

### **143r Chemical Modification of Sargassum Sp. for Enhancement of Heavy Metal Biosorption**

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Significantly high amount of organic leaching has been observed in treatment and recovery of heavy metals by raw biosorbents. This has limited wide application of biosorption process even though it has excellent metal uptake capacity and kinetics. In this study, sodium hydroxide, hydrochloric acid, calcium chloride, formaldehyde, and glutaraldehyde are employed for modification of locally derived raw seaweed (RSW), *Sargassum* sp. so that the modified seaweeds (MSW) have lower organic leaching while the metal biosorption capacity is maintained. It is found that 0.2 % formaldehyde is the best option in the chemical modifications. The organic content of the filtrated water samples is only 3.84 mg/L TOC, 80 % less than that when the RSW is used. The metal biosorption capacity is also greatly improved, while the uptake kinetics is similar to that of the RSW. The metal biosorption follows a descending sequence: lead > copper > zinc > cadmium > nickel. Higher pH would cause higher metal biosorption. Ion exchange plays an important role in the metal uptake. A surface diffusion model well describes the biosorption kinetics. It is found that 0.2 M hydrochloric acid is the best in the metal desorption. Approximately 90 % of metal ions can be eluted from the biosorbent; the desorption is completed with 20 min. A five-cycle operation of metal sorption and desorption confirms that the MSW is much better than the RSW.