Application of the γSF Method to Palladium*

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The γ-ray strength function (γSF) method [1] is applied to palladium isotopes with a focus on indirect determination of radiative neutron capture cross sections for a radioactive nucleus ^{107}Pd with $T_{1/2} = 6.5 \times 10^6$ y. Photoneutron cross sections were measured near neutron threshold for ^{108,106,105}Pd nuclei with laser Compton scattering γ rays at the National Institute of Advanced Industrial Science and Technology. The experimental cross section is compared with the statistical model calculations based on the TALYS code making use of different E1 γ-ray strength prescriptions including the Hybrid model [2] and two versions of the mean field plus QRPA model, namely the non-relativistic HFB plus QRPA calculation of [3] and the relativistic mean field plus continuum QRPA (RMF+cQRPA) calculation of [4]. We compare the model predictions from different γSF models for ^{108}Pd(γ,n)^{107}Pd and ^{107}Pd(n,γ)^{108}Pd cross section with experimental data. A recommendation is given to predictions with the Hybrid and RMF+cQRPA models of the γSF in an application of the γSF method to ^{108,106,105}Pd.

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