682 *APPENDIX B. Properties of Pure Species*

**Table B.2: Constants for the Antoine Equation for Vapor Pressures of Pure Species**

B

In *P* sal/kPa = A

t/°C *C*

Latent heat of vaporization at the normal boiling point (A *H„),* and normal boiling point *(t n)*

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| Name | Formula/ | Parameters for Antoine Eqn.  At B C | | | Temp. Range  °C | *AH,,* kJ/mol | *t,,* °C |
| Acetone | C3H60 | 14.3145 | 2756.22 | 228.060 | -26 - 77 | 29.10 | 56.2 |
| Acetic acid | C2H402 | 15.0717 | 3580.80 | 224.650 | 24 - 142 | 23.70 | 117.9 |
| Acetonitri le\* | C2H3N | 14.8950 | 3413.10 | 250.523 | -27 - 81 | 30.19 | 81.6 |
| Benzene | C6H6 | 13.7819 | 2726.81 | 217.572 | 6 - 104 | 30.72 | 80.0 |
| iso-Butane | C4H10 | 13.8254 | 2181.79 | 248.870 | -83 -- 7 | 21.30 | -11.9 |
| n-Butane | C4H10 | 13.6608 | 2154.70 | 238.789 | -73 - 19 | 22.44 | -0.5 |
| 1-Butanol | C4H100 | 15.3144 | 3212.43 | 182.739 | 37 - 138 | 43.29 | 117.6 |
| 2-Butano1\* | C4H100 | 15.1989 | 3026.03 | 186.500 | 25 - 120 | 40.75 | 99.5 |
| iso-Butanol | C4H100 | 14.6047 | 2740.95 | 166.670 | 30 - 128 | 41.82 | 107.8 |
| *tert-Butanol* | *C4H1*00 | 14.8445 | 2658.29 | 177.650 | 10- 101 | 39.07 | 82.3 |
| Carbon tetrachloride | CC1.4 | 14.0572 | 2914.23 | 232.148 | -14 ----- 101 | 29.82 | 76.6 |
| Chlorobenzene | C6H5CI | 13.8635 | 3174.78 | 211.700 | 29 - 159 | 35.19 | 131.7 |
| 1 -Chlorobutane | C4H9CI | 13.7965 | 2723.73 | 218.265 | -17 - 79 | 30.39 | 78.5 |
| Chloroform | CHC13 | 13.7324 | 2548.74 | 218.552 | -23 - 84 | 29.24 | 61.1 |
| Cyclohexane | C6H 12 | 13.6568 | 2723.44 | 220.618 | 9- 105 | 29.97 | 80.7 |
| Cyclopentane | C5H10 | 13.9727 | 2653.90 | 234.510 | -35 - 71 | 27.30 | 49.2 |
| n-Decane | C 10H22 | 13.9748 | 3442.76 | 193.858 | 65 - 203 | 38.75 | 174.1 |
| Dichloromethane | CH2C12 | 13.9891 | 2463.93 | 223.240 | -38 - 60 | 28.06 | 39.7 |
| Diethyl ether | C4H100 | 14.0735 | 2511.29 | 231.200 | -43 - 55 | 26.52 | 34.4 |
| I ,4-Dioxane | C4H802 | 15.0967 | 3579.78 | 240.337 | 20- 105 | 34.16 | 101.3 |
| n-Eicosane | C20H42 | 14.4575 | 4680.46 | 132.100 | 208 - 379 | 57.49 | 343.6 |
| Ethanol | C2H60 | 16.8958 | 3795.17 | 230.918 | 3 - 96 | 38.56 | 78.2 |
| Ethylbenzene | C8H 10 | 13.9726 | 3259.93 | 212.300 | 33 - 163 | 35.57 | 136.2 |
| Ethylene glycol\* | C2H602 | 15.7567 | 4187.46 | 178.650 | 100 - 222 | 50.73 | 197.3 |
| n-Heptane | e7H16 | 13.8622 | 2910.26 | 216.432 | 4 - 123 | 31.77 | 98.4 |
| n-Hexane | C6H 14 | 13.8193 | 2696.04 | 224.317 | -19 - 92 | 28.85 | 68.7 |
| Methanol | CH4O | 16.5785 | 3638.27 | 239.500 | -11 - 83 | 35.21 | 64.7 |
| Methyl acetate | C3H602 | 14.2456 | 2662.78 | 219.690 | -23 - 78 | 30.32 | 56.9 |
| Methyl ethyl ketone | C4H80 | 14.1334 | 2838.24 | 218.690 | -8 - 103 | 31.30 | 79.6 |
| Nitromethane\* | CH3NO2 | 14.7513 | 3331.70 | 227.600 | 56 - 146 | 33.99 | 101.2 |
| n-Nonane | C9H20 | 13.9854 | 3311.19 | 202.694 | 46 - 178 | 36.91 | 150.8 |
| iso-Octane | C8H 18 | 13.6703 | 2896.31 | 220.767 | 2 - 125 | 30.79 | 99.2 |
| n-Octane | C811 18 | 13.9346 | 3123.13 | 209.635 | 26 - 152 | 34.41 | 125.6 |
| n-Pentane | C5 H 12 | 13.7667 | 2451.88 | 232.014 | -45 - 58 | 25.79 | 36.0 |
| Phenol | C6H60 | 14.4387 | 3507.80 | 175.400 | 80 - 208 | 46.18 | 181.8 |
| 1 -Propanol | C3H80 | 16.1154 | 3483.67 | 205.807 | 20 - 116 | 41.44 | 97.2 |
| 2-Propanol | C3H80 | 16.6796 | 3640.20 | 219.610 | 8 - 100 | 39.85 | 82.2 |
| Toluene | C7H8 | 13.9320 | 3056.96 | 217.625 | 13 - 136 | 33.18 | 110.6 |
| Water | HBO | 16.3872 | 3885.70 | 230.170 | 0 - 200 | 40.66 | 100.0 |
| o-Xylene | C8H10 | 14.0415 | 3358.79 | 212.041 | 40- 172 | 36.24 | 144.4 |
| m-Xylene | C8H10 | 14.1387 | 3381.81 | 216.120 | 35- 166 | 35.66 | 139.1 |
| p-Xylene | C8H10 | 14.0579 | 3331.45 | 214.627 | 35 - 166 | 35.67 | 138.3 |

Based primarily on data presented by B. E. Poling, J. M. Prausnitz, and J. P. O'Connell, *The Properties of Gases and Liquids,* 5th ed., App. A, McGraw-Hill, New York. 2001.

\*Antoine parameters adapted from Gmehling et al. See footnote 2, p. 791.
  
t Antoine parameters *A* are adjusted to reproduce the listed values of *tn.*