

NaCl介质中盐浓度、pH对 α -Al₂O₃表面相互作用力的影响

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摘要 利用原子显微镜研究NaCl介质浓度及体pH值对氧化铝表面作用力的影响规律。发现较低的盐浓度下,相互作用表示为长程排斥力,双电层厚度的实际值与理论值较好地吻合,随NaCl介质浓度的提高,双电层压缩长程斥力减弱,测定了pH4.0变化到9.67的作用力曲线,发现当pH等于7.90时,两表面的相互作用表现为吸引力,通过恒电荷、恒电位拟合,发现氧化铝的等电点在pH8.2处,与Zeta电位的测定结果相一致。

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Effects of pH and salt concentration on the interaction between alumina surfaces in NaCl solutions

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Abstract Interaction between alumina surfaces has been measured using atomic force microscope (AFM). The effects of pH and electrolyte concentration of NaCl on the force measurement were investigated. At low ionic strength around 0.0003mol/L, the interaction behaves as long-ranged repulsive force. With the rising of salt concentration, the magnitude of the repulsive force decreases due to compression of the electric double layer. The measured double layer decay lengths were consistent with the theoretical values. The measured force curve of 0.000 3mol.L was fitted with DLVO theory with constant charge and constant potential as 8.8mV. The pH value has great influence on the interaction magnitude. At pH 7.90, the interaction force is attractive. The fitted constant charge data show the isoelectric point of alumina is at 8.2, which is consistent with the results obtained from the electrophoretic mobility measurement .

Key words [SODIUM CHLORIDE](#) [ALUMINIUM OXIDE](#) [INTERACTIONS](#)

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