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**Note:** Unless indicated otherwise, the quoted data, documents or codes are available costfree upon request. - When requesting data on magnetic tape, kindly specify the acceptable density (1600 or 6250 bpi), maximum block size, and whether the data should be in EBCDIC or ASCII code. Only 9 track tapes are used. Not too large data files or computer codes can also be sent on DOS standard diskettes (either 5.25 inch, 1.2 Mb or 3.5 inch, 1.44 Mb).

**News on tape density:** The IAEA Computer Centre does no longer have a tape drive that writes tapes at 800 bpi. Therefore, requests for tapes at 800 bpi can no longer be fulfilled. Only in exceptional cases when the requestor has really no access to a 1600 bpi tape drive, we may find a way to provide tapes at 800 bpi.

#### Data indexes and bibliographies

**CINDA-89.** The bibliography and data index for microscopic neutron data available for a sales price of 1080.- Austrian Schillings. It covers the period 1982-89 and supplements the books CINDA A (1935-1976) and CINDA B (1977-1981). Note: CINDA like other priced IAEA publications can be bought either directly from the IAEA, Division of Publications, or for local currency by means of UNESCO coupons which can be obtained at the UNESCO office of your country. Furthermore, it can be obtained at half the nominal price when ordered through the Permanent Mission of your country to the IAEA in Vienna. A complete CINDA issue is planned to be published in 1990.

**CINDA computer retrievals** on specific nuclides or quantities are available costfree upon request.

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Integral Charged-Particle Nuclear Data Bibliography, BNL-NCS-51771 first ed., suppl. 5, Dec. 1989, for literature scanned from Nov. 1988 to Nov. 1989, by the US National Nuclear Data Center. Few copies available costfree. Also available as computer file costfree upon request.

EXFOR index. Exfor is the international data file for experimental nuclear reaction data. Retrievals are available upon request. For information on the contents of this data file, the EXFOR Index File is available on magnetic tape. A subset of this file restricted to charged-particle induced and photon-induced nuclear reactions has been published by F.E. Chukreev, V.V. Varlamov et al. This index book is in English, however explanations are given in Russian only.

Fotojadernye Dannye - Photonuclear Data, a bibliographic index on the photofission of nuclei covering the period 1952-1988, by the USSR Photonuclear Data Center (V. Varlamov et al). Costfree.

IAEA-NDS-7 (Rev. 90/1): Index of data libraries available on magnetic tape from the IAEA Nuclear Data Section. H.D. Lemmel (ed.).

IAEA-NDS-0 (Rev. 90/1): Index to the IAEA-NDS-Documentation Series.

#### New data libraries received

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BROND. Supplements and revisions to the USSR evaluated neutron reaction data library BROND have been received and collected in the file BROND-NDS2. This includes data for the isotopes of H, He, Li, Cr, for natural Fe, Nb-93, U-235 and Pu-241. Whereas the first file BROND-NDS1 is in ENDF-5 format, the present file BROND-NDS2 is in ENDF-6 format. Both BROND files together are documented in the report IAEA-NDS-90 Rev.2.

"ACTIV87". Fast Neutron Activation Cross-Section File by V.N. Manokhin, A.B. Pashchenko, V.I. Pljaskin, V.M. Bychkov, V.G. Pronjaev. This library contains evaluated cross-sections for 206 important fast-neutron induced activation reactions in the energy range from threshold up to 20 MeV. This file contains the numerical data of the graphical plots that had been published in the IAEA Handbook on Nuclear Activation Data (K. Okamoto, ed.), IAEA Technical Report 273 (1987), pp 305-411. A brief documentation of this data library is given in the report IAEA-NDS-96 (O. Schwerer, ed.).

"ACTIV-F/H". Neutron activation cross-section library for fusion reactor design. 284 reactions on 58 nuclides (zero to 20 MeV) selected from the Hanford REAC\*2 data library, in ENDF-6 format. Documentation and graphical plots by V. Goulo, document IAEA-NDS-114.

