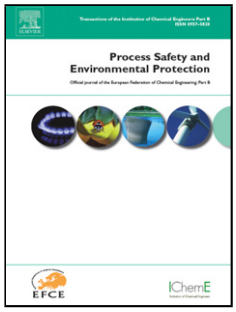

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Efficiency of electro-Fenton process in removing Acid Red 18 dye from aqueous solutions

***Short title*:** Electro-Fenton process for removing Acid Red 18 dye

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ABSTRACT

The presence of dye in aqueous solutions can have carcinogenic and mutagenic effects on human health. This study examined the efficiency of the electro-Fenton process in removing Acid Red 18 azo dye from aqueous solutions. In this experimental study, a reactor with a useful volume of 500 mL and 2 electrodes made of iron were used. The factors affecting dye removal (pH, voltage, hydrogen peroxide concentration, initial dye concentration, type and concentration of electrolyte, distance between electrodes, and time) were examined. Results revealed that the considered parameters affected the efficiency of the process. The maximum removal efficiency rates for Acid Red 18 dye under optimal process conditions (pH=3, voltage of 30 V, hydrogen peroxide concentration of 1 ml/L, electrolyte concentration of 100 mg/L, and electrode distance of 1 cm from each other) in synthetic and real solutions (wastewater from the Asia wool knitting factory) were found to be 99.9%±0.2% and 90.5%±1.7%, respectively. The electro-Fenton process with iron electrodes is a rapid and effective method for removing dye compounds from industrial wastewaters with a high efficiency.

Keywords: Electro-Fenton, Acid Red 18, Hydrogen peroxide, Textile industries

1. Introduction:

Dyes are aromatic organic compounds that absorb light at a wavelength of 350-700 nm (visible light range). Around 100,000 types of dye are produced around the world, with