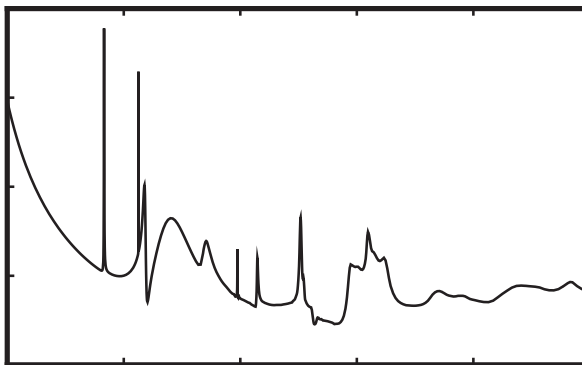




# NUCLEAR DATA

# NEWSLETTER



Nuclear Data Section (NDS)

International Atomic Energy Agency  
Vienna

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Please contact us on the following addresses:

Nuclear Data Section	e-mail: <a href="mailto:services@iaeand.iaea.org">services@iaeand.iaea.org</a>
International Atomic Energy Agency	fax: (43-1) 26007
P.O. Box 100	cable: INATOM VIENNA
A-1400 Vienna	telex: 1-12645
Austria	telephone: (43-1) 2600-21710

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	RIPL for FTP file transfer of RIPL;
	NDSOHL for files saved in NDIS Telnet session

Web: <http://www-nds.iaea.org>

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## Staff Items

We extend our very best wishes to Dr. Michal Herman who has left the Nuclear Data Section and taken up new duties at Brookhaven National Laboratory.

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## Online News

The following INDC Reports are available online at [http://www-nds.iaea.org/indc\\_sel.html](http://www-nds.iaea.org/indc_sel.html): INDC(AUS)-018, INDC(BLR)-014, 015, 016 and 017; INDC(CCP)-432, 434 Rev. 1, and 435; INDC(CPR)-057, INDC(NDS)-437,438, 439 and 440.

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## Computer Codes and Packages

### **DROSG 2000 Neutron Source Reactions.**

Version 2.2, prepared by M. Drogg (January 2003). Data files with computer codes for 59 monoenergetic neutron source reactions. The package is available on CD-ROM and online at:

<http://www-nds.iaea.org/drosg2000.html>

The revised report **IAEA-NDS-87, Rev. 8** (January 2003) with contents summary is available on request as hardcopy or online at:

<http://www-nds.iaea.org/reports/nds-87.pdf>

**ENDVER Verification Codes. Updates of November 2002**, by A. Trkov. The ENDVER package can be used to retrieve selected materials from a master library in ENDF format, extract cross sections (including differential and double differential ones) and output the data in two-column PLOTTAB "curves" format.

EXFOR data can be produced in computational C4 format and compared graphically with the corresponding data in the ENDF file. The code is available on CD-ROM and online at:

<http://www-nds.iaea.org/ndspub/ndf/endver>

### **EXFOR+CINDA/Java2 on CD-ROM.**

A stand-alone retrieval system provides search and presentation of data from integrated EXFOR and CINDA databases.

Main features: user-friendly interface based on Java2-Swing forms; powerful, fast and flexible search capability; interactive plotting provided by plugged-in ZVView; does not need any installation and can work on CD. The package can work on any platform having Java/JDBC (tested on Windows and Linux) with local and remote databases at the same time.

These programs were written by Viktor Zerkin,

Nuclear Data Section, IAEA, 2002-2003.

Full version for Windows is available on CD-ROM on request.

