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Summary Report of
Second Research Coordination Meeting on
**Minor Actinide Nuclear Reaction Data
(MANREAD)**

International Atomic Energy Agency (IAEA)
Vienna, Austria

31 March – 3 April 2009

Prepared by

Yasuki Nagai
Japan Atomic Energy Agency (JAEA), Japan

and

Alberto Mengoni
IAEA Nuclear Data Section, Vienna, Austria

July 2009

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Nuclear Data Section
International Atomic Energy Agency
Vienna International Centre
PO Box 100
A-1400 Vienna
Austria

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July 2009

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Abstract

The second Research Co-ordination Meeting of the MANREAD (Minor Actinides Neutron Reaction Data) was held at the IAEA Headquarters in Vienna from 31 March to 3 April 2009. A summary of the discussion which took place at the meeting is reported here together with a list of the main outcomes and recommendations produced by the RCM participants.

July 2009

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1. INTRODUCTION

Participants at the Second Research Coordination Meeting (RCM) on Minor Actinide Nuclear Reaction Data (MANREAD) were welcomed to the IAEA by A. Nichols (Section Head, NDS, IAEA).

A. Mengoni (IAEA, NAPC/NDS) presented a summary of the CRP activities performed so far. An overview of the “Experimental Data Assessment Initiative” (EDAI) was given and the main results obtained were presented.

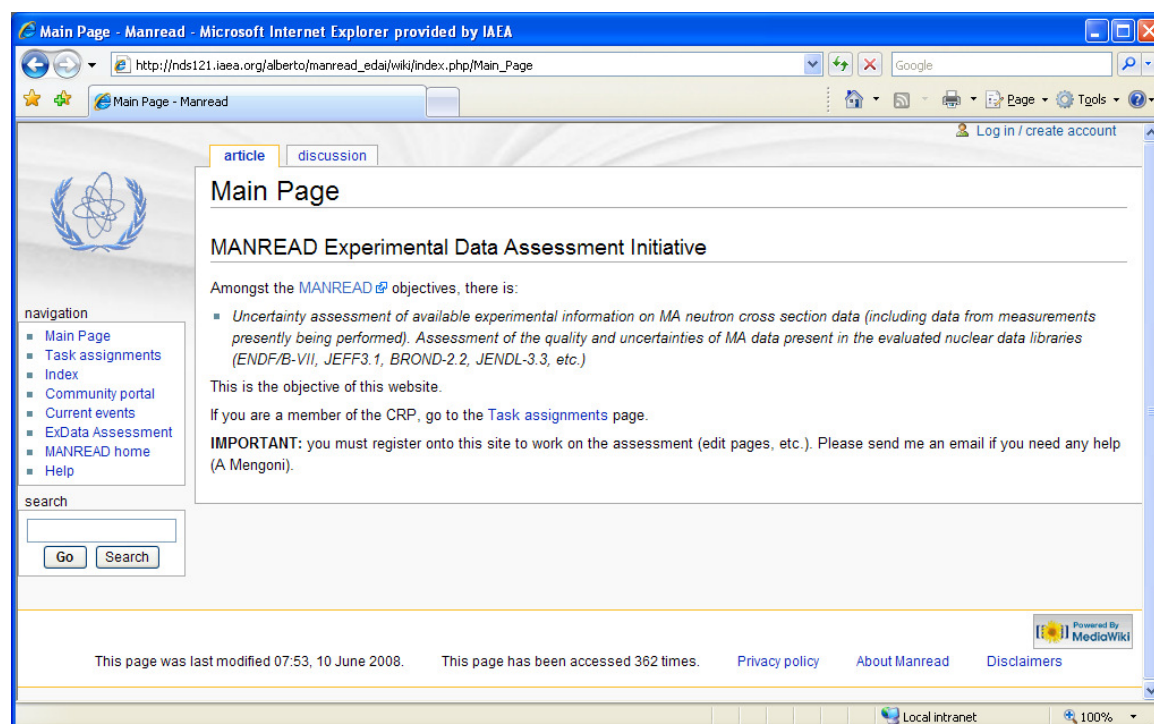
The proposed Agenda of the meeting was adopted (See APPENDIX 1 enclosed). Prof. Y. Nagai, JAEA, was elected chairman of the meeting.

RCM participants were provided with a summary of the CRP objectives, list of participants and other administration-related informations.

