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Neutron-capture cross-section measurements of ^{74}Ge and ^{76}Ge in the energy region 0.4-14.8 MeV for neutrinoless double β decay applications MEGHA BHIKE, WERNER TORNOW, Triangle Universities Nuclear Laboratory and Duke University — Fast neutron capture cross sections for the reactions ^{74}Ge(n,γ)^{75}Ge and ^{76}Ge(n,γ)^{77}Ge have been measured in the neutron energy region 0.4-14.8 MeV with the activation method. The results are important to identify backgrounds in the neutrinoless double-β decay experiments GERDA and MAJORANA, which use germanium as both source and detector. Isotopically enriched targets which consisted of 86% of ^{76}Ge and 14% of ^{74}Ge were irradiated with monoenergetic neutrons produced via ^{3}H(p,n)^{3}He, ^{2}H(d,n)^{3}He and ^{3}H(d,n)^{4}He reactions. The cross sections were determined relative to ^{197}Au(n,γ)^{198}Au, ^{115}In(n,n$'$)^{115m}In and ^{197}Au(n,2n)^{196}Au standard cross sections. The activities of the products were measured using high-resolution γ-ray spctroscopy. The present results are compared with the evaluated data from ENDF/B-VII.1 and TALYS.

Megha Bhike
Triangle Universities Nuclear Laboratory and Duke University

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