### **PREPRO-2002 ENDF/B Pre-Processing**

**Codes**, by D.E. Cullen. This supersedes all previous versions of Pre-Processing Codes. These codes are named "Pre-Processing" codes, because they are designed to pre-process ENDF/B data for later, further processing in applications. This is a modular set of computer codes, each of which reads and writes evaluated nuclear data in ENDF/B format. Each code performs one or more independent operations on the data. These codes are designed to be computer independent, and are presently operational on every type of computer from large mainframe computers to PCs such as IBM-PC and Power MAC. The codes are available on CD-ROM from the IAEA Nuclear Data Section or can be downloaded from:

<http://nds.iaea.or.at/ndspub/ndf/prepro>

### **RIPL-2 Reference Input Parameter Library.**

RIPL-2 library contains input parameters for theoretical calculations of nuclear reactions involving light particles such as n, p, d, t, <sup>3</sup>He, and gammas at incident energies up to about 100 MeV. The library contains **nuclear masses and deformations, nuclear matter densities, discrete levels and decay schemes, average spacings of neutron resonances, optical model potentials, level density parameters, Giant Resonance parameters, gamma-ray strength-functions and fission barriers**. Also includes an extensive database of level densities, gamma-ray strength-functions and fission barriers calculated with microscopic approaches. Several computer codes are provided in order to facilitate use of the library.

RIPL-2 has been developed as a continuation of the RIPL-1 project concluded in 1997. RIPL-2 does not supersede RIPL-1.

Full RIPL-2 report (IAEA-TECDOC) will be advertised when completed. Data are available on CD-ROM and online at:

<http://ndsli01.iaea.org/RIPL-2/>

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## Offline News

**Updated databases and libraries are now available on CD-ROM:**

**NSDD2002. IAEA Workshop on Nuclear Structure and Decay Data Evaluation. Manuals, Reports, Documents and Codes**, Vienna, Austria, 18 – 22 November, 2002. Available on CD-ROM.

**CINDA 2002. Book (1988 – 2002) and CD-ROM (full CINDA).** The index to Literature and Computer Files on Microscopic Neutron Data.

Published on behalf of USA National Nuclear Data Center, Russian Nuclear Data Center, NEA Data Bank and IAEA Nuclear Data Section.

Available as hard copy on request.

## Coordinated Research Projects

IAEA Coordinated Research Projects (CRPs) are a valuable mechanism for stimulating research in IAEA Member States of relevance to Agency programmes. CRPs of the Nuclear Data Section, both active and recently completed and additional information can be found at:

[www.iaea.org/programmes/ripc/nd/crps.htm](http://www.iaea.org/programmes/ripc/nd/crps.htm)

## Selected Reports and Documents

**Chart of the Nuclides.** *Wall chart of the Nuclides from KAPL and General Electric Co, 15th edition (revision to 1996).*

Available cost free on request by users from developing countries.

**Karlsruher Nuklidkarte.** *Wall Chart of the Nuclides from Karlsruhe, 6th edition (1995).*

Available cost free on request by users from developing countries.

**INDC(AUS)-018.** *Evaluations of the Fast Neutron Cross Sections of Si-28 including complete covariance information.* S. Tagesen, H. Vonach and A. Wallner, Institut fuer Isotopenforschung und Kernphysik der Universitaet Wien, Austria, November 2002. This report is available as hard copy or online at:

[http://www-nds.iaea.org/indc\\_sel.html](http://www-nds.iaea.org/indc_sel.html)

**INDC(BLR)-014.** *Neutron Data Evaluation of  $^{238}\text{U}$ .* V.M. Maslov, Yu.V. Porodzinskij, N.A. Tetereva, A.B. Kagalenko, N.V. Kornilov, M. Baba and A. Hasegawa, March 2003. This report is available as hard copy or online at:

[http://www-nds.iaea.org/indc\\_sel.html](http://www-nds.iaea.org/indc_sel.html)

**INDC(BLR)-015.** *Neutron Data Evaluation of  $^{232}\text{U}$ .* V.M. Maslov, Yu. V. Porodzinskij, N.A. Tetereva, A.B. Kagalenko, N.V. Kornilov, M. Baba and A. Hasegawa, March 2003.

