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Maize corn cob as an adsorbent for the removal of Cd (II) from aqueous solutions

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Biomaterials are gaining importance as inexpensive adsorbents for removing pollutants, especially heavy metals, from aqueous solutions. Cadmium has been one of the major pollutants in the waters of small foundries and is often released before effective treatment. This paper proposes an inexpensive adsorption based removal of Cd (II) for these foundries using Maize Corn Cob (MCC) as an adsorbent. MCC is an abundant agricultural waste in most parts of India and easily available at very low prices. The dried raw MCC was pulverized and was investigated for its adsorption properties and tested for the removal of Cd (II) from aqueous solutions using different sets of experimental variables. Adsorption of Cd (II) on MCC was found to be dependent on contact time, pH, adsorbent dosage and initial concentration of metal ion (adsorbate). Maximum adsorption occurred at pH 6.0. Among the different sets of experimentation, maximum adsorption was found with an adsorbent particle size of 0.21mm and the pH of the aqueous solution at 6.0 with Cd (II) concentration of 200mg/l. 200mg of Maize corn cob has the potential to reduce Cd (II) concentration to 1mg from 50ml aqueous solution containing 10mg of Cd (II) with a contact time of 70 minutes. The results of the study reveal that Maize Corn Cob (MCC) can be effectively used for Cd (II) removal in the foundry effluent waters, by optimizing the technique in the field trials.

Biography

P V V Prasada Rao worked on Pollution Analysis, Remediation of wastes, Microbial ecology, Vegetation studies and also on Environmental Impact Assessment. At present, he is involved in the Apportioning of Particulate Matter in ambient air of Visakhapatnam, an important city in Southern India. He developed low-cost methodologies for the removal of heavy metals from industrial effluents. He also worked on biodegradation of plastics, bio removal of fluoride in groundwater and climate change studies. At present, he is working on the development of silver nanoparticles for addressing pollutants in aqueous solutions. A good number of students are benefitted by the research studies. He had published more than 60 scientific papers in both national and international journals. He is at present working as a senior professor in the Dept. of Environmental Sciences, Andhra University, Visakhapatnam, India.

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