



Contribution ID: 148

Type: Poster

Radiological Measurement techniques of NORM samples in IRAN's Industries

Regarding to the development of Iran's industries producing Naturally Occurring Radioactive Material (NORM) residue and waste including oil and gas, uranium milling and mining, water treatment plants, phosphate production, rare earth elements mining, and iodine production, characterization and measuring NORM concentrations that belong to the two natural decay series of U-238 and Th-232 and K-40 in samples from the source and the environment is of great importance for assessment of their radiological effects on personnel and public. In addition, based on national law NORM producing industries must declare their inventories to the Regulatory Body.

To evaluate the concentration of NORM and ambient radiation conditions, different radiological measurement methods and techniques such as screening and active/passive analysis has been taken by Iran Radioactive Waste Management (IRWA) Company as the only responsible of NORM management in country.

This article will provide materials about equipment (HPGe detectors and Gas Proportional Counter), sample preparation methods and innovative measurement of NORM concentration of more than 100 waste and residues samples and environmental media such as water resources, soil and sediment samples of uranium mine and iodine production facility. Moreover, due to the limitations of using the alpha spectrometry, the use of high-resolution gamma spectrometry system to separate the concentrations of Radium and Thorium isotopes in soil and sediment samples has been explained. It should be noted that these projects were implemented for the first time in Iran.

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Session Classification: Session IV - Characterization in Industrial Facilities and in the Environment

Track Classification: NORM Characterization, Measurement, Decontamination