

Measurement of neutron induced reaction cross sections with covariance analysis

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Abstract

The cross section of $^{65}\text{Cu}(n,\alpha)^{62\text{m}}\text{Cu}$, $^{41}\text{K}(n,\alpha)^{38}\text{Cl}$ and $^{65}\text{Cu}(n,2n)^{64}\text{Cu}$ reactions have been measured at 14.92 ± 0.02 MeV neutron energy with $^{27}\text{Al}(n,\alpha)^{24}\text{Al}$ as a monitor reaction using the neutron activation technique followed by off-line γ -ray spectrometry. The neutron irradiation was carried out using the neutrons produced via D-T fusion reaction based neutron generator and the γ -ray spectra of the residue product measured off-line with the pre-calibrated lead-shielded HPGe detector. The measured cross sections have been reported with their detailed fractional uncertainties and inter-correlation matrix. The cross sections measured in the present work are compared with the earlier reported cross sections available in the EXFOR database. Theoretical calculations have also been performed from the reaction threshold to 20 MeV using EMPIRE-3.2 and TALYS-1.9 codes and its results are compared with present obtained results along with the evaluated data from TENDL-2019, JENDL-4.0, JEFF-3.1/A and ENDF/B-VIII.0. The detailed measurement technique and primarily results of data analysis will be presented during the conference.