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Nuclear Data Newsletter

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All services provided to users are free of charge. Please contact us on the following addresses:

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On-line News

Ongoing Service

The Nuclear Data Section is currently compiling an accessible electronic library of all documents produced by the IAEA pertaining to our Nuclear Data Services. These documents include IAEA-NDS, INDC and other NDS technical reports. Many only existed on microfiche or in paper form. All known documents will eventually be converted to PDF and placed on our web site.

This project is still on-going and can be accessed on:

http://www-nds.iaea.org/reports-new/

Staff Items

Naohiko Otsuka joined the Nuclear Data Section at the beginning of February 2008, effectively to replace Otto Schwerer who retired at the end of August 2007. Naohiko possesses a PhD in nuclear physics, and has specialised for a number of years in nuclear data and nuclear applications databases whilst working at the Japan Atomic Energy Agency prior to his employment in the Section. His primary role within the Section will be to ensure the quality and content of the EXFOR master file, along with being responsible for liaison and interactions with members of the International Network of Nuclear Reaction Data Centres (NRDC). He is also involved with other members of staff in the development of our Nuclear Data Services for on-line access to the cross-section databases.
Telephone: +43-1-2600-21715; e-mail: n.otsuka@iaea.org

Coordinated Research Projects

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

http://www.iaea.org/programmes/ripc/nd/crps.htm

Announcement

Our congratulations go to Professor Dr. Dr. h. c. Syed. Qaim who has been awarded the Becquerel Medal for 2008 by the Radiochemistry Group of the Royal Society of Chemistry (UK). This is a biennial award for a scientist who has made an outstanding lifetime's contribution to radiochemistry. The award was inaugurated to mark the 100th anniversary of the discovery of radioactivity, and consists of a Commemorative Medal. The recipient is invited to give a one-hour lecture to a Radiochemistry Group meeting at a time and venue to be arranged (late 2008).

Professor Qaim served as Chairman of the International Nuclear Data Committee, the primary nuclear data advisory body to the IAEA Nuclear Data Section, from late 2001 to early 2008. He has also contributed significantly to the formulation and assembly of various IAEA nuclear databases for medical applications in an advisory capacity and through his direct involvement in specific coordinated research projects.

Database News

CINDA — Bibliographical references to experimental nuclear reaction data, and calculations, reviews, compilations and evaluations of neutron reaction and spontaneous fission data.

- Extended by information from EXFOR
- Available via retrieval systems on CD and the Web: http://www-nds.iaea.org/cinda/
- Contains 438,688 lines, 55,823 publications and 185,435 blocks.

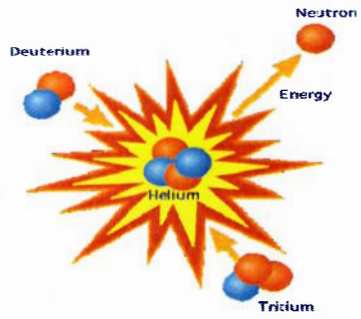
EXFOR — Comprehensive library of experimental nuclear reaction data induced by neutrons, charged particles and photons.

- Available via retrieval systems on CD and the Web: http://www-nds.iaea.org/exfor/
- Contains 17,145 entries and 116,464 data tables
- Master file, trans files, dictionaries and software for compilers are regularly updated and available on the Web: http://www-nds.iaea.org/exfor-master
- Upload users' data on the Web: http://www-nds.iaea.org/exfor/x4send.htm
- New Web service: conversion of EXFOR data to R33 (format for the IBANDL users' community)

ENDF — Core nuclear reaction database containing recommended, evaluated cross sections, spectra, angular distributions, fission product yields, photo-atomic and thermal scattering law data, with emphasis on neutron induced reactions. The data were analyzed by experienced nuclear physicists to produce recommended libraries for one of the national nuclear data projects (USA, Europe, Japan, Russian Federation and China).

