

## Comparative study of biosorption of $\text{Cu}^{+2}$ , $\text{Ni}^{+2}$ , $\text{Cd}^{+2}$ , $\text{Zn}^{+2}$ and $\text{Co}^{+2}$ ions on the *Pleurotus mutilus* biomass

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### ABSTRACT/RESUME

**Abstract :** In this study the biomass *Pleurotus mutilus* was used for the biosorption of  $\text{Cu}^{2+}$ ,  $\text{Ni}^{2+}$ ,  $\text{Cd}^{2+}$ ,  $\text{Zn}^{2+}$  and  $\text{Co}^{2+}$  ions. The effect of different parameters such as contact time, adsorbate concentration, pH of the medium and temperature were investigated. The sorption capacities were in the order of  $\text{Cd}^{2+} > \text{Zn}^{2+} > \text{Co}^{2+} > \text{Cu}^{2+} > \text{Ni}^{2+}$ . This order can be explained by their different values of affinities respectively. In order to prediction of the rate controlling step (external or internal mass transfer), Boyd model was used in all case. Results showed that the external mass transfer is the rate controlling step. Different thermodynamic parameters such as enthalpy and entropy and change in standard free energy have also been evaluated and it has been found that the reaction was spontaneous and exothermic in nature. The Freundlich, Langmuir, Temkin and Dubinin-Raduskovich adsorption models were used for the mathematical description of the biosorption equilibrium.

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