

Biosorption of copper(II) from aqueous solutions by *Pleurotus cornucopiae*

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ABSTRACT

Pleurotus cornucopiae was used as biosorbent for the adsorption of Cu(II) ions in water. The adsorption process was carried out in a batch process and the effects of contact time, initial pH, initial Cu(II) ion concentration, adsorbent amount on the adsorption were investigated. The removal percentage of Cu(II) was increased with an increase in pH, biomass concentration and a decrease in Cu(II). *Pleurotus cornucopiae* exhibited the highest Cu(II) uptake of 25.25 mg·g⁻¹ of biomass at pH 5 in the presence of 100 mg l⁻¹ Cu(II) at 298°K. The experimental isotherm data were analysed using the Langmuir, Freundlich and Temkin equations. It was observed that Langmuir model exhibited the best fit to experimental data. The experimental data were analysed using four sorption kinetic models the pseudo first and second order equations, and the Elovich and the intraparticle diffusion equation to determine the best fit equation for the biosorption of Cu(II) ions onto *Pleurotus cornucopiae*. Pseudo second order model described well the sorption kinetic of Cu(II) ions in comparison to pseudo first order, Elovich equation and intraparticle diffusion kinetic model. Fourier transform infrared analysis revealed that hydroxyl, carboxyl, amino functional groups were mainly responsible for Cu(II) biosorption.

Keywords: Biosorption; Copper; Equilibrium studies; Kinetic studies