This report is available as hard copy or online at:

[http://www-nds.iaea.org/indc\\_sel.html](http://www-nds.iaea.org/indc_sel.html)

**INDC(BLR)-016.** *Neutron Data Evaluation of  $^{232}\text{Th}$ .* V.M. Maslov, Yu. V. Porodzinskij, N.A. Tetereva, A.B. Kagalenko, N.V. Kornilov, M. Baba and A. Hasegawa, March 2003. This report is available as hard copy or online at:

[http://www-nds.iaea.org/indc\\_sel.html](http://www-nds.iaea.org/indc_sel.html)

**INDC(BLR)-017.** *Neutron Data Evaluation of  $^{234}\text{U}$ .* V.M. Maslov, Yu.V. Porodzinskij, N.A. Tetereva, A.B. Kagalenko, N.V. Kornilov, M. Baba and A. Hasegawa, March 2003.

This report is available as hard copy or online at:

[http://www-nds.iaea.org/indc\\_sel.html](http://www-nds.iaea.org/indc_sel.html)

**INDC(CCP)-432.** *Articles Translated from Journal Yadernye Konstanty (Series: Nuclear Constants Issue No.1, 2001), December 2002.* This report contains the full English version of Nuclear Constants journal and includes 8 papers translated from Russian and 6 papers originally published in English:

- *Investigation of the  $^{93}\text{Nb}$  Neutron Cross-Sections in Resonance Energy Range* by Yu. V. Grigoriev et al.

- *The TENDL Neutron Data Library and the TEND1038 38 Group Neutron Constant System* by S.N. Abramovich et al.

- *Resolved Resonance Parameters for  $^{236}\text{Np}$*  by G.B. Morogovskij et al.

- *Evaluation of the Cross Sections of Threshold Reactions Leading to the Production of Long-Lived Radionuclides during Irradiation of Steels by Thermonuclear Spectrum Neutrons* by A.I. Blokhin et al.

- *8-Group Relative Delayed Neutron Yields for Monoenergetic Neutron Induced Fission of  $^{239}\text{Pu}$*

by V.M. Piksaikin et al.

- *8-Group Relative Delayed Neutron Yields for Epithermal Neutron Induced Fission of  $^{235}\text{U}$  and  $^{239}\text{Pu}$*

by V.M. Piksaikin et al.

- *Delayed Neutron Yield from Fast Neutron Induced Fission of  $^{238}\text{U}$*

by V.M. Piksaikin et al.

- *Delayed Neutrons as a Probe of Nuclear Charge Distribution in Fission of Heavy Nuclei by Neutrons*

by S.G. Isaev et al.

- *The Energy Spectrum of Delayed Neutrons from Thermal Neutron Induced Fission of  $^{235}\text{U}$  and its Analytical Approximation*

by A. Yu. Doroshenko et al.

- *New Possibilities for Improving the Accuracy of Parameter Calculations for Cascade Gamma-Ray Decay of Heavy Nuclei*

by A.M. Sukhovej et al.

- *Half-Lives of Radionuclides used in Nuclear Geochronology and Cosmochronology (Evaluated Data)*

by V.P. Chechev

- *Test Calculations of Photoneutrons Emission from Surface of Uranium Sphere Irradiated by 28 MeV Electrons*

by A.I. Blokhin et al.

- *Calculational Estimations of Neutron Yield from ADS target*

by I.I. Degtyarev et al.

- *Fundamentals for the Development of a Low-Activation Lead Coolant with Isotopic Enrichment for Advanced Nuclear Power Facilities*

by G.L. Khorasanov

Available as hard copy or online at:

[http://www-nds.iaea.org/indc\\_sel.html](http://www-nds.iaea.org/indc_sel.html)

**INDC(CCP)-434.** *Experimental and Theoretical Study of the Yields of Residual Product Nuclei Produced in Thin Targets Irradiated by 100-2600 MeV Protons.* Yu. E. Titarenko (Project Manager), ITEP co-authors: V.F. Batyaev, et al. Revision 1, February 2003. Available as hard copy or online at:

[http://www-nds.iaea.org/indc\\_sel.html](http://www-nds.iaea.org/indc_sel.html)

**INDC(CCP)-435.** *Articles Translated from Journal Yadernye Konstanty (Series: Nuclear Constants Issue No.2, 2001), December 2002.* This report contains the full English version of Nuclear Constants journal and includes 3 papers translated from Russian and 4 papers originally published in English:

- *Evaluation of the Energy Dependence of the Mean Number of Prompt Neutrons  $\bar{\nu}_p$  for Neptunium and for Americium Isotopes*

by B.D. Kuz'minov et al.

