

On Site Removal of Radioactive Contamination by Circulating Salt Solution in Contaminated Soil

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Summary

A method to collect radioactive material on site effectively without removing surface soil was studied. Cesium which bound to the soil electrostatically was solubilized by circulating a salt solution in the soil. Half molar ammonium acetate was used for circulation. On the other hand, cesium which bound to the soil strongly was removed effectively by collecting fine particles of the soil. The fine particles adsorb much cesium, because the surface area of such a fine particles is relatively large. A salt solution was poured into the soil through a large number of pipes. The solution which leached out was collected with a different pipe at the surface of the soil. The collected solution was supplied again to the injection pipes. Two or three times of one-hour circulation was performed. The fine particles were collected using a filter paper. The fine particles and remaining soil were dried at 140°C for 20 hours. Radioactivity was measured about the filtrate, the fine particles and the residual soil. When water was used for circulation the dissolved radioactive material was around 3%. In this case around 16 % of radioactive material was included in the fine particles. When 0.5M ammonium acetate solution including the alginic acid (200 mg/L) was used for circulation liquid, 12 % of radioactive material dissolved. In this case the radioactive material collected in the circulation liquid and the fine particles was 42 %. On the other hand, the dry mass of the fine particles was 18 % of all dry soil. This shows that much radioactive material adheres to relatively small amount of the fine particles.

Key Words: Soil, On Site Removal, Salt Solution, Circulation, Fine Particle