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"Gheorghe Asachi" Technical University of Iasi, Romania

DYE REMOVAL FROM AQUEOUS SOLUTION BY ELECTROCOAGULATION PROCESS USING STAINLESS STEEL ELECTRODES

Ponnusamy SenthilKumar[1], Neduvelannal Umaiyambika[1], Rangasamy Gayathri[2*]

[1]Sri Sivasubramaniya Nadar College of Engineering, Department of Chemical Engineering, Chennai, 603 110, India
[2]Sengunthar Engineering College, Department of Civil Engineering, Tiruchengode, 637 205, India

Abstract

The removal of pollutants from effluents by Electrocoagulation (EC) has become an alternative method in recent years. This paper deals with the batch removal of reactive red 120 dyes from the aqueous solution by electrocoagulation method using stainless steel electrodes. Electrocoagulation using stainless steel electrodes was found to be more effective particularly for the color removal. The effects of initial pH, current density, initial dye concentration, usage of different electrolytes and electrolysis time on the decolorization and Chemical Oxygen Demand (COD) removal efficiencies have been investigated. The increase of current density up to 50 A/m^2 enhanced the color and COD removal. The optimum electrolysis time was found to be 15 min. The results of this study showed that an initial pH of 8 and current density of 50 A/m^2 were the optimum conditions for the maximum color and COD removal. NaCl electrolyte was found to be the best suited electrolyte for the electrocoagulation process. The dominant mechanism of color and COD removal from the reactive red 120 dye by electrocoagulation process found to follow coagulation and adsorption at pH values from 6 to 8. It was found that EC process under the optimum conditions was able to attain a COD removal of nearly 74% and color removal of more than 98%.

Key words: COD, color, electrocoagulation, Reactive Red 120, removal

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[*] Author to whom all correspondence should be addressed: e-mail: gay3civil@gmail.com; Phone: +91-9894427191