A′ = DMA; used $k_r^{A'} = 2.1 \times 10^7$ L mol^{-1} s^{-1} in benzene [747312].	89F024
	CH_2Cl_2	6.5×10^6			PL/Ld-2	S = TPP.	89F024
	MeOH/ H_2O (50:50)				CP/Ac-17	S = MB; k_r^A/k_t^A(MeOH) = 24.	84F350
	MeOH/ H_2O (80:20)				CP/Ac-17	S = MB; k_r^A/k_t^A(MeOH) = 7.	84F350
11.57	**Diazene, diphenyl-**						
	CH_2Cl_2	$<1 \times 10^5$			PL/Ld-2	S = TPP.	89F024
11.58	**Diazene, 1-[4-*N*-ethyl-*N*-(2-hydroxyethyl)aminophenyl]-2-(4-methoxyphenyl)-**						
	CH_2Cl_2	9×10^6			PL/Ld-2	S = TPP.	89F024
	CH_2Cl_2	1.3×10^4 (k_r)			CP/Ac,A′c-17	S = MB; A′ = DMA; used $k_r^{A'} = 2.1 \times 10^7$ L mol^{-1} s^{-1} in benzene [747312].	89F024
11.59	**Diazene, 1-(4-methoxy-1-naphthyl)-2-phenyl-**						
	CH_2Cl_2	1.5×10^6			PL/Ld-2	S = TPP.	89F024
	CH_2Cl_2	1.4×10^4 (k_r)			CP/Ac,A′c-17	S = MB; A′ = DMA; used $k_r^{A'} = 2.1 \times 10^7$ L mol^{-1} s^{-1} in benzene [747312].	89F024
11.60	**Diazene, 1-(4-methylphenyl)-2-[1-(phenylaminocarbonyl)-2-oxopropyl]-**						
	DMAA	4.0×10^6 (k_r)			CP/A′c-17	S = RB; A′ = DMA; used $k_r^{A'} = 1.4 \times 10^7$ L mol^{-1} s^{-1}.	86F622
	DMF	3.0×10^6 (k_r)			CP/A′c-17	S = RB; A′ = DMA; used $k_r^{A'} = 1.4 \times 10^7$ L mol^{-1} s^{-1}.	86F622
11.61	**Diazene, 1-(4-nitrophenyl)-2-phenyl-**						
	CH_2Cl_2	$<1 \times 10^5$			PL/Ld-2	S = TPP.	89F024
11.62	**Diazene, 1-phenyl-2-[1-(phenylaminocarbonyl)-2-oxopropyl]-**						
	DMAA	3×10^5 (k_r)			CP/A′c-17	S = RB; A′ = DMA; used $k_r^{A'} = 1.4 \times 10^7$ L mol^{-1} s^{-1}.	86F622
	DMF	1×10^5 (k_r)			CP/A′c-17	S = RB; A′ = DMA; used $k_r^{A'} = 1.4 \times 10^7$ L mol^{-1} s^{-1}.	86F622
	2-PrOH	3.2×10^6 (k_r)			CP/A′c-17	S = RB; A′ = DMA; used $k_r^{A'} = 1.4 \times 10^7$ L mol^{-1} s^{-1}.	86F622

TABLE 11. Rate constants for the interaction of singlet oxygen with diazo compounds and dyes. — Continued

No.	Solvent	k ($L\ mol^{-1}\ s^{-1}$)	β (k_d/k) ($mol\ L^{-1}$)	T (K)	Method	Comment	Ref.
11.63	**Fluorene, 9-diazo-**						
	CH_3CN	6.6×10^7		300	PL/Pb-5	S = MB; P = 9-Fluorenone oxide.	85A206
	CH_3CN	1.0×10^8 (k_r)			CP/Ac,A'c-17	S = MB; A' = DMA; used $k_r^{A'} = 1.7 \times 10^8$ L $mol^{-1}\ s^{-1}$; meas. $k_r/k_r^{A'} = 0.59$.	777113
	CH_3CN	1.0×10^8	3.3×10^{-4}		CP/Ac-15	S = MB; used $k_d = 3.3 \times 10^4\ s^{-1}$.	777113
	$CHCl_3$	5.1×10^7	3×10^{-4}		CP/Ac-15	S = MB; used $k_d = 1.7 \times 10^4\ s^{-1}$.	777113
	$CHCl_3$	6.8×10^7 (k_r)			CR/Ac,A'c-17	A' = DMA; used $k_r^{A'} = 9.3 \times 10^7$ L $mol^{-1}\ s^{-1}$; meas. $k_r/k_r^{A'} = 0.74$; $^1O_2$* from $(PhO)_3PO_3$.	777113
	MeOH	3.3×10^7	4.2×10^{-3}		CP/Ac-15	S = MB; used $k_d = 1.4 \times 10^5\ s^{-1}$.	777113
11.64	**Fluorescein, 2',7'-dibromo-4'-(hydroxymercuri)-, disodium salt (Merbromin)**						
	CH_3CN/H_2O (50:50)	2.0×10^8			PL/Ld-2	S = A.	93F069
11.65	**Fluorescein dianion, 2',4',5',7'-tetrabromo- (Eosin)**						
	CH_3CN	7.2×10^7			CP/Oc-19	S = A; A' = 2M2P; used $k_d = 1.7 \times 10^4\ s^{-1}$.	84F191
	CH_3CN/H_2O (50:50)	2.7×10^7			PL/Ld-2	S = A.	93F069
	MeOH	2.4×10^7			CP/Oc-19	S = A; A' = 2M2P; used $k_d = 1.1 \times 10^5\ s^{-1}$.	84F191
11.66	**Fluorescein dianion, 3,4,5,6-tetrachloro-2',4',5',7'-tetraiodo- (Rose Bengal, RB)**						
	CD_3COCD_3	9.9×10^6			PL/Ld-2	S = A.	89E324
	CH_3CN	5.0×10^7			CP/Oc-19	S = A; A' = 2M2P; used $k_d = 1.7 \times 10^4\ s^{-1}$.	84F191
	CH_3CN/H_2O (50:50)	1.5×10^7			PL/Ld-2	S = A.	93F069
	MeOH	2.0×10^7			CP/Oc-19	S = A; A' = 2M2P; used $k_d = 1.1 \times 10^5\ s^{-1}$.	84F191
11.67	**3,5-Heptanedione, 4-[[2-ethyl-4-(diethylamino)phenyl]imino]-2,2,6,6-tetramethyl-**						
	C_5H_5N	$\sim 1.6 \times 10^7$			CP/Oc-20	S = RB; A' = 2M2P; used $k_d = 3.1 \times 10^4\ s^{-1}$, $\beta_{A'} = 0.043\ mol\ L^{-1}$; No evidence of chemical reaction.	757166
11.68	**Indene-1,3-dione, 2-(2-quinolylidene)- (Quinophthalone)**						
	CH_3COCH_3			294	CP/Ac-19	S = A; A' = $[(CH_3)_2NCS_2]_2Ni$; meas. $k_A/k_{A'} = 0.068$.	80F634
11.69	**Indigo**						
	$CHCl_3$				CP/Ac-17	S = A; A' = $[(CH_3)_2NCS_2]_2Ni$; meas. $k_r/k_r^{A'} = \sim 0.025$.	79F582
11.70	**Indolium, 2-[7-[4-bromo-1-(1,3,3-trimethyl-2-indol-2-ylidene)]-1,3,5-heptatrienyl]-1,3,3-trimetetrafluoroborate**						
	Propylene carbonate	2.7×10^8 (k_q)		293	PL/A'd-5	S = MB; A' = DPBF; Measured $k_q + k_r$, k_q calcd. knowing k_r from $k_r/k_r^{A'}$.	87E690
	Propylene carbonate	3.0×10^8 (k_r)		293	PL/A'd-17	S = MB; A' = DPBF; used $k_r^{A'} = 1.0 \times 10^9$ L $mol^{-1}\ s^{-1}$.	87E690
11.71	**Indolium, 2-[7-[4-chloro-1-(1,3,3-trimethyl-2-indol-2-ylidene)]-1,3,5-heptatrienyl]-1,3,3-trimethyl-, tetrafluoroborate**						
	Propylene carbonate	3.6×10^8 (k_r)		293	PL/A'd-17	S = MB; A' = DPBF; used $k_r^{A'} = 1.0 \times 10^9$ L $mol^{-1}\ s^{-1}$.	87E690
	Propylene carbonate	2.6×10^8 (k_q)		293	PL/A'd-5	S = MB; A' = DPBF; Measured $k_q + k_r$, k_q calcd. knowing k_r from $k_r/k_r^{A'}$.	87E690
11.72	**Indolium, 2-[7-[4-iodo-1-(1,3,3-trimethyl-2-indol-2-ylidene)]-1,3,5-heptatrienyl]-1,3,3-trimethyl-, iodide**						
	Propylene carbonate	1.5×10^9 (k_q)		293	PL/A'd-5	S = MB; A' = DPBF; Measured $k_q + k_r$, k_q calcd. knowing k_r from $k_r/k_r^{A'}$.	87E690
	Propylene carbonate	2.6×10^8 (k_r)		293	PL/A'd-17	S = MB; A' = DPBF; used $k_r^{A'} = 1.0 \times 10^9$ L $mol^{-1}\ s^{-1}$.	87E690

TABLE 11. Rate constants for the interaction of singlet oxygen with diazo compounds and dyes. — Continued

No.	Solvent	k ($L\ mol^{-1}\ s^{-1}$)	β (k_d/k) ($mol\ L^{-1}$)	T (K)	Method	Comment	Ref.
11.73	**Indolium, 2-[7-[4-iodo-1-(1,3,3-trimethyl-2-indol-2-ylidene)]-1,3,5-heptatrienyl]-1,3,3-trimethyl-, tetrafluoroborate**						
	Propylene carbonate	1.1×10^8 (k_r)		293	PL/A'd-17	S = MB; A' = DPBF; used $k_r^{A'} = 1.0 \times 10^9$ L $mol^{-1}\ s^{-1}$.	87E690
	Propylene carbonate	4×10^7 (k_q)		293	PL/A'd-5	S = MB; A' = DPBF; Measured $k_q + k_r$, k_q calcd. knowing k_r from $k_r/k_r^{A'}$.	87E690
11.74	**Indolium, 2-[7-(1,3,3-trimethyl-2-indol-2-ylidene)-1-[4-(2,2-dimethoxyethyl)-1,3,5-heptatrienyl]-1,3,3-trimethyl-, tetrafluoroborate**						
	Propylene carbonate	8×10^7 (k_r)		293	PL/A'd-17	S = MB; A' = DPBF; used $k_r^{A'} = 1.0 \times 10^9$ L $mol^{-1}\ s^{-1}$.	87E690
	Propylene carbonate	8.9×10^8 (k_q)		293	PL/A'd-5	S = MB; A' = DPBF; Measured $k_q + k_r$, k_q calcd. knowing k_r from $k_r/k_r^{A'}$.	87E690
11.75	**Indolium, 2-[7-(1,3,3-trimethyl-2-indol-2-ylidene)-1-[4-(1-piperidinio)-1,3,5-heptatrienyl]-1,3,3-trimethyl-, bis(tetrafluoroborate)**						
	Propylene carbonate	1.4×10^9 (k_r)		293	PL/A'd-17	S = MB; A' = DPBF; used $k_r^{A'} = 1.0 \times 10^9$ L $mol^{-1}\ s^{-1}$.	87E690
	Propylene carbonate	1.9×10^9 (k_q)		293	PL/A'd-5	S = MB; A' = DPBF; Measured $k_q + k_r$, k_q calcd. knowing k_r from $k_r/k_r^{A'}$.	87E690
11.76	**Indolium, 2-[7-(1,3,3-trimethyl-2-indol-2-ylidene)-1-[4-[3-(1,3,3-trimethyl-2-indolylidene)-2-propenyl]-1,3,5-heptatrienyl]-1,1,3-trimethyl-, tetrafluoroborate**						
	Propylene carbonate	2.0×10^9 (k_q)		293	PL/A'd-5	S = MB; A' = DPBF; Measured $k_q + k_r$, k_q calcd. knowing k_r from $k_r/k_r^{A'}$.	87E690
	Propylene carbonate	3.8×10^8 (k_r)		293	PL/A'd-17	S = MB; A' = DPBF; used $k_r^{A'} = 1.0 \times 10^9$ L $mol^{-1}\ s^{-1}$.	87E690
11.77	**Leucomalachite Green**						
	$C_6H_5CH_3$	$<1 \times 10^5$ (k_r)		298	CP/Ac,A'c-17	S = A' = 9-Phenylanthracene.	79F148
	$C_6H_5CH_3$	2×10^8	3×10^{-4}	298	CP/Ac-18	S = A' = DMA; used $k_d = 5.3 \times 10^4\ s^{-1}$, $\beta_{A'} = 1.5 \times 10^{-3}$ mol L^{-1}; meas. $\beta_A/\beta_{A'} = 0.2$.	79F148
11.78	**Methanesulfonamide, *N*-[2-[[4-(1,5-dihydro-3-methyl-5-oxo-1-phenylpyrazol-4-ylidene)amino]methylphenyl]ethylamino]ethyl-**						
	MeOH	3×10^7 (k_r) 5×10^6 (k_q)		298	CP/Ac,A'c-17,19	S = MB; A' = DPA; used $k_r^{A'} = 1.8 \times 10^7$ L $mol^{-1}\ s^{-1}$.	87F542
11.79	**2-Naphthalenecarboxamide, 4-[[4-(aminocarbonyl)phenyl]azo]-3-hydroxy-*N*-(2-methoxyphenyl)-**						
	DMAA	7.0×10^6			CP/A'c-17	S = RB; A' = DMA; used $k_r^{A'} = 1.4 \times 10^7$ L $mol^{-1}\ s^{-1}$.	86F622
	DMF	3.6×10^6			CP/A'c-17	S = RB; A' = DMA; used $k_r^{A'} = 1.4 \times 10^7$ L $mol^{-1}\ s^{-1}$.	86F622
11.80	**2-Naphthalenecarboxamide, 3-hydroxy-4-[(4-methylphenyl)azo]-*N*-phenyl-**						
	DMAA	2.0×10^6			CP/A'c-17	S = RB; A' = DMA; used $k_r^{A'} = 1.4 \times 10^7$ L $mol^{-1}\ s^{-1}$.	86F622
	DMF	1.9×10^6			CP/A'c-17	S = RB; A' = DMA; used $k_r^{A'} = 1.4 \times 10^7$ L $mol^{-1}\ s^{-1}$.	86F622
11.81	**1-Naphthalenone, 4-[[2,6-dimethyl-4-(diethylamino)phenyl]imino]-2-(2-methoxy-5-fluorosulfonylphenyl)aminocarbonyl-**						
	C_5H_5N	1.4×10^9			CP/Oc-20	S = RB; A' = 2M2P; used $k_d = 3.1 \times 10^4\ s^{-1}$, $\beta_{A'} = 0.043$ mol L^{-1}; No evidence of chemical reaction.	757166
	C_6H_6	4.7×10^9			CP/Oc-20	S = azine; A' = 2M2P; used $k_d = 4.2 \times 10^4\ s^{-1}$, $\beta_{A'} = 0.053$ mol L^{-1}; No evidence of chemical reaction.	757166
	CH_3CN	3.9×10^{10}			CP/Oc-20	S = RB; A' = 2M2P; used $k_d = 3.3 \times 10^4\ s^{-1}$, $\beta_{A'} = 0.018$ mol L^{-1}; No evidence of chemical reaction.	757166

TABLE 11. Rate constants for the interaction of singlet oxygen with diazo compounds and dyes. — Continued

No.	Solvent	k ($L\ mol^{-1}\ s^{-1}$)	β (k_d/k) ($mol\ L^{-1}$)	T (K)	Method	Comment	Ref.
11.82	**1-Naphthalenone, 4-[[4-(diphenylamino)phenyl]imino]-**						
	C_5H_5N	$\leq 3.2 \times 10^6$			CP/Oc-20	S = RB; A′ = 2M2P; used $k_d = 3.1 \times 10^4\ s^{-1}$, $\beta_{A'} = 0.043\ mol\ L^{-1}$; No evidence of chemical reaction.	757166
11.83	**1-Naphthalenone, 4-[(*N*-methyl-*N*-phenyl)amino]imino-**						
	CH_2Cl_2	8.9×10^7			PL/Ld-2	S = MB.	89F024
	CH_2Cl_2	2×10^3 (k_r)			CP/Ac,A′c-17	S = MB; A′ = DMA; used $k_r^{A'} = 2.1 \times 10^7$ L $mol^{-1}\ s^{-1}$ in benzene [747312].	89F024
11.84	**1-Naphthalenone, 4-[[4-(phenylamino)phenyl]imino]-**						
	C_5H_5N	$\leq 4.0 \times 10^7$			CP/Oc-20	S = RB; A′ = 2M2P; used $k_d = 3.1 \times 10^4\ s^{-1}$, $\beta_{A'} = 0.043\ mol\ L^{-1}$; No evidence of chemical reaction.	757166
11.85	**1-Naphthol, 5-[[3-(aminosulfonyl)phenyl]sulfonylamino]-4-[2-(methylsulfonyl)-4-nitrophenylazo]-, conjugate base**						
	DMF	9.3×10^6 (k_r) 5.6×10^7 (k_q)	7.7×10^{-3}		CP/Ac-14	S = RB; used $k_d = 7.1 \times 10^4\ s^{-1}$; k_q includes possible back energy transfer; k_r derived using $\phi_\Delta(S) = 0.4$; soln. contains NH_4OH.	79F412
	H_2O	1.3×10^8 (k_r)	2.5×10^{-3} (β_r)		CP/Ac-14	S = A; used $k_d = 3.3 \times 10^5\ s^{-1}$; k_r derived using $\phi_\Delta(S) = 1.3 \times 10^{-4}$; soln. contains NH_4OH.	79F412
	MeOH	4.8×10^6 (k_r) 7.2×10^7 (k_q)			CP/Ac-14	S = A; used $k_d = 1.3 \times 10^5\ s^{-1}$; k_q includes possible back energy transfer; k_r derived using $\phi_\Delta(S) = 1.6 \times 10^{-3}$; soln. contains NH_4OH.	79F412
11.86	**1-Naphthol, 5-[[3-(aminosulfonyl)phenyl]sulfonylamino]-4-[2-(methylsulfonyl)-4-nitrophenylazo]-, conjugate dibase**						
	DMF		2.6×10^{-3}		CP/Ac-14	S = RB; soln. contains NH_4OH.	79F412
	DMF	2.7×10^7 (k_r)			CP/Ac-16	S = A; A′ = DPBF; used $k_d = 7.1 \times 10^4\ s^{-1}$; soln. contains NH_4OH.	79F412
	H_2O	5×10^8 (k_r)	7×10^{-4} (β_r)		CP/Ac-16	S = A; A′ = 2,5-DMF; used $k_d = 3.3 \times 10^5\ s^{-1}$; soln. contains NH_4OH.	79F412
	MeOH		1.3×10^{-3}		CP/Ac-14	S = RB; soln. contains NH_4OH.	79F412
	MeOH	1.0×10^7 (k_r)			CP/Ac-16	S = A; A′ = DPBF; used $k_d = 1.3 \times 10^5\ s^{-1}$; soln. contains NH_4OH.	79F412
11.87	**1-Naphthol, 4-(4-chlorophenylazo)-**						
	MeOH			293	CP/Ac-17	S = MB; A′ = 4-Phenylazo-1-naphthol; meas. $k_r/k_r^{A'} = 0.40$.	81A403
11.88	**1-Naphthol, 5-methoxy-4-[2-(methylsulfonyl)-4-nitrophenyl]azo-, conjugate base**						
	DMF	4.3×10^7 (k_r)			CP/Ac-14	S = RB; used $k_d = 1 \times 10^5\ s^{-1}$; k_r derived using $\phi_\Delta(S) = 0.4$; soln. contains NH_4OH.	79F412
	DMF	4.6×10^7 (k_r) 2.6×10^8 (k_q)			CP/Ac-14	S = A; used $k_d = 1 \times 10^5\ s^{-1}$; k_q includes possible back energy transfer; k_r derived using $\phi_\Delta(S) = 2.7 \times 10^{-4}$; soln. contains NH_4OH.	79F412
11.89	**1-Naphthol, 4-(4-methoxyphenylazo)-**						
	MeOH			293	CP/Ac-17	S = MB; A′ = 4-Phenylazo-1-naphthol; meas. $k_r/k_r^{A'} = 1.9$.	81A403
11.90	**1-Naphthol, 4-(4-methylphenylazo)-**						
	CD_3OD				CP/Ac-17	S = MB; A′ = 4-(Diethylamino)azobenzene; meas. $k_r/k_r^{A'} = 2.5 \times 10^2$; Rel. to A′ in MeOH.	84F350
	CD_3OD/D_2O (80:20)				CP/Ac-17	S = MB; A′ = 4-(Diethylamino)azobenzene; meas. $k_r/k_r^{A'} = 5.3 \times 10^2$; Rel. to A′ in MeOH.	84F350
	CH_2Cl_2	8.1×10^4 (k_r)			CL/Ac,A′c-17	S = MB; A′ = DMA; used $k_r^{A'} = 2 \times 10^7$ L $mol^{-1}\ s^{-1}$.	89F024

TABLE 11. Rate constants for the interaction of singlet oxygen with diazo compounds and dyes. — Continued

No.	Solvent	k (L mol^{-1} s^{-1})	β (k_d/k) (mol L^{-1})	T (K)	Method	Comment	Ref.
11.90	**1-Naphthol, 4-(4-methylphenylazo)- — Continued**						
	CH_2Cl_2	1.3×10^7			PL/Ld-2	S = TPP; charge-transfer; $k = 2.6 \times 10^7$ L mol^{-1} s^{-1} normalized to 100% hydrazone form.	89F024
	MeOH/ H_2O (80:20)				CP/Ac-17	S = MB; A′ = 4-(Diethylamino)azobenzene; meas. $k_r/k_r^{A'} = 50$; Rel. to A′ in MeOH.	84F350
	MeOH/ H_2O (50:50)				CP/Ac-17	S = MB; A′ = 4-(Diethylamino)azobenzene; meas. $k_r/k_r^{A'} = 1.6 \times 10^2$; Rel. to A′ in MeOH.	84F350
	MeOH				CP/Ac-17	S = MB; A′ = 4-(Diethylamino)azobenzene; meas. $k_r/k_r^{A'} = 26$.	84F350
	MeOH			293	CP/Ac-17	S = MB; A′ = 4-Phenylazo-1-naphthol; meas. $k_r/k_r^{A'} = 1.8$.	81A403
11.91	**1-Naphthol, 4-(4-nitrophenylazo)-**						
	MeOH			293	CP/Ac-17	S = MB; A′ = 4-Phenylazo-1-naphthol; meas. $k_r/k_r^{A'} = 0.06$.	81A403
11.92	**1-Naphthol, 4-phenylazo-**						
	CH_2Cl_2	2.1×10^7			PL/Ld-2	S = MB; charge-transfer; $k = 4.2 \times 10^7$ L mol^{-1} s^{-1} normalized to 100% hydrazone form.	89F024
	CH_2Cl_2	2.2×10^4 (k_r)			CL/Ac,A′c-17	S = MB; A′ = DMA; used $k_r^{A'} = 2 \times 10^7$ L mol^{-1} s^{-1}.	89F024
11.93	**2-Naphthol, 1-(4-aminophenylazo)-**						
	CH_3COCH_3			294	CP/Ac-19	S = A; A′ = $[(CH_3)_2NCS_2]_2Ni$; meas. $k_A/k_{A'} = 0.67$.	80F634
11.94	**2-Naphthol, 1-(4-bromophenylazo)-**						
	MeOH			293	CP/Ac-17	S = MB; A′ = 1-Phenylazo-2-naphthol; meas. $k_r/k_r^{A'} = 0.58$.	81A403
11.95	**2-Naphthol, 1-(4-chlorophenylazo)-**						
	MeOH			293	CP/Ac-17	S = MB; A′ = 1-Phenylazo-2-naphthol; meas. $k_r/k_r^{A'} = 0.54$.	81A403
11.96	**2-Naphthol, 1-[4-(dimethylamino)phenylazo]-**						
	MeOH			293	CP/Ac-17	S = MB; A′ = 1-Phenylazo-2-naphthol; meas. $k_r/k_r^{A'} = 3.8$.	81A403
11.97	**2-Naphthol, 1-(4-flurorophenylazo)-**						
	MeOH			293	CP/Ac-17	S = MB; A′ = 1-Phenylazo-2-naphthol; meas. $k_r/k_r^{A'} = 0.69$.	81A403
11.98	**2-Naphthol, 1-(4-hydroxyphenylazo)-**						
	MeOH			293	CP/Ac-17	S = MB; A′ = 1-Phenylazo-2-naphthol; meas. $k_r/k_r^{A'} = 1.6$.	81A403
11.99	**2-Naphthol, 1-(4-iodophenylazo)-**						
	MeOH			293	CP/Ac-17	S = MB; A′ = 1-Phenylazo-2-naphthol; meas. $k_r/k_r^{A'} = 0.50$.	81A403
11.100	**2-Naphthol, 1-(4-methoxyphenylazo)-**						
	CH_2Cl_2	3.5×10^6			PL/Ld-2	S = MB; charge-transfer; $k = 4.5 \times 10^6$ L mol^{-1} s^{-1} normalized to 100% hydrazone form.	89F024
	MeOH			293	CP/Ac-17	S = MB; A′ = 1-Phenylazo-2-naphthol; meas. $k_r/k_r^{A'} = 1.6$.	81A403
11.101	**2-Naphthol, 1-(4-methyl-2-nitrophenylazo)-**						
	DMAA	6×10^5			CP/A′c-17	S = RB; A′ = DMA; used $k_r^{A'} = 1.4 \times 10^7$ L mol^{-1} s^{-1}.	86F622

TABLE 11. Rate constants for the interaction of singlet oxygen with diazo compounds and dyes. — Continued

No.	Solvent	k ($L\ mol^{-1}\ s^{-1}$)	β (k_d/k) ($mol\ L^{-1}$)	T (K)	Method	Comment	Ref.
11.101	**2-Naphthol, 1-(4-methyl-2-nitrophenylazo)-** — Continued						
	DMF	$\leq 2 \times 10^5$			CP/A'c-17	S = RB; A' = DMA; used $k_r^{A'} = 1.4 \times 10^7$ L mol^{-1} s^{-1}.	86F622
	2-PrOH	$\leq 7 \times 10^5$			CP/A'c-17	S = RB; A' = DMA; used $k_r^{A'} = 1.4 \times 10^7$ L mol^{-1} s^{-1}.	86F622
11.102	**2-Naphthol, 1-(4-methylphenylazo)-**						
	CD_3OD				CP/Ac-17	S = MB; A' = 4-(Diethylamino)azobenzene; meas. $k_t/k_r^{A'} = 2.7 \times 10^2$; Rel. to A' in MeOH.	84F350
	CD_3OD/ D_2O (80:20)				CP/Ac-17	S = MB; A' = 4-(Diethylamino)azobenzene; meas. $k_t/k_r^{A'} = 3.5 \times 10^2$; Rel. to A' in MeOH.	84F350
	CH_2Cl_2	3×10^6			PL/Ld-2	S = MB; charge-transfer; $k = 4 \times 10^6$ L mol^{-1} s^{-1} normalized to 100% hydrazone form.	89F024
	MeOH/ H_2O (50:50)				CP/Ac-17	S = MB; A' = 4-(Diethylamino)azobenzene; meas. $k_t/k_r^{A'} = 42$; Rel. to A' in MeOH.	84F350
	MeOH/ H_2O (80:20)				CP/Ac-17	S = MB; A' = 4-(Diethylamino)azobenzene; meas. $k_t/k_r^{A'} = 16$; Rel. to A' in MeOH.	84F350
	MeOH			293	CP/Ac-17	S = MB; A' = 1-Phenylazo-2-naphthol; meas. $k_t/k_r^{A'} = 1.3$.	81A403
	MeOH				CP/Ac-17	S = MB; A' = 4-(Diethylamino)azobenzene; meas. $k_t/k_r^{A'} = 6$.	84F350
11.103	**2-Naphthol, 1-(4-nitrophenylazo)-**						
	MeOH			293	CP/Ac-17	S = MB; A' = 1-Phenylazo-2-naphthol; meas. $k_t/k_r^{A'} = 0.15$.	81A403
	DMAA	1.1×10^6			CP/A'c-17	S = RB; A' = DMA; used $k_r^{A'} = 1.4 \times 10^7$ L mol^{-1} s^{-1}.	86F622
	DMF	1×10^7			CP/A'c-17	S = RB; A' = DMA; used $k_r^{A'} = 1.4 \times 10^7$ L mol^{-1} s^{-1}.	86F622
	2-PrOH	5.5×10^6			CP/A'c-17	S = RB; A' = DMA; used $k_r^{A'} = 1.4 \times 10^7$ L mol^{-1} s^{-1}.	86F622
11.104	**2-Naphthol, 1-phenylazo-**						
	CH_2Cl_2	2.0×10^4 (k_r)			CL/Ac,A'c-17	S = MB; A' = DMA; used $k_r^{A'} = 2 \times 10^7$ L mol^{-1} s^{-1}.	89F024
	CH_2Cl_2	2×10^6			PL/Ld-2	S = MB; charge-transfer; $k = 2.5 \times 10^6$ L mol^{-1} s^{-1} normalized to 100% hydrazone form.	89F024
11.105	**Naphtho[1,2-*d*]thiazolium, 1-ethyl-2-[(1-ethylnaphtho[1,2-*d*]thiazol-2-ylidene)methyl]-, chloride**						
	MeOH	4.0×10^5 (k_r)			CP/Ac-15	S = 2-ACN; used $k_d = 1.9 \times 10^5$ s^{-1}; k_r derived using $\phi_\Delta(S) = 0.75$.	767071
11.106	**Naphtho[1,2-*d*]thiazolium, 1-ethyl-2-[(1-ethylnaphtho[1,2-*d*]thiazol-2-ylidene)methyl]-1-butenyl-, bromide**						
	MeOH	7.3×10^7 (k_r)			CP/Ac-15	S = 2-ACN; used $k_d = 1.9 \times 10^5$ s^{-1}; k_r derived using $\phi_\Delta(S) = 0.75$.	767071
11.107	**Naphtho[1,2-*d*]thiazolium, 1-ethyl-2-[(1-ethylnaphtho[1,2-*d*]thiazol-2-ylidene)-1-propenyl]-, toluenesulfonate**						
	MeOH	1.6×10^7 (k_r)			CP/Ac-15	S = 2-ACN; used $k_d = 1.9 \times 10^5$ s^{-1}; k_r derived using $\phi_\Delta(S) = 0.75$.	767071
11.108	**Naphtho[2,3-*d*]thiazolium, 2-[2-[2-(diphenylamino)-3-[3-(4-methoxy-4-oxobutyl)naphtho[2,3-*d*]thiazol-2-ylidene]ethylidene]1-cyclopenten-1-yl]ethenyl]-3-(4-methoxy-4-oxobutyl)-, perchlorate**						
	DMSO	2.3×10^6 (k_r)	6×10^{-3}		CL/Ac-15	S = Th; used $k_d = 1.3 \times 10^4$ s^{-1}; k_r derived using $\phi_\Delta(S) = 0.87$.	82F531
	MeOH	1.4×10^7 (k_r)	0.012		CL/Ac-15	S = Th; used $k_d = 1.4 \times 10^5$ s^{-1}; k_r derived using $\phi_\Delta(S) = 0.87$.	82F531

TABLE 11. Rate constants for the interaction of singlet oxygen with diazo compounds and dyes. — Continued

No.	Solvent	k ($L\ mol^{-1}\ s^{-1}$)	β (k_d/k) ($mol\ L^{-1}$)	T (K)	Method	Comment	Ref.
11.109	**2,2'-Oxatricarbocyanine, 3,3'-diethyl-, iodide**						
	Propylene carbonate	3.2×10^8 (k_r)		293	PL/A'd-17	S = MB; A' = DPBF; used $k_r^{A'} = 1.0 \times 10^9$ L $mol^{-1}\ s^{-1}$.	87E690
	Propylene carbonate	9×10^8 (k_q)		293	PL/A'd-5	S = MB; A' = DPBF; Measured $k_q + k_r$, k_q calcd. knowing k_r from $k_r/k_r^{A'}$.	87E690
11.110	**Pentadienylium, 1,1,5,5-tetrakis[4-(diethylamino)phenyl]-**						
	CH_3CN/ C_6H_6 (80:20)	1×10^8 1×10^5 (k_r) 6.6×10^7 (k_q)		298	CP/Ac,A'c-23	S = A' = Rub; used $k_d = 3.4 \times 10^4\ s^{-1}$, $k_{A'} = 4.2 \times 10^7$ L $mol^{-1}\ s^{-1}$.	90F360
11.111	**Pentanamide, 2-[[(4-diethylamino)-2-methylphenyl]imino]-4,4-dimethyl-3-oxo-*N*-phenyl-**						
	C_5H_5N	2.5×10^7			CP/Oc-20	S = RB; A' = 2M2P; used $k_d = 3.1 \times 10^4\ s^{-1}$, $\beta_{A'}$ = 0.043 mol L^{-1}; No evidence of chemical reaction.	757166
11.112	**Pentanamide, 2-[[(4-diethylamino)phenyl]imino]-4,4-dimethyl-3-oxo-*N*-phenyl-**						
	C_5H_5N	7.9×10^6			CP/Oc-20	S = RB; A' = 2M2P; used $k_d = 3.1 \times 10^4\ s^{-1}$, $\beta_{A'}$ = 0.043 mol L^{-1}; No evidence of chemical reaction.	757166
11.113	**Phenothiazinium, 3,7-bis(dimethylamino)- (Methylene Blue, MB)**						
	CCl_4/ MeOH (98:2)	$<5 \times 10^7$		293	PL/A'd-5	S = A; A' = DPBF; no effect of [MB] on decay rate up to 1.9×10^{-5} mol L^{-1}.	83A371
	$CHCl_3$		6.8×10^{-4}		CP/Oc-19	S = A; A' = 2M2P.	84F673
	D_2O pH = 5.9	4×10^8			CP/A'c-25	S = A; A' = Lysozyme; used $k_d = 5 \times 10^4\ s^{-1}$, $k_{A'}$ = 6.4×10^8 L $mol^{-1}\ s^{-1}$.	81R011
	H_2O pH = 5.9	3×10^8			CP/A'c-25	S = A; A' = Lysozyme; used $k_d = 5 \times 10^5\ s^{-1}$, $k_{A'}$ = 4.4×10^8 L $mol^{-1}\ s^{-1}$.	81R011
	MeOD	1.6×10^7			PL/Ld-2	S = A.	88A165
	MeOH	2.3×10^8	4.8×10^{-4}		CP/Ac-14	S = A; used $k_d = 1.1 \times 10^5\ s^{-1}$.	87F479
11.114	**Phenothiazinium, 3,7-diamino- (Thionine)**						
	D_2O	6.8×10^7			PL/Ld-2	S = MPDME.	83E235
11.115	**Propanediamide, 2-[[(4-diethylamino)-2-ethylphenyl]imino]-*N,N'*-diphenyl-**						
	C_5H_5N	$\sim 1.6 \times 10^7$			CP/Oc-20	S = RB; A' = 2M2P; used $k_d = 3.1 \times 10^4\ s^{-1}$, $\beta_{A'}$ = 0.043 mol L^{-1}; No evidence of chemical reaction.	757166
11.116	**1,3-Propanedione, 2-[[2-ethyl-4-(diethylamino)phenyl]imino]-1,3-diphenyl-**						
	C_5H_5N	$\sim 1.6 \times 10^7$			CP/Oc-20	S = RB; A' = 2M2P; used $k_d = 3.1 \times 10^4\ s^{-1}$, $\beta_{A'}$ = 0.043 mol L^{-1}; No evidence of chemical reaction.	757166
11.117	**Pyrazole, 4,5-dihydro-5-[4-(diethylamino)phenyl]-3-[2-[4-(diethylamino)phenyl]ethenyl]-1-phenyl-**						
	MeOH/ C_6H_6 (68:32)	5.8×10^9			CP/P'a-23	S = RB; A' = DPBF; used $k_d = 1.8 \times 10^5\ s^{-1}$, $k_{A'}$ = 6.3×10^8 L $mol^{-1}\ s^{-1}$.	83A063
11.118	**Pyrazole, 4,5-dihydro-5-[4-(dimethylamino)phenyl]-3-[2-[4-(dimethylamino)phenyl]ethenyl]-1-phenyl-**						
	MeOH/ C_6H_6 (80:20)	1.9×10^9			CP/P'a-23	S = RB; A' = 2M2P; used $k_d = 1.8 \times 10^5\ s^{-1}$, $k_{A'}$ = 8.1×10^5 L $mol^{-1}\ s^{-1}$.	83A063
11.119	**Pyrazole, 4,5-dihydro-1,5-diphenyl-3-(2-phenylethenyl)-**						
	MeOH/ C_6H_6 (80:20)	7.2×10^8			CP/P'a-23	S = RB; A' = 2M2P; used $k_d = 1.8 \times 10^5\ s^{-1}$, $k_{A'}$ = 8.1×10^5 L $mol^{-1}\ s^{-1}$.	83A063
	MeOH/ C_6H_6 (68:32)	1.7×10^8			CP/P'a-23	S = RB; A' = DPBF; used $k_d = 1.8 \times 10^5\ s^{-1}$, $k_{A'}$ = 6.3×10^8 L $mol^{-1}\ s^{-1}$.	83A063

TABLE 11. Rate constants for the interaction of singlet oxygen with diazo compounds and dyes. — Continued

No.	Solvent	k ($L\ mol^{-1}\ s^{-1}$)	β (k_d/k) ($mol\ L^{-1}$)	T (K)	Method	Comment	Ref.
11.120	**Pyrazole, 4,5-dihydro-5-(4-methoxyphenyl)-3-[2-(4-methoxyphenyl)ethenyl]-1-phenyl-**						
	MeOH/ C_6H_6 (80:20)	6.0×10^8			CP/P'a-23	S = RB; A' = 2M2P; used $k_d = 1.8 \times 10^5\ s^{-1}$, $k_{A'} = 8.1 \times 10^5\ L\ mol^{-1}\ s^{-1}$.	83A063
	MeOH/ C_6H_6 (68:32)	1.3×10^9			CP/P'a-23	S = RB; A' = DPBF; used $k_d = 1.8 \times 10^5\ s^{-1}$, $k_{A'} = 6.3 \times 10^8\ L\ mol^{-1}\ s^{-1}$.	83A063
11.121	**2-Pyrazoline, 3-(4-chlorophenyl)-1,5-diphenyl-**						
	CH_2Cl_2				CP/Ac-17	S = MB; A' = 1,3,5-Triphenyl-2-pyrazoline; meas. $k_r/k_r^{A'} = 2.1$.	86F225
11.122	**2-Pyrazoline, 5-(4-chlorophenyl)-1,3-diphenyl-**						
	CH_2Cl_2				CP/Ac-17	S = MB; A' = 1,3,5-Triphenyl-2-pyrazoline; meas. $k_r/k_r^{A'} = 1.5$.	86F225
11.123	**2-Pyrazoline, 5-deutero-1,3,5-triphenyl-**						
	CH_2Cl_2				CP/Ac-17	S = MB; A' = 1,3,5-Triphenyl-2-pyrazoline; meas. $k_r/k_r^{A'} = 0.48$; electron transfer.	86F225
11.124	**2-Pyrazoline, 3-(4-methoxyphenyl)-1,5-diphenyl-**						
	CH_2Cl_2				CP/Ac-17	S = MB; A' = 1,3,5-Triphenyl-2-pyrazoline; meas. $k_r/k_r^{A'} = 0.3$.	86F225
11.125	**2-Pyrazoline, 5-(4-methoxyphenyl)-1,3-diphenyl-**						
	CH_2Cl_2				CP/Ac-17	S = MB; A' = 1,3,5-Triphenyl-2-pyrazoline; meas. $k_r/k_r^{A'} = 0.8$.	86F225
11.126	**2-Pyrazoline, 3-(4-methylphenyl)-1,5-diphenyl-**						
	CH_2Cl_2				CP/Ac-17	S = MB; A' = 1,3,5-Triphenyl-2-pyrazoline; meas. $k_r/k_r^{A'} = 0.7$.	86F225
11.127	**2-Pyrazoline, 5-(4-methylphenyl)-1,3-diphenyl-**						
	CH_2Cl_2				CP/Ac-17	S = MB; A' = 1,3,5-Triphenyl-2-pyrazoline; meas. $k_r/k_r^{A'} = 1.1$.	86F225
11.128	**3-Pyrazolinone, 4-(4-diethylamino-2-methylphenyl)imino-5-methylcarbamyl-2-phenyl-**						
	MeOH	4×10^7 (k_r) 4×10^6 (k_q)		298	CP/Ac,A'c-17,19	S = MB; A' = DPA; used $k_r^{A'} = 1.8 \times 10^7\ L\ mol^{-1}\ s^{-1}$.	87F542
11.129	**3-Pyrazolinone, 4-[4-[ethyl(2-hydroxyethyl)amino]-2-methylphenyl]imino-5-methyl-2-phenyl-**						
	MeOH	4×10^7 (k_r) 5×10^6 (k_q)		298	CP/Ac,A'c-17,19	S = MB; A' = DPA; used $k_r^{A'} = 1.8 \times 10^7\ L\ mol^{-1}\ s^{-1}$.	87F542
11.130	**3-Pyrazolinone, 4-[4-[(2-hydroxyethyl)ethylamino]phenyl]imino-5-methyl-2-phenyl-**						
	MeOH	2×10^7 (k_r) 5×10^6 (k_q)		298	CP/Ac,A'c-17,19	S = MB; A' = DPA; used $k_r^{A'} = 1.8 \times 10^7\ L\ mol^{-1}\ s^{-1}$.	87F542
11.131	**Pyrazolo[1,2-*a*]benzotriazole**						
	CH_3CN	5×10^6	3×10^{-3}		CP/Ac-15	S = RB; used $k_d = 1.6 \times 10^4\ s^{-1}$.	83F136
11.132	**Pyrazolo[1,2-*a*]benzotriazole, 1,3-dimethyl-**						
	CH_3CN	2×10^7	8×10^{-4}		CP/Ac-15	S = RB; used $k_d = 1.6 \times 10^4\ s^{-1}$.	83F136
11.133	**Pyrazol-3-one, 4-[(4-aminophenyl)imino]-2,4-dihydro-5-methyl-2-phenyl-**						
	CH_3CN	5.0×10^7			CP/Oc-20	S = RB; A' = 2M2P; used $k_d = 3.3 \times 10^4\ s^{-1}$, $\beta_{A'} = 0.018\ mol\ L^{-1}$; No evidence of chemical reaction.	757166
	MeOH	4×10^6 (k_q)		298	CP/Ac,A'c-19	S = MB; A' = DPA.	87F542

TABLE 11. Rate constants for the interaction of singlet oxygen with diazo compounds and dyes. — Continued

No.	Solvent	k (L mol^{-1} s^{-1})	β (k_d/k) (mol L^{-1})	T (K)	Method	Comment	Ref.
11.134	**Pyrazol-3-one, 4-[(4-amino-2,3,5,6-tetramethylphenyl)imino]-2,4-dihydro-5-methyl-2-phenyl-**						
	CH_3CN	5.0×10^8			CP/Oc-20	S = RB; A′ = 2M2P; used $k_d = 3.3 \times 10^4$ s^{-1}, $\beta_{A'}$ = 0.018 mol L^{-1}; No evidence of chemical reaction.	757166
11.135	**Pyrazol-3-one, 2-(4-bromophenyl)-4-(4-diethylamino-2-methylphenyl)-2,4-dihydro-imino-5-methylcarbamyl-**						
	MeOH	4×10^7 (k_r)		298	CP/Ac,A′c-17	S = MB; A′ = DPA; used $k_r^{A'} = 1.8 \times 10^7$ L mol^{-1} s^{-1}.	87F542
11.136	**Pyrazol-3-one, 2-(3-chlorophenyl)-4-(4-diethylamino-2-methylphenyl)-2,4-dihydro-imino-5-methylcarbamyl-**						
	MeOH	4×10^7 (k_r)		298	CP/Ac,A′c-17	S = MB; A′ = DPA; used $k_r^{A'} = 1.8 \times 10^7$ L mol^{-1} s^{-1}.	87F542
11.137	**Pyrazol-3-one, 2-(4-chlorophenyl)-4-(4-diethylamino-2-methylphenyl)-2,4-dihydro-imino-5-methylcarbamyl-**						
	MeOH	4×10^7 (k_r) 4×10^6 (k_q)		298	CP/Ac,A′c-17,19	S = MB; A′ = DPA; used $k_r^{A'} = 1.8 \times 10^7$ L mol^{-1} s^{-1}.	87F542
11.138	**Pyrazol-3-one, 4-[[4-(diethylamino)-2,6-dimethylphenyl]imino]-2,4-dihydro-5-(benzoylamino)-2-phenyl-**						
	C_5H_5N	1.0×10^9			CP/Oc-20	S = RB; A′ = 2M2P; used $k_d = 3.1 \times 10^4$ s^{-1}, $\beta_{A'}$ = 0.043 mol L^{-1}; No evidence of chemical reaction.	757166
11.139	**Pyrazol-3-one, 4-[[4-(diethylamino)-2,6-dimethylphenyl]imino]-2,4-dihydro-5-(1,1-dimethylethyl)-2-phenyl-**						
	C_5H_5N	1.0×10^9			CP/Oc-20	S = RB; A′ = 2M2P; used $k_d = 3.1 \times 10^4$ s^{-1}, $\beta_{A'}$ = 0.043 mol L^{-1}; No evidence of chemical reaction.	757166
11.140	**Pyrazol-3-one, 4-[[4-(diethylamino)-2,6-dimethylphenyl]imino]-2,4-dihydro-5-methyl-2-phenyl-**						
	C_5H_5N	6.3×10^8			CP/Oc-20	S = RB; A′ = 2M2P; used $k_d = 3.1 \times 10^4$ s^{-1}, $\beta_{A'}$ = 0.043 mol L^{-1}; No evidence of chemical reaction.	757166
	C_6H_6	1.1×10^9			CP/Oc-20	S = azine; A′ = 2M2P; used $k_d = 4.2 \times 10^4$ s^{-1}, $\beta_{A'}$ = 0.053 mol L^{-1}; No evidence of chemical reaction.	757166
	CH_3CN	4.0×10^9			CP/Oc-20	S = RB; A′ = 2M2P; used $k_d = 3.3 \times 10^4$ s^{-1}, $\beta_{A'}$ = 0.018 mol L^{-1}; No evidence of chemical reaction.	757166
11.141	**Pyrazol-3-one, 4-[[4-(diethylamino)-2-methylphenyl]imino]-2,4-dihydro-5-(1,1-dimethylethyl)-2-phenyl-**						
	C_5H_5N	1.7×10^8			CP/Oc-20	S = RB; A′ = 2M2P; used $k_d = 3.1 \times 10^4$ s^{-1}, $\beta_{A'}$ = 0.043 mol L^{-1}; No evidence of chemical reaction.	757166
	C_6H_6	1.3×10^8			CP/Oc-20	S = azine; A′ = 2M2P; used $k_d = 4.2 \times 10^4$ s^{-1}, $\beta_{A'}$ = 0.053 mol L^{-1}; No evidence of chemical reaction.	757166
	CH_3CN	1.3×10^9			CP/Oc-20	S = RB; A′ = 2M2P; used $k_d = 3.3 \times 10^4$ s^{-1}, $\beta_{A'}$ = 0.018 mol L^{-1}; No evidence of chemical reaction.	757166
11.142	**Pyrazol-3-one, 4-(4-diethylamino-2-methylphenyl)imino-2,4-dihydro-5-methylcarbamyl-2-(3-methoxyphenyl)-**						
	MeOH	5×10^7 (k_r)		298	CP/Ac,A′c-17	S = MB; A′ = DPA; used $k_r^{A'} = 1.8 \times 10^7$ L mol^{-1} s^{-1}.	87F542
11.143	**Pyrazol-3-one, 4-(4-diethylamino-2-methylphenyl)imino-2,4-dihydro-5-methylcarbamyl-2-(3-methylphenyl)-**						
	MeOH	4×10^7 (k_r) 4×10^6 (k_q)		298	CP/Ac,A′c-17,19	S = MB; A′ = DPA; used $k_r^{A'} = 1.8 \times 10^7$ L mol^{-1} s^{-1}.	87F542
11.144	**Pyrazol-3-one, 4-[[4-(diethylamino)-2-methylphenyl]imino]-2,4-dihydro-5-methyl-2-phenyl-**						
	C_5H_5N	4.0×10^7			CP/Oc-20	S = RB; A′ = 2M2P; used $k_d = 3.1 \times 10^4$ s^{-1}, $\beta_{A'}$ = 0.043 mol L^{-1}; No evidence of chemical reaction.	757166

TABLE 11. Rate constants for the interaction of singlet oxygen with diazo compounds and dyes. — Continued

No.	Solvent	k ($L\ mol^{-1}\ s^{-1}$)	β (k_d/k) ($mol\ L^{-1}$)	T (K)	Method	Comment	Ref.
11.144	**Pyrazol-3-one, 4-[[4-(diethylamino)-2-methylphenyl]imino]-2,4-dihydro-5-methyl-2-phenyl-** — Continued						
	MeOH	4×10^7 (k_r) 5×10^6 (k_q)		298	CP/Ac,A'c-17,19	S = MB; A' = DPA; used $k_r^{A'} = 1.8 \times 10^7$ L mol^{-1} s^{-1}.	87F542
11.145	**Pyrazol-3-one, 4-(4-diethylamino-2-methylphenyl)imino-5-methylcarbamyl-2,4-dihydro-2-(4-nitrophenyl)-**						
	MeOH	4×10^7 (k_r)		298	CP/Ac,A'c-17	S = MB; A' = DPA; used $k_r^{A'} = 1.8 \times 10^7$ L mol^{-1} s^{-1}.	87F542
11.146	**Pyrazol-3-one, 4-(4-diethylamino-2-methylphenyl)imino-5-methylcarbamyl-2,4-dihydro-2-(2,4,6-trichlorophenyl)-**						
	MeOH	4×10^7 (k_r)		298	CP/Ac,A'c-17	S = MB; A' = DPA; used $k_r^{A'} = 1.8 \times 10^7$ L mol^{-1} s^{-1}.	87F542
11.147	**Pyrazol-3-one, 4-[[4-(diethylamino)phenyl]imino]-2,4-dihydro-5-methyl-2-phenyl-**						
	C_5H_5N	4.0×10^7			CP/Oc-20	S = RB; A' = 2M2P; used $k_d = 3.1 \times 10^4\ s^{-1}$, $\beta_{A'} = 0.043$ mol L^{-1}; No evidence of chemical reaction.	757166
	C_6H_6	1.2×10^7			CP/Oc-20	S = azine; A' = 2M2P; used $k_d = 4.2 \times 10^4\ s^{-1}$, $\beta_{A'} = 0.053$ mol L^{-1}; No evidence of chemical reaction.	757166
	CH_3CN	4.0×10^8			CP/Oc-20	S = RB; A' = 2M2P; used $k_d = 3.3 \times 10^4\ s^{-1}$, $\beta_{A'} = 0.018$ mol L^{-1}; No evidence of chemical reaction.	757166
	MeOH	3×10^7 (k_r) 4×10^6 (k_q)		298	CP/Ac,A'c-17,19	S = MB; A' = DPA; used $k_r^{A'} = 1.8 \times 10^7$ L mol^{-1} s^{-1}.	87F542
11.148	**Pyrazol-3-one, 2,4-dihydro-4-[(4-methoxyphenyl)imino]-5-methyl-2-phenyl-**						
	C_5H_5N				CP/Oc-20	S = RB; A' = 2M2P; No measurable effect.	757166
	CH_3CN				CP/Oc-20	S = RB; A' = 2M2P; No measurable effect.	757166
11.149	**Pyrazol-3-one, 4-[[4-(dimethylamino)-3,5-dimethylphenyl]imino]-2,4-dihydro-5-methyl-2-phenyl-**						
	CH_3CN	6.3×10^6			CP/Oc-20	S = RB; A' = 2M2P; used $k_d = 3.3 \times 10^4\ s^{-1}$, $\beta_{A'} = 0.018$ mol L^{-1}; No evidence of chemical reaction.	757166
11.150	**Pyrazol-3-one, 4-[[4-(dimethylamino)phenyl]imino]-2,4-dihydro-5-methyl-2-phenyl-**						
	C_5H_5N	4.0×10^7			CP/Oc-20	S = RB; A' = 2M2P; used $k_d = 3.1 \times 10^4\ s^{-1}$, $\beta_{A'} = 0.043$ mol L^{-1}; No evidence of chemical reaction.	757166
	MeOH	4×10^6 (k_q)		298	CP/Ac,A'c-19	S = MB; A' = DPA.	87F542
11.151	**Pyrazol-3-one, 4-[[4-(dimethylamino)-2,3,5,6-tetramethylphenyl]imino]-2,4-dihydro-5-methyl-2-phenyl-**						
	CH_3CN	4.0×10^6			CP/Oc-20	S = RB; A' = 2M2P; used $k_d = 3.3 \times 10^4\ s^{-1}$, $\beta_{A'} = 0.018$ mol L^{-1}; No evidence of chemical reaction.	757166
11.152	**Pyrazol-3-one, 4-[[4-(diphenylamino)phenyl]imino]-2,4-dihydro-5-methyl-2-phenyl-**						
	C_5H_5N	5.0×10^7			CP/Oc-20	S = RB; A' = 2M2P; used $k_d = 3.1 \times 10^4\ s^{-1}$, $\beta_{A'} = 0.043$ mol L^{-1}; No evidence of chemical reaction.	757166
11.153	**Pyrazol-3-one, 4,4'-[(2,3,5,6-tetramethyl-1,4-phenylene)dinitrilo]bis[2,4-dihydro-5-methyl-2-phenyl-**						
	C_5H_5N				CP/Oc-20	S = MB; A' = 2M2P; No measurable effect.	757166
	CH_3CN				CP/Oc-20	S = RB; A' = 2M2P; No measurable effect.	757166
11.154	**Pyrazolo[5,1-*c*]-1,2,4-triazole, 7-[4-(*N*-ethyl-[*N*-(2-methylsulfonylamino)ethyl]amino-2-methylphenylimino]-6-methyl-3-[4-[3-[(3-butyl-4-hydroxyphenoxy(dodecyl)methoxy]carbonylamino)phenyl]propyl]-**						
	EtOH	$<6 \times 10^7$			PL/A'd-8	S = An; A' = DPBF.	91A448
11.155	**Pyrazolo[5,1-*c*]-1,2,4-triazole-6-carboxylic acid, 7-[[4-(diethylamino)-2-methylphenyl]imino]-3-phenyl-, ethyl ester**						
	EtOH	2×10^8			PL/A'd-8	S = An; A' = DPBF.	91A448

TABLE 11. Rate constants for the interaction of singlet oxygen with diazo compounds and dyes. — Continued

No.	Solvent	k ($L\ mol^{-1}\ s^{-1}$)	β (k_d/k) ($mol\ L^{-1}$)	T (K)	Method	Comment	Ref.
11.155	**Pyrazolo[5,1-*c*]-1,2,4-triazole-6-carboxylic acid, 7-[[4-(diethylamino)-2-methylphenyl]imino]-3-phenyl-, ethyl ester** — Continued						
	EtOH	1.4×10^6 (k_r)			CP/Ac-17	S = AlCl(tspc); A′ = Azo dye 10; used $k_r^{A'} = 2.4 \times 10^6\ L\ mol^{-1}\ s^{-1}$; values from graph.	91A448
	EtOH	9×10^7			CP/A′c-16	S = AlCl(tspc); A′ = DPBF; used $k_d = 8 \times 10^4\ s^{-1}$.	91A448
11.156	**Pyrido[2,1-*b*]benzothiazolium, 4-[(2,3-dihydro)pyrido[2,1-*b*]benzothiazol-4-yl)methylene]-1,2,3,4-tetrahydro-, iodide**						
	MeOH	2.7×10^7 (k_r)			CP/Ac-15	S = 2-ACN; used $k_d = 1.9 \times 10^5\ s^{-1}$; k_r derived using $\phi_\Delta(S) = 0.75$.	767071
11.157	**Pyrylium, 2,6-bis(1,1-dimethylethyl)-4-[1-[2,6-bis(1,1-dimethylethyl)selenapyran-4-ylidene]-3-propenyl]-**						
	MeOH/ H_2O (50:50)	4×10^6 (k_r)			CP/Ac-14	S = RB; used $k_d = 1.7 \times 10^5\ s^{-1}$; k_r derived using $\phi_\Delta(RB) = 0.77$.	90F157
	MeOH/ H_2O (50:50)	3×10^6 (k_r)			CP/Ac-14	S = MB; used $k_d = 1.7 \times 10^5\ s^{-1}$; k_r derived using $\phi_\Delta(MB) = 0.50$.	90F157
11.158	**Pyrylium, 2,6-bis(1,1-dimethylethyl)-4-[1-[2,6-bis(1,1-dimethylethyl)telluropyran-4-ylidene]-3-propenyl]-**						
	MeOH/ H_2O (50:50)	8.5×10^7 (k_r)			CP/Ac-14	S = MB; used $k_d = 1.7 \times 10^5\ s^{-1}$; k_r derived using $\phi_\Delta(MB) = 0.50$.	90F157
	MeOH/ H_2O (50:50)	9.4×10^7 (k_r)			CP/Ac-14	S = RB; used $k_d = 1.7 \times 10^5\ s^{-1}$; k_r derived using $\phi_\Delta(RB) = 0.77$.	90F157
11.159	**Pyrylium, 4,4′-(1,3-propenyl)bis[2,6-di(1,1-dimethylethyl)-**						
	MeOH/ H_2O (50:50)	3×10^5 (k_r)			CP/Ac-14	S = RB; used $k_d = 1.7 \times 10^5\ s^{-1}$; k_r derived using $\phi_\Delta(RB) = 0.77$.	90F157
11.160	**Selenopyrylium, 2,6-bis(1,1-dimethylethyl)-4-[1-[2,6-bis(1,1-dimethylethyl)selenopyran-4-ylidene]-3-propenyl]-**						
	MeOH/ H_2O (50:50)	5×10^6 (k_r)			CP/Ac-14	S = RB; used $k_d = 1.7 \times 10^5\ s^{-1}$; k_r derived using $\phi_\Delta(RB) = 0.77$.	90F157
11.161	**Telluropyrylium, 2,6-bis(1,1-dimethylethyl)-4-[1-[2,6-bis(1,1-dimethylethyl)telluropyran-4-ylidene]-3-propenyl]-**						
	MeOH/ H_2O (99:1)	9×10^6 (k_r)			CP/Ac-14	S = MB; used $k_d = 1 \times 10^5\ s^{-1}$; k_r derived using $\phi_\Delta(MB) = 0.50$.	90F157 92F189
	MeOH/ H_2O (50:50)	1.8×10^8 (k_r)			CP/Ac-14	S = MB; used $k_d = 1.7 \times 10^5\ s^{-1}$; k_r derived using $\phi_\Delta(MB) = 0.50$.	90F157
	MeOH/ H_2O (50:50)	1.8×10^8 (k_r)			CP/Ac-14	S = RB; used $k_d = 1.7 \times 10^5\ s^{-1}$; k_r derived using $\phi_\Delta(RB) = 0.77$.	90F157
	H_2O	8×10^8 (k_r)			CP/Ac-14	S = MB; used $k_d = 2.4 \times 10^5\ s^{-1}$; k_r derived using $\phi_\Delta(MB) = 0.50$.	90F157 92F189
11.162	**Telluropyrylium, 2,6-diphenyl-4-(2,6-diphenyltelluropyran-4-ylidene)methyl-**						
	MeOH/ H_2O (99:1)	1×10^7 (k_r)		298	CP/Ac-14	S = RB; used $k_d = 1 \times 10^5\ s^{-1}$.	92F189
11.163	**2,2′-Thiacarbocyanine, 5,5′-dichloro-3,3-diethyl-, bromide**						
	MeOH	1.3×10^6 (k_r)			CP/Ac-15	S = 2-ACN; used $k_d = 1.9 \times 10^5\ s^{-1}$; k_r derived using $\phi_\Delta(S) = 0.75$.	767071
11.164	**2,2′-Thiacarbocyanine, 5,5′-dichloro-3,9,3′-triethyl-, bromide**						
	MeOH	7.1×10^6 (k_r)			CP/Ac-15	S = 2-ACN; used $k_d = 1.9 \times 10^5\ s^{-1}$; k_r derived using $\phi_\Delta(S) = 0.75$.	767071
11.165	**2,2′-Thiacarbocyanine, 5,5′-dicyano-3,9,3′-triethyl-, tetrafluoroborate**						
	MeOH	3.3×10^6 (k_r)			CP/Ac-15	S = 2-ACN; used $k_d = 1.9 \times 10^5\ s^{-1}$; k_r derived using $\phi_\Delta(S) = 0.75$.	767071
11.166	**2,2′-Thiacarbocyanine, 3,3′-diethyl-, toluenesulfonate**						
	MeOH	3.5×10^6 (k_r)			CP/Ac-15	S = 2-ACN; used $k_d = 1.9 \times 10^5\ s^{-1}$; k_r derived using $\phi_\Delta(S) = 0.75$.	767071

TABLE 11. Rate constants for the interaction of singlet oxygen with diazo compounds and dyes. — Continued

No.	Solvent	k ($L\ mol^{-1}\ s^{-1}$)	β (k_d/k) ($mol\ L^{-1}$)	T (K)	Method	Comment	Ref.
11.167	**2,2'-Thiacarbocyanine, 3,3'-diethyl-5,5'-dimethoxy-, toluenesulfonate**						
	MeOH	6.7×10^6 (k_r)			CP/Ac-15	S = 2-ACN; used $k_d = 1.9 \times 10^5\ s^{-1}$; k_r derived using $\phi_\Delta(S) = 0.75$.	767071
11.168	**2,2'-Thiacarbocyanine, 3,3'-diethyl-8,10-dimethyl-, toluenesulfonate**						
	MeOH	2.9×10^8 (k_r)			CP/Ac-15	S = 2-ACN; used $k_d = 1.9 \times 10^5\ s^{-1}$; k_r derived using $\phi_\Delta(S) = 0.75$.	767071
11.169	**2,2'-Thiacarbocyanine, 3,3'-diethyl-8,10-ethanediyl-, toluenesulfonate**						
	MeOH	1.2×10^8 (k_r)			CP/Ac-15	S = 2-ACN; used $k_d = 1.9 \times 10^5\ s^{-1}$; k_r derived using $\phi_\Delta(S) = 0.75$.	767071
11.170	**2,2'-Thiacarbocyanine, 3,3'-diethyl-8,9-(1,3-propanediyl)-, iodide**						
	MeOH	1.5×10^8 (k_r)			CP/Ac-15	S = 2-ACN; used $k_d = 1.9 \times 10^5\ s^{-1}$; k_r derived using $\phi_\Delta(S) = 0.75$.	767071
11.171	**2,2'-Thiacarbocyanine, 3,9,3'-triethyl-, bromide**						
	MeOH	1.6×10^7 (k_r)			CP/Ac-15	S = 2-ACN; used $k_d = 1.9 \times 10^5\ s^{-1}$; k_r derived using $\phi_\Delta(S) = 0.75$.	767071
11.172	**2,2'-Thiacarbocyanine, 3,9,3'-triethyl-5,5'-dimethoxy-, toluenesulfonate**						
	MeOH	3.1×10^7 (k_r)			CP/Ac-15	S = 2-ACN; used $k_d = 1.9 \times 10^5\ s^{-1}$; k_r derived using $\phi_\Delta(S) = 0.75$.	767071
11.173	**2,2'-Thiadicarbocyanine, 3,3'-diethyl-, iodide**						
	MeOH	1.3×10^7 (k_r)			CP/Ac-15	S = 2-ACN; used $k_d = 1.9 \times 10^5\ s^{-1}$; k_r derived using $\phi_\Delta(S) = 0.75$.	767071
11.174	**2,2'-Thiatricarbocyanine, 3,3'-diethyl-, iodide**						
	Propylene carbonate	2.7×10^9 (k_q)		293	PL/A'd-5	S = MB; A' = DPBF; Measured $k_q + k_r$, k_q calcd. knowing k_r from $k_r/k_r^{A'}$.	87E690
	Propylene carbonate	3.8×10^8 (k_r)		293	PL/A'd-17	S = MB; A' = DPBF; used $k_r^{A'} = 1.0 \times 10^9$ L $mol^{-1}\ s^{-1}$.	87E690
	MeOH	5.1×10^7 (k_r)			CP/Ac-15	S = 2-ACN; used $k_d = 1.9 \times 10^5\ s^{-1}$; k_r derived using $\phi_\Delta(S) = 0.75$.	767071
11.175	**Thiopyrylium, 2,6-bis(1,1-dimethylethyl)-4-[1-[2,6-bis(1,1-dimethylethyl)selenopyran-4-ylidene]-3-propenyl]-**						
	MeOH/ H_2O (50:50)	9.0×10^6 (k_r)		298	CP/Ac-14	S = RB; used $k_d = 1.7 \times 10^5\ s^{-1}$.	92F189
11.176	**Thiopyrylium, 2,6-bis(1,1-dimethylethyl)-4-[1-[2,6-bis(1,1-dimethylethyl)thiopyran-4-ylidene]-3-propenyl]-**						
	MeOH/ H_2O (50:50)	1.3×10^7 (k_r)			CP/Ac-14	S = RB; used $k_d = 1.7 \times 10^5\ s^{-1}$; k_r derived using $\phi_\Delta(RB) = 0.77$.	90F157
11.177	**1,2,3-Triazolo[1,2-*a*]benzotriazole**						
	CH_3CN	4×10^4	0.4		CP/Ac-15	S = RB; used $k_d = 1.6 \times 10^4\ s^{-1}$.	83F136
11.178	**Tricarbocyanine, 5,5'-dichloro-1,1',3,3,3',3'-hexamethyl-, iodide**						
	Propylene carbonate	4.0×10^9 (k_q)		293	PL/A'd-5	S = MB; A' = DPBF; Measured $k_q + k_r$, k_q calcd. knowing k_r from $k_r/k_r^{A'}$.	87E690
	Propylene carbonate	4×10^7 (k_r)		293	PL/A'd-17	S = MB; A' = DPBF; used $k_r^{A'} = 1.0 \times 10^9$ L $mol^{-1}\ s^{-1}$.	87E690
11.179	**Tricarbocyanine, 5,5'-difluoro-1,1',3,3,3',3'-hexamethyl-, iodide**						
	Propylene carbonate	7×10^7 (k_r)		293	PL/A'd-17	S = MB; A' = DPBF; used $k_r^{A'} = 1.0 \times 10^9$ L $mol^{-1}\ s^{-1}$.	87E690
	Propylene carbonate	1.0×10^9 (k_q)		293	PL/A'd-5	S = MB; A' = DPBF; Measured $k_q + k_r$, k_q calcd. knowing k_r from $k_r/k_r^{A'}$.	87E690

TABLE 11. Rate constants for the interaction of singlet oxygen with diazo compounds and dyes. — Continued

No.	Solvent	k (L mol^{-1} s^{-1})	β (k_d/k) (mol L^{-1})	T (K)	Method	Comment	Ref.
11.180	**Tricarbocyanine, 5,5'-dimethoxy-1,1',3,3,3',3'-hexamethyl-, iodide**						
	Propylene carbonate	1.5×10^8 (k_r)		293	PL/A'd-17	S = MB; A' = DPBF; used $k_r^{A'} = 1.0 \times 10^9$ L mol^{-1} s^{-1}.	87E690
	Propylene carbonate	2.6×10^9 (k_q)		293	PL/A'd-5	S = MB; A' = DPBF; Measured $k_q + k_r$, k_q calcd. knowing k_r from $k_r/k_r^{A'}$.	87E690
11.181	**Tricarbocyanine, 1,1',3,3,3',3'-hexamethyl-, fluoride**						
	Propylene carbonate	8×10^7 (k_r)		293	PL/A'd-17	S = MB; A' = DPBF; used $k_r^{A'} = 1.0 \times 10^9$ L mol^{-1} s^{-1}.	87E690
	Propylene carbonate	5.4×10^8 (k_q)		293	PL/A'd-5	S = MB; A' = DPBF; Measured $k_q + k_r$, k_q calcd. knowing k_r from $k_r/k_r^{A'}$.	87E690
11.182	**Tricarbocyanine, 1,1',3,3,3',3'-hexamethyl-, iodide**						
	Propylene carbonate	7×10^7 (k_r)		293	PL/A'd-17	S = MB; A' = DPBF; used $k_r^{A'} = 1.0 \times 10^9$ L mol^{-1} s^{-1}.	87E690
	Propylene carbonate	1.8×10^9 (k_q)		293	PL/A'd-5	S = MB; A' = DPBF; Measured $k_q + k_r$, k_q calcd. knowing k_r from $k_r/k_r^{A'}$.	87E690
	DMSO	1.9×10^5 (k_r)	0.078		CL/Ac-15	S = Th; used $k_d = 1.3 \times 10^4$ s^{-1}; k_r derived using $\phi_\Delta(S) = 0.87$.	82F531
	MeOH	1.2×10^6 (k_r)	0.14		CL/Ac-15	S = Th; used $k_d = 1.4 \times 10^5$ s^{-1}; k_r derived using $\phi_\Delta(S) = 0.87$.	82F531
11.183	**Tricarbocyanine, 1,1',3,3,3',3'-hexamethyl-, perchlorate**						
	Propylene carbonate	1.0×10^8 (k_r)		293	PL/A'd-17	S = MB; A' = DPBF; used $k_r^{A'} = 1.0 \times 10^9$ L mol^{-1} s^{-1}.	87E690
	Propylene carbonate	7.7×10^8 (k_q)		293	PL/A'd-5	S = MB; A' = DPBF; Measured $k_q + k_r$, k_q calcd. knowing k_r from $k_r/k_r^{A'}$.	87E690
	CH_3CN/ C_6H_6 (80:20)	8×10^7 1.6×10^6 (k_r) 4×10^7 (k_q)		298	CP/Ac,A'c-23	S = A' = Rub; used $k_d = 3.4 \times 10^4$ s^{-1}, $k_{A'} = 4.2 \times 10^7$ L mol^{-1} s^{-1}.	90F360
11.184	**Tricarbocyanine, 1,1',3,3,3',3',5,5'-octamethyl-, iodide**						
	Propylene carbonate	5×10^7 (k_r)		293	PL/A'd-17	S = MB; A' = DPBF; used $k_r^{A'} = 1.0 \times 10^9$ L mol^{-1} s^{-1}.	87E690
	Propylene carbonate	5.8×10^8 (k_q)		293	PL/A'd-5	S = MB; A' = DPBF; Measured $k_q + k_r$, k_q calcd. knowing k_r from $k_r/k_r^{A'}$.	87E690

TABLE 12. Rate constants for the interaction of singlet oxygen with metal complexes.

No.	Solvent	k ($L\ mol^{-1}\ s^{-1}$)	β (k_d/k) ($mol\ L^{-1}$)	T (K)	Method	Comment	Ref.
12.1	**Acetatobis(acetylacetonato)manganese(III)**						
	CH_3COCH_3/H_2O (95:5)	2.2×10^7			PL/Ld-2	S = PdMP.	82A412
12.2	**Ammine[2,2'-thiobis[4-(1,1,3,3-tetramethylbutyl)]phenolato]nickel(II)**						
	$C_6H_5CH_3$	4.8×10^8			CP/A'c-25	S = A' = Rub; used $k_d = 1 \times 10^5\ s^{-1}$, $k_{A'} = 1.7 \times 10^8\ L\ mol^{-1}\ s^{-1}$.	752063
12.3	**Aniline[2,2'-thiobis[4-(1,1,3,3-tetramethylbutyl)]phenolato]nickel(II)**						
	$C_6H_5CH_3$	1.9×10^8			CP/A'c-25	S = A' = Rub; used $k_d = 1 \times 10^5\ s^{-1}$, $k_{A'} = 1.7 \times 10^8\ L\ mol^{-1}\ s^{-1}$.	752063
12.4	**Aqua[2,2'-thiobis(3,4-dimethylphenolato)]nickel(II)**						
	$C_6H_5CH_3$	1.2×10^8			CP/A'c-25	S = A' = Rub; used $k_d = 1 \times 10^5\ s^{-1}$, $k_{A'} = 1.7 \times 10^8\ L\ mol^{-1}\ s^{-1}$.	752063
12.5	**Aqua[2,2'-thiobis[4-(1,1,3,3-tetramethylbutyl)]phenolato]nickel(II)**						
	$C_6H_5CH_3$	1.4×10^8			CP/A'c-25	S = A' = Rub; used $k_d = 1 \times 10^5\ s^{-1}$, $k_{A'} = 1.7 \times 10^8\ L\ mol^{-1}\ s^{-1}$.	752063
12.6	**Bis(acetylacetonato)chloroacetatomanganese(III)**						
	CH_3COCH_3/H_2O (95:5)	2.7×10^7			PL/Ld-2	S = PdMP.	82A412
12.7	**Bis(acetylacetonato)cobalt(II)**						
	$C_6H_5CH_3$	1×10^8			CP/A'c-25	S = A' = Rub; used $k_d = 1 \times 10^5\ s^{-1}$, $k_{A'} = 1.7 \times 10^8\ L\ mol^{-1}\ s^{-1}$.	752063
	$CCl_4/CHCl_3$ (90:10)	1.5×10^8			CP/A'c-23	S = A' = Rub; used $k_d = 1.4 \times 10^3\ s^{-1}$, $k_{A'} = 7 \times 10^7\ L\ mol^{-1}\ s^{-1}$; Measured $k_A/(k_{A'}[A'] + k_d) = 8.2 \times 10^4\ L\ mol^{-1}$ at $[A'] = 5 \times 10^{-6}\ mol\ L^{-1}$.	74F645
12.8	**Bis(acetylacetonato)copper(II)**						
	$C_6H_5CH_3$	1×10^8			CP/A'c-25	S = A' = Rub; used $k_d = 1 \times 10^5\ s^{-1}$, $k_{A'} = 1.7 \times 10^8\ L\ mol^{-1}\ s^{-1}$.	752063
	$CCl_4/CHCl_3$ (90:10)	3.7×10^6			CP/A'c-23	S = A' = Rub; used $k_d = 1.4 \times 10^3\ s^{-1}$, $k_{A'} = 7 \times 10^7\ L\ mol^{-1}\ s^{-1}$; Measured $k_A/(k_{A'}[A'] + k_d) = 2.1 \times 10^3\ L\ mol^{-1}$ at $[A'] = 5 \times 10^{-6}\ mol\ L^{-1}$.	74F645
12.9	**Bis(acetylacetonato)manganese(III)**						
	CH_3COCH_3/H_2O (95:5)	2.5×10^7			PL/Ld-2	S = PdMP.	82A412
12.10	**Bis(acetylacetonato)nickel(II)**						
	$BuOCH_2CH_2OH$	7.5×10^7		273	MD/A'c-33	A' = Rub; used $k_d = 3.8 \times 10^5\ s^{-1}$, $k_{A'} = 7 \times 10^7\ L\ mol^{-1}\ s^{-1}$.	727319
	C_6H_5Br	6.5×10^7		273	MD/A'c-33	A' = Rub; used $k_d = 1.3 \times 10^4\ s^{-1}$, $k_{A'} = 4.0 \times 10^7\ L\ mol^{-1}\ s^{-1}$; Measured $k/[(k_d/[A']) + k_{A'}] = 0.5$ at $[A'] = 1.5 \times 10^{-4}\ mol\ L^{-1}$. A exists as a trimer in solution.	737333
	$C_6H_5CH_3$	3×10^8			CP/A'c-25	S = A' = Rub; used $k_d = 1 \times 10^5\ s^{-1}$, $k_{A'} = 1.7 \times 10^8\ L\ mol^{-1}\ s^{-1}$.	752063
	$CCl_4/CHCl_3$ (90:10)	8.2×10^7			CP/A'c-23	S = A' = Rub; used $k_d = 1.4 \times 10^3\ s^{-1}$, $k_{A'} = 7 \times 10^7\ L\ mol^{-1}\ s^{-1}$; Measured $k_A/(k_{A'}[A'] + k_d) = 4.6 \times 10^4\ L\ mol^{-1}$ at $[A'] = 5 \times 10^{-6}\ mol\ L^{-1}$.	74F645
	CH_2Cl_2	1.5×10^8		298	CP/A'c-23	S = A' = Rub; used $k_d = 8 \times 10^3\ s^{-1}$, $k_{A'} = 8 \times 10^7\ L\ mol^{-1}\ s^{-1}$.	747341
	CH_2Cl_2	7.5×10^7			CP/A'c-23	S = A' = Rub; used $k_d = 7.3 \times 10^3\ s^{-1}$, $k_{A'} = 7 \times 10^7\ L\ mol^{-1}\ s^{-1}$.	732066

TABLE 12. Rate constants for the interaction of singlet oxygen with metal complexes. — Continued

No.	Solvent	k ($L\ mol^{-1}\ s^{-1}$)	β (k_d/k) ($mol\ L^{-1}$)	T (K)	Method	Comment	Ref.
12.10	**Bis(acetylacetonato)nickel(II)** — Continued						
	CH_3COCH_3/ H_2O (95:5)	1.5×10^8			PL/Ld-2	S = PdMP.	82A412
	CH_2Cl_2	1.8×10^8			CP/A'c-19	S = A' = Rub; used $k_d = 7.3 \times 10^3\ s^{-1}$, $k_{A'} = 7 \times 10^7\ L\ mol^{-1}\ s^{-1}$.	88F059
12.11	**Bis(acetylacetonato)nickel(II) dihydrate**						
	CCl_4/ MeOH (98:2)	6.6×10^7			FP/A'd-5	S = MB; A' = DPBF.	78E238
12.12	**Bis(acetylacetonato)trichloroacetatomanganese(III)**						
	CH_3COCH_3/ H_2O (95:5)	2.2×10^7			PL/Ld-2	S = PdMP.	82A412
12.13	**Bis(acetylacetonato)zinc(II)**						
	CCl_4/ $CHCl_3$ (90:10)	1.1×10^7			CP/A'c-23	S = A' = Rub; used $k_d = 1.4 \times 10^3\ s^{-1}$, $k_{A'} = 7 \times 10^7\ L\ mol^{-1}\ s^{-1}$; Measured $k_A/(k_{A'}[A'] + k_d) = 6.1 \times 10^3\ L\ mol^{-1}$ at $[A'] = 5 \times 10^{-6}\ mol\ L^{-1}$.	74F645
12.14	**Bis(5-bromo-2-hydroxybenzaldehydato)nickel(II) dihydrate**						
	$CHCl_3$	5.3×10^7			CP/A'c-33	S = A' = Rub; used $k_d = 1.7 \times 10^4\ s^{-1}$, $k_{A'} = 5.3 \times 10^7\ L\ mol^{-1}\ s^{-1}$.	79A050
12.15	**Bis(2-butene-2,3-dithiolato)nickel(II)**						
	$C_6H_5CH_3$	2.8×10^{10}			CP/A'c-25	S = A' = Rub; used $k_d = 1 \times 10^5\ s^{-1}$, $k_{A'} = 1.7 \times 10^8\ L\ mol^{-1}\ s^{-1}$.	752063
	CH_3CN/ C_6H_6 (80:20)	1.3×10^{10} 9×10^5 (k_r) 1.4×10^{10} (k_q)		298	CP/Ac,A'c-23	S = A' = Rub; used $k_d = 3.4 \times 10^4\ s^{-1}$, $k_{A'} = 4.2 \times 10^7\ L\ mol^{-1}\ s^{-1}$.	90F360
12.16	**Bis[*O*-butyl-3,5-di-(1,1-dimethylethyl)-4-hydroxybenzylphosphonato]nickel(II)**						
	$BuOCH_2CH_2OH$	3.4×10^7		273	MD/A'c-33	A' = Rub; used $k_d = 3.8 \times 10^5\ s^{-1}$, $k_{A'} = 7 \times 10^7\ L\ mol^{-1}\ s^{-1}$.	727319
	C_6H_5Br	1.3×10^7		273	MD/A'c-33	A' = Rub; used $k_d = 1.3 \times 10^4\ s^{-1}$, $k_{A'} = 4.0 \times 10^7\ L\ mol^{-1}\ s^{-1}$; Measured $k/[(k_d/[A']) + k_{A'}] = 0.1$ at $[A'] = 1.5 \times 10^{-4}\ mol\ L^{-1}$. A exists as a trimer in solution.	737333
	$C_6H_5CH_3$	2.0×10^8			CP/A'c-25	S = A' = Rub; used $k_d = 1 \times 10^5\ s^{-1}$, $k_{A'} = 1.7 \times 10^8\ L\ mol^{-1}\ s^{-1}$.	752063
	C_6H_6	1.4×10^7			PL/A'd-8	S = MB; A' = DPBF.	76F902
	CCl_4/ $CHCl_3$ (90:10)	9.0×10^6			CP/A'c-23	S = A' = Rub; used $k_d = 1.4 \times 10^3\ s^{-1}$, $k_{A'} = 7 \times 10^7\ L\ mol^{-1}\ s^{-1}$; Measured $k_A/(k_{A'}[A'] + k_d) = 5.2 \times 10^3\ L\ mol^{-1}$ at $[A'] = 5 \times 10^{-6}\ mol\ L^{-1}$.	74F645
	CH_2Cl_2	1.6×10^7		298	CP/A'c-23	S = A' = Rub; used $k_d = 7.3 \times 10^3\ s^{-1}$, $k_{A'} = 7.3 \times 10^7\ L\ mol^{-1}\ s^{-1}$.	74F642
	CH_2Cl_2	1.4×10^7		298	CP/A'c-23	S = A' = Rub; used $k_d = 7.3 \times 10^3\ s^{-1}$, $k_{A'} = 7 \times 10^7\ L\ mol^{-1}\ s^{-1}$.	727319
	CH_2Cl_2/ MeOH/ C_5H_5N (94:3:3)	1.0×10^7		298	CR/A'c-32	A' = Rub; used $k_d = 7.3 \times 10^3\ s^{-1}$, $k_{A'} = 7 \times 10^7\ L\ mol^{-1}\ s^{-1}$; $^1O_2$* from $(PhO)_3PO_3$.	727319
12.17	**Bis[2-[(butylimino)methyl]-4-bromophenolato]nickel(II)**						
	$CHCl_3$	3.7×10^9			CP/A'c-33	S = A' = Rub; used $k_d = 1.7 \times 10^4\ s^{-1}$, $k_{A'} = 5.3 \times 10^7\ L\ mol^{-1}\ s^{-1}$.	79A050
12.18	**Bis[2-[(butylimino)methyl]-4-methoxyphenolato]nickel(II)**						
	n-$C_{16}H_{34}$	4.0×10^8		298	MD/A'c-33	A' = Rub; used $k_d = 9.0 \times 10^4\ s^{-1}$, $k_{A'} = 7.3 \times 10^7\ L\ mol^{-1}\ s^{-1}$.	747341
	n-$C_{16}H_{34}$	2.0×10^8		298	MD/A'c-33	A' = Rub; used $k_d = 9.0 \times 10^4\ s^{-1}$, $k_{A'} = 7 \times 10^7\ L\ mol^{-1}\ s^{-1}$.	727319

TABLE 12. Rate constants for the interaction of singlet oxygen with metal complexes. — Continued

