



Contribution ID: 13

Type: oral presentation

## Automated and rapid determination of radionuclides for emergency analysis, radioecology investigation and characterization of decommissioning waste

Thursday 22 September 2011 11:00 (20 minutes)

With the increasing threat of potential nuclear terrorism and radiological accidents, establishment of a rapid reaction system under nuclear emergency preparedness is an urgent requirement for reducing the health risk to the public. Rapid determination of radionuclides in large number of biological and environmental samples is a key and crucial step in the emergency process and determines the whole reaction time. With increasing numbers of nuclear facilities being closed in recent years and from now on, a considerable decommissioning work is needed, and characterization of various wastes from decommissioning is required for evaluation of the radioactivity inventory in various materials. In the radioecological investigation, a large number of environmental and biological samples need to be analysed to obtain a better estimation of the environmental risk. All these work requires to accurate determination of various radionuclides. Except for the gamma radionuclides, the traditional analytical methods for radionuclides normally take a few days to weeks for one analysis; this makes the emergency reaction impossible in one day, and impossible to analyse a large number of sample from decommissioning work and radioecological investigation. In recent years, considerable efforts have been focused on the development of automated and rapid analytical methods. In our laboratory, automated analytical systems have been established by exploiting flow/sequential injection approach, using chromatographic separation concept, combined with rapid measurement of radionuclides using ICP-MS. A number of analytical methods have been developed to determine  $^{99}\text{Tc}$ ,  $^{237}\text{Np}$ , and isotopes of Pu, U and Th in biological, environmental and nuclear waste samples. This work aims to summarize these automated and rapid analytical methods for the determination of various radionuclides.

**Author:** Prof. HOU, Xiaolin (Risø National Laboratory for Sustainable Energy, Technical University of Denmark)

**Co-authors:** Dr QIAO, Jixin (Risø National Laboratory for Sustainable Energy, Technical University of Denmark); Mr KELIANG, Shi (Risø National Laboratory for Sustainable Energy, Technical University of Denmark)

**Presenter:** Prof. HOU, Xiaolin (Risø National Laboratory for Sustainable Energy, Technical University of Denmark)

**Session Classification:** Session 11

**Track Classification:** Radioanalytical Chemistry and Nanoparticles