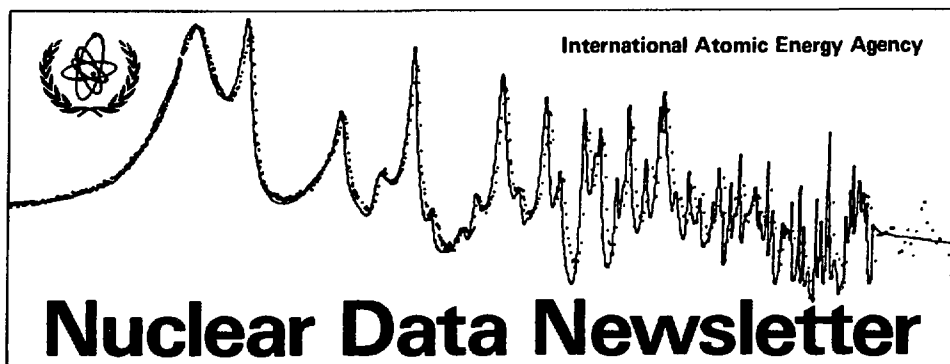


XAPJ39328

INIS-mf--14506



ISSUE No. 20
ISSN 0257-6376

November 1994

Special issue:

Nuclear Structure and Decay

Data Network

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Nuclear Structure and Decay Data Network

A network of internationally recognized experts provides to scientists worldwide recommended databases of nuclear structure and decay data to be used in basic and applied research, which include

- Bibliographic information,
- Numerical data in various arrangements and formats.

The evaluated nuclear properties include the following:

- Nuclear level schemes, excitation energies, half-life, decay modes
- Level spin-parity values and justifications for those values
- Magnetic dipole and electric quadrupole moments
- Disintegration energies, radiations and their transition probabilities
- Nuclear band structure

The information is available worldwide via electronic networks as close to you as your favorite personal computer:

- up-to-date,
- easily accessed,
- evaluated by experts,
- flexible computer searches.

The international Nuclear Structure and Decay Data (NSDD) network was established in 1974 under the auspices of the IAEA. It is a group of 17 laboratories and universities in 10 countries; the present member institutions are listed on page 16. The Network scientists evaluate nuclear structure and decay data for all nuclear masses $A=1 - 266$ on a continual basis. These evaluations are published in the journals Nuclear Physics A for $A=3 - 44$ and Nuclear Data Sheets (NDS) for $A > 44$.

The data files from these evaluations form the Evaluated Nuclear Structure Data File (ENSDF) which is maintained by the National Nuclear Data Center (NNDC) at the Brookhaven National Laboratory, USA. The bibliographic information on publications in low and intermediate energy nuclear physics which forms the Nuclear Structure References file (NSR) is also maintained by the NNDC and the information on new references is published in the Nuclear Data Sheets. ENSDF, NSR and related data files have been made available since 1986 for online access via electronic networks.

Nuclear Data and Programs for Online Access

NSR - Nuclear Structure References file

Bibliographic information on low and intermediate energy nuclear physics, covering the period from 1910 to the present.

ENSDF - Evaluated Nuclear Structure Data File

Evaluated experimental data on nuclear level properties, radiations, radioactive decay, and reaction data for all known nuclides.

NUDAT - Nuclear Data

Evaluated numeric data containing adopted levels and gammas, ground and metastable state properties, nuclear half-lives, decay radiations, thermal neutron cross-section data, and resonance integrals.

MIRD* - Medical Internal Radiation Dose

The MIRD program accesses the evaluated experimental radioactive decay data in the ENSDF database and produces tables of radiations and decay schemes in the format of the Medical Internal Radiation Committee's publications.

PHYSICO* - Physics Codes

Codes to calculate physics quantities, e.g., internal conversion coefficients, logft values, etc.

CINDA - Computer Index of Neutron Data

Index to the literature and computer files on neutron reaction data.

CSISRS/EXFOR - Cross Section Information Storage and Retrieval System

Experimental data on nuclear reactions induced by neutrons, photons, and charged particles.

ENDF - Evaluated Nuclear Data File

Evaluated nuclear reaction and decay data from the data libraries ENDF/B-6 (U.S.A.), JEF-2 (OECD/NEA), JENDL-3 (Japan), BROND-2 (Russia), CENDL-2 (China).

