Vapor Pressure of Coal Chemicals

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Vapor Pressure of Coal Chemicals

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The vapor pressure data on 324 coal compounds are collected and analyzed. The adopted data sets for each substance are weighted and combined to fit into a Cox vapor pressure equation, $\log_{10}P = (1 - D/T) \times 10^{(A + BT + CT^2)}$ by the least-squares method. The results of the literature review and the evaluated values of coefficients for the vapor pressure equations are presented in separate tables. For ease of presentation, the coal compounds are divided into seven groups, based upon their molecular structures. They are (1) benzene and its derivatives, (2) naphthalene and its derivatives, (3) saturated ring compounds, (4) unsaturated ring compounds, (5) heterocyclic sulfur compounds, (6) heterocyclic nitrogen compounds, and (7) heterocyclic oxygen compounds.

Key words: aromatic hydrocarbons; benzene derivatives; coal chemicals; Cox equation; cycloalkanes; cycloalkenes; heterocyclic nitrogen compounds; heterocyclic oxygen compounds; heterocyclic sulfur compounds; naphthalene derivatives; vapor pressure; vapor pressure equation.

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1. Introduction

Coal has been used for production of industrial organic chemicals for many years. Benzene, toluene, naphthas, tar acids, pyridine bases, anthracene, etc., are separated from coal tar for syntheses of dyestuffs, explosives, perfumes, and drugs. Products from coal gasification and liquefaction may be employed as feedstocks for the manufacture of various organic chemicals.

For large scale manufacturing of coal chemicals, it is essential to have the best values of the basic physical properties of the coal conversion products. The aim of this work is to collect the experimental vapor pressure data on pertinent coal compounds reported in the literature and to fit the adopted data into a selected vapor pressure equation in a systematic fashion. From these results the missing vapor pressure data for useful coal compounds may be estimated by extrapolation or correlation.

It is known that an average of 70% to 80% of the total carbon in bituminous coal is in the aromatic structure, about 15% to 25% is in hydroaromatic structure, and the remaining is aliphatic carbon. The average cluster making up the overall range contains single rings to perhaps six or seven rings.

The heteroatoms like sulfur, oxygen, and nitrogen in coal appear in many types of structures. About 50% of the sulfur is inorganic, principally pyritic. The organic sulfur atoms may exist in structures such as thioether, dialkyl disulfides, thiopenol, aromatic thioether, and cyclic thioethers. The organic oxygen atoms may appear in rings, carbonyls, ethers, and phenolic hydroxyls; and the nitrogen atoms, in pyridine, pyrrole, etc.

For presentation of our evaluated results, the selected coal compounds were separated into the following groups based upon similarity in molecular structure: (1) benzene and its derivatives, (2) naphthalene and its derivatives, (3) saturated ring compounds, (4) unsaturated ring compounds, (5) heterocyclic sulfur compounds, (6) heterocyclic nitrogen compounds, and (7) heterocyclic oxygen compounds.

2. Vapor Pressure Equation

Numerous equations have been proposed for representing vapor pressure data on chemical substances. It seems no one equation for fitting the vapor pressure data on all substances with high accuracy has found universal acceptance among investigators.

In the past, mathematically simple vapor pressure equations were preferred. The adjustable parameters were evaluated by simple graphic or numerical methods. However, in recent years, because of the availability of digital electronic computers, mathematically complex vapor pressure equations provide no difficulty for use.

Basically, the selection of a vapor pressure equation depends on the shape of the vapor pressure curves of the given substance. One mathematical equation cannot fit well all the vapor pressure curves for all chemical substances over the entire temperature range from the low temperature triple point up to the critical point.

Often, vapor pressure data are available only over a limited temperature range well below the critical temperature. A simple three-constant or four-constant equation is used to represent them. Obviously, none of these simple equations would be expected to extrapolate reliably to high temperatures up to the critical point, since equations with as many as 11 constants are usually required for the entire liquid range.

The American Petroleum Institute Research Project 44, now renamed the Thermodynamics Research Center (TRC) Hydrocarbon Project,[2] and the TRC Data Project, Texas A&M University, have adopted the Antoine equation for representing the vapor pressure data on many classes of hydrocarbons and related compounds found in petroleum, and on the other classes of both organic and inorganic substances, respectively.

When the pressure and temperature ranges are small, the Antoine equation, $\log P = A - B/(t + C)$, where A, B, and C are adjustable parameters, is capable of representing the results within the experimental error and is adopted generally for correlation purposes. With recent improvement in vapor pressure measurements, the results obtained have greater precision, accuracy, and wider temperature range. Consequently, better vapor pressure equations are needed to represent the experimental measurements. In Engineering Science Data Unit publications,[8] the vapor pressure data on many classes of chemical substances were represented by Chebyshev equations.

Recently, the Wagner equation[76] was used to correlate and extrapolate the experimental vapor pressure data on aliphatic nitrogen compounds in order to incorporate constraints that ensured that the fitted equation exhibited certain established characteristics. This equation may be employed to fit the vapor pressure data for a wide range of compounds with good accuracy. This vapor pressure equation has been used satisfactorily for interpolation of vapor pressure data between 100 to 200 kPa and the critical point. It provides a new procedure for estimation and extrapolation based upon observed values in a limited range.

For higher molecular weight compounds that have low vapor pressures at room temperature, the vapor pressures often are determined at higher temperatures. The selected vapor pressure equations are used for calculating the enthalpies and entropies of vaporization at 298.15 K. The accuracy of the results obtained depends upon how well the vapor pressure equations extrapolate to lower temperatures.

Osborn and Douslin have employed both the Antoine and Cox vapor pressure equations[19] for presenting the vapor pressure data on hydrocarbons,[34] nitrogen compounds,[35] and sulfur compounds[36] found in petroleum. Cox's equation was selected by researchers in the Bartlesville Energy Technology Center for representing the experimental vapor pressure measurements for numerous petroleum compounds for many years.

Scott and Osborn[20] chose five simple vapor pressure equations for fitting the vapor pressures of several typical chemical compounds. From the results obtained, they concluded that the Cox equation yielded by far the best extrapolation both to lower temperatures and to high temperatures from 448 to 530 K. The two three-constant equations, the

Rankine and the Antoine, produced very poor extrapolations. The other two four-constant equations, the Frost–Kalkwarf and the Cragoe, rendered better extrapolations than the three-constant equations, but definitely were inferior to the Cox equation.

New vapor pressure equations have been proposed by Somayajulu[77] and Borrelli *et al.*[78] The merit of these equations is still under investigation.

The above situation indicates the complexity and confusion involved in choosing an appropriate vapor pressure equation for representing the vapor pressure data on chemical compounds.

In selecting a vapor pressure equation in this work, we emphasized the following points as important critera: (1) the equation should be reliable for extrapolation, (2) the equation should provide no difficulty for generating derivatives, e.g., dP/dT or $d(\ln P)/d(1/T)$, (3) the equation has been used by reputable researchers and shown its reliability and usefulness, and (4) the equation can be employed for correlation with molecular structure.

After careful scrutinization and evaluation, we decided to use the Cox equation in this work. That this equation may provide reliable extrapolated vapor pressure values without employing the critical constants of the given compounds is particularly valuable, because for many coal compounds these constants are not available.

3. Vapor Pressure Data

The vapor pressure data obtained from the literature were converted to SI units, i.e., temperatures in degrees kelvin (K) and pressure in kilopascals (kPa). The adopted data points for each substance were fitted into a Cox equation: $\log_{10}P = (1 - D/T) \times 10^{(A + BT + CT^2)}$ by the least-squares method, where the constants A, B, C, and D are adjustable parameters. The constants which yielded the smallest deviations were adopted.

In cases where more than one set of vapor pressure data was available for the given compound, a proper weight factor was applied to the data points in each data set before combining them for a least-squares fit into the Cox equation. The value of the weight factor was assigned on the basis of our assessment of the quality of the experimental work reported. A weight factor of 5 to 10 was assigned to the high quality vapor pressure measurements for fitting into the vapor pressure equation.

For some compounds the adopted vapor pressure data points were computed from the vapor pressure equations reported. In many cases, only the smoothed vapor pressures at selected temperatures were available. Many authors did not mention the uncertainties of their experimental measurements, the purities of their sample materials, or the detailed method of measurements. As expected, the quality of the adopted data points was not uniform.

Evaluating and fitting the reported vapor pressure data into an appropriate equation are complicated tasks. The inconsistent data points revealed by the fitting process should be eliminated. Even in the same data set, the uncertainties of the data points in different temperature ranges may be different.

Only a few extensive vapor pressure measurements on aromatic and polynuclear aromatic coal compounds were available in the recent literature. Some pertinent vapor pressure data on coal related substances have been collected and reported.[2,4,6,8,16,35,41,62,65]

We employed the vapor pressure data reevaluated for coal compounds by authoritative and reputable researchers as reliable sources of information in this work. In our opinion, these vapor pressure values, which did not include the inconsistent original data points, are better values for fitting into a vapor pressure equation for extrapolation and estimation of missing data for coal compounds, which is the principal purpose of the present work.

The adopted vapor pressure data sets were divided into several groups, according to the similarity in the molecular structure of the substances included. Within each group of compounds, the arrangement followed an increasing order of the number of carbon atoms in their molecular formulas.

Table 1 contains the vapor pressure data on benzene and its alkyl derivatives. Similar information for naphthalene and its derivatives, unsaturated ring compounds, sulfur, nitrogen, and oxygen compounds are listed in Tables 2–9, respectively.

The contents of each table are compound number, molecular formula, name of compound, vapor pressure range (in kPa), temperature range (K), number of data points, reference number, author's name, year published, data types and method of measurement, and compilations citing the same data. The last item was included to illustrate the presence of cross references on vapor pressure data.

We classified the reported vapor pressure data into four categories A, B, C, and D. The type A data refer to the experimental vapor pressure data measured by the authors of the reference listed. Previously reported experimental data that have been compiled in the indicated reference belong to class B. Class C represents the calculated vapor pressures from a regressed correlation based upon experimental data. Finally, vapor pressure values predicted from theory are denoted as class D.

The results of our comprehensive literature search are summarized in Tables 1–9. The sources of vapor pressure data adopted for fitting into a Cox equation for each individual substance are described in the next section.

TABLE 1. Vapor pressure data on benzene and its derivatives

No.	Formula	Name	Vapor Pressure Range, kPa[a]	Temperature Range, K	Number of Data Points	Reference Number	Authors	Year Published	Data Types and Method of Measurement[b]	References Citing the Same Data
1	C_6H_6	Benzene	1.269 ~ 202.8	261.1 ~ 377.8	43	2	TRCHP	1978	C	10
			5.133 ~ 4769.6	280. ~ 560	57	8	Eng. Sci. Data Unit	1978	C	
			5.300 ~ 4924.0	280. ~ 562.6	48	17	Vargaftik, N.B.	1975	B	
			0.21 ~ 4897.87	280.75~562.55		18	Yaws, C.	1978	C	
			0.0001~ 0.001	183.35 ~ 196.0	10	23	De Kruif, C. G.	1980	D	
			52.93 ~ 182.65	333.45 ~ 373.45	5	24	Eon, C. et al.	1971	A, Isoteniscopic	15
			275.59~ 662.79	389.679 ~ 429.61	13	33	Ambrose, D. et al.	1969	A, Ebulliometric	
			545.8 ~ 4771.7	420. ~ 560.	8	55	Ambrose, D. et al.	1967	A, Dynamic & Static	15
			3.225 ~ 4382.6	273. ~ 553	21	5	Chao, J.	1978	C	
2	C_7H_8	Toluene	1.407 ~ 206.7	280.6 ~ 411.1	48	2	TRCHP	1978	C	10
			0.119 ~ 4016.3	245. ~ 590.	70	8	Eng. Sci. Data Unit	1978	C	
			0.0012~ 3774.00	203.2 ~ 583.2	40	17	Vargaftik, N.B.	1975	B	
			0.0044~4186.32	213.15~593.75		18	Yaws, C.	1978	C	
			0.9013~ 11.670	273.15 ~ 322.41	7	52	Murday, E.B. et al.	1980	A, Static	
			256.2 ~ 3556.8	420. ~ 580.	9	55	Ambrose, D. et al.	1967	A, Dynamic & Static	15
			0.9074~ 3.7551	273.143 ~ 297.90	60	34	Osborn, A.G. et al.	1974	A, Ebullionmetric	
3	C_8H_8	Styrene	0.0094~ 100.51	246.25 ~ 417.92	31	6	Coal Tar Res. Ass.	1965	B	4, 15
			0.012 ~ 3823.07	246.25~642.15		18	Yaws, C.	1978	C	
4	C_8H_{10}	Ethylbenzene	1.393 ~ 209.8	300.0 ~ 438.9	51	2	TRCHP	1978	C	10
			0.0747~ 104.00	261.55 ~ 410.31	36	6	Coal Tar Res. Ass.	1965	B	
			0.143 ~ 3507.1	265. ~ 615.	71	8	Eng. Sci. Data Unit	1978	C	
			0.0204~ 622.9	243.2 ~ 493.2	26	17	Vargaftik, N.B.	1975	B	
			0.021 ~ 972.08	243.15~519.15		18	Yaws, C.	1978	C	
			133.8 ~ 2924.9	420. ~ 600.	10	55	Ambrose, D. et al.	1967	A, Dynamic & Static	15
			9.585 ~ 270.03	339.181 ~ 450.103	21	56	Osborn, A.G. et al.	1980	A, Static	
5	C_8H_{10}	2-Methyltoluene	1.338 ~ 195.7	300.0 ~ 444.4	51	2	TRCHP	1978	C	10
			0.0267~ 104.00	256.15 ~ 418.55	28	6	Coal Tar Res. Ass.	1965	B	4, 15
			0.138 ~ 3715.9	270. ~ 630.	73	8	Eng. Sci. Data Unit	1978	C	
			0.0324~ 3808.	253.2 ~ 631.6	43	17	Vargaftik, N.B.	1975	B	
			0.033 ~ 3801.02	253.15~631.55		18	Yaws, C.	1978	C	
			108.0 ~ 3304.1	420. ~ 620.	11	55	Ambrose, D. et al.	1967	A, Dynamic & Static	15
6	C_8H_{10}	3-Methyltoluene	1.427 ~ 196.2	302.8 ~ 438.9	50	2	TRCHP	1978	C	10
			0.120 ~ 104.00	264.75 ~ 413.23	28	6	Coal Tar Res. Ass.	1965	B	4, 15
			0.120 ~ 3449.1	265. ~ 615.	71	8	Eng. Sci. Data Unit	1978	C	
			0.0169 ~3650.0	243.2 ~ 619.2	47	17	Vargaftik, N.B.	1975	B	
			0.018 ~ 917.12	243.15 ~ 619.15		18	Yaws, C.	1978	C	
			124.2 ~ 2872.1	420. ~ 600.	10	55	Ambrose, D. et al.	1967	A, Dynamic & Static	15
7	C_8H_{10}	4-Methyltoluene	1.282 ~ 199.2	300.0 ~ 438.9	51	2	TRCHP	1978	C	10
			0.044 ~ 104.00	263.65 ~ 412.48	26	6	Coal Tar Res. Ass.	1965	B	4, 15
			0.724 ~ 3459.0	290. ~ 615.	66	8	Eng. Sci. Data Unit	1978	C	
			0.8666~ 3617.0	293.2 ~ 618.2	36	17	Vargaftik, N.B.	1975	B	
			0.86 ~ 3600.77	293.15~618.15		18	Yaws, C.	1978	C	
			0.0116~ 270.002	247.107 ~ 452.38	34	34	Osborn, A.G. et al.	1974	A, Ebullionmethric	
			126.5 ~ 2880.4	420. ~ 600.	10	55	Ambrose, D. et al.	1967	A, Dynamic & Static	15
8	C_9H_{10}	2-Methylstyrene	0.387 ~ 17.699	305.16 ~ 385.50	9	4	Boublik, T. et al.	1973	B	15
			0.133 ~ 101.33	280.55 ~ 438.55	10	41	Stull, D.R.	1947	C	10
9	C_9H_{10}	3-Methylstyrene	0.687 ~ 99.725	314.93 ~ 442.15	27	4	Boublik, T. et al.	1973	B	15
			0.133 ~ 101.33	290.65 ~ 452.15	10	41	Stull, D.R.	1947	C	10
10	C_9H_{10}	4-Methylstyrene	0.376 ~ 99.725	304.97 ~ 443.15	30	4	Boublik, T. et al.	1973	B	15
			0.133 ~ 101.33	289.15 ~ 448.15	10	41	Stull, D.R.	1947	C	10
11	C_9H_{12}	n-Propylbenzene	1.324 ~ 199.6	316.7 ~ 461.1	53	2	TRCHP	1978	C	10
			6.402 ~ 104.00	348.968 ~ 433.389	19	4	Boublik, T. et al.	1973	B	15
			0.133 ~ 3078.1	280. ~ 635.	72	8	Eng. Sci. Data Unit	1978	C	
12	C_9H_{12}	Isopropylbenzene	1.296 ~ 207.0	311.1 ~ 455.6	53	2	TRCHP	1978	C	10
			0.057 ~ 104.00	264.95 ~ 426.55	36	6	Coal Tar Res. Ass.	1965	B	16
			0.125 ~ 3166.0	275. ~ 630.	72	8	Eng. Sci. Data Unit	1978	C	
			3.360 ~ 99.618	329.54 ~ 425.04	26	16	Timmermans, J.	1965	B	
			0.019 ~ 3157.47	253.15 ~ 633.15		18	Yaws, C.	1978	C	
13	C_9H_{12}	1-Methyl-2-ethylbenzene	1.365 ~ 197.5	322.2 ~ 466.7	53	2	TRCHP	1978	C	10
			6.417 ~ 103.97	354.296 ~ 439.324	20	4	Boublik, T. et al.	1973	B	15, 16
			0.141 ~ 3206.6	285. ~ 645.	73	8	Eng. Sci. Data Unit	1978	C	
14	C_9H_{12}	1-Methyl-3-ethylbenzene	1.365 ~ 203.6	319.4 ~ 463.9	53	2	TRCHP	1978	C	10
			6.417 ~ 103.97	351.255 ~ 435.466	20	4	Boublik, T. et al.	1973	B	15, 16
			0.118 ~ 3065.4	280. ~ 635.	72	8	Eng. Sci. Data Unit	1978	C	
15	C_9H_{12}	1-Methyl-4-ethylbenzene	1.365 ~ 199.6	319.4 ~ 463.9	53	2	TRCHP	1978	C	10
			6.417 ~ 103.98	351.456 ~ 436.158	19	4	Boublik, T. et al.	1973	B	15, 16
			0.120 ~ 2977.6	280. ~ 635.	72	8	Eng. Sci. Data Unit	1978	C	
16	C_9H_{12}	1,2,3-Trimethylbenzene	1.365 ~ 196.1	330.6 ~ 477.8	54	2	TRCHP	1978	C	10
			0.233 ~ 103.98	308.05 ~ 450.28	34	6	Coal Tar Res. Ass.	1965	B	4, 15
			0.116 ~ 3283.3	290. ~ 660.	75	8	Eng. Sci. Data Unit	1978	C	
			0.00725~0.02241	253. ~ 268.	15	10	Jordan, T.E.	1954	C	
17	C_9H_{12}	1,2,4-Trimethylbenzene	1.331 ~ 203.0	325.0 ~ 472.2	54	54	TRCHP	1978	C	10
			0.786 ~ 103.99	273.15 ~ 443.53	38	38	Coal Tar Res. Ass.	1965	B	4, 15, 16
			0.110 ~ 3076.9	285. ~ 645.	73	8	Eng. Sci. Data Unit	1978	C	
			0.00883~0.0306	253. ~ 268.	15	10	Jordan, T.E.	1954	C	
18	C_9H_{12}	1,3,5-Trimethylbenzene	1.338 ~ 201.2	322.2 ~ 469.4	54	2	TRCHP	1978	C	10
			0.039 ~ 103.99	270.4 ~ 438.9	31	6	Coal Jar. Res. Ass.	1965	B	4, 15, 16
			0.131 ~ 3042.9	285. ~ 635.	71	8	Eng. Sci. Data Unit	1978	C	
			0.00949~0.03677	253. ~ 268.	15	10	Jordan, T.E.	1954	C	
19	$C_{10}H_{14}$	n-Butylbenzene	1.365 ~ 176.1	336.1 ~ 480.6	53	2	TRCHP	1978	C	
			6.417 ~ 103.99	369.383 ~ 457.479	18	4	Boublik, T. et al.	1973	B	15, 16
			0.112 ~ 2870.9	295. ~ 660.	74	8	Eng. Sci. Data Unit	1978	C	
			0.133 ~ 101.33	296.85 ~ 456.25	10	41	Stull, D.R.	1947	C	10
20	$C_{10}H_{14}$	Isobutylbenzene	1.420 ~ 196.6	327.8 ~ 475.0	55	2	TRCHP	1978	C	
			6.415 ~ 103.99	359.788 ~ 446.964	20	4	Boublik, T. et al.	1973	B	15
			0.105 ~ 2755.0	285. ~ 645.	73	8	Eng. Sci. Data Unit	1978	C	
			0.133 ~ 101.33	263.35 ~ 443.65	10	41	Stull, D.R.	1947	C	10
21	$C_{10}H_{14}$	sec-Butylbenzene	1.386 ~ 196.6	327.8 ~ 475.0	21	2	TRCHP	1978	C	
			6.415 ~ 103.99	360.268 ~ 447.508	20	4	Boublik, T. et al.	1973	B	15
			0.101 ~ 2733.7	285. ~ 645.	73	8	Eng. Sci. Data Unit	1978	C	
			0.133 ~ 101.33	291.75 ~ 446.65	10	41	Stull, D.R.	1947	C	10
22	$C_{10}H_{14}$	tert-Butylbenzene	1.400 ~ 213.7	325.0 ~ 475.0	56	2	TRCHP	1978	C	
			6.426 ~ 103.99	357.027 ~ 443.315	19	4	Boublik, T. et al.	1973	B	15
			0.119 ~ 2591.4	285. ~ 635.	71	8	Eng. Sci. Data Unit	1978	C	
			0.133 ~ 101.33	286.15 ~ 441.65	10	41	Stull, D.R.	1947	C	10
23	$C_{10}H_{14}$	1-Methyl-2-propylbenzene	1.276 ~ 170.3	335.9 ~ 480.3	53	2	TRCHP	1978	C	
			0.106 ~ 2827.0	295. ~ 660.	74	8	Eng. Sci. Data Unit	1978	C	
24	$C_{10}H_{14}$	1-Methyl-3-propylbenzene	1.427 ~ 182.7	335.9 ~ 480.3	53	2	TRCHP	1978	C	
			0.124 ~ 2670.8	295. ~ 650.	72	8	Eng. Sci. Data Unit	1978	C	
25	$C_{10}H_{14}$	1-Methyl-4-propylbenzene	1.386 ~ 175.8	335.9 ~ 480.3	53	2	TRCHP	1978	C	
			0.118 ~ 2705.5	295. ~ 655.	73	8	Eng. Sci. Data Unit	1978	C	
26	$C_{10}H_{14}$	1-Methyl-2-isopropylbenzene	1.317 ~ 196.5	330.3 ~ 480.3	55	2	TRCHP	1978	C	
			4.170 ~ 104.72	354.32 ~ 452.86	8	4	Boublik, T. et al.	1973	B	15
			0.112 ~ 2835.9	290. ~ 655.	70	8	Eng. Sci. Data Unit	1978	C	
27	$C_{10}H_{14}$	1-Methyl-3-isopropylbenzene	1.282 ~ 197.9	327.6 ~ 480.3	55	2	TRCHP	1978	C	
			4.117 ~ 104.88	351.91 ~ 449.48	8	4	Boublik, T. et al.	1973	B	15
			0.131 ~ 2652.8	290. ~ 645.	72	8	Eng. Sci. Data Unit	1978	C	

