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Degradation of aniline from aqueous solution by Fenton process: modeling and optimization

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ABSTRACT

In the present study, the influences of different parameters on aniline removal by Fenton oxidation using response surface methodology (RSM) were investigated. The central composite design (CCD) was applied in designing the experiments to observe the effects of important operating variables (initial aniline concentration, Fe^{2+} dose, H_2O_2 dose and reaction time). The process performance was evaluated with the analysis of variance. A quadratic model describes the experimental data. The experimental value and predicted value were in good agreement with $R^2 = 0.98$ and Adj-$R^2 = 0.92$, which state the correctness of the model. The optimum aniline removal of 72.57% was achieved at 1000 mg/L of aniline concentration, 1100 mg/L of H_2O_2, 70 mg/L of Fe^{2+} and 40 min of reaction time.

Keywords: Aniline; Fenton process; Modeling; Wastewater; Optimization

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