Chinese neutron activation cross-sections. A compilation and evaluation of data for 58 fast neutron activation reactions of interest to nuclear technology applications is contained in the report INDC(CPR)-16 by Shao Wenrong et al. Included are: tables of experimental data measured at the Institute of Atomic Energy, Beijing; tables of evaluated data; graphical plots.

Delayed fission gamma-ray spectra from U-235,238, Pu-239,240,241. Calculated data by T. Yoshida. Tabular data in the report JAERI-M-80-037. (If data are requested on magnetic tape, we will try to obtain them).

#### Nuclear Wall Chart

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A new nuclear wall chart has been issued by the General Electric Company, USA. As in earlier issues it contains in a graphical form all isotopes of all elements, including for stable isotopes the abundance and thermal neutron cross-section, or for unstable isotopes the half-life and decay mode, as well as other information. The wall chart (measuring 72 cm x 130 cm) together with an information booklet may be obtained by contacting the

General Electric Company, Nuclear Energy Operations, 175 Curtner Avenue, M/C 684, San Jose, California, USA-95125. A limited number of copies is available free of charge to scientists in developing countries upon request.

#### Handbooks

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Handbook of fast neutron generators, 2 vols, by Julius Csikai. CRC Press, 2000 Corporate Blvd N.W., Boca Raton, Florida, USA-33431. Contents: Vol. 1: Principles of operation, ion acceleration, neutron source reactions, neutron beam characteristics, design of a neutron generator laboratory; survey of neutron generator applications, 14 MeV neutron activation analysis; Vol. 2: fundamental nuclear research and neutron data measurements, experimental techniques and methods, present status of fast neutron cross-section data. Each volume with a subject index and a comprehensive bibliography. Not available from the IAEA; to be bought from the publishers.

Applied Nuclear Theory and Nuclear Model Calculations for Nuclear Technology Applications. Lectures of a workshop at the Int. Centre of Theor. Phys. in Trieste, Italy, 15 Feb.-19 March 1988. M.K. Mehta, J.J. Schmidt (ed.). Not available from the IAEA; to be purchased from the publishers: World Scientific Publ. Co., P.O. Box 128, Farrer Road, Singapore 9128.

Neutron Physics and Nuclear Data Measurements with Accelerators and Research Reactors. Lectures presented at an International Training Course held in Riga and Leningrad, USSR, 18-30 May 1987. IAEA-TECDOC-469. Costfree.

Gamma and X-Ray Spectrometry with Semiconductor Detectors. K. Debertin and R.G. Helmer. Available for 180.- Dutch Florin from Elsevier Scientific Publishers, P.O. Box 211, NL-1000 Amsterdam, Netherlands. - Chapter: 1. Background material. 2. Experimental set-up. 3. Spectrum Analysis and energy measurements. 4. Efficiency calibration and emission-rate measurements. 5. Applications. 6. Atomic and nuclear data.

Charged-particle induced monitor reactions for radioisotope production, a status report with tables and graphical plots of cross-sections. O. Schwerner, K. Okamoto. INDC(NDS)-218. Costfree.

Radionuclide yield in reactions with p, d,  $\alpha$ , He-3. IAEA translation of a handbook in Russian published by P.P. Dmitriev. INDC(CCP)-263. Costfree.

IAEA Yearbook 1989. Summary: The Yearbook provides descriptions of the IAEA's major programmes, with articles on particular projects and areas of activity, together with reports of particular current interest and general information about the IAEA. The Yearbook presents the work of the IAEA in the context of scientific, technical and economic developments worldwide. Contents: Foreword by the Director General; the IAEA'S Contribution to Sustainable Development; Part A - Transfer of Nuclear Technology; Part B - Applications of Nuclear Techniques; including a chapter on the IAEA nuclear data program; Part C - Nuclear Power and Fuel Cycle: Status and Trends; Part D - Nuclear Safety Review; Part E - IAEA Safeguards; Part F - the IAEA. - Available for a price of 560.- Austrian Schillings. Parts A (110.- AS), B (110.- AS), C (140.- AS) and D (150.- AS) are also available separately.

