# 1,4-Butanediol

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| **Other names:** | 1,4-BD |
| | 1,4-BUTYLENE GLYCOL |
| | 1,4-Dihydroxybutane |
| | 1,4-Tetramethylene glycol |
| | BDO |
| | Butane diol-1,4 |
| | Butane-1,4-diol |
| | Butanediol |
| | Butylene glycol |
| | Dabco BDO |
| | Diol 14B |
| | NSC 406696 |
| | SUCOL B |
| | TETRAMETHYLENE GLYCOL |
| | Tetramethylene 1,4-diol |
| **Inchi:** | InChI=1S/C4H10O2/c5-3-1-2-4-6/h5-6H,1-4H2 |
| **InchiKey:** | WERYXYBDKMZEQL-UHFFFAOYSA-N |
| **Formula:** | C4H10O2 |
| **SMILES:** | OCCCCO |
| **Mol. weight [g/mol]:** | 90.12 |
| **CAS:** | 110-63-4 |

# Physical Properties

| Property code | Value | Unit | Source |
|---|---|---|---|
| affp | 915.60 | kJ/mol | NIST Webbook |
| affp | 871.70 | kJ/mol | NIST Webbook |
| affp | 884.30 ± 0.50 | kJ/mol | NIST Webbook |
| affp | 875.00 | kJ/mol | NIST Webbook |
| basg | 854.90 | kJ/mol | NIST Webbook |
| basg | 852.90 ± 0.50 | kJ/mol | NIST Webbook |
| basg | 841.20 | kJ/mol | NIST Webbook |
| basg | 843.50 | kJ/mol | NIST Webbook |
| chl | -2495.50 ± 5.70 | kJ/mol | NIST Webbook |
| chl | -2499.90 ± 2.00 | kJ/mol | NIST Webbook |

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|---|---|---|---|
| cpl | 203.79 | J/mol×K | Molar heat capacities for {isomer of butanediol + methanol} as function of mixture composition and temperature |
| gf | -290.84 | kJ/mol | Joback Method |
| hf | -427.00 ± 3.00 | kJ/mol | NIST Webbook |
| hf | -426.00 ± 5.70 | kJ/mol | NIST Webbook |
| hfl | -503.00 ± 2.00 | kJ/mol | NIST Webbook |
| hfl | -505.30 ± 5.70 | kJ/mol | NIST Webbook |
| hfus | 14.29 | kJ/mol | Joback Method |
| hvap | 57.86 | kJ/mol | Joback Method |
| log10ws | -0.02 | | Crippen Method |
| logp | -0.249 | | Crippen Method |
| mcvol | 78.960 | ml/mol | McGowan Method |
| nfpaf | %!d(float64=1) | | KDB |
| nfpah | %!d(float64=1) | | KDB |
| pc | 6220.00 ± 150.00 | kPa | NIST Webbook |
| rinpol | 912.40 | | NIST Webbook |
| rinpol | 922.00 | | NIST Webbook |
| rinpol | 900.00 | | NIST Webbook |
| rinpol | 900.00 | | NIST Webbook |
| rinpol | 922.00 | | NIST Webbook |
| rinpol | 931.00 | | NIST Webbook |
| rinpol | 912.40 | | NIST Webbook |
| ripol | 1911.00 | | NIST Webbook |
| ripol | 1861.00 | | NIST Webbook |
| ripol | 1890.00 | | NIST Webbook |
| ripol | 1911.00 | | NIST Webbook |
| ripol | 1870.00 | | NIST Webbook |
| sl | 223.40 | J/mol×K | NIST Webbook |
| tb | 501.15 ± 1.00 | K | NIST Webbook |
| tb | 501.15 | K | Isobaric Vapor-Liquid Equilibrium for Binary System of Tetrahydrofuran + 1,4-Butanediol and gamma-Butyrolactone at 50.0 and 70.0 kPa |
| tb | 503.20 | K | NIST Webbook |
| tb | 502.88 ± 0.05 | K | NIST Webbook |
| tb | 501.15 ± 2.00 | K | NIST Webbook |
| tb | 503.15 ± 2.00 | K | NIST Webbook |
| tb | 501.05 | K | Isobaric Vapor Liquid Equilibrium for Two Binary Systems (n-Butanol + 1,4-Butanediol and .gamma.-Butyrolactone + 1,4-Butanediol) at p = (30.0, 50.0, and 70.0) kPa |

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|---|---|---|---|
| tc | 728.00 | K | Critical temperatures and pressures of straight-chain alkanediols (C3 to C12) |
| tc | 727.00 ± 3.00 | K | NIST Webbook |
| tf | 292.80 ± 0.50 | K | NIST Webbook |
| tf | 355.40 ± 1.00 | K | NIST Webbook |
| tf | 289.90 ± 3.00 | K | NIST Webbook |
| tf | 292.15 ± 2.00 | K | NIST Webbook |
| tf | 289.40 ± 1.20 | K | NIST Webbook |
| tf | 294.05 ± 0.60 | K | NIST Webbook |
| tf | 292.40 ± 0.70 | K | NIST Webbook |
| tt | 293.58 ± 0.05 | K | NIST Webbook |
| tt | 293.38 ± 0.10 | K | NIST Webbook |
| tt | 293.58 ± 0.02 | K | NIST Webbook |
| tt | 289.90 ± 0.10 | K | NIST Webbook |
| vc | 0.297 | m3/kmol | Joback Method |