* Available through the NNDC online service only, not through the services of the other centers.

Online Access

Online access to the databases is available from the NNDC, Brookhaven National Laboratory, the NEA Data Bank, Paris, and the IAEA Nuclear Data Section, Vienna. Information on how to access these databases at these institutions with sample logins is given on the next pages.

I. U.S. National Nuclear Data Center

A. Sample login:

>SET HOST BNLND2 (see below for addresses) OR,
TELNET BNLND2.DNE.BNL.GOV (130.199.112.132)

*BROOKHAVEN NATIONAL LAB.
NNDC CCMPUTER COMPLEX OpenVMS AXP V1.5
User Name: NNDC*

*Welcome to OpenVMS AXP (TM) OPERATING SYSTEM,
VERSION V1.5 on node BNLND2*

.....

Enter NNDC assigned authorization code (or GUEST): _ _ _ _ _
(see authorization)

Enter your last name (or DEFAULT or?) _ _ _ _ _

.....

LOGOUT (to terminate a retrieval session)

Networks and Telephone Access:

DECNET (ESNET only):

Command: SET HOST Address: BNLND2 (44436 or 43.404)

TCP/IP (ESNET or INTERNET)

Command: TELNET Address:

BNLND2.DNE.BNL.GOV (130.199.112.132)

Telephone:

Number: (516)282-5390

Protocol: ASCII only. Full duplex.

Speed: 1200, 2400, or 9600 bps

Word: 8-bit, parity off, 1 stop bit, or 7-bit, parity even, 1 stop bit.

After getting the online signal, type a carriage return, wait and then type a second carriage return. The VAX login prompt should then appear on your terminal.

World Wide Web:

<http://necs01.dne.bnl.gov/html/dathome.html>

Telnet connection to BNLND2 node as well as National Nuclear Data Center information are available.

B. Authorization:

Persons without an authorization code may access the online service by using the code GUEST. This authorization code restricts the amount of computer processor time to 30 seconds. Most of the databases as well as some of the utility features, namely the HELP files, the sample cases, and the newsletter can be used in this limited time. On logout from this session, a user may sign up directly for full access service by answering the computer prompts.

C. 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 may be obtained by contacting the NNDC. The output can be displayed on the user's terminal or written as a file to the online disk area for later transfer to the user's computer. Some modules prepare files containing graphic displays in Tektronix or PostScript formats for output at a user's local facility.

D. Mail:

You may contact the NNDC by

**Mail: ONLINE DATA SERVICE
National Nuclear Data Center
Brookhaven National Laboratory
Upton, NY 11973, USA.**

Tel: (516) 282-2901

BITNET: "NNDC@BNL"

Fax: (516) 282-2806

INTERNET: "NNDC@BNL.GOV"

II. NEA Data Bank, Paris

QUICK GUIDE to the NEA ONLINE SERVICES

The NEA Online Services are open to scientific users in the seventeen countries* participating in the NEA Data Bank.

It offers access to a wide range of databases, in particular NSDD (ENSDF, NSR, NUDAT) as well as EXFOR, CINDA, evaluated data files (EVA), and the NEA Thermochemical DataBase (TDB).

Data Bank services are funded by the participating countries (no charge is made to individual users); national authorities are informed of new users from their country. Registered users are given an access password, while new users may use the username GUEST for a time-limited trial, and can apply for registration using an electronic form which appears on exit from the system.

Users can scan and retrieve data using a simple and friendly search program; small files can be sent directly via network, larger files will be sent by post on suitable magnetic media. While ASCII files are the simplest to transmit by network, procedures exist for transferring binary files which may include wordprocessor documents with imbedded graphics. E-mail can be exchanged with all NEA staff and with other registered users of the online service. A news service on NEA activities is available.

NEA address:

OECD Nuclear Energy Agency	Tel: +33 (1) 45 24 10 71
Le Seine Saint Germain	+33 (1) 45 23 10 86
12, boulevard des Iles	
92130 Issy-les-Moulineaux	Fax: +33 (1) 45 24 11 10

* Austria, Belgium, Denmark, Finland, France, Germany, Greece, Italy, Japan, the Netherlands, Norway, Portugal, Spain, Sweden, Switzerland, Turkey, United Kingdom. The Republic of Korea will join the Data Bank following its entry to NEA.

