

# **Vapour pressures and critical points of liquids: Halogenated alkylbenzenes and halogenated styrenes**

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# VAPOUR PRESSURES AND CRITICAL POINTS OF LIQUIDS HALOGENATED ALKYL BENZENES AND HALOGENATED STYRENES

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## MONOHALOGENATED TOLUENES

|    |                  |                       |                         |    |
|----|------------------|-----------------------|-------------------------|----|
| 1  | $C_6H_5CH_2F$    | (Fluoromethyl)benzene | Benzyl fluoride         | 7  |
| 2  | $2-FC_6H_4CH_3$  | 2-Fluorotoluene       | <i>o</i> -Fluorotoluene | 9  |
| 3  | $3-FC_6H_4CH_3$  | 3-Fluorotoluene       | <i>m</i> -Fluorotoluene | 11 |
| 4  | $4-FC_6H_4CH_3$  | 4-Fluorotoluene       | <i>p</i> -Fluorotoluene | 13 |
| 5  | $C_6H_5CH_2Cl$   | (Chloromethyl)benzene | Benzyl chloride         | 15 |
| 6  | $2-ClC_6H_4CH_3$ | 2-Chlorotoluene       | <i>o</i> -Chlorotoluene | 17 |
| 7  | $3-ClC_6H_4CH_3$ | 3-Chlorotoluene       | <i>m</i> -Chlorotoluene | 19 |
| 8  | $4-ClC_6H_4CH_3$ | 4-Chlorotoluene       | <i>p</i> -Chlorotoluene | 21 |
| 9  | $C_6H_5CH_2Br$   | (Bromomethyl)benzene  | Benzyl bromide          | 23 |
| 10 | $2-BrC_6H_4CH_3$ | 2-Bromotoluene        | <i>o</i> -Bromotoluene  | 25 |
| 11 | $3-BrC_6H_4CH_3$ | 3-Bromotoluene        | <i>m</i> -Bromotoluene  | 27 |
| 12 | $4-BrC_6H_4CH_3$ | 4-Bromotoluene        | <i>p</i> -Bromotoluene  | 29 |
| 13 | $C_6H_5CH_2I$    | (Iodomethyl)benzene   | Benzyl iodide           | 31 |
| 14 | $2-IC_6H_4CH_3$  | 2-Iodotoluene         | <i>o</i> -Iodotoluene   | 33 |
| 15 | $3-IC_6H_4CH_3$  | 3-Iodotoluene         | <i>m</i> -Iodotoluene   | 35 |
| 16 | $4-IC_6H_4CH_3$  | 4-Iodotoluene         | <i>p</i> -Iodotoluene   | 37 |

## DIHALOGENATED TOLUENES

|    |                      |                                  |                              |    |
|----|----------------------|----------------------------------|------------------------------|----|
| 17 | $C_6H_5CHF_2$        | (Difluoromethyl)benzene          | Benzal fluoride              | 39 |
| 18 | $C_6H_5CHCl_2$       | (Dichloromethyl)benzene          | Benzal chloride              | 41 |
| 19 | $2-ClC_6H_4CH_2Cl$   | 2-Chloro-1-(chloromethyl)benzene | 2-Chlorobenzyl chloride      | 43 |
| 20 | $3-ClC_6H_4CH_2Cl$   | 3-Chloro-1-(chloromethyl)benzene | 3-Chlorobenzyl chloride      | 45 |
| 21 | $4-ClC_6H_4CH_2Cl$   | 4-Chloro-1-(chloromethyl)benzene | 4-Chlorobenzyl chloride      | 47 |
| 22 | $2,3-Cl_2C_6H_3CH_3$ | 2,3-Dichlorotoluene              | 1,2-Dichloro-3-methylbenzene | 49 |
| 23 | $2,4-Cl_2C_6H_3CH_3$ | 2,4-Dichlorotoluene              | 2,4-Dichloro-1-methylbenzene | 51 |
| 24 | $2,5-Cl_2C_6H_3CH_3$ | 2,5-Dichlorotoluene              | 1,4-Dichloro-2-methylbenzene | 53 |
| 25 | $2,6-Cl_2C_6H_3CH_3$ | 2,6-Dichlorotoluene              | 2,6-Dichloro-1-methylbenzene | 55 |
| 26 | $3,4-Cl_2C_6H_3CH_3$ | 3,4-Dichlorotoluene              | 1,2-Dichloro-4-methylbenzene | 57 |
| 27 | $3,5-Cl_2C_6H_3CH_3$ | 3,5-Dichlorotoluene              | 1,3-Dichloro-5-methylbenzene | 59 |

Continued on next page

## HIGHER HALOGENATED TOLUENES

|    |                 |                                     |                          |    |
|----|-----------------|-------------------------------------|--------------------------|----|
| 28 | $C_6H_5CF_3$    | (Trifluoromethyl)benzene            | Benzotrifluoride         | 61 |
| 29 | $C_6H_5CCl_3$   | (Trichloromethyl)benzene            | Benzotrichloride         | 63 |
| 30 | $3-FC_6H_4CF_3$ | 3-Fluoro-1-(trifluoromethyl)benzene | 3-Fluorobenzotrifluoride | 65 |
| 31 | $C_6F_5CH_3$    | 2,3,4,5,6-Pentafluorotoluene        |                          | 67 |
| 32 | $C_6F_5CF_3$    | Octafluorotoluene                   | Perfluorotoluene         | 69 |

## HALOGENATED HIGHER ALKYL BENZENES

|    |                        |                             |                             |    |
|----|------------------------|-----------------------------|-----------------------------|----|
| 33 | $C_6H_5C_2H_4Cl$       | (2-Chloroethyl)benzene      | $\beta$ -Phenethyl chloride | 71 |
| 34 | $2-ClC_6H_4C_2H_5$     | 2-Chloro-1-ethylbenzene     | 2-Ethylchlorobenzene        | 73 |
| 35 | $3-ClC_6H_4C_2H_5$     | 3-Chloro-1-ethylbenzene     | 3-Ethylchlorobenzene        | 75 |
| 36 | $4-ClC_6H_4C_2H_5$     | 4-Chloro-1-ethylbenzene     | 4-Ethylchlorobenzene        | 77 |
| 37 | $C_6H_5C_2H_4Br$       | (2-Bromoethyl)benzene       | $\beta$ -Phenethyl bromide  | 79 |
| 38 | $2-BrC_6H_4C_2H_5$     | 2-Bromo-1-ethylbenzene      | 2-Ethylbromobenzene         | 81 |
| 39 | $4-BrC_6H_4C_2H_5$     | 4-Bromo-1-ethylbenzene      | 4-Ethylbromobenzene         | 83 |
| 40 | $2-ClC_6H_4CH(CH_3)_2$ | 2-Chloro-1-isopropylbenzene | 2-Chlorocumene              | 85 |
| 41 | $4-ClC_6H_4CH(CH_3)_2$ | 4-Chloro-1-isopropylbenzene | 4-Chlorocumene              | 87 |
| 42 | $2-BrC_6H_4CH(CH_3)_2$ | 2-Bromo-1-isopropylbenzene  | 2-Bromocumene               | 89 |
| 43 | $4-BrC_6H_4CH(CH_3)_2$ | 4-Bromo-1-isopropylbenzene  | 4-Bromocumene               | 91 |

## HALOGENATED STYRENES

|    |                     |                         |                 |    |
|----|---------------------|-------------------------|-----------------|----|
| 44 | $2-ClC_6H_4CH=CH_2$ | 2-Chloro-1-vinylbenzene | 2-Chlorostyrene | 93 |
| 45 | $4-ClC_6H_4CH=CH_2$ | 4-Chloro-1-vinylbenzene | 4-Chlorostyrene | 95 |
| 46 | $2-BrC_6H_4CH=CH_2$ | 2-Bromo-1-vinylbenzene  | 2-Bromostyrene  | 97 |
| 47 | $4-BrC_6H_4CH=CH_2$ | 4-Bromo-1-vinylbenzene  | 4-Bromostyrene  | 99 |

# VAPOUR PRESSURES AND CRITICAL POINTS OF LIQUIDS HALOGENATED ALKYL BENZENES AND HALOGENATED STYRENES

## 1. INTRODUCTION

This Item presents saturated vapour pressures of the halogenated alkylbenzenes and halogenated styrenes shown in the order of arrangement on the Contents page.

Table 1, page 5, gives the constants of the Wagner vapour pressure equation for all the compounds. On the following sheets, the values of vapour pressure for each compound have been obtained by calculation from the Wagner vapour pressure equation given at the top of each sheet. Using the critical temperature and the critical pressure given, the coefficients were derived by fitting the equation to the data that had been selected and weighted in accordance with a critical assessment of all the data. Note that estimated values of critical temperature are normally rounded to the nearest kelvin and that values in other units are obtained by exact conversion. The Tables also give the acentric factor, the normal boiling point, the value of  $dT/dp$  at the normal boiling point and the approximate melting point rounded to the nearest K or °C. Brackets enclose data at temperatures outside the range of supporting experimental data.

The table of Data at Specified Pressures for each compound gives, at each pressure, the temperature and the derivative of pressure with respect to temperature. In addition this table also gives an assessment of the data quality, indicated in decreasing order, by one of the letters 'A', 'B' or 'C'. At pressures of 1 kPa and above the estimated uncertainties in temperature and pressure which are dependent upon the data quality are shown below each letter rounded to 1, 2, or 5 times a power of 10. Uncertainties are discussed at greater length in Section 5.

Tabulated values of vapour pressure are presented in two sets of units, namely, (i) pressures in kPa at temperatures in kelvins, (ii) pressures in bar at temperatures in degrees C. The Table providing pressures in kPa also gives the uncertainties in pressure and temperature for pressures greater than 1 kPa. In general, pressures are given from just above the melting point to just below the critical point at intervals adjusted to make maximum use of the space available, a larger interval frequently being used at low temperatures. For compounds with very high estimated critical temperatures the tables are usually truncated at a convenient lower temperature.

The sources of information which give vapour pressure and/or critical point data for the compound considered are listed on the reverse side of each sheet. Those sources that were used to derive the critical properties and the coefficients of the vapour pressure equation are shown in bold type together with the pressure ranges of their data. These arbitrary pressure ranges are described in Section 3.

## 2. NOTATION AND UNITS

All temperatures are based on the International Temperature Scale (ITS-90). On ITS-90 Kelvin temperatures are strictly called International Kelvin Temperatures, similarly Celsius temperatures are strictly called International Celsius Temperatures.

$N_1, N_2, N_3, N_4$  non-dimensional coefficients of the Wagner vapour pressure equation

$p$  vapour pressure

$T$  kelvin temperature

$t$  Celsius temperature,  $(T - 273.15)$

$\tau$   $1 - T/T_c$

Note: The units of temperature and vapour pressure are shown in each table.

## Subscripts

- |   |                                              |
|---|----------------------------------------------|
| b | denotes value at normal boiling point        |
| c | denotes value at critical point              |
| m | denotes value at normal melting point        |
| r | denotes reduced quantity, e.g. $T_r = T/T_c$ |

## 3. SOURCES OF DATA

Experimental vapour pressure data are, according to the apparatus and technique applied, usually reported for different pressure regions which may loosely be defined as:

- low pressure, below say 1 kPa (approximately 7.5 mmHg),
- medium pressure, say 1 kPa to 200 kPa (approximately 2 atm),
- high pressure, say 200 kPa to the critical point,
- the critical point.

The experimental data reported for the low and high pressure ranges are usually less accurate than, and not always compatible with, data for the medium pressure range, which may be of a very high degree of precision, possibly with an uncertainty in pressure less than 0.01 per cent near the normal boiling point. In the high pressure range the uncertainties increase progressively with temperature up to the critical point where the uncertainty in pressure is seldom lower than 0.1 per cent and frequently higher than 1 per cent.

Of the compounds considered here, very reliable medium pressure range measurements have been made on several fluoro- and polyfluoro- compounds. On some of these compounds reliable high pressure range, and on most of them, reliable critical point measurements have also been made. For several of the chloro- and bromo- compounds medium pressure range measurements of varying reliability have been made and for remaining compounds only boiling temperatures at various pressures have been reported.

In this Item critical temperatures and critical pressures were estimated, using References 2, 3 and 8, for those compounds for which they were not reliably known.

## 4. CRITERIA TO BE MET BY VAPOUR PRESSURE EQUATIONS

## 4.1. Low reduced temperatures

Vapour pressures of liquids at very low temperatures are, in general, more reliably obtained by calculation than by direct measurement. In Reference 4 Ambrose and Davies show that such vapour pressures may be obtained from the difference between the heat capacities of the ideal gas and the liquid. Rigorous treatment also requires the molar volume of the liquid and the second virial coefficient of the vapour. Unfortunately, the requisite experimental data determinations have been made for comparatively few liquids and these do not include any of the compounds considered here. However, low range vapour pressures obtained in this way are available for the normal alkanes from ethane to hexadecane, and these have been used in the derivation of their vapour pressure equations, see Reference 7, which may be used as a guide to extrapolate the vapour pressure curves of other non-associated liquids as follows.

The second differential of the Wagner vapour pressure equation with respect to temperature gives the difference,  $D$  say, between the saturated vapour and liquid heat capacities. Denoting the differences at reduced temperatures of 0.3 and 0.5 by,  $D_3$  and  $D_5$  respectively, it was noted that for the alkanes from propane to hexadecane, the variation of  $D_3/D_5$  with  $D_5$  could be represented by a straight line without significant error. If it is assumed that this line is approximately valid for other groups of compounds the equation of the line may be included in the program which fits the Wagner vapour pressure equation and the deviation of the

extrapolation of each fit from this line may be calculated. If necessary, the ratio of the third and fourth coefficients of the equation may be slightly constrained to reduce the deviation.

#### 4.2. High reduced temperatures

In References 5 and 6 Ambrose has examined the differences, in the high pressure range, between the shapes of well-established vapour pressure curves for a variety of compounds. He has shown that for compounds in different classes of chemical substances these differences in shape are characterised by different ranges of numerical relationships between the coefficients of their Wagner equations. In Reference 7 Ambrose and Walton have demonstrated this phenomenon for the two homologous series of normal alkanes and normal alkanols. Thus, for certain classes of compounds it is possible to establish criteria that should be met by vapour pressure curves based on less extensive or less reliable data.

### 5. EVALUATION AND CORRELATION

The vapour pressure equations of the polyfluoro- compounds with the most reliable vapour pressure and critical point data yielded values of  $D_3/D_5$  which were consistent with the line for alkanes referred to in Section 4.1. and were consistent with the criteria referred to in Section 4.2. Therefore in this Item the equations of these compounds were then used to derive a correlation which was similar to that derived for the alkanes and which is described in Items 84022, 84028 and 85002. This correlation was then used to derive the vapour pressure equations of those fluoro- compounds for which the data were not extensive or precise enough to yield reliable results when fitted by the Wagner equation in the normal way.

The correlation for the alkanes, already referred to above, was used to derive the vapour pressure equations of the remaining chloro-, bromo- and iodo- compounds. This procedure ensured that the vapour pressure equations of all the compounds presented here met the desired criteria.

For most of the compounds considered here, saturated liquid density data were available and the liquid density equations for them, see Item 99008, were derived in parallel with the vapour pressure equations presented here. Where necessary, the estimated values of critical temperature, critical pressure and critical density for some compounds were adjusted until they were optimum values for the correlation of both properties.

### 6. DISCUSSION OF UNCERTAINTIES

At any temperature, the estimated uncertainties in the tabulated values of temperature and pressure are dependent upon the reliability of the experimental and estimated data on which they are based. Except in the low pressure range values dependent on estimated data are much less certain than values dependent upon measured data.

The reliability of the experimental or estimated data may vary considerably over the entire liquid range of a compound. The term 'data quality' is used here to express the assessed reliability of the fitted data and hence also the reliability of the tabulated values. In the table of Data at Specified Pressures the data quality at each pressure is denoted by one of the letters 'A', 'B' or 'C'. The uncertainties in temperature and pressure are not thought to be more than the values shown below each letter.

