

BOOK OF ABSTRACTS

8TH MEETING OF YOUNG RESEARCHERS
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Chondroitin sulfate or fucoidan crosslinked with a sol – gel network as sorbents for metal cations.

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Chondroitin sulfate (CS) and Fucoidan (Fd) are compounds of marine origin extracted from the cartilage and tissues of animals and seaweed respectively [1, 2]. Both are linear acidic polysaccharide, composed of repeating disaccharide units and modified with sulfate residues at different positions.

The aim of this study took into account the valorization of marine resources by aiming at innovative applications. In this context, the reticulation of CS/Fd via a sol-gel process was explored with the purpose of preparing sorptive materials for metal cations such as Pb^{2+} , Ag^+ , Cu^{2+} and Zn^{2+} . The same process was also attempted for the molecular imprinting of target cations (Cu^{2+} and Pb^{2+}) envisaging an increase in the selectivity of the adsorbents. Simultaneously controls, corresponding to adsorbents without CS/Fd, were performed. All sorbents were structurally characterized and its efficiency in sorption of the cations under study was briefly assessed by solid phase extraction (SPE) and monitored by atomic absorption spectrophotometry (AAS).

The developed sorbents presented low surface areas (range of 4 - 6 m^2/g) and low pore volume (range of 0.003 - 0.004 cm^3/g) but the adsorbents with CS/Fd showed significant SPE retention of Cu^{2+}/Zn^{2+} (aprox. 90% and 84 % respectively) and Pb^{2+} (aprox. 70%), which demonstrated that the compounds of marine origin greatly benefit the adsorption of cations in study. The Ag^+ was the cation with lowest SPE retention with all the adsorbents (< 15%).

Sorbents composed of CS showed better retention capacity of metals as compared with sorbents composed of Fd. However the later appears to retain more strongly the cations. The molecular imprinting with CS did not increase the retention of the imprinted cation, however it increased selectivity for the metals used as templates.

The data concerning the kinetics and isotherms adsorption is currently being collected and will also be presented during the meeting.

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References:

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[2] Bo, L. et al. (2008), *Fucoidan: Structure and Bioactivity*, Molecules, 13, 1671-1695.