No.	Solvent	k (L mol^{-1} s^{-1})	β (k_d/k) (mol L^{-1})	T (K)	Method	Comment	Ref.
12.18	**Bis[2-[(butylimino)methyl]-4-methoxyphenolato]nickel(II)** — Continued						
	CH_2Cl_2	2.0×10^9		298	CP/A'c-23	S = A' = Rub; used $k_d = 8 \times 10^3$ s^{-1}, $k_{A'} = 7.3 \times 10^7$ L mol^{-1} s^{-1}.	747341
	$CHCl_3$	3.4×10^9			CP/A'c-33	S = A' = Rub; used $k_d = 1.7 \times 10^4$ s^{-1}, $k_{A'} = 5.3 \times 10^7$ L mol^{-1} s^{-1}.	79A050
	i-octane/ MeOH/ C_5H_5N (94:3:3)	3.5×10^9		298	CR/A'c-32	A' = Rub; used $k_d = 5.0 \times 10^4$ s^{-1}, $k_{A'} = 7 \times 10^7$ L mol^{-1} s^{-1}; $^1O_2$* from $(PhO)_3PO_3$.	727319
	i-octane	2.6×10^9		298	CP/A'c-23	S = A' = Rub; used $k_d = 4.7 \times 10^4$ s^{-1}, $k_{A'} = 7.3 \times 10^7$ L mol^{-1} s^{-1}.	747341
12.19	**Bis[2-[(butylimino)methyl]phenolato]nickel(II)**						
	$CHCl_3$	2.8×10^9			CP/A'c-33	S = A' = Rub; used $k_d = 1.7 \times 10^4$ s^{-1}, $k_{A'} = 5.3 \times 10^7$ L mol^{-1} s^{-1}.	79A050
12.20	**Bis[3-(cyclohexylimino)methyl]-5-ethyl-2-thiophenethionato]cobalt(II)**						
	$C_6H_5CH_3$	2.7×10^9			PL/Ld-2	S = TPP.	88A507
	$C_6H_5CH_3$	3.5×10^7 (k_r)			CP/Ac,A'c-17	S = PP; A' = DPBF; used $k_r^{A'} = 6.7 \times 10^8$ L mol^{-1} s^{-1}.	88A507
	CH_3CN	1.9×10^9			PL/Ld-2	S = TPP.	88A507
	CH_3CN	8.5×10^6 (k_r)			CP/Ac,A'c-17	S = MB; A' = DPBF; used $k_r^{A'} = 1.1 \times 10^9$ L mol^{-1} s^{-1}.	88A507
12.21	**Bis[3-(cyclohexylimino)methyl]-5-ethyl-2-thiophenethionato]nickel(II)**						
	$C_6H_5CH_3$	4.7×10^9			PL/Ld-2	S = TPP.	88A507
	$C_6H_5CH_3$	5.0×10^7 (k_r)			CP/Ac,A'c-17	S = PP; A' = DPBF; used $k_r^{A'} = 6.7 \times 10^8$ L mol^{-1} s^{-1}.	88A507
	CH_3CN	1.3×10^7 (k_r)			CP/Ac,A'c-17	S = MB; A' = DPBF; used $k_r^{A'} = 1.1 \times 10^9$ L mol^{-1} s^{-1}.	88A507
	CH_3CN	8.4×10^9			PL/Ld-2	S = TPP.	88A507
12.22	**Bis[3-(cyclohexylimino)methyl]-5-ethyl-2-thiophenonato]copper(II)**						
	$C_6H_5CH_3$	5.0×10^7 (k_r)			CP/Ac,A'c-17	S = PP; A' = DPBF; used $k_r^{A'} = 6.7 \times 10^8$ L mol^{-1} s^{-1}.	88A507
	$C_6H_5CH_3$	1.5×10^9			PL/Ld-2	S = TPP.	88A507
12.23	**Bis[3-(cyclohexylimino)methyl]-5-ethyl-2-thiophenethionato]zinc(II)**						
	$C_6H_5CH_3$	5.0×10^7			PL/Ld-2	S = TPP.	88A507
	$C_6H_5CH_3$	1.3×10^7 (k_r)			CP/Ac,A'c-17	S = PP; A' = DPBF; used $k_r^{A'} = 6.7 \times 10^8$ L mol^{-1} s^{-1}.	88A507
	CH_3CN	9.0×10^6 (k_r)			CP/Ac,A'c-17	S = MB; A' = DPBF; used $k_r^{A'} = 1.1 \times 10^9$ L mol^{-1} s^{-1}.	88A507
	CH_3CN	1.9×10^8			PL/Ld-2	S = TPP.	88A507
	$CHCl_3$	1.2×10^8			PL/Ld-2	S = TPP.	88A507
12.24	**Bis[2-[(cyclohexylimino)methyl]phenolato]nickel(II)**						
	$C_6H_5CH_3$	4.7×10^9			CP/A'c-25	S = A' = Rub; used $k_d = 1 \times 10^5$ s^{-1}, $k_{A'} = 1.7 \times 10^8$ L mol^{-1} s^{-1}.	752063
12.25	**Bis[1,2-di(2-bromophenyl)-1,2-ethenedithiolato]nickel(II)**						
	CH_3CN/ C_6H_6 (80:20)	1.1×10^{10} 9×10^5 (k_r) 1.1×10^{10} (k_q)		298	CP/Ac,A'c-23	S = A' = Rub; used $k_d = 3.4 \times 10^4$ s^{-1}, $k_{A'} = 4.2 \times 10^7$ L mol^{-1} s^{-1}.	90F360
12.26	**Bis(dibutyldithiocarbamato)cobalt(II)**						
	CCl_4/ MeOH (98:2)	1.2×10^9			FP/A'd-5	S = MB; A' = DPBF.	78E238

TABLE 12. Rate constants for the interaction of singlet oxygen with metal complexes. — Continued

No.	Solvent	k ($L\ mol^{-1}\ s^{-1}$)	β (k_d/k) ($mol\ L^{-1}$)	T (K)	Method	Comment	Ref.
12.27	**Bis(dibutyldithiocarbamato)copper(II)**						
	CCl_4/ MeOH (98:2)	$<5 \times 10^8$			FP/A'd-5	S = MB; A' = DPBF; no effect for [A] = 5×10^{-6} mol L^{-1}.	78E238
12.28	**Bis(dibutyldithiocarbamato)nickel(II)**						
	n-$C_{16}H_{34}$	9.7×10^8		298	MD/A'c-33	A' = Rub; used $k_d = 9 \times 10^4\ s^{-1}$, $k_{A'} = 7.3 \times 10^7$ L $mol^{-1}\ s^{-1}$.	88F415
	n-$C_{16}H_{34}$	1.0×10^9		298	MD/A'c-33	A' = Rub; used $k_d = 9.0 \times 10^4\ s^{-1}$, $k_{A'} = 7.3 \times 10^7$ L $mol^{-1}\ s^{-1}$.	747341
	n-$C_{16}H_{34}$	9.0×10^8		298	MD/A'c-33	A' = Rub; used $k_d = 9.0 \times 10^4\ s^{-1}$, $k_{A'} = 7 \times 10^7$ L $mol^{-1}\ s^{-1}$.	727319
	C_6H_5Br	2.6×10^8		273	MD/A'c-33	A' = Rub; used $k_d = 1.3 \times 10^4\ s^{-1}$, $k_{A'} = 4.0 \times 10^7$ L $mol^{-1}\ s^{-1}$; Measured $k/[(k_d/[A']) + k_{A'}] = 2.0$ at $[A'] = 1.5 \times 10^{-4}$ mol L^{-1}.	737333
	$C_6H_5CH_3$	4.3×10^9			CP/A'c-25	S = A' = Rub; used $k_d = 1 \times 10^5\ s^{-1}$, $k_{A'} = 1.7 \times 10^8$ L $mol^{-1}\ s^{-1}$.	752063
	C_6H_6	6×10^9 5.2×10^9 (k_q)		298	CP/Ac,A'c-23	S = A' = Rub; used $k_d = 4.2 \times 10^4\ s^{-1}$, $k_{A'} = 4.2 \times 10^7$ L $mol^{-1}\ s^{-1}$.	90F360
	C_6H_6/ EtOH (89:11)	1.6×10^9		295	CP/P'a-19	S = RB; A' = TEMP-4-OH; used $k_d = 3 \times 10^4\ s^{-1}$; P' = TEMPOL.	757445
	CCl_4/ MeOH (98:2)	4.1×10^9			FP/A'd-5	S = MB; A' = DPBF.	78E238
	CH_2Cl_2	1.2×10^9		293	CP/Oc-22	S = Chl a; A' = Soybean oil; used $k_d = 1.0 \times 10^4\ s^{-1}$.	91U026 90U480
	CH_2Cl_2	3.5×10^9	2.1×10^{-6}		CP/A'c-19	S = A' = Tetr; used $k_d = 7.3 \times 10^3\ s^{-1}$.	75F654
	CH_2Cl_2	9.0×10^9		298	CP/A'c-23	S = A' = Rub; used $k_d = 8 \times 10^3\ s^{-1}$, $k_{A'} = 8 \times 10^7$ L $mol^{-1}\ s^{-1}$.	747341
	CH_2Cl_2	8.0×10^9		298	CP/A'c-23	S = A' = Rub; used $k_d = 7.3 \times 10^3\ s^{-1}$, $k_{A'} = 7.3 \times 10^7$ L $mol^{-1}\ s^{-1}$.	74F642
	CH_2Cl_2/ MeOH/ C_5H_5N (94:3:3)	$\geq 1.0 \times 10^9$		298	CR/A'c-32	A' = Rub; used $k_d = 7.3 \times 10^3\ s^{-1}$, $k_{A'} = 7 \times 10^7$ L $mol^{-1}\ s^{-1}$; $^1O_2$* from $(PhO)_3PO_3$. Interference by chelate ozonide reaction to give colored products.	727319
	$CHCl_3$	7.7×10^9			CP/P'a-17	S = 1,5-Diamino-4,8-dihydroxyanthraquinone; A' = DMA; used $k_r^{A'} = 3.2 \times 10^7$ L $mol^{-1}\ s^{-1}$.	80E446
	$CHCl_3$	8.1×10^9			CP/A'c-33	S = A' = Rub: used $k_d = 1.7 \times 10^4\ s^{-1}$. $k_{A'} = 5.3 \times 10^7$ L $mol^{-1}\ s^{-1}$.	79A050
	CS_2/ MeOH (98:2)	4×10^9			FP/A'd-5	S = MB; A' = DPBF.	737334
	DMF	2.0×10^9			CP/A'c-25	S = TTMPP; A' = DPBF; used $k_d = 1.0 \times 10^5\ s^{-1}$, $k_{A'} = 1.1 \times 10^9$ L $mol^{-1}\ s^{-1}$.	92F505
	DMF	3.6×10^{10}		301	MP/P'a-19	S = Pt(phen)(BCAT); A' = 2,2,6,6-Tetramethyl-4-piperidinol; used $k_d = 1.4 \times 10^5\ s^{-1}$; P' = 2,2,6,6-Tetramethyl-4-hydroxypiperidine-1-oxyl detected by esr.	89F181
	DMF	1.1×10^{10}			MP/P'a-19	S = HP; A' = TEMP-4-OH; used $k_d = 1.4 \times 10^5\ s^{-1}$; P' = TEMPOL; esr detection.	89F311
	DMF	$\sim 2 \times 10^{10}$		301	MP/P'a-19	S = Pt(phen)$(N_3)_2$; A' = TEMPO-4-OH; used $k_d = 1.4 \times 10^5\ s^{-1}$; P' = TEMPOL; detected by esr.	88A276
	i-octane	1.7×10^{10}		298	CP/A'c-23	S = A' = Rub; used $k_d = 4.7 \times 10^4\ s^{-1}$, $k_{A'} = 7.3 \times 10^7$ L $mol^{-1}\ s^{-1}$.	747341
	i-octane	7.0×10^9		298	CP/A'c-23	S = A' = Rub; used $k_d = 4.0 \times 10^4\ s^{-1}$, $k_{A'} = 7 \times 10^7$ L $mol^{-1}\ s^{-1}$.	727319
12.29	**Bis(dibutyldithiocarbamato)zinc(II)**						
	C_6H_5Br	$\leq 1 \times 10^6$		273	MD/A'c-33	A' = Rub; No measurable effect.	737333
	CS_2/ MeOH (98:2)	2×10^7			FP/A'd-5	S = MB; A' = DPBF.	737334

TABLE 12. Rate constants for the interaction of singlet oxygen with metal complexes. — Continued

No.	Solvent	k ($L\ mol^{-1}\ s^{-1}$)	β (k_d/k) ($mol\ L^{-1}$)	T (K)	Method	Comment	Ref.
12.29	**Bis(dibutyldithiocarbamato)zinc(II)** — Continued						
	i-octane	$\leq 1 \times 10^6$			CP/A'c-23	S = A' = Rub; used $k_d = 4.7 \times 10^4\ s^{-1}$, $k_{A'} = 7.3 \times 10^7\ L\ mol^{-1}\ s^{-1}$.	747341
12.30	**Bis[*O,O'*-di-(4-*tert*-butylphenyl)phosphorodithiolato]cobalt(II)**						
	C_6H_6	1.2×10^9			CP/A'c-23	S = A' = Rub; used $k_d = 2.8 \times 10^4\ s^{-1}$, $k_{A'} = 3 \times 10^7\ L\ mol^{-1}\ s^{-1}$.	78F497
12.31	**Bis[*O,O'*-di-(4-*tert*-butylphenyl)phosphorodithiolato]copper(II)**						
	C_6H_6	7.0×10^6			CP/A'c-23	S = A' = Rub; used $k_d = 2.8 \times 10^4\ s^{-1}$, $k_{A'} = 3 \times 10^7\ L\ mol^{-1}\ s^{-1}$.	78F497
12.32	**Bis[*O,O'*-di-(4-*tert*-butylphenyl)phosphorodithiolato]nickel(II)**						
	C_6H_6	2.3×10^9			CP/A'c-23	S = A' = Rub; used $k_d = 2.8 \times 10^4\ s^{-1}$, $k_{A'} = 3 \times 10^7\ L\ mol^{-1}\ s^{-1}$.	78F497
12.33	**Bis[1,2-di(2-chlorophenyl)-1,2-ethenedithiolato]nickel(II)**						
	$CH_3CN/\ C_6H_6$ (80:20)	1.1×10^{10} 1×10^6 (k_r) 1.2×10^{10} (k_q)		298	CP/Ac,A'c-23	S = A' = Rub; used $k_d = 3.4 \times 10^4\ s^{-1}$, $k_{A'} = 4.2 \times 10^7\ L\ mol^{-1}\ s^{-1}$.	90F360
12.34	**Bis[1,2-di(4-chlorophenyl)-1,2-ethenedithiolato]nickel(II)**						
	$CH_3CN/\ C_6H_6$ (80:20)	1.2×10^{10} 1.1×10^6 (k_r) 1.2×10^{10} (k_q)		298	CP/Ac,A'c-23	S = A' = Rub; used $k_d = 3.4 \times 10^4\ s^{-1}$, $k_{A'} = 4.2 \times 10^7\ L\ mol^{-1}\ s^{-1}$.	90F360
12.35	**Bis(dicyclohexylphosphinodithiolato)nickel(II)**						
	$CHCl_3$	5.7×10^9			CP/A'c-33	S = A' = Rub; used $k_d = 1.7 \times 10^4\ s^{-1}$, $k_{A'} = 5.3 \times 10^7\ L\ mol^{-1}\ s^{-1}$.	79A050
12.36	**Bis(*O,O'*-dicyclohexylphosphorodithiolato)cobalt(II)**						
	$C_6H_5CH_3$	2.7×10^9			CP/A'c-25	S = A' = Rub; used $k_d = 1 \times 10^5\ s^{-1}$, $k_{A'} = 1.7 \times 10^8\ L\ mol^{-1}\ s^{-1}$.	752063
12.37	**Bis[1,2-di(2,4-dichlorophenyl)-1,2-ethenedithiolato]nickel(II)**						
	$CH_3CN/\ C_6H_6$ (80:20)	1.2×10^{10} 3.1×10^6 (k_r) 1.3×10^{10} (k_q)		298	CP/Ac,A'c-23	S = A' = Rub; used $k_d = 3.4 \times 10^4\ s^{-1}$, $k_{A'} = 4.2 \times 10^7\ L\ mol^{-1}\ s^{-1}$.	90F360
12.38	**Bis[1,2-di(3,4-dichlorophenyl)-1,2-ethenedithiolato]nickel(II)**						
	$CH_3CN/\ C_6H_6$ (80:20)	1.2×10^{10} 2.4×10^6 (k_r) 1.2×10^{10} (k_q)		298	CP/Ac,A'c-23	S = A' = Rub; used $k_d = 3.4 \times 10^4\ s^{-1}$, $k_{A'} = 4.2 \times 10^7\ L\ mol^{-1}\ s^{-1}$.	90F360
12.39	**Bis[1,2-di(dimethylaminophenyl)-1,2-ethenedithiolato]nickel(II)**						
	$CH_3CN/\ C_6H_6$ (80:20)	9.8×10^9 3×10^5 (k_r) 9.8×10^9 (k_q)		298	CP/Ac,A'c-23	S = A' = Rub; used $k_d = 3.4 \times 10^4\ s^{-1}$, $k_{A'} = 4.2 \times 10^7\ L\ mol^{-1}\ s^{-1}$.	90F360
12.40	**Bis(diethyldithiocarbamato)nickel(II)**						
	$CCl_4/$ MeOH (98:2)	6.6×10^9			FP/A'd-5	S = MB; A' = DPBF.	78E238
	DMF	3×10^{10}		301	MP/P'a-19	S = Pt(DHBA)(DPA); A' = TEMP-4-OH; used $k_d = 1.4 \times 10^5\ s^{-1}$, $k_{A'} = 6.7 \times 10^7\ L\ mol^{-1}\ s^{-1}$; P' = TEMPOL; detected by esr.	94F004
	DMF	1.5×10^{10}		301	CP/P'a-19	S = Pt(phen)(DMT); A' = 2,2,6,6-Tetramethyl-4-piperidinol; used $k_d = 1.4 \times 10^5\ s^{-1}$; P' = TEMPOL obs. by esr.	92F210
	DMF	1.3×10^{11}			CP/A'c-22	S = A' = Pt(phen)(DMT); used $k_d = 1.4 \times 10^5\ s^{-1}$.	91F098

TABLE 12. Rate constants for the interaction of singlet oxygen with metal complexes. — Continued

No.	Solvent	k ($L\ mol^{-1}\ s^{-1}$)	β (k_d/k) ($mol\ L^{-1}$)	T (K)	Method	Comment	Ref.
12.41	**Bis[1,2-di(4-ethylphenyl)-1,2-ethenedithiolato]cobalt(II)**						
	C_6H_6	5.5×10^9 1.6×10^6 (k_r) 5.4×10^9 (k_q)		298	CP/Ac,A'c-23	S = A' = Rub; used $k_d = 4.2 \times 10^4\ s^{-1}$, $k_{A'} = 4.2 \times 10^7\ L\ mol^{-1}\ s^{-1}$.	90F360
12.42	**Bis[1,2-di(4-ethylphenyl)-1,2-ethenedithiolato]nickel(II)**						
	C_6H_6	7.8×10^9 1×10^5 (k_r) 7.1×10^9 (k_q)		298	CP/Ac,A'c-23	S = A' = Rub; used $k_d = 4.2 \times 10^4\ s^{-1}$, $k_{A'} = 4.2 \times 10^7\ L\ mol^{-1}\ s^{-1}$.	90F360
12.43	**Bis[1,2-di(4-ethylphenyl)-1,2-ethenedithiolato]platinum(II)**						
	C_6H_6	8.5×10^9 2×10^5 (k_r) 8.0×10^9 (k_q)		298	CP/Ac,A'c-23	S = A' = Rub; used $k_d = 4.2 \times 10^4\ s^{-1}$, $k_{A'} = 4.2 \times 10^7\ L\ mol^{-1}\ s^{-1}$.	90F360
12.44	**Bis(*O*,*O*'-diethylphosphorodithiolato)nickel(II)**						
	CH_3CN/ C_6H_6 (80:20)	6.8×10^9 3.6×10^6 (k_r) 8.2×10^9 (k_q)		298	CP/Ac,A'c-23	S = A' = Rub; used $k_d = 3.4 \times 10^4\ s^{-1}$, $k_{A'} = 4.2 \times 10^7\ L\ mol^{-1}\ s^{-1}$.	90F360
	$CHCl_3$	9.5×10^9			CP/A'c-33	S = A' = Rub; used $k_d = 1.7 \times 10^4\ s^{-1}$, $k_{A'} = 5.3 \times 10^7\ L\ mol^{-1}\ s^{-1}$.	79A050
12.45	**Bis[2,3-dihydro-*N*-2-pyridinyl-3-(2-pyridinylimino)isoindol-1-amine]nickel(II)**						
	$CHCl_3$	1.6×10^8			CP/A'c-33	S = A' = Rub; used $k_d = 1.7 \times 10^4\ s^{-1}$, $k_{A'} = 5.3 \times 10^7\ L\ mol^{-1}\ s^{-1}$.	79A050
12.46	**Bis(diisopropyldithiocarbamato)cobalt(II)**						
	n-$C_{16}H_{34}$	9.0×10^8		298	MD/A'c-33	A' = Rub; used $k_d = 9.0 \times 10^4\ s^{-1}$, $k_{A'} = 7.3 \times 10^7\ L\ mol^{-1}\ s^{-1}$.	747341
	CH_2Cl_2	1.9×10^9			CP/A'c-23	S = A' = Rub; used $k_d = 7.3 \times 10^3\ s^{-1}$, $k_{A'} = 7 \times 10^7\ L\ mol^{-1}\ s^{-1}$.	732066
	i-octane	1.9×10^9		298	CP/A'c-23	S = A' = Rub; used $k_d = 4.7 \times 10^4\ s^{-1}$, $k_{A'} = 7.3 \times 10^7\ L\ mol^{-1}\ s^{-1}$.	747341
12.47	**Bis(diisopropyldithiocarbamato)copper(II)**						
	CH_2Cl_2	$<1.0 \times 10^7$			CP/A'c-23	S = A' = Rub; used $k_d = 7.3 \times 10^3\ s^{-1}$, $k_{A'} = 7.3 \times 10^7\ L\ mol^{-1}\ s^{-1}$.	732066
12.48	**Bis(diisopropyldithiocarbamato)iron(III)**						
	n-$C_{16}H_{34}$	1.2×10^9		298	MD/A'c-33	A' = Rub; used $k_d = 9.0 \times 10^4\ s^{-1}$, $k_{A'} = 7.3 \times 10^7\ L\ mol^{-1}\ s^{-1}$.	747341
	CH_2Cl_2	4.3×10^9		298	CP/A'c-23	S = A' = Rub; used $k_d = 7.3 \times 10^3\ s^{-1}$, $k_{A'} = 8 \times 10^7\ L\ mol^{-1}\ s^{-1}$.	747341
	CH_2Cl_2	3.9×10^9		298	CP/A'c-23	S = A' = Rub; used $k_d = 7.3 \times 10^3\ s^{-1}$, $k_{A'} = 7.3 \times 10^7\ L\ mol^{-1}\ s^{-1}$.	74F642
	CH_2Cl_2	3.8×10^9			CP/A'c-23	S = A' = Rub; used $k_d = 7.3 \times 10^3\ s^{-1}$, $k_{A'} = 7 \times 10^7\ L\ mol^{-1}\ s^{-1}$.	732066
	i-octane	3.8×10^9		298	CP/A'c-23	S = A' = Rub; used $k_d = 4.0 \times 10^4\ s^{-1}$, $k_{A'} = 7.3 \times 10^7\ L\ mol^{-1}\ s^{-1}$.	74F642
12.49	**Bis(diisopropyldithiocarbamato)manganese(I**						
	CH_2Cl_2	$<1.0 \times 10^7$			CP/A'c-23	S = A' = Rub; used $k_d = 7.3 \times 10^3\ s^{-1}$, $k_{A'} = 7 \times 10^7\ L\ mol^{-1}\ s^{-1}$.	732066
12.50	**Bis(diisopropyldithiocarbamato)nickel(II)**						
	CH_2Cl_2	3.4×10^9			CP/A'c-23	S = A' = Rub; used $k_d = 4.0 \times 10^4\ s^{-1}$, $k_{A'} = 7 \times 10^7\ L\ mol^{-1}\ s^{-1}$.	732066

TABLE 12. Rate constants for the interaction of singlet oxygen with metal complexes. — Continued

No.	Solvent	k ($L\ mol^{-1}\ s^{-1}$)	β (k_d/k) ($mol\ L^{-1}$)	T (K)	Method	Comment	Ref.
12.51	**Bis(diisopropyldithiocarbamato)zinc(II)**						
	CH_2Cl_2	$<1.0 \times 10^7$			CP/A'c-23	S = A' = Rub; used $k_d = 7.3 \times 10^3\ s^{-1}$, $k_{A'} = 7 \times 10^7\ L\ mol^{-1}\ s^{-1}$.	732066
12.52	**Bis(*O,O'*-diisopropylphosphorodithiolato)nickel(II)**						
	$C_2H_5CO_2CH_3$	6.4×10^9		293	PL/Ld-2	S = Pz and 2-ACN.	92E220
	$C_6H_5CH_3$	6.5×10^9		293	PL/Ld-2	S = Pz and 2-ACN.	92E220
	CCl_4/ MeOH (98:2)	7.6×10^9			FP/A'd-5	S = MB; A' = DPBF.	78E238
	CH_2Cl_2	5.4×10^9			CP/A'c-23	S = A' = Rub; used $k_d = 4.0 \times 10^4\ s^{-1}$, $k_{A'} = 7 \times 10^7\ L\ mol^{-1}\ s^{-1}$.	732066
12.53	**Bis[1,2-di(4-methoxyphenyl)-1,2-ethanedithionato]nickelate(I), tetrabutylammonium salt**						
	CH_3CN/ C_6H_6 (80:20)	8.6×10^9 8.4×10^6 (k_r) 8.9×10^9 (k_q)		298	CP/Ac,A'c-23	S = A' = Rub; used $k_d = 3.4 \times 10^4\ s^{-1}$, $k_{A'} = 4.2 \times 10^7\ L\ mol^{-1}\ s^{-1}$.	90F360
12.54	**Bis[1,2-di(4-methoxyphenyl)-1,2-ethenedithiolato]nickel(II)**						
	CH_3CN/ C_6H_6 (80:20)	1.0×10^{10} 4×10^5 (k_r) 1.0×10^{10} (k_q)		298	CP/Ac,A'c-23	S = A' = Rub; used $k_d = 3.4 \times 10^4\ s^{-1}$, $k_{A'} = 4.2 \times 10^7\ L\ mol^{-1}\ s^{-1}$.	90F360
12.55	**Bis(dimethyldithiocarbamato)bismuth(II)**						
	C_6H_6/ EtOH (89:11)			295	CP/P'a-19	S = RB; A' = TEMP-4-OH; P' = TEMPOL; no effect for $[A] = 1.8 \times 10^{-5}\ mol\ L^{-1}$.	757445
	CH_2Cl_2	9.2×10^4	0.067		CP/A'c-19	S = A' = Tetr; used $k_d = 7.3 \times 10^3\ s^{-1}$, $\beta_{A'} = 4.0 \times 10^{-4}\ mol\ L^{-1}$.	75F654
12.56	**Bis(dimethyldithiocarbamato)nickel(II)**						
	DMF	3×10^3			CP/A'c-19	S = RB; A' = DMA; used $k_d = 1.4 \times 10^5\ s^{-1}$, $k_{A'} = 1.4 \times 10^7\ L\ mol^{-1}\ s^{-1}$.	86F622
12.57	**Bis[2-[(1,1-dimethylethylimino)methyl]phenolato]nickel(II)**						
	C_6H_6	2.6×10^8			PL/A'd-8	S = MB; A' = DPBF.	76F902
12.58	**Bis[4-(1,1-dimethylethyl)phenylsalicylato]nickel(II)**						
	CCl_4/ $CHCl_3$ (90:10)	1.5×10^7			CP/A'c-23	S = A' = Rub; used $k_d = 1.4 \times 10^3\ s^{-1}$, $k_{A'} = 7 \times 10^7\ L\ mol^{-1}\ s^{-1}$; Measured $k_A/(k_{A'}[A'] + k_d) = 8.5 \times 10^3\ L\ mol^{-1}$ at $[A'] = 5 \times 10^{-6}\ mol\ L^{-1}$.	74F645
12.59	**Bis[3,5-di(1-methylethyl)salicylato]cobalt(II)**						
	$C_6H_5CH_3$	3.0×10^7			CP/A'c-25	S = A' = Rub; used $k_d = 1 \times 10^5\ s^{-1}$, $k_{A'} = 1.7 \times 10^8\ L\ mol^{-1}\ s^{-1}$.	752063
12.60	**Bis[3,5-di(1-methylethyl)salicylato]nickel(II)**						
	$C_6H_5CH_3$	5.0×10^7			CP/A'c-25	S = A' = Rub; used $k_d = 1 \times 10^5\ s^{-1}$, $k_{A'} = 1.7 \times 10^8\ L\ mol^{-1}\ s^{-1}$.	752063
12.61	**Bis[*O,O'*-di(4-methylphenyl)phosphorodithiolato]cobalt(II)**						
	C_6H_6	1.1×10^9			CP/A'c-23	S = A' = Rub; used $k_d = 2.8 \times 10^4\ s^{-1}$, $k_{A'} = 3 \times 10^7\ L\ mol^{-1}\ s^{-1}$.	78F497
12.62	**Bis[*O,O'*-di(4-methylphenyl)phosphorodithiolato]copper(II)**						
	C_6H_6	2.0×10^6			CP/A'c-23	S = A' = Rub; used $k_d = 2.8 \times 10^4\ s^{-1}$, $k_{A'} = 3 \times 10^7\ L\ mol^{-1}\ s^{-1}$.	78F497
12.63	**Bis[*O,O'*-di(4-methylphenyl)phosphorodithiolato]nickel(II)**						
	C_6H_6	2.3×10^9			CP/A'c-23	S = A' = Rub; used $k_d = 2.8 \times 10^4\ s^{-1}$, $k_{A'} = 3 \times 10^7\ L\ mol^{-1}\ s^{-1}$.	78F497

TABLE 12. Rate constants for the interaction of singlet oxygen with metal complexes. — Continued

No.	Solvent	k ($L\ mol^{-1}\ s^{-1}$)	β (k_d/k) ($mol\ L^{-1}$)	T (K)	Method	Comment	Ref.
12.64	**Bis(diphenyldithiocarbamato)nickel(II)**						
	$CHCl_3$	6.3×10^9			CP/A'c-33	S = A' = Rub; used $k_d = 1.7 \times 10^4\ s^{-1}$, $k_{A'} = 5.3 \times 10^7\ L\ mol^{-1}\ s^{-1}$.	79A050
	i-octane	$<1.0 \times 10^6$		298	CP/A'c-23	S = A' = Rub; used $k_d = 4.7 \times 10^4\ s^{-1}$, $k_{A'} = 7.3 \times 10^7\ L\ mol^{-1}\ s^{-1}$.	747341
12.65	**Bis(1,2-diphenyl-1,2-ethanedithionato)nickelate(I), tetrabutylammonium salt**						
	CH_3CN/ C_6H_6 (80:20)	9.2×10^9 4.3×10^6 (k_r) 9.7×10^9 (k_q)		298	CP/Ac,A'c-23	S = A' = Rub; used $k_d = 3.4 \times 10^4\ s^{-1}$, $k_{A'} = 4.2 \times 10^7\ L\ mol^{-1}\ s^{-1}$.	90F360
12.66	**Bis[1,2-diphenyl-1,2-ethenedithiolato]nickel(II)**						
	$C_6H_5CH_3$	2.2×10^{10}			CP/A'c-25	S = A' = Rub; used $k_d = 1 \times 10^5\ s^{-1}$, $k_{A'} = 1.7 \times 10^8\ L\ mol^{-1}\ s^{-1}$.	752063
	CH_3CN/ C_6H_6 (80:20)	1.3×10^{10} 9×10^5 (k_r) 1.2×10^{10} (k_q)		298	CP/Ac,A'c-23	S = A' = Rub; used $k_d = 3.4 \times 10^4\ s^{-1}$, $k_{A'} = 4.2 \times 10^7\ L\ mol^{-1}\ s^{-1}$.	90F360
	$CHCl_3$	1.6×10^{10}		293	CP/P'a-23	S = A' = 2,4-Di[2-hydroxy-4-(diethylamino)phenyl]squarylium; used $k_d = 1.7 \times 10^4\ s^{-1}$, $k_{A'} = 1.2 \times 10^9\ L\ mol^{-1}\ s^{-1}$; meas. $k_A/k_{A'} = 13$.	90F554
	$CHCl_3$	1.1×10^{10}			CP/A'c-33	S = A' = Rub; used $k_d = 1.7 \times 10^4\ s^{-1}$, $k_{A'} = 5.3 \times 10^7\ L\ mol^{-1}\ s^{-1}$.	79A050
12.67	**Bis(*O,O'*-diphenylphosphorodithiolato)chromium(II)**						
	C_6H_6	3.2×10^6			CP/A'c-23	S = A' = Rub; used $k_d = 2.8 \times 10^4\ s^{-1}$, $k_{A'} = 3 \times 10^7\ L\ mol^{-1}\ s^{-1}$.	78F497
12.68	**Bis(*O,O'*-diphenylphosphorodithiolato)cobalt(II)**						
	C_6H_6	1.2×10^9			CP/A'c-23	S = A' = Rub; used $k_d = 2.8 \times 10^4\ s^{-1}$, $k_{A'} = 3 \times 10^7\ L\ mol^{-1}\ s^{-1}$.	78F497
12.69	**Bis(*O,O'*-diphenylphosphorodithiolato)copper(II)**						
	C_6H_6	1.7×10^6			CP/A'c-23	S = A' = Rub; used $k_d = 2.8 \times 10^4\ s^{-1}$, $k_{A'} = 3 \times 10^7\ L\ mol^{-1}\ s^{-1}$.	78F497
12.70	**Bis(*O,O'*-diphenylphosphorodithiolato)lead(II)**						
	C_6H_6	3.4×10^7			CP/A'c-23	S = A' = Rub; used $k_d = 2.8 \times 10^4\ s^{-1}$, $k_{A'} = 3 \times 10^7\ L\ mol^{-1}\ s^{-1}$.	78F497
12.71	**Bis(*O,O'*-diphenylphosphorodithiolato)nickel(II)**						
	C_6H_6	2.5×10^9			CP/A'c-23	S = A' = Rub; used $k_d = 2.8 \times 10^4\ s^{-1}$, $k_{A'} = 3 \times 10^7\ L\ mol^{-1}\ s^{-1}$.	78F497
	$CHCl_3$	1.1×10^{10}			CP/A'c-33	S = A' = Rub; used $k_d = 1.7 \times 10^4\ s^{-1}$, $k_{A'} = 5.3 \times 10^7\ L\ mol^{-1}\ s^{-1}$.	79A050
12.72	**Bis(*O,O'*-diphenylphosphorodithiolato)zinc(II)**						
	C_6H_6	5.0×10^6			CP/A'c-23	S = A' = Rub; used $k_d = 3 \times 10^7\ s^{-1}$.	78F497
12.73	**Bis(dithioacetylacetonate)cobalt(II)**						
	$C_6H_5CH_3$	9.4×10^8		293	PL/Ld-2	S = An or PPDME; $E_a = 4.2\ kJ\ mol^{-1}$; log(*A*) = 9.7.	86A540
	CH_2Cl_2	1.8×10^8		293	PL/Ld-2	S = An or PPDME.	86A540
	CH_3CN	7.2×10^8		293	PL/Ld-2	S = An or PPDME.	86A540
	CH_3COCH_3	9.0×10^8		293	PL/Ld-2	S = An or PPDME.	86A540
	$CHCl_3$	7.4×10^8		293	PL/Ld-2	S = An or PPDME.	86A540

TABLE 12. Rate constants for the interaction of singlet oxygen with metal complexes. — Continued

No.	Solvent	k ($L\ mol^{-1}\ s^{-1}$)	β (k_d/k) ($mol\ L^{-1}$)	T (K)	Method	Comment	Ref.
12.74	**Bis(dithioacetylacetonato)nickel(II)**						
	C_6H_5Br	2.3×10^8		273	MD/A'c-23	A' = Rub; used $k_d = 1.3 \times 10^4\ s^{-1}$, $k_{A'} = 4.0 \times 10^7$ $L\ mol^{-1}\ s^{-1}$; Measured $k/[(k_d/[A']) + k_{A'}] = 1.8$ at $[A'] = 1.5 \times 10^{-5}\ mol\ L^{-1}$.	73733
12.75	**Bis[1,2-di(4-trifluoromethylphenyl)-1,2-ethanedithionato]nickelate(I), tetrabutylammonium salt**						
	$CH_3CN/\ C_6H_6$ (80:20)	1.1×10^{10} 2.1×10^6 (k_r) 1.0×10^{10} (k_q)		298	CP/Ac,A'c-23	S = A' = Rub; used $k_d = 3.4 \times 10^4\ s^{-1}$, $k_{A'} = 4.2 \times 10^7\ L\ mol^{-1}\ s^{-1}$.	90F360
12.76	**Bis[1,2-di(4-trifluoromethylphenyl)-1,2-ethenedithiolato]nickel(II)**						
	$CH_3CN/\ C_6H_6$ (80:20)	1.4×10^{10} 2.7×10^6 (k_r) 1.4×10^{10} (k_q)		298	CP/Ac,A'c-23	S = A' = Rub; used $k_d = 3.4 \times 10^4\ s^{-1}$, $k_{A'} = 4.2 \times 10^7\ L\ mol^{-1}\ s^{-1}$.	90F360
12.77	**Bis[1,2-di(3,4,5-trimethoxyphenyl)-1,2-ethanedithionato]nickelate(I), tetrabutylammonium salt**						
	$CH_3CN/\ C_6H_6$ (80:20)	7.0×10^9 4.9×10^6 (k_r) 7.6×10^9 (k_q)		298	CP/Ac,A'c-23	S = A' = Rub; used $k_d = 3.4 \times 10^4\ s^{-1}$, $k_{A'} = 4.2 \times 10^7\ L\ mol^{-1}\ s^{-1}$.	90F360
12.78	**Bis[1,2-di(3,4,5-trimethoxyphenyl)-1,2-ethanedithionato]nickelate(I), 4-[1,5,5-tri(4-diethylaminophenyl)pentadienylidene]anilinium salt**						
	$CH_3CN/\ C_6H_6$ (80:20)	5.6×10^9 5×10^5 (k_r) 5.1×10^9 (k_q)		298	CP/Ac,A'c-23	S = A' = Rub; used $k_d = 3.4 \times 10^4\ s^{-1}$, $k_{A'} = 4.2 \times 10^7\ L\ mol^{-1}\ s^{-1}$.	90F360
12.79	**Bis[1,2-di(3,4,5-trimethoxyphenyl)-1,2-ethenedithiolato]nickel(II)**						
	$CH_3CN/\ C_6H_6$ (80:20)	9.7×10^9 4×10^5 (k_r) 9.6×10^9 (k_q)		298	CP/Ac,A'c-23	S = A' = Rub; used $k_d = 3.4 \times 10^4\ s^{-1}$, $k_{A'} = 4.2 \times 10^7\ L\ mol^{-1}\ s^{-1}$.	90F360
12.80	**Bis[2-[(dodecylimino)methyl]phenolato]cobalt(II)**						
	$C_6H_5CH_3$	2.4×10^9			CP/A'c-25	S = A' = Rub; used $k_d = 1 \times 10^5\ s^{-1}$, $k_{A'} = 1.7 \times 10^8\ L\ mol^{-1}\ s^{-1}$.	752063
12.81	**Bis[2-[(dodecylimino)methyl]phenolato]copper(II)**						
	$C_6H_5CH_3$	5.0×10^7			CP/A'c-25	S = A' = Rub; used $k_d = 1 \times 10^5\ s^{-1}$, $k_{A'} = 1.7 \times 10^8\ L\ mol^{-1}\ s^{-1}$.	752063
12.82	**Bis[2-[(dodecylimino)methyl]phenolato]nickel(II)**						
	$C_6H_5CH_3$	7.0×10^9			CP/A'c-25	S = A' = Rub; used $k_d = 1 \times 10^5\ s^{-1}$, $k_{A'} = 1.7 \times 10^8\ L\ mol^{-1}\ s^{-1}$.	752063
12.83	**Bis[*O*-ethyl-3,5-di-(1,1-dimethylethyl)-4-hydroxybenzylphosphonato]nickel(II)**						
	CH_2Cl_2	3.6×10^6	2.0×10^{-3}		CP/A'c-19	S = A' = Tetr; used $k_d = 7.3 \times 10^3\ s^{-1}$.	75F654
	$CHCl_3$	2.2×10^7			CP/A'c-33	S = A' = Rub; used $k_d = 1.7 \times 10^4\ s^{-1}$, $k_{A'} = 5.3 \times 10^7\ L\ mol^{-1}\ s^{-1}$.	79A050
12.84	**Bis[5-ethyl-3-[(3-pyridinylimino)methyl]-2-thiophenethionato]cobalt(II)**						
	$C_6H_5CH_3$	5.0×10^7 (k_r)			CP/Ac,A'c-17	S = PP; A' = DPBF; used $k_r^{A'} = 6.7 \times 10^8\ L\ mol^{-1}\ s^{-1}$.	88A507
	$C_6H_5CH_3$	1.5×10^9			PL/Ld-2	S = TPP.	88A507
	CH_3CN	4.0×10^6 (k_r)			CP/Ac,A'c-17	S = MB; A' = DPBF; used $k_r^{A'} = 1.1 \times 10^9\ L\ mol^{-1}\ s^{-1}$.	88A507
	CH_3CN	2.0×10^9			PL/Ld-2	S = TPP.	88A507
12.85	**Bis[1,1,1,4,4,4-hexafluoro-2-butene-2,3-dithiolato]nickel(II)**						
	$CHCl_3$	8.1×10^9			CP/A'c-33	S = A' = Rub; used $k_d = 1.7 \times 10^4\ s^{-1}$, $k_{A'} = 5.3 \times 10^7\ L\ mol^{-1}\ s^{-1}$.	79A050

TABLE 12. Rate constants for the interaction of singlet oxygen with metal complexes. — Continued

No.	Solvent	k ($L\ mol^{-1}\ s^{-1}$)	β (k_d/k) ($mol\ L^{-1}$)	T (K)	Method	Comment	Ref.
12.86	**Bis[hydrotris(1-pyrazolyl)borato]nickel(II)**						
	$CHCl_3$	2.1×10^6			CP/A'c-33	S = A' = Rub; used $k_d = 1.7 \times 10^4\ s^{-1}$, $k_{A'} = 5.3 \times 10^7\ L\ mol^{-1}\ s^{-1}$.	79A050
12.87	**Bis(2'-hydroxyacetophenone oximato)nickel(II)**						
	$C_6H_5CH_3$	5.2×10^9			CP/A'c-25	S = A' = Rub; used $k_d = 1 \times 10^5\ s^{-1}$, $k_{A'} = 1.7 \times 10^8\ L\ mol^{-1}\ s^{-1}$.	752063
12.88	**Bis(2-hydroxybenzaldehydato)nickel(II) dihydrate**						
	$CHCl_3$	4.6×10^7			CP/A'c-33	S = A' = Rub; used $k_d = 1.7 \times 10^4\ s^{-1}$, $k_{A'} = 5.3 \times 10^7\ L\ mol^{-1}\ s^{-1}$.	79A050
12.89	**Bis(2-hydroxybenzaldehyde oximato)nickel(II)**						
	$C_6H_5CH_3$	5.9×10^9			CP/A'c-25	S = A' = Rub; used $k_d = 1 \times 10^5\ s^{-1}$, $k_{A'} = 1.7 \times 10^8\ L\ mol^{-1}\ s^{-1}$.	752063
12.90	**Bis[2-hydroxybenzaldehyde phenylhydrazone]nickel(II)**						
	$C_6H_5CH_3$	7.5×10^9			CP/A'c-25	S = A' = Rub; used $k_d = 1 \times 10^5\ s^{-1}$, $k_{A'} = 1.7 \times 10^8\ L\ mol^{-1}\ s^{-1}$.	752063
12.91	**Bis[2'-hydroxy-4'-*tert*-butyloctadecanophenone oximato]palladium(II)**						
	C_6H_6	6.0×10^7		298	PL/A'd-8	S = An; A' = DPBF.	737438
12.92	**Bis(2-hydroxy-5-methoxybenzaldehydato)nickel(II) dihydrate**						
	$CHCl_3$	1.2×10^8			CP/A'c-33	S = A' = Rub; used $k_d = 1.7 \times 10^4\ s^{-1}$, $k_{A'} = 5.3 \times 10^7\ L\ mol^{-1}\ s^{-1}$.	79A050
12.93	**Bis[2'-hydroxy-4'-methylacetophenone oximato]nickel(II)**						
	C_6H_6	3.0×10^9		298	PL/A'd-8	S = An; A' = DPBF.	737438
12.94	**Bis[2-hydroxy-5-methylbenzophenonato]nickel(II)**						
	$C_6H_5CH_3$	3.9×10^9			CP/A'c-25	S = A' = Rub; used $k_d = 1 \times 10^5\ s^{-1}$, $k_{A'} = 1.7 \times 10^8\ L\ mol^{-1}\ s^{-1}$.	752063
12.95	**Bis[2'-hydroxy-4'-methyldodecanophenone oximato]nickel(II)**						
	$C_6H_5CH_3$	5.7×10^9			CP/A'c-25	S = A' = Rub; used $k_d = 1 \times 10^5\ s^{-1}$, $k_{A'} = 1.7 \times 10^8\ L\ mol^{-1}\ s^{-1}$.	752063
	C_6H_6	2.7×10^9		298	PL/A'd-8	S = An; A' = DPBF.	737438
12.96	**Bis[2-(iminomethyl)phenolato]nickel(II)**						
	$CHCl_3$	3.2×10^9			CP/A'c-33	S = A' = Rub; used $k_d = 1.7 \times 10^4\ s^{-1}$, $k_{A'} = 5.3 \times 10^7\ L\ mol^{-1}\ s^{-1}$.	79A050
12.97	**Bis(4-imino-2-pentanonato)nickel(II)**						
	$C_6H_5CH_3$	7.2×10^9			CP/A'c-25	S = A' = Rub; used $k_d = 1 \times 10^5\ s^{-1}$, $k_{A'} = 1.7 \times 10^8\ L\ mol^{-1}\ s^{-1}$.	752063
12.98	**Bis[*O*-(1-methylethyl)carbonodithionato]nickel(II)**						
	i-octane	5.4×10^9		298	CP/A'c-23	S = A' = Rub; used $k_d = 4.0 \times 10^4\ s^{-1}$, $k_{A'} = 7.3 \times 10^7\ L\ mol^{-1}\ s^{-1}$.	74F642
12.99	**Bis[4-methyl-1,2-benzenedithiolato]cobalt(II) tetrabutylammonium salt**						
	$C_6H_5CH_3$	3.5×10^9			CP/A'c-25	S = A' = Rub; used $k_d = 1 \times 10^5\ s^{-1}$, $k_{A'} = 1.7 \times 10^8\ L\ mol^{-1}\ s^{-1}$.	752063
12.100	**Bis[4-methyl-1,2-benzenedithiolato]nickel(II) tetrabutylammonium salt**						
	$C_6H_5CH_3$	5.8×10^9			CP/A'c-25	S = A' = Rub; used $k_d = 1 \times 10^5\ s^{-1}$, $k_{A'} = 1.7 \times 10^8\ L\ mol^{-1}\ s^{-1}$.	752063

TABLE 12. Rate constants for the interaction of singlet oxygen with metal complexes. — Continued

No.	Solvent	k ($L\ mol^{-1}\ s^{-1}$)	β (k_d/k) ($mol\ L^{-1}$)	T (K)	Method	Comment	Ref.
12.101	**Bis[2-[(1-methylethylimino)methyl]phenolato]nickel(II)**						
	$C_6H_5CH_3$	5.9×10^9			CP/A'c-25	S = A' = Rub; used $k_d = 1 \times 10^5\ s^{-1}$, $k_{A'} = 1.7 \times 10^8\ L\ mol^{-1}\ s^{-1}$.	752063
	$CHCl_3$	2.6×10^9			CP/A'c-33	S = A' = Rub; used $k_d = 1.7 \times 10^4\ s^{-1}$, $k_{A'} = 5.3 \times 10^7\ L\ mol^{-1}\ s^{-1}$.	79A050
12.102	**Bis[*N*-methyl-7-(methylimino)-1,3,5-cycloheptatrien-1-aminato]nickel(II)**						
	$CHCl_3$	6.1×10^9			CP/A'c-33	S = A' = Rub; used $k_d = 1.7 \times 10^4\ s^{-1}$, $k_{A'} = 5.3 \times 10^7\ L\ mol^{-1}\ s^{-1}$.	79A050
12.103	**Bis(4-methylphenyldithiocarbamato)nickel(II)**						
	$CHCl_3$	1.1×10^{10}			CP/A'c-33	S = A' = Rub; used $k_d = 1.7 \times 10^4\ s^{-1}$, $k_{A'} = 5.3 \times 10^7\ L\ mol^{-1}\ s^{-1}$.	79A050
12.104	**Bis[*N*-(4-methylphenyl)-7-[(4-methylphenyl)imino]-1,3,5-cycloheptatrien-1-aminato]nickel(II)**						
	$CHCl_3$	5.6×10^9			CP/A'c-33	S = A' = Rub; used $k_d = 1.7 \times 10^4\ s^{-1}$, $k_{A'} = 5.3 \times 10^7\ L\ mol^{-1}\ s^{-1}$.	79A050
12.105	**Bis[2-[(1-methylpropylimino)methyl]phenolato]nickel(II)**						
	$C_6H_5CH_3$	4.0×10^9			CP/A'c-25	S = A' = Rub; used $k_d = 1 \times 10^5\ s^{-1}$, $k_{A'} = 1.7 \times 10^8\ L\ mol^{-1}\ s^{-1}$.	752063
12.106	**Bis[2-[[(4-(phenylamino)phenyl)imino]methyl]phenolato]nickel(II)**						
	$C_6H_5CH_3$	1.7×10^9			CP/A'c-25	S = A' = Rub; used $k_d = 1 \times 10^5\ s^{-1}$, $k_{A'} = 1.7 \times 10^8\ L\ mol^{-1}\ s^{-1}$.	752063
12.107	**Bis(phenyldithiocarbamato)nickel(II)**						
	C_6H_6	4.4×10^9		303	CP/P'a-16	S = A' = Rub; k_d not given.	87A107
	$CHCl_3$	1.1×10^{10}			CP/A'c-33	S = A' = Rub; used $k_d = 1.7 \times 10^4\ s^{-1}$, $k_{A'} = 5.3 \times 10^7\ L\ mol^{-1}\ s^{-1}$.	79A050
	$ClCF_2CCl_2F$	7.2×10^9		303	CR/P'a-32	A' = Rub; $^1O_2$* from $DMNO_2$; $k_{A'}$ and k_d not given.	87A107
12.108	**Bis[2-[(phenylimino)methyl]phenolato]cobalt(II)**						
	$C_6H_5CH_3$	3.2×10^9			CP/A'c-25	S = A' = Rub; used $k_d = 1 \times 10^5\ s^{-1}$, $k_{A'} = 1.7 \times 10^8\ L\ mol^{-1}\ s^{-1}$.	752063
12.109	**Bis[2-[(phenylimino)methyl]phenolato]copper(II)**						
	$C_6H_5CH_3$	4.0×10^8			CP/A'c-25	S = A' = Rub; used $k_d = 1 \times 10^5\ s^{-1}$, $k_{A'} = 1.7 \times 10^8\ L\ mol^{-1}\ s^{-1}$.	752063
12.110	**Bis[2-[(phenylimino)methyl]phenolato]nickel(II)**						
	$C_6H_5CH_3$	7.8×10^9			CP/A'c-25	S = A' = Rub; used $k_d = 1 \times 10^5\ s^{-1}$, $k_{A'} = 1.7 \times 10^8\ L\ mol^{-1}\ s^{-1}$.	752063
12.111	**Bis[2,2'-thiobis[*O,O'*-di(4-*tert*-butylphenyl)phosphorodithiolato]cadmium(II)**						
	C_6H_6	8.4×10^6			CP/A'c-23	S = A' = Rub; used $k_d = 2.8 \times 10^4\ s^{-1}$, $k_{A'} = 3 \times 10^7\ L\ mol^{-1}\ s^{-1}$.	78F497
12.112	**Bis[2,2'-thiobis[*O,O'*-di(4-*tert*-butylphenyl)phosphorodithiolato]cobalt(II)**						
	C_6H_6	8.7×10^8			CP/A'c-23	S = A' = Rub; used $k_d = 2.8 \times 10^4\ s^{-1}$, $k_{A'} = 3 \times 10^7\ L\ mol^{-1}\ s^{-1}$.	78F497
12.113	**Bis[2,2'-thiobis[*O,O'*-di(4-*tert*-butylphenyl)phosphorodithiolato]lead(II)**						
	C_6H_6	1.0×10^7			CP/A'c-23	S = A' = Rub; used $k_d = 2.8 \times 10^4\ s^{-1}$, $k_{A'} = 3 \times 10^7\ L\ mol^{-1}\ s^{-1}$.	78F497
12.114	**Bis[2,2'-thiobis[*O,O'*-di(4-*tert*-butylphenyl)phosphorodithiolato]nickel(II)**						
	C_6H_6	2.2×10^9			CP/A'c-23	S = A' = Rub; used $k_d = 2.8 \times 10^4\ s^{-1}$, $k_{A'} = 3 \times 10^7\ L\ mol^{-1}\ s^{-1}$.	78F497

TABLE 12. Rate constants for the interaction of singlet oxygen with metal complexes. — Continued

No.	Solvent	k ($L\ mol^{-1}\ s^{-1}$)	β (k_d/k) ($mol\ L^{-1}$)	T (K)	Method	Comment	Ref.
11.115	**Bis[2,2'-thiobis[*O,O'*-di(4-*tert*-butylphenyl)phosphorodithiolato]zinc(II)**						
	C_6H_6	4.4×10^6			CP/A'c-23	S = A' = Rub; used $k_d = 2.8 \times 10^4\ s^{-1}$, $k_{A'} = 3 \times 10^7\ L\ mol^{-1}\ s^{-1}$.	78F497
11.116	**Bis(2,2'-thiobis[4-(1,1,3,3-tetramethylbutyl)phenolato]nickel(II)**						
	n-$C_{16}H_{34}$	1.3×10^8		298	MD/A'c-33	A' = Rub; used $k_d = 9.0 \times 10^4\ s^{-1}$, $k_{A'} = 7 \times 10^7\ L\ mol^{-1}\ s^{-1}$.	727319
	C_6H_5Br	3.9×10^7		273	MD/A'c-33	A' = Rub; used $k_d = 1.3 \times 10^4\ s^{-1}$, $k_{A'} = 4.0 \times 10^7\ L\ mol^{-1}\ s^{-1}$; Measured $k_A/[(k_d/[A']) + k_{A'}] = 0.3$ at $[A'] = 1.5 \times 10^{-4}\ mol\ L^{-1}$.	737333
	$C_6H_5CH_3$	2.7×10^8			CP/A'c-25	S = A' = Rub; used $k_d = 1 \times 10^5\ s^{-1}$, $k_{A'} = 1.7 \times 10^8\ L\ mol^{-1}\ s^{-1}$.	752063
	C_6H_6	1.1×10^8			PL/A'd-8	S = MB; A' = DPBF.	76F902
	CCl_4/ $CHCl_3$ (90:10)	5.7×10^7			CP/A'c-23	S = A' = Rub; used $k_d = 1.4 \times 10^3\ s^{-1}$, $k_{A'} = 7 \times 10^7\ L\ mol^{-1}\ s^{-1}$; Measured $k_A/(k_{A'}[A'] + k_d) = 3.2 \times 10^4\ L\ mol^{-1}$ at $[A'] = 5 \times 10^{-6}\ mol\ L^{-1}$.	74F645
	CS_2/ MeOH (98:2)	5×10^8			PP/A'd-5	S = MB; A' = DPBF.	737334
	i-octane/ MeOH/ C_5H_5N (94:3:3)	2.0×10^8		298	CR/A'c-32	A' = Rub; used $k_d = 5.0 \times 10^4\ s^{-1}$, $k_{A'} = 7 \times 10^7\ L\ mol^{-1}\ s^{-1}$; $^1O_2$* from $(PhO)_3PO_3$.	727319
	i-octane	9.6×10^7		298	CP/A'c-23	S = A' = Rub; used $k_d = 4.7 \times 10^4\ s^{-1}$, $k_{A'} = 7.3 \times 10^7\ L\ mol^{-1}\ s^{-1}$.	747341
	i-octane	1.3×10^8		298	CP/A'c-23	S = A' = Rub; used $k_d = 4.0 \times 10^4\ s^{-1}$, $k_{A'} = 7 \times 10^7\ L\ mol^{-1}\ s^{-1}$.	727319
11.117	**Bis[3,4,6-trichloro-1,2-benzenedithiolato]nickelate(I), tetrabutylammonium salt**						
	CH_3CN/ C_6H_6 (80:20)	6.5×10^9 1×10^6 (k_r) 6.7×10^9 (k_q)		298	CP/Ac,A'c-23	S = A' = Rub; used $k_d = 3.4 \times 10^4\ s^{-1}$, $k_{A'} = 4.2 \times 10^7\ L\ mol^{-1}\ s^{-1}$.	90F360
11.118	**Bis(2,4,6-trimethylbenzenesulfonato)nickel(II)**						
	C_6H_6/ EtOH (50:50)	1×10^7 3×10^7 (k_q)		298	CP/Ac,A'c-23	S = A' = Rub; used $k_d = 5.6 \times 10^4\ s^{-1}$, $k_{A'} = 3.3 \times 10^7\ L\ mol^{-1}\ s^{-1}$.	90F360
11.119	**Bromocarbonylbis(triphenylphosphine)iridium**						
	CH_2Cl_2	2.5×10^8			PL/Ld-2	S = TPP.	94A126
11.120	**Butylamine[2,2'-thiobis(3,4-dimethylphenolato)]nickel(II)**						
	$C_6H_5CH_3$	2.5×10^8			CP/A'c-25	S = A' = Rub; used $k_d = 1 \times 10^5\ s^{-1}$, $k_{A'} = 1.7 \times 10^8\ L\ mol^{-1}\ s^{-1}$.	752063
11.121	**Butylamine[2,2'-thiobis[4-(1,1,3,3-tetramethylbutyl)]phenolato]cobalt(II)**						
	$C_6H_5CH_3$	3.7×10^8			CP/A'c-25	S = A' = Rub; used $k_d = 1 \times 10^5\ s^{-1}$, $k_{A'} = 1.7 \times 10^8\ L\ mol^{-1}\ s^{-1}$.	752063
11.122	**Butylamine[2,2'-thiobis[4-(1,1,3,3-tetramethylbutyl)]phenolato]nickel(II)**						
	n-$C_{16}H_{34}$	1.0×10^8		298	MD/A'c-33	A' = Rub; used $k_d = 9.0 \times 10^4\ s^{-1}$, $k_{A'} = 7.3 \times 10^7\ L\ mol^{-1}\ s^{-1}$.	747341
	n-$C_{16}H_{34}$	8.0×10^7		298	MD/A'c-33	A' = Rub; used $k_d = 9.0 \times 10^4\ s^{-1}$, $k_{A'} = 7 \times 10^7\ L\ mol^{-1}\ s^{-1}$.	727319
	$BuOCH_2CH_2OH$	2.8×10^8		273	MD/A'c-33	A' = Rub; used $k_d = 3.8 \times 10^5\ s^{-1}$, $k_{A'} = 7 \times 10^7\ L\ mol^{-1}\ s^{-1}$.	727319
	C_6H_5Br	1.3×10^8		273	MD/A'c-33	A' = Rub; used $k_d = 1.3 \times 10^4\ s^{-1}$, $k_{A'} = 4.0 \times 10^7\ L\ mol^{-1}\ s^{-1}$; Measured $k_A/[(k_d/[A']) + k_{A'}] = 1.0$ at $[A'] = 1.5 \times 10^{-4}\ mol\ L^{-1}$. A exists as a tetramer in solution.	737333
	$C_6H_5CH_3$	4.0×10^8			CP/A'c-25	S = A' = Rub; used $k_d = 1 \times 10^5\ s^{-1}$, $k_{A'} = 1.7 \times 10^8\ L\ mol^{-1}\ s^{-1}$.	752063
	C_6H_6	1.1×10^8			PL/A'd-8	S = MB; A' = DPBF.	76F902

TABLE 12. Rate constants for the interaction of singlet oxygen with metal complexes. — Continued

No.	Solvent	k ($L\ mol^{-1}\ s^{-1}$)	β (k_d/k) ($mol\ L^{-1}$)	T (K)	Method	Comment	Ref.
12.122	**Butylamine[2,2'-thiobis[4-(1,1,3,3-tetramethylbutyl)]phenolato]nickel(II)** — Continued						
	CCl_4/ $CHCl_3$ (90:10)	1.1×10^8			CP/A'c-23	S = A' = Rub; used $k_d = 1.4 \times 10^3\ s^{-1}$, $k_{A'} = 7 \times 10^7\ L\ mol^{-1}\ s^{-1}$; Measured $k_A/(k_{A'}[A'] + k_d) = 6.1 \times 10^4\ L\ mol^{-1}$ at $[A'] = 5 \times 10^{-6}\ mol\ L^{-1}$.	74F645
	CH_2Cl_2	3.7×10^7		293	CP/Oc-22	S = Chl a; A' = Soybean oil; used $k_d = 1.0 \times 10^4\ s^{-1}$.	91U026
	$CHCl_3$	1.7×10^8			CP/A'c-33	S = A' = Rub; used $k_d = 1.7 \times 10^4\ s^{-1}$, $k_{A'} = 5.3 \times 10^7\ L\ mol^{-1}\ s^{-1}$.	79A050
	CS_2/ MeOH (98:2)	2×10^8			FP/A'd-5	S = MB; A' = DPBF.	737334
	i-octane/ MeOH/ C_5H_5N (94:3:3)	2.7×10^8		298	CR/A'c-32	A' = Rub; used $k_d = 5.0 \times 10^4\ s^{-1}$, $k_{A'} = 7 \times 10^7\ L\ mol^{-1}\ s^{-1}$; $^1O_2$* from $(PhO)_3PO_3$.	727319
	i-octane	2.0×10^8		298	CP/A'c-23	S = A' = Rub; used $k_d = 4.7 \times 10^4\ s^{-1}$, $k_{A'} = 7.3 \times 10^7\ L\ mol^{-1}\ s^{-1}$.	747341
	i-octane	1.4×10^8		298	CP/A'c-23	S = A' = Rub; used $k_d = 4.0 \times 10^4\ s^{-1}$, $k_{A'} = 7.3 \times 10^7\ L\ mol^{-1}\ s^{-1}$.	74F642
	i-octane	1.8×10^8		298	CP/A'c-23	S = A' = Rub; used $k_d = 4 \times 10^4\ s^{-1}$, $k_{A'} = 7 \times 10^7\ L\ mol^{-1}\ s^{-1}$.	727319
12.123	**Carbonylchlorobis(triphenylphosphine)iridium**						
	C_6D_6	3.9×10^8 2×10^7 (k_r)	3.5×10^{-6}		PL/Ac,A'c-15,27	S = MB; A' = TME; used $k_d = 1.1 \times 10^2\ s^{-1}$; assumed $f_r^{A'} = 1$.	93A050
	C_6D_6	4.3×10^8			PL/Ld-2	S = MB.	93A050
	$CDCl_3$	2.6×10^8			PL/Ld-2	S = MB.	93A050
	CH_2Cl_2	2.6×10^8			PL/Ld-2	S = TPP.	94A126
	$CHCl_3$	2×10^7 (k_r)			CP/Ac,A'c-17	S = MB; A' = DMA; used $k_r^{A'} = 2.9 \times 10^7\ L\ mol^{-1}\ s^{-1}$; meas. $k_r/k_r^{A'} = 0.67$.	93A050
12.124	**Carbonylchlorobis(triphenylphosphine)rhodium**						
	$CDCl_3$	3.1×10^8			PL/Ld-2	S = MB or C_{60}.	93E539
	$CDCl_3$	1×10^8 (k_r)			PL/Ac,A'c-15,27	S = MB or C_{60}; A' = TME; assumed $f_r^{A'} = 1$; used $k_A = 3.1 \times 10^8\ L\ mol^{-1}\ s^{-1}$.	93E539
12.125	**Carbonyliodobis(triphenylphosphine)iridium**						
	CH_2Cl_2	3×10^8			PL/Ld-2	S = TPP.	94A126
12.126	**Cobalt(II) acetate**						
	CH_3COCH_3/ H_2O (95:5)	4×10^7			PL/Ld-2	S = PdMP.	82A412
12.127	**Cobalt(II) chloride hexahydrate**						
	$BuOCH_2CH_2OH$	4.8×10^7		273	MD/A'c-33	A' = Rub; used $k_d = 3.8 \times 10^5\ s^{-1}$, $k_{A'} = 7 \times 10^7\ L\ mol^{-1}\ s^{-1}$.	727319
12.128	**Cobalt(II) ion**						
	CH_3COCH_3/ H_2O (95:5)	2×10^7			PL/Ld-2	S = PdMP.	82A412
12.129	**Copper(II) ion**						
	D_2O	6.4×10^7			PL/Ld-2	S = RB.	84N150
12.130	**Cyclohexylamine[2,2'-thiobis(3,4-dimethylphenolato)]nickel(II)**						
	$C_6H_5CH_3$	3.4×10^8			CP/A'c-25	S = A' = Rub; used $k_d = 1 \times 10^5\ s^{-1}$, $k_{A'} = 1.7 \times 10^8\ L\ mol^{-1}\ s^{-1}$.	752063
12.131	**Cyclohexylamine[2,2'-thiobis[4-(1,1,3,3-tetramethylbutyl)]phenolato]nickel(II)**						
	$C_6H_5CH_3$	1.8×10^8			CP/A'c-25	S = A' = Rub; used $k_d = 1 \times 10^5\ s^{-1}$, $k_{A'} = 1.7 \times 10^8\ L\ mol^{-1}\ s^{-1}$.	752063

TABLE 12. Rate constants for the interaction of singlet oxygen with metal complexes. — Continued

No.	Solvent	k ($L\ mol^{-1}\ s^{-1}$)	β (k_d/k) ($mol\ L^{-1}$)	T (K)	Method	Comment	Ref.
12.132	**Didodecylamine[2,2'-thiobis(3,4-dimethylphenolato)]nickel(II)**						
	$C_6H_5CH_3$	3.2×10^8			CP/A'c-25	S = A' = Rub; used $k_d = 1 \times 10^5\ s^{-1}$, $k_{A'} = 1.7 \times 10^8\ L\ mol^{-1}\ s^{-1}$.	752063
12.133	**1,1'-(7,13-Dimethyl-1,4,8,12-tetraazacyclopentadeca-4,7,12,15-tetraene-6,14-diyl)bis[ethanoato]nickel(II)**						
	$CHCl_3$	1.6×10^9			CP/A'c-33	S = A' = Rub; used $k_d = 1.7 \times 10^4\ s^{-1}$, $k_{A'} = 5.3 \times 10^7\ L\ mol^{-1}\ s^{-1}$.	79A050
12.134	**Dodecylamine[2,2'-thiobis(3,4-dimethylphenolato)]nickel(II)**						
	$C_6H_5CH_3$	3.9×10^8			CP/A'c-25	S = A' = Rub; used $k_d = 1 \times 10^5\ s^{-1}$, $k_{A'} = 1.7 \times 10^8\ L\ mol^{-1}\ s^{-1}$.	752063
12.135	**Dodecylamine[2,2'-thiobis[4-(1,1,3,3-tetramethylbutyl)]phenolato]nickel(II)**						
	$C_6H_5CH_3$	2.6×10^8			CP/A'c-25	S = A' = Rub; used $k_d = 1 \times 10^5\ s^{-1}$, $k_{A'} = 1.7 \times 10^8\ L\ mol^{-1}\ s^{-1}$.	752063
12.136	**2,2'-[1,2-Ethanediylbis(nitrilodecylidyne)]bis[4-methylphenolato]nickel(II)**						
	$C_6H_5CH_3$	4.8×10^9			CP/A'c-25	S = A' = Rub; used $k_d = 1 \times 10^5\ s^{-1}$, $k_{A'} = 1.7 \times 10^8\ L\ mol^{-1}\ s^{-1}$.	752063
12.137	**2,2'-[1,2-Ethanediylbis(nitriloethylidyne)]bis[phenolato]nickel(II)**						
	$C_6H_5CH_3$	3.4×10^9			CP/A'c-25	S = A' = Rub; used $k_d = 1 \times 10^5\ s^{-1}$, $k_{A'} = 1.7 \times 10^8\ L\ mol^{-1}\ s^{-1}$.	752063
12.138	**[[3,3]-[1,2-Ethanediylbis(nitrilomethylidyne)]bis[5-ethyl-2-thiophenethionato]]copper(II)**						
	$C_6H_5CH_3$	2.9×10^8			PL/Ld-2	S = TPP.	88A507
	$C_6H_5CH_3$	4.3×10^5 (k_r)			CP/Ac,A'c-17	S = PP; A' = DPBF; used $k_r^{A'} = 6.7 \times 10^8\ L\ mol^{-1}\ s^{-1}$.	88A507
	CH_3CN	3.4×10^8			PL/Ld-2	S = TPP.	88A507
	CH_3CN	4.0×10^5 (k_r)			CP/Ac,A'c-17	S = MB; A' = DPBF; used $k_r^{A'} = 1.1 \times 10^9\ L\ mol^{-1}\ s^{-1}$.	88A507
12.139	**2,2'-[1,2-Ethanediylbis(nitrilomethylidyne)]bis[phenolato]cobalt(II)**						
	$C_6H_5CH_3$	1.0×10^{10}			CP/A'c-25	S = A' = Rub; used $k_d = 1 \times 10^5\ s^{-1}$, $k_{A'} = 1.7 \times 10^8\ L\ mol^{-1}\ s^{-1}$.	752063
12.140	**2,2'-[1,2-Ethanediylbis(nitrilomethylidyne)]bis[phenolato]nickel(II)**						
	$C_6H_5CH_3$	5.3×10^9			CP/A'c-25	S = A' = Rub; used $k_d = 1 \times 10^5\ s^{-1}$, $k_{A'} = 1.7 \times 10^8\ L\ mol^{-1}\ s^{-1}$.	752063
12.141	**Ethylamine[2,2'-thiobis(3,4-dimethylphenolato)]nickel(II)**						
	$C_6H_5CH_3$	4.1×10^8			CP/A'c-25	S = A' = Rub; used $k_d = 1 \times 10^5\ s^{-1}$, $k_{A'} = 1.7 \times 10^8\ L\ mol^{-1}\ s^{-1}$.	752063
12.142	**Ethylamine[2,2'-thiobis[4-(1,1,3,3-tetramethylbutyl)]phenolato]nickel(II)**						
	$C_6H_5CH_3$	3.1×10^8			CP/A'c-25	S = A' = Rub; used $k_d = 1 \times 10^5\ s^{-1}$, $k_{A'} = 1.7 \times 10^8\ L\ mol^{-1}\ s^{-1}$.	752063
12.143	**[*N,N'*-Ethylenebis(5-sulfosalicylideneiminato)]nickelate(II) disodium salt**						
	H_2O	1.6×10^9			CR/A'c-32	A' = AES; used $k_{A'} = 4.7 \times 10^7\ L\ mol^{-1}\ s^{-1}$; meas. $k_A/k_{A'} = 34$; $^1O_2^*$ from H_2O_2/OCl^-.	85A177
12.144	**Ferrocene**						
	C_6H_6	9×10^6		298	PL/A'd-8	S = An; A' = DPBF.	737438
	CCl_4/ $CHCl_3$ (90:10)	3.0×10^6			CP/A'c-23	S = A' = Rub; used $k_d = 1.4 \times 10^3\ s^{-1}$, $k_{A'} = 7 \times 10^7\ L\ mol^{-1}\ s^{-1}$; Measured $k_A/(k_{A'}[A'] + k_d) = 1.7 \times 10^3\ L\ mol^{-1}$ at $[A'] = 5 \times 10^{-6}\ mol\ L^{-1}$.	74F645
12.145	**Hexaamminecobalt(III) ion**						
	D_2O	1.2×10^6			PL/Ld-2	S = RB.	84N150

TABLE 12. Rate constants for the interaction of singlet oxygen with metal complexes. — Continued

No.	Solvent	k ($L\ mol^{-1}\ s^{-1}$)	β (k_d/k) ($mol\ L^{-1}$)	T (K)	Method	Comment	Ref.
12.146	**Hydroxybis(dimethylglyoximato)pyridinecobalt(II)**						
	CH_2Cl_2/ MeOH (90:10)	4.5×10^7			PL/A'd-5	S = MB; A' = DPBF.	87F655
12.147	**Hydroxybis(dimethylglyoximato)triethylaminecobalt(II)**						
	CH_2Cl_2/ MeOH (90:10)	1.5×10^8			PL/A'd-5	S = MB; A' = DPBF.	87F655
12.148	**Hydroxybis(dimethylglyoximato)triphenylphosphinecobalt(II)**						
	CH_2Cl_2/ MeOH (90:10)	$<5 \times 10^6$			PL/A'd-5	S = MB; A' = DPBF.	87F655
12.149	**Hydroxybis(diphenylglyoximato)pyridinecobalt(II)**						
	CH_2Cl_2/ MeOH (90:10)	2×10^7			PL/A'd-5	S = MB; A' = DPBF.	87F655
12.150	**Hydroxybis(diphenylglyoximato)triphenylphosphinecobalt(II)**						
	CH_2Cl_2/ MeOH (90:10)	$<5 \times 10^6$			PL/A'd-5	S = MB; A' = DPBF.	87F655
12.151	**Manganese(II) chloride hexahydrate**						
	$BuOCH_2CH_2OH$	$<1.0 \times 10^6$		273	MD/A'c-33	A' = Rub; used $k_d = 3.8 \times 10^5\ s^{-1}$, $k_{A'} = 7 \times 10^7\ L\ mol^{-1}\ s^{-1}$.	727319
12.152	**Manganese(II) chloride tetrahydrate**						
	i-octane	$\leq 1.0 \times 10^6$		298	CP/A'c-23	S = A' = Rub; used $k_d = 4.7 \times 10^4\ s^{-1}$, $k_{A'} = 7.3 \times 10^7\ L\ mol^{-1}\ s^{-1}$.	747341
12.153	**[4-Methyl-1,2-benzenedithiolato](2,2'-bipyridine)nickel(II) [Ni(bpy)(DMT)]**						
	DMF	7×10^9			MP/P'a-19	S = HP; A' = TEMP-4-OH; used $k_d = 1.4 \times 10^5\ s^{-1}$; P' = TEMPOL; esr detection.	89F311
12.154	**[4-Methyl-1,2-benzenedithiolato])(1,10-phenanthroline)nickel(II)**						
	DMF	1.1×10^{10}			MP/P'a-19	S = HP; A' = TEMP-4-OH; used $k_d = 1.4 \times 10^5\ s^{-1}$; P' = TEMPOL; esr detection.	89F311
12.155	**[4-Methyl-1,2-benzenedithiolato](1,10-phenanthroline)platinum(II) [Pt(phen)(DMT)]**						
	DMF	4.7×10^9			CP/Ac-19	S = A; Q = Bis(diethyldithiocarbamato)nickel(II); used $k_d = 1.4 \times 10^5\ s^{-1}$.	91F098
12.156	**2,2'-Methylenebis[*O,O'*-di(4-*tert*-butylphenyl)dithiophosphate]cobalt(II)**						
	C_6H_6	1.8×10^8			CP/A'c-23	S = A' = Rub; used $k_d = 2.8 \times 10^4\ s^{-1}$, $k_{A'} = 3 \times 10^7\ L\ mol^{-1}\ s^{-1}$.	79A434
12.157	**2,2'-Methylenebis[*O,O'*-di(4-*tert*-butylphenyl)dithiophosphate]lead(II)**						
	C_6H_6	4.3×10^7			CP/A'c-23	S = A' = Rub; used $k_d = 2.8 \times 10^4\ s^{-1}$, $k_{A'} = 3 \times 10^7\ L\ mol^{-1}\ s^{-1}$.	79A434
12.158	**2,2'-Methylenebis[*O,O'*-di(4-*tert*-butylphenyl)dithiophosphate]nickel(II)**						
	C_6H_6	2.7×10^8			CP/A'c-23	S = A' = Rub; used $k_d = 2.8 \times 10^4\ s^{-1}$, $k_{A'} = 3 \times 10^7\ L\ mol^{-1}\ s^{-1}$.	79A434
12.159	**Methylthiolato(triethylphosphino)gold(I)**						
	C_6H_6	3.7×10^7		303	CP/P'a-19	S = A' = Rub; k_d not given.	87A107
	$ClCF_2CCl_2F$	4.5×10^7		303	CR/P'a-32	A' = Rub; $^1O_2$* from $DMNO_2$; k_d and $k_{A'}$ not given.	87A107
12.160	**2,2'-[1,8-Naphthylenebis(nitrilomethylidyne)]bis[phenolato]nickel(II)**						
	$C_6H_5CH_3$	1.2×10^{10}			CP/A'c-25	S = A' = Rub; used $k_d = 1 \times 10^5\ s^{-1}$, $k_{A'} = 1.7 \times 10^8\ L\ mol^{-1}\ s^{-1}$.	752063

TABLE 12. Rate constants for the interaction of singlet oxygen with metal complexes. — Continued

No.	Solvent	k ($L\ mol^{-1}\ s^{-1}$)	β (k_d/k) ($mol\ L^{-1}$)	T (K)	Method	Comment	Ref.
11.161	**Nickel(II) acetate**						
	CH_3COCH_3/ H_2O (95:5)	2×10^7			PL/Ld-2	S = PdMP.	82A412
11.162	**Nickel(II) dichloride**						
	C_5H_5N	1.6×10^7			PL/Ld-2	S = PdMP.	82A412
	CH_3COCH_3/ H_2O (95:5)	3×10^7			PL/Ld-2	S = PdMP.	82A412
11.163	**Nickel(II) dichloride hexahydrate**						
	$BuOCH_2CH_2OH$	3.1×10^8		273	MD/A'c-33	A' = Rub; used $k_d = 3.8 \times 10^5\ s^{-1}$, $k_{A'} = 7 \times 10^7$ L $mol^{-1}\ s^{-1}$.	727319
	C_6H_6/ EtOH (50:50)	9.2×10^7 8.9×10^7 (k_q)		298	CP/Ac,A'c-23	S = A' = Rub; used $k_d = 5.6 \times 10^4\ s^{-1}$, $k_{A'} = 3.3 \times 10^7$ L $mol^{-1}\ s^{-1}$.	90F360
11.164	**Nickel(I) ion**						
	D_2O pD = 10.6	3.3×10^7		295	PL/A'd-5	S = 2-ACN; A' = BR^{2-}.	82N021
11.165	**Nickelocene**						
	tert-BuOH	2.8×10^9		295	PL/A'd-5	S = DMTBP; A' = DPBF.	87E181
	c-C_6H_{12}	4.5×10^9		295	PL/A'd-5	S = DMTBP; A' = DPBF.	87E181
	C_6H_6	5.4×10^9		295	PL/A'd-5	S = DMTBP; A' = DPBF.	87E181
	CCl_4	2.7×10^9		295	PL/A'd-5	S = DMTBP; A' = DPBF.	87E181
	CH_3CN	6.4×10^9		295	PL/A'd-5	S = DMTBP; A' = DPBF.	87E181
	CH_3COCH_3	4.8×10^9		295	PL/A'd-5	S = DMTBP; A' = DPBF.	87E181
	$CHCl_3$	4.4×10^9		295	PL/A'd-5	S = DMTBP; A' = DPBF.	87E181
	MeOH	6.8×10^9		295	PL/A'd-5	S = DMTBP; A' = DPBF.	87E181
	2-PrOH	2.9×10^9		295	PL/A'd-5	S = DMTBP; A' = DPBF.	87E181
11.166	**2,2'-[1,2-Phenylenebis(nitrilomethylidyne)]bis[phenolato]nickel(II)**						
	$C_6H_5CH_3$	3.7×10^9			CP/A'c-25	S = A' = Rub; used $k_d = 1 \times 10^5\ s^{-1}$, $k_{A'} = 1.7 \times 10^8$ L $mol^{-1}\ s^{-1}$.	752063
11.167	**[*N,N'*-*o*-Phenylenebis(5-sulfosalicylideneiminato)]nickelate(II) disodium salt**						
	H_2O	~10^8			CR/A'c-32	A' = AES; used $k_{A'} = 4.7 \times 10^7$ L $mol^{-1}\ s^{-1}$; meas. $k_A/k_{A'} = 10$; $^1O_2$* from H_2O_2/OCl^-; k is concn. dependent.	85A177
11.168	**Propylamine[2,2'-thiobis[4-(1,1,3,3-tetramethylbutyl)]phenolato]nickel(II)**						
	$C_6H_5CH_3$	3.0×10^8			CP/A'c-25	S = A' = Rub; used $k_d = 1 \times 10^5\ s^{-1}$, $k_{A'} = 1.7 \times 10^8$ L $mol^{-1}\ s^{-1}$.	752063
11.169	**[*N,N'*-Propylenebis(5-sulfosalicylideneiminato)]nickelate(II) disodium salt**						
	H_2O	1.3×10^9			CR/A'c-32	A' = AES; used $k_{A'} = 4.7 \times 10^7$ L $mol^{-1}\ s^{-1}$; meas. $k_A/k_{A'} = 28$; $^1O_2$* from H_2O_2/OCl^-.	85A177
11.170	**Tetra-*O*-acetylglucose-1-thiolato(triethylphosphino)gold(I) (Auranofin)**						
	C_6H_6	2×10^6		303	CP/P'a-19	S = A' = Rub; k_d not given.	87A107
	$ClCF_2CCl_2F$	7.5×10^6		303	CR/P'a-32	A' = Rub; $^1O_2$* from $DMNO_2$; $k_{A'}$ and k_d not given.	87A107
11.171	**Triethanolamine[2,2'-thiobis[4-(1,1,3,3-tetramethylbutyl)]phenolato]nickel(II)**						
	$C_6H_5CH_3$	1.1×10^8			CP/A'c-25	S = A' = Rub; used $k_d = 1 \times 10^5\ s^{-1}$, $k_{A'} = 1.7 \times 10^8$ L $mol^{-1}\ s^{-1}$.	752063

TABLE 12. Rate constants for the interaction of singlet oxygen with metal complexes. — *Continued*

No.	Solvent	k (L mol^{-1} s^{-1})	β (k_d/k) (mol L^{-1})	T (K)	Method	Comment	Ref.
12.172	**Tris(acetylacetonato)chromate(III)**						
	CCl_4/ $CHCl_3$ (90:10)	5.0×10^5			CP/A'c-23	S = A' = Rub; used $k_d = 1.4 \times 10^3$ s^{-1}, $k_{A'} = 7 \times 10^7$ L mol^{-1} s^{-1}; Measured $k_A/(k_{A'}[A'] + k_d) = 3.0 \times 10^2$ L mol^{-1} at [A'] = 5×10^{-6} mol L^{-1}.	74F645
12.173	**Tris(acetylacetonato)cobalt(III)**						
	CCl_4/ $CHCl_3$ (90:10)	9.2×10^8			CP/A'c-23	S = A' = Rub; used $k_d = 1.4 \times 10^3$ s^{-1}, $k_{A'} = 7 \times 10^7$ L mol^{-1} s^{-1}; Measured $k_A/(k_{A'}[A'] + k_d) = 5.2 \times 10^5$ L mol^{-1} at [A'] = 5×10^{-6} mol L^{-1}.	74F645
	CH_2Cl_2/ MeOH (90:10)	6.5×10^8			PL/A'd-5	S = MB; A' = DPBF.	87F655
12.174	**Tris(acetylacetonato)iron(III)**						
	CCl_4/ $CHCl_3$ (90:10)	8.7×10^7			CP/A'c-23	S = A' = Rub; used $k_d = 1.4 \times 10^3$ s^{-1}, $k_{A'} = 7 \times 10^7$ L mol^{-1} s^{-1}; Measured $k_A/(k_{A'}[A'] + k_d) = 4.9 \times 10^4$ L mol^{-1} at [A'] = 5×10^{-6} mol L^{-1}.	74F645
12.175	**Tris(acetylacetonato)manganese(III)**						
	$C_6H_5CH_3$	5×10^8			CP/A'c-25	S = A' = Rub; used $k_d = 1 \times 10^5$ s^{-1}, $k_{A'} = 1.7 \times 10^8$ L mol^{-1} s^{-1}.	752063
	CH_3COCH_3/ H_2O (95:5)	1.6×10^8			PL/Ld-2	S = PdMP.	82A412
12.176	**Tris(2,2'-bipyridine)cobalt(II) ion**						
	CH_3COCH_3/ H_2O (95:5)	$<1 \times 10^6$			PL/Ld-2	S = PdMP.	82A412
12.177	**Tris(2,2'-bipyridine)ruthenium(II) dichloride**						
	CCl_4/ MeOH (98:2)	$\leq 1.0 \times 10^9$			FP/A'd-5	S = MB; A' = DPBF; no effect for [A] = 1×10^{-6} mol L^{-1}.	78E238
12.178	**Tris(1,10-phenanthroline)cobalt(II) ion**						
	CH_3COCH_3/ H_2O (95:5)	$<1 \times 10^6$			PL/Ld-2	S = PdMP.	82A412

TABLE 13. Rate constants for the interaction of singlet oxygen with sulfur, selenium, and telurium compounds.

