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Title: Release of ENDF81SaB: ENDF/B-VIII.1-Based ACE Data Files for Thermal Scattering

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Report

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Memorandum

XCP-5 Materials and Physical Data

To: Distribution

From: Wim Haeck, XCP-5

Nathan Gibson, XCP-5

Noah Kleedtke, XCP-5

Symbol: XCP-5:25-023

Date: August 19, 2025

Subject: Release of ENDF81SaB: ENDF/B-VIII.1-Based ACE Data Files for Thermal Scattering

Introduction

On August 30, 2024, the National Nuclear Data Center (NNDC) released the ENDF/B-VIII.1 nuclear data library. The library was released in the standard Evaluated Nuclear Data File (ENDF) format. These files can be accessed on the NNDC's website (www.nndc.bnl.gov). The files provided in the thermal neutron scattering sublibrary were processed into A Compact ENDF (ACE)-formatted files, verified, and validated by the XCP-5 Nuclear Data Team, resulting in the ENDF81SaB application library. This report details the processing of these files and the quality assurance approach taken. This is not intended to be a full validation effort; rather, this library is intended to simply reproduce the released files for further validation testing by the community. The validation basis and details of the evaluations are documented in the forthcoming "Big Paper". ENDF81SaB is available on LANL computing resources and will be made available without restriction via nucleardata.lanl.gov.

Each release of the ENDF/B nuclear data library pushes the limits of the processing codes through the introduction of new data and new data formats. Processing codes must be adapted to ensure that they are capable of using these new formats, or at the very least understand them. NJOY, the nuclear data processing code developed at Los Alamos National Laboratory is no exception to this. As NJOY2016 is still the main production code for nuclear data libraries at LANL, we will continue to make the necessary changes in this version of NJOY to ensure full compatibility with the ENDF/B-VIII.1 nuclear data library.

The addition of the mixed elastic scattering option (LTHR = 2) for elastic thermal scattering was one of the most anticipated changes for the ENDF/B-VIII.1 nuclear data library since it lifts the limitation of using either coherent or incoherent elastic scattering for moderators. For NJOY2016, this new format has required changes in various modules, the most important ones being THERMR (which processes the thermal scattering data) and ACER (which formats the data into an ACE file for use in application codes like the MCNP code).

Figure 1 gives an example of what this mixed mode data looks like for D in 7LiD after processing through ACER in NJOY2016. To enable the use of this new type of thermal scattering data, NJOY users have to use NJOY2016.65 or above.

Because the coherent and incoherent data needs to be treated separately by MCNP6, the mixed mode scattering also necessitated an update to the ACE format itself by adding an additional elastic scattering data block, and a subsequent modification to MCNP so that the mixed mode elastic data can be used during a Monte Carlo simulation. This new format is fully supported in MCNP, version 6.3.0 and above.

The ENDF/B-VIII.1 thermal scattering sublibrary provides a total of 114 evaluations for 69 materials. Nine materials (light water, beryllium oxide, beryllium-metal, yttrium hydride, silicon carbide, silicon dioxide, Lucite, liquid hydrogen, and liquid deuterium) were reevaluated, and 18 new materials were added

(calcium hydride, uranium hydride, lithium-7 hydride, lithium-7 deuteride, paraffinic oil, polystyrene, teflon, FLiBe, hydrogen fluoride, sapphire, uranium metal, plutonium dioxide, magnesium oxide, beryllium fluoride, magnesium fluoride, beryllium carbide, uranium carbide, and zirconium carbide). Two materials were evaluated with added physics (graphite and beryllium metal with Sd effects). Four material evaluation sets were expanded to include new phases, material conditions, or enrichments (zirconium hydride, 20% porous graphite, uranium dioxide, and uranium nitride). The remaining evaluations were imported from the ENDF/BVIII.0 thermal scattering sublibrary.

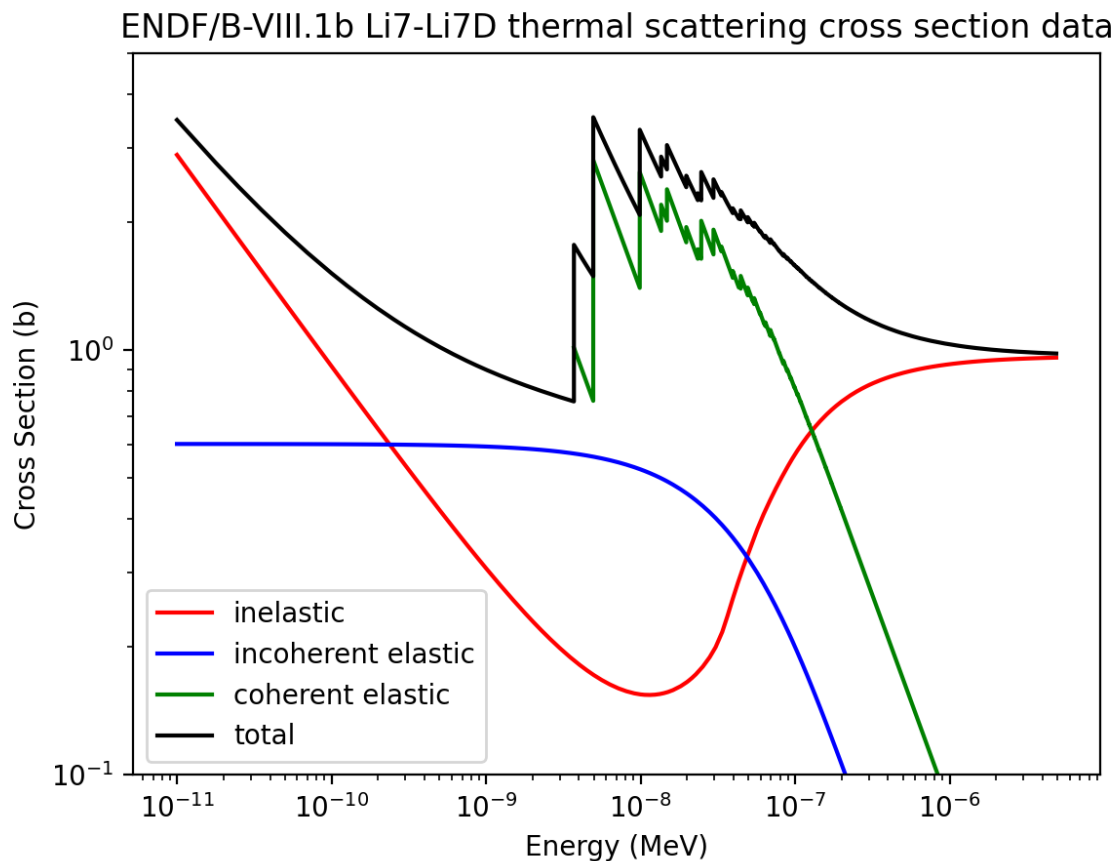


Figure 1: Mixed mode thermal scattering in D-7LiD at 400 K processed by NJOY2016.65.

Library content

Of the 114 available evaluations, the following 9 evaluations were not included in the ENDF81SaB library:

- All CaH2 evaluations (ts1-H1inCaH2.endf, ts1-H2inCaH2.endf and ts1-CainCaH2.endf): there are two H in CaH2 evaluations, one for each hydrogen atom site location in the molecule. The current version of MCNP is incapable of distinguishing between these two “different” hydrogen atoms unless we introduce different ZAIDs for both which makes these CaH2 evaluations effectively unusable in MCNP.

- The H and Zr in ZrH evaluations (tsl-HinZrH.endf and tsl-ZrinZrH.endf): the ENDF/B-VIII.1 thermal scattering sublibrary now has evaluations for the epsilon (ZrH2) and delta (ZrHx) phase of ZrH. The original H and Zr in ZrH evaluations were still included in the sublibrary but they have not changed since ENDF/B-VIII.0. Users wanting to use these original evaluations can continue to use the ENDF81SaB2 library instead.
- The benzene (tsl-benzene.endf), liquid and solid methane (tsl-l-CH4.endf and tsl-s-CH4.endf): these represent some of the oldest mixed moderator evaluations in the ENDF/B-VIII.1 thermal scattering sublibrary. There were no updates to these evaluations. Users wanting to use these evaluations can continue to use the ENDF81SaB2 library instead.
- The SiO2 evaluation (tsl-SiO2-beta.endf): the ENDF/B-VIII.1 thermal scattering sublibrary now has evaluations for the H and Si in SiO2 as well as the original SiO2 evaluation which remained unchanged from ENDF/B-VIII.0. Users wanting to use this evaluation can continue to use the ENDF81SaB2 library instead.

The library provides thermal scattering ACE tables for 103 moderator materials (using a total of 105 evaluations). The ACE identifiers, a description of the moderator materials and the evaluations these were based on is given in the following table.

ACE id	Moderator description	Evaluation
al-27	aluminium-27 metal	tsl-013_Al_027.endf
fe-56	iron-56 metal	tsl-026_Fe_056.endf
7l-7ld	lithium-7 in lithium-7 deuteride	tsl-7Liin7LiD-mixed.endf
7l-7lh	lithium-7 in lithium-7 hydride	tsl-7Liin7LiH-mixed.endf
al-sap	aluminium in single crystal sapphire	tsl-AlinAl2O3.endf
be-met	beryllium metal	tsl-Be-metal+Sd.endf tsl-Be-metal.endf
be-bec	beryllium in beryllium carbide	tsl-BeinBe2C.endf
be-bef	beryllium in beryllium fluoride	tsl-BeinBeF2.endf
be-beo	beryllium in beryllium oxide	tsl-BeinBeO.endf
be-flb	beryllium in FLiBe	tsl-BeinFLiBe.endf
c-bec	carbon in beryllium carbide	tsl-CinBe2C.endf
c-luci	carbon in Lucite	tsl-CinC5O2H8.endf
c-styr	carbon in polystyrene	tsl-CinC8H8.endf
c-ptfe	carbon in Teflon (PTFE)	tsl-CinCF2.endf
c-sic	carbon in silicon carbide	tsl-CinSiC.endf
c-uc1	carbon in uranium carbide (natural uranium)	tsl-CinUC.endf
c-uc2	carbon in uranium carbide (5% U235)	tsl-CinUC-5P.endf
c-uc3	carbon in uranium carbide (10% U235)	tsl-CinUC-10P.endf
c-uc4	carbon in uranium carbide (19.75% U235)	tsl-CinUC-HALEU.endf
c-uc5	carbon in uranium carbide (93% U235)	tsl-CinUC-HEU.endf
c-uc6	carbon in uranium carbide (100% U235)	tsl-CinUC-100P.endf
c-zrc	carbon in zirconium carbide	tsl-CinZrC.endf
d-7ld	deuterium in lithium-7 deuteride	tsl-Din7LiD-mixed.endf

