



Effects of operational conditions on the floc formation time and rate in magnesium hydroxide coagulation process

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ABSTRACT

Feasibility of using magnesium hydroxide as coagulant for treating high pH wastewater was studied. The floc formation kinetics and minimum dose were investigated with a laser particle analyzing system under different experimental conditions. Floc formation time tended to decrease with the increase of coagulant dose, turbidity, temperature and pH value. A pseudo first-order mathematical model was developed to estimate the floc formation rate. The experimental data agreed well with the pseudo first-order equation. It was also found that when pH value reached 11.5, floc formation rate is not significantly influenced by initial turbidity. The relationship between floc formation rate coefficient and temperature is in agreement with the Arrhenius equation. Based on the changes of residual turbidity and zeta potential, charge neutralization is believed to be the main coagulation mechanism.

Keywords: Magnesium hydroxide; Coagulation; Floc formation time; Coagulation kinetics

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