




EXFOR/GUI Retrieval System

CD-ROM covering page

 Nuclear Data Section International Atomic Energy Agency Wagramer Strasse 5, P.O.Box 100, A-1400 Vienna, Austria Tel:(+43 1) 2600-21714; Fax:(+43 1) 26007		2020-04-07  International Atomic Energy Agency Nuclear Data Services 2004-2020	 for Windows, Linux, Mac SQLite
EXFOR for Applications EXFOR-CINDA databases, retrieval systems, Endver/GUI package for Linux, Windows and MacOSX using SQLite Run software packages:		EXFOR for Applications EXFOR-CINDA databases and retrieval systems, ENDVER/GUI integrated tools for ENDF-Evaluators (Windows, Linux, MacOSX) Version 2.1.1. April 2020	
Preparation. Install JDK "1.7" or higher, + on MacOSX: install XQuartz			
Download: https://www.nds.iaea.org/cdroms/#x4app2 ==> x4app-2020-04-07.tar.gz Un-compress:			
Windows: → Run → cmd.exe > cd c:\x4app >"c:\program files\7-zip\7z.exe" x x4app-2020-04-07.tar.gz >"c:\program files\7-zip\7z.exe" x -r x4app-2020-04-07.tar > cd x4app-2020-04-07		Linux: → Terminal MacOSX: → Finder → Applications → Utilities → Terminal \$ tar xvzf x4app-2020-04-76.tar.gz \$ cd x4app-2020-04-07	
Run:	Windows	Linux	MacOSX
1 Interactive EXFOR retrieval system	run_x4cd.bat	./run_x4cd.sh	./run_x4cd-mac.sh
2 EndVer/GUI	run_endver.bat	./run_endver.sh	./run_endver-mac.sh
3 Non-interactive retrieval utility	cd app_example runme.bat	cd app_example ./runme.sh	cd app_example ./runme-mac.sh
4 EXFOR retrieval and converters	cd app_example2020 ./runme.sh	cd app_example2020 ./runme.sh	cd app_example2020 ./runme.sh
General description: readme.txt How to use and setup: setup.txt IAEA Nuclear Data Services: http://www.nds.iaea.org/			
		<ul style="list-style-type: none"> ✓ Does not need installation ✓ Integrated CINDA and EXFOR ✓ Advanced interactive search ✓ Help based on Dictionaries ✓ Interactive graphics with ZVView 	
		<ul style="list-style-type: none"> ✓ Can work with local and remote databases ✓ Non-interactive EXFOR retrievals ✓ Converter from EXFOR to C4, C5, X4+, JSON, XML ✓ Examples of retrieval and converter scripts ✓ Real application: ENDVER/GUI package + EXFOR. 	
EXFOR is a comprehensive library of experimental nuclear reaction data induced by neutrons, charged particles and photons. Contents (2020-03-05): 23038 Entries, 33092 publications, 158739 data tables			
CINDA library contains bibliographical references to experimental nuclear reaction data and to calculations, reviews, compilations and evaluations of neutron, charged particle reactions and spontaneous fission data. Includes import from EXFOR. Contents (2020-03-09): 497717 lines, 68261 publications, 209927 blocks			
Retrieval Systems on Java2: v1=2.1.1 (2020-04-02)			
© The data on this CD are a product of the Network of Nuclear Reaction Data Centres.			

Welcome window



Search Window

EXFOR-Session 1

Request SQL Config About EXFOR Help Files

Search Stop Reset MakeSQL Example Request Type: Basic Advanced Expert

Basic Criteria

Target: Al-27
Reaction: n,a
Product: Na-24
Quantity: CS
Energy range(eV): 0..20e+6
Last modified: 1970-01-01..2001-12-31
Accession #: 22012*

Extended Criteria

CINDA Quantity: CS
1-st Author: Hockenbury
Author(s): Green
Country: CAN
Institute: 1CANCRC,1USARPI
Short Reference: J,NIM
Publication year: 1970-2002
Area: 1; 3
Debut date: 1974-09-19..1980-03-06
Full Reference: J,NIM,86,83,70;
R,INDC(YUG)-6,7912

