**Evaluation of natural radionuclides and their radioactive equilibrium for zircon samples in raw materials and residues**

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According to *the Act on Protective Action Guideline Against Radiation in the Natural Environment*, in South Korea, the Nuclear Safety and Security Commission (NSSC) has planned and conducted the field investigation to monitor the radioactivity concentration surrounding usage facilities of raw materials and residues and protect from radiation in the natural environment. Among the samples collected from the facilities in 2014, this paper shows that raw materials and residues such as zirconia, zircon sands or zircon oxides analyzed by quadrupole inductively coupled plasma mass spectrometry (ICP-MS). The samples were dissolved well by fusion method rather than acid digestion. It was found that a mixture amount of fluxer and remover to separate the sample melted with the platinum crucible. It was determined the uranium and thorium elements concentrations and isotope ratios using by quadrupole ICP-MS. In order to evaluate the natural radionuclides and their radioactive equilibrium, the samples analyzed thorium and uranium series using by a gamma-ray spectrometer.