

## Removal of $\text{Cr}^{6+}$ , $\text{Co}^{2+}$ and $\text{Ni}^{2+}$ Ions from Aqueous Solutions by Algerian *Enteromorpha compressa* (L.) Biomass

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**Abstract :** The marine *Enteromorpha Compressa* (L.) (ECL) biomass was used as a low-cost biological adsorbent for the removal of  $\text{Cr}^{6+}$ ,  $\text{Co}^{2+}$  and  $\text{Ni}^{2+}$  ions from artificially contaminated aqueous solutions. The operating variables pH, the initial concentration  $\text{C}_0$ , the solid/liquid ratio R and the temperature T were studied. A full factorial experimental design technique enabled us to obtain a mathematical model describing the adsorption of  $\text{Cr}^{6+}$ ,  $\text{Co}^{2+}$  and  $\text{Ni}^{2+}$  ions and to study the main effects and interactions among operational parameters. The equilibrium isotherm has been analyzed by Langmuir, Freundlich, and Dubinin-Radushkevich models; it has been found that the adsorption process follows the Langmuir model for the used ions. Kinetic studies showed that the pseudo-second-order model correlates our experimental data. Thermodynamic parameters showed the endothermic heat of adsorption and the spontaneity of the adsorption process for  $\text{Cr}^{6+}$  ions and exothermic heat of adsorption for  $\text{Co}^{2+}$  and  $\text{Ni}^{2+}$  ions.

**Keywords :** enteromorpha Compressa, adsorption process,  $\text{Cr}^{6+}$ ,  $\text{Co}^{2+}$  and  $\text{Ni}^{2+}$ , equilibrium isotherm

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