Biosorption of Cd(II) and Zn(II) by Nostoc commune: Isotherm and Kinetics Studies

Fatthy M. Morsy, Sedky H. A. Hassan, Mostafa Koutb

Abstract:

In this study, Nostoc commune (cyanobacterium) was used as an inexpensive and efficient biosorbent for Cd(II) and Zn(II) removal from aqueous solutions. The effect of various physicochemical factors on Cd(II) and Zn(II) biosorption such as pH 2.0–7.0, initial metal concentration 0.0–300 mg/L and contact time 0–120 min were studied. Optimum pH for removal of Cd(II) and Zn(II) was 6.0, while the contact time was 30 min at room temperature. The nature of biosorbent and metal ion interaction was evaluated by infrared (IR) technique. IR analysis of bacterial biomass revealed the presence of amino, carboxyl, hydroxyl, and carbonyl groups, which are responsible for biosorption of Cd(II) and Zn (II). The maximum biosorption capacities for Cd(II) and Zn(II) biosorption by N. commune calculated from Langmuir biosorption isotherm were 126.32 and 115.41 mg/g, respectively. The biosorption isotherm for two biosorbents fitted well with Freundlich isotherm than Langmuir model with correlation coefficient ($r^2$)

Published In: