

N N D E N 3 7 への投稿

Contribution to Neutron Nuclear Data Evaluation Newsletter-37

Japanese Nuclear Data Committee
(Nuclear Data Center, JAERI)

Work Recently Completed and Publications:

- (i) Neutron Nuclear Data of ${}^7\text{Li}$ Adopted in JENDL-2
Keiichi SHIBATA

(JAERI-M 84-163(1984))

Neutron nuclear data of ${}^7\text{Li}$ were evaluated for JENDL-2 in the energy range from 10^{-5} eV to 20 MeV. Evaluated quantities are the total, elastic and inelastic scattering, (n,γ) , (n,n') at reaction cross sections and the angular distributions of neutrons. The present evaluation was completely based on available experimental data.

- (ii) Neutron Nuclear Data of ${}^9\text{Be}$ Adopted in JENDL-2
Keiichi SHIBATA and Kimihiro IOKI

(JAERI-M 84-165(1984))

Neutron nuclear data of ${}^9\text{Be}$ were evaluated for JENDL-2 in the energy range from 10^{-5} eV to 20 MeV. Evaluated quantities are the total, elastic scattering, $(n,2n)$, (n,γ) , (n,p) , (n,d) , (n,t) and (n,α) reaction cross sections and the angular and energy distributions of emitted neutrons. The present evaluation was completely based on available experimental data.

- (iii) Evaluation of Neutron Nuclear Data of ${}^6\text{Li}$ for JENDL-3
Keiichi SHIBATA

(JAERI-M 84-198(1984))

Neutron nuclear data of ${}^6\text{Li}$ have been evaluated for JENDL-3 in the energy range from 10^{-5} eV to 20 MeV. Evaluated quantities are the total, elastic and inelastic scattering, radiative capture, photon-production, $(n,2n)$, (n,p) and (n,α) reaction cross sections and the angular and energy distributions of secondary neutrons. The total, elastic scattering and (n,α) cross sections below 1 MeV have been calculated on the basis of the R-matrix theory. Two discrete levels were taken into account for the inelastic scattering. The double-differential cross sections for the $(n,2n)$ reaction and the inelastic scattering to the continuous levels were obtained from the phase-space model calculations.

- (iv) Evaluation of Neutron Nuclear Data of ${}^7\text{Li}$ for JENDL-3
Keiichi SHIBATA

(JAERI-M 84-204(1984))

Neutron nuclear data of ${}^7\text{Li}$ have been evaluated for JENDL-3 in the energy range from 10^{-5} eV to 20 MeV. Evaluated quantities are the total, elastic and inelastic scattering, radiative capture, photon-production, $(n,2n)$, (n,d) and (n,n') at reaction cross sections and the angular and energy distributions of secondary neutrons. For the inelastic scattering two discrete levels were taken into consideration. The energy-angle distributions of neutrons from the

inelastic scattering to continuum and the (n,2n) reaction were calculated with the three-body phase-space model.

- (v) Evaluation of Neutron Nuclear Data of ^{241}Pu for JENDL-2
Yasuyuki KIKUCHI and Nobuo SEKINE

(JAERI-M 84-111(1984))

Neutron nuclear data of ^{241}Pu were newly 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 and energy distributions of emitted neutrons, and the average number of neutrons emitted per fission. The simultaneous evaluation method was adopted for the fission cross section so as to keep the consistency among the main fissile and fertile material nuclides. The theoretical calculations based on the spherical optical model and the statistical model were also used, when the experimental data were not sufficient. Discussion is given on the evaluation method.

- (vi) Evaluation of Neutron Nuclear Data for ^{248}Cm and ^{249}Cm
Yasuyuki KIKUCHI and Tsuneo NAKAGAWA

(JAERI-M 84-116(1984))

Neutron nuclear data of ^{248}Cm and ^{249}Cm have been 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. The fission cross section of ^{248}Cm was evaluated mainly on the basis of measured data and that of ^{249}Cm was estimated from the systematic trends. The other cross sections were calculated with the optical and statistical models because of scarce measured data.

Work in Progress:

- (i) Evaluation of neutron nuclear data for ^{249}Bk and ^{249}Cf is in progress in the energy range from 10^{-5} eV to 20 MeV.

(from Y. Kikuchi, JAERI)

- (ii) Simultaneous evaluation of ^{235}U , ^{238}U , ^{239}Pu , ^{240}Pu and ^{241}Pu is in progress. The covariance data were estimated from the partial errors given by the experimenters.

(from T. NAKAGAWA, JAERI)

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