TABLE 1. Vapor pressure data on benzene and its derivatives, (continued)

No.	Formula	Name	Vapor Pressure Range, kPa[a]	Temperature Range, K	Number of Data Points	Reference Number	Authors	Year Published	Data Types and Method of Measurement[b]	References Citing the Same Data
28	$C_{10}H_{14}$	1-Methyl-4-isopropylbenzene	1.393 ~ 200.6	330.3 ~ 480.3	55	2	TRCHP	1978	C	
			12.026 ~ 104.55	380.19 ~ 451.57	7	4	Boublik, T. et al.	1973	B	15
			0.121 ~ 2694.2	290. ~ 650.	73	8	Eng. Sci. Data Unit	1978	C	
29	$C_{10}H_{14}$	1,2-Diethylbenzene	1.331 ~ 198.2	335.9 ~ 485.9	55	2	TRCHP	1978	C	10
			6.425 ~ 104.02	369.879 ~ 457.64	20	4	Boublik, T. et al.	1973	B	15, 16
			0.112 ~ 2901.5	295. ~ 660.	74	8	Eng. Sci. Data Unit	1978	C	
			0.133 ~ 101.33	298.75 ~ 449.65	10	41	Stull, D.R.	1947	C	10
30	$C_{10}H_{14}$	1,3-Diethylbenzene	1.427 ~ 197.3	335.9 ~ 483.1	54	2	TRCHP	1978	C	10
			6.423 ~ 104.02	368.242 ~ 455.31	20	4	Boublik, T. et al.	1973	B	15, 16
			0.119 ~ 2716.8	295. ~ 650.	72	8	Eng. Sci. Data Unit	1978	C	
			0.133 ~ 101.33	294.85 ~ 455.35	10	41	Stull, D.R.	1947	C	10
31	$C_{10}H_{14}$	1,4-Diethylbenzene	1.331 ~ 196.6	335.9 ~ 485.9	55	2	TRCHP	1978	C	10
			6.422 ~ 104.02	371.967 ~ 457.97	20	4	Boublik, T et al.	1973	B	15, 16
			0.107 ~ 2708.6	295. ~ 655.	73	8	Eng. Sci. Data Unit	1978	C	
			0.133 ~ 101.33	292.55 ~ 455.65	10	41	Stull, D.R.	1947	C	10
32	$C_{10}H_{14}$	1,2-Dimethyl-3-ethylbenzene	1.331 ~ 199.98	344.25 ~ 497.15	27	2	TRCHP	1978	C	
			0.139 ~ 2956.5	305. ~ 675.	75	8	Eng. Sci. Data Unit	1978	C	
33	$C_{10}H_{14}$	1,2-Dimethyl-4-ethylbenzene	1.331 ~ 199.98	341.05 ~ 492.85	27	2	TRCHP	1978	C	
			0.114 ~ 2858.4	300. ~ 665.	74	8	Eng. Sci. Data Unit	1978	C	
34	$C_{10}H_{14}$	1,3-Dimethyl-2-ethylbenzene	1.358 ~ 204.8	341.4 ~ 494.2	56	2	TRCHP	1978	C	
			0.112 ~ 2964.6	300. ~ 670.	75	8	Eng. Sci. Data Unit	1978	C	
35	$C_{10}H_{14}$	1,3-Dimethyl-4-ethylbenzene	1.269 ~ 199.9	388.7 ~ 491.4	56	2	TRCHP	1978	C	
			0.130 ~ 2852.5	300. ~ 665.	74	8	Eng. Sci. Data Unit	1978	C	
			0.133 ~ 101.33	296.35 ~ 457.65	10	41	Stull, D.R.	1947	C	
36	$C_{10}H_{14}$	1,3-Dimethyl-5-ethylbenzene	1.310 ~ 197.2	335.9 ~ 485.9	55	2	TRCHP	1978	C	
			0.107 ~ 2633.3	295. ~ 650.	72	8	Eng. Sci. Data Unit	1978	C	
			0.133 ~ 101.33	296.35 ~ 458.15	10	41	Stull, D.R.	1947	C	
37	$C_{10}H_{14}$	1,4-Dimentyl-2-ethylbenzene	1.372 ~ 194.4	338.7 ~ 488.7	55	2	TRCHP	1978	C	
			0.101 ~ 3381.6	295. ~ 680.	78	8	Eng. Sci. Data Unit	1978	C	
			0.133 ~ 101.33	297.25 ~ 458.15	10	41	Stull, D.R.	1947	C	
38	$C_{10}H_{14}$	1,2,3,4-Tetramethylbenzene	1.331 ~ 196.5	352.6 ~ 508.1	57	2	TRCHP	1978	C	
			0.111 ~ 2970.1	310. ~ 690.	77	8	Eng. Sci. Data Unit	1978	C	
			0.3401 ~ 107.31	330. ~ 480.	16	10	Jordan, T.E.	1954	C	
39	$C_{10}H_{14}$	1,2,3,5-Tetramethylbenzene	1.289 ~ 204.8	347.0 ~ 502.6	57	2	TRCHP	1978	C	
			0.106 ~ 2850.3	305. ~ 675.	75	8	Eng. Sci. Data Unit	1978	C	
			0.3988 ~ 98.765	330. ~ 470.	15	10	Jordan, T.E.	1954	C	
40	$C_{10}H_{14}$	1,2,4,5-Tetramethylbenzene	1.351 ~ 198.6	347.0 ~ 499.8	56	2	TRCHP	1978	C	
			1.996 ~ 2913.0	355. ~ 675.	75	8	Eng. Sci. Data Unit	1978	C	
			0.3988 ~ 98.765	330. ~ 470.	15	10	Jordan, T.E.	1954	C	
41	$C_{11}H_{16}$	sec-Amylbenzene	0.133 ~ 101.33	300.95 ~ 451.15	10	41	Stull, D.R.	1947	C	10, 15
42	$C_{11}H_{16}$	3-Ethyl-1-isopropylbenzene	0.133 ~ 101.33	301.45 ~ 466.15	10	41	Stull, D.R.	1947	C	10, 15
43	$C_{11}H_{16}$	4-Ethyl-1-isopropylbnezene	0.133 ~ 101.33	304.65 ~ 468.95	10	41	Stull, D.R.	1947	C	10, 15
44	$C_{11}H_{16}$	3,5-Diethyltoluene	0.133 ~ 101.33	304.95 ~ 472.15	10	41	Stull, D.R.	1947	C	15
45	$C_{11}H_{16}$	1,2,4-Trimethyl-5-ethylbenzene	1.467 ~ 9.466	360.45 ~ 405.5	11	4	Boublik, T. et al.	1973	C	
			0.133 ~ 101.33	316.85 ~ 481.25	10	41	Stull, D.R.	1947	C	15
46	$C_{11}H_{16}$	1,3,5-Trimethyl-2-ethylbenzene	1.573 ~ 101.33	361.65 ~ 483.35	19		Boublik, T. et al.	1973	B	
			0.133 ~ 101.33	311.95 ~ 481.15	10	41	Stull, D.R.	1947	C	15
47	$C_{12}H_{18}$	1,2-Diisopropylbenzene	0.133 ~ 101.33	313.15 ~ 482.15	10	41	Stull, D.R.	1947	C	10, 15
48	$C_{12}H_{18}$	1,3-Diisopropylbenzene	0.133 ~ 101.33	307.85 ~ 475.15	10	41	Stull, D.R.	1947	C	10, 15
49	$C_{12}H_{18}$	1,4-Diisopropylbenzene	6.753 ~ 104.63	393.41 ~ 484.73	7	4	Boublik, T. et al.	1973	B	15
50	$C_{12}H_{18}$	1,2,4-Triethylbenzene	0.133 ~ 101.33	319.15 ~ 491.15	10	41	Stull, D.R.	1947	C	10, 15
51	$C_{12}H_{18}$	1,3,4-Triethylbenzene	0.133 ~ 101.33	321.05 ~ 490.65	10	41	Stull, D.	1947	C	
52	$C_{12}H_{18}$	Hexamethylbenzene	2.80 x 10 ~0.0144	303.10 ~ 343.02	9	48	Ambrose, D.	1976	A, static	

[a] 1 kPa = 7.50062 torr (mm Hg)

[b]
A = experimental data measured by the author(s) of the reference.
B = experimental data collected from literature by the author(s) of the reference.
C = calculated values from a regressed correlation based on experimental data.
D = predicted values from theory.

TABLE 2. Vapor pressure data on napthalene and its derivatives

No.	Formula	Name	Vapor Pressure Range, kPa[a]	Temperature Range, K	Number of Data Points	Reference Number	Authors	Year Published	Data Types and Method of Measurement[b]	Reference Citing the same Data
1	$C_{10}H_{18}$	Naphthalene	1.001 ~ 38.786	353.48 ~ 452.66	32	4	Boublik, T. et al.	1973	B	15
			0.00080 ~ 4045.4	273.15 ~ 751.65	63	6	Coal Tar Res. Ass.	1965	B	16
			0.28.10 ~0.5253	223.151 ~ 340.15	13	6	Coal Tar Res. Ass.	1965	B	
			0.00232 ~ 110.02	283.15 ~ 494.60	57	16	Timmermans, J.	1965	B	
			0.0004 ~ 1337.0	273.2 ~ 643.2	38	17	Vergaftik, N.B.	1975		
			1.587 ~ 110.018	360.62~494.60	27	18	Yaws, C.	1978	C	
			28.82 ~ 3378.42	441.32~727.59	15	22	Bradley, R.S. et al.	1953	A, Gas Effusion	
			0.000163~0.0007119	279.85 ~ 293.85	11	23	De Kruif, C.G.	1980	D	
			0.0001 ~ 0.001	257.21 ~ 257.21	10	28	MacKnick, A.B. et al.	1979	A, Gas-Saturation	
			0.00176 ~ 0.02053	280.3 ~ 305.0	6	45	Ambrose, D. et al.	1975	A, Static	
			23. 10 ~ 0.4886	263.61 ~ 343.06	22	2	TRCHP	1978	C	15
			1.413 ~ 209.5	3 60.9 ~ 524.8	60	10	Jordan, T.E.	1954	C	
			1.13 ~ 4023.94	356.05~748.15		73	Wilson, G.M., et al.	1981	A, Static	
2	$C_{11}H_{10}$	1-Mehylnaphthalene	1.303 ~ 204.1	80.3 ~ 552.6	63	2	TRCHP	1978	C	
			5.524 ~ 102.765	415.29 ~ 518.48	17	4	Boublik, T. et al.	1973	B	15
			0.00176 ~ 0.0235	278.85 ~ 311.75	8	28	Macknick, A.B. et al.	1979	A, Gas-Saturation	
			7.719 ~ 415.36	424.43 ~ 593.38	24	53	Wieczorek, S.A. et al.	1980	A, Static	
			15.58 ~ 3026.79	447.04~755.37	18	73	Wilson, G.M., et al.	1981	A, Static	
3	$C_{11}H_{10}$	2-Methylnaphthalene	1.310 ~ 197.9	377.6 ~ 547.0	62	2	TRCHP	1978	C	
			5.536 ~ 102.937	412.34 ~ 514.91	17	4	Boublik, T. et al.	1973	B	15
			8.627 ~ 821.27	424.41 ~ 638.93	29	53	Wieczorek, S.A. et al.	1980	A, Static	
4	$C_{12}H_{12}$	1-Ethylnaphthalene	1.379 ~ 204.1	394.2 ~566.4	63	2	TRCHP	1978	C	
			0.133 ~ 101.33	343.15 ~ 531.25	10	41	Stull, D.R.	1947	C	10, 15
5	$C_{12}H_{12}$	2-Ethylnaphthalene	1.448 ~ 205.5	394.2 ~ 566.4	63	2	TRCHP	1978	C	
			0.00153~0.01999	286.2 ~ 318.25	7	28	Macknick, A.B. et al.	1979	A, Gas-Saturation	
6	$C_{12}H_{12}$	1,2-Dimethylnaphthalene	1.379 ~ 112.4	402.6 ~ 544.2	52	2	TRCHP	1978	C	
7	$C_{12}H_{12}$	1,3-Dimethylnaphthalene	1.655 ~ 402.6	402.6 ~ 541.4	15	2	TRCHP	1978	C	
8	$C_{12}H_{12}$	1,4-Dimethylnaphthalene	1.310 ~ 103.99	397.0 ~ 544.15	16	2	TRCHP	1978	C	
9	$C_{12}H_{12}$	1,8-Dimethylnaphthalene	0.0148 ~ 1.8032	328.15 ~ 413.15	20	38	Osborn, A.G. et al.	1975	A, Ebulliometric	15
10	$C_{12}H_{12}$	2,3-Dimethylnaphthalene	0.0140 ~ 1.8534	33.15 ~ 408.15	15	38	Osborn, A.G. et al.	1975	A, Ebulliometric	15
11	$C_{12}H_{12}$	2,6-Dimethylnaphthalene	0.05360 ~ 3.4419	348.15 ~ 418.15	15	38	Osborn, A.G. et al.	1975	A, Ebulliometric	15
12	$C_{12}H_{12}$	2,7-Dimethylnaphthalene	0.01987 ~ 1.5037	333.15 ~ 398.15	15	38	Osborn, A.G. et al.	1975	A, Ebulliometric	15
13	$C_{13}H_{14}$	1-n-Propylnaphthalene	1.333 ~ 101.33	403.15 ~ 545.95	10	2	TRCHP	1978	C	
14	$C_{13}H_{14}$	2-n-Propylnaphthalene	1.333 ~ 101.33	404.15~ 546.65	10	2	TRCHP	1978	C	
15	$C_{13}H_{14}$	1-Isopropylnaphthalene	1.344 ~ 208.2	402.5 ~ 577.6	64	2	TRCHP	1978	C	
16	$C_{13}H_{14}$	2-Isopropylnaphthalene	1.393 ~ 202.7	402.6 ~ 577.6	64	2	TRCHP	1978	C	
			0.133 ~ 101.33	349.15 ~ 539.15	10	41	Stull, D.R.	1947	C	
17	$C_{13}H_{14}$	1,3,5-Trimethylnaphthalene	1.333 ~ 101.33	415.15 ~ 557.65	8	2	TRCHP	1978	C	
18	$C_{13}H_{14}$	1,3,7-Trimethylnaphthalene	1.333 ~ 101.33	409.15 ~ 553.15	7	2	TRCHP	1978	C	
19	$C_{13}H_{14}$	1,4,5-Trimethylnaphthalene	1.333 ~ 101.33	415.15 ~ 558.15	7	2	TRCHP	1978	C	
20	$C_{14}H_{16}$	1-n-Butylnaphthalene	1.400 ~ 107.6	413.7 ~ 566.4	56	2	TRCHP	1978	C	
21	$C_{14}H_{16}$	2-n-Butylnaphthalene	0.0667 ~ 1.3332	362.15 ~ 420.65	5	1	API 42	1966	A	
			1.379 ~ 112.4	419.2 ~ 566.4	54	2	TRCHP	1978	C	
22	$C_{14}H_{16}$	1-tert-Butylnaphthalene	0.0667 ~ 1.3332	353.15 ~ 410.65	5	1	API 42	1966	A	
			1.379 ~ 133.8	408.1 ~ 566.4	58	2	TRCHP	1978	C	
23	$C_{14}H_{16}$	2-tert-Butylnaphthalene	0.0667 ~ 1.3332	351.15 ~ 408.65	5	1	API 42	1966	A	
			1.379 ~ 128.9	408.1 ~ 566.4	58	2	TRCHP	1978	C	

[a] 1 kPa = 7.5002 torr (mm Hg).

[b] A = experimental data measured by the author(s) of the reference.
B = experimental data collected from literature by the author(s) of the reference.
C = calculated values from a regressed correlation based on experimental data.
D = predicted values from theory.

Table 3. Vapor pressure data on saturated ring compounds

No.	Formula	Name	Vapor Pressure Range, kPa[a]	Temperature Range, K	Number of Data Points	Reference Number	Authors	Year Published	Data Types[b] and Method of Measurement	Reference Citing the Same Data
1	C_3H_6	Cyclopropane	1.333-199.98	171.85-257.37	27	2	TRCHP	1978	C	
			3.50-104.74	181.121-241.067	13	4	Boublik, T. et al	1973	B	16
			3.68-5582.11	183.15-398.35		18	Yaws, C.	1978	C	
			0.133-101.33	156.4-239.7	10	41	Stull, D.R.	1947	C	10
			631.56-5579.46	293.15-398.30	24	54	Lin, D.C.K. et al	1970	A	
2	C_4H_8	Cyclobutane	1.333-199.98	204.95-305.66	27	2	TRCHP	1978	C	
			2.50-100.15	213.220-285.345	12	4	Boublik, T. et al	1973	B	10,15
			0.13-4847.34	181.15-463.55		18	Yaws, C.	1978	C	
			0.133-101.33	181.2-286.1	10	41	Stull, D.R.	1947	C	10
			0.813-103.192	198.75-286.23	13	70	Hsisig, G. B.	1941	A	
3	C_4H_8	Methylcyclopropane	0.133-101.33	177.2-277.7	10	41	Stull, D.R.	1947	C	10,15
4	C_5H_{10}	Cyclopentane	1.333-199.98	232.75-344.75	27	2	TRCHP	1978	C	
			0.83-103.92	225.90-323.18	22	4	Boublik, T. et al	1973	B	10,15,16
			0.080-2.360	193.15-240.65	3	7	Doss, M.P.	1943	B	
			0.043-4039.0	193.2-503.2	33	17	Vargaftik, N.B.	1975	B	
			0.29-4530.30	213.15-511.65		18	Yaws, C.	1978	C	
			1.57-4023.4	234.085-503.215	8	50	Pasek, G.J. et al	1962	B	
5	C_6H_{12}	Cyclohexane	5.333-199.98	279.84-378.35	24	2	TRCHP	1978	C	6
			5.35-103.92	279.47-354.73	22	4	Boublik, T. et al	1973	B	10,16
			6.33-3561.0	283.2-543.2	28	17	Vargaftik, N. B.	1975	B	
			0.72-4107.80	247.75-553.45		18	Yaws, C.	1978	C	
			0.133-3039.	227.85-530.65	15	41	Stull, D.R.	1947	C	
			13.04-85.01	298.-348.	6	46	Cruickshank, A.et al	1967	A, Static	
			936.6-4074.8	451.44-553.69	12	47	Hugill, J. A. et al	1978	A	
			10.25-3959.4	293.165-551.225	8	50	Pasek, G. J. et al	1962	B	
6	C_6H_{12}	Methylcyclopentane	1.333-199.98	249.45-368.85	27	2	TRCHP	1978	C	10
			19.92-270.11	339.354-432.172	15	4	Boublik, T. el al	1973	B	10,15
			14.57-70.07	293.05-330.60	3	7	Doss, M.P.	1943	B	
			0.00185-2924.	183.15-513.15	33	17	Vargaftik, N.B.	1975	B	

Table 3. Vapor pressure data on saturated ring compcunds--Continued

No.	Formula	Name	Vapor Pressure Range, kPa[a]	Temperature Range, K	Number of Data Points	Reference Number	Authors	Year Published	Data Types[b] and Method of Measurement	Reference Citing the Same Data
7	C_7H_{14}	Cycloheptane	1.333-199.98	284.35-418.88	27	2	TRCHP	1978	C	
			19.920-270.111	341.354-432.172	15	4	Boublik, T. et al	1973	B	15
8	C_7H_{14}	Ethylcyclopentane	1.333-199.98	273.24-402.45	27	2	TRCHP	1978	C	10
			6.41-103.99	301.928-377.532	20	4	Boublik, T. et al	1973	B	10,15
			1.341-3143.	273.2-563.2	30	17	Vargaftik, N. B.	1975	B	
			0.133-101.33	240.95-376.55	10	41	Stull, D. R.	1947	C	
9	C_7H_{14}	1,1-Dimethylcyclo-pentane	1.333-199.98	260.84-388.15	27	2	TRCHP	1978	C	10
			6.415-103.99	288.648-361.886	19	4	Boublik, T. et al	1973	B	3,15
			0.02582-561.37	213.15-433.15	24	17	Vargaftik, N. B.	1975	B	
10	C_7H_{14}	1,cis-2-Di-methylcyclopentane	1.333-199.98	271.89-398.35	27	2	TRCHP	1978	C	10
			6.41-103.99	298.497-379.596	20	4	Boublik, T. et al	1973	B	15
11	C_7H_{14}	1,trans-2-Di methylcyclopentane	1.333-199.98	264.15-390.25	27	2	TRCHP	1978	C	10
			8.99-103.99	299.263-365.919	18	4	Boublik, T. et al	1973	B	15
12	C_7H_{14}	1,cis-3 Di-methylcyclopentane	1.333-199.98	263.15-389.15	27	2	TRCHP	1978	C	10
			9.013-104.02	299.127-365.778	18	4	Boublik, T. et al	1973	B	15
13	C_7H_{14}	1,trans-3-Di-methylcyclopentane	1.333-199.98	263.95-390.15	27	2	TRCHP	1978	C	10
			6.41-103.99	291.155-364.820	19	4	Boublik, T. et al	1973	B	15
14	C_7H_{14}	Methylcyclohexane	1.333-199.98	269.95-400.15	27	2	TRCHP	1978	C	10
			6.35-103.92	298.736-374.982	20	4	Boublik, T. et al	1973	B	10
			1.333-199.98	269.95-400.15	30	6	Coal Tar Res. Ass.	1965	B	
			0.0036-3116.0	203.2-563.2	38	17	Vargaftik, N. B.	1975	B	
15	C_8H_{16}	Ethylcyclohexane	1.333-199.98	293.75-432.65	27	2	TRCHP	1978	C	10
			0.033-310.80	243.2-453.2	22	17	Vargaftik, N. B.	1975	B	
			0.133-101.33	258.65-404.95	10	41	Stull, D. R.	1947	C	
16	C_8H_{16}	1,1-Dimethylcyclo-hexane	1.333-199.98	283.25-420.25	27	2	TRCHP	1978	C	10
			6.413-104.00	313.647-393.670	20	4	Boublik, T. et al	1973	B	15
			0.133-101.33	248.75-392.65	10	41	Stull, D. R.	1947	C	

