

## Decontamination and loss of trace elements in soil

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### Abstract

A large quantity of radioisotopes was released by the Fukushima Daiichi Nuclear Power Plant accident in March 2011. As a result, decontamination of radioactive materials in the soil became a pressing issue. However, if contaminated soil is merely removed, the quantity of radioactive wastes will become enormous, and it will be impossible to find places to keep all the wastes. Therefore, it is very important that only radioactive materials (mainly radioactive cesium) adhering to soil is separated, so that the quantity of radioactive waste is reduced. However, not only radioactive cesium in soil but also essential trace elements may be removed when chemical decontamination methods are adopted. Therefore, in the present work, concentrations of trace elements in soil after simulated decontamination processing were determined in order to examine whether trace elements are lost or not.

Five grams of commercially obtained *Kuroboku* soil (andosol, a crumbly black topsoil) were placed into five centrifuge tubes. Then, 40 mL of pure water, 1M KNO<sub>3</sub>, 1M KI, 2M KI, or 0.1 M HNO<sub>3</sub> were added and the mixture was stirred for one day at 25 °C. After centrifugation, each supernatant was removed. Each sample was dried after five times of washing using 40mL of pure water, then, subjected to PIXE analysis.

Manganese concentration in the soil treated with 1 M and 2 M KI solution was lower than that in the other processed. This may indicate that not only the radioactive cesium in contaminated soil but also the essential trace elements will be removed depending on a way of extraction.