No.	Solvent	k ($L\ mol^{-1}\ s^{-1}$)	β (k_d/k) ($mol\ L^{-1}$)	T (K)	Method	Comment	Ref.
13.1	**Azepine-1-carbodithioate ion, hexahydro- (Hexamethylenedithiocarbamate)**						
	EtOH	1.5×10^8			CP/Oc-23	S = RB; A′ = Car; used $k_d = 1.0 \times 10^4\ s^{-1}$, $k_{A'} = 5.0 \times 10^9\ L\ mol^{-1}\ s^{-1}$; Measured $k_A/(k_d + k_A\ [A]) = 7 \times 10^4\ L\ mol^{-1}$ at $[A] = 3.35 \times 10^{-4}\ mol\ L^{-1}$.	727116
13.2	**Benzamide, 2-(methylseleno)-*N*-phenyl-**						
	CD_3OD	9.2×10^6			PL/Ld-2	S = H_2TPPS^{4-}.	91R262
13.3	**Benzamide, 2-(methylthio)-*N*-phenyl-**						
	CD_3OD	7.8×10^5			PL/Ld-2	S = H_2TPPS^{4-}.	91R262
13.4	**Benzamide, *N*-phenyl-2-(phenylmethyl)seleno-**						
	CD_3OD	5.2×10^6			PL/Ld-2	S = H_2TPPS^{4-}.	91R262
13.5	**Benzamide, *N*-phenyl-2-(phenylmethyl)thio-**						
	CD_3OD	3.4×10^5			PL/Ld-2	S = H_2TPPS^{4-}.	91R262
13.6	**Benzenamine, *N*,*N*-dimethyl-4-(methylthio)-**						
	C_6H_6	3.0×10^7		308	CR/A′c-16	A′ = DPBF; used $k_d = 5.4 \times 10^4\ s^{-1}$; $^1O_2$* from $MNPO_2$.	85M098
	MeOH/ H_2O (50:50)	3.6×10^8		308	CR/A′c-16	A′ = DPBF; used $k_d = 2.8 \times 10^5\ s^{-1}$; $^1O_2$* from $MNPO_2$.	85M098
13.7	**Benzene, 1-bromo-4-(methylthio)-**						
	$CHCl_3$	1.1×10^6			CP/A′c-33	S = A′ = Rub; used $k_d = 1.7 \times 10^4\ s^{-1}$, $k_{A'} = 5.3 \times 10^7\ L\ mol^{-1}\ s^{-1}$.	79A085
13.8	**Benzene, (butylthio)-**						
	CH_3COCH_3	1.6×10^6			PL/Ld-2	S = RB.	91F286 92F225
	CH_3COCH_3	1.1×10^4 (k_r)			CP/Ac,A′c-17	S = RB; A′ = Limonene; used $k_r^{A'} = 1.7 \times 10^5\ L\ mol^{-1}\ s^{-1}$.	92F225
13.9	**Benzene, 1-(butylthio)-3-chloro-**						
	CH_3COCH_3	5.3×10^5			PL/Ld-2	S = RB.	91F286 92F225
13.10	**Benzene, 1-(butylthio)-4-chloro-**						
	CH_3COCH_3	7.7×10^5			PL/Ld-2	S = RB.	91F286 92F225
13.11	**Benzene, 1-(butylthio)-4-fluoro-**						
	CH_3COCH_3	1.3×10^6			PL/Ld-2	S = RB.	91F286 92F225
13.12	**Benzene, 1-(butylthio)-4-methoxy-**						
	CH_3COCH_3	4.3×10^6			PL/Ld-2	S = RB.	91F286 92F225
13.13	**Benzene, 1-(butylthio)-4-methyl-**						
	CH_3COCH_3	2.8×10^6			PL/Ld-2	S = RB.	91F286 92F225
13.14	**Benzene, 1-chloro-3-(methylthio)-**						
	$CHCl_3$	5.5×10^5			CP/A′c-33	S = A′ = Rub; used $k_d = 1.7 \times 10^4\ s^{-1}$, $k_{A'} = 5.3 \times 10^7\ L\ mol^{-1}\ s^{-1}$.	79A085
13.15	**Benzene, 1-chloro-4-(methylthio)-**						
	$CHCl_3$	1.0×10^6			CP/A′c-33	S = A′ = Rub; used $k_d = 1.7 \times 10^4\ s^{-1}$, $k_{A'} = 5.3 \times 10^7\ L\ mol^{-1}\ s^{-1}$.	79A085

TABLE 13. Rate constants for the interaction of singlet oxygen with sulfur, selenium, and telurium compounds. — Continued

No.	Solvent	k ($L\ mol^{-1}\ s^{-1}$)	β (k_d/k) ($mol\ L^{-1}$)	T (K)	Method	Comment	Ref.
13.15	**Benzene, 1-chloro-4-(methylthio)-** — Continued						
	MeOH	8.3×10^5			CP/A'c-16	S = RB; A' = DPF; used $k_d = 1.1 \times 10^5\ s^{-1}$.	79A086
13.16	**Benzene, 1-chloro-4-(phenylthio)-**						
	MeOH				CP/Ac,Pa-17	S = RB; A' = $(C_6H_5)_2S$; meas. $k_r/k_r^{A'} = 0.93$.	80F104
13.17	**Benzene, [(2,3-dimethyl-2-butenyl)thio]-**						
	CH_3COCH_3	2.3×10^6			PL/Ad-5	S = RB.	89F298
13.18	**Benzene, [(2,3-dimethyl-2-butenyl)thio]-4-methoxy-**						
	CH_3COCH_3	7.6×10^6			PL/Ad-5	S = RB.	89F298
13.19	**Benzene, [(2,3-dimethyl-2-butenyl)thio]-4-methyl-**						
	CH_3COCH_3	3.1×10^6			PL/Ad-5	S = RB.	89F298
13.20	**Benzene, 1-(1,1-dimethylethyl)-4-(methylthio)-**						
	$CHCl_3$	4.7×10^6			CP/A'c-33	S = A' = Rub; used $k_d = 1.7 \times 10^4\ s^{-1}$, $k_{A'} = 5.3 \times 10^7\ L\ mol^{-1}\ s^{-1}$.	79A085
13.21	**Benzene, 1-fluoro-4-(methylthio)-**						
	$CHCl_3$	1.9×10^6			CP/A'c-33	S = A' = Rub; used $k_d = 1.7 \times 10^4\ s^{-1}$, $k_{A'} = 5.3 \times 10^7\ L\ mol^{-1}\ s^{-1}$.	79A085
13.22	**Benzene, 1-methoxy-4-(methylthio)-**						
	C_6H_6	2×10^6		308	CR/A'c-16	A' = DPBF; used $k_d = 5.4 \times 10^4\ s^{-1}$; $^1O_2$* from $MNPO_2$.	85M098
	$CHCl_3$	7.6×10^6			CP/A'c-33	S = A' = Rub; used $k_d = 1.7 \times 10^4\ s^{-1}$, $k_{A'} = 5.3 \times 10^7\ L\ mol^{-1}\ s^{-1}$.	79A085
	MeOH	5.3×10^6			CP/A'c-16	S = RB; A' = DPF; used $k_d = 1.1 \times 10^5\ s^{-1}$.	79A086
	MeOH/ H_2O (50:50)	4.6×10^7		308	CR/A'c-16	A' = DPBF; used $k_d = 2.8 \times 10^5\ s^{-1}$; $^1O_2$* from $MNPO_2$.	85M098
13.23	**Benzene, 1-methoxy-4-(phenylthio)-**						
	MeOH				CP/Ac,Pa-17	S = RB; A' = $(C_6H_5)_2S$; meas. $k_r/k_r^{A'} = 2.5$.	80F104
13.24	**Benzene, 1-methyl-3-(methylthio)-**						
	$CHCl_3$	3.1×10^6			CP/A'c-33	S = A' = Rub; used $k_d = 1.7 \times 10^4\ s^{-1}$, $k_{A'} = 5.3 \times 10^7\ L\ mol^{-1}\ s^{-1}$.	79A085
13.25	**Benzene, 1-methyl-4-(methylthio)-**						
	C_6H_6	1.5×10^6		308	CR/A'c-16	A' = DPBF; used $k_d = 5.4 \times 10^4\ s^{-1}$; $^1O_2$* from $MNPO_2$.	85M098
	$CHCl_3$	4.6×10^6			CP/A'c-33	S = A' = Rub; used $k_d = 1.7 \times 10^4\ s^{-1}$, $k_{A'} = 5.3 \times 10^7\ L\ mol^{-1}\ s^{-1}$.	79A085
	MeOH	3.1×10^6			CP/A'c-16	S = RB; A' = DPF; used $k_d = 1.1 \times 10^5\ s^{-1}$.	79A086
	MeOH/ H_2O (50:50)	3.2×10^7		308	CR/A'c-16	A' = DPBF; used $k_d = 2.8 \times 10^5\ s^{-1}$; $^1O_2$* from $MNPO_2$.	85M098
13.26	**Benzene, 1-methyl-4-(phenylthio)-**						
	MeOH				CP/Ac,Pa-17	S = RB; A' = $(C_6H_5)_2S$; meas. $k_r/k_r^{A'} = 1.9$.	80F104
13.27	**Benzene, methylseleno-**						
	CCl_4	1.4×10^8		296	CR/LI-12	used $k_d = 1.7 \times 10^3\ s^{-1}$; $^1O_2$* from $DMNO_2$.	90F069
13.28	**Benzene, methyltelluro-**						
	CCl_4	3.8×10^9		296	CR/LI-12	used $k_d = 1.7 \times 10^3\ s^{-1}$; $^1O_2$* from $DMNO_2$.	90F069

TABLE 13. Rate constants for the interaction of singlet oxygen with sulfur, selenium, and telurium compounds. — Continued

No.	Solvent	k (L mol^{-1} s^{-1})	β (k_d/k) (mol L^{-1})	T (K)	Method	Comment	Ref.
13.29	**Benzene, (methylthio)-**						
	C_6H_6	8×10^5		308	CR/A'c-16	A' = DPBF; used $k_d = 5.4 \times 10^4$ s^{-1}; $^1O_2$* from $MNPO_2$.	85M098
	CCl_4	7.1×10^6		296	CR/LI-12	used $k_d = 1.7 \times 10^3$ s^{-1}; $^1O_2$* from $DMNO_2$.	90F069
	$CHCl_3$	2.3×10^6			CP/A'c-33	S = A' = Rub; used $k_d = 1.7 \times 10^4$ s^{-1}, $k_{A'} = 5.3 \times 10^7$ L mol^{-1} s^{-1}.	79A085
	MeOH	2.0×10^6			CP/A'c-16	S = RB; A' = DPF; used $k_d = 1.1 \times 10^5$ s^{-1}.	79A086
	MeOH/ H_2O (50:50)	2.3×10^7		308	CR/A'c-16	A' = DPBF; used $k_d = 2.8 \times 10^5$ s^{-1}; $^1O_2$* from $MNPO_2$.	85M098
13.30	**Benzene, [(methylthio)methyl]-**						
	$CHCl_3$	1.2×10^7			CP/A'c-33	S = A' = Rub; used $k_d = 1.7 \times 10^4$ s^{-1}, $k_{A'} = 5.3 \times 10^7$ L mol^{-1} s^{-1}.	79A085
13.31	**Benzene, 1-nitro-4-(phenylthio)-**						
	MeOH				CP/Ac,Pa-17	S = RB; A' = $(C_6H_5)_2S$; meas. $k_t/k_r^{A'} = 0.30$.	80F104
13.32	**Benzene, [(phenylmethyl)seleno]-**						
	$CHCl_3$	6×10^6		253	CP/A'c-33	S = A' = Rub; used $k_d = 1.7 \times 10^4$ s^{-1}, $k_{A'} = 5.3 \times 10^7$ L mol^{-1} s^{-1}.	82N064
13.33	**Benzene, [(phenylmethyl)thio]-**						
	$CHCl_3$	8.5×10^5		253	CP/A'c-33	S = A' = Rub; used $k_d = 1.7 \times 10^4$ s^{-1}, $k_{A'} = 5.3 \times 10^7$ L mol^{-1} s^{-1}.	82N064
13.34	**Benzene, 1,1'-thiobis-**						
	$CHCl_3$	8.0×10^4			CP/A'c-33	S = A' = Rub; used $k_d = 1.7 \times 10^4$ s^{-1}, $k_{A'} = 5.3 \times 10^7$ L mol^{-1} s^{-1}.	79A085
	MeOH	$\sim 1.0 \times 10^5$			CP/A'c-16	S = RB; A' = DPF; used $k_d = 1.1 \times 10^5$ s^{-1}; Theoretical intercept of 1.0 used in calculation.	79A086
13.35	**Benzenemethanesulfenamide, *N,N*-diethyl-**						
	C_6H_6	2.0×10^6			PL/Ld-2	S = TPP.	94F024
13.36	**1,2-Benzisoselenazol-3-one, 7-chloro-2-phenyl-**						
	CD_3OD	3.0×10^5			PL/Ld-2	S = H_2TPPS^{4-}.	91R262
13.37	**1,2-Benzisoselenazol-3-one, 7-fluoro-2-phenyl-**						
	CD_3OD	4.5×10^5			PL/Ld-2	S = H_2TPPS^{4-}.	91R262
13.38	**1,2-Benzisoselenazol-3-one, 7-methoxy-2-phenyl-**						
	CD_3OD	1.3×10^6			PL/Ld-2	S = H_2TPPS^{4-}.	91R262
13.39	**1,2-Benzisoselenazol-3-one, 7-nitro-2-phenyl-**						
	CD_3OD	1.1×10^5			PL/Ld-2	S = H_2TPPS^{4-}.	91R262
13.40	**1,2-Benzisoselenazol-3-one, 2-phenyl**						
	CD_3OD	2.5×10^6			PL/Ld-2	S = H_2TPPS^{4-}.	91R262
13.41	**1,2-Benzisothiazol-3-one, 2-phenyl-**						
	CD_3OD	2.3×10^5			PL/Ld-2	S = H_2TPPS^{4-}.	91R262
13.42	**Benzyl mercaptan**						
	MeOH	1.2×10^5	0.73		CP/A'c-16	S = MB; A' = DPBF; used $k_d = 9.0 \times 10^4$ s^{-1}.	72F519
13.43	**Bicyclo[2.2.1]heptane-2-thione**						
	$CHCl_3$	1.8×10^5			CP/A'c-33	S = A' = Rub; used $k_d = 1.7 \times 10^4$ s^{-1}, $k_{A'} = 5.3 \times 10^7$ L mol^{-1} s^{-1}.	82A059 83F028

TABLE 13. Rate constants for the interaction of singlet oxygen with sulfur, selenium, and telurium compounds. — Continued

No.	Solvent	k ($L\ mol^{-1}\ s^{-1}$)	β (k_d/k) ($mol\ L^{-1}$)	T (K)	Method	Comment	Ref.
13.44	**Bicyclo[2.2.1]heptane-2-thione, 3,3-dimethyl-**						
	$CHCl_3$	1×10^5			CP/A'c-33	S = A' = Rub; used $k_d = 1.7 \times 10^4\ s^{-1}$, $k_{A'} = 5.3 \times 10^7\ L\ mol^{-1}\ s^{-1}$.	82A093 83F028
13.45	**Bicyclo[2.2.1]heptane-2-thione, 1,3,3,7,7-pentamethyl-**						
	$CHCl_3$	5.8×10^4			CP/A'c-33	S = A' = Rub; used $k_d = 1.7 \times 10^4\ s^{-1}$, $k_{A'} = 5.3 \times 10^7\ L\ mol^{-1}\ s^{-1}$.	82A059 83F028
13.46	**Bicyclo[2.2.1]heptane-2-thione, 1,3,3-trimethyl- (Thiofenchone)**						
	$CHCl_3$	5.1×10^5			CP/A'c-33	S = A' = Rub; used $k_d = 1.7 \times 10^4\ s^{-1}$, $k_{A'} = 5.3 \times 10^7\ L\ mol^{-1}\ s^{-1}$.	82A093 83F028
13.47	**Bicyclo[2.2.1]heptane-2-thione, 1,7,7-trimethyl- (Thiocamphor)**						
	$CHCl_3$	8.1×10^4			CP/A'c-33	S = A' = Rub; used $k_d = 1.7 \times 10^4\ s^{-1}$, $k_{A'} = 5.3 \times 10^7\ L\ mol^{-1}\ s^{-1}$.	82A093 83F028
13.48	**Bicyclo[3.1.1]hept-3-ene-2-thione, 4,6,6-trimethyl-**						
	$CHCl_3$	5.6×10^5			CP/A'c-33	S = A' = Rub; used $k_d = 1.7 \times 10^4\ s^{-1}$, $k_{A'} = 5.3 \times 10^7\ L\ mol^{-1}\ s^{-1}$.	85F151
13.49	**2,3-Butanediol, 1,4-dimercapto-, *erythro*- (Dithioerythritol)**						
	$CHCl_3$/ EtOH (50:50)	7.4×10^8 2.9×10^6 (k_r)		310	CR/LI,Ac-12,14	used $k_d = 1 \times 10^5\ s^{-1}$; $^1O_2$* from $NDPO_2$.	90E622
13.50	**2,3-Butanediol, 1,4-dimercapto-, *threo*- (Dithiothreitol)**						
	$CHCl_3$/ EtOH (50:50)	9.8×10^8 2.8×10^6 (k_r)		310	CR/LI,Ac-12,14	used $k_d = 1 \times 10^5\ s^{-1}$; $^1O_2$* from $NDPO_2$.	90E622
	D_2O pD = 7.4	1.5×10^6 (k_r)		310	CR/Ac-17	A' = CysSH; used $k_r^{A'} = 8.3 \times 10^6\ L\ mol^{-1}\ s^{-1}$; $^1O_2$* from $NDPO_2$.	91R055
	D_2O pD = 7.4	1.9×10^6		310	CR/LI-12	used $k_d = 1.9 \times 10^4\ s^{-1}$; $^1O_2$* from $NDPO_2$.	91R055
13.51	**1-Butanethiol**						
	MeOH	5.3×10^4	1.7		CP/A'c-16	S = MB; A' = DPBF; used $k_d = 9.0 \times 10^4\ s^{-1}$.	72F519
13.52	**1-Butanol, 4-(4-methylphenyl)thio-**						
	CH_3COCH_3	4.1×10^4 (k_r)			CP/Ac-17	S = RB; A' = Limonene; used $k_r^{A'} = 1.7 \times 10^5\ L\ mol^{-1}\ s^{-1}$; meas. $k_q/k_r = 64.9$.	91F286 92F225
	CH_3COCH_3	2.7×10^6			PL/Ld-2	S = RB.	91F286 92F225
13.53	**2-Butene, [(2-methyl-3-(phenylsulfinyl)]-**						
	C_6H_6		11 (β_r)		CP/Ac-17	S = TPP; A' = Linalool; used $\beta_r^{A'} = 0.18\ mol\ L^{-1}$.	89F400
13.54	**2-Butene, 2-(phenylsulfinyl)- (*E*)**						
	C_6H_6		26 (β_r)		CP/Ac-17	S = TPP; A' = Linalool; used $\beta_r^{A'} = 0.18\ mol\ L^{-1}$.	89F400
13.55	**2-Butene, 2-(phenylsulfinyl)- (*Z*)**						
	C_6H_6		$>1 \times 10^2$ (β_r)		CP/Ac-17	S = TPP; A' = Linalool; used $\beta_r^{A'} = 0.18\ mol\ L^{-1}$.	89F400
13.56	***tert*-Butyl ethyl sulfide**						
	$CHCl_3$	6.4×10^6			CP/A'c-33	S = A' = Rub; used $k_d = 1.7 \times 10^4\ s^{-1}$, $k_{A'} = 5.3 \times 10^7\ L\ mol^{-1}\ s^{-1}$.	79A085
13.57	**Butyl methyl sulfide**						
	$CHCl_3$	2.9×10^7			CP/A'c-33	S = A' = Rub; used $k_d = 1.7 \times 10^4\ s^{-1}$, $k_{A'} = 5.3 \times 10^7\ L\ mol^{-1}\ s^{-1}$.	79A085

TABLE 13. Rate constants for the interaction of singlet oxygen with sulfur, selenium, and telurium compounds. — Continued

No.	Solvent	k ($L\ mol^{-1}\ s^{-1}$)	β (k_d/k) ($mol\ L^{-1}$)	T (K)	Method	Comment	Ref.
13.58	***tert*-Butyl propyl sulfide**						
	$CHCl_3$	7.2×10^6			CP/A'c-33	S = A' = Rub; used $k_d = 1.7 \times 10^4\ s^{-1}$, $k_{A'} = 5.3 \times 10^7\ L\ mol^{-1}\ s^{-1}$.	79A085
13.59	***sec*-Butyl propyl sulfide**						
	$CHCl_3$	1.1×10^7			CP/A'c-33	S = A' = Rub; used $k_d = 1.7 \times 10^4\ s^{-1}$, $k_{A'} = 5.3 \times 10^7\ L\ mol^{-1}\ s^{-1}$.	79A085
13.60	**1,3-Cyclobutanedithione, 2,2,4,4-tetramethyl-**						
	$CHCl_3$	2.2×10^5			CP/A'c-33	S = A' = Rub; used $k_d = 1.7 \times 10^4\ s^{-1}$, $k_{A'} = 5.3 \times 10^7\ L\ mol^{-1}\ s^{-1}$.	82A093
13.61	**Cyclobutanethione, 2,2,4,4-tetramethyl-**						
	$CHCl_3$	3.1×10^5			CP/A'c-33	S = A' = Rub; used $k_d = 1.7 \times 10^4\ s^{-1}$, $k_{A'} = 5.3 \times 10^7\ L\ mol^{-1}\ s^{-1}$.	82A093
13.62	**Cyclobutanone, 2,2,4,4-tetramethyl-3-thioxo-**						
	$CHCl_3$	8.5×10^4			CP/A'c-33	S = A' = Rub; used $k_d = 1.7 \times 10^4\ s^{-1}$, $k_{A'} = 5.3 \times 10^7\ L\ mol^{-1}\ s^{-1}$.	82A093
13.63	**Cyclohexanamine, *N,N'*-[dithiobis[(5-ethyl-2,3-thiophenediyl)methylidyne]]bis-**						
	$C_6H_5CH_3$	2.9×10^8			PL/Ld-2	S = TPP.	88A507
	$C_6H_5CH_3$	3.2×10^8 (k_r)			CP/Ac,A'c-17	S = PP; A' = DPBF; used $k_r^{A'} = 6.7 \times 10^8\ L\ mol^{-1}\ s^{-1}$.	88A507
	CH_3CN	1.1×10^8 (k_r)			CP/Ac,A'c-17	S = MB; A' = DPBF; used $k_r^{A'} = 1.1 \times 10^9\ L\ mol^{-1}\ s^{-1}$.	88A507
	CH_3CN	3.7×10^8			PL/Ld-2	S = TPP.	88A507
	$CHCl_3$	5.6×10^7			PL/Ld-2	S = TPP.	88A507
13.64	**Cyclohexanamine, *N*-[[(5-methyl-2-(methylthio)-3-thienyl]methylene]-**						
	$C_6H_5CH_3$	2.5×10^5			PL/Ld-2	S = TPP.	88A507
	CH_3CN	2.0×10^5 (k_r)			CP/Ac,A'c-17	S = MB; A' = DPBF; used $k_r^{A'} = 1.1 \times 10^9\ L\ mol^{-1}\ s^{-1}$.	88A507
	CH_3CN	2.2×10^6			PL/Ld-2	S = TPP.	88A507
	$CHCl_3$	6.0×10^5			PL/Ld-2	S = TPP.	88A507
	2-PrOH	3.4×10^5			PL/Ld-2	S = TPP.	88A507
13.65	**2-Cyclohexene-1-thione, 3,5,5-trimethyl-**						
	$CHCl_3$	6.1×10^5			CP/A'c-33	S = A' = Rub; used $k_d = 1.7 \times 10^4\ s^{-1}$, $k_{A'} = 5.3 \times 10^7\ L\ mol^{-1}\ s^{-1}$.	85F151
13.66	**2-Cyclopentene-1-thione, 3-(4-methoxyphenyl)-**						
	$CHCl_3$	2.3×10^6			CP/A'c-33	S = A' = Rub; used $k_d = 1.7 \times 10^4\ s^{-1}$, $k_{A'} = 5.3 \times 10^7\ L\ mol^{-1}\ s^{-1}$.	85F151
13.67	**Cysteine**						
	$CHCl_3$/ EtOH (50:50)	2.4×10^8 7×10^7 (k_r)		310	CR/LI,Ac-12,14	used $k_d = 1 \times 10^5\ s^{-1}$; $^1O_2$* from $NDPO_2$.	90E622
	D_2O pD = 7.4	8.3×10^6		310	CR/LI-12	used $k_d = 1.9 \times 10^4\ s^{-1}$; $^1O_2$* from $NDPO_2$.	91R055
	D_2O	$\leq 4 \times 10^4$			PL/Ld-2	S = H_2TPPS^{4-} or H_2TMpyP^{4+}; calcd. from k_{obs} = 8.9×10^6 at pH 7 and $pK_a(D_2O) = 8.6$.	88A164
	D_2O	1×10^5			PL/Ld-2	S = RF, water-sol. TPP derivs., or Chl a in micelles contg. Triton X-100.	86F149
	D_2O/ EtOH (75:25)	5×10^7		295	PL/Ld-2	S = RB.	94A113
	EtOH	8×10^6			CP/Pa-15	S = Ret; used $k_d = 3.5 \times 10^5\ s^{-1}$; $CysS^{\bullet}$ obs. by esr.	85A443

TABLE 13. Rate constants for the interaction of singlet oxygen with sulfur, selenium, and telurium compounds. — Continued

No.	Solvent	k ($L\ mol^{-1}\ s^{-1}$)	β (k_d/k) ($mol\ L^{-1}$)	T (K)	Method	Comment	Ref.
13.68	**Cysteine, negative ion**						
	D_2O	1.5×10^8			PL/Ld-2	S = H_2TPPS^{4-} or H_2TMpyP^{4+}; calcd. from k_{obs} = 8.9×10^6 at pH 7 and $pK_a = 8.6$.	88A164
13.69	**L-Cysteine, *N*-acetyl-**						
	D_2O pD = 7.4	6×10^5 (k_r)		310	CR/Ac-17	A′ = CysSH; used $k_r^{A'} = 8.3 \times 10^6$ $L\ mol^{-1}\ s^{-1}$; $^1O_2$* from $NDPO_2$.	91R055
	D_2O pD = 7.4	6×10^5		310	CR/LI-12	used $k_d = 1.9 \times 10^4\ s^{-1}$; $^1O_2$* from $NDPO_2$.	91R055
	D_2O	$\leq 4 \times 10^4$			PL/Ld-2	S = H_2TPPS^{4-} or H_2TMpyP^{4+}; calcd. from k_{obs} = 2.5×10^6 at pH 7 and $pK_a(D_2O) = 10.0$.	88A164
13.70	**L-Cysteine, *N*-acetyl-, negative ion**						
	D_2O	2.1×10^8			PL/Ld-2	S = H_2TPPS^{4-} or H_2TMpyP^{4+}; calcd. from k_{obs} = 2.5×10^6 at pH 7 and $pK_a = 8.6$.	88A164
13.71	**Dibenzyl sulfide**						
	$CHCl_3$	6.4×10^6		253	CP/A′c-33	S = A′ = Rub; used $k_d = 1.7 \times 10^4\ s^{-1}$, $k_{A'} = 5.3 \times 10^7\ L\ mol^{-1}\ s^{-1}$.	82N064
	MeOH		5.5×10^{-3}	293	CP/Oc-15	S = $FlCl_4^{2-}$; $E_a = 1.7\ kJ\ mol^{-1}$.	68F288
	MeOH		9.0×10^{-3}	293	CP/Oc-15	S = MB; $E_a = 7.1\ kJ\ mol^{-1}$.	68F288
	MeOH		0.012	293	CP/Oc-15	S = RB; $E_a = 3.8\ kJ\ mol^{-1}$.	68F288
	MeOH		6.7×10^{-3}	293	CP/Oc-15	S = $FlBr_4Cl_4^{2-}$; $E_a = 5.4\ kJ\ mol^{-1}$.	68F288
	MeOH		8.0×10^{-3}	293	CP/Oc-15	S = DNT; $E_a = 6.7\ kJ\ mol^{-1}$.	68F288
13.72	**Dibutyl sulfide**						
	$CHCl_3$	2.3×10^7			CP/A′c-33	S = A′ = Rub; used $k_d = 1.7 \times 10^4\ s^{-1}$, $k_{A'} = 5.3 \times 10^7\ L\ mol^{-1}\ s^{-1}$.	79A085
	EtOH			298	?	S = Chrysene, 2-bromochrysene, MB; meas. $k_q/k_r = \sim 0.7$.	74F648
	MeOH	2.5×10^7	7.2×10^{-3}		CP/A′c-16	S = RB; A′ = DPBF; used $k_d = 1.8 \times 10^5\ s^{-1}$.	85F480
	MeOH	8.2×10^6	0.011		CP/A′c-16	S = MB; A′ = DPBF; used $k_d = 9.0 \times 10^4\ s^{-1}$.	72F519
13.73	**Di-*sec*-butyl sulfide**						
	$CHCl_3$	1.8×10^6			CP/A′c-33	S = A′ = Rub; used $k_d = 1.7 \times 10^4\ s^{-1}$, $k_{A'} = 5.3 \times 10^7\ L\ mol^{-1}\ s^{-1}$.	79A085
13.74	**Di-*tert*-butyl sulfide**						
	$CHCl_3$	1×10^5			CP/A′c-33	S = A′ = Rub; used $k_d = 1.7 \times 10^4\ s^{-1}$, $k_{A'} = 5.3 \times 10^7\ L\ mol^{-1}\ s^{-1}$.	79A085
	MeOH	$\sim 1.5 \times 10^5$			CP/A′c-16	S = RB; A′ = DPF; used $k_d = 1.1 \times 10^5\ s^{-1}$; Theoretical intercept of 1.0 used in calculation.	79A086
13.75	**Diethyl disulfide**						
	MeOH	1.6×10^7	5.5×10^{-3}		CP/A′c-16	S = MB; A′ = DPBF; used $k_d = 9.0 \times 10^4\ s^{-1}$.	72F519
13.76	**Diethyl sulfide**						
	$(C_2H_5)_2O$	5×10^6	6.0×10^{-3} 4.1×10^{-3}	296 195	CP/A′c-16	S = ZnTPP; A′ = DPF; used $k_d = 3 \times 10^4\ s^{-1}$.	82F357
	$C_6H_5CH_3$	1.4×10^7	2.9×10^{-3}	296	CP/A′c-16	S = ZnTPP; A′ = DPF; used $k_d = 4.0 \times 10^4\ s^{-1}$.	82F357
	C_6H_6	2.0×10^7			CP/A′c-16	S = ZnTPP; A′ = DPF; used $k_d = 4 \times 10^4\ s^{-1}$.	79A086
	C_6H_6	7.6×10^6			CP/Pa-20	S = ZnTPP; A′ = Car; used $k_d = 4.0 \times 10^4\ s^{-1}$, $k_{A'} = 1.3 \times 10^{10}\ L\ mol^{-1}\ s^{-1}$; Measured $k_A/(k_d + k[A]) = 1.7 \times 10^4\ L\ mol^{-1}$ at [A] = 0.1 $mol\ L^{-1}$; k calcd. in [81Z251].	71F580
	C_6H_6				CP/Ac-20	S = ZnTPP; A′ = DPA; meas. $k_A/k_{A'} = 6.0$.	71F580

TABLE 13. Rate constants for the interaction of singlet oxygen with sulfur, selenium, and telurium compounds. — Continued

No.	Solvent	k ($L\ mol^{-1}\ s^{-1}$)	β (k_d/k) ($mol\ L^{-1}$)	T (K)	Method	Comment	Ref.
13.76	**Diethyl sulfide** — Continued						
	C_6H_6		0.032		CP/Pa-15	S = ZnTPP.	71F580
	C_6H_6/ MeOH (80:20)	6×10^6 3×10^5 (k_r)		298	CP/P'a-20	S = MB; A' = 2M2P; used $k_d = 1.0 \times 10^5\ s^{-1}$. $\beta_{A'}$ = 0.04 mol L^{-1}; P = Diethyl sulfoxide.	70F734
	CH_3CN	2.1×10^7			PL/Ld-2	S = Ac.	89A099
	CH_3COCH_3	2.7×10^7	8.9×10^{-4} 9.7×10^{-4}	296 195	CP/A'c-16	S = RB; A' = DPF; used $k_d = 2.4 \times 10^4\ s^{-1}$.	82F357
	$ClCF_2CCl_2F$	3.2×10^6			PL/Ld-2	S = DNT.	87A072
	H_2O pH = 7.0	2×10^7 (k_r)		292	MP/Ac,A'c-17	S = RB; A' = FFA; used $k_r^{A'} = 1.2 \times 10^8\ L\ mol^{-1}\ s^{-1}$.	87A180
	MeOH	2.1×10^7	8.7×10^{-3}		CP/A'c-16	S = RB; A' = DPBF; used $k_d = 1.8 \times 10^5\ s^{-1}$.	85F480
	MeOH	1.7×10^7	6.6×10^{-3} 0.011	296 195	CP/A'c-16	S = RB; A' = DPF; used $k_d = 1.1 \times 10^5\ s^{-1}$.	82F357
	MeOH	1.7×10^7			CP/A'c-16	S = MB; A' = DPF; used $k_d = 1.1 \times 10^5\ s^{-1}$.	79A086
	MeOH		0.02		CP/Pa-15	S = ZnTPP.	71F580
13.77	**Diisobutyl sulfide**						
	MeOH	2.9×10^7	6.1×10^{-3}		CP/A'c-16	S = RB; A' = DPBF; used $k_d = 1.8 \times 10^5\ s^{-1}$.	85F480
13.78	**Diisopropyl sulfide**						
	$CHCl_3$	2.2×10^6			CP/A'c-33	S = A' = Rub; used $k_d = 1.7 \times 10^4\ s^{-1}$, $k_{A'} = 5.3 \times 10^7\ L\ mol^{-1}\ s^{-1}$.	79A085
	MeOH	2.5×10^6			CP/A'c-16	S = RB; A' = DPF; used $k_d = 1.1 \times 10^5\ s^{-1}$.	79A086
13.79	**Dimethyldithiocarbamate ion**						
	H_2O pH = 7.1	$\sim 8 \times 10^7$		298	CP/Oc-19	S = Phenosafranine; Q = NaN_3; used $k_Q = 2.0 \times 10^8\ L\ mol^{-1}\ s^{-1}$.	78A360
13.80	**Dimethyl sulfide**						
	C_6H_6/ MeOH (50:50)			293	MP/Pa-17	S = TPP; rate is 19 times faster than in benzene.	81F311
	MeOH	5.8×10^7	3.1×10^{-3}		CP/A'c-16	S = RB; A' = DPBF; used $k_d = 1.8 \times 10^5\ s^{-1}$.	85F480
13.81	**Dimethyl sulfoxide**						
	C_6H_6/ MeOH (50:50)			293	MP/Pa-17	S = TPP; A' = CH_3SCH_3; meas. $k_r/k_r^{A'} = 4.2 \times 10^{-3}$.	81F311
	C_6H_6			293	MP/Pa-17	S = TPP; A' = CH_3SCH_3; meas. $k_r/k_r^{A'} = 0.021$.	81F311
13.82	**Dipropyl sulfide**						
	MeOH	3.1×10^7	5.8×10^{-3}		CP/A'c-16	S = RB; A' = DPBF; used $k_d = 1.8 \times 10^5\ s^{-1}$.	85F480
13.83	**Diselenide, diphenyl-**						
	CCl_4	1.2×10^6		296	CR/LI-12	used $k_d = 1.7 \times 10^3\ s^{-1}$; $^1O_2$* from $DMNO_2$.	90F069
13.84	**Disulfide, diphenyl-**						
	CCl_4	3.0×10^5		296	CR/LI-12	used $k_d = 1.7 \times 10^3\ s^{-1}$; $^1O_2$* from $DMNO_2$.	90F069
13.85	**Ditelluride, diphenyl-**						
	CCl_4	1.1×10^8		296	CR/LI-12	used $k_d = 1.7 \times 10^3\ s^{-1}$; $^1O_2$* from $DMNO_2$.	90F069
13.86	**1,5-Dithiacyclooctane**						
	$C_6H_5CH_3$	1.7×10^7		298	PL/Ld-2	S = TPP.	92F104
	CH_3COCH_3	3.7×10^7 (k_r)		298	CP/Pa-17	S = RB; A' = TME; used $k_r^{A'} = 2.7 \times 10^7\ L\ mol^{-1}\ s^{-1}$.	92F104
	CH_3COCH_3	5.3×10^7		298	PL/Ld-2	S = RB.	92F104

TABLE 13. Rate constants for the interaction of singlet oxygen with sulfur, selenium, and telurium compounds. — Continued

No.	Solvent	k ($L\ mol^{-1}\ s^{-1}$)	β (k_d/k) ($mol\ L^{-1}$)	T (K)	Method	Comment	Ref.
13.86	**1,5-Dithiacyclooctane — Continued**						
	$CHCl_3$	8.2×10^6 (k_r)			CP/Pa-17	S = TPP; A′ = TME; used $k_r^{A'} = 2.7 \times 10^7$ L $mol^{-1}\ s^{-1}$.	92F103
	$CHCl_3$	1.2×10^7			PL/Ld-2	S = TPP.	92F103
	2-PrOH	2.4×10^7		298	PL/Ld-2	S = RB.	92F104
13.87	**1,5-Dithiacyclooctane 1-oxide**						
	CH_3COCH_3	2.4×10^5 (k_r)		298	CP/Pa-17	S = RB; A′ = DMHD; used $k_r^{A'} = 7.4 \times 10^5$ L $mol^{-1}\ s^{-1}$.	92F104
	CH_3COCH_3	3.3×10^6		298	PL/Ld-2	S = RB.	92F104
	$CHCl_3$	8.7×10^4 (k_r)			CP/Pa-17	S = TPP; A′ = 2M2P; used $k_r^{A'} = 7.6 \times 10^5$ L $mol^{-1}\ s^{-1}$.	92F103
	$CHCl_3$	2.1×10^5			PL/Ld-2	S = TPP.	92F103
13.88	**1,4-Dithiane**						
	$C_6H_5CH_3$	2.0×10^6		298	PL/Ld-2	S = TPP.	92F104
	CH_3CN		~0.050		CP/Pa-15	S = RB; Slope estimated as tangent to curve.	71F580
	CH_3CN		0.017		CP/Pa-15	S = RB; Solvent contains 0.52% H_2O by molarity.	71F580
	CH_3CN		9.8×10^{-3}		CP/Pa-15	S = RB; Solvent contains 0.05% H_2O by molarity.	71F580
	CH_3CN/H_2O (95:5)		6.7×10^{-3}		CP/Pa-15	S = RB.	71F580
	CH_3CN/H_2O (61:39)		0.017		CP/Pa-15	S = RB.	71F580
	CH_3COCH_3	4.8×10^6		298	PL/Ld-2	S = RB.	92F104
	CH_3COCH_3	2.4×10^5 (k_r)		293	CP/Pa-17	S = RB; A′ = DMHD; used $k_r^{A'} = 7.4 \times 10^5$ L $mol^{-1}\ s^{-1}$; $\Delta H‡ = -26$ kJ mol^{-1}; $\Delta S‡ = -226$ J $K^{-1}\ mol^{-1}$; studied at 202-293 K; P = sulfoxide + sulfone.	91F170
	2-PrOH	2.1×10^6		298	PL/Ld-2	S = RB.	92F104
13.89	**1,3-Dithiane-2-thione, 4,5-diphenyl-**						
	C_6H_6/ MeOH (83:17)		1.4×10^{-3}	293	CP/Oc-15	S = MB.	77F794
13.90	**1,2-Dithiolane-3-pentanoic acid (Lipoic acid)**						
	C_6H_6	1.0×10^8	3.5×10^{-4}	298	CP/A′c-23	S = A′ = Rub; used $k_d = 4.2 \times 10^4\ s^{-1}$.	74F641
	$CHCl_3$/ EtOH (50:50)	1.3×10^8		310	CR/LI-12	used $k_d = 1 \times 10^5\ s^{-1}$; $^1O_2$* from $NDPO_2$.	90E622
13.91	**Ethanesulfonate ion, 2,2'-dithiobis- (Dimesna)**						
	$CHCl_3$/ EtOH (50:50)	6×10^6		310	CR/LI-12	used $k_d = 1 \times 10^5\ s^{-1}$; $^1O_2$* from $NDPO_2$.	90E622
13.92	**Ethanesulfonate ion, 2-mercapto-, (Mesna)**						
	$CHCl_3$/ EtOH (50:50)	2.4×10^7 2.8×10^6 (k_r)		310	CR/LI,Ac-12,14	used $k_d = 1 \times 10^5\ s^{-1}$; $^1O_2$* from $NDPO_2$.	90E622
	D_2O pD = 7.4	2.7×10^6		310	CR/LI-12	used $k_d = 1.9 \times 10^4\ s^{-1}$; $^1O_2$* from $NDPO_2$.	91R055
13.93	**Ethanethiol, 2-amino- (Cysteamine)**						
	$CHCl_3$/ EtOH (50:50)	4.1×10^7 1.1×10^7 (k_r)		310	CR/LI,Ac-12,14	used $k_d = 1 \times 10^5\ s^{-1}$; $^1O_2$* from $NDPO_2$.	90E622
	H_2O	8.3×10^6			PL/Ld-2	S = H_2TPPS^{4-}.	91R020

TABLE 13. Rate constants for the interaction of singlet oxygen with sulfur, selenium, and telurium compounds. — Continued

No.	Solvent	k ($L\ mol^{-1}\ s^{-1}$)	β (k_d/k) ($mol\ L^{-1}$)	T (K)	Method	Comment	Ref.
13.94	**Ethanethiol, 2-[(3-aminopropyl)amino]-**						
	$CHCl_3$/ EtOH (50:50)	5.3×10^7 7.0×10^6 (k_r)		310	CR/LI,Ac-12,14	used $k_d = 1 \times 10^5\ s^{-1}$; $^1O_2$* from $NDPO_2$.	90E622
	H_2O	7.4×10^6			PL/Ld-2	S = H_2TPPS^{4-}.	91R020
13.95	**Ethanethiol, 2-hydroxy-,**						
	D_2O	$\leq 4 \times 10^4$			PL/Ld-2	S = H_2TPPS^{4-} or H_2TMpyP^{4+}; calcd. from k_{obs} = 3.0×10^5 at pH 7 and $pK_a(D_2O) = 9.9$.	88A164
13.96	**Ethanethiol, 2-hydroxy-, negative ion**						
	D_2O	3.0×10^8			PL/Ld-2	S = H_2TPPS^{4-} or H_2TMpyP^{4+}; calcd. from k_{obs} = 3.0×10^5 at pH 7.	88A164
13.97	**Ethanol, 2-(4-methylphenyl)thio-**						
	CH_3COCH_3	4.2×10^4 (k_r)			CP/Ac-17	S = RB; A′ = Limonene; used $k_r^{A'} = 1.7 \times 10^5$ L $mol^{-1}\ s^{-1}$; meas. $k_q/k_r = 34.8$.	91F286 92F225
	CH_3COCH_3	1.5×10^6			PL/Ld-2	S = RB.	91F286 92F225
13.98	**Fluorene, 9-(phenylsulfonyl)-, anion**						
	tert-BuOH		4.6×10^{-4}	303	CP/Pa-15	S = RB; P = 9-Fluorenone.	707250
	tert-BuOH		3.8×10^{-4}	303	CP/Pa-15	S = A; P = 9-Fluorenone.	707250
13.99	**Glutathione**						
	$CHCl_3$/ EtOH (50:50)	5.9×10^7 1.7×10^6 (k_r)		310	CR/LI,Ac-12,14	used $k_d = 1 \times 10^5\ s^{-1}$; $^1O_2$* from $NDPO_2$.	90E622
	D_2O pD = 7.4	2.4×10^6		310	CR/LI-12	used $k_d = 1.9 \times 10^4\ s^{-1}$; $^1O_2$* from $NDPO_2$.	91R055
	D_2O	8.7×10^5			PL/Ld-2	S = MB^+.	91R251
	D_2O	$\leq 4 \times 10^4$			PL/Ld-2	S = H_2TPPS^{4-} or H_2TMpyP^{4+}; calcd. from k_{obs} = 2.9×10^6 at pH 7 and $pK_a(D_2O) = 9.2$.	88A164
13.100	**Glutathione, negative ion**						
	D_2O	1.9×10^8			PL/Ld-2	S = H_2TPPS^{4-} or H_2TMpyP^{4+}; calcd. from k_{obs} = 2.9×10^6 at pH 7 and pK_a.	88A164
13.101	**Glycine, *N*-(2-mercapto-1-oxopropyl)-**						
	D_2O pD = 7.4	4.1×10^6		310	CR/LI-12	used $k_d = 1.9 \times 10^4\ s^{-1}$; $^1O_2$* from $NDPO_2$.	91R055
	D_2O	$\leq 4 \times 10^4$			PL/Ld-2	S = H_2TPPS^{4-} or H_2TMpyP^{4+}; calcd. from k_{obs} = 2.7×10^6 at pH 7 and $pK_a(D_2O) = 10.4$.	88A164
13.102	**Glycine, *N*-(2-mercapto-1-oxopropyl)-, negative ion**						
	D_2O	1.8×10^8			PL/Ld-2	S = H_2TPPS^{4-} or H_2TMpyP^{4+}; calcd. from k_{obs} = 2.7×10^6 at pH 7 and pK_a.	88A164
13.103	**1-Hexanol, 6-(4-methylphenyl)thio-**						
	CH_3COCH_3	6.1×10^3 (k_r)			CP/Ac-17	S = RB; A′ = α-Pinene; used $k_r^{A'} = 4.3 \times 10^4$ L $mol^{-1}\ s^{-1}$; meas. $k_q/k_r = 359$.	91F286 92F225
	CH_3COCH_3	2.2×10^6			PL/Ld-2	S = RB.	91F286 92F225
13.104	**Imidazole-4-ethanaminium, α-carboxy-2,3-dihydro-*N*,*N*,*N*-trimethyl-2-thioxo-, *S*, (Ergothioneine)**						
	D_2O pD = 7	2×10^7			PL/Ld-2	S = Carboxyanthracene.	92E225
	D_2O pD = 7.4	3.1×10^7		310	CR/LI-12	used $k_d = 1.9 \times 10^4\ s^{-1}$; $^1O_2$* from $NDPO_2$.	91R055

TABLE 13. Rate constants for the interaction of singlet oxygen with sulfur, selenium, and telurium compounds. — Continued

No.	Solvent	k ($L\ mol^{-1}\ s^{-1}$)	β (k_d/k) ($mol\ L^{-1}$)	T (K)	Method	Comment	Ref.
13.104	**Imidazole-4-ethanaminium, α-carboxy-2,3-dihydro-*N,N,N*-trimethyl-2-thioxo-, *S*, (Ergothioneine)** — Continued						
	D_2O pH = 7	2.3×10^7			PL/Ld-2	S = H_2TPPS^{4-} or H_2TMpyP^{4+}; observed value; $pK_a(D_2O) = 8.4$.	88A164
	H_2O pH = 7.0			283	CP/A'c-17	S = RB; A' = BHMF; meas. $k_r/k_r^{A'} = 1.1$; sensitizer immobilized on glass beads.	88R064
	H_2O pH = 7.0			283	CP/A'c-17	S = RB; A' = BHMF; meas. $k_r/k_r^{A'} = 0.20$.	88R064
13.105	**Imidazole-4-ethanaminium, α-carboxy-2,3-dihydro-*N,N,N*-trimethyl-2-thioxo-, ion**						
	D_2O	5.0×10^8			PL/Ld-2	S = H_2TPPS^{4-} or H_2TMpyP^{4+}; calcd. from $k_{obs} = 2.3 \times 10^7$ at pH 7 and $pK_a(D_2O) = 8.4$.	88A164
13.106	**Imidazole-4-propionic acid, α-amino-2,3-dihydro-2-thioxo-, (*S*)**						
	H_2O pH = 7.0			283	CP/A'c-17	S = RB; A' = BHMF; meas. $k_r/k_r^{A'} = 1.1$; sensitizer immobilized on glass beads.	88R064
	H_2O pH = 7.0			283	CP/A'c-17	S = RB; A' = BHMF; meas. $k_r/k_r^{A'} = 0.26$.	88R064
13.107	**L-Leucine, L-methionyl-**						
	D_2O/ EtOH (75:25)	2.1×10^7		295	PL/Ld-2	S = RB.	94A113
13.108	**Methionine**						
	CH_3CN/ H_2O (50:50)	3×10^6 (k_r)			CP/Ac,A'c-17	S = RB; A' = DMA; $k_r^{A'}$ not given.	93R059
	CH_3CN/ H_2O (50:50)	9×10^6			PL/Ld-2	S = RB or Eos.	93R059
	D_2O pD = 7.4	1.3×10^7		310	CR/LI-12	used $k_d = 1.9 \times 10^4\ s^{-1}$; $^1O_2$* from $NDPO_2$.	91R055
	D_2O pD = 11.2	4.1×10^8		310	CR/A'c-32	A' = DPBF; used $k_d = 1.5 \times 10^4\ s^{-1}$; $^1O_2$* from Dopamine/H_2O_2.	89M038
	D_2O pD = 11.2	2.1×10^8		310	CR/A'c-32	A' = DPBF; used $k_d = 1.5 \times 10^4\ s^{-1}$; $^1O_2$* from DOPA/H_2O_2.	89M038
	D_2O pD = 7.4	1.5×10^7			PL/A'd-5	S = MB; A' = ADPA.	81N048
	D_2O pD = 8.4	1.6×10^7 (k_r)		293	CL/Ad-35	used $k_d = 2.9 \times 10^4\ s^{-1}$; high pressure O_2 (0.195 $mol\ L^{-1}$); statistical error of 30% and systematic error of the same order.	79A112
	D_2O pD = 11	1.6×10^7			CP/A'c-16	S = RB; A' = DPF; k_d not given; plots are nonlinear, used slope as [A] → 0.	777433
	D_2O pD = 7	3.3×10^7			CP/A'c-16	S = RB; A' = DPF; k_d not given; plots are nonlinear, used slope as [A] → 0.	777433
	D_2O pD = 8.1	1.7×10^7		295	CL/A'c-22	A' = BRH_2; used $k_d = 2.9 \times 10^4\ s^{-1}$; high pressure O_2; recalc. [79A112].	757147
	D_2O (mic) pD = 7.4	1.8×10^7			PL/A'd-5	S = 2-ACN; A' = DPBF; 0.1 $mol\ L^{-1}$ SDS.	81N048
	D_2O (mic) pD = 7.4	1.6×10^7			PL/A'd-5	S = 2-ACN; A' = DPBF; 0.1 $mol\ L^{-1}$ CTAB.	81N048
	D_2O/ EtOH (75:25)	1.3×10^7		295	PL/Ld-2	S = RB.	94A113
	H_2O pH = 10.6	2.8×10^7		310	CR/LI-12	used $k_d = 3.2 \times 10^5\ s^{-1}$; soln. cont. 5×10^{-4} mol L^{-1} $CoCl_2$, $^1O_2$* from autoxidation of oxytetracycline.	92M228
	H_2O pH = 7	2.1×10^7 (k_r)			CP/Oc-17	S = RB; A' = FFA; used $k_r^{A'} = 1.2 \times 10^8\ L\ mol^{-1}\ s^{-1}$.	93R059
	H_2O pH = 7	2.1×10^7			CP/A'c-18	S = RB; A' = TrpH; used $k_d = 2.5 \times 10^5\ s^{-1}$, $k_{A'} = 6 \times 10^8\ L\ mol^{-1}\ s^{-1}$.	93R059

TABLE 13. Rate constants for the interaction of singlet oxygen with sulfur, selenium, and telurium compounds. — Continued

No.	Solvent	k ($L\ mol^{-1}\ s^{-1}$)	β (k_d/k) ($mol\ L^{-1}$)	T (K)	Method	Comment	Ref.
13.108	**Methionine** — Continued						
	H_2O pH = 10	4×10^7			CP/Ac-16	S = Eos; A′ = 2,4-$Cl_2C_6H_3O^-$; used $k_d = 5 \times 10^5$ s^{-1}.	87F537
	H_2O pH = 7.1	8.6×10^6		298	CP/Oc-19	S = Phenosafranine; Q = NaN_3; used $k_Q = 2.0 \times 10^8$ $L\ mol^{-1}\ s^{-1}$.	78A360
	H_2O pH = 11	$\leq 5.0 \times 10^7$			CP/A′c-16	S = RB; A′ = DPF; used $k_d = 1 \times 10^6\ s^{-1}$; Plots are nonlinear. Used slope as [A] → 0.	777433
	H_2O pH = 7	1.2×10^7			CP/A′c-16	S = RB; A′ = DPF; used $k_d = 1 \times 10^6\ s^{-1}$; Plots are nonlinear. Used slope as [A] → 0.	777433
	H_2O pH = 6		0.052	298	CP/Ac-14	S = PF; β derived using $\phi_{isc}(PF) = 0.73$.	70F732
	H_2O		0.020	283	CP/Oc-15	S = MB; The mechanism of oxidation is not clear.	65F029
	H_2O/ MeOH (50:50)	3×10^7			PL/A′d-5	S = MB; A′ = DPBF.	72F516
	H_2O/ MeOH (50:50)	5×10^6 (k_r)			CP/Ac,A′c-17	S = MB; A′ = DPBF; used $k_r^{A'} = 8 \times 10^8$ $L\ mol^{-1}\ s^{-1}$; k_r derived using $k_{TQ}^{A} = 3 \times 10^8$ $L\ mol^{-1}\ s^{-1}$ and $k_A = 3 \times 10^7$ $L\ mol^{-1}\ s^{-1}$.	72F516
13.109	**Methionine, glycyl-**						
	CH_3CN/ H_2O (50:50)	1.5×10^6 (k_r)			CP/Ac,A′c-17	S = RB; A′ = DMA; $k_r^{A'}$ not given.	93R059
	CH_3CN/ H_2O (50:50)	1.5×10^7			PL/Ld-2	S = RB or Eos.	93R059
	D_2O/ EtOH (75:25)	2.1×10^7		295	PL/Ld-2	S = RB.	94A113
	H_2O pH = 7	1.3×10^7 (k_r)			CP/Oc-17	S = RB; A′ = FFA; used $k_r^{A'} = 1.2 \times 10^8$ $L\ mol^{-1}\ s^{-1}$.	93R059
	H_2O pH = 7	9.0×10^7			CP/A′c-18	S = RB; A′ = TrpH; used $k_d = 1.5 \times 10^5\ s^{-1}$, $k_{A'} = 6 \times 10^8$ $L\ mol^{-1}\ s^{-1}$.	93R059
13.110	**Methionine, *S*-methyl-*N*-(phenylmethyl)carbonyl-, methyl ester**						
	$CHCl_3$	1.4×10^7			CP/A′c-33	S = A′ = Rub; used $k_d = 1.7 \times 10^4\ s^{-1}$, $k_{A'} = 5.3 \times 10^7$ $L\ mol^{-1}\ s^{-1}$.	79A085
13.111	**Methionine methyl ester**						
	CH_3CN/ H_2O (50:50)	1.2×10^6 (k_r)			CP/Ac,A′c-17	S = RB; A′ = DMA; $k_r^{A'}$ not given.	93R059
	CH_3CN/ H_2O (50:50)	1.4×10^7			PL/Ld-2	S = RB or Eos.	93R059
	H_2O pH = 7	1.0×10^8			CP/A′c-18	S = RB; A′ = TrpH; used $k_d = 1.5 \times 10^5\ s^{-1}$, $k_{A'} = 6 \times 10^8$ $L\ mol^{-1}\ s^{-1}$.	93R059
	H_2O pH = 7	7×10^6 (k_r)			CP/Oc-17	S = RB; A′ = FFA; used $k_r^{A'} = 1.2 \times 10^8$ $L\ mol^{-1}\ s^{-1}$.	93R059
13.112	**Morpholine, 4-[(phenylmethyl)thio]-**						
	C_6H_6	1.5×10^6 (k_r)			CP/Pa,P′a-17	S = TPP; A′ = Octalin; used $k_r^{A'} = 1.8 \times 10^6$ $L\ mol^{-1}\ s^{-1}$; P = 4-[(Phenylmethyl)sulfinyl]morpholine; $k_{obs} = 2.9 \times 10^6$ $L\ mol^{-1}\ s^{-1}$, $f_r^A = 2$.	94F024
	C_6H_6	1.5×10^6 (k_r)			CP/Pa,P′a-17	S = TPP; A′ = Adamantylideneadamantane; used $k_r^{A'} = 3.5 \times 10^5$ $L\ mol^{-1}\ s^{-1}$; P = 4-[(Phenylmethyl)sulfinyl]morpholine; $k_{obs} = 2.9 \times 10^6$ $L\ mol^{-1}\ s^{-1}$, $f_r^A = 2$.	94F024
	C_6H_6	1.3×10^6			PL/Ld-2	S = TPP; product formation rate studies suggest no physical quenching.	94F024

TABLE 13. Rate constants for the interaction of singlet oxygen with sulfur, selenium, and telurium compounds. — Continued

No.	Solvent	k ($L\ mol^{-1}\ s^{-1}$)	β (k_d/k) ($mol\ L^{-1}$)	T (K)	Method	Comment	Ref.
13.113	**2-Naphthalenethione, 1,2-dihydro-1,1-dimethyl-**						
	$CHCl_3$	4.3×10^5			CP/A'c-33	S = A' = Rub; used $k_d = 1.7 \times 10^4\ s^{-1}$, $k_{A'} = 5.3 \times 10^7\ L\ mol^{-1}\ s^{-1}$.	85F151
13.114	**2-Naphthalenethione, 1,2-dihydro-1,1,3-trimethyl-**						
	$CHCl_3$	6.7×10^5			CP/A'c-33	S = A' = Rub; used $k_d = 1.7 \times 10^4\ s^{-1}$, $k_{A'} = 5.3 \times 10^7\ L\ mol^{-1}\ s^{-1}$.	85F151
13.115	**Octanoate ion, 6,8-dimercapto- (Dihydrolipoate ion)**						
	$CHCl_3$/ EtOH (50:50)	5×10^6 5×10^6 (k_r)		310	CR/LI,Ac-12,14	used $k_d = 1 \times 10^5\ s^{-1}$; $^1O_2$* from $NDPO_2$.	90E622
13.116	**Penicillamine**						
	D_2O pD = 7.4	4.6×10^6		310	CR/LI-12	used $k_d = 1.9 \times 10^4\ s^{-1}$; $^1O_2$* from $NDPO_2$.	91R055
	H_2O	2.4×10^6			PL/Ld-2	S = H_2TPPS^{4-}.	91R020
13.117	**3-Pentanethione, 2,2,4,4-tetramethyl-**						
	$CHCl_3$	1.0×10^4			CP/A'c-33	S = A' = Rub; used $k_d = 1.7 \times 10^4\ s^{-1}$, $k_{A'} = 5.3 \times 10^7\ L\ mol^{-1}\ s^{-1}$.	82A093
13.118	**1-Pentanol, 5-(4-methylphenyl)thio-**						
	CH_3COCH_3	1.5×10^4 (k_r)			CP/Ac-17	S = RB; A' = α-Pinene; used $k_r^{A'} = 4.3 \times 10^4\ L\ mol^{-1}\ s^{-1}$; meas. $k_q/k_r = 192$.	91F286 92F225
	CH_3COCH_3	2.9×10^6			PL/Ld-2	S = RB.	91F286 92F225
13.119	**3-Pentanol, 3,4-dimethyl-1-[(4-methylphenyl)thio]-**						
	CH_3COCH_3	6.5×10^4 (k_r)		293	CP/Ac-17	S = RB; A' = Limonene; used $k_r^{A'} = 1.7 \times 10^5\ L\ mol^{-1}\ s^{-1}$; $\Delta H‡ = -22\ kJ\ mol^{-1}$; $\Delta S‡ = -226\ J\ K^{-1}\ mol^{-1}$; studied at 195-293 K; $k_r = 9.7 \times 10^5\ L\ mol^{-1}\ s^{-1}$ at 223 K when A' = Cyclopentene and $k_r^{A'} = 3.9 \times 10^4\ L\ mol^{-1}\ s^{-1}$.	91F170
	CH_3COCH_3	3.7×10^6			PL/Ld-2	S = RB.	91F286 92F225
	CH_3COCH_3	7.1×10^4 (k_r)			CP/Ac-17	S = RB; A' = Limonene; used $k_r^{A'} = 1.7 \times 10^5\ L\ mol^{-1}\ s^{-1}$; meas. $k_q/k_r = 51.1$.	91F286 92F225
13.120	**Phenol, 4-(methylthio)-**						
	C_6H_6	1.1×10^7		308	CR/A'c-16	A' = DPBF; used $k_d = 5.4 \times 10^4\ s^{-1}$; $^1O_2$* from $MNPO_2$.	85M098
	MeOH/ H_2O (50:50)	1.3×10^8 (k_r)		308	CR/A'c-17	A' = DPBF; $^1O_2$* from $MNPO_2$. $k_r^{A'}$ not given.	85M098
	MeOH/ H_2O (50:50)	1.6×10^8		308	CR/A'c-16	A' = DPBF; used $k_d = 2.8 \times 10^5\ s^{-1}$; $^1O_2$* from $MNPO_2$.	85M098
13.121	**Phenothiazine**						
	C_6H_5Br/ MeOH (67:33)	4.2×10^7			CP/A'c-23	S = A' = Rub; used $k_d = 4.9 \times 10^4\ s^{-1}$, $k_{A'} = 4 \times 10^7\ L\ mol^{-1}\ s^{-1}$.	777240
	MeOH/ C_6H_6 (90:10)			288	CP/Pa-17	S = MB; measured $(\beta_r/\beta_r(MeOH)) = 0.94$.	757623
	MeOH/ C_6H_6 (80:20)			288	CP/Pa-17	S = MB; measured $(\beta_r/\beta_r(MeOH)) = 1.0$.	757623
	MeOH/ C_6H_6 (20:80)			288	CP/Pa-17	S = MB; measured $(\beta_r/\beta_r(MeOH)) = 1.5$.	757623
	MeOH/ $HOCH_2CH_2OH$ (25:75)			288	CP/Pa-17	S = MB; measured $(\beta_r/\beta_r(MeOH)) = 0.34$.	757623

TABLE 13. Rate constants for the interaction of singlet oxygen with sulfur, selenium, and telurium compounds. — Continued

No.	Solvent	k ($L\ mol^{-1}\ s^{-1}$)	β (k_d/k) ($mol\ L^{-1}$)	T (K)	Method	Comment	Ref.
13.121	**Phenothiazine** — Continued						
	MeOH/ $HOCH_2CH_2OH$ (75:25)			288	CP/Pa-17	S = MB; measured $(\beta_r/\beta_r(MeOH)) = 0.51$.	757623
13.122	**Phenothiazine, 2-chloro-10-dimethylaminopropyl- (Chlorpromazine)**						
	C_6H_5Br/ MeOH (67:33)	3.5×10^7			CP/A'c-23	S = A' = Rub; used $k_d = 4.9 \times 10^4\ s^{-1}$, $k_{A'} = 4 \times 10^7\ L\ mol^{-1}\ s^{-1}$.	777240
13.123	**Phenothiazine, 10-methyl-**						
	C_6H_5Br/ MeOH (67:33)	$\leq 1.2 \times 10^6$			CP/A'c-23	S = A' = Rub; used $k_d = 4.9 \times 10^4\ s^{-1}$, $k_{A'} = 4 \times 10^7\ L\ mol^{-1}\ s^{-1}$.	777240
	$CHCl_3$	2.9×10^6		253	CP/A'c-33	S = A' = Rub; used $k_d = 1.7 \times 10^4\ s^{-1}$, $k_{A'} = 5.3 \times 10^7\ L\ mol^{-1}\ s^{-1}$.	82N064
	H_2O/1-BuOH/c-C_6H_{12} (72:16:4) (mic)	8.4×10^4 (k_r)		289	CP/LI,Pa-12,27	S = RB; used $k_d = 1.6 \times 10^5\ s^{-1}$; P = 10-Methylphenothiazine-5-oxide; 8% SDS; used $k_q = 5.0 \times 10^6\ L\ mol^{-1}\ s^{-1}$, $\phi_\Delta(RB) = 0.75$.	87N090
	MeOD	5.3×10^6 2.7×10^5 (k_r) 5.0×10^6 (k_q)		289	CP/LI,Pa-12,27	S = RB; used $k_d = 4.4 \times 10^3\ s^{-1}$; P = 10-Methylphenothiazine-5-oxide; used $\phi_\Delta(RB) = 0.75$.	87N090
13.124	**Phenothiazine, 10-(12-sulfonatododecyl)-**						
	H_2O (mic)	4.9×10^5 (k_r) 1.1×10^6 (k_q)		289	CP/LI,Pa-12,27	S = RB; used $k_d = 2.5 \times 10^5\ s^{-1}$; P = 10-(12-Sulfonatododecyl)phenothiazine-9-oxide; [A] = $10^{-2}\ mol\ L^{-1}$; counter ion Na^+; used $\phi_\Delta(RB) = 0.75$.	87N090
13.125	**Piperidine, 1-[(phenylmethyl)thio]-**						
	C_6H_6	3.6×10^6			PL/Ld-2	S = TPP.	94F024
13.126	**Pivalothiophenone**						
	$CHCl_3$	4.3×10^5			CP/A'c-33	S = A' = Rub; used $k_d = 1.7 \times 10^4\ s^{-1}$, $k_{A'} = 5.3 \times 10^7\ L\ mol^{-1}\ s^{-1}$.	82A093
13.127	**Pivalothiophenone, 4'-chloro-**						
	$CHCl_3$	2.0×10^5			CP/A'c-33	S = A' = Rub; used $k_d = 1.7 \times 10^4\ s^{-1}$, $k_{A'} = 5.3 \times 10^7\ L\ mol^{-1}\ s^{-1}$.	82A093
13.128	**Pivalothiophenone, 4'-fluoro-**						
	$CHCl_3$	3.6×10^5			CP/A'c-33	S = A' = Rub; used $k_d = 1.7 \times 10^4\ s^{-1}$, $k_{A'} = 5.3 \times 10^7\ L\ mol^{-1}\ s^{-1}$.	82A093
13.129	**Pivalothiophenone, 4'-methoxy-**						
	$CHCl_3$	9.2×10^5			CP/A'c-33	S = A' = Rub; used $k_d = 1.7 \times 10^4\ s^{-1}$, $k_{A'} = 5.3 \times 10^7\ L\ mol^{-1}\ s^{-1}$.	82A093
13.130	**L-Proline, 1-(3-mercapto-2-methyl-1-oxopropyl)-, (*S*)- (Captopril)**						
	$CHCl_3$/ EtOH (50:50)	4×10^6		310	CR/LI-12	used $k_d = 1 \times 10^5\ s^{-1}$; $^1O_2$* from $NDPO_2$.	90E622
	D_2O pD = 7.4	$<1 \times 10^5$		310	CR/LI-12	used $k_d = 1.9 \times 10^4\ s^{-1}$; $^1O_2$* from $NDPO_2$.	91R055
13.131	**1-Propanethiol, 3-amino-2-hydroxy-**						
	H_2O	8×10^5			PL/Ld-2	S = H_2TPPS^{4-}.	91R020
13.132	**1-Propanol, 3-(3-chlorophenyl)thio-**						
	CH_3COCH_3	6.0×10^5			PL/Ld-2	S = RB.	91F286 92F225

TABLE 13. Rate constants for the interaction of singlet oxygen with sulfur, selenium, and telurium compounds. — Continued

No.	Solvent	k ($L\ mol^{-1}\ s^{-1}$)	β (k_d/k) ($mol\ L^{-1}$)	T (K)	Method	Comment	Ref.
13.133	**1-Propanol, 3-(4-chlorophenyl)thio-**						
	CH_3COCH_3	8.6×10^5			PL/Ld-2	S = RB.	91F286 92F225
13.134	**1-Propanol, 3-(4-fluorophenyl)thio-**						
	CH_3COCH_3	1.3×10^6			PL/Ld-2	S = RB.	91F286 92F225
13.135	**1-Propanol, 3-(4-methoxyphenyl)thio-**						
	CH_3COCH_3	4.1×10^6			PL/Ld-2	S = RB.	91F286 92F225
13.136	**1-Propanol, 3-(4-methylphenyl)thio-**						
	CH_3COCH_3	7.1×10^4 (k_r)			CP/Ac-17	S = RB; A′ = Limonene; used $k_r^{A'} = 1.7 \times 10^5$ L $mol^{-1}\ s^{-1}$; meas. $k_q/k_r = 31.3$.	91F286 92F225
	CH_3COCH_3	2.3×10^6			PL/Ld-2	S = RB.	91F286 92F225
13.137	**1-Propanol, 3-(phenylthio)-**						
	CH_3COCH_3	3.3×10^4 (k_r)			CP/Ac-17	S = RB; A′ = α-Pinene; used $k_r^{A'} = 4.3 \times 10^4$ L $mol^{-1}\ s^{-1}$.	92F225
	CH_3COCH_3	1.5×10^6			PL/Ld-2	S = RB.	91F286 92F225
13.138	**Pyran-4-thione**						
	CH_2Cl_2		2×10^{-3}	298	CP/Pa-15	S = MB; P = Pyran-4-one.	717403
13.139	**Pyran-4-thione, 2,6-dimethyl-**						
	CH_2Cl_2		3×10^{-4}	298	CP/Pa-15	S = MB; P = 2,6-Dimethylpyran-4-one.	717403
13.140	**Pyran-4-thione, 2,6-diphenyl-**						
	CH_2Cl_2		1.4×10^{-3}	298	CP/Ac-15	S = MB.	717403
13.141	**Pyrazole-3-selone, 4-(aminomethylene)-2,4-dihydro-5-methyl-2-phenyl-, (Z)-**						
	1-BuOH	1.8×10^8 (k_r)	6.1×10^{-4} (β_r)	295	CP/Ac-14	S = A; used $k_d = 1.1 \times 10^5\ s^{-1}$; used ϕ_Δ(S).	85F646
	c-C_6H_{12}	1.2×10^9 (k_r)	4.8×10^{-5} (β_r)	295	CP/Ac-14	S = A; used $k_d = 5.9 \times 10^4\ s^{-1}$; used ϕ_Δ(S).	85F646
	CCl_4	1.3×10^6 (k_r)	3×10^{-5} (β_r)	295	CP/Ac-14	S = A; used $k_d = 38\ s^{-1}$; used ϕ_Δ(S).	85F646
	$CDCl_3$	2.6×10^7 (k_r)	4.5×10^{-5} (β_r)	295	CP/Ac-14	S = A; used $k_d = 1.2 \times 10^3\ s^{-1}$; used ϕ_Δ(S).	85F646
	CH_3CN	1.3×10^8 (k_r)	1.3×10^{-4} (β_r)	295	CP/Ac-14	S = A; used $k_d = 1.7 \times 10^4\ s^{-1}$; used ϕ_Δ(S).	85F646
	$CHCl_3$	2.0×10^7 (k_r)	2.0×10^{-4} (β_r)	295	CP/Ac-14	S = A; used $k_d = 4.0 \times 10^3\ s^{-1}$; used ϕ_Δ(S).	85F646
	EtOH	2.8×10^8 (k_r)	3.5×10^{-4} (β_r)	295	CP/Ac-14	S = A; used $k_d = 1 \times 10^5\ s^{-1}$; used ϕ_Δ(S).	85F646
	EtOH	1.3×10^8 (k_r)	7.4×10^{-4} (β_r)	295	CP/Ac-14	S = Ery; used $k_d = 1 \times 10^5\ s^{-1}$; used ϕ_Δ(S).	85F646
	EtOH	2.2×10^8 (k_r)	4.5×10^{-4} (β_r)	295	CP/Ac-14	S = Eos; used $k_d = 1 \times 10^5\ s^{-1}$; used ϕ_Δ(S).	85F646
	EtOH	7×10^7 (k_r)	1.4×10^{-3} (β_r)	295	CP/Ac-14	S = Rhodamine S; used $k_d = 1 \times 10^5\ s^{-1}$; used ϕ_Δ(S).	85F646
	EtOH	8×10^7 (k_r)	1.2×10^{-3} (β_r)	295	CP/Ac-14	S = MB; used $k_d = 1 \times 10^5\ s^{-1}$; used ϕ_Δ(S).	85F646
	MeOH	2.6×10^8 (k_r)	5.5×10^{-4} (β_r)	295	CP/Ac-14	S = A; used $k_d = 1.4 \times 10^5\ s^{-1}$; used ϕ_Δ(S).	85F646
	MeOH-d_3		3.1×10^{-4} (β_r)	295	CP/Ac-14	S = A; used ϕ_Δ(S).	85F646
	2-PrOH		3.1×10^{-4} (β_r)	295	CP/Ac-14	S = A; used ϕ_Δ(S).	85F646
	dioxane	3.6×10^8 (k_r)	9.1×10^{-5} (β_r)	295	CP/Ac-14	S = A; used $k_d = 3.3 \times 10^4\ s^{-1}$; used ϕ_Δ(S).	85F646
13.142	**Pyrazole-3-thione, 4-(aminomethylene)-2,4-dihydro-5-methyl-2-phenyl-**						
	1-BuOH	9.2×10^7 (k_r)	1.2×10^{-3} (β_r)	295	CP/Ac-14	S = A; used $k_d = 1.1 \times 10^5\ s^{-1}$; used ϕ_Δ(S).	85F646
	c-C_6H_{12}	5×10^8 (k_r)	1.1×10^{-4} (β_r)	295	CP/Ac-14	S = A; used $k_d = 5.9 \times 10^4\ s^{-1}$; used ϕ_Δ(S).	85F646
	$C_6H_5CH_3$	1.4×10^8 (k_r)	2.7×10^{-4} (β_r)		CP/Ac-14	S = A; used $k_d = 4.2 \times 10^4\ s^{-1}$; used ϕ_Δ(S).	84F244

TABLE 13. Rate constants for the interaction of singlet oxygen with sulfur, selenium, and telurium compounds. — Continued

No.	Solvent	k ($L\ mol^{-1}\ s^{-1}$)	β (k_d/k) ($mol\ L^{-1}$)	T (K)	Method	Comment	Ref.
13.142	**Pyrazole-3-thione, 4-(aminomethylene)-2,4-dihydro-5-methyl-2-phenyl-** — Continued						
	n-C_7H_{16}	7.0×10^8 (k_r)	8.4×10^{-5} (β_r)		CP/Ac-14	S = A; used $k_d = 5.9 \times 10^4\ s^{-1}$; used ϕ_Δ(S).	84F244
	CCl_4	1.9×10^6 (k_r)	2×10^{-5} (β_r)	295	CP/Ac-14	S = A; used $k_d = 38\ s^{-1}$; used ϕ_Δ(S).	85F646
	$CDCl_3$	2.4×10^7 (k_r)	5.0×10^{-5} (β_r)	295	CP/Ac-14	S = A; used $k_d = 1.2 \times 10^3\ s^{-1}$; used ϕ_Δ(S).	85F646
	CH_3CN	1.3×10^8 (k_r)	1.3×10^{-4} (β_r)	295	CP/Ac-14	S = A; used $k_d = 1.7 \times 10^4\ s^{-1}$; used ϕ_Δ(S).	85F646
	CH_3CN	2.8×10^8 (k_r)	6.7×10^{-5} (β_r)		CP/Ac-14	S = A; used $k_d = 3.3 \times 10^4\ s^{-1}$; used ϕ_Δ(S).	84F244
	$CHCl_3$	1.9×10^7 (k_r)	2.1×10^{-4} (β_r)	295	CP/Ac-14	S = A; used $k_d = 4.0 \times 10^3\ s^{-1}$; used ϕ_Δ(S).	85F646
	$CHCl_3$	7.4×10^7 (k_r)	2.3×10^{-4} (β_r)		CP/Ac-14	S = A; used $k_d = 1.7 \times 10^4\ s^{-1}$; used ϕ_Δ(S).	84F244
	EtOH	8.3×10^7 (k_r)	1.2×10^{-3} (β_r)	295	CP/Ac-14	S = A; used $k_d = 1 \times 10^5\ s^{-1}$; used ϕ_Δ(S).	85F646
	EtOH/ H_2O (96:4)	8.5×10^7 (k_r)	9.7×10^{-4} (β_r)		CP/Ac-14	S = A; used $k_d = 8.3 \times 10^4\ s^{-1}$; used ϕ_Δ(S).	84F244
	MeOH	8.4×10^7 (k_r)	1.7×10^{-3} (β_r)	295	CP/Ac-14	S = A; used $k_d = 1.4 \times 10^5\ s^{-1}$; used ϕ_Δ(S).	85F646
	MeOH	8.7×10^7 (k_r)	1.6×10^{-3} (β_r)		CP/Ac-14	S = A; used $k_d = 1.4 \times 10^5\ s^{-1}$; used ϕ_Δ(S).	84F244
	MeOH-d_3		8.1×10^{-4} (β_r)	295	CP/Ac-14	S = A; used ϕ_Δ(S).	85F646
	2-PrOH		7.3×10^{-4} (β_r)	295	CP/Ac-14	S = A; used ϕ_Δ(S).	85F646
	dioxane	1.0×10^8 (k_r)	3.3×10^{-4} (β_r)	295	CP/Ac-14	S = A; used $k_d = 3.3 \times 10^4\ s^{-1}$; used ϕ_Δ(S).	85F646
	dioxane	2.0×10^8 (k_r)	1.5×10^{-4} (β_r)		CP/Ac-14	S = A; used $k_d = 3.1 \times 10^4\ s^{-1}$; used ϕ_Δ(S).	84F244
13.143	**Thiacyclohex-2-ene, 2-methyl-, 1-oxide**						
	C_6H_6		$>1 \times 10^2$ (β_r)		CP/Ac-17	S = TPP; A′ = Linalool; used $\beta_r^{A'} = 0.18\ mol\ L^{-1}$.	89F400
13.144	**Thiacyclopent-2-ene, 2-methyl-, 1-oxide**						
	C_6H_6		$>1 \times 10^2$ (β_r)		CP/Ac-17	S = TPP; A′ = Linalool; used $\beta_r^{A'} = 0.18\ mol\ L^{-1}$.	89F400
13.145	**Thiane**						
	$C_6H_5CH_3$	1.3×10^7		298	PL/Ld-2	S = TPP.	92F104
	$C_6H_5CH_3$	2×10^7 (k_r)		198	CP/Pa-17	S = TPP; A′ = TME; used $k_r^{A'} = 1.2 \times 10^7\ L\ mol^{-1}\ s^{-1}$; $\Delta H‡ = -21\ kJ\ mol^{-1}$; $\Delta S‡ = -205\ J\ K^{-1}\ mol^{-1}$; studied at 198-293 K; P = sulfoxide + sulfone.	91F170
	CH_3COCH_3	1.6×10^7		298	PL/Ld-2	S = RB.	92F104
	CH_3COCH_3	4.7×10^5 (k_r)		298	CP/Pa-17	S = RB; A′ = TME; used $k_r^{A'} = 2.7 \times 10^7\ L\ mol^{-1}\ s^{-1}$.	92F104
	CH_3COCH_3	9.4×10^6 (k_r)		198	CP/Pa-17	S = RB; A′ = TME; used $k_r^{A'} = 1.2 \times 10^7\ L\ mol^{-1}\ s^{-1}$; $\Delta H‡ = -17\ kJ\ mol^{-1}$; $\Delta S‡ = -192\ J\ K^{-1}\ mol^{-1}$; studied at 198-293 K; P = sulfoxide + sulfone.	91F170
	$CHCl_3$	1.3×10^7			CP/A′c-33	S = A′ = Rub; used $k_d = 1.7 \times 10^4\ s^{-1}$, $k_{A'} = 5.3 \times 10^7\ L\ mol^{-1}\ s^{-1}$.	79A085
	2-PrOH	1.4×10^7		298	PL/Ld-2	S = RB.	92F104
13.146	**Thiepane**						
	$CHCl_3$	1.3×10^7			CP/A′c-33	S = A′ = Rub; used $k_d = 1.7 \times 10^4\ s^{-1}$, $k_{A'} = 5.3 \times 10^7\ L\ mol^{-1}\ s^{-1}$.	79A085
13.147	**Thiepin, 4,5-didehydro-2,3,6,7-tetrahydro-3,3,6,6-tetramethyl-**						
	$CHCl_3$	3.5×10^6			CR/A′c-33	A′ = Rub; used $k_d = 1.7 \times 10^4\ s^{-1}$, $k_{A'} = 5.3 \times 10^7\ L\ mol^{-1}\ s^{-1}$; $^1O_2$* from $DMNO_2$.	81E003
13.148	**Thiepin, 4,5-didehydro-2,3,6,7-tetrahydro-3,3,6,6-tetramethyl-, 1,1-dioxide**						
	$CHCl_3$	3×10^5			CR/A′c-33	A′ = Rub; used $k_d = 1.7 \times 10^4\ s^{-1}$, $k_{A'} = 5.3 \times 10^7\ L\ mol^{-1}\ s^{-1}$; $^1O_2$* from $DMNO_2$.	81E003
13.149	**Thiepin, 4,5-didehydro-2,3,6,7-tetrahydro-3,3,6,6-tetramethyl-, 1-oxide**						
	$CHCl_3$	7.2×10^4			CR/A′c-33	A′ = Rub; used $k_d = 1.7 \times 10^4\ s^{-1}$, $k_{A'} = 5.3 \times 10^7\ L\ mol^{-1}\ s^{-1}$; $^1O_2$* from $DMNO_2$.	81E003

TABLE 13. Rate constants for the interaction of singlet oxygen with sulfur, selenium, and telurium compounds. — Continued

No.	Solvent	k ($L\ mol^{-1}\ s^{-1}$)	β (k_d/k) ($mol\ L^{-1}$)	T (K)	Method	Comment	Ref.
13.150	**Thiepin, 2,3,6,7-tetrahydro-3,3,6,6-tetramethyl-**						
	$CHCl_3$	3.5×10^6			CR/A'c-33	A' = Rub; used $k_d = 1.7 \times 10^4\ s^{-1}$, $k_{A'} = 5.3 \times 10^7$ $L\ mol^{-1}\ s^{-1}$; $^1O_2$* from $DMNO_2$.	81E003
13.151	**Thiirane, 2,3-diphenyl-, (*E*)**						
	$ClCF_2CCl_2F$	4.3×10^3			PL/Ld-2	S = DNT.	87A072
13.152	**Thiirane, methyl-**						
	$ClCF_2CCl_2F$	6.6×10^4			PL/Ld-2	S = DNT.	87A072
13.153	**Thiobenzamide, 4-chloro-**						
	CH_2Cl_2			273	CP/Ac,A'c-17	S = Poly-RB; A' = $C_6H_5CSNH_2$; meas. $k_t/k_r^{A'}$ = 0.80.	84F196
13.154	**Thiobenzamide, 4-methoxy-**						
	CH_2Cl_2			273	CP/Ac,A'c-17	S = Poly-RB; A' = $C_6H_5CSNH_2$; meas. $k_t/k_r^{A'}$ = 1.1.	84F196
13.155	**Thiobenzamide, 4-methyl-**						
	CH_2Cl_2			273	CP/Ac,A'c-17	S = Poly-RB; A' = $C_6H_5CSNH_2$; meas. $k_t/k_r^{A'}$ = 1.0.	84F196
13.156	**Thiobenzamide, 4-nitro-**						
	CH_2Cl_2			273	CP/Ac,A'c-17	S = Poly-RB; A' = $C_6H_5CSNH_2$; meas. $k_t/k_r^{A'}$ = 0.45.	84F196
13.157	**Thiobenzamide, 4-(trifluoromethyl)-**						
	CH_2Cl_2			273	CP/Ac,A'c-17	S = Poly-RB; A' = $C_6H_5CSNH_2$; meas. $k_t/k_r^{A'}$ = 0.52.	84F196
13.158	**Thiobenzophenone, 4-chloro-**						
	$CHCl_3$	1.1×10^6			CP/A'c-33	S = A' = Rub; used $k_d = 1.7 \times 10^4\ s^{-1}$, $k_{A'} = 5.3 \times 10^7\ L\ mol^{-1}\ s^{-1}$.	82A093
13.159	**Thiobenzophenone, 4,4'-dichloro-**						
	$CHCl_3$	2×10^5			CP/A'c-33	S = A' = Rub; used $k_d = 1.7 \times 10^4\ s^{-1}$, $k_{A'} = 5.3 \times 10^7\ L\ mol^{-1}\ s^{-1}$.	82A093
13.160	**Thiobenzophenone, 4,4'-dimethoxy-**						
	$CHCl_3$	9.6×10^6			CP/A'c-33	S = A' = Rub; used $k_d = 1.7 \times 10^4\ s^{-1}$, $k_{A'} = 5.3 \times 10^7\ L\ mol^{-1}\ s^{-1}$.	82A093
13.161	**Thiobenzophenone, 4,4'-dimethyl-**						
	$CHCl_3$	3.7×10^6			CP/A'c-33	S = A' = Rub; used $k_d = 1.7 \times 10^4\ s^{-1}$, $k_{A'} = 5.3 \times 10^7\ L\ mol^{-1}\ s^{-1}$.	82A093
13.162	**Thiobenzophenone, 4-methoxy-**						
	$CHCl_3$	5.4×10^6			CP/A'c-33	S = A' = Rub; used $k_d = 1.7 \times 10^4\ s^{-1}$, $k_{A'} = 5.3 \times 10^7\ L\ mol^{-1}\ s^{-1}$.	82A093
13.163	**Thiobenzophenone, 4-phenyl-**						
	$CHCl_3$	3.1×10^6			CP/A'c-33	S = A' = Rub; used $k_d = 1.7 \times 10^4\ s^{-1}$, $k_{A'} = 5.3 \times 10^7\ L\ mol^{-1}\ s^{-1}$.	82A093
13.164	**2,2'-Thiodiethanol**						
	MeOH		0.016	293	CP/Oc-15	S = $FlCl_4^{2-}$; E_a = 6.3 $kJ\ mol^{-1}$.	68F288
	MeOH		0.013	293	CP/Oc-15	S = $FlBr_4Cl_4^{2-}$; E_a = 3.8 $kJ\ mol^{-1}$.	68F288
	MeOH		0.010	293	CP/Oc-15	S = DNT; E_a = 8.4 $kJ\ mol^{-1}$.	68F288
	MeOH		0.022	293	CP/Oc-15	S = MB; E_a = 7.5 $kJ\ mol^{-1}$.	68F288
	MeOH		0.025	293	CP/Oc-15	S = RB; E_a = 5.4 $kJ\ mol^{-1}$.	68F288

TABLE 13. Rate constants for the interaction of singlet oxygen with sulfur, selenium, and telurium compounds. — Continued

No.	Solvent	k (L mol^{-1} s^{-1})	β (k_d/k) (mol L^{-1})	T (K)	Method	Comment	Ref.
13.165	**Thioketene, di-*tert*-butyl-**						
	$CHCl_3$	1.2×10^7			CP/A'c-33	S = A' = Rub; used $k_d = 1.7 \times 10^4$ s^{-1}, $k_{A'} = 5.3 \times 10^7$ L mol^{-1} s^{-1}.	84A070
13.166	**Thioketene, 2,2,6,6-tetramethylcyclohexyl-**						
	$CHCl_3$	9.9×10^7			CP/A'c-33	S = A' = Rub; used $k_d = 1.7 \times 10^4$ s^{-1}, $k_{A'} = 5.3 \times 10^7$ L mol^{-1} s^{-1}.	84A070
13.167	**Thiophene**						
	MeOH	2.0×10^5	0.45		CP/A'c-16	S = MB; A' = DPBF; used $k_d = 9.0 \times 10^4$ s^{-1}.	72F519
	MeOH		$\geq 6.0 \times 10^2$	293	CP/Oc-15	S = RB; $E_a = 25$ kJ mol^{-1}.	68F288
13.168	**Thiophene, tetrahydro-**						
	$CHCl_3$	4.2×10^7			CP/A'c-33	S = A' = Rub; used $k_d = 1.7 \times 10^4$ s^{-1}, $k_{A'} = 5.3 \times 10^7$ L mol^{-1} s^{-1}.	79A085
	MeOH	2.8×10^6	0.032		CP/A'c-16	S = MB; A' = DPBF; used $k_d = 9.0 \times 10^4$ s^{-1}.	72F519
13.169	**2,5-Thiophenedithione, 3,4-bis[(cyclohexylamino)methylene]dihydro-, (Z,Z)**						
	$C_6H_5CH_3$	1.0×10^7 (k_r)			CP/Ac,A'c-17	S = PP; A' = DPBF; used $k_r^{A'} = 6.7 \times 10^8$ L mol^{-1} s^{-1}.	88A507
	$C_6H_5CH_3$	9.0×10^7			PL/Ld-2	S = TPP.	88A507
	CH_3CN	4.0×10^6 (k_r)			CP/Ac,A'c-17	S = MB; A' = DPBF; used $k_r^{A'} = 1.1 \times 10^9$ L mol^{-1} s^{-1}.	88A507
	CH_3CN	1.6×10^8			PL/Ld-2	S = TPP.	88A507
	$CHCl_3$	4.8×10^7			PL/Ld-2	S = TPP.	88A507
13.170	**2-Thiophenethione, 3-[(cyclohexylamino)methylene]-5-ethyl-, (Z)-**						
	$C_6H_5CH_3$	1.8×10^8 (k_r)			CP/Ac,A'c-17	S = PP; A' = DPBF; used $k_r^{A'} = 6.7 \times 10^8$ L mol^{-1} s^{-1}.	88A507
	$C_6H_5CH_3$	1.6×10^8			PL/Ld-2	S = TPP.	88A507
	CH_3CN	7.7×10^8 (k_r)			CP/Ac,A'c-17	S = MB; A' = DPBF; used $k_r^{A'} = 1.1 \times 10^9$ L mol^{-1} s^{-1}.	88A507
	CH_3CN	9.0×10^8			PL/Ld-2	S = TPP.	88A507
	$CHCl_3$	2.5×10^8			PL/Ld-2	S = TPP.	88A507
	2-PrOH	5.5×10^8			PL/Ld-2	S = TPP.	88A507
13.171	**2-Thiophenethione, 3,3'-[1,2-ethanediylbis(iminomethylidyne)]bis[5-ethyl-, (Z,Z)**						
	C_6H_5Cl	2.1×10^8			PL/Ld-2	S = TPP.	88A507
	CH_3CN	5.8×10^8			PL/Ld-2	S = TPP.	88A507
	CH_3CN	2.7×10^8 (k_r)			CP/Ac,A'c-17	S = MB; A' = DPBF; used $k_r^{A'} = 1.1 \times 10^9$ L mol^{-1} s^{-1}.	88A507
	$CHCl_3$	2.0×10^8			PL/Ld-2	S = TPP.	88A507
13.172	**Thiopyran-4-thione**						
	CH_2Cl_2		$<1.0 \times 10^{-4}$	298	CP/Pa-15	S = MB; P = Thiopyran-4-one.	717403
13.173	**Thiopyran-4-thione, 2,6-diphenyl-**						
	CH_2Cl_2		2.6×10^{-3}	298	CP/Ac-15	S = MB.	717403
13.174	**Thiourea**						
	C_5H_5N	6×10^7 (k_r)			PL/Ld-2	S = PdMP; meas. $\phi_{ox} = \phi_\Delta$.	80A398
	C_5H_5N	9×10^7		273	CP/Ll-12	S = MP; used $k_d = 5.9 \times 10^4$ s^{-1}.	78F549
	CH_3COCH_3	2.5×10^7 (k_t)			PL/Ld-2	S = PdMP; meas. $\phi_{ox} = \phi_\Delta$.	80A398
	CH_3COCH_3	1.3×10^8		273	CP/Ll-12	S = MP; used $k_d = 5.0 \times 10^4$ s^{-1}.	78F549
	EtOH/ H_2O (96:4)	$\sim 1 \times 10^8$		273	CP/Ll-12	S = MP; k_d not given.	78F549

TABLE 13. Rate constants for the interaction of singlet oxygen with sulfur, selenium, and telurium compounds. — Continued

No.	Solvent	k (L mol^{-1} s^{-1})	β (k_d/k) (mol L^{-1})	T (K)	Method	Comment	Ref.
13.174	**Thiourea** — Continued						
	H_2O pH = 7.1	4.4×10^6		298	CP/Oc-19	S = Phenosafranine; Q = NaN_3; used $k_Q = 2.0 \times 10^8$ L mol^{-1} s^{-1}.	78A360
	MeOH		0.024		CL/Oc-15	S = $Ru(bpy)_3^{2+}$.	777221
	MeOH		0.040	293	CP/Oc-15	S = MB; E_a = 6.3 kJ mol^{-1}.	68F288
13.175	**Thiourea, allyl-**						
	i-$C_5H_{11}OH$		0.023	293	CP/Oc-14	S = Chl a.	56F007
	C_5H_5N	~2.7×10^7		285	CP/P'a-20	S = A' = DMA; meas. $k_A/k_{A'} = 0.7$; k derived using (k(TME)/$k_{A'}$) = 1.1 and k(TME) = 4.0×10^7 L mol^{-1} s^{-1}.	737202
	c-$C_6H_{11}OH$		$\leq 1 \times 10^{-3}$	293	CP/Oc-14	S = Chl a.	56F007
	$C_6H_5CH_2OH$		9.2×10^{-3}	293	CP/Oc-14	S = Chl a.	56F007
	H_2O pH = 7.1	4×10^6		298	CP/Oc-19	S = Phenosafranine; Q = NaN_3; used $k_Q = 2 \times 10^8$ L mol^{-1} s^{-1}.	78F020
	H_2O pH = 5-9		0.01	310	CP/Oc-15	S = PF.	617008
	H_2O (mic) pH = 7.0	4.5×10^6			CP/Oc-19	S = Chl a; Q = N_3^-; used $k_Q = 2 \times 10^8$ L mol^{-1} s^{-1}; S solubilized in Triton X-100 micelles (1.0 % by volume).	78A278
	MeOH		0.10	293	CP/Oc-15	S = Chl a.	56F007
13.176	**Thiourea, methyl-**						
	H_2O pH = 7.1	2×10^6		298	CP/Oc-19	S = Phenosafranine; Q = NaN_3; used $k_Q = 2 \times 10^8$ L mol^{-1} s^{-1}.	78A360
13.177	**1,4-Thioxane**						
	$CHCl_3$	1.5×10^6			CP/A'c-33	S = A' = Rub; used $k_d = 1.7 \times 10^4$ s^{-1}, $k_{A'} = 5.3 \times 10^7$ L mol^{-1} s^{-1}.	79A085

TABLE 14. Rate constants for the interaction of singlet oxygen with inorganic compounds.

