

Thermophysical Property Measurements in the System 2-Propanol + *n*-Tetradecane

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A systematic experimental program is carried out to explore the molecular interactions in binary systems consisting of a polar and a nonpolar compound. The current study involved the compounds 2-propanol and *n*-tetradecane, which differ considerably in size and shape in addition to being polar and nonpolar. Their molecular structures were elucidated in ab initio calculations. Despite of their molecular differences, the viscosity of the two liquids at room temperature is about the same. The density, viscosity, and speed of sound of the pure liquids, and of the binary system were measured at 12 compositions at ambient pressure in the combined temperature range from 233 K to 373 K. Density measurements were carried out with two vibrating tube densimeters. Viscosity measurements were performed with Ubbelohde capillary viscometers and with a rotating concentric cylinder viscometer. The speed of sound was measured with a pulse-echo instrument. The measurement results reveal on one hand nonlinear but otherwise featureless density and speed of sound variations with composition whereas the viscosity-composition dependencies exhibit minima. The viscosities of the pure compounds exhibit a crossover of their temperature dependencies with the equality at room temperature being the intersection. The composition dependence of the mixture freezing temperature was also assessed and the greatest variation occurred at mole fractions of *n*-tetradecane of 10 % and less.