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**Note:** Unless indicated otherwise, the quoted data files, printed materials, or computer codes are available cost-free upon request. The major databases are available online within NDIS, the Nuclear Data Information System. FTP transfer can be arranged by e-mail exchange. When requesting data files or codes on magnetic tapes or diskettes, kindly give us your acceptable specifications:

**Magnetic tapes:** specify acceptable density (1600 or 6250 bpi), maximum block size, and whether the data should be coded in EBCDIC, ASCII, or VAX-backup coding. Only 9-track tapes are used.

**DAT tapes:** 4 mm only, either in TAR format, IBM format or VMS format, uncompressed or compressed. Preferable for very large data libraries (up to several Gigabytes).

**PC diskettes:** DOS standard diskettes, either 3.5 inch or 5.25 inch. Preferable for not too large files (if compressed up to several Megabytes).

**CD-ROM:** under development; please check with Nuclear Data Section about availability.

#### Personal item

Dr. Hans-Dietrich Lemmel, the head of the Nuclear Data Center Unit and editor of this Newsletter since it was started in 1979, retired in November 1996 after 32 years of service with the IAEA Nuclear Data Section. The staff of the unit thanks him for his guidance throughout the years and will try hard to continue the work in his spirit.

#### New data libraries

**ENDF/B-6 Release 4** was received (distribution date February 1997). It contains (in the neutron sublibrary) new evaluations for five materials: Gd-152, Gd-154, Ir-191 (new material), Ir-193 (new material), Pu-236, and minor updates for ten other materials. See IAEA-NDS-100 Rev. 7 for details. This release also contains updated comments in the high energy sublibrary. The updated files are included in our online service NDIS and can also be obtained on magnetic tape.

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online: TELNET or FTP: [iaeaand.iaea.or.at](http://iaeaand.iaea.or.at)  
username: IAEANDS for interactive Nuclear Data Information System  
username: ANONYMOUS for FTP file transfer  
username: FENDL for FTP file transfer of FENDL-1 files, FENDL2 for FENDL-2 files  
For users with Web-browsers: <http://www-nds.iaea.or.at>

**FENDL/A-2.0** (March 1997). Comprehensive neutron cross section library for 13006 neutron activation reactions with 739 target nuclides from H to Cm in the incident energy range up to 20 MeV. The data are in ENDF format with some modifications. Compared to the previous version FENDL/A-1.1, many nuclides and reactions were added or revised. The evaluations were selected from major activation libraries including EAF-4.1, ADL-3, JENDL/A-3.2 and others. Available on magnetic tape or by FTP file transfer. Summary documentation: IAEA-NDS-173.

**FENDL/A-2.0 Processed Files.**

(FENDL2/A-MCNP, FENDL2/A-VITJ\_E, FENDL2/A-VITJ\_FLAT). Pointwise cross sections (any resonance parameters contained in the original data files were converted to cross sections) for 13006 activation reactions for 739 target nuclides (including metastable states), processed for use with the Monte Carlo neutron/photon transport code MCNP, and as VITAMIN-J 175 multigroup data weighted with the VITAMIN-E neutron weighting spectrum and with a constant (flat) weighting spectrum. Available on magnetic tape or by FTP file transfer. Summary documentation: IAEA-NDS-174 (March 1997).

**FENDL/C-2.0** (March 1997). Integrated cross section evaluations and processed data for the fusion reactions H-2(d,n)He-3, H-2(d,p)H-3, He-3(d,p)He-4, H-3(t,2n)He-4, and H-3(d,n)He-4, in ENDF-6 format. The data for the first four reactions are extracted from ENDF/B-6 (unchanged from previous version FENDL/C-1.0), while the data for the H-3(d,n)He-4 reaction were replaced with an improved evaluation by G.M. Hale and M. Drosog. Available on magnetic tape or by FTP file transfer. Summary documentation: IAEA-NDS-177.

**FENDL/D-2.0.** Decay properties (decay type, decay energy, half-life) for 1867 nuclides and isomers, taken from the EAF-4.1 decay library. The data, in ENDF-6 format as well as processed into MCNP and REAC-compatible formats, are available on magnetic tape or by FTP file transfer. Summary documentation: IAEA-NDS-178 (March 1997).

**FENDL/E-2.0** (March 1997). Selected evaluated neutron, photon interaction and photon production cross sections in ENDF format, for 61 nuclides of importance for coupled neutron-photon transport calculations for fusion applications, in the energy range  $10^{-5}$  eV to 20 MeV. Relative to the previous version FENDL/E-1, 19 evaluations were replaced and evaluations for six additional nuclides were added. The neutron interaction cross sections were selected from ENDF/B-6, JENDL-3, JENDL-FF (Fusion File), BROND-2, and EFF-3 libraries, while the photon interaction cross sections were taken from the ENDF/B-6 photon interaction library. Available on magnetic tape or by FTP file transfer. Summary documentation: IAEA-NDS-175.

