Dry *Trichoderma* biomass: biosorption behavior for the treatment of toxic heavy metal ions

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**ABSTRACT**

The dried biomass of *Trichoderma* sp. was investigated to remove toxic heavy metal ions using the batch method in the concentration range of 0.5 to 2.0 mg/L at different pH. The biosorption capacity of *Trichoderma* biomass was found to be pH dependent. Biosorption of nickel at pH 10 was observed 20% higher than at pH 2. The maximum sorption (91%) for Cd(II) was achieved (0.45 mg cadmium/g biomass) at pH 10 within 72 h equilibrium time. The maximum sorption capacity of Cr(VI) was achieved (0.053 mg chromium/g biomass) upon equilibration after 72 h. In comparison with nickel and cadmium, the biosorption of chromium was found to be pH independent, while nickel and cadmium showed a higher absorption capacity at higher pH. In addition, Freundlich and Langmuir adsorption isotherms were used to verify the biosorption performance of *Trichoderma* biomass. Langmuir adsorption isotherm was found to be fit better than Freundlich adsorption isotherm. The dried biomass of *Trichoderma* has been fruitfully applied for the removal and recovery of Ni (II), Cd(II), and Cr(VI) ions. Thus, it can be successfully used for the treatment of toxic heavy metal ions from the industrial effluents as well as natural waters.

**Keywords:** Biosorption; Freundlich adsorption isotherm; Langmuir adsorption isotherm; FAAS; Removal of metal ions