

Decolourization of Textile Dyebath Chloride Rich Wastewater by Electrolytic Processes

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The potential of electrolytic process was studied for the treatment of textile dyebath dump chloride (Cl⁻ concentration ~8250 ppm) rich wastewater. The effluent used in the experiments was obtained from the cotton dyeing industry in Ludhiana/India. The performances of four electrode combinations (stainless steel-stainless steel, iron-iron, aluminium-aluminium and iron-aluminium) were investigated to remove color and COD concentration. In addition, best removal efficiency and minimum power consumption along with sludge generation rate was estimated. The coefficient of determination value (R²) of Color removal % was 0.984 as determined from Analysis of variance (ANOVA). Response surface methodology was followed for optimizing the voltage and treatment time. ANOVA model seems significant with Fe-Fe electrodes for CRWW and optimized process conditions were 1V and 8.2 min. to achieve 96% color removal efficiency. The study indicated that the dye bath dump wastewaters from cotton fabric dyeing can be consistently treated by electrolytic processes using iron electrodes.

Keywords: Electrocoagulation, Electrodes, Response Surface Methodology (RSM), Optimization, Chloride wastewater

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