**LLCRP.** Excitation functions of 16 long-lived activation reactions of importance in fusion reactor technology. Available in slightly modified ENDF-5 format on magnetic tape or by FTP file transfer. Summary documentation: INDC(NDS)-344.

**"Maslov" update 97/1.** Evaluated neutron reaction data for 95-Am-242-m and 95-Am-242-g by V. Maslov et al., Minsk/Belarus, in ENDF-6 format, received in January/March 1997 as a supplement to five evaluations for Am and Cm isotopes received earlier. Documented in report IAEA-NDS-164 Rev. 1 (1997).

**WIND-2.** Neutron activation data for Pu-239 at energies up to 2 GeV by A.Yu. Konobeyev et al., Obninsk, Russia. Available on PC diskette. Summary documentation: IAEA-NDS-143 Rev. 1 (March 1997).

**NRABASE 2.0.** Differential charged-particle cross sections for Ion Beam Analysis. Experimental data compiled in tabular and graphical form by A. Gurbich, Obninsk, Russia, under a contract with the IAEA Physics Section. PC database with display software. Summary documentation: IAEA-NDS-201 (March 1997).

**BISERM v.2.** Nuclear Data Library for Evaluation of Radiation Effects in Materials Induced by Neutrons of Intermediate Energies. By Yu.A. Korovin et al., Obninsk, Russia. The library contains neutron displacement cross sections as well as hydrogen and helium production cross sections for 259 stable nuclei from Al-27 to Bi-209 at neutron energies up to 1 GeV. The data are in slightly modified ENDF-6 format. Available on PC diskette. Summary documentation: IAEA-NDS-203 (March 1997).

### Chart of nuclides

A new version of the "Chart of The Nuclides" was issued by General Electric and Knolls Atomic Power Laboratory (15th edition, revised to 1996, by J.R. Parrington, H.D. Knox, S.L. Breneman, E.M. Baum, F. Feiner). It consists of a wall chart and a booklet "Nuclides and Isotopes" and can be ordered from GE Nuclear Energy, 175 Curtner Ave. M/C 948, San Jose, CA 95125-1088, USA, e-mail: [nuclides@sjcpo2.ne.ge.com](mailto:nuclides@sjcpo2.ne.ge.com). A limited number of copies is available from IAEA cost-free for scientists in developing countries.

### Conference announcement

The next International Nuclear Physics Conference (INPC98) will be held in Paris, France, 24-28 August 1998, sponsored by IUPAP (the International Union of Pure and Applied Physics) and organized by the two French agencies CEA and CNRS. It will be in the spirit of the tri-annual IUPAP nuclear physics conferences (the last ones were held in Beijing 1995 and Wiesbaden 1992) but will have a special character in celebrating the centennial of the discovery of radioactivity by Henri Becquerel and of the first radioactive elements by Pierre and Marie Curie. The topics will include: Quark and Hadron Dynamics; Quark Gluon Plasma; Nuclear Reaction Dynamics and Nuclear Matter at High Temperature; Nuclear Structure: many-body problem, nuclei at large deformation or at extrem isospin...; Nuclear Astrophysics; Fundamental Interactions and Symmetries; Experimental Techniques and Facilities: new opportunities; Impact of Nuclear Science on Society: industry, medicine, environment, waste management, production of energy, art... Conference secretariat: Frederique Dykstra, Institut de Physique Nucleaire, F-91406 Orsay cedex, France. E-mail: [inpc98@in2p3.fr](mailto:inpc98@in2p3.fr), Worldwide Web: <http://www-dapnia.cea.fr/Inpc98>.

### Nuclear data handbook

Atlas of Neutron Capture Cross Sections. J. Kopecky et al. Report INDC(NDS)-362, 370 pages. Plots of neutron capture cross sections in the energy range  $10^{-5}$  eV - 20 MeV as evaluated and compiled in recent activation libraries, compared with available experimental values at thermal energy, 30 keV and 14.5 MeV, for 739 targets from H to Cm. Report available cost-free. The evaluated cross section data are available in pointwise ENDF-5 format and can be downloaded from the NDS WWW page (<http://www-nds.iaea.or.at>, see NGATLAS).