The majority of reliable data are considered of quality 'A' with uncertainties of about 0.01 to 0.1 K at the normal boiling point or about 0.1 to 1 K at the critical point. Similarly the letters 'B' and 'C' indicate that the vapour pressures are based on progressively less reliable data, the uncertainties increasing tenfold with each successive letter.

When the data quality is 'C' it will be appreciated that the uncertainties are necessarily rather speculative and that for some compounds they may be underestimated. Furthermore for those compounds for which the data quality at the critical pressure is denoted by 'C' the values of critical temperature and critical pressure given in the Tables should be regarded only as correlating parameters. Since the acentric factor,  $w$ , is dependent upon the value of critical pressure selected, the uncertainty in  $w$  for these compounds is high, possibly greater than 0.05.

## 7. REFERENCES

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**TABLE 1**

Summary of Constants in the Wagner vapour pressure equation

$$\ln p = \ln p_c + (N_1 \tau + N_2 \tau^{1.5} + N_3 \tau^{2.5} + N_4 \tau^5) / (T/T_c) \quad \text{where } \tau = 1 - T/T_c$$

| No.                                | Name                                | $T_c$<br>K | $p_c$<br>kPa | $N_1$    | $N_2$   | $N_3$    | $N_4$    |
|------------------------------------|-------------------------------------|------------|--------------|----------|---------|----------|----------|
| <b>MONOHALOGENATED TOLUENES</b>    |                                     |            |              |          |         |          |          |
| 1                                  | (Fluoromethyl)benzene               | 620.       | 4150.        | -7.91787 | 1.92130 | -2.80611 | -4.00038 |
| 2                                  | 2-Fluorotoluene                     | 589.       | 3930.        | -7.50840 | 1.77943 | -2.38121 | -3.61579 |
| 3                                  | 3-Fluorotoluene                     | 593.       | 3950.        | -7.50586 | 1.77855 | -2.37857 | -3.61341 |
| 4                                  | 4-Fluorotoluene                     | 594.       | 3950.        | -7.53458 | 1.89118 | -2.60952 | -2.89046 |
| 5                                  | (Chloromethyl)benzene               | 681.       | 4100.        | -7.84465 | 1.98506 | -3.03200 | -3.35983 |
| 6                                  | 2-Chlorotoluene                     | 658.       | 3850.        | -7.49230 | 1.81513 | -2.50705 | -3.00607 |
| 7                                  | 3-Chlorotoluene                     | 662.       | 3975.        | -7.56417 | 1.84812 | -2.61147 | -3.08157 |
| 8                                  | 4-Chlorotoluene                     | 664.       | 3850.        | -7.45559 | 1.79861 | -2.45424 | -2.96683 |
| 9                                  | (Bromomethyl)benzene                | 720.       | 3950.        | -7.58119 | 1.85606 | -2.63641 | -3.09920 |
| 10                                 | 2-Bromotoluene                      | 692.       | 3850.        | -7.48581 | 1.81219 | -2.49768 | -2.99916 |
| 11                                 | 3-Bromotoluene                      | 696.       | 3850.        | -7.48678 | 1.81263 | -2.49908 | -3.00020 |
| 12                                 | 4-Bromotoluene                      | 697.       | 3900.        | -7.49609 | 1.81685 | -2.51252 | -3.01009 |
| 13                                 | (Iodomethyl)benzene                 | 765.       | 3700.        | -7.47423 | 1.80698 | -2.48102 | -2.98682 |
| 14                                 | 2-Iodotoluene                       | 737.       | 3900.        | -7.52792 | 1.83137 | -2.55863 | -3.04371 |
| 15                                 | 3-Iodotoluene                       | 740.       | 3800.        | -7.46023 | 1.80069 | -2.46089 | -2.97181 |
| 16                                 | 4-Iodotoluene                       | 742.       | 3900.        | -7.45364 | 1.79774 | -2.45145 | -2.96473 |
| <b>DIHALOGENATED TOLUENES</b>      |                                     |            |              |          |         |          |          |
| 17                                 | (Difluoromethyl)benzene             | 611.       | 3500.        | -7.92329 | 1.92317 | -2.81173 | -4.00546 |
| 18                                 | (Dichloromethyl)benzene             | 717.       | 3750.        | -7.66297 | 1.95829 | -3.33759 | -4.44497 |
| 19                                 | 2-Chloro-1-(chloromethyl)benzene    | 732.       | 3750.        | -7.82976 | 2.09529 | -3.62834 | -4.38296 |
| 20                                 | 3-Chloro-1-(chloromethyl)benzene    | 730.       | 3750.        | -7.79277 | 2.06525 | -3.56428 | -4.39576 |
| 21                                 | 4-Chloro-1-(chloromethyl)benzene    | 740.       | 3800.        | -7.84075 | 2.10418 | -3.64734 | -4.37926 |
| 22                                 | 2,3-Dichlorotoluene                 | 721.       | 3750.        | -7.65360 | 1.95048 | -3.32112 | -4.44878 |
| 23                                 | 2,4-Dichlorotoluene                 | 704.       | 3750.        | -7.67269 | 1.96638 | -3.35466 | -4.44106 |
| 24                                 | 2,5-Dichlorotoluene                 | 709.       | 3750.        | -7.65358 | 1.95046 | -3.32108 | -4.44879 |
| 25                                 | 2,6-Dichlorotoluene                 | 706.       | 3750.        | -7.68218 | 1.97427 | -3.37132 | -4.43727 |
| 26                                 | 3,4-Dichlorotoluene                 | 723.       | 3750.        | -7.60725 | 1.91164 | -3.23939 | -4.46812 |
| 27                                 | 3,5-Dichlorotoluene                 | 712.       | 3750.        | -7.65359 | 1.95047 | -3.32109 | -4.44879 |
| <b>HIGHER HALOGENATED TOLUENES</b> |                                     |            |              |          |         |          |          |
| 28                                 | (Trifluoromethyl)benzene            | 551.       | 3070.        | -7.82956 | 1.95469 | -2.88374 | -3.36500 |
| 29                                 | (Trichloromethyl)benzene            | 733.       | 3270.        | -7.70622 | 1.91586 | -2.82189 | -3.22572 |
| 30                                 | 3-Fluoro-1-(trifluoromethyl)benzene | 544.       | 3010.        | -8.08691 | 2.29599 | -3.51509 | -2.82318 |
| 31                                 | 2,3,4,5,6-Pentafluorotoluene        | 566.48     | 3126.        | -8.15319 | 1.94821 | -2.97045 | -3.82885 |
| 32                                 | Octafluorotoluene                   | 534.43     | 2705.        | -8.51017 | 2.20021 | -3.56053 | -4.48105 |

Continued on next page

TABLE 1 continued

| No.                                      | Name                        | $T_c$<br>K | $p_c$<br>kPa | $N_1$    | $N_2$   | $N_3$    | $N_4$    |
|------------------------------------------|-----------------------------|------------|--------------|----------|---------|----------|----------|
| <b>HALOGENATED HIGHER ALKYL BENZENES</b> |                             |            |              |          |         |          |          |
| 33                                       | (2-Chloroethyl)benzene      | 697.       | 3450.        | -7.86802 | 1.99705 | -3.06796 | -3.38186 |
| 34                                       | 2-Chloro-1-ethylbenzene     | 671.       | 3400.        | -7.76078 | 1.94277 | -2.90412 | -3.27933 |
| 35                                       | 3-Chloro-1-ethylbenzene     | 679.       | 3400.        | -7.75860 | 1.94168 | -2.90081 | -3.27720 |
| 36                                       | 4-Chloro-1-ethylbenzene     | 680.       | 3500.        | -7.81390 | 1.96942 | -2.98491 | -3.33058 |
| 37                                       | (2-Bromoethyl)benzene       | 727.       | 3400.        | -7.74191 | 1.93341 | -2.87560 | -3.26090 |
| 38                                       | 2-Bromo-1-ethylbenzene      | 704.       | 3400.        | -7.73026 | 1.92766 | -2.85802 | -3.24946 |
| 39                                       | 4-Bromo-1-ethylbenzene      | 711.       | 3400.        | -7.72063 | 1.92292 | -2.84353 | -3.23998 |
| 40                                       | 2-Chloro-1-isopropylbenzene | 679.       | 3000.        | -7.86684 | 1.99644 | -3.06614 | -3.38075 |
| 41                                       | 4-Chloro-1-isopropylbenzene | 690.       | 3000.        | -7.85149 | 1.98856 | -3.04250 | -3.36629 |
| 42                                       | 2-Bromo-1-isopropylbenzene  | 707.       | 3160.        | -7.98108 | 2.05626 | -3.24385 | -3.48597 |
| 43                                       | 4-Bromo-1-isopropylbenzene  | 719.       | 3150.        | -7.98738 | 2.05962 | -3.25375 | -3.49165 |
| <b>HALOGENATED STYRENES</b>              |                             |            |              |          |         |          |          |
| 44                                       | 2-Chloro-1-vinylbenzene     | 693.       | 3550.        | -7.62015 | 1.87442 | -2.69377 | -3.13918 |
| 45                                       | 4-Chloro-1-vinylbenzene     | 697.       | 3550.        | -7.62897 | 1.87861 | -2.70681 | -3.14816 |
| 46                                       | 2-Bromo-1-vinylbenzene      | 726.       | 3550.        | -7.61528 | 1.87211 | -2.68657 | -3.13421 |
| 47                                       | 4-Bromo-1-vinylbenzene      | 728.       | 3600.        | -7.71323 | 1.91929 | -2.83241 | -3.23267 |

**C<sub>6</sub>H<sub>5</sub>CH<sub>2</sub>F**  
 (Fluoromethyl)benzene; Benzyl fluoride

**C<sub>7</sub>H<sub>7</sub>F**

CAS Reg. No. 350-50-5

Mol. Wt. 110.13

Vapour Pressure  $\ln p = \ln p_c + (N_1 \tau + N_2 \tau^{1.5} + N_3 \tau^{2.5} + N_4 \tau^5)/(T/T_c)$

where  $p$  is the vapour pressure,  $p_c$  is the critical pressure,  $T$  is the kelvin temperature on the International Temperature Scale of 1990 (ITS-90),  $T_c$  is the critical temperature and  $\tau = 1 - T/T_c$ .

Critical Temperature  
 Critical Pressure

$T_c = 620. \text{ K}$  ( $t_c = 346.85 \text{ }^\circ\text{C}$ )  
 $p_c = 4150. \text{ kPa}$  ( $p_c = 40.96 \text{ atm}$ )

$N_1 = -7.91787$   $N_2 = 1.92130$   $N_3 = -2.80611$   $N_4 = -4.00038$

Acentric Factor  
 Normal Boiling Point

$\omega = 0.370$   
 $T_b = 412.850 \text{ K}$  ( $t_b = 139.700 \text{ }^\circ\text{C}$ )

$dT/dp$  at  $T_b$ ,  $t_b$

$= 0.352 \text{ K/kPa}$  ( $= 0.0470 \text{ }^\circ\text{C/mmHg}$ )

Approximate Melting Point

$T_m = 238. \text{ K}$  ( $t_m = -35. \text{ }^\circ\text{C}$ )

|                          |  | Data at Specified Pressures |       |           |         |         |         |
|--------------------------|--|-----------------------------|-------|-----------|---------|---------|---------|
| $p/\text{kPa}$           |  | 1.E-6                       | 1.E-4 | 0.01      | 1       | 10      | 101.325 |
| $T/\text{K}$             |  |                             |       | (242.374) | 300.911 | 346.097 | 412.850 |
| $(dp/dT)/(\text{kPa/K})$ |  |                             |       | (0.001)   | 0.060   | 0.429   | 2.839   |
| Data Quality             |  |                             |       | (C)       | C       | C       | C       |
| Uncert. in $T$ (K)       |  |                             |       | (0.5)     | 0.2     | 0.2     | 0.5     |
| Uncert. in $p$ (kPa)     |  |                             |       | (0.0005)  | 0.01    | 0.1     | 1.      |
| Uncert. in $p$ (%)       |  |                             |       | (5.)      | 1.      | 1.      | 1.      |

## Vapour Pressure of (Fluoromethyl)benzene

Units: kPa v. K

| Uncertainty in |         |     |     | Uncertainty in |          |     |     | Uncertainty in |          |     |     |
|----------------|---------|-----|-----|----------------|----------|-----|-----|----------------|----------|-----|-----|
| $T$            | $p$     | $T$ | $p$ | $T$            | $p$      | $T$ | $p$ | $T$            | $p$      | $T$ | $p$ |
| K              | kPa     | K   | %   | K              | kPa      | K   | %   | K              | kPa      | K   | %   |
|                |         |     |     | 350            | 11.796   | 0.2 | 1   | 500            | (716.76) | 2   | 5   |
|                |         |     |     | 360            | 17.659   | 0.2 | 1   | 510            | (855.39) | 2   | 5   |
|                |         |     |     | 370            | 25.748   | 0.2 | 1   | 520            | (1013.4) | 2   | 5   |
|                |         |     |     | 380            | 36.654   | 0.2 | 1   | 530            | (1192.7) | 2   | 5   |
| 240            | (0.008) | 0.5 | 5   | 390            | 51.054   | 0.2 | 1   | 540            | (1395.0) | 5   | 5   |
| 250            | (0.021) | 0.5 | 5   | 400            | 69.714   | 0.2 | 1   | 550            | (1622.4) | 5   | 5   |
| 260            | (0.052) | 0.2 | 2   | 410            | 93.485   | 0.5 | 1   | 560            | (1877.1) | 5   | 5   |
| 270            | (0.119) | 0.2 | 2   | 420            | (123.30) | 0.5 | 1   | 570            | (2161.4) | 5   | 5   |
| 280            | (0.252) | 0.2 | 2   | 430            | (160.18) | 0.5 | 1   | 580            | (2478.2) | 5   | 5   |
| 290            | (0.502) | 0.2 | 1   | 440            | (205.21) | 0.5 | 2   | 590            | (2830.6) | 5   | 10  |
| 300            | 0.946   | 0.2 | 1   | 450            | (259.56) | 1   | 2   | 600            | (3222.4) | 5   | 10  |
| 310            | 1.698   | 0.2 | 1   | 460            | (324.47) | 1   | 2   | 610            | (3659.1) | 5   | 10  |
| 320            | 2.915   | 0.2 | 1   | 470            | (401.23) | 1   | 2   | 620            | (4150.0) | 10  | 10  |
| 330            | 4.808   | 0.2 | 1   | 480            | (491.23) | 2   | 2   |                |          |     |     |
| 340            | 7.654   | 0.2 | 1   | 490            | (595.91) | 2   | 5   |                |          |     |     |

C<sub>7</sub>H<sub>7</sub>F

## Vapour Pressure of (Fluoromethyl)benzene continued

Units: bar v. °C

| $t$<br>°C | $p$<br>bar | $t$<br>°C | $p$<br>bar | $t$<br>°C | $p$<br>bar | $t$<br>°C | $p$<br>bar | $t$<br>°C | $p$<br>bar |
|-----------|------------|-----------|------------|-----------|------------|-----------|------------|-----------|------------|
|           |            | 50        | 0.034      | 150       | (1.341)    | 250       | (10.675)   |           |            |
|           |            | 60        | 0.056      | 160       | (1.734)    | 260       | (12.538)   |           |            |
| -30       | (1.E-4)    | 70        | 0.088      | 170       | (2.213)    | 270       | (14.638)   |           |            |
| -20       | (3.E-4)    | 80        | 0.134      | 180       | (2.788)    | 280       | (16.996)   |           |            |
| -10       | (7.E-4)    | 90        | 0.199      | 190       | (3.473)    | 290       | (19.633)   |           |            |
| 0         | (0.002)    | 100       | 0.288      | 200       | (4.281)    | 300       | (22.576)   |           |            |
| 10        | (0.003)    | 110       | 0.408      | 210       | (5.226)    | 310       | (25.852)   |           |            |
| 20        | (0.006)    | 120       | 0.564      | 220       | (6.322)    | 320       | (29.495)   |           |            |
| 30        | 0.011      | 130       | 0.766      | 230       | (7.584)    | 330       | (33.548)   |           |            |
| 40        | 0.020      | 140       | 1.022      | 240       | (9.030)    | 340       | (38.071)   |           |            |

The following Sources give vapour pressure and/or critical point data for this compound. Those Sources used to derive the critical properties and coefficients of the vapour pressure equation are shown in bold type together with the pressure range (low 'L', medium 'M', normal boiling point only 'N', high 'H' or critical 'C') of the data. An asterisk (\*) indicates that the Source is not a primary source of experimental data for this compound.