2. DISCUSSION

The proposal to perform most of the activities of the RCM in working groups was adopted by the participants. During the first phase of work on the EDAI, participants have compiled 612 web-forms, which have been used to produce the assessment for each isotope and reaction channel. During the discussions the upload of the assessment directly to the MANREAD wiki site was agreed

<http://www-nds.iaea.org/manread/wiki>



3. WORKING GROUPS

The working groups were formed according to the task assignment list agreed during the 1st RCM. This is main page of the EDAI website.

MANREAD experimental data assessment initiative (version 5)

home clear form example of filled-in form help on formatting index of submitted forms wiki site

task assignment (see RCM1, November 2007)

ISOTOPE	n,tot	n,y	n,f, pfns	n,2n	n,inel	others
Np-237	Reifarh Günsing	Reifarh Günsing	Reifarh	Vlastou	Reifarh	Reifarh
Pu-238	Günsing	Wallner Belgia Szentmiklosi	Colonna	Wallner	Belgia Szentmiklosi	Plompen
Pu-240	Günsing	Wallner Belgia Szentmiklosi	Colonna	Wallner	Belgia Szentmiklosi	Plompen
Pu-241	Günsing	Wallner Belgia Szentmiklosi	Colonna	Wallner	Belgia Szentmiklosi	Plompen
Pu-242	Günsing	Wallner Belgia Szentmiklosi	Colonna	Wallner	Belgia Szentmiklosi	Plompen
Am-241	Plompen	Käppeler Nagai Plompen	Fursov Colonna	Vlastou Plompen	Plompen	Plompen
Am-242	Plompen	Käppeler Nagai	Fursov	Vlastou	Plompen	Plompen
Am-242m	Plompen	Käppeler Nagai	Fursov	Vlastou	Plompen	Plompen
Am-243	Plompen	Käppeler Nagai Plompen	Fursov Colonna	Vlastou Plompen	Plompen	Plompen
Cm-242	Maslov	Nagai Käppeler	Fursov	Maslov	Maslov	Maslov
Cm-243	Maslov	Nagai Käppeler	Fursov	Maslov	Maslov	Maslov
Cm-244	Maslov	Nagai Käppeler	Fursov Colonna	Maslov	Maslov	Maslov
Cm-245	Maslov	Nagai Käppeler	Fursov Colonna	Maslov	Maslov	Maslov
Cm-246	Maslov	Nagai Käppeler	Fursov	Maslov	Maslov	Maslov
Cm-247	Maslov	Nagai Käppeler	Fursov	Maslov	Maslov	Maslov
Cm-248	Maslov	Nagai Käppeler	Fursov	Maslov	Maslov	Maslov
U-234	Günsing	Günsing	Colonna Vlastou	Wallner	Plompen	Plompen
U-236	Günsing	Günsing	Colonna Vlastou	Wallner	Plompen	Plompen

what is new in version 5:

- possibility to upload "postscript" as well as "gif" figure format files
- different index ordering by clicking on the table headings
- updated style of the input form
- links with EXFOR retrieval tool
- inhibit lower-case IDs

Chat with Alberto Mengoni Available

people

Yasuki Nagai

Working groups started to work immediately on the first day of the meeting. An example of a compilation result for the capture reaction channel in Am-243 is shown in the two figures below.

Index:Am-243 - Manread - Microsoft Internet Explorer provided by IAEA

http://nds121.iaea.org/alberto/manread_edai/wiki/index.php/Index:Am-243

Index:Am-243 - Manread

Log in / create account

article discussion

Index:Am-243

Contents [hide]

- 1 Am-243
 - 1.1 (n,tot)
 - 1.2 (n,y)
 - 1.3 (n,f)
 - 1.4 (n,inf)
 - 1.5 (n,others)

Am-243

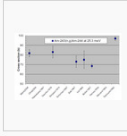
(n,tot)

- Thermal cross section
- Resolved Resonance Parameters
- Fast region
- E > 20 MeV
- Normalization
- Quality of documentation
- Recommendation**
- EXFOR entries

(n,y)

- Thermal cross section

Twelve entries report data for the thermal range or give a resonance integral. Six of these have thermal values, four of which are in reasonable agreement. An overall uncertainty of 4% has been achieved. The effective cross sections (spectrum averages) vary more widely. Ohta et al. 2006 argue that their effective cross section is in agreement with the result by Marie et al. 2006 provided the s0 value of Marie is combined with a resonance integral of 2250 b. This rules out the lower value for the RI of Simpson et al. 1974. The overall uncertainty for the RI is 6%. The uncertainties of Butler et al. 1954 and Darouzet et al. 1982 appear unrealistically small.



