

## Evaluation of Lead II Adsorption in Porous Structures Manufactured from Chitosan, Hydroxiapatite and Moringa

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**Abstract :** Heavy metals present in wastewater constitute a danger for living beings in general. In Ecuador, one of the sources of contamination is artisanal mining whose liquid effluents, in many of the cases without prior treatment, are discharged to the surrounding rivers. Lead is a pollutant that accumulated in the body causes severe health effects. Nowadays, there are several treatment methods to reduce this pollutant. The aim of this study is to reduce the concentration of lead II through the use of a porous material formed by a matrix of chitosan, in which hydroxyapatite and moringa particles smaller than 53  $\mu\text{m}$  are suspended. These materials are not toxic to the environment, and each one adsorbs metals independently, so the synergic effect between them will be evaluated. The synthesized material has a cylindrical design that allows increasing the surface area, which is expected to have greater capacity of adsorption. It has been determined that the best conditions for its preparation are to dissolve the chitosan in 1% v/v acetic acid with a pH = 5, then the hydroxyapatite and moringa are added to the mixture with magnetic stirring. This suspension is frozen, lyophilized and finally dried. In order to evaluate the performance of the synthesized material, synthetic solutions of lead are prepared at different concentrations, and the percentage of removal is evaluated. It is expected to have an effluent whose lead content is less than 0.2 mg/L which is the limit maximum allowable according to established environmental standards.

**Keywords :** adsorption, chitosan, hydroxyapatite, lead, moringa, water treatment

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