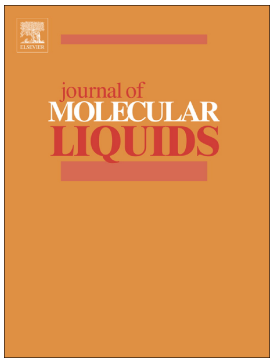

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Measurement and correlation of thermodynamic properties of amine and esters

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Abstract

This paper presents the experimental measurements of densities (ρ) and speeds of sound (u) of triethylamine + methyl acetate or ethyl acetate or propyl acetate or butyl acetate or pentyl acetate mixtures at all concentrations and at temperature (293.15 to 313.15) K. From this data, excess molar volume (V_m^E), molar isentropic compressibility ($K_{S,m}$), excess molar isentropic compressibility ($K_{S,m}^E$), deviations in speeds of sound (u^D), partial molar volume ($\bar{V}_i$), excess partial molar volume ($\bar{V}_i^E$) and apparent molar volume ($V_{\phi i}$) have been calculated. Negative values of V_m^E and $K_{S,m}^E$ indicate the presence of strong intermolecular interactions. For an equimolar mixture, negative values of V_m^E decrease with increase in alkyl chain length from methyl acetate to pentyl acetate. The outcomes of V_m^E have been correlated to Prigogine−Flory−Patterson theory (PFP).

Keywords: Triethylamine; Esters; Excess molar volume; Partial molar properties; PFP theory.