

Density Measurements of the Mixture Dimethyl Carbonate + Heptane at Compressed-Liquid States and Three Compositions

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The properties of numerous mixtures have been studied at near-ambient temperatures and atmospheric pressure. Those that consist of a polar and a non-polar compound exhibit non-ideal composition dependencies such as azeotropic vapor-liquid equilibria and minima or maxima of their excess volumes. The pressure dependencies of these phenomena have been measured much less but are indispensable to develop reliable models of complex fluid behavior. The binary system dimethyl carbonate + heptane is in the class of polar+non-polar compound mixtures and exhibits azeotropy with a minimum in boiling temperature. The density surfaces of the mixture were measured with an automated vibrating tube densimeter in the temperature range from 270 K to 470 K with pressures from 0.5 MPa to 50 MPa and at three compositions. These data greatly extend the temperature range of current literature sources. The large temperature and pressure range of the measurements allows for in-depth exploration of the polar+non-polar interactions of this mixture and the resulting non-ideal behavior.