عنوان مقاله:

Biosorption of Fe (III) onto coffee and tea powder: Equilibrium and kinetic study

محل انتشار:

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خلاصه مقاله:

The coffee and tea powders were investigated to be as a novel low-cost non-conventional biosorbent for the removal of Fe (III) from aqueous solutions. Biosorption isotherms and kinetics were also assessed. The studied operating parameters were initial Fe (III) concentration, contact time, pH, and biosorbent dose. The adsorption capacity was significantly increased from ۹.۱۸ mg/g to ۵۴.۱۴ mg/g when the initial metal ion concentration increased from ۲۰ to ۱۲۰ ppm. However, the adsorbed amount of Fe was improved from ۲.۲۹ to ۲۳.۳۱ mg/g when the biosorbent dose decreased from ۱.۰ to ۰.۱ g. Biosorption isothermal data could be well simulated by Langmuir, Freundlich, and then Temkin models denoted by high correlation coefficient values (R۲ > ۰.۹۵). However, the Dubinin-Radushkevich isotherms model gives the least fit to experimental data. Langmuir adsorption capacities of coffee and tea were ۸۵.۵ and ۲۸۵ mg/g, respectively. The kinetic data fitted very well to the pseudo-second-order kinetic model. As indicated by the biosorption capacity, coffee and tea powder are considered to be an efficient, low cost, and environmentally friendly biosorbent for the removal of Fe (III) ions from aqueous solutions.

کلمات کلیدی:

Biosorption, Iron, Isotherms model, Kinetics