Table 3. Vapor pressure data on saturated ring compounds--Continued

No.	Formula	Name	Vapor Pressure Range, kPa[a]	Temperature Range, K	Number of Data Points	Reference Number	Authors	Year Published	Data Types[b] and Method of Measurement	Reference Citing the Same Data
17	C_8H_{16}	1,cis-2-Dimethylcyclohexane	1.333-199.98	291.55-430.75	27	2	TRCHP	1978	C	10
			6.353-103.91	322.335-403.834	20	4	Boublik, T. et al	1973	B	15
			0.133-101.33	257.3-402.9	10	41	Stull, D. R.	1947	C	
18	C_8H_{16}	1,trans-2-Dimethylcyclohexane	1.333-199.98	286.2-424.3	27	2	TRCHP	1978	C	10
			0.133-101.33	252.1-396.6	10	41	Stull, D. R.	1947	C	
19	C_8H_{16}	1,cis-3-Dimethylcyclohexane	1.333-199.98	284.4-420.6	27	2	TRCHP	1978	C	3,10
			0.133-101.33	253.8-397.6	10	41	Stull, D. R.	1947	C	3
20	C_8H_{16}	1,trans-3-Dimethylcyclohexane	1.333-199.98	288.1-425.1	27	2	TRCHP	1978	C	3
			0.133-101.33	250.5-393.3	10	41	Stull, D. R.	1947	C	3
21	C_8H_{16}	1,cis-4-Dimethylcyclohexane	333-199.98	287.7-425.0	27	2	TRCHP	1978	C	3
			0.133-101.33	253.2-397.5	10	41	Stull, D. R.	1947	C	3
22	C_8H_{16}	1,trans-4-Dimethylcyclohexane	1.333-199.98	283.2-420.0	27	2	TRCHP	1978	C	
			0.133-101.33	248.9-392.5	10	41	Stull, D. R.	1947	C	
23	C_8H_{16}	Isopropylcyclopentane	6.40-104.00	320.183-400.544	20	4	Boublik, T. et al	1973	B	15
			1.333-199.98	289.55-426.95	27	2	TRCHP	1978	C	
24	C_8H_{16}	Propylcyclopentane	6.40-104.00	325.025-405.067	19	4	Boublik, T. et al	1973	B	15
			1.333-199.98	294.45-431.35	27	2	TRCHP	1978	C	
25	C_8H_{16}	1-Ethyl-1-methylcyclopentane	6.41-104.00	316.206-395.634	20	4	Boublik, T. et al	1973	B	
			0.042-270.02	238.150-435.293	32	34	Osborn, A.G. et al	1947	A, Ebulliometric	15
			1.333-199.98	285.85-421.85	27	2	TRCHP	1978	C	
26	C_8H_{16}	cis-2- Ethyl-1-methylcyclopentane	6.40-104.00	321.996-402.171	20	4	Boublik, T. et al	1973	B	
			0.028-1.114	238.150-288.150	11	34	Osborn, A.G. et al	1974	A, Ebulliometric	15
			1.333-199.98	291.34-428.55	27	2	TRCHP	1978	C	
27	C_8H_{16}	1,1,2-Trimethylcyclopentane	6.41-104.00	309.357-387.836	19	4	Boublik, T. et al	1973	B	15
			1.333-199.98	279.53-413.75	27	2	TRCHP	1978	C	
28	C_8H_{16}	1,1,3-Trimethylcyclopentane	6.41-104.00	302.094-378.980	19	4	Boublik, T. et al	1973	B	15
			1.333-199.98	272.85-404.45	27	2	TRCHP	1978	C	

Table 3. Vapor pressure data on saturated ring compounds--Continued

No.	Formula	Name	Vapor Pressure Range, kPa[a]	Temperature Range, K	Number of Data Points	Reference Number	Authors	Year Published	Data Types[b] and Method of Measurement	Reference Citing the Same Data
29	C_9H_{18}	Propylcyclohexane	6.41-104.00	345.841-430.906	20	4	Boublik, T. et al	1973	B	10
			1.333-199.98	313.35-458.95	27	2	TRCHP	1978	C	3
30	C_9H_{18}	Isopropylcyclohexane	6.411-104.01	343.665-428.752	20	4	Boublik, T. et al	1973	B	
31	C_9H_{18}	cis-3-Ethyl-1-methylcyclohexane	9.588-269.980	348.306-464.422	21	34	Osborn, A.G. et al	1974	A, Ebulliometric	
32	C_9H_{18}	1,1,3 - Trimethylcyclohexane	6.398-104.00	327.819-410.786	20	4	Boublik, T. et al	1973	B	50
33	$C_{10}H_{20}$	n-Butylcyclohexane	1.333-199.98	332.65-484.35	27	2	TRCHP		C	
34	$C_{10}H_{20}$	Isobutylcyclohexane	6.41-104.01	357.902-445.544	20	4	Boublik, T. et al	1973	B	8
35	$C_{10}H_{20}$	sec-Butylcyclohexane	6.41-104.01	367.608-453.571	20	4	Boublik, T. et al	1973	B	
36	$C_{10}H_{20}$	tert-Butylcyclohexane	6.40-104.00	357.183-445.820	20	4	Boublik, T. et al	1973	B	

[a] 1 kPa = 7.50062 torr (mmHg)

[b] A = Experimental Data Measured by the Authors(s) of the Reference.
B = Experimental Data Collected from Literature by the Author(s) of the Reference.
C = Calculated Values from a Regressed Correlation Based on Experimental Data.

Table 4. Vapor pressure data on unsaturated ring compounds

No.	Formula	Name	Vapor Pressure Range, kPa[a]	Temperature Range, K	Number of Data Points	Reference Number	Authors	Year Published	Data Types[b] and Method of Measurement	Reference Citing the Same Data
1	C_4H_6	Cyclobutene	1.160-98.939	196.050-275.050	12	70	Heisig, G. B.	1941	A	4,10,15
			0.133-101.33	174.1-275.6	10	41	Stull, D. R.	1947	C	
2	C_5H_6	1,3-Cyclopentadiene	18.821-96.327	271.25-313.05	6	15	Shuzo, O.	1978	B	
3	C_5H_8	Cyclopentene	0.85-743.80	223.2-393.2	18	17	Vargaftik, N. B.	1975	B	
			1.447-39.89	230.40-292.92	4	71	Lister, M. W.	1941	A, Static	
4	C_6H_8	1,3-Cyclohexdiene	16.8-34.76	303.96-322.03	7	27	Letcher,T.M. et al	1974	A, Static	
			307.34-363.31	19,444-135.198	12	31	Meyer, E. F. et al	1973	A Ebullionmetric	15
5	C_6H_8	1,4-Cyclohexdiene	11.89-25.25	304.25-322.23	7	27	Letcher,T.M. et al	1974	A, Static	
6	C_6H_{10}	Cyclohexene	0.033-528.70	213.2-423.2	22	17	Vargaftik, N. B.	1975	B	
			16.29-32.25	305.37-322.14	7	27	Letcher,T. M.et al	1974	A, Static	
			19.885-129.633	310.03-364.53	10	31	Meyer, E. F. et al	1973	A, Ebullionmetric	15
			0.160-0.752	228.73-248.30	4	71	Lister, M. W.	1941	A, Static	
7	C_9H_8	Indene	0.133-104.41	289.55-456.97	10	6	Coal Tar Res. Ass.	1965	B	10
			0.133-101.33	289.6-454.8	10	41	Stull, D. R.	1947	C	
8	C_9H_{10}	Indan	6.623-104.44	364.83-452.24	7	6	Coal Tar Res. Ass.	1965	B	
			4.343-206.401	355.006-482.437	25	26	Ambrose, D. et al	1976	A, Ebulliometric	
			9.59-143.24	374.274-465.558	19	37	Osborn, A.G. et al	1978	A, Ebulliometric	
9	$C_{10}H_{12}$	Tetralin	2.67-98.66	366.950-479.350	6	4	Boublik, T. et al	1973	B	16
			1.74-348.03	355.44-540.35	6	32	Nasir, P. et al	1980	A, Static	
			0.133-101.33	311.15-480.35	10	41	Stull, D. R.	1947	C	
			46.47-3364.64	450.15-710.93	18	73	Wilson, G.M. et al	1981	A, Static	
10	$C_{10}H_{18}$	cis-Decalin	5.53-102.73	373.033-469.526	19	4	Boublik, T. et al	1973	B	
			2.666-13.332	353.65-397.65	5	1	API 42	1966	A,	
			0.133-101.33	295.65-467.75	10	41	Stull, D. R.	1947	C	
			17.65-3571.48	406.21-727.59	17	73	Wilson, G.M. et al	1981	A, Static	

Table 4. Vapor pressure data on unsaturated ring compounds--Continued

No.	Formula	Name	Vapor Pressure Range, kPa[a]	Temperature Range, K	Number of Data Points	Reference Number	Authors	Year Published	Data Types[b] and Method of Measurement	Reference Citing the Same Data
11	$C_{10}H_{18}$	trans-Decalin	2.666-13.333	346.15-390.15	5	1	API 42	1966	A	
			5.53-102.73	365.510-461.017	19	4	Boublik, T. et al	1973	B	
			0.133-101.33	272.35-459.85	10	41	Stull, D. R.	1947	C	
12	$C_{11}H_{14}$	1,1-Dimethylindan	0.258-101.325	313.15-467.22	24	37	Osborn, A.G. et al	1978	A, Ebulliometric	
13	$C_{11}H_{14}$	4,6-Dimethylindan	0.057-47.38	313.15-467.22	18	37	Osborn, A.G. et al	1978	A, Ebulliometric	
14	$C_{11}H_{14}$	4,7-Dimethylindan	0.050-47.375	313.15-469.97	17	37	Osborn, A.G. et al	1978	A, Ebulliometric	
15	$C_{12}H_{8}$	Biphenylene	0.0176-1.8352	338.15-408.15	16	56	Osborn, A.G. et al	1980	A, Static	
16	$C_{12}H_{10}$	Biphenyl	0.10-142.03	342.35-544.25	15	4	Boublik, T. et al	1973	B	
			0.000416-363.57	288.20-595.45	75	6	Coal Tar Res. Ass.	1965	B	
			0.58-880.0	373.2-653.2	13	17	Vargaftik, N. B.	1975	B	
			0.000118-0.000123	297.15-297.85	15	22	Bradley, R.S.et al	1953	A, Effusion	
			2.04-400.11	396.14-600.69	12	32	Nasir, P. et al	1980	A, Static	
			0.016-0220	326.2-354.2	4	40	Sharma, R.K. et al	1974	A, Chromatographic	
			0.109-1108.576	343.15-673.15	16	72	Chipman, J. et al	1929	A, Isotenlscopic	
17	$C_{12}H_{16}$	Phenylcyclohexane	264.8-2457.3	560.93-727.59	7	73	Wilson, G.M. et al	1981	A, Static	
18	$C_{12}H_{22}$	Bicyclohexyl	9.59-346.69	424.25-577.25	23	44	Wieczorek, S.A.et al	1980	A, Static	
			0.067-1.333	321.15-376.15	5	1	API 42	1966	A	
19	$C_{12}H_{22}$	1,1-Dicyclo-pentylethane	0.067-1.333	385.65-430.65	5	1	API 42	1966	A,	
20	$C_{13}H_{12}$	Biphenylmethane	0.067-1.333	343.2-400.2	5	1	API'42	1966	A,	
			32.33-146.89	490.69-555.39	9	16	Timmermans, J.	1965	B	
			0.133-101.33	349.15-537.65	10	41	Stull, D. R.	1947	C	
			390-670.12	424.64-647.25	32	44	Wieczorek,S.A. et al	1980	A, Static	
			15.93-1827.1	560.93-727.59	7	73	Wilson, G. M. et al	1981	A, Static	
21	$C_{13}H_{18}$	1,1,4,6-Tetra-methylindan	0.032-38.565	313.15-468.64	18	37	Osborn, A. G. et al	1978	A, Ebulliometric	
22	$C_{13}H_{18}$	1,1,4,7-Tetra-methylindan	0.025-31.177	313.15-468.80	18	37	Osborn, A. G. et al	1978	A, Ebulliometric	

Table 4. Vapor pressure data on unsaturated ring compounds--Continued

No.	Formula	Name	Vapor Pressure Range, kPa[a]	Temperature Range, K	Number of Data Points	Reference Number	Authors	Year Published	Data Types[b] and Method of Measurement	Reference Citing the Same Data
23	$C_{14}H_{12}$	Biphenylethylene	0.067-1.333	350.15-407.15	5	1	API 42	1966	A,	
24	$C_{14}H_{14}$	1,1-Diphenylethane	0.067-1.333	348.65-404.65	5	1	API 42	1966	A,	
25	$C_{14}H_{14}$	1,2-Diphenylethane	0.067-1.333	354.15-411.65	5	1	API 42	1966	A,	
			0.017-1.498	333.15-413.15	17	56	Osborn, A. G. et al	1980	A, Static	
26	$C_{14}H_{20}$	2-Butyltetralin	0.067-1.333	354.65-410.65	5	1	API 42	1966	A,	
27	$C_{14}H_{20}$	1-Cyclohexyl-1-phenylethane	0.067-1.333	345.15-399.65	5	1	API 42	1966	A,	
28	$C_{14}H_{20}$	2-Cyclohexyl-1-phenylethane	0.067-1.333	348.15-406.15	5	1	API 42	1966	A,	
29	$C_{14}H_{20}$	3-Cyclopentyl-1-phenylpropane	0.067-1.333	348.15-406.15	5	1	API 42	1966	A,	
30	$C_{14}H_{26}$	1,1-Dicyclohexyl-ethane	0.067-1.333	346.15-402.15	5	1	API 42	1966	A,	
31	$C_{14}H_{26}$	1,2-Dicyclohexyl-ethane	0.067-1.333	347.65-402.15	5	1	API 42	1966	A,	

[a] 1 kPa = 7.50062 torr (mmHg)

[b] A = Experimental Data Measured by the Authors(s) of the Reference
B = Experimental Data collected from Literature by the Author(s) of the Reference
C = Calculated Values from a Regressed Correlation Based on Experimental Data

Table 5. Vapor pressure data on sulfur compounds

No.	Formula	Name	Vapor Pressure Range, kPa[a]	Temperature Range, K	Number of Data Points	Reference Number	Authors	Year Published	Data Types[b] and Method of Measurement	Reference Citing the Same Data
1	C_2H_4S	Thiacyclopropane	1.333-199.98	238.55-350.06	27	2	TRCHP	1978	C	
			25.009-270.111	291.44-360.88	14	4	Boublik, T. et al	1973	B	
2	C_3H_6S	Thiacyclobutane	1.333-199.98	268.25-392.68	27	2	TRCHP	1978	C	
			19.920-270.111	321.507-404.789	15	36	Osborn,A.G. et al	1966	A,Static & Ebulliometric	4,15
3	C_4H_4S	Thiophene	1.333-199.98	260.85-381.16	30	2	TRCHP	1978	C	
			19.920-270.111	312.211-392.937	15	4	Boublik, T. et al	1973	B	6,15,9
			0.00207-4543.6	195.38-560.93	25	6	Coal Tar Res.Ass.	1965	B	9
			0.107-119.99	228.19-362.85	24	16	Timmermans, J.	1965	B	9
			44.93-172.52	333.45-373.45	5	24	Eon, C. et al	1971	A, Isoteniscopic	15
			0.133-101.33	232.45-357.55	10	41	Stull, D.R.	1947	C	
			482.6-5467.5	422.05-577.61	29	51	Kobe, K. A. et al	1956	A, Static	
4	C_4H_8S	Tetrahydrothiophene	12.95-54.93	333.45-373.45	5	24	Eon, C. et al	1971	A, Isoteniscopic	15
			1.333-199.98	287.35-420.609	27	2	TRCHP	1978	C	
5	C_4H_8S	Thiacyclopentane	1.333-199.98	287.38-420.61	27	2	TRCHP	1978	C	
			19.920-270.111	344.332-433.601	15	36	Osborn,A.G. et al	1966	A, Static & Ebulliometric	4,15,16
			11.67-122.51	331.31-401.56	19	43	White, P.T. et al	1952	A, Ebulliometric	
6	C_5H_6S	2-Methylthiophene	1.333-199.98	282.15-411.15	30	2	TRCHP	1978	C	
			17.20-71.33	333.45-373.45	5	24	Eon, C. et al	1971	A, Isoteniscopic	15
			0.133-101.33	245.75-385.65	10	41	Stull, D. R.	1947	C	9
7	C_5H_6S	3-Methylthiophene	1.333-199.98	284.15-414.15	30	2	TRCHP	1978	C	
			15.47-65.33	333.45-373.45	5	24	Eon, C. et al	1971	A, Isoteniscopic	15
			0.133-101.33	248.65-388.55	10	41	Stull, D.R.	1947	C	
8	$C_5H_{10}S$	Cyclopentanethiol	19.920-270.111	354.024-445.933	15	36	Osborn,A.G. et al	1966	A,State & Ebulliometric	4
9	$C_5H_{10}S$	2-Methylthiacyclo-pentane	1.333-199.98	295.87-432.811	27	2	TRCHP	1978	C	
			9.582-270.111	335.783-446.240	21	36	Osborn,A.G. et al	1966	A,Static & Ebulliometric	4,15
			11.64-116.28	340.94-411.49	18	43	White, P.T. et al	1952	A, Ebulliometric	9

Table 5. Vapor pressure data on sulfur compounds--Continued

No.	Formula	Name	Vapor Pressure Range, kPa[a]	Temperature Range, K	Number of Data Points	Reference Number	Authors	Year Published	Data Types[b] and Method of Measurement	Reference Citing the Same Data
10	$C_5H_{10}S$	3-Methylthiacyclo-pentane	1.333-199.98	300.25-439.026	27	2	TRCHP	1978	C	
			9.582-270.111	340.690-452.626	21	36	Osborn, A.G.et al	1966	A, Static & Ebulliometric	4,15
			11.68-133.03	345.71-422.38	20	43	White, P.T. et al	1952	A, Ebulliometric	9
11	$C_5H_{10}S$	Thiacyclohexane	1.333-199.98	302.35-443.15	27	2	TRCHP	1978	C	
			13.332-101.33	351.43-414.90	5	4	Boublik, T. et al	1973	B	15
			11.65-129.10	348.01-422.16	17	43	White, P.T. et.al	1952	A, Ebulliometric	9
12	$C_6H_{10}S$	Benzenethiol	1.333-199.98	325.43-471.102	27	2	TRCHP	1978	C	
			19.920-270.111	387.693-485.310	15	36	Osborn, A.G. et al	1966	A, Static & Ebulliometric	4,15
			0.133-101.33	291.75-441.15	10	41	Stull, D.R.	1947	C	
			2.000-101.33	339.15-441.15	9	9	Haines, W.E. et al	1963	B	
13	C_6H_8S	2,5-Dimethylthiaphene	7.40-34.26	333.45-373.45	5	24	Eon, C. et al	1971	A, Isoteniscopic	
14	C_6H_8S	2-Ethylthiophene	8.12-37.33	333.45-373.45	5	24	Eon, C. et al	1971	A, Isoteniscopic	
15	$C_6H_{12}S$	Cyclohexanthiol	9.582-270.111	356.89-475.80	21	36	Osborn, A.G. et al	1966	A, Static & Ebulliometric	4, 15
			1.60-101.32	314.15-431.15	6	9	Haines, W.E. et al	1963	B	
16	$C_6H_{12}S$	2,cis-5-Dimethyl-thiacyclopentane	1.333-199.98	303.15-444.15	27	2	TRCHP	1978	C	
			11.65-133.01	348.86-426.37	19	43	White, P.T. et al	1952	A, Ebulliometric	9
17	$C_6H_{12}S$	2,trans-5-Dimethyl-thiacyclopentane	1.333-199.98	302.15-443.15	27	2	TRCHP	1978	C	
			11.65-59.39	348.05-395.82	13	43	White, P.T. et al	1952	A, Ebulliometric	9
18	$C_6H_{12}S$	2-Methylthiacyclo-hexane	1.333-199.98	309.15-455.15	30	2	TRCHP	1978	C	
			11.65-133.10	356.84-437.32	20	43	White, P.T. et al	1952	A, Ebulliometric	9
19	$C_6H_{12}S$	3-Methylthiacyclo-hexane	1.333-199.98	313.15-460.15	30	2	TRCHP	1978	C	
			11.65-91.59	361.23-427.18	15	43	White P.T. et al	1952	A, Ebulliometric	9
20	$C_6H_{12}S$	4-Methylthiacyclo-hexane	1.333-199.98	314.15-461.15	30	2	TRCHP	1978	C	
			11.65-122.01	361.66-439.37	19	43	White, P.T. et al	1952	A, Ebulliometric	9

Table 5. Vapor pressure data on sulfur compounds--Continued

No.	Formula	Name	Vapor Pressure Range, kPa[a]	Temperature Range, K	Number of Data Points	Reference Number	Authors	Year Published	Data Types[b] and Method of Measurement	Reference Citing the Same Data
21	C_7H_8S	2-Methylbenzenthiol	1.333-199.98	343.15-498.15	27	2	TRCHP	1978	C	
22	C_7H_8S	3-Methylbenzenthiol	1.333-199.98	345.15-498.15	27	2	TRCHP	1978	C	
23	C_7H_8S	4-Methylbenzenthiol	1.333-199.98	343.15-499.15	27	2	TRCHP	1978	C	
24	C_7H_8S	1-Thiaethylbenzene	9.582-120.798	390.296-474.772	16	36	Osborn, A.G. et al	1966	A, Static & Ebulliometric. 4	
			0.800-98.26	332.2-467.2	10	9	Haines, W.E. et al	1963	B	
25	$C_{10}H_8S$	1-Naphthalenethiol	0.200-101.33	379.15-559.15	8	9	Haines, W.E. et al	1963	B	
26	$C_{10}H_8S$	2-Naphthalenethiol	1.373-101.33	419.45-559.15	6	9	Haines, W.E. et al	1963	B	
27	$C_{12}H_8S$	Dibenzothiophene	0.471-105.902	424.81-607.53	19	75	Sivaraman,A. et al	1982	A, Static	
28	$C_{12}H_8S$	Diphenylthaimethane	0.00267-101.33	368.2-569.2	17	9	Haines, W.E. et al	1963	B	

[a] 1 kPa = 7.50062 torr (mmHg)

[b] A = Experimental Data Measured by the Author(s) of the Reference
B = Experimental Data Collected from Literature by the Author(s) of the Reference
C = Calculated Values from a Regressed Correlation Based on Experimental Data