- *New Technique for a Simultaneous Estimation of the Level Density and Radiative Strength Functions of Dipole Transitions at  $E_{ex} \leq B_n - 0.5$  MeV*

by V.A. Khitrov et al.

- *Neutron Cross Section Evaluations for Actinides at Intermediate Energies*

by A.V. Ignatyuk et al.

- *Scission Neutron Emission and Prompt Fission Neutron Spectrum*

by N.V. Kornilov et al.

- *Transmutation of  $^{204}\text{Pb}$  in an Intensive Gamma-Ray Flux*

by B.S. Ishkhanov et al.

- *Evaluation and Benchmarking of Nuclear Data of Vanadium in Integral Experiments with 14-MeV Neutrons*

by A. Bokhin et al.

- *Burnup Calculations using the Origen Code in the Conkemo Computing System*

by S.V. Zabrodskaya et al.

Available as hard copy or online at:

[http://www-nds.iaea.org/indc\\_sel.html](http://www-nds.iaea.org/indc_sel.html)

**INDC(CPR)-057.** *Thermal-Neutron Capture for A=36-44*, Zhou Chunmei and R.B. Firestone, January 2003.

This report is available as hard copy or online at:

[http://www-nds.iaea.org/indc\\_sel.html](http://www-nds.iaea.org/indc_sel.html)

**INDC(CPR)-058.** *Communication of Nuclear Data Progress No. 27 (June 2002).* China Nuclear Data Center, ed. by Liu Tingjing and Zhuang Youxiang. This report is available as hard copy.

**INDC(CPR)-059.** *Communication of Nuclear Data Progress No. 28 (December 2002).* China Nuclear Data Center, ed. by Liu Tingjing and Zhuang Youxiang. This report is available as hard copy.

**INDC(NDS)-435.** *Summary Report of the Technical Meeting on "International Reactor Dosimetry File: IRDF-2002"*, IAEA Headquarters, Vienna, Austria, 27-29 August 2002, prepared by L.R. Greenwood, R. Paviotti-Corcuera, September 2002

This report is available as hard copy or online at:

[http://www-nds.iaea.org/indc\\_sel.html](http://www-nds.iaea.org/indc_sel.html)

**INDC(NDS)-437.** *Update of X- and Gamma-Ray Decay Data Standards for Detector Calibration and Other Applications.* Summary report of the Third Research Co-ordination Meeting, IAEA, Vienna, Austria, 21-24 October 2002, prepared by M. Herman and A.L. Nichols, IAEA Nuclear Data Section, December 2002.

This report is available as hard copy or online at:

[http://www-nds.iaea.org/indc\\_sel.html](http://www-nds.iaea.org/indc_sel.html)

**INDC(NDS)-438.** *Summary Report of the First Research Co-ordination Meeting on Improvement of the Standard Cross Sections for Light Elements*, IAEA Headquarters, Vienna, Austria, 23-27 September 2002, prepared by A.D. Carlson, G.M. Hale and V.G. Pronyaev, January 2003. This report is available as hard copy or online at:

[http://www-nds.iaea.org/indc\\_sel.html](http://www-nds.iaea.org/indc_sel.html)

**INDC(NDS)-439.** *Workshop on Nuclear Structure and Decay Data Evaluation.* Summary report, IAEA Headquarters, Vienna, Austria, 18-22 November 2002. prepared by V.G. Pronyaev, and A.L. Nichols, January 2003.

This report is available as hard copy or online at: [http://www-nds.iaea.org/indc\\_sel.html](http://www-nds.iaea.org/indc_sel.html)

**INDC(NDS)-440.** *Thermal Neutron Capture Cross Sections Resonance Integrals and g-Factors*, S.F. Mughabghab, February 2002. This report is available as hard copy or online at: [http://www-nds.iaea.org/indc\\_sel.html](http://www-nds.iaea.org/indc_sel.html)

**JAERI-Data/Code 2002-020.** *Curves and Tables of Neutron Cross Sections in JENDL-3.3 Part 1 (Z=1-50)*, edited by Tsuneo Nakagawa, Hiromitsu Kawasaki and Keiichi Shibata, November 2002. This report is available as hard copy.

