Physicochemical Properties of Bayer Liquors: Experimental Aspects

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Numerous industrial applications require the development of semiempirical physicochemical models for multicomponent electrolyte solutions, for instance those based on the Pitzer equations. Model parameterization strongly depends on accurate and thermodynamically consistent experimental data. A wide range of apparatus has been applied by us for the study of solution chemistry, including facilities for potentiometric, calorimetric, isopiestic, solubility, densimetric, viscometric, NMR, Raman and dielectric relaxation measurements. This is part of a long-term project sponsored by the alumina-refining industry to develop a fundamental understanding of these solutions. Recent thermodynamic measurements on synthetic Bayer liquors, including heat capacities, activity and osmotic coefficients, densities and solubilities over the concentration and temperature ranges of industrial interest, will be presented.