



Contribution ID: 370

Type: Verbal

## Speciation analysis of radionuclides in the environment

Naturally occurring and artificially produced radionuclides in the environment can be present in different physico-chemical forms (i. e. radionuclide species) varying in size (nominal molecular mass), charge properties and valence, oxidation state, structure and morphology, density, complexing ability etc. Low molecular mass (LMM) species are believed to be mobile and potentially bioavailable, while high molecular mass (HMM) species such as colloids, polymers, pseudocolloids and particles are considered inert. Due to time dependent transformation processes such as mobilization of radionuclide species from solid phases or interactions of mobile and reactive radionuclide species with components in soils and sediments. Therefore, the original distribution of radionuclides deposited in ecosystems will change over time and influence the ecosystem behaviour.

To assess the environmental impact from radionuclide contamination, information on radionuclide species deposited, interactions within affected ecosystems and the time-dependent distribution of radionuclide species influencing mobility and biological uptake is essential. The development of speciation techniques to characterize radionuclide species in waters, soils and sediments should therefore be essential for improving the prediction power of impact and risk assessment models. The present paper will focus on analytical techniques which should be utilised for characterizing radionuclide species in the environment.

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**Track Classification:** Separation Methods, Speciation