d-d2o	deuterium in heavy water	tsl-DinD2O.endf
f-bef	fluorine in beryllium fluoride	tsl-FinBeF2.endf
f-ptfe	fluorine in Teflon (PTFE)	tsl-FinCF2.endf
f-flb	fluorine in FLiBe	tsl-FinFLiBe.endf
f-hf	fluorine in hydrogen fluoride	tsl-FinHF.endf
f-mgf	fluorine in magnesium fluoride	tsl-FinMgF2.endf
h-7lh	hydrogen in lithium-7 hydride	tsl-Hin7LiH-mixed.endf
h-luci	hydrogen in Lucite	tsl-HinC5O2H8.endf
h-styr	hydrogen in polystyrene	tsl-HinC8H8.endf
h-poly	hydrogen in polyethylene	tsl-HinCH2.endf
h-h2o	hydrogen in light water	tsl-HinH2O.endf
h-hf	hydrogen in hydrogen fluoride	tsl-HinHF.endf
h-ice	hydrogen in solid light water (ice)	tsl-HinIceIh.endf
h-poil	hydrogen in heavy paraffinic oil	tsl-HinParaffinicOil.endf
h-uh3	hydrogen in uranium hydride	tsl-HinUH3.endf
h-yh2	hydrogen in yttrium hydride	tsl-HinYH2.endf
h-ezh	hydrogen in zirconium hydride (epsilon, ZrH2)	tsl-HinZrH2.endf
h-dzh	hydrogen in zirconium hydride (delta, ZrHx)	tsl-HinZrHx.endf
li-flb	lithium in FLiBe	tsl-LiinFLiBe.endf
mg-mgf	magnesium in magnesium fluoride	tsl-MginMgF2.endf
mg-mgo	magnesium in magnesium oxide	tsl-MginMgO.endf
n-un1	nitrogen in uranium nitride (natural uranium)	tsl-NinUN.endf
n-un2	nitrogen in uranium nitride (5% U235)	tsl-NinUN-5P.endf
n-un3	nitrogen in uranium nitride (10% U235)	tsl-NinUN-10P.endf
n-un4	nitrogen in uranium nitride (19.75% U235)	tsl-NinUN-HALEU.endf
n-un5	nitrogen in uranium nitride (93% U235)	tsl-NinUN-HEU.endf
n-un6	nitrogen in uranium nitride (100% U235)	tsl-NinUN-100P.endf
o-sap	oxygen in single crystal sapphire	tsl-OinAl2O3.endf
o-beo	oxygen in beryllium oxide	tsl-OinBeO.endf
o-luci	oxygen in Lucite	tsl-OinC5O2H8.endf
o-d2o	oxygen in heavy water	tsl-OinD2O.endf
o-ice	oxygen in solid light water (ice)	tsl-OinIceIh.endf
o-mgo	oxygen in magnesium oxide	tsl-OinMgO.endf
o-puo	oxygen in plutonium oxide	tsl-OinPuO2.endf
o-aqu	oxygen in alpha-quartz (SiO2)	tsl-OinSiO2-alpha.endf
o-uo1	oxygen in uranium oxide (natural uranium)	tsl-OinUO2.endf
o-uo2	oxygen in uranium oxide (5% U235)	tsl-OinUO2-5P.endf
o-uo3	oxygen in uranium oxide (10% U235)	tsl-OinUO2-10P.endf
o-uo4	oxygen in uranium oxide (19.75% U235)	tsl-OinUO2-HALEU.endf
o-uo5	oxygen in uranium oxide (93% U235)	tsl-OinUO2-HEU.endf
o-uo6	oxygen in uranium oxide (100% U235)	tsl-OinUO2-100P.endf
pu-puo	plutonium in plutonium oxide	tsl-PuinPuO2.endf
si-sic	silicon in silicon carbide	tsl-SiinSiC.endf
si-aqu	silicon in alpha-quartz (SiO2)	tsl-SiinSiO2-alpha.endf
u-met1	uranium metal (natural uranium)	tsl-U-metal.endf
u-met2	uranium metal (5% U235)	tsl-U-metal-5P.endf
u-met3	uranium metal (10% U235)	tsl-U-metal-10P.endf
u-met4	uranium metal (19.75% U235)	tsl-U-metal-HALEU.endf
u-met5	uranium metal (93% U235)	tsl-U-metal-HEU.endf

u-met6	uranium metal (100% U235)	tsl-U-metal-100P.endf
u-uc1	uranium in uranium carbide (natural uranium)	tsl-UinUC.endf
u-uc2	uranium in uranium carbide (5% U235)	tsl-UinUC-5P.endf
u-uc3	uranium in uranium carbide (10% U235)	tsl-UinUC-10P.endf
u-uc4	uranium in uranium carbide (19.75% U235)	tsl-UinUC-HALEU.endf
u-uc5	uranium in uranium carbide (93% U235)	tsl-UinUC-HEU.endf
u-uc6	uranium in uranium carbide (100% U235)	tsl-UinUC-100P.endf
u-un1	uranium in uranium nitride (natural uranium)	tsl-UinUN.endf
u-un2	uranium in uranium nitride (5% U235)	tsl-UinUN-5P.endf
u-un3	uranium in uranium nitride (10% U235)	tsl-UinUN-10P.endf
u-un4	uranium in uranium nitride (19.75% U235)	tsl-UinUN-HALEU.endf
u-un5	uranium in uranium nitride (93% U235)	tsl-UinUN-HEU.endf
u-un6	uranium in uranium nitride (100% U235)	tsl-UinUN-100P.endf
u-uo1	uranium in uranium oxide (natural uranium)	tsl-UinUO2.endf
u-uo2	uranium in uranium oxide (5% U235)	tsl-UinUO2-5P.endf
u-uo3	uranium in uranium oxide (10% U235)	tsl-UinUO2-10P.endf
u-uo4	uranium in uranium oxide (19.75% U235)	tsl-UinUO2-HALEU.endf
u-uo5	uranium in uranium oxide (93% U235)	tsl-UinUO2-HEU.endf
u-uo6	uranium in uranium oxide (100% U235)	tsl-UinUO2-100P.endf
y-yh2	yttrium in yttrium-hydride	tsl-YinYH2.endf
zr-zrc	zirconium in zirconium carbide	tsl-ZrinZrC.endf
zr-ezh	zirconium in zirconium hydride (epsilon, ZrH2)	tsl-ZrinZrH2.endf
zr-dzh	zirconium in zirconium hydride (delta, ZrHx)	tsl-ZrinZrHx.endf
grph	crystalline graphite	tsl-graphiteSd.endf tsl-crystalline-graphite.endf
orthod	liquid ortho-deuterium	tsl-ortho-D.endf
orthoh	liquid ortho-hydrogen	tsl-ortho-H.endf
parad	liquid para-deuterium	tsl-para-D.endf
parah	liquid para-hydrogen	tsl-para-H.endf
grph10	10% porous graphite	tsl-reactor-graphite-10P.endf
grph20	20% porous graphite	tsl-reactor-graphite-20P.endf
grph30	30% porous graphite	tsl-reactor-graphite-30P.endf

Notes concerning usage

al-sap and o-sap

Sapphire filters are single crystal materials with a highly ordered structure to allow neutrons of select energies to pass through. As a filter material, sapphire is used in research reactors which require the neutron beam to be filtered to transmit specific neutron energies and remove others. In order to serve as a filter material, the coherent elastic impacts were removed from the sapphire evaluations. As such, both sapphire thermal scattering evaluations provide only inelastic scattering. The resulting ACE tables should thus only be used in applications where sapphire is used as a filter material.

Other neutron filter materials

Other than the previously mentioned sapphire, there are a few more evaluations that were added to ENDF/B-VIII.1 specifically to be used as neutron filter materials. These are magnesium oxide (o-mgo

and *mg-mgo*), magnesium fluoride (*f-mgf* and *mg-mgf*) and beryllium fluoride (*be-bef* and *f-bef*).

be-met and grph

Both the beryllium metal metal and crystalline graphite have two thermal scattering evaluations each, one using the more traditional approach to thermal scattering evaluation and another using a novel evaluation approach. These last ones are referred to as the evaluations with distinct (Sd) effects. This addition of distinct effects provides the ability to directly compare the thermal scattering evaluation against experimentally measured data for beryllium metal and crystalline graphite, and these new evaluations with distinct effects seem to improve the agreement with experimentally measured cross sections.

It was thus decided to use the evaluations with distinct effects as the primary source for the *be-met* and *grph* thermal scattering tables, using extensions 70t to 79t for *be-mat* and 70t to 77t for *grph*. ACE tables using the traditional evaluation approach are also provided in this library using extensions 80t to 90t for *be-mat* and 80t to 89t for *grph*.

Delta and epsilon phase zirconium hydride

Zirconium hydride exists in two stable phases, as ZrH_x or delta phase, and ZrH_2 or epsilon phase. The ENDF/B-VIII.1 thermal scattering sublibrary added evaluations for these 2 phases, effectively replacing the older zirconium hydride evaluations. The associated ACE tables are named *h-dzh* and *zr-dzh* for the delta phase and, *h-ezh* and *zr-ezh* for the epsilon phase. These new names were introduced to distinguish these tables from the older zirconium hydride ones (*h-zrh* and *zr-zrh*). Because the older zirconium hydride evaluations were not changed from ENDF/B-VIII.0, these were not reprocessed, as noted above in the library content.

Water

The ENDF/B-VIII.1 evaluation for hydrogen in water provides a total of 94 temperatures between 273.15 K and 1000 K. Providing ACE tables for all these temperatures would have made the entire library prohibitively larger than it already is. As a result, we decided to only include the temperatures that were used in ENDF/B-VIII.0 (284, 294, 300, 324, 350, 374, 400, 424, 450, 474, 500, 524, 550, 574, 600, 624, 650 and 800 K) and only add another table for 273.15 K (freezing point) so only 19 out of 94 temperatures are provided.

NJOY processing

As mentioned above in the introduction, ENDF/B-VIII.1 thermal scattering added the option of mixed mode elastic scattering (both coherent and incoherent elastic scattering can now be specified in the evaluation). To process evaluations using mixed mode elastic, NJOY users have to use NJOY2016.65 or above.

The following are examples of input files for the following typical cases: inelastic thermal scattering only (*h-h2o*), incoherent elastic and inelastic thermal scattering (*h-poly*), coherent elastic and inelastic thermal scattering (*grph*) and mixed elastic and inelastic thermal scattering (*71-71d*).

Inelastic thermal scattering only

```
-- read free endf from tape20 and transform to binary
moder
20 -30
-- reconstruct, linearise and unionise
reconr
-30 -21
'H in H2O - ENDF/B-VIII.1' /
125 /
0.001 /
0 /
broadr
-30 -21 -22
125 1 /
0.001 /
293.6 /
0 /
-- read tsl endf from tape25 and transform to binary
moder
25 -35
-- process thermal scattering
thermr
-35 -22 -21
1 125 20 1 2 0 0 2 221 2
293.6 /
0.001 10.00008 /
-- produce a thermal scattering ACE file
acer
-30 -21 0 70 71
2 0 1 0.7 /
'H in H2O - ENDF/B-VIII.1 - 293.6 K' /
125 293.6 'h-h2o' 1 /
1001 /
221 20 0 0 1 10.00008 2 /
-- check ACE file
acer
0 70 90 80 81
7 1 1 -1 /
/
-- produce the plot file
viewr
90 91
stop
```

Incoherent elastic and inelastic thermal scattering

```
-- read free endf from tape20 and transform to binary
moder
20 -30
-- reconstruct, linearise and unionise
reconr
-30 -21
'H in CH2 (polyethylene) - ENDF/B-VIII.1' /
125 /
0.001 /
0 /
```

```
broadr
-30 -21 -22
125 1 /
0.001 /
293.6 /
0 /
-- read tsl endf from tape25 and transform to binary
moder
25 -35
-- process thermal scattering
thermr
-35 -22 -21
37 125 20 1 2 1 0 2 221 2
293.6 /
0.001 5.000001 /
-- produce a thermal scattering ACE file
acer
-30 -21 0 70 71
2 0 1 0.7 /
'H in CH2 (polyethylene) - ENDF/B-VIII.1 - 293.6 K' /
125 293.6 'h-poly' 1 /
1001 /
221 20 222 1 1 5.000001 2 /
-- check ACE file
acer
0 70 90 80 81
7 1 1 -1 /
/
-- produce the plot file
viewr
90 91
stop
```