1 ASHCROFT, S.J.;

*J.Chem.Eng.Data*, Vol.21, p.397, 1976. L

The following Sources were used to estimate critical point data for this compound.

AMBROSE, D. ;

NPL Report Chem 92, Nat.Phys.Lab., Teddington, UK, 1978.\*

AMBROSE, D. ;

NPL Report Chem 98, Nat.Phys.Lab., Teddington, UK, 1979.\*

SOMAYAJULU, G.R.;

*J.Chem.Eng.Data*, Vol.34, p.106, 1989.\*



2-FC<sub>6</sub>H<sub>4</sub>CH<sub>3</sub>  
 2-Fluorotoluene; *o*-Fluorotoluene; *o*-Tolylfluoride

CAS Reg. No. 95-52-3

Mol. Wt. 110.13

Vapour Pressure  $\ln p = \ln p_c + (N_1 \tau + N_2 \tau^{1.5} + N_3 \tau^{2.5} + N_4 \tau^5)/(T/T_c)$

where  $p$  is the vapour pressure,  $p_c$  is the critical pressure,  $T$  is the kelvin temperature on the International Temperature Scale of 1990 (ITS-90),  $T_c$  is the critical temperature and  $\tau = 1 - T/T_c$ .

Critical Temperature  $T_c = 589. \text{ K}$  ( $t_c = 315.85 \text{ }^\circ\text{C}$ )  
 Critical Pressure  $p_c = 3930. \text{ kPa}$  ( $p_c = 38.79 \text{ atm}$ )

$N_1 = -7.50840$   $N_2 = 1.77943$   $N_3 = -2.38121$   $N_4 = -3.61579$

Acentric Factor  $\omega = 0.294$   
 Normal Boiling Point  $T_b = 386.750 \text{ K}$  ( $t_b = 113.600 \text{ }^\circ\text{C}$ )  
 $dT/dp$  at  $T_b, t_b = 0.345 \text{ K/kPa}$  ( $= 0.0460 \text{ }^\circ\text{C/mmHg}$ )  
 Approximate Melting Point  $T_m = 211. \text{ K}$  ( $t_m = -62. \text{ }^\circ\text{C}$ )

| Data at Specified Pressures |       |       |           |           |         |         |
|-----------------------------|-------|-------|-----------|-----------|---------|---------|
| $p/\text{kPa}$              | 1.E-6 | 1.E-4 | 0.01      | 1         | 10      | 101.325 |
| $T/\text{K}$                |       |       | (222.427) | (278.210) | 321.727 | 386.750 |
| $(dp/dT)/(\text{kPa/K})$    |       |       | (0.001)   | (0.063)   | 0.444   | 2.895   |
| Data Quality                |       |       | (C)       | (C)       | C       | C       |
| Uncert. in $T$ (K)          |       |       | (2.)      | (1.)      | 0.5     | 0.2     |
| Uncert. in $p$ (kPa)        |       |       | (0.002)   | (0.05)    | 0.2     | 1.      |
| Uncert. in $p$ (%)          |       |       | (20.)     | (5.)      | 2.      | 1.      |

### Vapour Pressure of 2-Fluorotoluene

Units: kPa v. K

| Uncertainty in |         |     |     | Uncertainty in |        |     |     | Uncertainty in |          |     |     |
|----------------|---------|-----|-----|----------------|--------|-----|-----|----------------|----------|-----|-----|
| $T$            | $p$     | $T$ | $p$ | $T$            | $p$    | $T$ | $p$ | $T$            | $p$      | $T$ | $p$ |
| K              | kPa     | K   | %   | K              | kPa    | K   | %   | K              | kPa      | K   | %   |
| 210            | (0.002) | 2   | 50  | 350            | 31.063 | 0.5 | 1   | 500            | 1138.9   | 2   | 5   |
| 220            | (0.008) | 2   | 20  | 360            | 44.090 | 0.5 | 1   | 510            | 1334.1   | 5   | 5   |
| 230            | (0.022) | 2   | 20  | 370            | 61.192 | 0.5 | 1   | 520            | 1553.3   | 5   | 5   |
| 240            | (0.056) | 1   | 10  | 380            | 83.213 | 0.2 | 1   | 530            | (1798.7) | 5   | 5   |
|                |         |     |     | 390            | 111.08 | 0.5 | 1   | 540            | (2072.4) | 5   | 5   |
| 250            | (0.132) | 1   | 10  | 400            | 145.81 | 0.5 | 1   | 550            | (2376.9) | 5   | 5   |
| 260            | (0.288) | 1   | 5   | 410            | 188.48 | 0.5 | 2   | 560            | (2715.3) | 5   | 10  |
| 270            | (0.585) | 1   | 5   | 420            | 240.22 | 1   | 2   | 570            | (3091.2) | 5   | 10  |
| 280            | (1.118) | 1   | 5   | 430            | 302.26 | 1   | 2   | 580            | (3509.5) | 5   | 10  |
| 290            | (2.027) | 0.5 | 5   | 440            | 375.87 | 1   | 2   |                |          |     |     |
| 300            | (3.503) | 0.5 | 2   | 450            | 462.37 | 1   | 2   |                |          |     |     |
| 310            | 5.804   | 0.5 | 2   | 460            | 563.14 | 2   | 2   |                |          |     |     |
| 320            | 9.258   | 0.5 | 2   | 470            | 679.64 | 2   | 5   |                |          |     |     |
| 330            | 14.275  | 0.5 | 2   | 480            | 813.37 | 2   | 5   |                |          |     |     |
| 340            | 21.349  | 0.5 | 2   | 490            | 965.89 | 2   | 5   |                |          |     |     |

C<sub>7</sub>H<sub>7</sub>F

## Vapour Pressure of 2-Fluorotoluene continued

Units: bar v. °C

| $t$<br>°C | $p$<br>bar | $t$<br>°C | $p$<br>bar | $t$<br>°C | $p$<br>bar | $t$<br>°C | $p$<br>bar | $t$<br>°C | $p$<br>bar |
|-----------|------------|-----------|------------|-----------|------------|-----------|------------|-----------|------------|
|           |            | 0         | (0.007)    | 100       | 0.676      | 200       | 7.198      | 300       | (32.181)   |
|           |            | 10        | (0.014)    | 110       | 0.913      | 210       | 8.593      | 310       | (36.513)   |
|           |            | 20        | (0.024)    | 120       | 1.212      | 220       | 10.181     |           |            |
|           |            | 30        | 0.041      | 130       | 1.583      | 230       | 11.979     |           |            |
| -60       | (4.E-5)    | 40        | 0.067      | 140       | 2.037      | 240       | 14.004     |           |            |
| -50       | (1.E-4)    | 50        | 0.106      | 150       | 2.586      | 250       | 16.277     |           |            |
| -40       | (3.E-4)    | 60        | 0.163      | 160       | 3.241      | 260       | (18.817)   |           |            |
| -30       | (7.E-4)    | 70        | 0.241      | 170       | 4.017      | 270       | (21.648)   |           |            |
| -20       | (0.002)    | 80        | 0.348      | 180       | 4.925      | 280       | (24.797)   |           |            |
| -10       | (0.004)    | 90        | 0.490      | 190       | 5.981      | 290       | (28.295)   |           |            |

The following Sources give vapour pressure and/or critical point data for this compound. Those Sources used to derive the critical properties and coefficients of the vapour pressure equation are shown in bold type together with the pressure range (low 'L', medium 'M', normal boiling point only 'N', high 'H' or critical 'C') of the data. An asterisk (\*) indicates that the Source is not a primary source of experimental data for this compound.

- POTTER, J.C.; SAYLOR, J.H.; *J.Am.Chem.Soc.*, Vol.73, p.90, 1951.
- MOZHIGINSKAYA, L.V.; KOLYSKO, L.E.; *Russ.J.Phys.Chem.*, Vol.48, p.881, 1974.
- MOUSA, A.H.N.; *J.Fluorine Chem.*, Vol.25, p.165, 1984. H
- LIDE, D.R., (Ed-in-Chief); *CRC Handbook of Chemistry and Physics*, 74th Ed., 1993.\* N

The following Sources were used to estimate critical point data for this compound.

- AMBROSE, D.; NPL Report Chem 92, Nat.Phys.Lab., Teddington, UK, 1978.\*  
 AMBROSE, D.; NPL Report Chem 98, Nat.Phys.Lab., Teddington, UK, 1979.\*  
 SOMAYAJULU, G.R.; *J.Chem.Eng.Data*, Vol.34, p.106, 1989.\*

3-FC<sub>6</sub>H<sub>4</sub>CH<sub>3</sub>  
 3-Fluorotoluene; *m*-Fluorotoluene; *m*-Tolylfluoride

C<sub>7</sub>H<sub>7</sub>F

CAS Reg. No. 352-70-5

Mol. Wt. 110.13

Vapour Pressure  $\ln p = \ln p_c + (N_1 \tau + N_2 \tau^{1.5} + N_3 \tau^{2.5} + N_4 \tau^5)/(T/T_c)$

where  $p$  is the vapour pressure,  $p_c$  is the critical pressure,  $T$  is the kelvin temperature on the International Temperature Scale of 1990 (ITS-90),  $T_c$  is the critical temperature and  $\tau = 1 - T/T_c$ .

Critical Temperature  
 Critical Pressure

$T_c = 593. \text{ K}$  ( $t_c = 319.85 \text{ }^\circ\text{C}$ )  
 $p_c = 3950. \text{ kPa}$  ( $p_c = 38.98 \text{ atm}$ )

$N_1 = -7.50586$   $N_2 = 1.77855$   $N_3 = -2.37857$   $N_4 = -3.61341$

Acentric Factor  
 Normal Boiling Point

$\omega = 0.294$   
 $T_b = 389.150 \text{ K}$  ( $t_b = 116.000 \text{ }^\circ\text{C}$ )  
 $dT/dp \text{ at } T_b, t_b = 0.347 \text{ K/kPa}$  ( $= 0.0463 \text{ }^\circ\text{C/mmHg}$ )

Approximate Melting Point

$T_m = 185. \text{ K}$  ( $t_m = -88. \text{ }^\circ\text{C}$ )

| Data at Specified Pressures |       |           |           |           |           |         |           |           |
|-----------------------------|-------|-----------|-----------|-----------|-----------|---------|-----------|-----------|
| $p/\text{kPa}$              | 1.E-6 | 1.E-4     | 0.01      | 1         | 10        | 101.325 | 1000      | 3950.     |
| $T/\text{K}$                |       | (188.607) | (223.836) | (279.963) | (323.743) | 389.150 | (495.080) | (593.000) |
| $(dp/dT)/(\text{kPa/K})$    |       | (2.E-05)  | (0.001)   | (0.063)   | (0.441)   | 2.879   | (16.579)  | (49.997)  |
| Data Quality                |       |           | (C)       | (C)       | (C)       | C       | (C)       | (C)       |
| Uncert. in $T$ (K)          |       |           | (2.)      | (1.)      | (0.5)     | 0.5     | (2.)      | (10.)     |
| Uncert. in $p$ (kPa)        |       |           | (0.002)   | (0.05)    | (0.2)     | 1.      | (50.)     | (500.)    |
| Uncert. in $p$ (%)          |       |           | (20.)     | (5.)      | (2.)      | 1.      | (5.)      | (10.)     |

## Vapour Pressure of 3-Fluorotoluene

Units: kPa v. K

| Uncertainty in |         |     |     | Uncertainty in |          |     |     | Uncertainty in |          |     |     |
|----------------|---------|-----|-----|----------------|----------|-----|-----|----------------|----------|-----|-----|
| $T$            | $p$     | $T$ | $p$ | $T$            | $p$      | $T$ | $p$ | $T$            | $p$      | $T$ | $p$ |
| K              | kPa     | K   | %   | K              | kPa      | K   | %   | K              | kPa      | K   | %   |
|                |         |     |     | 300            | (3.173)  | 0.5 | 2   | 450            | (437.22) | 1   | 2   |
|                |         |     |     | 310            | (5.280)  | 0.5 | 2   | 460            | (533.33) | 2   | 2   |
|                |         |     |     | 320            | (8.459)  | 0.5 | 2   | 470            | (644.58) | 2   | 5   |
| 180            | (2.E-5) |     |     | 330            | (13.094) | 0.5 | 2   | 480            | (772.43) | 2   | 5   |
| 190            | (1.E-4) |     |     | 340            | (19.655) | 0.5 | 2   | 490            | (918.40) | 2   | 5   |
| 200            | (5.E-4) |     |     | 350            | (28.697) | 0.5 | 1   | 500            | (1084.1) | 2   | 5   |
| 210            | (0.002) | 5   | 50  | 360            | (40.861) | 0.5 | 1   | 510            | (1271.2) | 5   | 5   |
| 220            | (0.007) | 2   | 20  | 370            | (56.876) | 0.5 | 1   | 520            | (1481.5) | 5   | 5   |
| 230            | (0.019) | 2   | 20  | 380            | (77.556) | 0.5 | 1   | 530            | (1717.0) | 5   | 5   |
| 240            | (0.049) | 1   | 10  | 390            | (103.80) | 0.5 | 1   | 540            | (1979.7) | 5   | 5   |
| 250            | (0.116) | 1   | 10  | 400            | (136.57) | 0.5 | 1   | 550            | (2272.1) | 5   | 5   |
| 260            | (0.255) | 1   | 10  | 410            | (176.91) | 0.5 | 1   | 560            | (2596.8) | 5   | 10  |
| 270            | (0.521) | 1   | 5   | 420            | (225.95) | 0.5 | 2   | 570            | (2957.2) | 5   | 10  |
| 280            | (1.002) | 1   | 5   | 430            | (284.84) | 1   | 2   | 580            | (3357.5) | 5   | 10  |
| 290            | (1.827) | 0.5 | 5   | 440            | (354.84) | 1   | 2   | 590            | (3804.5) | 10  | 10  |

C<sub>7</sub>H<sub>7</sub>F

## Vapour Pressure of 3-Fluorotoluene continued

Units: bar v. °C

| $t$<br>°C | $p$<br>bar | $t$<br>°C | $p$<br>bar | $t$<br>°C | $p$<br>bar | $t$<br>°C | $p$<br>bar | $t$<br>°C | $p$<br>bar |
|-----------|------------|-----------|------------|-----------|------------|-----------|------------|-----------|------------|
| -90       | (4.E-7)    | 0         | (0.006)    | 100       | (0.628)    | 200       | (6.830)    | 300       | (30.788)   |
| -80       | (2.E-6)    | 10        | (0.012)    | 110       | (0.852)    | 210       | (8.164)    | 310       | (34.929)   |
| -70       | (8.E-6)    | 20        | (0.022)    | 120       | (1.134)    | 220       | (9.684)    |           |            |
| -60       | (3.E-5)    | 30        | (0.037)    | 130       | (1.484)    | 230       | (11.406)   |           |            |
|           |            | 40        | (0.061)    | 140       | (1.914)    | 240       | (13.349)   |           |            |
| -50       | (9.E-5)    | 50        | (0.097)    | 150       | (2.434)    | 250       | (15.529)   |           |            |
| -40       | (3.E-4)    | 60        | (0.149)    | 160       | (3.056)    | 260       | (17.967)   |           |            |
| -30       | (7.E-4)    | 70        | (0.222)    | 170       | (3.794)    | 270       | (20.685)   |           |            |
| -20       | (0.002)    | 80        | (0.322)    | 180       | (4.659)    | 280       | (23.707)   |           |            |
| -10       | (0.003)    | 90        | (0.455)    | 190       | (5.667)    | 290       | (27.063)   |           |            |

The following Sources give vapour pressure and/or critical point data for this compound. Those Sources used to derive the critical properties and coefficients of the vapour pressure equation are shown in bold type together with the pressure range (low 'L', medium 'M', normal boiling point only 'N', high 'H' or critical 'C') of the data. An asterisk (\*) indicates that the Source is not a primary source of experimental data for this compound.

