BATCH ZINC BIOSORPTION BY A BACTERIAL NONLIVING STREPTOMYCES RIMOSUS BIOMASS

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AbstractÐThe zinc biosorption capacity of a Streptomyces rimosus biomass was studied in the batch mode. After a heat pretreatment, optimum conditions of biosorption were found to be: an average saturation contact time of 4 h, a biomass particle size between 140 and 250 mm, the ambient temperature, a stirring speed of 250 rpm, and pH of 7.5. The equilibrium data could be ®tted by a Langmuir isotherm equation. Under these optimal conditions, up to 30 mgZn/gbiomass, was ®xed. Moreover, additional chemical treatment of the biomass by NaOH (1 mol/L), increased the biosorption capacity of about 80 mgZn/gbiomass. # 1999 Elsevier Science Ltd. All rights reserved

Key wordsÐzinc, Streptomyces rimosus, biosorption, heavy metals

SYMBOLS

[A]: Adsorbate in solution concentration (mol/L)
C_b: Biomass concentration (g/L)
C_e: Zn(II) residual concentration at equilibrium (mg/L)
C_o: Zn(II) initial concentration (mg/L)
C_s: Zn(II) concentration on surface sites (mg/L)
C_t: Zn(II) residual concentration at time t (mg/L)
K: Kinetic constant (min^{-1})
K_{ads}: Langmuir isotherm coe•cient corresponding to the enthalpy of adsorption (L3/mol)
pH_i: Initial pH
PS: Biomass particle size (mm)
Surf: Speci®c surface area (m^{-2})
[SA]: Adsorbate concentration on surface sites (mol/L)
[ST]: Maximum concentration of surface sites (mol/L)
t: Time for biosorption (s)
T: Temperature (8C)
G_e: Surface concentration at equilibrium (mg/g)