	Solvent	k ($L\ mol^{-1}\ s^{-1}$)	β (k_d/k) ($mol\ L^{-1}$)	T (K)	Method	Comment	Ref.
14.1	**Ammonia**						
	MeOH/ C_6H_6 (67:33)		3.3×10^{-4} (β_r)	298	CR/A'c-17	A' = Rub; used $\beta_r^{A'} = 1.4 \times 10^{-3}$ mol L^{-1}; $^1O_2$* from $(PhO)_3PO_3$.	80M378
14.2	**Azide ion**						
	n-C_7H_{16}/H_2O (mic)	3.3×10^8			PL/Ld-2	S = RB; reverse micelles contg. 0.25 mol L^{-1} AOT and 2% H_2O.	84N114
	CH_3CN	4.8×10^9			PL/Ld-2	S = MB.	89A346
	DMF	1.2×10^8			CP/Ac-22	S = A' = Pt(phen)(DMT); used $k_d = 1.4 \times 10^5\ s^{-1}$.	89F462
	DMSO	6×10^8			CP/P'a-25	S = GV; A' = TEMP-4-OH; used $k_d = 5.2 \times 10^4\ s^{-1}$, $k_{A'} = 5.2 \times 10^6$ L $mol^{-1}\ s^{-1}$; P = 4-Hydroxy-2,2,6,6-tetramethylpiperidine *N*-oxyl; counter ion = Na^+, measured by esr.	89D112
	D_2O	3×10^8			PL/Ld-2	S = MB; k for $I \rightarrow 0$; at $I = 3$ (tetramethylammonium chloride) $k = 7.9 \times 10^8$, at $I = 3$ (NaCl) $k = 7.1 \times 10^8$ L $mol^{-1}\ s^{-1}$.	92F181
	D_2O pD = 11.2	9×10^7		310	CR/A'c-32	A' = DPBF; used $k_d = 1.5 \times 10^4\ s^{-1}$; $^1O_2$* from DOPA/H_2O_2.	89M038
	D_2O pD = 11.2	5×10^7		310	CR/A'c-32	A' = DPBF; used $k_d = 1.5 \times 10^4\ s^{-1}$; $^1O_2$* from Dopamine/H_2O_2.	89M038
	D_2O pH = 7.0	6.3×10^8	4.0×10^{-5}		CP/LI-12	S = RB; used $k_d = 2.5 \times 10^4\ s^{-1}$.	87E150
	D_2O pH = 7.0	6.9×10^8	3.1×10^{-5}		CP/LI-12	S = Eos; used $k_d = 2.2 \times 10^4\ s^{-1}$.	87E150
	D_2O	4.4×10^8			PL/Ld-2	S = H_2TPPS^{4-}; counter ion Na^+.	86F149
	D_2O pD = 7.4	5.1×10^8			PL/A'd-5	S = MB; A' = ADPA.	81N048
	D_2O (mic) pD = 7.4	3.9×10^8			PL/A'd-5	S = 2-ACN; A' = DPBF; 0.1 mol L^{-1} SDS.	81N048
	D_2O (mic) pD = 7.4	8.2×10^8			PL/A'd-5	S = 2-ACN; A' = DPBF; 0.1 mol L^{-1} CTAB.	81N048
	D_2O (ves)	1.1×10^8			CP/A'c-16	S = RB; A' = DMA; used $k_d = 1.8 \times 10^4\ s^{-1}$; 0.05% egg yolk lecithin.	86N104
	EtOH	2.2×10^8			PL/Ld-2	S = MB; k for $I \rightarrow 0$; at $I = 3$ (tetramethylammonium chloride) $k = 5.5 \times 10^8$ L $mol^{-1}\ s^{-1}$.	92F181
	EtOH	2.0×10^8			CP/A'c-16	S = MC 540; A' = DPBF; used $k_d = 6.5 \times 10^4\ s^{-1}$.	88F151
	EtOH/ H_2O (96:4)	3.9×10^8			CP/P'a-18	S = HA; A' = TEMP; used $k_d = 6.5 \times 10^4\ s^{-1}$; P = 2,2,6,6-Tetramethylpiperidine-*N*-oxyl; monitored by esr.	90R162
	H_2O pH = 10.6	2.9×10^7		310	CR/LI-12	used $k_d = 3.2 \times 10^5\ s^{-1}$; soln. cont. 5×10^{-4} mol L^{-1} $CoCl_2$, $^1O_2$* from autoxidation of oxytetracycline.	92M228
	H_2O pH = 7	4.5×10^8			CP/A'c-18	S = RB; A' = TrpH; used $k_d = 2.5 \times 10^5\ s^{-1}$, $k_{A'} = 6 \times 10^8$ L $mol^{-1}\ s^{-1}$.	93R059
	H_2O pH = 5.4	3.8×10^8			CL/LI-12	S = RB; used $k_d = 2.4 \times 10^5\ s^{-1}$.	91E570 89E798
	H_2O pH = 4.7-8.1	$<7 \times 10^5$ (k_r) 5.0×10^8 (k_q)		298	CP/A'c-16,17	S = RB, Humic acids; A' = FFA; used $k_d = 2.5 \times 10^5\ s^{-1}$; meas. $k_r/k_r^{A'} \leq 0.0061$; used $k_r^{A'} = 1.2 \times 10^8$ L $mol^{-1}\ s^{-1}$; counter ion Na^+.	87A063
	H_2O pH = 7.0	5.8×10^8	4.1×10^{-4}		CP/LI-12	S = Eos or RB; used $k_d = 2.4 \times 10^5\ s^{-1}$.	87E150
	H_2O pH = 10	1×10^9			CP/Oc-16	S = Eos; A' = 2,4-$Cl_2C_6H_3O^-$; used $k_d = 5 \times 10^5\ s^{-1}$.	87F537

TABLE 14. Rate constants for the interaction of singlet oxygen with inorganic compounds. — Continued

No.	Solvent	k (L mol^{-1} s^{-1})	β (k_d/k) (mol L^{-1})	T (K)	Method	Comment	Ref.
14.2	**Azide ion** — Continued						
	H_2O pH = 7	6.4×10^8		298	CP/A'c-16	S = UP; A' = TrpH; used $k_d = 3 \times 10^5$ s^{-1}.	86F678
	H_2O	1.5×10^9			CP/Oc-22	S = MB; A' = PBN; used $k_d = 5 \times 10^5$ s^{-1}.	80A339
	H_2O pH = 8.4	1.7×10^9		298	CP/A'c-20	S = MB; A' = TrpH; used $k_d = 5.0 \times 10^5$ s^{-1}.	78F061
	H_2O	2.1×10^9			CP/P''a-23	S = A' = 1-AnS; used $k_d = 5.0 \times 10^5$ s^{-1}; A'' = KI, P'' = I_3^-.	78F183
	H_2O (mic)	2.5×10^8		303	CP/A'c-20	S = HA; A' = DPBF; used $k_d = 5.0 \times 10^5$ s^{-1}; 2.9 $\times 10^{-4}$ mol L^{-1} SDS.	92N179
	H_2O (mic)	6.0×10^8		303	CP/A'c-20	S = HA; A' = DPBF; used $k_d = 5.0 \times 10^5$ s^{-1}; 2.2 $\times 10^{-4}$ mol L^{-1} Triton X-100.	92N179
	H_2O (mic)	7.6×10^8		303	CP/A'c-20	S = HA; A' = DPBF; used $k_d = 5.0 \times 10^5$ s^{-1}; 2.3 $\times 10^{-4}$ mol L^{-1} TDPB.	92N179
	H_2O (mic)	1.8×10^9		313	CP/A'c-23	S = Py; A' = DPBF; used $k_d = 5.0 \times 10^5$ s^{-1}; A' and S solubilized in DTAC micelles.	78A174
	H_2O (mic)	7.9×10^8		313	CP/A'c-23	S = Py; A' = DPBF; used $k_d = 5.0 \times 10^5$ s^{-1}; A' and S solubilized in SDS micelles.	78A174
	H_2O (mic) pH = 7.0	2.3×10^9		298	CP/A'c-20	S = MB; A' = DMA; used $k_d = 5.0 \times 10^5$ s^{-1}; A' solubilized in DTAC micelles.	78F061
	H_2O (mic) pH = 7.0	2.2×10^9		298	CP/A'c-20	S = MB; A' = 2,5-Diphenyloxazole; used $k_d = 5.0 \times 10^5$ s^{-1}; A' solubilized in DTAC micelles.	78F061
	H_2O (ves)	1.7×10^8			CP/A'c-16	S = A' = MC 540; used $k_d = 4.0 \times 10^4$ s^{-1}; soln. contg. DLPC.	92A123
	H_2O (ves)	9.9×10^7			CP/A'c-16	S = RB; A' = DMA; used $k_d = 2.5 \times 10^5$ s^{-1}; 0.05% egg yolk lecithin.	86N104
	H_2O/ MeOH (80:20)	1.3×10^9			CP/P''a-23	S = A' = 1-AnS; used $k_d = 4.0 \times 10^5$ s^{-1}; A'' = KI, P'' = I_3^-.	78F183
	H_2O/ MeOH (60:40)	1.1×10^9			CP/P''a-23	S = A' = 1-AnS; used $k_d = 3.2 \times 10^5$ s^{-1}; A'' = KI, P'' = I_3^-.	78F183
	H_2O/ MeOH (40:60)	5.2×10^8			CP/P''a-23	S = A' = 1-AnS; used $k_d = 2.5 \times 10^5$ s^{-1}; A'' = KI, P'' = I_3^-.	78F183
	H_2O/ MeOH (20:80)	3.0×10^8			CP/P''a-23	S = A' = 1-AnS; used $k_d = 1.9 \times 10^5$ s^{-1}; A'' = KI, P'' = I_3^-.	78F183
	MeOH	1.6×10^8		297	CR/P'a-16	A' = TEMP; formn. of TEMPO monitored by esr; soln. cont. MeONa and $CoCl_2$, $^1O_2$* from autoxidation of adrenaline; k_d not given.	92D227
	MeOH	2.3×10^8			CP/A'c-16	S = MC 540; A' = DPBF; used $k_d = 1 \times 10^5$ s^{-1}.	88F151
	MeOH	2.3×10^8		303	PL/Tb-3	S = Ery; E_a = 7.2 kJ mol^{-1}; studied at 303-323 K.	82A140
	MeOH	2.3×10^8			CP/A'c-23	S = Py; A' = DPBF; used $k_d = 1.4 \times 10^5$ s^{-1}.	78A174
	MeOH	2.2×10^8			PL/A'd-5	S = MB; A' = DPBF.	72F515
	MeOH/ C_6H_6 (67:33)		0.018 (β_r)	298	CR/A'c-17	A' = Rub; used $\beta_r^{A'} = 1.4 \times 10^{-3}$ mol L^{-1}; $^1O_2$* from $(PhO)_3PO_3$.	80M378
	MeOH/ $HOCH_2CH_2OH$ (90:10)	2.5×10^8		303	PL/Tb-3	S = Ery.	82A140
	MeOH/ $HOCH_2CH_2OH$ (80:20)	3.0×10^8		303	PL/Tb-3	S = Ery.	82A140
	MeOH/ $HOCH_2CH_2OH$ (70:30)	3.8×10^8		303	PL/Tb-3	S = Ery.	82A140

TABLE 14. Rate constants for the interaction of singlet oxygen with inorganic compounds. — Continued

No.	Solvent	k ($L\ mol^{-1}\ s^{-1}$)	β (k_d/k) ($mol\ L^{-1}$)	T (K)	Method	Comment	Ref.
14.3	**Azide ion** — Continued						
	MeOH/ $HOCH_2CH_2OH$ (60:40)	4.9×10^8		303	PL/Tb-3	S = Ery.	82A140
	MeOH/ $HOCH_2CH_2OH$ (50:50)	6.9×10^8		303	PL/Tb-3	S = Ery.	82A140
14.3	**Hydrogen azide**						
	H_2O pH = 1.9	$<2 \times 10^6$		298	CP/A'c-16	S = MB; A' = FFA; used $k_d = 2.5 \times 10^5\ s^{-1}$.	87A063
14.4	**Bromide ion**						
	C_6H_5Br/ CH_3COCH_3 (67:33)	$\leq 10^6$			CP/A'c-23	S = A' = Rub; No measurable effect; LiBr or tetrabutylammonium bromide.	767126
	C_6H_5Br/ CH_3COCH_3 (67:33)	$\sim 1 \times 10^6$			CP/A'c-23	S = A' = Rub; used $k_d = 3.2 \times 10^4\ s^{-1}$, $k_{A'} = 4 \times 10^7\ L\ mol^{-1}\ s^{-1}$; dicyclohexano-18-crown-6-polyether, potassium bromide.	767126
	C_6H_5Br/ MeOH (67:33)	$\leq 10^6$			CP/A'c-23	S = A' = Rub; No measurable effect; LiBr or tetrabutylammonium bromide.	767126
14.5	**Chloride ion**						
	C_6H_5Br/ CH_3COCH_3 (67:33)	$\leq 10^6$			CP/A'c-23	S = A' = Rub; No measurable effect; tetrabutylammonium chloride.	767126
	C_6H_5Br/ MeOH (67:33)	$\leq 10^6$			CP/A'c-23	S = A' = Rub; No measurable effect; tetrabutylammonium chloride.	767126
	CH_3CN	2.4×10^4			PL/Ld-2	S = MB; 0.1 $mol\ L^{-1}$ tetraethylammonium chloride	89A346
	D_2O	10^3			PL/Ld-2	S = RF, H_2TPPS^{4-}, or Chl in Triton X-100 micelles; counter ion Na^+.	86F149
14.6	**Deuterium peroxide**						
	D_2O	8.8×10^2		293	PL/Ld-2	S = PTSA; soln. contg. 2-9 $mol\ L^{-1}$ D_2O_2.	89A506
14.7	**Hydrazine hydrate**						
	C_5H_5N	8.7×10^7 (k_r)			PL/Ld-2	S = TPP, MPDEE or PdMP; meas. $\phi_{ox} = \phi_\Delta$.	80A398
	CCl_4	6.1×10^5			PL/Ld-2	S = MPDEE.	80A398
	CH_3COCH_3	5.5×10^7 (k_r)			PL/Ld-2	S = TPP, MPDEE or PdMP; meas. $\phi_{ox} = \phi_\Delta$.	80A398
	MeOH/ C_6H_6 (67:33)		4.0×10^{-4} (β_r)	298	CR/A'c-17	A' = Rub; used $\beta_r^{A'} = 1.4 \times 10^{-3}\ mol\ L^{-1}$; $^1O_2$* from $(PhO)_3PO_3$.	80M378
14.8	**Hydroxide-*d* ion**						
	D_2O	5.5×10^3		293	PL/Ld-2	S = PTSA; soln. contg. 0.5-6 $mol\ L^{-1}$ NaOD.	89A506
14.9	**Iodide ion**						
	C_6H_5Br/ CH_3COCH_3 (67:33)	9.1×10^7			CP/A'c-23	S = A' = Rub; used $k_d = 3.2 \times 10^4\ s^{-1}$, $k_{A'} = 4 \times 10^7\ L\ mol^{-1}\ s^{-1}$; $[CH_3(CH_2)_2CH_2]_4NI$.	767126
	C_6H_5Br/ CH_3COCH_3 (67:33)	8.1×10^7			CP/A'c-23	S = A' = Rub; used $k_d = 3.2 \times 10^4\ s^{-1}$, $k_{A'} = 4 \times 10^7\ L\ mol^{-1}\ s^{-1}$; from LiI.	767126
	C_6H_5Br/ CH_3COCH_3 (67:33)	2.8×10^8			CP/A'c-23	S = A' = Rub; used $k_d = 3.2 \times 10^4\ s^{-1}$, $k_{A'} = 4 \times 10^7\ L\ mol^{-1}\ s^{-1}$; dicyclohexano-18-crown-6-polyether potassium iodide.	767126
	C_6H_5Br/ MeOH (67:33)	$\leq 10^6$			CP/A'c-23	S = A' = Rub; No measurable effect; LiI or KI or tetrabutylammonium iodide.	767126

TABLE 14. Rate constants for the interaction of singlet oxygen with inorganic compounds. — Continued

No.	Solvent	k ($L\ mol^{-1}\ s^{-1}$)	β (k_d/k) ($mol\ L^{-1}$)	T (K)	Method	Comment	Ref.
14.9	**Iodide ion** — Continued						
	D_2O pH = ~7	8.7×10^5			PL/Ld-2	S = 2-AnS.	88A398
	H_2O pH = ~7	8.7×10^5			PL/Ld-2	S = 2-AnS.	88A398
	H_2O	8.7×10^6	0.058		CP/Pa-23	S = A′ = 1-AnS; Q = N_3^-; used $k_d = 5.0 \times 10^5\ s^{-1}$; P = Triiodine ion.	78F183
	H_2O	7.2×10^6		301	CP/Pa-23	S = 1-AnS; Q = NaN_3; used $k_d = 5.0 \times 10^5\ s^{-1}$, $k_Q = 2.2 \times 10^8\ L\ mol^{-1}\ s^{-1}$; P = Triiodine ion; from KI.	777074
	H_2O	7.2×10^6		301	CP/Pa-23	S = 1,5-Anthracenedisulfonate ion; Q = NaN_3; used $k_d = 5.0 \times 10^5\ s^{-1}$, $k_Q = 2.2 \times 10^8\ L\ mol^{-1}\ s^{-1}$; P = Triiodine ion; from KI.	777074
	H_2O	6.4×10^6		301	CP/Pa-23	S = 2-AnS; Q = NaN_3; used $k_d = 5.0 \times 10^5\ s^{-1}$, $k_Q = 2.2 \times 10^8\ L\ mol^{-1}\ s^{-1}$; P = Triiodine ion; from KI.	777074
	H_2O/ MeOH (60:40)	3.0×10^6	0.11		CP/Pa-23	S = A′ = 1-AnS; Q = N_3^-; used $k_d = 3.2 \times 10^5\ s^{-1}$; P = Triiodine ion; from KI.	78F183
	H_2O/ MeOH (20:80)	3.4×10^5	0.56		CP/Pa-23	S = A′ = 1-AnS; Q = N_3^-; used $k_d = 1.9 \times 10^5\ s^{-1}$; P = Triiodine ion; from KI.	78F183
	H_2O/ MeOH (40:60)	1.5×10^6	0.16		CP/Pa-23	S = A′ = 1-AnS; Q = N_3^-; used $k_d = 2.5 \times 10^5\ s^{-1}$; P = Triiodine ion; from KI.	78F183
	H_2O/ MeOH (80:20)	5.6×10^6	0.072		CP/Pa-23	S = A′ = 1-AnS; Q = N_3^-; used $k_d = 4.0 \times 10^5\ s^{-1}$; P = Triiodine ion; from KI.	78F183
14.10	**Iodine**						
	C_6H_6	1.4×10^9			PL/A′d-8	S = An; A′ = DPBF; Quenching is non-linear.	84E291
14.11	**Nitrite ion**						
	H_2O pH = 8.3	3.1×10^6			CP/Oc-16	S = Eos; A′ = N_3^-; used $k_d = 2.5 \times 10^5\ s^{-1}$; $k = 7.4 \times 10^4\ L\ mol^{-1}\ sec^{-1}$ was also evaluated; $k = 4.4 \times 10^4\ L\ mol^{-1}\ sec^{-1}$ was also quoted [92D008].	88F485
14.12	**Oxygen**						
	Perfluorodecalin	4.1×10^3		295	PL/Ld-2	S = PHO.	91E427
	n-C_6F_{14}	2.6×10^3		295	PL/Ld-2	S = PHO.	91E427
	C_6H_6	$\sim 6 \times 10^4$			CP/A′c-?	S = A′ = DMA; Reported as unpublished data.	73F659
	CCl_4	3.9×10^3		295	PL/Ld-2	S = PHO.	91E427
	CS_2	1.3×10^4		298	FP/Ld-2	S = Per.	82A322
	$ClCF_2CCl_2F$	3.2×10^3		295	PL/Ld-2	S = PHO.	91E427
	$ClCF_2CCl_2F$	9.2×10^2		298	FP/Ld-2	S = Per.	82A322
	$ClCF_2CCl_2F$	2.5×10^3		293	PL/A′d-10	A′ = DPBF; high pressure O_2.	79A113
	$ClCF_2CCl_2F$	2.7×10^3			PL/A′d-10	A′ = DPBF; high pressure O_2.	747102
	H_2O pH = 6.2		0.060		CP/A′c-19	S = Ac; A′ = Leuco fluorescein.	68F287
	H_2O pH = 6.2		1.9×10^{-3}		CP/A′c-19	S = Th^+; A′ = Leuco fluorescein.	68F287
	H_2O pH = 6.2		1.2×10^{-3}		CP/A′c-19	S = MB; A′ = Leuco fluorescein.	68F287
	H_2O pH = 6.2		2.2×10^{-3}		CP/A′c-19	S = Eos; A′ = Leuco fluorescein.	68F287
	O_2	5.9×10^2		77	PL/Ld-2	Liquid oxygen, direct laser excitation.	82E575
	O_2	6.0×10^2		77	PL/Ld-2	Liquid oxygen, direct laser excitation, 1064 nm.	80E616

TABLE 14. Rate constants for the interaction of singlet oxygen with inorganic compounds. — Continued

No.	Solvent	k ($L\ mol^{-1}\ s^{-1}$)	β (k_d/k) ($mol\ L^{-1}$)	T (K)	Method	Comment	Ref.
14.12	**Oxygen — Continued**						
	O_2	6.0×10^2		77	PL/Ld-2	Liquid oxygen, direct laser excitation, 1060 nm; $k = 1.3 \times 10^3\ (T/300)^{0.5}$ [719112].	746110
14.13	**Oxygen-18**						
	Perfluorodecalin	60		295	PL/Ld-2	S = PHO.	91E427
	n-C_6F_{14}	1×10^2		295	PL/Ld-2	S = PHO.	91E427
	$ClCF_2CCl_2F$	1×10^2		295	PL/Ld-2	S = PHO.	91E427
	O_2	3		77	PL/Ld-2	Liquid oxygen, direct laser excitation.	82E575
14.14	**Superoxide radical anion**						
	C_6H_5Br/ CH_3CN (67:33)	3.6×10^7			CP/A′c-23	S = A′ = Rub; used $k_d = 3.1 \times 10^4\ s^{-1}$, $k_{A'} = 4 \times 10^7\ L\ mol^{-1}\ s^{-1}$; Showed $k_q \gg k_r$; tetrabutylammonium superoxide.	757578
	CH_3CN	2×10^8			PL/Ld-2	S = 2-ACN; KO_2/18-crown-6.	91A394
	CH_3CN	2×10^8			PL/Ld-2	S = $Ru(bpy)_3^{2+}$; KO_2/18-crown-6.	91A394
	CH_3CN	7×10^9	5×10^{-6}		CP/A′c-16	S = RB; A′ = DPBF; used $k_d = 3.3 \times 10^4\ s^{-1}$; tetramethylammonium superoxide.	766072
	DMSO	1.6×10^9	3.3×10^{-5}		CP/A′c-16	S = RB; A′ = DPBF; used $k_d = 5.2 \times 10^4\ s^{-1}$; tetramethylammonium superoxide.	766072

TABLE 15. Rate constants for the interaction of singlet oxygen with oximes, hydrazones, nitrones, nitroso compounds and *N*-oxides.

No.	Solvent	k (L mol^{-1} s^{-1})	β (k_d/k) (mol L^{-1})	T (K)	Method	Comment	Ref.
15.1	**Acetaldehyde, (2,6-diphenylpyran-4-ylidene)-, dimethyl hydrazone**						
	MeOH/ C_6H_6 (80:20)	3.0×10^9 (k_r)			CP/A'c-17	S = RB; A' = 2M2P; used $k_r^{A'} = 8.1 \times 10^5$ L mol^{-1} s^{-1}; meas. $k_t/k_r^{A'} = 3.7 \times 10^3$.	86A438
	MeOH/ C_6H_6 (80:20)	2.2×10^{10} (k_r)			CP/A'c-17	S = RB; A' = DPBF; used $k_r^{A'} = 6.3 \times 10^8$ L mol^{-1} s^{-1}; meas. $k_t/k_r^{A'} = 35$.	86A438
15.2	**Acetone oxime**						
	MeOH	$\leq 1.0 \times 10^4$ (k_r)			CP/A'c-17	S = RB; A' = 2M2B; used $k_r^{A'} = 1.3 \times 10^6$ L mol^{-1} s^{-1}; meas. $k_t/k_r^{A'} = 7.7 \times 10^{-3}$.	767197
15.3	**Acetone, (1-methylethylidene)hydrazone (Acetone azine)**						
	CCl_3F			253	CP/Pa-17	S = TPP; A' = 3,4,4,5-Tetramethylpyrazole; meas. $k_t/k_r^{A'} = 3.1$.	79F278
	CCl_4			253	CP/Pa-17	S = TPP; A' = 3,4,4,5-Tetramethylpyrazole; meas. $k_t/k_r^{A'} = 3.2$; with 10^{-4} mol L^{-1} TPP.	79F278
	CCl_4			253	CP/Pa-17	S = TPP; A' = 3,4,4,5-Tetramethylpyrazole; meas. $k_t/k_r^{A'} = 3.8$; with 10^{-6} mol L^{-1} TPP.	79F278
	$CDCl_3$			253	CP/Pa-17	S = TPP; A' = 3,4,4,5-Tetramethylpyrazole; meas. $k_t/k_r^{A'} = 3.2$.	79F278
	CH_2Cl_2			253	CP/Pa-17	S = TPP; A' = 3,4,4,5-Tetramethylpyrazole; meas. $k_t/k_r^{A'} = 3.3$.	79F278
	$CHCl_3$			253	CP/Pa-17	S = TPP; A' = 3,4,4,5-Tetramethylpyrazole; meas. $k_t/k_r^{A'} = 3.0$.	79F278
	$CHCl_3$			253	CP/Pa-17	S = MB; A' = 3,4,4,5-Tetramethylpyrazole; meas. $k_t/k_r^{A'} = 3.8$.	79F278
15.4	**Benzaldehyde, 4-diethylamino-, diphenylhydrazone**						
	MeOH/ C_6H_6 (80:20)	1.8×10^9			CP/P'a-23	S = RB; A' = 2M2P; used $k_d = 1.8 \times 10^5$ s^{-1}, $k_{A'} = 8.1 \times 10^5$ L mol^{-1} s^{-1}.	83A063
	MeOH/ C_6H_6 (68:32)	8.8×10^8			CP/P'a-23	S = RB; A' = DPBF; used $k_d = 1.8 \times 10^5$ s^{-1}, $k_{A'} = 6.3 \times 10^8$ L mol^{-1} s^{-1}.	83A063
15.5	**Benzenamine, *N*-(diphenylmethylene)-, *N*-oxide (Triphenyl nitrone)**						
	c-C_6H_{12}	5×10^6		296	PL/A'd-8	S = ZnTPP; A' = DPBF.	91A297
	C_6H_6	3.9×10^7		296	PL/A'd-8	S = ZnTPP; A' = DPBF.	91A297
	CH_3CN	3.3×10^7		296	PL/A'd-8	S = MB; A' = DPBF.	91A297
	MeOH	1.0×10^7		296	PL/A'd-8	S = MB; A' = DPBF.	91A297
15.6	**Benzenamine, *N*-fluoren-9-ylidene, *N*-oxide (Phenyl fluorenyl nitrone)**						
	C_6H_6	6.2×10^7		296	PL/A'd-8	S = ZnTPP; A' = DPBF.	91A297
15.7	**Benzenamine, *N*-[(2-hydroxyphenyl)methylene]-, *N*-oxide (2-Hydroxyphenyl phenyl nitrone)**						
	C_6H_6	4.5×10^7		296	PL/A'd-8	S = ZnTPP; A' = DPBF.	91A297
15.8	**Benzenamine, 4-methyl-*N*-(phenylmethylene)-, *N*-oxide (4-Methylphenyl phenyl nitrone)**						
	C_6H_6	4.3×10^7		296	PL/A'd-8	S = ZnTPP; A' = DPBF.	91A297
15.9	**Benzenamine, *N*-[(4-methylphenyl)methylene]-, *N*-oxide (Phenyl 4-methylphenyl nitrone)**						
	c-C_6H_{12}	2.1×10^7		296	PL/A'd-8	S = ZnTPP; A' = DPBF.	91A297
	C_6H_6	5.5×10^7		296	PL/A'd-8	S = ZnTPP; A' = DPBF.	91A297
	CH_3CN	4.6×10^7		296	PL/A'd-8	S = MB; A' = DPBF.	91A297
	MeOH	7.7×10^7		296	PL/A'd-8	S = MB; A' = DPBF.	91A297
15.10	**Benzenamine, *N*-(phenylmethylene)-, *N*-oxide (Diphenyl nitrone)**						
	c-C_6H_{12}	8×10^6		296	PL/A'd-8	S = ZnTPP; A' = DPBF.	91A297
	C_6H_6	3.7×10^7		296	PL/A'd-8	S = ZnTPP; A' = DPBF.	91A297

TABLE 15. Rate constants for the interaction of singlet oxygen with oximes, hydrazones, nitrones, nitroso compounds and *N*-oxides. — Continued

No.	Solvent	k ($L\ mol^{-1}\ s^{-1}$)	β (k_d/k) ($mol\ L^{-1}$)	T (K)	Method	Comment	Ref.
15.10	**Benzenamine, *N*-(phenylmethylene)-, *N*-oxide (Diphenyl nitrone)** — Continued						
	CH_3CN	3.3×10^7		296	PL/A'd-8	S = MB; A' = DPBF.	91A297
	MeOH	5.1×10^7		296	PL/A'd-8	S = MB; A' = DPBF.	91A297
15.11	**Benzenemethanamine, *N*-hydroxy-*N*-(phenylmethyl)- (Dibenzylhydroxylamine)**						
	CCl_4	1.2×10^4	2.2×10^{-3}		CP/Pa-14	S = DCA; used $k_d = 26\ s^{-1}$; P = α-Phenyl-*N*-benzylnitrone.	92F491
15.12	**Benzenmethanamine, *N*-(phenylmethylene)-, *N*-oxide (Phenyl benzyl nitrone)**						
	C_6H_6	1.4×10^7		296	PL/A'd-8	S = ZnTPP; A' = DPBF.	91A297
15.13	**Benzophenone oximate anion**						
	MeOH	3.4×10^5 (k_r)			CP/A'c,Pa-17	S = RB; A' = 2M2B; used $k_r^{A'} = 1.3 \times 10^6$ L $mol^{-1}\ s^{-1}$; meas. $k_r/k_r^{A'} = 0.26$; P = Benzophenone.	767197
15.14	**Benzophenone oxime**						
	MeOH	7.7×10^4 (k_r)			CP/A'c,Pa-17	S = RB; A' = 2M2B; used $k_r^{A'} = 1.3 \times 10^6$ L $mol^{-1}\ s^{-1}$; meas. $k_r/k_r^{A'} = 0.059$; P = Benzophenone.	767197
15.15	**Benzophenone oxime *O*-methyl ether**						
	MeOH	2.0×10^5 (k_r)			CP/A'c,Pa-17	S = RB; A' = 2M2B; used $k_r^{A'} = 1.3 \times 10^6$ L $mol^{-1}\ s^{-1}$; meas. $k_r/k_r^{A'} = 0.15$; P = Benzophenone.	767197
15.16	**Cyclohexane, 1,4-dichloro-1,4-dinitroso-, (*E*)-**						
	CH_2Cl_2/ MeOH (69:31)	5.3×10^9			CR/A'c-32	A' = Rub; used $k_d = 1.9 \times 10^4\ s^{-1}$, $k_{A'} = 4.0 \times 10^7$ L $mol^{-1}\ s^{-1}$; $^1O_2$* from $(PhO)_3PO_3$.	76F900
15.17	**Cyclohexane, 1,4-dichloro-1,4-dinitroso-, (*Z*)-**						
	CH_2Cl_2/ MeOH (69:31)	9.2×10^9			CP/A'c-32	S = Chl a; A' = DPBF; used $k_d = 2.1 \times 10^4\ s^{-1}$, $k_{A'} = 8 \times 10^8$ L $mol^{-1}\ s^{-1}$; Assumed that quenching is due to equilibrium mixture of this species with 1,4-dichloro-2,3-diazabicyclo[2.2.2]oct-2-ene 2,3-dioxide.	76F900
	CH_2Cl_2/ MeOH (69:31)	1.2×10^{10}			CR/A'c-32	A' = Rub; used $k_d = 2.1 \times 10^4\ s^{-1}$, $k_{A'} = 4.0 \times 10^7$ L $mol^{-1}\ s^{-1}$; $^1O_2$* from $(PhO)_3PO_3$; Assumed that quenching is due to this species in equilibrium with 1,4-dichloro-2,3-diazabicyclo[2.2.2]oct-2-ene 2,3-dioxide.	76F900
15.18	**2,3-Diazabicyclo[2.2.2]oct-2-ene, 1,4-dichloro-, 2,3-dioxide**						
	CH_2Cl_2/ MeOH (69:31)	8.0×10^7			CR/A'c-32	A' = Rub; used $k_d = 2.1 \times 10^4\ s^{-1}$, $k_{A'} = 4.0 \times 10^7$ L $mol^{-1}\ s^{-1}$; $^1O_2$* from $(PhO)_3PO_3$; Assumed that quenching is due to this species only.	76F900
15.19	**Dimethylglyoxime**						
	CH_2Cl_2/ MeOH (90:10)	1×10^6			PL/A'd-5	S = MB; A' = DPBF.	87F655
15.20	**3,7,4,6-Ethanediylidenepentaleno[1,6-*cd*]pyridazine, 3,7a-dichloro-3a,4,5,5a,6,7,7a,7b-octahydro-, 1,2-dioxide**						
	CH_2Cl_2/ MeOH (69:31)	$<2 \times 10^6$			CR/A'c-32	A' = Rub; used $k_d = 2.1 \times 10^4\ s^{-1}$, $k_{A'} = 4.0 \times 10^7$ L $mol^{-1}\ s^{-1}$; $^1O_2$* from $(PhO)_3PO_3$.	76F900
15.21	**Ethylamine, *N*-ethoxy-**						
	n-C_6H_{14}	3×10^4			CP/A'c-16	S = A' = Rub; k_d not given.	87F639
	CH_3CN	8×10^5			CP/A'c-16	S = RB; A' = DMA; used $k_d = 3.3 \times 10^4\ s^{-1}$.	87F639
15.22	**Ethylamine, *N*-ethyl-*N*-ethoxy-**						
	n-C_6H_{14}	6×10^5			CP/A'c-16	S = A' = Rub; k_d not given.	87F639

TABLE 15. Rate constants for the interaction of singlet oxygen with oximes, hydrazones, nitrones, nitroso compounds and *N*-oxides. — Continued

No.	Solvent	k (L mol^{-1} s^{-1})	β (k_d/k) (mol L^{-1})	T (K)	Method	Comment	Ref.
15.22	**Ethylamine, *N*-ethyl-*N*-ethoxy-** — Continued						
	CH_3CN	2.1×10^6			CP/A'c-16	S = RB; A' = DMA; used $k_d = 3.3 \times 10^4$ s^{-1}.	87F639
15.23	**Ethylamine, *N*-ethyl-*N*-hydroxy-**						
	n-C_6H_{14}	2.5×10^7			CP/A'c-16	S = A' = Rub; k_d not given.	87F639
	C_6H_6	2.7×10^7			CP/A'c-16	S = A' = Rub; used $k_d = 4.2 \times 10^4$ s^{-1}.	87F639
	CH_3CN	1.8×10^7			CP/A'c-16	S = RB; A' = DMA; used $k_d = 3.3 \times 10^4$ s^{-1}.	87F639
	CH_3COCH_3	2.5×10^7			CP/A'c-16	S = RB; A' = DMA; used $k_d = 3.8 \times 10^4$ s^{-1}.	87F639
	$CHCl_3$	1.2×10^7			CP/A'c-16	S = RB; A' = DMA; k_d not given.	87F639
	D_2O	$<10^5$			CP/LI-12	S = RB; used $k_d = 1.8 \times 10^4$ s^{-1}.	93D154
	$HCONH_2$	1.0×10^7			CP/A'c-16	S = RB; A' = DMA; k_d not given.	87F639
	MeOH	3×10^6			CP/A'c-16	S = RB; A' = DMA; used $k_d = 2.0 \times 10^4$ s^{-1}.	87F639
15.24	**Ethylamine, *N*-ethyl-*N*-hydroxy-, conjugate acid**						
	D_2O pH = 8.5	$<5 \times 10^3$			CP/LI-12	S = RB; used $k_d = 1.8 \times 10^4$ s^{-1}.	93D154
15.25	**Isoindole, 1,1,3-triphenyl-, 2-oxide**						
	C_6H_6	8×10^6		296	PL/A'd-8	S = ZnTPP; A' = DPBF.	91A297
15.26	**Nitroxide, bis[4-(1,1-dimethylethyl)phenyl]-**						
	$C_6H_5CH_3$	1.6×10^7		293	PL/Ld-2	S = An and PP; $E_a = 1.0$ kJ mol^{-1}; log(A) = 7.4.	86E108
	CH_3CN	1.7×10^7		293	PL/Ld-2	S = An and PP.	86E108
	CH_3CN/ MeOH (96:4)	7.5×10^6			PL/Ld-2	S = HP.	92F402
15.27	**Nitroxide, bis[4-(1-methyl-1-phenylethyl)phenyl]-**						
	$C_6H_5CH_3$	2.5×10^6		293	PL/Ld-2	S = An and PP; $E_a = 5.0$ kJ mol^{-1}; log(A) = 7.3.	86E108
15.28	**Piperidin-1-ol, 2,2,6,6-tetramethyl- (TEMPOH)**						
	CH_2Cl_2	1.5×10^8			CP/A'c-18	S = A' = Rub; used $k_d = 7.3 \times 10^3$ s^{-1}, $k_{A'} = 7 \times 10^7$ L mol^{-1} s^{-1}.	88F059
15.29	**1-Piperidinyloxy, 4-amino-2,2,6,6-tetramethyl-**						
	C_6H_6/ MeOH (80:20)	8.5×10^5			PL/A'd-8	S = MB; A' = DPBF.	84A167
15.30	**1-Piperidinyloxy, 4-azido-2,2,6,6-tetramethyl-**						
	CH_3CN/ MeOH (96:4)	8.3×10^6			PL/Ld-2	S = HP.	92F402
15.31	**1-Piperidinyloxy, 4-hydroxy-4-(2-naphthyl)-2,2,6,6-tetramethyl-,**						
	$CHCl_3$	1.0×10^5		293	PL/Ld-2	S = An and PP; $E_a = 7.5$ kJ mol^{-1}; log(A) = 6.3.	86E108
15.32	**1-Piperidinyloxy, 4-hydroxy-4-(2-phenylethynyl)-2,2,6,6-tetramethyl-**						
	$CHCl_3$	7.5×10^4		293	PL/Ld-2	S = An and PP; $E_a = 1.3$ kJ mol^{-1}; log(A) = 5.1.	86E108
	EtOH	1.7×10^5		293	PL/Ld-2	S = An and PP.	86E108
15.33	**1-Piperidinyloxy, 4-hydroxy-2,2,6,6-tetramethyl- (TEMPOL)**						
	$C_6H_5CH_3$	1.6×10^5		293	PL/Ld-2	S = An and PP; $E_a = 5.4$ kJ mol^{-1}; log(A) = 6.2.	86E108
	CCl_4	9.8×10^4			PL/Ld-2	S = TPP.	93E090
	CH_2Cl_2	9.5×10^4			PL/Ld-2	S = TPP.	93E090
	CH_3CN	1.4×10^5		293	PL/Ld-2	S = An and PP.	86E108
	$CHCl_3$	1.2×10^6			CP/A'c-33	S = A' = Rub; used $k_d = 1.7 \times 10^4$ s^{-1}, $k_{A'} = 5.3 \times 10^7$ L mol^{-1} s^{-1}.	88P313
	$CHCl_3$	1.1×10^5		293	PL/Ld-2	S = An and PP.	86E108

TABLE 15. Rate constants for the interaction of singlet oxygen with oximes, hydrazones, nitrones, nitroso compounds and *N*-oxides. — Continued

No.	Solvent	k ($L\ mol^{-1}\ s^{-1}$)	β (k_d/k) ($mol\ L^{-1}$)	T (K)	Method	Comment	Ref.
15.33	**1-Piperidinyloxy, 4-hydroxy-2,2,6,6-tetramethyl- (TEMPOL)** — Continued						
	EtOH	1.2×10^5		293	PL/Ld-2	S = An and PP.	86E108
15.34	**1-Piperidinyloxy, 4-hydroxy-2,2,6,6-tetramethyl-, benzoate**						
	$CHCl_3$	1.4×10^6			CP/A'c-33	S = A' = Rub; used $k_d = 1.7 \times 10^4\ s^{-1}$, $k_{A'} = 5.3 \times 10^7\ L\ mol^{-1}\ s^{-1}$.	88P313
15.35	**1-Piperidinyloxy, 4-hydroxy-2,2,6,6-tetramethyl-, butyrate**						
	$CHCl_3$	1.1×10^6			CP/A'c-33	S = A' = Rub; used $k_d = 1.7 \times 10^4\ s^{-1}$, $k_{A'} = 5.3 \times 10^7\ L\ mol^{-1}\ s^{-1}$.	88P313
15.36	**1-Piperidinyloxy, 4-hydroxy-2,2,6,6-tetramethyl-, crotonate**						
	$CHCl_3$	1.6×10^6			CP/A'c-33	S = A' = Rub; used $k_d = 1.7 \times 10^4\ s^{-1}$, $k_{A'} = 5.3 \times 10^7\ L\ mol^{-1}\ s^{-1}$.	88P313
15.37	**1-Piperidinyloxy, 4-hydroxy-2,2,6,6-tetramethyl-, diester with 1,10-decanedioic acid**						
	$CHCl_3$	3.1×10^6			CP/A'c-33	S = A' = Rub; used $k_d = 1.7 \times 10^4\ s^{-1}$, $k_{A'} = 5.3 \times 10^7\ L\ mol^{-1}\ s^{-1}$.	88P313
15.38	**1-Piperidinyloxy, 4-hydroxy-2,2,6,6-tetramethyl-, diester with 1,6-hexanedioic acid**						
	$CHCl_3$	3.1×10^6			CP/A'c-33	S = A' = Rub; used $k_d = 1.7 \times 10^4\ s^{-1}$, $k_{A'} = 5.3 \times 10^7\ L\ mol^{-1}\ s^{-1}$.	88P313
15.39	**1-Piperidinyloxy, 4-hydroxy-2,2,6,6-tetramethyl-, diester with terephthalic acid**						
	$CHCl_3$	3.4×10^6			CP/A'c-33	S = A' = Rub; used $k_d = 1.7 \times 10^4\ s^{-1}$, $k_{A'} = 5.3 \times 10^7\ L\ mol^{-1}\ s^{-1}$.	88P313
15.40	**1-Piperidinyloxy, 4-hydroxy-2,2,6,6-tetramethyl-, methacrylate**						
	$CHCl_3$	1.7×10^6			CP/A'c-33	S = A' = Rub; used $k_d = 1.7 \times 10^4\ s^{-1}$, $k_{A'} = 5.3 \times 10^7\ L\ mol^{-1}\ s^{-1}$.	88P313
15.41	**1-Piperidinyloxy, 4-hydroxy-2,2,6,6-tetramethyl-, pentanoate**						
	$CHCl_3$	1.7×10^6			CP/A'c-33	S = A' = Rub; used $k_d = 1.7 \times 10^4\ s^{-1}$, $k_{A'} = 5.3 \times 10^7\ L\ mol^{-1}\ s^{-1}$.	88P313
15.42	**1-Piperidinyloxy, 4-iodo-2,2,6,6-tetramethyl-**						
	CH_3CN/ MeOH (96:4)	3.7×10^5			PL/Ld-2	S = HP.	92F402
15.43	**1-Piperidinyloxy, 2,2,6,6-tetramethyl- (TEMPO)**						
	C_6H_6/ MeOH (80:20)	$<1.0 \times 10^5$			PL/A'd-8	S = MB; A' = DPBF.	84A167
	$C_6H_5CH_3$	5.5×10^5		293	PL/Ld-2	S = An and PP; $E_a = 8.4\ kJ\ mol^{-1}$; $\log(A) = 7.2$.	86E108
	CCl_4	1.4×10^5			PL/Ld-2	S = TPP.	93E090
	CH_2Cl_2	1.6×10^5			PL/Ld-2	S = TPP.	93E090
	CH_2Cl_2	2.8×10^6			CP/A'c-18	S = A' = Rub; used $k_d = 7.3 \times 10^3\ s^{-1}$, $k_{A'} = 7 \times 10^7\ L\ mol^{-1}\ s^{-1}$.	88P059
	CH_3CN	4.3×10^5		293	PL/Ld-2	S = An and PP.	86E108
	EtOH	2.5×10^5		293	PL/Ld-2	S = An and PP.	86E108
15.44	**4-Piperidone, 2,2,6,6-tetramethyl-1-oxyl- (TAN)**						
	$C_6H_5CH_3$	1.2×10^6		293	PL/Ld-2	S = An and PP; $E_a = 6.7\ kJ\ mol^{-1}$; $\log(A) = 7.3$.	86E108
	CCl_4	6.2×10^5			PL/Ld-2	S = TPP.	93E090
	CH_2Cl_2	6.3×10^5			PL/Ld-2	S = TPP.	93E090
	CH_3CN	1.3×10^6		293	PL/Ld-2	S = An and PP.	86E108
	EtOH	1.3×10^6		293	PL/Ld-2	S = An and PP.	86E108
	MeOH/ C_6H_6 (67:33)		3.4×10^{-5}	298	CR/A'c-17	A' = Rub; used $\beta_{A'} = 1.4 \times 10^{-3}\ mol\ L^{-1}$; $^1O_2$* from $(PhO)_3PO_3$.	80M378

TABLE 15. Rate constants for the interaction of singlet oxygen with oximes, hydrazones, nitrones, nitroso compounds and *N*-oxides. — Continued

No.	Solvent	k ($L\ mol^{-1}\ s^{-1}$)	β (k_d/k) ($mol\ L^{-1}$)	T (K)	Method	Comment	Ref.
15.45	**2-Propanamine, 2-methyl-*N*-(1-methyl-4-pyridylmethylene)-, *N*-oxyl**						
	H_2O	8.0×10^7			CP/Ac-23	S = MB; Q = N_3^-; used $k_d = 5 \times 10^5\ s^{-1}$, $k_Q = 1.5 \times 10^9\ L\ mol^{-1}\ s^{-1}$.	80A339
15.46	**2-Propanamine, 2-methyl-*N*-phenylmethylene-, *N*-oxyl (Phenyl *N*-*tert*-butyl nitrone, PBN)**						
	$C_6H_5CH_3$	9.0×10^6		293	PL/A'd-8	S = PP; A' = DPBF; $E_a = 0.4 \pm 0.4\ kJ\ mol^{-1}$; studied at 223-293 K.	88F462
	$C_6H_5CH_3$	9.0×10^6		293	PL/Ld-2	S = PP; $E_a = 0.4 \pm 0.4\ kJ\ mol^{-1}$; studied at 223-293 K.	86A307
	$C_6H_5CH_3$	$\leq 1 \times 10^5$ (k_r)		293	CP/A'c-17	S = PP; A' = Tetr; used $k_r^{A'} = 1.2 \times 10^7\ L\ mol^{-1}\ s^{-1}$.	86A307 88F462
	C_6H_6	8.3×10^6		293	PL/A'd-8	S = PP; A' = DPBF.	84A247 85F538
	C_6H_6	1.4×10^5 (k_r)		293	CL/Ac,A'c-17	S = PP; A' = Tetr; used $k_r^{A'} = 1.2 \times 10^7\ L\ mol^{-1}\ s^{-1}$; meas. $k_r/k_r^{A'} = 0.011$.	84A247 85F538
	CH_3CN	1.8×10^7		293	PL/A'd-8	S = PP; A' = DPBF.	88F462
	CH_3CN	1.8×10^7		293	PL/Ld-2	S = PP.	86A307
	CH_3CN	$\leq 1 \times 10^5$ (k_r)		293	CP/A'c-17	S = PP; A' = Tetr; used $k_r^{A'} = 1.2 \times 10^7\ L\ mol^{-1}\ s^{-1}$.	86A307
	$CHCl_3$	4.4×10^6		293	PL/A'd-8	S = PP; A' = DPBF.	88F462
	$CHCl_3$	4.4×10^6		293	PL/Ld-2	S = PP.	86A307
	$CHCl_3$	$\leq 1 \times 10^5$ (k_r)		293	CP/A'c-17	S = PP; A' = Tetr; used $k_r^{A'} = 1.2 \times 10^7\ L\ mol^{-1}\ s^{-1}$.	86A307
	H_2O	1.4×10^8			CP/Ac-23	S = MB; Q = N_3^-; used $k_d = 5 \times 10^5\ s^{-1}$, $k_Q = 1.5 \times 10^9\ L\ mol^{-1}\ s^{-1}$.	80A339
15.47	**2-Propanamine, 2-methyl-*N*-(4-pyridylmethylene)-, *N*,*N*-dioxyl- (4-POBN)**						
	H_2O	1.2×10^8			CP/Ac-23	S = MB; Q = N_3^-; used $k_d = 5 \times 10^5\ s^{-1}$, $k_Q = 1.5 \times 10^9\ L\ mol^{-1}\ s^{-1}$.	80A339
15.48	**2-Propanamine, 2-methyl-*N*-(4-pyridylmethylene)-, *N*-oxyl (4-PyBN)**						
	H_2O	1.4×10^8			CP/Ac-23	S = MB; Q = N_3^-; used $k_d = 5 \times 10^5\ s^{-1}$, $k_Q = 1.5 \times 10^9\ L\ mol^{-1}\ s^{-1}$.	80A339
15.49	**2-Propanamine, 2-methyl-*N*-(2-sulfonatophenyl)methylene-, *N*-oxyl (2-SSPB)**						
	H_2O	9.4×10^7			CP/Ac-23	S = MB; Q = N_3^-; used $k_d = 5 \times 10^5\ s^{-1}$, $k_Q = 1.5 \times 10^9\ L\ mol^{-1}\ s^{-1}$.	80A339
15.50	**Propane, 2-methyl-2-nitroso-**						
	CH_2Cl_2/ MeOH (94:6)	9.3×10^9			CR/A'c-32	A' = Rub; used $k_d = 1.1 \times 10^4\ s^{-1}$, $k_{A'} = 4.0 \times 10^7\ L\ mol^{-1}\ s^{-1}$; $^1O_2$* from $(PhO)_3PO_3$.	76F900
15.51	**Pyrrole, 3,4-dihydro-2,2,3-trimethyl-, 1-oxide**						
	$CHCl_3$	5×10^7			CP/A'c-16	S = MB; A' = DPBF; k_d not given; $k = k_q$ (No reaction observed).	75F653
15.52	**Pyrrole, 3,4-dihydro-3,5,5-trimethyl-, 1-oxide**						
	$CHCl_3$	2.1×10^7			CP/A'c-16	S = MB; A' = DPBF; k_d not given.	75F653
15.53	**1-Pyrrolidinyloxy, 3-cyano-2,2,5,5-tetramethyl-4-nitro-**						
	CH_3CN/ MeOH (96:4)	1.7×10^5			PL/Ld-2	S = HP.	92F402
15.54	**1-Pyrrolidinyloxy, 2,5-di-(4-hydroxy-3-nitrophenyl)-2,5-dimethyl-**						
	CH_3CN/ MeOH (96:4)	3.1×10^5			PL/Ld-2	S = HP.	92F402

TABLE 15. Rate constants for the interaction of singlet oxygen with oximes, hydrazones, nitrones, nitroso compounds and *N*-oxides. — Continued

No.	Solvent	k (L mol^{-1} s^{-1})	β (k_d/k) (mol L^{-1})	T (K)	Method	Comment	Ref.
15.55	**1-Pyrrolidinyloxy, 2-(4-fluoro-3-nitrophenyl)-2,5,5-trimethyl-**						
	CH_3CN/ MeOH (96:4)	1.7×10^5			PL/Ld-2	S = HP.	92F402
15.56	**1-Pyrrolinyl-1-oxy, 5,5-dimethyl-**						
	H_2O	1.8×10^7			CP/Ac-23	S = MB; Q = N_3^-; used $k_d = 5 \times 10^5$ s^{-1}, $k_Q = 1.5 \times 10^9$ L mol^{-1} s^{-1}.	80A339

TABLE 16. Rate constants for the interaction of singlet oxygen with some compounds of biological interest.

No.	Solvent	k ($L\ mol^{-1}\ s^{-1}$)	β (k_d/k) ($mol\ L^{-1}$)	T (K)	Method	Comment	Ref.
16.1	**Adenosine**						
	D_2O pH = ~7	$<2 \times 10^5$		293	PL/Ld-2	S = H_2TPPS^{4-}; No reaction at [A] = 2×10^{-2} mol L^{-1}.	86A198
	H_2O pH = 7.1	$\leq 1 \times 10^6$		298	CP/Oc-19	S = Phenosafranine; No measurable effect.	78A360
16.2	**Adenosine 5′-monophosphate**						
	D_2O pH = ~7	4.3×10^4		293	PL/Ld-2	S = H_2TPPS^{4-}.	86A198
16.3	**Adenosine triphosphate**						
	D_2O	4×10^4			PL/Ld-2	S = RF, H_2TPPS^{4-}, or Chl in Triton X-100 micelles.	86F149
16.4	**4-Androsten-3-one, 17-hydroxy-4-methyl-**						
			$>2 \times 10^2$		CP/Ac-18	S = Poly-RB or RB or MB; A′ = Linalool; used $\beta_{A'} = 0.18$ mol L^{-1}; solvent is CH_2Cl_2 or MeOH or C_6H_6.	80F111
16.5	**Androst-5-en-17-one, 3-(acetyloxy)- (3β)**						
	C_6H_6/ C_5H_5N (91:9)		6.3	293	CP/Oc-14	S = HP.	57F008
16.6	**Ascorbate ion**						
	C_5H_5N	1.1×10^7		303	CR/A′c-23	A′ = DMA; used $k_d = 3.1 \times 10^4\ s^{-1}$, $k_{A'} = 2.1 \times 10^7\ L\ mol^{-1}\ s^{-1}$; $^1O_2$* from $MNPO_2$.	83F407
	C_5H_5N	8.4×10^6		303	CP/A′c-23	S = TPP; A′ = DMA; used $k_d = 3.1 \times 10^4\ s^{-1}$, $k_{A'} = 2.1 \times 10^7\ L\ mol^{-1}\ s^{-1}$.	83F407
	C_5H_5N	7×10^7			PL/Ld-2	S = TPP, MPDEE or PdMP.	80A398
	CD_3OD	1.5×10^8		293	PL/Ld-2	S = HP.	90F411
	CH_3COCH_3	9×10^5			PL/Ld-2	S = TPP, MPDEE or PdMP.	80A398
	D_2O pH = ~7	1.6×10^8		293	PL/Ld-2	S = H_2TPPS^{4-}.	86A198
	D_2O	4×10^7			PL/Ld-2	S = RF, water-sol. TPP derivs., or Chl a in micelles contg. Triton X-100; counter ion Na^+.	86F149
	D_2O pD = 7.2	2.5×10^6			CP/LI-12	S = Chrysenesulfonate ion; used $k_d = 1.8 \times 10^4\ s^{-1}$.	83A205
	H_2O pH = 6.8	8.3×10^6			CP/LI-12	S = Chrysenesulfonate ion; used $k_d = 2.6 \times 10^5\ s^{-1}$.	83A205
	MeOH		0.012	293	CP/Oc-15	S = RB; $E_a = 6.3$ kJ mol^{-1}.	68F288
16.7	**Azirino[2′,3′:3,4]pyrrolo[1,2-*a*]indole-4,7-dione, 6-amino-8-[[(aminocarbonyl)oxy]methyl]-1,1a,2,8,8a,8b-hexahydro-8a-methoxy-5-methyl- (Mitomycin C)**						
	H_2O	8.9×10^9		297	CP/Ac-14	S = RF; used $k_d = 5.0 \times 10^5\ s^{-1}$.	79F816
16.8	**Benzo[*e*]naphtho[2′,3′:5,6]fluoreno[1,9*ab*]oxepin-5,10,19-trione, 5*c*,8,8*a*,16-tetrahydro-1,8,11,15,18-pentahydroxy-13-methyl- (Rubellin A)**						
	CD_3OD	$\leq 8 \times 10^6$			CP/LI-12	S = RB; used $k_d = 4.2 \times 10^3\ s^{-1}$.	92F063
16.9	**Benzo[*ghi*]perylene-4,11-dione, 1-acetyl-1,2-dihydro-5,10-dihydroxy-2-(1-hydroxyethyl)-3,7,8,12-tetramethoxy- (Elsinochrome B)**						
	CD_3OD	$\leq 5.5 \times 10^6$			CP/LI-12	S = RB; used $k_d = 4.2 \times 10^3\ s^{-1}$.	92F063
16.10	**Benzo[*ghi*]perylene-4,11-dione, 1,2-diacetyl-1,2-dihydro-5,10-dihydroxy-3,7,8,12-tetramethoxy-, *trans*- (Elsinochrome A)**						
	CD_3OD	$\leq 5 \times 10^6$			CP/LI-12	S = RB; used $k_d = 4.2 \times 10^3\ s^{-1}$.	92F063
16.11	**Benzopyran-6-ol, 3,4-dihydro-2,5,7,8-tetramethyl-2-(4,8,12-trimethyltridecyl)-, acetate (α-Tocopheryl acetate)**						
	C_5H_5N	$\leq 1.6 \times 10^6$			CP/A′c-23	S = A′ = Rub; used $k_d = 6.0 \times 10^4\ s^{-1}$, $k_{A'} = 4 \times 10^7\ L\ mol^{-1}\ s^{-1}$.	743112

TABLE 16. Rate constants for the interaction of singlet oxygen with some compounds of biological interest. — Continued

No.	Solvent	k ($L\ mol^{-1}\ s^{-1}$)	β (k_d/k) ($mol\ L^{-1}$)	T (K)	Method	Comment	Ref.
16.12	**1,4-Benzoquinone**						
	C_6H_6/ EtOH (67:33)	1.6×10^7			CP/A'c-19	S = RB; A' = Chl a; used $k_d = 1 \times 10^5\ s^{-1}$.	78F404
	EtOH	3.4×10^7			CP/A'c-19	S = RB; A' = Chl a; used $k_d = 1 \times 10^5\ s^{-1}$.	78F404
16.13	**1,4-Benzoquinone, methyl-**						
	$C_6H_5CH_3$	$\ll 10^4$			PL/Ld-2	S = TPP.	93Y025
16.14	**Cholesterol**						
	C_5H_5N		0.89	293	CP/Oc-14	S = HP.	57F008
	C_6D_6	5.7×10^4			PL/Ld-2	S = TPP.	89A331
	MeOH/ H_2O (95:5)	2.5×10^8		310	CR/LI-12	used $k_d = 1.8 \times 10^5\ s^{-1}$; soln. cont. 0.05 mol L^{-1} MeONa and 5×10^{-4} mol L^{-1} $CoCl_2$, $^1O_2$* from autoxidation of oxytetracycline.	92M228
16.15	**Cholesteryl benzoate**						
	C_6H_6/ C_5H_5N (91:9)		4.0	293	CP/Oc-14	S = HP.	57F008
16.16	**Cobrynic acid, bis(cyano)-7-de(carboxymethyl)-7,8-didehydro-, hexamethyl ester**						
	C_6D_6	8×10^6		293	CP/Ac-14	S = A; k_d not given.	83F222
	$CHCl_3$	5×10^6		293	CP/Ac-14	S = A; k_d not given.	83F222
	MeOH	6×10^6		293	CP/Ac-14	S = A; used $k_d = 1 \times 10^5\ s^{-1}$.	83F222
16.17	**Coenzyme A**						
	$CHCl_3$/ EtOH (50:50)	8.9×10^7 1.2×10^6 (k_r)		310	CR/LI,Ac-12,14	used $k_d = 1 \times 10^5\ s^{-1}$; $^1O_2$* from $NDPO_2$.	90E622
16.18	**Cytidine**						
	H_2O pH = 7.1	$\leq 1 \times 10^6$		298	CP/Oc-19	S = Phenosafranine; No measurable effect.	78A360
16.19	**Cytidine 5'-monophosphate**						
	D_2O pH = ~7	2.8×10^4		293	PL/Ld-2	S = H_2TPPS^{4-}.	86A198
16.20	**Cytosine**						
	D_2O pH = ~7	$<8 \times 10^4$		293	PL/Ld-2	S = H_2TPPS^{4-}; No reaction at [A] = 5×10^{-2} mol L^{-1}.	86A198
	DMSO/ H_2O (75:25)	6.8×10^4		298	CP/A'c-16	S = MB; A' = DPBF; used $k_d = 1.2 \times 10^5\ s^{-1}$.	86R210
16.21	**2'-Deoxyadenosine 5'-monophosphate**						
	H_2O pH = 7.0, 10.5	$<10^5$			PL/Ld-2	S = RB.	87A043
	D_2O pH = ~7	7.5×10^4		293	PL/Ld-2	S = H_2TPPS^{4-}.	86A198
16.22	**2'-Deoxycytidine-5'-monophosphate**						
	H_2O pH = 7.0, 10.5	$<10^5$			PL/Ld-2	S = RB.	87A043
16.23	**2'-Deoxyguanosine 5'-monophosphate**						
	D_2O pH = ~7	5×10^6		293	PL/Ld-2	S = H_2TPPS^{4-}.	86A198
	H_2O				PL/Ld-2	S = RB.	87A043
	pH = 7.0	5.3×10^6					
	pH = 10.5	5.7×10^7					

TABLE 16. Rate constants for the interaction of singlet oxygen with some compounds of biological interest. — Continued

No.	Solvent	k ($L\ mol^{-1}\ s^{-1}$)	β (k_d/k) ($mol\ L^{-1}$)	T (K)	Method	Comment	Ref.
16.24	**Deoxyribonucleic acid (DNA)**						
	D_2O pH = 7	7×10^5			PL/Ld-2	S = AlCl(tspc).	89R092
	H_2O				PL/Ld-2	S = RB.	87A043
	pH = 7.0	5.1×10^5					
	pH = 10.5	2.3×10^6					
16.25	**3′-Deoxythymidine 5′-monophosphate**						
	D_2O pH = ~7	1.4×10^5		293	PL/Ld-2	S = H_2TPPS^{4-}.	86A198
16.26	**Ergosterol**						
	C_5H_5N		4.5×10^{-3}	293	CP/Oc-14	S = HP.	57F008
	C_6H_6	2.1×10^7			PL/Ld-2	S = TPP.	87E055
16.27	**Ergosterol acetate**						
	$CHCl_3$	2.7×10^7			CP/A′c-33	S = A′ = Rub; used $k_d = 1.7 \times 10^4\ s^{-1}$, $k_{A'} = 5.3 \times 10^7\ L\ mol^{-1}\ s^{-1}$.	81F445
16.28	**1,3,5(10),8-Estratetraen-17-one, 3-methoxy-**						
	MeOH	1.6×10^7 (k_r)	9.2×10^{-3} (β_r)		CP/Ac-14	S = RB; used $k_d = 1.4 \times 10^5\ s^{-1}$.	91F405
16.29	**1,3,5(10),9(11)-Estratetraen-17-one, 3-(acetyloxy)-**						
	MeOH	5.5×10^5 (k_r)		273	CP/Ac-17	S = RB; A′ = 3-Methoxy-1,3,5(10),9(11)-estratetraen-17-one; used $k_r^{A'} = 4.3 \times 10^6$ L $mol^{-1}\ s^{-1}$; meas. $k_r/k_r^{A'} = 0.13$.	89A202
16.30	**1,3,5(10),9(11)-Estratetraen-17-one, 3-(benzoyloxy)-**						
	MeOH	7.5×10^5 (k_r)		273	CP/Ac-17	S = RB; A′ = 3-Methoxy-1,3,5(10),9(11)-estratetraen-17-one; used $k_r^{A'} = 4.3 \times 10^6$ L $mol^{-1}\ s^{-1}$; meas. $k_r/k_r^{A'} = 0.17$.	89A202
16.31	**1,3,5(10),9(11)-Estratetraen-17-one, 3-hydroxy-**						
	MeOH	6.8×10^6 (k_r)		273	CP/Ac-17	S = RB; A′ = 3-Methoxy-1,3,5(10),9(11)-estratetraen-17-one; used $k_r^{A'} = 4.3 \times 10^6$ L $mol^{-1}\ s^{-1}$; meas. $k_r/k_r^{A'} = 1.6$.	89A202
16.32	**1,3,5(10),9(11)-Estratetraen-17-one, 3-methoxy-**						
	MeOH	4.3×10^6 (k_r)	0.033 (β_r)	273	CP/Ac-14	S = RB; used $k_d = 1.4 \times 10^5\ s^{-1}$.	89A202
16.33	**1,3,5(10),9(11)-Estratetraen-17-one, 3-(toluenesulfonyloxy)-**						
	MeOH	2.7×10^5 (k_r)		273	CP/Ac-17	S = RB; A′ = 3-Methoxy-1,3,5(10),9(11)-estratetraen-17-one; used $k_r^{A'} = 4.3 \times 10^6$ L $mol^{-1}\ s^{-1}$; meas. $k_r/k_r^{A'} = 0.06$.	89A202
16.34	**Glucose**						
	D_2O	1.4×10^4			PL/Ld-2	S = RF, water-sol. TPP derivs., or Chl a in micelles contg. Triton X-100.	86F149
16.35	**Guanine**						
	DMSO/ H_2O (75:25)	5.0×10^5		298	CP/A′c-16	S = MB; A′ = DPBF; used $k_d = 1.2 \times 10^5\ s^{-1}$, $k_{A'} = 6.9 \times 10^8\ L\ mol^{-1}\ s^{-1}$.	86R210
16.36	**Guanosine**						
	D_2O pD = 7.4	6.2×10^6		310	CR/LI-12	used $k_d = 1.9 \times 10^4\ s^{-1}$; $^1O_2$* from $NDPO_2$.	91R127
	H_2O pH = 7.1	$\leq 1 \times 10^6$		298	CP/Oc-19	S = Phenosafranine; No measurable effect.	78A360
	H_2O/ MeOH (50:50)	$\leq 1 \times 10^7$			PL/A′d-5	S = MB; A′ = DPBF.	72F516

TABLE 16. Rate constants for the interaction of singlet oxygen with some compounds of biological interest. — Continued

	Solvent	k ($L\ mol^{-1}\ s^{-1}$)	β (k_d/k) ($mol\ L^{-1}$)	T (K)	Method	Comment	Ref.
16.37	**Guanosine, 2′-deoxy-**						
	D_2O pD = 7.4	5.2×10^6		310	CR/LI-12	used $k_d = 1.9 \times 10^4\ s^{-1}$; $^1O_2$* from $NDPO_2$.	91R127
	D_2O pH = ~7	5×10^6		293	PL/Ld-2	S – H_2TPPS^{4-}.	86A198
	H_2O pH = 10				CP/A′c-17	S = MB; A′ = BHMF; meas. $k_r/k_r^{A'} = 0.4$; sensitizer is immobilized on glass beads.	83F166
16.38	**Guanosine 5′-monophosphate**						
	D_2O pH = ~7	5×10^6		293	PL/Ld-2	S = H_2TPPS^{4-}.	86A198
16.39	**Imidazo[1,2-*a*]pyrazin-3-one, 4-methyl-6-[4-[2-[3-carboxy-4-(6-hydroxy-3-xanthenon-9-yl)phenylthiocarbamylethoxy]phenyl]- (FCLA)**						
	H_2O pH = 7.1	8.0×10^7			CL/LI-12	S = RB; used $k_d = 2.4 \times 10^5\ s^{-1}$.	90F502
16.40	**Imidazo[1,2-*a*]pyrazin-3-one, 2-methyl-6-(4-methoxyphenyl)- (MCLA)**						
	H_2O pH = 5.4	2.9×10^9			CL/LI-12	S = RB; used $k_d = 2.4 \times 10^5\ s^{-1}$.	91E570 89E798
16.41	**Imidazo[1,2-*a*]pyrazin-3-one, 2-methyl-6-phenyl- (CLA)**						
	H_2O pH = 7.1	6.3×10^8			CL/LI-12	S = RB; used $k_d = 2.4 \times 10^5\ s^{-1}$.	90F502
16.42	**Inosine diphosphate, ester with 1,4-dihydro-1-β-D-ribofuranosyl-3-pyridinecarboxamide**						
	CH_3CN/ D_2O (80:20)	1.6×10^8			PL/A′d-5	S = 2-ACN; A′ = DPBF.	81A191
	CH_3CN/ D_2O (20:80)	8.8×10^7 (k_r) 7.9×10^7 (k_q)			PL/A′d-5	S = 2-ACN; A′ = DPBF; k_r calcd. from k_A; 56 ± 11% electron transfer giving O_2^-, detd. from buildup of radical anion in soln. contg. (2-20) × 10^{-5} mol L^{-1} 1,4-benzoquinone.	81A191
16.43	**Methyl stearate**						
	C_5H_5N	$\leq 5 \times 10^4$ (k_r)			CP/Ac,A′c-17	S = PP; A′ = Cholesterol; No measurable effect.	743115
16.44	**1,4-Naphthoquinone, 2-methyl-**						
	EtOH	2.4×10^6			CP/A′c-19	S = RB; A′ = Chl a; used $k_d = 1 \times 10^5\ s^{-1}$.	78F404
16.45	**1,8-Naphthyridine-3-carboxylic acid, 1,4-dihydro-1-ethyl-7-methyl-4-oxo- (Nalidixic acid)**						
	D_2O pH = 4.4	$\sim 2.5 \times 10^8$			PL/Ld-12	S = A; used $k_d = 3 \times 10^4\ s^{-1}$; estd. from increased lifetime on decreasing concn.	88R070
16.46	**1,8-Naphthyridine-3-carboxylic acid, 1,4-dihydro-1-ethyl-7-methyl-4-oxo-, anion (Nalidixic acid anion)**						
	D_2O pH = 8.9	$\sim 1 \times 10^8$			PL/Ld-12	S = A; used $k_d = 3 \times 10^4\ s^{-1}$; estd. from increased lifetime on decreasing concn.	88R070
16.47	**Nicotinamide adenine dinucleotide**						
	D_2O	3×10^4			PL/Ld-2	S = RF, water-sol. TPP derivs., or Chl a in micelles contg. Triton X-100.	86F149
	D_2O	$< 5 \times 10^6$			PL/A′d-5	S = 2-ACN; A′ = DPBF.	80R072 81A191
16.48	**Nicotinamide adenine dinucleotide, reduced**						
	CH_3CN/ MeOH (75:25)	7.5×10^7			PL/A′d-5	S = 2-ACN; A′ = DPBF.	81A191
	CH_3CN/ D_2O (20:80)	4.3×10^7 (k_r) 3.6×10^7 (k_q)			PL/A′d-5	S = 2-ACN; A′ = DPBF; k_r calcd. from k_A; 54.5 ± 15% electron transfer giving O_2^-, detd. from buildup of radical anion in soln. contg. (2-20) × 10^{-5} mol L^{-1} 1,4-benzoquinone.	81A191

TABLE 16. Rate constants for the interaction of singlet oxygen with some compounds of biological interest. — Continued

No.	Solvent	k ($L\ mol^{-1}\ s^{-1}$)	β (k_d/k) ($mol\ L^{-1}$)	T (K)	Method	Comment	Ref.
16.48	**Nicotinamide adenine dinucleotide, reduced** — Continued						
	D_2O	2×10^7			PL/Ld-2	S = RF, water-sol. TPP derivs., or Chl a in micelles contg. Triton X-100.	86F149
	D_2O (mic)	7.9×10^7			PL/A'd-5	S = 2-ACN; A' = DPBF; 0.1 mol L^{-1} SDS.	80R072 81A191
	H_2O pH = 7.4	$\sim 2 \times 10^9$			CP/Oc-19	S = FMN; Q = N_3^-; used $k_Q = 2 \times 10^9$ L mol^{-1} s^{-1}.	81A422
16.49	**Nicotinamide adenine dinucleotide phosphate**						
	D_2O	2×10^5			PL/Ld-2	S = RF, H_2TPPS^{4-}, or Chl in Triton X-100 micelles.	86F149
16.50	**Nicotinamide-adenine dinucleotide phosphate, reduced**						
	CH_3CN/D_2O (80:20)	1.3×10^8			PL/A'd-5	S = 2-ACN; A' = DPBF.	81A191
	CH_3CN/D_2O (20:80)	8.4×10^7 (k_r) 5.0×10^7 (k_q)			PL/A'd-5	S = 2-ACN; A' = DPBF; k_r calcd. from k_A; 63 ± 9% electron transfer giving O_2^-, detd. from buildup of radical anion in soln. contg. (2-20) × 10^{-5} mol L^{-1} 1,4-benzoquinone.	81A191
16.51	**Nicotinamide mononucleotide, reduced**						
	CH_3CN/D_2O (80:20)	8.0×10^7			PL/A'd-5	S = 2-ACN; A' = DPBF.	81A191
16.52	**Ommochrome**						
	D_2O pD = 7.5-8.1	3×10^6			PL/Ld-2	S = ?; rate is per monomer unit of MW = 600; ommochromes extracted from shrimp eyes contain pigments of the ommin group, e.g. phenothiazine-phenoxazine structures with 3-amino-3-carboxy-1-oxopropyl side chains.	87R227
16.53	**3,10-Perylenedione, 4,9-dihydroxy-1,12-bis(2-hydroxypropyl)-2,6,7,11-tetramethoxy- (Phleichrome)**						
	CD_3OD	$\leq 6 \times 10^6$			CP/LI-12	S = RB; used $k_d = 4.2 \times 10^3\ s^{-1}$.	92F063
16.54	**Perylo[1,12-*def*]-1,3-dioxepin-5,11-dione, 6-amino-12-hydroxy-8,9-bis(2-hydroxypropyl)-7,10-dimethoxy- (Aminocercosporin)**						
	CD_3OD	$\leq 3 \times 10^6$			CP/LI-12	S = RB; used $k_d = 4.2 \times 10^3\ s^{-1}$.	92F063
16.55	**Perylo[1,12-*def*]-1,3-dioxepin-5,11-dione, 6,12-dihydroxy-8,9-bis(2-hydroxypropyl)-7,10-dimethoxy- (Cercosporin)**						
	CD_3OD	3.5×10^6			CP/LI-12	S = RB; used $k_d = 4.2 \times 10^3\ s^{-1}$.	92F063
16.56	**Perylo[1,12-*def*]-1,3-dioxepin-5,12-dione, 6,11-diamino-8,9-bis(2-hydroxypropyl)-7,10-dimethoxy-**						
	CD_3OD	3.6×10^6			CP/LI-12	S = RB; used $k_d = 4.2 \times 10^3\ s^{-1}$.	92F063
16.57	**Perylo[1,12-*def*]-1,3-dioxepin-6,11-dione, 8,9-bis(2-hydroxypropyl)-5,7,10,12-tetramethoxy-**						
	CD_3OD	1.1×10^7			CP/LI-12	S = RB; used $k_d = 4.2 \times 10^3\ s^{-1}$.	92F063
16.58	**Perylo[1,12-*def*]-1,3-dioxepin-6,11-dione, 5-hydroxy-8,9-bis(2-hydroxypropyl)-7,10,12-trimethoxy-**						
	CD_3OD	$\leq 10^7$			CP/LI-12	S = RB; used $k_d = 4.2 \times 10^3\ s^{-1}$.	92F063
16.59	**Phenanthro[1,10,9,8-*opqra*]perylene-7,14-dione, 1,3,4,6,8,13-hexahydroxy-10,11-dialkyl-**						
	CH_3CN	2.0×10^{10}			PL/Ld-2	S = Riboflavine tetrabutyrate; Red pigment extracted form *Blepharima japonicum*; on irradiation red form converts to blue form which reacts with $^1O_2$* with $k = 4.4 \times 10^{10}$ L mol^{-1} s^{-1}; k probably overestimated due to impurities in the crude extracts.	92R107
16.60	**Phenanthro[1,10,9,8-*opqra*]perylene-7,14-dione, 1,3,4,6,8,13-hexahydroxy-10,11-dimethyl- (Hypericin, HYP)**						
	EtOH	5.0×10^9			PL/Ld-2	S = Riboflavine tetrabutyrate.	92R107

TABLE 16. Rate constants for the interaction of singlet oxygen with some compounds of biological interest. — Continued

No.	Solvent	k (L mol^{-1} s^{-1})	β (k_d/k) (mol L^{-1})	T (K)	Method	Comment	Ref.
16.61	**Pregna-5,16-dien-20-one, 3-(acetyloxy)- (3β)**						
	C_6H_6/ C_5H_5N (91:9)		4.7	293	CP/Oc-14	S = HP.	57F008
16.62	**Pregn-5-en-20-one, 3-hydroxy-, (3β)**						
	C_5H_5N		1.7	293	CP/Oc-15	S = HP.	587002
	C_6H_6/ C_5H_5N (60:40)		1.8	293	CP/Oc-15	S = HP.	587002
	C_6H_6/ C_5H_5N (71:29)		1.8	293	CP/Oc-14	S = HP.	57F008
16.63	**Purine, 6-amino- (Adenine)**						
	D_2O pH = ~7	$<4 \times 10^5$		293	PL/Ld-2	S = H_2TPPS^{4-}; No reaction at [A] = 9×10^{-3} mol L^{-1}.	86A198
	DMSO/ H_2O (75:25)	7.2×10^4		298	CP/A′c-16	S = MB; A′ = DPBF; used $k_d = 1.2 \times 10^5$ s^{-1}, $k_{A'} = 6.9 \times 10^8$ L mol^{-1} s^{-1}.	86R210
	H_2O pH = 7.1	$\leq 1 \times 10^6$		298	CP/Oc-19	S = Phenosafranine; No measurable effect.	78A360
16.64	**Purin-2,6,8-trione, 7,9-dihydro-, anion (Urate ion)**						
	D_2O pD = 7.4	3.6×10^8		298	PL/Ld-2	S = H_2TMpyP^{4+}.	90R134
	H_2O pH = 7.0			283	CP/A′c-17	S = RB; A′ = BHMF; meas. $k_r/k_r^{A'} = 1.0$; sensitizer immobilized on glass beads.	88R064
	H_2O pH = 7.0			283	CP/A′c-17	S = RB; A′ = BHMF; meas. $k_r/k_r^{A'} = 0.50$.	88R064
16.65	**2-Pyrimidinamine, *N,N*,4,5-tetramethyl-6-(phenylmethoxy)-**						
	$CHCl_3$	9.0×10^6			CP/A′c-33	S = A′ = Rub; used $k_d = 1.7 \times 10^4$ s^{-1}, $k_{A'} = 5.3 \times 10^7$ L mol^{-1} s^{-1}.	81A363
16.66	**Pyrimidin-4-ol, 5-butyl-2-(dimethylamino)-6-methyl- (Dimethirimol)**						
	$CHCl_3$	5.5×10^6			CP/A′c-33	S = A′ = Rub; used $k_d = 1.7 \times 10^4$ s^{-1}, $k_{A'} = 5.3 \times 10^7$ L mol^{-1} s^{-1}.	81A363
16.67	**Pyrimidin-4-ol, 5-butyl-2-(ethylamino)-6-methyl- (Ethirimol)**						
	$CHCl_3$	2.3×10^6			CP/A′c-33	S = A′ = Rub; used $k_d = 1.7 \times 10^4$ s^{-1}, $k_{A'} = 5.3 \times 10^7$ L mol^{-1} s^{-1}.	81A363
16.68	**Pyrimidin-4-ol, 2-(diethylamino)-6-methyl-**						
	$CHCl_3$	7.0×10^5			CP/A′c-33	S = A′ = Rub; used $k_d = 1.7 \times 10^4$ s^{-1}, $k_{A'} = 5.3 \times 10^7$ L mol^{-1} s^{-1}.	81A363
16.69	**Pyrimidin-4-ol, 2-(dimethylamino)-5,6-dimethyl-**						
	$CHCl_3$	1.2×10^7			CP/A′c-33	S = A′ = Rub; used $k_d = 1.7 \times 10^4$ s^{-1}, $k_{A'} = 5.3 \times 10^7$ L mol^{-1} s^{-1}.	81A363
	H_2O				CP/Oc-15	S = RB; used $k_d = 5 \times 10^5$ s^{-1}.	83A315
	pH = 4.0	4.4×10^7					
	pH = 7.0	8×10^7					
	pH = 9.0	1.4×10^8					
	H_2O	9.0×10^7		296	CP/Oc-15	S = RB; used $k_d = 5 \times 10^5$ s^{-1}; $\Delta S^{\ddagger} = 150.5$ J K^{-1} mol^{-1}; $E_a = 71.9$ kJ mol^{-1}; studied at 279-296 K.	83A315
16.70	**Pyrimidin-4-ol, 2-(dimethylamino)-6-methyl-**						
	$CHCl_3$	1.0×10^6			CP/A′c-33	S = A′ = Rub; used $k_d = 1.7 \times 10^4$ s^{-1}, $k_{A'} = 5.3 \times 10^7$ L mol^{-1} s^{-1}.	81A363

TABLE 16. Rate constants for the interaction of singlet oxygen with some compounds of biological interest. — Continued

No.	Solvent	k ($L\ mol^{-1}\ s^{-1}$)	β (k_d/k), ($mol\ L^{-1}$)	T (K)	Method	Comment	Ref.
16.71	**Rhodopsin**						
	H_2O pH = 8	1.1×10^9			CP/Pa-15	S = Ret; used $k_d = 3.5 \times 10^5\ s^{-1}$; membrane suspension; sulfur radicals obs. by esr.	85A443
16.72	**Riboflavine**						
	MeOD	6.0×10^7			PL/Ld-2	S = A.	88A165
16.73	**Sitosteryl acetate**						
	C_6H_6/ C_5H_5N (91:9)		6.5	293	CP/Oc-14	S = HP.	57F008
16.74	**Stigmasteryl acetate**						
	C_6H_6/ C_5H_5N (91:9)		4.1	293	CP/Oc-14	S = HP.	57F008
16.75	**Sucrose**						
	D_2O	3×10^4			PL/Ld-2	S = RF, water-sol. TPP derivs., or Chl a in micelles contg. Triton X-100.	86F149
16.76	**4-Thiouridine**						
	D_2O pH = ~7	1.2×10^6		293	PL/Ld-2	S = H_2TPPS^{4-}.	86A198
16.77	**Thymidine**						
	D_2O pH = ~7	3×10^4		293	PL/Ld-2	S = H_2TPPS^{4-}.	86A198
16.78	**Thymidine 5′-monophosphate**						
	H_2O pH = 7.0, 10.5	$<10^5$			PL/Ld-2	S = RB.	87A043
16.79	**Thymine**						
	D_2O pH = ~7	$<1.6 \times 10^5$		293	PL/Ld-2	S = H_2TPPS^{4-}; No reaction at [A] = 2.5×10^{-2} mol L^{-1}.	86A198
	DMSO/ H_2O (75:25)	2.5×10^4		298	CP/A′c-16	S = MB; A′ = DPBF; used $k_d = 1.2 \times 10^5\ s^{-1}$.	86R210
	H_2O pH = 7.1	$\leq 1 \times 10^6$		298	CP/Oc-19	S = Phenosafranine; No measurable effect.	78A360
16.80	**Uridine**						
	D_2O pH = ~7	5×10^4		293	PL/Ld-2	S = H_2TPPS^{4-}.	86A198

TABLE 17. Rate constants for the interaction of singlet oxygen with miscellaneous substrates.