- 1 POTTER, J.C.; SAYLOR, J.H.; *J.Am.Chem.Soc.*, Vol.73, p.90, 1951.
- 2 MOZHGINSKAYA, L.V.; KOLYSKO, L.E.; *Russ.J.Phys.Chem.*, Vol.48, p.881, 1974.
- 3 LIDE, D.R., (Ed-in-Chief); *CRC Handbook of Chemistry and Physics*, 74th Ed., 1993.\* N

The following Sources were used to estimate critical point data for this compound.

- AMBROSE, D.; NPL Report Chem 92, Nat.Phys.Lab., Teddington, UK, 1978.\*  
 AMBROSE, D.; NPL Report Chem 98, Nat.Phys.Lab., Teddington, UK, 1979.\*  
 SOMAYAJULU, G.R.; *J.Chem.Eng.Data*, Vol.34, p.106, 1989.\*

4-FC<sub>6</sub>H<sub>4</sub>CH<sub>3</sub>  
 4-Fluorotoluene; *p*-Fluorotoluene; *p*-Tolylfluoride

C<sub>7</sub>H<sub>7</sub>F

CAS Reg. No. 352-32-9

Mol. Wt. 110.13

Vapour Pressure  $\ln p = \ln p_c + (N_1 \tau + N_2 \tau^{1.5} + N_3 \tau^{2.5} + N_4 \tau^5)/(T/T_c)$

where  $p$  is the vapour pressure,  $p_c$  is the critical pressure,  $T$  is the kelvin temperature on the International Temperature Scale of 1990 (ITS-90),  $T_c$  is the critical temperature and  $\tau = 1 - T/T_c$ .

Critical Temperature  $T_c = 594. \text{ K}$  ( $t_c = 320.85 \text{ }^\circ\text{C}$ )  
 Critical Pressure  $p_c = 3950. \text{ kPa}$  ( $p_c = 38.98 \text{ atm}$ )

$N_1 = -7.53458$   $N_2 = 1.89118$   $N_3 = -2.60952$   $N_4 = -2.89046$

Acentric Factor  $\omega = 0.294$   
 Normal Boiling Point  $T_b = 389.790 \text{ K}$  ( $t_b = 116.640 \text{ }^\circ\text{C}$ )  
 $dT/dp$  at  $T_b, t_b = 0.348 \text{ K/kPa}$  ( $= 0.0464 \text{ }^\circ\text{C/mmHg}$ )  
 Approximate Melting Point  $T_m = 216. \text{ K}$  ( $t_m = -57. \text{ }^\circ\text{C}$ )

| Data at Specified Pressures |       |       |           |           |           |         |
|-----------------------------|-------|-------|-----------|-----------|-----------|---------|
| $p/\text{kPa}$              | 1.E-6 | 1.E-4 | 0.01      | 1         | 10        | 101.325 |
| $T/\text{K}$                |       |       | (223.346) | (280.063) | (324.151) | 389.790 |
| $(dp/dT)/(\text{kPa/K})$    |       |       | (0.001)   | (0.062)   | (0.439)   | 2.873   |
| Data Quality                |       |       | (B)       | (A)       | (A)       | A       |
| Uncert. in $T$ (K)          |       |       | (0.02)    | (0.01)    | (0.002)   | 0.005   |
| Uncert. in $p$ (kPa)        |       |       | (2.E-05)  | (0.0005)  | (0.0010)  | 0.01    |
| Uncert. in $p$ (%)          |       |       | (0.2)     | (0.05)    | (0.01)    | 0.01    |

## Vapour Pressure of 4-Fluorotoluene

Units: kPa v. K

| Uncertainty in |          |       |      | Uncertainty in |          |       |      | Uncertainty in |          |      |      |
|----------------|----------|-------|------|----------------|----------|-------|------|----------------|----------|------|------|
| $T$            | $p$      | $T$   | $p$  | $T$            | $p$      | $T$   | $p$  | $T$            | $p$      | $T$  | $p$  |
| K              | kPa      | K     | %    | K              | kPa      | K     | %    | K              | kPa      | K    | %    |
|                |          |       |      | 350            | 28.148   | 0.002 | 0.01 | 500            | (1069.8) | 0.05 | 0.05 |
|                |          |       |      | 360            | 40.081   | 0.002 | 0.01 | 510            | (1254.6) | 0.05 | 0.1  |
| 220            | (0.007)  | 0.02  | 0.2  | 370            | 55.804   | 0.002 | 0.01 | 520            | (1462.4) | 0.1  | 0.1  |
| 230            | (0.020)  | 0.02  | 0.2  | 380            | 76.124   | 0.005 | 0.01 | 530            | (1694.9) | 0.1  | 0.2  |
| 240            | (0.050)  | 0.01  | 0.1  | 390            | 101.93   | 0.005 | 0.01 | 540            | (1954.4) | 0.2  | 0.2  |
| 250            | (0.118)  | 0.01  | 0.1  | 400            | 134.18   | 0.005 | 0.01 | 550            | (2243.2) | 0.2  | 0.5  |
| 260            | (0.257)  | 0.01  | 0.1  | 410            | 173.92   | 0.005 | 0.01 | 560            | (2564.0) | 0.5  | 0.5  |
| 270            | (0.521)  | 0.01  | 0.05 | 420            | 222.26   | 0.005 | 0.02 | 570            | (2920.0) | 0.5  | 1    |
| 280            | (0.996)  | 0.01  | 0.05 | 430            | (280.35) | 0.01  | 0.02 | 580            | (3315.6) | 1    | 1    |
| 290            | (1.808)  | 0.005 | 0.02 | 440            | (349.41) | 0.01  | 0.02 | 590            | (3757.2) | 1    | 2    |
| 300            | (3.130)  | 0.005 | 0.02 | 450            | (430.74) | 0.01  | 0.02 |                |          |      |      |
| 310            | (5.197)  | 0.002 | 0.02 | 460            | (525.66) | 0.02  | 0.02 |                |          |      |      |
| 320            | (8.312)  | 0.002 | 0.01 | 470            | (635.54) | 0.02  | 0.05 |                |          |      |      |
| 330            | (12.854) | 0.002 | 0.01 | 480            | (761.84) | 0.02  | 0.05 |                |          |      |      |
| 340            | (19.284) | 0.002 | 0.01 | 490            | (906.05) | 0.02  | 0.05 |                |          |      |      |

C<sub>7</sub>H<sub>7</sub>F

## Vapour Pressure of 4-Fluorotoluene continued

Units: bar v. °C

| <i>t</i><br>°C | <i>p</i><br>bar | <i>t</i><br>°C | <i>p</i><br>bar | <i>t</i><br>°C | <i>p</i><br>bar | <i>t</i><br>°C | <i>p</i><br>bar | <i>t</i><br>°C | <i>p</i><br>bar |
|----------------|-----------------|----------------|-----------------|----------------|-----------------|----------------|-----------------|----------------|-----------------|
|                |                 | 0              | (0.006)         | 100            | 0.617           | 200            | (6.735)         | 300            | (30.401)        |
|                |                 | 10             | (0.012)         | 110            | 0.836           | 210            | (8.053)         | 310            | (34.493)        |
|                |                 | 20             | (0.022)         | 120            | 1.113           | 220            | (9.554)         | 320            | (39.080)        |
|                |                 | 30             | (0.037)         | 130            | 1.458           | 230            | (11.256)        |                |                 |
| -60            | (3.E-5)         | 40             | (0.060)         | 140            | 1.882           | 240            | (13.175)        |                |                 |
| -50            | (1.E-4)         | 50             | (0.096)         | 150            | 2.394           | 250            | (15.329)        |                |                 |
| -40            | (3.E-4)         | 60             | (0.147)         | 160            | (3.009)         | 260            | (17.737)        |                |                 |
| -30            | (7.E-4)         | 70             | 0.218           | 170            | (3.736)         | 270            | (20.421)        |                |                 |
| -20            | (0.002)         | 80             | 0.315           | 180            | (4.591)         | 280            | (23.407)        |                |                 |
| -10            | (0.003)         | 90             | 0.446           | 190            | (5.586)         | 290            | (26.721)        |                |                 |

The following Sources give vapour pressure and/or critical point data for this compound. Those Sources used to derive the critical properties and coefficients of the vapour pressure equation are shown in bold type together with the pressure range (low 'L', medium 'M', normal boiling point only 'N', high 'H' or critical 'C') of the data. An asterisk (\*) indicates that the Source is not a primary source of experimental data for this compound.

- 1 POTTER, J.C.; SAYLOR, J.H.; *J.Am.Chem.Soc.*, Vol.73, p.90, 1951.
- 2 MOZHGINSKAYA, L.V.; KOLYSKO, L.E.; *Russ.J.Phys.Chem.*, Vol.48, p.881, 1974.
- 3 SCOTT, D.W.; MESSERLY, J.F.; et al.; *J.Chem.Phys.*, Vol.37, p.867, 1962. M

The following Sources were used to estimate critical point data for this compound.

- AMBROSE, D.; NPL Report Chem 92, Nat.Phys.Lab., Teddington, UK, 1978.\*  
 AMBROSE, D.; NPL Report Chem 98, Nat.Phys.Lab., Teddington, UK, 1979.\*  
 SOMAYA JULU, G.R.; *J.Chem.Eng.Data*, Vol.34, p.106, 1989.\*

**C<sub>6</sub>H<sub>5</sub>CH<sub>2</sub>Cl**  
 (Chloromethyl)benzene; Benzyl chloride

**C<sub>7</sub>H<sub>7</sub>Cl**

CAS Reg. No. 100-44-7

Mol. Wt. 126.59

Vapour Pressure  $\ln p = \ln p_c + (N_1 \tau + N_2 \tau^{1.5} + N_3 \tau^{2.5} + N_4 \tau^5)/(T/T_c)$

where  $p$  is the vapour pressure,  $p_c$  is the critical pressure,  $T$  is the kelvin temperature on the International Temperature Scale of 1990 (ITS-90),  $T_c$  is the critical temperature and  $\tau = 1 - T/T_c$ .

Critical Temperature  
 Critical Pressure

$T_c = 681. \text{ K}$  ( $t_c = 407.85 \text{ }^\circ\text{C}$ )  
 $p_c = 4100. \text{ kPa}$  ( $p_c = 40.46 \text{ atm}$ )

$N_1 = -7.84465$   $N_2 = 1.98506$   $N_3 = -3.03200$   $N_4 = -3.35983$

Acentric Factor  
 Normal Boiling Point

$\omega = 0.356$   
 $T_b = 452.475 \text{ K}$  ( $t_b = 179.325 \text{ }^\circ\text{C}$ )  
 $dT/dp \text{ at } T_b, t_b = 0.388 \text{ K/kPa}$  ( $= 0.0517 \text{ }^\circ\text{C/mmHg}$ )  
 Approximate Melting Point  $T_m = 234. \text{ K}$  ( $t_m = 39. \text{ }^\circ\text{C}$ )

|                          |  | Data at Specified Pressures |       |           |         |         |         |
|--------------------------|--|-----------------------------|-------|-----------|---------|---------|---------|
| $p/\text{kPa}$           |  | 1.E-6                       | 1.E-4 | 0.01      | 1       | 10      | 101.325 |
| $T/\text{K}$             |  |                             |       | (264.588) | 329.173 | 378.959 | 452.475 |
| $(dp/dT)/(\text{kPa/K})$ |  |                             |       | (9.E-04)  | 0.055   | 0.390   | 2.577   |
| Data Quality             |  |                             |       | (C)       | C       | C       | B       |
| Uncert. in $T$ (K)       |  |                             |       | (1.)      | 0.5     | 0.5     | 0.2     |
| Uncert. in $p$ (kPa)     |  |                             |       | (0.0010)  | 0.02    | 0.2     | 0.5     |
| Uncert. in $p$ (%)       |  |                             |       | (10.)     | 2.      | 2.      | 0.5     |

## Vapour Pressure of (Chloromethyl)benzene

Units: kPa v. K

| Uncertainty in |         |     |     | Uncertainty in |          |     |     | Uncertainty in |          |     |     |
|----------------|---------|-----|-----|----------------|----------|-----|-----|----------------|----------|-----|-----|
| $T$            | $p$     | $T$ | $p$ | $T$            | $p$      | $T$ | $p$ | $T$            | $p$      | $T$ | $p$ |
| K              | kPa     | K   | %   | K              | kPa      | K   | %   | K              | kPa      | K   | %   |
|                |         |     |     | 400            | 21.556   | 0.5 | 1   | 600            | (1533.4) | 2   | 2   |
|                |         |     |     | 410            | 30.040   | 0.2 | 1   | 610            | (1751.7) | 2   | 5   |
|                |         |     |     | 420            | 41.076   | 0.2 | 1   | 620            | (1992.9) | 2   | 5   |
| 230            | (2.E-4) | 5   | 50  | 430            | 55.197   | 0.2 | 0.5 | 630            | (2258.9) | 5   | 5   |
| 240            | (8.E-4) | 2   | 50  | 440            | 72.991   | 0.2 | 0.5 | 640            | (2551.7) | 5   | 5   |
| 250            | (0.002) | 2   | 20  | 450            | 95.105   | 0.2 | 0.5 | 650            | (2873.8) | 5   | 5   |
| 260            | (0.006) | 1   | 10  | 460            | (122.24) | 0.2 | 0.5 | 660            | (3228.3) | 5   | 5   |
| 270            | (0.016) | 1   | 10  | 470            | (155.15) | 0.2 | 0.5 | 670            | (3619.1) | 5   | 10  |
| 280            | 0.038   | 1   | 5   | 480            | (194.63) | 0.2 | 1   | 680            | (4053.4) | 10  | 10  |
| 290            | 0.082   | 0.5 | 5   | 490            | (241.55) | 0.5 | 1   |                |          |     |     |
| 300            | 0.167   | 0.5 | 5   | 500            | (296.78) | 0.5 | 1   |                |          |     |     |
| 310            | 0.323   | 0.5 | 2   | 510            | (361.26) | 0.5 | 1   |                |          |     |     |
| 320            | 0.595   | 0.5 | 2   | 520            | (435.98) | 0.5 | 1   |                |          |     |     |
| 330            | 1.046   | 0.5 | 2   | 530            | (521.94) | 1   | 1   |                |          |     |     |
| 340            | 1.769   | 0.5 | 2   | 540            | (620.22) | 1   | 2   |                |          |     |     |
| 350            | 2.886   | 0.5 | 2   | 550            | (731.89) | 1   | 2   |                |          |     |     |
| 360            | 4.555   | 0.5 | 2   | 560            | (858.12) | 1   | 2   |                |          |     |     |
| 370            | 6.981   | 0.5 | 2   | 570            | (1000.1) | 1   | 2   |                |          |     |     |
| 380            | 10.413  | 0.5 | 2   | 580            | (1159.1) | 2   | 2   |                |          |     |     |
| 390            | 15.152  | 0.5 | 2   | 590            | (1336.4) | 2   | 2   |                |          |     |     |

Units: bar v. °C

| $t$<br>°C | $p$<br>bar | $t$<br>°C | $p$<br>bar | $t$<br>°C | $p$<br>bar | $t$<br>°C | $p$<br>bar | $t$<br>°C | $p$<br>bar |
|-----------|------------|-----------|------------|-----------|------------|-----------|------------|-----------|------------|
| -40       | (3.E-6)    | 50        | 0.007      | 150       | 0.452      | 250       | (4.618)    | 350       | (20.740)   |
| -30       | (1.E-5)    | 60        | 0.012      | 160       | 0.604      | 260       | (5.515)    | 360       | (23.481)   |
| -20       | (3.E-5)    | 70        | 0.021      | 170       | 0.795      | 270       | (6.539)    | 370       | (26.499)   |
| -10       | (9.E-5)    | 80        | 0.033      | 180       | (1.031)    | 280       | (7.700)    | 380       | (29.818)   |
|           |            | 90        | 0.052      | 190       | (1.319)    | 290       | (9.011)    | 390       | (33.472)   |
| 0         | 2.E-4      | 100       | 0.079      | 200       | (1.668)    | 300       | (10.483)   | 400       | (37.507)   |
| 10        | 5.E-4      | 110       | 0.117      | 210       | (2.086)    | 310       | (12.129)   |           |            |
| 20        | 0.001      | 120       | 0.170      | 220       | (2.580)    | 320       | (13.962)   |           |            |
| 30        | 0.002      | 130       | 0.240      | 230       | (3.160)    | 330       | (15.998)   |           |            |
| 40        | 0.004      | 140       | 0.332      | 240       | (3.836)    | 340       | (18.251)   |           |            |

The following Sources give vapour pressure and/or critical point data for this compound. Those Sources used to derive the critical properties and coefficients of the vapour pressure equation are shown in bold type together with the pressure range (low 'L', medium 'M', normal boiling point only 'N', high 'H' or critical 'C') of the data. An asterisk (\*) indicates that the Source is not a primary source of experimental data for this compound.

