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# The Effect of Aluminum on the Surface Properties of Kaolinite

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**Abstract:** Aluminum ions as well as hydroxide precipitates promote improved extraction of iron from kaolinites during leaching. Selective aggregation of ultrafine particles in kaolinites, seemingly induced by precipitation of aluminum hydroxide, gives brightness improvement in excess of that which can be ascribed to iron extraction. Aggregation of anatase, a primary discolorant confined mostly to the fine end of the kaolinite particle size distribution, is the suggested mechanism for complementary brightness improvement.

Precipitation of aluminum hydroxide in kaolinite systems substantially changes flocculation characteristics, surface area (methylene blue), and rheology. Edge-edge and edge-face flocculation are promoted where sulfate retention is high, becoming progressively more face-face with sulfate removal. The character of the flocculation can be interpreted by the combined use of surface area and low shear viscosity data.

The extent to which kaolinites can be dispersed after processing increases with increase in sulfate retention. Stability of suspensions deflocculated with polyphosphates shows an inverse relationship, decreasing with increase in sulfate retention.

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