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INTRODUCTION: After the accident of Fukushima Daiichi nuclear power plant, decontamination work has been carried out. Soil containing radioactive materials such as Cs is present in the decontamination waste. It is necessary to understand the behavior of radioactive substances in case of the incineration of waste. Therefore, in this study, the dissolution test was carried out using heat-treated soils containing Cs and Sr. Moreover, most of these kind of experiments are carried out using much higher concentration of stable isotope compared to the actual pollution concentration. Therefore, the difference of the results between in case of using high concentration stable isotope and in case of using actual level concentration of radioisotope is investigated.

EXPERIMENTS: The soil of the A1 layer of coniferous trees forest of Iwate University Takizawa practice forest was used for the experiment. 10 g of the soil of the A1 layer was taken and made into samples with addition of 5 μg of stable Cs (mainly Cs-133) and Sr (mainly Sr-88) or 1250Bq of Cs -134 and Sr -85. 10 ml of distilled water was added to each soil sample, and each sample was dried for 20 hours in 45 degree Celsius temperature. Then, each sample was heated at 100, 200, 300, 400, 500, and 600 degrees Celsius using muffle furnace for one hour, and then they were let cool off naturally. After the addition of distilled water to each heat treated sample at solid-liquid ratio 1:10, they were shaken for six hours and centrifuged for ten minutes. Finally, supernatant liquid of them were filtered using 0.45 μm filter and the filtrates were measured by Pure Ge semiconductor detector or ICP-MS.

RESULTS: The results are shown in Fig. 1 and Fig. 2. Fig. 1 showed that the elution rate of Cs decreased with increasing heat treatment temperature, and that there was almost no difference between in case of using high concentration stable isotope and in case of using actual level concentration of radioisotope is investigated. It is highly possible that less Cs in the decontamination waste containing soil is eluted in the environment because of the fixation of Cs in soil by the heat treatment. Fig. 2 showed that the elution rate of Sr increased with increasing the heat treatment temperature. Because of high concentration of background stable Sr, the elusion rates for stable Sr and radioactive Sr cannot be compared. However, their tendencies with the temperature of heat treatment are almost same.

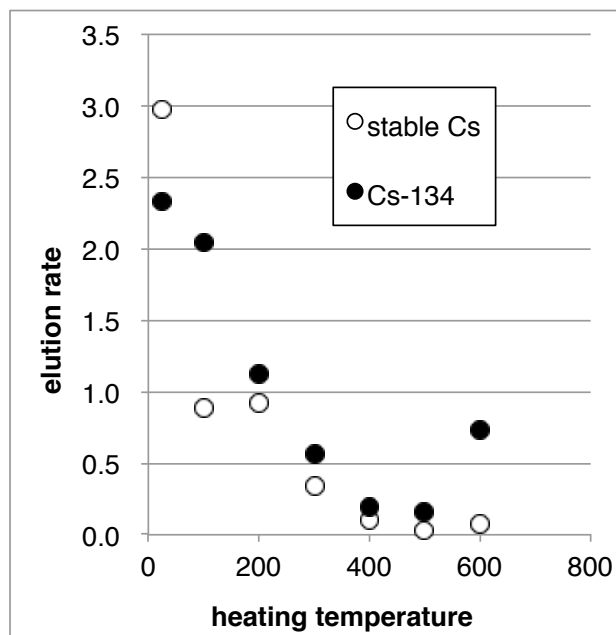


Fig. 1 Relation of elution rate of Cs and heating temperature.

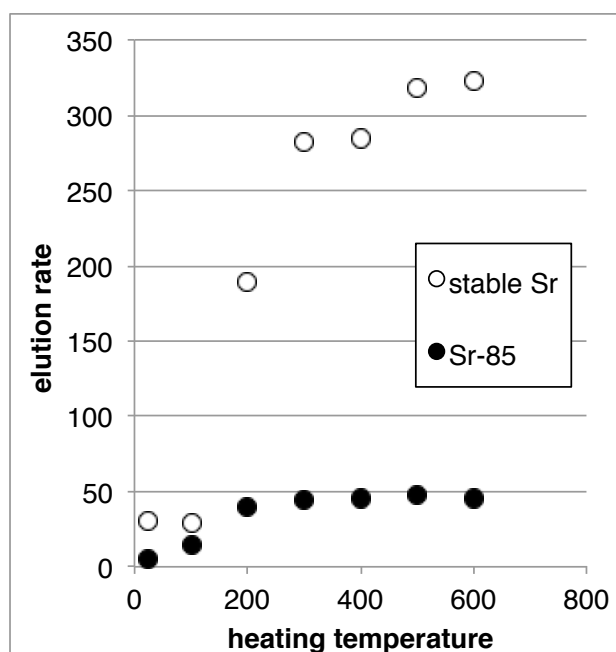


Fig. 2 Relation of elution rate of Sr and heating temperature.