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Osmania University, Hyderabad- 500007

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THERMO PHYSICAL INVESTIGATIONS ON BINARY LIQUID MIXTURES OF BENZYL ALCOHOL WITH HETEROCYCLIC COMPOUNDS AT VARYING TEMPERATURES

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Abstract:

Thermo physical behaviour of the different binary non-ideal liquid mixtures of benzyl alcohol (BA) with N-containing heterocyclic components (NCHC) namely: pyrrole, pyridine, and quinoline has been studied through the experimental measurement of density (ρ), and viscosity (η) and speed of sound (u) over the entire mole fraction range of benzyl alcohol at a temperature from 293.15 to 313.15 K under atmospheric pressure. Based on ρ, η and u data, thermodynamic parameters such as excess volume (V^E), viscosity deviation ($\Delta\eta$) were calculated and fitted to Redlich–Kister (R-K) type polynomial equation. They are used to elucidate possible intermolecular interactions (H-bond, OH-π interaction, and molecules fitting) between the unlike chemical species present in the solutions. The V^E values were found to be negative deviations and $\Delta\eta$ values were found to be positive deviations from the ideality for all systems at measured temperatures. Further, the influence of temperature on ρ, η, V^E and $\Delta\eta$ were also reported.

Keywords: Density; Viscosity, Redlich–Kister model, intermolecular interactions.