**Abstract**

Heavy metal contaminations via industrial wastewaters endure as startle pollutants due to their nondestructive nature, toxicity, bioamplification and bioaccumulation. Removal of Pb(II) from aqueous solutions using animal waste is presented in this study. Acid treatment of the collected animal waste is done, further subjected to FTIR, SEM / EDAX analysis to study the morphology and presence of surface functional groups. Prefatory batch studies are performed to experiment the effects of sorbent particle size / dosage, contact time, initial metal ion concentrations and pH of the medium. The studies reveal excellent chelating ability of the treated material with 99.9% Pb(II) removal at a pH 5, the calculated adsorption capacity being 62.32 mg/g. Desorption/ Regeneration studies are carried out to assess the quantitative aspect of the metal laden material. Isothermal verification, thermodynamic parameters and kinetics of adsorption were applied. A comparison of isothermal models viz., Langmuir, Freundlich, Tempkin and DKR reveal the fit in of linearity to be best suited for Langmuir plot. Thermodynamic studies imply the process to be favorable, exothermic and spontaneous in nature. The sorption kinetics exhibits the system to be simulated well by pseudosecond-order kinetic model. A scientific basis for monitoring the Pb(II) removal is done with statistical data verification using descriptive and ANOVA tools. The results promote the employment of chosen animal waste material as an excellent biosorbent, in trapping toxic metal ions.