Bio-Fenton process for Acid Blue 113 textile azo dye decolorization: characteristics and neural network modeling

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ABSTRACT

In this study, decolorization of Acid Blue 113 textile azo dye (AB 113) by a bio-Fenton process has been performed in an aqueous medium. The bio-Fenton oxidation process tested is the oxidation process of glucose for H_2O_2 generation and *in situ* use of H_2O_2 with Fe^{2+} as Fenton reagents to produce hydroxyl radicals which degrade the organic dyes. The effect of different parameters such as AB 113, glucose, $FeSO_4$ concentrations, and also the glucose oxidase activity on the decolorization of AB 113 dye was assessed. Artificial neural network was used to simulate the decolorization of AB 113 aqueous solution. Different networks were designed for this process. The best network was 5-14-1 due to the best coefficient of determination (0.996) and mean square error (0.42). The results indicated that ANN is provided reasonable predictive performance.

Keywords: Acid Blue 113; Artificial neural network; Bio-Fenton; Decolorization; Glucose oxidase

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