- Available via retrieval systems on the Web: http://www-nds.iaea.org/endf/
- Contains 27 libraries
- Recently added and updated libraries:
  - JENDL/AC-2008: JENDL Actinoid File 2008
  - JENDL/AN-2005: (Alpha,n) Reaction Data File 2005
  - JENDL/G-2005: Photoreaction Data File 2004
  - JENDL/HE-2004: High Energy File 2004
  - MENDL-2: Medium Energy Nuclear Data Library, 1998
  - MINKS-ACT: Minsk Actinides Library (Maslov et al.)
  - Wind: Library for U, Np, and Pu up to 100 MeV, and Pu-239 up to 2 GeV, Obninsk, Russian Federation
  - Yavshits: neutron- and proton-induced fission for Pb-Pu (20-200 MeV), St. Petersburg, Russian Federation
  - IBA-Eval: Differential charged-particle cross sections for ion beam analysis
  - Medical radioisotopes production: updated
  - PADF-2007 Proton Activation Data File

Computer Codes and Data Libraries



The following databases and libraries are available cost-free on CD-ROM on request:

EXFOR-CINDA Database and Retrieval Systems, version 1.95, data updated to January 2007:

- Integrated CINDA and EXFOR
- Advanced interactive search
- Help based on Dictionaries
- Interactive graphics with ZVView
- Can access and run from the CD without installation
- Works with local and remote databases
- Includes non-interactive EXFOR retrievals

Two CD-ROMs are available:

- for Windows with MS-Access databases

- for Applications on Linux and Windows with MySQL databases

Developed by V. Zerkin, Nuclear Data Section, IAEA, 2001-2008.

EndVer/GUI and EXFOR-CINDA package, January 2007:

An integrated software package for comparison of evaluated nuclear data files with experimental data from the EXFOR database (also contains interactive plotting).
Features:

- EndVer with software graphics and user interface
- Integrated EndVer-EXFOR-CINDA
- PostScript graphics with PlotC4
- Interactive graphics with ZVView
- Non-interactive EXFOR retrievals
- Can run from the CD without installation
- Advanced interactive search
- Help based on Dictionaries
- Works with local and remote Databases
- CINDA with charged particle and photonuclear reactions
- New: works for meta-stable materials

Developed by A. Trkov and V. Zerkin, Nuclear Data Section, IAEA, 2004-2008.

ENSDF and XUNDL

These ASCII files have been updated by J. Tuli, NNDC, (BNL). The latest version: March 2008 can be accessed on-line at:
http://www-nds.iaea.org/ensdf_base_files/

GANDR

This is a system of programs designed for a variety of tasks in the evaluation of neutron-induced nuclear reaction data, including the Global Assessment of Nuclear Data. Global data assessment emphasises the use of fixed rules that apply, at least approximately, over an extensive range of target nuclei. Such rules permit the convenient estimation of data covariances for a wide range of targets and reactions with a high level of nuclide-to-nuclide consistency. This level of consistency is crucial if, for example, one wishes to use the estimated covariances to rank the dataneeds of a given application.

The current GANDR approach assumes that nuclear reaction theory accurately determines the fine details of the energy dependence of cross sections and the distributions of reaction products, but that the uncertainty of the absolute magnitudes of cross sections in various energy regions depends mainly on the uncertainty of experimental data. Recently, an evaluation of six standards nuclides in the GANDR system has been implemented. This effort began with the incorporation of total cross-section measurements for these nuclides retrieved from the EXFOR database. An important benefit of this approach is the proper treatment of the cross-material covariances that arise when several such ratio measurements are made relative to the same, or different, standards.

Further information on GANDR can be found at http://www-nds.iaea.org/gandr.
Contacts:
Alberto Mengoni: a.mengoni@iaea.org
Scientific Officier
Doug Muir (email: douglasmuir@comcast.net)
Main developer

Janis 3.0 — NEA Data Bank 2007:

JANIS (JAva-based Nuclear Information Software) is a display program designed to facilitate the visualisation and manipulation of nuclear data. Its objective is to allow the user of nuclear data to access numerical and graphical representations without prior knowledge of the storage format. Several standardised data formats are supported, and data originating from the major evaluation libraries, such as ENDF/B, JEFF, JENDL, BROND etc., can be displayed, inter-correlated, and compared with experimental reaction data in the database EXFOR.
Bibliographical data from the database CINDA as well as nuclear properties from NUBASE-2003 are also included.
This is available on DVD on request, or on-line from the web page www.nea.fr/janis.

