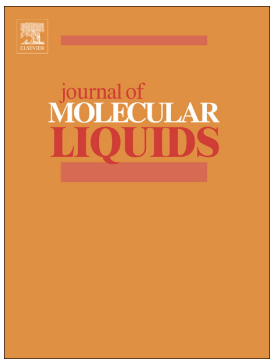

Thermodynamic properties of aqueous ternary system CuSO4 + PEG 4000 + H2O at different temperatures

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Thermodynamic properties of aqueous ternary system $CuSO_4$ + PEG 4000 + H_2O at different temperatures

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Abstract

The present study has the aim to investigate the thermodynamic behaviour of the aqueous ternary system composed of $CuSO_4$ and poly(ethylene glycol) (PEG). These compounds are known to form aqueous two-phase systems for applications in metal ions and biomolecules partitioning. To have a better understanding of these systems, water activities were determined at different temperatures (T = 303.15, 313.15, 323.15 and 333.15 K), using a vapour pressure osmometer. The results indicate that $CuSO_4$ has a significant effect on the water activity of the system composed by salt-PEG-water. Additionally, water activities of the constituent binary systems, $CuSO_4$+H_2O and PEG 4000+H_2O, were measured at the same temperatures of the ternary system.

From these experimental measurements the vapour pressure values were determined for the systems and correlated with the extended UNIQUAC model, obtaining a good agreement between the experimental and correlated data.

Keywords: Water activity, poly(ethylene glycol), copper sulphate, UNIQUAC

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