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Surface complexation modeling for Eu adsorption on granite

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It is planned that the high-level nuclear waste caused by nuclear electricity generation is isolated deep underground from the human environment by the geological disposal. AThe radionuclide Migration of radioactive nuclidetransfer to the human environmentbiosphere is prevented by the multi-barrier system which is composed of the artificial engineered barrier and the natural barrier. The artificial barrier is composed of the steel overpack and the bentonite.The natural barrier is composed of laying underground to underground many hundreds of meter restoration. After disposal of the high-level nuclear waste, the function of the artificial engineered barrier will lose the desired functionsis seemed to last probably up to one thousand years. Adsorption of the radionuclide on a rock bed is expected to play an important role in afor the retardation migration retardant of it when the artificial barrier becomes depleted and the radionuclide is released into a native environmentfrom the engineered barrier. Although aAdsorption of the radionuclide on a rock bed is an important process to value a safety offor the safety assessment of the geological disposal. Adsorption of the radionuclide is influenced by solution conditions such as pH, ionic strength, adsorbent and adsorbate. So to value to predict thea safety of the adsorption characteristics of adsorption radionuclide on a rock bed, it is needed to predict thean adsorption behavior is needed to be expected in various water quality environment. Surface complexation models modeling are is the suitable method to handle quantitatively absorption of solute to on a the rock bed (minerals).

This study is aimed at ato building construct the method which is based on surface complexation models to predict expept the an absorption behavior of unclear radionuclide species on a rock bed based on surface complexation modeling. In present study, granite is used for tThe adsorbent, while europium which has strong adsorptive property like some actinides species is selected to the solute granite and the adsorbate is Eu which has strong adsorptive property. The calculation model of adsorption is tried to lie, based on the analysis of the surface charge of a granite and the adsorption behavior of Eu.A granite which was stamped in Mizunami Underground Research Laboratory is used.

This study is the collaboration with the Japan Atomic Energy Agency.

Keywords: adsorption