

お知らせ II

N N D E N 3 4 への投稿

Contribution to Neutron Nuclear Data Evaluation Newsletter-34

Japanese Nuclear Data Committee
(Nuclear Data Center, JAERI)

Work Recently Completed and Publications:

- (i) Calculation of Gamma-Ray Production Cross Sections at the Neutron Energies of 1-20 MeV

Hideo KITAZAWA, Yoshiko HARIMA, Masayoshi KAWAI, Hisao YAMAKOSHI,
Yuji SANNO, and Tsuguyuki KOBAYASHI

J. Nucl. Sci. Technol., Vol. 20, No. 4, pp. 273-285 (1983)

Gamma-ray production cross sections and spectra of Al, Si, Ca, Fe, Ni, Cu, Nb, Ta, Au, and Pb have been obtained at the neutron energies of 1-20 MeV, using a spin-dependent multi-step evaporation model. Calculations include dipole and quadrupole transition without the distinction between electric and magnetic process, and take explicit account of the role of yrast levels. The effects of the yrast levels and gamma-ray strength function upon gamma-ray production are also investigated in relation to particle emission. At the incident neutron energies where (n,n' γ) and/or (n,2n γ) reactions are dominant, the present model is shown to be able to predict the production of secondary gamma-rays (<9.0 MeV) from medium-heavy to heavy nuclei with reasonable accuracy.

- (ii) Evaluation of Neutron Nuclear Data for Uranium-233

Norio ASANO, Hiroyuki MATSUNOBU and Yasuyuki KIKUCHI

J. Nucl. Sci. Technol., Vol. 19, No. 12, pp. 1037-1053 (1982)

Evaluation has been made for the neutron nuclear data of ^{233}U in the energy range from 10^{-5} eV to 20 MeV. Evaluated quantities are the total, fission, capture, elastic and inelastic scattering, (n,2n) and (n,3n) reaction cross sections as well as the resonance parameters. The average numbers of prompt and delayed neutrons per fission have also been evaluated. The presently evaluated fission cross section is considerably lower than that of ENDF/B-IV between 10 and 50 keV.

- (iii) Evaluation of Neutron Nuclear Data for ^{241}Am and ^{243}Am

Yasuyuki KIKUCHI

(JAERI-M 82-096 (1982))

Neutron nuclear data of ^{241}Am and ^{243}Am were evaluated for JENDL-2. Evaluated quantities are the total, elastic and inelastic scattering, fission, capture, (n,2n), (n,3n) and (n,4n) reaction cross sections, the resolved and unresolved resonance parameters, the angular or energy distribution of the emitted neutrons, and the average number of neutrons emitted per fission. The fission cross section was evaluated on the basis of newly measured data, and lower values than JENDL-1 were given in the subthreshold energy region. The reliability of the calculation parameters are also much improved, because experimental data became available for the total and capture cross sections of ^{241}Am in the high energy region.

(iv) Evaluation of Neutron Nuclear Data for Deuterium
Keiichi SHIBATA, Tsutomu NARITA and Sin-iti IGARASI

(JAERI-M 83-006 (1983))

Evaluation of neutron nuclear data for ^2H has been performed in the neutron energy region from 10^{-5} eV to 20 MeV. The evaluated quantities are the total, elastic scattering, capture and (n,2n) reaction cross sections, the angular distribution for the elastic scattering and the double-differential cross section for the (n,2n) reaction. Theoretical calculations were done of the elastic angular distribution and the neutron spectrum from the (n,2n) reaction on the basis of the Faddeev equation.

Work in Progress:

(i) Evaluation of neutron nuclear data for ^{12}C is in progress in the energy region from 10^{-5} eV to 20 MeV. The total cross section below the threshold energy of the inelastic scattering is calculated on the basis of the R-matrix theory. Three discrete levels are taken into consideration for the inelastic scattering.

(from K. Shibata, JAERI)

(ii) The inelastic scattering cross section of structural materials are calculated with the coupled channel optical model and DWBA.

(from Y. Kikuchi, JAERI)

(iii) Neutron nuclear data of ^{246}Cm and ^{247}Cm are evaluated. Evaluated quantities are the total, elastic and inelastic scattering, fission, capture, (n,2n), (n,3n) and (n,4n) reaction cross sections, the resolved and unresolved resonance parameters, the angular and energy distributions of the emitted neutrons, and the average number of neutrons emitted per fission.

(from Y. Kikuchi, JAERI)

Work Planned for the Near Future:

(i) Evaluation of ^{248}Cm and ^{249}Cm nuclear data is planned below 20 MeV.

(from Y. Kikuchi, JAERI)

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May 20, 1983