How to obtain priced IAEA publication see above under CINDA-90. You may subscribe to costfree information on new IAEA publications by writing to the IAEA Division of Publications, P.O. Box 100, A-1400 Vienna, Austria.

Meeting Proceedings

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(Limited number of copies available costfree upon request.)

Nuclear theory for fast neutron nuclear data evaluation. Proc. of an IAEA Advisory Group Meeting, Beijing, China, 12-16 Oct. 1987. Wang Dahai (ed.). IAEA-TECDOC-483.

Physics of neutron emission in fission. Proc. of an IAEA Consultants' Meeting, Mito, Japan, 24-27 May 1988. H.D. Lemmel (ed.). INDC(NDS)-220.

Fusion Evaluated Nuclear Data Library (FENDL). Proc. of an IAEA Specialists' Meeting, Vienna, 8-11 May 1989, V. Goulo (ed.). INDC(NDS)-223.

Atomic and Molecular Data for Radiotherapy. Proc. of an Advisory Group Meeting held in Vienna, 13-16 June 1988. K. Okamoto (ed.). IAEA-TECDOC-506.

Japanese 1988 Seminar on Nuclear Data. Proc. by T. Nakagawa et al (ed.), JAERI-M-89-026. Same Seminar 1987, JAERI-M-88-65, copies still available.

First International Kiev Conference on Neutron Physics, Kiev, USSR, 14-18 Sept. 1987. 4 vols, publ. Moscow 1988, B.D. Kuzminov (ed.). 35 papers in English, 261 papers in Russian with English abstracts. (Note that neither titles nor an index are given in English, nor are the author names given in English transliteration).

39th USSR Conference on Nuclear Spectroscopy and Nuclear Structure, Tashkent, 18-21 April 1989. In Russian, without abstracts in English.

Conference of the International Nuclear Target Development Society, Darmstadt, FRG, 5-9 Sept. 1988. The proceedings have been published in Nucl.Inst.& Meth. in Phys.Res. A282 (1989) p. 1-373 (not available from IAEA). At the same time and place an IAEA meeting was held on "The influence of target and sample properties on nuclear data measurements"; a summary report is available as report INDC(NDS)-213.

Properties of Neutron Sources. Proc. of an IAEA meeting held in Leningrad, USSR, 9-13 June 1986. IAEA-TECDOC-410. (Compare Nuclear Data Newsletter, issue no. 11.) A few copies still available.

Nuclear Data for Fusion Reactor Technology. Proc. of a meeting held in Gausig, GDR, 1-5 Dec. 1986. IAEA-TECDOC-457. Copies still available.

Nuclear Data for Fusion Neutronics. Proc. of a meeting in Tokai, Japan, 23-25 July 1985. JAERI-M-86-29. Few copies still available.

Nuclear Data for Calculation of Thermal Reactor Reactivity Coefficients. Proc. of an IAEA meeting, Vienna, 7-10 Dec. 1987. IAEA-TECDOC-491. Copies still available.

Fast Neutron Physics. Proc. of a Conference at Dubrovnik, Yugoslavia, 26-31 May 1986. A few copies still available.

Announcement

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The next International Conference on Nuclear Data for Science and Technology will be in Jülich, Fed. Rep. of Germany, 13-17 May 1991. For information contact Ms. Renate Mengels, P.O. Box 1913, D-5170 Jülich, FRG.

