Study on the Thermo-Chemical Properties of an Ionic Liquid based on Alanine [C_4mim][Ala]

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The enthalpies of solution of an ionic liquid(IL) based on alanine, [C_4mim][Ala] (1-butyl-3-methylimidazolium alanine),with various amounts of water, $D_{sol}H_m$(wc), were measured over a molality range of about 0.01-0.06 mol·kg^{-1} by the solution-reaction isoperibol calorimeter at 298.15 K. According to Archer's method, the standard molar enthalpies of solution of [C_4mim][Ala] with a known amounts of water, $D_{sol}H^0_m$(wc), were obtained. Plotting $D_{sol}H^0_m$(wc) against water content, w_2,was carried out, so that a good straight line was obtained and the intercept was the standard molar enthalpy of solution of [C_4mim][Ala] without water**,** $D_sH_m^0$(pure IL)=$D_sH_m^0$(pure IL)=-60.74 kJ·mol^{-1}. Using an oxygen-bomb combustion calorimeter, the molar combustion enthalpy of [C_4mim][Ala] was determined at 298.15 K and the standard molar formation enthalpy of [C_4mim][Ala], $\Delta_fH_m^0$=-675±11 kJ·mol^{-1}, was obtained.