No.	Solvent	k ($L\ mol^{-1}\ s^{-1}$)	β (k_d/k) ($mol\ L^{-1}$)	T (K)	Method	Comment	Ref.
17.1	**Acetic acid**						
	CCl_4	2.3×10^3			MP/LI-12	S = TPP; used $k_d = 42\ s^{-1}$.	83E425 83F151
17.2	**Acetone**						
	CCl_4	1.9×10^3		298	CP/LI-12	S = Benz[*de*]anthracen-7-one, phenalenone or fluorenone; used $k_d = 32\ s^{-1}$.	82E329
17.3	**Acetone-d_6**						
	CCl_4	95		298	CP/LI-12	S = Benz[*de*]anthracen-7-one, phenalenone or fluorenone; used $k_d = 32\ s^{-1}$.	82E329
17.4	**Acetonitrile**						
	CCl_4	9×10^2		298	CP/LI-12	S = Benz[*de*]anthracen-7-one, phenalenone or fluorenone; used $k_d = 32\ s^{-1}$.	82E329
17.5	**Acetonitrile-d_3**						
	CCl_4	55		298	CP/LI-12	S = Benz[*de*]anthracen-7-one, phenalenone or fluorenone; used $k_d = 32\ s^{-1}$.	82E329
17.6	**Butanoic acid**						
	C_6D_6	3.7×10^3			PL/Ld-2	S = TPP.	89A331
17.7	**Butanoic acid, 3,3-dimethyl-2-oxo-**						
	MeOH	$\sim 1 \times 10^6$			PL/A'd-5	S = MB; A' = DPBF.	79A386
17.8	**1-Butanol**						
	CCl_4	2×10^3			PL/A'd-8	S = MB; A' = DPBF.	76F903
17.9	**Chloroform**						
	CCl_4	5×10^2		298	CP/LI-12	S = Benz[*de*]anthracen-7-one, phenalenone or fluorenone; used $k_d = 32\ s^{-1}$.	82E329
17.10	**Chloroform-*d***						
	CCl_4	22		298	CP/LI-12	S = Benz[*de*]anthracen-7-one, phenalenone or fluorenone; used $k_d = 32\ s^{-1}$.	82E329
17.11	**2,5-Cyclohexadien-4-one, 1,2-ethanediylidenebis[3-[2-hydroxy-5-methyl-3-(1,1-dimethylethyl)benzyl]-5-(1,1-dimethylethyl)]-**						
	CH_2Cl_2	8.2×10^9		303	CP/Oc-23	S = MB; A' = TME; used $k_d = 1.2 \times 10^4\ s^{-1}$, $k_{A'} = 3.0 \times 10^7\ L\ mol^{-1}\ s^{-1}$; k calcd. in [81Z251].	76F921
17.12	**2,5-Cyclohexadien-4-one, 4,4'-(1,2-ethanediylidene)bis[2,6-bis(1,1-dimethylethyl)-**						
	CH_2Cl_2	5.4×10^9		303	CP/Oc-23	S = MB; A' = Rub; used $k_d = 1.2 \times 10^4\ s^{-1}$, $k_{A'} = 5.3 \times 10^7\ L\ mol^{-1}\ s^{-1}$; k calcd. in [81Z251].	76F921
	CH_2Cl_2	2.3×10^9		303	CP/Oc-23	S = MB; A' = CHD; used $k_d = 1.2 \times 10^4\ s^{-1}$, $k_{A'} = 3.5 \times 10^6\ L\ mol^{-1}\ s^{-1}$; k calcd. in [81Z251].	76F921
	CH_2Cl_2	4.3×10^9		303	CP/Oc-23	S = MB; A' = TME; used $k_d = 1.2 \times 10^4\ s^{-1}$, $k_{A'} = 4.0 \times 10^7\ L\ mol^{-1}\ s^{-1}$; k calcd. in [81Z251].	76F921
17.13	**Cyclohexane**						
	CCl_4	6.4×10^3		298	CP/LI-12	S = Benz[*de*]anthracen-7-one, phenalenone or fluorenone; used $k_d = 32\ s^{-1}$.	82E329
17.14	**Cyclohexane-d_{12}**						
	CCl_4	3.4×10^2		298	CP/LI-12	S = Benz[*de*]anthracen-7-one, phenalenone or fluorenone; used $k_d = 32\ s^{-1}$.	82E329
17.15	**1,3-Cyclohexanedione, 5,5-dimethyl-**						
	D_2O pD = 11.2	9×10^7		310	CR/A'c-32	A' = DPBF; used $k_d = 1.5 \times 10^4\ s^{-1}$; $^1O_2$* from Dopamine/H_2O_2.	89M038

TABLE 17. Rate constants for the interaction of singlet oxygen with miscellaneous substrates. — Continued

No.	Solvent	k ($L\ mol^{-1}\ s^{-1}$)	β (k_d/k) ($mol\ L^{-1}$)	T (K)	Method	Comment	Ref.
17.15	**1,3-Cyclohexanedione, 5,5-dimethyl-** — Continued						
	D_2O pD = 11.2	1.2×10^8		310	CR/A'c-32	A' = DPBF; used $k_d = 1.5 \times 10^4\ s^{-1}$; $^1O_2$* from DOPA/H_2O_2.	89M038
17.16	**Dichloromethane**						
	CCl_4	1.1×10^3		298	CP/LI-12	S = Benz[*de*]anthracen-7-one, phenalenone or fluorenone; used $k_d = 32\ s^{-1}$.	82E329
17.17	**Dichloromethane-d_2**						
	CCl_4	5.3×10^2		298	CP/LI-12	S = Benz[*de*]anthracen-7-one, phenalenone or fluorenone; used $k_d = 32\ s^{-1}$.	82E329
17.18	**1,1-Dimethylethyl methyl ether**						
	CD_3OD	4.1×10^3			CP/LI-12	S = RB; used $k_d = 4.0 \times 10^3\ s^{-1}$.	92A386
	$(CH_3)_3COCH_3$	4.1×10^3			PL/Ld-2	S = TPP.	92A386
17.19	**2,2-Dimethylpropyl methyl ether**						
	CD_3OD	4.9×10^3			CP/LI-12	S = RB; used $k_d = 4.0 \times 10^3\ s^{-1}$.	92A386
	$(CH_3)_3CCH_2OCH_3$	2.9×10^3			PL/Ld-2	S = TPP.	92A386
17.20	**1,4-Dioxane**						
	CCl_4	7×10^2			PL/A'd-8	S = MB; A' = DPBF.	76F903
17.21	**Disilirane, 1,1,2,2-tetrakis(2,4,6-trimethylphenyl)-**						
	C_6H_6	6.4×10^4			CP/LI-12	S = TPP; k_d not given.	93F160
17.22	**Docosanoic acid (Behenic acid)**						
	CCl_4	1.1×10^4			MP/LI-12	S = TPP; used $k_d = 42\ s^{-1}$.	83E425 83F151
17.23	**Dodecane**						
	CCl_4	1.1×10^4 (k_q)			MP/LI-12	S = TPP; used $k_d = 39\ s^{-1}$.	83E813
17.24	**Dodecanoic acid**						
	CCl_4	6.1×10^3			MP/LI-12	S = TPP; used $k_d = 42\ s^{-1}$.	83E425 83F151
17.25	**Dodecyl sulfate, sodium salt**						
	H_2O (mic)	1.0×10^9		313	CP/A'c-23	S = Py; A' = DPBF; Q = NaN_3; used $k_d = 5.0 \times 10^5\ s^{-1}$; S and A' solubilized in SDS micelles.	78A174
17.26	**Dodecyltrimethylammonium chloride**						
	H_2O (mic)	1.7×10^8		313	CP/A'c-23	S = Py; A' = DPBF; Q = NaN_3; used $k_d = 5.0 \times 10^5\ s^{-1}$; S and A' solubilized in DTAC micelles.	78A174
17.27	**Eicosanoic acid (Arachidic acid)**						
	C_6D_6	1.2×10^4			PL/Ld-2	S = TPP.	89A331
	CCl_4	1.0×10^4			MP/LI-12	S = TPP; used $k_d = 42\ s^{-1}$.	83E425 83F151
17.28	**Ethane, iodo-**						
	C_6H_5Br/ CH_3COCH_3 (67:33)	$\leq 10^6$			CP/A'c-23	S = A' = Rub; No measurable effect.	767126
	C_6H_5Br/ MeOH (67:33)	$\leq 10^6$			CP/A'c-23	S = A' = Rub; No measurable effect.	767126
	C_6H_6	2×10^4			PL/A'd-8	S = An; A' = DPBF.	76F902

TABLE 17. Rate constants for the interaction of singlet oxygen with miscellaneous substrates. — Continued

No.	Solvent	k (L mol^{-1} s^{-1})	β (k_d/k) (mol L^{-1})	T (K)	Method	Comment	Ref.
17.29	**Ethanol**						
	CCl_4	2×10^3			PL/A'd-8	S = MB; A' = DPBF.	76F903
17.30	**Ethylene-propylene-ethylidenenorbornene terpolymer**						
	c-C_6H_{12}	3.6×10^4 (k_r)		298	CP/Ac-17	S = A' = DPBF; used $k_r^{A'} = 5.4 \times 10^8$ L mol^{-1} s^{-1}; [A] = 5 g/L, assuming that reaction is only at the ethylidenenorbornene groups, $k = 8.8 \times 10^7$.	84P629
17.31	**Formamide, *N,N*-dimethyl-**						
	EtOH	3.0×10^2 (k_r)			CP/Pa-19	S = RB; used $k_d = 8.3 \times 10^4$ s^{-1}; used k_q/k_r (not reported); k_r derived assuming a singlet oxygen mechanism.	75F655
17.32	**Fullerene-C_{60}**						
	C_6D_6	5×10^5			PL/Ld-2	S = TPP.	91E003
	CCl_4	6.1×10^4			PL/Ld-2	S = A.	93E091
17.33	**Fullerene-C_{70}**						
	C_6F_6	3×10^6			PL/Ld-2	S = A.	93E301
17.34	**Heptane**						
	CCl_4/ MeOH (96:4)	4×10^2			PL/A'd-8	S = MB; A' = DPBF.	777162
17.35	**Heptane, 3-methyl -**						
	CCl_4/ MeOH (96:4)	6×10^2			PL/A'd-8	S = MB; A' = DPBF.	777162
17.36	**Heptane, 4-methyl -**						
	CCl_4/ MeOH (96:4)	5×10^2			PL/A'd-8	S = MB; A' = DPBF.	777162
17.37	**Hexadecanoic acid**						
	C_6D_6	1.2×10^4			PL/Ld-2	S = TPP.	89A331
	CCl_4	8.0×10^3			MP/LI-12	S = TPP; used $k_d = 42$ s^{-1}.	83E425 83F151
17.38	**Hexanoic acid**						
	C_6D_6	5.6×10^3			PL/Ld-2	S = TPP.	89A331
	CCl_4	3.9×10^3			MP/LI-12	S = TPP; used $k_d = 42$ s^{-1}.	83E425 83F151
17.39	**Malonic acid**						
	D_2O	4×10^4			PL/Ld-2	S = RF, water-sol. TPP derivs., or Chl a in micelles contg. Triton X-100.	86F149
17.40	**Methanol**						
	CCl_4	3×10^3			PL/A'd-8	S = MB; A' = DPBF.	76F903
17.41	**5,8-Methano-[1,2,4]triazolo[1,2-*a*]pyridazine-1,3-dione, tetrahydro-2-methyl-**						
	CH_2Cl_2	4×10^4			PR/A'd-8	S = An; A' = DPBF.	79A457
17.42	**Methyl esters of fatty acids from peanut oil**						
	MeOH/ $CHCl_3$ (80:20)	8×10^4			PL/Ld-2	S = ZnTPP.	91U181
17.43	**Methyl esters of fatty acids from soybean oil**						
	MeOH	1.7×10^5			CP/A'c-33	S = A' = Rub; used $k_d = 1.4 \times 10^5$ s^{-1}, $k_{A'} = 6 \times 10^7$ L mol^{-1} s^{-1}.	91U201
	MeOH/ $CHCl_3$ (80:20)	3.6×10^5			PL/Ld-2	S = ZnTPP.	91U181

TABLE 17. Rate constants for the interaction of singlet oxygen with miscellaneous substrates. — Continued

No.	Solvent	k ($L\ mol^{-1}\ s^{-1}$)	β (k_d/k) · ($mol\ L^{-1}$)	T (K)	Method	Comment	Ref.
17.44	**Methyl esters of fatty acids from sunflower oil**						
	MeOH/ $CHCl_3$ (80:20)	9×10^4			PL/Ld-2	S = ZnTPP.	91U181
17.45	**4-Morpholineethanesulfonic acid (MES)**						
	D_2O	1.6×10^4			PL/Ld-2	S = RF, water-sol. TPP derivs., or Chl a in micelles contg. Triton X-100.	86F149
17.46	**Oxadisilirane, 2,2,3,3-tetrakis(2,6-diethylphenyl)-**						
	C_6H_6	8.4×10^4			CP/LI-12	S = TPP; k_d not given.	93F160 90F241
17.47	**Oxadisilirane, 2,2,3,3-tetrakis(2,6-diisopropylphenyl)-**						
	C_6H_6	7.1×10^4			CP/LI-12	S = TPP; k_d not given.	93F160 90F241
17.48	**Oxalate ion**						
	D_2O	2×10^4			PL/Ld-2	S = RF, water-sol. TPP derivs., or Chl a in micelles contg. Triton X-100; counter ion K^+.	86F149
17.49	**Oxirane, 2,3-diphenyl-, (*E*)-**						
	$ClCF_2CCl_2F$	5.0×10^3			PL/Ld-2	S = DNT.	87A072
17.50	**Pentane**						
	CCl_4	5.9×10^3			MP/LI-12	S = TPP; used $k_d = 39\ s^{-1}$.	83E813
17.51	**Pentanedioic acid, 2-oxo- (α-Ketoglutaric acid)**						
	MeOH	$\sim 3 \times 10^6$			PL/A′d-5	S = MB; A′ = DPBF.	79A386
17.52	**Phosphoric acid, mono(2-aminoethyl) mono(2,3-dihydroxypropyl) ester (Phosphatidylethanolamine)**						
	CCl_4	10^5			MP/LI-12	S = PP; used $k_d = 36\ s^{-1}$.	79F463
17.53	**Phosphoric acid, mono(2-dimethylammonioethyl) mono(2,3-dihydroxypropyl) ester (Phosphatidylcholine, Lecithin)**						
	CCl_4	10^5			MP/LI-12	S = PP; used $k_d = 36\ s^{-1}$.	79F463
	D_2O (ves)	7.4×10^5			CP/Pa-15	S = RB; used $k_d = 1.8 \times 10^4\ s^{-1}$; P = Lecithin hydroperoxide; 0.05% egg yolk lecithin, ave. MW per monomer = 750.	86N104
	H_2O (ves)	7.5×10^5			CP/Pa-15	S = RB; used $k_d = 2.5 \times 10^5\ s^{-1}$; P = Lecithin hydroperoxide; 0.05% egg yolk lecithin.	86N104
17.54	**Phycol-400**						
	D_2O	2.4×10^7			PL/Ld-2	S = RF, water-sol. TPP derivs., or Chl a in micelles contg. Triton X-100.	86F149
17.55	**Polycarbonate**						
	CH_2Cl_2	3.9×10^3			PL/Ld-2	S = An or Ac.	86E884
17.56	**Poly(ethylene glycol)**						
	D_2O	4×10^4			PL/Ld-2	S = RF, water-sol. TPP derivs., or Chl a in micelles contg. Triton X-100.	86F149
17.57	**Poly(methyl methacrylate)**						
	CH_2Cl_2	2.2×10^3			PL/Ld-2	S = An.	86E809
17.58	**Polystyrene**						
	CH_2Cl_2	3.3×10^3			PL/Ld-2	S = An or Ac.	86E884
17.59	**1,3-Propanediol, 2-amino-2-(hydroxymethyl)- (Tris)**						
	D_2O	1.5×10^4			PL/Ld-2	S = RF, water-sol. TPP derivs., or Chl a in micelles contg. Triton X-100.	86F149

TABLE 17. Rate constants for the interaction of singlet oxygen with miscellaneous substrates. — Continued

No.	Solvent	k (L mol^{-1} s^{-1})	β (k_d/k) (mol L^{-1})	T (K)	Method	Comment	Ref.
17.60	**Propanoic acid, 2-oxo-3-phenyl- (Phenylpyruvic acid)**						
	MeOH	$<7 \times 10^6$			PL/A'd-5	S = MB; A' = DPBF.	79A386
17.61	**2-Propanol**						
	CCl_4	2×10^3			PL/A'd-8	S = MB; A' = DPBF.	76F903
17.62	**2-Propanol, 2-methyl- (*tert*-BuOH)**						
	CCl_4	2×10^3			PL/A'd-8	S = MB; A' = DPBF.	76F903
17.63	**Quadricyclane**						
	$CHCl_3$	4.8×10^4			CR/A'c-33	A' = Rub; used $k_d = 1.7 \times 10^4$ s^{-1}, $k_{A'} = 5.3 \times 10^7$ L mol^{-1} s^{-1}; $^1O_2$* from $DMNO_2$.	81E003
17.64	**Singlet oxygen**						
	C_6F_6	2.6×10^7			PL/Ld-2	S = Chr; self-annihilation from high intensity photolysis; M = $^1O_2$*.	87F333
	c-C_6H_{12}	$<4 \times 10^7$			PL/Ld-2	S = Chr; self-annihilation from high intensity photolysis; M = $^1O_2$*.	87F333
	CCl_4	1×10^9			PL/Ld-2	S = PdMPDME; [$^1O_2$*] estd. from sensitizer triplet concn.	79E846
	O_2	2×10^5		77	PL/Ld-2	In liquid $^{18}O_2$ $k = (2 \pm 0.6) \times 10^6$. Emission is monitored at 635 nm.	82E575
17.65	**Soybean oil**						
	CH_2Cl_2	1.4×10^5	0.073	293	CP/Oc-15	S = Chl a; used $k_d = 1.0 \times 10^4$ s^{-1}.	91U026
	CH_2Cl_2	1.0×10^5	0.11	298	CP/Pa-15	S = Chl a; used $k_d = 1.1 \times 10^4$ s^{-1}; measured peroxide formation.	91U180 91U128
17.66	**Stearic acid**						
	C_6D_6	1.2×10^4			PL/Ld-2	S = TPP.	89A331
	CCl_4	9.0×10^3			MP/LI-12	S = TPP; used $k_d = 42$ s^{-1}.	83E425 83F151
17.67	**Tetradecanoic acid (Myristic acid)**						
	C_6D_6	9.9×10^3			PL/Ld-2	S = TPP.	89A331
17.68	**Tetrahydrofuran**						
	CCl_4	2×10^3			PL/A'd-8	S = MB; A' = DPBF.	76F903
17.69	**1,2,4-Triazolobenzo[1,3]cyclopropa[1,2,3-*cd*]cyclopropa[*gh*]pentalene, 1,2,5,6,6a,6b,6c,6d-octahydro-1,6[1',2']-4-methyl-3,5-dioxo-**						
	CH_2Cl_2	1.0×10^5			PR/A'd-8	S = An; A' = DPBF.	79A457
17.70	**1,2,4-Triazolo[1,3]cyclopropa[1,2,3-*cd*]cyclopropa[*gh*]pentalene, 1,2,5,6,6a,6b,6c,6d-octahydro-1,6[1',2']-4-methyl-3,5-dioxo-**						
	CH_2Cl_2	3.4×10^4			PR/A'd-8	S = An; A' = DPBF.	79A457
17.71	**Tributyl phosphite**						
	CH_3COCH_3				CP/Pa,P'a-17	S = RB; A' = $(C_2H_5O)_3P$; meas. $k_r/k_r^{A'} = 0.78$.	747495
17.72	**Tricyclohexyl phosphite**						
	CH_3COCH_3				CP/Pa,P'a-17	S = RB; A' = $(C_2H_5O)_3P$; meas. $k_r/k_r^{A'} = 0.60$.	747495
17.73	**Triethyl phosphite**						
	CH_3COCH_3				CP/Pa,P'a-17	S = MB; A' = $(CH_3O)_3P$; meas. $k_r/k_r^{A'} = 1.5$.	747495
	C_6H_6/ MeOH (80:20)	2.5×10^7			CP/Pa-19	S = RB; A' = Car; k_d and $k_{A'}$ not given.	747495
17.74	**Trimethyl phosphite**						
	C_6H_6	4.7×10^4			PL/Ld-2	S = Ac.	89A099

TABLE 17. Rate constants for the interaction of singlet oxygen with miscellaneous substrates. — Continued

No.	Solvent	k ($L\ mol^{-1}\ s^{-1}$)	β (k_d/k) ($mol\ L^{-1}$)	T (K)	Method	Comment	Ref.
17.74	**Trimethyl phosphite — Continued**						
	C_6H_6/ MeOH (80:20)	1.5×10^7			CP/Pa-19	S = RB; A′ = Car; k_d and $k_{A'}$ not given.	747495
	C_6H_6/ MeOH (80:20)	3.9×10^4			PL/Ld-2	S = Ac.	89A099
	CH_3CN	6.6×10^4			PL/Ld-2	S = Ac.	89A099
	CH_3COCH_3	6.3×10^4			PL/Ld-2	S = Ac.	89A099
	MeOD	2.7×10^4			PL/Ld-2	S = Ac.	89A099
17.75	**Triphenylphosphine**						
	CH_2Cl_2/ MeOH (90:10)	5×10^6			PL/A′d-5	S = MB; A′ = DPBF.	87F655
	$CHCl_3$	8.5×10^6		253	CP/A′c-33	S = A′ = Rub; used $k_d = 1.7 \times 10^4\ s^{-1}$, $k_{A'} = 5.3 \times 10^7\ L\ mol^{-1}\ s^{-1}$.	82N064
	MeOH		6.0×10^{-3}	293	CP/Oc-15	S = MB; $E_a = 5.0\ kJ\ mol^{-1}$.	68F288
	MeOH		5.0×10^{-3}	293	CP/Oc-15	S = RB; $E_a = 5.9\ kJ\ mol^{-1}$.	68F288
17.76	**Undecanoic acid**						
	C_6D_6	9.3×10^3			PL/Ld-2	S = TPP.	89A331
17.77	**Urea**						
	H_2O pH = 7.0			283	CP/A′c-17	S = RB; A′ = BHMF; meas. $k_r/k_r^{A'} = 1.1$.	88R064
17.78	**Urea, allyl-**						
	H_2O pH = 7.1	$<2 \times 10^5$		298	CP/Oc-19	S = Phenosafranine; Q = NaN_3; used $k_Q = 2.0 \times 10^8\ L\ mol^{-1}\ s^{-1}$.	78F020
17.79	**Valeric acid**						
	C_6D_6	4.0×10^3			PL/Ld-2	S = TPP.	89A331

12. References to Tables

517004 Reactions in the liquid phase photochemistry of anthracene. Part 1. The photo-oxidation of anthracenes in solution. Bowen, E.J., *Discuss. Faraday Soc.* : 143-6 (1953)

517004 The photochemistry of anthracenes. Part 3. Inter-relations between fluorescence quenching, dimerization, and photo-oxidation. Bowen, E.J.; Tanner, D.W., *Trans. Faraday Soc.* **51**: 475-81 (1955)

517007 A diffusion-controlled step in chlorophyll-sensitized photochemical autooxidations. Livingston, R.; Owens, K.E., *J. Am. Chem. Soc.* **78**: 3301-5 (1956)

517008 Zur photosensibilisierten Autoxydation der Steroide. Darstellung von Steroid-Hydroperoxyden Mittels Phototoxischer Photosensibilisatoren. Schenck, G.O.; Gollnick, K.; Neumueller, O.A., *Ann. Chem.* **603**: 46-59 (1957)

517002 Zur photosensibilisierten Autoxydation der Steroide. Synthese tertiaerer Steroid-Hydroperoxyde, insbesondere des Δ^6-Allopregnen-3β-ol-20-on-5α-Hydroperoxyds. Schenck, G.O.; Neumueller, O.A., *Ann. Chem.* **618**: 194-201 (1958)

517004 Cinetique et inhibition de reactions photosensibilisees en presence d'oxygene moleculaire. Schenck, G.O.; Gollnick, K., *J. Chim. Phys. Phys.-Chim. Biol.* **55**: 892-8 (1958)

59F003 A further study of the photochemical autooxidation of anthracenes. Livingston, R.; Rao, V.S., *J. Phys. Chem.* **63**: 794-9 (1959)

617008 Photo-oxidation, sensitised by proflavine, of furfuryl alcohol, N-allyl thiourea and histidine. Sluyterman, L.A.E., *Recl. Trav. Chim. Pays-Bas* **80**: 989-1002 (1961)

627005 Chemismus und Kinetik der durch Xanthenfarbstoffe photosensibilisierten O_2-Uebertragungen. (Analyse der Beteiligung angeregter Singulett- und Triplettzustaende sowie der Natur der Terminationsprozesse). Gollnick, K., Ph.D., Thesis, Univ. Goettingen, 1962, 144p.

65F028 Reactivities in photosensitized olefin oxidations. Kopecky, K.R.; Reich, H.J., *Can. J. Chem.* **43**: 2265-70 (1965)

65F029 On the mechanism of the photo-oxidation of amino acids sensitized by methylene blue. Weil, L., *Arch. Biochem. Biophys.* **110**: 57-68 (1965)

66F041 Excited singlet molecular oxygen in photooxidation. Wilson, T., *J. Am. Chem. Soc.* **88**: 2898-902 (1966)

66F197 Quantum yield studies of the dye-sensitized photoinactivation of trypsin. Glad, B.W.; Spikes, J.D., *Radiat. Res.* **27**: 237-49 (1966)

68F285 Quenching of singlet oxygen by tertiary aliphatic amines. Effect of DABCO. Ouannes, C.; Wilson, T., *J. Am. Chem. Soc.* **90**: 6527-8 (1968)

68F287 Reactions by singlet oxygen and via transient complex (between dye and oxygen), produced simultaneously through the interaction between triplet eosine and oxygen. Koizumi, M.; Usui, Y., *Tetrahedron Lett.* : 6011-4 (1968)

68F288 Zur Photosensibilisierten Sauerstoffuebertragung. Untersuchung der Terminationsschritte durch Belichtungen bei tiefen Temperaturen. Koch, E., *Tetrahedron* **24**: 6295-318 (1968)

68F289 Type II photosensitized oxygenation reactions. Gollnick, K., *Adv. Chem. Ser.* **77**: 78-101 (1968)

68F292 Chemistry of singlet oxygen. V. Reactivity and kinetic characterization. Higgins, R.; Foote, C.S.; Cheng, H., *Adv. Chem.* **77**: 102-17 (1968)

69F388 The photoperoxidation of unsaturated organic molecules. IV. The photosensitized reaction. Stevens, B.; Algar, B.E., *J. Phys. Chem.* **73**: 1711-5 (1969)

706079 The photoperoxidation of unsaturated organic molecules. VI. The inhibited reaction. Algar, B.E.; Stevens, B., *J. Phys. Chem.* **74**: 3029-34 (1970)

707188 Chemistry of singlet oxygen. X. Carotenoid quenching parallels biological protection. Foote, C.S.; Chang, Y.C.; Denny, R.W., *J. Am. Chem. Soc.* **92**: 5216-8 (1970)

707250 Photo-oxidation of carbanions: The reactivity of singlet oxygen with 9-benzenesulphonylfluoren-9-yl anion. Bethell, D.; Wilkinson, R.G., *Chem. Commun.* : 1178-9 (1970)

70F200 1,2 Cycloaddition of singlet oxygen to 9,9'-bifluorenylidene. Richardson, W.H.; Hodge, V., *J. Org. Chem.* **35**: 1216-7 (1970)

70F454 Photoinduced reactions. XL. Addition of singlet oxygen to monocyclic aromatic ring. Saito, I.; Kato, S.; Matsuura, T., *Tetrahedron Lett.* : 239-42 (1970)

70F732 Proflavine-sensitized photooxidation of methionine. Jori, G.; Cauzzo, G., *Photochem. Photobiol.* **12**: 231-7 (1970)

70F733 Competitive modes of reaction of singlet oxygen. Bartlett, P.D.; Mendenhall, G.D.; Schaap, A.P., *Ann. New York Acad. Sci.* **171**: 79-87 (1970)

70F734 Quenching of singlet oxygen. Foote, C.S.; Denny, R.W.; Weaver, L.; Chang, Y.; Peters, J., *Ann. New York Acad. Sci.* **171**: 139-45 (1970)

70F735 Photosensitized oxygenation as a function of the triplet energy of sensitizers. Gollnick, K.; Franken, T.; Schade, G.; Doerhoefer, G., *Ann. N.Y. Acad. Sci.* **171**: 89-107 (1970)

717299 Cinetique d'oxydation de l'aniline par l'oxygene singulet forme a partir d'aniline a l'etat triplet. Pouyet, B.; Chapelon, R., *C. R. Hebd. Seances Acad. Sci., Ser. C* **272**: 1753-6 (1971)

717356 Chemistry of singlet oxygen. XIII. Solvent effects on the reaction with olefins. Foote, C.S.; Denny, R.W., *J. Am. Chem. Soc.* **93**: 5168-71 (1971)

717398 Solvent effects in dye-sensitized photooxidation reactions. Young, R.H.; Wehrly, K.; Martin, R.L., *J. Am. Chem. Soc.* **93**: 5774-9 (1971)

717403 Photo-oxygenation of 4H-pyran-4-thiones and 4H-thiopyran-4-thiones. Reactivity and kinetic characterization. Ishibe, N.; Odani, M.; Sunami, M., *J. Chem. Soc. Pt. B* : 1837-40 (1971)

719112 Collisional deactivation of $O_2(^1\Delta_g)$. Findlay, F.D.; Snelling, D.R., *J. Chem. Phys.* **55**: 545-51 (1971)

719325 Direct measurement of the lifetime of $^1\Delta$ oxygen in solution. Merkel, P.B.; Kearns, D.R., *Chem. Phys. Lett.* **12**: 120-22 (1971)

71F577 Chemistry of singlet oxygen. XII. Electronic effects on rate and products of the reaction with olefins. Foote, C.S.; Denny, R.W., *J. Am. Chem. Soc.* **93**: 5162-7 (1971)

71F580 Photooxidation of sulfides. Foote, C.S.; Peters, J.W., *23d. Internat. Congr. Pure Appl. Chem., Special Lectures,* London, Butterworths, 1971, Vol. 4, p. 129-54.

71F581 Photoinduced reactions-XLIX. Photosensitized oxygenation of cis. cis-1.5-cyclooctadiene and cis-cyclooctene. Matsuura, T.; Horinaka, A.; Yoshida, H.; Butsugan, Y., *Tetrahedron* **27**: 3095-100 (1971)

727027 Deuterium effects on singlet oxygen lifetimes in solutions. A new test of singlet oxygen reactions. Merkel, P.B.; Nilsson, R.; Kearns, D.R., *J. Am. Chem. Soc.* **94**: 1030-1 (1972)

727028 Chemistry of singlet oxygen. XVI. Long lifetime of singlet oxygen in carbon disulfide. Foote, C.; Peterson, E.R.; Lee, K.-W., *J. Am. Chem. Soc.* **94**: 1032-3 (1972)

727116 The dye-sensitized photooxygenation of hexamethyleneammonium hexamethylenedithiocarbamate by xanthene dyes. Yamase, T.; Kokado, H.; Inoue, E., *Bull. Chem. Soc. Jpn.* **45**: 726-31 (1972)

727196 The photoperoxidation of unsaturated organic molecules. Intersystem crossing in 9,10-diphenylanthracene. Stevens, B.; Mills, L.E., *Chem. Phys. Lett.* **15**: 381-2 (1972)

727260 Radiationless decay of singlet molecular oxygen in solution. An experimental and theoretical study of electronic-to-vibrational energy transfer. Merkel, P.B.; Kearns, D.R., *J. Am. Chem. Soc.* **94**: 7244-53 (1972)

727319 Singlet oxygen ($^1\Delta_g$) quenching in the liquid phase by metal(II) chelates. Carlsson, D.J.; Mendenhall, G.D.; Suprunchuk, T.; Wiles, D.M., *J. Am. Chem. Soc.* **94**: 8960-2 (1972)

72A019 Dye-sensitized photooxidation of tocopherols. Correlation between singlet oxygen reactivity and vitamin E activity. Grams, G.W.; Eskins, K., *Biochemistry* **11**: 606-8 (1972)

72A020 Photoinduced reactions. LIX. Reactivity of singlet oxygen toward methoxybenzenes. Saito, I.; Imuta, M.; Matsuura, T., *Tetrahedron* **28**: 5307-11 (1972)

72F510 Substituent effects in dye-sensitized photooxidation reactions of furans. Young, R.H.; Martin, R.L.; Chinh, N.; Mallon, C.; Kayser, R.H., *Can. J. Chem.* **50**: 932 8 (1972)

72F512 Kinetic evidence for both quenching and reaction of singlet oxygen with triethylamine in pyridine solution. Smith, W.F.,Jr., J. Am. Chem. Soc. 94(1) 186-90 (1972)

72F514 On the mechanism of quenching of singlet oxygen by amines. Young, R.H.; Martin, R.L., *J. Am. Chem. Soc.* **94**: 5183-5 (1972)

72F515 Role of azide in singlet oxygen reactions: reaction of azide with singlet oxygen. Hasty, N.; Merkel, P.B.; Radlick, P.; Kearns, D.R., *Tetrahedron Lett.* : 49-52 (1972)

72F516 Unambiguous evidence for the participation of singlet oxygen ($^1\Delta$) in photodynamic oxidation of amino acids. Nilsson, R.; Merkel, P.B.; Kearns, D.R., *Photochem. Photobiol.* **16**: 117-24 (1972)

72F517 The reactivity of isobenzofuran. Young, R.H.; Feriozi, D.T., *J. Chem. Soc. Chem. Commun.* 841-2 (1972)

72F518 Inhibition de l'oxygene singulet. Dalle, J.P.; Magous, R.; Mousseron-Canet, M., *Photochem. Photobiol.* **15**: 411-9 (1972)

72F519 An investigation of reaction and quenching mechanisms of singlet molecular oxygen. Martin, R.L., Ph.D., Thesis, Georgetown Univ., Wash. D.C., 1972, 330p.

72F520 Photoinduced reactions. LVI. Participation of singlet oxygen in the hydrogen abstraction from a phenol in the photosensitized oxygenation. Matsuura, T.; Yoshimura, N.; Nishinaga, A.; Saito, I., *Tetrahedron* **28**: 4933-8 (1972)

72F521 Iodine-sensitized photoformation of singlet oxygen. Olmsted, J.,III; Karal, G., *J. Am. Chem. Soc.* **94**: 3305-13 (1972)

732066 The possible importance of singlet oxygen quenching reactions in the photostabilization of polyolefins. Carlsson, D.J.; Suprunchuk, T.; Wiles, D.M., *J. Polym. Sci., Polym. Lett. Ed.* **11**: 61-5 (1973)

733045 Photodynamic inactivation of lysozyme by eosin. Kepka, A.G.; Grossweiner, L.I., *Photochem. Photobiol.* **18**: 49-61 (1973)

736061 On the mechanism of quenching of singlet oxygen by amines. III. Evidence for a charge-transfer-like complex. Young, R.H.; Martin, R.L.; Feriozi, D.; Brewer, D.; Kayser, R., *Photochem. Photobiol.* **17**: 233-44 (1973)

737014 The determination of rate constants for reaction and lifetimes of singlet oxygen in solution by a flash photolysis technique. Young, R.H.; Brewer, D.; Keller, R.A., *J. Am. Chem. Soc.* **95**: 375-9 (1973)

737202 Sensitized photooxygenation: Change from the Type I (radical) to Type II (singlet oxygen) mechanism. Kramer, H.E.A.; Maute, A., *Photochem. Photobiol.* **17**: 413-23 (1973)

737333 Energy transfer processes involving ultraviolet stabilizers. Quenching of singlet oxygen. Guillory, J.P.; Cook, C.F., *J. Polym. Sci., Polym. Chem. Ed.* **11**: 1927-37 (1973)

737334 Quenching of singlet molecular oxygen by polyolefin additives in carbon disulfide solution. Flood, J.; Russell, K.E.; Wan, J.K.S., *Macromolecules* **6**: 669-71 (1973)

737438 On the mechanism of quenching of singlet oxygen in solution. Farmilo, A.; Wilkinson, F., *Photochem. Photobiol.* **18**: 447-50 (1973)

737479 Etude cinetique de l'oxydation photosensibilisee d'aldehydes α-ethyleniques en phase liquide a -10°C. Carmier, J.-C.; Deglise, X., *C. R. Hebd. Seances Acad. Sci., Ser. C* **277**: 1187-9 (1973)

73F659 Kinetics of photoperoxidation in solution. Stevens, B., *Acc. Chem. Res.* **6**: 90-6 (1973)

73F660 Photooxidation of isobenzofurans. A dual mechanism process. Olmsted, J.,III; Akashah, T., *J.Am. Chem. Soc.* **95**: 6211-5 (1973)

73F662 Mechanisms of singlet oxygen reactions. Intermediates in the reaction of singlet oxygen with dienes. Hasty, N.M.; Kearns, D.R., *J. Am. Chem. Soc.* **95**: 3380-1 (1973)

73F664 The reaction of singlet oxygen with α- and β-pinenes. Jefford C.W.; Boschung, A.F.; Moriarty, R.M.; Rimbault, C.G.; Laffer, M.H., *Helv. Chim. Acta* **56**: 2649-59 (1973)

743112 On the quenching of singlet oxygen by α-tocopherol Fahrenholtz, S.R.; Doleiden, F.H.; Trozzolo, A.M.; Lamola, A.A., *Photochem. Photobiol.* **20**: 505-9 (1974)

743113 Chemistry of singlet oxygen. XVIII. Rates of reaction and quenching of α-tocopherol and singlet oxygen. Foote, C.S.; Ching, T. Y.; Geller, G.G., *Photochem. Photobiol.* **20**: 511-3 (1974)

743114 The photoperoxidation of unsaturated organic molecules. XIII $O_2{}^1\Delta_g$ quenching by α-tocopherol. Stevens, B.; Small, R.D.,Jr.; Perez, S.R., *Photochem. Photobiol.* **20**: 515-7 (1974)

743115 Reactivity of cholesterol and some fatty acids toward singlet oxygen. Doleiden, F.H.; Fahrenholtz, S.R.; Lamola, A.A.; Trozzolo, A.M., *Photochem. Photobiol.* **20**: 519-21 (1974)

746110 Fluorescence and quenching of $O_2(^1\Delta_g)$ and $(O_2(^1\Delta_g))_2$ in liquid oxygen. Huestis, D.L.; Black, G.; Edelstein, S.A.; Sharpless, R.L., *J. Chem. Phys.* **60**: 4471-4 (1974)

747042 Carotenoid chromophore length and protection against photosensitization. Mathews-Roth, M.M.; Wilson, T.; Fujimori, E.; Krinsky, N.I., *Photochem. Photobiol.* **19**: 217-22 (1974)

747044 A standard system to determine the quantum yield of singlet oxygen formation in aqueous solution. Usui, Y.; Kamogawa, K., *Photochem. Photobiol.* **19**: 245-7 (1974)

747102 Measurement of the absolute rate constants for singlet molecular oxygen($^1\Delta_g$) reaction with 1,3-diphenylisobenzofuran and physical quenching by ground state molecular oxygen. Matheson, I.B.C.; Lee, J.; Yamanashi, B.S.; Wolbarsht, M.L., *J. Am. Chem. Soc.* **96**: 3343-8 (1974)

747103 Reaction rate of bilirubin with singlet oxygen ($^1\Delta_g$) and its strong enhancement by added base. Matheson, I.B.C.; Curry, N.U.; Lee, J., *J. Am. Chem. Soc.* **96**: 3348-51 (1974)

747207 The photoperoxidation of unsaturated organic molecules. X. Solvent effect on $O_2{}^1\Delta$ acceptor reactivity. Stevens, B.; Perez, S.R., *Mol. Photochem.* **6**: 1-7 (1974)

747312 Photoperoxidation of unsaturated organic molecules. XIV. $O_2{}^1\Delta_g$ acceptor properties and reactivity. Stevens, B.; Perez, S.R.; Ors, J.A., *J. Am. Chem. Soc.* **96**: 6846-50 (1974)

747341 The quenching of singlet oxygen ($^1\Delta_g$) by transition metal chelates. Carlsson, D.J.; Suprunchuk, T.; Wiles, D.M., *Can. J. Chem.* **52**: 3728-37 (1974)

747495 Singlet oxygen oxidation of phosphites to phosphates. Bolduc, P.R.; Goe, G.L., *J. Org. Chem.* **39**: 3178-9 (1974)

74F640 On the mechanism of quenching by amines: A new method for investigation of interactions with triplet states. Young, R.H.; Brewer, D.; Kayser, R.; Martin, R.; Feriozi, D.; Keller, R.A., *Can. J. Chem.* **52**: 2889-93 (1974)

74F641 The photoperoxidation of unsaturated organic molecules. IX. Lipoic acid inhibition of rubrene autoperoxidation. Stevens, B.; Perez, S.R.; Small, R.D., *Photochem. Photobiol.* **19**: 315-6 (1974)

74F642 Importance of singlet oxygen in the degradation of rubbers and plastics. Carlsson, D.J.; Wiles, D.M., *Rubber Chem. Technol.* **47**: 991-1004 (1974)

74F643 Role of singlet oxygen in some chemiluminescence and enzyme oxidation reactions. Nilsson, R.; Kearns, D.R., *J. Phys. Chem.* **78**: 1681-3 (1974)

74F645 Study of the quenching of triplet carbonyl groups and singlet oxygen by light stabilizers. Hrdlovic, P.; Danecek, J.; Karvas, M.; Durmis, J., *Chem. Zvesti* **28**: 792-801 (1974)

74F646 A kinetic investigation of the generation and decay of singlet oxygen in dye sensitized systems. Part 1. Brewer, D.R.,III, Ph.D., Thesis, Georgetown Univ., Wash. D.C., 1974, 694p.

74F647 Reaction of singlet oxygen with 2-methylnorborn-2-ene, 2-methylidenenorbornane, and their 7,7-dimethyl derivatives. The transition state geometry for hydroperoxidation. Jefford, C.W.; Boschung, A.F., *Helv. Chim. Acta* **57**: 2242-57 (1974)

74F648 Photosensitized oxidation of di-n-butyl sulphide. Casagrande, M.; Gennari, G.; Cauzzo, G., *Gazz. Chim. Ital.* **104**: 1251-7 (1974)

74F649 The photo-peroxidation of unsaturated organic molecules. $O_2\ ^1\Delta_g$ -acceptor re-encounter probabilities. Stevens, B.; Ors, J.A.; Pinsky, M.L., *Chem. Phys. Lett.* **27**: 157-60 (1974)

74R214 Concerning the formation of singlet O_2 during the decomposition of H_2O_2 by catalase. Porter, D.J.T.; Ingraham, L.L., *Biochim. Biophys. Acta* **334**: 97-102 (1974)

752063 Singlet oxygen and polymer photooxidations. I. Sensitizers, quenchers, and reactants. Zweig, A.; Henderson, W.A.,Jr., *J. Polym. Sci., Polym. Chem. Ed.* **13**: 717-36 (1975)

753071 Chemistry of singlet oxygen. XXI. Kinetics of bilirubin photooxygenation. Foote, C.S.; Ching, T.-Y., *J. Am. Chem. Soc.* **97**: 6209-14 (1975)

756223 Untersuchung der selbst-sensibilisierten Photooxidation des Rubrens in verschiedenen Loesungsmitteln. Brauer, H.-D.; Wagener, H., *Ber. Bunsenges. Phys. Chem.* **79**: 597-604 (1975)

757088 Radiationless decay of singlet molecular oxygen in solution. II. Temperature dependence and solvent effects. Long, C.A.; Kearns, D.R., *J. Am. Chem. Soc.* **97**: 2018-20 (1975)

757147 The quenching of singlet oxygen by amino acids and proteins. Matheson, I.B.C.; Etheridge, R.D.; Kratowich, N.R.; Lee, J., *Photochem. Photobiol.* **21**: 165-71 (1975)

757166 Quenching of singlet molecular oxygen in solution by azomethine dyes. Smith, W.F.,Jr.; Herkstroeter, W.G.; Eddy, K.L., *J. Am. Chem. Soc.* **97**: 2764-70 (1975)

757445 Kinetics and mechanism of nitroxyl radical formation during sensitized amine oxidation. Ivanov, V.B.; Shlyapintokh, V.Ya.; Khvostach, O.M.; Shapiro, A.B.; Rozantsev, E.G., *J. Photochem.* **4**: 313-9 (1975)

757485 Photodynamic sensitization by 8-methoxypsoralen via the singlet oxygen mechanism. Poppe, W.; Grossweiner, L.I., *Photochem. Photobiol.* **22**: 217-9 (1975)

757558 An experimental approach to the estimation of diffusive displacement parameters for bimolecular reactions in solution. Stevens, B.; Williams, R.R., *Chem. Phys. Lett.* **36**: 100-5 (1975)

757578 Singlet molecular oxygen and superoxide radical anion. Rosenthal, I., *Isr. J. Chem.* **13**: 86-90 (1975)

757623 Reactions of singlet oxygen III. Dye sensitized oxidation of phenothiazine. Nathu Ram: Bansal. W.R.: Uppal. S.S.: Sidhu. K.S.. *Proceedings of the Symposium on Singlet Molecular Oxygen,* Bhabha At. Res. Cent., Bombay, 10-13 Feb 1975, p.141-52

75F652 Dye-sensitized photooxygenation of tert-butylpyrroles. Lightner, D.A.; Pak, C. S., *J. Org. Chem.* **40**: 2724-8 (1975)

75F653 Chemistry of singlet oxygen. XXII. Photooxidation of nitrones. Ching, T.-Y.; Foote, C.S., *Tetrahedron Lett.* : 3771-4 (1975)

75F654 Effect of the aggregate state of the medium on singlet oxygen quenching. Bystritskaya, E.V.; Karpukhin, O.N., *Dokl. Phys. Chem.* **221**: 353-6 (1975) Translated from: *Dokl. Akad. Nauk SSSR* **221**: 1100-3 (1975)

75F655 New method for the mass spectrometric study of the kinetics of molecular oxygen consumption in liquid-phase photooxidation processes. Zolotoi, N.B.; Karpov, G.V.; Skurat, V.E., *Kinet. Catal.* **16**: 1229-35 (1975) Translated from: *Kinet. Katal.* **16**: 1415-22 (1975)

75F656 Chemistry of singlet oxygen. XX. Mechanism of the sensitized photooxidation of enamines. Foote, C.S.; Dzakpasu, A.A.; Lin, J.W.-P., *Tetrahedron Lett.* : 1247-50 (1975)

75F669 Mechanism of photo-oxidation of the porphyrins by oxygen. Byteva, I.M.; Gurinovich, G.P.; Petsol'd, O.M., *Biophysics* **20**: 48-52 (1975) Translated from: *Biofizika* **20**: 51-5 (1975)

763011 The photoperoxidation of unsaturated organic molecules. XV. $O_2\ ^1\Delta_g$ quenching by bilirubin and biliverdin. Stevens, B.; Small, R.D.,Jr., *Photochem. Photobiol.* **23**: 33-6 (1976)

766072 Chemistry of superoxide ion. III. Quenching of singlet oxygen. Guiraud, H.J.; Foote, C.S., *J. Am. Chem. Soc.* **98**: 1984-6 (1976)

767041 Kinetic aspects of dye-sensitized photo-oxygenation. Brkic, D.; Forzatti, P.; Pasquon, I.; Trifiro, F., *J. Photochem.* **5**: 23-32 (1976)

767071 Direct and sensitized photooxidation of cyanine dyes. Byers, G.W.; Gross, S.; Henrichs, P.M., *Photochem. Photobiol.* **23**: 37-43 (1976)

767105 On the mechanism of the acridine orange sensitized photodynamic inactivation of lysozyme. I. Basic kinetics. Schmidt, H.; Rosenkranz, P., *Z. Naturforsch., C, Biosci.* **31**: 29-39 (1976)

767126 The quenching effect of iodide ion on singlet oxygen. Rosenthal, I.; Frimer, A., *Photochem. Photobiol.* **23**: 209-11 (1976)

767197 Photooxidation of benzophenone oxime and derivatives. Wamser, C.C.; Herring, J.W., *J. Org. Chem.* **41**: 1476-7 (1976)

767247 The photosensitized formation and reaction of singlet oxygen, $O_2{}^*(^1\Delta)$, in aqueous micellar systems. Gorman, A.A.; Lovering, G.; Rodgers, M.A.J., *Photochem. Photobiol.* **23**: 399-403 (1976)

767422 Photoperoxidation of unsaturated organic molecules. 16. Excitation energy fission. Stevens, B.; Ors, J.A., *J. Phys. Chem.* **80**: 2164-5 (1976)

767570 Photoperoxidation of heterocoerdianthrone in different solvents. Wagener, H.; Brauer, H.-D., *Mol. Photochem.* **7**: 441-64 (1976)

76F900 Nitroso compounds and azo dioxides as quenchers of singlet oxygen ($^1\Delta_g$) and sensitizer triplet states. Singh, P.; Ullman, E.F., *J. Am. Chem.Soc.* **98**: 3018-9 (1976)

76F902 Physical properties of singlet oxygen in fluid solvents. Wilkinson, F., *Singlet Oxygen, Reactions with Organic Compounds and Polymers,* B. Ranby and J.F. Rabek (eds.), John Wiley & Sons, New York, N.Y., 1976, p.27-35

76F903 The mechanism of quenching of singlet oxygen. Young, R.H.; Brewer, D.R., *Singlet Oxygen, Reactions with Organic Compounds and Polymers,* B. Ranby and J.F. Rabek (eds.), John Wiley & Sons, New York, N.Y., 1976, p.36-47

76F909 Singlet oxygen reactions with polyisoprene model molecules: 4-methyl-4-octene and 4,8-dimethyl-4,8-dodecadiene. Chaineaux, J.; Tanielian, C., *Singlet Oxygen, Reactions with Organic Compounds and Polymers,* B. Ranby and J.F. Rabek (eds.), John Wiley & Sons, New York, N.Y., 1976, p.164-73

76F921 Antioxidants and stabilizers. LXV. Contribution to the investigation of sensitized photooxidation of phenolic antioxidants. Quenching of singlet oxygen with stilbenequinoid compounds. Taimr, L.; Pospisil, J., *Angew. Makromol. Chem.* **52**: 31-8 (1976)

777055 Concerning the use of amines as probes for participation of singlet oxygen in dye-sensitised oxygenation reactions. Davidson, R.S.; Trethewey, K.R., *J. Chem. Soc., Perkin Trans. 2* : 178-82 (1977)

777074 Anthracene sulphonate sensitized photooxidation of iodide ion in aqueous solution via singlet oxygen. Rohatgi-Mukherjee, K.K.; Gupta, A.K., *Chem. Phys. Lett.* **46**: 368-71 (1977)

777113 Intermediates in the decomposition of aliphatic diazo-compounds. Part 13. Mechanistic studies on the reaction of diaryldiazomethanes with singlet molecular oxygen. Bethell, D.; McKeivor, R., *J. Chem. Soc., Perkin Trans. 2* : 327-33 (1977)

777129 The singlet oxygen reactivity of biliverdin. Matheson, I.B.C.; Toledo, M.M., *Photochem. Photobiol.* **25**: 243-8 (1977)

777162 Interaction between singlet oxygen ($^1\Delta_g$) and model compounds for polymers. A flash photolytic study. Bortolus, P.; Dellonte, S.; Beggiato, G.; Corio, W., *Eur. Polym. J.* **13**: 185-8 (1977)

777176 Die Kinetik der selbst-sensibilisierten Photooxidation des Heterocoerdianthrons im bereich niedriger Konzentrationen. Drews, W.; Schmidt, R.; Brauer, H.-D., *J. Photochem.* **6**: 391-403 (1976/77)

777221 Energy transfer from luminescent transition metal complexes to oxygen. Demas, J.N.; Harris, E.W.; McBride, R.P., *J. Am. Chem. Soc.* **99**: 3547-51 (1977)

777240 Dye sensitized photooxidation of chlorpromazine. Rosenthal, I.; Bercovici, T.; Frimer, A., *J. Heterocycl. Chem.* **14**: 355-7 (1977)

777378 Products formed by photosensitized oxidation of unsaturated fatty acid esters. Terao, J.; Matsushita, S., *J. Am. Oil Chem. Soc.* **54**: 234-8 (1977)

777433 Chemistry of singlet oxygen. XXV. Photooxygenation of methionine. Sysak, P.K.; Foote, C.S.; Ching, T.-Y., *Photochem. Photobiol.* **26**: 19-27 (1977)

777486 Quenching of singlet oxygen by aliphatic amines. Monroe, B.M., *J. Phys. Chem.* **81**: 1861-4 (1977)

777489 Mechanisms of the photosensitized oxidation of tyramine. Seely, G.R., *Photochem. Photobiol.* **26**: 115-23 (1977)

777645 Reaction of singlet oxygen with 4-methyl-2,3-dihydro-γ-pyrans. Frimer, A.A.; Bartlett, P.D.; Boschung, A.F.; Jewett, J.G., *J. Am. Chem. Soc.* **99**: 7977-86 (1977)

77E617 Photoluminescence of singlet oxygen in solutions of chlorophylls and pheophytins. Krasnovsky, A.A.,Jr., *Biophysics* **22**: 960-2 (1977) Translated from: *Biofizika* **22**: 927-8 (1977)

77F794 Studies on the sensitized photooxidation of 1,3-dithiol-thiones-(2). Fanghaenel, E.; Lutze, G., *J. Prakt. Chem.* **319**: 875-82 (1977)

77F858 Quenching effect of tocopherols on the methyl linoleate photooxidation and their oxidation products. Yamauchi, R.; Matsushita, S., *Agric. Biol. Chem.* **41**: 1425-30 (1977)

77F876 I. A study of the kinetics of the 1,2-cycloaddition of singlet oxygen to vinyl ethers. II. An investigation of the reaction of singlet oxygen with adamantylideneadamantane. Faler, G.R., Ph.D., Thesis, Wayne State Univ., Detroit, MI, 1977, 157p.

78A005 Rates of reaction of singlet oxygen with olefins. Monroe, B.M., *J. Phys. Chem.* **82**: 15-8 (1978)

78A171 Chemistry of singlet oxygen. XXVI. Photooxygenation of phenols. Thomas, M.J.; Foote, C.S., *Photochem. Photobiol.* **27**: 683-93 (1978)

78A174 Production and reaction of singlet oxygen in aqueous micellar solutions using pyrene as photosensitizer. Miyoshi, N.; Tomita, G., *Z. Naturforsch., Teil B* **33B**: 622-7 (1978)

78A227 Mechanisms of chlorine oxidation of hydrogen peroxide. Held, A.M.; Halko, D.J.; Hurst, J.K., *J. Am. Chem. Soc.* **100**: 5732-40 (1978)

78A266 Kinetics and mechanism of the interaction of sterically hindered phenols with singlet oxygen. Snyakin, A.P.; Samsonova, L.V.; Shlyapintokh, V.Ya.; Ershov, V.V., *Bull. Acad. Sci. USSR, Div. Chem. Sci.* **27**: 46-52 (1978) Translated from: *Izv. Akad. Nauk SSSR, Ser. Khim.* : 55-61 (1978)

78A275 Photoperoxidation of anthracene sulphonates. Gupta, A.K.; Singh, B.P.; Rohatgi-Mukherjee, K.K., *J. Indian Chem. Soc.* **55**: 382-5 (1978)

78A278 On the reactivity of singlet oxygen in aqueous micellar systems. Barboy, N.; Kraljic, I., *J. Photochem.* **9**: 336-7 (1978)

78A338 Photo-oxidation of tryptophan sensitized by methylene blue. Smith, G.J., *J. Chem. Soc., Faraday Trans. 2* **74**: 1350-4 (1978)

78A344 Singlet oxygen reactions with model compounds of cis and trans polyisoprene containing two units. Tanielian, C.; Chaineaux, J., *J. Photochem.* **9**: 19-32 (1978)

78A357 Singlet oxygen reactions with 2,7-dimethyl-2,6-octadiene. Tanielian, C.; Chaineaux, J., *Photochem. Photobiol.* **28**: 487-92 (1978)

78A360 Determination of singlet oxygen rate constants in aqueous solutions. Kraljic, I.; Sharpatyi, V.A., *Photochem. Photobiol.* **28**: 583-6 (1978)

78E036 The fate of oxygen in the quenching of excited singlet states. Merkel, P.B.; Herkstroeter, W.G., *Chem. Phys. Lett.* **53**: 350-4 (1978)

78E143 The lifetime of singlet oxygen ($^1\Delta_g$) in heavy water, a revised value. Matheson, I.B.C.; Lee, J.; King, A.D., *Chem. Phys. Lett.* **55**: 49-51 (1978)

78E144 Lifetime and reactivity of singlet oxygen in an aqueous micellar system: A pulsed nitrogen laser study. Gorman, A.A.; Rodgers, M.A.J., *Chem. Phys. Lett.* **55**: 52-4 (1978)

78E238 Deactivation of singlet oxygen and triplet pentacene by transition metal complexes. Furue, H.; Russell, K.E., *Can. J. Chem.* **56**: 1595-601 (1978)

78E263 A pulse radiolysis study of the triplet sensitized production of singlet oxygen: determination of energy transfer efficiencies. Gorman, A.A.; Lovering, G.; Rodgers, M.A.J., *J. Am. Chem. Soc.* **100**: 4527-33 (1978)

78E881 Luminescence of singlet oxygen during energy transfer from photoexcited pigments in solution. Krasnovsky, A.A.,Jr., *Izv. Akad. Nauk. SSSR, Ser. Fiz.* **42**: 343-8 (1978) Translated from: *Bull. Acad. Sci. USSR, Phys. Ser.* **42**: 96-100 (1978)

78E892 Quenching of luminescence of singlet oxygen by porphyrins and metalloporphyrins. Krasnovsky, A.A.,Jr.; Venediktov, E.A., *Biophysics* **23**: 294-6 (1978) Translated from: *Biofizika* **23**: 387-9 (1978)

78F020 On the reaction of singlet molecular oxygen with N-allylthiourea in aqueous solution. Kraljic, I.; Kramer. H.E.A., *Photochem. Photobiol.* **27**: 9-12 (1978)

78F061 Kinetic studies of photosensitized oxygenation by singlet oxygen in aqueous micellar solutions. Usui, Y.; Tsukada, M.; Nakamura, H., *Bull. Chem. Soc. Jpn.* **51**: 379-84 (1978)

78F149 Reaction of singlet oxygen with 2-methylnorbornadiene and 2-methylidenenorbornene. Evaluation of electronic and steric effects on the course of hydroperoxidation. Jefford, C.W.; Rimbault, C.G., *J. Org. Chem.* **43**: 1908-12 (1978)

78F183 Solvent effect on photosensitized oxidation of iodide ion by anthracene sulphonates. Gupta, A.K.; Rohatgi-Mukherjee, K.K., *Photochem. Photobiol.* **27**: 539-43 (1978)

78F201 An investigation of retinal as a source of singlet oxygen. Delmelle, M., *Photochem. Photobiol.* **27**: 731-4 (1978)

78F276 Electronic energy transfer from singlet molecular oxygen to carotenoids. Wilkinson, F.; Ho, W.-T., *Spectrosc. Lett.* **11**: 455-63 (1978)

78F290 Reaction of singlet oxygen with a norbornadienol ether. Intramolecular interception of a zwitterionic peroxide. Jefford, C.W.; Rimbault, C.G., *J. Am. Chem. Soc.* **100**: 6515-6 (1978)

78F404 Protection of chlorophyll a by carotenoid from photodynamic decomposition. Koka, P.; Song, P.-S., *Photochem. Photobiol.* **28**: 509-15 (1978)

78F430 Petits cycles. XL. Sur le mechanisme de formation des hydroperoxydes allyliques dans la reaction de l'oxygene singulet avec les vinylcyclopropanes. Rousseau, G.; Le Perchec, P.; Conia, J.M., *Tetrahedron* **34**: 3483-94 (1978)

78F438 Photosensitized oxidation of pseudoazulenes. Timpe, G.I.; Klokova, E.M.; El'tsov, A.V., *J. Org. Chem. USSR* **14**: 625-30 (1978) Translated from: *Zh. Org. Khim.* **14**: 673-9 (1978)

78F464 Preference for syn ene additions of $^1O_2$ to trisubstituted, acyclic olefins. Schulte-Elte, K.H.; Muller, B.L.; Rautenstrauch, V., *Helv. Chim. Acta* **61**: 2777-83 (1978)

78F474 Oxydation photochimique d'une amine tertiaire: la dregamine. Herlem, D.; Ouannes, C., *Bull. Soc. Chim. Fr.* : I-451-4 (1978)

78F497 The quenching of singlet oxygen by complex salts of O,O-diarylphosphorodithioic acids. Edilashvili, I.L.; Ioseliani, K.B.; Dzhanibekov, N.F.; Markova, E.I.; Akhmed-zade, D.A., *Russ. J. Phys. Chem.* **52**: 1197-8 (1978) Translated from: *Zh. Fiz. Khim.* **52**: 2079-80 (1978)

78F549 Oxygen luminescence and sensitization of photooxidation reactions in solutions. Byteva, I.M.; Gurinovich, G.P.; Izbavitelev, S.P., *J. Appl. Spectrosc.* **29**: 870-2 (1978) Translated from: *Zh. Prikl. Spektrosk.* **29**: 156-8 (1978)

78F586 Concerning the inhibition of singlet oxygen attack on compounds containing urazole rings. Kretschmer, G.; Paquette, L.A., *Heterocycles* **11**: 359-62 (1978)

78F605 Chemiluminescence and the formation of singlet oxygen in the oxidation of certain polyphenols and quinones. Slawinska, D., *Photochem. Photobiol.* **28**: 453-8 (1978)

78F700 Production and quenching of singlet oxidation by retinals. Krasnovsky, A.A.,Jr.; Kagan, V.E., *Dokl. Biophys.* **241-243**: 147-50 (1978) Translated from: *Dokl. Akad. Nauk SSSR* **242**: 229-32 (1978)

79F701 Singlet oxygen reactivity of bilirubin and related tetrapyrroles. Lightner, D.A.; Park, Y.-T., *Experientia* **34**: 555-7 (1978)

79N003 Photosensitized carcinogen degradation and the possible role of singlet oxygen in carcinogen activation. Greenstock, C.L.; Wiebe, R.H., *Photochem. Photobiol.* **28**: 863-7 (1978)

79A010 Photoluminescence of singlet oxygen in pigment solutions. Krasnovsky, A.A.,Jr., *Photochem. Photobiol.* **29**: 29-36 (1979)

79A050 Quenching of singlet oxygen by nickel complexes. Monroe, B.M.; Mrowca, J.J., *J. Phys. Chem.* **83**: 591-5 (1979)

79A085 Rates of reaction of singlet oxygen with sulfides. Monroe, B.M., *Photochem. Photobiol.* **29**: 761-4 (1979)

79A086 Chemistry of singlet oxygen. XXVIII. Steric and electronic effects on the reactivity of sulfides with singlet oxygen. Kacher, M.L.; Foote, C.S., *Photochem. Photobiol.* **29**: 765-9 (1979)

79A106 The entropy-controlled reactivity of singlet oxygen ($^1\Delta_g$) toward furans and indoles in toluene. A variable-temperature study by pulse radiolysis. Gorman, A.A.; Lovering, G.; Rodgers, M.A.J., *J. Am. Chem. Soc.* **101**: 3050-5 (1979)

79A111 The absolute value of the reaction rate constant of bilirubin with singlet oxygen in D_2O. Matheson, I.B.C., *Photochem. Photobiol.* **29**: 875-8 (1979)

79A112 Chemical reaction rates of amino acids with singlet oxygen. Matheson, I.B.C.; Lee, J., *Photochem. Photobiol.* **29**: 879-81 (1979)

79A113 Oxodipyrromethenes as reactive singlet oxygen acceptors. Measurement of their chemical reaction rates by a laser flash photolysis technique. Matheson, I.B.C.; Lightner, D.A., *Photochem. Photobiol.* **29**: 933-5 (1979)

79A241 Photochemistry and photooxidation of tetraphenyl-p-dioxin. George, M.V.; Kumar, C.V.; Scaiano, J.C., *J. Phys. Chem.* **83**: 2452-5 (1979)

79A386 The question of the role of singlet oxygen in the dye-sensitised photo-oxygenation of α-oxo-carboxylic acids. Davidson, R.S.; Goodwin, D.; Smith, G., *J. Chem. Soc., Chem. Commun.* : 463-4 (1979)

79A434 Mechanism of the antioxidant effect of some salts of O,O-diaryldithiophosphoric acids in photochemical reactions. Ioseliani, K.B.; Edilashvili, I.L.; Dzhanibekov, N.F., *Izv. Akad. Nauk Gruz. SSR, Ser. Khim.* **5**: 334-9 (1979)

79A457 Stereoreversed electrophilic additions to 3-norcarenes. Insight into the relative steric demands of singlet oxygen in the ene reaction. Paquette, L.A.; Kretschmer, G., *J. Am. Chem. Soc.* **101**: 4655-63 (1979)

79E846 Duration of the luminescence of singlet oxygen in solution following pulsed laser excitation. Salokhiddinov, K.I.; Byteva, I.M.; Dzhagarov, B.M., *Opt. Spectrosc. (USSR)* **47**: 487-90 (1979) Translated from: *Opt. Spektrosk.* **47**: 881-6 (1979)

79E970 Investigation of the luminescence of oxygen in solutions by pulsed spectroscopy. Byteva, I.M., *J. Appl Spectrosc.* **31**: 1041-3 (1979) Translated from: *Zh. Prikl. Spektrosk.* **31**: 333-5 (1979)

79F051 Differentiation in singlet oxygenation rates of 2,3-diaryl-2-butenes as a function of cis-trans isomerism. Adam, W.; Carballeira, N.; Cheng, C.-C.; Sakanishi, K.; Gleiter, R., *J. Org. Chem.* **44**: 851-3 (1979)

79F074 Singlet oxygen reactions with model compounds of cis- and trans-polyisoprene containing one unit. Kinetic aspects. Tanielian, C.; Chaineaux, J., *J. Polym. Sci., Polym. Chem. Ed.* **17**: 715-29 (1979)

79F104 On the syntheses and singlet oxygen reactivity of oxodipyrromethene models for bilirubin. Lightner, D.A.; Park, Y-T., *Tetrahedron* **35**: 463-71 (1979)

79F119 Effect of strain on singlet oxygen ($^1O_2$) reactions. 2. Photooxidation of methylenecyclopropanes. Frimer, A.A.; Farkash, T.; Sprecher, M., *J. Org. Chem.* **44**: 989-95 (1979)

79F137 Photooxygenation of 3,3-dialkylsubstituted allyl alcohols. Occurrence of syn preference in the ene addition of $^1O_2$ at E/Z-isomeric allyl alcohols. Schulte-Elte, K.H.; Muller, B.L.; Pamingle, H., *Helv. Chim. Acta* **62**: 816-29 (1979)

79F148 The photoperoxidation of unsaturated organic molecules. XVIII. Malachite green and leucomalachite green. Stevens, B.; Kaplan, S.J., *Mol. Photochem.* **9**: 205-11 (1979)

79F155 Stereochemical dependence of isotope effects in the singlet oxygen-olefin reaction. Grdina, B.; Orfanopoulos, M.; Stephenson, L.M., *J. Am. Chem. Soc.* **101**: 3111-2 (1979)

79F278 Photooxidatiion of azines. Evidence for a free-radical oxidation initiated by singlet oxygen. Landis, M.E.; Madoux, D.C., *J. Am. Chem. Soc.* **101**: 5106-7 (1979)

79F314 Formation of singlet molecular oxygen by 8-methoxypsoralen. de Mol, N.J.; Beijersbergen van Henegouwen, G.M.J., *Photochem. Photobiol.* **30**: 331-5 (1979)

79F315 Photochemical decomposition of 1,4-benzodiazepines Nitrazepam. Cornelissen, P.J.G.; Beijersbergen van Henegouwen, G.M.J., *Photochem. Photobiol.* **30**: 337-41 (1979)

79F412 The role of geminate reaction in the self-sensitized photooxidation of arylazonaphtholate dyes. Merkel, P.B.; Smith, W.F.,Jr., *J. Phys. Chem.* **83**: 2834-40 (1979)

79F434 Mechanism of indole-singlet oxygen reactions. Interception of zwitterionic intermediates and "ene" reaction. Saito, I.; Matsugo, S.; Matsuura, T., *J. Am. Chem. Soc.* **101**: 7332-8 (1979)

79F463 Photosensitization and quenching of singlet oxygen by pigments and lipids of photoreceptor cells of the retina. Krasnovsky, A.A.,Jr.; Kagan, V.E., *FEBS Lett.* **108**: 152-4 (1979)

79F473 Photooxygenation product of dibenzo[a,j]perylene. Kajiwara, T.; Fujisawa, S.; Ohno, K.; Harada, Y., *Bull. Chem. Soc. Jpn.* **52**: 2771-7 (1979)

79F582 Contribution of singlet oxygen to the photofading of indigo. Kuramoto, N.; Kitao, T., *J. Soc. Dyers Colour.* **95**: 257-61 (1979)

79F646 Reaction of $^1O_2$ with strained olefins. 3. Photooxidation of vinylcyclopropanes. Frimer, A.A.; Roth, D., *J. Org. Chem.* **44**: 3882-7 (1979)

79F816 The mechanism of the riboflavin sensitized photodestruction of mitomycin C. Ueda, K.; Mizunoya, T., *J. Biochem. (Tokyo)* **86**: 857-62 (1979)

79F824 Mechanism of quenching of singlet molecular oxygen by porphyrins and their metal complexes. Venediktov, E.A.; Krasnovsky, A.A.,Jr., *Izv. Vyssh. Uchebn. Zaved., Khim. Khim. Tekhnol.* **22**: 395-8 (1979)

79N020 Quenching of singlet oxygen by sodium azide in reversed micellar systems. Miyoshi, N.; Tomita, G., *Z. Naturforsch., Teil B* **34B**: 339-43 (1979)

79N041 Laser photolysis studies of singlet molecular oxygen in aqueous micellar dispersions. Lindig, B.A.; Rodgers, M.A.J., *J. Phys. Chem.* **83**: 1683-8 (1979)

80A041 Rate constants for the reaction of singlet oxygen with derivatives of p-aminobenzoic acid. Monroe, B.M., *Biochem. Biophys. Res. Commun.* **93**: 321-5 (1980)

80A143 Kinetic and spectroscopic features of some carotenoid triplet states: Sensitization by singlet oxygen. Rodgers, M.A.J.; Bates, A.L., *Photochem. Photobiol.* **31**: 533-7 (1980)

80A205 Determination of the lifetime of singlet oxygen in D_2O using 9,10-anthracenedipropionic acid, a water-soluble probe. Lindig, B.A.; Rodgers, M.A.J.; Schaap, A.P., *J. Am. Chem. Soc.* **102**: 5590-3 (1980)

80A339 Singlet oxygen and spin trapping with nitrones. Harbour, J.R.; Issler, S.L.; Hair, M.L., *J. Am. Chem. Soc.* **102**: 7778-9 (1980)

80A398 Quenching of oxygen luminescence by electron acceptors and donors. Byteva, I.M.; Salokhiddinov, K.I., *Opt. Spectrosc. (USSR)* **49**: 387-90 (1980) Translated from: *Opt. Spektrosk.* **49**: 707-13 (1980)

80A430 Sensitized photo-oxidation of polyisoprene: Effect of the presence of hydroxy and hydroperoxy groups. Tanielian, C.; Chaineaux, J., *Eur. Polym. J.* **16**: 619-22 (1980)

