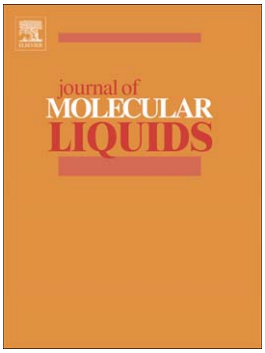

Dielectric relaxation study of sulfolane-water mixtures

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Dielectric relaxation study of sulfolane-water mixtures

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Abstract

In the present work broadband dielectric spectra are reported for sulfolane-water mixtures in the complete composition range. The complex dielectric permittivity was measured at frequencies between 100 MHz and 50 GHz and at three temperatures 298.15 K, 308.15 K and 318.15 K. The permittivity spectra in these mixtures reveal a single relaxation process, which can be described by the Cole-Davidson relaxation function. The dielectric parameters, static dielectric constant (ε_S), relaxation time (τ) and relaxation strength ($\Delta\varepsilon$) have been determined by the least squares fit method. The concentration and temperature dependent excess dielectric constant and excess inverse relaxation time of the binary mixtures have been calculated. The obtained results confirm that strong interactions take place between sulfolane and water molecules.

Keywords: Sulfolane; Aqueous solution; Dielectric relaxation spectroscopy; Permittivity