Key-Words

DETECTOR SCIN
METHOD ACTIV
FACILITY REAC
ANALYSIS AREA

Sort: Reaction Accession# React/Acc#

Special Options

No reaction combinations
 Exclude superseded data
 Enhanced search of Products

Ranges

	Target	Product
Z:	<input type="checkbox"/> 13-15	<input type="checkbox"/> 13
A:	<input type="checkbox"/> 0,27	<input type="checkbox"/> 13
Isomer:	<input type="checkbox"/> M1,M2	<input type="checkbox"/> G,M1,M2

Reaction Sub-Fields

SF1: 13-AL-27 Target
SF2: N Incident Particle
SF3: G Product Particle/Process
SF4: 13-AL-28 Product
SF5: Branch
SF6: SIG Parameters
SF7: Particles Considered
SF8: Modifiers
SF9: Data Code
SF58: ,SIG Quantity Code

Data Headings and Units

Heading: EN
Units: MEV

Welcome! EXFOR/Session:1

Select Window

EXFOR-Session 1

Request SQL Config About EXFOR Help Files **Select** Output

Submit Stop View Found: Reactions:13 DataSets:134

Output Formats: EXFOR Bibliography ZVD Plot X4+ X4json C5 XML

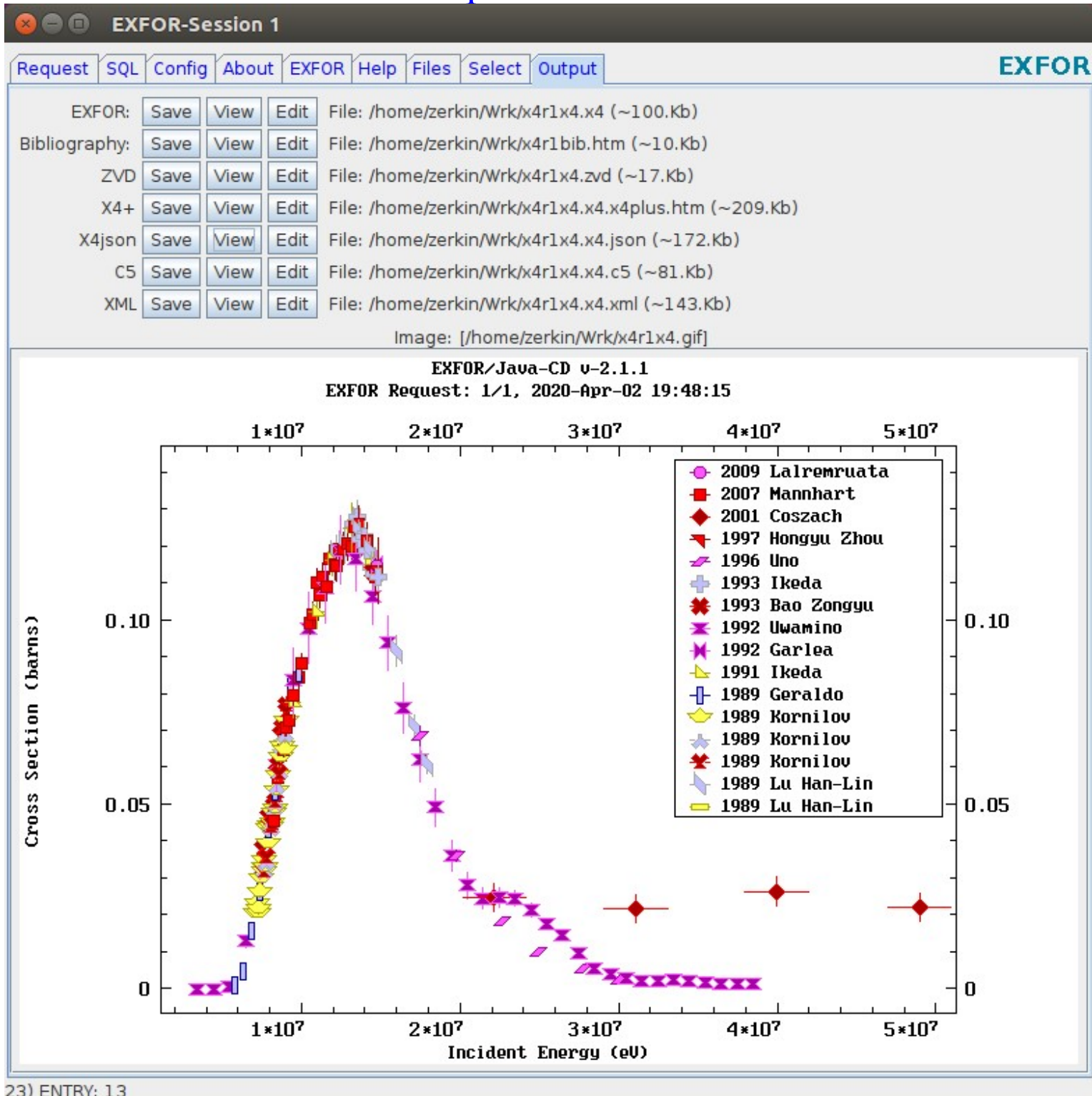
Data Selection: Selected Unselected All Use Mouse: <Shift>, <Ctrl>, Double-click, Right-button