Table 6. Vapor pressure data on nitrogen compounds-I

No.	Formula	Name	Vapor Pressure Range, kPa[a]	Temperature Range, K	Number of Data Points	Reference	Authors	Year Published	Data Types, Methods of Measurement[b]	Reference Citing the Same Data Set
1	C_2H_5N	Aziridine	0.001 ~ 9363.2	175.~520.	70	8	Eng. Sci. Data Unit	1978	C	
2	C_3H_7N	Azetidine	0.001~8539.7	180.~545.	74	8	Eng. Sci. Data Unit	1978	C	
3	C_4H_5N	Pyrrole	0.031~5832.3	250.~635.	78	8	Eng. Sci. Data Unit	1978	C	
			8.39~42.26	333.5~373.5	5	24	Eon, C., et al.	1971	A, Isoteniscopic	15
			9.582~270.11	338.82~439.26	21	35	Osborn, A.G., et al.	1968	A, Static & Ebull.	4, 15, 39
			359.~2034.	450.~544.	18	51	Kobe, K.A., et al.	1956	A, Static	6
4	C_4H_9N	Pyrrolidine	19.920~270.11	316.308~394.055	15	35	Osborn, A.G., et al.	1968	A, Static & Ebull.	4, 15
			0.014~5339.1	215.~565	71	8	Eng. Sci. Data Unit	1978	C	
			531.~5461.	422.~567.	27	51	Kobe, K.A., et al.	1956	A, Static	
5	C_5H_5N	Pyridine	19.920~270.11	340.449~426.036	15	35	Osborn, A.G., et al.	1968	A, Static & Ebull.[c]	4, 15
			0.121~270.11	253.~426.04	21	6	Coal Tar Res. Ass.	1965	B	10
			0.029~5645.0	235.~620.	78	8	Eng. Sci. Data Unit	1978	C	
			8.506~101.98	320.477~388.623	22	16	Timmermans, J.	1965	B	
			462.~5433.	450.~617	31	51	Kobe, K.A., et al.	1956	A, Static	
6	C_5H_7N	1-Methylpyrrole	0.016~4790.5	230.~595	74	8	Eng. Sci. Data Unit	1978	C	
			16.5~71.1	333.5~373.5	5	24	Eon, C., et al.	1971	A, Isoteniscopic	15
			9.582~270.11	322.112~422.590	21	35	Osborn, A.G., et al.	1968	A, Static & Ebull.	4, 15
7	$C_5H_{11}N$	Piperidine	0.515~4388.7	265.~590	66	8	Eng. Sci. Data Unit	1978	C	
			3.04~101.	292.65~379.49	32	16	Timmermans, J.	1965	B	
			9.580~270.07	315.511~416.763	21	35	Osborn, A.G., et al.	1968	A, Static & Ebull.	4, 15
			0.667~101.3	266.2~379.2	9	41	Stull, D.R., et al.	1947	C	10
8	C_6H_7N	Aniline	6.807~104.59	375.74~458.30	7	4	Boublik, T., et al.	1973	B	
			0.0075~129.7	267.3~467.2	15	6	Coal Tar Res. Ass.	1965	B	10
			0.008~5165.0	270.~695.	86	8	Eng. Sci. Data Unit	1978	C	
			6.786~101.8	375.95~457.60	45	16	Timmermans, J.	1965	B	
			0.1333~2000.0	300.0~699.2	19	17	Vargaftik, M.D.	1975	B	
			0.133~101.3	308.0~457.6	10	41	Stull, D.R.	1947	C	10
			2.67~5281.83	350.55~699.15	18		Yaw, C.L.	1978	C	
9	C_6H_7N	2-Methylpyridine	19.920~270.11	352.944~441.506	15	35	Osborn, A.G., et al.	1968	A, Static & Ebull.	4, 15, 16
			0.8~9.3	289.0~335.0	8	6	Coal Tar Res. Ass.	1965	B	
			0.001~4545.9	210.~620.0	83	8	Eng. Sci. Data Unit	1978	C	
			10.66~103.10	337.513~403.187	28	16	Timmermans, J.	1965	B	4, 15
			0.133~101.3	262.1~402.0	10	41	Stull, D.R.	1947	C	10
			16.31~101.1	359.7~417.1	12	68	Coulson, E., et al.	1946	A, Isoteniscopic	10
10	C_6H_7N	3-Methylpyridine	9.582~270.11	347.186~457.718	21	35	Osborn, A.G., et al.	1968	A, Static & Ebull.	4, 6, 15, 16
			0.035~4650.0	255.~645	84	8	Eng. Sci. Data Unit	1978	C	
			12.87~103.99	354.432~418.251	20	16	Timmermans, J.	1965	B	4, 15
			15.71~100.9	359.8~418.4	12	68	Coulson, E.A., et al.	1946	A, Isoteniscopic	10
11	C_6H_7N	4-Methylpyridine	0.234~4548.2	280.~645.	74	8	Eng. Sci. Data Unit	1978	C	
			10.35~101.59	350.056~418.612	21	16	Timmermans, J.	1965	B	4, 15
			9.582~270.11	348.202~459.085	21	35	Osborn, A.G., et al.	1968	A, Static & Ebull.	4, 6, 15, 16
12	C_6H_9N	2,5-Dimethylpyrrole	0.002~5037.7	255.~660.	82	8	Eng. Sci. Data Unit	1978	C	
			9.582~232.09	373.710~472.389	20	35	Osbon, A.G., et al.	1968	A, Static & Ebull.	4
13	$C_6H_{13}N$	Cyclohexylamine	7.843~86.06	333.87~401.52	15	16	Timmermans, J.	1965	B	15
14	$C_6H_{13}N$	2-Methylpiperidine	0.443~3666.3	270.~595.	66	8	Eng. Sci. Data Unit	1978	C	
			9.582~270.11	324.630~430.679	21	35	Osborn, A.G., et al.	1968	A, Static & Ebull.	4, 15
15	C_7H_9N	Benzylamine	0.001~4745.4	250.~685.	88	8	Eng. Sci. Data Unit	1978	C	
			0.133~101.3	302.2~457.7	10	41	Stull, D.R.	1947	C	
16	C_7H_9N	2-Ethylpyridine	0.001~3908.2	220.~630.	83	8	Eng. Sci. Data Unit	1978	C	
17	C_7H_9N	3-Ethylpyridine	0.001~3955.2	225.~660.	88	8	Eng. Sci. Data Unit	1978	C	
18	C_7H_9N	4-Ethylpyridine	0.001~3962.8	230.~660.	87	8	Eng. Sci. Data Unit	1978	C	
19	C_7H_9N	2,3-Dimethylpyridine	0.019~4086.3	260.~655.	80	8	Eng. Sci. Data Unit	1978	C	
			14.583~104.70	372.693~435.562	22	16	Timmermans, J.	1965	B	4
20	C_7H_9N	2,4-Dimethylpyridine	2.3~5.6	325.7~344.7	2	6	Coal Tar Res. Ass.	1965	B	
			0.025~3862.5	260.~645.	78	8	Eng. Sci. Data Unit	1978	C	
			6.237~105.18	349.396~432.975	27	16	Timmermans, J.	1965	B	4, 15
21	C_7H_9N	2,5-Dimethylpyridine	0.026~3686.8	260.~640.	77	8	Eng. Sci. Data Unit	1978	C	
			9.567~102.11	358.248~430.449	27	16	Timmermans, J.	1965	B	4, 15
22	C_7H_9N	2,6-Dimethylpyridine	0.106~3721.5	270.~620.	71	8	Eng. Sci. Data Unit	1978	C	
			11.607~102.02	352.44~417.45	24	16	Timmermans, J.	1965	B	4, 6, 15
			18.89~100.7	342.2~417.0	10	68	Coulson, E.A., et al.	1946	A, Isoteniscopic	10
23	C_7H_9N	3,4-Dimethylpyridine	86.880~104.46	446.254~453.499	12	4	Boublik, T., et al.	1973	B	15
			0.019~3955.1	270.~680.	83	8	Eng. Sci. Data Unit	1978	C	
24	C_7H_9N	3,5-Dimethylpyridine	79.928~103.46	436.000~445.879	11	4	Boublik, T., et al.	1973	B	15
			0.018~3847.1	265.~665.	81	8	Eng. Sci. Data Unit	1978	C	
25	C_7H_9N	N-Methylaniline	0.453~111.28	323.15~472.76	26	4	Boublik, T., et al.	1973	B, Isoteniscopic	10, 66
			0.001~4693.7	255.~700.	80	8	Eng. Sci. Data Unit	1978	C	
			0.133~101.33	309.15~468.65	10	41	Stull, D.R.	1947	C	
26	C_7H_9N	2-Methylaniline	7.605~101.33	391.61~473.45	7	4	Boublik, T., et al.	1973	B	6, 15, 16
			0.133~6.67	319.4~388.3	50	6	Coal Tar Res. Ass.	1965	B	16
			0.001~4649.8	260.~710.	91	8	Eng. Sci. Data Unit	1978	C	
			0.27~113.3	313.~473.		67	Berliner, J.F.T., et al	1927	A&C, Isoteniscopic	10
27	C_7H_9N	3-Methylaniline	7.605~101.33	394.92~476.49	7	4	Boublik, T., et al.	1973	B	6, 15
			0.133~6.67	323.0~391.9	50	6	Coal Tar Res. Ass.	1965	B	16
			0.001~4399.1	260.~705.	90	8	Eng. Sci. Data Unit	1978	C	
			0.27~113.3	313.~473.		67	Berliner, J.F.T., et al.	1927	A&C, Isoteniscopic	10
28	C_7H_9N	4-Methylaniline	0.133~101.33	320.1~473.6	65	6	Coal Tar Res. Ass.	1965	B	16
			0.001~4443.4	260.~700.	89	8	Eng. Sci. Data Unit	1978	C	
			0.27~113.2	313.~473.		67	Berliner, J.F.T., et al.	1927	A&C, Isoteniscopic	10
29	$C_7H_{14}N$	2-Methyl-5-vinylpyridine	1.467~100.93	342.77~456.34	8	4	Boublik, T., et al.	1973	B	
			0.001~3650.0	240.~675.	88	8	Eng. Sci. Data Unit	1978	C	
30	$C_8H_{11}N$	N-Ethylaniline	0.001~3862.7	260.~695.	88	8	Eng. Sci. Data Unit	1978	C	
			0.133~6.67	322.2~392.4	50	16	Timmermans, J.	1965	B	
			0.133~101.33	311.7~477.2	10	41	Stull, D.R.	1947	C	
			0.32~106.1	323.2~479.9	32	66	Nelson, O.A., et al.	1925	A, Isoteniscopic	
31	$C_8H_{11}N$	4-Ethylaniline	0.001~3850.1	270.~715.	90	8	Eng. Sci. Data Unit	1978	C	
			0.133~101.33	325.2~490.6	10	41	Stull, D.R.	1947	C	
32	$C_8H_{11}N$	N,N-Dimethylaniline	0.010~3721.2	275.~685.	83	8	Eng. Sci. Data Unit	1978	C	
			0.67~101.7	334.8~467.7	15	16	Timmermans, J.	1965	B	
			0.133~101.33	302.7~466.3	10	41	Stull, D.R.	1947	C	
			0.32~109.6	313.2~469.93	29	66	Nelson, O.A., et al.	1925	A, Isoteniscopic	10
33	$C_8H_{11}N$	2,4-Dimethylaniline	0.009~3820.3	290.~715.	85	8	Eng. Sci. Data Unit	1978	C	
			0.133~101.33	325.8~484.7	10	41	Stull, D.R.	1947	C	
34	$C_8H_{11}N$	2,6-Dimethylaniline	0.005~4107.4	285.~720.	88	8	Eng. Sci. Data Unit	1978	C	
			0.133~101.33	317.2~491.1	10	41	Stull, D.R.	1947	C	
35	$C_8H_{11}N$	2-Methyl-5-ethylpyridine	0.800~101.06	325.05~449.81	14	4	Boublik, T., et al.	1973	B	
			0.001~3272.6	235.~660.	86	8	Eng. Sci. Data Unit	1978	C	
			0.00360~0.0273	252.76~275.85	6	42	van De Rostyne,C.,et al.	1980	A, Gas-saturation	
36	$C_8H_{11}N$	2,4,6-Trimethylpyridine	0.001~3200.0	230.~645.	84	8	Eng. Sci. Data Unit	1978	C	
37	$C_8H_{17}N$	2-Methyl-5-ethylpiperidine	0.023~3232.8	260.~640.	77	8	Eng. Sci. Data Unit	1978	C	

Table 6. Vapor pressure data on nitrogen compounds-I--Continued

No.	Formula	Name	Vapor Pressure Range, kPa[a]	Temperature Range, K	Number of Data Points	Reference	Authors	Year Published	Data Types , Methods of Measurement[b]	Reference Citing the Same Data Set
38	C_9H_7N	Isoquinoline	13.412~102.29	439.93~516.85	40	4	Boublik, T., et al.	1973	B	15
			0.80~101.33	373.9~513.3	14	6	Coal Tar Res. Ass.	1965	B	
			0.009~4479.0	300.~800.	201	8	Eng. Sci. Data Unit	1978	C	
			0.133~101.3	336.7~513.7	10	41	Stull, D.R.	1947	C	10
39	C_9H_7N	Quinoline	15.399~102.02	437.82~511.09	28	4	Boublik, T., et al.	1973	B	15
			0.340~101.3	348.5~510.7	24	6	Coal Tar Res. Ass.	1965	B	10
			0.001~3731.5	265.~780.	204	8	Eng. Sci. Data Unit	1978	C	
			0.340~99.37	348.5~509.80	69	16	Timmermans, J.	1965	B	
			0.00385~0.0243	285.77~309.05	8	42	van De Rostyne,C.,et al.	1980	A, Gas-saturation	
			164.1~2806.2	533.15~727.59	8	73	Wilson, G. M. et al.	1981	A, Static	
			0.133~101.3	332.9~510.9	10	41	Stull, D.R.	1947	C	10
40	$C_9H_{13}N$	4-Cumidine	0.133~101.3	333.15~500.15	10	41	Stull, D.R.	1947	C	10
41	$C_9H_{13}N$	4-Isopropylaniline	0.003~3238.6	280.~715.	88	8	Eng. Sci. Data Unit	1978	C	
42	$C_9H_{13}N$	N,N,2-Trimethylaniline	0.001~3223.7	245.~665.	85	8	Eng. Sci. Data Unit	1978	C	
			0.667~13.33	327.3~391.3	47	16	Timmermans, J.	1965	B	
			0.133~101.3	302.0~458.0	10	41	Stull, D.R.	1947	C	
43	$C_9H_{13}N$	N,N,4-Trimethylaniline	0.001~3750.0	265.~695.	87	8	Eng. Sci. Data Unit	1978	C	
			0.133~101.3	323.3~482.7	10	41	Stull, D.R.	1947	C	
44	$C_9H_{13}N$	2,4,5-Trimethylaniline	0.154~3500.0	340.~725.	78	8	Eng. Sci. Data Unit	1978	C	
			0.133~101.33	341.6~507.7	10	41	Stull, D.R.	1947	C	15
45	$C_{10}H_9N$	3-Methylisoquiroline	12.27~104.66	449.46~527.74	25	4	Boublik, T., et al.	1973	B	15
			0.001~4956.9	285.~805.	205	8	Eng. Sci. Data Unit	1978	C	
46	$C_{10}H_9N$	2-Methylquinoline	0.001~4800.8	280.~785.	202	8	Eng. Sci. Data Unit	1978	C	
			0.133~101.33	348.45~519.65	10	41	Stull, D.R.	1947	C	10, 15
47	$C_{10}H_9N$	4-Methylquinoline	0.001~4554.4	295.~795.	201	8	Eng. Sci. Data Unit	1978	C	
48	$C_{10}H_9N$	6-Methylquinoline	16.719~101.75	471.73~538.97	22	4	Boublik, T., et al.	1973	B	15
			12.73~103.71	459.64~539.29	26	4	Boublik, T., et al.	1973	B	15
			0.001~3628.2	290.~795.	202	8	Eng. Sci. Data Unit	1978	C	
49	$C_{10}H_9N$	7-Methylquinoline	63.168~101.90	511.~531.15	17	4	Boublik, T., et al.	1973	B	15
			0.001~4654.7	290.~790.	201	8	Eng. Sci. Data Unit	1978	C	
50	$C_{10}H_9N$	8-Methylquinoline	61.723~101.87	500.48~521.30	16	4	Boublik, T., et al.	1973	B	15
			0.001~4950.8	280.~790.	203	8	Eng. Sci. Data Unit	1978	C	
51	$C_{10}H_9N$	1-Naphthylamine	0.005~385.56	325.~645.	65	8	Eng. Sci. Data Unit	1978	C	
52	$C_{10}H_9N$	2-Naphthylamine	0.161~351.60	385.~645.	53	8	Eng. Sci. Data Unit	1978	C	
53	$C_{10}H_9N$	Quinaldine	15.225~101.62	451.45~521.01	41	4	Boublik, T., et al.	1973	B	
			0.00143~0.0180	281.90~312.64	9	42	van De Rostyne,C.,et al.	1980	A, Gas-saturation	
54	$C_{10}H_{15}N$	N,N-Diethylaniline	0.001~1684.2	265.~645.	77	8	Eng. Sci. Data Unit	1978	C	
			0.133~101.33	322.9~488.7	10	41	Stull, D.R.	1947	C	15
			0.213~106.6	323.2~491.55	30	66	Nelson, O.A., et al.	1925	A, Isoteniscopic	
55	$C_{11}H_{11}N$	2,4-Dimethylquinoline	11.79~106.53	458.5~542.60	19	4	Boublik, T., et al.	1973	B	15
			0.001~3826.2	295.~805.	203	8	Eng. Sci. Data Unit	1978	C	
56	$C_{11}H_{11}N$	2,6-Dimethylquinoline	13.416~100.66	461.61~539.44	27	4	Boublik, T., et al.	1973	B	15
			0.001~3753.3	290.~800.	203	8	Eng. Sci. Data Unit	1978	C	
57	$C_{12}H_9N$	Carbazol	9.346~107.62	525.76~630.86	34	4	Boublik, T., et al.	1973	B	10, 15
			7.33~99.19	518.0~625.2	18	6	Coal Tar Res. Ass.	1965	B	
58	$C_{12}H_{11}N$	Diphenylamine	0.003~555.48	330.~670.	69	8	Eng. Sci. Data Unit	1978	C	
			60.00~72.26	551.~558.	8	16	Timmermans. J.	1965	B	
			0.133~101.33	381.45~575.15	10	41	Stull, D.R.	1947	C	
59	$C_{13}H_9N$	Acridine	0.65x10^-4~1.07x10^-3	281.11~323.15	11	29	McEachern, D.M., et al.	1975	A	10
60	$C_{13}H_{13}N$	N-Methyldiphenylamine	0.133~101.33	402.6~619.2	10	41	Stull, D.R.	1947	C	6, 10,15
			0.133~101.33	376.7~555.2	10	41	Stull, D.R.	1947	C	
61	$C_{14}H_{13}N$	N-Ethylcarbazol	0.00247~0.0147	347.81~373.80	7	42	van De Rostyne,C.,et al.	1980	A, Gas-saturation	
62	$C_{14}H_{15}N$	N-Ethyldiphenylamine	0.001~583.05	310.~670.	73	8	Eng. Sci. Data Unit	1978	C	
63	$C_{14}H_{15}N$	Dibenzylamine	0.001~492.57	320.~670.	71	8	Eng. Sci. Data Unit	1978	C	
			0.133~101.33	391.5~573.2	10	41	Stull, D.R.	1947	C	
64	$C_{19}H_{17}N$	N-Methyldiphenylaniline	0.001~623.62	310.~670.	73	8	Eng. Sci. Data Unit	1978	C	

[a] 1 kPa = 7.50062 torr (mm Hg).

[b] A = experimental data measured by the author(s) of the reference.
B = experimental data collected from literature by the author(s) of the reference.
C = calculated values from a regressed correlation based on experimental data.

[c] Ebull. = Ebulliometric

Table 7. Vapor pressure data on nitrogen compounds-II

No.	Formula	Name	Vapor Pressure Range, kPa[a]	Temperature Range, K	Number of Data Points	Reference	Authors	Year Published	Data Types[b], Methods of Measurement
1	$C_4H_4N_2$	Pyrazine	12.755~5673.0	330.~620.	59	8	Eng. Sci. Data Unit	1978	C
2	$C_4H_{10}N_2$	Piperazine	0.165~4553.3	270.~655.	61	8	Eng. Sci. Data Unit	1978	C
3	$C_5H_6N_2$	2-Methylpyrazine	2.392~4777.6	310.~630.	65	8	Eng. Sci. Data Unit	1978	C
4	$C_5H_{12}N_2$	1-Methylpiperazine	0.001~4550.0	230.~630.	81	8	Eng. Sci. Data Unit	1978	C
5	$C_6H_8N_2$	1,3-Diaminobenzene	0.012~1587.7	340.~720	77	8	Eng. Sci. Data Unit	1978	C
6	$C_6H_8N_2$	1,3-Phenylenediamine	0.133~101.33	373.0~558.7	10	41	Stull, D.R.	1947	C
7	$C_6H_8N_2$	Phenylhydrazine	0.133~101.33	345.~491.4	10	41	Stull, D.R.	1947	C
			..137~12.00	373.~465.		69	Williams, G.E., et al.	1942	A&C, Isoteniscopic
8	$C_6H_{14}N_2$	cis-2,5-Dimethylpiperazine	0.103~3000.0	290.~635.	70	8	Eng. Sci. Data Unit	1978	C
9	$C_7H_{10}N_2$	4-Amino-2,6-dimethylpyridine	20.251~3820.7	460.~745.	58	8	Eng. Sci. Data Unit	1978	C
10	$C_7H_{10}N_2$	2,4-Diamirotoluene	0.091~1440.6	375.~720.	70	8	Eng. Sci. Data Unit	1978	C
11	$C_8H_{18}N_2$	Tetramethylpiperazine	0.001~2488.2	295.~645.	71	8	Eng. Sci. Data Unit	1978	C
			0.133~101.33	296.9~456.7	10	41	Stull, D.R.	1947	C
12	$C_{10}H_{14}N_2$	1-Phenylpiperazine	0.001~561.33	300.~655.	72	8	Eng. Sci. Data Unit	1978	C
13	$C_{12}H_8N_2$	Phenazine	0.48×10^{-6}~6.23×10^{-5}	281.11~323.15	12	29	McEachern, D.M., et al.	1975	A (solid)
14	$C_{12}H_{10}N_2$	Azobenzene	0.133~101.33	376.7~566.2	10	41	Stull, D.R.	1947	C
15	$C_{13}H_{14}N_2$	Di-(4-aminophenyl)-methane	0.001~325.17	375.~720.	70	8	Eng. Sci. Data Unit	1978	C
16	C_3H_3NO	Isoxazole	0.001~3741.8	195.~550.	72	8	Eng. Sci. Data Unit	1978	C
17	C_3H_3NO	Oxazole	0.001~3629.1	180.~510.	67	8	Eng. Sci. Data Unit	1978	C
18	$C_6H_5NO_3$	2-Nitrophenol	0.133~101.33	322.5~487.7	10	41	Stull, D.R.	1947	C

[a] 1 kPa = 7.50062 torr (mm Hg)

[b]
A = experimental data measured by the author(s) of the reference.
B = experimental data collected from literature by the author(s) of the reference.
C = calculated values from a regressed correlation based on experimental data.

