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APPLICATION OF *Mangifera indica* SEED SHELL FOR EFFECTIVE ADSORPTION OF Fe(II) AND Mn(II) FROM AQUEOUS SOLUTION

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Abstract

Adsorption has proved to be an excellent way to treat industrial wastewater, due to its significant advantages like easy availability, inexpensive, ease of operation and highly efficient, compared to conventional expensive adsorbents like activated charcoal, alumina etc. The present investigation focused on utilization of *Mangifera indica* seed shell substrate for the removal of toxic heavy metals like Fe(II) and Mn(II) from wastewater. *Mangifera indica* seed shell substrate as an effective adsorbent was used for the first time for removal of Fe(II) and Mn(II) from aqueous solution. The adsorption isotherms were obtained in a batch reactor. Effect of various parameters like agitation time, pH, metal ion concentration, temperature, and doses of substrate were studied. It is evident that, the process of removal followed first order rate adsorption and the experimental data fitted well to Freundlich adsorption isotherm. The values of Freundlich isotherm parameter were between zero and one indicating favourable sorption for Fe(II) and Mn(II) metal ions. It shows good adsorption capacity towards Iron (II) and Manganese (II) at 30 min of optimum agitation time and at a pH of 4.5 even at low concentration. It effectively removed 81-82% of Fe(II) and Mn(II) in a single batch. It is also effective to remove heavy metal ions from single metal solutions as well as in the presence of other co-metal ions with the main metal of solution. This biosorbent can be successfully utilized for removal of toxic metals from industrial effluents, which could solve the problem of disposal of plant waste materials.

Key words: adsorption, Freundlich isotherm, iron, manganese, *Mangifera indica*

Received: September, 2011; Revised final: July, 2012; Accepted: July, 2012

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