



Biosorption of Cu(II) on the *Pleurotus ostreatus*: Equilibrium, Kinetic and Thermodynamic Studies

Ümmühan Daniş^{1,*}, Ensar Oğuz², Yusuf Kaya³

¹*Ondokuz Mayıs University, Engineering Faculty, Department of Chemical, 55139, Kurupelit, Samsun, Turkey;*

²*Atatürk University, Department of Environmental Engineering, 25240, Erzurum/Turkey;* ³*Atatürk University, Science and Letters Faculty, Department of Biology, 25240, Erzurum/ Turkey,*

Received November 18, 2013; Accepted December 19, 2013

Abstract: In this study, The biosorption process was carried out in a batch process and the effects of contact time (1-30 min.), initial pH (2-5.4), initial metal ion concentration (30-250 mg L⁻¹), agitation speed(50-200 rpm), biosorbent dosage (0.05-0.25 g) and temperature (298-328 K) on the biosorption were investigated. Electrophoretic studies which were measured at various pHs showed that the presence of the metal affected the zeta potential profiles. The efficiencies of Cu(II) removal from aqueous solutions increased with the increase of pH, agitation speed, and temperature. A pseudo second order reaction model provided the best description of the data with a correlation coefficient 0.97-0.99 for different initial metal concentrations and temperatures. The isothermal data could be described well by the langmuir equatious and monolayer capacity had a mean value of 31.57 mg g⁻¹ at 298 K. Thermodynamic parameters indicated that biosorption of Cu(II) on *P.ostreatus* was endothermic and spontaneous. The activation energy of biosorption (*E_a*) was determined as 21.45 kJ/mol using the Arrhenius equation.

Keywords: *Biosorption, copper, mushroom, isotherm, kinetic, equilibrium, thermodynamic*

*Corresponding: E-Mail: ummuhanster@gmail.com Tel: +90 362 1919-1342, Fax: +90 362 457 60 35