

Solution Enthalpies of Organic Solutes in the Ionic Liquids Butyl-Trimethyl-Ammonium (Trifluoromethylsulfonyl)Imide and 1-Ethyl-3-Methyl-Imidazolium Ethyl-Sulfate

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All currently published research results indicate that the unique character of ionic liquids offers new opportunities in catalysis and organic synthesis. Some of the properties that make the room temperature ionic liquids (IL) attractive for various applications are the wide liquid range, non-volatility, their non-flammable nature, and the ability to dissolve a large variety of organic and inorganic substances. In continuation of our work on thermodynamic properties of IL and mixtures containing ionic liquids we present new data of the heats of solution of 8 ionic liquid solute systems with the ILs Butyl-Trimethyl-Ammonium(Trifluorosulfonyl)Imide and 1-Ethyl-3-Methyl-Imidazolium Ethyl-Sulfate.

The heats of solutions of the different solvents in the ILs were measured in the mole fraction range 1% - 14% of the solute at 25 °C using a titration calorimeter (Thermal Activity Monitor 2277). The heat effect of solute injection into the IL was transformed in the molar enthalpy of solution. For all investigated solvents the dependences of the partial enthalpy of solution on the mole fraction of solute have been determined, and the limiting partial molar excess enthalpies have been obtained by extrapolation to infinite dilution.

A comparison of the limiting partial molar excess enthalpy of solution of the solutes in ionic liquids measured by calorimetric titration method and those calculated from temperature dependence of limiting activity coefficients obtained by GLC method are presented.