

Measurement and Correlation of Isothermal Vapor-Liquid Equilibria and Excess Molar Volumes of the Binary Mixtures Containing Environmental Friendly Gasoline Additive

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Dimethyl carbonate (DMC) is an environmentally benign and biodegradable chemical. DMC is mainly produced by the oxidative carbonylation of methanol over a CuCl catalyst system, but the current worldwide production capacity of DMC is much less than the demand. It is achieving increasing importance in the chemical industry mainly for two aspects. The first is versatility as reagent and solvent, and the second is non-toxicity for human health and environment, as indicated by its toxicological and eco-toxicological properties. Various phase equilibrium data and mixing properties of the mixtures containing DMC are needed for the designed gasoline. However the reported phase equilibria and physical properties are not sufficient.

In this work, directly measured isothermal vapor-liquid equilibria at 333.15 K and mixing properties, excess volume at 298.15 K for the binary systems containing some linear alcohols, benzene, *n*-heptane and *iso*-octane with DMC are reported and correlated with some g^E models and Redlich-Kister polynomial.