1) 13-AL-27(N,A)11-NA-24,,SIG

1	33025010	2009	B.Lalremruata+		1.48e7	1	J,NP/A,821,23,2009
2	22976004	2007	W.Mannhart+	8.33e6	1.47e7	28	R,PTB-N-53,200701
3	22497003	2000	R.Coszach+	2.22e7	4.90e7	4	J,PR/C,61,(6),064615,200006
4	31528009	1997	Hongyu Zhou+		1.49e7	1	J,NSE,125,61,1997
5	23279006	1996	Y.Uno+	1.76e7	3.01e7	6	C,96PRAHA,,465,1996
6	22312002	1993	Y.Ikeda+	1.33e7	1.49e7	8	J,NST,30,870,199309
7	30993002	1993	Bao Zongyu+		1.46e7	1	J,CNP,15,(4),341,1993
8	22703002	1992	Y.Uwamino+	3.50e6	3.85e7	36	J,NSE,111,391,1992
9	31459008	1992	I.Garlea+		1.48e7	1	J,RRP,37,(1),19,1992
10	22209009	1991	Y.Ikeda+	9.50e6	1.32e7	4	C,91JUELIC,,294,199105
11	13171003	1989	L.P.Geraldo+	5.87e6	9.86e6	10	J,ANE,16,293,8906
12	30523002	1989	Lu Han-Lin+		1.46e7	1	R,INDC(CPR)-16,198908
13	.003	1989	Lu Han-Lin+	1.22e7	1.80e7	10	R,INDC(CPR)-16,198908
14	41048002	1989	N.V.Kornilov+	7.13e6	9.10e6	23	J,PR/C,39,(3),789,198903
15	.003	1989	N.V.Kornilov+	7.62e6	9.09e6	19	J,PR/C,39,(3),789,198903
16	.004	1989	N.V.Kornilov+	7.63e6	9.10e6	19	J,PR/C,39,(3),789,198903
17	41051002	1989	N.N.Moiseev+		1.48e7	1	J,YK,,(3),101,1989
18	.003	1989	N.N.Moiseev+		1.48e7	1	J,YK,,(3),101,1989
19	.004	1989	N.N.Moiseev+		1.48e7	1	J,YK,,(3),101,1989
20	12969003	1987	J.W.Meadows+		1.47e7	1	J,ANE,14,489,1987
21	12977002	1987	L.R.Greenwood	1.45e7	1.49e7	5	S,ASTM-STP-956,743,1987
22	30755002	1987	Zhou Muyao+		1.46e7	1	J,CNP,9,34,198702
23	30821002	1986	T.Chimoye+	1.38e7	1.47e7	5	J,ZP/A,325,69,198609
24	30933002	1986	J.Csikai+	1.34e7	1.48e7	12	J,ZP/A,325,69,1986
25	21923002	1984	K.Kudo	1.40e7	1.99e7	8	W,KUDO,84
26	30813002	1984	I.Garlea+		1.48e7	1	J,RRP,29,421,1984
27	21900002	1983	W.Enz+	6.36e6	8.29e6	9	P,NEANDC(E)-242U,57,8306
28	21941006	1983	S.Firkin	7.35e6	1.41e7	5	R,AERE-M-3350,198309
29	30640002	1982	J.Csikai	1.35e7	1.48e7	5	C,82ANTWER,,414,198209
30	12912003	1981	P.Welch+	2.00e7	2.30e7	2	J,BAP,26,708(G3),198105
31	21756003	1981	H.Friedmann	1.37e7	1.44e7	20	J,ZP/A,302,271,1981
32	.004	1981	H.Friedmann	1.37e7	1.44e7	20	J,ZP/A,302,271,1981
33	20986003	1979	M.T.Swinhoe+	7.50e6	1.18e7	3	P,AERE-PR/MP,26,39,197903

