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# Particle Interaction and Rheology of Illite-Iron Oxide Complexes

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**Abstract:** The Bingham yield stress for suspensions of illite-iron oxide complexes is examined as a function of pH and iron oxide content. Addition of iron oxides to illite increased the yield stress over a pH range of 3 to 10. With increasing pH the yield stress decreased for the complexes with iron oxides of 2 and 5% while the complexes with iron oxides of 7, 10, and 20% exhibited the maximum yield stresses at pH values from 6 to 8. The iron oxides which are not associated with the illite enhanced the yield stress more than the iron oxides precipitated on the illite surfaces. The yield stress for the complexes was correlated with their zeta potential, and the higher yield stress is considered due to smaller interparticle repulsion.

**Key Words:** Bingham yield stress • Morphology • Illite • Iron oxide • Particle interaction • Zeta potential

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