



A comparative study of degradation of the azo dye C.I. Acid Blue 9 by Fenton and photo-Fenton oxidation

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ABSTRACT

A comparative study of degradation of the azo dye C.I. Acid Blue 9 in aqueous solution by Fenton and photo-Fenton oxidation processes has been carried out by the optimum conditions. Results indicate that the azo dye C.I. Acid Blue 9 can be effectively decolorized using two methods with a litter difference for optimal conditions, 97.7% and 98.12% respectively. However, in the mineralization removal of C.I. Acid Blue 9, with photo-Fenton oxidation process there is a significant increasement relatively to Fenton oxidation process. That is, although UV has little effect on dye degradation, it is particularly important in dye mineralization removal. In addition, the effect of relation $[\text{H}_2\text{O}_2]_0/[\text{Fe}^{2+}]_0$ and $[\text{H}_2\text{O}_2]_0/[\text{dye}]_0$ were also investigated. The results showed that a ratio $[\text{H}_2\text{O}_2]_0/[\text{Fe}^{2+}]_0$ ranged from 2.0 to 3.5 and a ratio $[\text{H}_2\text{O}_2]_0/[\text{dye}]_0$ of 7.0 are optimal operational conditions by Fenton and photo-Fenton oxidation processes.

Keywords: Comparative; Degradation; Mineralization; Fenton process; Photo-Fenton process; CI Acid Blue 9