# Temperature Dependent Properties

| Property code | Value | Unit | Temperature [K] | Source |
|---|---|---|---|---|
| cpg | 185.68 | J/mol×K | 528.12 | Joback Method |
| cpg | 173.07 | J/mol×K | 475.28 | Joback Method |
| cpg | 191.63 | J/mol×K | 554.54 | Joback Method |
| cpg | 197.36 | J/mol×K | 580.97 | Joback Method |
| cpg | 202.87 | J/mol×K | 607.39 | Joback Method |
| cpg | 208.17 | J/mol×K | 633.81 | Joback Method |
| cpg | 179.49 | J/mol×K | 501.70 | Joback Method |
| cpl | 217.61 | J/mol×K | 323.15 | Molar heat capacities for (1-butanol + 1,4-butanediol, 2,3-butanediol, 1,2-butanediol, and 2-methyl-2,4-pentanediol) as function of temperature |
| cpl | 220.72 | J/mol×K | 328.15 | Molar heat capacities for (1-butanol + 1,4-butanediol, 2,3-butanediol, 1,2-butanediol, and 2-methyl-2,4-pentanediol) as function of temperature |

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|---|---|---|---|---|
| cpl | 223.90 | J/mol×K | 333.15 | Molar heat capacities for (1-butanol + 1,4-butanediol, 2,3-butanediol, 1,2-butanediol, and 2-methyl-2,4-pentanediol) as function of temperature |
| cpl | 227.12 | J/mol×K | 338.15 | Molar heat capacities for (1-butanol + 1,4-butanediol, 2,3-butanediol, 1,2-butanediol, and 2-methyl-2,4-pentanediol) as function of temperature |
| cpl | 230.40 | J/mol×K | 343.15 | Molar heat capacities for (1-butanol + 1,4-butanediol, 2,3-butanediol, 1,2-butanediol, and 2-methyl-2,4-pentanediol) as function of temperature |
| cpl | 233.72 | J/mol×K | 348.15 | Molar heat capacities for (1-butanol + 1,4-butanediol, 2,3-butanediol, 1,2-butanediol, and 2-methyl-2,4-pentanediol) as function of temperature |
| cpl | 237.07 | J/mol×K | 353.15 | Molar heat capacities for (1-butanol + 1,4-butanediol, 2,3-butanediol, 1,2-butanediol, and 2-methyl-2,4-pentanediol) as function of temperature |
| cpl | 200.51 | J/mol×K | 293.15 | Heat Capacities of Some Liquid alpha,omega-Alkanediols within the Temperature Range between (293.15 and 353.15) K |

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| cpl | 201.33 | J/mol×K | 294.65 | Heat Capacities of Some Liquid alpha,omega-Alkanediols within the Temperature Range between (293.15 and 353.15) K |
| cpl | 202.16 | J/mol×K | 296.15 | Heat Capacities of Some Liquid alpha,omega-Alkanediols within the Temperature Range between (293.15 and 353.15) K |
| cpl | 202.99 | J/mol×K | 297.65 | Heat Capacities of Some Liquid alpha,omega-Alkanediols within the Temperature Range between (293.15 and 353.15) K |
| cpl | 203.27 | J/mol×K | 298.15 | Heat Capacities of Some Liquid alpha,omega-Alkanediols within the Temperature Range between (293.15 and 353.15) K |
| cpl | 203.82 | J/mol×K | 299.15 | Heat Capacities of Some Liquid alpha,omega-Alkanediols within the Temperature Range between (293.15 and 353.15) K |
| cpl | 204.67 | J/mol×K | 300.65 | Heat Capacities of Some Liquid alpha,omega-Alkanediols within the Temperature Range between (293.15 and 353.15) K |
| cpl | 205.51 | J/mol×K | 302.15 | Heat Capacities of Some Liquid alpha,omega-Alkanediols within the Temperature Range between (293.15 and 353.15) K |

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| cpl | 206.36 | J/mol×K | 303.65 | Heat Capacities of Some Liquid alpha,omega-Alkanediols within the Temperature Range between (293.15 and 353.15) K |
| cpl | 207.22 | J/mol×K | 305.15 | Heat Capacities of Some Liquid alpha,omega-Alkanediols within the Temperature Range between (293.15 and 353.15) K |
| cpl | 214.55 | J/mol×K | 318.15 | Molar heat capacities for (1-butanol + 1,4-butanediol, 2,3-butanediol, 1,2-butanediol, and 2-methyl-2,4-pentanediol) as function of temperature |
| cpl | 208.95 | J/mol×K | 308.15 | Heat Capacities of Some Liquid alpha,omega-Alkanediols within the Temperature Range between (293.15 and 353.15) K |
| cpl | 209.82 | J/mol×K | 309.65 | Heat Capacities of Some Liquid alpha,omega-Alkanediols within the Temperature Range between (293.15 and 353.15) K |
| cpl | 210.70 | J/mol×K | 311.15 | Heat Capacities of Some Liquid alpha,omega-Alkanediols within the Temperature Range between (293.15 and 353.15) K |
| cpl | 211.58 | J/mol×K | 312.65 | Heat Capacities of Some Liquid alpha,omega-Alkanediols within the Temperature Range between (293.15 and 353.15) K |

