

DEVELOPMENT OF MODELS FOR DYE REMOVAL PROCESS USING RESPONSE SURFACE METHODOLOGY AND ARTIFICIAL NEURAL NETWORKS

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ABSTRACT

In this study, simple, green and economic bio sorbent was examined for dye removal process. The influence temperature, initial pH, contact time, adsorbent dosage and initial dye concentration of the solution on dye removal capacity of Ficus religiosa seeds was studied by using statistical designs. Response surface methodology was used to develop a model to predict the effects of all the above parameters on dye removal. Model analysis revealed that the adsorption capacity was affected by the changes in temperature, initial pH, contact time, adsorbent dosage and initial dye concentration of the solution. The results obtained were also modeled by using Artificial Neural Networks (ANN). High values of correlation coefficients indicated the best fits of experimental results with that of values obtained from both the modeling methods. From these studies, it may be concluded that green carbon adsorbent prepared is efficient and economical for crystal violet removal from aqueous solutions.

KEY WORDS: ANN, Dye, Model, RSM