$NaOH-NaAl(OH)_4-Na_2CO_3-H_2O$体系活度因子的计算模型

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摘　　要：　应用Bromley模型，通过对氢氧化钠、铝酸钠和碳酸钠等溶液体系活度因子的实验数据进行校验与回归分析，获得了各电解质合理的Bromley参数，建立基于Bromley模型的$NaOH-NaAl(OH)_4-Na_2CO_3-H_2O$体系活度因子的计算模型，其适用范围为：质量摩尔浓度分别为$m(NaOH) \leq 8$ mol/kg，$m(NaAl(OH)_4) \leq 3$ mol/kg，$m(Na_2CO_3) \leq 3$ mol/kg且离子强度$I \leq 9$ mol/kg。使用该模型和Rard方法计算所得水的活度比较结果表明：该模型正确有效，计算精度较高，各电解质的Bromley参数取值合理；该模型也可用于$NaOH-NaAl(OH)_4-H_2O$体系活度因子的计算。

关键字：　铝酸钠溶液；Bromley模型；活度因子

Calculation model of activity coefficient for NaOH-NaAl(OH)$_4$-Na$_2$CO$_3$-H$_2$O system

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Abstract: According to Bromley model, the reasonable Bromley parameters for NaOH, NaAl(OH)$_4$ and Na$_2$CO$_3$ were obtained by calibration regression on their experimental activity coefficients. The activity coefficient calculation model for NaOH-NaAl(OH)$_4$-Na$_2$CO$_3$-H$_2$O system was established based on Bromley model and the molatlity in the molal scale is that m(NaOH)$\leq$8 mol/kg, m(NaAl(OH)$_4$)$\leq$3 mol/kg, m(Na$_2$CO$_3$)$\leq$3 mol/kg, respectively, and ionic strength $I \leq 9$ mol/kg.

The comparison of the activities of water calculated by the presented model with that of Rard's method shows that the presented model is reliable and accurate and the values of the parameters for the three electrolytes are appropriate. Furthermore, the presented model can also be applied in the activity coefficient calculation for NaOH-NaAl(OH)$_4$-H$_2$O

system.

Key words: sodium aluminate solution; Bromley model; activity coefficient