

THERMOPHYSICAL AND SPECTROSCOPIC APPROACH ON MOLECULAR INTERACTIONS OF METHYL-TERT-BUTYL ETHER WITH ETHANOL AT TEMPERATURES OF 303.15 K, 308.15 K, 313.15 K, AND 318.15 K

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Abstract:

The addition of binary fuel additives mixtures aids in reduction of exhaust emission from vehicles. There is lack of data in terms of their thermodynamic properties and molecular interaction study of the mixtures. The properties of density and viscosity of the binary mixtures of methyl tert butyl ether with ethanol have been measured at the entire composition range at several temperatures ($T = 303.15\text{ K}$, 308.15 K , 313.15 K and 318.15 K) and atmospheric pressure. The experimental density and viscosity results were used to calculate the excess molar volume, V^E and viscosity deviation, $\Delta\eta$ of the binary mixtures. The results of the excess properties obtained were discussed in terms of the presence of molecular interaction between the unlike molecules in the binary mixture. The presence of interactions were further validated with spectroscopic analysis using FTIR and $^1\text{H-NMR}$.