

Appendix: Progress Report received after the meeting

Ukrainian Nuclear Data Centre

Status report to the the 2003 Technical
NRDC Meeting in Vienna

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Introduction

UKRNDC is subdivision within the Department of Neutron Physics, Institute for Nuclear Research of the National Academy of Sciences Ukraine.

Compilation

We continue collection and compilation of experimental data published in Ukrainian printed sources. After compilation of numerical data and related information using EXFOR format they are sent to NDS IAEA to be included to EXFOR library. After last meeting in 2002 we prepared and revised four entries 32202, 32207, 32208 and 41012.

Collaboration

We continue our collaboration with the Laboratory of Engineering and Technology (LET) of the Chernobyl Center for Nuclear Safety, Radioactive Waste and Radioecology (CCNSRWR), Slavutych in scientific support of Slavutych Nuclear Data Bank and its users. In frame of this activity a series of lectures (*“ENDF/B libraries”, “ Using the NJOY code system for preparation of specialized nuclear data libraries”*) was red for this laboratory staff.

- ◆ The work under the joint project supported by Science and Technology Center of Ukraine (STCU Project #1648) *Development and support of Nuclear Data Base in Slavutych for decommissioning of Chernobyl NPP reactor units* has started since 1 April 2002. This work is foreseen for three years and this activity is very important for support our UKRNDC work. We are very much obliged to our collaborators, two of them are here: NNDC, USA and NDS, IAEA. Due to their strong support we can plan our activity for next years.
- ◆ The teaching course *“Nuclear Data for Science and Technology”* (68 hours) was lectured in 2002-2003 for graduate course students of Kyiv University, Physical Department. This course included the following items: ENDF/B libraries, EXFOR system, ENSDF library, the use of PREPRO codes in the work with ENDF libraries, the introduction to NJOY94 (NJOY97) code system, the Network of Nuclear Data Centers and the use of on-line services.

Customer Services

- ◆ During 2002-2003 the data for users requests were prepared and adapted (from ENDF, ENSDF and EXFOR libraries) for our institute researchers and for ones from other institutes

(Kyiv National University, Institute of Physics, Kyiv, Kharkiv Institute of Physics and Technology.).

- ◆ The UKRNDc site is operating and developing. Ukrainian customers, especially students and those physicists, who wish to prepare the pointwise and multigroup cross sections self-dependently, but do not have a good experience in it, use this site very often.
Address: <http://ukrndc.kinr.kiev.ua>

Calculation

- ◆ Special library for modeling of neutron filters my means the code FILTER_L was extended using ENDF/B-6 (release 8), JENDL-3.3.
- ◆ Analysis of self-shielding factors for Cr-52, using all new release of ENDF libraries was fulfilled at several energy ranges. These calculations were carried out with the code complex DT_GRO, GROUPIE, SELF. The results were used to present the measured cross sections on Cr-52 samples and will be used in further investigations.
- ◆ We (together with LET) started a preparation the first order of nuclear constant library for transport calculation for NPP with RBMK-1000 reactor type.

For all calculations of the pointwise and group cross sections we used PREPRO2002 and/or NJOY99 package codes.

Experimental Neutron Data Measurements

- ◆ The total neutron cross section and its self-shielding values for Cr-52 was measured at Kyiv Research Reactor using Neutron Filter Technique. The accuracy of measured cross sections was better than 2%, as it was requested 3% in *The NEA High Priority Nuclear Data List (1998)*. These data for neutron energies 24 and 58 keV were compared with the data from ENDF libraries and presented at International Conference (ISINN-11, Dubna, Russia, May 2003 and MPNP-5, Samarkand, Uzbekistan, August 2003).

Future Plans

Experimental investigations

- ◆ To continue the study of the Cr and Cr-52 total neutron cross sections and self-shielding effects for different energies with high accuracy using Neutron Filter Technique (2, 12, 144 keV and other energies).
- ◆ The same investigations we plan to start for Ni-nat samples.

Data analysis and calculation

- ◆ Analysis of ENDF libraries files for the main RBMK structural elements and comparing with the recent EXFOR and other experimental data with the purpose to develop the specialized library for MCNP code calculations of RBMK decommissioning. This work is planned in the framework of the STCU Project #1648.
- ◆ The other analysis of ENDF files is planned for MCNP library additional files for calculation of epithermal neutron source needed in BNCT. This work is supported with CRDF Project # UP2-2437-KV-02.
- ◆ We plan to intensify our work in EXFOR compilation also with charge particles and CINDA references by recruiting the young graduates from Kyiv University.