

Volumetric Properties of Binary and Ternary Mixtures of Diisopropyl Ether, α,α,α -Trifluorotoluene and Ethanol at 298.15 K and 101 kPa

Z. Atik^{C, S} and K. Lourdani

Crystallography-Thermodynamics Laboratory, University of Science and Technology, Houari Boumediene, Bab-Ezzouar, Algeria

Many hydro-fluorocarbons are already proposed and tested as CFC's substitutes. Branched ethers are alternative oxygenated additives in unleaded gasoline. In this work, we report experimental data of excess molar volumes of binary mixtures of (trifluorotoluene - ethanol), (diisopropyl ether - ethanol), (diisopropyl ether - α,α,α - trifluorotoluene), and ternary mixture (diisopropyl ether - α,α,α -trifluorotoluene - ethanol) at 298.15 K and 101 kPa. The densities were obtained using an Anton-Paar DMA5000 vibrating-tube densimeter with a precision of 5×10^{-5} g/cm³. The experimental results of binary and ternary mixtures were well fitted by least squares to the Redlich-Kister and Cibulka equations. The partial excess molar volumes at infinite dilution of the mixture components are estimated. The volumes of mixing of ternary mixtures were predicted by empirical equations using their binary solution data. The experimental and calculated results are in good accordance. The examined properties reveal the nature of molecular packing within the investigated systems.