23) ENTRY: 13

Output Window



File Edit Help

REQUEST	1001	20200331	3	230818	0	0	0
ENTRY	13171	891122		20050926	000013171000		1
SUBENT	13171001	891122		20050926	000013171001		1
BIB	13	24			13171001		2
INSTITUTE	(LUSAANL)				13171001		3
REFERENCE	(J,ANE,16,293,8906)				13171001		4
AUTHOR	(L.P.GERALDO,D.L.SMITH,J.W.MEADOWS)				13171001		5
TITLE	ACTIVATION CROSS SECTION MEASUREMENTS NEAR THRESHOLD				13171001		6
	FOR THE 24MG(N,P)24NA AND 27AL(N,A)24NA REACTIONS				13171001		7
FACILITY	FAST NEUTRON GENERATOR				13171001		8
INC-SOURCE	(D-D)				13171001		9
DETECTOR	(GELI)				13171001		10
MONITOR	2(92-U-238(N,F),,SIG)				13171001		11
DECAY-DATA	(11-NA-24,15.020HR,DG,1.369,1.0,DG,2.754,1.0)				13171001		12
CORRECTION	CORRECTED FOR:				13171001		13
	- DECAY				13171001		14
	- DETECTOR EFFICIENCY				13171001		15
	- FINITE SAMPLE GEOMETRY				13171001		16
	- NONUNIFORM SAMPLE ACTIVITY				13171001		17
	- EFFECT OF SECONDARY NEUTRONS FROM THE GASS CELL				13171001		18
	TARGET				13171001		19
	- NEUTRON ABSORPTION AND SCATTERING				13171001		20
ERR-ANALYS1	(ERR-T) TOTAL UNCERTAINTY. SEE TABLE 2 IN ARTICLE FOR				13171001		21
	COMPLETE LIST OF ERROR SOURCES.				13171001		22
	UNCERTAINTY CORRELATION MATRICES GIVEN IN TABLES 5 AND				13171001		23
	6 IN ARTICLE.				13171001		24
STATUS	(APRVD) D.L.SMITH, 89/11/20.				13171001		25
HISTORY	(891101C)				13171001		26
ENDBIB	24				13171001		27
NOCOMMON	0	0			13171001		28
ENDSUBENT	27				13171001	999999	
SUBENT	13171003	891122		20050926	000013171003		1
BIB	1	2			13171003		2
REACTION	1((13-AL-27(N,A)11-NA-24,,SIG)/(92-U-238(N,F),,SIG))				13171003		3
	2(13-AL-27(N,A)11-NA-24,,SIG)				13171003		4
ENDBIB	2				13171003		5
NOCOMMON	0	0			13171003		6
DATA	6	10			13171003		7
EN	EN-RSL-FW	DATA	1ERR-T	1MONIT	2DATA	213171003	8
MEV	MEV	NO-DIM	PER-CENT	MB	MB	13171003	9
5.869	0.163	1.948	-03 7.6	587.7	1.145	13171003	10
6.399	0.150	6.212	-03 8.6	778.6	4.837	13171003	11
6.914	0.138	1.690	-02 5.1	925.0	15.63	13171003	12
7.419	0.145	2.699	-02 4.3	975.6	26.33	13171003	13
7.917	0.160	4.351	-02 3.8	992.7	43.19	13171003	14
8.408	0.178	5.366	-02 3.6	998.8	53.60	13171003	15
8.895	0.188	6.807	-02 3.5	998.3	67.95	13171003	16
9.379	0.198	8.265	-02 3.9	993.7	82.13	13171003	17
9.379	0.198	8.240	-02 4.2	993.7	81.88	13171003	18
9.859	0.231	8.675	-02 4.1	988.4	85.74	13171003	19
ENDDATA		12				13171003	20
ENDSUBENT		19				13171003	999999
ENDENTRY		2				13171999999999	

