

Procedure of Neutron Cross Section Evaluation in the Resonance Region and Evaluation of Iodine-129 Resonance Parameters

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Abstract

A procedure for the evaluation of neutron cross sections in the resonance energy region has been established. The procedure is introduced herein. In the resonance region, the neutron cross sections are constructed from the resonance parameters consisting of File 2 in the ENDF-6 format, so the eventual product of the procedure is a File 2 for each nuclide under consideration. The procedure has been used for recent evaluations of 25 fission product nuclides. Among these nuclides, the evaluation results for iodine-129, which is one of the fission products important to the transmutation study, are presented. This evaluation takes account for recent measurements, thus shows differences in the evaluated thermal capture cross section, capture resonance integral, and capture cross sections in the unresolved resonance region from those of existing evaluated libraries such as the ENDF/B-VI.

Evaluation of Neutron Induced Cross Sections on ^{109}Ag

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Abstract

The neutron induced cross sections for ^{109}Ag were evaluated from 1 keV to 20 MeV. The parameters of optical model potential depending on incident neutron energy were extracted based on the experimental data and the s-wave strength function was calculated. The reaction cross sections produced by GNASH and EMPIRE were analyzed. The model calculated cross sections were compared with the experimental data and other evaluated files (ENDF/B-VI, JENDL3.2 and JEF-2.2) on the total, elastic and reaction cross sections. The model calculated total and capture cross sections gave good agreement with the reference experimental data. The evaluated cross sections were compiled to ENDF-6 format.