"Gheorghe Asachi" Technical University of Iasi, Romania

BIOSORPTION OF Cd(II) FROM AQUEOUS SOLUTION ON MARINE GREEN ALGAE BIOMASS

Marius Lupea, Laura Bulgariu[∗], Matei Macoveanu

Technical University Gheorghe Asachi of Iasi, Faculty of Chemical Engineering and Environmental Protection, Department of Environmental Engineering and Management, 73 D. Mangeron, 700050 Iasi, Romania

Abstract

In this study the marine green algae (*Ulva lactuca sp*.) was used as low-cost sorbent for the removal of Cd(II) ions from aqueous solution. The biosorption of Cd(II) on marine green algae was investigated as a function of initial solution pH, sorbent dose, initial Cd(II) concentration and contact time, in batch experiments at room temperature (20±0.5°C). About 0.2 g of marine green algae biomass was found to be enough to remove 85% of 67.57mg/L Cd(II) from 25 mL aqueous solution in 30 min, at initial solution pH of 5.0, considered to be optimum. The Langmuir and Freundlich isotherm models were used to describe the biosorption equilibrium of Cd(II) on marine green algae biomass. The experimental data gave good fit with Langmuir isotherm model, and the parameters deduced from this model agree with the conditions of favourable biosorption. The pseudo-first order and pseudo-second order kinetic models were used to correlate the experimental data. The kinetics parameters were determined for both models, and the pseudo-second order equation was found to be more suitable. The analysis of FT-IR spectra suggest that amido, hydroxyl, C–O and C=O could interact with Cd(II) ions, during of biosorption process.

Key words: biosorption, Cd(II) ions, isotherm, kinetics, marine green algae biomass

Received: September, 2011; Revised final: February, 2012; Accepted: March, 2012

[∗] Author to whom all correspondence should be addressed: e-mail: lbulg@ch.tuiasi.ro