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| cpl | 212.47 | J/mol×K | 314.15 | Heat Capacities of Some Liquid alpha,omega-Alkanediols within the Temperature Range between (293.15 and 353.15) K |
| cpl | 213.36 | J/mol×K | 315.65 | Heat Capacities of Some Liquid alpha,omega-Alkanediols within the Temperature Range between (293.15 and 353.15) K |
| cpl | 222.58 | J/mol×K | 330.65 | Heat Capacities of Some Liquid alpha,omega-Alkanediols within the Temperature Range between (293.15 and 353.15) K |
| cpl | 215.17 | J/mol×K | 318.65 | Heat Capacities of Some Liquid alpha,omega-Alkanediols within the Temperature Range between (293.15 and 353.15) K |
| cpl | 216.08 | J/mol×K | 320.15 | Heat Capacities of Some Liquid alpha,omega-Alkanediols within the Temperature Range between (293.15 and 353.15) K |
| cpl | 216.99 | J/mol×K | 321.65 | Heat Capacities of Some Liquid alpha,omega-Alkanediols within the Temperature Range between (293.15 and 353.15) K |
| cpl | 217.91 | J/mol×K | 323.15 | Heat Capacities of Some Liquid alpha,omega-Alkanediols within the Temperature Range between (293.15 and 353.15) K |

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| cpl | 218.83 | J/mol×K | 324.65 | Heat Capacities of Some Liquid alpha,omega-Alkanediols within the Temperature Range between (293.15 and 353.15) K |
| cpl | 219.76 | J/mol×K | 326.15 | Heat Capacities of Some Liquid alpha,omega-Alkanediols within the Temperature Range between (293.15 and 353.15) K |
| cpl | 214.26 | J/mol×K | 317.15 | Heat Capacities of Some Liquid alpha,omega-Alkanediols within the Temperature Range between (293.15 and 353.15) K |
| cpl | 221.64 | J/mol×K | 329.15 | Heat Capacities of Some Liquid alpha,omega-Alkanediols within the Temperature Range between (293.15 and 353.15) K |
| cpl | 211.57 | J/mol×K | 313.15 | Molar heat capacities for (1-butanol + 1,4-butanediol, 2,3-butanediol, 1,2-butanediol, and 2-methyl-2,4-pentanediol) as function of temperature |
| cpl | 223.53 | J/mol×K | 332.15 | Heat Capacities of Some Liquid alpha,omega-Alkanediols within the Temperature Range between (293.15 and 353.15) K |
| cpl | 224.49 | J/mol×K | 333.65 | Heat Capacities of Some Liquid alpha,omega-Alkanediols within the Temperature Range between (293.15 and 353.15) K |

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| cpl | 225.45 | J/mol×K | 335.15 | Heat Capacities of Some Liquid alpha,omega-Alkanediols within the Temperature Range between (293.15 and 353.15) K |
| cpl | 226.41 | J/mol×K | 336.65 | Heat Capacities of Some Liquid alpha,omega-Alkanediols within the Temperature Range between (293.15 and 353.15) K |
| cpl | 227.38 | J/mol×K | 338.15 | Heat Capacities of Some Liquid alpha,omega-Alkanediols within the Temperature Range between (293.15 and 353.15) K |
| cpl | 228.36 | J/mol×K | 339.65 | Heat Capacities of Some Liquid alpha,omega-Alkanediols within the Temperature Range between (293.15 and 353.15) K |
| cpl | 229.34 | J/mol×K | 341.15 | Heat Capacities of Some Liquid alpha,omega-Alkanediols within the Temperature Range between (293.15 and 353.15) K |
| cpl | 230.33 | J/mol×K | 342.65 | Heat Capacities of Some Liquid alpha,omega-Alkanediols within the Temperature Range between (293.15 and 353.15) K |
| cpl | 231.32 | J/mol×K | 344.15 | Heat Capacities of Some Liquid alpha,omega-Alkanediols within the Temperature Range between (293.15 and 353.15) K |

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| cpl | 220.70 | J/mol×K | 327.65 | Heat Capacities of Some Liquid alpha,omega-Alkanediols within the Temperature Range between (293.15 and 353.15) K |
| cpl | 233.32 | J/mol×K | 347.15 | Heat Capacities of Some Liquid alpha,omega-Alkanediols within the Temperature Range between (293.15 and 353.15) K |
| cpl | 234.32 | J/mol×K | 348.65 | Heat Capacities of Some Liquid alpha,omega-Alkanediols within the Temperature Range between (293.15 and 353.15) K |
| cpl | 235.34 | J/mol×K | 350.15 | Heat Capacities of Some Liquid alpha,omega-Alkanediols within the Temperature Range between (293.15 and 353.15) K |
| cpl | 236.35 | J/mol×K | 351.65 | Heat Capacities of Some Liquid alpha,omega-Alkanediols within the Temperature Range between (293.15 and 353.15) K |
| cpl | 237.38 | J/mol×K | 353.15 | Heat Capacities of Some Liquid alpha,omega-Alkanediols within the Temperature Range between (293.15 and 353.15) K |
| cpl | 200.10 | J/mol×K | 298.15 | NIST Webbook |
| cpl | 178.00 | J/mol×K | 297.79 | NIST Webbook |
| cpl | 208.65 | J/mol×K | 308.15 | Molar heat capacities for (1-butanol + 1,4-butanediol, 2,3-butanediol, 1,2-butanediol, and 2-methyl-2,4-pentanediol) as function of temperature |

