

ABSTRACT

PHOTOLYTIC AND PHOTOCATALYTIC TREATMENT OF LINEAR ALKYLBENZENE SULFONATE IN WATER

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Treatment of linear alkylbenzene sulfonate using various photolytic and photocatalytic processes is described. Based on first order rates, it is shown that 5,000 mg/L of H_2O_2 for degradation of a 100 mg/L solution of linear alkylbenzene sulfonate is optimum. Two different photocatalysts, Degussa P25 and Hombikat UV 100 TiO_2 , are used to degrade LAS in slurry batch reactors. The optimum photocatalyst loading for Degussa P25 is 4.0 g/L while for Hombikat UV 100 2.0 g/L. The photoactivity for Degussa P25 is higher than UV 100 for treatment of LAS since >20% adsorbs to the surface of the UV 100 photocatalyst. Combination of photocatalysts does not improve degradation rates in batch tests. Combination of Degussa P25 and 600 mg/L H_2O_2 and irradiation with either UV light at 254 or 365 nm does not improve degradation rates over the photocatalytic or photolytic processes individually. Photolysis of LAS with UV light at 254 nm and 600 mg/L H_2O_2 added at different time intervals was not successful and no improvement in the first order rate constant was observed. For optimum results, the hydrogen peroxide was added at the beginning of irradiation.