

Kinetic and thermodynamic study for the removal of cadmium(II) ions from aqueous media by *Aucoumea klaineana* sawdust

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ABSTRACT

In this study, the biosorption by *Aucoumea klaineana* sawdust (AS) of cadmium(II) ions, from aqueous media was investigated under various operating conditions in a batch process. The influence of operating conditions such as initial concentration, ionic strength, initial pH solution, temperature, biosorbent dose, and biosorbent particle size on cadmium(II) ions removal by biosorption on AS is discussed. It was found that the equilibrium time at initial concentrations from 25 to 150 mg/L, was from 10 to 30 min, respectively. Pseudo-first-order, pseudo-second-order and Elovich models were used to fit the experimental data. The obtained results indicate that the biosorption system obeyed a pseudo-second-order kinetics model ($r \geq 0.987$). In addition, thermodynamic parameters such as ΔG° , ΔH° , and ΔS° were calculated. The thermodynamic study of biosorption isotherm indicated that the biosorption of cadmium(II) ions is spontaneous ($\Delta G^\circ < 0$) and endothermic ($\Delta H^\circ > 0$) process.

Keywords: *Aucoumea klaineana* sawdust; Cadmium(II); Kinetic; Modeling; Thermodynamic

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