

稀散金属化合物水溶液热力学研究 1: HCL+GaCl3+H2O体系

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摘要 在HCL+GaCl3+H2O体系中, 恒定五个总离子强度I=0.4,0.6,0.8,1.0,1.5mol/kg, 控制混合电解质中氯化镓离子强度分数YB=0.0,0.1,0.3,0.5,0.7, 并在278.15~318.15K范围内测定了五个温度的无液接电池: Pt|H2 (101.325kPa)|HCL(mA),GaCl3(mB),H2O|AgCl|Ag的电动势。根据150个实验点的电动势数据, 确定了HCL的活系数及其随氯化镓浓度变化规律, 结果发现HCL活度系数遵守Harned规则。同时本文在Pitzer电解质溶液理论上提出一个确定氯化镓的pitzer参数和活度系数的方法, 指出了氯化镓在这个混合电解质溶液中遵守扩展的Harned规则。

关键词 金属化合物 热力学研究 盐酸 氯化镓 水 活度系数 Pitzer理论

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Studies on thermodynamics of solution of scattered metal compounds 1: The system HCL+GaCl3+H2O

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Abstract Activity coefficients of HCL in HCL+GaCl3+H2O at 5 different temperatures from 278.15 to 318.15K have been determined at total ionic strengths from 0.4 to 1.5mol/kg using a cell of the type: Pt|H2(101.325kPa)|HCL(mA),GaCl3(mB),H2O|AgCl|Ag (A) The results for the 150 experimental emf data points have been used to determine the variation of the activity coefficients of HCL with the change in molality of GaCl3 in the solution. It is found that the linear form of Harned's rule is obeyed for HCL. Besides the ion-interaction model (Pitzer's electrolyte solution theory) has been applied to this system, the Pitzer's parameters of GaCl3:(β^(0)Ga,Cl+θGa,H),β^(1)Ga,Cl,CGa, Cl, ΨGa,H,Cl were obtained by the method of least squares. According to Yang and Pitzer, the mixing parametes,θ Ga,H and β^(0)Ga,Cl are obtained in terms of Harned coefficient of HCL,αA,from the value of (β^(0)Ga,Cl+ θGa,H). The activity coefficients of GaCl3 in the system are calculated using Pitzer equation. It is found that the extensive Harned equation is obeyed for GaCl3.

Key words METAL COMPOUNDS HYDROCHLORIC ACID GALLIUM CHLORIDE WATER ACTIVITY COEFFICIENT

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