80C002 Photocalorimetric studies of singlet oxygen reactions. Olmsted, J.,III, *J. Am. Chem. Soc.* **102**: 66-71 (1980)

80D076 On the production of nitroxide radicals by singlet oxygen reaction: an EPR study. Lion, Y.; Gandin, E.; Van de Vorst, A., *Photochem. Photobiol.* **31**: 305-9 (1980)

80E446 The role of anthraquinonoid dyes in the 'catalytic fading' of dye mixtures. Substituent-dependent triplet yield of diaminoanthraquinones. Rembold, M.W.; Kramer, H.E.A., *J. Soc. Dyers Colour.* **96**: 122-6 (1980)

80E548 Quenching of the luminescence of singlet molecular oxygen with complexes of porphyrins with highly charged metal ions. Venediktov, E.A.; Krasnovsky, A.A.,Jr., *Biophysics* **25**: 347-8 (1980) Translated from: *Biofizika* **25**: 336-7 (1980)

80E549 Lifetime of singlet oxygen in different solvents. Byteva, I.M.; Salokhiddinov, K.I., *Biofizika* **25**: 358 (1980)

80E558 Photosensitized luminescence of singlet oxygen in solutions at 1588 nm. Salokhiddinov, K.I.; Dzhagarov, B.M.; Byteva, I.M.; Gurinovich, G.P., *Chem. Phys. Lett.* **76**: 85-7 (1980)

80E606 Direct observation of singlet oxygen by a thermal lensing technique. Fuke, K.; Ueda, M.; Itoh, M., *Chem. Phys. Lett.* **76**: 372-4 (1980)

80E616 Laser induced fluorescence and relaxation of singlet molecular oxygen in the liquid phase. Protz, R.; Maier, M., *J. Chem. Phys.* **73**: 5464-7 (1980)

80E761 Yield of singlet oxygen in the quenching of triplet states of aromatic compounds by molecular oxygen. Ivanov, V.B.; Kuprashvili, B.G.; Edilashvili, I.L., *Khim. Vys. Energ.* **14**: 280-2 (1980)

80F007 Mechanisms of photooxygenation. 1. Substituent effects on the [2 + 2] cycloaddition of singlet oxygen to vinyl ethers. Zaklika, K.A.; Kaskar, B.; Schaap, A.P., *J. Am. Chem. Soc.* **102**: 386-9 (1980)

80F020 Photoinduced reactions. 104. Photooxygenation of magnesium meso-tetraphenylporphyrin. Matsuura, T.; Inoue, K.; Ranade, A.C.; Saito, I., *Photochem. Photobiol.* **31**: 23-6 (1980)

80F104 Nature of peroxy intermediates produced by the photosensitized oxygenation of diethyl sulfide and phenylbenzoyl diazomethane: Kinetic studies by co-oxidation with 4-mono substituted diphenyl sulfides. Ando, W.; Kabe, Y.; Miyazaki, H., *Photochem. Photobiol.* **31**: 191-4 (1980)

80F111 Reaction of singlet oxygen with α,β-unsaturated ketones and lactones. Ensley, H.E.; Carr, R.V.C.; Martin, R.S.; Pierce, T.E., *J. Am. Chem. Soc.* **102**: 2836-8 (1980)

80F151 Ein neues photochromes System von ungewoehnlich hoher thermischer Stabilitaet. Brauer, H.-D.; Drews, W.; Schmidt, R., *J. Photochem.* **12**: 293-304 (1980)

80F169 β-Carotene inhibited photooxidation of polystyrene. 1. Effect of β-carotene on photochemical reactivity of anthracene in hexane solution. Nowakowska, M., *Makromol. Chem.* **181**: 1013-20 (1980)

80F204 The photooxidation of mono- and dimethylnaphthalenes by singlet oxygen. van den Heuvel, C.J.M.; Steinberg, H.; de Boer, Th.J., *Recl. Trav. Chim. Pays.-Bas* **99**: 109-13 (1980)

80F427 Reactions of singlet oxygen. Part V. Dye sensitized photooxidation of m-hydroxydiphenylamine. Ram, N.; Sidhu, K.S., *Can. J. Chem.* **58**: 2073 9 (1980)

80F548 Singlet oxygen photo-oxidation of some triazapentalenes. Albini, A.; Bettinetti, G.F.; Minoli, G.; Pietra, S., *J. Chem. Soc., Perkin Trans. 1* : 2904-8 (1980)

80F634 Mechanism of the photofading of dye. Contribution of singlet oxygen in the catalytic fading of anthraquinone dye mixtures. Kuramoto, N.; Kitao, T., *J. Chem. Technol. Biotechnol.* **30**: 129-35 (1980)

80F718 Photochemical processes of 2,6-di-tert-butyl-4-methylphenol. Nowakowska, M.; Kowal, J., *Eur. Polym. J.* **16**: 615-8 (1980)

80M378 Controlled generation of singlet oxygen at low temperatures from triphenyl phosphite ozonide. Bartlett, P.D.; Mendenhall, G.D.; Durham, D.L., *J. Org. Chem.* **45**: 4269-71 (1980)

80N018 Photophysical and photosensitized generation of singlet molecular oxygen ($^1\Delta_g$) in micellar solutions at elevated pressures. Measurement of singlet molecular oxygen solvent to micelle transfer rates via both molecular diffusion and energy transfer. Matheson, I.B.C.; Massoudi, R., *J. Am. Chem. Soc.* **102**: 1942-8 (1980)

80N021 Fluorescein-photosensitized furan oxidation in methanolic and reversed micellar solutions. Part II. Kinetic analysis. Miyoshi, N.; Tomita, G., *Z. Naturforsch., Teil B* **35B**: 107-11 (1980)

80R072 On the feasibility of electron transfer to singlet oxygen from mitochondrial components. Peters, G.; Rodgers, M.A.J., *Biochem Biophys. Res. Commun.* **96**: 770-6 (1980)

80R116 Retinal-sensitized photochemiluminescence of trypsin solutions and the effect of 3-hydrooxypyridine on it. Shiryaev, V.M.; Fedorovich, I.B.; Sapezhinskii, I.I.; Khristophorov, V.L.; Kuz'min, V.I.; Smirnov, L.D., *Biophysics* **25**: 454-61 (1981) Translated from: *Biofizika* 25: 439-45 (1980)

81A191 Single-electron transfer from NADH analogues to singlet oxygen. Peters, G.; Rodgers, M.A.J., *Biochim. Biophys. Acta* **637**: 43-52 (1981)

81A287 Time-resolved determinations of deuterium isotope effects on $O_2(^1\Delta_g)$ lifetimes in solution. Peters, G.; Rodgers, M.A.J., *J. Am. Chem. Soc.* **103**: 6759-61 (1981)

81A327 1,4-Dihydropyridine derivatives as deactivators of singlet oxygen. Tirzitis, G.; Byteva, I.M.; Salokhiddinov, K.I.; Gurinovich, G.P.; Dubure, G., *Chem. Heterocycl. Compd.* : 682-4 (1981) Translated from: *Khim. Geterotsikl. Soedin.* : 924-6 (1981)

81A363 Rates of reaction of singlet oxygen with some systemic pyrimidine fungicides and related compounds. Harkness, G.J.; Wells, C.H.J., *Pestic. Sci.* **12**: 215-8 (1981)

81A403 Photooxidation of arylazonaphthols with singlet oxygen. Becker, H.G.O.; Franze, J., *J. Prakt. Chem.* **323**: 957-64 (1981)

81A422 Oxidation of NADH by singlet oxygen generated by triplet flavin. Vekshin, N.L.; Mironov, G.P., *Biophysics* **26**: 974-81 (1981) Translated from: *Biofizika* **26**: 953-9 (1981)

81A437 Electronic control of stereoselectivity. 8. The stereochemical course of electrophilic additions to aryl-substituted 9-isopropylidenebenzonorbornenes. Paquette, L.A.; Hertel, L.W.; Gleiter, R.; Boehm, M.C.; Beno, M.A.; Christoph, G.G., *J. Am. Chem. Soc.* **103**: 7106-21 (1981)

81E003 Reactivity of singlet oxygen toward strained substrates and a novel non-photochemical method for determination of quenching constants of singlet oxygen. Turro, N.J.; Chow, M.-F.; Kanfer, S.; Jacobs, M., *Tetrahedron Lett.* **22**: 3-6 (1981)

81E398 Lifetime of singlet oxygen in different solvents. Salokhiddinov, K.I.; Byteva, I.M.; Gurinovich, G.P., *J. Appl. Spectrosc.* **34**: 561-4 (1981) Translated from: *Zh. Prikl. Spektrosk.* **34**: 892-7 (1981)

81E472 Study of the sensitized luminescence of singlet oxygen in solutions in the 1588 nm region. Salokhiddinov, K.I.; Byteva, I.M.; Dzhagarov, B.M.; Gurinovich, G.P., *J. Appl. Spectrosc.* **35**: 888-91 (1981) Translated from: *Zh. Prikl. Spektrosk.* **35**: 280-4 (1981)

81E631 Determination of radiative lifetime of the $^1\Delta_g$ state of oxygen in solutions. Krasnovsky, A.A.,Jr., *Sov. Phys. Dokl.* **26**: 425-6 (1981) Translated from: *Dokl. Akad. Nauk SSSR* **257**: 1360-2 (1981)

81E704 Energy transfer processes accompanying laser excitation of hematoporphyrin in various solvents. Parker, J.G.; Stanbro, W.D., *Johns Hopkins APL Tech. Dig.* **2**: 196-9 (1981)

81F018 Syn regioselectivity of the hydroperoxidation of cyclo-alkenes with singlet oxygen. Jefford, C.W.; Rimbault, C.G., *Tetrahedron Lett.* **22**: 91-4 (1981)

81F043 Kinetic studies of self-sensitized photooxygenation in H_2O and D_2O of a water-soluble rubrene derivative. Aubry, J.M.; Rigaudy, J.; Chuong, N.K., *Photochem. Photobiol.* **33**: 155-8 (1981)

81F311 Nucleophilic oxygen atom transfer reactions by persulfoxide and persulfone. Sawaki, Y.; Ogata, Y., *J. Am. Chem. Soc.* **103**: 5947-8 (1981)

81F321 Quenching of singlet oxygen by sensitizer in dye-sensitized photooxygenation. Tanielian, C.; Golder, L., *Photochem. Photobiol.* **34**: 411-4 (1981)

81F364 Photoperoxidation of unsaturated organic molecules. 21. Sensitizer yields of O_2 $^1\Delta_g$. Stevens, B.; Marsh, K.L.; Barltrop, J.A., *J. Phys. Chem.* **85**: 3079-82 (1981)

81F445 Rate constants for the reaction of singlet oxygen with conjugated dienes. Monroe, B.M., *J. Am. Chem. Soc.* **103**: 7253-6 (1981)

81F534 The mechanism of ene-reactions with singlet oxygen, $^1O_2$ ($^1\Delta_g$): Dependence of rates on solvent polarity and structure. Gollnick, K.; Hartmann, H.; Paur, H., *Oxygen and Oxy-Radicals in Chemistry and Biology*, M.A.J. Rodgers and E.L. Powers (eds.), Academic Press, New York, NY, 1981, p.379-95

81F582 Solvent effect in reaction of singlet oxygen with conjugated dienes. Matsumoto, M.; Kuroda, K., *Synth. Commun.* **11**: 987-92 (1981)

81F609 Formation of singlet oxygen by photoexcitation of substituted aromatic azo compounds in oxygenated solution. Gruen, H.; Steffen, H.; Schulte-Frohlinde, D., *J. Soc. Dyers Colour.* **97**: 430-5 (1981)

81F622 Intermediates in the reactions of oxazoles with singlet oxygen. Wasserman, H.H.; Pickett, J.E.; Vinnick, F.S., *Heterocycles* **15**: 1069-73 (1981)

81N048 Rate parameters for the quenching of singlet oxygen by water-soluble and lipid-soluble substrates in aqueous and micellar systems. Lindig, B.A.; Rodgers, M.A.J., *Photochem. Photobiol.* **33**: 627-34 (1981)

81R011 On the acridine and thiazine dye sensitized photodynamic inactivation of lysozyme-singlet oxygen self-quenching by the sensitizers. Schmidt, H.; Al-Ibrahim, A.; Dietzel, U.; Bieker, L., *Photochem. Photobiol.* **33**: 127-30 (1981)

81R052 Relation between some photobiological propertites of furocoumarins and their extent of singlet oxygen production. de Mol, N.J.; Beijersbergen van Henegouwen, G.M.J., *Photochem. Photobiol.* **33**: 815-9 (1981)

81Z251 Rate constants for the decay and reactions of the lowest electronically excited singlet state of molecular oxygen in solution. Wilkinson, F.; Brummer, J.G., *J. Phys. Chem. Ref. Data* **10**: 809-999 (1981)

82A059 Steric aspects of the oxidation of thioketones by singlet oxygen. Ramnath, N.; Jayathertha Rao, V.; Ramesh, V.; Ramamurthy, V., *Chem. Lett.* : 89-92 (1982)

82A080 Chemistry of singlet oxygen. 37. One-electron oxidation of tetramethylphenylenediamine by singlet oxygen. Manring, L.E.; Foote, C.S., *J. Phys. Chem.* **86**: 1257-9 (1982)

82A093 Rates of oxidation of thioketones by singlet oxygen. Ramesh, V.; Ramnath, N.; Jayathertha Rao, V.; Ramamurthy, V., *J. Photochem.* **18**: 109-15 (1982)

82A140 Lifetime of singlet oxygen and quenching by NaN_3 in mixed solvents. Miyoshi, N.; Ueda, M.; Fuke, K.; Tanimoto, Y.; Itoh, M.; Tomita, G., *Z. Naturforsch., Teil B* **37B**: 649-52 (1982)

82A179 Photoperoxidation of unsaturated organic molecules. 22. Tetraphenylcyclopentadienone. Stevens, B.; Marsh, K.L., *J. Phys. Chem.* **86**: 2553-6 (1982)

82A204 Crocetin, a water soluble carotenoid monitor for singlet molecular oxygen. Matheson, I.B.C.; Rodgers, M.A.J., *Photochem. Photobiol.* **36**: 1-4 (1982)

82A291 Mechanism of dye-sensitized photooxidation of tryptophan, tryptamine, and their derivatives. Singlet oxygen process in competition with type I process. Inoue, K.; Matsuura, T.; Saito, I., *Bull. Chem. Soc. Jpn.* **55**: 2959-64 (1982)

82A322 Photoperoxidation of unsaturated organic molecules. 24. Mixed solvent quenching of $O_2(^1\Delta_g)$ phosphorescence. Stevens, B.; Marsh, K.L., *J. Phys. Chem.* **86**: 4473-6 (1982)

82A349 Time-resolved study of the solvent and temperature dependence of singlet oxygen($^1\Delta_g$) reactivity toward enol ethers: Reactivity parameters typical of rapid reversible exciplex formation. Gorman, A.A.; Gould, I.R.; Hamblett, I., *J. Am. Chem. Soc.* **104**: 7098-104 (1982)

82A384 Generation and quenching of the luminescence of singlet molecular oxygen by anthraquinone dyes. Venediktov, E.A.; Krasnovsky, A.A.,Jr., *Opt. Spectrosc. (USSR)* **52**: 338-9 (1982) Translated from: *Opt. Spektrosk.* **52**: 567-9 (1982)

82A412 The quenching of the sensitised luminescence of molecular oxygen by transition metal complexes of different structures. Byteva, I.M.; Salokhiddinov, K.I.; Bondarev, S.L., *Russ. J. Phys. Chem.* **56**: 1056-9 (1982) Translated from: *Zh. Fiz. Khim.* **56**: 1743-7 (1982)

82A421 Quenching of singlet oxygen with chlorophylls and porphyrins. Krasnovsky, A.A.,Jr.; Venediktov, E.A.; Cherenko, O.M., *Biophysics* **27**: 1009-16 (1982) Translated from: *Biofizika* **27**: 966-72 (1982)

82A464 Kinetics of dye-sensitized photodegradation of aqueous phenol. Okamoto, K.; Hondo, F.; Itaya, A.; Kusabayashi, S., *J. Chem. Eng. Jpn.* **15**: 368-75 (1982)

82E072 Laser photolysis study of the mechanism of rubrene quenching by molecular oxygen. Darmanyan, A.P., *Chem. Phys. Lett.* **86**: 405-10 (1982)

82E104 Lifetime of singlet oxygen in solution directly determined by laser spectroscopy. Hurst, J.R.; McDonald, J.D.; Schuster, G.B., *J. Am. Chem. Soc.* **104**: 2065-7 (1982)

82E105 Optical determination of the collisional lifetime of singlet molecular oxygen [$O_2(^1\Delta_g)$] in acetone and deuterated acetone. Parker, J.G.; Stanbro, W.D., *J. Am. Chem. Soc.* **104**: 2067-9 (1982)

82E106 Chemistry of singlet oxygen. 36. Singlet molecular oxygen ($^1\Delta_g$) luminescence in solution following pulsed laser excitation. Solvent deuterium isotope effects on the lifetime of singlet oxygen. Ogilby, P.R.; Foote, C.S., *J. Am. Chem. Soc.* **104**: 2069-70 (1982)

82E329 Solvent and deuterium isotope effects on the lifetime of singlet oxygen determined by direct emission spectroscopy at 1.27 μm. Jenny, T.A.; Turro, N.J., *Tetrahedron Lett.* **23**: 2923-6 (1982)

82E575 Non-exponential decay of the fluorescence from the $^1\Delta_g$ state in liquid oxygen at high excitation intensities. Klingshirn, H.; Faltermeier, B.; Hengl, W.; Maier, M., *Chem. Phys. Lett.* **93**: 485-9 (1982)

82F018 Mechanisms for the photooxidation of protoporphyrin IX in solution. Cox, G.S.; Whitten, D.G., *J. Am. Chem. Soc.* **104**: 516-21 (1982)

82F068 Wavelength dependent and adiabatic photochemistry of endoperoxides of aromatic hydrocarbons. Schmidt, R.; Drews, W.; Brauer, H.-D., *Z. Naturforsch., Teil A* **37A**: 55-7 (1982)

82F102 The effect of solvent on competing hydroperoxide and dioxetane formation on photo-sensitized oxygenation of olefins. Jefford, C.W.; Kohmoto, S., *Helv. Chim. Acta* **65**: 133-6 (1982)

82F357 Chemistry of singlet oxygen. 38. Temperature effect on the photooxidation of sulfides. Gu, C.-L.; Foote, C.S., *J. Am. Chem. Soc.* **104**: 6060-3 (1982)

82F379 A new water-soluble singlet oxygen probe. Giraud, M.; Valla, A.; Bazin, M.; Santus, R.; Momzikoff, A., *J. Chem. Soc., Chem. Commun.* : 1147-8 (1982)

82F446 Wavelength-dependent photostable or photoreversible photochromic system. Schmidt, R.; Drews, W.; Brauer, H.-D., *J. Phys. Chem.* **86**: 4909-13 (1982)

82F450 Effects of remote substitution on the photo-oxidation of exocyclic s-cis-butadienes grafted onto bicyclo[2.2.1]heptanes. Thermal and rhodium catalyzed rearrangements of 3,6-dihydro-1,2-dioxines. Hagenbuch, J.-P.; Birbaum, J.-L.; Metral, J.-L.; Vogel, P., *Helv. Chim. Acta* **65**: 887-95 (1982)

82F525 Photoreaction of crystal violet in solution. Nakamura, R.; Hida, M., *Sen'i Gakkaishi* **38**: T183-T190 (1982)

82F531 Physiochemical study of a series of cyanines. Part V. Photodegradation mechanism. Lougnot, D.J.; Lepaja, S.; Fouassier, J.P., *J. Chim. Phys. Phys.-Chim. Biol.* **79**: 617-28 (1982)

82N021 Oxygen transfer rates across water-micelle interfaces derived from measurements of Ni^{2+} quenching of singlet molecular oxygen in aerosol-OT-heptane reverse micelles. Matheson, I.B.C.; Rodgers, M.A.J., *J. Phys. Chem.* **86**: 884-7 (1982)

82N027 A laser flash kinetic spectrophotometric examination of the dynamics of singlet oxygen in unilammellar vesicles. Rodgers, M.A.J.; Bates, A.L., *Photochem. Photobiol.* **35**: 473-7 (1982)

82N064 Micellar photochemistry. Photooxidations with intramicellar-generated singlet oxygen. Hovey, M.C., *J. Am. Chem. Soc.* **104**: 4196-202 (1982)

83A006 Studies on the interactions of transient species formed in liquid phase oxidation of hydrocarbons by laser flash photolysis. I. Interactions of singlet oxygen with ethylbenzene and with products of the oxidation of ethylbenzene. Darmanyan, A.P.; Vidoczy, T.; Irinyi, G.; Gal, D., *Oxid. Commun.* **3**: 15-24 (1983)

83A026 Reaction of singlet oxygen with enol esters: A new path implicating a dipolar intermediate. Wilson, S.L.; Schuster, G.B., *J. Am. Chem. Soc.* **105**: 679-81 (1983)

83A050 Thermal lensing study of singlet oxygen reactions. Fuke, K.; Ueda, M.; Itoh, M., *J. Am. Chem. Soc.* **105**: 1091-6 (1983)

83A063 Quenching of singlet oxygen by 1,3,5-triaryl-2-pyrazolines. Ando, W.; Sato, R.; Yamashita, M.; Akasaka, T.; Miyazaki, H., *J. Org. Chem.* **48**: 542-6 (1983)

83A078 Photosensitized oxygenation of oligoisoprenes. Tanielian, C.; Chaineaux, J., *J. Photochem.* **21**: 265-73 (1983)

83A094 Formation of superoxide ion via one-electron transfer from electron donors to singlet oxygen. Saito, I.; Matsuura, T.; Inoue, K., *J. Am. Chem. Soc.* **105**: 3200-6 (1983)

83A205 L Ascorbic acid quenching of singlet delta molecular oxygen in aqueous media: Generalized antioxidant property of vitamin C. Chou, P.-T.; Khan, A.U., *Biochem. Biophys. Res. Commun.* **115**: 932-7 (1983)

83A223 Solvent-induced deactivation of singlet oxygen: Additivity relationships in nonaromatic solvents. Rodgers, M.A.J., *J. Am. Chem. Soc.* **105**: 6201-5 (1983)

83A315 Dye-sensitized photooxidation of 2-dimethylamino-5,6-dimethylpyrimidin-4-ol in aqueous solution. Dixon, S.R.; Wells, C.H.J., *Pestic. Sci.* **14**: 444-8 (1983)

83A317 A kinetic study of the interaction between bilirubin and thermally produced singlet oxygen. Galliani, G.; Manitto, P.; Monti, D., *Isr. J. Chem.* **23**: 219-22 (1983)

83A336 Interaction of singlet oxygen with carotenoids: rate constants of physical and chemical quenching. Krasnovsky, A.A.,Jr.; Paramonova, L.I., *Biophysics* **28**: 769-74 (1983) Translated from: *Biofizika* **28**: 725-9 (1983)

83A371 Influence of medium on lifetime and reactivity of $^1O_2$ with 1,3-diphenylisobenzofuran, and the role of $^1O_2$ in liquid-phase oxidation of ethylbenzene. Darmanyan, A.P.; Vidoczy, T.; Irinii, G.; Gal, D., *Bull. Acad. Sci. USSR, Div. Chem. Sci.* **32**: 2423-9 (1983) Translated from: *Izv. Akad. Nauk SSSR, Ser. Khim.* : 2702-8 (1983)

83A394 Sensitized photooxygenation of cis 9-tricosene (housefly sex attractant). Tanielian, C.; Mechin, R.; Esch, M., *Oxygen Radicals Chem. Biol.*, W. Bors, M. Saran and D. Tait (eds.), de Gruyter, Berlin, Fed. Rep. Germany, Pub. 1984, p.527-30

83A395 On the reactivity of singlet oxygen with hemoglobin. Kraljic, I.; Pin, S.; El Mohsni, S.; Alpert, B., *Oxygen Radicals Chem. Biol.*, W. Bors, M. Saran and D. Tait (eds.), de Gruyter, Berlin, Fed. Rep. Germany, Pub. 1984, p.531-4

83A397 Dye-sensitized photooxidation of tryptophan. Tanielian, C.; Muller, H.; Golder, L., *Oxygen Radicals Chem. Biol.*. W. Bors, M. Saran and D. Tait (eds.), de Gruyter, Berlin, Fed. Rep. Germany, Pub. 1984, p.551-4

83E235 Chemistry of singlet oxygen. 42. Effect of solvent, solvent isotopic substitution, and temperature on the lifetime of singlet molecular oxygen ($^1\Delta_g$). Ogilby, P.R.; Foote, C.S., *J. Am. Chem. Soc.* **105**: 3423-30 (1983)

83E398 Nonradiative relaxation of singlet oxygen in solution. Hurst, J.R.; Schuster, G.B., *J. Am. Chem. Soc.* **105**: 5756-60 (1983)

83E425 Mechanism of quenching of singlet oxygen luminescence by saturated and unsaturated aliphatic acids. Krasnovsky, A.A.,Jr.; Minin, A.A.; Kagan, V.E., *Dokl. Biophys.* **268**: 59-61 (1983) Translated from: *Dokl. Akad. Nauk SSSR* **268**: 1488-91 (1983)

83E667 Flash photolysis studies of hemato- and copro-porphyrins in homogeneous and microheterogeneous aqueous dispersions. Reddi, E., Jori, G.; Rodgers, M.A.J.; Spikes, J.D., *Photochem. Photobiol.* 38 639-45 (1983)

83E756 Direct measurement of the lifetime of molecular oxygen in the singlet $^1\Delta_g$ state, generated in water by a porphyrin sensitizer. Salokhiddinov, K.I.; Dzhagarov, B.M.; Egorova, G.D., *Opt. Spectrosc. (USSR)* **55**: 40-1 (1983) Translated from: *Opt. Spektrosk.* **55**: 71-3 (1983)

83E813 Photogeneration of singlet oxygen by psoralens. Krasnovsky, A.A.; Sukhorukov, V.L.; Potapenko, A.Ya., *Bull. Exp. Biol. Med.* **96**: 1259-61 (1983) Translated from: *Byull. Eksp. Biol. Med.* **96**: 59-61 (1983)

83E818 Effect of solvent deuteration and of an external heavy atom on the luminescence quenching time of molecular oxygen. Salokhiddinov, K.I.; Byteva, I.M., *Opt. Spectrosc. (USSR)* **55**: 282-4 (1983) Translated from: *Opt. Spektrosk.* **55**: 479-82 (1983)

83E844 Pulsed laser excitation of photosensitized oxygen luminescence. Decay kinetics in aqueous solutions. Egorov, S.Yu.; Krasnovsky, A.A., *Biophysics* **28**: 532-4 (1983) Translated from: *Biofizika* **28**: 497-8 (1983)

83F028 Photochemical oxidation of thioketones: Steric and electronic aspects. Ramnath, N.; Ramesh, V.; Ramamurthy, V., *J. Org. Chem.* **48**: 214-22 (1983)

83F075 Solvent effect on $^1O_2$ yield and the mechanism of polycyclic hydrocarbon triplet-state quenching by oxygen. Darmanyan, A.P., *Chem. Phys. Lett.* **96**: 383-9 (1983)

83F136 Photooxidation of some triaza- and tetraazabenzopentalenes. Albini, A.; Bettinetti, G.F.; Minoli, G., *J. Org. Chem.* **48**: 1080-3 (1983)

83F151 Quenching of singlet oxygen luminescence by fatty acids and lipids. Contribution of physical and chemical mechanisms. Krasnovsky, A.A.,Jr.; Kagan, V.E.; Minin, A.A., *FEBS Lett.* **155**: 233-6 (1983)

83F166 Singlet oxygen generation for solution kinetics: Clean and simple. Midden, W.R.; Wang, S.Y., *J. Am. Chem. Soc.* **105**: 4129-35 (1983)

83F188 Photosensitizing properties of furocoumarins. V. 8-Methoxypsoralen: Quantum yields of reaction in aerated and degased solution: Role of singlet oxygen. Le, Q.T.; Arnaud, R.; Lemaire, J., *C.R. Seances Acad. Sci., Ser. II* **296**: 687-90 (1983)

83F195 Chemistry of singlet oxygen. 43. Quenching by conjugated olefins. Manring, L.E.; Kanner, R.C.; Foote, C.S., *J. Am. Chem. Soc.* **105**: 4707-10 (1983)

83F196 Chemistry of singlet oxygen. 44. Mechanism of photooxidation of 2,5-dimethylhexa-2,4-diene and 2-methyl-2-pentene. Manring, L.E.; Foote, C.S., *J. Am. Chem. Soc.* **105**: 4710-7 (1983)

83F222 The vitamin-B_{12}-derived Co(III)- complex 'pyrocobester' as photosensitizer and as substrate in reactions involving 'singlet oxygen'. Kraeutler, B.; Stepanek, R., *Helv. Chim. Acta* **66**: 1493-512 (1983)

83F256 Reaction of retinol and retinal with singlet oxygen. Smith, G.J., *Photochem. Photobiol.* **38**: 119-21 (1983)

83F323 Spectroscopic studies of cutaneous photosensitizing agents. IV. The photolysis of benoxaprofen, an anti-inflammatory drug with phototoxic properties. Reszka, K.; Chignell, C.F., *Photochem. Photobiol.* **38**: 281-91 (1983)

83F335 Generation of $^1O_2$ from O_2 quenching of the lowest excited singlet and triplet states of 9,10-diphenylanthracene. Drews, W.; Schmidt, R.; Brauer, H.-D., *Chem. Phys. Lett.* **100**: 466-9 (1983)

83F406 Mesodiphenylhelianthrene - the most reactive singlet oxygen acceptor. Acs, A.; Schmidt, R.; Brauer, H.-D., *Photochem. Photobiol.* **38**: 527-31 (1983)

83F407 Ascorbic acid as a photooxidation inhibitor. Rooney, M.L., *Photochem. Photobiol.* **38**: 619-21 (1983)

83N084 Time resolved studies of 1.27 μm luminescence from singlet oxygen generated in homogeneous and microheterogeneous fluids. Rodgers, M.A.J., *Photochem. Photobiol.* **37**: 99-103 (1983)

84A171 Singlet molecular oxygen in micellar systems. 1. Distribution equilibria between hydrophobic and hydrophilic compartments. Lee, P.C.; Rodgers, M.A.J., *J. Phys. Chem.* **87**: 4894-8 (1983)

84B008 Hematoporphyrin photosensitization of serum albumin and subtilisin BPN'. Richard, P.; Blum, A.; Grossweiner, L.I., *Photochem. Photobiol.* **37**: 287-91 (1983)

84B123 Chemistry of singlet oxygen. 46. Cercosporin, a singlet oxygen generator. Dobrowolski, D.C.; Foote, C.S., *Angew. Chem. Int. Ed. Engl.* 22: 720-1 (1983)

84A070 Oxidation of thioketenes by singlet oxygen. Rao, V.J.; Ramamurthy, V.; Schaumann, E.; Nimmesgern, H., *J. Org. Chem.* **49**: 615-21 (1984)

84A167 Quenching of singlet oxygen by hindered amine light stabilisers. A flash photolytic study. Ballardini, R.; Beggiato, G.; Bortolus, P.; Faucitano, A.; Buttafava, A.; Gratani, F., *Polym. Degradation Stab.* **7**: 41-53 (1984)

84A247 Mechanism of singlet oxygen interaction with spin trap α-phenyl-N-tert-butylnitrone. Darmanyan, A.P.; Moger, G., *J. Photochem.* **26**: 269-74 (1984)

84A339 Study of carbonyl oxide formation in the reaction of singlet oxygen with diphenyldiazomethane. Casal, H.L.; Sugamori, S.E.; Scaiano, J.C., *J. Am. Chem. Soc.* **106**: 7623-4 (1984)

84B066 Strychnine: A fast physical quencher of singlet oxygen ($^1\Delta_g$). Gorman, A.A.; Hamblett, I.; Smith, K.; Standen, M.C., *Tetrahedron Lett.* **25**: 581-4 (1984)

84B289 Relaxation of the $^1\Delta_g$ state in pure liquid oxygen and in liquid mixtures of $^{16}O_2$ and $^{18}O_2$. Wild, E.; Klingshirn, H.; Maier, M., *J. Photochem.* **25**: 131-43 (1984)

84B291 The mechanism of quenching of singlet oxygen $O_2^*(^1\Delta_g)$ by molecular iodine. Wilkinson, F.; Farmilo, A., *J. Photochem.* **25**: 153-60 (1984)

84B296 Optical determination of the rates of formation and decay of $O_2(^1\Delta_g)$ in H_2O, D_2O and other solvents. Parker, J.G.; Stanbro, W.D., *J. Photochem.* **25**: 545-7 (1984)

84B492 Reversible exciplex formation between singlet oxygen, $^1\Delta_g$, and vitamin E. Solvent and temperature effects. Gorman, A.A.; Gould, I.R.; Hamblett, I.; Standen, M.C., *J. Am. Chem. Soc.* **106**: 6956 9 (1984)

84B005 Laser flash photolytic determination of triplet yields via singlet oxygen generation. Chattopadhyay, S.K.; Kumar, C.V.; Das, P.K., *J. Photochem.* **24**: 1-9 (1984)

84B065 Solvent dependence of singlet oxygen / substrate interactions in ene-reactions, (4 + 2)- and (2 + 2)-cycloaddition reactions. Gollnick, K.; Griesbeck, A., *Tetrahedron Lett.* **25**: 725-8 (1984)

84F075 Photooxidation of 3,4-dihydroxyphenylalanine by hematoporphyrin in aqueous solutions: An electron spin resonance study using 2,2,6,6-tetramethyl-4-piperidone-1-oxyl (tempone). Reszka, K.; Sealy, R.C., *Photochem. Photobiol.* **39**: 293-9 (1984)

84F191 Production and quenching of singlet oxygen by the sensitizer in dye-sensitized photo-oxygenations. Tanielian, C.; Golder, L.; Wolff, C., *J. Photochem.* **25**: 117-25 (1984)

84F193 Effects of solvent on the rate of bacteriochlorophyll a photo-oxidation. Marsh, K.L.; Connolly, J.S., *J. Photochem.* **25**: 183-95 (1984)

84F194 Aspects of photosensitized lignin oxygenation. Forsskahl, I., *J. Photochem.* **25**: 197-209 (1984)

84F196 Singlet oxygen oxidation of substituted thiobenzamides. Murray, R.W.; Agarwal, S.K., *J. Photochem.* **25**: 335-43 (1984)

84F197 Generation of $^1O_2$ from oxygen quenching of the lowest excited singlet and triplet states of some aromatic compounds. Brauer, H.-D.; Acs, A.; Drews, W.; Gabriel, R.; Ghaeni, S.; Schmidt, R., *J. Photochem.* **25**: 475-88 (1984)

84F199 Singlet oxygen and free-radical oxidation of polydienes and related problems with stabilization: Synergistic and antagonistic effects. Rabek, J.F.; Ranby, B.; Arct, J.; Liu, R., *J. Photochem.* **25**: 519-36 (1984)

84F240 Solvent effect on the quantum yield of the self-sensitized photoperoxidation of 1,3-diphenylisobenzofuran. Nowakowska, M., *J. Chem. Soc., Faraday Trans. 1* **80**: 2119-26 (1984)

84F244 Photoreactions of 4-(aminomethylene) derivatives of 3-methyl-1-phenyl-2-pyrazoline-5-thione. Rtishchev, N.I.; El'tsov, A.V.; Kvitko, I.Ya.; Alam, L.V.; Bocharova, E.G., *J. Gen. Chem., USSR* **54**: 134-42 (1984) Translated from: *Zh. Obshch. Khim.* **54**: 152-61 (1984)

84F327 The effect of medium polarity on the hematoporphyrin-sensitized photooxidation of L-tryptophan. Reddi, E.; Rodgers, M.A.J.; Spikes, J.D.; Jori, G., *Photochem. Photobiol.* **40**: 415-21 (1984)

84F330 Photosensitization of melanin: An electron spin resonance study of sensitized radical production and oxygen consumption. Sealy, R.C.; Sarna, T.; Wanner, E.J.; Reszka, K., *Photochem. Photobiol.* **40**: 453-9 (1984)

84F335 Interactions of singlet oxygen with 2,5-dimethyl-2,4-hexadiene in polar and non-polar solvents. Evidence for a vinylog ene-reaction. Gollnick, K.; Griesbeck, A., *Tetrahedron* **40**: 3235-50 (1984)

84F350 Is self-sensitized photo-oxidation a significant pathway in the photofading of azo dyes? Albini, A.; Fasani, E.; Pietra, S.; Sulpizio, A., *J. Chem. Soc., Perkin Trans. 2* : 1689-92 (1984)

84F381 Singlet oxygen in surface waters. Part I. Furfuryl alcohol as a trapping agent. Haag, W.R.; Hoigne, J.; Gassman, E.; Braun, A.M., *Chemosphere* **13**: 631-40 (1984)

84F474 Effect of substituents, solvent, and temperature on the reactivity of the zwitterionic peroxides arising from the photo-oxygenation of 2-(methoxymethylidene)- and 2-(phenoxymethylidene)adamantane. Jefford, C.W.; Grant, H.G.; Jaggi, D.; Boukouvalas, J.; Kohmoto, S., *Helv. Chim. Acta* **67**: 2210-7 (1984)

84F477 Mechanism of endoperoxide formation. 3. Utilization of the Young and Carlsson kinetic techniques. Clennan, E.L.; Mehrsheikh-Mohammadi, M.E., *J. Am. Chem. Soc.* **106**: 7112-8 (1984)

84F670 Quenching of singlet oxygen by alkaloids and related nitrogen heterocycles. Larson, R.A.; Marley, K.A., *Phytochemistry* **23**: 2351-4 (1984)

84F673 Quenching of singlet oxygen by methylene blue. Tanielian, C.; Mechin, R., *Proc. 10th IUPAC Symp. Photochem.*, Presses Polytechniques Romandes, Lausanne, Switzerland, 1984, p.471-2

84N114 Singlet molecular oxygen in micellar systems. 2. Quenching behavior in AOT reverse micelles. Rodgers, M.A.J.; Lee, P.C., *J. Phys. Chem.* **88**: 3480-4 (1984)

84N150 Kinetic properties of singlet oxygen in a polymeric microheterogeneous system. Lee, P.C.; Rodgers, M.A.J., *J. Phys. Chem.* **88**: 4385-9 (1984)

84P629 Studies on singlet oxygen reaction with ethylene-propylene-ethylidenenorbornene terpolymer. Part II. Determination of kinetic parameters of photosensitized oxidation of ethylene-propylene-ethylidenenorbornene terpolymer. Nowakowska, M., *Polym. Photochem.* **4**: 347-59 (1984)

85A124 Interaction of singlet oxygen with α- and β-naphthols. Moger, G.; Darmanyan, A.P., *J. Radioanal. Nucl. Chem.* **94**: 9-15 (1985)

85A167 The ene reaction of singlet oxygen: Kinetic and product evidence in support of a perepoxide intermediate. Hurst, J.R.; Wilson, S.L.; Schuster, G.B., *Tetrahedron* **41**: 2191-7 (1985)

85A176 Studies on singlet oxygen in aqueous solution. Part 1. Formation of singlet oxygen from hydrogen peroxide with two-electron oxidants. Evans, D.F.; Upton, M.W., *J. Chem. Soc., Dalton Trans.* : 1141-5 (1985)

85A177 Studies on singlet oxygen in aqueous solution. Part 2. Water-soluble square-planar nickel complexes as quenchers. Botsivali, M.; Evans, D.F.; Missen, P.H.; Upton, M.W., *J. Chem. Soc., Dalton Trans.* : 1147-9 (1985)

85A206 Fluorenone oxide: Transient spectroscopy and kinetics of its formation and reactions. Casal, H.L.; Tanner, M.; Werstiuk, N.H.; Scaiano, J.C., *J. Am. Chem. Soc.* **107**: 4616-20 (1985)

85A261 The unusual reactions of singlet oxygen with isomeric 1,4-di-tert-butoxy-1,3-butadienes. A $2_s + 2_a$ cycloaddition. Clennan, E.L.; L'Esperance, R.P., *J. Am. Chem. Soc.* **107**: 5178-82 (1985)

85A443 Retinal-sensitized photooxidation of rhodopsin. Starostin, A.V.; Fedorovich, I.B.; Ostrovskii, M.A., *Biophysics* **30**: 1082-8 (1985) Translated from: *Biofizika* **30**: 995-9 (1985)

85E190 Quantitative aspects of all-trans-retinol singlet and triplet quenching by oxygen. Bhattacharyya, K.; Das, P.K., *Chem. Phys. Lett.* **116**: 326-32 (1985)

85E293 Triplet excitation transfer involving β-ionone. A kinetic study by laser flash photolysis. Chattopadhyay, S.K.; Kumar, C.V.; Das, P.K., *Photochem. Photobiol.* **42**: 17-24 (1985)

85E591 Thermal-lensing measurements of singlet molecular oxygen ($^1\Delta_g$): Quantum yields of formation and lifetimes. Rossbroich, G.; Garcia, N.A.; Braslavsky, S.E., *J. Photochem.* **31**: 37-48 (1985)

85F145 Singlet oxygen photooxygenation of furans. Isolation and reactions of (4 + 2)-cycloaddition products (unsaturated sec.-ozonides). Gollnick, K.; Griesbeck, A., *Tetrahedron* **41**: 2057-68 (1985)

85F148 Reactions of singlet oxygen with polyisoprene and model compounds. Tanielian, C.; Mechin, R., *Tetrahedron* **41**: 2139-46 (1985)

85F150 Dye-sensitized photo-oxygenation of 1,2-cyclohexanediones. Utaka, M.; Nakatani, M.; Takeda, A., *Tetrahedron* **41**: 2163-7 (1985)

85F151 Mechanism of oxidation of α,β-unsaturated thiones by singlet oxygen. Pushkara Rao, V.; Ramamurthy, V., *Tetrahedron* **41**: 2169-76 (1985)

85F332 Quantum yield measurements of the hematoporphyrin derivative (Hpd) sensitized singlet oxygen production. Murasecco, P.; Oliveros, E.; Braun, A.M.; Monnier, P., *Photobiochem. Photobiophys.* **9**: 193-201 (1985)

85F480 Determination of the reaction rate constants of singlet oxygen with dialkyl sulfides. Xu, D.; Xu, B.; Cui, G.; Wu, S., *Huaxue Tongbao* : 17-9 (1985)

85F517 Generation and quenching of singlet molecular oxygen by bacteriochlorophyll and bacteriopheophytin a and b. Krasnovsky, A.A.,Jr.; Vychegzhanina, I.V.; Drozdova, N.N.; Krasnovsky, A.A., *Dokl. Biophys.* **283**: 161-3 (1985) Translated from: *Dokl. Akad. Nauk SSSR* **283**: 474-7 (1985)

85F538 Mechanism of interaction of singlet oxygen with spin trap C-phenyl-N-tert-butylnitrone. Darmanyan, A.P.; Moger, G., *Bull. Acad. Sci. USSR, Div. Chem. Sci.* **34**: 1163-6 (1985) Translated from: *Izv. Akad. Nauk SSSR, Ser. Khim.* : 1271-5 (1985)

85F646 Influence of the nature of the heteroatom in the H-chelate ring on the photochemical properties of aminomethylene derivatives of S or Se substituted pyrazolin-5-ones. Rtishchev, N.I.; El'tsov, A.V.; Kvitko, I.Ya.; Alam, L.V., *J. Gen. Chem., USSR* **55**: 2095-105 (1985) Translated from: *Zh. Obshch. Khim.* **55**: 2358-69 (1985)

85F667 Quenching of singlet oxygen generated in tetraphenylporphyrin solutions by retinoid RO 10-9359, ionol and α-tocopherol. Adam, F.; Schwider, P., *Stud. Biophys.* **109**: 95-100 (1985, Pub. 1986))

85F675 The influence of specific solvation on the deactivation of singlet molecular oxygen by 1,4-diaminoanthraquinone. Venediktov, E.A.; Perfil'ev, V.A.; Berezin, B.D., *Russ. J. Phys. Chem.* **59**: 1824-6 (1985) Translated from: *Zh. Fiz. Khim.* **59**: 3048-51 (1985)

85M098 Importance of single electron-transfer in singlet oxygen reaction in aqueous solution. Oxidation of electron-rich thioanisoles. Inoue, K.; Matsuura, T.; Saito, I., *Tetrahedron* **41**: 2177-81 (1985)

85M406 Ozonides de phosphite source d'oxygene singulet: rendement, mecanisme. Caminade, A.M.; El Khatib, F.; Koenig, M.; Aubry, J.M., *Can. J. Chem.* **63**: 3203-9 (1985)

85N293 O_2 ($^3\Sigma$) and O_2 ($^1\Delta$) processes in microheterogeneous systems. Rubio, M.A.; Araya, L.; Abuin, E.B.; Lissi, E.A., *An. Asoc. Quim. Argent.* **73**: 301-9 (1985)

85R008 Singlet oxygen generation by hematoporphyrin IX, uroporphyrin I and hematoporphyrin derivative at 546 nm in phosphate buffer and in the presence of egg phosphatidylcholine liposomes. Blum, A.; Grossweiner, L.I., *Photochem. Photobiol.* **41**: 27-32 (1985)

86A099 9,10-Dicyanoanthracene-sensitized photooxygenation of α,α'-dimethylstilbenes. Mechanism and kinetics of the competing singlet oxygen and electron transfer photooxygenation reactions. Gollnick, K.; Schnatterer, A., *Photochem. Photobiol.* **43**: 365-78 (1986)

86A159 Additions of singlet oxygen to alkoxy-substituted butadienes. An unexpectedly large s-cis/s-trans ratio in an (E,Z)-diene or a kinetic anomeric effect? Clennan, E.L.; L'Esperance, R.P.; Lewis, K.K., *J. Org. Chem.* **51**: 1440-6 (1986)

86A198 Determination of the decay rate constant of singlet oxygen($^1\Delta_g$) in presence of biomolecules. Rougee, M.; Bensasson, R.V., *C.R. Seances Acad. Sci., Ser. II* **302**: 1223-6 (1986)

86A203 Reactivity of sydnones with singlet oxygen. Bhattacharyya, K.; Das, P.K.; George, M.V., *J. Photochem.* **34**: 13-22 (1986)

86A216 Is water the best or the worst solvent for [2 + 4] cycloadditions of singlet oxygen to aromatic compounds? Cazin, B.; Aubry, J.-M.; Rigaudy, J., *J. Chem. Soc., Chem. Commun.* : 952-3 (1986)

86A264 Time-resolved $O_2\ ^1\Delta_g \rightarrow {}^3\Sigma_g^-$ chemiluminescence upon UV laser photolysis of an aromatic endoperoxide in aqueous solution. Chou, P.T.; Khan, S.; Frei, H., *Chem. Phys. Lett.* **129**: 463-7 (1986)

86A307 Solvent effect and temperature dependence in the interaction of singlet oxygen with α-phenyl-N-tert-butyl nitrone. Darmanyan, A.P.; Moger, G., *J. Radioanal. Nucl. Chem.* **105**: 303-8 (1986)

86A406 Flavin mononucleotide-sensitized photooxidation of indoleacetic acid. Miyoshi, N.; Fukuda, M.; Tomita, G., *Photobiochem. Photobiophys.* **11**: 57-65 (1986)

86A438 Quenching of singlet oxygen by 4-[2-(N,N-dimethylhydrazono)ethylidene]-2,6-diphenyl-4H-pyran. Akasaka, T.; Nakagawa, M.; Ando, W., *J. Org. Chem.* **51**: 4477-9 (1986)

86A540 Singlet oxygen quenching by $Co(SacSac)_2$ complexes. [Sac = dithioacetylacetonate] Darmanyan, A.P.; Karshalykov, K., *Bull. Acad. Sci. USSR, Div. Chem. Sci.* **35**: 2163-5 (1986) Translated from: *Izv. Akad. Nauk SSSR, Ser. Khim.* : 2361-4 (1986)

86E108 Singlet oxygen quenching by stable nitroxy radicals. Darmanyan, A.P.; Tatikolov, A.S., *J. Photochem.* **32**: 157-63 (1986)

86E809 Kinetics of singlet oxygen luminescence quenching in polymers. Influence of polymer matrices on the quenching process of the triplet sensitizer by molecular oxygen. Darmanyan, A.P.; Matveev, M.Yu., *Sov. J. Chem. Phys.* **5**: 2768-86 (1990) Translated from: *Khim. Fiz.* **5**: 1488-95 (1986)

86E884 Direct determination of the lifetime of singlet oxygen in polymers with saturated and unsaturated bonds. Matveev, M.Yu.; Darmanyan, A.P., *Dokl. Phys. Chem.* **290**: 894-7 (1986) Translated from: *Dokl. Akad. Nauk SSSR* **290**: 897-901 (1986)

86F091 Photosensitized oxygenation reactions of phytol and its derivatives. Mihara, S.; Tateba, H., *J. Org. Chem.* **51**: 1142-4 (1986)

86F149 Quenching of singlet molecular oxygen by components of media used for isolating chloroplasts and studying photosynthetic activity. Egorov, S.Yu.; Krasnovsky, A.A., *Sov. Plant Physiol.* **33**: 5-8 (1986) Translated from: *Fiziol. Rast. (Moscow)* **33**: 10-4 (1986)

86F219 Reactions of singlet oxygen with enol esters. Wilson, S.L.; Schuster, G.B., *J. Org. Chem.* **51**: 2056-60 (1986)

86F225 Reaction of singlet oxygen with 2-pyrazoline: Implication for cation radical - superoxide ion pair intermediate. Akasaka, T.; Nakagawa, M.; Nomura, Y.; Sato, R.; Someno, K.; Ando, W., *Tetrahedron* **42**: 3807-12 (1986)

86F226 Quenching of singlet oxygen by catecholamines in dye-sensitized photooxidation reactions. Kruk, I., *Z. Phys. Chem. (Leipzig)* **267**: 569-75 (1986)

86F316 Photogeneration of singlet oxygen by porphyrins in aqueous solutions. Egorov, S.Yu.; Krasnovsky, A.A.,Jr.; Nazarova, O.V.; Yartsev, E.I., *Biophysics* **31**: 376-8 (1986) Translated from: *Biofizika* **31**: 342-3 (1986)

86F337 State-selective photochemistry of singlet oxygen precursors: Kinetics and wavelength dependence of the photodissociation of anthracene endoperoxides. Eisenthal, K.B.; Turro, N.J.; Dupuy, C.G.; Hrovat, D.A.; Langan, J.; Jenny, T.A.; Sitzmann, E.V., *J. Phys. Chem.* **90**: 5168-73 (1986)

86F510 Photo-oxygenation des derives de l'hydroxymethyl-5 furfural-2. Cottier, L.; Descotes, G.; Nigay, H.; Parron, J.-C.; Gregoire, V., *Bull. Soc. Chim. Fr.* : 844-50 (1986)

86P610 Quenching of singlet molecular oxygen by zinc tetraphenylchlorin in solutions. Venediktov, E.A.; Mozhzhukhin, V.V.; Lipatov, N.G.; Berezin, B.D., *Kinet. Catal.* **27**: 847-50 (1986) Translated from: *Kinet. Katal.* **27**: 976-9 (1986)

86P622 Investigation of the role of singlet oxygen in the photodegradation of monoazo dyes. Koval'chuk, N.V.; Anisimov, V.M.; Tambieva, O.A.; Titov, V.V., *J. Org. Chem. USSR* **22**: 1746-53 (1986) Translated from: *Zh. Org. Khim.* **22**: 1944-51 (1986)

86P670 Quenching of singlet molecular oxygen by pyrrole in solution. Venediktov, E.A.; Balakina, T.A.; Berezin, B.D., *Kinet. Catal.* **27**: 1274-6 (1986) Translated from: *Kinet. Katal.* **27**: 1465-7 (1986)

86P678 Singlet oxygen production by UV and visible photoexcited porphyrins under different states of aggregation. Seret, A.; Gandin, E.; Van de Vorst, A., *Photobiochem. Photobiophys.* **12**: 259-66 (1986)

86N104 Kinetics of $O_2(^1\Delta_g)$ photo-oxidation reactions in egg-yolk lecithin vesicles. Dearden, S.J., *J. Chem. Soc., Faraday Trans. 1* **82**: 1627-35 (1986)

86R129 Efficient singlet oxygen inactivation of firefly luciferase. Thompson, A.; Nigro, J.; Seliger, H.H., *Biochem. Biophys. Res. Commun.* **140**: 888-94 (1986)

86R210 Determination of the rate constants of reaction between singlet oxygen and DNA bases. Zhang, Y.; Ma, H.; Dai, J., *Kexue Tongbao (Foreign Lang. Ed.)* **31**: 1065-9 (1986)

87A035 Reactions of singlet oxygen with alkoxy-substituted dienes. Formation of dioxetanes in the singlet oxygenations of s-cis fixed dienes (*Z*,*Z*)- and (*E*,*Z*)-4,5-diethylidene-2,2-dimethyl-1,3-dioxolanes. Clennan, E.L.; Nagraba, K., *J. Org. Chem.* **52**: 294-6 (1987)

87A043 Laser flash photokinetic studies of Rose Bengal sensitized photodynamic interactions of nucleotides and DNA. Lee, P.C.C.; Rodgers, M.A.J., *Photochem. Photobiol.* **45**: 79-86 (1987)

87A063 Rate constants for interaction of $^1O_2$ ($^1\Delta_g$) with azide ion in water. Haag, W.R.; Mill, T., *Photochem. Photobiol.* **45**: 317-21 (1987)

87A064 Photokinetic and photophysical measurements of the sensitized photooxidation of the tryptophyl residue in N-acetyl tryptophanamide and in human serum albumin. Reddi, E.; Lambert, C.R.; Jori, G.; Rodgers, M.A.J., *Photochem. Photobiol.* **45**: 345-51 (1987)

87A072 Chemistry of singlet oxygen. 49. Photooxidation of thiiranes. Jensen, F.; Foote, C.S., *J. Am. Chem. Soc.* **109**: 1478-85 (1987)

87A107 Antiarthritic gold compounds effectively quench electronically excited singlet oxygen. Corey, E.J.; Mehrotra, M.M.; Khan, A.U., *Science* **236**: 68-9 (1987)

87A180 Rate constants for reactions for singlet oxygen with phenols and other compounds in water. Scully, F.E.,Jr.; Hoigne, J., *Chemosphere* **16**: 681-94 (1987)

87A202 Quenching of the luminescence of singlet molecular oxygen in carbon tetrachloride solution by substituted derivatives of pyrrole. Venediktov, E.A.; Perfil'ev, V.A.; Titova, Yu.V.; Karavaev, B.I.; Berezin, B.D., *Biophysics* **32**: 217-20 (1987) Translated from: *Biofizika* **32**: 203-5 (1987)

87A318 Singlet oxygen reactions in aqueous solution. Physical and chemical quenching rate constants of crocin and related carotenoids. Manitto, P.; Speranza, G.; Monti, D.; Gramatica, P., *Tetrahedron Lett.* **28**: 4221-4 (1987)

87A368 syn- and anti-Dioxasesquinorbornenes. Singlet oxidation of exocyclic S-cis-1,3-butadienes. Clennan, E.L.; Matusuno, K., *J. Org. Chem.* **52**: 3483-5 (1987)

87A371 Photophysics of the natural antioxidant quercetin and mechanism of its interaction with singlet oxygen. Darmanyan, A.P.; Kasaikina, O.T.; Khrameeva, N.P., *Khim. Fiz.* **6**: 1083-92 (1987)

87E054 Thermal-lensing and phosphorescence studies of the quantum yield and lifetime of singlet molecular oxygen ($^1\Delta_g$) sensitized by hematoporphyrin and related porphyrins in deuterated and non-deuterated ethanols. Redmond, R.W.; Heihoff, K.; Braslavsky, S.E.; Truscott, T.G., *Photochem. Photobiol.* **45**: 209-13 (1987)

87E055 Ergosterol (provitamin D2) triplet state: An efficient sensitiser of singlet oxygen, $O_2(^1\Delta_g)$, formation. Gorman, A.A.; Hamblett, I.; Rodgers, M.A.J., *Photochem. Photobiol.* **45**: 215-21 (1987)

87E142 Evidence for physical quenching of singlet oxygen ($O_2(^1\Delta_g)$) by dinitrophenols. Gsponer, H.E.; Previtali, C.M.; Garcia, N.A., *J. Photochem.* **36**: 247-53 (1987)

87E150 Steady-state near-infrared detection of singlet molecular oxygen: A Stern-Volmer quenching experiment with sodium azide. Hall, R.D.; Chignell, C.F., *Photochem. Photobiol.* **45**: 459-64 (1987)

87E181 Quenching of singlet oxygen by nickelocene. Rajadurai, S.; Das, P.K., *J. Photochem.* **37**: 33-40 (1987)

87E234 Aromatic ketone-naphthalene systems as absolute standards for the triplet-sensitized formation of singlet oxygen, $O_2(^1\Delta_g)$, in organic and aqueous media: A time-resolved luminescence study. Gorman, A.A.; Hamblett, I.; Lambert, C.; Prescott, A.L.; Rodgers, M.A.J.; Spence, H.M., *J. Am. Chem. Soc.* **109**: 3091-7 (1987)

87E466 Effect of solvent on the rate constant for the radiative deactivation of singlet molecular oxygen ($^1\Delta_g$ O_2). Scurlock, R.D.; Ogilby, P.R., *J. Phys. Chem.* **91**: 4599-602 (1987)

87E658 Radiationless deactivation of singlet oxygen ($^1\Delta_g$) by solvent molecules. Schmidt, R.; Brauer, H.-D., *J. Am. Chem. Soc.* **109**: 6976-81 (1987)

87E668 Medium effects on the quantum yields for generation of singlet oxygen via anthracene and luminescence lifetime of oxygen in the $^1\Delta_g$ state. Darmanyan, A.P., *Khim. Fiz.* **6**: 1192-8 (1987)

87E690 Etude physicochimique d'une serie de cyanines. Partie VII. Rendement en etat triplet et photosensibilisation de l'oxygene singulet. Carre, C.; Reichardt, C.; Lougnot, D.J., *J. Chim. Phys. Phys.-Chim. Biol.* **84**: 577-85 (1987)

87E941 Effectiveness of the formation of singlet oxygen photosensitised by water-soluble porphyrins. Dzhagarov, B.M.; Salokhiddinov, K.I.; Egorova, G.D.; Gurinovich, G.P., *Russ. J. Phys. Chem.* **61**: 1281-3 (1987) Translated from: *Zh. Fiz. Khim.* **61**: 2450-4 (1987)

87E959 Quenching of photosensitized luminescence of singlet molecular oxygen by 1,4-diaminoanthraquinone in solutions. Venediktov, E.A.; Perfilev, V.A.; Berezin, B.D., *Opt. Spectrosc. (USSR)* **63**: 400-1 (1987) Translated from: *Opt. Spektrosk.* **63**: 680-1 (1987)

87F104 Biological activities of phthalocyanines. VI. Photooxidation of L-tryptophan by selectively sulfonated gallium phthalocyanines: Singlet oxygen yields and effect of aggregation. Wagner, J.R.; Ali, H.; Langlois, R.; Brasseur, N.; van Lier, J.E., *Photochem. Photobiol.* **45**: 587-94 (1987)

87F290 Photosensitized generation of singlet molecular oxygen by endogenous photosensitizers of the human lens. Egorov, S.Yu.; Babizhaev, M.A.; Krasnovsky, A.A.,Jr.; Shvedova, A.A., *Biophysics* **32**: 184-6 (1987) Translated from: *Biofizika* **32**: 169-71 (1987)

87F333 Laser flash-chemiluminescence study of $O_2(^1\Delta)$ photoeliminated from 1,4-dimethylnaphthalene endoperoxide. Chou, P.-T.; Frei, H., *J. Chem. Phys.* **87**: 3843-54 (1987)

87F440 An efficient regeneration of singlet oxygen from 2,5-diphenylfuran endoperoxide produced by a dye-sensitized oxygenation. Usui, Y.; Koike, H.; Kurimura, Y., *Bull. Chem. Soc. Jpn.* **60**: 3373-8 (1987)

87F479 Generation and deactivation of $^1O_2(^1\Delta)$ by helianthrene and helianthrene-derivatives. Acs, A.; Schmidt, R.; Brauer, H.-D., *Ber. Bunsenges. Phys. Chem.* **91**: 1331-7 (1987)

87F480 The role of geminate reaction in the self-sensitized photooxygenation of helianthrene and helianthrene-derivatives encounter- and reencounter probabilities. Brauer, H.-D.; Acs, A.; Schmidt, R., *Ber. Bunsenges. Phys. Chem.* **91**: 1337-46 (1987)

87F537 Kinetics of the photosensitized oxidation of polychlorophenols in alkaline aqueous solution. Gsponer, H.E.; Previtali, C.M.; Garcia, N.A., *Toxicol. Environ. Chem.* **16**: 23-37 (1987)

87F541 Formation d'oxygene singulet $^1\Delta_g$ photosensibilisee par l'hypericine. Caracterisation et etude du mecanisme par spectroscopie laser. Jardon, P.; Lazortchak, N.; Gautron, R., *J. Chim. Phys. Phys.-Chim. Biol.* **84**: 1141-5 (1987)

87F542 Azomethine dyes - sensitizers, quenchers and reaction partner for singlet oxygen. Grossmann, N.; Winnig, B.; Weise, A.; Fanghaenel, E., *J. Prakt. Chem.* **329**: 767-74 (1987)

87F554 The photosensitising properties and photostability of stilbene fluorescent whitening agents. Davidson, R.S.; Ismail, G.M.; Lewis, D.M., *J. Soc. Dyers Colour.* **103**: 261-4 (1987)

87F569 Reactions involving an amino group: A basic mechanism for interaction between 7-dialkylaminocoumarins and singlet oxygen. Zin'kovskaya, O.V.; Kuznetsova, N.A.; Reznichenko, A.V., *High Energy Chem.* **21**: 296-9 (1987) Translated from: *Khim. Vys. Energ.* **21**: 352-5 (1987)

87F639 Interaction of singlet oxygen [$O_2(^1\Delta)$] with aliphatic amines and hydroxylamines. Encinas, M.V.; Lemp, E.; Lissi, E.A., *J. Chem. Soc., Perkin Trans. 2* : 1125-7 (1987)

87F655 Quenching of singlet oxygen by cobalt complexes. Vidoczy, T.; Nemeth, S., *Photochemistry and Photophysics of Coordination Compounds,* H. Yersin and A. Vogler (eds.), Springer-Verlag, Berlin, 1987, p. 331-3

87F676 Chemistry of singlet oxygen. 48. Isolation and structure of the primary product of photooxygenation of 3,5-di-t-butyl catechol. Jensen, F.; Foote, C.S., *Photochem. Photobiol.* **46**: 325-30 (1987)

87M341 Some limitations in the use of biliverdin for the examination of singlet oxygen participation in oxidation reactions. Polewski, K.; Slawinska, D., *Rocz. Akad. Roln. Poznaniu* **177**: 35-46 (1987)

87N090 Comparative study of the sensitized photooxidation of N-methyl phenothiazine in homogeneous and microheterogeneous media. Oliveros, E.; Pheulpin, P.; Braun, A.M., *Tetrahedron* **43**: 1713-23 (1987)

87R032 Photo-properties of a silicon naphthalocyanine: A potential photosensitizer for photodynamic therapy. Firey, P.A.; Rodgers, M.A.J., *Photochem. Photobiol.* **45**: 535-8 (1987)

87R074 Photo oxidation effects on β hydroxybutyrate dehydrogenase: Studies of membrane fragments and intact mitochondria. Robinson, R.S.; Roberts, A.J.; Campbell, I.D., *Photochem. Photobiol.* **45**: 231-4 (1987)

87R138 Dye sensitised photo-oxidation of the methyl and phenyl esters of oleic and linoleic acids. Chacon, J.N.; Jamieson, G.R.; Sinclair, R.S., *Chem. Phys. Lipids* **43**: 81-99 (1987)

87R227 Quenching of singlet molecular oxygen by the screening pigments melanin and ommochrome. Egorov, S.Yu.; Dontsov, A.E.; Krasnovsky, A.A.; Ostrovskii, M.A., *Biophysics* **32**: 740-2 (1987) Translated from: *Biofizika* **32**: 685-6 (1987)

88A026 Interaction of singlet molecular oxygen with disubstituted olefins. Evidence for a physical quenching induced by the hydrocarbon chain. Tanielian, C.; Mechin, R., *J. Phys. Chem.* **92**: 265-7 (1988)

88A105 Singlet molecular oxygen: Not a major product of the reaction between tris(2,2'-bipyridine)ruthenium(3+) and superoxide radical anions. Mulazzani, Q.G.; Ciano, M.; D'Angelantonio, M.; Venturi, M.; Rodgers, M.A.J., *J. Am. Chem. Soc.* **110**: 2451-7 (1988)

88A164 Deactivation of singlet molecular oxygen by thiols and related compounds, possible protectors against skin photosensitivity. Rougee, M.; Bensasson, R.V.; Land, E.J.; Pariente, R., *Photochem. Photobiol.* **47**: 485-9 (1988)

88A165 Singlet oxygen yields and radical contributions in the dye-sensitised photooxidation in methanol of esters of polyunsaturated fatty acids (oleic, linoleic, linolenic and arachidonic). Chacon, J.N.; McLearie, J.; Sinclair, R.S., *Photochem. Photobiol.* **47**: 647-56 (1988)

88A276 Ability of platinum(II) complexes of 2,2'-bipyridine and 1,10-phenanthroline with halides and pseudo-halides to photosensitize the production of $^1O_2$. Shukla, S.; Kamath, S.S.; Srivastava, T.S., *J. Photochem. Photobiol., A* **44**: 143-52 (1988)

88A284 The production of singlet molecular oxygen by zinc(II) phthalocyanine in ethanol and in unilamellar vesicles. Chemical quenching and phosphorescence studies. Valduga, G.; Nonell, S.; Reddi, E.; Jori, G.; Braslavsky, S.E., *Photochem. Photobiol.* **48**: 1-5 (1988)

88A385 Lumiflavin-sensitized photooxygenation of indole. Yoshimura, A.; Ohno, T., *Photochem. Photobiol.* **48**: 561-5 (1988)

88A398 Time-resolved reaction of $O_2(^1\Delta)$ with I^- in aqueous solution. Braathen, G.; Chou, P.-T.; Frei, H., *J. Phys. Chem.* **92**: 6610-5 (1988)

88A427 Identification of both preequilibrium and diffusion limits for reaction of singlet oxygen, $O_2(^1\Delta_g)$, with both physical and chemical quenchers: Variable-temperature, time-resolved infrared luminescence studies. Gorman, A.A.; Hamblett, I.; Lambert, C.; Spencer, B.; Standen, M.C., *J. Am. Chem. Soc.* **110**: 8053-9 (1988)

88A507 Kinetics of elementary reactions of singlet oxygen with thiophenes and with their complexes with metals. Darmanyan, A.P.; Sirota, T.V.; Mazaletskii, A.B., *Kinet. Catal.* **29**: 1151-7 (1988) Translated from: *Kinet. Katal.* **29**: 1323-30 (1988)

88E018 Singlet oxygen luminescence quantum yields in organic solvents and water. Losev, A.P.; Byteva, I.M.; Gurinovich, G.P., *Chem. Phys. Lett.* **143**: 127-9 (1988)

88E452 Triplet energy surfaces of one-way isomerizing olefins as studied by singlet oxygen luminescence technique. Arai, T.; Karatsu, T.; Tsuchiya, M.; Sakuragi, H.; Tokumaru, K., *Chem. Phys. Lett.* **149**: 161-6 (1988)

88E479 Singlet-oxygen quenching by carotenoids: Steady-state luminescence experiments. Murasecco-Suardi, P.; Oliveros, E.; Braun, A.M.; Hansen, H.-J., *Helv. Chim. Acta* **71**: 1005-10 (1988)

88E657 Silicon naphthalocyanine triplet state and oxygen: A reversible energy-transfer reaction. Firey, P.A.; Ford, W.E.; Sounik, J.R.; Kenney, M.E.; Rodgers, M.A.J., *J. Am. Chem. Soc.* **110**: 7626-30 (1988)

88E775 Delayed fluorescence of the Kautsky-Mueller type from liquid solutions of aromatic compounds and oxygen. Nickel, B.; Rodriguez Prieto, M.F., *Ber. Bunsenges. Phys. Chem.* **92**: 1493-503 (1988)

88F059 Mechanism of synergistic stabilization by hindered amines. Yang, X.-Z.; Chen, Y.; Dickinson, L.C.; Chien, J.C.W., *Polym. Degrad. Stab.* **20**: 1-35 (1988)

88F151 Singlet oxygen production and photoisomerization: Two competitive processes for merocyanine 540 irradiated with visible light. Hoebeke, M.; Seret, A.; Piette, J.; van de Vorst, A., *J. Photochem. Photobiol., B* **1**: 437-46 (1988)

88F415 Products and relative reaction rates of the oxidation of tocopherols with singlet molecular oxygen. Neely, W.C.; Martin, J.M.; Barker, S.A., *Photochem. Photobiol.* **48**: 423-8 (1988)

88F440 Study on antioxidants and their activity with singlet oxygen by fluorescence spectroscopy. Lang, J.; Shi, J.; Li, G., *Huadong Huagong Xueyuan Xuebao* **14**: 65-70 (1988)

88F462 Interaction of singlet oxygen with nitroso- and phenol-type inhibitors. Moger, G.; Darmanyan, A.P., *Magy. Kem. Foly.* **94**: 282-4 (1988)

88F485 Oxygen consumption in two aqueous systems: Excited nitrite ions-oxygen and nitrite ions-singlet oxygen. Bilski, P.; Szychlinski, J.; Oleksy, E., *J. Photochem. Photobiol., A* **45**: 269-88 (1988)

88F503 Photosensitized formation of singlet molecular oxygen in solutions of water soluble porphyrins. Direct luminescence measurements. Krasnovsky, A.A.,Jr.; Egorov, S.Yu.; Nasarova, O.V.; Yartsev, E.I.; Ponomarev, G.V., *Stud. Biophys.* **124**: 123-42 (1988)

88F582 Singlet oxygen in the photodegradation of aminoanthraquinones. Rtishchev, N.I.; Studzinskii, O.P.; Ponomareva, R.P., *J. Org. Chem. USSR* **24**: 1150-4 (1988) Translated from: *Zh. Org. Khim.* **24**: 1277-81 (1988)

88F650 On the mechanism of quenching of singlet oxygen by chlorinated phenolic pesticides. Palumbo, M.C.; Garcia, N.A., *Toxicol. Environ. Chem.* **17**: 103-16 (1988)

88M109 Chemical sources of singlet oxygen. 2. Quantitative generation of singlet oxygen from hydrogen peroxide disproportionation catalyzed by molybdate ions. Aubry, J.M.; Cazin, B., *Inorg. Chem.* **27**: 2013-4 (1988)

88N343 Generation of singlet oxygen $^1\Delta_g$ photosensitized by hypericin, kinetic study in non ionic micellar medium. Racinet, H.; Jardon, P.; Gautron, R., *J. Chim. Phys. Phys.-Chim. Biol.* **85**: 971-7 (1988)

88P313 Quenching action towards $^1O_2$ of some nitroxyl radicals and hindered amines and their photostabilizing efficiencies. Cen, J.; Hu, X.; Shen, D.; Zhu, L., *Ganguang Kexue Yu Kuang Huaxue* : 1-8 (1988)

88R064 Some prevalent biomolecules as defenses against singlet oxygen damage. Dahl, T.A.; Midden, W.R.; Hartman, P.E., *Photochem. Photobiol.* **47**: 357-62 (1988)

88R070 Direct detection of singlet oxygen sensitized by nalidixic acid: The effect of pH and melanin. Dayhaw-Barker, P.; Truscott, T.G., *Photochem. Photobiol.* **47**: 765-7 (1988)

88R136 Mechanism of physical quenching of singlet molecular oxygen by chlorophylls and related compounds of biological interest. Tanielian, C.; Wolff, C., *Photochem. Photobiol.* **48**: 277-80 (1988)

88R142 Quenching of singlet oxygen by haematoporphyrin derivative (and haematoporphyrin) and its consequences on the efficiency of photodynamic cancer therapy. Tanielian, C.; Heinrich, G.; Entezami, A., *J. Chem. Soc., Chem. Commun.* : 1197-8 (1988)

88R193 Photophysical parameters of pheophorbide a: phosphorescence and generation of singlet molecular oxygen. Krasnovsky, A.A.,Jr.; Neverov, K.V.; Egorov, S.Yu.; Reder, B., *Opt. Spectrosc. (USSR)* **64**: 471-4 (1988) Translated from: *Opt. Spektrosk.* **64**: 790-5 (1988)

88R194 Photophysical studies of tin(IV)-protoporphyrin: Potential phototoxicity of a chemotherapeutic agent proposed for the prevention of neonatal jaundice. Land, E.J.; McDonagh, A.F.; McGarvey, D.J.; Truscott, T.G., *Proc. Natl. Acad. Sci. U.S.A.* **85**: 5249-53 (1988)

88R200 Laser flash photolysis of purpurins: Novel potential photosensitizers of interest in photodynamic therapy. Borland, C.F.; McGarvey, D.J.; Morgan, A.R.; Truscott, T.G., *J. Photochem. Photobiol., B* **2**: 427-34 (1988)

88R236 Correlation between the rates of singlet oxygen quenching by phenols and their inhibitory effects on benzo(a)pyrene-induced neoplasia. Bensasson, R.V.; Rougee, M., *C. R. Acad. Sci., Ser. 3* **307**: 807-10 (1988)

88Z155 Absolute determination of quantum yields of photosensitization by time resolved thermal lensing. Redmond, R.W.; Braslavsky, S.E., *NATO ASI Ser., Ser. H* **15**: 93-5 (1988)

89A099 Trimethyl phosphite traps intermediates in the reaction of $^1O_2$ and diethyl sulfide. Nahm, K.; Foote, C.S., *J. Am. Chem. Soc.* **111**: 1909-10 (1989)

89A105 Generation and transient spectroscopy of substituted diaryl carbonyl oxides. Scaiano, J.C.; McGimpsey, W.G.; Casal, H.L., *J. Org. Chem.* **54**: 1612-6 (1989)

89A202 Photochemical reactions. Part 23. Photo-oxygenation of styrenic estrogens: Product characterization and kinetics of the dye-sensitized photo-oxygenation of 9,11-didehydroestrone derivatives. Planas, A.; Lupon, P.; Cascallo, M.; Bonet, J.-J., *Helv. Chim. Acta* **72**: 715-24 (1989)

89A235 Concerning the mechanism of reaction of simple conjugated olefin triplet states with oxygen. Gorman, A.A.; Rodgers, M.A.J., *J. Am. Chem. Soc.* **111**: 5557-60 (1989)

89A241 Photoenol biradicals as singlet oxygen sensitizers. Redmond, R.W.; Scaiano, J.C., *J. Phys. Chem.* **93**: 5347-9 (1989)

89A254 Mechanism and kinetics of the methylene-blue-sensitized photo-oxygenation of polydienes. Tanielian, C.; Mechin, R., *J. Photochem. Photobiol., A* **48**: 43-51 (1989)

89A322 Time-resolved study of the photooxygenation of 3-hydroxyflavone. Studer, S.L.; Brewer, W.E.; Martinez, M.L.; Chou, P.-T., *J. Am. Chem. Soc.* **111**: 7643-4 (1989)

89A331 Singlet molecular oxygen quenching by saturated and unsaturated fatty-acids and by cholesterol. Vever-Bizet, C.; Dellinger, M.; Brault, D.; Rougee, M.; Bensasson, R.V., *Photochem. Photobiol.* **50**: 321-5 (1989)

89A346 Evidence for hole injection from $O_2(^1\Delta)$ into p-Si. Graetzel, M.; Frei, H., *J. Phys. Chem.* **93**: 7037-41 (1989)

89A400 Determination of rate constants of $^1O_2$ consumption by $^1O_2$ acceptors in weakly deactivating solvents. Opriel, U.; Seikel, K.; Schmidt, R.; Brauer, H.-D., *J. Photochem. Photobiol., A* **49**: 299-309 (1989)

89A506 Lifetime of singlet oxygen in aqueous hydrogen peroxide (BHP). Rodgers, M.A.J.; Shand, M.A., AFWL-TR-89-07, 1989, 24p.; AD-A211545

89B024 Triplet state characteristics and singlet oxygen generation properties of anthracyclines. Andreoni, A.; Land, E.J.; Malatesta, V.; McLean, A.J.; Truscott, T.G., *Biochim. Biophys. Acta* **990**: 190-7 (1989)

89D112 An ESR study of the visible light photochemistry of gilvocarcin V. Alegria, A.E.; Krishna, C.M.; Elespuru, R.K.; Riesz, P., *Photochem. Photobiol.* **49**: 257-65 (1989)

89E113 A pulse radiolysis based singlet oxygen luminescence facility. Gorman, A.A.; Hamblett, I.; Land, E.J., *J. Am. Chem. Soc.* **111**: 1876-7 (1989)

89E158 Anthralin-derived transients. I. The triplet state and the products of its reaction with oxygen in benzene. Bruce, J.M.; Gorman, A.A.; Hamblett, I.; Kerr, C.W.; Lambert, C.; McNeeney, S.P., *Photochem. Photobiol.* **49**: 439-45 (1989)

89E232 Thermal lens measurements in liquids on a submicrosecond time scale. Isak, S.J.; Komorowski, S.J.; Merrow, C.N.; Poston, P.E.; Eyring, E.M., *Appl. Spectrosc.* **43**: 419-22 (1989)

89E324 Solvent effects on the ability of amines to physically quench singlet oxygen as determined by time-resolved infrared emission studies. Clennan, E.L.; Noe, L.J.; Wen, T.; Szneler, E., *J. Org. Chem.* **54**: 3581-4 (1989)

89E365 Dynamics of the triplet state and the reverse proton transfer of 3-hydroxyflavone. Brewer, W.E.; Studer, S.L.; Standiford, M.; Chou, P.-T., *J. Phys. Chem.* **93**: 6088-94 (1989)

89E388 Influence of heavy atoms on the deactivation of singlet oxygen ($^1\Delta_g$) in solution. Schmidt, R., *J. Am. Chem. Soc.* **111**: 6983-7 (1989)

89E505 Chlorin e_6. Spectral-energetic characteristics and generation of singlet molecular oxygen in some homogeneous and heterogeneous systems. Kochubeev, G.A.; Frolov, A.A.; Gurinovich, G.P., *Khim. Fiz.* **8**: 1184-90 (1989)

89E585 Rise and decay kinetics of photosensitized singlet oxygen luminescence in water. Measurements with nanosecond time-correlated single photon counting technique. Egorov, S.Yu.; Kamalov, V.F.; Koroteev, N.I.; Krasnovsky, A.A.,Jr.; Toleutaev, B.N.; Zinukov, S.V., *Chem. Phys. Lett.* **163**: 421-4 (1989)

89E597 Behavior of singlet molecular oxygen ($^1\Delta_gO_2$) in a polymer matrix: Effects of temperature, matrix rigidity, and molecular composition. Clough, R.L.; Dillon, M.P.; Iu, K.-K.; Ogilby, P.R., *Macromolecules* **22**: 3620-8 (1989)

89E700 Direct determination of lifetimes of singlet oxygen in various solvents. Wang, W.; Tang, Y.; Yu, Y., *Yingyong Huaxue* **6**: 54-6 (1989)

89E798 Measurement of rate constants for quenching singlet oxygen with a cypridina luciferin analoge (2-methyl-6-[p-methoxyphenyl]-3-7-dihydro-imidazo [1,2-a] pyrazin-3-one) and sodium azide. Mashiko, S.; Ashino, T.; Mizumoto, I.; Suzuki, N.; Nakano, M.; Goto, T.; Inaba, H., *Photomed. Photobiol.* **11**: 191-4 (1989)

89F024 Physical quenching and chemical reaction of singlet molecular oxygen with azo dyes. Bortolus, P.; Monti, S.; Albini, A.; Fasani, E.; Pietra, S., *J. Org. Chem.* **54**: 534-40, 54(13): 3246 (1989)

89F079 Reaction of singlet oxygen with 2-cyclopenten-1-ones. Kwon, B.-M.; Kanner, R.C.; Foote, C.S., *Tetrahedron Lett.* **30**: 903-6 (1989)

89F181 Mixed-ligand complexes of platinum(II) and palladium(II) with 1,10 phenanthroline and aromatic chelating ligands containing OH or SH groups as photosensitizers for the generation of $^1O_2$. Shukla, S.; Kamath, S.S.; Srivastava, T.S., *J. Photochem. Photobiol., A* **47**: 287-98 (1989)

89F238 Singlet oxygen mediated photofragmentation reactions of amino alcohols: A novel oxidative fragmentation involving both superoxide and excited oxygen intermediates. Haugen, C.M.; Whitten, D.G., *J. Am. Chem. Soc.* **111**: 7281-2 (1989)

89F260 Quantum yield of singlet molecular oxygen sensitization by copper(II) tetracarboxyphthalocyanine. Lagorio, M.G.; Dicelio, L.E.; San Roman, E.A.; Braslavsky, S.E., *J. Photochem. Photobiol., B* **3**: 615-24 (1989)

89F298 Temperature, solvent, and substituent effects on the singlet oxidations of allylic phenyl sulfoxides, sulfones, and sulfides. Clennan, E.L.; Chen, X., *J. Am. Chem. Soc.* **111**: 8212-8 (1989)

89F311 Mixed-ligand nickel(II) complexes of 2,2'-bipyridine and 1,10-phenanthroline with 3,4-dimercaptotoluene as quenchers of $^1O_2$. Shukla, S.; Srivastava, T.S., *J. Photochem. Photobiol., A* **48**: 249-57 (1989)

89F349 Singlet oxygen chemistry. IV. Sensitized photooxygenation of 6-substituted-1,4-cyclooctadienes. Chen, D.-L.; Wang, D.-Y.; Xiao, X.-L., *Acta Chim. Sin. (Huaxue Xuebao)* **47**: 147-51 (1989)

89F350 Singlet oxygen chemistry. V. Singlet oxygenation of dialkylated phenols. Liu, L.-P.; Wang, D.-Y.; Xiao, X.-L., *Acta Chim. Sin. (Huaxue Xuebao)* **47**: 456-60 (1989)

89F358 The comparison of photosensitized oxygenation efficiency for several kinds of sensitizers. Li, Q.-Y.; Xiao, X.-L.; He, H.-Z.; Zhang, L.-H.; Wang, D.-Y., *Ganguang Kexue Yu Kuang Huaxue* : 59-63 (1989)

89F368 Octahydropyrrolo[4,3,2-m,n]acridine derivatives. 3. Antiradical, antioxidant, erythrocyte-stabilizing activity and quenching of singlet oxygen. Tirzite, D.Ya.; Kirule, I.E.; Byteva, I.M.; Tirzit, G.D.; Bisenieks, E.A.; Dubur, G.Ya., *Khim.-Farm. Zh.* **23**: 290-2 (1989)

89F400 Singlet oxygen and triazolinedione additions to α,β-unsaturated sulfoxides. Akasaka, T.; Misawa, Y.; Goto, M.; Ando, W., *Tetrahedron* **45**: 6657-66 (1989)

89F462 Self-sensitized photo-oxidation of platinum(II) complexes of 1,10-phenanthroline with 3,4-dimercaptotoluene and thiosalicylic acid by $^1O_2$. Shukla, S.; Kamath, S.S.; Srivastava, T.S., *J. Photochem. Photobiol., A* **50**: 199-207 (1989)

89F484 Flavin-sensitized photo-oxidation of unsaturated fatty acids. Fukuzumi, S.; Tanii, K.; Tanaka, T., *J. Chem. Soc., Perkin Trans. 2* : 2103-8 (1989)

89M015 Chemical sources of singlet oxygen. 3. Peroxidation of water-soluble singlet oxygen carriers with the hydrogen peroxide-molybdate system. Aubry, J.M.; Cazin, B.; Duprat, F., *J. Org. Chem.* **54**: 726-8 (1989)

