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# Effect of Interaction Between Clay Particles and Fe<sup>3+</sup> Ions on Colloidal Properties of Kaolinite Suspensions

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**Abstract:** Fine kaolinite suspensions were mixed with unaged or aged FeCl<sub>3</sub> in this experiment. The interaction between clay particles and Fe<sup>3+</sup> hydrolysis products was studied by transmission electron microscopy (TEM) and scanning electron microscopy (SEM). The proportion of Fe adsorbed was measured and the electrical charge on the clay particles was determined by electrophoresis. The effect of this interaction on flocculation of clay suspensions was investigated in a series of sedimentation tests. The Fe<sup>3+</sup> ions acted as counterions when their concentration was low and when unaged FeCl<sub>3</sub> solution was used. Otherwise, their hydrolysis complexes acted as a bonding agent between kaolinite particles. The dispersion-flocculation behavior of kaolinite suspensions was found to be in agreement with the theory of Derjaguin, Landau, Verwey and Overbeek (DLVO), as the sedimentation behavior could be predicted from the data of zeta potentials ( $\zeta$ ).

**Key Words:** Colloid • Electron Microscopy • Flocculation • Iron • Kaolinite • Sedimentation • Zeta Potential

*Clays and Clay Minerals*; October 1997 v. 45; no. 5; p. 733-744; DOI: [10.1346/CCMN.1997.0450512](https://doi.org/10.1346/CCMN.1997.0450512)

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