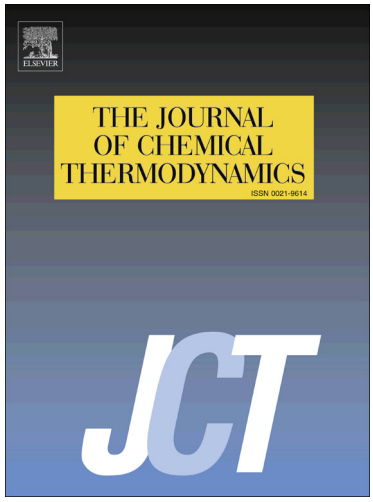

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ABSTRACT

The solubility of CO_2 in aqueous potassium lysinate (LysK) solutions was measured in a stirred reactor at temperatures from 298 to 353 K, for 9.0, 17.4, 25.3, 33.1 and 41.2 mass% LysK and CO_2 partial pressures up to 110 kPa. The vapor-liquid equilibrium (VLE) data were interpreted using the modified Kent-Eisenberg model. The apparent equilibrium constants of carbamate hydrolysis and amino acid deprotonation were correlated as a function of temperature, CO_2 loading (expressed as mole CO_2 per mole LysK) and LysK concentration to fit the experimental solubility data. The proposed model satisfactorily predicted the VLE data for the H_2O-LysK-CO_2 system, especially at moderate to high CO_2 loading, with an average absolute deviation within 3.2%. Liquid species in the CO_2-loaded LysK solutions were also qualitatively characterized by ^{13}C NMR experiments.

Key Words : CO_2 solubility; Amino acid salt; CO_2 absorption; Vapor-liquid equilibrium; Kent-Eisenberg model