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REMOVAL OF COLOR AND COD FROM AQUEOUS SOLUTION CONTAINING DYES BY ELECTROCOAGULATION IN A NEW CELL

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Abstract

A new cell design which makes an efficient use of the cathodically evolved H_2 to improve the mixing efficiency and the floatation ability during electrocoagulation was used to remove dyes from waste solution. In this study, the decolorization and COD reduction of colored solutions containing reactive and basic dyes by electrocoagulation was investigated using aluminum electrodes in a batch mode. The effect of operating parameters such as current density, initial dye concentration, NaCl concentration and pH on the percentage color removal and on percentage COD reduction have been examined. The results indicate that electrocoagulation is very efficient technique which is able to achieve > 95% color removal and > 50% in COD reduction under suitable operating conditions for the two dyes. The energy consumption was calculated and found to range from 4.26 to 19.04 and from 4.36 to 21 kWh/kg dye removed depending on the operating conditions for reactive and basic dyes respectively. Energy consumption based on COD reduction was found to be ranges from 10.33 to 36.1 and from 6.53 to 30.6 kWh/kg COD removed for the two dyes respectively.

Key words: cell design, COD, color removal, electrocoagulation, textile dyes, wastewater treatment

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