

Title: Densities and refractive indices for the ternary mixture methanol/propan-1-ol/acetonitrile

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Abstract: Refractive indices, $n(D)$, and densities, ρ , at 298.15 K were measured for the ternary mixture methanol (MeOH)/propan-1-ol (1-PrOH)/acetonitrile (MeCN) for a total of 22 mole fractions, along with 18 mole fractions of each of the corresponding binary mixtures, methanol/propan-1-ol, propan-1-ol/acetonitrile and methanol/acetonitrile. The variation of excess refractive indices and excess molar volumes with composition was modeled by the Redlich-Kister polynomial function in the case of binary mixtures and by the Cibulka equation for the ternary mixture. A thermodynamic approach to excess refractive indices, recently proposed by other authors, was applied for the first time to ternary liquid mixtures. Structural effects were identified and interpreted both in the binary and ternary systems. A complex relationship between excess refractive indices and excess molar volumes was identified, revealing all four possible sign combinations between these two properties. Structuring of the mixtures was also discussed on the basis of partial molar volumes of the binary and ternary mixtures. (C) 2012 Elsevier B.V. All rights reserved.

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