



Treatment of Textile Effluent by Electroflocculation: Optimization of Operating Conditions and Toxicological Evaluation

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Abstract: Textile effluents have high concentrations of dye solutions, and often, conventional treatment techniques face difficulties in reaching satisfactory levels of color removal. Within this context, the objective of this work is to study the application of an electrochemical treatment (electroflocculation) to a textile effluent. Using as an experimental planning strategy a Central Composite Rotatable Design-CCRD, it was assessed the influence of electric current intensity applied to the sacrificial electrodes and reaction time, in variable-response color removal. The obtaining of a quadratic, predictive mathematical model for color removal, provided the basis for the optimization of the operating conditions. The model proved to be statistically valid at 10% of significance, showing determination coefficient of approximately 0.8. The optimum conditions for the current intensity and reaction time, were respectively, 0.85 A and 3.119 min. Ten repetitions of the experiment, undertaken under optimal conditions, resulted in an mean percentage of color removal of 91.29%, which featured a model error percentage of 8.13%, considered satisfactory. The index of seed germination of lettuce (*Lactuca sativa* L.) was used to evaluate possible toxic effects caused by the electrochemically treated effluent. The results showed that three of the four treatments studied, did not exerted influence on the germination index; however, when using a ratio of 3:1 (treated effluent: water) a positive effect was observed.

Keywords: *dye solutions, electrochemical treatment, toxicity*

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