### Selected reports and documents on nuclear data

- \* = documents available cost-free from IAEA/NDS upon request.
- = available from originator or from the INIS Microfiche Service (IAEA, P.O. Box 100, A-1400 Vienna, Austria)

### ENDF documentation

- \* ENDF-6 Formats Manual Rev. 2/97. "ENDF-102 data formats and procedures for the evaluated nuclear data file ENDF-6", Informal Report BNL-NCS-44945, revised February 1997. Written by the Members of the US Cross Section Evaluation Working Group, edited by V. McLane, C.L. Dunford, P.F. Rose. Available in the form of several PostScript files by anonymous FTP or through the World Wide Web page from the IAEA Nuclear Data Section, or as a hardcopy report IAEA-NDS-76 Rev. 5 (with a few front pages added by the IAEA Nuclear Data Section).
- \* ENDF/B-6 Summary Documentation, Supplement 1, and ENDF/HE-6 Summary Documentation. Report BNL-NCS-17541 (ENDF-201) 4th edition, Supplement 1, December 1996. Edited by V. McLane and Members of the US Cross Section Evaluation Working Group. Contains updates of the ENDF/B-6 summary documentation since 1991 and the summary documentation of the High Energy file (neutron and proton sublibraries). Available in the form of several PostScript files by anonymous FTP or through the Worldwide Web page from the IAEA Nuclear Data Section, or as a hardcopy report.

#### Nuclear Data Center coordination

- \* INDC(NDS)-363. Coordination of the Nuclear Structure and Decay Data Evaluators Network. Report on a meeting in Budapest, Hungary, 14-18 October 1996. Edited by D.W. Muir.

#### Nuclear data standards

- \* INDC(NDS)-368. Update of the 1991 NEANDC/INDC Nuclear Standards File (which was published as "Nuclear Data Standards for Nuclear Measurements", NEANDC-311 = INDC(SEC)-101, 1992). A.D. Carlson et al.

#### Progress reports

- \* INDC(AUL)-044. Progress Report of Applications of Nuclear Physics 1994/95. Australian Nuclear Science and Technology Organisation.
- \* INDC(CPR)-041. Communication of Nuclear Data Progress No. 16 (1996). Chinese Nuclear Data Center.
- \* INDC(EUR)-030. Annual Progress Report on Nuclear Data 1995. Institute for Reference Materials and Measurements, Geel, Belgium.

#### Evaluation of neutron reaction data

- \* INDC(BLR)-007. Evaluation of Neutron Data for Americium-242m. V.M. Maslov et al.
- \* INDC(BLR)-008. Evaluation of Neutron Data for Americium-242g. V.M. Maslov et al.

#### FENDL - evaluated nuclear data library for fusion

- \* INDC(GER)-041 (FZKA-5785). Integral Data Tests of the FENDL-1 Nuclear Data Library for Fusion Applications. Summary report of the International Working Group on "Experimental and Computational Benchmarks on Fusion Neutronics for FENDL Validation". Forschungszentrum Karlsruhe. Edited by U. Fischer.

#### Helium production

- \* INDC(NDS)-358. The IAEA Co-ordinated Research Programme on "Improvement of Measurements, Theoretical Computations and Evaluations of Neutron Induced Helium Production Cross Sections". Status report prepared at the final CRP Meeting in Sendai, Japan, 25-29 September 1995. Edited by A.B. Pashchenko.

#### Activation cross sections

- \* INDC(CCP)-402. Systematic Measurement of Activation Cross Sections at Neutron Energies from 13.4-14.9 MeV. A.A. Filatenkov et al.
- \* INDC(NDS)-344. Activation Cross Sections for the Generation of Long-Lived Radionuclides of Importance in Fusion Reactor Technology. Final Report of a Co-ordinated Research Programme. Edited by A.B. Pashchenko.
- \* INDC(NDS)-361. Establishment of an International Reference Data Library of Nuclear Activation Cross Sections. Summary report of the Second Research Co-ordination Meeting organized by the IAEA in co-operation with the Instituto de Fusión Nuclear de la Universidad Politécnica de Madrid and held in Madrid, 13-16 May 1996. Edited by A.B. Pashchenko.

#### Photon production

- \* INDC(NDS)-357. Summary Report of the 2nd Research Co-ordination Meeting on Measurement, Calculation and Evaluation of Photon Production Data, Vienna, 21-24 May 1996. Edited by P. Obložinský.

#### Nuclear model calculations

- \* NSC/DOC(97)-1. International codes and model intercomparison for intermediate energy activation yields. By Rolf Michel and Pierre Nagel. Issued by OECD Nuclear Energy Agency. The report and the experimental data referred to therein are available also via the World Wide Web at <http://www.nea.fr/html/science/pt/ieay>.