Coherent elastic and inelastic thermal scattering

```
-- read free endf from tape20 and transform to binary
moder
20 -30
-- reconstruct, linearise and unionise
reconr
-30 -21
'C in graphite with Sd effects - ENDF/B-VIII.1' /
625 /
0.001 /
0 /
broadr
-30 -21 -22
625 1 /
0.001 /
296 /
0 /
-- read tsl endf from tape25 and transform to binary
moder
25 -35
```

```
-- process thermal scattering
thermr
-35 -22 -21
301 625 20 1 2 1 0 1 221 2
296 /
0.001 5.0 /
-- produce a thermal scattering ACE file
acer
-30 -21 0 70 71
2 0 1 0.7 /
'C in graphite with Sd effects - ENDF/B-VIII.1 - 296 K' /
625 296 'grph' 1 /
6012 /
221 20 222 0 1 5.0 2 /
-- check ACE file
acer
0 70 90 80 81
7 1 1 -1 /
/
-- produce the plot file
viewr
90 91
stop
```

Mixed elastic and inelastic thermal scattering

```
-- read free endf from tape20 and transform to binary
moder
20 -30
-- reconstruct, linearise and unionise
reconr
-30 -21
'7Li in 7LiD - ENDF/B-VIII.1' /
328 /
0.001 /
0 /
broadr
-30 -21 -22
328 1 /
0.001 /
293.6 /
0 /
-- read tsl endf from tape25 and transform to binary
moder
25 -35
-- process thermal scattering
thermr
-35 -22 -21
3034 328 20 1 2 1 0 1 221 2
293.6 /
0.001 5.0 /
-- produce a thermal scattering ACE file
acer
-30 -21 0 70 71
2 0 1 0.7 /
```

```
'7Li in 7LiD - ENDF/B-VIII.1 - 293.6 K' /  
328 293.6 '71-71d' 1 /  
3007 /  
221 20 222 2 1 5.0 2 /  
-- check ACE file  
acer  
0 70 90 80 81  
7 1 1 -1 /  
/  
-- produce the plot file  
viewr  
90 91  
stop
```

WH

Attachment(s):
ACE file listing

Copy:

Nuclear Data Team, nucldata@lanl.gov
Monte Carlo Codes, XCP-3, xcp-3@lanl.gov
Radiation Transport Applications, XTD-RTA, xtd-rta@lanl.gov
ASC-PEM-Nuclear Physics, asc-np@lanl.gov
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Jennifer Alwin, jalwin@lanl.gov
Abigail Hunter, ahunter@lanl.gov
Mark Chadwick, mbchadwick@lanl.gov

ACE file listing

ACE id	Filename	T [MeV]	T [K]
71-71d.70t	ENDF81SaB/71-71d.70t	2.530E-08	293.6
71-71d.71t	ENDF81SaB/71-71d.71t	3.447E-08	400
71-71d.72t	ENDF81SaB/71-71d.72t	4.309E-08	500
71-71d.73t	ENDF81SaB/71-71d.73t	5.170E-08	600
71-71d.74t	ENDF81SaB/71-71d.74t	6.032E-08	700
71-71d.75t	ENDF81SaB/71-71d.75t	6.894E-08	800
71-71h.70t	ENDF81SaB/71-71h.70t	2.530E-08	293.6
71-71h.71t	ENDF81SaB/71-71h.71t	3.447E-08	400
71-71h.72t	ENDF81SaB/71-71h.72t	4.309E-08	500
71-71h.73t	ENDF81SaB/71-71h.73t	5.170E-08	600
71-71h.74t	ENDF81SaB/71-71h.74t	6.032E-08	700
71-71h.75t	ENDF81SaB/71-71h.75t	6.894E-08	800
al-27.70t	ENDF81SaB/al-27.70t	2.530E-08	293.6
al-27.71t	ENDF81SaB/al-27.71t	1.724E-09	20
al-27.72t	ENDF81SaB/al-27.72t	6.894E-09	80
al-27.73t	ENDF81SaB/al-27.73t	3.447E-08	400
al-27.74t	ENDF81SaB/al-27.74t	5.170E-08	600
al-27.75t	ENDF81SaB/al-27.75t	6.894E-08	800
al-sap.70t	ENDF81SaB/al-sap.70t	2.530E-08	293.6
al-sap.71t	ENDF81SaB/al-sap.71t	6.635E-09	77
al-sap.72t	ENDF81SaB/al-sap.72t	6.894E-09	80
al-sap.73t	ENDF81SaB/al-sap.73t	8.617E-09	100
al-sap.74t	ENDF81SaB/al-sap.74t	1.723E-08	200
al-sap.75t	ENDF81SaB/al-sap.75t	2.551E-08	296
al-sap.76t	ENDF81SaB/al-sap.76t	2.585E-08	300
be-bec.70t	ENDF81SaB/be-bec.70t	2.530E-08	293.6
be-bec.71t	ENDF81SaB/be-bec.71t	3.447E-08	400
be-bec.72t	ENDF81SaB/be-bec.72t	4.309E-08	500
be-bec.73t	ENDF81SaB/be-bec.73t	5.170E-08	600
be-bec.74t	ENDF81SaB/be-bec.74t	6.032E-08	700
be-bec.75t	ENDF81SaB/be-bec.75t	6.894E-08	800
be-bec.76t	ENDF81SaB/be-bec.76t	8.617E-08	1000
be-bec.77t	ENDF81SaB/be-bec.77t	1.034E-07	1200
be-bec.78t	ENDF81SaB/be-bec.78t	1.379E-07	1600
be-bec.79t	ENDF81SaB/be-bec.79t	1.724E-07	2000

be-bef.70t	ENDF81SaB/be-bef.70t	2.530E-08	293.6
be-beo.70t	ENDF81SaB/be-beo.70t	2.530E-08	293.6
be-beo.71t	ENDF81SaB/be-beo.71t	3.447E-08	400
be-beo.72t	ENDF81SaB/be-beo.72t	4.309E-08	500
be-beo.73t	ENDF81SaB/be-beo.73t	5.170E-08	600
be-beo.74t	ENDF81SaB/be-beo.74t	6.032E-08	700
be-beo.75t	ENDF81SaB/be-beo.75t	6.894E-08	800
be-beo.76t	ENDF81SaB/be-beo.76t	8.617E-08	1000
be-beo.77t	ENDF81SaB/be-beo.77t	1.034E-07	1200
be-flb.70t	ENDF81SaB/be-flb.70t	6.661E-08	773
be-flb.71t	ENDF81SaB/be-flb.71t	7.523E-08	873
be-flb.72t	ENDF81SaB/be-flb.72t	7.954E-08	923
be-flb.73t	ENDF81SaB/be-flb.73t	8.385E-08	973
be-flb.74t	ENDF81SaB/be-flb.74t	9.246E-08	1073
be-flb.75t	ENDF81SaB/be-flb.75t	1.011E-07	1173
be-flb.76t	ENDF81SaB/be-flb.76t	1.097E-07	1273
be-flb.77t	ENDF81SaB/be-flb.77t	1.269E-07	1473
be-flb.78t	ENDF81SaB/be-flb.78t	1.442E-07	1673
be-met.70t	ENDF81SaB/be-met.70t	2.551E-08	296
be-met.71t	ENDF81SaB/be-met.71t	6.635E-09	77
be-met.72t	ENDF81SaB/be-met.72t	8.617E-09	100
be-met.73t	ENDF81SaB/be-met.73t	3.447E-08	400
be-met.74t	ENDF81SaB/be-met.74t	4.309E-08	500
be-met.75t	ENDF81SaB/be-met.75t	5.170E-08	600
be-met.76t	ENDF81SaB/be-met.76t	6.032E-08	700
be-met.77t	ENDF81SaB/be-met.77t	6.894E-08	800
be-met.78t	ENDF81SaB/be-met.78t	8.617E-08	1000
be-met.79t	ENDF81SaB/be-met.79t	1.034E-07	1200
be-met.80t	ENDF81SaB/be-met.80t	2.530E-08	293.6
be-met.81t	ENDF81SaB/be-met.81t	6.635E-09	77
be-met.82t	ENDF81SaB/be-met.82t	8.617E-09	100
be-met.83t	ENDF81SaB/be-met.83t	2.551E-08	296
be-met.84t	ENDF81SaB/be-met.84t	3.447E-08	400
be-met.85t	ENDF81SaB/be-met.85t	4.309E-08	500
be-met.86t	ENDF81SaB/be-met.86t	5.170E-08	600
be-met.87t	ENDF81SaB/be-met.87t	6.032E-08	700
be-met.88t	ENDF81SaB/be-met.88t	6.894E-08	800
be-met.89t	ENDF81SaB/be-met.89t	8.617E-08	1000
be-met.90t	ENDF81SaB/be-met.90t	1.034E-07	1200

c-bec.70t	ENDF81SaB/c-bec.70t	2.530E-08	293.6
c-bec.71t	ENDF81SaB/c-bec.71t	3.447E-08	400
c-bec.72t	ENDF81SaB/c-bec.72t	4.309E-08	500
c-bec.73t	ENDF81SaB/c-bec.73t	5.170E-08	600
c-bec.74t	ENDF81SaB/c-bec.74t	6.032E-08	700
c-bec.75t	ENDF81SaB/c-bec.75t	6.894E-08	800
c-bec.76t	ENDF81SaB/c-bec.76t	8.617E-08	1000
c-bec.77t	ENDF81SaB/c-bec.77t	1.034E-07	1200
c-bec.78t	ENDF81SaB/c-bec.78t	1.379E-07	1600
c-bec.79t	ENDF81SaB/c-bec.79t	1.724E-07	2000
c-luci.70t	ENDF81SaB/c-luci.70t	2.530E-08	293.6
c-luci.71t	ENDF81SaB/c-luci.71t	1.724E-09	20
c-luci.72t	ENDF81SaB/c-luci.72t	6.635E-09	77
c-luci.73t	ENDF81SaB/c-luci.73t	1.689E-08	196
c-luci.74t	ENDF81SaB/c-luci.74t	2.008E-08	233
c-luci.75t	ENDF81SaB/c-luci.75t	2.585E-08	300
c-luci.76t	ENDF81SaB/c-luci.76t	2.611E-08	303
c-luci.77t	ENDF81SaB/c-luci.77t	2.697E-08	313
c-luci.78t	ENDF81SaB/c-luci.78t	2.783E-08	323
c-luci.79t	ENDF81SaB/c-luci.79t	2.870E-08	333
c-luci.80t	ENDF81SaB/c-luci.80t	2.956E-08	343
c-luci.81t	ENDF81SaB/c-luci.81t	3.016E-08	350
c-ptfe.70t	ENDF81SaB/c-ptfe.70t	2.530E-08	293.6
c-ptfe.71t	ENDF81SaB/c-ptfe.71t	1.724E-09	20
c-ptfe.72t	ENDF81SaB/c-ptfe.72t	6.635E-09	77
c-ptfe.73t	ENDF81SaB/c-ptfe.73t	1.689E-08	196
c-ptfe.74t	ENDF81SaB/c-ptfe.74t	2.008E-08	233
c-ptfe.75t	ENDF81SaB/c-ptfe.75t	2.585E-08	300
c-ptfe.76t	ENDF81SaB/c-ptfe.76t	2.611E-08	303
c-ptfe.77t	ENDF81SaB/c-ptfe.77t	2.697E-08	313
c-ptfe.78t	ENDF81SaB/c-ptfe.78t	2.783E-08	323
c-ptfe.79t	ENDF81SaB/c-ptfe.79t	2.870E-08	333
c-ptfe.80t	ENDF81SaB/c-ptfe.80t	2.956E-08	343
c-ptfe.81t	ENDF81SaB/c-ptfe.81t	3.016E-08	350
c-sic.70t	ENDF81SaB/c-sic.70t	2.551E-08	296
c-sic.71t	ENDF81SaB/c-sic.71t	2.585E-08	300
c-sic.72t	ENDF81SaB/c-sic.72t	3.447E-08	400
c-sic.73t	ENDF81SaB/c-sic.73t	4.309E-08	500
c-sic.74t	ENDF81SaB/c-sic.74t	5.170E-08	600

