

## Nickel removal from aqueous solution by non-living *Pleurotus mutilus*: kinetic, equilibrium, and thermodynamic studies

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### ABSTRACT/RESUME

**Abstract:** Fungal biomass is cost-efficient and efficient biosorbent for heavy metals removal. In this paper the ability of fungal biomass *Pleurotus mutilus* (filamentous fungi) to remove Ni(II) from aqueous solutions has been undertaken. The speciation of Ni(II) was modeled and the most probable precipitates forming were predicted using visual MINTEQ. The surface of fungal biomass was characterized by  $pH_{PZC}$  determination, and Boehm and potentiometric titrations. The effects of various physico-chemical factors on Ni(II) biosorption were investigated. The optimum pH for Ni(II) removal was achieved at pH 8.0. The maximum adsorption capacity calculated from Langmuir adsorption isotherm was 47.169 mg/g. The adsorption isotherms fitted the data in the order: Dubinin-Radushkevich > Temkin > Freundlich > Langmuir. The biosorption kinetic data were fitted well with the pseudo-second-order kinetic model. The negative values of Gibbs free energy ( $\Delta G^0$ ) indicate the feasible and spontaneous adsorption of nickel.

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