- \* INDC(CHL)-004. Full-Folding Model for Optical Potentials. H.F. Arellano and F.A. Brieva.

#### Group cross sections

- \* INDC(BUL)-015. BGL440 and BGL1000. Broad Group Neutron/Photon Cross-Section Libraries derived from ENDF/B-VI Nuclear Data. J.A. Bucholz, S.Y. Antonov and S.I. Belousov.

#### Integral experiments

- \* INDC(CCP)-400. Integral 14 MeV Neutron Experiments with the Samples of Multiplying Materials. D.Yu. Chuvilin et al.
- \* INDC(CCP)-401. Total Neutron Leakage Multiplication Experiments and Analysis on a combined Beryllium Sphere with a 14 MeV Source. D.Yu. Chuvilin et al.

#### Nuclear data for radiation therapy

- \* INDC(NDS)-365. Status of Nuclear Data Needed for Radiation Therapy and Existing Data Development Activities in Member States. Summary Report of a Consultants' Meeting held in Vienna, 9-11 December 1996. Edited by N.P. Kocherov.

Yadernye Konstanty ("Nuclear Constants"), Moscow, Russia. This series appears in Russian with abstracts in English. Copies are available, costfree, from the IAEA Nuclear Data Section. Tables of contents are given in the following. Subject to available funds, selected articles are translated by IAEA and published as INDC(CCP)-reports.

- \* Yad. Konst. 1996 (1). Contents: Development of national neutron data base for nuclear technology (Ignatyuk). Group data system ABBN-93. Part I: Nuclear data for neutrons and photons (Manturov). A nuclear reaction cross-section data base for ion beam analysis (Gurbich). Research of neutron spectra from fission of heavy nuclei induced by fast neutrons (Lovchikova). Low energy  $^{231}\text{Pa}$  photofission cross section (Soldatov). Measurement of the cross-section of  $^{58}\text{Ni}(n,\alpha)^{55}\text{Fe}$  reaction (Ketlerov). Threshold neutron reactions systematics development (Dityuk). Analysis of  $\text{Nb}(n,xn)$  and  $\text{Bi}(n,xn)$  reactions in the energy range of incident neutrons between 5 and 27 MeV (Lunev).
- \* Yad. Konst. 1996 (2). Status of Nuclear Data Needed for Radiation Therapy and 1996 (2). In Russian, with abstracts in English, cost-free. Contents: About attestation of reference data and constants by interdepartment commity ... (Golashvili). Systematic measurement of activation cross sections at neutron energy of 13.4-14.9 MeV (Filatenkov; English translation see INDC(CCP)-402). Gamma-ray production cross-section by interaction of 13.8 MeV neutrons with Cu, W, and  $^{235}\text{U}$  nuclei (Gorbachev). Cross section of the formation of gamma rays from neutron inelastic scattering of energy 3.0 MeV (Lashuk). The measurements of  $^{117}\text{Sn}$  resonance parameters in the energy range 40-5000 eV (Georgiev). The definition of spins of indium isotopes by means of gamma-line intensities (Grigor'ev). Some criteria for selection of evaluated threshold reaction excitation functions (Manokhin; in English). On possible contribution of knockout process and inelastic scattering with excitation of anomaly parity states in neutron emission spectra (Lunev). Dependence of the total neutron cross sections for even-even nuclei  $^{112-124}\text{Sn}$  at low energies on the mass number (Zaikin). Helium production neutron cross section data library (Zolotarev; in English). Effects of transport approximation in reactivity coefficients in large fast reactor with sodium plenum (Grabeshnoi). Half-lives of radionuclides used for calibration of X-ray and gamma-ray detectors (Chechev). Proton optical potential for  $^{90}\text{Zr}$  nucleus near the coulomb barrier (Gurbich).

The addresses of the 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. 516-344-2902; Fax 516-344-2806; e-mail: [nndc@bnl.gov](mailto:nndc@bnl.gov); World Wide Web: <http://www.nndc.bnl.gov/>. For information on online services and requests contact: V. McLane

For services to customers in OECD countries in West 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; Telex OCDE 620160 F; e-mail: [nea@nea.fr](mailto:(name)@nea.fr) or [nea@nea.fr](mailto:nea@nea.fr); World Wide Web: <http://www.nea.fr> username: NEADB. Contact: C. Nordborg, ext. 1092

For services to the countries of the former USSR:

Neutron data: Russia Nuclear Data Center, Centr Jadernykh Dannyykh (CJD), Ploshchad Bondarenko, 249020 Obninsk, Kaluga Region, Russia.

