

Biosorption study of radiotoxic nuclide and toxic heavy metals using green adsorbent

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[en] Our research scientifically illuminates the pioneering and successful application of the ancient Indian epitome of energy, Dry Cow Dung Powder, DCP, a combo humiresin, in its naive 'as it is form' for the bioremediation of toxic pollutants. The potential of DCP to sequester toxic heavy metal ions such as Cr(III), Cr(VI), Cd(II), Hg(II) and radionuclide ⁹⁰Sr(II) has been successfully demonstrated, employing tracer technique. The Batch equilibration method and all the important parameters such as pH, dose of sorbent, metal ion concentration, contact time, agitation speed, temperature and interference of different salts have been studied and optimized. The study on thermodynamic, kinetic and isotherm modeling of biosorption indicates that it is feasible, eco-friendly and efficient process to employ DCP for the removal of metal ions from aqueous medium. Spectroscopic analysis by FTIR and EDAX effectively explain the mechanism involved in the biosorption by DCP. The adsorption capacity and the pseudo-second order rate constant were also obtained by regression analysis. Thus DCP proves to be Eco-friendly resin for the removal of these toxic pollutants such as Cr(III), Cr(VI), Cd(II), Hg(II) and ⁹⁰Sr(II) from aqueous medium. (author)

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