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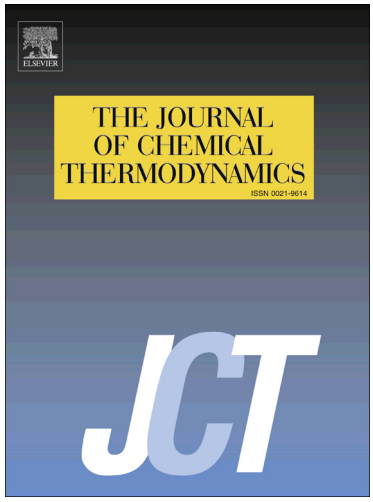


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# Thermophysical properties of binary mixtures of 1-butyl-1-methylpyrrolidinium trifluoromethanesulfonate ionic liquid with alcohols at several temperatures

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**ABSTRACT**

Densities, speeds of sound, and refractive indices for the binary systems made up by 1-butyl-1-methylpyrrolidinium trifluoromethanesulfonate and methanol, ethanol, 1-propanol, or 2-propanol, as well as for the pure components, have been measured covering the whole range of compositions at atmospheric pressure and $T$ = (278.15 to 338.15) K. From densities and speeds of sound, isentropic compressibilities were calculated using the Newton-Laplace equation. Liquid ideal-mixture properties have been defined and calculated, and they have been used to determine excess molar volumes, excess isentropic compressibilities, and deviations in refractive indices. Excess and deviations in properties were fitted to extended or modified versions of the Redlich–Kister equation, taking into account the dependence on composition and temperature simultaneously, with a good agreement. Optimal fitting parameters have been obtained and reported. The results have been interpreted in terms of interactions between the mixture components.

**Keywords:** Density; Speed of sound; Refractive index; Isentropic compressibility: 1-Butyl-1-methylpyrrolidinium triflate; Alcohols.

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