Table 8. Vapor pressure data on oxygen compounds-I

No.	Formula	Name	Vapor Pressure Range, kPa[a]	Temperature Range, K	Number of Data Points	Reference Numbers	Author(s)	Year Published	Data Types and Method of Measurement[b]	Reference Citing the Same Data
1	C_4H_4O	Furan	31.16~270.11	275.702~334.580	13	4	Boublik, T., et al.	1973	B	
			0.082~5500.	193.15~480.25	27	14	Kudchadker, A.P., et al.	1978	B	
			627.4~5012.5	366.50~483.17	22	51	Kobe, K.A., et al.	1956	A, Static	
2	C_4H_6O	Cyclobutanone	0.267~5.760	249.09~298.39	11	4	Boublik, T., et al.	1973	B	15
3	C_4H_8O	Tetrahydrofuran	19.92~270.11	296.289~372.850	15	4	Boublik, T., et al.	1973	B	15
			1.954~5130.	253.15~540.15	25	14	Kudchadker, A.P., et al.	1978	C	
			434.4~5053.8	394.28~538.72	27	51	Kobe, K.A., et al.	1956	A, Static	
4	C_5H_6O	2-Methylfuran	86.13~283.98	333.45~373.45	5	24	Fon, C., et al.	1971	A, Isoteniscopic	15
			358.5~4722.9	383.17~527.61	27	51	Kobe, K.A., et al.	1956	A, Static	
5	C_5H_8O	Cyclopentanone	0.307~1.600	273.09~298.79	4	4	Boublik, T., et al.	1973	B	15
6	$C_5H_{10}O$	2-Methyltetrahydrofuran	634.3~3557.8	427.61~533.17	20	51	Kobe, K.A., et al.	1956	A, Static	
7	C_6H_6O	Phenol	1.333~199.98	345.72~481.57	27	2	TRCHP	1978	C	
			7.605~101.33	380.30~454.90	6	4	Boublik, T., et al.	1973	B	15
			0.00373~102.27	273.15~455.33	33	6	Coal Tar Res. Ass.	1965	B	10
			0.0104~6130.	283.2~694.25	20	11	Kudchadker, A.P., et al.	1977	C	
			0.00667~6.666	278.55~377.85	79	16	Timmermans, J.	1965	B	
			0.93~593751	340.95~693.15		18	Jaws, C.	1978	C	
			0.133~6078	313.25~691.85	19	41	Stull, D.R.	1947	C	10
8	$C_6H_{10}O$	Cyclohexanone	12.725~131.422	362.78~438.92	16	31	Meyer, E.F., et al.	1973	A, Ebulliometric	15
			0.133~101.33	274.55~428.75	10	41	Stull, D.R.	1947	C	
9	$C_6H_{12}O$	Cyclohexanol	0.133~101.33	294.15~434.15	10	41	Stull, D.R.	1947	C	
			7.843~99.192	366.88~433.85	16	15	Shuzo, O.	1976	B	
10	$C_6H_{12}O$	2-Hexanone	0.133~101.33	280.85~400.65	10	41	Stull, D.R.	1947	C	
	$C_7H_6O_2$	Benzoic Acid	9.479~97.329	466.85~521.95	7	16	Timmermans, J.	1965	B	
			0.133~101.33	369.15~522.35	10	41	Stull, D.R.	1947	C	
12	C_7H_8O	Methoxybenzene (Anisole)	6.287~67.661	346.49~412.52	6	16	Timmermans, J.	1965	B	15, 17
13	C_7H_8O	Benzylalcohol	0.133~67.661	334.05~463.65	19	16	Timmermans, J.	1965	B	15
14	C_7H_8O	2-Hydroxytoluene (2-Cresol)	1.333~199.98	350.10~492.06	27	2	TRCHP	1978	C	
			10.11~101.33	393.37~464.10	5	4	Boublik, T., et al.	1973	B	10, 15
			0.00267~104.98	273.15~465.51	26	6	Coal Tar. Res. Ass.	1965	B	
			0.007419~5010.	283.2~697.65	28	12	Kudchadker, A.P. et al.	1978	C	
			0.133~6.667	309.75~383.45	49	16	Timmermans, J.	1965	B	
			0.133~101.33	311.35~463.95	10	41	Stull, D.R.	1947	C	10
15	C_7H_8O	3-Hydroxytoluene	1.333~199.98	360.90~503.17	27	2	TRCHP	1978	C	
			20.27~98.93	422.65~474.25	12	4	Boublik, T., et al.	1973	B	10, 15
			0.00213~105.53	273.15~476.93	26	6	Coal Tar Res. Ass.	1965	B	
			0.007479~4560.	283.2~705.85	29	12	Kudchadker, A.P., et al.	1978	C	
			4.119~1124.29	388.12~595.63	15	32	Nasir, P., et al.	1980	A, Static	
			0.133~101.33	325.15~475.95	10	41	Stull, D.R.	1947	C	10
16	C_7H_8O	4-Hydroxytoluene (4-Cresol)	1.333~199.98	361.45~502.78	27	2	TRCHP	1978	C	
			8.85~101.33	401.20~475.03	6	4	Boublik, T., et al.	1973	B	10, 15
			0.00147~104.13	273.15~476.14	24	6	Coal Tar Res. Ass.	1965	B	
			0.003222~5150	283.2~704.65	29	12	Kudchadker, A. P., et al.	1978	C	
			0.133~6.667	328.85~394.45	50	16	Timmermans, J.	1965	B, Static	
			0.133~101.33	326.15~474.95	10	41	Stull, D.R.	1947	C	10
17	C_8H_6O	Coumarone	0.0107~0.1640	273.15~313.15	7	6	Coal Tar Res. Ass.	1965	B	
18	C_8H_8O	Acetophenone	1.373~3.253	352.65~370.85	39	16	Timmermans, J.	1965	B	
			0.133~101.33	310.25~475.55	10	41	Stull, D.R.	1947	C	10
19	$C_8H_{10}O$	2-Ethylphenol	1.333~101.33	359.15~480.65	19	4	Boublik, T., et al.	1973	B	6
			0.133~101.33	319.35~480.65	10	41	Stull, D.R.	1947	C	10
			0.00335~141.030	278.13~491.197	28	15	Shuzo, O.	1976	B	
20	$C_8H_{10}O$	3-Ethylphenol	1.333~101.33	370.35~491.35	19	4	Boublik, T., et al.	1973	B	6
			0.133~101.33	333.15~487.15	10	41	Stull, D.R.	1947	C	10
			0.000947~133.414	278.11~502.742	27	15	Shuzo, O.	1976	B	
21	$C_8H_{10}O$	4-Ethylphenol	1.333~101.33	374.15~491.35	19	4	Boublik, T., et al.	1973	B	6
			0.000480~133.418	278.15~502.297	26	15	Shuzo, O.	1976	B	
			0.133~101.33	332.45~492.15	10	41	Stull, D.R.	1947	C	10
22	$C_8H_{10}O$	2,3-Dimethylphenol	1.333~199.98	369.68~519.55	27	2	TRCHP	1978	C	
			1.333~105.40	357.150~491.617	41	4	Boublik, T., et al	1973	B	
			0.000314~4900.	278.2~722.95	29	13	Kudchadker, A.P., et al.,	1978	C	
			0.133~101.33	329.1~491.15	10	41	Stull, D.R.	1947	C	10
			0.00061~105.40	283.06~491.62	29	58	Andon, R.J.L., et al.	1960	A, Ebulliometric	6, 15
23	$C_8H_{10}O$	2,4-Dimethylphenol	1.333~199.98	366.02~513.04	27	2	TRCHP	1978	C	
			0.00190~4400.	278.2~707.65	29	13	Kudchadker, A.P., et al.	1978	C	
			0.133~101.33	324.95~484.65	10	41	Stull, D.R.	1947	C	10
			0.00304~104.93	282.88~485.47	30	58	Andon, R.J.L., et al.	1960	A, Ebulliometric	4, 6, 10, 15
			24.34~5005.28	431.87~727.59	18	73	Wilson, G.M., et al.	1981	A, Static	
24	$C_8H_{10}O$	2,5-Dimethylphenol	1.333~199.98	365.69~513.39	27	2	TRCHP	1978	C	
			0.000338~4900.	278.2~707.05	29	13	Kudchadker, A.P., et al.	1978	C	
			0.133~101.33	324.95~484.65	10	41	Stull, D.R.	1947	C	10
			0.00060~102.87	282.58~484.89	29	58	Andon, R.J.L., et al.	1960	A, Ebulliometric	4, 6, 15
25	$C_8H_{10}O$	2,6-Dimethylphenol	1.333~199.98	353.86~503.66	27	2	TRCHP	1978	C	
			0.00267~4300.	278.2~701.05	29	13	Kudchadker, A.P., et al.	1978	C	
			0.00260~107.738	277.90~476.68	29	58	Andon, R.J.L., et al.	1960	A, Ebulliometric	4,6, 15
26	$C_8H_{10}O$	3,4-Dimethylphenol	1.333~199.98	380.65~529.32	27	2	TRCHP	1978	C	
			0.000155~5000.	278.2~729.95	29	13	Kudchadker, A.P., et al.	1978	C	
			0.133~101.33	339.35~498.35	10	41	Stull, D.R.	1947	C	10
			0.000293~106.371	283.04~502.05	30	58	Andon, R.J.L., et al.	1960	A, Ebulliometric	4, 6, 15
27	$C_8H_{10}O$	3,5-Dimethylphenol	1.333~199.98	376.55~523.67	27	2	TRCHP	1978	C	
			0.000242~3600.	278.2~715.65	28	13	Kudchadker, A.P., et al.	1978	C	
			0.133~101.33	335.15~492.65	10	41	Stull, D.R.	1947	C	10
			0.00044~105.575	282.72~490.471	31	58	Andon, R.J.L., et al.	1960	A, Ebulliometric	4, 6, 15
28	$C_8H_{10}O$	5-Indanol	0.133~101.33	393.65~524.15	19	6	Coal Tar Res. Ass.	1965	B	
29	$C_9H_{12}O$	2-Ethylanisole	0.133~101.33	302.85~460.25	10	41	Stull, D.R.	1947	C	
30	$C_9H_{12}O$	3-Ethylanisole	0.133~101.33	306.85~469.65	10	41	Stull, D.R.	1947	C	
31	$C_9H_{12}O$	4-Ethylanisole	0.133~101.33	306.65~469.65	10	41	Stull, D.R.	1947	C	
32	$C_9H_{12}O$	3-Methyl-5-ethylphenol	1.333~101.33	384.65~506.15	19	4	Boublik, T., et al.	1973	B	6, 15
33	$C_9H_{12}O$	2-Isopropylphenol	1.333~101.33	369.05~487.65	19	4	Boublik, T., et al.	1973	B	10, 15
			0.133~101.33	329.75~487.65	10	41	Stull, D.R.	1947	C	
34	$C_9H_{12}O$	3-Isopropylphenol	0.133~101.33	335.15~501.35	10	41	Stull, D.R.	1947	C	10, 15
35	$C_9H_{12}O$	4-Isopropylphenol	1.333~101.33	381.35~501.35	19	4	Boublik, T., et al.	1973	B	10, 15
			0.133~101.33	340.15~501.35	10	41	Stull, D.R.	1947	C	
36	$C_9H_{12}O$	3-Phenyl-1-propanol	0.133~101.33	347.85~508.15	10	41	Stull, D.R.	1947	C	15
37	$C_9H_{12}O$	2-Propylphenol	1.333~101.33	377.45~494.65	19	4	Boublik, T., et al.	1973	B	15
38	$C_9H_{12}O$	4-Propylphenol	3.333~101.33	392.15~507.65	18	4	Boublik, T., et al.	1973	B	15
39	$C_9H_{12}O$	2,3,5-Trimethylphenol	26.547~133.34	459.632~520.212	17	4	Boublik, T., et al.	1973	B	15
40	$C_{10}H_8O$	1-Hydroxynaphthalene	1.333~101.33	414.65~555.65	19	4	Boublik, T., et al.	1973	B	
			0.133~101.33	367.15~555.65	10	41	Stull, D.R.	1947	C	6, 15
41	$C_{10}H_8O$	2-Hydroxynaphthalene	1.333~101.33	417.15~561.15	19	4	Boublik, T., et al.	1973	B	
			0.667~101.33	401.75~561.15	9	41	Stull, D.R.	1947	C	6, 15
42	$C_{10}H_{14}O$	4-Isobutylpheol	0.133~101.33	345.25~510.15	10	41	Stull, D.R.	1947	C	15
43	$C_{10}H_{14}O$	2-sec-Butylphenol	26.543~133.40	451.885~512.662	17	4	Boublik, T., et al.	1973	B	
			0.133~101.33	330.55~501.15	10	41	Stull, D.R.	1947	C	15
44	$C_{10}H_{14}O$	4-sec-Butylphenol	0.133~101.33	344.55~515.25	10	41	Stull, D.R.	1947	C	15
45	$C_{10}H_{14}O$	2-tert-Butylphenol	6.885~104.59	407.80~498.58	8	4	Boublik, T., et al.	1973	B	
			0.133~101.33	329.75~492.65	10	41	Stull, D.R.	1947	C	15
46	$C_{10}H_{14}O$	4-tert-Butylphenol	33.059~133.35	471.271~524.750	16	4	Boublik, T., et al.	1973	B	
			0.133~101.33	343.15~511.15	10	41	Stull, D.R.	1947	C	15
47	$C_{10}H_{14}O$	3,5-Diethylphenol	1.333~101.33	387.65~521.15	19	4	Boublik, T., et al.	1973	B	15
48	$C_{10}H_{14}O$	4-(2,1,3,3-Tetramethyl)-phenol	8.707~103.87	472.47~564.77	9	4	Boublik, T., et al.	1973	B	
49	$C_{11}H_{16}O$	2-tert-Butyl-4-cresol	0.133~101.33	343.15~505.75	10	41	Stull, D.R.	1947	C	
50	$C_{11}H_{16}O$	4-tert-Butyl-2-cresol	0.133~101.33	347.45~520.15	10	41	Stull, D.R.	1947	C	15
51	$C_{12}H_{10}O$	2-Phenylphenol	1.333~101.33	435.05~548.15	19	4	Boublik, T., et al.	1973	B	
			0.133~101.33	373.15~540.15	10	41	Stull, D.R.	1947	C	3
52	$C_{12}H_{10}O$	4-Phenylphenol	1.333~101.33	450.15~581.15	19	4	Boublik, T., et al.	1973	B	3, 15
			0.133~101.33	449.35~581.15	10	41	Stull, D.R.	1947	C	3
53	$C_{12}H_{10}O$	Phenylether	83.2~684.	523.15~643.15	13	17	Vargaftik, N.B.	1975	B	3, 15
54	$C_{12}H_{18}O$	2-tert-Butyl-4-ethyl-phenol	0.133~101.33	349.45~520.95	10	41	Stull, D.R.	1947	C	
55	$C_{12}H_{18}O$	4-tert-Butyl-2,5-Xylenol	0.133~101.33	361.35~538.45	10	41	Stull, D.R.	1947	C	
56	$C_{12}H_{18}O$	4-tert-Butyl-2,6-Xylenol	0.133~101.33	347.15~512.95	10	41	Stull, D.R.	1947	C	
57	$C_{12}H_{18}O$	6-tert-Butyl-2,4-Xylenol	0.133~101.33	341.45~509.65	10	41	Stull, D.R.	1947	C	
58	$C_{12}H_{18}O$	5-tert-Butyl-3,4-Xylenol	0.133~101.33	357.05~522.65	10	41	Stull, D.R.	1947	C	
59	$C_{12}H_{18}O$	2,4-Diisopropylphenol	1.333~101.33	395.15~528.15	19	4	Boublik, T., et al.	1973	B	
60	$C_{14}H_{14}O$	2-Phenylethylphenol	0.813~18.785	442.35~523.45	29	4	Boublik, T., et al.	1973	B	
61	$C_{14}H_{14}O$	4-Phenylethylphenol	0.560~13.186	447.55~523.65	23	4	Boublik, T., et al.	1973	B	

[a] 1 kPa = 7.50062 torr (mm Hg).

[b] A = Experimental data measured by the author(s) of the reference.
B = Experimental data collected from literature by the author(s) of the reference.
C = Calculated values from a regressed correlation based on experimental data.

TABLE 9. Vapor Pressure Data on More Oxygen Compounds - II

No.	Formula	Name	Vapor Pressure Range, kPa[a]	Temperature Range, K	Number of Data Points	Reference Number	Author(s)	Year Published	Data Types and Method of Measurement[b]	Reference citing the same Data
1	$C_6H_4O_2$	Quinone(-Benzoquinone)	0.280~2.027	259.85~278.45	4	16	Timmermans, J.	1965	B	
2	$C_6H_6O_2$	1,2-Dihydroxybenzene (Pyrocatechol)	1.333~101.33	391.65~518.65	19	4	Boublik, T., et al.	1973	B	
			0.133~101.33	377.15~518.65	10	41	Scull, D.R.	1947	C	
3	$C_6H_6O_2$	1,3-Dihydroxybenzene (Resorcinol)	1.333~101.33	424.65~549.65	19	4	Boublik, T., et al.	1973	B	
			0.133~101.33	381.55~549.65	10	41	Scull, D.R.	1947	C	6
4	$C_6H_6O_2$	1,4-Dihydroxybenzene (Hydroquinone)	1.333~101.33	432.25~559.15	19	4	Boublik, T., et al.	1973	B	
			0.787~64.301	428.15~541.05	14	16	Timmermans, J.	1965	B	6
			0.133~101.33	405.55~559.35	10	41	Scull, D.R.	1947	C	
5	$C_6H_6O_3$	Pyrogallol	1.333~101.33	450.45~582.15	19	4	Boublik, T., et al.	1973	B	
			0.133~101.33	424.85~582.15	10	41	Scull, D.R.	1947	C	
6	$C_7H_8O_2$	Guaiacol	1.333~101.33	355.15~478.15	19	4	Boublik, T., et al.	1973	B	
7	$C_{12}H_8O$	Diphenylene Oxide	1.333~101.33	398.35~558.25	19	6	Coal Tar Res. Ass.	1965	B	
8	$C_{12}H_8O$	Dibenzofuran	0.626~171.714	377.01~586.46	6	74	Nasir, P., et al.	1982	A, Static	
			5.186~291.677	435.35~618.05	19	75	Svaraman, A., et al.	1982	A, Static	
9	$C_{12}H_{10}O_2$	2,2-Diphenol	1.333~101.33	444.15~598.15	19	4	Boublik, T., et al.	1973	B	
10	$C_{12}H_8O_4$	Quinhydrone	.0004346~.0020398	317.55~333.55	6	16	Timmermans, J.	1965	B	15
11	$C_{14}H_8O_4$	Anthrarhrone	13.866~107.285	558.73~656.33	33	10	Jordan, T.E.	1954	C	

[a] 1 kPa = 7.50062 torr (mm Hg)

[b] A = Experimental data measured by the author(s) of the reference.
B = Experimental data collected from literature by the author(s) of the reference.
C = Calculated values from a regressed correlation based on experimental data.

4. Results and Discussion

The most reliable vapor pressure data points were adopted for fitting into a Cox equation for each selected compound. The equation which yielded the least deviation of the calculated vapor pressures from the experimental values by a least-squares fit was accepted to represent the vapor pressure of the given compound.

The coefficients of the Cox equations for the seven classes of compounds are presented in Tables 10–18. Also included in each table are compound number, compound name, vapor pressure range (kPa) and temperature range (K) covered, calculated vapor pressure at 400 K, absolute average deviation (AAD), number of data points, and the reference numbers for the vapor pressure data used in the fit that yielded the listed coefficients.

As indicated in the tables, there are many cases where more than 100 data points were employed for fitting into a Cox equation for one compound. The average value of AAD for benzene and its derivatives is 0.37% which is excellent. The corresponding value for sulfur and nitrogen compounds is 0.39% and 0.45%, respectively. This value is higher for the other classes of compounds, probably due to the poor quality of the vapor pressure data employed for fitting.

The Cox equation can be used to fit a wide range of vapor pressures with reasonable precision (see Tables 10, 15, and 16). Using the listed coefficients of the Cox equation, we calculated the vapor pressure at 400 K for each compound as examples.

The vapor pressures of benzene were listed in TRC Hydrocarbon Project Tables as k, kb, and k-E Tables. The k table covered the temperature range from 263.74 to 377 K; while the kb table covered 368.15–543.15 K. The k-E table presented the vapor pressures of benzene (in lb in.$^{-2}$) in the temperature range from 10–220 °F.[2] The vapor pressures in the k table were represented by an Antoine equation. Those in the kb table were represented by a modified Antoine equation.

A consistent set of vapor pressures for benzene was reported by Ambrose *et al.*[33,35] and was fitted to a Chebyshev polynomial.[8] However, it is not convenient to obtain dP/dT from the Chebyshev polynomial vapor pressure equation for calculating enthalpy of vaporization (ΔH_v) using the Clapeyron equation.

Based upon the Cox equation, the values of dP/dT and $-[d(\ln P)/d(1/T)]$ may be obtained as follows[19]:

$$\frac{dP}{dT} = 2.303P\left[\frac{D}{T^2} + \left(1 - \frac{D}{T}\right)(2.303B + 4.606CT)\right] \times \exp[2.303(A + BT + CT^2)],$$

and

$$-\frac{d(\ln P)}{d(1/T)} = 2.303\left[D + \left(1 - \frac{D}{T}\right)(2.303BT^2 + 4.606CT^3)\right] \times \exp[2.303(A + BT + CT^2)],$$

where the quantities A, B, C, and D are known from the Cox equation.

