Flocculation of Clay Suspensions by Natural Ferrihydrite. (S06-rhoton155452-Poster)

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Abstract:

The turbidity of water is normally reduced by the addition of chemicals which coagulate finely divided particles in suspension causing them to settle. This study was conducted to determine the effectiveness of the mineral ferrihydrite at flocculating suspended clays. Clay samples were saturated with Ca and suspended in pH 5 and pH 8 0.001N CaCl2 at a concentration of 0.5 g/L. Ferrihydrite was mixed with the suspension at rates of 0, 1, 2, 5, and 10% w/w clay. After a 24 h settling period, % transmittance(T) was measured at 375 nm using a 3 ml sample collected at a depth of 2 cm. Ferrihydrite addition to the pH 5 suspension progressively increased %T to a maximum of 10% at the 5% ferrihydrite rate, but the 10% rate decreased %T by 17% relative to the 0 rate. At pH 8, ferrihydrite additions decreased %T an average of 33% relative to the 0 rate. These results show that turbidity was reduced at pH 5 by ferrihydrite concentrations below 10%. At higher concentrations, turbidity increased perhaps due to excess ferrihydrite remaining in suspension after all clay had flocculated. The increase in turbidity at pH 8 indicates that flocculation did not occur because the zero point of charge for ferrihydrite was exceeded, resulting in a net negative charge.

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