

## Biosorption and Elution of Heavy Metals by Seaweed Biomass

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### Abstract

Heavy metals contaminated wastewaters are originated from mining, metal plate, dyestuff, electronic, and petroleum industries. Although conventional heavy metal treatment processes can remove heavy metals from wastewater easily in its high concentration condition, it is difficult to be an attractive alternative in low concentration condition. To remove low concentration heavy metal ions from the water solution effectively, biosorption process has been proposed recently. In this study, characteristics of biosorption and elution of heavy metals, lead and cadmium, by marine algae, *Laminaria japonica* and *Undaria pinnatifida*, were examined. The biosorption capacity of lead by *L. japonica* was achieved up to 30% of its own weight and proportional to the initial lead concentration. Ion exchange reaction between lead ions and calcium ions was observed on lead biosorption with Ca-loaded biomass. In *U. pinnatifida*, there were similar results for biosorption of lead and calcium ions. Stoichiometric coefficient, which can represent the exchange ratio between metal ions and protons during elution process, was proposed to understand the mechanism of elution in this experiments. In case of lead and *L. japonica*, it was determined as 1.39. Therefore, it was concluded that the reaction between lead ions already attached in biomass and protons in bulk solution was not fully stoichiometric ion exchange relation at elution process.

### References

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