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| cpl | 205.82 | J/mol×K | 303.15 | Molar heat capacities for (1-butanol + 1,4-butanediol, 2,3-butanediol, 1,2-butanediol, and 2-methyl-2,4-pentanediol) as function of temperature |
| cpl | 203.06 | J/mol×K | 298.15 | Molar heat capacities for (1-butanol + 1,4-butanediol, 2,3-butanediol, 1,2-butanediol, and 2-methyl-2,4-pentanediol) as function of temperature |
| cpl | 200.39 | J/mol×K | 293.15 | Molar heat capacities for (1-butanol + 1,4-butanediol, 2,3-butanediol, 1,2-butanediol, and 2-methyl-2,4-pentanediol) as function of temperature |
| cpl | 232.32 | J/mol×K | 345.65 | Heat Capacities of Some Liquid alpha,omega-Alkanediols within the Temperature Range between (293.15 and 353.15) K |
| cpl | 208.08 | J/mol×K | 306.65 | Heat Capacities of Some Liquid alpha,omega-Alkanediols within the Temperature Range between (293.15 and 353.15) K |
| dvisc | 0.0448850 | Pa×s | 308.15 | Molecular interactions in binary mixtures of formamide with 1-butanol, 2-butanol, 1,3-butanediol and 1,4-butanediol at different temperatures: An ultrasonic and viscometric study |

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|---|---|---|---|---|
| dvisc | 0.0568860 | Pa×s | 303.15 | Molecular interactions in binary mixtures of formamide with 1-butanol, 2-butanol, 1,3-butanediol and 1,4-butanediol at different temperatures: An ultrasonic and viscometric study |
| dvisc | 0.0727454 | Pa×s | 298.15 | Molecular interactions in binary mixtures of formamide with 1-butanol, 2-butanol, 1,3-butanediol and 1,4-butanediol at different temperatures: An ultrasonic and viscometric study |
| dvisc | 0.0972620 | Pa×s | 293.15 | Molecular interactions in binary mixtures of formamide with 1-butanol, 2-butanol, 1,3-butanediol and 1,4-butanediol at different temperatures: An ultrasonic and viscometric study |
| dvisc | 0.0290542 | Pa×s | 318.15 | Molecular interactions in binary mixtures of formamide with 1-butanol, 2-butanol, 1,3-butanediol and 1,4-butanediol at different temperatures: An ultrasonic and viscometric study |
| dvisc | 0.0358106 | Pa×s | 313.15 | Molecular interactions in binary mixtures of formamide with 1-butanol, 2-butanol, 1,3-butanediol and 1,4-butanediol at different temperatures: An ultrasonic and viscometric study |

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| hfust | 18.70 | kJ/mol | 293.58 | NIST Webbook |
| hfust | 18.70 | kJ/mol | 293.60 | NIST Webbook |
| hfust | 18.70 | kJ/mol | 293.60 | NIST Webbook |
| hvapt | 72.00 | kJ/mol | 445.00 | NIST Webbook |
| hvapt | 77.10 | kJ/mol | 298.15 | Vaporization Enthalpies of the r,o-Alkanediols by Correlation Gas Chromatography |
| hvapt | 77.00 ± 2.00 | kJ/mol | 419.00 | NIST Webbook |
| pvap | 0.08 | kPa | 351.20 | Thermodynamic Properties of Mixtures Containing Ionic Liquids. Activity Coefficients of Ethers and Alcohols in 1-Methyl-3-Ethyl-Imidazolium Bis(trifluoromethyl-sulfonyl) Imide Using the Transpiration Method |
| pvap | 0.05 | kPa | 343.60 | Thermodynamic Properties of Mixtures Containing Ionic Liquids. Activity Coefficients of Ethers and Alcohols in 1-Methyl-3-Ethyl-Imidazolium Bis(trifluoromethyl-sulfonyl) Imide Using the Transpiration Method |
| pvap | 0.06 | kPa | 346.30 | Thermodynamic Properties of Mixtures Containing Ionic Liquids. Activity Coefficients of Ethers and Alcohols in 1-Methyl-3-Ethyl-Imidazolium Bis(trifluoromethyl-sulfonyl) Imide Using the Transpiration Method |

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| pvap | 0.07 | kPa | 348.20 | Thermodynamic Properties of Mixtures Containing Ionic Liquids. Activity Coefficients of Ethers and Alcohols in 1-Methyl-3-Ethyl-Imidazolium Bis(trifluoromethyl-sulfonyl) Imide Using the Transpiration Method |
| pvap | 0.05 | kPa | 343.60 | Thermodynamic Properties of Mixtures Containing Ionic Liquids. Activity Coefficients of Ethers and Alcohols in 1-Methyl-3-Ethyl-Imidazolium Bis(trifluoromethyl-sulfonyl) Imide Using the Transpiration Method |
| pvap | 0.07 | kPa | 348.60 | Thermodynamic Properties of Mixtures Containing Ionic Liquids. Activity Coefficients of Ethers and Alcohols in 1-Methyl-3-Ethyl-Imidazolium Bis(trifluoromethyl-sulfonyl) Imide Using the Transpiration Method |
| pvap | 0.05 | kPa | 343.20 | Thermodynamic Properties of Mixtures Containing Ionic Liquids. Activity Coefficients of Ethers and Alcohols in 1-Methyl-3-Ethyl-Imidazolium Bis(trifluoromethyl-sulfonyl) Imide Using the Transpiration Method |
| pvap | 0.10 | kPa | 353.20 | Thermodynamic Properties of Mixtures Containing Ionic Liquids. Activity Coefficients of Ethers and Alcohols in 1-Methyl-3-Ethyl-Imidazolium Bis(trifluoromethyl-sulfonyl) Imide Using the Transpiration Method |

