

Photoproton Reaction Cross Sections Involving ^{16}O up to 120 MeV in the Continuum Random Phase Approximation

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Abstract

The total and 90° differential cross sections for the photoproton reactions $^{16}\text{O}(\gamma, p)^{15}\text{N}$ leading to the ground and third excited states of ^{15}N are calculated for photon energies up to 120 MeV within the continuum random phase approximation (CRPA) approach taking into account particle-hole correlations and the spreading (damping) effects as well as the continuum state boundary condition. In solving the continuum response function, a correlated source function which makes the numerical calculation possible is used. The structures of the theoretical cross sections are in good agreement with the corresponding experimental data.

Evaluated Photonuclear Data Library in KAERI

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abstract

Based on available experimental data of photonuclear reaction and theoretical models, an evaluated photonuclear data library is provided for a variety of applications up to 140 MeV. The photoabsorption cross section is evaluated with the giant dipole resonance model and quasideuteron model, and production cross section and mission spectra for neutron, proton, deuteron, triton, alpha particles, gamma rays, and all residual nuclides produced ($A \geq 5$) in the reaction chains were calculated with the Hauser-Feshbach statistical, preequilibrium and multiple-preequilibrium theories by GNASH. The calculated results of photonuclear reaction data were analysed and compared with existing experimental data. Total 142 isotopes of 39 elements were included in the evaluated photonuclear data library, and the cross sections are stored in ENDF/B-VI format.

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