عنوان مقاله:

Chemical Treatment of Oily Wastewater by Coagulation/Flocculation Process

محل انتشار:

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خلاصه مقاله:

Oily wastewater industries generate significant amounts of effluent which has to be treated before being discharged into water stream. Because of the varying degree of chemicals used, thewastewater contains considerable concentrations of chemical oxygen demand (COD), suspended solids, toxic compounds and color. The discharge of such pernicious wastewater into the environment is not only aesthetically displeasing, but impedes light penetration, damages thequality of the receiving streams and may be toxic to treatment processes, to food chain organisms and to aquatic life. For these reasons, the effluent treatment is necessary before their discharge into the environment. So far, very little attention has been paid towards oily effluenttreatment by physico-chemical process. In the present study, chemical coagulation–flocculation process was used to separate solids from industrial oily effluent in order to make the effluent dischargeable with suitable characteristics. Aluminum sulphate [Al2(SO4)3], ferrous sulphate[FeSO4] and chloro ferric [FeCl3] were used as coagulant and flocculent respectively. Sulphuric acid [H2SO4] and Sodium hydroxide [NaOH] (1 M) were used to adjust the pH values during the treatment process. A series of jar tests were conducted with different values of pH and dosingamounts of coagulant and flocculent. After each test, the supernatant layer of treated effluent was analyzed for COD and Electric Conductivity (EC). The process efficiency varied between 3% and 85% in COD removal, and about 80% reduction in EC. The optimal working pH value forcoagulation-flocculation was found to be 5 and that for some composites was 7. The optimal doses of coagulant and flocculent were 2 mg/L of effluent. These jar testing results have been further proved by a successful pilot scale trial at the oily plant with 1000 L effluent in anintermediate bulk container (IBC) using the same optimal values of the jar tests, which indicates that the chemical coagulation and flocculation process is a feasible solution for the treatment of effluent generated at oily industry.

کلمات کلیدی:

Oily wastewater, COD, effluent treatment, coagulation–flocculation, EC