

River water turbidity removal using new natural coagulant aids: case study of Euphrates River, Iraq

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Abstract

For turbidity removal, most drinking water treatment plants are using coagulants due to the presence of suspended and colloidal materials at the coagulation and flocculation units. Aluminium and sulphates salts are the widely used coagulants, such as aluminium sulphate (Alum) and ferric chloride. However, several researches have linked Alzheimer's disease to the use of aluminium sulphate. Hence, scholars have conducted several researches on the possibility to reduce the amount of aluminium sulphate by using natural material/plants base as coagulant aids. In this study, Mallow's Leaves Extracts (MLE) and Carob's Pods Extracts (CPE) were used as an alternative coagulant aid. Couples of coagulation tests were implemented to find the optimal dosage of aluminium sulphates used as coagulants. The results displayed that the maximum turbidity removal efficiency by adding 100% of each coagulant, i.e. alum, MLE and CPE, were 61.16, 51.175 and 37.12%, respectively. In addition, the minimum residual turbidity and maximum turbidity removal efficiency were 4.56 NTU and 97.72% by adding 22.5 alum and 7.5 MLE presenting 30 mg/L dosing. Further, the minimum residual turbidity and maximum turbidity removal efficiency were 15.4 NTU and 92.3% by adding 22.5 alum and 7.5 CPE presenting 30 mg/L dosing