**Abstract**

Copper is one of the prior pollutants discharged from industries like textile, mining, metallurgical and smelting operations into aqueous streams. The tolerance limit of copper in potable water has been fixed as 0.05mg/L. Exposure to higher concentration of copper causes severe mucosal irritation, widespread capillary damage, hepatic and renal damage, and irritation of the central nervous system followed by depression. Hence, the present study deals with the removal of Cu(II) from aqueous solution using naturally occurring material, *Prosopis juliflora* bark (PJB). The plant waste was chemically treated, activated and utilized for the adsorption of Cu(II) from aqueous solutions. The effect of various parameters such as pH of the solution, dosages of adsorbent, contact time and initial concentration of metal ion solution were investigated. The morphology of the adsorbent surface was analyzed using Scanning Electron Microscope (SEM) for both unloaded and loaded material. The linearity of the plot for Freundlich model suggests that the Cu(II) – PJBAC system obeyed Freundlich isotherm amongst the studied Langmuir, Freundlich and Tempkin models. The adsorption process was found to follow a pseudo second order kinetic model. The outcome of the present work indicates that the employed adsorbent has excellent sorption characteristics in the removal of Cu(II) ions.