

Study the Effect of Adding Co-Solvent (n-Alkoxyethanol) To Sulfolane on the Toluene Extraction

Abstract

Liquid–liquid equilibrium data, both binodal and tie lines are presented for the pseudo-ternary systems: {(sulfolane + n-Alkoxyethanol) + octane + toluene} at 293.15 K. The experimental liquid–liquid equilibrium data have been correlated using the nonrandom two liquid (NRTL), UNIQUAC and UNIFAC models to predict the phase composition of the systems studied here, and the binary interaction parameters of these components have been calculated. The correlated tie lines have been compared with the experimental data. The comparisons indicate that the calculation based on both NRTL and UNIQUAC models gave a good representation of the equilibrium compositions data for all systems studied. Also Othmer, Tobias and Hand method satisfactorily correlated tie-line data of the studied systems. The agreement between the correlated and experimental results was very good. The solvent (25% sulfolane+75% 2-ethoxyethanol) shows high capacity for toluene (a distribution coefficient around unity) and for this reason it can be used for higher recovery of aromatics at lower solvent to feed ratios and temperatures.