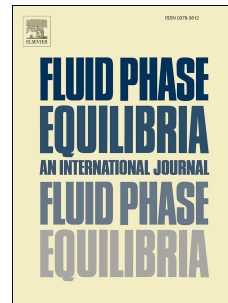


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Vapor-liquid equilibria and excess enthalpies of the binary systems 1-pentanol or 2-pentanol and 1-hexene or 1,2,4-trimethylbenzene for the development of biofuels

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Abstract

Accurate experimental data of vapor-liquid equilibria (VLE) and excess enthalpies are reported for four binary systems: (1-pentanol + 1-hexene), (2-pentanol + 1-hexene), (1-pentanol + 1,2,4-trimethylbenzene) and (2-pentanol + 1,2,4-trimethylbenzene). An isothermal total pressure cell was used for measuring VLE at $T = 313.15$ K. The data were fitted using Margules, Wilson and NRTL equations. Excess enthalpies were measured at two different temperatures $T = (298.15$ and $313.15)$ K using an isothermal flow calorimeter and were correlated by the Redlich-Kister equation. All systems present a positive deviation from the Raoult's Law. An azeotropic behavior with maximum pressure is observed for the mixtures 1-pentanol or 2-pentanol with 1,2,4-trimethylbenzene. In addition, an endothermic behavior, which increases with temperature, is obtained when the alcohols are mixed with these hydrocarbons.

Keywords:

VLE; excess enthalpies; 1-pentanol; 2-pentanol; 1-hexene; 1,2,4-trimethylbenzene.

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