

Removal of hexavalent chromium from aqueous solutions using low cost adsorbents and ANN modeling for prediction

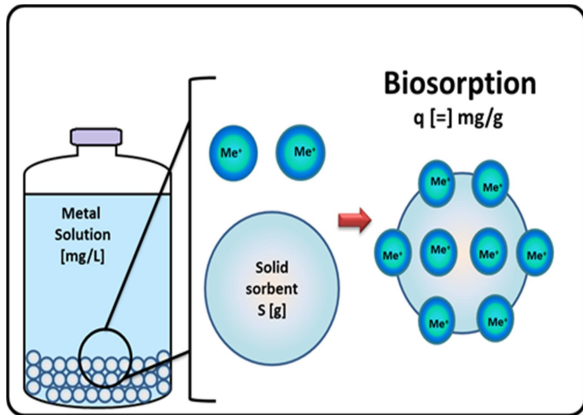
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ABSTRACT

Three low cost adsorbents such as groundnut seed cake powder, sesame seed cake powder and coconut cake powder were chosen for the bio sorption of Cr(VI) from aqueous solutions and industrial effluent. Effect of contact time, pH, adsorbent dosage, temperature and initial metal concentration on the removal of Cr(VI) were investigated and optimized. Isothermal studies indicated that the bio-sorption of Cr(VI) followed Langmuir adsorption isotherm. Reaction kinetic studies indicated that removal of the chosen metal by the three adsorbents followed pseudo second order kinetics. Artificial Neural Networks tool was used for modeling the adsorption of the metal on the chosen adsorbents. ANN was trained to predict the percent removal of the adsorbents. The percent error obtained between the ANN predicted value of and experimental value percentage removal of Cr(VI) was found 0.8, implicating that the network and the algorithm used predicted the adsorption efficiency accurately. The three adsorbents chosen for the present study have not been so far used in the removal of heavy metals. And

method was found to be economical, easy, and simple, can be applicable for industrial applications.

KEYWORDS: Bio-sorption, Cr(VI), Artificial Neural Networks, adsorption isotherms, pseudo second order kinetics, groundnut cake powder, sesame seed cake powder, coconut cake powder



Wastewater free from heavy metal is the result. Various conditions of batch adsorption have also been optimized.

These values were taken as inputs and a network was trained and predicted the process of adsorption