Yadernye Konstanty

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- \* The series "Yadernye Konstanty" (Nuclear Constants), in Russian language with abstracts in English, appears in 4 issues per year. It contains papers in the fields of 1. neutron data, 2. nuclear structure data, 3. nuclear reactor data. Copies of the original issues are available on request. English translations of selected papers are contained in the following reports:
- \* INDC(CCP)-302. Translations from Yad. Konst. 1986-4. Neutron data evaluation activities of the USSR Nuclear Data Centre (Manokhin). Evaluation of nuclear data for heavy fissile nuclei (Konshin). Absolute measurements of fission cross-sections for important nuclides (Shpakov). Measurements and analysis of radiative capture cross-sections of Np and U isotopes (Tolstikov). Consistent evaluation of neutron cross-sections for the Cm isotopes 242-244 (Ignatjuk). Re-evaluation of the neutron cross-sections for iron (Pronjaev). Evaluation of fission cross-sections for Cm isotopes for fast neutrons (Fursov).
- \* INDC(CCP)-298. Translations from Yad. Konst. 1988-2. Calculation of integral delayed neutron properties (Manevich). U and Pu energy release per fission event in a nuclear reactor (Badalov). Use of evaluated nuclear data libraries for the calculation of Kerma factors (Bondarenko). Target properties and nuclear data (Kornilov). Cross-sections for the production of  $\gamma$ -rays by the interaction of neutrons with Th-232, U-235, U-238 (Filatenkov).
- \* INDC(CCP)-297. Translation from Yad. Konst. 1985-3. The ENSDF file in fundamental and applied photonuclear research. I.N. Boboshin, V.V. Varlamov.
- \* INDC(CCP)-293. Translations from Yad. Konst. 1985-3. Measurement of Cf-252 fission neutron spectrum (Dyachenko). Fission neutron spectra from U-233, 235, Pu-239, Cf-252 (Starostov). Level density and mean radiation width, of transactinides (Antsipov). Evaluation of total cross-sections for nuclei with mass=3 (Zvenigorodskij).
- \* INDC(CCP)-292. Translation from Yad. Konst. 1985-2. Internal conversion coefficients in ENSDF (Ignatochkin). Angular anisotropy of U-235 fission fragments (Androsenko). Kinetic energy of fission fragments (Vorobeva). Fission cross-sections for heavy nuclei in the plateau region (Smirenkin). Energy dependence of  $\nu$ -bar of U-235 (Malinovskij). Resonance selfshielding factors for U-238 (Kononov). Measurement of capture cross-sections for U-236 and Au-197 (Kazakov).
- \* INDC(CCP)-291. Translation from Yad. Konst. 1985-3. Estimation of total cross-sections for interactions between deuterons and Li-7. A.G. Zbenigorodskij et al.
- \* INDC(CCP)-289. Translation from Yad. Konst. 1988-1. Pu-239 neutron cross-sections in the resolved resonance region (Lukjanov). Elastic and quasi-elastic nucleon scattering on vanadium (Titarenko).
- \* INDC(CCP)-274. Translations from Yad. Konst. 5 (59) 1984. Neutron Physics Constants Bank of the Kurchatov Institute (Yudkevich). Unified Constant System package (Voloshchenko). Group neutron data library GNDL (Voronkov). Armanyak Code (Velikanov). A neutron data library for calculating group constants (Koshcheev). Index program and archive system (Manturov). Status of Aramako System (Nikolaev). Automatic preparation of few-group constants (Pivovarov). Calculating group constants (Sinitza). Evaluation of methodical error in 26-group approximation (Doljov). Fine group constant system (Doljov).



Selected new publications on nuclear data

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- \* = document available costfree from IAEA/NDS upon request
- = available from originator

International Nuclear Data Committee

- \* INDC(NDS)-219. Report of the IAEA Nuclear Data Section to the International Nuclear Data Committee. A. Lorenz (ed.)
- \* INDC(GER)-34. Progress report (April 1988 to March 1989) on nuclear data activities in the Federal Republic of Germany. Also earlier issues are still available: INDC(GER)-32 for the period April 1987 to March 1988, and INDC(GER)-30 for the period April 1986 to March 1987.
- \* NEANDC(E)-302. Annual progress report on nuclear data 1988 by the C.E.C. Central Bureau of Nuclear Measurements, Geel.
- \* INDC(USA)-100. Stable isotope research pool inventory at Oak Ridge.
- \* INDC(SEC)-97. INDC list of correspondents for the exchange of nuclear data information, and compilation of national nuclear data committees.
- \* INDC(SEC)-98. Index of recent INDC documents and single copy documents received.