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| pvap | 0.10 | kPa | 353.60 | Thermodynamic Properties of Mixtures Containing Ionic Liquids. Activity Coefficients of Ethers and Alcohols in 1-Methyl-3-Ethyl-Imidazolium Bis(trifluoromethyl-sulfonyl) Imide Using the Transpiration Method |
| pvap | 0.10 | kPa | 353.60 | Thermodynamic Properties of Mixtures Containing Ionic Liquids. Activity Coefficients of Ethers and Alcohols in 1-Methyl-3-Ethyl-Imidazolium Bis(trifluoromethyl-sulfonyl) Imide Using the Transpiration Method |
| pvap | 0.12 | kPa | 356.20 | Thermodynamic Properties of Mixtures Containing Ionic Liquids. Activity Coefficients of Ethers and Alcohols in 1-Methyl-3-Ethyl-Imidazolium Bis(trifluoromethyl-sulfonyl) Imide Using the Transpiration Method |
| pvap | 0.04 | kPa | 341.20 | Thermodynamic Properties of Mixtures Containing Ionic Liquids. Activity Coefficients of Ethers and Alcohols in 1-Methyl-3-Ethyl-Imidazolium Bis(trifluoromethyl-sulfonyl) Imide Using the Transpiration Method |

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| pvap | 0.14 | kPa | 358.60 | Thermodynamic Properties of Mixtures Containing Ionic Liquids. Activity Coefficients of Ethers and Alcohols in 1-Methyl-3-Ethyl-Imidazolium Bis(trifluoromethyl-sulfonyl) Imide Using the Transpiration Method |
| pvap | 0.14 | kPa | 358.60 | Thermodynamic Properties of Mixtures Containing Ionic Liquids. Activity Coefficients of Ethers and Alcohols in 1-Methyl-3-Ethyl-Imidazolium Bis(trifluoromethyl-sulfonyl) Imide Using the Transpiration Method |
| pvap | 0.17 | kPa | 361.20 | Thermodynamic Properties of Mixtures Containing Ionic Liquids. Activity Coefficients of Ethers and Alcohols in 1-Methyl-3-Ethyl-Imidazolium Bis(trifluoromethyl-sulfonyl) Imide Using the Transpiration Method |
| pvap | 0.19 | kPa | 363.20 | Thermodynamic Properties of Mixtures Containing Ionic Liquids. Activity Coefficients of Ethers and Alcohols in 1-Methyl-3-Ethyl-Imidazolium Bis(trifluoromethyl-sulfonyl) Imide Using the Transpiration Method |

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| pvap | 0.66 | kPa | 383.15 | Vapor-Liquid Equilibria on Seven Binary Systems: Ethylene Oxide + 2-Methylpropane; Acetophenone + Phenol; cis-1,3-Dichloropropene + 1,2-Dichloropropane; 1,5-Hexadiene + Allyl Chloride; Isopropyl Acetate + Acetonitrile; Vinyl Chloride + Methyl Chloride; and 1,4-Butanediol + c-Butyrolactone |
| pvap | 0.04 | kPa | 339.60 | Thermodynamic Properties of Mixtures Containing Ionic Liquids. Activity Coefficients of Ethers and Alcohols in 1-Methyl-3-Ethyl-Imidazolium Bis(trifluoromethyl-sulfonyl) Imide Using the Transpiration Method |
| pvap | 0.04 | kPa | 339.60 | Thermodynamic Properties of Mixtures Containing Ionic Liquids. Activity Coefficients of Ethers and Alcohols in 1-Methyl-3-Ethyl-Imidazolium Bis(trifluoromethyl-sulfonyl) Imide Using the Transpiration Method |
| pvap | 0.03 | kPa | 338.20 | Thermodynamic Properties of Mixtures Containing Ionic Liquids. Activity Coefficients of Ethers and Alcohols in 1-Methyl-3-Ethyl-Imidazolium Bis(trifluoromethyl-sulfonyl) Imide Using the Transpiration Method |

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| pvap | 0.02 | kPa | 335.20 | Thermodynamic Properties of Mixtures Containing Ionic Liquids. Activity Coefficients of Ethers and Alcohols in 1-Methyl-3-Ethyl-Imidazolium Bis(trifluoromethyl-sulfonyl) Imide Using the Transpiration Method |
| pvap | 0.02 | kPa | 332.30 | Thermodynamic Properties of Mixtures Containing Ionic Liquids. Activity Coefficients of Ethers and Alcohols in 1-Methyl-3-Ethyl-Imidazolium Bis(trifluoromethyl-sulfonyl) Imide Using the Transpiration Method |
| pvap | 0.01 | kPa | 329.20 | Thermodynamic Properties of Mixtures Containing Ionic Liquids. Activity Coefficients of Ethers and Alcohols in 1-Methyl-3-Ethyl-Imidazolium Bis(trifluoromethyl-sulfonyl) Imide Using the Transpiration Method |
| pvap | 0.14 | kPa | 358.30 | Thermodynamic Properties of Mixtures Containing Ionic Liquids. Activity Coefficients of Ethers and Alcohols in 1-Methyl-3-Ethyl-Imidazolium Bis(trifluoromethyl-sulfonyl) Imide Using the Transpiration Method |
| pvap | 0.07 | kPa | 348.60 | Thermodynamic Properties of Mixtures Containing Ionic Liquids. Activity Coefficients of Ethers and Alcohols in 1-Methyl-3-Ethyl-Imidazolium Bis(trifluoromethyl-sulfonyl) Imide Using the Transpiration Method |