- |    |                                     |                                                           |   |
|----|-------------------------------------|-----------------------------------------------------------|---|
| 1  | SCHIFF, R.;                         | <i>Liebigs Ann.Chem.</i> , Vol.220, p.71, 1883.           |   |
| 2  | KAHLBAUM, G.W.A.;                   | <i>Chem.Ber.</i> , Vol.17, p.1263, 1884.                  |   |
| 3  | PERKIN, W.H.;                       | <i>J.Chem.Soc.</i> , Vol.69, p.1025, 1896.                |   |
| 4  | TIMMERMANS, J.;                     | <i>Bull.Soc.Chim.Belg.</i> , Vol.27, p.334, 1913.         |   |
| 5  | SMITH, R.H.; ANDREWS, D.H.;         | <i>J.Am.Chem.Soc.</i> , Vol.53, p.3644, 1931.             |   |
| 6  | TIMMERMANS, J.; HENNAUT-ROLAND, M.; | <i>J.Chim.Phys.</i> , Vol.32, p.501, 1935.                | N |
| 7  | RADULESCU, D.; TILSCHI, S.;         | <i>Z.Phys.Chem.(Leipzig),(A)</i> , Vol.179, p.210, 1937.  |   |
| 8  | HALFORD, J.O.; REID, E.B.;          | <i>J.Am.Chem.Soc.</i> , Vol.63, p.1873, 1941.             |   |
| 9  | LECAT, M.;                          | <i>Tables Azeotropiques</i> , Brussels, 1949.             | N |
| 10 | GROSS, H.; GLOEDE, J.;              | <i>Chem.Ber.</i> , Vol.96, p.1387, 1963.                  |   |
| 11 | SIVTISOVA, E.V.; et al.;            | <i>J.Appl.Chem.USSR</i> , Vol.38, p.2549, 1965.           |   |
| 12 | ASHCROFT, S.J.;                     | <i>J.Chem.Eng.Data</i> , Vol.21, p.397, 1976.             |   |
| 13 | STRYJEK, R.; et al.;                | <i>Bull.Acad.Pol.Sci.Sci.Chim.</i> , Vol.27, p.127, 1979. |   |
| 14 | TRC Thermodynamic Tables,           | Texas A & M Univ., Loose leaf data sheets extant 1998.*   |   |

The following Sources were used to estimate critical point data for this compound.

- |                   |                                                           |
|-------------------|-----------------------------------------------------------|
| AMBROSE, D.;      | NPL Report Chem 92, Nat.Phys.Lab., Teddington, UK, 1978.* |
| AMBROSE, D.;      | NPL Report Chem 98, Nat.Phys.Lab., Teddington, UK, 1979.* |
| SOMAYAJULU, G.R.; | <i>J.Chem.Eng.Data</i> , Vol.34, p.106, 1989.*            |

2-ClC<sub>6</sub>H<sub>4</sub>CH<sub>3</sub>  
 2-Chlorotoluene; *o*-Chlorotoluene; *o*-Tolylchloride

C<sub>7</sub>H<sub>7</sub>Cl

CAS Reg. No. 95-49-8

Mol. Wt. 126.59

Vapour Pressure  $\ln p = \ln p_c + (N_1 \tau + N_2 \tau^{1.5} + N_3 \tau^{2.5} + N_4 \tau^5)/(T/T_c)$

where  $p$  is the vapour pressure,  $p_c$  is the critical pressure,  $T$  is the kelvin temperature on the International Temperature Scale of 1990 (ITS-90),  $T_c$  is the critical temperature and  $\tau = 1 - T/T_c$ .

Critical Temperature  $T_c = 658. \text{ K}$  ( $t_c = 384.85 \text{ }^\circ\text{C}$ )  
 Critical Pressure  $p_c = 3850. \text{ kPa}$  ( $p_c = 38.00 \text{ atm}$ )

$N_1 = -7.49230$   $N_2 = 1.81513$   $N_3 = -2.50705$   $N_4 = -3.00607$

Acentric Factor  $\omega = 0.291$   
 Normal Boiling Point  $T_b = 432.450 \text{ K}$  ( $t_b = 159.300 \text{ }^\circ\text{C}$ )  
 $dT/dp$  at  $T_b$ ,  $t_b$   $= 0.388 \text{ K/kPa}$  ( $= 0.0517 \text{ }^\circ\text{C/mmHg}$ )  
 Approximate Melting Point  $T_m = 238. \text{ K}$  ( $t_m = -35. \text{ }^\circ\text{C}$ )

| Data at Specified Pressures |       |       |           |           |           |           |
|-----------------------------|-------|-------|-----------|-----------|-----------|-----------|
| $p/\text{kPa}$              | 1.E-6 | 1.E-4 | 0.01      | 1         | 10        | 101.325   |
| $T/\text{K}$                |       |       | (247.415) | (310.349) | (359.358) | 432.450   |
| $(dp/dT)/(\text{kPa/K})$    |       |       | (1.E-03)  | (0.056)   | (0.394)   | 2.578     |
| Data Quality                |       |       | (C)       | (C)       | (B)       | B         |
| Uncert. in $T$ (K)          |       |       | (0.5)     | (0.2)     | (0.1)     | 0.2       |
| Uncert. in $p$ (kPa)        |       |       | (0.0005)  | (0.01)    | (0.05)    | 0.5       |
| Uncert. in $p$ (%)          |       |       | (5.)      | (1.)      | (0.5)     | 0.5       |
|                             |       |       |           |           |           | 1000      |
|                             |       |       |           |           |           | (550.802) |
|                             |       |       |           |           |           | (14.822)  |
|                             |       |       |           |           |           | (B)       |
|                             |       |       |           |           |           | (1.)      |
|                             |       |       |           |           |           | (20.)     |
|                             |       |       |           |           |           | (500.)    |
|                             |       |       |           |           |           | (10.)     |

## Vapour Pressure of 2-Chlorotoluene

Units: kPa v. K

| Uncertainty in |          |     |     | Uncertainty in |          |     |     | Uncertainty in |          |     |     |
|----------------|----------|-----|-----|----------------|----------|-----|-----|----------------|----------|-----|-----|
| $T$            | $p$      | $T$ | $p$ | $T$            | $p$      | $T$ | $p$ | $T$            | $p$      | $T$ | $p$ |
| K              | kPa      | K   | %   | K              | kPa      | K   | %   | K              | kPa      | K   | %   |
|                |          |     |     | 400            | 40.999   | 0.2 | 0.5 | 600            | (1953.4) | 2   | 5   |
|                |          |     |     | 410            | 55.167   | 0.2 | 0.5 | 610            | (2210.5) | 5   | 5   |
|                |          |     |     | 420            | 73.010   | 0.2 | 0.5 | 620            | (2493.0) | 5   | 5   |
|                |          |     |     | 430            | 95.163   | 0.2 | 0.5 | 630            | (2803.2) | 5   | 5   |
| 240            | (0.005)  | 0.5 | 5   | 440            | 122.31   | 0.2 | 0.5 | 640            | (3143.9) | 5   | 10  |
| 250            | (0.013)  | 0.5 | 5   | 450            | 155.18   | 0.2 | 0.5 | 650            | (3519.4) | 10  | 10  |
| 260            | (0.031)  | 0.5 | 2   | 460            | 194.56   | 0.2 | 1   |                |          |     |     |
| 270            | (0.070)  | 0.2 | 2   | 470            | 241.25   | 0.5 | 1   |                |          |     |     |
| 280            | (0.147)  | 0.2 | 2   | 480            | (296.12) | 0.5 | 1   |                |          |     |     |
| 290            | (0.291)  | 0.2 | 2   | 490            | (360.04) | 0.5 | 1   |                |          |     |     |
| 300            | (0.548)  | 0.2 | 1   | 500            | (433.96) | 0.5 | 1   |                |          |     |     |
| 310            | (0.981)  | 0.2 | 1   | 510            | (518.82) | 1   | 1   |                |          |     |     |
| 320            | (1.682)  | 0.2 | 1   | 520            | (615.63) | 1   | 2   |                |          |     |     |
| 330            | (2.777)  | 0.2 | 0.5 | 530            | (725.40) | 1   | 2   |                |          |     |     |
| 340            | (4.425)  | 0.1 | 0.5 | 540            | (849.21) | 1   | 2   |                |          |     |     |
| 350            | (6.834)  | 0.1 | 0.5 | 550            | (988.17) | 1   | 2   |                |          |     |     |
| 360            | (10.256) | 0.1 | 0.5 | 560            | (1143.4) | 2   | 2   |                |          |     |     |
| 370            | 14.996   | 0.1 | 0.5 | 570            | (1316.2) | 2   | 2   |                |          |     |     |
| 380            | 21.413   | 0.1 | 0.5 | 580            | (1507.9) | 2   | 2   |                |          |     |     |
| 390            | 29.924   | 0.2 | 0.5 | 590            | (1719.7) | 2   | 5   |                |          |     |     |

Units: bar v. °C

| <i>t</i><br>°C | <i>p</i><br>bar | <i>t</i><br>°C | <i>p</i><br>bar | <i>t</i><br>°C | <i>p</i><br>bar | <i>t</i><br>°C | <i>p</i><br>bar | <i>t</i><br>°C | <i>p</i><br>bar |
|----------------|-----------------|----------------|-----------------|----------------|-----------------|----------------|-----------------|----------------|-----------------|
| -40            | (2.E-5)         | 50             | (0.020)         | 150            | 0.795           | 250            | (6.488)         | 350            | (25.876)        |
| -30            | (7.E-5)         | 60             | (0.032)         | 160            | 1.031           | 260            | (7.628)         | 360            | (29.070)        |
| -20            | (2.E-4)         | 70             | (0.051)         | 170            | 1.320           | 270            | (8.913)         | 370            | (32.582)        |
| -10            | (4.E-4)         | 80             | (0.078)         | 180            | 1.668           | 280            | (10.353)        | 380            | (36.458)        |
|                |                 | 90             | (0.116)         | 190            | 2.084           | 290            | (11.959)        |                |                 |
| 0              | (9.E-4)         | 100            | 0.168           | 200            | 2.576           | 300            | (13.745)        |                |                 |
| 10             | (0.002)         | 110            | 0.238           | 210            | (3.152)         | 310            | (15.723)        |                |                 |
| 20             | (0.004)         | 120            | 0.331           | 220            | (3.822)         | 320            | (17.909)        |                |                 |
| 30             | (0.007)         | 130            | 0.451           | 230            | (4.595)         | 330            | (20.317)        |                |                 |
| 40             | (0.012)         | 140            | 0.604           | 240            | (5.480)         | 340            | (22.966)        |                |                 |

The following Sources give vapour pressure and/or critical point data for this compound. Those Sources used to derive the critical properties and coefficients of the vapour pressure equation are shown in bold type together with the pressure range (low 'L', medium 'M', normal boiling point only 'N', high 'H' or critical 'C') of the data. An asterisk (\*) indicates that the Source is not a primary source of experimental data for this compound.

- |    |                                        |                                                           |   |
|----|----------------------------------------|-----------------------------------------------------------|---|
| 1  | FEITLER, S.;                           | <i>Z.Phys.Chem.</i> , Vol.4, p.66, 1889.                  | M |
| 2  | PERKIN, W.H.;                          | <i>J.Chem.Soc.</i> , Vol.69, p.1025, 1896.                |   |
| 3  | WIBAUT, J.P.;                          | <i>Rec.Trav.Chim.</i> , Vol.32, p.244, 1913.              |   |
| 4  | LECAT, M.;                             | <i>Soc.Sci.Bruxelles Ann.B.</i> , Vol.45, p.169, 1926.    |   |
| 5  | MATHEWS, J.H.;                         | <i>J.Am.Chem.Soc.</i> , Vol.48, p.562, 1926.              |   |
| 6  | LECAT, M.;                             | <i>Rec.Trav.Chim.</i> , Vol.46, p.244, 1927.              | N |
| 7  | TIMMERMANS, J.;                        | <i>Bull.Soc.Chim.Belg.</i> , Vol.36, p.502, 1927.         |   |
| 8  | TIMMERMANS, J.; HENNAUT-ROLAND, M.;    | <i>J.Chim.Phys.</i> , Vol.27, p.401, 1930.                |   |
| 9  | STUCKEY, J.M.; SAYLOR, J.H.;           | <i>J.Am.Chem.Soc.</i> , Vol.62, p.2922, 1940.             |   |
| 10 | LECAT, M.;                             | <i>C.R.Hebd.Seances Acad.Sci.</i> , Vol.217, p.273, 1943. |   |
| 11 | LECAT, M.;                             | <i>Ann.Soc.Sci.Bruxelles,(I)</i> , Vol.61, p.73, 1947.    |   |
| 12 | CONRAD, J.J.; LI, N.C.;                | <i>J.Am.Chem.Soc.</i> , Vol.75, p.1785, 1953.             |   |
| 13 | KARIYONE, T.; KAJIURA, T.; et al.;     | <i>Yakugaku Zasshi</i> , Vol.73, p.493, 1953.             |   |
| 14 | BROWN, H.C.; STOCK, L.M.;              | <i>J.Am.Chem.Soc.</i> , Vol.79, p.5175, 1957.             |   |
| 15 | LEVI, L.; NICHOLLS, R.V.V.;            | <i>Ind.Eng.Chem.</i> , Vol.50, p.1005, 1958.              |   |
| 16 | FELDMAN, L.N.; SAVKO, V.V.; et al.;    | <i>Zh.Fiz.Khim.</i> , Vol.47, p.2715, 1973.               |   |
| 17 | OSCARSON, J.L.; LUNDELL, S.O.; et al.; | <i>AIChE Symp.Ser.</i> , (Vol.83), No.256, p.1, 1987.     |   |
| 18 | TRC Thermodynamic Tables,              | Texas A & M Univ., Loose leaf data sheets extant 1998.*   |   |

The following Sources were used to estimate critical point data for this compound.

- |                   |                                                           |
|-------------------|-----------------------------------------------------------|
| AMBROSE, D.;      | NPL Report Chem 92, Nat.Phys.Lab., Teddington, UK, 1978.* |
| AMBROSE, D.;      | NPL Report Chem 98, Nat.Phys.Lab., Teddington, UK, 1979.* |
| SOMAYAJULU, G.R.; | <i>J.Chem.Eng.Data</i> , Vol.34, p.106, 1989.*            |

3-ClC<sub>6</sub>H<sub>4</sub>CH<sub>3</sub>  
 3-Chlorotoluene; *m*-Chlorotoluene; *m*-Tolylchloride

C<sub>7</sub>H<sub>7</sub>Cl

CAS Reg. No. 108-41-8

Mol. Wt. 126.59

Vapour Pressure  $\ln p = \ln p_c + (N_1 \tau + N_2 \tau^{1.5} + N_3 \tau^{2.5} + N_4 \tau^5)/(T/T_c)$

where  $p$  is the vapour pressure,  $p_c$  is the critical pressure,  $T$  is the kelvin temperature on the International Temperature Scale of 1990 (ITS-90),  $T_c$  is the critical temperature and  $\tau = 1 - T/T_c$ .

