

Biosorption of Toxic Heavy Metals by Unmodified Marine Red Alga (*Kappaphycus alvarezii*): Kinetics and Isotherm Studies.

Abstract

Present study has been undertaken to propose an alternative use of unmodified marine red alga (*Kappaphycus alvarezii*) (UMRA) as biosorbent for the removal of heavy metal ions from aqueous solutions. The biosorption studies were conducted in batch adsorption system as a function of contact time and initial metal ion concentration. The adsorption system attained equilibrium after 150 min of contact time for Pb (II), Cu (II), Zn (II) and Cd (II). The removal efficiency of red alga improved as metal ions concentrations were lowered. The equilibrium sorption data was better explained by Langmuir isotherm model suggesting that the adsorption of metal cations observed monolayer sorption pattern. Pseudo-first-order model, pseudo-second-order model and intraparticle diffusion model were utilised to test the sorption kinetics involved in the process. It was observed that pseudo-first-order kinetic model could better describe the adsorption kinetics. A comparison of maximum sorption capacity of several agro-based waste material showed that red alga can be a suitable alternative to use as biosorbent in the removal of toxic heavy metals from aqueous solutions