WRENDA

- \* INDC(SEC)-95. WRENDA 87/88. World Request List for Nuclear Data. Wang Dahai (ed.). This document lists nuclear reactions, mostly neutron reactions but also charged-particle reactions or half-lives, for which existing data have insufficient accuracy as to meet the requirements in the physics of fission reactors, nuclear material safeguards, thermonuclear fusion, and other applications. The requests included were submitted by official bodies such as national nuclear data committees and serve as a guide to nuclear physicists and administrators when planning nuclear data measurement and evaluation programs.

Evaluated neutron nuclear data

- \* JAERI-M-89-046. Evaluation of neutron nuclear data of B-11 for JENDL-3. T. Fukahori.
- \* JAERI-M-89-047. Evaluation of neutron nuclear data of N-15 for JENDL-3. T. Fukahori.
- \* IAEA-NDS-97. ENDF/B-3 scattering law library. This rather old data library is still in wide use, and this document contains a reprint of the reference manual for this data library issued by J.U. Koppel and D.H. Houston, GA-8774 (1969) and revised by P.F. Rose, GA-8774 Rev. (1978).
- \* INDC(NDS)-215. Nuclear data for structural materials of fission and fusion reactors. Summary of a research co-ordination meeting, Vienna, 15-17 Feb. 1988. V. Goulo (ed.)
- \* INDC(INS)-1. Plans for use of ENDF/B in reactor research in Indonesia. Budi Santoso, S. Ganesan et al.

Codes

- \* INDC(BZL)-31. Evaluation of the codes ETOG-3Q, ETOG-3, FLANGE-3, FLANGE-II, XLACS, NJOY and LINEAR/RECENT/GROUPIE in relation to resonance contributions and background collision cross-sections. J. Anaf and G.S. Chalhoub.
- \* INDC(CSR)-16. PEQAG: A PC version of fully pre-equilibrium computer code with gamma-emission. E. Bêták.
- \* INDC(CSR)-12. Data acquisition and reduction system DARS at Bratislava. M. Morhác et al.

### Nuclear Theory

- \* INDC(BZL)-30. Multi-step compound description of fast particle induced reactions. Brett V. Carlson.
- \* INDC(CPR)-13. Analysis of neutron optical potential for A=40-60 below 10 MeV. Su Zongdi.
- \* INDC(CPR)-14. UNIFY code for the calculation of fast neutron data for structural materials. Zhang Jingshang et al.
- \* INDC(CSR)-14. Pre-equilibrium decay calculations based on the realistic level scheme. E. Beták et al.
- \* INDC(CSR)-15. Methods for calculation of neutron-induced reactions. S. Gmuca et al.
- \* INDC(GDR)-54. Statistical multistep reactions: applications. H. Kalka.
- \* INDC(GDR)-55. Global description of (n,p) and (n,2n) activation cross-sections within statistical multistep theory. H. Kalka et al.
- \* INDC(GDR)-056/L. Prompt neutron emission in nuclear fission. D. Seeliger et al.
- \* INDC(VN)-6. Pre-equilibrium emission of protons and isotopic effect in the fast neutron induced (n,p) reactions on heavy elements. Hien P.Z.

