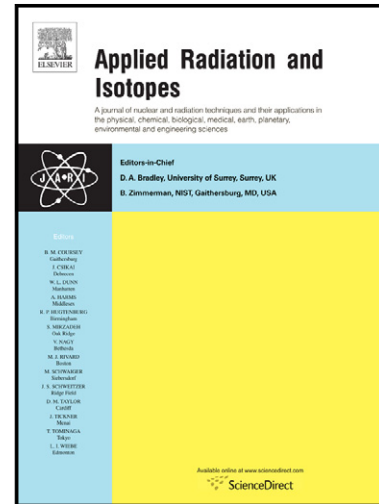


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# Decay chains and photofission investigation based on nuclear spectroscopy of highly enriched uranium sample

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## Abstract

Nuclear spectroscopy experiments were performed for 100 g metallic uranium rod enriched to 93%  $^{235}\text{U}$ , in order to establish and characterize the most prominent  $\gamma$ -rays in the natural decay series and photofission reaction. Single  $\gamma$ -ray spectra and  $\gamma$ - $\gamma$  coincidences measurements were conducted before irradiation. The uranium sample was subsequently irradiated with 15 MeV bremsstrahlung photons. Relative intensities of  $\gamma$ -lines and several values of half-lives of the fission fragments decays were determined. The obtained information can be utilized in detection of smuggled nuclear materials and characterization of bulky nuclear waste packages.

*Keywords:* radioactive chain, gamma ray spectroscopy, photofission, highly enriched uranium, detection of concealed nuclear materials

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