



Heavy Metals Ni(ii), Cr(vi) and Co(ii) Adsorption Kinetic Isotherm in Aqueous Solution Using Cherry Seed (*Chrysophyllum africanum*) Fibre

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Received June 02, 2012; Accepted September 23, 2012

Abstract: The biosorption of three metal ions, Ni (ii), Cr (vi) and Co (ii) onto cherry seed (*Chrysophyllum africanum*) fibre waste biomass over a wide range of reaction conditions was studied. The batch experiments showed that initial-ion metal concentration of 70mg/L was the best range for the sorption of the metal ions onto the biomass. The metal ions were best adsorbed at a contact time of 5mins and the adsorption of the metal ions onto the biomass was rapid at a biomass dosage of 1g. Also at a particle size of 100Nm, great quantity of metal ions were adsorb onto the biomass. The sorption process was examined by means of Langmuir and Freundlich isotherms. According to the evaluation using the Langmuir Equation, the monolayer sorption capacity obtained was 0.10mg/g Ni (ii), 0.12mg/g Cr (vi), and 0.10 mg/g Co (ii). The kinetics of the sorption mechanism was evaluated using the pseudo-first order rate model and the pseudo-second order rate model. The results showed that the pseudo-second order model provided a more appropriate description of the metal ion sorption process of Ni (ii) Cr (vi) and Co (ii) onto cherry seed fibre waste biomass. The results from these studies indicated that cherry seed fibre waste biomass could be employed in the removal of toxic and valuable metals from industrial effluent.

Keywords: *Adsorption condition, Kinetic isotherm adsorption efficiency.*

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