

Density Measurements under Pressure for the Binary System Di-Isopropyl Ether + 1-Hexanol at Temperatures up to 353.15 K and at Pressures up to 100 MPa

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Tertiary alkyl ethers like di-isopropylether DIPE, having similar properties (e.g., vapour pressures) to hydrocarbons and the potential to increase the octane number and to decrease the emission of carbon monoxide, have become important additives for gasoline. The ethers increase the amount of oxygen in gasoline in order to reduce the CO content in the exhaust gas of automobiles. DIPE, pure or mixed with alkanols or alkanes, has been recommended as a high octane blending agent for motor gasoline. Ether + alcohol mixtures are of interest as model mixtures for gasoline in which the ether and the alcohol act as non-polluting, high octane number blending agents. Despite of this interest, density data of binary mixtures containing ether + alcohol at pressures other than the atmospheric pressure are very scarce in the literature. Density of the binary mixture DIPE + 1-hexanol have been measured under pressure and reported in this work using a vibrating tube densitometer. No literature data on the density at high temperature and pressure for the same binary mixture has been found. Experimental densities for the binary system DIPE + 1-hexanol have been measured at, 298.15, 313.15, 333.15 and 353.15 K and at nineteen isobars up to 100 MPa. For each composition, the experimental values were correlated using a Tait-type equation. Furthermore, the excess molar volume and the isothermal compressibility were calculated from the density data. This paper is part of the Doctoral Thesis of A. Shriyer.