

Analysis on the Influence of Forest Soil Characteristics on Radioactive Cs Infiltration

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Summary

Soil core (0-5 cm and 5-10 cm) was collected in 5 points with different vegetation in Fukushima Prefecture in order to explore the permeability, field capacity and voidage. Depth profiles of radioactive Cs, ignition loss and CEC (Cation Exchange Capacity) in the 5 forest soils were also investigated, using scraper plate (at 0.5 cm intervals for 0-5 cm and at 1.0 cm intervals for 5-10 cm). Depth profiles in soil layers were totally different between forests and did not show explicit correlation with field capacity, voidage or ignition loss. On the other hand, CEC correlated weakly and permeability did strongly with infiltration of radioactive Cs. Compartment modeling was conducted, so as to reproduce the monitored depth profile, taking ignition loss as a parameter, based on the experiment result that ignition loss had positive correlation with CEC, which might influence the adsorption process on radioactive Cs in soil layer. However, the ignition loss alone failed to fully reproduce the depth profile. Considering the present results as well as the fact that permeability might have explicit relation with infiltration of radioactive Cs, factors related with precipitation or water flow in early stage after the accident could influence the depth profile, before adsorbed with negative charge in soil particles.

Key Words: Infiltration of radioactive Cs, Characteristics of soil layer in forests, Compartment model
