**Abstract**

 The present work deals with the efficiency of modified Terminalia catappa seed shell (TCSS), an agricultural waste, for the removal of Co(II) from aqueous solutions. Three methods of modifications of the sorbent material have been done and the experiments were carried out by employing batch equilibration method. The influences of variable parameters viz., particle sizes and adsorbent dosages of the sorbent material, agitation time, initial concentrations of the sorbate solutions, pH, cations, anions, co-ions and temperatures have been studied. The surface characteristic study of the modified TCSS has been supported by FT-IR, SEM and EDAX techniques. The linearity of the isothermal plots suggests that the Co(II) – TCCS system obeys Langmuir and Freundlich adsorption models.