E-mail:	INTERNET EARN/BITNET PSI X400 NEA-mail Replace name	name@NEA.FR name@FRNEAB51 (Truncate name to 8 characters) (2080)921607751::name or in France: (1)921607751::name coming soon name (the user must first be logged on to the NEA computer) or by the staff member's username or by the general mailbox name: NEA
----------------	--	---

Other file transfer options are available for ASCII and binary files:

Log-in	Log in as NEADB and give your assigned user name and password or use the GUEST name for a limited time.
INTERNET	DB.NEA.FR (numeric = 193.51.64.1) (2080) 921607751 or in France (1) 921607751
X25	

Sample log-in procedure

OECD

*NUCLEAR ENERGY AGENCY
Node NEADBB: VAX 6000-510/VMS*

OECD

Username: NEADB

... Optional system information ...

Use GUEST for trying out the service (time limited)

Enter your personal user name: SMITH

Enter your password: XXXXXXXXX

You have access to the following services:

MAIL NEWS ...

For access to other services contact the NEA Data Bank

Press RETURN to continue

Is your terminal VT100 compatible (Y/N)? Y

III. IAEA Nuclear Data Section, Vienna

Offers NDIS (Nuclear Data Information System) which is available through INTERNET (TCP/IP).

A. Sample login:

TELNET IAEAND.IAEA.or.at
(or 161.5.2.2)

IAEA VAX-VMS V5.4-3

Username: IAEANDS

Welcome to VAX/VMS version V5.4-3 on node M4300

.....

.....

Enter NDS assigned authorization code (or GUEST): GUEST

(or your authorization code if you have one)

Enter your last name (or DEFAULT or ?) _ _ _ _ _

B. 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.

Mail:

Nuclear Data Section
NDIS Manager
International Atomic Energy
Agency, P.O. Box 100
A-1400 Vienna, Austria

Tel.: (43-1) 2360-1715
Telex: 1-12645
Fax: (43-1) 234564
BITNET: RNDS@IAEA1
INTERNET:
ONLINE@IAEAND.IAEA.OR.AT

C. Retrieval system:

Identical to the system at the US National Nuclear Data Center. See I.C. above.

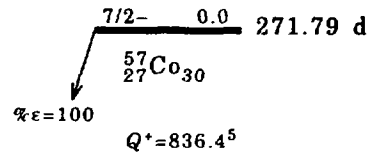
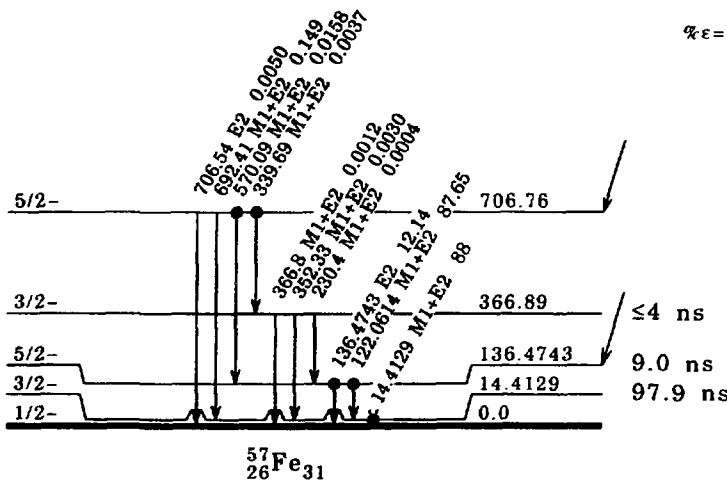
SOFTWARE

Users of the online services of the U.S. National Nuclear Data Center and the IAEA Nuclear Data Section can download codes for use with the ENSDF database. The most interesting example is PREND for the plotting of nuclear decay schemes.

^{57}Fe from ^{57}Co ϵ Decay

Decay Scheme

Intensities: $I(\gamma+e)$ per 100 parent decays



$I\epsilon$	Log ft
0.174	7.71

≤ 4 ns
 9.0 ns
 97.9 ns

Example of a decay scheme

The data were retrieved from the ENSDF database and plotted for publication in the journal Nuclear Data Sheets.

