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Sorption affinities of chromium on natural phosphate and its derivative hydroxyapatite

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Moroccan natural phosphate and its converted hydroxyapatite were used to develop an effective adsorbent suitable for the removal of trivalent and hexavalent chromium from aqueous solution. The converted hydroxyapatite was prepared from natural phosphate and characterized using various techniques of characterization. Thus, the adsorption of Cr (III) and Cr₂O₇²⁻ ions were investigated to understand the adsorptive selectivity of two chromium oxidative degrees on natural phosphate and its derivative apatite using batch system at room temperature. The sorption results showed a high affinity of natural phosphate for the Cr₂O₇²⁻ than c-HAP contrary to Cr (III) adsorption related to the presence of silica groups present in natural phosphate while the converted apatite has a good affinity for Cr (III) ions. The adsorption behavior of both adsorbent fitted the Langmuir and Freundlich isotherm models implying that the adsorption mostly occurred through a heterogeneous binding of metal to the surface of the adsorbent.

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