

## Prediction of Vapor Liquid Equilibrium for Dilute Solutions of Components in Ionic Liquid by Neural Networks

**Authors :** S. Mousavian, A. Abedianpour, A. Khanmohammadi, S. Hematian, Gh. Eidi Veisi

**Abstract :** Ionic liquids are finding a wide range of applications from reaction media to separations and materials processing. In these applications, Vapor-Liquid equilibrium (VLE) is the most important one. VLE for six systems at 353 K and activity coefficients at infinite dilution  $\gamma_i^\infty$  for various solutes (alkanes, alkenes, cycloalkanes, cycloalkenes, aromatics, alcohols, ketones, esters, ethers, and water) in the ionic liquids (1-ethyl-3-methylimidazolium bis (trifluoromethylsulfonyl)imide [EMIM][BTI], 1-hexyl-3-methyl imidazolium bis (trifluoromethylsulfonyl) imide [HMIM][BTI], 1-octyl-3-methylimidazolium bis(trifluoromethylsulfonyl) imide [OMIM][BTI], and 1-butyl-1-methylpyrrolidinium bis (trifluoromethylsulfonyl) imide [BMPYR][BTI]) have been used to train neural networks in the temperature range from (303 to 333) K. Densities of the ionic liquids, Hildebrandt constant of substances, and temperature were selected as input of neural networks. The networks with different hidden layers were examined. Networks with seven neurons in one hidden layer have minimum error and good agreement with experimental data.

**Keywords :** ionic liquid, neural networks, VLE, dilute solution

**Conference Title :** ICCSE 2016 : International Conference on Chemical Science and Engineering

**Conference Location :** Los Angeles, United States

**Conference Dates :** April 05-06, 2016