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Eco-friendly waste water treatment by cow dung powder (Adsorption studies of Cr(III), Cr(VI) and Cd(II) using tracer technique)

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ABSTRACT

This explicit investigation aims to explore a green and clean alternative for the waste water treatment employing a natural biosorbent: Dry cow dung powder (DCP). The potential of DCP to sequester toxic heavy metal ions such as Cr(III), Cr(VI) and Cd(II) has been successfully demonstrated, employing Tracer Technique. We have carried out 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 kinetic studies were carried out employing various models but the best fitting was Lagergren pseudo-second order model with high Correlation coefficient R^2 values approximately of 0.997 for all three metal ions. The adsorption capacity and the pseudo-second order rate constant for Cr(III), Cr(VI) and Cd(II) was obtained by regression analysis. Thus DCP proves to be Eco-friendly resin for the heavy metal removal from aqueous medium and for waste water treatment.

Keywords: Waste water treatment; Heavy metal toxicity; Biosorbent; DCP; Eco-friendly removal; Humic acid

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