Critical Temperature  $T_c = 662. \text{ K}$  ( $t_c = 388.85 \text{ }^\circ\text{C}$ )  
 Critical Pressure  $p_c = 3975. \text{ kPa}$  ( $p_c = 39.23 \text{ atm}$ )

$N_1 = -7.56417$   $N_2 = 1.84812$   $N_3 = -2.61147$   $N_4 = -3.08157$

Acentric Factor  $\omega = 0.304$   
 Normal Boiling Point  $T_b = 435.350 \text{ K}$  ( $t_b = 162.200 \text{ }^\circ\text{C}$ )  
 $dT/dp$  at  $T_b$ ,  $t_b$   $= 0.386 \text{ K/kPa}$  ( $= 0.0515 \text{ }^\circ\text{C/mmHg}$ )  
 Approximate Melting Point  $T_m = 225. \text{ K}$  ( $t_m = -48. \text{ }^\circ\text{C}$ )

| $p/\text{kPa}$<br>$T/\text{K}$<br>$(dp/dT)/(\text{kPa/K})$<br>Data Quality<br>Uncert. in $T$ (K)<br>Uncert. in $p$ (kPa)<br>Uncert. in $p$ (%) | Data at Specified Pressures |       |           |           |           |           |
|------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------|-------|-----------|-----------|-----------|-----------|
|                                                                                                                                                | 1.E-6                       | 1.E-4 | 0.01      | 1         | 10        | 101.325   |
|                                                                                                                                                |                             |       | (250.473) | (313.539) | (362.514) | 435.350   |
|                                                                                                                                                |                             |       | (9.E-04)  | (0.056)   | (0.395)   | 2.591     |
|                                                                                                                                                |                             |       | (C)       | (C)       | (B)       | B         |
|                                                                                                                                                |                             |       | (0.5)     | (0.2)     | (0.1)     | 0.2       |
|                                                                                                                                                |                             |       | (0.0005)  | (0.01)    | (0.05)    | 0.5       |
|                                                                                                                                                |                             |       | (5.)      | (1.)      | (0.5)     | 0.5       |
|                                                                                                                                                |                             |       |           |           |           | 1000      |
|                                                                                                                                                |                             |       |           |           |           | (552.863) |
|                                                                                                                                                |                             |       |           |           |           | (14.953)  |
|                                                                                                                                                |                             |       |           |           |           | (B)       |
|                                                                                                                                                |                             |       |           |           |           | (1.)      |
|                                                                                                                                                |                             |       |           |           |           | (10.)     |
|                                                                                                                                                |                             |       |           |           |           | (500.)    |
|                                                                                                                                                |                             |       |           |           |           | (10.)     |

## Vapour Pressure of 3-Chlorotoluene

Units: kPa v. K

| Uncertainty in |          |     |     | Uncertainty in |          |     |     | Uncertainty in |          |     |     |
|----------------|----------|-----|-----|----------------|----------|-----|-----|----------------|----------|-----|-----|
| $T$            | $p$      | $T$ | $p$ | $T$            | $p$      | $T$ | $p$ | $T$            | $p$      | $T$ | $p$ |
| K              | kPa      | K   | %   | K              | kPa      | K   | %   | K              | kPa      | K   | %   |
|                |          |     |     | 400            | 37.315   | 0.2 | 0.5 | 600            | (1913.8) | 2   | 5   |
|                |          |     |     | 410            | 50.535   | 0.2 | 0.5 | 610            | (2169.4) | 5   | 5   |
| 220            | (3.E-4)  | 2   | 20  | 420            | 67.285   | 0.2 | 0.5 | 620            | (2450.6) | 5   | 5   |
| 230            | (0.001)  | 1   | 10  | 430            | 88.194   | 0.2 | 0.5 | 630            | (2759.5) | 5   | 5   |
| 240            | (0.004)  | 1   | 10  | 440            | (113.95) | 0.2 | 0.5 | 640            | (3098.9) | 5   | 5   |
|                |          |     |     |                |          |     |     |                |          |     |     |
| 250            | (0.010)  | 0.5 | 5   | 450            | (145.29) | 0.2 | 0.5 | 650            | (3472.4) | 5   | 10  |
| 260            | (0.024)  | 0.5 | 5   | 460            | (182.98) | 0.2 | 0.5 | 660            | (3886.1) | 10  | 10  |
| 270            | (0.055)  | 0.5 | 2   | 470            | (227.87) | 0.5 | 1   |                |          |     |     |
| 280            | (0.117)  | 0.2 | 2   | 480            | (280.82) | 0.5 | 1   |                |          |     |     |
| 290            | (0.236)  | 0.2 | 2   | 490            | (342.73) | 0.5 | 1   |                |          |     |     |
|                |          |     |     |                |          |     |     |                |          |     |     |
| 300            | (0.451)  | 0.2 | 1   | 500            | (414.55) | 0.5 | 1   |                |          |     |     |
| 310            | (0.818)  | 0.2 | 1   | 510            | (497.26) | 0.5 | 1   |                |          |     |     |
| 320            | (1.422)  | 0.2 | 1   | 520            | (591.87) | 1   | 1   |                |          |     |     |
| 330            | (2.376)  | 0.2 | 1   | 530            | (699.44) | 1   | 2   |                |          |     |     |
| 340            | (3.828)  | 0.1 | 0.5 | 540            | (821.07) | 1   | 2   |                |          |     |     |
|                |          |     |     |                |          |     |     |                |          |     |     |
| 350            | (5.972)  | 0.1 | 0.5 | 550            | (957.88) | 1   | 2   |                |          |     |     |
| 360            | (9.047)  | 0.1 | 0.5 | 560            | (1111.1) | 2   | 2   |                |          |     |     |
| 370            | (13.344) | 0.1 | 0.5 | 570            | (1281.9) | 2   | 2   |                |          |     |     |
| 380            | 19.209   | 0.1 | 0.5 | 580            | (1471.6) | 2   | 2   |                |          |     |     |
| 390            | 27.046   | 0.2 | 0.5 | 590            | (1681.7) | 2   | 5   |                |          |     |     |

C<sub>7</sub>H<sub>7</sub>Cl

## Vapour Pressure of 3-Chlorotoluene continued

Units: bar v. °C

| <i>t</i><br>°C | <i>p</i><br>bar | <i>t</i><br>°C | <i>p</i><br>bar | <i>t</i><br>°C | <i>p</i><br>bar | <i>t</i><br>°C | <i>p</i><br>bar | <i>t</i><br>°C | <i>p</i><br>bar |
|----------------|-----------------|----------------|-----------------|----------------|-----------------|----------------|-----------------|----------------|-----------------|
| -50            | (5.E-6)         | 50             | (0.017)         | 150            | 0.734           | 250            | (6.243)         | 350            | (25.448)        |
| -40            | (2.E-5)         | 60             | (0.028)         | 160            | 0.958           | 260            | (7.362)         | 360            | (28.630)        |
| -30            | (5.E-5)         | 70             | (0.044)         | 170            | (1.232)         | 270            | (8.625)         | 370            | (32.127)        |
| -20            | (1.E-4)         | 80             | (0.068)         | 180            | (1.564)         | 280            | (10.043)        | 380            | (35.980)        |
| -10            | (3.E-4)         | 90             | (0.103)         | 190            | (1.963)         | 290            | (11.629)        |                |                 |
| 0              | (7.E-4)         | 100            | 0.150           | 200            | (2.436)         | 300            | (13.395)        |                |                 |
| 10             | (0.001)         | 110            | 0.214           | 210            | (2.993)         | 310            | (15.355)        |                |                 |
| 20             | (0.003)         | 120            | 0.300           | 220            | (3.642)         | 320            | (17.524)        |                |                 |
| 30             | (0.005)         | 130            | 0.411           | 230            | (4.394)         | 330            | (19.917)        |                |                 |
| 40             | (0.010)         | 140            | 0.554           | 240            | (5.257)         | 340            | (22.551)        |                |                 |

The following Sources give vapour pressure and/or critical point data for this compound. Those Sources used to derive the critical properties and coefficients of the vapour pressure equation are shown in bold type together with the pressure range (low 'L', medium 'M', normal boiling point only 'N', high 'H' or critical 'C') of the data. An asterisk (\*) indicates that the Source is not a primary source of experimental data for this compound.

- 1 FEITLER, S.; *Z.Phys.Chem.*, Vol.4, p.66, 1889. M
- 2 STUCKEY, J.M.; SAYLOR, J.H.; *J.Am.Chem.Soc.*, Vol.62, p.2922, 1940.
- 3 OGIMACHI, N.N.; ANDREWS, L.J.; et al.; *J.Am.Chem.Soc.*, Vol.77, p.4202, 1955.
- 4 BROWN, H.C.; STOCK, L.M.; *J.Am.Chem.Soc.*, Vol.79, p.5175, 1957.
- 5 TRC Thermodynamic Tables, Texas A & M Univ., Loose leaf data sheets extant 1998.\*

The following Sources were used to estimate critical point data for this compound.

- AMBROSE, D.; NPL Report Chem 92, Nat.Phys.Lab., Teddington, UK, 1978.\*  
 AMBROSE, D.; NPL Report Chem 98, Nat.Phys.Lab., Teddington, UK, 1979.\*  
 SOMAYAJULU, G.R.; *J.Chem.Eng.Data*, Vol.34, p.106, 1989.\*

4-ClC<sub>6</sub>H<sub>4</sub>CH<sub>3</sub>  
 4-Chlorotoluene; *p*-Chlorotoluene; *p*-Tolylchloride

C<sub>7</sub>H<sub>7</sub>Cl

CAS Reg. No. 106-43-4

Mol. Wt. 126.59

Vapour Pressure  $\ln p = \ln p_c + (N_1 \tau + N_2 \tau^{1.5} + N_3 \tau^{2.5} + N_4 \tau^5)/(T/T_c)$

where  $p$  is the vapour pressure,  $p_c$  is the critical pressure,  $T$  is the kelvin temperature on the International Temperature Scale of 1990 (ITS-90),  $T_c$  is the critical temperature and  $\tau = 1 - T/T_c$ .

Critical Temperature  $T_c = 664. \text{ K}$  ( $t_c = 390.85 \text{ }^\circ\text{C}$ )  
 Critical Pressure  $p_c = 3850. \text{ kPa}$  ( $p_c = 38.00 \text{ atm}$ )

$N_1 = -7.45559$   $N_2 = 1.79861$   $N_3 = -2.45424$   $N_4 = -2.96683$

Acentric Factor  $\omega = 0.284$   
 Normal Boiling Point  $T_b = 435.600 \text{ K}$  ( $t_b = 162.450 \text{ }^\circ\text{C}$ )  
 $dT/dp$  at  $T_b$ ,  $t_b$   $= 0.392 \text{ K/kPa}$  ( $= 0.0523 \text{ }^\circ\text{C/mmHg}$ )  
 Approximate Melting Point  $T_m = 281. \text{ K}$  ( $t_m = 8. \text{ }^\circ\text{C}$ )

| Data at Specified Pressures |       |       |      |           |         |
|-----------------------------|-------|-------|------|-----------|---------|
| $p/\text{kPa}$              | 1.E-6 | 1.E-4 | 0.01 | 1         | 10      |
| $T/\text{K}$                |       |       |      | (312.203) | 361.708 |
| $(dp/dT)/(\text{kPa/K})$    |       |       |      | (0.055)   | 0.390   |
| Data Quality                |       |       |      | (C)       | B       |
| Uncert. in $T$ (K)          |       |       |      | (0.2)     | 0.1     |
| Uncert. in $p$ (kPa)        |       |       |      | (0.01)    | 0.05    |
| Uncert. in $p$ (%)          |       |       |      | (1.)      | 0.5     |
|                             |       |       |      |           | 0.5     |
|                             |       |       |      |           | (2.)    |
|                             |       |       |      |           | (10.)   |

## Vapour Pressure of 4-Chlorotoluene

Units: kPa v. K

| Uncertainty in |         |     |     | Uncertainty in |          |     |     | Uncertainty in |          |     |     |
|----------------|---------|-----|-----|----------------|----------|-----|-----|----------------|----------|-----|-----|
| $T$            | $p$     | $T$ | $p$ | $T$            | $p$      | $T$ | $p$ | $T$            | $p$      | $T$ | $p$ |
| K              | kPa     | K   | %   | K              | kPa      | K   | %   | K              | kPa      | K   | %   |
|                |         |     |     | 400            | 37.662   | 0.2 | 0.5 | 550            | (923.56) | 1   | 2   |
|                |         |     |     | 410            | 50.759   | 0.2 | 0.5 | 560            | (1069.4) | 1   | 2   |
|                |         |     |     | 420            | 67.280   | 0.2 | 0.5 | 570            | (1231.7) | 2   | 2   |
| 280            | (0.132) | 0.2 | 2   | 430            | 87.824   | 0.2 | 0.5 | 580            | (1411.8) | 2   | 2   |
| 290            | (0.261) | 0.2 | 2   | 440            | (113.04) | 0.2 | 0.5 | 590            | (1610.9) | 2   | 2   |
| 300            | (0.493) | 0.2 | 1   | 450            | (143.61) | 0.2 | 0.5 | 600            | (1830.4) | 2   | 5   |
| 310            | (0.884) | 0.2 | 1   | 460            | (180.28) | 0.2 | 0.5 | 610            | (2071.8) | 5   | 5   |
| 320            | (1.521) | 0.2 | 1   | 470            | (223.81) | 0.5 | 1   | 620            | (2337.0) | 5   | 5   |
| 330            | (2.516) | 0.2 | 1   | 480            | (275.02) | 0.5 | 1   | 630            | (2627.8) | 5   | 5   |
| 340            | (4.019) | 0.1 | 0.5 | 490            | (334.76) | 0.5 | 1   | 640            | (2946.7) | 5   | 5   |
| 350            | (6.219) | 0.1 | 0.5 | 500            | (403.89) | 0.5 | 1   | 650            | (3296.8) | 5   | 10  |
| 360            | (9.352) | 0.1 | 0.5 | 510            | (483.34) | 0.5 | 1   | 660            | (3683.0) | 10  | 10  |
| 370            | 13.701  | 0.1 | 0.5 | 520            | (574.04) | 1   | 1   |                |          |     |     |
| 380            | 19.601  | 0.1 | 0.5 | 530            | (676.96) | 1   | 2   |                |          |     |     |
| 390            | 27.441  | 0.2 | 0.5 | 540            | (793.12) | 1   | 2   |                |          |     |     |

C<sub>7</sub>H<sub>7</sub>Cl

## Vapour Pressure of 4-Chlorotoluene continued

Units: bar v. °C

| <i>t</i><br>°C | <i>p</i><br>bar | <i>t</i><br>°C | <i>p</i><br>bar | <i>t</i><br>°C | <i>p</i><br>bar | <i>t</i><br>°C | <i>p</i><br>bar | <i>t</i><br>°C | <i>p</i><br>bar |
|----------------|-----------------|----------------|-----------------|----------------|-----------------|----------------|-----------------|----------------|-----------------|
| 10             | (0.002)         | 100            | 0.154           | 200            | (2.391)         | 300            | (12.865)        |                |                 |
| 20             | (0.003)         | 110            | 0.218           | 210            | (2.929)         | 310            | (14.724)        |                |                 |
| 30             | (0.006)         | 120            | 0.304           | 220            | (3.555)         | 320            | (16.777)        |                |                 |
| 40             | (0.011)         | 130            | 0.415           | 230            | (4.278)         | 330            | (19.040)        |                |                 |
|                |                 | 140            | 0.556           | 240            | (5.107)         | 340            | (21.527)        |                |                 |
| 50             | (0.018)         | 150            | 0.733           | 250            | (6.051)         | 350            | (24.257)        |                |                 |
| 60             | (0.029)         | 160            | 0.952           | 260            | (7.121)         | 360            | (27.251)        |                |                 |
| 70             | (0.046)         | 170            | (1.221)         | 270            | (8.326)         | 370            | (30.534)        |                |                 |
| 80             | (0.071)         | 180            | (1.545)         | 280            | (9.678)         | 380            | (34.142)        |                |                 |
| 90             | 0.106           | 190            | (1.932)         | 290            | (11.187)        | 390            | (38.137)        |                |                 |

The following Sources give vapour pressure and/or critical point data for this compound. Those Sources used to derive the critical properties and coefficients of the vapour pressure equation are shown in bold type together with the pressure range (low 'L', medium 'M', normal boiling point only 'N', high 'H' or critical 'C') of the data. An asterisk (\*) indicates that the Source is not a primary source of experimental data for this compound.

