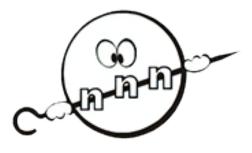
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Primary Gamma Transitions in 176Lu and 177Lu after Resonance Neutron Capture

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^{175, 176}Lu (n, γ) ^{176, 177}Lu reactions were studied via radiative capture of resonance neutrons at the CSNS Back-n White Neutron Source. Using the time-of-flight (ToF) technique, gamma-ray spectra for isolated resonances were measured. The experiment was conducted with a coaxial HPGe gamma detector equipped with an anti-Compton system, positioned 20 cm from the target. A 60 g sample of metallic natural lutetium (^{nat}Lu) with 99.9% purity (dimensions: 60 × 2.2 mm) was used as the target, located 76 m from the spallation target in the ES#2 experimental hall. The ToF spectrum was measured in the 1–700 eV energy range, with sufficient γ -ray statistics up to 100 eV. The measurement time was approximately 200 hours. The ToF resolution enabled the extraction of gamma-ray spectra from 16 neutron resonances for the ¹⁷⁵Lu (n, γ) ¹⁷⁶Lu reaction. Due to the low natural abundance of ¹⁷⁶Lu (2.6 %), gamma-ray spectra were obtained from 10 resonances for ¹⁷⁷Lu. Resonance spins were also deduced from the analysis of gamma-transition intensities for both reactions.

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