Statistical Model Analysis of (n,t) Cross Sections for 14–15 MeV Neutrons

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Fast neutron-induced (n,t) reactions lead to enhancement of tritium in structural materials of fusion reactors. However, experimental data of the (n,t) reaction cross sections are scarce and their available values for the same isotopes are varied in the wide range. So, a systematical analysis of known (n,t) cross sections is a useful to estimate those for nuclides where no experimental data are available. On the other hand, from the systematical regularity of the known cross sections it can be concluded that which value is a probably correct.

In this work, we carried out a systematical analysis of known (n,t) cross sections for 14–15 MeV neutrons and observed some dependence of the reduced (n,t) cross sections on the proton-neutron relative numbers of the target nuclei. In the framework of the statistical model of nuclear reactions these obtained results are analyzed and discussed.