

Electrochemical Decolorization of Reactive Dye from Synthetic Wastewater by Mono-Polar Aluminum Electrodes System

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Azo dyes are important groups of chromospheres having a particular structure in color-contaminated wastewater. In the present study, Reactive Red 198 (RR198) dye was chosen as a model of azo dyes group. Electrocoagulation technique as an effective and environmental-friendly process for wastewater treatment was applied. Hence; to determine the extent of decolorization process, the main different parameters such as pH (4-11), contact time (80 min), initial concentrations (25-400 mg/L), current density (1.9-23.1 mA/cm²), distance between gaps (1-4 cm), and effect of supporting electrolytes were evaluated. Results show that optimum conditions were 20 min of operation time, 1 cm distance between electrodes, pH equal to 4 and optimum initial concentration of dye equal to 100 mg/L as well as NaCl was identified as the best electrolyte. Under these optimum conditions and also at both aeration and non-aeration operating conditions decolorization efficiency was more than 90%. The results also demonstrated that total organic carbon removal efficiency as (TOC), during 120 min of contact time was about 80.95%. XRF analyses show that a large portion of deposited sludge (58.282%) was aluminum oxide.

Keywords: Aluminum electrode; Electrochemical decolorization; Reactive Red 198, aqueous solutions

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