# 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 | |
| | | | 0.5013~ 11.070 | 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, Ebulliometric | |
| 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 | |
| | | | 0.019 ~ 927.12 | 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 | Vergaftik, 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, Ebulliometric | |
| | | | 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 | 295.85 ~ 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 ~ 443.65 | 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 ~0.014 | 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 | 402.6 ~ 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 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 |
|---|---|---|---|---|---|---|---|---|---|---|
| 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-Dicyclohexylethane | 0.067-1.333 | 346.15-402.15 | 5 | 1 | API 42 | 1966 | A, | |
| 31 | $C_{14}H_{26}$ | 1,2-Dicyclohexylethane | 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 | 30 | 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 | |
| | | | 0.1333~300.0 | 300.0~699.2 | 18 | 17 | Vargaftik, M.D. | 1972 | 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 | 359.7~417.3 | 12 | 68 | Coulson, E.A., 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 | 312.~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.~710. | 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 | |
| | | | 16.719~101.75 | 471.73~538.97 | 22 | 4 | Boublik, T., et al. | 1973 | B | 15 |
| 48 | $C_{10}H_9N$ | 6-Methylquinoline | 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 |
| | | | 0.133~101.33 | 402.6~619.2 | 10 | 41 | Stull, D.R. | 1947 | C | |
| 60 | $C_{13}H_{13}N$ | N-Methyldiphenylamine | 0.133~101.33 | 376.7~555.2 | 10 | 41 | Stull, D.R. | 1947 | C | 6, 10,15 |
| 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 |
| 8 | $C_6H_{14}N_2$ | cis-2,5-Dimethylpiperazine | ..137~12.00<br>0.103~3000.0 | 373.~465.<br>290.~635. | 70 | 69<br>8 | Williams, G.E., et al.<br>Eng. Sci. Data Unit | 1942<br>1978 | A&C, Isoteniscopic<br>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-Diaminotoluene | 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 |
| 12 | $C_{10}H_{14}N_2$ | 1-Phenylpiperazine | 0.133~101.33<br>0.001~561.33 | 296.9~456.7<br>300.~655. | 10<br>72 | 41<br>8 | Stull, D.R.<br>Eng. Sci. Data Unit | 1947<br>1978 | C<br>C |
| 13 | $C_{12}H_8N_2$ | Phenazine | $0.48\times10^{-6}$~$6.23\times10^{-5}$ | 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 | $C_4H_6O$ | 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 |
| | | | 1.954-5190. | 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 | Eon, 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 | |
| | | | 0.133-5078 | 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 | 9.479-97.325 | 440.65-521.65 | 7 | 16 | Timmermans, J. | 1965 | B | |
| | | | 0.133-101.33 | 369.15-522.35 | 10 | 41 | Stull, D.R. | 1947 | C | 15, 17 |
| 12 | $C_7H_8O$ | Methoxybenzene (Anisole) | 6.287-67.661 | 346.49-412.52 | 6 | 16 | Timmermans, J. | 1965 | B | |
| 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 | |
| | | | 0.007479-5010. | 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 | 369.68-495.55 | 27 | 2 | TRCHP | 1978 | C | |
| | | | 1.333-105.40 | 357.150-491.617 | 41 | 4 | Boublik, T., et al. | 1973 | B | |
| | | | 0.0003814-4900. | 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 | 282.72-496.471 | 31 | 58 | Andon, R.J.L., et al. | 1960 | A, Ebulliometric | 4, 6, 15 |
| 28 | $C_9H_{10}O$ | 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 | 335.15-501.16 | 10 | 41 | Stull, D.R. | 1947 | C | 10, 15 |
| 35 | $C_9H_{12}O$ | 4-Isopropylphenol | 1.333-101.33 | 381.75-501.35 | 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-(1,1,3,3-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 | 15 |
| 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 | |
| 51 | $C_{12}H_{10}O$ | 2-Phenylphenol | 1.333-101.33 | 435.05-548.15 | 19 | 4 | Boublik, T., et al. | 1973 | B | 3 |
| | | | 0.133-101.33 | 373.15-548.15 | 10 | 41 | Stull, D.R. | 1947 | C | 3, 15 |
| 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 |
| | | | 0.133-101.33 | 449.35-581.15 | 10 | 41 | Stull, D.R. | 1947 | C | 3, 15 |
| 53 | $C_{12}H_{10}O$ | Phenylether | 83.2-684. | 523.15-643.15 | 13 | 17 | Vargaftik, N.B. | 1975 | B | |
| 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-Kylenol | 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-Kylenol | 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-Kylenol | 0.133-101.33 | 343.45-509.65 | 10 | 41 | Stull, D.R. | 1947 | C | |
| 58 | $C_{12}H_{18}O$ | 5-tert-Butyl-3,4-Kylenol | 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 | Sivaraman, 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 | $C_{14}H_8O_4$ | Anthrarufin | 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 ($\Delta H_v$) 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[79]:

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

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 | 14.582 | 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 | 13.037 | 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 | 183.15-513.15 | 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 | 287.35-433.60 | 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 | 333.45-373.45 | 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 | 303.15-444.15 | 0.222 | 45 | 2, 43 | 65.782 |
| 17 | 2,trans-5-Dimethylthiacyclopentane | 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 | 0.085~4650.0 | 255.0~645.0 | 62.139 | 0.1687 | 141 | 4, 8, 16, 35 |
| 11 | 4-Methylpyridine | 0.862538 | -6.32828 | 5.24419 | 418.461 | 0.234~4548.2 | 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 | Diphaylamine | 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 | 0.635 | 10 | 41 |
| 61 | N-Ethylcartazol | 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'-Diphenol | 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 $\Delta H_v$ 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.

## 5. Acknowledgments

The authors would like to thank the management of the Bechtel Group, Inc. for the permission for publication of this paper. The help provided by the staff of the Thermodynamics Research Center for preparation of the manuscript is acknowledged.

## 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.