**Abstract**

The current investigation deals with utilizing Treated Goat Hoof (TGH), a no cost material derived from butcher shop for the removal of Pb(II) and Cd(II) ions from aqueous media. FTIR / SEM analyses are carried out for the functional groups identification and describe the surface morphology of the chosen material respectively. Batch studies are experimented under varied operating factors viz., particle size, dosage, initial concentration, contact time and pH of the medium to assess the sorptive nature of the chosen material. Verification of the experimental data reveal the optimized conditions for the uptake of Pb(II) and Cd(II) by TGH. Langmuir model registered the best linearity amongst the isothermal plots derived for Langmuir, Freundlich and Tempkin models. Experimental results of both the systems: Pb(II) – TGH and Cd(II)- TGH are subjected to Statistical tool analyses using SPSS 20 software for significance and correlation assessment.