

Heat Capacity and Enthalpy of Fusion of Ionic Liquids

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The IUPAC Project 2002-005-1-100, Thermodynamics of ionic liquids, ionic liquid mixtures, and the development of standardized systems revealed discrepancies for the heat capacity of the reference ionic liquid 1-hexyl-3-methylimidazolium bis[(trifluoromethyl)sulfonyl]amide [C₆mim][Tf₂N] measured with both adiabatic calorimeters and differential scanning calorimeters (DSC). The results differed from 5.5 % high to 7 % low over the temperature range. The two sets of adiabatic measurements were made on sample masses from 0.68 g to 16.7 g while the three with DSC were made on much smaller samples. We report here heat capacities and enthalpies of fusion for: [C₆mim][Tf₂N] measured with a Setaram BT 2.15 DSC and heat capacities with a Setaram C80 DSC. Sample size used for both calorimeters was of the order of 10 g. In addition the heat capacities of 1-butyl-3-methylimidazolium hexafluorophosphate and 1-octyl-3-methylimidazolium bis[(trifluoromethyl)sulfonyl]amide are reported. Results are compared with literature data where available.