- |    |                                        |                                                              |   |
|----|----------------------------------------|--------------------------------------------------------------|---|
| 1  | HUBNER, H.; MAJERT, W.;                | <i>Chem. Ber.</i> , Vol.6, p.790, 1873.                      |   |
| 2  | SCHIFF, R.;                            | <i>Liebigs Ann. Chem.</i> , Vol.220, p.71, 1883.             |   |
| 3  | KAHLBAUM, G.W.A.;                      | <i>Chem. Ber.</i> , Vol.17, p.1245, 1884.                    |   |
| 4  | FEITLER, S.;                           | <i>Z. Phys. Chem.</i> , Vol.4, p.66, 1889.                   | M |
| 5  | PERKIN, W.H.;                          | <i>J. Chem. Soc.</i> , Vol.69, p.1025, 1896.                 |   |
| 6  | CAUWOOD, J.D.; TURNER, W.E.S.;         | <i>J. Chem. Soc. Trans.</i> , Vol.107, p.276, 1915.          |   |
| 7  | JAEGER, F.M.;                          | <i>Z. Anorg. Allg. Chem.</i> , Vol.101, p.130, 1917.         | N |
| 8  | SUGDEN, S.;                            | <i>J. Chem. Soc.</i> , Vol.125, p.1167, 1924.                |   |
| 9  | SUGDEN, S.;                            | <i>J. Chem. Soc.</i> , Vol.125, p.1177, 1924.                |   |
| 10 | MATHEWS, J.H.;                         | <i>J. Am. Chem. Soc.</i> , Vol.48, p.562, 1926.              |   |
| 11 | STUCKEY, J.M.; SAYLOR, J.H.;           | <i>J. Am. Chem. Soc.</i> , Vol.62, p.2922, 1940.             |   |
| 12 | LECAT, M.;                             | <i>C.R. Hebd. Seances Acad. Sci.</i> , Vol.217, p.273, 1943. |   |
| 13 | LECAT, M.;                             | <i>Bull. Cl. Sci., Acad. R. Belg.</i> , Vol.33, p.160, 1947. |   |
| 14 | VOGEL, A.L.;                           | <i>J. Chem. Soc.</i> , p.644, 1948.                          |   |
| 15 | LECAT, M.;                             | <i>Tables Azeotropiques</i> , Brussels, 1949.                | N |
| 16 | CONRAD, J.J.; LI, N.C.;                | <i>J. Am. Chem. Soc.</i> , Vol.75, p.1785, 1953.             |   |
| 17 | KARIYONE, T.; KAJIURA, T.; et al.;     | <i>Yakugaku Zasshi</i> , Vol.73, p.493, 1953.                |   |
| 18 | OGIMACHI, N.N.; ANDREWS, L.J.; et al.; | <i>J. Am. Chem. Soc.</i> , Vol.77, p.4202, 1955.             |   |
| 19 | PETRO, A.J.; SMYTH, C.P.;              | <i>J. Am. Chem. Soc.</i> , Vol.79, p.6142, 1957.             |   |
| 20 | FELDMAN, L.N.; SAVKO, V.V.; et al.;    | <i>Zh. Fiz. Khim.</i> , Vol.47, p.2715, 1973.                |   |
| 21 | TRC Thermodynamic Tables,              | Texas A & M Univ., Loose leaf data sheets extant 1998.*      |   |

The following Sources were used to estimate critical point data for this compound.

- |                   |                                                             |
|-------------------|-------------------------------------------------------------|
| AMBROSE, D.;      | NPL Report Chem 92, Nat. Phys. Lab., Teddington, UK, 1978.* |
| AMBROSE, D.;      | NPL Report Chem 98, Nat. Phys. Lab., Teddington, UK, 1979.* |
| SOMAYAJULU, G.R.; | <i>J. Chem. Eng. Data</i> , Vol.34, p.106, 1989.*           |

**C<sub>6</sub>H<sub>5</sub>CH<sub>2</sub>Br**  
 (Bromomethyl)benzene; Benzyl bromide

**C<sub>7</sub>H<sub>7</sub>Br**

CAS Reg. No. 100-39-0

Mol. Wt. 171.04

Vapour Pressure  $\ln p = \ln p_c + (N_1 \tau + N_2 \tau^{1.5} + N_3 \tau^{2.5} + N_4 \tau^5)/(T/T_c)$

where  $p$  is the vapour pressure,  $p_c$  is the critical pressure,  $T$  is the kelvin temperature on the International Temperature Scale of 1990 (ITS-90),  $T_c$  is the critical temperature and  $\tau = 1 - T/T_c$ .

Critical Temperature  
 Critical Pressure

$T_c = 720. \text{ K}$   
 $p_c = 3950. \text{ kPa}$

$(t_c = 446.85 \text{ }^\circ\text{C})$   
 $(p_c = 38.98 \text{ atm})$

$N_1 = -7.58119$

$N_2 = 1.85606$

$N_3 = -2.63641$

$N_4 = -3.09920$

Acentric Factor  
 Normal Boiling Point

$\omega = 0.307$   
 $T_b = 474.150 \text{ K}$

$(t_b = 201.000 \text{ }^\circ\text{C})$   
 $( = 0.0560 \text{ }^\circ\text{C/mmHg})$

$dT/dp$  at  $T_b, t_b$   
 Approximate Melting Point

$T_m = 271. \text{ K}$

$(t_m = -2. \text{ }^\circ\text{C})$

| Data at Specified Pressures |       |       |           |         |         |           |
|-----------------------------|-------|-------|-----------|---------|---------|-----------|
| $p/\text{kPa}$              | 1.E-6 | 1.E-4 | 0.01      | 1       | 10      | 101.325   |
| $T/\text{K}$                |       |       | (272.971) | 341.610 | 394.903 | 474.150   |
| $(dp/dT)/(\text{kPa/K})$    |       |       | (9.E-04)  | 0.051   | 0.363   | 2.381     |
| Data Quality                |       |       | (C)       | C       | C       | B         |
| Uncert. in $T$ (K)          |       |       | (1.)      | 0.5     | 0.2     | 0.2       |
| Uncert. in $p$ (kPa)        |       |       | (0.0010)  | 0.02    | 0.1     | 0.5       |
| Uncert. in $p$ (%)          |       |       | (10.)     | 2.      | 1.      | 0.5       |
|                             |       |       |           |         |         | 1000      |
|                             |       |       |           |         |         | (601.981) |
|                             |       |       |           |         |         | (13.748)  |
|                             |       |       |           |         |         | (B)       |
|                             |       |       |           |         |         | (1.)      |
|                             |       |       |           |         |         | (20.)     |
|                             |       |       |           |         |         | (500.)    |
|                             |       |       |           |         |         | (10.)     |

## Vapour Pressure of (Bromomethyl)benzene

Units: kPa v. K

| Uncertainty in |         |     |     | Uncertainty in |          |     |     | Uncertainty in |          |     |     |
|----------------|---------|-----|-----|----------------|----------|-----|-----|----------------|----------|-----|-----|
| $T$            | $p$     | $T$ | $p$ | $T$            | $p$      | $T$ | $p$ | $T$            | $p$      | $T$ | $p$ |
| K              | kPa     | K   | %   | K              | kPa      | K   | %   | K              | kPa      | K   | %   |
|                |         |     |     | 450            | 55.406   | 0.2 | 0.5 | 650            | (1842.2) | 2   | 5   |
|                |         |     |     | 460            | 71.788   | 0.2 | 0.5 | 660            | (2069.8) | 5   | 5   |
| 270            | (0.008) | 1   | 10  | 470            | 91.816   | 0.2 | 0.5 | 670            | (2318.3) | 5   | 5   |
| 280            | (0.018) | 1   | 10  | 480            | (116.03) | 0.2 | 0.5 | 680            | (2589.5) | 5   | 5   |
| 290            | (0.040) | 1   | 5   | 490            | (145.01) | 0.2 | 0.5 | 690            | (2885.2) | 5   | 5   |
| 300            | (0.083) | 0.5 | 5   | 500            | (179.35) | 0.2 | 0.5 | 700            | (3207.8) | 5   | 10  |
| 310            | (0.162) | 0.5 | 5   | 510            | (219.71) | 0.5 | 1   | 710            | (3560.7) | 10  | 10  |
| 320            | (0.301) | 0.5 | 2   | 520            | (266.75) | 0.5 | 1   | 720            | (3950.0) | 10  | 10  |
| 330            | (0.537) | 0.5 | 2   | 530            | (321.17) | 0.5 | 1   |                |          |     |     |
| 340            | (0.920) | 0.5 | 2   | 540            | (383.70) | 0.5 | 1   |                |          |     |     |
| 350            | 1.520   | 0.5 | 2   | 550            | (455.09) | 1   | 1   |                |          |     |     |
| 360            | 2.428   | 0.2 | 2   | 560            | (536.11) | 1   | 1   |                |          |     |     |
| 370            | 3.763   | 0.2 | 1   | 570            | (627.57) | 1   | 2   |                |          |     |     |
| 380            | 5.675   | 0.2 | 1   | 580            | (730.30) | 1   | 2   |                |          |     |     |
| 390            | 8.347   | 0.2 | 1   | 590            | (845.16) | 1   | 2   |                |          |     |     |
| 400            | 11.998  | 0.2 | 1   | 600            | (973.04) | 1   | 2   |                |          |     |     |
| 410            | 16.886  | 0.2 | 1   | 610            | (1114.9) | 2   | 2   |                |          |     |     |
| 420            | 23.310  | 0.2 | 1   | 620            | (1271.6) | 2   | 2   |                |          |     |     |
| 430            | 31.610  | 0.2 | 0.5 | 630            | (1444.4) | 2   | 2   |                |          |     |     |
| 440            | 42.168  | 0.2 | 0.5 | 640            | (1634.2) | 2   | 2   |                |          |     |     |

Units: bar v. °C

| $t$<br>°C | $p$<br>bar | $t$<br>°C | $p$<br>bar | $t$<br>°C | $p$<br>bar | $t$<br>°C | $p$<br>bar | $t$<br>°C | $p$<br>bar |
|-----------|------------|-----------|------------|-----------|------------|-----------|------------|-----------|------------|
| 0         | (1.E-4)    | 100       | 0.043      | 200       | 0.990      | 300       | (6.587)    | 400       | (24.012)   |
| 10        | (2.E-4)    | 110       | 0.064      | 210       | (1.246)    | 310       | (7.651)    | 410       | (26.799)   |
| 20        | (5.E-4)    | 120       | 0.094      | 220       | (1.552)    | 320       | (8.840)    | 420       | (29.838)   |
| 30        | (0.001)    | 130       | 0.134      | 230       | (1.914)    | 330       | (10.162)   | 430       | (33.155)   |
| 40        | (0.002)    | 140       | 0.187      | 240       | (2.338)    | 340       | (11.626)   | 440       | (36.789)   |
| 50        | (0.004)    | 150       | 0.257      | 250       | (2.831)    | 350       | (13.243)   |           |            |
| 60        | (0.006)    | 160       | 0.347      | 260       | (3.400)    | 360       | (15.023)   |           |            |
| 70        | 0.011      | 170       | 0.460      | 270       | (4.052)    | 370       | (16.977)   |           |            |
| 80        | 0.018      | 180       | 0.602      | 280       | (4.795)    | 380       | (19.117)   |           |            |
| 90        | 0.028      | 190       | 0.777      | 290       | (5.638)    | 390       | (21.457)   |           |            |

The following Sources give vapour pressure and/or critical point data for this compound. Those Sources used to derive the critical properties and coefficients of the vapour pressure equation are shown in bold type together with the pressure range (low 'L', medium 'M', normal boiling point only 'N', high 'H' or critical 'C') of the data. An asterisk (\*) indicates that the Source is not a primary source of experimental data for this compound.

- 1 RADULESCU, D.; TILSCH, S.; *Z.Phys.Chem.(Leipzig)*, Vol.179, p.210, 1937.
- 2 ASHCROFT, S.J.; *J.Chem.Eng.Data*, Vol.21, p.397, 1976. L
- 3 LIDE, D.R., (Ed-in-Chief); *CRC Handbook of Chemistry and Physics*, 74th Ed., 1993.\* N

The following Sources were used to estimate critical point data for this compound.

- AMBROSE, D.; NPL Report Chem 92, Nat.Phys.Lab., Teddington, UK, 1978.\*  
 AMBROSE, D.; NPL Report Chem 98, Nat.Phys.Lab., Teddington, UK, 1979.\*  
 SOMAYAJULU, G.R.; *J.Chem.Eng.Data*, Vol.34, p.106, 1989.\*

2-BrC<sub>6</sub>H<sub>4</sub>CH<sub>3</sub>  
 2-Bromotoluene; *o*-Bromotoluene; *o*-Tolylbromide

C<sub>7</sub>H<sub>7</sub>Br

CAS Reg. No. 95-46-5

Mol. Wt. 171.04

Vapour Pressure  $\ln p = \ln p_c + (N_1 \tau + N_2 \tau^{1.5} + N_3 \tau^{2.5} + N_4 \tau^5)/(T/T_c)$

where  $p$  is the vapour pressure,  $p_c$  is the critical pressure,  $T$  is the kelvin temperature on the International Temperature Scale of 1990 (ITS-90),  $T_c$  is the critical temperature and  $\tau = 1 - T/T_c$ .

Critical Temperature  $T_c = 692. \text{ K}$  ( $t_c = 418.85 \text{ }^\circ\text{C}$ )  
 Critical Pressure  $p_c = 3850. \text{ kPa}$  ( $p_c = 38.00 \text{ atm}$ )

$N_1 = -7.48581$   $N_2 = 1.81219$   $N_3 = -2.49768$   $N_4 = -2.99916$

Acentric Factor  $\omega = 0.289$   
 Normal Boiling Point  $T_b = 454.650 \text{ K}$  ( $t_b = 181.500 \text{ }^\circ\text{C}$ )  
 $dT/dp$  at  $T_b, t_b = 0.408 \text{ K/kPa}$  ( $= 0.0544 \text{ }^\circ\text{C/mmHg}$ )  
 Approximate Melting Point  $T_m = 245. \text{ K}$  ( $t_m = -28. \text{ }^\circ\text{C}$ )

| $p/\text{kPa}$<br>$T/\text{K}$<br>$(dp/dT)/(\text{kPa/K})$<br>Data Quality<br>Uncert. in $T$ (K)<br>Uncert. in $p$ (kPa)<br>Uncert. in $p$ (%) | Data at Specified Pressures |       |           |         |         |           |
|------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------|-------|-----------|---------|---------|-----------|
|                                                                                                                                                | 1.E-6                       | 1.E-4 | 0.01      | 1       | 10      | 101.325   |
|                                                                                                                                                |                             |       | (260.019) | 326.206 | 377.757 | 454.650   |
|                                                                                                                                                |                             |       | (9.E-04)  | 0.053   | 0.375   | 2.450     |
|                                                                                                                                                |                             |       | (C)       | C       | C       | B         |
|                                                                                                                                                |                             |       | (1.)      | 0.5     | 0.2     | 0.2       |
|                                                                                                                                                |                             |       | (0.0010)  | 0.02    | 0.1     | 0.5       |
|                                                                                                                                                |                             |       | (10.)     | 2.      | 1.      | 0.5       |
|                                                                                                                                                |                             |       |           |         |         | 1000      |
|                                                                                                                                                |                             |       |           |         |         | (579.181) |
|                                                                                                                                                |                             |       |           |         |         | (14.085)  |
|                                                                                                                                                |                             |       |           |         |         | (B)       |
|                                                                                                                                                |                             |       |           |         |         | (1.)      |
|                                                                                                                                                |                             |       |           |         |         | (20.)     |
|                                                                                                                                                |                             |       |           |         |         | (500.)    |
|                                                                                                                                                |                             |       |           |         |         | (10.)     |