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| rfi | 1.44220 | 308.20 | A thermodynamic study of solute solvent interactions through dielectric properties of the mixtures consisting of 1,4-butanediol, 1-octanol, and 1,4-dioxane at different temperatures | |
| rfi | 1.44170 | 308.20 | A thermodynamic study of solute solvent interactions through dielectric properties of the mixtures consisting of 1,4-butanediol, 1-octanol, and 1,4-dioxane at different temperatures | |
| rfi | 1.43860 | 318.20 | A thermodynamic study of solute solvent interactions through dielectric properties of the mixtures consisting of 1,4-butanediol, 1-octanol, and 1,4-dioxane at different temperatures | |
| rfi | 1.44420 | 298.15 | Densities, Dynamic Viscosities, Speeds of Sound, and Relative Permittivities for Water + Alkanediols (Propane-1,2- and -1,3-diol and Butane-1,2-, -1,3-, -1,4-, and -2,3-Diol) at Different Temperatures | |

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|---|---|---|---|---|
| rfi | 1.44510 | 293.15 | Refractive Indices and Deviations in Refractive Indices for Binary Mixtures of Formamide + 1-Butanol, + 2-Butanol, + 1,3-Butanediol, and + 1,4-Butanediol at Temperatures from (293.15 to 318.15) K | |
| rfi | 1.44310 | 298.15 | Refractive Indices and Deviations in Refractive Indices for Binary Mixtures of Formamide + 1-Butanol, + 2-Butanol, + 1,3-Butanediol, and + 1,4-Butanediol at Temperatures from (293.15 to 318.15) K | |
| rfi | 1.44110 | 303.15 | Refractive Indices and Deviations in Refractive Indices for Binary Mixtures of Formamide + 1-Butanol, + 2-Butanol, + 1,3-Butanediol, and + 1,4-Butanediol at Temperatures from (293.15 to 318.15) K | |
| rfi | 1.43910 | 308.15 | Refractive Indices and Deviations in Refractive Indices for Binary Mixtures of Formamide + 1-Butanol, + 2-Butanol, + 1,3-Butanediol, and + 1,4-Butanediol at Temperatures from (293.15 to 318.15) K | |

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|---|---|---|---|---|
| rfi | 1.43720 | | 313.15 | Refractive Indices and Deviations in Refractive Indices for Binary Mixtures of Formamide + 1-Butanol, + 2-Butanol, + 1,3-Butanediol, and + 1,4-Butanediol at Temperatures from (293.15 to 318.15) K |
| rfi | 1.43520 | | 318.15 | Refractive Indices and Deviations in Refractive Indices for Binary Mixtures of Formamide + 1-Butanol, + 2-Butanol, + 1,3-Butanediol, and + 1,4-Butanediol at Temperatures from (293.15 to 318.15) K |
| rfi | 1.44570 | | 298.20 | A thermodynamic study of solute solvent interactions through dielectric properties of the mixtures consisting of 1,4-butanediol, 1-octanol, and 1,4-dioxane at different temperatures |
| rfi | 1.44470 | | 298.15 | The effect of temperature and pressure on acoustic and thermodynamic properties of 1,4-butanediol. The comparison with 1,2- and 1,3-butanediols |
| rhol | 1012.80 | kg/m3 | 298.15 | Acoustic and volumetric study of renewable oxygenated fuel additives at (298.15-323.15) K: Isomeric butanediols with ethylbutyrate |

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|---|---|---|---|---|
| rhol | 1012.60 | kg/m3 | 298.15 | Densities, Ultrasonic Speeds, and Excess Properties of Binary Mixtures of Diethylene Glycol with 1-Butanol, 2-Butanol, and 1,4-Butanediol at Different Temperatures |
| rhol | 1009.60 | kg/m3 | 303.15 | Densities, Ultrasonic Speeds, and Excess Properties of Binary Mixtures of Diethylene Glycol with 1-Butanol, 2-Butanol, and 1,4-Butanediol at Different Temperatures |
| rhol | 1006.70 | kg/m3 | 308.15 | Densities, Ultrasonic Speeds, and Excess Properties of Binary Mixtures of Diethylene Glycol with 1-Butanol, 2-Butanol, and 1,4-Butanediol at Different Temperatures |
| rhol | 1003.70 | kg/m3 | 313.15 | Densities, Ultrasonic Speeds, and Excess Properties of Binary Mixtures of Diethylene Glycol with 1-Butanol, 2-Butanol, and 1,4-Butanediol at Different Temperatures |
| rhol | 1022.21 | kg/m3 | 283.15 | Excess volumes and excess heat capacities for alkanediol + water systems in the temperature interval (283.15-313.15) K |

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| rhol | 1016.11 | kg/m3 | 293.15 | Excess volumes and excess heat capacities for alkanediol + water systems in the temperature interval (283.15-313.15) K |
| rhol | 1013.06 | kg/m3 | 298.15 | Excess volumes and excess heat capacities for alkanediol + water systems in the temperature interval (283.15-313.15) K |
| rhol | 1009.99 | kg/m3 | 303.15 | Excess volumes and excess heat capacities for alkanediol + water systems in the temperature interval (283.15-313.15) K |
| rhol | 1003.85 | kg/m3 | 313.15 | Excess volumes and excess heat capacities for alkanediol + water systems in the temperature interval (283.15-313.15) K |
| rhol | 1003.95 | kg/m3 | 308.15 | Effect of placement of hydroxyl groups in isomeric butanediol on the behaviour of thermophysical and spectroscopic properties of pyrrolidin-2-one |
| rhol | 1003.95 | kg/m3 | 308.15 | A comparative study of thermophysical and spectroscopic properties in mixtures of isomeric butanediol and N,N-dimethylformamide |

