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COMBINED AEROBIC AND H_2O_2/SULFURIC ACID TREATED ACTIVATED CARBON-FENTON TREATMENT OF AGROCHEMICAL INDUSTRY WASTEWATER

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Abstract

Treatment of agrochemical industry wastewater is difficult to carry out unless integration with some advanced oxidation process (AOP) is used. The present study deals with treatment of an agrochemical industry wastewater, first using activated sludge and then with sulfuric acid treated activated carbon (SAAC) in presence of Fenton reagent. During the activated sludge treatment the food-to-microorganisms (F/M) ratio is varied from 0.1 to 0.2 mg chemical oxygen demand (COD) per mg mixed liquor suspended solids (MLSS) by varying concentration from 6000 to 15000 mg L^{-1}. The dissolved oxygen (DO) concentration is varied from 2.0 to 4.0 mg L^{-1} in order to study its effect. The pH and oxidation-reduction potential (ORP) of the systems were monitored online for all the batch operations. The maximum percentage reduction in activated sludge treatment is found to be 72.65% at optimum conditions. The treated wastewater from activated sludge process is further treated with Fenton oxidation and H_2O_2/SAAC. The optimum dosing of H_2O_2, Fe^{2+} and SAAC are determined. The maximum COD reduction using Fenton and H_2O_2/SAAC has been found to be 27.0% and 50.22%, respectively.

Key words: activated sludge process; fenton oxidation; hydroxyl radicals; sulfuric acid treated activated carbon

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