

Removal of Pb(II) Ions from Wastewater Using Magnetic Chitosan-Ethylene Glycol Diglycidyl Ether Beads as Adsorbent

Authors : Pyar Singh Jassal, Priti Rani, Rajni Johar

Abstract : The adsorption of Pb(II) ions from wastewater using ethylene glycol diglycidyl ether cross-linked magnetic chitosan beads (EGDE-MCB) was carried out by considering a number of parameters. The removal efficiency of the metal ion by magnetic chitosan beads (MCB) and its cross-linked derivatives depended on viz contact time, dose of the adsorbent, pH, temperature, etc. The concentration of Cd(II) at different time intervals was estimated by differential pulse anodic stripping voltammetry (DPSAV) using 797 voltametric analyzer computrace. The adsorption data could be well interpreted by Langmuir and Freundlich adsorption model. The equilibrium parameter, RL values, support that the adsorption ($0 < RL < 1$) is a favorable and spontaneous process. The thermodynamic parameters suggest that it is an exothermic reaction which results with an increase in the randomness of the adsorption process. The kinetic data of Pb(II) ions fitted well with the pseudo-second-order kinetic model. The EGDE-MCB was characterized by using FTIR, SEM, EDX, and TGA techniques. The desorption of metal ion loaded chitosan beads was performed with 0.1M ethylene diamine tetra acetic acid (EDTA) solution for further use.

Keywords : magnetic chitosan beads, ethylene glycol diglycidyl ether, equilibrium parameters, desorption

Conference Title : ICECP 2022 : International Conference on Environmental Chemical Pollution

Conference Location : Rome, Italy

Conference Dates : June 02-03, 2022