Contribution ID: **108** Type: **Oral talk (15 min + 5 min questions)**

MEASUREMENT OF THE NEUTRON YIELD FROM 13C(α,n0)16O REACTION

Thursday, 14 July 2022 18:29 (20 minutes)

The 13C(α,n)16O reaction is important for some application including neutrino measurements, nuclear astrophysics and nuclear power industry. The measurement of the total neutron yields (TNY) from this reaction has a high priority [1] because this data are used for normalization and testing the experimental data and the cross-section evaluations. The existing sets of experimental data on TNY were measured with uncertainty >10% due to the uncertainty of the 13C content in natural graphite.
The goal of the work is the independent check and normalization of the 13C(α,n0)16O reaction cross-section data measured in 2021 [2]. The differential spectra of neutrons and the total neutron yields from the 13C(α,n0)16O reaction were measured in the energy range 3-6.5 MeV using the thick carbon target enriched in 13C. The time-of-flight method was used to determine the neutron energy and to separate the neutrons corresponding to ground state of the residual nucleus. The 13C enrichment and the elemental composition of the target were determined using the ion beam analysis methods. The obtained TNY values were compared with ones calculated based on the ENDF/B-VIII.0 evaluation.

1. S. S. Westerdale, A. Junghans, R. J. deBoer, M. Pigni, P. Dimitrou, Summary Report of the Virtual Technical Meeting on (alpha,n) Nuclear Data Evaluation and Data Needs, 8-12 November 2021 (INDC(NDS)-0836), printed by the IAEA in Austria, March 2022.
2. P. S. Prusachenko, T. L. Bobrovsky, I. P. Bondarenko, M. V. Bokhovko, A. F. Gurbich and V. V. Ketlerov, Physical Review C, 105 (2022) 024612.

The speaker is a student or young scientist

Yes

Section

1. Experimental and theoretical studies of nuclear reactions

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Session Classification: Experimental and theoretical studies of nuclear reactions