

ABSTRACT

Statistical gamma-decay and isomeric ratio in ^{168}Er measured by DANCE

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Gamma decay in highly excited nuclei is usually described within the statistical model of the nucleus, employing nuclear level density (NLD) and a set of photon strength functions (PSFs). The gamma rays following the neutron capture on the ^{167}Er target were measured with the Detector for Advanced Neutron Capture Experiments (DANCE) at the Los Alamos Neutron Science Center. The experimental gamma-ray spectra for different multiplicities and many s-wave resonances were compared with their simulated counterparts using DICEBOX code to test different models of NLD and PSFs. Moreover, ^{168}Er is of particular interest because of its isomeric state at 1094 keV. We were able to detect the decay of this short-lived isomer and estimate the isomeric ratio for a few resonances. Comparison to the simulated isomeric ratio provided an important test of the applicability of the statistical model. The experimental isomeric ratio was reproduced with simulations when adopting the decay scheme well above 2 MeV. This finding indicates that structural effects in ^{168}Er likely still play a significant role in the region of high excitation energies.