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The measurement of the 6Li(n, t)4He reaction cross-section in the energy range of 4.25–7.50 MeV

The measurement of the total cross-section of the 6Li(n,t)4He reaction was carried out over the energy range of 4.25-7.50 MeV by a time-of-flight method relative to the cross-section of the 235U fission. The Cs2LiYCl6:Ce based scintillation detector was used as a lithium containing target. The scintillation detector was placed in an axially symmetrical geometry relative to a monitor fission chamber containing 235U layers. The pulsed quasi-monoenergetic neutron beam from the 2H(d,n)3He reaction was used as a neutron source. The total systematic uncertainty in the experiment was 4.6-6.7% with the statistical uncertainty of 2.0-3.7%. The obtained data do not support the evaluated cross-section of the 6Li(n,t)4He reaction from the ENDF-B/VIII.0 library. At the same time, the average difference between the evaluated cross-section from the JENDL-5.0 library and the experimental data obtained in this work also exceeds the total systematic uncertainty of the measurements.

Section

Experimental and theoretical studies of nuclear reactions

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