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Evaluation of the Adsorption of Hexavalent Chromium on Kaolinite and Illite

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ABSTRACT

The adsorption of hexavalent chromium on Kaolinite and Illite was studied in order to evaluate their potential for the reduction of hexavalent chromium mobility and their possible application for the treatment of polluted sediment. The influence of various parameters affecting the adsorption of hexavalent chromium, such as the pH of aqueous solution, the ionic strength and the initial metal ion concentration were investigated. The optimal pH range corresponding to the hexavalent chromium adsorption maximum on the Kaolinite and Illite is 2 - 4 and 2 - 2.6, respectively. The results showed that hexavalent chromium sorption on Kaolinite and Illite was strongly influenced by the pH, the ionic strength and the initial metal ion concentration. Langmuir and Freundlich adsorption isotherms are employed to understand the nature of adsorption at room temperature. The characteristic parameters for each isotherm have been determined. This showed that the Freundlich isotherm model well described the equilibrium data. The data suggest that the charge of the clay mineral surface is one of the main factors controlling hexavalent chromium desorption at alkaline pHs.

KEYWORDS

Hexavalent Chromium, Clay Mineral, Sediment, Adsorption, Stabilization

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