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Valorisation of a Bioflocculant and Hydroxyapatites as Coagulation-Flocculation Adjuvants in Wastewater Treatment of the Steppe in the Wilaya of Saida

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Abstract : Pollution caused by wastewater is a serious problem in Algeria. This pollution has certainly harmful effects on the environment. In order to reduce the bad effects of these pollutants, many wastewater treatment processes, mainly physicochemical, are implemented. This study consists in using two flocculants; the first one is a biodegradable natural bioflocculant, i.e. Cactaceaeou ficus-indica cactus juice, and the second is the synthetic hydroxyapatite, in a physico-chemical process through coagulation-flocculation, using two coagulants, i.e. ferric chloride and aluminum sulfate, to treat wastewater collected at the entrance of the treatment plant, in the town of Saida. The influence of various experimental parameters, such as the amounts of coagulants and flocculants used, pH, turbidity, COD and BOD5, was investigated. The coagulation - flocculation jar tests of wastewater reveal that ferric chloride, containing a mass of 0.3 g – hydroxyapatite, treated for 1 hour through calcination, is the most effective adjuvant in clarifying the wastewater, with turbidity equal to 98.16 %. In the presence of the two bioflocculants, Cactaceae juice and aluminum sulphate, with a dose of 0.2 g, flocculation is good, with turbidity equal to 95.61 %. Examination of the key reaction parameters, following the flocculation tests of wastewater, shows that the degree of pollution decreases. This is confirmed by the COD and turbidity values obtained. Examination of these results suggests the use of these flocculants in wastewater treatment.

Keywords : wastewater, cactus ficus-indica, hydroxyapatite, coagulation - flocculation
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