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| rhol | 1003.95 | kg/m3 | 308.15 | Thermodynamic, transport, and spectroscopic studies for mixtures of isomeric butanediol and N-methyl-2-pyrrolidinone |
| rhol | 1003.95 | kg/m3 | 308.15 | Effect of B-cyclodextrin on the behaviour of thermophysical and spectroscopic properties of binary mixtures of (isomeric butanediol + pyrrolidin-2-one) |
| rhol | 1013.90 | kg/m3 | 298.15 | Investigation on some thermophysical properties of poly(ethylene glycol) binary mixtures at different temperatures |
| rhol | 1010.60 | kg/m3 | 303.15 | Investigation on some thermophysical properties of poly(ethylene glycol) binary mixtures at different temperatures |
| rhol | 1007.50 | kg/m3 | 308.15 | Investigation on some thermophysical properties of poly(ethylene glycol) binary mixtures at different temperatures |
| rhol | 997.80 | kg/m3 | 323.15 | Densities and Excess Molar Volumes for Binary Mixtures of 1,4-Butanediol + 1,2-Propanediol, + 1,3-Propanediol, and + Ethane-1,2-diol from (293.15 to 328.15) K |

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| rhol | 1009.77 | kg/m3 | 303.15 | Acoustic and volumetric study of renewable oxygenated fuel additives at (298.15-323.15) K: Isomeric butanediols with ethylbutyrate |
| rhol | 1006.74 | kg/m3 | 308.15 | Acoustic and volumetric study of renewable oxygenated fuel additives at (298.15-323.15) K: Isomeric butanediols with ethylbutyrate |
| rhol | 1003.70 | kg/m3 | 313.15 | Acoustic and volumetric study of renewable oxygenated fuel additives at (298.15-323.15) K: Isomeric butanediols with ethylbutyrate |
| rhol | 1000.67 | kg/m3 | 318.15 | Acoustic and volumetric study of renewable oxygenated fuel additives at (298.15-323.15) K: Isomeric butanediols with ethylbutyrate |
| rhol | 997.63 | kg/m3 | 323.15 | Acoustic and volumetric study of renewable oxygenated fuel additives at (298.15-323.15) K: Isomeric butanediols with ethylbutyrate |
| rhol | 1012.96 | kg/m3 | 298.15 | Isobaric Vapor Liquid Equilibrium for Two Binary Systems, (3-Methyl-1-butanol + 1,4-Butanediol) and (Hexylene Glycol + 1,4-Butanediol), at p = 40.0, 60.0, and 80.0 kPa |

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| rhol | 1015.76 | kg/m3 | 293.15 | Excess Molar Volume, Viscosity, and Heat Capacity for the Mixtures of 1,4-Butanediol + Water at Different Temperatures |
| rhol | 1012.68 | kg/m3 | 298.15 | Excess Molar Volume, Viscosity, and Heat Capacity for the Mixtures of 1,4-Butanediol + Water at Different Temperatures |
| rhol | 1009.54 | kg/m3 | 303.15 | Excess Molar Volume, Viscosity, and Heat Capacity for the Mixtures of 1,4-Butanediol + Water at Different Temperatures |
| rhol | 1006.43 | kg/m3 | 308.15 | Excess Molar Volume, Viscosity, and Heat Capacity for the Mixtures of 1,4-Butanediol + Water at Different Temperatures |
| rhol | 1003.37 | kg/m3 | 313.15 | Excess Molar Volume, Viscosity, and Heat Capacity for the Mixtures of 1,4-Butanediol + Water at Different Temperatures |
| rhol | 1000.45 | kg/m3 | 318.15 | Excess Molar Volume, Viscosity, and Heat Capacity for the Mixtures of 1,4-Butanediol + Water at Different Temperatures |
| rhol | 997.14 | kg/m3 | 323.15 | Excess Molar Volume, Viscosity, and Heat Capacity for the Mixtures of 1,4-Butanediol + Water at Different Temperatures |

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| rhol | 994.02 | kg/m3 | 328.15 | Excess Molar Volume, Viscosity, and Heat Capacity for the Mixtures of 1,4-Butanediol + Water at Different Temperatures |
| rhol | 990.93 | kg/m3 | 333.15 | Excess Molar Volume, Viscosity, and Heat Capacity for the Mixtures of 1,4-Butanediol + Water at Different Temperatures |
| rhol | 987.93 | kg/m3 | 338.15 | Excess Molar Volume, Viscosity, and Heat Capacity for the Mixtures of 1,4-Butanediol + Water at Different Temperatures |
| rhol | 984.81 | kg/m3 | 343.15 | Excess Molar Volume, Viscosity, and Heat Capacity for the Mixtures of 1,4-Butanediol + Water at Different Temperatures |
| rhol | 981.70 | kg/m3 | 348.15 | Excess Molar Volume, Viscosity, and Heat Capacity for the Mixtures of 1,4-Butanediol + Water at Different Temperatures |
| rhol | 978.59 | kg/m3 | 353.15 | Excess Molar Volume, Viscosity, and Heat Capacity for the Mixtures of 1,4-Butanediol + Water at Different Temperatures |
| rhol | 972.71 | kg/m3 | 363.15 | Excess Molar Volume, Viscosity, and Heat Capacity for the Mixtures of 1,4-Butanediol + Water at Different Temperatures |

