Entrapment of marine micro alga, Isochrysis galbana for biosorption of Cr (III) from aqueous solution: Isotherms and spectroscopic characterization

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Micro alga, Isochrysis galbana biomass was entrapped into alginate gel by liquid curing method in the presence of Ca (II) ions. The Biosorption of Chromium (III) by the entrapped live algal biomass has been studied in a batch system. The effect of initial cadmium concentration, pH, temperature and Liquid and Solid ratio on Cr(III) removal has been investigated. The maximum experimental biosorption capacities for entrapped live algal biomass found to be 335.27 mg Cr (III) g⁻¹ of dry algal biomass. The kinetics of Chromium biosorption was slow; approximately 75% of Biosorption takes place in 2 hours. The percent adsorption increased with increase in pH, at pH 5 of the solution were found to favor adsorption very strongly. The equilibrium biosorption data was evaluated by Langmuir, Freundlich isotherm models, and was best described by Langmuir and Freundlich isotherms. The biosorbent was characterized and evaluated, the functional groups –OH, –COOH and C=O were involved in the biosorption process. Since binding capacity was relatively high for immobilized live algal biomass, those algal forms are to be considered as suitable biosorbent for the removal of chromium in wastewater treatment.

Keywords: Biosorption, Marine micro alga, Immobilization, Isotherms, Characterization

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