### Experimental neutron reaction data

- \* CEA-N-2506. Diffusion élastique et inélastique de neutrons sur N-14 entre 7.7 et 13.5 MeV. J. Chardine et al.
- \* INDC(CCP)-290. Spectra of inelastically scattered neutrons with an initial energy of 14.1 MeV and nuclear level density. O.A. Salnikov et al.
- \* INDC(CCP)-301. Neutron leakage spectra from Be, Pb and U spheres at 14 MeV. A.A. Androsenko et al. Thermonuclear reactors and nuclear data requirements. D.V. Markovskij et al.
- \* INDC(CCP)-305. Study of structure in the Al-27(n, $\alpha$ ) reaction cross-section. N.V. Kornilov et al.
- \* INDC(CSR)-13. Gamma-ray production cross-sections for Cr-52 (n, $\chi\gamma$ ) at 14.6 MeV. P. Oblozinsky et al.
- \* INDC(GDR)-50/L. Influence of atomic, molecular and solid state effects on the neutron resonance cross-section. K. Seidel et al.
- \* INDC(GDR)-52/G. Absolute measurements of the U-238 fission cross-section at 4.8, 8.4 and 18.8 MeV neutron energies. K. Merla et al.
- \* INDC(JPN)-118. Measurement and analysis of double differential neutron emission cross-sections at 14.1 MeV for Nb-93 and Ta-181. A. Takahashi.
- \* INDC(NDS)-224. Neutron leakage from Pb and Be spherical shells with a central 14 MeV neutron source. Integral experiment on transmission of 14 MeV neutrons in a FLiBe assembly. S. Antonov (NRPI Bulgaria) et al.
- \* INDC(PAK)-7. Induced radioactivities and cross-section measurements of the 14 MeV irradiated Mo foils. K. Gul et al.
- \* JAERI-M-88-102. Measurement of double differential neutron emission cross-sections at 14.1 MeV for Bi-209, B-10, B-11. A Takahashi et al.
- \* JAERI-M-89-083. Measurement of activation cross-section. T. Katoh et al.
- \* JAERI-M-89-089. Measurements of gamma-ray production nuclear data of Ca and Cr. M. Igashira. In Japanese, with abstracts and captions to tables and figures in English.
- \* JAERI-M-89-107. Measurements of differential cross-sections for the (n,d) and (n,t) reactions on Li-6 and Li-7 at 14.1 MeV. S. Shirato.

#### Actinides and Fission-Products

- Actinide Newsletter. Issued annually with world-wide collected progress reports on actinide nuclear data: data needs, data measurements, data evaluation, data applications. Contact the editor: S. Raman, Physics Division, Oak Ridge National Laboratory, P.O. Box 2008, Oak Ridge, USA-37831.
- \* INDC(CCP)-307. Parametrization of mass curve of neutron-induced actinide fission-products. A.A. Goverdovsky.

#### (p,n) and (alpha,n) Reactions

- \* INDC(GER)-31. Angle and energy differential cross-sections for the (p,xn) reactions of 25.6 MeV protons with Mo isotopes. E. Mordhorst.
- \* INDC(GER)-33. Double differential cross-sections for the (p,n) reactions of 13.1 MeV protons with Mo isotopes. T. Bröer et al.
- \* INDC(NDS)-230. Measurements and analysis of double differential neutron spectra in (p,n) and ( $\alpha$ ,n) reactions. Summary report of an IAEA research coordination meeting, Bologna, Italy, 13-15 Nov. 1989. N.P. Kocherov.

#### X-Rays and Gamma-Rays

- \* INDC(NDS)-221. X- and gamma-ray standards for detector efficiency calibration. Summary of a research co-ordination meeting, Braunschweig, Fed. Rep. of Germany, 31 May - 2 June 1989. A.L. Nichols et al (ed.)
- \* INDC(CCP)-278. Characteristics of x-ray transitions in multiply charged ions of Ar, Cl, K. R.S. Kiselyus et al.
- \* INDC(CCP)-309. The operation research as an instrument for analysis and planning of nuclear spectroscopic experiment. (Example: Pu-239 decay). F.E. Chukreev.

#### Radiotherapy

- \* INDC(NDS)-216. Nuclear data needed for neutron therapy. Summary of an IAEA meeting in Vienna, 24-27 Jan. 1989. K. Okamoto (ed.)
- \* INDC(NDS)-217. Atomic and molecular data for radiotherapy. Summary of an IAEA meeting, 30 Jan. - 2 Feb. 1989. K. Okamoto (ed.)

#### Neutron Dosimetry and Radiation Damage

- \* INDC(NDS)-190. Assessment of the results of the "REAL-84" exercise on estimation of accuracies in radiation damage predictions. Summary of an IAEA meeting, Budapest, Hungary, 8-10 Sept. 1986. E.M. Zsolnay (ed.)
- \* INDC(HUN)-26. A solution for the neutron spectrum unfolding problem without using input spectrum. S. Sudár.
- \* INDC(CCP)-282. Accuracy of neutron spectrum unfolding in fusion reactor blankets. M.A. Berzonis et al.

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