

Recovery of Dysprosium Ions by Biosorption-desorption onto Organic Plants Wastes

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The recovery process of dysprosium from sewage by biosorption-desorption has been evaluated using low-cost biosorbents. Both dried and 450°C carbonized mandarin-orange peels and ginkgo leaves were selected as biosorbents and used to evaluate the recovery process of dysprosium ions. Evaluating the effect of pH with respect to contact time indicated a rapid biosorption of dysprosium ions onto the surfaces of the biosorbents. Equilibrium was reached within 10 min of contact, with the best biosorption capacity of 25.64 mg/g obtained with carbonized ginkgo leaves. The recovery process of adsorbed dysprosium was studied using hydrochloric acid, nitric acid, sulfuric acid and hot water. High recovery rates were obtained with acids but not with hot water. Hot water did not desorb dysprosium. Maximum recovery rates of 86.06% and 100% were obtained for dried ginkgo leaves and mandarin-orange peels, respectively, whereas 86.40% and 96.88% were obtained for 450°C carbonized ginkgo leaves and mandarin-orange peels, respectively. This suggests that carbonization treatment has little influence on the desorption capacity of mandarin-orange peels but significantly improves the biosorption performance of ginkgo leaves and mandarin-orange peels.

Key Words : Rare Earth, organic plants wastes, carbonization, dysprosium, biosorption