中国有色金属学报
中国有色金属学报(英文版)
中国科学技术协会 主管
中国有色金属学会 主办

论文摘要

中国有色金属学报
ZHONGGUO YOUSEJINSHUXUEBAO XUEBAO
第18卷 专辑1 2008年6月

[PDF全文下载] [全文在线阅读]

文章编号：1004-0609(2008)S1-0199-08

$RbCl-H_2O$二元系和$RbCl-RbNO_3-H_2O$三元系作用浓度计算模型

郭汉杰[1]，杨学民[2]，赵伟洁[1]，焦晋沙[1]

(1. 北京科技大学 冶金与生态工程学院，北京 100083；
2. 中国科学院 过程工程研究所 多相复杂系统国家重点实验室， 北京 100080)

摘 要： 利用离子−分子共存理论建立温度为298.15 K时强电解质水溶液二元系$RbCl-H_2O$和三元系$RbCl-RbNO_3-H_2O$作用浓度计算热力学模型。热力学模型计算的以纯物质为标准态、以摩尔分数为浓度单位的$RbCl-H_2O$二元系各组元作用浓度经过转换系数转换后，与文献报道的以无限稀为标准态、以质量摩尔浓度为浓度单位的组元活度吻合良好。$RbCl-RbNO_3-H_2O$三元系的RbCl和$RbNO_3$转换后的作用浓度与文献报道的活度在总离子强度为0.01、0.05、0.1、0.5、1.0、1.5、2.0、3.0和3.5 mol/kg时均良好吻合。这说明基于离子−分子共存理论建立的作用浓度计算热力学模型能反映强电解质水溶液$RbCl-H_2O$和$RbCl-RbNO_3-H_2O$的结构特性；且组元的作用浓度在计算的浓度单位内严格遵守质量作用定律。

关键字： $RbCl-H_2O$；$RbCl-RbNO_3-H_2O$；作用浓度；活度；离子−分子共存理论；转换系数

Calculating models of mass action concentrations for $RbCl-H_2O$ binary system and $RbCl-RbNO_3-H_2O$ ternary system

GUO Han-jie [1], YANG Xue-min [2], ZHAO Wei-jie [1], JIAO Jin-sha [1]

(1. School of Metallurgical and Ecological Engineering, University of Science and Technology Beijing, Beijing 100083, China;
2. State Key Laboratory of Multiphase Complex System, Institute of Process Engineering, Chinese Academy of Sciences, Beijing 100080, China)

Abstract: Thermodynamic models of calculating mass action concentrations of components in $RbCl-H_2O$ binary and $RbCl-RbNO_3-H_2O$ ternary strong electrolyte aqueous solutions were developed based on the ion and molecule coexistence theory at 298.15 K. A transformation coefficient is needed to compare calculated mass action concentration with reported activity

because they are obtained at different standard state and concentration unit. The results show that transformation coefficients between calculated mass action concentrations and reported activities of the same components change in a very narrow range. The transformed mass action concentrations of components in RbCl-H_2O binary system are in good agreement with reported activities. The transformed mass action concentrations of RbCl and $RbNO_3$ in RbCl-$RbNO_3$-H_2O ternary solution are in good agreement with reported activities and with different constant total ionic strengths as 0.01, 0.05, 0.1, 0.5, 1.0, 1.5, 2.0, 3.0 and 3.5 mol/kg, respectively. All those results mean that the developed thermodynamic model of strong electrolyte aqueous solutions can reflect structural characteristics of RbCl-H_2O binary and RbCl-$RbNO_3$-H_2O ternary strong electrolyte aqueous solutions and the mass action concentration also strictly follows mass action law.

Key words: RbCl-H_2O; RbCl-$RbNO_3$-H_2O; mass action concentration; activity; coexistence theory; transformation coefficient

地 址：湖南省长沙市岳麓山中南大学内 邮编： 410083

电 话： 0731-8876765，8877197，8830410 传真： 0731-8877197

电子邮箱： f-ysxb@mail.csu.edu.cn