

Role of Biosorbent *Ficus Religiosa* Leaf Powder (FRLP) in Chemical Speciation of Chromium: A Green Method for Separation – Pritee Goyal, Shalini Srivastava

Summary

The present study explores the unexploited sorption property of the unmodified *Ficus religiosa* leaf powder (FRLP) for decontamination and a possible method of separation of environmentally important two oxidation states of chromium (Cr(III) and Cr(VI)) from aqueous media. Sorption studies using standard practices were carried out in batch experiments as functions of biomass dosage, metal concentration, contact time, particle size and pH. Sorption studies result into the standardization of optimum conditions for the removal of Cr(III) 82.47% and Cr(VI) 88.23% as follows: biomass dosage (4.0 g), initial metal concentration in the aqueous system (Cr(III) 25 mg·dm⁻³, Cr(VI) 50 mg·dm⁻³), particle size (105 μm) at pH (Cr(III) – 6.5 and Cr(VI) – 2.5). The adsorption data were fitted in Freundlich and Langmuir isotherms. Studies of academic interest like kinetics studies revealed that adsorption equilibrium in each case followed first order equation. Morphological changes observed in the scanning electron micrograph of native and exhausted biomass indicate the existence of biosorption phenomenon. Fourier transform infrared spectrometry of exhausted leaf biomass highlights amino acid – Cr interactions responsible for sorption phenomenon. Regeneration of exhausted biomass was attempted for several cycles for its effective reusability.