



Effect of competitive interference on biosorption of cadmium by immobilized *Lentinus edodes* residue

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ABSTRACT

Use polyvinyl alcohol-Na-alginate (PVA-SA) to immobilize *Lentinus edodes* residue for Cd²⁺ removal. In a single-metal solution, the biosorption of Cd²⁺ reached equilibrium within 7 h which can be well described by a pseudo-second-order model, with equilibrium biosorption 0.2008 mg/g; 4–7 was the suitable pH value for Cd²⁺ biosorption by immobilized fungus, a much wider range than that required by mobilized fungus. Unlike the single-metal solution, the Cd²⁺ biosorption ratio in a two-metal solution increased linearly as the pH values increased. When the concentration of the interferential ion (Cu²⁺/Pb²⁺) increased, Cd²⁺ biosorption decreased significantly ($p = 0.01$). Isotherm analysis showed that Cd²⁺ biosorption increased as the initial concentration in a single-metal solution increased. When the initial Cd²⁺ concentration in the two-metal solution increased, the biosorption increased at first, but when the Cd²⁺ concentration was over 90 mg/g, a remarkable decrease occurred. Langmuir, Freundlich, Dubinin–Radushkevich and Langmuir–Freundlich isotherm models were fit to the experimental data. The Langmuir model fit the Cd²⁺ isotherm biosorption best, with correlation coefficients of 0.9981 in Cd²⁺ single-metal solution and 0.9291 in a Cd²⁺–Pb²⁺ solution. The D–R isotherm fit the Cd²⁺ isotherm biosorption in the Cd²⁺–Cu²⁺ solution with a correlation coefficient of 0.9623.

Keywords: Immobilization; *L. edodes*; Two-metal solution; Interference; Cd²⁺; Biosorption isotherm

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