c-sic.75t	ENDF81SaB/c-sic.75t	6.032E-08	700
c-sic.76t	ENDF81SaB/c-sic.76t	6.894E-08	800
c-sic.77t	ENDF81SaB/c-sic.77t	8.617E-08	1000
c-sic.78t	ENDF81SaB/c-sic.78t	1.034E-07	1200
c-styr.70t	ENDF81SaB/c-styr.70t	2.530E-08	293.6
c-styr.71t	ENDF81SaB/c-styr.71t	1.724E-09	20
c-styr.72t	ENDF81SaB/c-styr.72t	6.635E-09	77
c-styr.73t	ENDF81SaB/c-styr.73t	1.689E-08	196
c-styr.74t	ENDF81SaB/c-styr.74t	2.008E-08	233
c-styr.75t	ENDF81SaB/c-styr.75t	2.585E-08	300
c-styr.76t	ENDF81SaB/c-styr.76t	2.611E-08	303
c-styr.77t	ENDF81SaB/c-styr.77t	2.697E-08	313
c-styr.78t	ENDF81SaB/c-styr.78t	2.783E-08	323
c-styr.79t	ENDF81SaB/c-styr.79t	2.870E-08	333
c-styr.80t	ENDF81SaB/c-styr.80t	2.956E-08	343
c-styr.81t	ENDF81SaB/c-styr.81t	3.016E-08	350
c-uc1.70t	ENDF81SaB/c-uc1.70t	2.530E-08	293.6
c-uc1.71t	ENDF81SaB/c-uc1.71t	3.447E-08	400
c-uc1.72t	ENDF81SaB/c-uc1.72t	4.309E-08	500
c-uc1.73t	ENDF81SaB/c-uc1.73t	5.170E-08	600
c-uc1.74t	ENDF81SaB/c-uc1.74t	6.032E-08	700
c-uc1.75t	ENDF81SaB/c-uc1.75t	6.894E-08	800
c-uc1.76t	ENDF81SaB/c-uc1.76t	8.617E-08	1000
c-uc1.77t	ENDF81SaB/c-uc1.77t	1.034E-07	1200
c-uc1.78t	ENDF81SaB/c-uc1.78t	1.379E-07	1600
c-uc1.79t	ENDF81SaB/c-uc1.79t	1.724E-07	2000
c-uc2.70t	ENDF81SaB/c-uc2.70t	2.530E-08	293.6
c-uc2.71t	ENDF81SaB/c-uc2.71t	3.447E-08	400
c-uc2.72t	ENDF81SaB/c-uc2.72t	4.309E-08	500
c-uc2.73t	ENDF81SaB/c-uc2.73t	5.170E-08	600
c-uc2.74t	ENDF81SaB/c-uc2.74t	6.032E-08	700
c-uc2.75t	ENDF81SaB/c-uc2.75t	6.894E-08	800
c-uc2.76t	ENDF81SaB/c-uc2.76t	8.617E-08	1000
c-uc2.77t	ENDF81SaB/c-uc2.77t	1.034E-07	1200
c-uc2.78t	ENDF81SaB/c-uc2.78t	1.379E-07	1600
c-uc2.79t	ENDF81SaB/c-uc2.79t	1.724E-07	2000
c-uc3.70t	ENDF81SaB/c-uc3.70t	2.530E-08	293.6
c-uc3.71t	ENDF81SaB/c-uc3.71t	3.447E-08	400
c-uc3.72t	ENDF81SaB/c-uc3.72t	4.309E-08	500

c-uc3.73t	ENDF81SaB/c-uc3.73t	5.170E-08	600
c-uc3.74t	ENDF81SaB/c-uc3.74t	6.032E-08	700
c-uc3.75t	ENDF81SaB/c-uc3.75t	6.894E-08	800
c-uc3.76t	ENDF81SaB/c-uc3.76t	8.617E-08	1000
c-uc3.77t	ENDF81SaB/c-uc3.77t	1.034E-07	1200
c-uc3.78t	ENDF81SaB/c-uc3.78t	1.379E-07	1600
c-uc3.79t	ENDF81SaB/c-uc3.79t	1.724E-07	2000
c-uc4.70t	ENDF81SaB/c-uc4.70t	2.530E-08	293.6
c-uc4.71t	ENDF81SaB/c-uc4.71t	3.447E-08	400
c-uc4.72t	ENDF81SaB/c-uc4.72t	4.309E-08	500
c-uc4.73t	ENDF81SaB/c-uc4.73t	5.170E-08	600
c-uc4.74t	ENDF81SaB/c-uc4.74t	6.032E-08	700
c-uc4.75t	ENDF81SaB/c-uc4.75t	6.894E-08	800
c-uc4.76t	ENDF81SaB/c-uc4.76t	8.617E-08	1000
c-uc4.77t	ENDF81SaB/c-uc4.77t	1.034E-07	1200
c-uc4.78t	ENDF81SaB/c-uc4.78t	1.379E-07	1600
c-uc4.79t	ENDF81SaB/c-uc4.79t	1.724E-07	2000
c-uc5.70t	ENDF81SaB/c-uc5.70t	2.530E-08	293.6
c-uc5.71t	ENDF81SaB/c-uc5.71t	3.447E-08	400
c-uc5.72t	ENDF81SaB/c-uc5.72t	4.309E-08	500
c-uc5.73t	ENDF81SaB/c-uc5.73t	5.170E-08	600
c-uc5.74t	ENDF81SaB/c-uc5.74t	6.032E-08	700
c-uc5.75t	ENDF81SaB/c-uc5.75t	6.894E-08	800
c-uc5.76t	ENDF81SaB/c-uc5.76t	8.617E-08	1000
c-uc5.77t	ENDF81SaB/c-uc5.77t	1.034E-07	1200
c-uc5.78t	ENDF81SaB/c-uc5.78t	1.379E-07	1600
c-uc5.79t	ENDF81SaB/c-uc5.79t	1.724E-07	2000
c-uc6.70t	ENDF81SaB/c-uc6.70t	2.530E-08	293.6
c-uc6.71t	ENDF81SaB/c-uc6.71t	3.447E-08	400
c-uc6.72t	ENDF81SaB/c-uc6.72t	4.309E-08	500
c-uc6.73t	ENDF81SaB/c-uc6.73t	5.170E-08	600
c-uc6.74t	ENDF81SaB/c-uc6.74t	6.032E-08	700
c-uc6.75t	ENDF81SaB/c-uc6.75t	6.894E-08	800
c-uc6.76t	ENDF81SaB/c-uc6.76t	8.617E-08	1000
c-uc6.77t	ENDF81SaB/c-uc6.77t	1.034E-07	1200
c-uc6.78t	ENDF81SaB/c-uc6.78t	1.379E-07	1600
c-uc6.79t	ENDF81SaB/c-uc6.79t	1.724E-07	2000
c-zrc.70t	ENDF81SaB/c-zrc.70t	2.530E-08	293.6
c-zrc.71t	ENDF81SaB/c-zrc.71t	6.635E-09	77

c-zrc.72t	ENDF81SaB/c-zrc.72t	3.447E-08	400
c-zrc.73t	ENDF81SaB/c-zrc.73t	4.309E-08	500
c-zrc.74t	ENDF81SaB/c-zrc.74t	5.170E-08	600
c-zrc.75t	ENDF81SaB/c-zrc.75t	6.032E-08	700
c-zrc.76t	ENDF81SaB/c-zrc.76t	6.894E-08	800
c-zrc.77t	ENDF81SaB/c-zrc.77t	8.617E-08	1000
c-zrc.78t	ENDF81SaB/c-zrc.78t	1.034E-07	1200
c-zrc.79t	ENDF81SaB/c-zrc.79t	1.206E-07	1400
c-zrc.80t	ENDF81SaB/c-zrc.80t	1.379E-07	1600
c-zrc.81t	ENDF81SaB/c-zrc.81t	1.551E-07	1800
c-zrc.82t	ENDF81SaB/c-zrc.82t	1.724E-07	2000
d-7ld.70t	ENDF81SaB/d-7ld.70t	2.530E-08	293.6
d-7ld.71t	ENDF81SaB/d-7ld.71t	3.447E-08	400
d-7ld.72t	ENDF81SaB/d-7ld.72t	4.309E-08	500
d-7ld.73t	ENDF81SaB/d-7ld.73t	5.170E-08	600
d-7ld.74t	ENDF81SaB/d-7ld.74t	6.032E-08	700
d-7ld.75t	ENDF81SaB/d-7ld.75t	6.894E-08	800
d-d2o.70t	ENDF81SaB/d-d2o.70t	2.530E-08	293.6
d-d2o.71t	ENDF81SaB/d-d2o.71t	2.444E-08	283.6
d-d2o.72t	ENDF81SaB/d-d2o.72t	2.585E-08	300
d-d2o.73t	ENDF81SaB/d-d2o.73t	2.789E-08	323.6
d-d2o.74t	ENDF81SaB/d-d2o.74t	3.016E-08	350
d-d2o.75t	ENDF81SaB/d-d2o.75t	3.219E-08	373.6
d-d2o.76t	ENDF81SaB/d-d2o.76t	3.447E-08	400
d-d2o.77t	ENDF81SaB/d-d2o.77t	3.650E-08	423.6
d-d2o.78t	ENDF81SaB/d-d2o.78t	3.878E-08	450
d-d2o.79t	ENDF81SaB/d-d2o.79t	4.081E-08	473.6
d-d2o.80t	ENDF81SaB/d-d2o.80t	4.309E-08	500
d-d2o.81t	ENDF81SaB/d-d2o.81t	4.512E-08	523.6
d-d2o.82t	ENDF81SaB/d-d2o.82t	4.740E-08	550
d-d2o.83t	ENDF81SaB/d-d2o.83t	4.943E-08	573.6
d-d2o.84t	ENDF81SaB/d-d2o.84t	5.170E-08	600
d-d2o.85t	ENDF81SaB/d-d2o.85t	5.374E-08	623.6
d-d2o.86t	ENDF81SaB/d-d2o.86t	5.601E-08	650
f-bef.70t	ENDF81SaB/f-bef.70t	2.530E-08	293.6
f-flb.70t	ENDF81SaB/f-flb.70t	6.661E-08	773
f-flb.71t	ENDF81SaB/f-flb.71t	7.523E-08	873
f-flb.72t	ENDF81SaB/f-flb.72t	7.954E-08	923
f-flb.73t	ENDF81SaB/f-flb.73t	8.385E-08	973

