Experimental results for fluid phase equilibria of (n-propanol + water + salt) and comparison with predictions

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ABSTRACT

Salt-containing vapor-liquid equilibrium for the n-propanol + water system was obtained experimentally at atmospheric pressure using a modified Orthmer still. The studied salts include lithium chloride (LiCl), sodium chloride (NaCl), potassium chloride (KCl), potassium bromide (KBr) and potassium iodide (KI). The experimental vapor-liquid equilibrium data was compared with that calculated using the LIFAC model. The average relative deviation between experimental data and the correlation are –0.24%, –1.42%, –0.29%, –1.33% and 0.23% for LiCl, NaCl, KCl, KBr and KI, respectively. The corresponding standard deviations are 2.06%, 2.83%, 2.27%, 2.71%, and 2.11%. From these results, it may be seen that the new experimental data for the vapor-liquid equilibrium of the ternary system (n-propanol + water + salt) and the predictive thermodynamic model LIFAC can be used to estimate the influence of the salts on the VLE of the n-propanol + water system. Furthermore, the effect of different salts on relative volatility was studied.

Keywords: Vapor-liquid equilibrium; Thermodynamic predictive model; n-Propanol; Salt

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