



OPTIMIZATION OF COAGULATION-FLOCCULATION IN THE TREATMENT OF CANAL WATER

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Abstract

A study was conducted for the treatment of canal water using coagulation-flocculation-sedimentation process. Different coagulants i.e. alum, ferric sulfate and ferric chlorides were used. The effect of pH and mixing condition i.e. rapid mixing energy and time and slow mixing energy and time on the performance of coagulants were studied. Jar test apparatus was used to conduct the studies. The results of the study demonstrated that pH and mixing conditions affect the efficiency of the coagulant and there exist particular conditions for achieving maximum efficiency of a coagulant at an economical cost. Among different coagulants tested, alum was found to be a suitable coagulant for canal water on the basis of removal of turbidity and cost of treatment. The optimum dose of alum was found to be 12 mg/L at an optimum rapid mixing energy of 100 sec⁻¹ and mixing time of 1 minute and slow mixing energy of 35 sec⁻¹ and mixing time of 20 minutes and 30 minutes of sedimentation time. At the optimum dose, alum removed 99.5% turbidity and 94.4% fecal coliforms. The cost of alum to treat one cubic meter of canal water was 2.55 US\$. Sludge production at optimum dose of alum was 2.4 mL/L.

Key words: canal water, coagulation, flocculation, surface waters, water treatment

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