

Volumetric study of binary mixtures of isomers of butanol with n-decane

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Occasional oil crises, increasing fuel demand, and environmental concern shifted the attention of scientist to study fuel additive oxygenates. Oxygenates are the compounds that contain oxygen such as ethers, glycol ethers, alcohol, and carbonates or biomass products such as esters of vegetable oils and used as fuel additives. Oxygenates presence in fuel not only reduces the carbon monoxide emission and other toxic emissions but also increase the octane/cetane rating of fuel. Thus the thermo-physical properties of oxygenate additive with aromatic as well as with aliphatic hydrocarbon would be of great importance in process engineering design, in formulating motor fuel and also for chemist to understand nature of molecular interactions in oxygenated fuel.

In this paper, we studied the volumetric properties of binary mixtures of isomers of butanol with n-decane were measured at 298.15 K. The excess volume data were correlated with Redlich-Kister polynomial and also predicted with Prigogine-Flory-Patterson theory and Mecke-Kempton type of association model.