## Vapour Pressure of 2-Bromotoluene

Units: kPa v. K

| Uncertainty in |         |     |     | Uncertainty in |          |     |     | Uncertainty in |          |     |     |
|----------------|---------|-----|-----|----------------|----------|-----|-----|----------------|----------|-----|-----|
| $T$            | $p$     | $T$ | $p$ | $T$            | $p$      | $T$ | $p$ | $T$            | $p$      | $T$ | $p$ |
| K              | kPa     | K   | %   | K              | kPa      | K   | %   | K              | kPa      | K   | %   |
|                |         |     |     | 400            | 21.788   | 0.2 | 1   | 600            | (1326.9) | 2   | 2   |
|                |         |     |     | 410            | 29.932   | 0.2 | 0.5 | 610            | (1509.6) | 2   | 2   |
|                |         |     |     | 420            | 40.394   | 0.2 | 0.5 | 620            | (1710.6) | 2   | 5   |
|                |         |     |     | 430            | 53.626   | 0.2 | 0.5 | 630            | (1931.2) | 5   | 5   |
|                |         |     |     | 440            | 70.123   | 0.2 | 0.5 | 640            | (2172.8) | 5   | 5   |
| 240            | (0.001) | 2   | 20  |                |          |     |     |                |          |     |     |
| 250            | (0.004) | 2   | 20  | 450            | 90.427   | 0.2 | 0.5 | 650            | (2437.1) | 5   | 5   |
| 260            | (0.010) | 1   | 10  | 460            | (115.12) | 0.2 | 0.5 | 660            | (2725.9) | 5   | 5   |
| 270            | (0.024) | 1   | 5   | 470            | (144.81) | 0.2 | 0.5 | 670            | (3041.7) | 5   | 5   |
| 280            | (0.053) | 0.5 | 5   | 480            | (180.17) | 0.2 | 0.5 | 680            | (3387.5) | 10  | 10  |
| 290            | (0.109) | 0.5 | 5   | 490            | (221.87) | 0.5 | 1   | 690            | (3768.4) | 10  | 10  |
| 300            | (0.215) | 0.5 | 2   | 500            | (270.65) | 0.5 | 1   |                |          |     |     |
| 310            | (0.401) | 0.5 | 2   | 510            | (327.25) | 0.5 | 1   |                |          |     |     |
| 320            | 0.714   | 0.5 | 2   | 520            | (392.46) | 0.5 | 1   |                |          |     |     |
| 330            | 1.220   | 0.5 | 2   | 530            | (467.08) | 0.5 | 1   |                |          |     |     |
| 340            | 2.010   | 0.2 | 2   | 540            | (551.94) | 1   | 1   |                |          |     |     |
| 350            | 3.200   | 0.2 | 1   | 550            | (647.91) | 1   | 2   |                |          |     |     |
| 360            | 4.942   | 0.2 | 1   | 560            | (755.89) | 1   | 2   |                |          |     |     |
| 370            | 7.423   | 0.2 | 1   | 570            | (876.79) | 1   | 2   |                |          |     |     |
| 380            | 10.871  | 0.2 | 1   | 580            | (1011.6) | 1   | 2   |                |          |     |     |
| 390            | 15.554  | 0.2 | 1   | 590            | (1161.3) | 2   | 2   |                |          |     |     |

C<sub>7</sub>H<sub>7</sub>Br

## Vapour Pressure of 2-Bromotoluene continued

Units: bar v. °C

| <i>t</i><br>°C | <i>p</i><br>bar | <i>t</i><br>°C | <i>p</i><br>bar | <i>t</i><br>°C | <i>p</i><br>bar | <i>t</i><br>°C | <i>p</i><br>bar | <i>t</i><br>°C | <i>p</i><br>bar |
|----------------|-----------------|----------------|-----------------|----------------|-----------------|----------------|-----------------|----------------|-----------------|
|                |                 | 50             | 0.008           | 150            | 0.442           | 250            | (4.149)         | 350            | (17.779)        |
|                |                 | 60             | 0.014           | 160            | 0.584           | 260            | (4.927)         | 360            | (20.050)        |
| -30            | (2.E-5)         | 70             | 0.023           | 170            | 0.761           | 270            | (5.809)         | 370            | (22.535)        |
| -20            | (5.E-5)         | 80             | 0.037           | 180            | 0.977           | 280            | (6.806)         | 380            | (25.253)        |
| -10            | (1.E-4)         | 90             | 0.056           | 190            | (1.239)         | 290            | (7.925)         | 390            | (28.224)        |
| 0              | (3.E-4)         | 100            | 0.084           | 200            | (1.553)         | 300            | (9.177)         | 400            | (31.472)        |
| 10             | (7.E-4)         | 110            | 0.122           | 210            | (1.926)         | 310            | (10.571)        | 410            | (35.033)        |
| 20             | (0.001)         | 120            | 0.173           | 220            | (2.364)         | 320            | (12.117)        |                |                 |
| 30             | (0.003)         | 130            | 0.241           | 230            | (2.876)         | 330            | (13.826)        |                |                 |
| 40             | (0.005)         | 140            | 0.330           | 240            | (3.468)         | 340            | (15.709)        |                |                 |

The following Sources give vapour pressure and/or critical point data for this compound. Those Sources used to derive the critical properties and coefficients of the vapour pressure equation are shown in bold type together with the pressure range (low 'L', medium 'M', normal boiling point only 'N', high 'H' or critical 'C') of the data. An asterisk (\*) indicates that the Source is not a primary source of experimental data for this compound.

- |   |                              |                                                           |   |
|---|------------------------------|-----------------------------------------------------------|---|
| 1 | KAHLBAUM, G.W.A.;            | <i>Chem.Ber.</i> , Vol.17, p.1263, 1884.                  |   |
| 2 | PERKIN, W.H.;                | <i>J.Chem.Soc.</i> , Vol.69, p.1025, 1896.                |   |
| 3 | TIMMERMANS, J.;              | <i>Bull.Soc.Chim.Belg.</i> , Vol.30, p.62, 1921.          |   |
| 4 | STUCKEY, J.M.; SAYLOR, J.H.; | <i>J.Am.Chem.Soc.</i> , Vol.62, p.2922, 1940.             |   |
| 5 | LECAT, M.;                   | <i>C.R.Hebd.Seances Acad.Sci.</i> , Vol.217, p.273, 1943. | N |
| 6 | LECAT, M.;                   | <i>Tables Azeotropiques</i> , Brussels, 1949.             |   |
| 7 | HUSSEY, A.S.; DYER, J.R.;    | <i>J.Am.Chem.Soc.</i> , Vol.73, p.603, 1951.              |   |
| 8 | RIDING, F.; et al.;          | <i>Trans.Faraday Soc.</i> , Vol.52, p.1354, 1956.         |   |

The following Sources were used to estimate critical point data for this compound.

- |                   |                                                           |
|-------------------|-----------------------------------------------------------|
| AMBROSE, D. ;     | NPL Report Chem 92, Nat.Phys.Lab., Teddington, UK, 1978.* |
| AMBROSE, D. ;     | NPL Report Chem 98, Nat.Phys.Lab., Teddington, UK, 1979.* |
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3-BrC<sub>6</sub>H<sub>4</sub>CH<sub>3</sub>  
 3-Bromotoluene; *m*-Bromotoluene; *m*-Tolylbromide

C<sub>7</sub>H<sub>7</sub>Br

CAS Reg. No. 591-17-3

Mol. Wt. 171.04

Vapour Pressure  $\ln p = \ln p_c + (N_1 \tau + N_2 \tau^{1.5} + N_3 \tau^{2.5} + N_4 \tau^5)/(T/T_c)$

where  $p$  is the vapour pressure,  $p_c$  is the critical pressure,  $T$  is the kelvin temperature on the International Temperature Scale of 1990 (ITS-90),  $T_c$  is the critical temperature and  $\tau = 1 - T/T_c$ .

Critical Temperature  $T_c = 696. \text{ K}$  ( $t_c = 422.85 \text{ }^\circ\text{C}$ )  
 Critical Pressure  $p_c = 3850. \text{ kPa}$  ( $p_c = 38.00 \text{ atm}$ )

$N_1 = -7.48678$   $N_2 = 1.81263$   $N_3 = -2.49908$   $N_4 = -3.00020$

Acentric Factor  $\omega = 0.290$   
 Normal Boiling Point  $T_b = 457.300 \text{ K}$  ( $t_b = 184.150 \text{ }^\circ\text{C}$ )  
 $dT/dp$  at  $T_b$ ,  $t_b$   $= 0.411 \text{ K/kPa}$  ( $= 0.0547 \text{ }^\circ\text{C/mmHg}$ )  
 Approximate Melting Point  $T_m = 233. \text{ K}$  ( $t_m = -40. \text{ }^\circ\text{C}$ )

| Data at Specified Pressures |       |       |         |         |         |         |
|-----------------------------|-------|-------|---------|---------|---------|---------|
| $p/\text{kPa}$              | 1.E-6 | 1.E-4 | 0.01    | 1       | 10      | 101.325 |
| $T/\text{K}$                |       |       | 261.550 | 328.118 | 379.966 | 457.300 |
| $(dp/dT)/(\text{kPa/K})$    |       |       | 9.E-04  | 0.053   | 0.373   | 2.436   |
| Data Quality                |       |       | C       | C       | C       | B       |
| Uncert. in $T$ (K)          |       |       | 1.      | 0.5     | 0.2     | 0.2     |
| Uncert. in $p$ (kPa)        |       |       | 0.0010  | 0.02    | 0.1     | 0.5     |
| Uncert. in $p$ (%)          |       |       | 10.     | 2.      | 1.      | 0.5     |

## Vapour Pressure of 3-Bromotoluene

Units: kPa v. K

| Uncertainty in |         |     |     | Uncertainty in |          |     |     | Uncertainty in |          |     |     |
|----------------|---------|-----|-----|----------------|----------|-----|-----|----------------|----------|-----|-----|
| $T$            | $p$     | $T$ | $p$ | $T$            | $p$      | $T$ | $p$ | $T$            | $p$      | $T$ | $p$ |
| K              | kPa     | K   | %   | K              | kPa      | K   | %   | K              | kPa      | K   | %   |
|                |         |     |     | 400            | 20.183   | 0.2 | 1   | 600            | (1267.7) | 2   | 2   |
|                |         |     |     | 410            | 27.799   | 0.2 | 0.5 | 610            | (1443.4) | 2   | 2   |
|                |         |     |     | 420            | 37.607   | 0.2 | 0.5 | 620            | (1636.7) | 2   | 5   |
| 230            | (4.E-4) | 5   | 50  | 430            | 50.040   | 0.2 | 0.5 | 630            | (1848.8) | 2   | 5   |
| 240            | (0.001) | 2   | 20  | 440            | 65.575   | 0.2 | 0.5 | 640            | (2081.2) | 5   | 5   |
| 250            | (0.003) | 2   | 20  | 450            | 84.732   | 0.2 | 0.5 | 650            | (2335.5) | 5   | 5   |
| 260            | (0.009) | 1   | 10  | 460            | (108.07) | 0.2 | 0.5 | 660            | (2613.2) | 5   | 5   |
| 270            | 0.021   | 1   | 10  | 470            | (136.19) | 0.2 | 0.5 | 670            | (2916.7) | 5   | 5   |
| 280            | 0.046   | 1   | 5   | 480            | (169.73) | 0.2 | 0.5 | 680            | (3248.4) | 5   | 10  |
| 290            | 0.097   | 0.5 | 5   | 490            | (209.36) | 0.5 | 1   | 690            | (3612.6) | 10  | 10  |
| 300            | 0.192   | 0.5 | 5   | 500            | (255.77) | 0.5 | 1   |                |          |     |     |
| 310            | 0.359   | 0.5 | 2   | 510            | (309.70) | 0.5 | 1   |                |          |     |     |
| 320            | 0.643   | 0.5 | 2   | 520            | (371.91) | 0.5 | 1   |                |          |     |     |
| 330            | 1.104   | 0.5 | 2   | 530            | (443.17) | 0.5 | 1   |                |          |     |     |
| 340            | 1.826   | 0.2 | 2   | 540            | (524.32) | 1   | 1   |                |          |     |     |
| 350            | 2.918   | 0.2 | 1   | 550            | (616.17) | 1   | 2   |                |          |     |     |
| 360            | 4.523   | 0.2 | 1   | 560            | (719.62) | 1   | 2   |                |          |     |     |
| 370            | 6.816   | 0.2 | 1   | 570            | (835.54) | 1   | 2   |                |          |     |     |
| 380            | 10.013  | 0.2 | 1   | 580            | (964.88) | 1   | 2   |                |          |     |     |
| 390            | 14.368  | 0.2 | 1   | 590            | (1108.6) | 2   | 2   |                |          |     |     |

C<sub>7</sub>H<sub>7</sub>Br

## Vapour Pressure of 3-Bromotoluene continued

Units: bar v. °C

| $t$<br>°C | $p$<br>bar | $t$<br>°C | $p$<br>bar | $t$<br>°C | $p$<br>bar | $t$<br>°C | $p$<br>bar | $t$<br>°C | $p$<br>bar |
|-----------|------------|-----------|------------|-----------|------------|-----------|------------|-----------|------------|
| -40       | (5.E-6)    | 50        | 0.008      | 150       | 0.412      | 250       | (3.933)    | 350       | (17.014)   |
| -30       | (2.E-5)    | 60        | 0.013      | 160       | 0.546      | 260       | (4.676)    | 360       | (19.198)   |
| -20       | (5.E-5)    | 70        | 0.021      | 170       | 0.712      | 270       | (5.521)    | 370       | (21.589)   |
| -10       | 1.E-4      | 80        | 0.034      | 180       | 0.916      | 280       | (6.475)    | 380       | (24.203)   |
| 0         | 3.E-4      | 90        | 0.052      | 190       | (1.164)    | 290       | (7.547)    | 390       | (27.059)   |
| 10        | 6.E-4      | 100       | 0.077      | 200       | (1.461)    | 300       | (8.748)    | 400       | (30.180)   |
| 20        | 0.001      | 110       | 0.112      | 210       | (1.815)    | 310       | (10.086)   | 410       | (33.594)   |
| 30        | 0.002      | 120       | 0.160      | 220       | (2.232)    | 320       | (11.570)   | 420       | (37.351)   |
| 40        | 0.004      | 130       | 0.224      | 230       | (2.719)    | 330       | (13.212)   |           |            |
|           |            | 140       | 0.306      | 240       | (3.284)    | 340       | (15.023)   |           |            |

The following Sources give vapour pressure and/or critical point data for this compound. Those Sources used to derive the critical properties and coefficients of the vapour pressure equation are shown in bold type together with the pressure range (low 'L', medium 'M', normal boiling point only 'N', high 'H' or critical 'C') of the data. An asterisk (\*) indicates that the Source is not a primary source of experimental data for this compound.

- |   |                              |                                                           |   |
|---|------------------------------|-----------------------------------------------------------|---|
| 1 | STUCKEY, J.M.; SAYLOR, J.H.; | <i>J.Am.Chem.Soc.</i> , Vol.62, p.2922, 1940.             | N |
| 2 | LECAT, M.;                   | <i>C.R.Hebd.Seances Acad.Sci.</i> , Vol.217, p.273, 1943. | N |
| 3 | HUSSEY, A.S.; DYER, J.R.;    | <i>J.Am.Chem.Soc.</i> , Vol.73, p.603, 1951.              |   |
| 4 | RIDING, F.; et al.;          | <i>Trans.Faraday Soc.</i> , Vol.52, p.1354, 1956.         |   |

The following Sources were used to estimate critical point data for this compound.

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|-------------------|-----------------------------------------------------------|
| AMBROSE, D.;      | NPL Report Chem 92, Nat.Phys.Lab., Teddington, UK, 1978.* |
| AMBROSE, D.;      | NPL Report Chem 98, Nat.Phys.Lab., Teddington, UK, 1979.* |
| SOMAYAJULU, G.R.; | <i>J.Chem.Eng.Data</i> , Vol.34, p.106, 1989.*            |