Study of the chitosan performance in conjunction with polyaluminum chloride in removing turbidity from Ahvaz water treatment plant

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ABSTRACT

Chitosan is a biodegradable cationic polymer derived from the deacetylation of chitin. This study aims to investigate the effects of chitosan as a coagulant aid for the improvement of a polyaluminum chloride coagulant in removing the turbidity from drinking water. This study was conducted in the laboratory using a jar test in the water treatment plant of Ahvaz, Iran. Experiments were conducted based on various variables such as concentration of coagulant, pH, and different concentrations of chitosan as a coagulant aid. After preparation in a jar test, samples were mixed fast at 120 rpm for 1 min and slowly at 40 rpm for 20 min and remained under stable conditions for 30 min to allow for settlement. The optimal pH for the removal of the turbidity was pH 8. The optimal dosage of polyaluminum chloride combined with chitosan was 5 and 0.02 mg/L, respectively. Under optimal conditions, the use of chitosan could reduce the concentration of polyaluminum chloride by approximately 50%. In addition, particles formed in flocculation by chitosan were coarser and settled faster. Results indicated good performance of chitosan as a coagulant aid for the removal of the turbidity from drinking water.

Keywords: Coagulation; Turbidity; Chitosan; Polyaluminum chloride; Water treatment