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Desorption behavior of cesium (133 and 137Cs) from the clay minerals distributed around the Power Plant

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In 11 March 2011, Tohoku region Pacific Ocean earthquake occurred and Fukushima Daiichi nuclear power plant caused a steam explosion. AAnd a large amounts of radioactive material was were released around nuclear power plant. Among the released radioactive material, from the total emissions and half-life, a major cause of soil pollution around nuclear power plant has been said to beis radioactive cesium (Cs).

Extensive radioactive Cs around nuclear power plants have been identified retained in the fine materials of the soil surface and. the The layered clay minerals such as smectite, vermiculate and illite contained in the universal soil is are pointed out that considered to be the main uptake medium Csa for radioactive Cs. Soil of Fukushima Prefecture has Abukuma granite and host rock, smectite, vermiculite, the presence of illite has been confirmed is the layered clay mineral is its weathering products.Host rock of soil of Fukushima Prefecture is in Abukuma granite.having a layered clay mineral which is a weathering product, smectite, vermiculite, illite presence has been confirmed. Layered These clay minerals has possess a the layered crystal structure and hydrated cations held in the interlayer, which can be exchanged with the foreign cations in solution. For a particularly high affinity for the Cs+ to these clay minerals,Therefore, Cs emitted by the nuclear accident is expected that it isto be firmly held between the layers of the layered clay minerals.

However, if the concentrations of the foreign main cations in the solution is are high concentration, the retained Cs+ by exchange with firmly held Cs+ is a also other cations may be leachedin the clay minerals is possibly released to the solutions. Natural water the clay particles are contacted in naturegenerally contains a wide variety of the major cations at different concentrations. Thus radioactive Cs which is adsorbed on the natural soil it is feared eluting natural environment. To the understanding of the dynamics of radioactive Cs in the environment, the understanding of Cs leaching desorption behavior by major cation from natural soil is essential. This study, by using a soil clay distributed around the Fukushima Daiichi nuclear power plant, was intended to systematically verify the desorption behavior of Cs from the soil clay minerals distributed around the Fukushima Daiichi Power Nuclear Plant by adding the majorin cation.