Nordic research and development cooperation to strengthen nuclear reactor safety after the Fukushima accident - DTU Orbit (30/07/2019)

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A comprehensive study of photon interaction features has been made for some alloys containing Pd and Ag content to evaluate its possible use as alternative gamma radiations shielding material. The mass attenuation coefficient ($\mu/\rho$) of the present alloys was measured at various photon energies between 81 keV – 1333 keV utilizing HPGe detector. The measured $\mu/\rho$ values were compared to those of theoretical and computational (MCNPX code) results. The results exhibited that the $\mu/\rho$ values of the studied alloys are in same line with results of WinXCOM software and MCNPX code results at all energies. Moreover, Pd75/Ag25 alloy sample has the maximum radiation protection efficiency (about 53% at 81 keV) and lowest half value layer, which shows that Pd75/Ag25 has superior gamma radiation shielding performance among the compared other alloys.

General information
Publication status: Published
Organisations: Center for Nuclear Technologies, The Hevesy Laboratory, Radioecology and Tracer Studies, Nordic Nuclear Safety Research
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Contributors: Linde, C., Andersson, K. G., Magnússon, S. M., Physant, F.
Pages: 647-653
Publication date: 2019
Peer-reviewed: Yes

Publication information
Journal: Nuclear Engineering and Technology
Volume: 51
Issue number: 3
ISSN (Print): 1738-5733
Ratings:
Web of Science (2019): Indexed yes
Original language: English
Electronic versions:
1-s2.0-S1738573318304042-main (1)
DOIs:
10.1016/j.net.2018.11.013
Source: FindIt
Source-ID: 2441931167
Research output: Contribution to journal › Journal article – Annual report year: 2019 › Research › peer-review