

Study of the refractive index of gasoline+alcohol pseudo-binary mixtures

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Abstract. The properties of gasoline change as a result of blending with a bioalcohol, affecting the behavior of the pseudo-binary system. The aim of this paper is to present experimental data of the refractive index for pseudo-binary mixtures of a reformat gasoline with ethanol, isopropanol and n-butanol over the entire composition range and for temperature ranging from 293.15 K to 313.15 K. The accuracy of different equations to predict the refractive index of the mixtures was tested. The best prediction accuracy (the lower AAD) corresponded to Eykman and Lorentz-Lorenz mixing rules. A logarithmic equation proposed to correlate the refractive index with composition and temperature of gasoline+alcohol mixtures showed a good accuracy (the absolute average deviation AAD < 0.052%). The deviations in refractive index for investigated systems are negative over the entire composition range and at all investigated temperatures.

Keywords: gasoline, alcohol, refractive index, mixing rules, predictive equations.

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