f-flb.74t	ENDF81SaB/f-flb.74t	9.246E-08	1073
f-flb.75t	ENDF81SaB/f-flb.75t	1.011E-07	1173
f-flb.76t	ENDF81SaB/f-flb.76t	1.097E-07	1273
f-flb.77t	ENDF81SaB/f-flb.77t	1.269E-07	1473
f-flb.78t	ENDF81SaB/f-flb.78t	1.442E-07	1673
f-hf.70t	ENDF81SaB/f-hf.70t	2.956E-08	343
f-hf.71t	ENDF81SaB/f-hf.71t	2.999E-08	348
f-hf.72t	ENDF81SaB/f-hf.72t	3.042E-08	353
f-hf.73t	ENDF81SaB/f-hf.73t	3.128E-08	363
f-hf.74t	ENDF81SaB/f-hf.74t	3.214E-08	373
f-hf.75t	ENDF81SaB/f-hf.75t	3.300E-08	383
f-mgf.70t	ENDF81SaB/f-mgf.70t	2.530E-08	293.6
f-ptfe.70t	ENDF81SaB/f-ptfe.70t	2.530E-08	293.6
f-ptfe.71t	ENDF81SaB/f-ptfe.71t	1.724E-09	20
f-ptfe.72t	ENDF81SaB/f-ptfe.72t	6.635E-09	77
f-ptfe.73t	ENDF81SaB/f-ptfe.73t	1.689E-08	196
f-ptfe.74t	ENDF81SaB/f-ptfe.74t	2.008E-08	233
f-ptfe.75t	ENDF81SaB/f-ptfe.75t	2.585E-08	300
f-ptfe.76t	ENDF81SaB/f-ptfe.76t	2.611E-08	303
f-ptfe.77t	ENDF81SaB/f-ptfe.77t	2.697E-08	313
f-ptfe.78t	ENDF81SaB/f-ptfe.78t	2.783E-08	323
f-ptfe.79t	ENDF81SaB/f-ptfe.79t	2.870E-08	333
f-ptfe.80t	ENDF81SaB/f-ptfe.80t	2.956E-08	343
f-ptfe.81t	ENDF81SaB/f-ptfe.81t	3.016E-08	350
fe-56.70t	ENDF81SaB/fe-56.70t	2.530E-08	293.6
fe-56.71t	ENDF81SaB/fe-56.71t	1.724E-09	20
fe-56.72t	ENDF81SaB/fe-56.72t	6.894E-09	80
fe-56.73t	ENDF81SaB/fe-56.73t	3.447E-08	400
fe-56.74t	ENDF81SaB/fe-56.74t	5.170E-08	600
fe-56.75t	ENDF81SaB/fe-56.75t	6.894E-08	800
grph.70t	ENDF81SaB/grph.70t	2.551E-08	296
grph.71t	ENDF81SaB/grph.71t	3.447E-08	400
grph.72t	ENDF81SaB/grph.72t	4.309E-08	500
grph.73t	ENDF81SaB/grph.73t	5.170E-08	600
grph.74t	ENDF81SaB/grph.74t	6.032E-08	700
grph.75t	ENDF81SaB/grph.75t	6.894E-08	800
grph.76t	ENDF81SaB/grph.76t	8.617E-08	1000
grph.77t	ENDF81SaB/grph.77t	1.034E-07	1200
grph.80t	ENDF81SaB/grph.80t	2.551E-08	296

grph.81t	ENDF81SaB/grph.81t	3.447E-08	400
grph.82t	ENDF81SaB/grph.82t	4.309E-08	500
grph.83t	ENDF81SaB/grph.83t	5.170E-08	600
grph.84t	ENDF81SaB/grph.84t	6.032E-08	700
grph.85t	ENDF81SaB/grph.85t	6.894E-08	800
grph.86t	ENDF81SaB/grph.86t	8.617E-08	1000
grph.87t	ENDF81SaB/grph.87t	1.034E-07	1200
grph.88t	ENDF81SaB/grph.88t	1.379E-07	1600
grph.89t	ENDF81SaB/grph.89t	1.724E-07	2000
grph10.70t	ENDF81SaB/grph10.70t	2.551E-08	296
grph10.71t	ENDF81SaB/grph10.71t	3.447E-08	400
grph10.72t	ENDF81SaB/grph10.72t	4.309E-08	500
grph10.73t	ENDF81SaB/grph10.73t	5.170E-08	600
grph10.74t	ENDF81SaB/grph10.74t	6.032E-08	700
grph10.75t	ENDF81SaB/grph10.75t	6.894E-08	800
grph10.76t	ENDF81SaB/grph10.76t	8.617E-08	1000
grph10.77t	ENDF81SaB/grph10.77t	1.034E-07	1200
grph10.78t	ENDF81SaB/grph10.78t	1.379E-07	1600
grph10.79t	ENDF81SaB/grph10.79t	1.724E-07	2000
grph20.70t	ENDF81SaB/grph20.70t	2.551E-08	296
grph20.71t	ENDF81SaB/grph20.71t	3.447E-08	400
grph20.72t	ENDF81SaB/grph20.72t	4.309E-08	500
grph20.73t	ENDF81SaB/grph20.73t	5.170E-08	600
grph20.74t	ENDF81SaB/grph20.74t	6.032E-08	700
grph20.75t	ENDF81SaB/grph20.75t	6.894E-08	800
grph20.76t	ENDF81SaB/grph20.76t	8.617E-08	1000
grph20.77t	ENDF81SaB/grph20.77t	1.034E-07	1200
grph20.78t	ENDF81SaB/grph20.78t	1.379E-07	1600
grph20.79t	ENDF81SaB/grph20.79t	1.724E-07	2000
grph30.70t	ENDF81SaB/grph30.70t	2.551E-08	296
grph30.71t	ENDF81SaB/grph30.71t	3.447E-08	400
grph30.72t	ENDF81SaB/grph30.72t	4.309E-08	500
grph30.73t	ENDF81SaB/grph30.73t	5.170E-08	600
grph30.74t	ENDF81SaB/grph30.74t	6.032E-08	700
grph30.75t	ENDF81SaB/grph30.75t	6.894E-08	800
grph30.76t	ENDF81SaB/grph30.76t	8.617E-08	1000
grph30.77t	ENDF81SaB/grph30.77t	1.034E-07	1200
grph30.78t	ENDF81SaB/grph30.78t	1.379E-07	1600
grph30.79t	ENDF81SaB/grph30.79t	1.724E-07	2000

h-7lh.70t	ENDF81SaB/h-7lh.70t	2.530E-08	293.6
h-7lh.71t	ENDF81SaB/h-7lh.71t	3.447E-08	400
h-7lh.72t	ENDF81SaB/h-7lh.72t	4.309E-08	500
h-7lh.73t	ENDF81SaB/h-7lh.73t	5.170E-08	600
h-7lh.74t	ENDF81SaB/h-7lh.74t	6.032E-08	700
h-7lh.75t	ENDF81SaB/h-7lh.75t	6.894E-08	800
h-dzh.70t	ENDF81SaB/h-dzh.70t	2.530E-08	293.6
h-dzh.71t	ENDF81SaB/h-dzh.71t	6.635E-09	77
h-dzh.72t	ENDF81SaB/h-dzh.72t	3.447E-08	400
h-dzh.73t	ENDF81SaB/h-dzh.73t	4.309E-08	500
h-dzh.74t	ENDF81SaB/h-dzh.74t	5.170E-08	600
h-dzh.75t	ENDF81SaB/h-dzh.75t	6.032E-08	700
h-dzh.76t	ENDF81SaB/h-dzh.76t	6.894E-08	800
h-dzh.77t	ENDF81SaB/h-dzh.77t	8.617E-08	1000
h-dzh.78t	ENDF81SaB/h-dzh.78t	1.034E-07	1200
h-ezh.70t	ENDF81SaB/h-ezh.70t	2.530E-08	293.6
h-ezh.71t	ENDF81SaB/h-ezh.71t	6.635E-09	77
h-ezh.72t	ENDF81SaB/h-ezh.72t	3.447E-08	400
h-ezh.73t	ENDF81SaB/h-ezh.73t	4.309E-08	500
h-ezh.74t	ENDF81SaB/h-ezh.74t	5.170E-08	600
h-ezh.75t	ENDF81SaB/h-ezh.75t	6.032E-08	700
h-ezh.76t	ENDF81SaB/h-ezh.76t	6.894E-08	800
h-ezh.77t	ENDF81SaB/h-ezh.77t	8.617E-08	1000
h-ezh.78t	ENDF81SaB/h-ezh.78t	1.034E-07	1200
h-h2o.70t	ENDF81SaB/h-h2o.70t	2.530E-08	293.6
h-h2o.71t	ENDF81SaB/h-h2o.71t	2.354E-08	273.15
h-h2o.72t	ENDF81SaB/h-h2o.72t	2.444E-08	283.6
h-h2o.73t	ENDF81SaB/h-h2o.73t	2.585E-08	300
h-h2o.74t	ENDF81SaB/h-h2o.74t	2.789E-08	323.6
h-h2o.75t	ENDF81SaB/h-h2o.75t	3.016E-08	350
h-h2o.76t	ENDF81SaB/h-h2o.76t	3.219E-08	373.6
h-h2o.77t	ENDF81SaB/h-h2o.77t	3.447E-08	400
h-h2o.78t	ENDF81SaB/h-h2o.78t	3.650E-08	423.6
h-h2o.79t	ENDF81SaB/h-h2o.79t	3.878E-08	450
h-h2o.80t	ENDF81SaB/h-h2o.80t	4.081E-08	473.6
h-h2o.81t	ENDF81SaB/h-h2o.81t	4.309E-08	500
h-h2o.82t	ENDF81SaB/h-h2o.82t	4.512E-08	523.6
h-h2o.83t	ENDF81SaB/h-h2o.83t	4.740E-08	550
h-h2o.84t	ENDF81SaB/h-h2o.84t	4.943E-08	573.6

h-h2o.85t	ENDF81SaB/h-h2o.85t	5.170E-08	600
h-h2o.86t	ENDF81SaB/h-h2o.86t	5.374E-08	623.6
h-h2o.87t	ENDF81SaB/h-h2o.87t	5.601E-08	650
h-h2o.88t	ENDF81SaB/h-h2o.88t	6.894E-08	800
h-hf.70t	ENDF81SaB/h-hf.70t	2.956E-08	343
h-hf.71t	ENDF81SaB/h-hf.71t	2.999E-08	348
h-hf.72t	ENDF81SaB/h-hf.72t	3.042E-08	353
h-hf.73t	ENDF81SaB/h-hf.73t	3.128E-08	363
h-hf.74t	ENDF81SaB/h-hf.74t	3.214E-08	373
h-hf.75t	ENDF81SaB/h-hf.75t	3.300E-08	383
h-ice.70t	ENDF81SaB/h-ice.70t	9.910E-09	115.0
h-ice.71t	ENDF81SaB/h-ice.71t	1.621E-08	188.15
h-ice.72t	ENDF81SaB/h-ice.72t	1.794E-08	208.15
h-ice.73t	ENDF81SaB/h-ice.73t	1.966E-08	228.15
h-ice.74t	ENDF81SaB/h-ice.74t	2.009E-08	233.15
h-ice.75t	ENDF81SaB/h-ice.75t	2.138E-08	248.15
h-ice.76t	ENDF81SaB/h-ice.76t	2.182E-08	253.15
h-ice.77t	ENDF81SaB/h-ice.77t	2.311E-08	268.15
h-ice.78t	ENDF81SaB/h-ice.78t	2.354E-08	273.15
h-luci.70t	ENDF81SaB/h-luci.70t	2.530E-08	293.6
h-luci.71t	ENDF81SaB/h-luci.71t	1.724E-09	20
h-luci.72t	ENDF81SaB/h-luci.72t	6.635E-09	77
h-luci.73t	ENDF81SaB/h-luci.73t	1.689E-08	196
h-luci.74t	ENDF81SaB/h-luci.74t	2.008E-08	233
h-luci.75t	ENDF81SaB/h-luci.75t	2.585E-08	300
h-luci.76t	ENDF81SaB/h-luci.76t	2.611E-08	303
h-luci.77t	ENDF81SaB/h-luci.77t	2.697E-08	313
h-luci.78t	ENDF81SaB/h-luci.78t	2.783E-08	323
h-luci.79t	ENDF81SaB/h-luci.79t	2.870E-08	333
h-luci.80t	ENDF81SaB/h-luci.80t	2.956E-08	343
h-luci.81t	ENDF81SaB/h-luci.81t	3.016E-08	350
h-poil.70t	ENDF81SaB/h-poil.70t	2.530E-08	293.6
h-poil.71t	ENDF81SaB/h-poil.71t	2.585E-08	300
h-poil.72t	ENDF81SaB/h-poil.72t	2.801E-08	325
h-poil.73t	ENDF81SaB/h-poil.73t	3.016E-08	350
h-poil.74t	ENDF81SaB/h-poil.74t	3.232E-08	375
h-poil.75t	ENDF81SaB/h-poil.75t	3.447E-08	400
h-poly.70t	ENDF81SaB/h-poly.70t	2.530E-08	293.6
h-poly.71t	ENDF81SaB/h-poly.71t	6.635E-09	77

