Electro-Fenton process efficiency for decolourization of aqueous solutions: study of reaction kinetics

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\textbf{A B S T R A C T}

Electro-Fenton is one of the advanced oxidation processes, which have been applied effectively to degrade recalcitrant organics such as dyes in aqueous solutions. In the present research, the efficiency of electro-Fenton process in the removal of reactive yellow dyes of 15 and 42 were investigated. In this regard, the effects of various parameters such as pH, H\textsubscript{2}O\textsubscript{2} concentration, current density, contact time and initial concentration of dyes were investigated. Colorimetry along with spectrophotometry was used to measure the concentration of the residual dye. The highest removal efficiencies (95\%) for both reactive yellow dyes of 42 and 15 occurred at pH = 3, H\textsubscript{2}O\textsubscript{2} concentration = 5 mg/L, contact time = 20 min, current density = 0.3 A and initial concentration = 80 mg/L. Also, the results of the kinetic study showed that data in this research follow the pseudo-first-order kinetic model.

\textit{Keywords:} Electro-Fenton; Reactive dyes; Electrochemical oxidation; Reaction kinetics; Degradation