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Bioadsorption of Cd (II) from Contaminated Water on Treated Sawdust: Adsorption Mechanism and Optimization

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ABSTRACT

Sawdust (SD) a very low cost material has been utilized as adsorbent material for the removal of Cd (II) from aqueous solutions after treatment with mono methylol urea (MMU) in the presence of zinc chloride as a catalyst to form MMU-SD. The reaction of MMU-SD was carried out under different conditions including MMU/SD molar ratio, catalyst concentration, and reaction time and temperature. Adsorption studies have been carried out to determine the effect of agitation time, pH, adsorbent and adsorbate concentrations on the adsorption capacity of Cd (II) ions onto MMU-SD. Langmuir, Freundlich and Redlich-Peterson isotherm models were applied in the adsorption studies. The experimental data were analyzed using various sorption kinetic models. The removal processes of Cd (II) onto MMU-SD particles could be well described by the pseudo-second order model. The maximum adsorption capacity of Cd(II) onto MMU-SD was 909 mg/g. Similarly, the Freundlich constant 1/n value was 0.45.

KEYWORDS

Sawdust; Methylolation; Adsorption Isotherm; Cd (II) Ion Removal

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