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## ELECTROCHEMICAL CATALYTIC DEGRADATION AND BIODEGRADABILITY ENHANCEMENT OF REAL TEXTILE WASTEWATER BY ANODIC AND CATHODIC REACTIONS

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### Abstract

An electro-Fenton process was carried out using undivided cell containing tridimensional graphite felt cathode for treatment of real textile wastewater. The study is essentially focused on effects of pH, applied current and transition metal types ( $\text{Fe}^{2+}$  and  $\text{Cu}^{2+}$ ) as catalysts on the electrochemical degradation efficiency based on color and COD removal and  $\text{BOD}_5/\text{COD}$  value. The results indicated that pH 3 and applied current of 150 mA are the optimum conditions for decolorization and COD removal of real textile wastewater. Moreover, the increasing of the transition metal dosage enhanced efficiency of electro-Fenton process significantly. The  $\text{BOD}_5/\text{COD}$  value of textile wastewater increased from 0.127 to 0.156, 0.38 and 0.453, after electrogenerated hydrogen peroxide with anodic oxidation and electro-Fenton processes conducted with  $\text{Cu}^{2+}$  and  $\text{Fe}^{2+}$  respectively. Therefore, biodegradability was significantly enhanced in presence of catalysts ( $\text{Fe}^{2+}$  and  $\text{Cu}^{2+}$ ), particularly in presence of  $\text{Fe}^{2+}$  which was superior to  $\text{Cu}^{2+}$ . It is also concluded that the electro-Fenton process is an effective technology for the colored wastewater treatment and it can be a pretreatment before biological processes.

**Key words:** Advanced Oxidation Process (AOP),  $\text{BOD}_5/\text{COD}$  value, colored wastewater, electrogenerated Fenton reagents, tridimensional graphite felt

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