

Methyltrioctylammonium Chloride as a Separation Solvent for Binary Mixtures: Evaluation Based on Experimental Activity Coefficients

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Abstract : An ammonium based ionic liquid (methyltrioctylammonium chloride) $[N^{8881}][Cl]$ was investigated as an extraction potential solvent for volatile organic solvents (in this regard, solutes), which includes alkenes, alkanes, ketones, alkynes, aromatic hydrocarbons, tetrahydrofuran (THF), alcohols, thiophene, water and acetonitrile based on the experimental activity coefficients at infinite THF measurements were conducted by the use of gas-liquid chromatography at four different temperatures (313.15 to 343.15) K. Experimental data of activity coefficients obtained across the examined temperatures were used in order to calculate the physicochemical properties at infinite dilution such as partial molar excess enthalpy, Gibbs free energy and entropy term. Capacity and selectivity data for selected petrochemical extraction problems (heptane/thiophene, heptane/benzene, cyclohexane/cyclohexene, hexane/toluene, hexane/hexene) were computed from activity coefficients data and compared to the literature values with other ionic liquids. Evaluation of activity coefficients at infinite dilution expands the knowledge and provides a good understanding related to the interactions between the ionic liquid and the investigated compounds.

Keywords : separation, activity coefficients, methyltrioctylammonium chloride, ionic liquid, capacity

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