

Excess molar volumes for the ternary systems of DIPE + propanol + iso-octane and
PVE + propanol +
iso-octane and their 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 are reported for the binary and ternary systems of diisopropyl ether (DIPE) + propanol, propanol + iso-octane, DIPE + iso-octane, DIPE + propanol + iso-octane at 303.15K, and propyl vinyl ether(PVE) + propanol, propanol + iso-octane, PVE + iso-octane, PVE + popanol + iso-octane at 298.15K. The excess molar volume of the binary and ternary systems were derived and correlated with the Redlich-Kister and Cibulka equation.