

Surface properties of Moroccan natural phosphate and its converted hydroxyapatite for adsorption of $\text{Cr}^{3+}/\text{Cr}_2\text{O}_7^{2-}$ ions: Kinetics and isotherms

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ABSTRACT

Surface of the natural phosphate and its converted hydroxyapatite was evaluated to develop an effective adsorbent suitable for the removal of individual oxymetal of Cr^{6+} and Cr^{3+} ions using batch system at room temperature. The converted hydroxyapatite was prepared from natural phosphate and characterized using various techniques. The experimental results suggest that several active sites exist on natural and synthetic apatite surfaces. They showed a high affinity of natural phosphate for the $\text{Cr}_2\text{O}_7^{2-}$ ions than c-HAP contrary to that of Cr^{3+} ions related to the presence of silica in natural adsorbent while the converted apatite has a good affinity for Cr^{3+} ions. The difference in adsorptive capacities is also related to the oxidation state of chromium and surface charge, which are effective parameters for Cr uptake on the natural and synthetic apatite.

Keywords: Phosphate rock; Converted hydroxyapatite; Surface property; Chromium; Adsorption

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