

Original

On-site Elimination Experiments of Cesium Ions by a Mini-Field Plant for Reducing Volume of Radioactively Contaminated Soil

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Summary

It is an urgent problem to reduce the volume of a huge amount of contaminated soil that was accumulated after the accident at the Fukushima nuclear power plant in 2011. In this paper, we reported the results when we performed the experiment in the mini-field plant at Fukushima in order to eliminate radioactive Cs ions out of contaminated soil. A contaminated soil on a scale of 1~3 kg was treated with magnesium chloride, sulfuric acid and oxalic acid. As a typical experiment, 3 kg of soil contaminated at the radioactive level of 39,500 Bq/kg was treated by sulfuric acid (c.a. 8M). After the mixture was decanted and centrifuged, 80% of radioactive Cs⁺ ions were desorbed into the water phase, leaving 2.7 kg of soil at the radioactive level of 2,800 Bq/kg. The contaminated water at 1,435 Bq/kg was purified down to 2.48 Bq/kg by being passed through a column packed with 2 kg of mordenite. The final volume reduction ratio was attained to be 1/16.

Key Words: Cesium ion, Desorption, Volume reduction, Mordenite, Vermiculite