NSDD Network Publications

Energy Levels of Light Nuclei: Evaluations of light nuclei $A < 45$ published in the journal *Nuclear Physics A*.

Nuclear Data Sheets (NDS): An international journal devoted to the evaluation of experimental results in nuclear physics. Produced by the National Nuclear Data Center, Brookhaven National Laboratory in affiliation with the NSDD network and published by the Academic Press Inc. Twelve issues are published per year with eleven devoted to mass-chain evaluations for $A > 44$ and one issue for Recent References which are new additions to the Nuclear Structure References.

Table of Radioactive Isotopes: Produced by the Isotopes Project, Lawrence Berkeley Laboratory (1986). Published by John Wiley & Sons.

Table of Isotopes: 8th Edition in preparation by the Isotopes Project, Lawrence Berkeley Laboratory.

Nuclear Wallet Cards: Produced by the National Nuclear Data Center, Brookhaven National Laboratory (1990).

CD-ROM

Papyrus NSR: The Nuclear Structure References file (as of Dec. 1993) programmed by P. Ekström and E. Browne for use on a PC (386 or higher, DOS 6.2 or WINDOWS 3.1 or later) distributed on a CD-ROM. Contact: E. Browne, Isotopes Project, Bldg. 50A, Berkeley, California 94720, U.S.A.

Related PC databases

Available on diskettes costfree from the IAEA Nuclear Data Section, P.O. Box 100, A-1400 Vienna, Austria.

ENSGAM

A PC database for about 15000 gamma rays from 2777 radioactive nuclides derived from ENSDF by P. Ekström and L. Spanier, Lund University, Sweden. This is a subset of the Decay-gammas database available on-line from Lund University (see p. 12).

Hardcopy documentation: IAEA-NDS-118.

Strong gammas

A PC database of strong gamma-rays emitted from radionuclides, extracted from ENSDF as of September 1993, by T. Ichimiya, T. Narita and K. Kitao (JAERI). An earlier version was published in the report JAERI-M-92-051 (1992).

Hardcopy documentation: IAEA-NDS-111, Rev. 1.

IDGAM

A PC package based on "Strong gammas" to identify radioactive isotopes, by R. Paviotti Corcuera, M. de Moraes Cunha, K.A. Jayanthi (Brazil).

Hardcopy documentation: IAEA-NDS-135.

XGStandards

PC diskette containing recommended values of X-ray and gamma-ray standards for detector calibration, including half-lives, energies and emission probabilities of X-rays, and energies and emission probabilities of gamma-rays for related radionuclides. The recommended data are the results of an IAEA Co-ordinated Research Project 1986-1990, published in IAEA-TECDOC-619 (1991). The diskette is described in IAEA-NDS-112 Rev. 1.

Nuclear Structure and Decay Data (NSDD) Network

Organized under the auspices of the

IAEA Nuclear Data Section, Vienna, Austria

National Nuclear Data Center, Brookhaven National Laboratory, USA

Nuclear Data Project, Oak Ridge National Laboratory, USA

Isotopes Project, Lawrence Berkeley Laboratory, USA

Idaho National Engineering Laboratory, USA

Triangle Universities Nuclear Laboratory, Duke University, USA

**Center for Nuclear Structure and Reaction Data, I.V. Kurchatova
Institute of Atomic Energy, Moscow, Russia**

**Data Center, St. Petersburg Nuclear Physics Institute, Gatchina,
Russia**

Fysisch Laboratorium, University of Utrecht, Netherlands

Centre d'Etudes Nucléaires, Grenoble, France

**Nuclear Data Center, Tokai Research Establishment, Japan Institute
of Atomic Energy, Japan**

Institute of Physics, University of Lund, Sweden

**Nuclear Data Project, Kuwait Institute for Scientific Research,
Kuwait**

Laboratorium voor Kernfysica, University of Ghent, Belgium

Tandem Accelerator Laboratory, McMaster University, Canada

Chinese Nuclear Data Center, Beijing, China

Jilin University, Changchun, China

Shanghai Institute of Nuclear Physics, Shanghai, China

**Fachinformationszentrum Energie, Physik, Mathematik GmbH,
Karlsruhe, Germany (discontinued 1982)**

**Oliver Lodge Laboratory, University of Liverpool, United Kingdom
(discontinued 1985)**