Abstract

Recent trend of contamination of the water bodies with heavy metal pollutants from industrial activities has posed a serious threat to inhabiting life forms, both in aquatic as well as terrestrial environments. This creates an acute need to develop effective technology for the removal of these pollutants. In the present study, green filamentous algae, *Spirogyra quadrata*, was employed for biosorption of Nickel [Ni (II)] and Copper [Cu (II)] to remove these pollutants from aqueous medium. Various physico-chemical parameters were optimized; optimum pH for the biosorption of Ni (II) was found to be 4 (q_{max}=27.40mg/L) and that of Cu (II) was 5 (q_{max}= 27.54 mg/L); optimum biomass concentration was found to be 10 mg/L for both the metal ions; optimum time required for the biosorption of Ni (II) and Cu (II) was 90 and 120 minutes respectively. Various adsorption isotherm models were employed, such as Langmuir, Freundlich, and Temkin; Langmuir model was found to be most suitable which shows monolayer sorption. Pseudo-second order kinetic model was also employed to elucidate the kinetics of the process. FTIR (Fourier Transform Infra-red Spectroscopy) was also performed which revealed the presence of possible electronegative functional groups on the surface of algal wall responsible for cation binding, such as Ni (II) and Cu (II).

Keywords: biosorption, *Spirogyra*, heavy metal, kinetics, FTIR