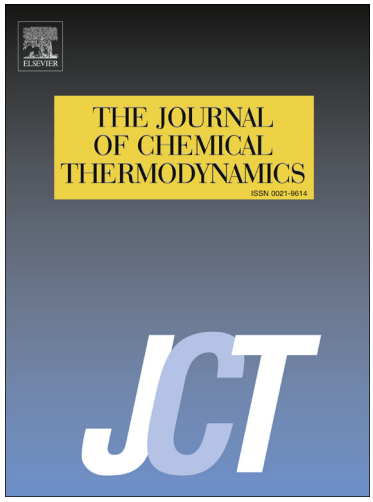

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Aqueous two-phase system based on cholinium chloride and polyethylene glycol di-methyl ether 250 and it use for acetaminophen separation

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Abstract

The goal of this work is to study the aqueous two-phase system composed of polyethylene glycol di-methyl ether 250 ($PEGDME_{250}$) and cholinium chloride at T = (298.15, 308.15 and 318.15) K and atmospheric pressure (≈ 85 kPa). First the binodal data and tie-lines were determined for this system at the temperatures mentioned. Moreover, the Merchuk equation with the temperature dependency and an empirical equation were used for representing the experimental binodal results. The Othmer-Tobias and Bancraft, a temperature dependent Setschenow equation and Osmotic virial model were used to fit the tie-line values of this system. The Gibbs energies, enthalpies and entropies of cloud points were calculated at the temperatures measured in order to investigate the driving force formation of this two-phase system. The use of this system for separation of acetaminophen, as a model of the drug was also examined. The effects of tie-line length and temperature on the drug separation were also researched. Finally, the equation proposed by Diamond-Hsu was used to the correlate the acetaminophen experimental partition coefficients in the two-phase system studied.

Keywords: Liquid–liquid equilibrium; polyethylene glycol di-methyl ether; cholinium chloride, acetaminophen; partition coefficient; Diamond-Hsu equation.

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