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THERMODYNAMICS, KINETICS AND EQUILIBRIUM STUDIES OF URANIUM SORPTION BY *Gracilaria corticata* RED ALGA

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Abstract

In this research capability of uranium biosorption by dried biomass of the red algae was investigated in a batch system. For the screening of the appropriate biosorbent they were placed in different pH against the 0.5 mmol/L uranium solution for 3hrs contact times. The obtained results showed that the species of the *Gracilaria corticata* (*J. Agardh*) having the maximum rate of the biosorption. Sorption equilibrium was reached within 3hrs contact times (at pH 4.5), and the results of the kinetic studies showed that the sorption of uranium followed pseudo-second order kinetics ($R^2=0.999$). The maximum uranium biosorption capacity (q_{max}) by *Gracilaria corticata* alga was 200 mg/g. The biosorption of uranium was found as endothermic process with ΔH° of +0.260 kJ/mol. The values of ΔG° (293K) and ΔS° obtained -0.504 kJ/mol and +1.083 J/mol.K respectively. The feasibility and spontaneous nature of the sorption process elucidated by these values. Freundlich isotherm constants, K_F and n , were found 0.72 and 0.94 respectively ($R^2=0.988$).

Key words: biosorption, *Gracilaria corticata*, kinetics, thermodynamics, uranium

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