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Mathematical modeling of biosorption of safranin onto rice husk in a packed bed column using artificial neural network analysis

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ABSTRACT

The study was undertaken to find out a suitable low cost, environmental friendly and highly effective biosorbent to remove safranin dye from wastewater. For this a continuous downward packed bed column experiment was carried out by using rice husk as a biosorbent. The effects of the operational parameters like pH, flow rate, time etc were studied in continuous downward column. A feedforward artificial neural network (ANN) model had been proposed to predict the decolorization efficiency of a non-linear behavior of a continuous column operation. The network was trained using different operational parameters and the findings indicated that the developed ANN model provided high performance criteria ($R^2 = 0.99$). The proposed simulated models were estimated the % reduction of dye in respect to time using the packed bed continuous column experiment.

Keywords: Rice husk; Safranin; Packed bed; Biosorption; ANN; Simulation

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