

Densities and refractive indices for the ternary system of DIPE + ethanol + *iso*-octane and the binary sub-systems

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Various oxygenated compounds, such as methyl tert-butyl ether (MTBE), ethyl tert-butyl ether (ETBE), tert-amyl methyl ether (TAME) have been suggested as fuel additives that either alone or with other ethers or alcohols can enhance the octane rating and reduce the pollution effects arising out of the combustion process. But the U.S. federal government unveiled a plan to phase out MTBE because of recent concerns of the contamination of underground drinking water. This actions have necessaritated additional studies on the properties of mixtures of the other ethers with hydrocarbons.

In this work, densities and refractive index at 298.15 K are reported for the binary systems of diisopropyl ether(DIPE) + ethanol, ethanol + *iso*-octane and DIPE + *iso*-octane, and also for the ternary system DIPE + ethanol + *iso*-octane. The excess molar volumes and changes of refractive index of the binary and ternary systems were derived and correlated with the Redlich-Kister and Cibulka equation.