Prepro 2007 Pre-Processing Codes

This package is a collection of 16 computer codes, designed to convert ENDF/B formatted neutron and/or photon data from the original distributed form to one in which the data can be used in applications. These codes have been tested to ensure they can handle new evaluation in the ENDF/B-VII.0 library. Available on CD-ROM or on-line at:
http://www-nds.iaea.org/ndspub/endf/prepro/

Feature Article

Mass Chain Evaluations for the Evaluated Nuclear Structure Data File (ENSDF) – An Urgent Appeal for European Participation

F.G. KONDEV[1], A.L. NICHOLS[2] and J.K. TULI[3]
[1]Argonne National Laboratory, USA
[2]Nuclear Data Section, Department of Nuclear Sciences, International Atomic Energy Agency, Vienna, Austria
[3]National Nuclear Data Center, Brookhaven National Laboratory, Upton, NY 11973-5000, USA.

Available as hard copy on request

Selected Charts, Reports and Documents

Chart of the Nuclides *Prepared by Knolls Atomic Power Laboratory and distributed by Lockheed Martin (16th edition, revised to 2002).* Available cost-free on request only for **teachers and scientists from developing countries.**

Chart of the Nuclides Book *Prepared by Knolls Atomic Power Laboratory and distributed by Lockheed Martin (16th edition, revised to 2002).* This book form of the Nuclides Chart is available cost-free on request only for **teachers and scientists from developing countries.**

Karlsruher Nuklidkarte Desk Chart *of the Nuclides from Karlsruhe, 6th edition (1995). Updates from 1998.* Available cost-free on request only for **teachers and scientists from developing countries**.

INDC(CCP)-0445 *Articles translated from Journal Yadernye Konstanty (Nuclear Constants). (Series: Nuclear Constants, Issue No. 1-2, 2006),* December 2007. This report contains 2 papers translated from Russian:

- *Study of the Energy Dependence of the $^{14}N(n,t)^{12}C$ Reaction Cross-Section* by V.A. Khryachkov, M.V. Dunaev, I.V. Dunaeva, B.D. Kuz'minov, N.N. Semenova and A.I. Sergachev

- *Cumulative Yields of Delayed Neutron Precursors in Neutron Induced Fission of ^{237}Np and ^{238}U in the 0.5-5 MeV Energy Region.*by V.A. Roshchenko, V.M.Piksaikin, G.G. Korolev and Yu. F. Balakshev

This report is available as hard copy on request or online at:
http://www-nds.iaea.org/indc_sel.html

INDC(ITY)-0015 *Activity Report of the ENEA Nuclear Data Project in 2007,* Bologna, March 2007, prepared by A. Ventura, March 2008. This report is available as hard copy or on-line at: http://www-nds.iaea.org/indc_sel.html

INDC(NDS)-0508 *Summary Report of the Second Research Coordination Meeting on Updated Decay Data Library for Actinides,* Vienna, 28-30 March 2007, prepared by M.A. Kellett, December 2007. This report is available as hard copy or on-line at: http://www-nds.iaea.org/indc_sel.html

INDC(NDS)-0515 *Summary Report of the Second IAEA Research Coordination Meeting on Atomic and Molecular Data for Plasma Modelling,* Vienna, 18-20 June 2007, prepared by D. Humbert, November 2007. This report is available as hard copy or on-line at: http://www-nds.iaea.org/indc_sel.html

INDC(NDS)-0516 *Summary Report of the final Research Coordination Meeting,* Vienna, 25-27 September 2006, prepared by R.E.H. Clark, November 2007.
This report is available as hard copy or on-line at: http://www-nds.iaea.org/indc_sel.html