EXFOR

EXFOR/IAEA, 2020/3/31 23:8:18

REQUEST #1

Bibliography

Bibliography

- 1) AUTHOR: L.P.Geraldo, D.L.Smith, J.W.Meadows
TITLE: ACTIVATION CROSS SECTION MEASUREMENTS NEAR THRESHOLD
FOR THE $^{24}\text{Mg}(n,p)^{24}\text{Na}$ AND $^{27}\text{Al}(n,\alpha)^{24}\text{Na}$ REACTIONS
REF: Annals of Nuclear Energy
TYPE: Journal
YEAR: 1989
CODE: J,ANE,16,293,8906
EXFOR: #13171
- 2) AUTHOR: Y.Ikeda, C.Konno, M.Mizumoto, K.Hasegawa, S.Chiba, Y.Yamanouchi, M.Sugimoto
TITLE: Activation cross section measurement at neutron
energies of 9.5, 11.0, 12.0 and 13.2 MeV using
 $\text{H-1}(B-11,n)\text{C-12}$ neutron source at JAERI.
REF: Conf.on Nucl.Data for Sci.and Technol.,Juelich 1991
TYPE: Conference
YEAR: 1991
CODE: C,91JUELIC,,294,199105
EXFOR: #22209
- 3) AUTHOR: Y.Ikeda, C.Konno, Y.Oyama, K.Kosako, K.Oishi, H.Maekawa
TITLE: Absolute measurements of activation cross sections of
 $^{27}\text{Al}(n,p)^{27}\text{Mg}$, $^{27}\text{Al}(n,\alpha)^{24}\text{Na}$, $^{56}\text{Fe}(n,p)^{56}\text{Mn}$,
 $^{90}\text{Zr}(n,2n)^{89}\text{Zr-m+g}$ and $^{93}\text{Nb}(n,2n)^{92}\text{Nb-m}$ at
energy range of 13.3 - 14.9 MeV
REF: Jour. of Nuclear Science and Technology
TYPE: Journal
YEAR: 1993
CODE: J,NST,30,870,199309
EXFOR: #22312

