

お知らせ(そのⅣ)

Contribution to FPND progress report (1979)

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T. Aoki (Fuji Electric Co.)
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T. Watanabe (Kawasaki Heavy Industries)
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Evaluation : Neutron cross sections of Nd isotopes.

Method : Calculation with spherical optical model and statistical
theory. Single and multi-level BW formula in thermal and
resonance regions. Optical model parameters are determined
by SPRT method. Level density parameters are re-evaluated.

Source : NEUDADA, CINDA, and the recent capture data for Nd isotopes
at JAERI and Lebedev institute. Integral data from STEK
and CFRMF.

Deadline of literatur coverage : Spring, 1979

Status : Progress is very slow. Difficulties are encountered in the
consistent determination of level density parameters ρ , T , etc.

Other relevant details :

The evaluation of 68 nuclides was completed in Aug., 1977,
and the file is available from NEA Data Bank. Integral
test calculation using STEK reactivity data and CFRMF acti-
vation data was completed recently. Results are being
examined.

Computer file of evaluated data : JENDL (ENDF/B-4 format)

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Expected completion data : The work is largely behind schedule.

Discrepancies encountered :

Summarized in No. 4 of publication list.

Recent publications :

1. H. Matsunobu and T. Watanabe, compilation of measured capture cross sections for JENDL FPND file, JAERI-M 7568 (1978).
2. Z. Matsumoto, T. Murata and R. Nakasima, Level scheme for some fission product nuclides. Comparison of level scheme used by JAERI and Petten, JAERI-M 7734 (1978).
3. S. Iijima et al., J. Nucl. Sci. Technol. 14 161 (1977).
4. S. Iijima, IAEA-213, Petten 1977, Review Paper No. 9.
5. H. Nishimura et al., Integral test of JENDL-FP data file, JAERI-M report (to be published shortly)

JAPAN

- Laboratory and address: Research Laboratory for Nuclear Reactors, Tokyo Institute of Technology
2-12-1, O-okayama, Meguro-ku, Tokyo
- Names: N. Yamamuro, K. Saito, T. Wada (TIT)
Y. Fujita, K. Kobayashi (Research Reactor Institute, Kyoto University)
- Facilities: 46-MeV Electron Linear Accelerator (Research Reactor Institute, Kyoto University)
- Experiment: Capture Cross Section Measurements of ^{93}Nb , ^{127}I , and ^{133}Cs from 3 to 80-KeV using time-of-flight method
- Method: Gamma-rays from the neutron capture processes were detected by a C_6F_6 or a C_6D_6 liquid scintillation detector. Neutron flux impinging on the sample was measured by ^{10}B (93%) disk placed at the sample position. The absolute values of cross section were determined by normalizing to the 24-KeV cross sections measured with Fe-filtered method.
Corrections for self-shielding and multiple scattering were performed using average cross sections. These data are currently examined for the correction for resonance self-shielding.
- Accuracy: Error of absolute cross section at 24-KeV is about 5%
Statistical error of measured cross sections is 2 to 4%
- (Expected) June, 1979 for ^{93}Nb and ^{127}I
Completion Date: Sept., 1979 for ^{133}Cs
- Publications: 1. N. Yamamuro et al., J. Nucl. Sci. and Technol. 15
637 (1978)
2. N. Yamamuro et al., Proc. Inter. Conf. Neutron Physics and Nuclear Data for Reactors and other Applied Purposes AERE Harwell Sept., 1978

JAPAN

Laboratory and address: Nuclear Physics II Laboratory,
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Names: A. Asami, Y. Nakajima, M. Mizumoto, M. Ohkubo,
Y. Kawarasaki, Y. Furuta (JAERI)
T. Yamamoto, M. Sugimoto (Tohoku Univ.)
Y. Kanda, T. Kawano (Kyushu Univ.)

Facilities: 120 MeV linac neutron TOF spectrometer.

1. Experiment: Neutron capture cross section measurements in the keV region.

Method: 3500 l liquid scintillator tank at 52 m flight path with a resolution of 1.9 to 0.5 nsec/m.

Analysis: Multiple scattering correction and self shielding (Schmitt, Monte Carlo) in the sample and neutron detector.
Self shielding correction (Dresner, Macklin).

(1) Samples: ^{151}Eu , ^{153}Eu , Eu. Chemical form Eu_2O_3 . Separated isotope samples are enriched to over 96 % for each isotope, loaned from ORNL.

Accuracy: --- 6 to 10 %.

Energy region: 3 to 100 keV.

Expected completion date: $^{151,153}\text{Eu}$ May 1979.
Eu Sep. 1979.

Publication:

A. Asami et al., Neutron capture cross section measurements of $^{151,153}\text{Eu}$ and Eu, Topical Conf. of Technique on Neutron capture cross section measurements, ORNL, 1978.

M. Mizumoto et al., Average neutron capture cross sections of ^{151}Eu and ^{153}Eu from 3 to 100 keV, to be published.

(2) Samples: $^{143,145,146,148}\text{Nd}$, enriched to over 91 % for each isotope, Nd_2O_3 in chemical form, loaned from ORNL.

Energy region: 5 to 300 keV.

Accuracy: 8 to 30 %.

Expected completion date: Dec. 1979.

Publication:

Y. Nakajima et al., Neutron capture cross section measurements of Nd-143, Nd-145, Nd-146 and Nd-148, Int. Conf. on Neutron Physics and Nuclear Data, Harwell., 1978.

JAPAN

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(3) Samples: $^{147,149}\text{Sm}$, enriched to over 97 % for each isotope, Sm_2O_3 in chemical form, loaned from ORNL.

Energy region: 1 eV to 300 keV.

Status: Measurements in progress.

2. Experiment: Neutron resonance parameters.

Method: A ^6Li -glass neutron detector and a Moxon-Rae detector at 47 m flight path.

Analysis: Atta-Harvey code and Monte Carlo code MCRTOF.

(1) Sample: Tb.

Results: Resonance parameters for 209 levels including 50 newly discovered ones in the region 3 to 1190 eV.

Completion date: Feb. 1978.

Publications:

M. Ohkubo, Y. Kawarasaki, Slow neutron resonances in Tb-159, JAERI-M 7545 (1978), also to be published in J. Nucl. Sci. Tech.

(2) Samples: $^{79,81}\text{Br}$, enriched to over 97 % for each sample, NaBr in chemical form, loaned from ORNL.

Status: Measurements in progress.