h-poly.72t	ENDF81SaB/h-poly.72t	1.689E-08	196
h-poly.73t	ENDF81SaB/h-poly.73t	2.008E-08	233
h-poly.74t	ENDF81SaB/h-poly.74t	2.585E-08	300
h-poly.75t	ENDF81SaB/h-poly.75t	2.611E-08	303
h-poly.76t	ENDF81SaB/h-poly.76t	2.697E-08	313
h-poly.77t	ENDF81SaB/h-poly.77t	2.783E-08	323
h-poly.78t	ENDF81SaB/h-poly.78t	2.870E-08	333
h-poly.79t	ENDF81SaB/h-poly.79t	2.956E-08	343
h-poly.80t	ENDF81SaB/h-poly.80t	3.016E-08	350
h-styr.70t	ENDF81SaB/h-styr.70t	2.530E-08	293.6
h-styr.71t	ENDF81SaB/h-styr.71t	1.724E-09	20
h-styr.72t	ENDF81SaB/h-styr.72t	6.635E-09	77
h-styr.73t	ENDF81SaB/h-styr.73t	1.689E-08	196
h-styr.74t	ENDF81SaB/h-styr.74t	2.008E-08	233
h-styr.75t	ENDF81SaB/h-styr.75t	2.585E-08	300
h-styr.76t	ENDF81SaB/h-styr.76t	2.611E-08	303
h-styr.77t	ENDF81SaB/h-styr.77t	2.697E-08	313
h-styr.78t	ENDF81SaB/h-styr.78t	2.783E-08	323
h-styr.79t	ENDF81SaB/h-styr.79t	2.870E-08	333
h-styr.80t	ENDF81SaB/h-styr.80t	2.956E-08	343
h-styr.81t	ENDF81SaB/h-styr.81t	3.016E-08	350
h-uh3.70t	ENDF81SaB/h-uh3.70t	2.530E-08	293.6
h-yh2.70t	ENDF81SaB/h-yh2.70t	2.530E-08	293.6
h-yh2.71t	ENDF81SaB/h-yh2.71t	3.447E-08	400
h-yh2.72t	ENDF81SaB/h-yh2.72t	4.309E-08	500
h-yh2.73t	ENDF81SaB/h-yh2.73t	5.170E-08	600
h-yh2.74t	ENDF81SaB/h-yh2.74t	6.032E-08	700
h-yh2.75t	ENDF81SaB/h-yh2.75t	6.894E-08	800
h-yh2.76t	ENDF81SaB/h-yh2.76t	8.617E-08	1000
h-yh2.77t	ENDF81SaB/h-yh2.77t	1.034E-07	1200
h-yh2.78t	ENDF81SaB/h-yh2.78t	1.206E-07	1400
h-yh2.79t	ENDF81SaB/h-yh2.79t	1.379E-07	1600
li-flb.70t	ENDF81SaB/li-flb.70t	6.661E-08	773
li-flb.71t	ENDF81SaB/li-flb.71t	7.523E-08	873
li-flb.72t	ENDF81SaB/li-flb.72t	7.954E-08	923
li-flb.73t	ENDF81SaB/li-flb.73t	8.385E-08	973
li-flb.74t	ENDF81SaB/li-flb.74t	9.246E-08	1073
li-flb.75t	ENDF81SaB/li-flb.75t	1.011E-07	1173
li-flb.76t	ENDF81SaB/li-flb.76t	1.097E-07	1273

li-flb.77t	ENDF81SaB/li-flb.77t	1.269E-07	1473
li-flb.78t	ENDF81SaB/li-flb.78t	1.442E-07	1673
mg-mgf.70t	ENDF81SaB/mg-mgf.70t	2.530E-08	293.6
mg-mgo.70t	ENDF81SaB/mg-mgo.70t	2.530E-08	293.6
n-un1.70t	ENDF81SaB/n-un1.70t	2.551E-08	296
n-un1.71t	ENDF81SaB/n-un1.71t	3.447E-08	400
n-un1.72t	ENDF81SaB/n-un1.72t	4.309E-08	500
n-un1.73t	ENDF81SaB/n-un1.73t	5.170E-08	600
n-un1.74t	ENDF81SaB/n-un1.74t	6.032E-08	700
n-un1.75t	ENDF81SaB/n-un1.75t	6.894E-08	800
n-un1.76t	ENDF81SaB/n-un1.76t	8.617E-08	1000
n-un1.77t	ENDF81SaB/n-un1.77t	1.034E-07	1200
n-un2.70t	ENDF81SaB/n-un2.70t	2.551E-08	296
n-un2.71t	ENDF81SaB/n-un2.71t	3.447E-08	400
n-un2.72t	ENDF81SaB/n-un2.72t	4.309E-08	500
n-un2.73t	ENDF81SaB/n-un2.73t	5.170E-08	600
n-un2.74t	ENDF81SaB/n-un2.74t	6.032E-08	700
n-un2.75t	ENDF81SaB/n-un2.75t	6.894E-08	800
n-un2.76t	ENDF81SaB/n-un2.76t	8.617E-08	1000
n-un2.77t	ENDF81SaB/n-un2.77t	1.034E-07	1200
n-un3.70t	ENDF81SaB/n-un3.70t	2.551E-08	296
n-un3.71t	ENDF81SaB/n-un3.71t	3.447E-08	400
n-un3.72t	ENDF81SaB/n-un3.72t	4.309E-08	500
n-un3.73t	ENDF81SaB/n-un3.73t	5.170E-08	600
n-un3.74t	ENDF81SaB/n-un3.74t	6.032E-08	700
n-un3.75t	ENDF81SaB/n-un3.75t	6.894E-08	800
n-un3.76t	ENDF81SaB/n-un3.76t	8.617E-08	1000
n-un3.77t	ENDF81SaB/n-un3.77t	1.034E-07	1200
n-un4.70t	ENDF81SaB/n-un4.70t	2.551E-08	296
n-un4.71t	ENDF81SaB/n-un4.71t	3.447E-08	400
n-un4.72t	ENDF81SaB/n-un4.72t	4.309E-08	500
n-un4.73t	ENDF81SaB/n-un4.73t	5.170E-08	600
n-un4.74t	ENDF81SaB/n-un4.74t	6.032E-08	700
n-un4.75t	ENDF81SaB/n-un4.75t	6.894E-08	800
n-un4.76t	ENDF81SaB/n-un4.76t	8.617E-08	1000
n-un4.77t	ENDF81SaB/n-un4.77t	1.034E-07	1200
n-un5.70t	ENDF81SaB/n-un5.70t	2.551E-08	296
n-un5.71t	ENDF81SaB/n-un5.71t	3.447E-08	400
n-un5.72t	ENDF81SaB/n-un5.72t	4.309E-08	500

n-un5.73t	ENDF81SaB/n-un5.73t	5.170E-08	600
n-un5.74t	ENDF81SaB/n-un5.74t	6.032E-08	700
n-un5.75t	ENDF81SaB/n-un5.75t	6.894E-08	800
n-un5.76t	ENDF81SaB/n-un5.76t	8.617E-08	1000
n-un5.77t	ENDF81SaB/n-un5.77t	1.034E-07	1200
n-un6.70t	ENDF81SaB/n-un6.70t	2.551E-08	296
n-un6.71t	ENDF81SaB/n-un6.71t	3.447E-08	400
n-un6.72t	ENDF81SaB/n-un6.72t	4.309E-08	500
n-un6.73t	ENDF81SaB/n-un6.73t	5.170E-08	600
n-un6.74t	ENDF81SaB/n-un6.74t	6.032E-08	700
n-un6.75t	ENDF81SaB/n-un6.75t	6.894E-08	800
n-un6.76t	ENDF81SaB/n-un6.76t	8.617E-08	1000
n-un6.77t	ENDF81SaB/n-un6.77t	1.034E-07	1200
o-aqu.70t	ENDF81SaB/o-aqu.70t	2.530E-08	293.6
o-aqu.71t	ENDF81SaB/o-aqu.71t	3.016E-08	350
o-aqu.72t	ENDF81SaB/o-aqu.72t	3.447E-08	400
o-aqu.73t	ENDF81SaB/o-aqu.73t	4.309E-08	500
o-aqu.74t	ENDF81SaB/o-aqu.74t	5.601E-08	650
o-aqu.75t	ENDF81SaB/o-aqu.75t	6.894E-08	800
o-aqu.76t	ENDF81SaB/o-aqu.76t	7.290E-08	846
o-beo.70t	ENDF81SaB/o-beo.70t	2.530E-08	293.6
o-beo.71t	ENDF81SaB/o-beo.71t	3.447E-08	400
o-beo.72t	ENDF81SaB/o-beo.72t	4.309E-08	500
o-beo.73t	ENDF81SaB/o-beo.73t	5.170E-08	600
o-beo.74t	ENDF81SaB/o-beo.74t	6.032E-08	700
o-beo.75t	ENDF81SaB/o-beo.75t	6.894E-08	800
o-beo.76t	ENDF81SaB/o-beo.76t	8.617E-08	1000
o-beo.77t	ENDF81SaB/o-beo.77t	1.034E-07	1200
o-d2o.70t	ENDF81SaB/o-d2o.70t	2.530E-08	293.6
o-d2o.71t	ENDF81SaB/o-d2o.71t	2.444E-08	283.6
o-d2o.72t	ENDF81SaB/o-d2o.72t	2.585E-08	300
o-d2o.73t	ENDF81SaB/o-d2o.73t	2.789E-08	323.6
o-d2o.74t	ENDF81SaB/o-d2o.74t	3.016E-08	350
o-d2o.75t	ENDF81SaB/o-d2o.75t	3.219E-08	373.6
o-d2o.76t	ENDF81SaB/o-d2o.76t	3.447E-08	400
o-d2o.77t	ENDF81SaB/o-d2o.77t	3.650E-08	423.6
o-d2o.78t	ENDF81SaB/o-d2o.78t	3.878E-08	450
o-d2o.79t	ENDF81SaB/o-d2o.79t	4.081E-08	473.6
o-d2o.80t	ENDF81SaB/o-d2o.80t	4.309E-08	500