X4.JSON file

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x4r1x4.x4.json - Notepad2
File Edit View Settings ?
[Icons]
1 {
2   "format": "X4JSON.0.1.2"
3   , "now": "2020-04-03T12:29:06.000Z"
4   , "program": "EXFOR converter, by V.Zerkin, IAEA-NDS, 2007-2019 (ver.2020-04-02)"
5   , "input": { "files": [ { "name": "x4r1x4.x4" , "format": "EXFOR" , "created": "2020-04-03T12:28:44.000Z" } ] }
6   , "output": { "files": [ { "name": "x4r1x4.x4.json" , "format": "JSON" , "outBib": "2" , "created": "2020-04-03T12:29:06.000Z" } ] }
7   , "datasets": [
8
9     { "id": "131710031" , "pointer": "1"
10      , "subent": { "id": "13171003" , "updated": "891122" }
11      , "entry": { "id": "13171" , "updated": "891122" }
12      , "author1": "L.P.Geraldo+"
13      , "year": "1989"
14      , "ref1": { "code": "J,ANE,16,293,8906" , "std": "J,ANE,16,293,1989"
15                , "exp": "Jour: Annals of Nuclear Energy, Vol.16, p.293 (1989)"
16              }
17      , "reaction": {
18        "code": "(13-AL-27(N,A)11-NA-24,,SIG)/(92-U-238(N,F),,SIG)"
19        , "C4Reaction": "((N,A),SIG)/((N,F),SIG)"
20        , "Proj": "N" , "ProjZA": "1"
21        , "Target": "13-AL-27" , "TargZA": "13027"
22        , "MF": 203 , "MT": 107
23        , "ReactionType": "Ratio"
24        , "Quantity": "Ratio of [Cross section]"
25        , "IndVarFamCode": "0 2"
26        , "ExpectedUnits": "NO-DIM"
27      }
28      , "BIB": {
29        "INSTITUTE": { "X4KW": "INSTITUTE" , "exp": "Institute"
30          , "CODES": [
31            { "CODE": "(1USAANL)" , "SAN": "001" }
32          ]
33        }
34        , "REFERENCE": { "X4KW": "REFERENCE" , "exp": "Reference"
35          , "CODES": [
36            { "CODE": "(J,ANE,16,293,8906)" , "std": "J,ANE,16,293,1989" , "SAN": "001" }
37          ]
38        }
39        , "AUTHOR": { "X4KW": "AUTHOR" , "exp": "Author"
40          , "CODES": [
41            { "CODE": "(L.P.GERALDO,D.L.SMITH,J.W.MEADOWS)" , "SAN": "001" }
42          ]
43        }
44        , "TITLE": { "X4KW": "TITLE" , "exp": "Title"
45          , "CODES": [
46            { "CODE": "" , "SAN": "001"
47              , "FREE": "ACTIVATION CROSS SECTION MEASUREMENTS NEAR THRESHOLD\n\
48                FOR THE 24MG(N,P)24NA AND 27AL(N,A)24NA REACTIONS"
49            }
50          ]
51        }
52      }
53   ]
54 }
55 }
```

X4json

X4+ in Web browser

Converted from EXFOR by [x4tox4+], ver.2020-03-11, V.Zerkin, IAEA-NDS, 2007-2020

ENTRY	13171001	891122	20050926	0000
SUBENT	13171001	891122	20050926	0000
BIB	13	24		

INSTITUTE (1USAANL)
(1USAANL) Argonne National Laboratory, Argonne, IL, United States of America

REFERENCE (J,ANE,16,293,8906)
(J,ANE,16,293,8906) Jour: Annals of Nuclear Energy, Vol.16, p.293 (1989), UK

AUTHOR (L.P.GERALDO,D.L.SMITH,J.W.MEADOWS)
TITLE ACTIVATION CROSS SECTION MEASUREMENTS NEAR THRESHOLD
FOR THE 24MG(N,P)24NA AND 27AL(N,A)24NA REACTIONS

FACILITY FAST NEUTRON GENERATOR
INC-SOURCE (D-D)
(D-D) 2H(d,n)

DETECTOR (GELI)
(GELI) Germanium-Lithium detector

MONITOR 2(92-U-238(N,F),,SIG)
DECAY-DATA (11-NA-24,15.020HR,DG,1.369,1.0,DG,2.754,1.0)
Decay-data: [11-NA-24]

CORRECTION CORRECTED FOR:
- DECAY
- DETECTOR EFFICIENCY
- FINITE SAMPLE GEOMETRY
- NONUNIFORM SAMPLE ACTIVITY
- EFFECT OF SECONDARY NEUTRONS FROM THE GASS CELL TARGET
