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# Adsorption of Citric Acid by Synthetic Pseudoboehmite

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**Abstract:** The adsorption of citrate, at  $10^{-4}$ - $10^{-3}$  M initial concentration, by pseudoboehmite suspended in 0.02 M NaClO<sub>4</sub> was investigated at varying pH. Citrate shows a strong affinity for the pseudoboehmite surface, as seen in the adsorption isotherm at pH 6. Adsorption envelopes of adsorbed citrate vs. pH for a given initial citrate concentration are characteristic for the adsorption of a polyprotic acid by a variable-charge mineral. The envelope data were fit well by the Constant Capacitance Model assuming a ligand-exchange adsorption mechanism, three monodentate surface species of citrate, and a reactive surface OH density of  $0.4 \text{ mol kg}^{-1}$ . Aqueous speciation calculations suggest that solubility equilibrium with pseudoboehmite was attained at pH > 9 and that particulate or polymeric Al may have existed at  $6 < \text{pH} < 9$ . Dissolved Al appeared to reduce the adsorption of citrate at pH < 5.5 via solution complexation reactions.

**Key Words:** Citrate • Pseudoboehmite • Adsorption reactions

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