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| rhol | 1013.04 | kg/m3 | 298.15 | Isobaric Vapor-Liquid Equilibrium for Four Binary Systems of Ethane-1,2-diol, Butane-1,4-diol, 2-(2-Hydroxyethoxy)ethan-1-ol and 2-[2-(2-Hydroxyethoxy)ethoxy]ethanol at 10.0 kPa, 20.0 kPa and 40.0 kPa |
| rhol | 1016.37 | kg/m3 | 293.15 | Densities and Excess Molar Volumes for Binary Mixtures of 1,4-Butanediol + 1,2-Propanediol, + 1,3-Propanediol, and + Ethane-1,2-diol from (293.15 to 328.15) K |
| rhol | 1013.04 | kg/m3 | 298.15 | Densities and Excess Molar Volumes for Binary Mixtures of 1,4-Butanediol + 1,2-Propanediol, + 1,3-Propanediol, and + Ethane-1,2-diol from (293.15 to 328.15) K |
| rhol | 1009.96 | kg/m3 | 303.15 | Densities and Excess Molar Volumes for Binary Mixtures of 1,4-Butanediol + 1,2-Propanediol, + 1,3-Propanediol, and + Ethane-1,2-diol from (293.15 to 328.15) K |

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|---|---|---|---|---|
| rhol | 1006.75 | kg/m3 | 308.15 | Densities and Excess Molar Volumes for Binary Mixtures of 1,4-Butanediol + 1,2-Propanediol, + 1,3-Propanediol, and + Ethane-1,2-diol from (293.15 to 328.15) K |
| rhol | 1003.55 | kg/m3 | 313.15 | Densities and Excess Molar Volumes for Binary Mixtures of 1,4-Butanediol + 1,2-Propanediol, + 1,3-Propanediol, and + Ethane-1,2-diol from (293.15 to 328.15) K |
| rhol | 1000.72 | kg/m3 | 318.15 | Densities and Excess Molar Volumes for Binary Mixtures of 1,4-Butanediol + 1,2-Propanediol, + 1,3-Propanediol, and + Ethane-1,2-diol from (293.15 to 328.15) K |
| rhol | 994.41 | kg/m3 | 328.15 | Densities and Excess Molar Volumes for Binary Mixtures of 1,4-Butanediol + 1,2-Propanediol, + 1,3-Propanediol, and + Ethane-1,2-diol from (293.15 to 328.15) K |
| sfust | 63.72 | J/mol×K | 293.58 | NIST Webbook |

# Pressure Dependent Properties

| Property code | Value | Unit | Pressure [kPa] | Source |
|---|---|---|---|---|

| | | | | |
|---|---|---|---|---|
| tbrp | 393.20 | K | 1.30 | NIST Webbook |

# Correlations

| Information | Value |
|---|---|
| Property code | pvap |
| Equation | ln(Pvp) = A + B/(T + C) |
| Coeff. A | 1.61683e+01 |
| Coeff. B | -4.88254e+03 |
| Coeff. C | -8.04700e+01 |
| Temperature range (K), min. | 387.92 |
| Temperature range (K), max. | 530.19 |

| Information | Value |
|---|---|
| Property code | pvap |
| Equation | ln(Pvp) = A + B/T + C*ln(T) + D*T^2 |
| Coeff. A | 5.07189e+01 |
| Coeff. B | -9.72020e+03 |
| Coeff. C | -4.35830e+00 |
| Coeff. D | 1.55136e-06 |
| Temperature range (K), min. | 293.05 |
| Temperature range (K), max. | 667.00 |

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# Legend

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|---|---|
| **affp:** | Proton affinity |
| **basg:** | Gas basicity |
| **chl:** | Standard liquid enthalpy of combustion |
| **cpg:** | Ideal gas heat capacity |
| **cpl:** | Liquid phase heat capacity |
| **dvisc:** | Dynamic viscosity |
| **gf:** | Standard Gibbs free energy of formation |
| **hf:** | Enthalpy of formation at standard conditions |
| **hfl:** | Liquid phase enthalpy of formation at standard conditions |
| **hfus:** | Enthalpy of fusion at standard conditions |
| **hfust:** | Enthalpy of fusion at a given temperature |
| **hvap:** | Enthalpy of vaporization at standard conditions |
| **hvapt:** | Enthalpy of vaporization at a given temperature |
| **log10ws:** | Log10 of Water solubility in mol/l |
| **logp:** | Octanol/Water partition coefficient |
| **mcvol:** | McGowan's characteristic volume |
| **nfpaf:** | NFPA Fire Rating |
| **nfpah:** | NFPA Health Rating |
| **pc:** | Critical Pressure |
| **pvap:** | Vapor pressure |
| **rfi:** | Refractive Index |
| **rhol:** | Liquid Density |
| **rinpol:** | Non-polar retention indices |
| **ripol:** | Polar retention indices |
| **sfust:** | Entropy of fusion at a given temperature |
| **sl:** | Liquid phase molar entropy at standard conditions |
| **tb:** | Normal Boiling Point Temperature |
| **tbrp:** | Boiling point at reduced pressure |
| **tc:** | Critical Temperature |
| **tf:** | Normal melting (fusion) point |
| **tt:** | Triple Point Temperature |
| **vc:** | Critical Volume |