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Feasibility of metal adsorption using Brown algae and fungi: effect of biosorbents structure on adsorption isotherm and kinetics

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Abstract

Three brown algae and one fungus (*Cytosiera compressa*, *Sargassum vulgare*, *Turbinaria* and *Agaricus campestris*) were evaluated as biosorbents in wastewater treatment containing copper and lead ions in a dynamic process under stirring condition at 200 rpm. The influences of biosorbents amounts, immersion time, initial metal ions concentration, and pH were determined on the efficiency of the metal ions adsorption process. The efficiency of the different biosorbents was increased by increasing the amount of biosorbents, immersion time and low initial metal ions concentration. Variation of the pH of the medium has a great influence on the efficiency of the adsorption process with the maximum removal at pH=8. The process obeyed Freundlich adsorption isotherm and second order kinetic model. The kinetic study showed the process occurred through three steps according to intraparticle diffusion process. The biochemical structures of the different biosorbents had a great influence on their efficiency of the metal ions removal.

Keywords

Brown algae; biosorbent; metal remediation; adsorption models; Freundlich; intraparticle model

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