
Charge Reversal of Kaolinite by Hydrolyzable Metal Ions: An Electroacoustic Study

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Abstract: Electroacoustic measurements at 1 MHz, using the Electro-Sonic Amplitude (ESA), on a kaolinite suspension provide a ready method for following the adsorption of hydrolyzable metal ions onto the clay surface. Co^{2+} , Cd^{2+} and Cu^{2+} ions show similar behavior: The initially negative surface becomes less negative, approaches zero, and may become positive at pH values around neutral, depending on the initial metal concentration. At higher pH, electrokinetic potential goes through a maximum. If the surface has become positive, it becomes less so; and at still higher pH values it may become negative again, depending on the metal ion concentration. The behavior can be interpreted using the model proposed by James and Healy.

Key Words: Adsorption • Cadmium • Charge reversal • Cobalt • Copper • Electroacoustics • Electrokinetics • Kaolin • Metal ions (hydrolyzable)

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