89M038 Evidence for the generation of singlet molecular oxygen during dopa and dopamine peroxidation. Kruk, I.; Lichszteld, K.; Michalska, T.; Bounias, M., *Z. Naturforsch., C, Biosci.* **44C**: 39-44 (1989)

89M096 The quenching of $^1O_2(^1\Delta_g)$ by anthracyclines in aqueous solution. Evidence for a charge-transfer mechanism. Manitto, P.; Speranza, G.; Malatesta, V., *Chem. Phys. Lett.* **159**: 310-4 (1989)

89M097 Quantification of singlet oxygen generated by thermolysis of 3,3'-(1,4-naphthylidene)dipropionate. Monomol and dimol photoemission and the effects of 1,4-diazabicyclo[2.2.2]octane. Di Mascio, P.; Sies, H., *J. Am. Chem. Soc.* **111**: 2909-14 (1989)

89R044 Bacteriochlorophyll a triplet state and its interactions with bacterial carotenoids and oxygen. Borland, C.F.; Cogdell, R.J.; Land, E.J.; Truscott, T.G., *J. Photochem. Photobiol., B* **3**: 237-45 (1989)

89R092 Photosensitized oxidation of biomaterials and related model compounds. Davila, J.; Harriman, A., *Photochem. Photobiol.* **50**: 29-35 (1989)

89R188 Lycopene as the most efficient biological carotenoid singlet oxygen quencher. Di Mascio, P.; Kaiser, S.; Sies, H., *Arch. Biochem. Biophys.* **274**: 532-8 (1989)

90A018 Pressure effect on the lifetime of singlet oxygen in solutions. Okamoto, M.; Tanaka, F.; Teranishi, H., *J. Phys. Chem.* **94**: 669-72 (1990)

90A022 Photoreactions of macrocyclic dyes bound to human serum albumin. Davila, J.; Harriman, A., *Photochem. Photobiol.* **51**: 9-19 (1990)

90A184 Physical and chemical scavenging of singlet molecular oxygen by tocopherols. Kaiser, S.; Di Mascio, P.; Murphy, M.E.; Sies, H., *Arch. Biochem. Biophys.* **277**: 101-8 (1990)

90A300 Kinetic studies on anthralin photooxidation. Mueller, K.; Kanner, R.C.; Foote, C.S., *Photochem. Photobiol.* **52**: 445-50 (1990)

90A328 Effect of oxygen-enhanced intersystem crossing on the observed efficiency of formation of singlet oxygen. McLean, A.J.; McGarvey, D.J.; Truscott, T.G.; Lambert, C.R.; Land, E.J., *J. Chem. Soc., Faraday Trans.* **86**: 3075-80 (1990)

90A437 Interaction between singlet oxygen and biologically active compounds in aqueous solution. III. Physical and chemical $^1O_2$ quenching rate constants of 6,6'-diapocarotenoids. Speranza, G.; Manitto, P.; Monti, D., *J. Photochem. Photobiol., B* **8**: 51-61 (1990)

90E030 A pulse radiolysis and pulsed laser study of the vitamin D3 triplet state: Lifetime, relaxation and 'nonvertical' excitation. Gorman, A.A.; Hamblett, I.; Lambert, C.; Prescott, A.L., *Photochem. Photobiol.* **51**: 29-35 (1990)

90E220 Singlet oxygen formation in a solid organic polymer upon irradiation of the oxygen-polymer charge-transfer band. Ogilby, P.R.; Kristiansen, M.; Clough, R.L., *Macromolecules* **23**: 2698-704 (1990)

90E297 Hydrazines: New charge-transfer physical quenchers of singlet oxygen. Clennan, E.L.; Noe, L.J.; Szneler, E.; Wen, T., *J. Am. Chem. Soc.* **112**: 5080-5 (1990)

90E312 Quantum yields of triplet and $O_2(^1\Delta_g)$ formation of 4-thiouridine in water and acetonitrile. Heihoff, K.; Redmond, R.W.; Braslavsky, S.E.; Rougee, M.; Salet, C.; Favre, A.; Bensasson, R.V., *Photochem. Photobiol.* **51**: 634-41 (1990)

90E324 Photosensitized formation and quenching of molecular oxygen by monomeric and aggregated pigment molecules of photosynthesizing bacteria. Egorov, S.Yu.; Krasnovsky, A.A.,Jr.; Vychegzhanina, I.V.; Drozdova, N.N.; Krasnovskii, A.A., *Doklady Biophys.* **310**: 6-10 (1990) Translated from: *Dokl. Akad. Nauk SSSR* **310**: 471-5 (1990)

90E374 Laser-induced optoacoustics combined with near-infrared emission. An alternative approach for the determination of intersystem crossing quantum yields applied to porphycenes. Nonell, S.; Aramendia, P.F.; Heihoff, K.; Negri, R.M.; Braslavsky, S.E., *J. Phys. Chem.* **94**: 5879-83 (1990)

90E400 Investigations of luminescence quenching of singlet oxygen by organic substances by the mechanism of charge transfer. Venediktov, E.A.; Lipatov, N.G.; Berezin, B.D., *Khim. Fiz.* **9**: 611-5 (1990)

90E491 A photophysical study of some purpurins. Macpherson, A.N.; Kessel, D.; Morgan, A.R.; Munro, I.; Truscott, T.G., *J. Chem. Soc., Faraday Trans.* **86**: 3081-5 (1990)

90E530 Potential photosensitizers for photodynamic therapy. II. Photophysical properties of [26] porphyrin. Schermann, G.; Schmidt, R.; Voelcker, A.; Brauer, H.-D.; Mertes, H.; Franck, B., *Photochem. Photobiol.* **52**: 741-4 (1990)

90E622 Carotenoids, tocopherols and thiols as biological singlet molecular oxygen quenchers. Di Mascio, P.; Devasagayam, T.P.A.; Kaiser, S.; Sies, H., *Biochem. Soc. Trans.* **18**: 1054-6 (1990)

90E731 Quenching of the luminescence of singlet molecular oxygen by phthalocyanines and naphthalocyanines. Krasnovsky, A.A.,Jr.; Rodgers, M.A.J.; Gal'pern, M.G.; Kenney, M.E.; Luk'yanets, E.A., *Bioorg. Khim.* **16**: 1413-8 (1990)

90F065 Kinetic parameters of the reactivity of dihydroxy naphthalenes with singlet oxygen. Croux, S.; Maurette, M.-T.; Hocquaux, M.; Ananides, A.; Braun, A.M.; Oliveros, E., *New J. Chem.* **14**: 161-7 (1990)

90F069 Heavy atom quenching of the singlet delta dioxygen molecule ($^1\Delta g$ O_2). Corey, E.J.; Khan, A.U.; Ha, D.-C., *Tetrahedron Lett.* **31**: 1389-92 (1990)

90F111 Intermediates in the ene reactions of singlet oxygen and N-phenyl-1,2,4-triazoline-3,5-dione with olefins. Orfanopoulos, M.; Smonou, I.; Foote, C.S., *J. Am. Chem. Soc.* **112**: 3607-14 (1990)

90F157 Chalcogenapyrylium dyes as potential photochemotherapeutic agents. Solution studies of heavy atom effects on triplet yields, quantum efficiencies of singlet oxygen generation, rates of reaction with singlet oxygen, and emission quantum yields. Detty, M.R.; Merkel, P.B., *J. Am. Chem. Soc.* **112**: 3845-55 (1990)

90F196 Mixed-ligand palladium(II) and platinum(II) complexes of α-diimine and azide as photosensitizers of $^1O_2$ production. Kamath, S.S.; Srivastava, T.S., *J. Photochem. Photobiol., A* **52**: 83-9 (1990)

90F241 Singlet oxygenation of oxadisiliranes. Syntheses and crystal structure of 1,2,4,3,5-trioxadisilolanes. Ando, W.; Kako, M.; Akasaka, T.; Kabe, Y., *Tetrahedron Lett.* **31**: 4177-80 (1990)

90F251 Singlet oxygen photogeneration by ionized and un-ionized derivatives of Rose Bengal and eosin Y in diluted solutions. Amat-Guerri, F.; Lopez-Gonzalez, M.M.C.; Martinez-Utrilla, R.; Sastre, R., *J. Photochem. Photobiol., A* **53**: 199-210 (1990)

90F292 Role of exciplex and ion pair in the photosensitized oxygenation of 1,4-diphenyl-1,3-butadiene. Takahashi, Y.; Wakamatsu, K.; Kikuchi, K.; Miyashi, T., *J. Phys. Org. Chem.* **3**: 509-18 (1990)

90F329 Sensitized photooxygenation. 3. Mechanistic studies on the singlet oxygenation of 5,6-disubstituted 3,4-dihydro-2H-pyrans. Chan, Y.-Y.; Li, X.; Zhu, C.; Liu, X.; Zhang, Y.; Liang, X., *J. Org. Chem.* **55**: 5497-504 (1990)

90F347 The interaction of singlet molecular oxygen $O_2(^1\Delta_g)$ with indolic derivatives. Distinction between physical and reactive quenching. Palumbo, M.C.; Garcia, N.A.; Arguello, G.A., *J. Photochem. Photobiol., B* **7**: 33-42 (1990)

90F360 Mechanisms and rate constants for the quenching of singlet oxygen by nickel complexes. Shiozaki, H.; Nakazumi, H.; Takamura, Y.; Kitao, T., *Bull. Chem. Soc. Jpn.* **63**: 2653-8 (1990)

90F411 Redox properties of phenols, their relationships to singlet oxygen quenching and to their inhibitory effects on benzo(a)pyrene-induced neoplasia. Scurlock, R.; Rougee, M.; Bensasson, R.V., *Free Radical Res. Commun.* **8**: 251-8 (1990)

90F473 Quenching of singlet oxygen by alkenes with a hindered double bond. Sharipov, G.L.; Voloshin, A.I.; Kazakov, V.P.; Tolstikov, G.A., *Bull. Acad. Sci. USSR, Div. Chem. Sci.* **39**: 233-6 (1990) Translated from: *Izv. Akad. Nauk SSSR, Ser. Khim.* : 286-9 (1990)

90F502 Steady-state near-infrared detection of singlet molecular oxygen: A Stern-Volmer quenching experiment with luminol, superoxide dismutase, and Cypridina luciferin analogues. Suzuki, N.; Mizumoto, I.; Toya, Y.; Nomoto, T.; Mashiko, S.; Inaba, H., *Agric. Biol. Chem.* **54**: 2783-7 (1990)

90F511 The effect of oxygen on the kinetics of the photo-sensitised chemiluminescence of glycyltryptophan. Lozovskaya, E.L.; Sapezhinskii, I.I., *Russ. J. Phys. Chem.* **64**: 537-9 (1990) Translated from: *Zh. Fiz. Khim.* **64**: 1012-6 (1990)

90F518 Singlet molecular oxygen-mediated photooxidation of monochloro and mononitrophenols. A kinetic study. Palumbo, M.C.; Garcia, N.A.; Gutierrez, M.I.; Luiz, M., *Toxicol. Environ. Chem.* **29**: 85-94 (1990)

90F554 The role of excited singlet molecular oxygen in the photodegradation of functional squarylium dyes. Kuramoto, N., *J. Soc. Dyers Colour.* **106**: 181-6 (1990)

90M125 Determination of rate constants for quenching singlet oxygen by chemiluminescence technique. Shereshovets, V.V.; Kabalnova, N.N.; Komissarov, V.D.; Mavrodiev, V.K.; Lerman, B.M.; Belogaeva, T.A.; Tolstikov, G.A., *React. Kinet. Catal. Lett.* **41**: 251-6 (1990)

90N078 Quenching of singlet molecular oxygen ($^1\Delta_g O_2$) in silica gel/cyclohexane heterogeneous systems. A direct time-resolved study. Iu, K.-K.; Thomas, J.K., *J. Am. Chem. Soc.* **112**: 3319-25 (1990)

90R006 Potential photosensitizers for photodynamic tumor therapy. I. Photophysical properties of two chlorin derivatives. Schermann, G.; Voelcker, A.; Seikel, K.; Schmidt, R.; Brauer, H.-D.; Montforts, F.-P., *Photochem. Photobiol.* **51**: 45-51 (1990)

90R128 Effects, quenching mechanisms, and kinetics of carotenoids in chlorophyll-sensitized photooxidation of soybean oil. Lee, S.-H.; Min, D.B., *J. Agric. Food Chem.* **38**: 1630-4 (1990)

90R134 Quenching of singlet oxygen by human plasma. Kanofsky, J.R., *Photochem. Photobiol.* **51**: 299-303 (1990)

90R162 EPR studies of trapped singlet oxygen ($^1O_2$) generated during photoirradiation of hypocrellin A. Zang, L.-Y.; Zhang, Z.; Misra, H., *Photochem. Photobiol.* **52**: 677-83 (1990)

90R164 In vitro photodynamic activity of kryptocyanine. Harriman, A.; Luengo, G.; Gulliya, K.S., *Photochem. Photobiol.* **52**: 735-40 (1990)

90R212 The photodynamic effect of Rose Bengal on proteins of the mitochondrial inner membrane. Giulivi, C.; Sarcansky, M.; Rosenfeld, E.; Boveris, A., *Photochem. Photobiol.* **52**: 745-51 (1990)

90U480 The effects of nickel(II) chelates on photosensitized oxidation of soybean oil. Min, D.B.; Lee, S.H., *Dev. Food Sci.* **24**: 939-51 (1990)

91A252 Effect of the peptide bond on the singlet-molecular-oxygen-mediated sensitized photo-oxidation of tyrosine and tryptophan dipeptides. A kinetic study. Bertolotti, S.G.; Garcia, N.A.; Arguello, G.A., *J. Photochem. Photobiol., B* **10**: 57-70 (1991)

91A271 Pressure effect on the radiationless deactivation of singlet oxygen by 1,4-diazobicyclo[2.2.2]octane in six different solvents. Seikel, K.; Brauer, H.-D., *Ber. Bunsenges. Phys. Chem.* **95**: 900-4 (1991)

91A297 A laser flash photolysis study of aromatic nitrones. Triplet state properties and reactivity with singlet oxygen. Cyr, D.R.; Mathew, T.; Ashok, K.; Das, P.K.; George, M.V., *J. Photochem. Photobiol., A* **60**: 161-74 (1991)

91A311 Singlet oxygen and electron-transfer mechanisms in the dicyanoanthracene-sensitized photooxidation of 2,3-diphenyl-1,4-dioxene. Silverman, S.K.; Foote, C.S., *J. Am. Chem. Soc.* **113**: 7672-5 (1991)

91A341 Sensitized photo-oxidation of dihydroxybenzenes and chlorinated derivatives. A kinetic study. Martire, D.O.; Braslavsky, S.E.; Garcia, N.A., *J. Photochem. Photobiol., A* **61**: 113-24 (1991)

91A394 Oxidation of superoxide radical anion by excited tris(2,2'-bipyridine)ruthenium(II) ion in acetonitrile. A search for singlet molecular oxygen. Mulazzani, Q.G.; D'Angelantonio, M.; Venturi, M.; Rodgers, M.A.J., *J. Phys. Chem.* **95**: 9605-8 (1991)

91A448 Triplet energies and singlet oxygen reaction rates of pyrazolotriazole azomethine dyes. Douglas, P.; Townsend, S.M.; Ratcliffe, R., *J. Imaging Sci.* **35**: 211-8 (1991)

91A478 Nanosecond measurements of photosensitized luminescence of singlet molecular oxygen in aqueous solutions saturated by air: Effect of temperature and detergent presence. Zinukov, S.V.; Kamalov, V.F.; Koroteev, N.I.; Krasnovsky, A.A.,Jr., *Opt. Spectrosc. (USSR)* **70**: 460-2 (1991) Translated from: *Opt. Spektrosk.* **70**: 790-4 (1991)

91E003 Photophysical properties of C_{60}. Arbogast, J.W.; Darmanyan, A.P.; Foote, C.S.; Rubin, Y.; Diederich, F.N.; Alvarez, M.M.; Anz, S.J.; Whetten, R.L., *J. Phys. Chem.* **95**: 11-2 (1991)

91E134 Polymer bound pyrrole compounds. VI. Photophysical properties of monomeric models for polystyrene-bound porphyrins. Nonell, S.; Sese, M.L.; Martire, D.O.; Braslavsky, S.E.; Trull, F.R., *Photochem. Photobiol.* **53**: 185-93 (1991)

91E297 Charge-transfer state and singlet oxygen ($^1\Delta_g$ O_2) production in photoexcited organic molecule-molecular oxygen complexes. Kristiansen, M.; Scurlock, R.D.; Iu, K.-K.; Ogilby, P.R., *J. Phys. Chem.* **95**: 5190-7 (1991)

91E427 Isotope-dependent quenching of singlet molecular oxygen ($^1\Delta_g$) by ground-state oxygen in several perhalogenated solvents. Afshari, E.; Schmidt, R., *Chem. Phys. Lett.* **184**: 128-32 (1991)

91E465 The singlet oxygen and carotenoid interaction. Conn, P.F.; Schalch, W.; Truscott, T.G., *J. Photochem. Photobiol., B* **11**: 41-7 (1991)

91E570 Measurement of rate constants for quenching singlet oxygen with a Cypridina luciferin analog (2-methyl-6-[p-methoxyphenyl]-3,7-dihydroimidazo[1,2-a]pyrazin-3-one) and sodium azide. Mashiko, S.; Suzuki, N.; Koga, S.; Nakano, M.; Goto, T.; Ashino, T.; Mizumoto, I.; Inaba, H., *J. Biolumin. Chemilumin.* **6**: 69-72 (1991)

91E697 Structural effects of olefins in the photooxygenation with electron-accepting sensitizers. Kinetic approach to reactive intermediates. Konuma, S.; Aihara, S.; Kuriyama, Y.; Misawa, H.; Akaba, R.; Sakuragi, H.; Tokumaru, K., *Chem. Lett.* : 1897-900 (1991)

91F098 Self-sensitized photo-oxidation of platinum(II) complexes of 1,10-phenanthroline with 3,4-dimercaptotoluene and thiosalicyclic acid by $^1O_2$ (S. Shukla, S.S. Kamath and T.S. Srivastava, J. Photochem. Photobiol., A: Chem., 50 (1989) 199-207) - a reply. Paul, A.K.; Venkatesan, R.; Srivastava, T.S., *J. Photochem. Photobiol., A* **56**: 399 (1991)

91F163 Dye-sensitized photooxygenation of 2,3-dihydrofurans: Competing [2 + 2] cycloadditions and ene reactions of singlet oxygen with a rigid cyclic enol ether system. Gollnick, K.; Knutzen-Mies, K., *J. Org. Chem.* **56**: 4017-27 (1991)

91F170 Effect of temperature on sulfide photooxidations. Evidence for a reversibly formed exciplex? Clennan, E.L.; Oolman, K.A.; Yang, K.; Wang, D.-X., *J. Org. Chem.* **56**: 4286-9 (1991)

91F285 Structure-activity relationship in the quenching reaction of singlet oxygen by tocopherol (vitamin E) derivatives and related phenols. Finding of linear correlation between the rates of quenching of singlet oxygen and scavenging of peroxyl and phenoxyl radicals in solution. Mukai, K.; Daifuku, K.; Okabe, K.; Tanigaki, T.; Inoue, K., *J. Org. Chem.* **56**: 4188-92 (1991)

91F286 Kinetic implications of remote participation during photooxidation at sulfur. Clennan, E.L.; Yang, K.; Chen, X., *J. Org. Chem.* **56**: 5251-2 (1991)

91F300 Oxidation of substituted phenols in the environment: A QSAR analysis of rate constants for reaction with singlet oxygen. Tratnyek, P.G.; Hoigne, J., *Environ. Sci. Technol.* **25**: 1596-604 (1991)

91F332 The reactivity of citronellol and α-thujene with singlet oxygen. Rate constants of chemical reaction and physical quenching. El Bouamri, M.; Gorrichon, J.P.; Braun, A.M.; Oliveros, E., *Photochem. Photobiol.* **54**: 619-23 (1991)

91F359 Dark and photoinduced interactions between riboflavin and indole auxins. Miskoski, S.; Garcia, N.A., *Collect. Czech. Chem. Commun.* **56**: 1838-49 (1991)

91F405 Photo-oxygenation of styrenic estrogens: Structural analysis of 8,9-didehydro-, 6,7-didehydro-, and 9,11-didehydroestrone derivatives and their reactivity towards singlet oxygen. Malet, C.; Planas, A.; Brosa, C.; Piniella, J.F.; Rius, J., *Helv. Chim. Acta* **74**: 1412-24 (1991)

91F497 Sensitized photooxygenation. VI. Kinetic studies on the singlet oxygenation of 6-ethyl-3,4-dihydro-2H-pyran-5-carboxylic acid ethyl ester and 6-isopropyl-3,4-dihydro-2H-pyran-5-carboxylic acid ethyl ester. Huang, Z.; Liang, X.; Chan, Y., *Chin. J. Chem.* **9**: 506-11 (1991)

91F516 Determination of the chemical reaction rate constants of the quenching agents and singlet oxygen by HPLC. Li, G.; He, S.; Shi, J.; Zhang, J., *Huadong Huagong Xueyuan Xuebao* **17**: 431-6 (1991)

91P158 Inhibiting action of polymeric hindered amines on the oxidation of 1,4-polybutadiene by singlet oxygen. Pan, J.-Q., *Polym. Degrad. Stab.* **32**: 219-29 (1991)

91R017 Photochemistry of merocyanine 540: The mechanism of chemotherapeutic activity with cyanine dyes. Davila, J.; Harriman, A.; Gulliya, K.S., *Photochem. Photobiol.* **53**: 1-11 (1991)

91R020 In vivo and photophysical studies on photooxidative damage to lens proteins and their protection by radioprotectors. Roberts, J.E.; Kinley, J.S.; Young, A.R.; Jenkins, G.; Atherton, S.J.; Dillon, J., *Photochem. Photobiol.* **53**: 33-8 (1991)

91R053 Temperature effects on photosensitized processes. Gottfried, V.; Kimel, S., *J. Photochem. Photobiol., B* **8**: 419-30 (1991)

91R055 Activity of thiols as singlet molecular oxygen quenchers. Devasagayam, T.P.A.; Sundquist, A.R.; Di Mascio, P.; Kaiser, S.; Sies, H., *J. Photochem. Photobiol., B* **9**: 105-16 (1991)

91R127 Formation of 8-hydroxy(deoxy)guanosine and generation of strand breaks at guanine residues in DNA by singlet oxygen. Devasagayam, T.P.A.; Steenken, S.; Obendorf, M.S.W.; Schulz, W.A.; Sies, H., *Biochemistry* **30**: 6283-9 (1991)

91R206 Studies on the mechanism of the hematoporphyrin-sensitized photooxidation of 1,3-diphenylisobenzofuran in ethanol and unilamellar liposomes. Reddi, E.; Valduga, G.; Rodgers, M.A.J.; Jori, G., *Photochem. Photobiol.* **54**: 633-7 (1991)

91R251 Chemically induced Parkinson's disease. III. A study of a possible role of singlet molecular oxygen in Parkinson's disease. Chacon, J.N.; Truscott, T.G., *J. Photochem. Photobiol., B* **11**: 261-7 (1991)

91R262 Deactivation of singlet molecular oxygen by organo-selenium compounds exhibiting glutathione peroxidase activity and by sulfur-containing homologs. Scurlock, R.; Rougee, M.; Bensasson, R.V.; Evers, M.; Dereu, N., *Photochem. Photobiol.* **54**: 733-6 (1991)

91U026 Effects, quenching mechanisms, and kinetics of nickel chelates in singlet oxygen oxidation of soybean oil. Lee, S.-H.; Min, D.B., *J. Agric. Food Chem.* **39**: 642-6 (1991)

91U128 α-, γ- And δ-tocopherol effects on chlorophyll-photosensitized oxidation of soybean oil. Jung, M.Y.; Choe, E.; Min, D.B., *J. Food Sci.* **56**: 807-10, 815 (1991)

91U180 Effects of quenching mechanisms of carotenoids on the photosensitized oxidation of soybean oil. Jung, M.Y.; Min, D.B., *J. Am. Oil Chem. Soc.* **68**: 653-8 (1991)

91U181 A comparative study on the susceptibilities of soybean, sunflower and peanut oils to singet molecuar oxygen photooxidation. Neumann, M.M.; Fusero, S.N.; Garcia, N.A., *J. Am. Oil Chem. Soc.* **68**: 662-5 (1991)

91U201 Inhibitory effect of amino acids and dipeptides on the sensitized photooxidation of fats. Neumann, M.M.; Fusero, S.N.; Garcia, N.A., *Fett Wiss. Technol.* **93**: 453-6 (1991)

92A014 The contribution by diffusion to the cycloaddition reactions of singlet oxygen with furans in solution under high pressure. Okamoto, M., *J. Phys. Chem.* **96**: 245-8 (1992)

92A095 Yields of singlet dioxygen produced by the reaction between the excited state of tris(bipyridine)ruthenium(II) and triplet dioxygen in various solvents. Zahir, K.O.; Haim, A., *J. Photochem. Photobiol., A* **63**: 167-72 (1992)

92A123 Photobleaching of merocyanine 540: Involvement of singlet molecular oxygen. Singh, R.J.; Feix, J.B.; Kalyanaraman, B., *Photochem. Photobiol.* **55**: 483-9 (1992)

92A252 Antioxidant activity of the pyridoindole stobadine. Pulse radiolytic characterization of one-electron-oxidized stobadine and quenching of singlet molecular oxygen. Steenken, S.; Sundquist, A.R.; Jovanovic, S.V.; Crockett, R.; Sies, H., *Chem. Res. Toxicol.* **5**: 355-60 (1992)

92A325 Reaction of singlet molecular oxygen with tetramethyl-o-xylylene. Redmond, R.W.; Harwig, C.W.; Scaiano, J.C., *J. Photochem. Photobiol., A* **68**: 255-9 (1992)

92A386 Singlet oxygen quenching by tertiary alkyl ethers. Boneva, M.; Ivanov, S.K.; Oliveros, E.; Braun, A.M., *J. Photochem. Photobiol., A* **68**: 343-51 (1992)

92D008 Photooxidation of organic and inorganic substrates during UV photolysis of nitrite anion in aqueous solution. Bilski, P.; Chignell, C.F.; Szychlinski, J.; Borkowski, A.; Oleksy, E.; Reszka, K., *J. Am. Chem. Soc.* **114**: 549-56 (1992)

92D048 Spectroscopic studies of cutaneous photosensitizing agents. XVII. Benzanthrone. Dabestani, R.; Sik, R.H.; Motten, A.G.; Chignell, C.F., *Photochem. Photobiol.* **55**: 533-9 (1992)

92D227 Identification by ESR spectroscopy and spectrophotometry of singlet oxygen, formed during autoxidation of catecholamines. Lichszteld, K.; Michalska, T.; Kruk, I., *Z. Phys. Chem. (Munich)* **175**: 117-22 (1992)

92E220 Quenching of singlet oxygen in solid organic polymers. Ogilby, P.R.; Dillon, M.P.; Kristiansen, M.; Clough, R.L., *Macromolecules* **25**: 3399-405 (1992)

92E225 The quenching of singlet molecular oxygen by carnosine and anserine in aqueous solution. Egorov, S.Yu.; Kurella, E.G.; Boldyrev, A.A., Krasnovsky, A.A.,Jr., *Bioorg. Khim.* **18**: 142-4 (1992)

92E256 Collisional deactivation of $O_2(^1\Delta_g)$ by solvent molecules. Comparative experiments with $^{16}O_2$ and $^{18}O_2$. Schmidt, R.; Afshari, E., *Ber. Bunsenges. Phys. Chem.* **96**: 788-94 (1992)

92E274 Reaction of singlet oxygen with vinyl-substituted porphyrins. A kinetic study by laser flash photolysis. Aveline, B.; Delgado, O.; Brault, D., *J. Chem. Soc., Faraday Trans.* **88**: 1971-6 (1992)

92E555 Photophysics and photochemistry of 22π and 26π acetylene-cumulene porphyrinoids. Martire, D.O.; Jux, N.; Aramendia, P.F.; Negri, R.M.; Lex, J.; Braslavsky, S.E.; Schaffner, K.; Vogel, E., *J. Am. Chem. Soc.* **114**: 9969-78 (1992)

92E654 Assay of lycopene and other carotenoids as singlet oxygen quenchers. Di Mascio, P.; Sundquist, A.R.; Devasagayam, T.P.A.; Sies, H., *Methods Enzymol.* **213**: 429-38 (1992)

92F063 Quantum yields of singlet-oxygen production by some natural quinoid fungal metabolites and derivatives. Aminian-Saghafi, T.; Nasini, G.; Caronna, T.; Braun, A.M.; Oliveros, E., *Helv. Chim. Acta* **75**: 531-8 (1992)

92F103 Photooxidation of 1,5-dithiacyclooctane. A novel C-S bond cleavage. Sheu, C.; Foote, C.S.; Gu, C.-L., *J. Am. Chem. Soc.* **114**: 3015-21 (1992)

92F104 Comparison of the photooxidations of 1,5-dithiacyclooctane, 1,4-dithiane, and pentamethylene sulfide. Another example of remote participation during photooxidation at sulfur? Clennan, E.L.; Wang, D.-X.; Yang, K.; Hodgson, D.J.; Oki, A.R., *J. Am. Chem. Soc.* **114**: 3021-7 (1992)

92F181 Influence of the ionic strength on $O_2(^1\Delta_g)$ quenching by azide. Rubio, M.A.; Martire, D.O.; Braslavsky, S.E.; Lissi, E.A., *J. Photochem. Photobiol., A* **66**: 153-7 (1992)

92F189 Tellurapyrylium dyes as catalysts for oxidations with hydrogen peroxide and as scavengers of singlet oxygen. Dihydroxytelluranes as mild oxidizing agents. Detty, M.R.; Gibson, S.L., *Organometallics* **11**: 2147-56 (1992)

92F192 Photodynamic degradation of vitamin E induced by psoralens. Costantini, C.; d'Ischia, M.; Napolitano, A.; Misuraca, G.; Prota, G., *Biochim. Biophys. Acta* **1116**: 291-6 (1992)

92F210 Investigation of $^1O_2$ generation by water-soluble α-diimine complexes of platinum(II) and palladium(II) with 3,4-dihydroxybenzoic acid as photosensitizers. Anbalagan, V.; Srivastava, T.S., *J. Photochem. Photobiol., A* **66**: 345-53 (1992)

92F225 Remote participation during photooxidation at sulfur. Evidence for sulfurane intermediates. Clennan, E.L.; Yang, K., *J. Org. Chem.* **57**: 4477-87 (1992)

92F251 Photosensitized oxygenation of olefins with zinc tetraphenylporphine-1,4-diazabicyclo[2.2.2]octane complex. Sakuragi, M.; Ichimura, K.; Sakuragi, H., *Bull. Chem. Soc. Jpn.* **65**: 1944-9 (1992)

92F270 Photophysical properties and photo-oxygenation of 2-(4-ethoxycarbonylphenyl)-1,8-dihydropyrrolo[3',2':3,4]cyclopenta[1,2-b]pyridine (EPCP). Dunsbach, R.; Brauer, H.-D.; Schmidt, R.; Wang, J.; Gossauer, A., *J. Photochem. Photobiol., A* **67**: 227-35 (1992)

92F402 Physico-chemical modeling of the role of free radicals in photodynamic therapy. I. Utilization of quantum yield data of singlet oxygen formation for the study of the interaction between excited photosensitizer and stable free radicals. Vidoczy, T.; Elzemzam, S.; Gal, D., *Biochem. Biophys. Res. Commun.* **189**: 1548-52 (1992)

92F465 Kinetic and thermodynamic aspects of the dye-sensitised photo-oxidation of bioresmethrin and related compounds. Clements, P.; Wells, C.H.J., *Pestic. Sci.* **35**: 305-8 (1992)

92F491 Mechanism of the 9,10-dicyanoanthracene-sensitized photooxidation of N,N-dibenzylhydroxylamine in polar and non-polar solvents. Sakurai, T.; Uematsu, Y.; Tanaka, O.; Inoue, H., *J. Chem. Soc., Perkin Trans. 2* : 2163-7 (1992)

92F505 Singlet molecular oxygen quantum yield measurements of some porphyrins and metalloporphyrins. Venkatesan, R.; Periasamy, N.; Srivastava, T.S., *Proc. - Indian Acad. Sci., Chem. Sci.* **104**: 713-22 (1992)

92M228 The influence of some biological antioxidants on the light emission from the oxytetracycline oxidation reaction. Kruk, I.; Lichszteld, K.; Michalska, T.; Paraskevas, S.M., *Toxicol. Environ. Chem.* **35**: 167-73 (1992)

92N179 Singlet oxygen chemistry. VI. The kinetics of photooxygenation of 2,5-diphenylbenzofuran (DPBF) induced by hypocreallin A (HA) in micelles. Jiang, X.-F; Wang, D.-Y., *Acta Chim. Sin. (Huaxue Xuebao)* **50**: 391-6 (1992)

92N201 Generation and reactions of singlet oxygen photosensitized by hypericin in dipalmitoylphosphatidylcholine vesicles. Bouirig, H.; Eloy, D.; Jardon, P., *J. Chim. Phys. Phys.-Chim. Biol.* **89**: 1391-411 (1992)

92N305 Photocatalytic transformation of 2,5-furandimethanol in aqueous ZnO suspensions. Richard, C.; Martre, A.M.; Boule, P., *J. Photochem. Photobiol., A* **66**: 225-34 (1992)

92N330 Sensitized photooxygenation of mononitrophenols in micellar media. Luiz, M.; Gutierrez, M.I.; Bocco, G.; Bertolotti, S.G.; Garcia, N.A., *Toxicol. Environ. Chem.* **35**: 115-23 (1992)

92R054 Synthetic carotenoids, novel polyene polyketones and new capsorubin isomers as efficient quenchers of singlet molecular oxygen. Devasagayam, T.P.A.; Werner, T.; Ippendorf, H.; Martin, H.D.; Sies, H., *Photochem. Photobiol.* **55**: 511-4 (1992)

92R076 Quenching of singlet molecular oxygen by phthalocyanines and naphthalocyanines. Krasnovsky, A.A.,Jr.; Rodgers, M.A.J.; Galpern, M.G.; Rihter, B.; Kenney, M.E.; Lukjanetz, E.A., *Photochem. Photobiol.* **55**: 691-6 (1992)

92R107 A laser flash photolysis study of the triplet states of the red and the blue forms of Blepharisma japonicum pigment. Ghetti, F.; Checcucci, G.; Lenci, F.; Heelis, P.F., *J. Photochem. Photobiol., B* **13**: 315-21 (1992)

92R313 A proposed function for spermine and spermidine: Protection of replicating DNA against damage by singlet oxygen. Khan, A.U.; Mei, Y.-H.; Wilson, T., *Proc. Natl. Acad. Sci. U.S.A.* **89**: 11426-7 (1992)

93A017 Volume of activation for the radiationless deactivation of singlet oxygen in aromatic hydrocarbons. Okamoto, M.; Tanaka, F., *J. Phys. Chem.* **97**: 177-80 (1993)

93A050 Reactions of organometallic complexes with singlet oxygen. Photooxidation of Vaska's complex. Selke, M.; Foote, C.S., *J. Am. Chem. Soc.* **115**: 1166-7 (1993)

93A103 Hydroxyanthraquinones as sensitizers of electron-transfer-induced photo-oxygenation reactions. Gollnick, K.; Held, S., *J. Photochem. Photobiol., A* **70**: 135-45 (1993)

93A244 Production of singlet oxygen ($^1\Delta_g$ O_2) by 9,10-dicyanoanthracene and acridine: Quantum yields in acetonitrile. Scurlock, R.D.; Ogilby, P.R., *J. Photochem. Photobiol., A* **72**: 1-7 (1993)

93A326 Antioxidant activity of flavonoids: Efficiency of singlet oxygen ($^1\Delta_g$) quenching. Tournaire, C.; Croux, S.; Maurette, M.-T.; Beck, I.; Hocquaux, M.; Braun, A.M.; Oliveros, E., *J. Photochem. Photobiol., B* **19**: 205-15 (1993)

93A380 Photochromic reactions involving palladium(II) octabutoxynaphthalocyanine and molecular oxygen. Rihter, B.D.; Kenney, M.E.; Ford, W.E.; Rodgers, M.A.J., *J. Am. Chem. Soc.* **115**: 8146-52 (1993)

93D154 The photooxidation of diethylhydroxylamine by Rose Bengal in micellar and nonmicellar aqueous solutions. Bilski, P.; Motten, A.G.; Bilska, M.; Chignell, C.F., *Photochem. Photobiol.* **58**: 11-8 (1993)

93E090 Nitroxyl free radical enhancement of the forbidden $O_2(^3\Sigma_g^-) \rightarrow O_2(^1\Delta_g)$ radiative transition in chlorinated hydrocarbon solvents. Belford, R.E.; Seely, G.R.; Gust, D.; Moore, T.A.; Moore, A.; Cherepy, N.J.; Ekbundit, S.; Lewis, J.E.; Lin, S.H., *J. Photochem. Photobiol., A* **70**: 125-33 (1993)

93E091 $O_2(a\ ^1\Delta_g)$ production and quenching by C_{60} and C_{70}. Black, G.; Dunkle, E.; Dorko, E.A.; Schlie, L.A., *J. Photochem. Photobiol., A* **70**: 147-51 (1993)

93E183 Magnetic field effects on excited-state oxygen-organic molecule interactions. Ogilby, P.R.; Sanetra, J., *J. Phys. Chem.* **97**: 4689-94 (1993)

93E248 Upconversion of the singlet oxygen 1269 nm emission to the visible. Allan, D.; Gorman, A.A.; Hamblett, I.; Hodgson, B.W.; Lambert, C., *Photochem. Photobiol.* **57**: 893-4 (1993)

93E301 Time-resolved measurements of singlet oxygen dimol-sensitized luminescence. Krasnovsky, A.A.,Jr.; Foote, C.S., *J. Am. Chem. Soc.* **115**: 6013-6 (1993)

93E520 Synthesis and photoproperties of silicon phthalocyanines and silicon naphthalocyanines. Wen, T.-C.; Liu, M.-E.; Young, S.-H.; Lee, Y.-S.; Chen, K.-M.; Kuo, C.-N., *J. Chin. Chem. Soc. (Taipei)* **40**: 141-7 (1993)

93E536 Singlet molecular oxygen [$O_2(^1\Delta_g)$] production and quenching by hydroxybiphenyls. Martire, D.O.; Evans, C.; Bertolotti, S.G.; Braslavsky, S.E.; Garcia, N.A., *Chemosphere* **26**: 1691-701 (1993)

93E539 Reactions of singlet oxygen with organometallic complexes. 2. Formation of a metastable rhodium-dioxygen complex. Selke, M.; Foote, C.S.; Karney, W.L., *Inorg. Chem.* **32**: 5425-6 (1993)

93E684 Mechanism of quenching of singlet molecular oxygen luminescence by pyrroles. Venediktov, E.A.; Titova, Yu.V., *Biofizika* **38**: 1031-4 (1993)

93F069 A kinetic study of the photodynamic properties of the xanthene dye merbromin (mercurochrome) and its aggregates with amino acids in aqueous solution. Martinez, G.; Bertolotti, S.G.; Zimerman, O.E.; Martire, D.O.; Braslavsky, S.E.; Garcia, N.A., *J. Photochem. Photobiol., B* **17**: 247-55 (1993)

93F128 High reactivity of heterocoerdianthrones (HCDs) in photoperoxidation and thermal stability of their endoperoxides. Use of HCD as a photosensitizer under sunlight. Motoyoshiya, J.; Masunaga, T.; Harumoto, D.; Ishiguro, S.; Narita, S.; Hayashi, S., *Bull. Chem. Soc. Jpn.* **66**: 1166-71 (1993)

93F160 Reaction of singlet oxygen with disiliranes: Dioxygen insertion into Si-Si σ bonds. Ando, W.; Kako, M.; Akasaka, T.; Nagase, S., *Organometallics* **12**: 1514-22 (1993)

93F191 The aerobic riboflavin-sensitized photodecomposition of tryptophan, tryptamine and indole acetic acid. Ground-state and photopromoted flavin-indole interactions. Martinez, G.; Zimerman, O.E.; Garcia, N.A., *Collect. Czech. Chem. Commun.* **58**: 1299-308 (1993)

93F207 The formation and removal of singlet ($^1\Delta_g$) oxygen in solid organic polymers: Events that may influence polymer photodegradation. Ogilby, P.R.; Kristiansen, M.; Martire, D.O.; Scurlock, R.D.; Taylor, V.L.; Clough, R.L., *Polym. Prepr. (Am. Chem. Soc., Div. Polym. Chem.)* **34**: 133-4 (1993)

93F231 Formation of 2,5-dihydroxybenzoic acid during the reaction between $^1O_2$ and salicylic acid: Analysis by ESR oximetry and HPLC with electrochemical detection. Kalyanaraman, B.; Ramanujam, S.; Singh, R.J.; Joseph, J.; Feix, J.B., *J. Am. Chem. Soc.* **115**: 4007-12 (1993)

93F327 Mechanistic study of the photooxidation of squalene sensitized with 2,2':5',2''-terthiophene and 2,2'-bithiophene. Fujita, H.; Tokiwa, K.; Sayama, K.; Mori, H.; Sasaki, M., *Bull. Chem. Soc. Jpn.* **66**: 2960-4 (1993)

93F328 Solvent effect on the reactivity of monosubstituted phenols towards singlet molecular oxygen ($O_2(^1\Delta_g)$) in alkaline media. Luiz, M.; Gutierrez, M.I.; Bocco, G.; Garcia, N.A., *Can. J. Chem.* **71**: 1247-52 (1993)

93F361 Dimethyl 3,3'-(4-methyl-1,3-naphthylene)dipropionate as a singlet oxygen trap in biological systems. Mueller, K.; Ziereis, K., *Arch. Pharm. (Weinheim, Ger.)* **326**: 369-71 (1993)

93F367 Sensitized photooxygenations of 3-vinylindole derivatives. Zhang, X.; Khan, S.I.; Foote, C.S., *J. Org. Chem.* **58**: 7839-47 (1993)

93F368 Photochemical elimination of singlet oxygen from oxodiperoxomolybdenum(VI)-(hexamethyl phosphoric triamide, water). An adiabatic photoreaction originating from an upper excited electronic state. Seip, M.; Brauer, H.-D., *J. Photochem. Photobiol., A* **76**: 1-5 (1993)

93F413 On the $O_2(^1\Delta_g)$-mediated photooxidative behaviour of tripeptide glycyl-tyrosyl-alanine in alkaline medium. A kinetic study. Miskosky, S.; Bertolotti, S.G.; Garcia, N.A.; Arguello, G.A., *Amino Acids* **4**: 101-10 (1993)

93M161 Kinetic study of the quenching reaction of singlet oxygen by biological hydroquinones and related compounds. Mukai, K.; Itoh, S.; Daifuku, K.; Morimoto, H.; Inoue, K., *Biochim. Biophys. Acta* **1183**: 323-6 (1993)

93N051 Quenching of singlet molecular oxygen ($^1\Delta_gO_2$) in silica gel-solvent heterogeneous system. II. A direct time-resolved study. Iu, K.-K.; Thomas, J.K., *J. Photochem. Photobiol., A* **71**: 55-60 (1993)

93R059 Influence of the peptide bond on the singlet molecular oxygen-mediated ($O_2[^1\Delta_g]$) photooxidation of histidine and methionine dipeptides. A kinetic study. Miskoski, S.; Garcia, N.A., *Photochem. Photobiol.* **57**: 447-52 (1993)

93R131 Temporal and spectral separation of singlet oxygen luminescence from near infrared emitting photosensitizers. Naether, D.U.; Gilchrist, J.R.; Gensch, T.; Roeder, B., *Photochem. Photobiol.* **57**: 1056-9 (1993)

93R231 A pulsed laser and pulse radiolysis study of amphiphilic chlorophyll derivatives with PDT activity toward malignant melanoma. Fiedor, L.; Gorman, A.A.; Hamblett, I.; Rosenbach-Belkin, V.; Salomon, Y.; Scherz, A.; Tregub, I., *Photochem. Photobiol.* **58**: 506-11 (1993)

93R310 Photobiological activities of 1,6-dioxapyrene in pro- and eukaryotic cells. Averbeck, D.; Polasa, K.; Buisson, J.-P.; Bensasson, R.V.; Rougee, M.; Cadet, J.; Ravanat, J.L.; Perin, F.; Vigny, P.; Demerseman, P., *Mutat. Res.* **287**: 165-79 (1993)

93U041 Photooxygenation of 3-hydroxyflavone and molecular design of the radiation-hard scintillator based on the excited-state proton transfer. Chou, P.-T.; Martinez, M.L., *Radiat. Phys. Chem.* **41**: 373-8 (1993)

93Y025 Interaction of singlet and triplet excited states with the same quencher in micelles. Daraio, M.E.; Aramendia, P.F.; San Roman, E., *Chem. Phys. Lett.* **204**: 415-9 (1993)

94A113 Reactivity of singlet oxygen toward amino acids and peptides. Michaeli, A.; Feitelson, J., *Photochem. Photobiol.* **59**: 284-9 (1994)

94A126 Photochemical elimination of singlet oxygen from iridium peroxo complexes. Seip, M.; Brauer, H.-D., *J. Photochem. Photobiol., A* **79**: 19-24 (1994)

94E153 Curcumin-derived transients: A pulsed laser and pulse radiolysis study. Gorman, A.A.; Hamblett, I.; Srinivasan, V.S.; Wood, P.D., *Photochem. Photobiol.* **59**: 389-98 (1994)

94F004 Spectral and photochemical behaviour of newly synthesized 2,2'-dipyridylamine complexes of Pt(II) and Pd(II) with various dioxolenes. Anbalagan, V.; Srivastava, T.S., *J. Photochem. Photobiol., A* **77**: 141-8 (1994)

94F024 Photooxidation of sulfenic acid derivatives. 1. Sulfenamides. The surprising behavior of a new class of photooxidation substrates. Clennan, E.L.; Zhang, H., *J. Am. Chem. Soc.* **116**: 809-10 (1994)

94F069 Spectral and photochemical properties of curcumin. Chignell, C.F.; Bilski, P.; Reszka, K.J.; Motten, A.G.; Sik, R.H.; Dahl, T.A., *Photochem. Photobiol.* **59**: 295-302 (1994)

94F095 Influence of the nuclear substitution on the sensitized photooxidation of model compounds for phenolic-type pesticides. Bocco, G.; Luiz, M.; Gutierrez, M.I.; Garcia, N.A., *J. Prakt. Chem./Chem.-Ztg.* **336**: 243-6 (1994)

94R058 Reaction and quenching of singlet molecular oxygen with esters of polyunsaturated fatty acids. Tanielian, C.; Mechin, R., *Photochem. Photobiol.* **59**: 263-8 (1994)

13. Molecular Formula Index

$C_6H_{14}O$ 2,2-Dimethylpropyl methyl ether *17.19*

$C_6H_{14}S$ *tert*-Butyl ethyl sulfide *13.56*
Diisopropyl sulfide *13.78*
Dipropyl sulfide *13.82*

$C_6H_{15}N$ *N,N*-Dimethyl-1-butanamine *8.14*
Triethylamine *8.24*
Diisopropylamine *8.29*
Dipropylamine *8.86*

$C_6H_{15}NO$ *N,N*-Diethylethanolamine *8.23*
O,N,N-Triethylhydroxylamine *15.22*

$C_6H_{16}N_2$ 1,2-Diethyl-1,2-dimethylhydrazine *8.33*

$C_6H_{26}N_2$ Tetra(2-methylpropyl)hydrazine *8.43*

C_7D_8 Toluene-d_8 *3.128*

$C_7H_4NO^-$ 4-Cyanophenoxide ion *4.158*

C_7H_5NO 4-Cyanophenol *4.112*

$C_7H_5N_2O_5^-$ 2-Methyl-4,6-dinitrophenoxide ion *4.173*
4-Methyl-2,6-dinitrophenoxide ion *4.174*

$C_7H_5O_3^-$ Salicylate ion *4.35*

C_7H_6ClNS 4-Chlorothiobenzamide *13.153*

$C_7H_6Cl_2O$ 2,6-Dichloroanisole *3.37*

$C_7H_6NO_3^-$ 4-Methyl-2-nitrophenoxide ion *4.175*

$C_7H_6N_2O_2S$ 4-Nitrothiobenzamide *13.156*

$C_7H_6O_2$ Methyl-1,4-benzoquinone *16.13*

$C_7H_7BrO_3$ Ethyl 5-bromo-2-furoate *5.55*

C_7H_7BrS 4-Bromophenyl methyl sulfide *13.7*

C_7H_7ClO 2-Chloroanisole *3.34*

$C_7H_7ClO_2$ 3-Chloro-5-methoxyphenol *4.111*

C_7H_7ClS 3-Chlorophenyl methyl sulfide *13.14*
4-Chlorophenyl methyl sulfide *13.15*

C_7H_7FS 4-Fluorophenyl methyl sulfide *13.21*

$C_7H_7NO_3$ 2-Nitroanisole *3.44*

$C_7H_7O^-$ 4-Methylphenoxide ion *4.172*

$C_7H_7O_2^-$ 2-Methoxyphenoxide ion *4.169*
3-Methoxyphenoxide ion *4.170*
4-Methoxyphenoxide ion *4.171*

C_7H_8 Norbornadiene *2.4*
Quadricyclane *17.63*
Toluene *3.127*

C_7H_8O Anisole *3.43*
4-Methylphenol *4.135*

C_7H_8OS 4-(Methylmercapto)phenol *13.120*
2,6-Dimethylpyran-4-thione *13.139*

$C_7H_8O_2$ Methylhydroquinone *4.29*
2-Methoxyphenol *4.129*
3-Methoxyphenol *4.130*
4-Methoxyphenol *4.131*

$C_7H_8O_3$ 5-(Methoxymethyl)furan-2-carboxaldehyde *5.12*
2-[2-(1,3-Dioxolanyl)]furan *5.36*
Ethyl 2-furoate *5.56*

C_7H_8S Thioanisole *13.29*
Benzyl mercaptan *13.42*

C_7H_8Se Methylselenobenzene *13.27*

C_7H_8Te Methyltellurobenzene *13.28*

C_7H_9N Benzylamine *8.5*
N-Methylaniline *9.14*

C_7H_{10} 1,3-Cycloheptadiene *2.99*
1-Methyl-1,4-cyclohexadiene *2.107*

$C_7H_{10}O$ 2,3-Dimethyl-2-cyclopenten-1-one *2.165*

$C_7H_{10}O_2$ 2-Hydroxy-3-methyl-2-cyclohexen-1-one *2.128*
3-Methoxy-2-methyl-2-cyclopenten-1-one *2.167*
3-Isopropylidene-2-furanone *2.227*

$C_7H_{10}O_3$ Methyl 4,5-dihydro-2-methyl-3-furancarboxylate *5.58*

$C_7H_{10}S$ Bicyclo[2.2.1]heptane-2-thione *13.43*

$C_7H_{11}N_3O$ 4-Hydroxy-6-methyl-2-(dimethylamino)pyrimidine *16.70*

$C_7H_{11}OT$ 4,4-Dimethyl-2,3-dihydropyran-3-*t* *5.94*
4,4-Dimethyl-2,3-dihydropyran-2-*t* *5.96*

C_7H_{12} *trans*-2-Cyclopropyl-2-butene *2.49*
Methylenecyclohexane *2.112*
1-Methylcyclohexene *2.122*
4-Methylcyclohexene *2.123*
Ethylidenecyclopentane *2.152*
1,2-Dimethylcyclopentene *2.158*
1,5-Dimethylcyclopentene *2.159*
1-Cyclopropyl-2-methylpropene *2.335*

$C_7H_{12}NS_2^-$ Hexamethylenedithiocarbamate *13.1*

$C_7H_{12}O$ 5,6-Dimethyl-3,4-dihydropyran *5.91*
2-(Cyclopentylidene)ethanol *2.218*
3,4-Dimethyl-3-penten-2-one *2.324*

$C_7H_{13}N$ 1-(Diethylamino)-2-methylacetylene *8.87*
Quinuclidine *8.97*

$C_7H_{13}NO$ 4,5,5-Trimethyl-Δ^1-pyrroline-*N*-oxide *15.51*
2,4,4-Trimethyl-Δ^1-pyrroline-*N*-oxide *15.52*

C_7H_{14} 1-Heptene *2.228*
(*Z*)-2-Heptene *2.229*
2,4-Dimethyl-2-pentene *2.306*

$C_7H_{14}N_2$ 2,3-Dimethyl-2,3-diazabicyclo[2.2.1]heptane *8.18*
Diethyl(2-cyanoethyl)amine *8.81*

$C_7H_{14}N_2O_3S$ Glycylmethionine *13.109*

$C_7H_{14}O$ (*E*)-3,4-Dimethyl-2-penten-1-ol *2.316*
(*Z*)-3,4-Dimethyl-2-penten-1-ol *2.317*
3-Ethyl-2-penten-1-ol *2.318*

$C_7H_{15}N$ 1,2-Dimethylpiperidine *8.57*
2,6-Dimethylpiperidine *8.58*

C_7H_{16} Heptane *17.34*

$C_7H_{16}N_2$ *N,N*-Dimethyl-1-piperidinamine *8.52*

$C_{11}H_{13}FS$ 4′-Fluoropivalothiophenone *13.128*

$C_{11}H_{13}N$ 1,2,3-Trimethylindole *6.18*

$C_{11}H_{13}N_3O$ Tryptophanamide *10.43*

$C_{11}H_{14}$ 3-Methyl-1-phenyl-2-butene *3.45*
α,β,β-Trimethylstyrene *3.123*

$C_{11}H_{14}N_2O_2$ *N*-Methoxycarbonyltryptamine *10.35*

$C_{11}H_{14}N_2O_4$ L-Tyrosylglycine *4.76*
Glycyltyrosine *4.189*

$C_{11}H_{14}OS$ 2-Methyl-3-phenylsulfinyl-2-butene *13.53*

$C_{11}H_{14}S$ Pivalothiophenone *13.126*

$C_{11}H_{15}NO$ Phenyl-*N*-*tert*-butylnitrone *15.46*

$C_{11}H_{15}NOS$ 4-[(Phenylmethyl)thio]morpholine *13.112*

$C_{11}H_{15}NO_2$ 3,5-Diacetyl-1,4-dihydropyridine *6.41*
Ethyl 4-(dimethylamino)benzoate *9.21*

$C_{11}H_{15}NO_4S$
2-Sulfonatophenyl-*N*-*tert*-butylnitrone *15.49*

$C_{11}H_{16}$ Nopadiene *2.25*
2,3-Dimethylenebicyclo[3.2.2]nonane *2.31*
(Dicyclopropylmethylidene)cyclobutane *2.96*
1,1,2-Tricyclopropylethene *2.169*

$C_{11}H_{16}O$ 2-*tert*-Butyl-4-hydroxyanisole *4.122*

$C_{11}H_{16}OS$ 1-(Butylthio)-4-methoxybenzene *13.12*
4-(4-Methylphenyl)thio-1-butanol *13.52*

$C_{11}H_{16}O_2$ 4-Methoxy-2,3,5,6-tetramethylphenol *4.133*

$C_{11}H_{16}O_5$ Pentamethoxybenzene *3.48*

$C_{11}H_{16}S$ 1-(Butylthio)-4-methylbenzene *13.13*
Methyl 4-*tert*-butylphenyl sulfide *13.20*

$C_{11}H_{17}N$ *N*,*N*,2,4,6-Pentamethylaniline *9.15*

$C_{11}H_{17}NS$ *N*,*N*-Diethylbenzenemethanesulfenamide *13.35*

$C_{11}H_{17}N_2O^+$ α-(1-Methyl-4-pyridyl)-*tert*-butyl nitrone *15.45*

$C_{11}H_{17}N_2O_8P$
Nicotinamide mononucleotide, reduced *16.51*

$C_{11}H_{18}O$ 3-Methyl-2-pentyl-2-cyclopenten-1-one *2.162*

$C_{11}H_{18}O_3$ 6-Isopropyl-3,4-dihydropyran-5-carboxylic acid ethyl ester *5.99*

$C_{11}H_{18}S$ 2,2,6,6-Tetramethylcyclohexylthioketene *13.166*

$C_{11}H_{19}N_3O$ Dimethirimol *16.66*
Ethirimol *16.67*

$C_{11}H_{20}OSi$ 6-(Trimethylsiloxy)-1,4-cyclooctadiene *2.132*

$C_{11}H_{21}N$ *N*-Cyclohexylpiperidine *8.56*

$C_{11}H_{22}N_2O_3S$
L-Methionyl-L-leucine *13.107*

$C_{11}H_{22}O_2$ Undecanoic acid *17.76*

$C_{11}H_{23}NO$ *N*-(2-Hydroxyethyl)-2,2,6,6-tetramethylpiperidine *8.68*

$C_{11}H_{26}N_2$ *N*,*N*-Diethyl-1,7-heptanediamine *8.31*

$C_{12}H_2Cl_6NiS_4.C_{16}H_{36}N$
Bis[3,4,6-trichloro-1,2-benzenedithiolato]nickelate(I), tetrabutylammonium salt *12.117*

$C_{12}H_8O_4$ 8-Methoxypsoralen *5.87*

$C_{12}H_9ClS$ 1-Chloro-4-(phenylthio)benzene *13.16*

$C_{12}H_9NO$ Phenoxazine *6.38*

$C_{12}H_9NO_2S$ 1-Nitro-4-(phenylthio)benzene *13.31*

$C_{12}H_9NS$ Phenothiazine *13.121*

$C_{12}H_9N_3O_2$ 4-Nitroazobenzene *11.61*

$C_{12}H_9O^-$ 2-Phenylphenoxide *4.180*
4-Phenylphenoxide ion *4.181*

$C_{12}H_9O_2^-$ 2,2′-Dihydroxybiphenyl, conjugate base *4.166*
2,5-Dihydroxybiphenyl, conjugate base *4.167*

$C_{12}H_{10}N_2$ Azobenzene *11.57*

$C_{12}H_{10}N_3S^+$ Thionine cation *11.114*

$C_{12}H_{10}O$ 2′-Acetonaphthone *3.1*
2-Hydroxybiphenyl *4.141*

$C_{12}H_{10}O_2$ 2,5-Dihydroxybiphenyl *4.30*
2,2′-Dihydroxybiphenyl *4.128*

$C_{12}H_{10}S$ Diphenyl sulfide *13.34*

$C_{12}H_{10}S_2$ Diphenyl disulfide *13.84*

$C_{12}H_{10}Se_2$ Diphenyldiselenide *13.83*

$C_{12}H_{10}Te_2$ Diphenylditelluride *13.85*

$C_{12}H_{11}N$ Diphenylamine *9.16*

$C_{12}H_{11}NO$ 3-Hydroxydiphenylamine *4.142*

$C_{12}H_{11}N_2O_3^-$
Nalidixic acid, anion *16.46*

$C_{12}H_{12}$ 1,2-Dimethylnaphthalene *3.75*
1,3-Dimethylnaphthalene *3.76*
1,4-Dimethylnaphthalene *3.77*
1,6-Dimethylnaphthalene *3.78*
1,7-Dimethylnaphthalene *3.79*
1,8-Dimethylnaphthalene *3.80*
2,3-Dimethylnaphthalene *3.81*
2,6-Dimethylnaphthalene *3.82*
2,7-Dimethylnaphthalene *3.83*

$C_{12}H_{12}N^+$ *N*-Methyl-4-phenylpyridinium *6.55*

$C_{12}H_{12}NO_2^-$ Indole-3-butyrate ion *6.22*

$C_{12}H_{12}N_2$ Benzidine *9.23*

$C_{12}H_{12}N_2O_3$ Nalidixic acid *16.45*

$C_{12}H_{12}OS$ 3-(4-Methoxyphenyl)-2-cyclopentene-1-thione *13.66*

$C_{12}H_{12}O_2$ α-Benzylfurfuryl alcohol *5.72*
4-Hydroxymethyl-2-(phenylmethyl)furan *5.74*
[2,2](2,5)Furanophane *5.77*

$C_{12}H_{12}S$ 1,1-Dimethyl-2-naphthalenethione *13.113*

$C_{12}H_{13}N$ *m*-Cyano-α,β,β-trimethylstyrene *3.111*
p-Cyano-α,β,β-trimethylstyrene *3.112*

$C_{12}H_{13}NO$ (*E*)-1-Methyl-3-(β-methoxylvinyl)indole *2.247*
(*Z*)-1-Methyl-3-(β-methoxylvinyl)indole *2.248*

$C_{12}H_{13}NO_2$ 3-Indolebutyric acid *6.23*

$C_{12}H_{14}$ 4,5,6,7-Tetrahydrospirocyclopropane[4,7]methanoindene *2.345*

$C_{12}H_{14}Cl_3MnO_6$ Bis(acetylacetonato)trichloroacetato-manganese(III) *12.12*

$C_{12}H_{14}N^+$ *N*-Methyl-4-phenyl-2,3-dihydropyridinium *6.53*

$C_{12}H_{14}N_2O_2$ Tryptophan, methyl ester *10.42*

$(C_{12}H_{15}N)_n$ Permanax 45 *6.72*

$C_{12}H_{15}N$ *N*-Methyl-4-phenyl-1,2,3,6-tetrahydro-pyridine *8.94*

$C_{12}H_{15}NO$ 5-Methoxy-1,2,3-trimethylindole *6.14*

$C_{12}H_{16}$ Tetramethyl-*o*-xylylene *2.104*
3,α,β,β-Tetramethylstyrene *3.121*
4,α,β,β-Tetramethylstyrene *3.122*

$C_{12}H_{16}ClMnO_6$ Bis(acetylacetonato)chloroacetatomanganese (III) *12.6*

$C_{12}H_{16}N_2O_5S$ 5-*S*-Cysteinyldopa *4.71*

$C_{12}H_{16}O$ *m*-Methoxy-α,β,β-trimethylstyrene *3.117*
p-Methoxy-α,β,β-trimethylstyrene *3.118*

$C_{12}H_{16}OS$ 4′-Methoxypivalothiophenone *13.129*

$C_{12}H_{16}O_2$ 2,3-Dihydro-5-hydroxy-2,4,6,7-tetramethylbenzofuran *4.37*

$C_{12}H_{16}S$ 2,3-Dimethyl-2-butenyl phenyl sulfide *13.17*

$C_{12}H_{17}MnO_6$ Acetatobis(acetylacetonato)manganese(III) *12.1*

$C_{12}H_{17}NO_4$ Diethyl 2,4-dimethylpyrrole-3,5-dicarboxylate *6.66*

$C_{12}H_{17}NS$ 1-[(Phenylmethyl)thio]piperidine *13.125*

$C_{12}H_{18}$ Hexamethylbicyclo[2.2.0]hexa-2,5-diene *2.29*
(Dicyclopropylmethylidene)cyclopentane *2.151*

$C_{12}H_{18}O$ 2-(Cyclohexylidene)cyclohexanone *2.114*

$C_{12}H_{18}OS$ 5-(4-Methylphenyl)thio-1-pentanol *13.118*

$C_{12}H_{18}O_2$ Durohydroquinone monoethyl ether *4.126*

$C_{12}H_{18}O_3$ 4-(1-Hydroxy-2,2-dimethyl)propyl-2-methoxyphenol *4.127*

$C_{12}H_{18}O_6$ Hexamethoxybenzene *3.42*

$C_{12}H_{20}$ (Cyclohexylidene)cyclohexane *2.109*
1,1-Bis(cyclobutyl)-2-methyl-1-propene *2.332*

$C_{12}H_{20}O$ 2-*tert*-Butylfuran *5.24*
2,5-Di-*tert*-butylfuran *5.28*
2-(Cyclohexylidene)cyclohexanol *2.113*

$C_{12}H_{20}OSi$ 7,7-Dimethyl-2-(trimethylsiloxy)-norborna-2,5-diene *2.5*

$C_{12}H_{20}S$ 1,3,3,7,7-Pentamethylbicyclo[2.2.1]heptane-2-thione *13.45*

$C_{12}H_{22}O$ (*E,E*)-8,10-Dodecadienol *2.204*

$C_{12}H_{22}O_2$ (*E,E*)-1,4-Di(*tert*-butoxy)-1,3-butadiene *2.36*
(*E,Z*)-1,4-Di(*tert*-butoxy)-1,3-butadiene *2.37*
(*Z,Z*)-1,4-Di(*tert*-butoxy)-1,3-butadiene *2.38*

$C_{12}H_{22}O_{11}$ Sucrose *16.75*

$C_{12}H_{24}O_2$ Dodecanoic acid *17.24*

$C_{12}H_{26}$ Dodecane *17.23*

$C_{12}H_{26}O_4S$ Dodecyl sulfate, sodium salt *17.25*

$C_{12}H_{27}N$ Tributylamine *8.13*

$C_{12}H_{27}O_3P$ Tributyl phosphite *17.71*

$C_{12}H_{28}N_2$ 1,1-Dimethyl-2,2-di(2,2-dimethylpropyl)hydrazine *8.35*
1,2-Dimethyl-1,2-di(2,2-dimethylpropyl)hydrazine *8.36*
1,2-Dimethyl-1,2-dipentylhydrazine *8.39*

$C_{12}H_{28}NiO_4P_2S_4$ Bis(*O,O′*-diisopropylphosphorodithiolato)nickel(II) *12.52*

$C_{13}H_8ClNOSe$ 7-Chloro-2-phenyl-1,2-benzisoselenazol-3-one *13.36*

$C_{13}H_8Cl_2N_2$ Diazodi(4-chlorophenyl)methane *11.17*

$C_{13}H_8Cl_2S$ 4,4′-Dichlorothiobenzophenone *13.159*

$C_{13}H_8FNOSe$ 7-Fluoro-2-phenyl-1,2-benzisoselenazol-3-one *13.37*

$C_{13}H_8N_2$ 9-Diazofluorene *11.63*

$C_{13}H_8N_2O_3Se$ 7-Nitro-2-phenyl-1,2-benzisoselenazol-3-one *13.39*

$C_{13}H_8O$ Phenalen-1-one *3.97*

$C_{13}H_9BrN_2$ Diazo(4-bromophenyl)phenylmethane *11.15*

$C_{14}H_9NO_2$ 1-Aminoanthraquinone *11.3*
2-Aminoanthraquinone *11.4*

$C_{14}H_9NO_3$ 1-Amino-4-hydroxyanthraquinone *11.5*

$C_{14}H_9O_3^-$ 1,8-Dihydroxy-9-anthrone, conjugate base *4.3*

$C_{14}H_9O_3S^-$ 1-Anthracenesulfonate ion *3.18*
2-Anthracenesulfonate ion *3.19*

$C_{14}H_{10}$ Anthracene *3.3*

$C_{14}H_{10}N_2O_2$ 1,4-Diaminoanthraquinone *11.8*
1,5-Diaminoanthraquinone *11.9*
1,8-Diaminoanthraquinone *11.10*
2,6-Diaminoanthraquinone *11.11*
3,4-Diphenylsydnone *5.102*

$C_{14}H_{10}NiO_4.2H_2O$
Bis(2-hydroxybenzaldehydato)nickel(II) dihydrate *12.88*

$C_{14}H_{10}O_3$ 1,8-Dihydroxy-9-anthrone *4.2*

$C_{14}H_{11}NO_2Se$
7-Methoxy-2-phenyl-1,2-benzisoselenazol-3-one *13.38*

$C_{14}H_{12}$ (*Z*)-Stilbene *3.99*

$C_{14}H_{12}Cl_4$ 5,6,7,8-Tetrachloro-1,2,3,4-tetrahydro-9-isopropylidene-1,4-methanonaphthalene *2.258*

$C_{14}H_{12}CoS_4$ Bis[4-methyl-1,2-benzenedithiolato]cobalt(II) tetrabutylammonium salt *12.99*

$C_{14}H_{12}F_4$ 5,6,7,8-Tetrafluoro-1,2,3,4-tetrahydro-9-isopropylidene-1,4-methanonaphthalene *2.259*

$C_{14}H_{12}N_2NiO_2$
Bis[2-(iminomethyl)phenolato]nickel(II) *12.96*

$C_{14}H_{12}N_2NiO_4$
Bis(2-hydroxybenzaldehyde oximato)nickel(II) *12.89*

$C_{14}H_{12}N_2NiS_4$
Bis(phenyldithiocarbamato)nickel(II) *12.107*

$C_{14}H_{12}N_2O$ Diazo(4-methoxyphenyl)phenylmethane *11.20*

$C_{14}H_{12}N_2O_6S_2^{2-}$
4,4′-Diaminostilbene-2,2′-disulfonate ion *3.107*

$C_{14}H_{12}N_4O_2$ 1,4,5,8-Tetraaminoanthraquinone *11.14*

$C_{14}H_{12}NiS_4$ Bis[4-methyl-1,2-benzenedithiolato]nickel(II) tetrabutylammonium salt *12.100*

$C_{14}H_{12}O$ (*E*)-2,3-Diphenyloxirane *17.49*

$C_{14}H_{12}OS$ 4-Methoxythiobenzophenone *13.162*

$C_{14}H_{12}S$ (*E*)-2,3-Diphenylthiirane *13.151*

$C_{14}H_{13}NO$ 4-Methylphenyl phenyl nitrone *15.8*
Phenyl 4-methylphenyl nitrone *15.9*
α-Phenyl-*N*-benzylnitrone *15.12*
Benzophenone oxime *O*-methyl ether *15.15*

$C_{14}H_{13}NOS$ 2-(Methylthio)-*N*-phenylbenzamide *13.3*

$C_{14}H_{13}NOSe$
2-(Methylseleno)-*N*-phenylbenzamide *13.2*

$C_{14}H_{13}N_3O_2$ 2-Methyl-6-(4-methoxyphenyl)imidazo[1,2-*a*]pyrazin-3-one *16.40*

$C_{14}H_{14}$ 1-(β,β-Dimethylvinyl)naphthalene *3.87*

$C_{14}H_{14}N_3^+$ 3,6-Diamino-10-methylacridinium *11.2*

$C_{14}H_{14}O_3$ 4-Acetoxymethyl-2-(phenylmethyl)furan *5.75*

$C_{14}H_{14}S$ Dibenzyl sulfide *13.71*

$C_{14}H_{15}NO$ *N*,*N*-Dibenzylhydroxylamine *15.11*

$C_{14}H_{15}O_2^-$ 4-Methyl-1-naphthalenepropionate ion *3.91*

$C_{14}H_{15}O_4^-$ 4-Methyl-1-naphthalenepropionate ion endoperoxide *3.92*

$C_{14}H_{16}$ 1,2,3,4-Tetrahydro-9-isopropylidene-1,4-methanonaphthalene *2.260*

$C_{14}H_{16}N_2O_3$ *N*-Acetyltryptophan methyl ester *10.38*

$C_{14}H_{16}O_2$ α-(3-Phenylpropyl)furfuryl alcohol *5.73*

$C_{14}H_{16}O_3$ 5-Ethoxycarbonyl-3,4-dihydro-6-phenylpyran *5.100*

$C_{14}H_{16}O_4$ 4-Methyl-1-naphthalenepropionic acid endoperoxide *3.93*

$C_{14}H_{17}NO_2$ 7-(Diethylamino)-4-methylcoumarin *5.7*

$C_{14}H_{17}N_3O_3$ L-Alanyl-L-tryptophan *10.39*

$C_{14}H_{17}O_4^-$ 6-Hydroxy-2,5,7,8-tetramethylchroman-2-carboxylate ion *4.44*

$C_{14}H_{18}N_2O$ 5′-Oxo-3′,4′-diethyl-5-methyl-1′,5′-dihydro-(2.2′)-dipyrromethene *7.101*
5′-Oxo-3′-ethyl-4′,3,5-trimethyl-1′,5′-dihydro-(2.2′)-dipyrromethene *7.103*
5′-Oxo-4′,4,5-trimethyl-3′-ethyl-1′,5′-dihydro-(2.2′)-dipyrromethene *7.104*

$C_{14}H_{19}NO_3S$
CBZ-L-Methionine methyl ester *13.110*

$C_{14}H_{19}N_3O_5$ Glycyl-L-tyrosyl-L-alanine *4.1*

$C_{14}H_{20}N_2$ Caged hydrazine *8.22*

$C_{14}H_{20}O_2$ 6-Hydroxy-2,2,5,7,8-pentamethylchroman *4.49*
1-Adamantylideneethyl acetate *2.220*

$C_{14}H_{21}BrO$ 4-Bromo-2,6-di-*tert*-butylphenol *4.105*

$C_{14}H_{21}ClO$ 2,6-Di-*tert*-butyl-4-chlorophenol *4.110*

$C_{14}H_{21}NO_4$ 3,5-Diethoxycarbonyl-1,4-dihydro-2,4,6-trimethylpyridine *6.51*

$C_{14}H_{22}$ 2-Isobutylideneadamantane *2.355*

$C_{14}H_{22}O$ 2,6-Di-*tert*-butylphenol *4.99*

$C_{14}H_{22}OS$ 3-Hydroxy-3,4-dimethylpentyl *p*-methylphenyl sulfide *13.119*

$C_{14}H_{22}O_2$ 3,5-Di-*tert*-butylcatechol *4.7*
2,5-Di-*tert*-butylhydroquinone *4.14*

$C_{14}H_{26}$ 4,8-Dimethyl-4,8-dodecadiene *2.201*
(*E,E*)-4,8-Dimethyl-4,8-dodecadiene *2.202*

$C_{14}H_{26}NO_3$ 2,2,6,6-Tetramethyl-4-piperidinol-1-oxyl pentanoate *15.41*

$C_{14}H_{26}O$ 2-(Cyclododecylidene)ethanol *2.215*

$C_{14}H_{26}O_2$ Monohydroperoxides of 4,8-dimethyl-4,8-dodecadiene *2.203*

$C_{14}H_{28}CoN_2S_4$
Bis(diisopropyldithiocarbamato)cobalt(II) *12.46*

$C_{14}H_{28}CuN_2S_4$
Bis(diisopropyldithiocarbamato)copper(II) *12.47*

$C_{14}H_{28}FeN_2S_4^+$
Bis(diisopropyldithiocarbamato)iron(III) *12.48*

$C_{14}H_{28}MnN_2S_4$
Bis(diisopropyldithiocarbamato)manganese(II) *12.49*

$C_{14}H_{28}N_2NiS_4$
Bis(diisopropyldithiocarbamato)nickel(II) *12.50*

$C_{14}H_{28}N_2S_4Zn$
Bis(diisopropyldithiocarbamato)zinc(II) *12.51*

$C_{14}H_{28}O_2$ Tetradecanoic acid *17.67*

$C_{14}H_{31}CoN_5O_5$
Hydroxybis(dimethylglyoximato)triethylaminecobalt(II) *12.147*

$C_{15}H_9O_2^-$ 9-Anthroate ion *3.21*

$C_{15}H_{10}O_3$ 3-Hydroxyflavone *4.74*

$C_{15}H_{10}O_4$ 5,7-Dihydroxyflavone *4.73*

$C_{15}H_{10}O_5$ Galangin *4.65*

$C_{15}H_{10}O_6$ Luteolin *4.60*
Kaempferol *4.64*
Fisetin *4.75*

$C_{15}H_{10}O_7$ Quercetin *4.61*

$C_{15}H_{11}NO$ 2,5-Diphenyloxazole *6.31*

$C_{15}H_{11}NO_2$ 1-Amino-2-methylanthraquinone *11.6*

$C_{15}H_{12}$ 9-Methylanthracene *3.13*

$C_{15}H_{12}N_2O_2$ 3-(4-Methylphenyl)-4-phenylsydnone *5.106*

$C_{15}H_{12}N_2O_3$ 1,4-Diamino-2-methoxyanthraquinone *11.13*

$C_{15}H_{12}O$ 9-Methoxyanthracene *3.12*

$C_{15}H_{12}O_5$ 4′,5,7-Trihydroxyflavanone *4.72*

$C_{15}H_{12}O_6$ Dihydroluteolin *4.59*

$C_{15}H_{12}O_7$ Dihydroquercetin *4.63*

$C_{15}H_{12}S_3$ 4,5-Diphenyl-1,3-dithiane-2-thione *13.89*

$C_{15}H_{13}N$ 3-Methyl-2-phenylindole *6.17*

$C_{15}H_{14}$ (*E*)-α-Methylstilbene *3.104*
(*Z*)-α-Methylstilbene *3.105*

$C_{15}H_{14}N_2$ Diazodi(4-methylphenyl)methane *11.18*

$C_{15}H_{14}O_2S$ 4,4′-Dimethoxythiobenzophenone *13.160*

$C_{15}H_{14}O_6$ Catechin *4.67*

$C_{15}H_{14}S$ 4,4′-Dimethylthiobenzophenone *13.161*

$C_{15}H_{15}NO_2$ Coumarin LD-490 *8.3*

$C_{15}H_{15}N_3O_2$ 1,2,5,6,6*a*,6*b*,6*c*,6*d*-Octahydro-1,6[1′,2′]-4-methyl-3,5-dioxo-1,2,4-triazolobenzo[1,3]cyclopropa[1,2,3-*cd*]cyclopropa[*gh*]pentalene *17.69*

$C_{15}H_{18}N_2$ 1-Isopropylamino-4-phenylaminobenzene *9.30*

$C_{15}H_{18}N_4O_4$ L-Tryptophylglycylglycine *10.22*

$C_{15}H_{18}N_4O_5$ Mitomycin C *16.7*

$C_{15}H_{19}N_3O$ 4-Benzyloxy-5,6-dimethyl-2-(dimethylamino)pyrimidine *16.65*

$C_{15}H_{20}N_2O$ *N*-Acetylstobadine *6.57*

$C_{15}H_{21}CoO_6$ Tris(acetylacetonato)cobalt(III) *12.173*

$C_{15}H_{21}CrO_6$ Tris(acetylacetonato)chromate(III) *12.172*

$C_{15}H_{21}FeO_6$ Tris(acetylacetonato)iron(III) *12.174*

$C_{15}H_{21}MnO_6$
Tris(acetylacetonato)manganese(III) *12.175*

$C_{15}H_{22}O_2$ 7-(1,1-Dimethylethyl)-3,4-dihydro-2,2-dimethyl-1-benzopyran-6-ol *4.54*

$C_{15}H_{23}NO_4$ 1,4-Dihydro-2,6-dimethyl-3,5-di(1-methylethoxycarbonyl)pyridine *6.49*

$C_{15}H_{24}$ Caryophyllene *2.34*

$C_{15}H_{24}O$ 2,6-Di-*tert*-butyl-4-methylphenol *4.102*

$C_{15}H_{24}O_2$ 3,5-Di-*tert*-butyl-4-hydroxybenzyl alcohol *4.32*
2,4-Di-*tert*-butyl-5-methoxyphenol *4.100*
2,6-Di-*tert*-butyl-4-methoxyphenol *4.101*

$(C_{15}H_{25}NO_4)_n$
Tinuvin 622 *8.67*

$C_{15}H_{26}$ 2,6,10-Trimethyl-2,6,10-dodecatriene *2.210*

$C_{15}H_{26}O_2$ Hydroperoxy-2,6,10-trimethyl-2,6,10-dodecatriene *2.209*

$C_{15}H_{26}O_4$ Dihydroperoxy-2,6,10-trimethyl-2,6,10-dodecatriene *2.208*

$C_{15}H_{34}ClN$ Dodecyltrimethylammonium chloride *17.26*

$C_{16}H_{10}Br_2O$ 2,5-Bis(4-bromophenyl)furan *5.16*

$C_{16}H_{10}Cl_2O$ 2,5-Bis(4-chlorophenyl)furan *5.17*

$C_{16}H_{10}N_2O_2$ Indigo *11.69*

$C_{16}H_{11}BrN_2O$
1-(4-Bromophenylazo)-2-naphthol *11.94*

$C_{16}H_{11}ClN_2O$
4-(4-Chlorophenylazo)-1-naphthol *11.87*
1-(4-Chlorophenylazo)-2-naphthol *11.95*

$C_{16}H_{11}FN_2O$
1-(4-Fluorophenylazo)-2-naphthol *11.97*

$C_{16}H_{11}IN_2O$ 1-(4-Iodophenylazo)-2-naphthol *11.99*

$C_{16}H_{11}N_3O_3$ 4-(4-Nitrophenylazo)-1-naphthol *11.91*
1-(4-Nitrophenylazo)-2-naphthol *11.103*

$C_{16}H_{12}ClNO$
4-Methyl-2-(3-chlorophenyl)-5-phenyloxazole *6.33*
4-Methyl-2-(4-chlorophenyl)-5-phenyloxazole *6.34*

$C_{16}H_{12}Cl_2O_2$
2,3-Di(3-chlorophenyl)-1,4-dioxene *2.186*
2,3-Di(4-chlorophenyl)-1,4-dioxene *2.187*

$C_{16}H_{12}N_2Na_2NiO_8S_2$
[*N*,*N*′-Ethylenebis(5-sulfosalicylideneiminato)]nickelate(II) disodium salt *12.143*

$C_{16}H_{12}N_2O$ 4-Phenylazo-1-naphthol *11.92*
1-Phenylazo-2-naphthol *11.104*

$C_{16}H_{12}N_2O_2$ 1-(4-Hydroxyphenylazo)-2-naphthol *11.98*

$C_{16}H_{12}N_2O_3$ 4-Methyl-2-(4-nitrophenyl)-5-phenyloxazole *6.37*

$C_{16}H_{12}O$ 2,3-Diphenylfuran *5.37*
2,5-Diphenylfuran *5.38*
3,4-Diphenylfuran *5.39*

$C_{16}H_{13}NO$ 2,5-Diphenyl-4-methyloxazole *6.32*

$C_{16}H_{13}N_3O$ 1-(*p*-Aminophenylazo)-2-naphthol *11.93*

$C_{16}H_{14}$ 1,4-Diphenyl-1,3-butadiene *2.40*
9,10-Dimethylanthracene *3.10*
1-Methyl-2-phenylindene *3.71*

$C_{16}H_{14}CoN_2O_2$
2,2′-[1,2-Ethanediylbis(nitrilomethylidyne)]-bis[phenolato]cobalt(II) *12.139*

$C_{16}H_{14}N_2Na_2NiO_8S_2$
[*N*,*N*′-Propylenebis(5-sulfosalicylideneiminato)]nickelate(II) disodium salt *12.169*

$C_{16}H_{14}N_2NiO_2$
2,2′-[1,2-Ethanediylbis(nitrilomethylidyne)]-bis[phenolato]nickel(II) *12.140*

$C_{16}H_{14}N_2O_2$ 1,4-Bis(methylamino)anthraquinone *11.7*

$C_{16}H_{14}NiO_6.2H_2O$
Bis(2-hydroxy-5-methoxybenzaldehydato)nickel(II) dihydrate *12.92*

$C_{16}H_{14}O_2$ 9,10-Dimethoxyanthracene *3.8*
2,3-Diphenyl-1,4-dioxene *2.194*

$C_{16}H_{14}O_4$ 2,3-Di(4-hydroxyphenyl)-1,4-dioxene *2.189*

$C_{16}H_{14}O_4^{2-}$ 1,4-Naphthalenedipropionate ion *3.88*

$C_{16}H_{15}N_3O_2$ 1-(Phenylazo)-1-(phenylaminocarbonyl)-2-propanone *11.62*

$C_{16}H_{16}$ 1,1-Diphenyl-2-methylpropene *3.46*
trans-α,α′-Dimethylstilbene *3.102*
cis-α,α′-Dimethylstilbene *3.103*

$C_{16}H_{16}ClN_3O$
2-(2′-Hydroxy-3′-chloro-5′-*tert*-butylphenyl)benzotriazole *4.97*

$C_{16}H_{16}N_2NiO_4$
Bis(2′-hydroxyacetophenone oximato)nickel(II) *12.87*

$C_{16}H_{16}N_2NiS_4$
Bis(4-methylphenyldithiocarbamato)nickel(II) *12.103*

$C_{16}H_{16}O_2$ 4,4′-Dimethoxystilbene *3.100*
α,β-Dimethoxystilbene *3.101*

$C_{16}H_{17}NO_2$ 2,3,6,7-Tetrahydro-9-methyl[1]benzopyran[6,7,8-*ij*]quinolizin-11-one *8.4*

