

Application of various mixing rules in binary mixtures of 1-propanol with benzene and pyridine

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Abstract

The refractive indices for binary mixtures of 1-propanol + pyridine and 1-propanol + benzene were measured using a calibrated Abbe refractometer (Model G from Carl Zeiss) across the entire mole fraction region at a temperature of 298.15 K and under ambient pressure. In this study, the refractive index mixing rules Arago-Biot (A-B), Lorentz-Lorentz (L-L), Newton (N), and Eyring-John (E-J) were applied to verify their predictive capability for the studied binary systems. The predictive ability was estimated by calculating the average absolute percentage deviation between experimental and calculated values. The findings of the current work demonstrate that refractive index mixing rules can accurately describe the optical properties of binary mixtures, which is crucial in various chemical and industrial processes.

References

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