o-d2o.81t	ENDF81SaB/o-d2o.81t	4.512E-08	523.6
o-d2o.82t	ENDF81SaB/o-d2o.82t	4.740E-08	550
o-d2o.83t	ENDF81SaB/o-d2o.83t	4.943E-08	573.6
o-d2o.84t	ENDF81SaB/o-d2o.84t	5.170E-08	600
o-d2o.85t	ENDF81SaB/o-d2o.85t	5.374E-08	623.6
o-d2o.86t	ENDF81SaB/o-d2o.86t	5.601E-08	650
o-ice.70t	ENDF81SaB/o-ice.70t	9.910E-09	115
o-ice.71t	ENDF81SaB/o-ice.71t	1.621E-08	188.15
o-ice.72t	ENDF81SaB/o-ice.72t	1.794E-08	208.15
o-ice.73t	ENDF81SaB/o-ice.73t	1.966E-08	228.15
o-ice.74t	ENDF81SaB/o-ice.74t	2.009E-08	233.15
o-ice.75t	ENDF81SaB/o-ice.75t	2.138E-08	248.15
o-ice.76t	ENDF81SaB/o-ice.76t	2.182E-08	253.15
o-ice.77t	ENDF81SaB/o-ice.77t	2.311E-08	268.15
o-ice.78t	ENDF81SaB/o-ice.78t	2.354E-08	273.15
o-luci.70t	ENDF81SaB/o-luci.70t	2.530E-08	293.6
o-luci.71t	ENDF81SaB/o-luci.71t	1.724E-09	20
o-luci.72t	ENDF81SaB/o-luci.72t	6.635E-09	77
o-luci.73t	ENDF81SaB/o-luci.73t	1.689E-08	196
o-luci.74t	ENDF81SaB/o-luci.74t	2.008E-08	233
o-luci.75t	ENDF81SaB/o-luci.75t	2.585E-08	300
o-luci.76t	ENDF81SaB/o-luci.76t	2.611E-08	303
o-luci.77t	ENDF81SaB/o-luci.77t	2.697E-08	313
o-luci.78t	ENDF81SaB/o-luci.78t	2.783E-08	323
o-luci.79t	ENDF81SaB/o-luci.79t	2.870E-08	333
o-luci.80t	ENDF81SaB/o-luci.80t	2.956E-08	343
o-luci.81t	ENDF81SaB/o-luci.81t	3.016E-08	350
o-mgo.70t	ENDF81SaB/o-mgo.70t	2.530E-08	293.6
o-puo.70t	ENDF81SaB/o-puo.70t	2.551E-08	296
o-puo.71t	ENDF81SaB/o-puo.71t	3.447E-08	400
o-puo.72t	ENDF81SaB/o-puo.72t	4.309E-08	500
o-puo.73t	ENDF81SaB/o-puo.73t	5.170E-08	600
o-puo.74t	ENDF81SaB/o-puo.74t	6.032E-08	700
o-puo.75t	ENDF81SaB/o-puo.75t	6.894E-08	800
o-puo.76t	ENDF81SaB/o-puo.76t	8.617E-08	1000
o-puo.77t	ENDF81SaB/o-puo.77t	1.034E-07	1200
o-puo.78t	ENDF81SaB/o-puo.78t	1.379E-07	1600
o-puo.79t	ENDF81SaB/o-puo.79t	1.724E-07	2000
o-puo.80t	ENDF81SaB/o-puo.80t	2.068E-07	2399.8

o-puo.81t	ENDF81SaB/o-puo.81t	2.413E-07	2800.2
o-sap.70t	ENDF81SaB/o-sap.70t	2.530E-08	293.6
o-sap.71t	ENDF81SaB/o-sap.71t	6.635E-09	77
o-sap.72t	ENDF81SaB/o-sap.72t	6.894E-09	80
o-sap.73t	ENDF81SaB/o-sap.73t	8.617E-09	100
o-sap.74t	ENDF81SaB/o-sap.74t	1.723E-08	199.9
o-sap.75t	ENDF81SaB/o-sap.75t	2.551E-08	296
o-sap.76t	ENDF81SaB/o-sap.76t	2.585E-08	300
o-uo1.70t	ENDF81SaB/o-uo1.70t	2.551E-08	296
o-uo1.71t	ENDF81SaB/o-uo1.71t	3.447E-08	400
o-uo1.72t	ENDF81SaB/o-uo1.72t	4.309E-08	500
o-uo1.73t	ENDF81SaB/o-uo1.73t	5.170E-08	600
o-uo1.74t	ENDF81SaB/o-uo1.74t	6.032E-08	700
o-uo1.75t	ENDF81SaB/o-uo1.75t	6.894E-08	800
o-uo1.76t	ENDF81SaB/o-uo1.76t	8.617E-08	1000
o-uo1.77t	ENDF81SaB/o-uo1.77t	1.034E-07	1200
o-uo2.70t	ENDF81SaB/o-uo2.70t	2.551E-08	296
o-uo2.71t	ENDF81SaB/o-uo2.71t	3.447E-08	400
o-uo2.72t	ENDF81SaB/o-uo2.72t	4.309E-08	500
o-uo2.73t	ENDF81SaB/o-uo2.73t	5.170E-08	600
o-uo2.74t	ENDF81SaB/o-uo2.74t	6.032E-08	700
o-uo2.75t	ENDF81SaB/o-uo2.75t	6.894E-08	800
o-uo2.76t	ENDF81SaB/o-uo2.76t	8.617E-08	1000
o-uo2.77t	ENDF81SaB/o-uo2.77t	1.034E-07	1200
o-uo3.70t	ENDF81SaB/o-uo3.70t	2.551E-08	296
o-uo3.71t	ENDF81SaB/o-uo3.71t	3.447E-08	400
o-uo3.72t	ENDF81SaB/o-uo3.72t	4.309E-08	500
o-uo3.73t	ENDF81SaB/o-uo3.73t	5.170E-08	600
o-uo3.74t	ENDF81SaB/o-uo3.74t	6.032E-08	700
o-uo3.75t	ENDF81SaB/o-uo3.75t	6.894E-08	800
o-uo3.76t	ENDF81SaB/o-uo3.76t	8.617E-08	1000
o-uo3.77t	ENDF81SaB/o-uo3.77t	1.034E-07	1200
o-uo4.70t	ENDF81SaB/o-uo4.70t	2.551E-08	296
o-uo4.71t	ENDF81SaB/o-uo4.71t	3.447E-08	400
o-uo4.72t	ENDF81SaB/o-uo4.72t	4.309E-08	500
o-uo4.73t	ENDF81SaB/o-uo4.73t	5.170E-08	600
o-uo4.74t	ENDF81SaB/o-uo4.74t	6.032E-08	700
o-uo4.75t	ENDF81SaB/o-uo4.75t	6.894E-08	800
o-uo4.76t	ENDF81SaB/o-uo4.76t	8.617E-08	1000

o-uo4.77t	ENDF81SaB/o-uo4.77t	1.034E-07	1200
o-uo5.70t	ENDF81SaB/o-uo5.70t	2.551E-08	296
o-uo5.71t	ENDF81SaB/o-uo5.71t	3.447E-08	400
o-uo5.72t	ENDF81SaB/o-uo5.72t	4.309E-08	500
o-uo5.73t	ENDF81SaB/o-uo5.73t	5.170E-08	600
o-uo5.74t	ENDF81SaB/o-uo5.74t	6.032E-08	700
o-uo5.75t	ENDF81SaB/o-uo5.75t	6.894E-08	800
o-uo5.76t	ENDF81SaB/o-uo5.76t	8.617E-08	1000
o-uo5.77t	ENDF81SaB/o-uo5.77t	1.034E-07	1200
o-uo6.70t	ENDF81SaB/o-uo6.70t	2.551E-08	296
o-uo6.71t	ENDF81SaB/o-uo6.71t	3.447E-08	400
o-uo6.72t	ENDF81SaB/o-uo6.72t	4.309E-08	500
o-uo6.73t	ENDF81SaB/o-uo6.73t	5.170E-08	600
o-uo6.74t	ENDF81SaB/o-uo6.74t	6.032E-08	700
o-uo6.75t	ENDF81SaB/o-uo6.75t	6.894E-08	800
o-uo6.76t	ENDF81SaB/o-uo6.76t	8.617E-08	1000
o-uo6.77t	ENDF81SaB/o-uo6.77t	1.034E-07	1200
orthod.70t	ENDF81SaB/orthod.70t	1.637E-09	19
orthod.71t	ENDF81SaB/orthod.71t	1.724E-09	20
orthod.72t	ENDF81SaB/orthod.72t	1.810E-09	21
orthod.73t	ENDF81SaB/orthod.73t	1.896E-09	22
orthod.74t	ENDF81SaB/orthod.74t	1.982E-09	23
orthoh.70t	ENDF81SaB/orthoh.70t	1.206E-09	14
orthoh.71t	ENDF81SaB/orthoh.71t	1.293E-09	15
orthoh.72t	ENDF81SaB/orthoh.72t	1.379E-09	16
orthoh.73t	ENDF81SaB/orthoh.73t	1.465E-09	17
orthoh.74t	ENDF81SaB/orthoh.74t	1.551E-09	18
orthoh.75t	ENDF81SaB/orthoh.75t	1.637E-09	19
orthoh.76t	ENDF81SaB/orthoh.76t	1.724E-09	20
p-puo.70t	ENDF81SaB/p-puo.70t	2.551E-08	296
p-puo.71t	ENDF81SaB/p-puo.71t	3.447E-08	400
p-puo.72t	ENDF81SaB/p-puo.72t	4.309E-08	500
p-puo.73t	ENDF81SaB/p-puo.73t	5.170E-08	600
p-puo.74t	ENDF81SaB/p-puo.74t	6.032E-08	700
p-puo.75t	ENDF81SaB/p-puo.75t	6.894E-08	800
p-puo.76t	ENDF81SaB/p-puo.76t	8.617E-08	1000
p-puo.77t	ENDF81SaB/p-puo.77t	1.034E-07	1200
p-puo.78t	ENDF81SaB/p-puo.78t	1.379E-07	1600
p-puo.79t	ENDF81SaB/p-puo.79t	1.724E-07	2000

p-puo.80t	ENDF81SaB/p-puo.80t	2.068E-07	2400
p-puo.81t	ENDF81SaB/p-puo.81t	2.413E-07	2800
parad.70t	ENDF81SaB/parad.70t	1.637E-09	19
parad.71t	ENDF81SaB/parad.71t	1.724E-09	20
parad.72t	ENDF81SaB/parad.72t	1.810E-09	21
parad.73t	ENDF81SaB/parad.73t	1.896E-09	22
parad.74t	ENDF81SaB/parad.74t	1.982E-09	23
parah.70t	ENDF81SaB/parah.70t	1.206E-09	14
parah.71t	ENDF81SaB/parah.71t	1.293E-09	15
parah.72t	ENDF81SaB/parah.72t	1.379E-09	16
parah.73t	ENDF81SaB/parah.73t	1.465E-09	17
parah.74t	ENDF81SaB/parah.74t	1.551E-09	18
parah.75t	ENDF81SaB/parah.75t	1.637E-09	19
parah.76t	ENDF81SaB/parah.76t	1.724E-09	20
si-aqu.70t	ENDF81SaB/si-aqu.70t	2.530E-08	293.6
si-aqu.71t	ENDF81SaB/si-aqu.71t	3.016E-08	350
si-aqu.72t	ENDF81SaB/si-aqu.72t	3.447E-08	400
si-aqu.73t	ENDF81SaB/si-aqu.73t	4.309E-08	500
si-aqu.74t	ENDF81SaB/si-aqu.74t	5.601E-08	650
si-aqu.75t	ENDF81SaB/si-aqu.75t	6.894E-08	800
si-aqu.76t	ENDF81SaB/si-aqu.76t	7.290E-08	846
si-sic.70t	ENDF81SaB/si-sic.70t	2.551E-08	296
si-sic.71t	ENDF81SaB/si-sic.71t	2.585E-08	300
si-sic.72t	ENDF81SaB/si-sic.72t	3.447E-08	400
si-sic.73t	ENDF81SaB/si-sic.73t	4.309E-08	500
si-sic.74t	ENDF81SaB/si-sic.74t	5.170E-08	600
si-sic.75t	ENDF81SaB/si-sic.75t	6.032E-08	700
si-sic.76t	ENDF81SaB/si-sic.76t	6.894E-08	800
si-sic.77t	ENDF81SaB/si-sic.77t	8.617E-08	1000
si-sic.78t	ENDF81SaB/si-sic.78t	1.034E-07	1200
u-met1.70t	ENDF81SaB/u-met1.70t	2.530E-08	293.6
u-met1.71t	ENDF81SaB/u-met1.71t	3.447E-08	400
u-met1.72t	ENDF81SaB/u-met1.72t	4.309E-08	500
u-met1.73t	ENDF81SaB/u-met1.73t	5.170E-08	600
u-met1.74t	ENDF81SaB/u-met1.74t	6.032E-08	700
u-met1.75t	ENDF81SaB/u-met1.75t	6.894E-08	800
u-met1.76t	ENDF81SaB/u-met1.76t	7.756E-08	900.0
u-met2.70t	ENDF81SaB/u-met2.70t	2.530E-08	293.6
u-met2.71t	ENDF81SaB/u-met2.71t	3.447E-08	400

