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STRUCTURALLY MODIFIED THREE-DIMENSIONALLY ORDERED (3DOM) ALUMINA LINKED TO SUBGLEBA OF *Handkea utriformis* FOR Pb^{2+} REMOVAL

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Water pollution is a consequence of permanent technological development, urbanization and industrialization, having a huge impact on human health and the environment. Thus, metal oxides received considerable scientific interest in the field of adsorption to reduce heavy metal contamination from water and wastewater. Three-dimensionally ordered macroporous (3DOM) alumina modified with iron oxide and (3-aminopropyl)triethoxysilane (APTES) ($(FeAl)_2O_3$-APTES) was synthesized and linked with subgleba of *Handkea utriformis* (S) through 3-(Carbomethoxy)propionyl chloride (CPC). Surface hydroxyl groups of metal oxides have an affinity for cations while the introduction of amino groups in $(FeAl)_2O_3$-APTES allows the creation of covalent attachment on subgleba. Subglebal tissue of mosaic puffball *Handkea utriformis* contains sugars, proteins and melanins i.e. a large number of functional groups that could interact with an adsorbate. The obtained adsorbent (SCPC-$(FeAl)_2O_3$-APTES) was used for Pb^{2+} removal from aqueous solutions under batch conditions, constant initial concentration of adsorbate and pH and different concentrations of the adsorbent. Composition and surface morphology were characterized by using FT-IR and SEM analysis. Concentrations of Pb^{2+}, before and after adsorption, were determined by using Atomic Absorption Spectroscopy (AAS). The nonlinear Langmuir and Freundlich isotherm models were evaluated to correlate experimental data in which best fit was achieved with the Langmuir isotherm model. The specific surface area (S_{BET}) of the subgleba was very low; porosity and S_{BET} were increased by $(FeAl)_2O_3$-APTES deposition onto SCPC, indicating the formation of porous metal oxides deposits. This modification contributed to a significant increase in adsorption capacity.

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