Am-243 Thermal capture cross section



Am-243 Resonance integral

Done

Local intranet 100%

Index:Am-243 - Manread - Microsoft Internet Explorer provided by IAEA

http://nds121.iaea.org/alberto/manread_edai/wiki/index.php/Index:Am-243

Index:Am-243 - Manread

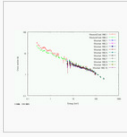
Log in / create account

Resolved Resonance Parameters

Three measurements in the energy range from 1 to 25 eV report between 3 and 23 resonance widths. The most complete data set is from the ORELA facility.

Fast region

Two average cross sections from time-of-flight measurements are reported. The first is by Wisshak et al. 1982 using Li-7(p,n) in the energy from 5 to 230 keV. The second is by Weston and Todd 1985 using the ORELA facility and ranging from 0.25 to 92 keV. The latter set uses two different methods of normalization. In the overlap region the difference is about 10% with Wisshak et al. 1982 for one of those sets, while the second set is in good agreement. The overall uncertainty is about 10%.



Am-243 Unresolved resonance range

E > 20 MeV

Normalization

Wisshak et al. 1982 normalized to the capture cross section of gold. Weston and Todd normalize to ENDF/B-V.

Quality of documentation

For the thermal range, only the works by Marie et al. 2006 and Ohta et al. 2006 appear to be well documented. Both Wisshak et al. 1982 and Weston and Todd 1985 are well documented.

Recommendation

Results from time-of-flight measurements normalised independently could make an improvement for the thermal cross section and the fast range. Resonance region results should be improved as well.

EXFOR entries

Done

Local intranet 100%

The best way to obtain all information on the assessments performed during the meeting is through the wiki site at the link given above.

4. RECOMMENDATIONS AND ACTIONS LIST

After the working group activities, the participants in the Research Coordination Project joined to discuss recommendations and the action list for the activities to be performed.

During the discussions it was proposed to compile a list of facilities in which measurements of neutron cross-section data and other relevant quantities for Minor Actinide (MA) are being performed at present and/or can be performed in the immediate future. A one-page form where basic characteristics of the beam, available detectors and estimated accuracy reachable in measurements on specific MA can be reached should be prepared by the CRP participants.

Actions list

1. Complete the submission of the Experimental Data Assessment forms (few missing experiments, mostly already compiled in EXFOR).
Action on: *All*.
Deadline: *July 2009*.
2. Complete editing of the assessment for each isotope and reaction channel on the wiki site.
Action on: *All*.
Deadline: *Fall 2009*.
3. Prepare a draft of the form to be used to produce a list of experimental facilities presently operating with basic information on the beam, detectors, and sample availability and handling capabilities.
Action on: *CRP Project Officer*.
Deadline: *End of 2009*.

5. CLOSE

The meeting was closed after Y. Nagai had thanked the participants for their cooperation and contributions, the IAEA for hospitality, and A. Mengoni for organization.

2nd Research Co-ordination Meeting on
Minor Actinide Neutron Reaction Data (MANREAD)
IAEA Headquarters, Vienna, Austria
31 March – 3 April 2009
Room A2774+A2311

AGENDA

Tuesday, 31 March

08:30 - 09:30 Registration (IAEA Registration desk, Gate 1)

09:30 - 10:30 Opening Session

- Welcoming address – A.L. Nichols - Head, Nuclear Data Section
- Introductory remarks – A. Mengoni, Scientific Secretary

10:30 – 11:30 Break for administrative matters

11:30 - 12:15 Discussion and Working Groups formation

(Coffee break as appropriate)

12:15 - 14:00 Lunch break

14:00 - 17:30 Working group activity

(Coffee break as appropriate)

Wednesday, 1 April

9:30 - 12:30 Working group activity

(Coffee break as appropriate)

12:30 - 14:00 Lunch break

14:00 - 17:30 Working group activity

(Coffee break as appropriate)

19:30 - Social event (dinner at "Restaurant Puerstner")

Thursday, 2 April

9:30 - 12:30 Working group activity

(Coffee break as appropriate)

12:30 - 14:00 Lunch break

14:00 - 17:30 Discussion (outcome from Working group activity)

(Coffee break as appropriate)

Friday, 3 April

9:30 - 12:30 Discussion on agreed MANREAD topics

(Coffee break as appropriate)

12:30 - 14:00 Lunch break

14:00 - 17:30 Discussion: RCM report

(Coffee break as appropriate)

