



MARINE MICRO AND MACRO ALGAL SPECIES AS BIOSORBENTS FOR HEAVY METALS

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Abstract

This paper reviews some practical aspects of the application of algal biomass for the biosorption of heavy metals from wastewater. The ability of different algal species to remove metals varies with algal group and morphology, with the speciation of specific metals and their competition with others in wastewater, and with environmental or process factors. The scattered literature on the uptake of heavy metals by both living and dead algal biomass - both macroalgae and immobilized microalgae - has been reviewed, and the uptake capacity and efficiency of different species, as well as what is known about the mechanisms of biosorption, are presented. Data on metal uptake have commonly been fitted to equilibrium models, such as the Langmuir and Freundlich isotherm models, and the parameters of these models permit the uptake capacity of different algal species under different process conditions to be compared. Higher uptake capacities have been found for brown algae than for red and green algae. Kelps and fucoids are the most important groups of algae used for biosorption of heavy metals, probably because of their abundant cell wall polysaccharides and extracellular polymers. Another important practical aspect is the possibility of re-using algal biomass in several adsorption/desorption cycles (up to 10 have been used with *Sargassum spp*), and the influence of morphology and environmental conditions on the re-usability of algal tissue is also considered.

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