- NEUTRON ABSORPTION AND SCATTERING

ERR-ANALYSIS1(ERR-T) TOTAL UNCERTAINTY. SEE TABLE 2 IN ARTICLE FOR COMPLETE LIST OF ERROR SOURCES.
UNCERTAINTY CORRELATION MATRICES GIVEN IN TABLES 5 AND 6 IN ARTICLE.

STATUS (APRVD) D.L.SMITH, 89/11/20.
(APRVD) Approved by author

HISTORY (891101C)

ENDBIB 24
NOCOMMON
ENDSUBENT 27

SUBENT	13171003	891122	20050926	0000
BIB	1	2		

REACTION 1((13-AL-27(N,A)11-NA-24,,SIG)/(92-U-238(N,F),,SIG))
2(13-AL-27(N,A)11-NA-24,,SIG)
1((13-AL-27(N,A)11-NA-24,,SIG)/(92-U-238(N,F),,SIG)) #R-combi:A/B a/a
Target:AL-27 #Projectile:N #Reaction:N,A #Quantity:,SIG:CS:Cross section
Product: [11-NA-24]
Target:U-238 #Projectile:N #Reaction:N,F #Process:F:Fission #Quantity:,SIG:CS:Cross section
2(13-AL-27(N,A)11-NA-24,,SIG)
Target:AL-27 #Projectile:N #Reaction:N,A #Quantity:,SIG:CS:Cross section
Product: [11-NA-24]

ENDBIB 2
NOCOMMON
DATA 6 10 12
#Legend: 6 x 10 x 12 : data columns * lines * column width

#EN	Energy of incident projectile, laboratory system	MEV	MeV
#EN-RSL-FW	Incident projectile energy resolution (Full width)	MEV	MeV
#DATA	Value of quantity specified under REACTION #+ (13-AL-27(N,A)11-NA-24,,SIG)/(92-U-238(...	NO-DIM	no Dimensions
#ERR-T	Total uncertainty (1-Sigma)	PER-CENT	per-cent
#MONIT	Normalization value for reaction given under MONITOR	MB	millibarns
#DATA	Cross section #+ 13-AL-27(N,A)11-NA-24,,SIG	MB	millibarns

#/Legend

EN	EN-RSL-FW	DATA	ERR-T	MONIT	DATA
MEV	MEV	NO-DIM	PER-CENT	MB	MB
5.869	0.163	1.948e-03	7.6	587.7	1.145
6.399	0.150	6.212e-03	8.6	778.6	4.837
6.914	0.138	1.690e-02	5.1	925.0	15.63
7.419	0.145	2.699e-02	4.3	975.6	26.33
7.917	0.160	4.351e-02	3.8	992.7	43.19
8.408	0.178	5.366e-02	3.6	998.8	53.60
8.895	0.188	6.807e-02	3.5	998.3	67.95
9.379	0.198	8.265e-02	3.9	993.7	82.13
9.379	0.198	8.240e-02	4.2	993.7	81.88
9.859	0.231	8.675e-02	4.1	988.4	85.74

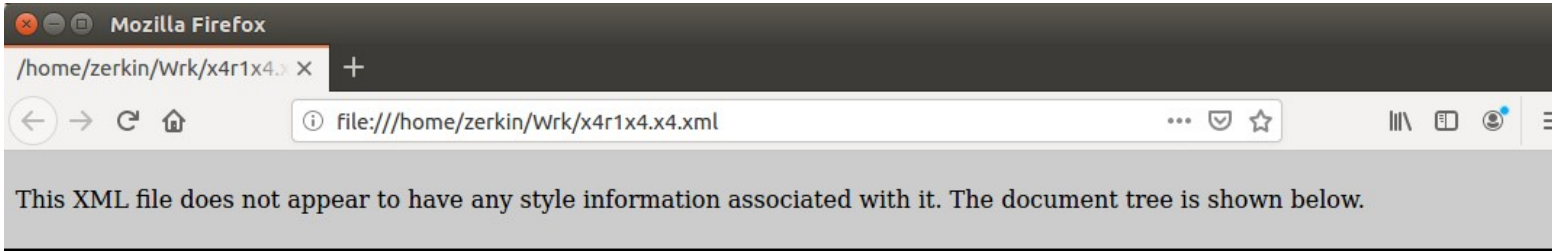
ENDDATA
ENDSUBENT 19
ENDENTRY

EXFOR.XML file

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x4r1x4.x4.xml (~/Wrk) - gedit
Open [icon]
<?xml version="1.0" encoding="UTF-8" ?>
<x4files
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  xsi:noNamespaceSchemaLocation="../x4js/x4x2.xsd"
>
<x4entry accnum="13171" Ref1Year="1989" Author="L.P.Geraldo+">
  <x4subent subacc="13171001" N2="891122">
    <bib nKw="24">
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            <kwCode pointer=" " iCode="0">
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            </kwCode>
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              <x4code type="AUTHOR">
                <authors nn="3" a1="Geraldo" a1ini="L.P.">
                  <author ii="1">L.P.GERALDO</author>
                  <author ii="2">D.L.SMITH</author>
                  <author ii="3">J.W.MEADOWS</author>
                </authors>
              </x4code>
            </kwCode>
          </keyword>
          <keyword kw="TITLE" subacc="13171001" nCodes="1">
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EXFOR.XML file in Web browser



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--<x4files xsi:noNamespaceSchemaLocation="../x4js/x4x2.xsd">
--<x4entry accnum="13171" Ref1Year="1989" Author="L.P.Geraldo+">
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