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The Effect of 4-Sulfonic Calix[6]arene on UO₂²⁺ Adsorption onto Goethite

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Abstract

The adsorption of UO₂²⁺ and 4-sulfonic calix[6]arene onto goethite, respectively, was well simulated by the triple layer model. With a inner-sphere surface complex of SOUO₂⁺ (log = 2.736), where SOH is the surface functional group, the model successfully explained the pH dependence of the UO₂²⁺ adsorption onto goethite. In the case of 4-sulfonic calix[6]arene, three outer-sphere surface complexes (SOH₂⁺-CalH₆, SOH₂⁺-CalH₅⁻ and SOH₂⁺-CalH₄²⁻) were assumed to be formed. This model well predicted the dominant adsorption of 4-sulfonic calix[6]arene onto goethite in the acidic condition. In the presence of 4-sulfonic calix[6]arene the adsorption of UO₂²⁺ onto goethite decreased in the neutral and alkaline conditions.

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Basic Assumptions and Safety/Technical Criteria for A Reference Geological Repository System

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Abstract

This paper presents basic assumptions and safety/technical criteria that are being used as guidelines in developing a reference geological repository system. These should be continuously revised based on more specific information collected from the site characterization processes and the repository system design and performance assessments to be carried out in the future. It is also important to investigate closely the other countries repository concepts and safety and technical criteria that would be developed further.