TABLE 10. Coefficients of vapor pressure equation and the calculated vapor pressures at 400 K for benzene and its derivatives

No.	Name	$\log_{10} P = (1 - D/T) \times 10^{(A + BT + CT^2)}$[a] A	B x 10^4	C x 10^7	D	Vapor Pressure Range, kPa	Temperature Range, K	Calculated Vapor Pressure kPa at 400.0 K	AAD[b] %	Number of Data	Data Reference Numbers
1	Benzene	0.832632	-6.72598	6.38324	353.214	5.13 ~ 4924.0	280.0~562.6	352.73	0.171	131	8, 17, 24, 35, 55
2	Toluene	0.837122	-6.48791	5.91293	383.737	0.119 ~ 4016.3	245.0~590.0	157.35	0.133	120	8, 52, 56, 60
3	Styrene	0.886470	-8.14267	7.57896	418.675	0.288 ~ 100.51	281.35~417.92	60.424	0.854	21	6
4	Ethylbenzene	0.859833	-6.85948	5.94439	409.229	0.0204 ~ 3507.0	243.2~615.0	78.549	0.424	127	8, 17, 56
5	2-Methyltoluene	0.855257	-6.48662	5.53883	417.496	0.0324 ~ 3808.0	253.2~631.64	62.263	0.347	127	8, 17, 56
6	3-Methyltoluene	0.858941	-6.73249	5.87438	412.135	0.0169 ~ 3650.0	243.2~619.2	72.326	0.513	156	6, 8, 17, 56
7	4-Methyltoluene	0.847730	-6.39489	5.59094	411.503	0.74 ~ 3617.0	290.0~618.2	73.728[c]	0.103	112	8, 17,56
8	2-Methylstyrene	0.890379	-7.17666	5.97058	443.504	0.387 ~ 17.70	305.16~385.5	28.979	0.145	9	4
9	3-Methylstyrene	0.885861	-7.19653	6.75359	442.985	0.687 ~ 99.725	314.93~442.15	28.811	0.774	27	4
10	4-Methylstyrene	0.875061	-7.08160	7.33467	443.748	0.133 ~ 99.725	289.15~443.15	27.919	0.733	31	4, 41
11	n-Propylbenzene	0.891023	-6.89092	5.79948	432.321	0.133 ~ 3078.1	280.0~635.0	40.890	0.128	91	4, 8
12	Isopropylbenzene	0.877964	-7.23971	6.06942	425.438	0.057 ~ 3166.0	264.95~630.0	49.827	0.382	127	6, 8, 16
13	1-Methyl-2-ethylbenzene	0.863837	-6.34917	5.19164	438.357	0.141 ~ 3206.6	285.0~645.0	34.109	0.077[c]	93	4, 8
14	1-Methyl-3-ethylbenzene	0.861399	-6.30303	5.19848	434.538	0.118 ~ 3065.4	280.0~635.0	38.056	0.122	92	4, 8
15	1-Methyl-4-ethylbenzene	0.856105	-6.18307	5.08568	435.228	0.120 ~ 2977.6	280.0~635.0	37.516	0.159	91	4, 8
16	1,2,3-Trimethylbenzene	0.869047	-6.33423	5.14963	449.175	0.116 ~ 3283.3	290.0~660.0	24.677	0.178	75	8
17	1,2,4-Trimethylbenzene	0.846724	-5.41424	4.22211	442.537	0.00886~3076.9	253.0~645.0	30.109	0.866	108	6, 8, 10
18	1,3,5-Trimethylbenzene	0.872945	-6.55508	5.47586	437.769	0.00938~3046.47	253.0~635.0	34.219	0.964	117	6, 8, 10
19	n-Butylbenzene	0.889482	-7.01177	5.65027	456.368	0.1120~ 2870.90	295.0~660.0	19.971	0.557	102	4, 8, 41
20	Isobutylbenzene	0.870338	-6.75481	5.59009	445.940	0.105 ~ 2775.0	285.0~645.0	27.781	0.0507	93	4, 8
21	sec-Butylbenzene	0.870844	-6.72060	5.52698	446.499	0.101 ~ 2733.7	285.0~645.0	27.275	0.0691	93	4, 8
22	tert-Butylbenzene	0.881530	-7.21114	6.01764	442.319	0.119 ~ 2591.4	285.0~635.0	30.782	0.0656	90	4, 8
23	1-Methyl-2-propylbenzene	0.887506	-6.92975	5.60140	458.002	0.106 ~ 2827.0	295.0~660.0	19.014	0.0447	74	8
24	1-Methyl-3-propylbenzene	0.817457	-6.56228	5.30555	455.038	0.124 ~ 2670.8	295.0~650.0	25.427	0.131	99	2, 8
25	1-Methyl-4-propylbenzene	0.882883	-6.86216	5.57573	456.497	0.118 ~ 2705.5	295.0~655.0	20.032	0.0612	100	2, 8
26	1-Methyl-2-isopropylbenzene	0.877779	-6.88555	5.61774	451.343	0.112 ~ 2835.9	290.0~655.0	23.648	0.150	109	2, 4, 8
27	1-Methyl-3-isopropylbenzene	0.875856	-6.90589	5.71011	448.380	0.131 ~ 2652.8	290.0~645.0	25.822	0.274	107	2, 4, 8
28	1-Methyl-4-isopropylbenzene	0.875129	-6.86627	5.61507	450.311	0.121 ~ 2694.2	290.0~650.0	24.504	0.124	107	2, 4, 8
29	1,2-Diethylbenzene	0.885449	-6.81892	5.48568	456.641	0.112 ~ 2901.5	295.0~660.0	19.736	0.0892	94	4, 8
30	1,3-Diethylbenzene	0.889714	-6.94128	5.62739	454.362	0.119 ~ 2716.8	294.85~650.0	20.954	0.603	102	4, 8, 41
31	1,4-Diethylbenzene	0.893772	-7.13376	5.76066	456.809	0.107 ~ 2708.6	295.0~655.0	19.631	0.337	93	4, 8
32	1,2-Dimethyl-3-ethylbenzene	0.868962	-5.88268	4.49402	467.211	0.139 ~ 2956.5	305.0~675.0	14.215	0.234	102	2, 8,
33	1,2-Dimethyl-4-ethylbenzene	0.888166	-6.72722	5.37774	462.948	0.114 ~ 2858.4	300.0~665.0	15.130	0.0639	101	2, 8
34	1,3-Dimethyl-2-ethylbenzene	0.891249	-6.82799	5.40578	463.219	0.112 ~ 2964.6	330.0~670.0	15.037	0.101	102	2, 8
35	1,3-Dimethyl-4-ethylbenzene	0.870425	-6.11874	4.78949	461.691	0.130 ~ 2852.5	300.0~665.0	15.938	0.227	101	2, 8
36	1,3-Dimethyl-5-ethylbenzene	0.892544	-7.08768	5.82215	456.921	0.17 ~ 2633.7	295.0~650.0	19.450	0.0751	99	2, 8
37	1,4-Dimethyl-2-ethylbenzene	0.867112	-6.04098	4.68254	460.129	0.101 ~ 3381.6	295.0~680.0	17.850	0.0997	105	2, 8
38	1,2,3,4-Tetramehylbenzene	0.889484	-6.47585	4.96841	478.255	0.111 ~ 2970.1	310.0~690.0	10.058	0.0988	104	2, 8
39	1,2,3,5-Tetramethylbenzene	0.891876	-6.64575	5.21861	471.208	0.106 ~ 2850.3	305.0~675.0	12.407	0.0721	102	2, 8
40	1,2,4,5-Tetramethylbenzene	0.884259	-6.36677	4.97446	470.032	1.333 ~ 2913.0	346.75~675.0	12.868	0.119	92	2, 8
41	sec-Amylbenzene	0.897853	-6.86006	7.72031	451.128	0.133 ~ 101.33	300.95~451.15	19.585	0.627	10	41
42	3-Ethyl-1-isopropylbenzene	0.859693	-6.82452	7.58198	465.962	0.133 ~ 101.33	301.45~446.15	11.582	0.370	10	41
43	4-Ethyl-1-isopropylbenzene	0.871494	-7.16782	8.01142	468.985	0.133 ~ 101.33	304.65~468.95	11.037	0.500	10	41
44	3,5-Diethyltoluene	0.865431	-7.13287	7.83657	472.018	0.133 ~ 101.33	304.95~472.15	12.355	0.617	10	41
45	1,2,4-Trimethyl-5-ethylbenzene	0.782663	-5.94151	18.3976	464.965	1.467 ~ 9.466	360.45~405.25	7.6514	2.75	11	4
46	1,3,5-Trimethyl-2-ethylbenzene	0.917293	-6.86816	4.53769	483.486	1.573 ~ 101.33	361.65~483.35	8.3653	1.05	19	4
47	1,2-Diisopropylbenzene	0.869528	-6.85396	7.42464	482.090	0.133 ~ 101.33	313.15~482.15	8.7959	0.437	10	41
48	1,3-Diisopropylbenzene	0.867688	-7.14442	8.11668	475.120	0.133 ~ 101.33	307.85~475.15	10.930	0.302	10	41
49	1,4-Diisopropylbenzene	0.900726	-6.87306	5.22622	483.33	6.753 ~ 104.63	393.41~484.73	8.6840	0.115	7	4
50	1,2,4-Triethylbenzene	0.881965	-7.59082	8.58854	491.389	0.133 ~ 101.33	319.15~491.15	6.5820	0.751	10	41
51	1,3,4-Triethylbenzene	0.879248	-6.92921	7.78309	490.542	0.133 ~ 101.33	321.05~490.65	6.3034	0.664	10	41
52	Hexamethylbenzene	1.00973	-5.04725	-6.30130	571.163	0.00028~0.0144	303.10~343.02	0.6701	0.533	9	48

[a] P in atm (1.01325 bar or 101.32 kPa); K in T.

[b] AAD = absolute average deviation = $\frac{\Sigma|\text{Calculated value-experimental value}|/\text{experimental value}}{\text{number of data points}}$

[c] 400 K oustside the temperature range of the data used in evaluating the coefficient of the vapor pressure equation.

TABLE 11. Coefficients of vapor pressure equation and the calculated vapor pressure at 400 K for naphthalene and its derivatives

No.	Name	$\log_{10} P = (1 - D/T) \times 10^{(A + BT + CT^2)}$[a]				Vapor Pressure Range, kPa	Temperature Range, K	Calculated Vapor Pressure kPa at 400.0 K	AAD[b] %	Number of Data Points	Data Reference Number
		A	B x 10^4	C x 10^7	D						
1	Naphthalene	0.832267	-4.41855	2.89627	490.988	0.5253 ~ 4045.4	340.15~751.65	7.2571	0.815	86	4, 6
2	1-Methylnaphthalene	0.863323	-5.26355	3.75850	517.727	0.00176~415.36	278.85~593.38	3.0627	0.366	93	2, 6, 53
3	2-Methylnaphthalene	0.879050	-5.85793	4.19253	514.242	1.33300~735.96	378.00~529.32	3.4264	0.195	89	2, 4, 6, 53
4	1-Ethylnaphthalene	0.923623	-6.97505	5.07450	531.480	1.33300~199.98	393.15~565.45	1.8090	0.0358	27	2
5	2-Ethylnaphthalene	0.871612	-5.23140	3.70623	531.189	0.00153~199.98	286.20~565.05	1.8964	0.932	34	2, 28
6	1,2-Dimethylnaphthalene	0.950015	-6.99660	4.52556	539.430	1.33300~106.66	402.35~541.75	1.1990[c]	0.113	23	2
7	1,3-Dimethylnaphthalene	1.72680	-7.87991	-42.8535	540.353	1.33300~103.99	400.00~541.00	1.3768	1.68	13	2
8	1,4-Dimethylnaphthalene	1.97594	-8.55425	-59.4189	544.362	1.33300~103.99	397.00~544.00	1.8453	2.27	13	2
9	1,8-Dimethylnaphthalene	0.951477	-8.49048	2.61743	576.908	0.0148 ~ 1.8032	328.15~413.15	1.0306	1.89	20	38
10	2,3-Dimethylnaphthalene	1.09999	-10.2378	-11.3931	631.969	0.01400~1.8534	333.15~408.15	1.3707	3.92	16	38
11	2,6-Dimethylnaphthalene	1.14901	-11.9220	-17.3468	687.081	0.0536~3.4419	328.15~418.15	1.6799	5.60	15	38
12	2,7-Dimethylnaphthalene	1.11518	-10.6526	-13.2234	632.459	0.01987~1.5037	333.15~398.15	1.8228[c]	5.87	15	38
13	1-n-Propylnaphthalene	1.01439	-7.21205	0.0344076	546.126	1.33300~101.33	403.15~545.95	1.1476[c]	0.525	10	2
14	2-n-Propylnaphthalene	1.02538	-7.12594	-0.699309	546.808	1.33300~101.33	404.15~546.65	1.0928[c]	0.557	10	2
15	1-Isopropylnaphthalene	0.946045	-6.97957	4.44862	540.864	1.33300~199.98	402.45~575.15	1.2000[c]	0.255	27	2
16	2-Isopropylnaphthalene	0.951658	-7.02612	3.90232	541.304	1.33300~199.98	401.65~577.15	1.2452[c]	0.307	27	2
17	1,3,5-Trimethylnaphthalene	1.01709	-6.95334	0.567876	557.950	1.33300~101.33	415.15~557.65	0.62396[c]	0.846	8	2
18	1,3,7-Trimethylnaphthalene	1.03964	-7.09533	-1.37129	553.629	1.33300~101.33	409.15~553.15	0.84060[c]	0.389	7	2
19	1,4,5-Trimethylnaphthalene	0.998467	-7.03095	1.71081	558.187	1.33300~101.33	415.15~558.15	0.64463[c]	1.20	7	2
20	1-n-Butylnaphthalene	1.10895	-7.77663	-4.60035	563.025	1.33300~106.66	412.85~565.95	0.70084[c]	1.28	23	2
21.	2-n-Butylnaphthalene	0.971423	-6.86834	3.12397	561.352	1.33300~106.66	418.15~564.15	0.56340[c]	0.848	28	2
22	1-tert-Butylnaphthalene	0.916603	-4.48364	-0.616268	551.533	1.33300~106.66	407.15~554.15	0.96225[c]	0.643	23	2
23	2-tert-Butylnaphthalene	0.930573	-5.27602	0.144968	553.378	1.33300~106.66	407.15~556.15	0.96730[c]	0.665	23	2

[a] P in atm (1.01325 bar or 101.325 kPa); T in K.

[b] AAD = absolute average deviation = $\frac{\sum |\text{Calculated value-experimental value}|/\text{experimental value}}{\text{number of data points}}$

[c] 400 K outside the temperature range of the data used in evaluating the coefficients of the vapor pressure equation.

Table 12. Coefficients of vapor pressure equation and the calculated vapor pressure at 400 K for saturated ring-compounds

No.	Name	$\log_{10} P = (1 - D/T) \times 10^{(A+BT+CT^2)}$ [a]				Vapor Pressure Range, kPa	Temperature Range, K	AAD [b] %	Number of Data Points	Reference Number	Pressure kPa at 400 K
		A	B x 10^4	C x 10^7	D						
1	Cyclopropane	0.764677	-6.98761	9.83198	240.301	1.333-5579.5	171.85-398.3	0.188	65	2, 4, 54	5734.5 [c]
2	Cyclobutane	0.887736	-15.1134	24.6051	285.734	0.133-199.98	181.15-305.66	0.770	62	2, 4, 41, 70	2307.9 [c]
3	Methylcyclobutane	0.861895	-10.8963	10.8762	278.061	0.133-101.33	177.15-277.65	1.021	10	41	1657.7 [c]
4	Cyclopentane	0.818603	-7.52365	8.27395	322.386	0.043-4039.0	193.20-503.20	0.574	85	4, 15, 17, 50	745.63
5	Cyclohexane	0.881199	-9.58655	9.72305	353.663	0.133-4074.8	227.85-553.64	0.877	140	2,4,6,17,41,46,47,50	336.61
6	Methylcyclopentane	0.872156	-9.88091	10.8367	344.830	0.0019-2924.0	183.15-533.15	0.848	60	2, 17	419.03
7	Cycloheptane	0.865524	-8.19621	7.88065	391.896	1.33-270.11	284.35-432.17	0.396	42	2, 4	125.64
8	Ethylcyclopentane	0.839111	-7.11414	6.79653	376.588	1.333-3143.0	273.24-563.15	0.151	77	2, 4, 17	188.49
9	1,1-Dimethylcyclopentane	0.883976	-10.8001	12.4624	361.619	0.026-561.37	213.15-433.15	1.522	70	2, 4, 17	272.69
10	1,cis-2-Dimethylcyclopentane	0.888150	-8.36884	6.19165	372.619	4.00-199.98	291.15-398.35	1.631	45	2, 4	205.69 [c]
11	1,trans-2-Dimethylcyclopentane	0.849992	-8.27119	8.67505	365.020	1.333-199.98	264.15-390.25	0.044	45	2, 4	253.25 [c]
12	1,cis-3-Dimethylcyclopentane	0.835365	-8.23938	10.1173	364.284	1.333-199.98	263.15-389.15	1.40	45	2, 4	263.71 [c]
13	1,trans-3-Dimethylcyclopentane	0.863033	-8.40761	7.45113	364.572	1.333-199.98	263.15-390.15	1.399	46	2, 4	249.84 [c]
14	Methylcyclohexane	0.862568	-8.71426	8.69685	373.957	0.0036-3116.0	203.20-563.20	0.682	115	2, 4, 6, 17	198.91
15	Ethylcyclohexane	0.877363	-8.63498	8.47613	404.971	0.033-310.80	243.20-453.20	0.394	57	2, 17, 41	88.698
16	1,1-Dimethylcyclohexane	0.803626	-5.20532	3.85619	392.673	0.133-199.98	248.75-420.25	0.346	57	2, 4, 41	122.71
17	1,cis-2-Dimethylcyclohexane	0.841813	-6.56119	5.01855	402.894	0.133-199.98	257.25-430.75	0.476	57	2, 4, 41	93.902
18	1,trans-2-Dimethylcyclohexane	0.827486	-6.12608	4.53086	396.346	0.133-199.98	252.05-424.25	1.11	37	2, 41	111.43
19	1,cis-3-Dimethylcyclohexane	0.841956	-7.14598	6.48250	393.241	0.133-199.98	250.45-420.55	0.137	37	2, 41	121.04
20	1,trans-3-Dimethylcyclohexane	0.840923	-6.82912	5.97404	397.599	0.133-199.98	253.75-425.05	0.149	37	2, 41	107.99
21	1,cis-4-Dimethylcyclohexane	0.826432	-6.13308	5.14765	397.443	0.133-199.98	253.15-424.95	0.230	37	2, 41	108.44
22	1,trans-4-Dimethylcyclohexane	0.826623	-6.77160	6.50408	392.510	0.133-199.98	248.85-419.95	0.187	37	2, 41	123.39
23	Isopropylcyclopentane	0.861708	-8.18102	8.29785	399.575	1.333-199.98	289.55-426.95	0.032	47	2, 4	102.48
24	Propylcyclopentane	0.856232	-7.04448	6.25094	404.097	1.333-199.98	294.45-431.35	0.051	46	2, 4	90.639
25	1-Ethyl-1-methylcyclopentane	0.835292	-6.58763	5.67554	394.712	0.042-270.02	238.15-435.30	0.391	52	4, 34	116.55
26	cis-2-Ethyl-1-methylcyclopentane	0.855851	-7.83360	11.3549	394.617	0.028-1.114	238.15-288.15	0.234	11	34	119.41 [c]
27	1,1,2-Trimethylcyclopentane	0.853137	-8.19842	8.40843	386.878	1.333-199.98	279.53-413.75	0.026	46	2, 4	143.08
28	1,1,3-Trimethylcyclopentane	0.848231	-8.28174	8.81168	378.065	1.333-199.98	272.85-404.45	0.184	46	2, 4	179.97
29	Propylcyclohexane	0.865420	-7.04026	5.98962	429.890	1.333-199.98	313.35-458.95	0.050	47	2, 4	44.499
30	Isopropylcyclohexane	0.876667	-7.99142	7.47343	427.713	6.411-104.01	343.66-428.75	0.013	20	4	47.502
31	cis-3-Ethyl-1-methylcyclohexane	0.843964	-6.42051	5.49912	421.619	9.59-269.98	348.31-464.42	0.011	21	34	56.223
32	1,1,3-Trimethylcyclohexane	0.838270	-6.63916	5.61172	409.802	6.40-104.00	327.82-440.80	0.286	25	4, 50	78.174
33	n-Butylcyclohexane	0.891776	-7.48841	6.21822	454.131	1.333-199.98	332.65-484.35	0.061	27	2	21.891
34	Isobutylcyclohexane	0.848267	-6.44098	5.35931	427.717	6.41-104.01	343.66-428.75	0.021	20	4	47.514
35	sec-Butylcyclohexane	0.925582	-7.13653	2.83949	452.650	6.41-104.01	376.61-453.57	1.37	20	4	23.314
36	tert-Butylcyclohexane	0.882098	-7.99990	7.31667	444.737	6.40-104.00	357.18-445.82	0.022	20	4	29.609

[a] P in Atm(1.01325 bar or 101.325 kPa); T in K

[b] AAD = absolute average deviation = $\frac{\Sigma \left| \text{Calculated value} - \text{experimental value} \right| / \text{experimental value}}{\text{number of data points}}$

[c] 400 K is outside the temperature range of the data used in evaluating the coefficients of the vapor pressure equation.

