CATALYTIC OXIDATION OF 2, 2 DI (HYDROXYMETHYL) PROPIONIC ACID

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Current, the textile dyeing wastewater is one of the most important source of pollution. Its composition are complex and diverse, as a result of using diversity of raw materials and technological processes. The effluent textile contains, in addition to dyes, auxiliary agents, which has consisted 30.0 % by weight of the dyes used.

Knowns numerous techniques calculated for physic-chemical treatment of wastewater are containing high concentrations of refractory organic matter. These techniques had included the treatment by ozonation, ultrasonic, coagulation-flocculation, and Fenton oxidation and adsorption processes with active charcoal. Of these, Fenton oxidation processes had been effective and it has made possible the transformation of recalcitrant compounds in biodegradable products.

The experimental researches of the lab have been carried out on model systems which has contained 2, 2 di-hydroxymethyl propionic acid, DMPA. The concentration of softeners has varied from 10.0 to 60.0 mg /L in the textile effluent.

It studied the model system containing an emollient [DMPA] = 60.0 mg /L. The oxidation treatment was carried out at a pH value of 2.0-2.5. It was determined, as the optimal experimental pH for the oxidation, because of higher value has formed the hydro compounds by iron (III). The oxidation was carried out with Fenton's reagent, $[Fe^{2+}] = 3x10^{-4}M$ and $[H_2O_2] = 3x10^{-3}$ M, for one hour. The degree of mineralization /oxidation has been 82.5% into these conditions. After one hour, the oxidation solution was separately. First system was oxidized an additional for one hour and in the second system was added another a dose of peroxide ($[H_2O_2] = 3x10^{-3}$ M). It is develop that the degree of oxidation/ mineralization has been 82.5% for system I, and in second system, the degree of mineralization reduced by 50.0% as against the first 60 min. Although high doses of H_2O_2 produce a larger amount HO●, when it is in excess, the hydrogen peroxide has a radical absorption capacity (HO2● hydroperoxyl radicals), as the concentration of H2O2 is reduced and the treatment efficiency drops.

It has been found that the formation of hydroxyl radicals happens in the first minute of reaction, and the increase of oxidation time does not increase the efficiency of the treatment process. Similarly, the excess of hydroxyl radicals leads to a higher value of the chemical oxygen demand.

1. Cortez, S., Teixeira, P., Oliveira, R. and Motta, M. Evaluation of Fenton and ozone-based advanced oxidation processes pre-treatments, Journal of Environmental Management, 92, 2011, p.749-755.