$C_{16}H_{17}N_5O_4$ 4-(Diethylamino)-2′,4′-dinitroazobenzene *11.52*

$C_{16}H_{18}CuN_2S_4$
[[3,3]-[1,2-Ethanediylbis(nitrilomethylidyne)]bis[5-ethyl-2-thiophenethionato]]copper(II) *12.138*

$C_{16}H_{18}N_3S^+$ Methylene Blue cation *11.113*

$C_{16}H_{18}N_4O_2$ 4-(Diethylamino)-3′-nitroazobenzene *11.54*
4-(Diethylamino)-4′-nitroazobenzene *11.55*

$C_{16}H_{18}NiO_3S$
Aqua[2,2′-thiobis(3,4-dimethylphenolato)]nickel(II) *12.4*

$C_{16}H_{19}N_3$ 4-(Diethylamino)azobenzene *11.56*

$C_{16}H_{20}N_2O$ 5′-Oxo-4′-vinyl-4-ethyl-3′,3,5-trimethyl-1′,5′-dihydro-(2.2′)-dipyrromethene *7.105*
5′-Oxo-4-ethyl-3′-ethenyl-3,5,4′-trimethyl-1′,5′-dihydro-(2.2′)-dipyrromethene *7.106*

$C_{16}H_{20}N_2S_4$ (Z,Z)-3,3′-[1,2-Ethanediylbis(iminomethylidyne)]bis[5-ethyl-2-thiophenethione *13.171*

$C_{16}H_{20}O_2$ 5,8-Dimethoxy-1,2,3,4-tetrahydro-9-isopropylidene-1,4-methanonaphthalene *2.257*

$C_{16}H_{22}NO_3$ 2,2,6,6-Tetramethyl-4-piperidinol-1-oxyl benzoate *15.34*

$C_{16}H_{22}O_4$ 3-(6-Hydroxy-2,5,7,8-tetramethylchroman-2-yl)propionic acid *4.66*

$C_{18}H_{16}N_2O_8S_2^{2-}$ 4,4′-Diacetamidostilbene-2,2′-disulfonate ion *3.106*

$C_{18}H_{16}O$ 2,5-Bis(4-methylphenyl)furan *5.20*
1-(4-Methoxyphenyl)-4-phenyl-1,3-cyclopentadiene *2.148*

$C_{18}H_{16}O_2$ α-Benzhydrylfurfuryl alcohol *5.68*
5-Benzoyl-3,4-dihydro-6-phenylpyran *5.89*

$C_{18}H_{16}O_3$ 2,5-Bis(4-methoxyphenyl)furan *5.19*

$C_{18}H_{16}O_6S_2^{2-}$ 9,10-Anthracenediethanesulfonate ion *3.15*

$C_{18}H_{17}NO$ β-Phenyl-α-pyrrolidinylbenzeneethanol *8.2*

$C_{18}H_{17}N_3O$ 1-[4-(Dimethylamino)phenylazo]-2-naphthol *11.96*

$C_{18}H_{18}N_2NiO_2$ 2,2′-[1,2-Ethanediylbis(nitriloethylidyne)]-bis[phenolato]nickel(II) *12.137*

$C_{18}H_{18}N_3O_7$ 2,5-Di-(4-hydroxy-3-nitrophenyl)-2,5-dimethylpyrrolidin-1-oxyl *15.54*

$C_{18}H_{18}N_4O$ 4-(4′-Dimethylaminophenyl)imino-3-methyl-1-phenyl-2-pyrazolin-5-one *11.150*

$C_{18}H_{18}O_2$ 1,4-Di(4,4′-dimethoxyphenyl)-1,3-butadiene *2.35*
2,3-Di(4-methylphenyl)-1,4-dioxene *2.193*

$C_{18}H_{18}O_4$ 2,3-Di(3-methoxyphenyl)-1,4-dioxene *2.190*
2,3-Di(4-methoxyphenyl)-1,4-dioxene *2.191*

$C_{18}H_{19}NO_2$ 2-(4-Dimethylaminophenyl)-3-phenyl-1,4-dioxene *2.192*

$C_{18}H_{20}B_2N_{12}Ni$ Bis[hydrotris(1-pyrazolyl)borato]nickel(II) *12.86*

$C_{18}H_{20}N_2NiO_4$ Bis[2′-hydroxy-4′-methylacetophenone oximato]nickel(II) *12.93*

$C_{18}H_{20}N_4O$ 4-[*N*-(2-Cyanoethyl)-*N*-ethylamino]-4′-methoxyazobenzene *11.50*

$C_{18}H_{20}O_2$ 3-Hydroxy-1,3,5(10),9(11)-estratetraen-17-one *16.31*

$C_{18}H_{20}O_4$ 6,11-Dimethyl4,6,8,10,12-hexadecapentaene-2,3,14,15-tetraone (*all-E*) *2.234*

$C_{18}H_{22}N_2$ 1-Cyclohexylamino-4-phenylaminobenzene *9.28*

$C_{18}H_{22}N_4Ni$ Bis[*N*-methyl-7-(methylimino)-1,3,5-cycloheptatrien-1-aminato]nickel(II) *12.102*

$C_{18}H_{22}NiO_6S_2$ Bis(2,4,6-trimethylbenzenesulfonato)nickel(II) *12.118*

$C_{18}H_{22}O$ 2-(4-Methylphenoxymethylidene)adamantane *2.354*

$C_{18}H_{22}O_2$ 2-(4-Methoxyphenoxymethylidene)adamantane *2.352*

$C_{18}H_{23}NNiO_2S$ Ethylamine[2,2′-thiobis(3,4-dimethylphenolato)]nickel(II) *12.141*

$C_{18}H_{24}O_2$ *exo,exo*-2,3-Dioxymethyl-7-adamantylidenenorbornane *2.10*

$C_{18}H_{26}O_2$ 1,2,3,8,9,10-Hexahydro-3,3,5,6,8,8-hexamethylbenzo[1,2-*b*:4,3-*b*′]dipyran *5.2*
2,3,4,7,8,9-Hexahydro-2,2,5,7,7,10-hexamethylbenzo[1,2-*b*:4,5-*b*′]dipyran *5.3*

$C_{18}H_{28}N_2S_3$ 3,4-Bis[(cyclohexylamino)methylene]dihydro-2,5-thiophenedithione *13.169*

$C_{18}H_{30}O$ 2,4,6-Tri-*tert*-butylphenol *4.147*

$C_{18}H_{30}O_2$ Linolenic acid *2.267*
4-*tert*-Butoxy-2,6-di-*tert*-butylphenol *4.119*

$C_{18}H_{32}O_2$ Linoleic acid *2.264*

$C_{18}H_{33}O_3P$ Tricyclohexyl phosphite *17.72*

$C_{18}H_{34}O_2$ Oleic acid *2.271*

$C_{18}H_{36}CoN_2S_4$ Bis(dibutyldithiocarbamato)cobalt(II) *12.26*

$C_{18}H_{36}CuN_2S_4$ Bis(dibutyldithiocarbamato)copper(II) *12.27*

$C_{18}H_{36}N_2NiS_4$ Bis(dibutyldithiocarbamato)nickel(II) *12.28*

$C_{18}H_{36}N_2S_4Zn$ Bis(dibutyldithiocarbamato)zinc(II) *12.29*

$C_{18}H_{36}O_2$ Stearic acid *17.66*

$C_{19}H_{13}NO$ Phenyl fluorenyl nitrone *15.6*

$C_{19}H_{13}O_2S^-$ 9-(Phenylsulfonyl)fluoren-9-yl anion *13.98*

$C_{19}H_{14}N_2NiS_2$ [4-Methyl-1,2-benzenedithiolato])(1,10-phenanthroline)nickel(II) *12.154*

$C_{19}H_{14}S$ 4-Phenylthiobenzophenone *13.163*

$C_{19}H_{15}NO$ Triphenyl nitrone *15.5*

$C_{19}H_{16}N_2O_2$ 2-(4-Ethoxycarbonylphenyl)-1,8-dihydropyrrolo[3′,2′:3,4]cyclopenta[1,2-*b*]pyridine *6.70*

$C_{19}H_{18}N_2O_2$ 1,4-Dioxene, 2-(4-cyanophenyl)-3-(4-dimethylaminophenyl)- *2.184*

$C_{19}H_{19}$ 1,4-Bis(4-methylphenyl)-1,3-cyclopentadiene *2.144*

$C_{19}H_{19}O_2$ 1,4-Bis(4-methoxyphenyl)-1,3-cyclopentadiene *2.143*

$C_{19}H_{21}NO_4$ Boldine *8.20*

$C_{19}H_{22}N_2$ Bis(2,4,6-trimethylphenyl)diazomethane *11.19*

$C_{19}H_{22}N_2O_3$ Dregamine *8.101*

$C_{19}H_{22}O_2$ 3-Methoxyestra-1,3,5(10),8-tetraen-17-one *16.28*
3-Methoxy-1,3,5(10),9(11)-estratetraen-17-one *16.32*

$C_{19}H_{22}O_3$ *endo*-7-Adamantylidenenorbornane-2,3-dicarboxylic acid anhydride *2.15*
exo-7-Adamantylidenenorbornane-2,3-dicarboxylic acid anhydride *2.16*

$C_{19}H_{22}O_4$ Dimethyl 4-methyl-1,3-naphthalenedipropionate *3.90*

$C_{19}H_{24}NO_2$ 4-Hydroxy-4-(2-naphthyl)-2,2,6,6-tetramethylpiperidine-1-oxyl *15.31*

$C_{19}H_{30}O_2$ Methyl arachidonate *2.213*

$C_{19}H_{32}O_2$ Methyl linolenate *2.269*

$C_{19}H_{34}O_2$ Methyl linoleate *2.265*

$C_{19}H_{36}O_2$ Methyl oleate *2.272*

$C_{19}H_{38}O_2$ Methyl stearate *16.43*

$C_{20}H_2Cl_4I_4O_5^{2-}$
Rose Bengal dianion *11.66*

$C_{20}H_6Br_4O_5^{2-}$
Eosin dianion *11.65*

$C_{20}H_8Br_2HgNa_2O_6$
Mercurochrome *11.64*

$C_{20}H_{12}N_2Na_2NiO_8S_2$
[*N*,*N*′-*o*-Phenylenebis(5-sulfosalicylideneiminato)]nickelate(II) disodium salt *12.167*

$C_{20}H_{12}N_4Zn$ Porphinatozinc(II) *7.71*

$C_{20}H_{14}$ 9-Phenylanthracene *3.14*

$C_{20}H_{14}N_2NiO_2$
2,2′-[1,2-Phenylenebis(nitrilomethylidyne)]-bis[phenolato]nickel(II) *12.166*

$C_{20}H_{14}O$ 1,3-Diphenylisobenzofuran *5.83*

$C_{20}H_{16}$ 9,10-Dimethylbenz[*a*]anthracene *3.24*

$C_{20}H_{16}O_4^{2-}$ 9,10-Anthracenedipropionate ion *3.16*

$C_{20}H_{17}NOS$ *N*-Phenyl-2-(phenylmethyl)thiobenzamide *13.5*

$C_{20}H_{17}NOSe$
N-Phenyl-2-(phenylmethyl)selenobenzamide *13.4*

$C_{20}H_{20}N_2O_4$ 2,3-Di(4-acetaminophenyl)-1,4-dioxene *2.185*

$C_{20}H_{20}O_2$ 1,2,5,6,6*a*,6*b*,6*c*,6*d*-Octahydro-9,12-dimethoxy-1,6-*o*-benzenobenzo[1,3]cyclopropa[1,2,3-*cd*]cyclopropa[*gh*]pentalene *2.180*

$C_{20}H_{20}O_7$ Tangeretin *4.62*

$C_{20}H_{22}N_4O$ 4-(4′-Amino-2′,3′,5′,6′-tetramethylphenyl)imino-3-methyl-1-phenyl-2-pyrazolin-5-one *11.134*
4-(4′-Diethylaminophenyl)imino-3-methyl-1-phenyl-2-pyrazolin-5-one *11.147*
4-(4′-Dimethylamino-3′,5′-dimethylphenyl)imino-3-methyl-1-phenyl-2-pyrazolin-5-one *11.149*

$C_{20}H_{22}N_4O_2$ 2,4-Dihydro-4-[4-[(2-hydroxyethyl)ethylamino]phenyl]imino-5-methyl-2-phenylpyrazol-3-one *11.130*

$C_{20}H_{22}O_3$ 3-Acetyloxy-1,3,5(10),9(11)-estratetraen-17-one *16.29*

$C_{20}H_{24}ClN_3O$
2-(3′,5′-Di-*tert*-butyl-2′-hydroxyphenyl)-5-chlorobenzotriazole *4.109*

$C_{20}H_{24}N_2NiO_2$
Bis[2-[(1-methylethylimino)methyl]-phenolato]nickel(II) *12.101*

$C_{20}H_{24}N_2O_2$ 1,4-Dioxene, 2,3-di(4-dimethylaminophenyl)- *2.188*

$C_{20}H_{24}O_4$ Crocetin *2.93*

$C_{20}H_{26}NO$ Bis(4-*tert*-butylphenyl)nitroxide *15.26*

$C_{20}H_{26}N_2O$ *N*,*N*-Diethyl-3,5-dimethyl-4-(4′-oxo-2′,6′-dimethylcyclohexadienyliden)aminoaniline *11.49*

$C_{20}H_{26}O$ 4-Phenyl-2,6-di-*tert*-butylphenol *4.103*

$C_{20}H_{27}NNiO_2S$
Butylamine[2,2′-thiobis(3,4-dimethylphenolato)]nickel(II) *12.120*

$C_{20}H_{28}$ Adamantylideneadamantane *2.356*

$C_{20}H_{28}O$ *exo,exo*-2,3-(2^1-Oxatrimethylene)-7-adamantylidenenorbornane *2.12*
11-(*Z*)-Retinal *2.339*
13-(*Z*)-Retinal *2.340*
(*all-E*)-Retinal *2.341*

$C_{20}H_{28}O_2$ (*all-E*)-Retinoic acid *2.342*

$C_{20}H_{30}O$ (*all-E*)-Retinol *2.343*

$C_{20}H_{30}O_2$ 17-Hydroxy-4-methyl-4-androsten-3-one *16.4*
Abietic acid *2.325*

$C_{20}H_{32}O_2$ Arachidonic acid *2.212*

$C_{20}H_{34}$ 2,6,10,14-Tetramethyl-2,6,10,14-hexadecatetraene *2.235*

$C_{20}H_{34}AuO_9PS$
Tetra-*O*-acetylglucose-1-thiolato(triethylphosphino)gold(I) *12.170*

$C_{20}H_{34}O_2$ Ethyl linolenate *2.268*

$C_{20}H_{40}O$ 3,7,11,15-Tetramethyl-2-hexadecen-1-ol *2.238*

$C_{20}H_{40}O_2$ Eicosanoic acid *17.27*

$C_{21}H_{14}$ 1,2-Diphenylindene *3.70*

$C_{21}H_{17}ClN_2$ 3-(4-Chlorophenyl)-1,5-diphenyl-2-pyrazoline *11.121*
5-(4-Chlorophenyl)-1,3-diphenyl-2-pyrazoline *11.122*

$C_{21}H_{17}DN_2$ 5-Deutero-1,3,5-triphenyl-2-pyrazoline *11.123*

$C_{21}H_{18}BrNO$ *N*-Benzhydryl-4-bromomethylbenzamide *3.22*

$C_{21}H_{19}BrCl_2N_2S_2$ 5,5′-Dichloro-3,3-diethyl-2,2′-thiacarbocyanine bromide *11.163*

$C_{21}H_{19}N_3O_2$ 1,4-Dihydro-2,6-dimethyl-3,5-diphenylaminocarbonylpyridine *6.44*

$C_{21}H_{20}N_2O$ 4-[2-(*N*,*N*-Dimethylhydrazono)ethylidene]-2,6-diphenylpyran *15.1*

$C_{21}H_{20}O_6$ Curcumin *4.77*

$C_{21}H_{21}N$ Tribenzylamine *8.6*

$C_{21}H_{22}N_2O_2$ Strychnine *8.99*

$C_{21}H_{22}N_6$ Pyrazole dye 4 *11.24*

$C_{21}H_{23}N_7$ Pyrazole dye 6 *11.21*

$C_{21}H_{24}N_4O$ 4-(4′-Diethylamino-2′-methylphenyl)imino-3-methyl-1-phenyl-2-pyrazolin-5-one *11.144*

$C_{21}H_{24}N_4O_2$ 2,4-Dihydro-4-[4-[ethyl(2-hydroxyethyl)amino]-2-methylphenyl]imino-5-methyl-2-phenylpyrazol-3-one *11.129*

$C_{21}H_{25}NO_4$ Glaucine *8.21*

$C_{21}H_{26}N_2O_3$ Vincamine *8.100*

$C_{21}H_{26}N_7O_{13}P_2^+$ Nicotinamide adenine dinucleotide *16.47*

$C_{21}H_{26}O_3$ 2-Hydroxy-4-octyloxybenzophenone *4.43*
4-(1,1,3,3 Tetramethylbutyl)phenyl salicylate *4.144*

$C_{21}H_{28}N_6O_{15}P_2$ Nicotinamide hypoxanthine dinucleotide, reduced *16.42*

$C_{21}H_{28}N_7O_{17}P_3$ Nicotinamide adenine dinucleotide phosphate *16.49*

$C_{21}H_{28}O$ 4-Benzyl-2,6-di-*tert*-butylphenol *4.104*

$C_{21}H_{28}O_4$ *endo*-2,3-Di(methoxycarbonyl)-7-adamantylidenenorbornane *2.17*
exo-2,3-Di(methoxycarbonyl)-7-adamantylidenenorbornane *2.18*

$C_{21}H_{29}N_7O_{14}P_2$ Nicotinamide adenine dinucleotide, reduced *16.48*

$C_{21}H_{30}N_7O_{17}P_3$ Nicotinamide-adenine dinucleotide phosphate, reduced *16.50*

$C_{21}H_{30}O_3$ 7-Dehydroandrosterone-3-acetate *16.5*

$C_{21}H_{31}NO_4$ 3,5-Dicyclohexyloxycarbonyl-1,4-dihydro-2,6-dimethylpyridine *6.46*

$C_{21}H_{32}O_2$ Pregnenolone *16.62*

$C_{21}H_{35}NO_4$ 3,5-Dihexyloxycarbonyl-1,4-dihydro-2,6-dimethylpyridine *6.48*

$C_{21}H_{36}N_7O_{16}P_3S$ Coenzyme A *16.17*

$C_{21}H_{42}O$ Methyl phytyl ether *2.237*

$C_{22}H_{14}$ Dibenz[*a*,*h*]anthracene *3.61*
Pentacene *3.96*

$C_{22}H_{16}N_2O$ 4-(2′,3′-Benzo-4′-oxocyclohexadienyliden)amino-*N*-phenylaniline *11.84*

$C_{22}H_{18}O$ 1,3-Diphenyl-5,6-dimethylisobenzofuran *5.82*

$C_{22}H_{20}N_2$ 3-(4-Methylphenyl)-1,5-diphenyl-2-pyrazoline *11.126*
5-(4-Methylphenyl)-1,3-diphenyl-2-pyrazoline *11.127*

$C_{22}H_{20}N_2O$ 3-(4-Methoxyphenyl)-1,5-diphenyl-2-pyrazoline *11.124*
5-(4-Methoxyphenyl)-1,3-diphenyl-2-pyrazoline *11.125*

$C_{22}H_{22}Cl_3N_5O_2$ 2,4-Dihydro-4-(4-diethylamino-2-methylphenyl)imino-5-methylcarbamyl-2-(2,4,6-trichlorophenyl)pyrazol-3-one *11.146*

$C_{22}H_{23}N_3O_2$ 1,4-Dihydro-2,4,6-trimethyl-3,5-diphenylaminocarbonylpyridine *6.45*

$C_{22}H_{24}BrN_5O_2$ 2,4-Dihydro-2-(4-bromophenyl)-4-(4-diethylamino-2-methylphenyl)imino-5-methylcarbamylpyrazol-3-one *11.135*

$C_{22}H_{24}ClN_5O_2$ 2,4-Dihydro-2-(3-chlorophenyl)-4-(4-diethylamino-2-methylphenyl)imino-5-methylcarbamylpyrazol-3-one *11.136*
2,4-Dihydro-2-(4-chlorophenyl)-4-(4-diethylamino-2-methylphenyl)imino-5-methylcarbamylpyrazol-3-one *11.137*

$C_{22}H_{24}N_2O_2$ 2,4-Di[2-methyl-4-(dimethylamino)phenyl]squarylium *11.47*

$C_{22}H_{24}N_6$ Pyrazole dye 3 *11.22*

$C_{22}H_{24}N_6O_4$ 2,4-Dihydro-4-(4-diethylamino-2-methylphenyl)imino-5-methylcarbamyl-2-(4-nitrophenyl)pyrazol-3-one *11.145*

$C_{22}H_{25}N_5O_2$ 2,4-Dihydro-4-(4-diethylamino-2-methylphenyl)imino-5-methylcarbamyl-2-phenylpyrazol-3-one *11.128*

$C_{22}H_{26}Br_2N_2NiO_2$
Bis[2-[(butylimino)methyl]-4-bromophenolato]nickel(II) *12.17*

$C_{22}H_{26}N_4O$ 4-(4′-Diethylamino-2′,6′-dimethylphenyl)imino-3-methyl-1-phenyl-2-pyrazolin-5-one *11.140*
4-(4′-Dimethylamino-2′,3′,5′,6′-tetramethylphenyl)imino-3-methyl-1-phenyl-2-pyrazolin-5-one *11.151*

$C_{22}H_{26}O_3$ Bioresmethrin *5.76*

$C_{22}H_{27}N_5O_3S$
2,4-Dihydro-4-[4-[(2-methylsulfamylethyl)ethylamino]-2-methylphenyl]imino-5-methyl-2-phenylpyrazol-3-one *11.78*

$C_{22}H_{28}N_2NiO_2$
Bis[2-[(butylimino)methyl]phenolato]nickel(II) *12.19*
Bis[2-[(1,1-dimethylethylimino)methyl]-phenolato]nickel(II) *12.57*
Bis[2-[(1-methylpropylimino)methyl]-phenolato]nickel(II) *12.105*

$C_{22}H_{29}NNiO_2S$
Cyclohexylamine[2,2′-thiobis(3,4-dimethylphenolato)]nickel(II) *12.130*

$C_{22}H_{29}N_3O$ 2-(2′-Hydroxy-3′,5′-di-*tert*-pentylphenyl)benzotriazole *4.96*

$C_{22}H_{32}O_2$ Docosahexaenoic acid *2.200*
Retinyl acetate *2.344*

$C_{22}H_{32}O_6$ 6,11-Dimethyl-2,2,15,15-tetramethoxy-4,6,8,10,12-hexadecapentaene-3,14-dione (*all-E*) *2.233*

$C_{22}H_{38}O_2$ 2,5-Di-*sec*-octylhydroquinone *4.19*

$C_{22}H_{42}O_2$ Phytyl acetate *2.239*

$C_{22}H_{44}O$ Ethyl phytyl ether *2.236*

$C_{22}H_{44}O_2$ Docosanoic acid *17.22*

$C_{23}H_{17}H_5O_9S_3^{2-}$
N-[5-Hydroxy-8-[[2-(methylsulfonyl)-4-nitrophenyl]azo]-1-naphthalenyl-1,3-benzenedisulfonamide, conjugate dibase *11.86*

$C_{23}H_{18}H_5O_9S_3^{-}$
N-[5-Hydroxy-8-[[2-(methylsulfonyl)-4-nitrophenyl]azo]-1-naphthalenyl-1,3-benzenedisulfonamide, conjugate base *11.85*

$C_{23}H_{20}N_2$ 4,5-Dihydro-1,5-diphenyl-3-(2-phenylethenyl)pyrazole *11.119*

$C_{23}H_{21}IN_2S_2$
3,8,3′,10′-Di(1,3-propanediyl)-2,2′-thiacarbocyanine iodide *11.156*

$C_{23}H_{23}BrCl_2N_2S_2$
5,5′-Dichloro-3,9,3′-triethyl-2,2′-thiacarbocyanine bromide *11.164*

$C_{23}H_{23}IN_2$ 1,1′-Diethyl-2,2′-cyanine iodide *11.45*

$C_{23}H_{23}IN_2S_2$
3,3′-Diethyl-2,2′-thiadicarbocyanine iodide *11.173*

$C_{23}H_{23}NO_2$ 3,5-Dibenzoyl-1,4-dihydro-2,6-dimethylpyridine *6.43*

$C_{23}H_{23}NO_4$ 3,5-Diethoxycarbonyl-1,4-dihydro-2,6-diphenylpyridine *6.50*

$C_{23}H_{25}BrN_2S_2$
3,9,3′-Triethyl-2,2′-thiacarbocyanine bromide *11.171*

$C_{23}H_{25}N_3$ 4-Diethylaminobenzaldehyde diphenylhydrazone *15.4*

$C_{23}H_{26}N_2$ Leucomalachite Green *11.77*

$C_{23}H_{26}N_2O_4$ Brucine *8.9*

$C_{23}H_{27}N_5O_2$ 2,4-Dihydro-4-(4-diethylamino-2-methylphenyl)imino-5-methylcarbamyl-2-(3-methylphenyl)pyrazol-3-one *11.143*

$C_{23}H_{27}N_5O_3$ 2,4-Dihydro-4-(4-diethylamino-2-methylphenyl)imino-5-methylcarbamyl-2-(3-methoxyphenyl)pyrazol-3-one *11.142*

$C_{23}H_{28}O_4$ 2,2′-Spirobis[3,4-dihydro-6-hydroxy-4,4,7-trimethyl-1-benzopyran] *4.185*

$C_{23}H_{29}N_3O_2$ *N*,*N*-Diethyl-4-[*N*-(phenylaminocarbonyl)-pivaloylmethylene]aminoaniline *11.112*

$C_{23}H_{30}N_2O_8$ 4,4′-Dimethyl-3,3′,5,5′-tetracarbethoxy-2,2′-dipyrrylmethane *6.65*

$C_{23}H_{30}O_3$ RO 10-9359 *2.262*

$C_{23}H_{32}O_2$ 2,2′-Methylenebis(6-*tert*-butyl-4-methylphenol) *4.136*

$C_{23}H_{32}O_3$ 16-Dehydropregnenolone-3-acetate *16.61*

$C_{23}H_{36}N_2O_2$ 4-(*N*-Dipivaloylmethylene)amino-3,*N*,*N*-triethylaniline *11.67*

$C_{23}H_{46}$ (*Z*)-9-Tricosene *2.349*

$C_{24}H_{16}N_2NiO_2$
2,2′-[1,8-Naphthylenebis(nitrilomethylidyne)]-bis[phenolato]nickel(II) *12.160*

$C_{24}H_{18}O$ 2,4,6-Triphenylphenol *4.149*

$C_{24}H_{19}N_3O_2$ 1-(4-Methylphenylazo)-3-(phenylaminocarbonyl)-2-naphthol *11.80*

$C_{24}H_{20}CoO_4P_2S_4$ Bis(*O,O'*-diphenylphosphorodithiolato)cobalt(II) *12.68*

$C_{24}H_{20}CrO_4P_2S_4$ Bis(*O,O'*-diphenylphosphorodithiolato)chromium(II) *12.67*

$C_{24}H_{20}CuO_4P_2S_4$ Bis(*O,O'*-diphenylphosphorodithiolato)copper(II) *12.69*

$C_{24}H_{20}NiO_4P_2S_4$ Bis(*O,O'*-diphenylphosphorodithiolato)nickel(II) *12.71*

$C_{24}H_{20}O_4P_2PbS_4$ Bis(*O,O'*-diphenylphosphorodithiolato)lead(II) *12.70*

$C_{24}H_{20}O_4P_2S_4Zn$ Bis(*O,O'*-diphenylphosphorodithiolato)zinc(II) *12.72*

$C_{24}H_{22}CoN_4S_4$ Bis[5-ethyl-3-[(3-pyridinylimino)methyl]-2-thiophenethionato],cobalt(II) *12.84*

$C_{24}H_{25}BrN_2O$ 1-(4-Bromophenyl)-4,4,8,8-tetramethyl-2,3,4,5,7,8,9,10-octahydropyrrolo[4,3,2-*m,n*]acridine-10-one *6.67*

$C_{24}H_{25}IN_2S_2$ 3,3'-Diethyl-8,9-(1,3-propanediyl)-2,2'-thiacarbocyanine iodide *11.170*

$C_{24}H_{26}N_2O$ 1-Phenyl-4,4,8,8-tetramethyl-2,3,4,5,7,8,9,10-octahydropyrrolo[4,3,2-*m,n*]acridine-10-one *6.69*

$C_{24}H_{26}N_6O_2$ Pyrazole dye 2 *11.155*

$C_{24}H_{28}N_2O_4$ 2,4-Di[2-hydroxy-4-(diethylamino)phenyl]squarylium *11.46*

$C_{24}H_{28}O_4$ 6,6'-Diapo-ψ,ψ-carotenedioic acid *2.174*
9-*cis*-6,6'-Diapo-ψ,ψ-carotenedioic acid *2.179*

$C_{24}H_{30}N_4O$ 4-(4'-Diethylamino-2'-methylphenyl)imino-3-(2-methyl-2-propyl)-1-phenyl-2-pyrazolin-5-one *11.141*

$C_{24}H_{31}N_3O_2$ *N,N*-Diethyl-3-methyl-4-[*N*-(phenylaminocarbonyl)-pivaloylmethylene]aminoaniline *11.111*

$C_{24}H_{32}NO_3S_2^-$ 10-(12-Sulfonatododecyl)phenothiazine *13.124*

$C_{24}H_{32}N_2NiO_4$ Bis[2-[(butylimino)methyl]-4-methoxyphenolato]nickel(II) *12.18*

$C_{24}H_{36}O_2$ Phenyl linoleate *2.266*

$C_{24}H_{38}O_2$ Phenyl oleate *2.273*

$C_{24}H_{42}N_2O_6$ Bis(2,2,6,6-tetramethyl-4-piperidinol-1-oxyl) 1,6-hexanedioate *15.38*

$C_{24}H_{44}CoO_4P_2S_4$ Bis(*O,O'*-dicyclohexylphosphorodithiolato)cobalt(II) *12.36*

$C_{24}H_{44}NiP_2S_4$ Bis(dicyclohexylphosphinodithiolato)nickel(II) *12.35*

$C_{24}H_{50}N_4$ *N,N'*-Bis[4-(2,2,6,6-tetramethylpiperidinyl)]-1,6-hexanediamine *8.64*

$(C_{24}H_{50}N_4)_n$ Poly(*N,N'*-Bis[4-(2,2,6,6-tetramethylpiperidinyl)]-1,6-hexanediamine) *8.65*

$C_{25}H_{19}N$ 1,2-Diphenyl-4-methylcyclopenta[*b*]quinoline *6.4*

$C_{25}H_{20}N_4O_4$ 1-(4-Aminocarbonylphenylazo)-3-(2-methoxyphenylaminocarbonyl)-2-naphthol *11.79*

$C_{25}H_{23}BF_4N_4S_2$ 5,5'-Dicyano-3,9,3'-triethyl-2,2'-thiacarbocyanine tetrafluoroborate *11.165*

$C_{25}H_{24}N_2O_2$ 4,5-Dihydro-5-(4-methoxyphenyl)-3-[2-(4-methoxyphenyl)ethenyl]-1-phenylpyrazole *11.120*

$C_{25}H_{24}N_6S$ Pyrazole dye 5 *11.25*

$C_{25}H_{24}O_3$ 3-Benzoyloxy-1,3,5(10),9(11)-estratetraen-17-one *16.30*

$C_{25}H_{25}ClN_2$ 1,1'-Diethyl-2,2'-carbocyanine chloride *11.41*

$C_{25}H_{25}IN_2O_2$ 3,3'-Diethyl-2,2'-oxatricarbocyanine iodide *11.109*

$C_{25}H_{25}IN_2S_2$ 3,3'-Diethyl-2,2'-thiatricarbocyanine iodide *11.174*

$C_{25}H_{25}N_2^+$ 1,1'-Diethyl-4,4'-carbocyanine *11.42*

$C_{25}H_{25}N_3O_2$ 4-[*N*-Benzoyl(phenylaminocarbonyl)-methylene]amino-*N,N*-diethylaniline *11.28*

$C_{25}H_{26}O_5S$ 3-Tosyloxy-1,3,5(10),9(11)-estratetraen-17-one *16.33*

$C_{25}H_{28}N_2O_2$ 1-(4-Methoxyphenyl)-4,4,8,8-tetramethyl-2,3,4,5,7,8,9,10-octahydropyrrolo[4,3,2-*m,n*]acridine-10-one *6.68*

$C_{25}H_{30}ClN_3$ Crystal Violet *11.44*

$C_{25}H_{30}O_4$ Bixin *2.177*

$C_{25}H_{32}N_4O$ 4-(4′-Diethylamino-2′,6′-dimethylphenyl)imino-3-(2-methyl-2-propyl)-1-phenyl-2-pyrazolin-5-one *11.139*

$C_{25}H_{34}O_3$ 4-Dodecyloxy-2-hydroxybenzophenone *4.42*

$C_{26}H_{14}O_2$ Anthra[1,9-*bc*:4,10-*b′c′*]dichromene *3.20*
Benzo[1,2,3-*kl*:4,5,6-*k′l′*]dixanthene *3.56*

$C_{26}H_{16}$ 9,9′-Bifluorenylidene *3.66*

$C_{26}H_{17}Cl$ 1-Chloro-9,10-diphenylanthracene *3.6*

$C_{26}H_{18}$ 9,10-Diphenylanthracene *3.11*

$C_{26}H_{19}NO$ 1,1,3-Triphenylisoindole *N*-oxyl *15.25*

$C_{26}H_{20}CoN_2O_2$
Bis[2-[(phenylimino)methyl]phenolato]cobalt(II) *12.108*

$C_{26}H_{20}CuN_2O_2$
Bis[2-[(phenylimino)methyl]phenolato]copper(II) *12.109*

$C_{26}H_{20}N_2NiO_2$
Bis[2-[(phenylimino)methyl]phenolato]nickel(II) *12.110*

$C_{26}H_{20}N_2NiS_4$
Bis(diphenyldithiocarbamato)nickel(II) *12.64*

$C_{26}H_{22}N_4NiO_2$
Bis[2-hydroxybenzaldehyde phenylhydrazone]nickel(II) *12.90*

$C_{26}H_{26}ClIN_2S$
3-Methyl-2-[7-(5-chloro-1,3,3-trimethyl-2-indolylidene)-1-(1,3,5-heptatrienyl)-benzothiazolium iodide *11.34*

$C_{26}H_{26}FIN_2S$
3-Methyl-2-[7-(5-fluoro-1,3,3-trimethyl-2-indolylidene)-1-(1,3,5-heptatrienyl)-benzothiazolium iodide *11.35*

$C_{26}H_{27}IN_2S$ 3-Methyl-2-[7-(1,3,3-trimethyl-2-indol-2-ylidene)-1,3,5-heptatrienyl]benzothiazolium, iodide *11.37*

$C_{26}H_{27}N_3O_2$ 4-[*N*-Benzoyl(phenylaminocarbonyl)methylene]-amino-*N*,*N*-diethyl-3-methylaniline *11.27*

$C_{26}H_{30}CoN_4O_5P$
Hydroxybis(dimethylglyoximato)triphenylphosphinecobalt(II) *12.148*

$C_{26}H_{32}CoO_6$ Bis[3,5-di(1-methylethyl)salicylato]cobalt(II) *12.59*

$C_{26}H_{32}N_2NiO_2$
Bis[2-[(cyclohexylimino)methyl]phenolato]nickel *12.24*

$C_{26}H_{32}NiO_6$ Bis[3,5-di(1-methylethyl)salicylato]nickel(II) *12.60*

$C_{26}H_{32}O_4$ *trans*-Methylbixin *2.175*
Methylbixin *2.176*

$C_{26}H_{33}N_3NaO_6S_2$
Merocyanine 540 *11.39*

$C_{26}H_{34}O_2$ Phenyl linolenate *2.270*

$C_{26}H_{36}CoN_2S_4$
Bis[3-(cyclohexylimino)methyl]-5-ethyl-2-thiophenethionato]cobalt(II) *12.20*

$C_{26}H_{36}CuN_2O_2S_2$
Bis[3-(cyclohexylimino)methyl]-5-ethyl-2-thiophenonato]copper(II) *12.22*

$C_{26}H_{36}N_2NiS_4$
Bis[3-(cyclohexylimino)methyl]-5-ethyl-2-thiophenethionato]nickel(II) *12.21*

$C_{26}H_{36}N_2S_4$ *N*,*N*′-[Dithiobis[(5-ethyl-2,3-thiophenediyl)-methylidyne]]biscyclohexanamine *13.63*

$C_{26}H_{36}N_2S_4Zn$
Bis[3-(cyclohexylimino)methyl]-5-ethyl-2-thiophenethionato]zinc(II) *12.23*

$C_{26}H_{36}O_2$ Phenyl arachidonate *2.214*

$C_{26}H_{36}O_6$ 8,13-Dimethyl-2,2,19,19-tetramethoxy-4,6,8,10,12,14,16-eicosaheptaene-3,18-dione (*all-E*) *2.211*

$C_{26}H_{38}N_2O_6$ Bis(2,2,6,6-tetramethyl-4-piperidinol-1-oxyl) terephthalate *15.39*

$C_{26}H_{44}O_2$ Tocol *4.48*

$C_{27}H_{21}N$ 1-Methylamino-9,10-diphenylanthracene *9.20*

$C_{27}H_{23}ClN_2S_2$
3,3′-Diethyl-4,5,4′,5′-dibenzo-2,2′-thiacyanine chloride *11.105*

$C_{27}H_{27}N_7$ Pyrazole dye 7 *11.23*

$C_{27}H_{28}N_2O_2$ 4-(Dibenzoylmethylene)amino-3,*N*,*N*-triethylaniline *11.116*

$C_{27}H_{28}N_2O_9$ 5-Iminodaunomycin *4.81*

$C_{27}H_{29}IN_2OS$
3-Methyl-2-[7-(5-methoxy-1,3,3-trimethyl-2-indolylidene)-1-(1,3,5-heptatrienyl)-benzothiazolium iodide *11.36*

$C_{27}H_{29}IN_2S$ 3-Methyl-2-[7-(1,3,3,5-tetramethyl-2-indolylidene)-1-(1,3,5-heptatrienyl)benzothiazolium, iodide *11.38*

$C_{27}H_{29}NO_{10}$ Daunomycin *4.79*

$C_{27}H_{29}NO_{11}$ Adriamycin *4.80*

$C_{27}H_{29}N_3O_2$ 4-[*N*-Benzoyl(phenylaminocarbonyl)-methylene]amino-*N*,*N*-diethyl-3,5-dimethylaniline *11.26*

$C_{27}H_{30}N_4$ 5-[*p*-(Dimethylamino)phenyl]-3-[*p*-(dimethylamino)styryl]-1-phenyl-2-pyrazoline *11.118*

$C_{27}H_{30}N_4O_2$ 4-[*N*-Di(phenylaminocarbonyl)methylene)-amino-3,*N*,*N*-triethylaniline *11.115*

$C_{27}H_{30}O_{16}$ Rutin *4.58*

$C_{27}H_{44}$ 3,5-Cholestadiene *2.89*

$C_{27}H_{44}O$ Vitamin D_3 *2.361*

$C_{27}H_{46}O$ Cholesterol *16.14*

$C_{27}H_{46}O_2$ δ-Tocopherol *4.46*

$C_{28}H_{12}Cl_8NiS_4$
Bis[1,2-di(2,4-dichlorophenyl)-1,2-ethenedithiolato]nickel(II) *12.37*
Bis[1,2-di(3,4-dichlorophenyl)-1,2-ethenedithiolato]nickel(II) *12.38*

$C_{28}H_{14}O_2$ Heterocoerdianthrone *3.68*

$C_{28}H_{16}$ Dibenzo[*a*,*j*]perylene *3.63*
Helianthrene *3.67*

$C_{28}H_{16}Br_4NiS_4$
Bis[1,2-di(2-bromophenyl)-1,2-ethenedithiolato]nickel(II) *12.25*

$C_{28}H_{16}Cl_4NiS_4$
Bis[1,2-di(2-chlorophenyl)-1,2-ethenedithiolato]nickel(II) *12.33*
Bis[1,2-di(4-chlorophenyl)-1,2-ethenedithiolato]nickel(II) *12.34*

$C_{28}H_{20}N_2O$ 4-(2′,3′-Benzo-4′-oxocyclohexadienyliden)amino-*N*,*N*-diphenylaniline *11.82*

$C_{28}H_{20}NiS_4$ Bis[1,2-diphenyl-1,2-ethenedithiolato]nickel(II) *12.66*

$C_{28}H_{20}O$ Tetraphenylfuran *5.52*

$C_{28}H_{20}O_2$ Tetraphenyl-*p*-dioxin *2.196*

$C_{28}H_{22}N_4O$ 4-(4′-Diphenylaminophenyl)*imino*-3-methyl-1-phenyl-2-pyrazolin-5-one *11.152*

$C_{28}H_{22}NiO_4$ Bis[2-hydroxy-5-methylbenzophenonato]nickel(II) *12.94*

$C_{28}H_{22}O_2$ 1,4-Dimethoxy-9,10-diphenylanthracene *3.9*

$C_{28}H_{28}CoO_4P_2S_4$
Bis[*O*,*O*′-di(4-methylphenyl)phosphorodithiolato]cobalt(II) *12.61*

$C_{28}H_{28}CuO_4P_2S_4$
Bis[*O*,*O*′-di(4-methylphenyl)phosphorodithiolato]copper(II) *12.62*

$C_{28}H_{28}N_2O_3S_3$
3,3′-Diethyl-2,2′-*thiacarbocyanine* toluenesulfonate *11.166*

$C_{28}H_{28}NiO_4P_2S_4$
Bis[*O*,*O*′-di(4-methylphenyl)phosphoro-dithiolato]nickel(II) *12.63*

$C_{28}H_{29}N_2O_2S_2^-$
Squarylium Dye 3a *11.32*

$C_{28}H_{29}N_5O_2$ 4-(4′-Diethylamino-2′,6′-dimethylphenyl)imino-3-(benzoylamino)-1-phenyl-2-pyrazolin-5-one *11.138*

$C_{28}H_{32}O_4$ 6,10,15,19-Tetramethyl-4,6,8,10,12,14,16,18,20-tetracosanonaene-2,3,22,23-tetraone (*all-E*) *2.348*

$C_{28}H_{42}NiO_3S$
Aqua[2,2′-thiobis[4-(1,1,3,3-tetramethylbutyl)]phenolato]nickel(II) *12.5*

$C_{28}H_{42}O_2S$ 2,2′-Thiobis[4-(1,1,3,3-tetramethylbutyl)phenol] *4.145*

$C_{28}H_{43}N$ 4,4′-Di-*tert*-octyldiphenylamine *9.18*

$C_{28}H_{43}NNiO_2S$
Ammine[2,2′-thiobis[4-(1,1,3,3-tetramethylbutyl)]phenolato]nickel(II) *12.2*
Dodecylamine[2,2′-thiobis(3,4-dimethylphenolato)]nickel(II) *12.134*

$C_{28}H_{44}O$ Ergosterol *16.26*

$C_{28}H_{46}O$ 4-Methyl-4-cholesten-3-one *2.90*

$C_{28}H_{48}O_2$ 5,7-Dimethyltocol *4.51*
β-Tocopherol *4.52*
γ-Tocopherol *4.53*

$C_{28}H_{50}O_3$ β-Tocopherol hydroquinone *4.26*
γ-Tocopherol hydroquinone *4.27*

$C_{28}H_{52}N_2O_4$ Tinuvin 770 *8.78*

$C_{28}H_{52}N_2O_6$ Bis(2,2,6,6-tetramethyl-4-piperidinol-1-oxyl) 1,10-decanedioate *15.37*

$C_{29}H_{20}O$ Tetraphenylcyclopentadienone *3.60*

$C_{29}H_{26}O_{10}$ Cercosporin *16.55*

$C_{29}H_{27}NO_9$ Aminocercosporin *16.54*

$C_{29}H_{30}N_2O_8$ Diaminocercosporin *16.56*

$C_{29}H_{31}Cl_2IN_2$
5,5′-Dichloro-1,1′,3,3,3′,3′-hexamethyltricarbocyanine, iodide *11.178*

$C_{29}H_{31}F_2IN_2$ 5,5′-Difluoro-1,1′,3,3,3′,3′-hexamethyltricarbocyanine, iodide *11.179*

$C_{29}H_{32}BBrF_4N_2$ 2-[7-(4-Bromo-1,3,3-trimethyl-2-indol-2-ylidene)-1,3,5-heptatrienyl]-1,3,3-trimethylindolium, tetrafluoroborate *11.70*

$C_{29}H_{32}BClF_4N_2$ 2-[7-(4-Chloro-1,3,3-trimethyl-2-indol-2-ylidene)-1,3,5-heptatrienyl]-1,3,3-trimethylindolium, tetrafluoroborate *11.71*

$C_{29}H_{32}BF_4IN_2$ 2-[7-(4-Iodo-1,3,3-trimethyl-2-indol-2-ylidene)-1,3,5-heptatrienyl]-1,3,3-trimethylindolium, tetrafluoroborate *11.73*

$C_{29}H_{32}I_2N_2$ 2-[7-(4-Iodo-1,3,3-trimethyl-2-indol-2-ylidene)-1,3,5-heptatrienyl]-1,3,3-trimethylindolium, iodide *11.72*

$C_{29}H_{32}O_8$ 1,1′-Spirobis[2,3-dihydro-5,6-di(methoxycarbonyl)-3,3-dimethylindene] *3.98*

$C_{29}H_{33}ClN_2O_4$ 1,1′,3,3,3′,3′-Hexamethyltricarbocyanine, perchlorate *11.183*

$C_{29}H_{33}FN_2$ 1,1′,3,3,3′,3′-Hexamethyltricarbocyanine, fluoride *11.181*

$C_{29}H_{33}IN_2$ 1,1′,3,3,3′,3′-Hexamethyltricarbocyanine, iodide *11.182*

$C_{29}H_{40}O_4$ 2,2′-Spirobis[7-*tert*-butyl-3,4-dihydro-6-hydroxy-4,4-dimethylbenzopyran] *4.184*

$C_{29}H_{42}O_3$ 2′,4′-Di-*tert*-butylphenyl 3,5-di-*tert*-butyl-4-hydroxybenzoate *4.38*

$C_{29}H_{43}OSe^+$ 2,6-Bis(1,1-dimethylethyl)-4-[1-[2,6-bis(1,1-dimethylethyl)selenapyran-4-ylidene]-3-propenyl]pyrylium *11.157*

$C_{29}H_{43}OTe^+$ 2,6-Bis(1,1-dimethylethyl)-4-[1-[2,6-bis(1,1-dimethylethyl)telluropyran-4-ylidene]-3-propenyl]pyrylium *11.158*

$C_{29}H_{43}O_2^+$ 4,4′-(1,3-Propenyl)bis[2,6-di(1,1-dimethylethyl)pyrylium *11.159*

$C_{29}H_{43}SSe^+$ 2,6-Bis(1,1-dimethylethyl)-4-[1-[2,6-bis(1,1-dimethylethyl)selenopyran-4-ylidene]-3-propenyl]thiopyrylium *11.175*

$C_{29}H_{43}S_2^+$ 2,6-Bis(1,1-dimethylethyl)-4-[1-[2,6-bis(1,1-dimethylethyl)thiopyran-4-ylidene]-3-propenyl]thiopyrylium *11.176*

$C_{29}H_{43}Se_2^+$ 2,6-Bis(1,1-dimethylethyl)-4-[1-[2,6-bis(1,1-dimethylethyl)selenopyran-4-ylidene]-3-propenyl]selenopyrylium *11.160*

$C_{29}H_{43}Te_2^+$ 2,6-Bis(1,1-dimethylethyl)-4-[1-[2,6-bis(1,1-dimethylethyl)telluropyran-4-ylidene]-3-propenyl]telluropyrylium *11.161*

$C_{29}H_{50}O_2$ α-Tocopherol *4.50*

$C_{29}H_{52}O_3$ α-Tocopherol hydroquinone *4.28*

$C_{30}H_{16}O_8$ Hypericin *16.60*

$C_{30}H_{18}O_2$ Dimethylhomocoerdianthrone *3.95*

$C_{30}H_{22}O_9$ Rubellin A *16.8*

$C_{30}H_{24}Cl_2N_6Ru$ Tris(2,2′-bipyridine)ruthenium(II) dichloride *12.177*

$C_{30}H_{24}CoN_6^{2+}$ Tris(2,2′-bipyridine)cobalt(II) ion *12.176*

$C_{30}H_{24}O_{10}$ Elsinochrome A *16.10*

$C_{30}H_{26}O_{10}$ Elsinochrome B *16.9*

$C_{30}H_{28}N_4NiO_4$ Nickel(II) deuteroporphyrin *7.95*

$C_{30}H_{28}N_6O_2$ 4,4′-[2,3,5,6-Tetramethylphenylenebis]-3-methyl-1-phenyl-2-pyrazolin-5-one *11.153*

$C_{30}H_{28}O_{10}$ Methylcercosporin *16.58*

$C_{30}H_{30}FN_3O_5S$ 4-[2′,3′-Benzo-4′-oxo-5′-(2-methoxy-5-fluorosulfonyl)phenyl]amino-*N,N*-diethylaniline *11.81*

$C_{30}H_{30}NO$ Bis[4-(1-methyl-1-phenylethyl)phenyl]nitroxide *15.27*

$C_{30}H_{30}N_2O_3S_3$ 3,3′-Diethyl-8,10-ethanediyl-2,2′-thiacarbocyanine toluenesulfonate *11.169*

$C_{30}H_{30}O_{10}$ Phleichrome *16.53*

$C_{30}H_{32}N_2O_3S_3$ 3,3′-Diethyl-8,10-dimethyl-2,2′-thiacarbocyanine toluenesulfonate *11.168*

$C_{30}H_{32}N_2O_5S_3$ 3,3′-Diethyl-5,5′-dimethoxy-2,2′-thiacarbocyanine toluenesulfonate *11.167*

$C_{30}H_{40}O$ β-*apo*-8′-Carotenal *2.62*

$C_{30}H_{42}O$ β-*apo*-8′-Carotenol *2.86*

$C_{30}H_{42}O_2$ 1,2-Ethandiylidenebis[3,5-di(1,1-dimethylethyl)-2,5-cyclohexadien-4-one] *17.12*

$C_{30}H_{44}$ C_{30}-Carotene analog *2.77*

$C_{30}H_{44}O_4$ C_{30}-Capsorubin *2.205*
C_{30}-Epiisocapsorubin *2.206*
C_{30}-Isocapsorubin *2.207*

$C_{30}H_{46}O_2$ Ergosterol acetate *16.27*

$C_{30}H_{47}NNiO_2S$
Ethylamine[2,2′-thiobis[4-(1,1,3,3-tetramethylbutyl)]phenolato]nickel(II) *12.142*

$C_{30}H_{50}$ Squalene *2.346*

$C_{30}H_{52}O_2$ α-Tocopherol methyl ether *5.4*
5,7-Diethyltocol *4.45*

$C_{30}H_{54}O_2$ 2,5-Di-*sec*-dodecylhydroquinone *4.17*

$C_{30}H_{56}N_2O_4$ Di(1,2,2,6,6-pentaamethyl-4-piperidinol) 1,10-decanedioate *8.74*

$C_{31}H_{29}BrN_2S_2$
3,9,3′-Triethyl-4,5,4′,5′-dibenzo-2,2′-thiacarbocyanine bromide *11.106*

$C_{31}H_{30}O_{10}$ Dimethylcercosporin *16.57*

$C_{31}H_{32}IN_3$ 1,3,3,1′,3′,3′-Hexamethyl-8,10-indolo-2,2′-carbocyanine iodide *11.40*

$C_{31}H_{37}IN_2$ 1,1′,3,3,3′,3′,5,5′-Octamethyltricarbocyanine, iodide *11.184*

$C_{31}H_{37}IN_2O_2$
5,5′-Dimethoxy-1,1′,3,3,3′,3′-hexamethyltricarbocyanine, iodide *11.180*

$C_{31}H_{38}N_4$ Pyrazole, 4,5-dihydro-5-[4-(diethylamino)phenyl]-3-[2-[4-(diethylamino)phenyl]ethenyl]-1-phenyl- *11.117*

$C_{31}H_{38}N_4O_2$ Etiobiliverdin-IVγ *7.3*

$C_{31}H_{40}N_4O_2$ Etiobilirubin-IVγ *7.4*

$C_{31}H_{49}NNiO_2S$
Propylamine[2,2′-thiobis[4-(1,1,3,3-tetramethylbutyl)]phenolato]nickel(II) *12.168*

$C_{31}H_{50}O_2$ Stigmasteryl acetate *16.74*

$C_{31}H_{52}O_2$ Sitosteryl acetate *16.73*

$C_{31}H_{52}O_3$ α-Tocopheryl acetate *16.11*

$C_{31}H_{54}O_2$ α-Tocopherol ethyl ether *5.5*
7-*tert*-Butyl-5-methyltocol *4.55*
8-*tert*-Butyl-5-methyltocol *4.56*

$C_{32}H_{12}AlClN_8O_9S_3$
Chloroaluminum(III) sulfophthalocyanine *7.43*

$C_{32}H_{16}F_{12}NiS_4$
Bis[1,2-di(4-trifluoromethylphenyl)-1,2-ethenedithiolato]nickel(II) *12.76*

$C_{32}H_{22}O$ 1,3,4,7-Tetraphenylisobenzofuran *5.85*

$C_{32}H_{28}NiO_4S_4$
Bis[1,2-di(4-methoxyphenyl)-1,2-ethenedithiolato]nickel(II) *12.54*

$C_{32}H_{32}N_2O_3S_3$
1,1′-Diethyl-4,4′-carbocyanine toluenesulfonate *11.43*

$C_{32}H_{32}N_4O_4$ 7-Ethenyl-3,8,13,17-tetramethylporphine-2,18-dipropanoic acid *7.93*

$C_{32}H_{34}N_4O_4$ Deuteroporphyrin, dimethyl ester *7.94*

$C_{32}H_{36}N_2O_3S_3$
3,9,3′-Triethyl-5,5′-dimethoxy-2,2′-thiacarbocyanine toluenesulfonate *11.172*

$C_{32}H_{44}O_2$ Ethyl β-*apo*-8′-carotenoate *2.85*

$C_{32}H_{44}O_6$ 6,10,15,19-Tetramethyl-2,2,23,23-tetramethoxytetracosa-4,6,8,10,12,14,16,18,20-nonaene-3,22-dione (*all-E*) *2.347*

$C_{32}H_{44}O_{14}$ emi-Crocin *2.178*

$C_{32}H_{51}CoNO_2S$
Butylamine[2,2′-thiobis[4-(1,1,3,3-tetramethylbutyl)]phenolato]cobalt(II) *12.121*

$C_{32}H_{51}NNiO_2S$
Butylamine[2,2′-thiobis[4-(1,1,3,3-tetramethylbutyl)]phenolato]nickel(II) *12.122*

$C_{32}H_{56}O_2$ 5,7-Di(1-methylethyl)tocol *4.47*

$C_{33}H_{30}CoN_5O_5$
Hydroxybis(diphenylglyoximato)pyridine-cobalt(II) *12.149*

$C_{33}H_{34}N_4O_6$ Biliverdin *7.7*

$C_{33}H_{36}N_4O_6$ Bilirubin *7.5*

$C_{33}H_{40}N_2O_9$ Reserpine *8.98*

$C_{33}H_{40}N_4O_6$ Mesobilirubin IX *7.9*

$C_{33}H_{41}BF_4N_2O$
2-[7-(1,3,3-Trimethyl-2-indol-2-ylidene)-1-[4-(2,2-dimethoxyethyl)-1,3,5-heptatrienyl]-1,1,3-trimethylindolium, tetrafluoroborate *11.74*

$C_{33}H_{42}O_{19}$ Troxerutin *4.57*

$C_{33}H_{60}N_4O_6$ Tri(2,2,6,6-tetramethyl-4-piperidinol) nitrilotriacetate *8.80*

$C_{34}H_{22}O_2$ 1,2,3,10,11,12-Hexahydrodiindeno[5,6-*a*:5′,6′-*j*]perylene-8,17-dione *3.65*

$C_{34}H_{32}CdN_4O_4$
Cadmium(II) protoporphyrin *7.75*

$C_{34}H_{32}CoN_4O_4$
Cobalt(II) protoporphyrin *7.76*

$C_{34}H_{32}CuN_4O_4$
Copper(II) protoporphyrin *7.77*

$C_{34}H_{32}N_4NiO_4$
Nickel(II) protoporphyrin *7.80*

$C_{34}H_{32}N_4O_4Zn$
Zinc(II) protoporphyrin IX *7.81*

$C_{34}H_{34}N_4O_4$ Protoporphyrin IX *7.73*

$C_{34}H_{34}NiO_6$ Bis[4-(1,1-dimethylethyl)phenylsalicylato]nickel(II) *12.58*

$C_{34}H_{36}CoN_4O_4$
Cobalt(II) mesoporphyrin *7.82*

$C_{34}H_{36}N_4NiO_4$
Nickel(II) mesoporphyrin *7.87*

$C_{34}H_{36}N_4O_4$ 8-Ethenyl-13-ethyl-3,7,12,17-tetramethylporphine-2,18-dipropanoic acid *7.90*

$C_{34}H_{36}N_4O_5$ Monohydroxyethyl vinyl deuteroporphyrin *7.92*

$C_{34}H_{38}N_4O_6$ Hematoporphyrin IX *7.72*

$C_{34}H_{42}B_2F_8N_3$
2-[7-(1,3,3-Trimethyl-2-indol-2-ylidene)-1-[4-(1-piperidinio)-1,3,5-heptatrienyl]-1,3,3-trimethylindolium, bis(tetrafluoroborate) *11.75*

$C_{34}H_{47}NNiO_2S$
Aniline[2,2′-thiobis[4-(1,1,3,3-tetramethylbutyl)]phenolato]nickel(II) *12.3*

$C_{34}H_{48}O_4$ C_{34}-Capsorubin *2.231*
C_{34}-Epiisocapsorubin *2.232*

$C_{34}H_{50}O_2$ Cholesteryl benzoate *16.15*

$C_{34}H_{53}NNiO_2S$
Cyclohexylamine[2,2′-thiobis[4-(1,1,3,3-tetramethylbutyl)]phenolato]nickel(II) *12.131*

$C_{34}H_{55}NNiO_5S$
Triethanolamine[2,2′-thiobis[4-(1,1,3,3-tetramethylbutyl)]phenolato]nickel(II) *12.171*

$C_{34}H_{56}NiO_8P_2$
Bis[*O*-ethyl-3,5-di-(1,1-dimethylethyl)-4-hydroxybenzylphosphonato]nickel(II) *12.83*

$C_{35}H_{25}Te_2^+$ 2,6-Diphenyl-4-(2,6-diphenyltelluropyran-4-ylidene)methyltelluropyrylium *11.162*

$C_{35}H_{32}MgN_4O_5$
Protochlorophyllide *7.37*

$C_{35}H_{38}N_4O_6$ Biliverdin, dimethyl ester *7.8*

$C_{35}H_{40}N_4O_6$ Bilirubin IX dimethyl ester *7.6*

$C_{35}H_{50}$ C_{35}-Carotene analog *2.78*

$C_{35}H_{62}O_3$ Octadecyl 3-(3′,5′-di-*tert*-butyl-4′-hydroxyphenyl)propionate *4.33*

$(C_{35}H_{66}N_8)_n$ Chimasorb 944 *8.16*

$C_{36}H_{16}CuN_8O_8$
Copper(II) tetracarboxyphthalocyanine *7.45*

$C_{36}H_{24}CoN_6^{2+}$
Tris(1,10-phenanthroline)cobalt(II) ion *12.178*

$C_{36}H_{24}N_{10}Ni$
Bis[2,3-dihydro-*N*-2-pyridinyl-3-(2-pyridinylimino)isoindol-1-amine]nickel(II) *12.45*

$C_{36}H_{26}N_5O_7S^-$
2-Methyl-6-[4-[2-[3-carboxy-4-(6-hydroxy-3-xanthenon-9-yl)-phenylthiocarbamylethoxy]phenyl]imidazo[*a*]pyrazin-3-one *16.39*

$C_{36}H_{26}O_2$ 1,2,3,4,11,12,13,14-Octahydrodinaphtho[2,3-*a*:2′,3′-*j*]perylene-9,19-dione *3.62*

$C_{36}H_{32}N_2O_3S_3$
3,3′-Diethyl-4,5,4′,5′-dibenzo-2,2′-thiacarbocyanine toluenesulfonate *11.107*

$C_{36}H_{36}CoS_4$ Bis[1,2-di(4-ethylphenyl)-1,2-ethenedithiolato]cobalt(II) *12.41*

$C_{36}H_{36}N_4NiO_4$
Nickel(II) protoporphyrin, dimethyl ester *7.79*

$C_{36}H_{36}NiS_4$ Bis[1,2-di(4-ethylphenyl)-1,2-ethenedithiolato]nickel(II) *12.42*

$C_{36}H_{36}PtS_4$ Bis[1,2-di(4-ethylphenyl)-1,2-*ethenedithiolato]platinum(II)* *12.43*

$C_{36}H_{38}N_4O_4$ Protoporphyrin IX, dimethyl ester *7.78*

$C_{36}H_{40}CoN_4O_4$
Cobalt(II) mesoporphyrin IX, dimethyl ester *7.86*

$C_{36}H_{40}N_4NiS_4$
Bis[1,2-di(dimethylaminophenyl)-1,2-ethenedithiolato]nickel(II) *12.39*

$C_{36}H_{40}N_4O_4$ 8-Ethenyl-13-ethyl-3,7,12,17-tetramethylporphine-2,18-dipropanoic acid, dimethyl ester *7.91*

$C_{36}H_{42}N_4O_4$ Mesoporphyrin IX, dimethyl ester *7.85*

$C_{36}H_{54}N_2NiO_2$
2,2′-[1,2-Ethanediylbis(nitrilodecylidyne)]bis[4-methylphenolato]nickel(II) *12.136*

$C_{36}H_{66}N_4O_6$ Tri(1,2,2,6,6-pentamethyl-4-piperidinol) nitrilotriacetate *8.75*

$C_{37}H_{30}BrIrOP_2$
Bromocarbonylbis(*triphenylphosphine)iridium* *12.119*

$C_{37}H_{30}ClIrOP_2$
Carbonylchlorobis(triphenylphosphine)iridium *12.123*

$C_{37}H_{30}ClOP_2Rh$
Carbonylchlorobis(triphenylphosphine)-rhodium *12.124*

$C_{37}H_{30}IrOP_2$
Carbonyliodobis(triphenylphosphine)iridium *12.125*

$C_{37}H_{42}N_4O_2$ Zinc(II) etiopurpurin ethyl ester *7.31*

$C_{37}H_{46}Si_2$ 1,1,2,2-Tetrakis(2,4,6-trimethylphenyl)disilirane *17.21*

$C_{37}H_{48}N_6O_{12}S_2$
Bilirubin ditaurate *7.10*

$C_{38}H_{30}N_4NiO_2$
Bis[2-[[(4-(phenylamino)phenyl)imino]methyl]-phenolato]nickel(II) *12.106*

$C_{38}H_{43}FeN_4O_6$
Iron(III) (acetato)mesoporphyrin IX, dimethyl ester *7.74*

$C_{38}H_{44}MnN_4O_4^+$
Manganese(III) mesoporphyrin diethyl ester *7.84*

$C_{38}H_{45}N_5O_5$ (*Z*)-Dimethyl 7-[2-(dimethylamino)-2-oxoethyl]-8-ethylidene-7,8-dihydro-3,7,12,17-tetramethylporphine-2,18-dipropionate *7.89*

$C_{38}H_{47}N_5O_5$ (*Z*)-Dimethyl 7-[2-(dimethylamino)-2-oxoethyl]-8-ethyl-7,8-dihydro- 3,7,12,17-tetramethylporphine-2,18-dipropionate *7.88*

$C_{38}H_{60}CoN_2O_2$
Bis[2-[(dodecylimino)methyl]phenolato]cobalt(II) *12.80*

$C_{38}H_{60}CuN_2O_2$
Bis[2-[(dodecylimino)methyl]phenolato]copper(II) *12.81*

$C_{38}H_{60}N_2NiO_2$
Bis[2-[(dodecylimino)methyl]phenolato]nickel(II) *12.82*

$C_{38}H_{60}N_2NiO_4$
Bis[2′-hydroxy-4′-methyldodecanophenone oximato]nickel(II) *12.95*

$C_{38}H_{64}NiO_8P_2$
Bis[*O*-butyl-3,5-di-(1,1-dimethylethyl)-4-hydroxybenzylphosphonato]nickel(II) *12.16*

$C_{38}H_{70}O_2$ 2,5-Di-*sec*-hexadecylhydroquinone *4.18*

$C_{39}H_{34}Cl_3N_3O_4S_2$
IR 140 *11.33*

$C_{39}H_{39}MgN_5O_7$
Protochlorophyllide 2-amino-2-(methoxycarbonyl)ethyl ester *7.36*

$C_{39}H_{60}O_4$ Ubiquinol 10 *4.25*

$C_{40}H_{24}$ Mesodiphenylhelianthrene *3.64*

$C_{40}H_{44}NiO_{12}S_4$
Bis[1,2-di(3,4,5-trimethoxyphenyl)-1,2-ethenedithiolato]nickel(II) *12.79*

$C_{40}H_{48}CdO_4P_2S_6$
Bis[2,2′-thiobis[*O,O′*-di(4-*tert*-butylphenyl)phosphorodithiolato]cadmium(II) *12.111*

$C_{40}H_{48}CoO_4P_2S_6$
Bis[2,2′-thiobis[*O,O′*-di(4-*tert*-butylphenyl)phosphorodithiolato]cobalt(II) *12.112*

$C_{40}H_{48}NiO_4P_2S_6$
Bis[2,2′-thiobis[*O,O′*-di(4-*tert*-butylphenyl)phosphorodithiolato]nickel(II) *12.114*

$C_{40}H_{48}O_4P_2PbS_6$
Bis[2,2′-thiobis[*O,O′*-di(4-*tert*-butylphenyl)phosphorodithiolato]lead(II) *12.113*

$C_{40}H_{48}O_4P_2S_6Zn$
Bis[2,2′-thiobis[*O,O′*-di(4-*tert*-butylphenyl)phosphorodithiolato]zinc(II) *12.115*

$C_{40}H_{50}N_4$ Octaethyl[22]porphyrin-(2.2.2.2) (di-*trans*) *7.98*

$C_{40}H_{52}CoO_4P_2S_4$
Bis[*O,O′*-di-(4-*tert*-butylphenyl)phosphorodithiolato]cobalt(II) *12.30*

$C_{40}H_{52}CuO_4P_2S_4$
Bis[*O,O′*-di-(4-*tert*-butylphenyl)phosphorodithiolato]copper(II) *12.31*

$C_{40}H_{52}NiO_4P_2S_4$
Bis[*O,O′*-di-(4-*tert*-butylphenyl)phosphorodithiolato]nickel(II) *12.32*

$C_{40}H_{52}OSi_2$ 2,2,3,3-Tetrakis(2,6-diethylphenyl)oxadisilirane *17.46*

$C_{40}H_{52}O_2$ β,β-Carotene-4,4′-dione *2.83*

$C_{40}H_{52}O_4$ Astaxanthin *2.82*

$C_{40}H_{54}O$ β,β-Caroten-4-one *2.88*

$C_{40}H_{56}$ α-Carotene *2.63*
9-*cis*-β-Carotene *2.64*
15,15′-(*Z*)-β-Carotene *2.65*
β-Carotene *2.66*
γ-Carotene *2.76*
Lycopene, (*all-E*)- *2.250*

$C_{40}H_{56}O$ β,β-Caroten-3-ol *2.87*

$C_{40}H_{56}O_2$ Xanthophyll *2.75*
β,β-Carotene-3,3′-diol, (3*R*,3′*R*)- *2.79*
β,β-Carotene-4,4′-diol, *all-E*- *2.81*
Dihydroxylycopene *2.251*

$C_{40}H_{56}O_4$ Violaxanthin *2.80*
C_{40}-Epiisocapsorubin *2.84*

$C_{40}H_{58}$ Neurosporene *2.70*

$C_{40}H_{60}$ ζ-Carotene *2.72*

$C_{40}H_{62}$ 15-*cis*-Phytofluene *2.73*

$C_{40}H_{64}$ 15-(*Z*)-Phytoene *2.74*

$C_{40}H_{67}NNiO_2S$
Didodecylamine[2,2′-thiobis(3,4-dimethylphenolato)]nickel(II) *12.132*
Dodecylamine[2,2′-thiobis[4-(1,1,3,3-tetramethylbutyl)]phenolato]nickel(II) *12.135*

$C_{40}H_{68}N_2O_5$ A12 *8.66*

$C_{41}H_{50}N_4O_2$ 2,3,7,8,12,13,17,18-Octaethyl-5-porphinepropenoic acid ethyl ester *7.97*

$C_{41}H_{52}Cl_2N_4O_2Sn$
Tin(IV) dichloro[octaethyldihydropurpurin ethyl ester] *7.29*

$C_{41}H_{52}N_4O_2$ Octaethylpurpurin ethyl ester *7.30*

$C_{41}H_{54}N_4O_2$ Octaethyldihydropurpurin ethyl ester *7.28*

$C_{41}H_{58}O_2$ Spheroidenone *2.69*

$C_{41}H_{60}O$ Spheroidene *2.68*

$C_{42}H_{28}$ Rubrene *3.125*

$C_{42}H_{38}N_4Ni$ Bis[*N*-(4-methylphenyl)-7-[(4-methylphenyl)imino]-1,3,5-cycloheptatrien-1-aminato]nickel(II) *12.104*

$C_{42}H_{52}CoO_4P_2S_4$
2,2′-Methylenebis[*O*,*O*′-di(4-*tert*-butylphenyl)dithiophosphate]cobalt(II) *12.156*

$C_{42}H_{52}NiO_4P_2S_4$
2,2′-Methylenebis[*O*,*O*′-di(4-*tert*-butylphenyl)dithiophosphate]nickel(II) *12.158*

$C_{42}H_{52}O_4P_2PbS_4$
2,2′-Methylenebis[*O*,*O*′-di(4-*tert*-butylphenyl)dithiophosphate]lead(II) *12.157*

$C_{42}H_{54}O_2^{2-}$ 4,4′-(4,7-Dihydro-5,6-dimethylisobenzofuran-1,3-diyl)bis(benzene-*p*-decanoate ion) *5.81*

$C_{42}H_{58}O_6$ Fucoxanthin *2.67*

$C_{42}H_{60}O_2$ Spirilloxanthin *2.71*

$C_{42}H_{72}N_2O_5$ Tinuvin 144 *8.73*

$C_{43}H_{47}N_2NaO_6S_2$
IR 125 *11.29*

$C_{43}H_{58}N_4O_4$ Methyl acetal of oxidized octaethylpurpurin ethyl ester *7.16*

$C_{44}H_{24}Cl_2N_4O_{12}S_4Sn^{4-}$
Dichloro[5,10,15,20-tetrakis(4-sulfonatophenyl)porphinatostannate(IV) ion *7.58*

$C_{44}H_{24}CuI_4N_4$
5,10,15,20-Tetrakis(4-iodophenyl)porphine, copper(II) *7.55*

$C_{44}H_{26}$ Mesodiphenylbenzhelianthrene *3.129*

$C_{44}H_{26}N_4O_{12}S_4^{4-}$
5,10,15,20-Tetrakis(4-sulfonatophenyl)porphine *7.57*

$C_{44}H_{28}AlClN_4$
5,10,15,20-Tetraphenylporphinato(chloro)aluminum(III) ion *7.61*

$C_{44}H_{28}CdN_4$ 5,10,15,20-Tetraphenylporphinatocadmium(II) *7.60*

$C_{44}H_{28}ClFeN_4$
Chloro(5,10,15,20-tetraphenylporphinato)iron(III) *7.49*

$C_{44}H_{28}Cl_2N_4Sn$
Dichloro(5,10,15,20-tetraphenylporphinato)tin(IV) *7.64*

$C_{44}H_{28}CoN_4$ 5,10,15,20-Tetraphenylporphinatocobalt(II) *7.62*

$C_{44}H_{28}CuN_4$ 5,10,15,20-Tetraphenylporphinatocopper(II) *7.63*

$C_{44}H_{28}MgN_4$
5,10,15,20-Tetraphenylporphinatomagnesium(II) *7.65*

$C_{44}H_{28}MnN_4^+$
Manganese(III) 5,10,15,20-tetraphenylporphyrin *7.66*

$C_{44}H_{28}N_4Zn$ 5,10,15,20-Tetraphenylporphinatozinc(II) *7.68*

$C_{44}H_{28}NiN_4$ Nickel(II) 5,10,15,20-tetraphenylporphyrin *7.67*

$C_{44}H_{30}CdN_4$ Cadmium(II) tetraphenylchlorin *7.51*

$C_{44}H_{30}CuN_4$ Copper(II) tetraphenylchlorin *7.52*

$C_{44}H_{30}N_4$ 5,10,15,20-Tetraphenylporphine *7.59*

$C_{44}H_{30}N_4Zn$ Zinc(II) tetraphenylchlorin *7.53*

$C_{44}H_{30}O$ Hexaphenylisobenzofuran *5.84*

$C_{44}H_{32}N_4$ Tetraphenylchlorin *7.50*

$C_{44}H_{34}N_4$ *trans*-Tetraphenylbacteriochlorin *7.54*

$C_{44}H_{46}N_4$ 2,3,10,11,16,17,24,25-Octaethyl-5,6,7,8,19,20,21,22-octadehydro[26]porphyrin-(2.4.2.4) *7.100*

$C_{44}H_{48}BF_4N_3$
2-[7-(1,3,3-Trimethyl-2-indol-2-ylidene)-1-[4-[3-(1,3,3-trimethyl-2-indolylidene)- 2-propenyl]-1,3,5-heptatrienyl]-1,1,3-trimethylindolium, tetrafluoroborate *11.76*

$C_{44}H_{56}NNiS_4$
Bis(1,2-diphenyl-1,2-ethanedithionato)nickelate(I), tetrabutylammonium salt *12.65*

$C_{44}H_{64}O_{24}$ Crocin *2.173*

$C_{45}H_{28}FeN_5S$
5,10,15,20-Tetraphenylporphinato(thiocyanato-*S*)iron(III) *7.70*

$C_{45}H_{59}N_4.ClO_4$
4-[1,5,5-Tri(4-diethylaminophenyl)-pentadienylidene]anilinium perchlorate *11.110*

$C_{46}H_{24}O_8^{4-}$ Rubrene-2,3,8,9-tetracarboxylate ion *3.126*

$C_{46}H_{31}FeN_4O_2$
Iron(III) (acetato)5,10,15,20-tetraphenylporphyrin *7.47*

$C_{46}H_{31}MnN_4O_2$
Acetato(5,10,15,20-tetraphenylporphinato)manganese(III) *7.48*

$C_{46}H_{38}CoN_4O_5P$
Hydroxybis(diphenylglyoximato)-triphenylphosphinecobalt(II) *12.150*

$C_{46}H_{58}O_4$ 1,2-Ethanediylidenebis[3-[2-hydroxy-5-methyl-3-(1,1-dimethylethyl)benzyl]- 5-(1,1-dimethylethyl)]-2,5-cyclohexadien-4-one *17.11*

$C_{47}H_{39}ClO_6$ 2,3,2′,3′-Bis(1,4,10,13-trideca-4,6,8,10-tetraen)tetrayl[4,6-diphenylpyrylium] perchlorate *11.31*

$C_{48}H_{36}CuN_4O_4$
5,10,15,20-Tetrakis(4-methoxyphenyl)porphinatocopper(II) *7.56*

$C_{48}H_{44}NNiO_4S_4$
Bis[1,2-di(4-methoxyphenyl)-1,2-ethanedithionato]nickelate(I), tetrabutylammonium salt *12.53*

$C_{48}H_{50}N_8$ Tetra-*tert*-butylphthalocyanine *7.46*

$C_{48}H_{52}F_{12}NNiS_4$
Bis[1,2-di(4-trifluoromethylphenyl)-1,2-ethanedithionato]nickelate(I), tetrabutylammonium salt *12.75*

$C_{48}H_{66}N_4^{2+}$ [26] Porphyrin *7.99*

$C_{48}H_{68}OSi_2$ 2,2,3,3-Tetrakis(2,6-diisopropylphenyl)oxadisilirane *17.47*

$C_{50}H_{50}N_6NiO_4$
Nickel(II) deuteroporphyrin bis(piperidine) *7.96*

$C_{50}H_{66}N_8O_2Si_3$
Bis(tripropylsiloxy)silicon phthalocyanine *7.41*

$C_{50}H_{68}$ Decapreno-β-carotene *2.230*

$C_{50}H_{72}N_8O_5S$
Magenta dye 9 *11.154*

$C_{50}H_{72}O_2$ P-438 (9 conjugated bonds) *2.299*

$C_{50}H_{74}O_2$ P-422 (8 conjugated bonds) *2.298*

$C_{51}H_{67}CoN_6O_{12}$
Hexamethyl Coα Coβ-dicyano-7-de(carboxymethyl)-7,8-didehydrocobyrinate *16.16*

$C_{53}H_{48}ClN_3O_8S_2$
IR 132 *11.108*

$C_{54}H_{88}N_2O_4$ 2,4-Di[2-methyl-4-(*N*-methyl-*N*-octadecylamino)phenyl]squarylium *11.48*

$C_{55}H_{70}MgN_4O_5$
Protochlorophyll *7.39*

$C_{55}H_{70}MgN_4O_6$
Chlorophyll *b* *7.12*

$C_{55}H_{72}MgN_4O_5$
Chlorophyll *a* *7.11*

$C_{55}H_{72}MgN_4O_6$
Bacteriochlorophyll *b* *7.2*

$C_{55}H_{72}N_4O_5$ Protopheophytin *7.38*

$C_{55}H_{72}N_4O_6$ Pheophytin *b* *7.27*

$C_{55}H_{74}MgN_4O_6$
Bacteriochlorophyll *a* *7.1*

$C_{55}H_{74}N_4O_5$ Pheophytin *a* *7.26*

$C_{55}H_{74}N_4O_6$ Bacteriopheophytin *b* *7.33*

$C_{55}H_{76}N_4O_6$ Bacteriopheophytin *a* *7.32*

$C_{56}H_{73}N_5O_8S_2$
IR 144 *11.30*

$C_{56}H_{80}NNiO_{12}S_4$
Bis[1,2-di(3,4,5-trimethoxyphenyl)-1,2-ethanedithionato]nickelate(I), tetrabutylammonium salt *12.77*

$C_{56}H_{84}NiO_4S_2$
Bis(2,2′-thiobis[4-(1,1,3,3-tetramethylbutyl)phenolato]nickel(II) *12.116*

$C_{56}H_{96}NiO_4Pd$
Bis[2′-hydroxy-4′-*tert*-butyloctadecanophenone oximato]palladium(II) *12.91*

$C_{57}H_{72}MgN_4O_5$
4-Vinylprotochlorophyll *7.34*

$C_{57}H_{74}N_4O_5$ 4-Vinylprotopheophytin *7.35*

C_{60} Fullerene-C_{60} *17.32*

$C_{60}H_{80}$ Dodecapreno-β-carotene *2.358*

$C_{64}H_{58}N_8$ 2,11,20,29-Tetra-*tert*-butylnaphthalocyanine *7.22*

$C_{64}H_{80}N_8O_8$ 1,4,8,11,15,18,22,25-Octabutoxyphthalocyanine *7.42*

$C_{66}H_{62}AlN_8OSi$ Bis(tri-*n*-hexyloxysiloxy)-2,3-naphthalocyaninatoaluminum *7.24*

$C_{66}H_{62}GaN_8OSi$ Bis(tri-*n*-hexyloxysiloxy)-2,3-naphthalocyaninatogallium *7.25*

C_{70} Fullerene-C_{70} *17.33*

$C_{72}H_{41}AlN_8O$ [1,10,19,28-Tetraphenylnaphthalocyanine]-hydroxyaluminum(III) *7.23*

$C_{72}H_{86}N_8O_2Si_3$ Bis(triisobutylsiloxy)silicon 2,3-naphthalocyanine *7.20*

$C_{74}H_{66}N_8O_2Si_3$ Bis(tribenzylsiloxy)silicon phthalocyanine *7.40*

$C_{76}H_{70}N_8O_{10}$ Mesoporphyrin di[4-(diphenylmethylaminocarbonyl-2-nitrophenylmethyl] ester *7.83*

$C_{80}H_{89}N_8O_8Pd$ 1,6,10,15,19,24,28,33-Octabutoxynaphthalocyaninatopalladium(II) *7.21*

$C_{84}H_{102}N_8O_2Si_2Sn$ Bis(tri-*n*-hexyloxysiloxy)-2,3-naphthalocyaninatotin *7.19*

$C_{84}H_{102}N_8O_2Si_3$ Bis(tri-*n*-hexyloxysiloxy)-2,3-naphthalocyaninatosilicon *7.18*

$C_{85}H_{103}N_4NiO_{12}S_4$ Bis[1,2-di(3,4,5-trimethoxyphenyl)-1,2-ethanedithionato]nickelate(I), 4-[1,5,5-tri(4-diethylaminophenyl)-pentadienylidene]anilinium salt *12.78*

$C_{88}H_{56}Fe_2N_8O$ μ-Oxobis[5,10,15,20-tetraphenylporphinatoiron(II)] *7.69*

$C_{90}H_{74}N_8O_2Si_3$ Bis(tribenzylsiloxy)silicon 2,3-naphthalocyanine *7.17*

Cl^- Chloride ion *14.5*

$Cl_2Co.6H_2O$ Cobalt(II) chloride hexahydrate *12.127*

$Cl_2Mn.6H_2O$ Manganese(II) chloride hexahydrate *12.151*

$Cl_2Mn.4H_2O$ Manganese(II) chloride tetrahydrate *12.152*

Cl_2Ni Nickel(II) dichloride *12.162*

$Cl_2Ni.6H_2O$ Nickel(II) dichloride hexahydrate *12.163*

Co^{2+} Cobalt(II) ion *12.128*

$CoH_{18}N_6^{3+}$ Hexaamminecobalt(III) ion *12.145*

Cu^{2+} Copper(II) ion *12.129*

DO^- Hydroxide-*d* ion *14.8*

D_2O_2 Deuterium peroxide *14.6*

HN_3 Hydrogen azide *14.3*

H_4N_2 Hydrazine hydrate *14.7*

I^- Iodide ion *14.9*

I_2 Iodine *14.10*

NH_3 Ammonia *14.1*

NO_2^- Nitrite ion *14.11*

N_3^- Azide ion *14.2*

Ni^+ Nickel(I) ion *12.164*

O_2 Oxygen *14.12*

$^{18}O_2$ Oxygen-18 *14.13*

O_2^- Superoxide radical anion *14.14*

14. Chemical Name Index

Entry numbers for Tables 2-17 are printed in bold face following the names. Entry numbers are printed in smaller type, not bold, for entries in which the chemical species have been used as reference substrates and relative rates have been determined. For example, Acetone azine appears in Table 15 (entry 15.3) but rate constants for another substrate relative to k_r for acetone azine are found in entry 2.40. There is no entry in the tables for 9-Acetyl-2,3,4,9-tetrahydrocarbazole but relative data are found in entries 6.2, 6.3, 6.10, 6.14, 6.18 and 6.19.