Table 13. Coefficients of vapor pressure equation and the calculated vapor pessure at 400 K for unsaturated ring compounds

No.	Name	$\log_{10} P = (1 - D/T) \times 10^{(A+BT+CT^2)}$ [a]				Vapor Pressure Range, kPa	Temperature Range, K	AAD[b] %	Number of Data Points	Reference Number	Pressure kPa, at 400 K
		A	B x 10^4	C x 10^7	D						
1	Cyclobutene	0.822553	-10.9389	18.2344	275.824	0.667-101.33	189.75-275.55	1.05	21	4, 41	3024.4 [c]
2	1,3-Cyclopentadiene	0.919018	-8.68344	-3.41259	314.762	18.82-96.33	271.25-313.05	0.055	20	15	508.88 [c]
3	Cyclopentene	0.814441	-7.42372	8.49035	317.520	0.852-743.8	223.2-393.2	0.459	22	17, 71	858.79 [c]
4	1,3-Cyclohexdiene	0.823433	-6.73214	6.67096	353.486	16.80-135.20	303.96-363.31	0.152	19	27, 31	345.40 [c]
5	1,4,-Cyclohexdiene	0.916704	-6.81678	-7.02362	368.566	11.89-25.25	304.25-322.23	0.206	7	27	187.51 [c]
6	Cyclohexene	0.873674	-9.73841	10.9078	356.172	0.0328-129.63	213.20-364.53	0.265	39	17, 27, 31	319.90 [c]
7	Indene	0.796974	-5.99769	9.52748	455.041	0.133-104.41	289.55-456.97	1.46	20	6, 41	19.990
8	Indan	0.859420	-6.08324	4.77502	451.051	4.34-104.41	355.01-452.24	0.169	50	6, 26, 37	23.825
9	Tetralin	0.859186	-5.75417	4.41971	480.364	0.133-3364.64	311.15-710.93	1.589	46	4, 16, 32, 41, 73	9.9861
10	cis-Decalin	0.683577	0.900942	-2.28255	468.915	0.133-3571.48	295.65-727.59	2.136	46	4, 41, 73	14.969
11	trans-Decalin	0.860979	-6.38749	4.59180	460.458	5.53-102.73	365.51-461.02	0.463	19	4	19.233
12	1,1-Dimethylindan	0.869995	-6.14831	4.52781	467.243	0.258-101.33	313.15-467.22	0.037	24	37	14.789
13	4,6-Dimethylindan	0.887063	-6.04521	4.35551	498.089	0.057-47.38	313.15-467.22	0.144	18	37	5.4159
14	4,7-Dimethylindan	0.887652	-6.04765	4.32653	501.078	0.050-47.38	313.15-469.96	0.160	17	37	4.9525
15	Biphenylene	1.11763	-8.19240	-13.7006	601.351	0.027-1.835	343.15-408.15	4.28	15	56	1.3564
16	Byphenyl	0.821410	-2.73337	1.02285	528.437	0.104-1108.57	342.35-673.15	1.298	85	4, 6, 72	1.9388
17	Pheylcyclohexane	0.914718	-8.43553	6.82927	508.790	264.8-2457.3	560.93-727.59	0.917	7	73	4.8321 [c]
18	Bicyclohexyl	0.876522	-5.41554	3.04865	510.926	0.066-346.09	321.20-577.25	0.959	28	1, 44	3.8708
19	1,1-Dicyclohexylethane	1.31737	-14.8631	14.2837	521.581	0.067-1.333	385.65-430.65	7.888	5	1	0.19413
20	Biphenylmethane	0.918987	-6.39483	4.39313	537.844	0.066-1827.10	343.15-727.59	1.613	50	1, 16, 44, 73	1.3809
21	1,1,4,6-Tetramethylindan	0.908228	-6.35384	4.10220	508.143	0.032-38.565	313.15-468.80	0.482	18	37	3.8709
22	1,1,4,7-Tetramethylindan	0.895344	-6.09096	4.01316	517.025	0.025-31.177	313.15-468.80	0.186	18	37	3.0528
23	Biphenylethylene	1.09345	-16.2565	20.9352	534.786	0.067-1.333	350.15-407.15	0.384	5	1	0.96348
24	1,1-Diphenylethane	0.893301	-5.45280	8.02493	524.104	0.067-1.333	348.65-404.65	0.524	5	1	1.0761
25	1,2-Diphenylethane	0.914704	-6.08831	5.11258	547.288	0.017-1.498	333.15-413.15	0.403	17	56	0.83338
26	2-Butyltetralin	0.903037	-5.60471	9.29569	524.981	0.067-1.333	354.65-410.65	0.219	5	1	0.80356
27	1-Cyclohexyl-1-phenylethane	1.08057	-15.5344	24.1341	507.179	0.067-1.333	345.15-399.65	0.833	5	1	1.3460 [c]
28	2-Cyclohexyl-1-phenylethane	1.06923	-16.0395	22.9852	528.286	0.067-1.333	348.15-406.15	0.667	5	1	1.0079
29	3-Cyclopentyl-1-phenylpropane	1.07498	-16.0536	22.6935	528.173	0.067-1.333	348.65-406.15	0.701	5	1	1.0064
30	1,1-Dicyclopentylethane	1.07652	-15.8050	23.4302	516.862	0.067-1.333	346.15-402.15	0.594	5	1	1.1995
31	1,2-Dicyclohexylenthane	1.07728	-15.4160	24.9170	506.850	0.067-1.333	347.75-402.15	0.972	5	1	1.1848

[a] P in Atm(1.01325 bar or 101.325 kPa); T in K

[b] AAD = absolute average deviation = $\frac{\Sigma \left| \text{Calculated value} - \text{experimental value} \right| / \text{experimental value}}{\text{number of data points}}$

[c] 400K is outside the temperature range of the data used in evaluating the coefficients of the vapor pressure equation.

Table 14. Coefficients of vapor pressure equation and the calculated vapor pressure at 400 K for sulfur compounds

no.	Name	$\log_{10} P = (1 - D/T) \times 10^{(A+BT+CT^2)}$ [a]				Vapor Pressure Range, kPa	Temperature Range, K	AAD [b] %	Number of Data Points	Reference Number	Pressure kPa at 400 K
		A	B x 10^4	C x 10^7	D						
1	Thiacyclopropane	0.823181	-7.01267	7.70188	328.076	1.333-270.11	238.55-360.88	0.051	40	2, 4	690.01[c]
2	Thiacyclobutane	0.880604	-9.52708	10.9166	368.152	1.333-270.11	268.25-404.79	0.090	57	2, 4, 36	240.84
3	Thiophene	0.901276	-10.3229	11.9393	394.395	1.333-270.11	287.35-431.60	0.436	61	2, 36, 43	118.22
4	Tetrahydrothiophene	0.851037	-7.11948	6.89859	394.281	1.333-199.98	287.35-420.61	0.134	32	2, 24	118.47
5	Thiacyclopentane	0.865149	-7.93338	7.59224	357.255	0.107-5467.5	228.15-577.61	1.354	145	2,4,6,16,41,51	319.69
6	2-Methylthiophene	0.913733	-10.3914	11.2735	385.680	1.333-199.98	282.15-411.15	0.250	35	2, 24	150.13
7	3-Methylthiophene	0.803952	-5.13436	5.45565	388.532	0.133-199.98	248.65-411.15	1.385	45	2, 24, 41	139.58
8	Cyclopentanethiol	0.925892	-10.4911	10.6639	405.333	19.920-270.11	354.02-445.93	0.061	30	4, 36	87.572
9	2-Methylthiacyclopentane	0.898551	-9.69558	10.5617	405.832	1.333-270.11	295.87-446.24	0.716	65	2, 36, 43	86.294
10	3-Methylthiacyclopentane	0.913016	-10.2124	10.9071	411.706	1.333-270.11	300.25-452.63	0.457	65	2, 36, 43	73.444
11	Thiacyclohexane	0.914589	-10.2766	10.8708	414.929	1.333-199.98	302.35-443.15	0.106	48	2, 4, 43	67.317
12	Benzenethiol	0.928694	-9.23421	8.59363	442.321	1.333-270.11	235.43-485.11	0.075	57	2, 4, 36	30.152
13	2,5-Dimethylthiophene	0.885251	-10.3540	14.9835	407.929	7.40-34.26	333.45-371.45	0.047	5	24	80.141[c]
14	2-Ethylthiophene	0.868809	-10.2879	16.6827	404.508	8.12-37.33	333.45-373.45	0.038	5	24	88.307[c]
15	Cyclohexanthiol	0.922485	-10.1571	10.0208	431.996	9.582-270.11	356.89-475.80	0.082	21	36	42.258
16	2,cis-5-Dimethylthiacyclopentane	0.916043	-10.2115	10.6693	415.741	1.333-199.98	303.15-441.15	0.222	45	2, 43	65.782
17	2,trans-5-Dimethylthiacyclo-pentane	0.911961	-10.3802	11.2368	415.203	1.333-199.98	302.15-443.15	0.268	40	2, 43	66.782
18	2-Methylthiacyclohexane	0.892566	-9.26534	9.58365	426.209	1.333-199.98	309.15-455.15	0.221	50	2, 43	49.601
19	3-Methylthiacyclohexane	0.903042	-9.76615	10.3670	431.193	1.333-199.98	313.15-460.15	0.176	44	2, 43	43.048
20	4-Methylthiacyclohexane	0.918744	-10.2913	10.5693	431.815	1.333-199.98	314.15-461.15	0.181	48	2, 43	42.496
21	2-Methylbenzenthiol	0.921152	-8.62878	7.84882	467.376	1.333-199.98	343.15-498.15	0.361	27	2	13.851
22	3-Methylbenzenthiol	0.958438	-10.1375	9.47433	468.259	1.333-199.98	345.15-498.15	0.203	27	2	14.402
23	4-Methylbenzenthiol	0.922351	-8.74250	7.84906	468.114	1.333-199.98	343.15-499.15	0.315	27	2	14.313
24	1-Thiaethylbenzene	0.884670	-6.02526	4.25882	467.456	9.582-70.11	390.29-452.97	0.011	13	4, 9	13.716
25	1-Naphthalenethiol	1.14267	-16.7242	17.1057	559.324	0.20-101.33	379.15-559.15	1.424	6	9	0.60153
26	2-Naphthalenethiol	0.865090	-6.20254	7.97377	559.174	1.373-101.33	419.45-559.15	1.820	6	9	0.62485[c]
27	Dibenzothiophene	0.865373	-5.51221	6.05701	605.160	0.471-105.90	424.81-607.53	0.405	19	75	0.14977[c]

[a] P in Atm(1.01325 bar or 101.325 kPa); T in K

[b] AAD = Absolute average deviation = $\frac{\Sigma \left| \text{Calculated value - experimental value} \right| / \text{experimental value}}{\text{number of data points}}$

[c] 400 K is outside the temperature range of the data used in evaluating the coefficients of the vapor pressure equation.

TABLE 15. Coefficients of vapor pressure equation and the calculated vapor pressures at 400 K for nitrogen compounds - I

No.	Name	$\log_{10} P = (1-D/T) \times 10^{(A + BT + CT^2)}$ [a]				Vapor Pressure Range, kPa	Temperature Range, K	Vapor Pressure kPa	AAD [b] %	Number of Data	Data Reference Numbers
		A	B x 10^4	C x 10^7	D						
1	Aziridine	0.805550	-3.53813	3.93398	328.480	0.001~9363.2	175.0~520.0	910.44	0.5580	70	8
2	Azetidine	0.845657	-5.40700	4.84507	333.317	0.016~8539.7	200.0~545.0	715.50	0.2138	70	8
3	Pyrrole	0.880256	-6.05913	5.02726	402.916	0.031~6832.3	250.0~635.0	92.813	0.7924	143	8, 24, 39, 35, 51
4	Pyrrolidine	0.917745	-9.28422	8.84651	359.642	0.014~5460.6	215.0~566.5	314.43	0.8259	127	4, 8, 35, 51
5	Pyridine	0.848882	-6.08910	5.15399	388.399	0.029~5645.0	235.0~620.0	140.30	0.7488	181	4, 6, 8, 16, 35, 51
6	1-Methylpyrrole	0.880560	-7.23818	6.44262	385.782	0.016~4790.5	230.0~595.0	151.87	0.3903	100	8, 24, 35
7	Piperdine	0.885414	-7.91476	6.97866	379.377	0.515~4388.7	265.0~590.0	178.96	0.6942	103	8, 16, 35
8	Aniline	0.911551	-6.64936	5.15455	457.025	0.008~5165.0	267.3~695.0	17.520	0.9436	130	4, 6, 8, 16
9	2-Methylpyridine	0.887914	-7.70705	6.85261	402.320	0.001~4545.9	215.0~620.0	94.920	1.4087	156	4, 6, 8, 16, 35
10	3-Methylpyridine	0.865977	-6.48542	5.41256	417.217	0.035~4650.0	255.0~645.0	62.139	0.1687	141	4, 8, 16, 35
11	4-Methylpyridine	0.862538	-6.32828	5.24419	418.461	0.284~4548.2	280.0~645.0	59.971	0.1155	115	8, 16, 35
12	2,5-Dimethylpyrrole	0.975279	-8.18064	6.24150	440.662	0.002~5037.7	255.0~660.0	13.262	0.4274	102	8, 35
13	Cyclohexylamine	0.848474	-5.99285	5.24860	406.825	7.843~86.06	333.9~401.5	83.487	0.4113	15	16
14	2-Methylpiperidine	0.890367	-8.35931	7.50471	391.355	0.443~3666.3	270.0~595.0	128.30	0.1978	86	8, 35
15	Benzylamine	0.910765	-6.64743	5.27032	457.650	0.001~4745.4	250.0~685.0	17.106	0.8609	97	8, 41
16	2-Ethylpyridine	0.846505	-5.49471	4.55275	421.790	0.004~3908.4	235.0~630.0	54.072	0.1726	80	8
17	3-Ethylpyridine	0.838237	-5.13221	4.04466	438.545	0.003~3955.2	240.0~660.0	33.524	0.1635	85	8
18	4-Ethylpyridine	0.841038	-5.09376	3.99740	440.104	0.007~3962.8	250.0~660.0	31.753	0.1716	85	8
19	2,3-Dimethylpyridine	0.881714	-6.74484	5.55055	434.216	0.019~4086.3	260.0~655.0	37.695	0.2542	102	8, 16
20	2,4-Dimethylpyridine	0.859213	-5.91288	4.83486	431.576	0.025~3862.5	260.0~645.0	40.741	0.0637	105	8, 16
21	2,5-Dimethylpyridine	0.871144	-6.47984	5.39996	430.124	0.026~3686.8	260.0~640.0	42.629	0.1021	104	8, 16
22	2,6-Dimethylpyridine	0.885281	-7.15067	6.18799	417.136	0.106~3721.5	270.0~620.0	61.925	0.1448	94	8, 16
23	3,4-Dimethylpyridine	0.873502	-6.18582	4.84358	452.235	0.019~3955.1	270.0~680.0	22.173	0.1543	95	4, 8
24	3,5-Dimethylpyridine	0.871062	-6.21188	4.99649	445.022	0.018~3847.1	265.0~665.0	27.435	0.1231	92	4, 8
25	N-Methylaniline	0.921600	-6.99135	5.56352	468.447	0.011~4693.7	280.0~700.0	12.154	0.5250	90	8, 41
26	2-Methylaniline	0.907135	-6.44774	4.94693	473.369	0.049~4649.9	300.0~710.0	10.577	0.2815	90	4, 8
27	3-Methylaniline	0.923479	-6.91988	5.41104	476.329	0.007~4399.1	280.0~705.0	9.4022	0.5243	93	4, 8
28	4-Methylaniline	0.915691	-6.57014	5.11261	473.445	0.020~4443.4	290.0~700.0	10.208	0.3445	97	4, 8
29	2-Methyl-5-vinylpyridine	0.839604	-4.92750	3.78043	455.434	0.002~3650.0	245.0~675.0	20.246	0.3642	88	8
30	N-Ethylaniline	0.918904	-6.84804	5.43030	477.780	0.007~3862.7	280.0~695.0	9.0565	0.3353	84	8
31	4-Ethylaniline	0.912477	-6.54610	5.04275	490.226	0.004~3850.1	280.0~715.0	6.1757	0.3925	88	8
32	N,N-Dimethylaniline	0.909397	-7.07673	5.69581	466.445	0.010~3721.2	275.0~685.0	13.773	0.4667	83	8
33	2,4-Dimethylaniline	0.913798	-6.44268	4.98805	490.122	0.014~3820.3	295.0~710.0	6.0146	0.3603	85	8
34	2,6-Dimethylaniline	0.926009	-6.89676	5.31053	490.795	0.005~4107.4	285.0~720.0	5.9198	0.6847	88	8
35	2-Methyl-5-ethylpyridine	0.845606	-5.35481	4.28671	451.482	0.004~3272.6	250.0~660.0	22.944	0.223	83	8
36	2,4,6-Trimethylpyridine	0.846954	-5.46549	4.48622	443.588	0.006~3200.0	250.0~645.0	28.803	0.221	80	8
37	2-Methyl-5-ethlypiperidine	0.840733	-5.47228	4.49971	436.593	0.023~3232.8	260.0~640.0	35.783	0.123	77	8
38	Isoquinoline	0.901210	-6.33889	4.26359	516.182	0.009~4479.0	300.0~800.0	3.1428	0.453	141	4, 8
39	Quinoline	0.897177	-6.73559	4.69070	510.552	0.006~3731.5	290.0~780.0	4.0885	0.520	127	4, 8
40	4-Cumidine	0.884718	-5.66541	5.73271	500.141	0.133~101.3	333.2~500.2	3.9669	0.730	10	41
41	4-Isopropylaniline	0.901277	-6.32720	4.83752	498.038	0.003~3238.6	280.0~715.0	5.0441	0.329	88	8
42	N,N,2-Trimethylaniline	0.890841	-6.76937	5.54004	458.592	0.005~3223.7	339.4~665.0	18.060	0.481	90	8, 41
43	N,N,4-Trimethylaniline	0.924688	-6.88109	5.49146	482.716	0.003~3750.0	275.0~695.0	7.5222	0.424	85	8
44	2,4,5-Trimethylaniline	0.909200	-6.02186	4.52808	507.562	0.154~3500.0	340.0~725.0	3.3522	0.176	78	8
45	3-Methylisoquinoline	0.959525	-7.30332	4.89518	526.133	0.030~4956.9	330.0~805.0	1.7778	0.399	120	4, 8
46	2-Methylquinoline	0.936276	-6.69538	4.65103	520.768	0.004~4800.8	300.0~785.0	2.1653	0.352	98	8
47	4-Methylquinoline	0.951188	-6.50942	4.37314	538.672	0.010~4554.4	325.0~795.0	1.0167	0.318	95	8
48	6-Methylquinoline	0.971408	-7.84250	5.29478	538.063	0.009~3628.2	320.0~795.0	1.2541	0.413	122	4, 8
49	7-Methylquinoline	0.942392	-6.45934	4.37190	530.777	0.023~4654.7	330.0~790.0	1.4135	0.278	110	4, 8
50	8-Methylquinoline	0.928604	-6.32078	4.26965	520.971	0.006~4950.8	305.0~790.0	2.1283	0.328	115	4, 8
51	1-Naphthylamine	0.822931	-2.94554	2.19845	574.066	0.005~385.56	325.0~645.0	0.40996	0.324	65	8
52	2-Naphthylamine	0.860256	-4.44286	3.71453	579.422	0.161~351.60	385.0~645.0	0.33845	0.307	53	8
53	Quinaldine	0.890722	-6.35906	6.06802	520.647	0.001~101.62	281.9~521.0	2.3606	0.567	50	4, 42
54	N-Diethylaniline	0.923880	-7.08036	5.70974	489.409	0.004~1684.20	280.0~645.0	6.3057	0.286	74	8
55	2,4-Dimethylquinoline	0.981169	-8.10352	5.44560	540.159	0.002~3826.2	305.0~805.0	1.1524	0.705	120	4, 8
56	2,6-Dimethylquinoline	0.962291	-7.46554	4.94350	538.435	0.004~3753.3	310.0~800.0	1.2350	0.443	126	4, 8
57	Carbazol	0.924810	-5.18974	2.68415	627.897	7.333~107.62	518.0~631.0	0.053203 [c]	0.393	42	18, 34
58	Diphenylamine	0.936992	-6.17195	4.32696	575.114	0.005~555.48	335.0~670.0	0.30926	0.582	85	8, 16, 41
59	Acridine	0.839996	-4.19344	3.63487	618.827	0.133~101.33	402.6~619.2	0.11614 [c]	0.920	10	41
60	Methyldiphenylamine	0.913570	-5.42806	5.24849	555.168	0.133~101.33	376.7~555.2	0.46343	0.685	10	41
61	N-Ethylcarbazol	0.906637	-4.74302	5.73341	595.800	0.002~0.015	347.8~373.8	0.071622 [c]	2.04	7	42
62	N-Ethyldiphenylamine	0.910264	-5.67107	3.83118	569.073	0.003~583.05	320.0~670.0	0.45449	0.391	70	8
63	Dibenzylamine	0.924113	-5.87692	4.40076	583.802	0.011~492.57	350.0~670.0	0.23169	0.222	65	8
64	N-Methyldiphenylaniline	0.920504	-5.86374	3.95486	566.122	0.004~623.62	325.0~670.0	0.47251	0.557	70	8

[a] P in atm (1.01325 bar or 101.325 kPa); T in K.

[b] AAD = absolute average deviation = $\frac{\Sigma \left| \text{Calculated value} - \text{experimental value} \right| / \text{experimental value}}{\text{number of data points}}$

[c] 400 K outside the temperature range of the data used in evaluating the coefficients of the vapor pressure equation.

TABLE 16. Coefficients of vapor pressure equation and the calculated vapor pressures at 400 K for nitrogen compounds - II

No.	Name	$\log_{10} P = (1-D/T) \times 10^{(A + BT + CT^2)}$ [a]				Vapor Pressure Range, kPa	Temperature Range, K	Vapor Pressure kPa at 400.0 K	AAD [b] %	Number of Data	Data Reference Numbers
		A	$Bx10^4$	$Cx10^7$	D						
1	Pyrazine	0.844138	-5.83079	4.89556	388.651	12.755~5673.0	330.0~620.0	139.46	0.0637	59	8
2	Piperazine	0.778574	-3.64705	2.83758	419.081	0.165~4553.3	270.0~655.0	60.034	0.550	61	8
3	2-Methylpyrazine	0.841770	-5.57164	4.63670	411.160	2.392~4777.6	310.0~630.0	82.399	0.0324	65	8
4	1-Methylpiperazine	0.844192	-5.70303	4.79143	438.398	1.168~4550.0	300.0~630.0	73.676	0.0400	67	8
5	1,3-Diaminobenzene	0.938599	-5.86839	4.04968	558.167	0.012~1578.7	340.0~720.0	0.48363	0.148	77	8
6	1,3-Phenylenediamine	0.896276	-5.49204	5.11780	558.585	0.133~101.33	373.0~558.7	0.53987	0.284	10	41
7	Phenylhydrazine	0.883884	-5.47784	6.06346	515.158	0.133~101.33	345.0~491.4	2.1990	1.01	9	41
8	cis-2,5-Dimethyl-piperazine	0.845668	-5.70303	4.79143	438.398	0.396~3000.0	300.0~635.0	33.961	0.0434	68	8
9	4-Amino-2,6-dimethyl-pyridine	0.915517	-5.83468	4.24064	519.085	20.251~3820.7	460.0~745.0	2.146	0.106	58	8
10	2,4-Diaminotoluene	0.937286	-5.67652	3.87010	565.108	0.091~1440.6	375.0~720.0	0.36568	0.0805	70	8
11	Tetramethylpiperazine	0.845378	-5.69793	4.73789	455.533	0.201~2488.2	300.0~645.0	20.922	0.0488	70	8
12	1-Phenylpiperazine	0.869801	-4.18652	2.62681	559.666	0.002~561.3	310.0~655.0	0.61654	0.404	70	8
14	Azobenzene	0.894170	-5.64849	5.36386	566.301	0.133~101.33	376.7~566.2	0.44244	0.461	10	41
15	Di-(4-aminophenyl)-methane	0.955651	-4.42562	2.43881	657.679	0.006~325.17	400.0~720.0	0.59230	0.605	65	8
16	Isoxazole	0.908474	-9.18057	8.98973	368.513	0.003~3741.8	205.0~550.0	243.74	0.588	70	8
17	Oxazole	0.917157	-10.4622	11.2062	342.718	0.005~3629.1	195.0~510.0	487.46	0.260	64	8
18	2-Nitrophenol	0.885400	-6.30106	6.42864	487.905	0.133~101.33	322.5~487.7	6.4344	0.581	10	41

[a] P in atm (1.01325 bar or 101.325 kPa); T in K.

