

## Abstract

In the present investigation, dead bacterium biomass *Streptomyces rimosus* was used as an inexpensive and efficient biosorbent for Cr (III) removal from aqueous solution. The bacterial biomass was treated with 0.1 M NaOH. Sorption level of 65 mg/g was observed at pH 4.8 while precipitation effect augmented this value at higher pH range. Chromium desorption increased with decreasing desorption agents pH (including HCl and H<sub>2</sub>SO<sub>4</sub>) to a maximum value of 95% at approximately zero pH. Langmuir, Freundlich and Temkin models were applied to describe the biosorption isotherm of the metal ions by *Streptomyces rimosus* biomass. Langmuir model fitted the equilibrium data better than the Freundlich isotherm. Maximum metal uptake  $q_{max}$  was observed as 83.33 mg g<sup>-1</sup> indicate good biosorbents than other biomass. Experimental data were also tested in terms of biosorption kinetics using fractional power, Elovich, pseudo-first order and pseudo-second order rate expressions. The results showed that the biosorption processes followed well pseudo-second-order kinetics and the intra-particle diffusion is not the rate-limiting step for the whole reaction