



Degradation process and kinetics study of actual urotropine wastewater by Fenton method

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ABSTRACT

The degradation of actual urotropine wastewater was investigated by Fenton oxidation process. The effect of initial pH, dosages of Fe^{2+} and H_2O_2 , reaction time and temperature of reaction on chemical oxygen demand (COD) and total organic carbon (TOC) removal was analyzed. The optimal conditions for COD and TOC removal of urotropine wastewater were determined. When the pH = 7.0, $\text{H}_2\text{O}_2/\text{Fe}^{2+}$ dosage = 4, H_2O_2 dosage = 16.5784 g/L, reaction temperature = 45°C, reaction time = 3 h were given, the removal of COD and TOC was 93.53% and 81.27%, respectively. The experimental results indicated that the removal efficiency was strongly dependent on initial pH, the concentration of Fenton reagents, time and temperature of the reaction. Second-order reaction kinetic model provides the best correlation of the data. Primary substances were identified by gas chromatography-mass spectrometry (GC-MS), and the possible reaction pathway was proposed based on the analysis in Fenton oxidation process. This study may lead as provide guidance to related industries treating the urotropine production wastewater by Fenton oxidation process.

Keywords: Degradation; Kinetics; Urotropine; Wastewater; Fenton

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