Close

2nd Research Co-ordination Meeting on
Minor Actinide Neutron Reaction Data (MANREAD)

IAEA Headquarters, Vienna, Austria

31 March - 3 April 2009

Room A2774+A2311-13

LIST OF PARTICIPANTS

Austria

Anton Wallner
 Vera Laboratory
 Faculty of Physics
 University of Vienna
 Waehringer Strasse 17
 1090 Vienna
 email: anton.wallner@univie.ac.at
 phone: +43 1 4277 51711
 fax: +43 1 4277 9517

Belarus

Vladimir Maslov
 Joint Institute for Power and Nuclear
 Research
 National Academy of Science of Belarus
 Krasina str. 99
 220072 Minsk Sosny
 email: Maslov@bas-net.by
 phone: +375 17 2994441

China

Han Yinlu
 China National Nuclear Corporation
 (CNNC)
 China Institute of Atomic Energy (CIAE)
 Nuclear Data Centre, Division of Nucl.
 Physics
 P.O. Box 275-64
 Beijing 102413
 Email: hanyl@ciae.ac.cn

France

Frank Gunsing
 CEA Saclay
 DSM/IRFU/SPHN
 Bat.703/ Orme-des-Merisiers
 91191 Gif-sur-Yvette
 email: gunsing@cea.fr
 phone: +33 1 69 08 75 23
 fax: +33 1 69 08 75 84

Germany

Franz Kaeppler
 Forschungszentrum Karlsruhe
 Institut fuer Kernphysik
 Postfach 3640
 76021 Karlsruhe
 Email: franz.kaeppler@ik.fzk.de
 Phone: +49 7247 823 991
 Fax: +49 7247 824 075

Greece

Rosa Vlastou - Zanni
 National Technical University of Athens
 Department of Physics
 Zografou Campus
 Athens 157 80
 email: vlastou@central.ntua.gr
 phone: +302 10 7723008
 fax: +302 10 7723025

Hungary

Tamas Belgya
 Department of Nuclear Research
 Institute of Isotopes
 Hungarian Academy of Sciences
 P.O.Box 77
 1525 Budapest
 email: belgya@iki.kfki.hu
 phone: +36 1 392 2539
 fax: +36 1 392 2584

Italy

Nicola Colonna
 INFN – Sezione di Bari
 V. Orabona, 4
 70126 Bari
 email: nicola.colonna@ba.infn.it
 phone: +39 080 544 2351
 fax: +39 080 544 2470

Japan

Yasuki Nagai
Division of Nucl. Data and Reactor
Engineering, Nuclear Science and
Engineering Directorate
Japan Atomic Energy Agency
Shirakata-Shirane 2-4, Tokai-mura, Naka-
gun
Ibaraki, 319-1195
email: nagai@rcnp.osaka-u.ac.jp
phone: +81 29 282 5470

Russian Federation

Boris Fursov
State Scientific Centre of the Russian
Federation
Institute of Physics and Power Engineering
Bondarenko Sq. 1
249 020 Obninsk, Kaluga Region
email: fursov@ippe.ru
phone: +7 84 399 8419
fax: +7 95 230 2326

CONSULTANTS

Germany

Rene Reifarh
Gesellschaft fuer Schwerionenforschung
(GSI)
Planckstrasse 1
64291 Darmstadt
email: r.reifarh@gsi.de
phone: +49 6159 711 559
fax: +49 6159 712 809

INTERNATIONAL ORGANIZATIONS

European Commission

Arjan Plompen
Neutron Physics
EC-JRC-IRMM
Retieseweg 111
2440 Geel
Belgium
email: arjan.plompen@ec.europa.eu
phone: +32 14 571 381
fax: +32 14 571 862

IAEA

Alberto Mengoni (Scientific Secretary)
NAPC-Nuclear Data Section
email: a.mengoni@iaea.org
phone: +43 1 2600 21717
fax: +43 1 2600 7

Alan L. Nichols
NAPC-Nuclear Data Section,
Section Head
email: a.nichols@iaea.org
phone: +43 1 2600 21709
fax: +43 1 2600 7

Roberto Capote Noy
NAPC-Nuclear Data Section,
email: r.capotenoy@iaea.org
phone: +43 1 2600 21713
fax: +43 1 2600 7

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

e-mail: services@iaeaand.iaea.org
fax: (43-1) 26007
telephone: (43-1) 2600-21710
Web: <http://www-nds.iaea.org>