INDC(NDS)-0517 *Summary Report of an IAEA Technical Meeting,* Vienna, 4-5 December 2006, prepared by R.E.H. Clark, November 2007. This report is available as hard copy or on-line at: http://www-nds.iaea.org/indc_sel.html

INDC(NDS)-0518 *Summary Report of an IAEA Consultants' Meeting,* Vienna, 11-12 December 2006, prepared by R.E.H. Clark, November 2007. This report is available as hard copy or on-line at: http://www-nds.iaea.org/indc_sel.html

INDC(NDS)-0519 *Report on the IAEA Technical Meeting of the International Network of Nuclear Reaction Data Centres,* Vienna, 8-10 October 2007, prepared by O. Schwerer and S. Dunaeva, November 2007.
This report is available as hard copy or on-line at: http://www-nds.iaea.org/indc_sel.html

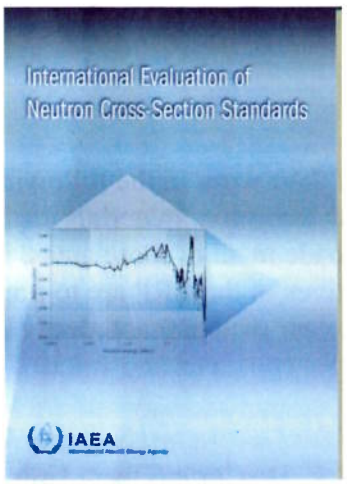
INDC(UK)-0091 *Progress Report of Data Studies during 2005 and 2006,* edited by N.P. Hawkes, January 2008. This report is available as hard copy only.

Nuclear Wallet Cards 2005 7th Edition, by Jagdish K. Tuli, National Nuclear Data Center. These pocket size wallet cards are available as hard copy on request

CINDA 2006: The Comprehensive Index of Nuclear Reaction Data, Archive 1935-2006

The CINDA Archive Index consists of a set of 6 volumes and is published on behalf of the IAEA Nuclear Data Section, the Russian Nuclear Data Section and the OECD/NEA Data Bank.
There are limited cost free sets available on request:

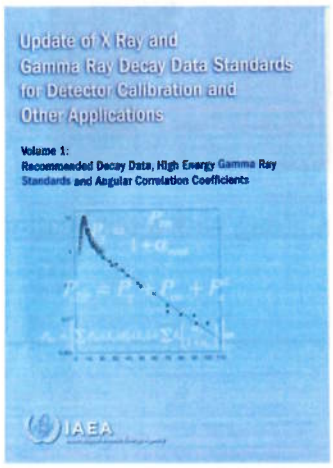
International Evaluation of Neutron Cross-Section Standards



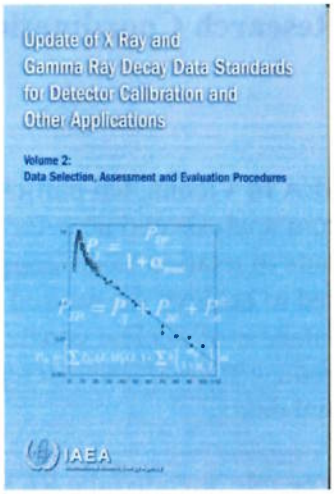
Neutron cross-section standards are important in the measurement and evaluation of all other neutron reaction cross-sections. Previous evaluations of a set of specific neutron cross-sections were completed in 1987, and established as both international and national standards. After the dissemination of significant amounts of precise experimental data and developments in the methodology of analysis and evaluation, a decision was recently made to re-evaluate the standards. An IAEA coordinated research project was established to catalyse this evaluation process. This report presents the resulting recommended standards, and describes how they were derived.

