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Salting effect of NaCl and KCl on the liquid–liquid equilibria of water + ethyl acetate + ethanol system and interaction parameters estimation using the genetic algorithm

A. Hasseine[a], A. Kabouche[b], A.-H. Meniai[c]*, M. Korichi[d]

[a]*Laboratoire de Recherche en Génie Civil, Hydraulique, Développement Durable et Environnement. University of Biskra, Algeria*
[b]*Department of Chemical Engineering, Centre universitaire Larbi Ben M'hidi Oum El Bouaghi, Algeria*
[c]*Laboratoire de l'Ingénierie des Procédés d'Environnement, University Mentouri Constantine, Algeria*
Tel. +213 662 57 14 26; email: meniai@yahoo.fr
[d]*Department of Chemistry, University Kasdi Merbeh, Ouargla, Algeria*

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ABSTRACT

Salting effect of NaCl and KCl on the liquid–liquid equilibria (LLE) of water–ethyl acetate–ethanol system was investigated experimentally at 293.15 K and 1 atm. The salt mass percentages considered were 5 and 10%. The results show that the two electrolytes significantly affected the solubility of the solute in the organic phase, since its distribution coefficient increased with rising amount of electrolyte, causing a salting-out effect which was more pronounced for NaCl than for KCl and could be particularly useful to eliminate solutropy. Interaction parameters for an extended version of the UNIQUAC model were retrieved from the obtained experimental results by means of a combination of the Levenberg-Marquardt and the genetic algorithms.

Keywords: Phase equilibria model; Salting effect; Activity coefficients models; Optimisation

* Corresponding author.