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STUDY ON ELECTROCHEMICAL ADVANCED OXIDATION PROCESS TO TREAT FISH MEAL INDUSTRY WASTEWATER

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Abstract

Fish meal processing industries convert the raw fish into a various commercially edible form. The effluent generated from this industry comprises a large amount of pollutants leading to high values of biochemical oxygen demand (BOD), chemical oxygen demand (COD) and total suspended solids (TSS). Mostly traditional biological and chemical methods have been adopted to treat the effluent coming out of the fish meal industry. By using these traditional methods at the end of the process, a large amount of sludge is produced. This sludge should undergo a process like sludge drying, thickening process and finally disposed of in the landfill. Electrochemical advanced oxidation process is an electrochemical method to treat wastewater and it can be performed using different methods such as electro-oxidation, electrochemical advanced oxidation process using Fenton's reagent. In this paper, we used the electro-oxidation method to reduce the polluting loads. A titanium electrode coated with ruthenium dioxide was used as anode, while the cathode was made from stainless steel.
The most complex organic compound could be broken by this electro-oxidation method. We have studied the effects of voltage on COD, BOD and TSS removal by applying the following voltage values: 3.2V with 0.06A, 5.65V with 1.17A, 7.79V with 1.62A. We have also discussed the effect of pH on the pollutants removal. About 88% of COD was removed at 7.79V after four hours of treatment. TSS and BOD removal was found to be 87% and 84% respectively. Overall, the electrochemical advanced oxidation process seems to be efficient in removing the pollutants such as BOD, COD and TSS.

Key words: biochemical oxygen demand, chemical oxygen demand, coated titanium anode, ruthenium dioxide, stainless steel cathode, total suspended solids

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