Update of X Ray and Gamma Ray Decay Data Standardsfor Detector Calibration and Other Applications

Volume 1: Recommended Decay Data, High Energy Gamma Ray Standards and Angular Correlation Coefficients



Volume 2: Data Selection, Assessment and Evaluation Procedures



Various groups around the world are engaged in the compilation and evaluation of decay data for either all known or specific radionuclides. Many evaluators operate independently and recommend slightly different values for the same parameter. Even small deviations in the recommended data can have a significant impact on the definition of the decay characteristics of radionuclides used as standards in detector efficiency calibrations and various applications. High quality decay data are essential for the efficiency calibration of X and gamma ray detectors that are used to quantify the radionuclidic content of a sample by determining the intensities of any resulting X and gamma rays. A major objective of the IAEA nuclear data programme is to promote improvements in the quality of nuclear data used in science and technology. This report presents the results of a coordinated research project on X Ray and Gamma Ray Decay Standards for Detector Calibration and other Applications. Recommended half-lives and X and gamma ray emission probabilities are listed in Volume 1 of this report for a carefully selected set of radionuclides and nuclear reactions that are suitable for detector efficiency calibration and other applications. The recommendations and detailed report of this work are published in two parts.

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Meeting Reports

Second Research Coordination Meeting (RCM) on Reference Database for Neutron Activation Analysis
7–9 May 2007

Held at the IAEA in Vienna, ten participants met to review the progress of their work in the following areas: gamma spectrum analysis and detector calibration, neutron spectrum characterisation, materials analysis and nuclear constants in relation to differential data. Good progress has been made in all of these areas, but further work is required to achieve the desired goals of this CRP. The main objectives of the CRP are to improve the status of the database of nuclear constants for k_0-NAA, to contribute to nuclear structure and decay data, and to remove or reduce some of the discrepancies that exist between the integral constants and values derived from differential data.

The following people attended the RCM: M. Arribere (CNEA, Argentina), F. De Corte (Ghent University, Belgium), Z. Revay (Institute of Isotopes, Budapest, Hungary), R. Jaćimović (Institute Jožef Stefan, Slovenia), R. B. Firestone (Lawrence Berkeley National Laboratory, USA), S. A. Jonah (Ahmadu Bello University, Nigeria), M. Blaauw (Reactor Institute Delft, Netherlands), P. Schillebeeckx (IRMM, Belgium), A. Trkov (Institute Jožef Stefan, Slovenia), M. A. Menezes (CDTN, Brazil) and data specialists from within the IAEA, M. A. Kellett and D. Abriola (both NAPC/NDS) and M. Rossbach (NAPC/IACS).



A third and final RCM will take place in November 2008. The database, along with a publication describing the methodology employed, will be prepared during 2009.

Nuclear Data Services – contact points

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; Email: nndc@bnl.gov; Worldwide Web: http//www.nndc.bnl.gov/ For information regarding on-line services, contact: B. Pritychenko: pritychenko@bnl.gov. For information regarding general NNDC services, contact M. Blennau: blennau@bnl.gov

For services to customers in OECD/NEA Data Bank member countries:
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; Email: (name)@nea.fr or nea@nea.fr; Worldwide Web: http://www.nea.fr Contact: A. Hasegawa, ext. 1080.

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, Russian Federation. Tel. +7 08439-9-8982; Fax +7 095-230-2326; E-mail: 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 Square 1, 123 182 Moscow, Russian Federation. Tel. +7 095-196-9968; Fax +7 095-882-5804; Email: s.babykina@polyn.kiae.su Contact: S. Babykina.
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, Russian Federation. Tel. +7 095-939-3483; Fax +7 095-939-0896; Email: varlamov@depni.sinp.msu.ru or 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; Email: 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; Email: pdc@ornl.gov. Worldwide Web http://epicws.epm.ornl.gov/ (there are charges and release restrictions)

Computer codes of non-US origin to all countries:
NEA Data Bank, see above, contact: E. Sartori, ext. 1072; Email: sartori@nea.fr (there may be release restrictions)
IAEA Nuclear Data Section offers data centre services primarily to non-OECD countries (except Russian Federation 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 on-line 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
Users in India and neighbouring countries may use IAEA-NDS mirror at Worldwide Web http://www-nds.indcentre.org.in

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