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NNDENへの投稿

Contribution to Neutron Nuclear Data Evaluation Newsletter-22

Japanese Nuclear Data Committee
(Nuclear Data Center, JAERI)

Work recently completed and publication:

i) Neutron Cross Sections of Americium-241
S. Igarasi, J. Nucl. Sci. Tech. 14,1 (1977)
Neutron cross sections of ^{241}Am are evaluated in the energy region from 1 keV to 15 MeV, by using optical and statistical model calculations. Existing experimental data for this nuclide are very scarce, except for the fission cross section. An empirical formula for the fission cross section is used to reproduce the experimental data. The cross sections on (n,2n) and (n,3n) reactions are calculated with a simple formula proposed by Pearlstein. These cross sections are treated as components of competing processes in calculation of the compound elastic, inelastic scattering and capture cross sections. Energy averaged absorption cross sections are compared with those measured by Weston and Todd.

ii) Neutron Cross Sections of ^{235}U, ^{238}U, ^{239}Pu, ^{240}Pu and ^{241}Pu Adopted in JENDL-1 - Preliminary Results -
Y. Kikuchi, T. Nakagawa, H. Matsunobu, Y. Kanda, M. Kawai and T. Murata, JAERI-M 6996 (1977)
An intensive work on evaluation for neutron nuclear data of ^{235}U, ^{238}U, ^{239}Pu, ^{240}Pu and ^{241}Pu had been carried out for the first version of Japanese Evaluated Nuclear Data Library (JENDL-1). The evaluation work above 1 keV was almost completed at the time of start of JENDL-1 compilation work. This report gives results of this evaluation work made above 1 keV. Brief reviews on the compilation of JENDL-1 are also presented.

iii) Evaluation of the ^{27}Al(n,α)^{24}Na, ^{27}Al(n,p)^{27}Mg and ^{58}Ni(n,p)^{58}Co cross sections has been made in the range from the threshold to 20 MeV. A short note of this work was presented to the IAEA Consultants' Meeting on Integral Cross-Section Measurements in Standard Neutron Fields for Reactor Dosimetry held in November 1976. The evaluated data were compiled in JENDL-1. (from T. Asami, JAERI)

Work in Progress:

i) Gamma-ray production cross sections of ^{27}Al, ^{40}Ca, ^{56}Fe, ^{93}Nb and ^{181}Ta have been calculated with an evaporation madel code GROGI. Brink-Axel estimation was adopted for the gamma-ray width. The level density formula of Gilbert-Cameron was used. Good agreement was obtained between the theory and the experimental data from ORNL, except for the low energy components which may come from the transition to the discrete levels of ^{27}Al. For these levels, calculations with the Hauser-Feshbach and direct reaction theories are in progress. (from H. Kitazawa, TIT)

ii) Evaluation has been carried out for neutron cross sections of ^{54}Fe, ^{56}Fe, ^{57}Fe and ^{181}Ta from 1 MeV to 14 MeV. Resonance parameters for ^{181}Ta, ^{54}Fe, ^{56}Fe and ^{57}Fe have been collected and compiled. Evaluation of the resonance parameters is in progress. (from H. Yamakoshi, SRI)

iii) Evaluation of ^{243}Am and ^{244}Cm cross sections is in progress. Resonance parameters and fission cross sections are partly available. Systematic trends of parameters are being investigated in order to estimate the data. (from S. Igarasi, JAERI)

iv) Elastic scattering and (n,α) reaction cross sections of ^{6}Li have been calculated below 20 MeV, with the Kapur-Peierls formula of the resonance cross sections. Levels with positive parity are looked for in order to reproduce the experimental data of (n,α) and elastic scattering cross sections simultaneously. (from S. Igarasi, JAERI)

Work planned for the near future:

Evaluation on ^{245}Cm cross section will be started. (from T. Fuketa, JAERI)

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