**JAERI-Research 2002-028.** *Neutron and Proton Nuclear Data Evaluation for  $^{235}\text{U}$  and  $^{238}\text{U}$  at Energies up to 250 MeV*, prepared by A. Yu. Konobeyev, Tokio Fukahori and Osamu Iwamoto, December 2002. This report is available as hard copy.

**JAERI-Research 2002-029.** *Nuclear Data Evaluation for  $^{238}\text{Pu}$ ,  $^{239}\text{Pu}$ ,  $^{240}\text{Pu}$ ,  $^{241}\text{Pu}$  and  $^{242}\text{Pu}$  Irradiated by Neutrons and Protons at Energies up to 250 MeV*, prepared by A. Yu. Konobeyev, Tokio Fukahori and Osamu Iwamoto, December 2002. This report is available as hard copy.

**JAERI-Research 2002-032.** *Nuclear Data Evaluation for  $^{237}\text{Np}$ ,  $^{241}\text{Am}$ ,  $^{242g}\text{Am}$  and  $^{242m}\text{Am}$  Irradiated by Neutrons and Protons at Energies up to 250 MeV*, prepared by A. Yu. Konobeyev, Tokio Fukahori and Osamu Iwamoto, December 2002. This report is available as hard copy.

**JAERI-Review 2002-029.** *JAERI Tandem Annual Report 2001. 1 April 2001 – 31 March 2002 (November 2002)*. This report is available as hard copy.

**Yadernye Konstanty (Nuclear Constants)**, issue 1-2, 2002. *Analysis and evaluation of the spectra and production cross-sections of gamma rays* (Ignatyuk A.V. et al., in Russian). *The investigation of resonance structure of the neutron cross-sections and the  $\alpha$ -value of  $^{235}\text{U}$  for different temperatures* (Grigoriev Yu. et al., in English). *The investigation of resonance*

*structure of the total and partial cross-sections for Nb, Mo and Pb in energy range 0.1 - 200 keV* (Grigoriev Yu. V. et al., in Russian).

*Evaluation of the series of criticality experiments carried out at the BFS-40 stand* (Ivanov E.A. et al., in Russian). *International analysis of reactivity coefficients for IAEA benchmark model (hybrid core of BN-600 reactor)* (Danilychev A.V. et al., in Russian). *Influence of a settlement error of the initial neutron physics data and prediction of consequences of basic accidents for the IAEA test model* (Danilychev A.V. et al., in Russian). *Interactive information system of nuclear-physical data for neutron-activation analysis* (Plyaskin V.I. and Kosilov R. in Russian). *Interactive information system of nuclear-physical data for neutron-activation analysis* (Plyaskin V.I. and Kosilov R.A., in Russian). Copies of papers published in this report are available on request.

**NEA/JEFF Reports.** *Complete collection of JEFF-Reports, numbers 1-18 in pdf format.* The Joint Evaluated File (JEF) was started in 1982 as a collaborative project among NEA Data Bank member countries. The main objective is to provide participating countries with a common and unique source of nuclear data for the calculation and prediction of different nuclear applications. These reports are available on CD-ROM.

**NEA/WPEC-6.** *Delayed Neutron Data for the Major Actinides.* A report by the Working Party on International Evaluation Co-operation of the NEA Nuclear Science Committee. Co-ordinators: G. Rudstam, Ph., Finck, A. Filip, A.D'Angelo and R.D. McKnight. CD-ROM also included of Annexes to this report. Limited copies are available on request.