[b] AAD = absolute average deviation = $\frac{\Sigma \left| \text{Calculated value - experimental value} \right| / \text{experimental value}}{\text{number of data points}}$

[c] 400 K outside the temperature range of te data used in evaluating the coefficients of the vapor pressure equation.

TABLE 17. Coefficients of Vapor Pressure Equation and the Calculated Vapor Pressure at 400 K for Oxygen Compounds - I

No.	Name	$\log_{10} P = (1 - D/T)\times 10^{(A + BT + CT^2)}$ [a]				Vapor Pressure Range, kPa	Temperature Range, K	AAD [b] %	Number of Data Points	Data Reference Numbers	Calculated Vapor Pressure, kPa, at 400 K
		A	Bx10^4	Cx10^7	D						
1	Furan	0.858331	-8.56435	9.32123	304.367	0.082~5500.0	193.15~490.25	0.692	62	4, 14, 51	1291.0
2	Cyclobutanone	0.870584	-9.76474	19.3674	364.075	0.267~5.760	249.09~298.39	0.786	11	4	362.52 [c]
3	Tetrahydrofuran	0.830424	-6.81525	6.84786	339.244	1.954~5190.0	253.15~540.15	0.612	67	4, 14, 51	515.10
4	2-Methylfuran	0.871223	-7.95690	7.81737	338.704	86.13~4722.90	333.45~527.61	0.607	32	24, 51	544.33
5	Cyclopentanone										
6	2-Methyltetrahydrofuran	0.897078	-6.60577	4.52567	359.254	643.3~3557.7	427.61~533.72	0.477	20	51	333.02 [c]
7	Phenol	1.00375	-8.88757	6.83750	454.610	0.3224~6132.00	323.20~694.25	1.160	130	2, 4, 6, 11, 16	16.763
8	Cyclohexanone	0.833332	-6.42578	7.09855	428.587	0.133~131.42	274.55~438.92	0.372	26	31, 41	45.267
9	Cyclohexanol	0.951396	-8.46102	8.87926	434.658	0.133~101.33	294.15~434.15	1.032	10	41	32.569
10	2-Hexanone	0.934881	-4.87941	4.16258	400.348	0.133~101.33	280.85~400.65	0.808	10	41	100.03
11	Benzoic Acid										
12	Anisole	0.942238	-10.2065	10.6819	426.827	6.287~67.661	346.49~415.52	0.123	6	16	46.321
13	Benzylalcohol	1.02742	-6.26739	1.28791	479.624	0.266~67.661	340.95~463.65	1.055	18	16	7.4206
14	2-Hydroxytoluene(2-cresol)	1.01555	-9.95980	7.92834	463.986	0.1238~5010.00	313.20~697.65	0.654	120	2, 4, 6, 12, 16	13.137.
15	3-Hydroxytoluene(3-cresol)	0.965085	-6.89845	4.47100	475.222	0.0029~4560.00	278.05~705.85	1.095	110	2, 4, 6, 12, 32, 41	8.3536
16	4-Hydroxytoluene(4-cresol)	1.07944	-11.6938	9.28202	475.109	0.1118~5150.00	323.20~704.65	0.518	123	2, 4, 6, 12, 16	8.4082
17	Coumarone	0.795901	-4.13024	21.5953	429.907	0.0107~0.164	273.15~313.15	4.298	7	6	19.856 [c]
18	Acetophenone	0.859974	-6.15392	6.99110	474.823	0.133~101.33	310.25~475.55	1.339	48	16, 41	10.259
19	2-Ethylphenol	0.883881	-6.07675	6.44264	480.731	0.133~101.33	319.35~480.65	0.743	29	4, 41	7.7020
20	3-Ethylphenol	0.971667	-6.29566	2.74098	491.415	0.001~133.41	278.11~502.74	1.055	44	4, 15	4.7795
21	4-Ethylphenol										
22	2,3-Dimethylphenol	0.979517	-8.35112	6.60684	489.845	0.308~4900.00	343.20~722.95	0.860	110	2, 4, 6, 13, 58	5.4851
23	2,4-Dimethylphenol	0.999891	-8.94506	6.96026	483.876	0.0128~4400.00	298.02~707.95	0.865	120	2, 4, 6, 13, 58	5.5635
24	2,5-Dimethylphenol	0.993879	-8.99374	7.44099	483.942	0.359~4900.00	343.20~707.05	1.175	107	2, 4, 6, 13, 58	5.5604
25	2,6-Dimethylphenol	0.993333	-9.96552	8.34247	474.112	0.1003~4300.00	312.81~701.05	0.6222	109	2, 4, 6, 13, 58	10.348
26	3,4-Dimethylphenol	1.05062	-10.2129	8.04338	499.926	0.266~5000.00	353.20~729.95	0.800	107	2, 4, 6, 13, 58	3.4040
27	3,5-Dimethylphenol	1.04106	-9.50547	6.64831	494.911	0.0901~3600.00	333.20~715.65	0.338	110	2, 4, 6, 13, 58	4.1444
28	5-Indanol										
29	2-Ethylanisole	0.881926	-6.65998	7.00344	460.386	0.133~101.33	302.85~460.25	0.554	10	41	15.830
30	3-Ethylanisole	0.874023	-6.87264	7.50986	469.810	0.133~101.33	306.85~469.65	0.620	10	41	12.340
31	4-Ethylanisole	0.872105	-6.70633	7.23277	469.450	0.133~101.33	306.65~469.65	0.700	10	41	12.457
32	3-Methyl-5-ethylphenol	0.913828	-6.36557	7.26448	505.528	1.333~101.33	384.65~506.15	1.128	19	4	2.7081
33	2-Isopropylphenol	0.912522	-6.17902	6.51481	487.650	0.133~101.33	329.75~487.65	0.679	10	41	5.2072
34	3-Isopropylphenol	0.901582	-6.42031	6.91585	501.397	0.133~101.33	335.15~501.15	0.738	10	41	3.6502
35	4-Isopropylphenol	0.932791	-6.98250	7.55366	501.658	0.133~101.33	340.15~501.35	0.777	10	41	3.1199
36	3-Phenyl-1-propanol	0.934132	-6.11678	6.13688	508.280	0.133~101.33	347.85~508.15	0.929	10	41	2.2162
37	2-Propylphenol	0.875307	-5.52137	7.84123	494.836	6.666~101.33	414.15~494.65	0.841	17	4	3.7792 [c]
38	4-Propylphenol	0.733568	-5.59797	13.8634	506.814	9.999~101.33	428.35~507.65	1.537	16	4	3.6882 [c]
39	2,3,5-Trimethylphenol	0.932965	-5.75276	3.29737	508.477	26.547~133.34	459.63~520.21	0.007	17	4	2.8897 [c]
40	4-Isobutylphenol										
41	1-Hydroxynaphthalene	0.881442	-5.80731	6.06214	555.113	0.133~101.33	367.15~555.95	1.181	38	4, 6	0.69877
42	2-Hydroxynaphthalene	0.874875	-5.63554	5.87458	560.208	0.667~101.33	401.75~561.15	1.181	27	4, 6	0.61258 [c]
43	2-sec-Buthylphenol										
44	4-sec-Butylphenol	0.885386	-5.26451	5.13029	515.194	0.133~101.33	344.55~515.25	0.522	10	41	2.2928
45	2-tert-Butylphenol	0.898200	-6.62186	5.90279	497.209	6.885~104.958	407.80~498.58	0.261	8	4	5.0968 [c]
46	4-tert-Butylphenol	0.834403	-2.10918	0.554077	512.693	0.130~133.35	343.15~524.76	1.159	26	4, 41	2.4469
47	3,5-Diethylphenol	0.876394	-6.55074	7.65283	521.080	1.333~101.33	387.65~521.15	0.963	19	4	2.2617
48	4-(1,1,3,3-Tetramethyl)Phenol	0.967228	-6.46884	3.61657	563.562	8.707~103.87	472.47~564.77	0.097	9	4	0.41506 [c]
49	2-tert-Butyl-4-Cresol	0.915488	-6.16723	6.81021	505.681	0.133~101.33	343.15~505.75	0.615	10	41	2.6419
50	4-tert-Butyl-2-Cresol	0.894294	-5.55746	5.24049	519.836	0.133~101.33	347.45~520.15	0.530	10	41	1.9869
51	2-Phenylphenol	0.889463	-4.72320	5.27654	549.249	0.133~101.33	373.15~548.15	1.672	28	4, 41	0.53903
52	4-Phenylphenol	0.949514	-5.54686	5.61184	580.171	1.333~101.33	450.15~581.15	0.891	19	4	0.11152 [c]
53	Phenylether										
54	2-tert-Butyl-4-ethylphenol	0.893089	-6.11822	7.45086	520.515	0.133~101.33	349.45~520.95	0.914	10	41	1.7438
55	4-tert-Butyl-2,5-xylenol	0.878041	-5.47812	6.92216	538.275	0.133~101.33	361.35~538.45	0.968	10	41	0.93692
56	4-tert-Butyl-2,6-xylenol	0.871204	-5.99541	9.85796	512.389	0.133~101.33	347.15~512.95	1.513	10	41	1.8914
57	6-tert-Butyl-2,4-xylenol	0.873072	-6.06053	9.46410	509.117	0.133~101.33	343.45~509.65	1.182	10	41	2.2600
58	6-tert-Butyl-3,4-xylenol	0.916526	-5.81421	6.69496	522.451	0.133~101.33	357.05~522.65	0.748	10	41	1.2986
59	2,4-Diisopropylphenol	0.916060	-6.48571	5.72246	527.384	1.333~101.33	395.15~528.15	1.665	19	4	1.6685
60	2-Phenylethylphenol	1.23153	-8.10573	-10.1736	637.998	0.813~18.78	442.35~523.45	1.852	29	4	0.05032 [c]
61	4-Phenylethylphenol	1.25864	-8.45954	-10.7815	664.652	0.560~13.18	447.55~523.65	1.917	23	4	0.02015 [c]

[a] P in atm (1.01325 bar or 101.325 kPa); T in K.

[b] ADD = absolute average deviation.

[c] 400 K outside the temperature range of the data used in evaluating the coefficients of the vapor pressure equation.

Table 18. Coefficients of Vapor Pressure Equation and the Calculated Vapor Pressure at 400 K for More Oxygen Compounds -II

No.	Name	$\log_{10} P = (1-D/T)x10 (A + BT + CT^2)^a$ A	B x10⁴	C x10⁷	D	Vapor Pressure Range, kPa	Temperature Range, K	AAD[b] %	No. of Data Points	Data Reference Numbers	Calculated Vapor Pressure, kPa, at 400 K
1	Quinone(p-Benzoquinone)	0.902426	-6.04783	6.58278	517.477	0.667~101.33	377.15~518.65	0.864	28	4, 41	1.9583
2	1,2-Dihydroxybenzene	0.958295	-5.78954	5.46841	549.041	0.133~101.33	381.55~549.65	1.358	29	4, 41	0.37720
3	1,3-Dihydroxybenzene	0.941185	-5.32724	5.41185	558.031	1.333~101.33	432.25~559.15	1.150	19	4	0.26743
4	1,4-Dihydroxybenzene	0.935304	-5.45471	6.15169	580.441	1.333~101.33	450.45~582.15	1.664	19	4	0.11370
5	Pyrogallol	0.858892	-4.47192	3.22549	477.010	1.333~101.33	355.15~478.15	2.073	19	4	9.2881
6	Guaiacol										
7	Diphenylene Oxide										
8	Dibenzofuran										
9	2,2'-Dipherol	0.872661	-6.33808	7.42629	596.940	1.333~101.33	444.15~598.15	0.809	19	4	0.20547
10	Quinohydrone										
11	Anthanthrone										

[a] P in atm (1.01325 bar or 101.325 kPa); T in K.

[b] AAD = absolute average deviation.

[c] 400 K outside the temperature range of the data used in evaluating the coefficients of the vapor pressure equation.

Therefore, the values of A, B, C, and D listed in Tables 10–18 may be employed to calculate the ΔH_v for the given compounds. In addition, these Cox equations may also be used to extrapolate to either lower or higher temperature regions with reasonable reliability[20] which is the main purpose of this work.

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6. References

[1]"Properties of Hydrocarbons of High Molecular Weight," American Petroleum Institute, Research Project 42, College of Science, The Pennsylvania State University, University Park, Pennsylvania, 1966.

[2]"Selected Values of Properties of Hydrocarbons and Related Compounds," Thermodynamics Research Center Hydrocarbon Project, Thermodynamics Research Center, Texas A&M University, College Station, Texas (Loose-leaf Data Sheets, Extant, 1982).

[3]H. C. Anderson and W. R. K. Wu, "Properties of Compounds in Coal-Carbonization Products," Bulletin 606, Bureau of Mines (U.S. GPO, Washington, D.C., 1963).

[4]T. Boublik, V. Fried, and E. Hala, *The Vapor Pressure of Pure Substances* (Elsevier Scientific, Amsterdam, Netherlands, 1973).

[5]J. Chao, "Benzene," Key Chemicals Data Books, Thermodynamics Research Center, Texas A&M University, College Station, Texas, 1978.

[6]"The Coal Tar Data Book," 2nd ed.. The Coal Tar Research Association, Oxford Road, Gomersal, Leeds, England, 1965.

[7]M. P. Doss, "Physical Constants of the Principal Hydrocarbons," 4th ed., Texas, Co., Tech. and Res. Division, New York, New York, 1943.

[8]Engineering Sciences Data Unit, "Vapor Pressures of Pure Substances Up To Their Critical Points," Vol. 5a–5d,5f, Engineering Sciences Data Unit, 251–259 Regent Street, London, WIR 7AD, England, 1978.

[9]W. E. Haines, R. V. Helm, and J. L. Stephens, "Physical Properties of Sulfur Compounds," in Bureau of Mines Bulletin, *Sulfur in Petroleum*, U.S. Bureau of Mines, 1963.

[10]T. E. Jordan, *Vapor Pressure of Organic Compounds* (Interscience, New York, 1954).

[11]A. P. Kudchadker, S. A. Kudchadker, and R. C. Wilhoit, "Phenol," Key Chemicals Data Books, Thermodynamics Research Center, Texas A&M University, College Station, Texas, 1977.

[12]A. P. Kudchadker, S. A. Kudchadker, and R. C. Wilhoit, "Cresols," Key Chemicals Data Books, Thermodynamics Research Center, Texas A&M University, College Station, Texas, 1978.

[13]A. P. Kudchadker and S. A. Kudchadker, "Xylenols," Key Chemicals Data Books, Thermodynamics Research Center, Texas A&M University, College Station, Texas, 1978.

[14]A. P. Kudchadker, S. A. Kudchadker, and R. C. Wilhoit, "Furan, Dihydrofuran, Tetrahydrofuran," Key Chemicals Data Books, Thermodynamics Research Center, Texas A&M University, College Station, Texas, 1978.

[15]O. Shuzo, *Computer Aided Data Book of Vapor Pressures* (Data, Tokyo, Japan, 1976).

[16]J. Timmermans, *Physico-Chemical Constants of Pure Organic Compounds* (Elsevier, Amsterdam, Netherlands, 1965), Vol. 2.

[17]N. B. Vargaftik, *Tables on the Thermophysical Properties of Liquids and Gases*, 2nd ed. (Wiley, New York, 1975).

[18]C. L. Yaws, *Physical Properties* (McGraw–Hill, New York, 1978).

[19]E. R. Cox, Ind. Eng. Chem. **28**, 613 (1936).

[20]D. W. Scott and A. G. Osborn, J. Phys. Chem. **83**, 2714 (1979).

[21]D. L. Bond and G. Thodos, J. Chem. Eng. Data **5**, 289 (1960).

[22]R. S. Bradley and T. G. Cleasby, J. Chem. Soc. 1690 (1953).

[23]C. G. De Kruif, J. Chem. Thermodyn. **12**, 243 (1980).

[24]C. Eon, C. Pommier, and G. Guiochon, J. Chem. Eng. Data **16**, 408 (1971).

[25]K. A. Kobe and J. F. Mathews, J. Chem. Eng. Data **15**, 182 (1970).
[26]D. Ambrose and C. H. S. Sparke, J. Chem. Thermodyn. **8**, 601 (1976).
[27]T. M. Letcher and F. Marsicano, J. Chem. Thermodyn. **6**, 509 (1974).
[28]A. B. MacKnick and J. M. Prausnitz, J. Chem. Eng. Data **24**, 175 (1979).
[29]D. M. McEachern, O. Sandoval, and J. C. Iniguez, J. Chem. Thermodyn. **7**, 299 (1975).
[30]E. F. Meyer and T. H. Gens, J. Chem. Eng. Data **22**, 30 (1977).
[31]E. F. Meyer and R. D. Hotz, J. Chem. Eng. Data **18**, 359 (1973).
[32]P. Nasir, S. C. Hwang, and R. Kobayashi, J. Chem. Eng. Data **25**, 298 (1980).
[33]D. Ambrose, C. H. S. Sparke, and R. Townsend, J. Chem. Thermodyn. **1**, 499 (1969).
[34]A. G. Osborn and D. R. Douslin, J. Chem. Eng. Data **19**, 114 (1974).
[35]A. G. Osborn and D. R. Douslin, J. Chem. Eng. Data **13**, 534 (1968).
[36]A. G. Osborn and D. R. Douslin, J. Chem. Eng. Data **11**, 502 (1966).
[37]A. G. Osborn and D. W. Scott, J. Chem. Thermodyn. **10**, 619 (1978).
[38]A. G. Osborn and D. R. Douslin, J. Chem. Eng. Data **20**, 229 (1975).
[39]D. W. Scott, W. T. Berg, I. A. Hossenlopp, W. N. Hubbard, J. F. Messerly, S. S. Tood, D. R. Douslin, J. P. McCullough, and G. Waddington, J. Phys. Chem. **71**, 2263 (1967).
[40]R. K. Sharma and J. B. Palmer, J. Chem. Eng. Data **19**, 6 (1974).
[41]D. R. Stull, Ind. Eng. Chem. **39**, 517 (1947).
[42]C. Van De Rostyne and J. M. Prausnitz, J. Chem. Eng. Data **25**, 1 (1980).
[43]P. T. White, D. G. Barnard-Smith, and F. A. Filder, Ind. Eng. Chem. **144**, 1430 (1952).
[44]S. A. Wieczorek and R. Kobayashi, J. Chem. Eng. Data **25**, 302 (1980).
[45]D. Ambrose, I. J. Lawrenson, and C. H. S. Sparke, J. Chem. Thermodyn. **7**, 1173 (1975).
[46]A. J. B. Cruickshank and A. J. B. Cuttler, J. Chem. Eng. Data **12**, 326 (1967).
[47]J. A. Hugill and M. L. McGlashan, J. Chem. Thermodyn. **10**, 95 (1978).
[48]D. Ambrose, I. J. Lawrenson, and C. H. S. Sparke, J. Chem. Thermodyn. **8**, 503 (1976).
[49]D. W. Morecroft, J. Chem. Eng. Data **9**, 488 (1964).
[50]G. J. Pasek and G. Thodos, J. Chem. Eng. Data **7**, 21 (1962).
[51]K. A. Kobe, A. E. Ravicz, and S. P. Vohra, J. Chem. Eng. Data **1**, 50 (1956).
[52]E. B. Munday, J. C. Mullins, and D. D. Edle, J. Chem. Eng. Data **25**, 191 (1980).
[53]S. A. Wieczorek and R. Kobayashi, J. Chem. Eng. Data **26**, 8 (1980).
[54]D. C. K. Lin, H. Silberberg, and J. J. McKetta, J. Chem. Eng. Data **15**, 483 (1970).
[55]D. Ambrose, B. E. Broderick, and R. Townsand, J. Chem. Soc. (A), 633 (1967).
[56]A. G. Osborn and D. W. Scott, J. Chem. Thermodyn. **12**, 429 (1980).
[57]N. K. Smith, R. C. Stewart, Jr., A. G. Osborn, and D. W. Scott, J. Chem. Thermodyn. **12**, 919 (1980).
[58]R. J. L. Andon, D. P. Biddiscombe, J. D. Cox, R. Handley, D. Harrop, E. F. G. Herington, and J. F. Martin, J. Chem. Soc. 5246 (1960).
[59]G. Bardi, R. Gigli, L. Malaspina, and V. Piacente, J. Chem. Eng. Data **18**, 127 (1973).
[60]L. M. Besley and G. A. Bottomley, J. Chem. Thermodyn. **6**, 577 (1974).
[61]B. Stevens, J. Chem. Soc., 2973 (1953).
[62]J. J. Murray, R. F. Pottie, and C. Pupp, Can. J. Chem. **52**, 557 (1974).
[63]H. Inokuchi, S. Shiba, T. Honda, and H. Akamatu, J. Chem. Soc. Jpn. **73**, 299 (1952).
[64]S. H. Lee-Bechtold, I. A. Hossenlopp, D. W. Scott, A. G. Osborn, and W. D. Good, J. Chem. Thermodyn. **11**, 469 (1979).
[65]H. Hoyer and W. Peperle, Z. Elektrochem. **62**, 61 (1958).
[66]O. A. Nelson and H. Wales, J. Am. Chem. Soc. **47**, 867 (1925).
[67]J. F. T. Berliner and O. E. May, J. Am. Chem. Soc. **49**, 1007 (1927).
[68]E. A. Coulson and J. I. Jones, J. Soc. Chem. Ind. London **65**, 169 (1946).
[69]G. E. Williams and E. C. Gilbert, J. Am. Chem. Soc. **64**, 2776 (1942).
[70]G. B. Heisig, J. Am. Chem. Soc. **63**, 1698 (1941).
[71]M. W. Lister, J. Am. Chem. Soc. **63**, 143 (1941).
[72]J. Chipman and S. B. Peltier, Ind. Eng. Chem. **21**, 1106 (1929).
[73]G. M. Wilson, R. H. Johnston, S. C. Hwang, and C. Tsonopoulos, Ind. Eng. Chem., Process Des. Dev. **20**, 94 (1981).
[74]P. Nasir, A. Sivaraman, and R. Kobayashi, "An Integrated Experimental Calculational Approach to Evaluate the Fugacity Function of Dibenzofuran at High Temperature and Pressures" (private communication, 1982).
[75]A. Sivaraman and R. Kobayashi, "Investigation of Vapor Pressures and Heat of Vaporization of Condensed Heterocyclic Aromatic Compounds at Elevated Temperature" (private communication, 1982).
[76]W. Wagner, Cryogenics **8**, 470 (1973).
[77]G. Raam Somayajulu (private communication).
[78]L. Borrelli, J. Holste, T. Eubank, and K. R. Hall, "A Concise Description of the Saturation Properties," presented at National AIChE Meeting, Orlando, Florida, March 1982.
[79]J. D. Cox and G. Pilcher, *Thermochemistry of Organic and Organometallic Compounds* (Academic, New York, 1970), p. 105.