

Simultaneous Measurements of excess enthalpies and solubilities for binary systems of carbon dioxide + ionic liquids using a high-pressure microcalorimeter

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Ionic liquid (ILs) have received a great attention as the environmentally benign solvent. Due to their unique properties, recent interest in the measurement of gas solubilities and excess molar enthalpies (HE) for systems containing ionic liquids has led to a rapid increase in available data. In this study HEs and solubilities for binary systems of carbon dioxide + ionic liquids were measured simultaneously at various pressures in the vicinity of the critical point of carbon dioxide using a high pressure isothermal microcalorimeter equipped with a specific measuring cell. The strong dependence of HE and gas solubilities on pressure at this area were observed. Excess molar enthalpies and solubilities were correlated using a composition-dependent equation based on the Lattice theory.