**Note: Unless indicated otherwise, the quoted data files, printed materials, or computer codes are available cost-free upon request. When requesting data files or codes, kindly give us your desired specifications.**



**Co-operating nuclear data service centers****For services to customers in USA and Canada:**

US National Nuclear Data Center, Bldg. 197D, Brookhaven National Laboratory, P.O. Box 5000, Upton, NY 11973-5000, USA. Tel. +1 631-344-2902; Fax +1 631-344-2806; E-mail: [nndc@bnl.gov](mailto:nndc@bnl.gov); Worldwide Web: <http://www.nndc.bnl.gov/> For information on online services and requests contact: Ms. V. McLane.

**For services to customers in OECD countries in Western Europe and Japan:**

NEA Data Bank: OECD Nuclear Energy Agency, Le Seine Saint-Germain, 12 blvd des Iles, F-92130 Issy-les-Moulineaux, France. Tel. +33 1 4524 (plus extension); Fax +33 1 45241110; E-mail: (name)@nea.fr or [nea@nea.fr](mailto:nea@nea.fr); Worldwide Web: <http://www.nea.fr> username: NEADB. Contact: C. Nordborg, ext. 1090.

**For services to the countries of the former USSR:**

**Neutron data:** Russia Nuclear Data Center, Centr Jadernykh Dannykh (CJD), Fiziko-Energeticheskij Institut, Ploschad Bondarenko, 249020 Obninsk, Kaluga Region, Russia. Tel. +7 08439-9-8982; Fax +7 095-230-2326; E-mail: [manokhin@ippe.obninsk.ru](mailto:manokhin@ippe.obninsk.ru). Worldwide Web <http://rndc.ippe.obninsk.ru/> Contact: V.N. Manokhin.

**Charged-particle data:** Russia Nuclear Structure and Reaction Data Center (CAJAD), Kurchatov Institute, Kurchatov's Square 1, 123 182 Moscow, Russia. Tel. +7 095-196-9968; Fax +7 095-882-5804; E-mail: [feliks@polyn.kiae.su](mailto:feliks@polyn.kiae.su) Contact: F.E. Chukreev.

**Photonuclear data:** Centre for Photonuclear Experiments Data, Centr Dannykh Fotoyadernykh Eksperimentov (CDFE), Skobeltsyn Institute of Nuclear Physics, Lomonosov Moscow State University, Leninskie Gory, 119 922 Moscow, Russia. Tel. +7 095-939-3483; Fax +7 095-939-0896; E-mail: [varlamov@depni.sinp.msu.ru](mailto:varlamov@depni.sinp.msu.ru) or [varlamov@depni.npi.msu.su](mailto:varlamov@depni.npi.msu.su). Worldwide Web <http://depni.sinp.msu.ru/cdfe/> Contact: V.V. Varlamov.

**For services to customers in China:**

China Nuclear Data Center, China Institute of Atomic Energy, P.O. Box 275(41), Beijing 102413, China. Tel. +86 10-6935-7275; Fax +86 10-6935-7008; E-mail: [gezg@iris.ciae.ac.cn](mailto:gezg@iris.ciae.ac.cn) Contact: Ge Zhigang.

**Computer codes of US origin to all countries:**

Radiation Safety Information Computational Center (RSICC), Oak Ridge National Laboratory, P.O. Box 2008, Oak Ridge, TN 37831-6362, USA. Tel. +1 865-574-6176; Fax +1 865-574-6182; E-mail: [pd@ornl.gov](mailto:pd@ornl.gov). Worldwide Web <http://epicws.epm.ornl.gov/> (there may be charges and release restrictions)

**Computer codes of non-US origin to all countries:**

NEA Data Bank, see above, contact: E. Sartori, ext. 1072; E-mail: [sartori@nea.fr](mailto:sartori@nea.fr) (there may be release restrictions)

**The IAEA Nuclear Data Section** offers data centre services primarily to non-OECD countries (except Russia and China, see above). However, most products advertised in this Newsletter, specifically INDC reports, IAEA-NDS-documents, etc., are provided, upon request to customers in all countries. For online services see the first page of this Newsletter. **Users of countries in Latin America and Caribbean** may use IAEA-NDS mirror at Worldwide Web <http://www.nds.ipen.br>

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