Tel. +7 084-399-8982; Fax +7 095-230-2326; Telex 411509 naf su; e-mail: [manokhin@cjd.obninsk.su](mailto:manokhin@cjd.obninsk.su). Contact: V. Manokhin

Charged-particle data: Russia Nuclear Structure and Reaction Data Center (CAJAD), Kurchatov Institute, 46 Ulitsa Kurchatova, 123182 Moscow, Russia.

Tel. +7 095-196-1612; Fax +7 095-882-5804; Telex 411594 shu su; e-mail: [chukreev@cajad.kiae.su](mailto:chukreev@cajad.kiae.su). Contact: F.E. Chukreev

Photonuclear data: Centr Dannyykh Fotojad. Eksp. (CDFE), Institute of Nuclear Physics, Moscow State University, Vorob'evy Gory, 119899 Moscow, Russia. Tel. +7 095-939-3483; Fax +7 095-939-0896; Telex 411483 mgu su; E-mail: [varlamov@cdfe.npi.msu.su](mailto:varlamov@cdfe.npi.msu.su). 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. 10-6935-7275; Fax 10-6935-7008; Telex 222373 iae cn; e-mail: [cndc@mipsa.ciae.ac.cn](mailto:cndc@mipsa.ciae.ac.cn). Contact: Zhang Jingshang

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. 615-574-6176; Fax 615-574-6182; e-mail: [pdcc@ornl.gov](mailto:pdcc@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. (There may be release restrictions.)

The IAEA Nuclear Data Section offers data center services primarily to non-OECD countries (except Russia and China, see above). However, certain 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 last page of this newsletter.



Access to NDIS  
(interactive online Nuclear Data Information System)  
via INTERNET (TCP/IP):

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**Sample login:**

TELNET        iaeand.iaea.or.at

The IAEA/Nuclear Data Section's AlphaServer Computer System

Username:    IAEANDS

THE IAEA/NDS ONLINE DATA SERVICE

.....  
.....

Enter NDS assigned authorization code (or GUEST): GUEST  
(or your authorization code if you have one)

**Authorization:**

As a "GUEST", you will have 30 seconds of CPU time allocated. At the end of a GUEST session, you may sign up directly for an authorization code for full access service. (This code still needs to be activated by the NDIS manager before you can use it for future access.) Or, you may contact the IAEA Nuclear Data Section for assignment of an authorization code.

**Retrieval system:**

A user-friendly system provides ample help to the user who specifies the retrieval criteria in response to step-by-step prompts by the system. It also provides interactive assistance through HELP files. More detailed documentation on the system can be found in the report IAEA-NDS-150 Rev. 96/8 by C.L. Dunford and T.W. Burrows, which is available as a hardcopy or online in "PostScript".

**Access to open areas for FTP file transfer:**

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**Sample login:**

FTP    IAEAND.IAEA.or.at

Username:    FENDL (if FENDL-1 files are wanted, or FENDL2 for  
                 FENDL-2 files)  
             ANONYMOUS (for retrieving other available files)  
             NDSOPEN (for sending files to IAEA)

No password required.

Then choose one of the available subdirectories, where you may find  
AAREADME.TXT files for further information.

#### How to find nuclear data

For a complete overview of all data libraries and services available from the IAEA Nuclear Data Section, see the document **IAEA-NDS-7**. A Worldwide Web version of it is available as the "IAEA Nuclear Data Guide" under [http://www-nds.iaea.or.at/indg\\_intro.html](http://www-nds.iaea.or.at/indg_intro.html)

An index to the **IAEA-NDS-Documentation Series** is available in the document **IAEA-NDS-0**.

The online nuclear data service **NDIS** provides access to several of the major databases via Telnet (see page 7 for instructions). Some data retrievals and files can be accessed through our WWW page at <http://www-nds.iaea.or.at/> or are accessible by FTP file transfer.

#### Major databases available through NDIS

NSR	(low and intermediate energy nuclear physics bibliography)
ENSDF	(evaluated nuclear structure and decay data)
NUDAT	(selected structure and decay data, thermal cross sections)
CINDA	(neutron data bibliography)
EXFOR/CSISRS	(experimental nuclear reaction data)
ENDF	(evaluated nuclear reaction data)
XRAY	(evaluated photo-atomic interaction data)

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username: ANONYMOUS for FTP file transfer  
username: FENDL for FTP file transfer of FENDL-1 files, FENDL2 for FENDL-2 files  
For users with web-browsers: <http://www-nds.iaea.or.at>