

2.4-P05. Identification of Fission Products in Air Filter by Using Portable HPGe Spectrometry System for Rapid Prediction of Nuclear Exploration

Radionuclide sources in the environment include nuclear explosions, normal or anomalous reactor operations, and releases from other nuclear industry, particularly medical isotope production. The most important source of artificially created radionuclides is neutron induced nuclear fission. A variety of systems and processes may introduce artificial radionuclides into the environment. Detection and measurements of fission products are necessary in the field of nuclear safety and radiation protection, as well as reducing the expected potential risk associated with the radionuclides of interest. A portable HPGe detector and battery powered multichannel analyzer is available to make in situ gamma-ray spectroscopy possible. The objective of this study is to provide a simple analytical technique for detection and analysis of radionuclides due to fission products in air and water samples by using a portable HPGe gamma spectrometry system for rapid detection of nuclear exploration. A shielding system has been developed for reducing background radiation levels in order analyze low energy gamma-ray peak due to fission products specially noble gas (such Kr-85, Xe-133 etc.) including other fission products (Cs-137, Cs-134 etc.). This technique could be utilized for rapid detection and analysis of fission products in air and water samples due to nuclear explosion source.

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Track Classification: 2. Events and their characterization