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Artificial Neural Network Modeling for Sorption of Cadmium from Aqueous System by Shelled Moringa Oleifera Seed Powder as an Agricultural Waste

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ABSTRACT

A two-layer Artificial Neural Network (ANN) model was developed to predict the removal efficiency of Cd(II) ions from aqueous solution using shelled Moringa Oleifera seed (SMOS) powder. Batch experiments resulted into standardization of optimum conditions: biomass dosage (4.0 g), Cd(II) concentration (25 mg/L) volume (200 mL) at pH 6.5. A time of forty minutes was found sufficient to achieve the equilibrium. The ANN model was designed to predict sorption efficiency of SMOS for target metal ion by combining back propagation (BP) with principle component analysis. A sigmoid axon was used as transfer function for input and output layer. The Levenberg-Marquardt algorithm (LMA) was applied, giving a minimum mean squared error (MSE) for training and cross validation at the ninth place of decimal.

KEYWORDS

Cite this paper

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