

話 題

N N D E N への投稿

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JNDC ニュース No.34 の「話題(そのⅢ)」でも触れましたように、国内での中性子データ評価の現状を紹介する意味から、NNDENへの原稿は継続してこの欄に掲載することにしてます。今回はNNDEN-18への分です。

Contribution to Neutron Nuclear Data Evaluation Newsletter-18

Japanese Nuclear Data Committee
(Nuclear Data Laboratory, JAERI)

Work in progress:

- i) Evaluation of elastic and inelastic scattering cross sections for ^{235}U is in progress in the energy range 1 keV to 15 MeV. The elastic and inelastic scattering cross sections were calculated using the ELIESE-3 code based on the optical model and statistical theory over the above energy range. The optical potential parameters were obtained by fitting the total cross section calculated by the TOTAL code to the experimental data. The competing processes owing to (n,f), (n, γ), (n,2n) and (n,3n) reactions were also taken into account in this calculation. The results were compared with the experimental data, and a good agreement was obtained for the elastic scattering cross section in the energy range 300 keV to 2 MeV. The calculated inelastic scattering cross section, however, shows somewhat lower values than the measured cross section in the energy range above 2 MeV. At present, a systematic method is examined in order to improve the discrepancy between the calculated and the measured data for the inelastic scattering cross section. (informed by H. Matsunobu, SAEI)
- ii) Review works on resonance parameters of ^{235}U , ^{238}U and ^{240}Pu have remained in the same stage as reported in the previous Newsletter (No. 17). The works will include those parameters which were reported at the conference on "Nuclear Cross Section and Technology", Washington, March 1975. (informed by A. Asami, JAERI)
- iii) Selected data of total cross section and prompt neutrons per fission for ^{239}Pu were used to determine polynomial functions of the energy which reproduce the evaluated data. Three polynomials were used in order to represent the total cross section in the energy region from 1 to 800 keV, from 800 keV to 2 MeV and from 2 to 15 MeV, respectively. The evaluated data of the neutrons per fission are also given by two kinds of the polynomials in the energy regions above and below 1.5 MeV, respectively. (informed by M. Kawai, NAIG)
- iv) Evaluation of neutron nuclear data for ^{241}Am is in progress. Work on the evaluation was completed for the total, capture, fission, (n,2n), (n,3n), elastic scattering and inelastic scattering cross sections above 1 keV. They were mainly obtained with the theoretical calculations. Results of this evaluation were published to JAERI-M 6221. Below 1 keV, the work is going on. (informed by S. Igarasi, JAERI)
- v) For about 50 fission product nuclides, new work on the evaluation was started. Systematic trends of the parameters such as level spacing of the resonances, γ -ray width, neutron strength functions and so on are being investigated in order to estimate the data even for the unmeasured nuclides. (informed by S. Iijima, NAIG)
- vi) Radiative capture cross section on ^{238}U was calculated by using direct and collective capture models. It was assumed that the nuclear shape was kept in an axially symmetric form during the reaction.

The coupled-channel calculations with adiabatic approximation were applied to obtain the contributions from the different kinds of the rotational bands of the residual nucleus. (informed by H. Kitazawa, TIT)

Work planned for the near future:

Evaluation of the neutron cross sections for some threshold reactions will be started in near future. (informed by T. Asami, JAERI)

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