

[EJ] Evening Poster | M (Multidisciplinary and Interdisciplinary) | M-AG Applied Geosciences

## [M-AG33]Dynamics of radionuclides emitted from Fukushima Dai-ichi Nuclear Power Plant in the environment

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The Great East Japan Earthquake caused the severe accident in TEPCO Fukushima dai-ichi nuclear power plant (FDNPP), leading to emission of huge amount of radionuclides to the environment. They have been transported and diffused by atmospheric motion, depositing them to soil and vegetation. Deposited radionuclides are dynamically shifted in the earth environment; atmosphere, soil, inland water, ocean, and ecosystem. To understand this dynamic shift in the environment and for the long-term prediction of the disaster by the radionuclides, investigation and discussion based on not only the earth sciences including ecology but also on the radiochemistry and other related sciences.

In this session, various efforts to understand the dynamic behavior of radionuclides emitted from FDNPP accident in the earth system as well as to predict their influences on the environment. It is expected that this session will offer a good opportunity to discuss radionuclides in the earth environment from wide aspect and to exchange information in various research fields.

## [MAG33-P01]Properties of the insoluble particles including radioactive Cs found in Okuma town, Fukushima prefecture

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Large amounts of radioactive materials were released into the environment thorough the atmosphere by the accident of Fukushima Dai-ichi Nuclear Power Plant. Among them, Cs-concentrated insoluble particles (insoluble particles) were found. The matrix of the particles were SiO<sub>2</sub>, and the particles never dissolved in water [1]. Due to their insolubility, these particles remain long time in the environment, and the environmental behavior and fate of the insoluble particle have still not been investigated. The insoluble particles can be classified to at least two types from the properties and radioactivity concentration of Cs [2], however, it is still puzzled when and how much of these particles were released. Investigation of the detail environmental dynamics and inventory of them are strongly desired. In this study, insoluble particles were extracted from the soil collected in Okuma town, Fukushima prefecture. For extraction of the insoluble particles from the soil, we separated the soils with their particle size utilizing the difference in sedimentation rate in water. We transferred the separated fraction into the glass vial, added the Milli-Q water in the vial, divided into two vials, measured the radioactivities of each vials and discarded the low activity one. The operation was repeated at least 30 times and the insoluble particle was isolated [3]. The water solution including the insoluble particle was dried on the carbon tape and conducted SEM-EDS analysis. The size of insoluble particles isolated from the soil was from a few <math>\mu\text{m}</math> to sevrsl hundreds of <math>\mu\text{m}</math>. The radioactivity was also ranged from a few Bq to hundreds of Bq of <sup>137</sup>Cs per particle. The main elemental composition of these particles was Si, and the particles also

contains Mg, Al, and Fe. For some particles, Cs was also identified within the EDS analyzing sensitivity. From these results, we found various types of insoluble particles for the difference of the size and radioactivity of Cs were deposited in Okuma town, Fukushima prefecture. The contribution of the insoluble particles for the radioactive soil pollution will be presented in the session. [1]K.Adachi *et al.*, Sci.Rep.3 (2013) 2554 [2]T.Ono *et al.* JSAC. 2017, 66, 4 [3]Y.Kurihara, *et al.*, 61<sup>th</sup> Workshop on the Japan Society of Nuclear and Radiochemical Science, 2017