u-met2.72t	ENDF81SaB/u-met2.72t	4.309E-08	500
u-met2.73t	ENDF81SaB/u-met2.73t	5.170E-08	600
u-met2.74t	ENDF81SaB/u-met2.74t	6.032E-08	700
u-met2.75t	ENDF81SaB/u-met2.75t	6.894E-08	800
u-met2.76t	ENDF81SaB/u-met2.76t	7.756E-08	900
u-met3.70t	ENDF81SaB/u-met3.70t	2.530E-08	293.6
u-met3.71t	ENDF81SaB/u-met3.71t	3.447E-08	400
u-met3.72t	ENDF81SaB/u-met3.72t	4.309E-08	500
u-met3.73t	ENDF81SaB/u-met3.73t	5.170E-08	600
u-met3.74t	ENDF81SaB/u-met3.74t	6.032E-08	700
u-met3.75t	ENDF81SaB/u-met3.75t	6.894E-08	800
u-met3.76t	ENDF81SaB/u-met3.76t	7.756E-08	900
u-met4.70t	ENDF81SaB/u-met4.70t	2.530E-08	293.6
u-met4.71t	ENDF81SaB/u-met4.71t	3.447E-08	400
u-met4.72t	ENDF81SaB/u-met4.72t	4.309E-08	500
u-met4.73t	ENDF81SaB/u-met4.73t	5.170E-08	600
u-met4.74t	ENDF81SaB/u-met4.74t	6.032E-08	700
u-met4.75t	ENDF81SaB/u-met4.75t	6.894E-08	800
u-met4.76t	ENDF81SaB/u-met4.76t	7.756E-08	900
u-met5.70t	ENDF81SaB/u-met5.70t	2.530E-08	293.6
u-met5.71t	ENDF81SaB/u-met5.71t	3.447E-08	400
u-met5.72t	ENDF81SaB/u-met5.72t	4.309E-08	500
u-met5.73t	ENDF81SaB/u-met5.73t	5.170E-08	600
u-met5.74t	ENDF81SaB/u-met5.74t	6.032E-08	700
u-met5.75t	ENDF81SaB/u-met5.75t	6.894E-08	800
u-met5.76t	ENDF81SaB/u-met5.76t	7.756E-08	900
u-met6.70t	ENDF81SaB/u-met6.70t	2.530E-08	293.6
u-met6.71t	ENDF81SaB/u-met6.71t	3.447E-08	400
u-met6.72t	ENDF81SaB/u-met6.72t	4.309E-08	500
u-met6.73t	ENDF81SaB/u-met6.73t	5.170E-08	600
u-met6.74t	ENDF81SaB/u-met6.74t	6.032E-08	700
u-met6.75t	ENDF81SaB/u-met6.75t	6.894E-08	800
u-met6.76t	ENDF81SaB/u-met6.76t	7.756E-08	900
u-uc1.70t	ENDF81SaB/u-uc1.70t	2.530E-08	293.6
u-uc1.71t	ENDF81SaB/u-uc1.71t	3.447E-08	400
u-uc1.72t	ENDF81SaB/u-uc1.72t	4.309E-08	500
u-uc1.73t	ENDF81SaB/u-uc1.73t	5.170E-08	600
u-uc1.74t	ENDF81SaB/u-uc1.74t	6.032E-08	700
u-uc1.75t	ENDF81SaB/u-uc1.75t	6.894E-08	800

u-uc1.76t	ENDF81SaB/u-uc1.76t	8.617E-08	1000
u-uc1.77t	ENDF81SaB/u-uc1.77t	1.034E-07	1200
u-uc1.78t	ENDF81SaB/u-uc1.78t	1.379E-07	1600
u-uc1.79t	ENDF81SaB/u-uc1.79t	1.724E-07	2000
u-uc2.70t	ENDF81SaB/u-uc2.70t	2.530E-08	293.6
u-uc2.71t	ENDF81SaB/u-uc2.71t	3.447E-08	400
u-uc2.72t	ENDF81SaB/u-uc2.72t	4.309E-08	500
u-uc2.73t	ENDF81SaB/u-uc2.73t	5.170E-08	600
u-uc2.74t	ENDF81SaB/u-uc2.74t	6.032E-08	700
u-uc2.75t	ENDF81SaB/u-uc2.75t	6.894E-08	800
u-uc2.76t	ENDF81SaB/u-uc2.76t	8.617E-08	1000
u-uc2.77t	ENDF81SaB/u-uc2.77t	1.034E-07	1200
u-uc2.78t	ENDF81SaB/u-uc2.78t	1.379E-07	1600
u-uc2.79t	ENDF81SaB/u-uc2.79t	1.724E-07	2000
u-uc3.70t	ENDF81SaB/u-uc3.70t	2.530E-08	293.6
u-uc3.71t	ENDF81SaB/u-uc3.71t	3.447E-08	400
u-uc3.72t	ENDF81SaB/u-uc3.72t	4.309E-08	500
u-uc3.73t	ENDF81SaB/u-uc3.73t	5.170E-08	600
u-uc3.74t	ENDF81SaB/u-uc3.74t	6.032E-08	700
u-uc3.75t	ENDF81SaB/u-uc3.75t	6.894E-08	800
u-uc3.76t	ENDF81SaB/u-uc3.76t	8.617E-08	1000
u-uc3.77t	ENDF81SaB/u-uc3.77t	1.034E-07	1200
u-uc3.78t	ENDF81SaB/u-uc3.78t	1.379E-07	1600
u-uc3.79t	ENDF81SaB/u-uc3.79t	1.724E-07	2000
u-uc4.70t	ENDF81SaB/u-uc4.70t	2.530E-08	293.6
u-uc4.71t	ENDF81SaB/u-uc4.71t	3.447E-08	400
u-uc4.72t	ENDF81SaB/u-uc4.72t	4.309E-08	500
u-uc4.73t	ENDF81SaB/u-uc4.73t	5.170E-08	600
u-uc4.74t	ENDF81SaB/u-uc4.74t	6.032E-08	700
u-uc4.75t	ENDF81SaB/u-uc4.75t	6.894E-08	800
u-uc4.76t	ENDF81SaB/u-uc4.76t	8.617E-08	1000
u-uc4.77t	ENDF81SaB/u-uc4.77t	1.034E-07	1200
u-uc4.78t	ENDF81SaB/u-uc4.78t	1.379E-07	1600
u-uc4.79t	ENDF81SaB/u-uc4.79t	1.724E-07	2000
u-uc5.70t	ENDF81SaB/u-uc5.70t	2.530E-08	293.6
u-uc5.71t	ENDF81SaB/u-uc5.71t	3.447E-08	400
u-uc5.72t	ENDF81SaB/u-uc5.72t	4.309E-08	500
u-uc5.73t	ENDF81SaB/u-uc5.73t	5.170E-08	600
u-uc5.74t	ENDF81SaB/u-uc5.74t	6.032E-08	700

u-uc5.75t	ENDF81SaB/u-uc5.75t	6.894E-08	800
u-uc5.76t	ENDF81SaB/u-uc5.76t	8.617E-08	1000
u-uc5.77t	ENDF81SaB/u-uc5.77t	1.034E-07	1200
u-uc5.78t	ENDF81SaB/u-uc5.78t	1.379E-07	1600
u-uc5.79t	ENDF81SaB/u-uc5.79t	1.724E-07	2000
u-uc6.70t	ENDF81SaB/u-uc6.70t	2.530E-08	293.6
u-uc6.71t	ENDF81SaB/u-uc6.71t	3.447E-08	400
u-uc6.72t	ENDF81SaB/u-uc6.72t	4.309E-08	500
u-uc6.73t	ENDF81SaB/u-uc6.73t	5.170E-08	600
u-uc6.74t	ENDF81SaB/u-uc6.74t	6.032E-08	700
u-uc6.75t	ENDF81SaB/u-uc6.75t	6.894E-08	800
u-uc6.76t	ENDF81SaB/u-uc6.76t	8.617E-08	1000
u-uc6.77t	ENDF81SaB/u-uc6.77t	1.034E-07	1200
u-uc6.78t	ENDF81SaB/u-uc6.78t	1.379E-07	1600
u-uc6.79t	ENDF81SaB/u-uc6.79t	1.724E-07	2000
u-un1.70t	ENDF81SaB/u-un1.70t	2.551E-08	296
u-un1.71t	ENDF81SaB/u-un1.71t	3.447E-08	400
u-un1.72t	ENDF81SaB/u-un1.72t	4.309E-08	500
u-un1.73t	ENDF81SaB/u-un1.73t	5.170E-08	600
u-un1.74t	ENDF81SaB/u-un1.74t	6.032E-08	700
u-un1.75t	ENDF81SaB/u-un1.75t	6.894E-08	800
u-un1.76t	ENDF81SaB/u-un1.76t	8.617E-08	1000
u-un1.77t	ENDF81SaB/u-un1.77t	1.034E-07	1200
u-un2.70t	ENDF81SaB/u-un2.70t	2.551E-08	296
u-un2.71t	ENDF81SaB/u-un2.71t	3.447E-08	400
u-un2.72t	ENDF81SaB/u-un2.72t	4.309E-08	500
u-un2.73t	ENDF81SaB/u-un2.73t	5.170E-08	600
u-un2.74t	ENDF81SaB/u-un2.74t	6.032E-08	700
u-un2.75t	ENDF81SaB/u-un2.75t	6.894E-08	800
u-un2.76t	ENDF81SaB/u-un2.76t	8.617E-08	1000
u-un2.77t	ENDF81SaB/u-un2.77t	1.034E-07	1200
u-un3.70t	ENDF81SaB/u-un3.70t	2.551E-08	296
u-un3.71t	ENDF81SaB/u-un3.71t	3.447E-08	400
u-un3.72t	ENDF81SaB/u-un3.72t	4.309E-08	500
u-un3.73t	ENDF81SaB/u-un3.73t	5.170E-08	600
u-un3.74t	ENDF81SaB/u-un3.74t	6.032E-08	700
u-un3.75t	ENDF81SaB/u-un3.75t	6.894E-08	800
u-un3.76t	ENDF81SaB/u-un3.76t	8.617E-08	1000
u-un3.77t	ENDF81SaB/u-un3.77t	1.034E-07	1200

u-un4.70t	ENDF81SaB/u-un4.70t	2.551E-08	296
u-un4.71t	ENDF81SaB/u-un4.71t	3.447E-08	400
u-un4.72t	ENDF81SaB/u-un4.72t	4.309E-08	500
u-un4.73t	ENDF81SaB/u-un4.73t	5.170E-08	600
u-un4.74t	ENDF81SaB/u-un4.74t	6.032E-08	700
u-un4.75t	ENDF81SaB/u-un4.75t	6.894E-08	800
u-un4.76t	ENDF81SaB/u-un4.76t	8.617E-08	1000
u-un4.77t	ENDF81SaB/u-un4.77t	1.034E-07	1200
u-un5.70t	ENDF81SaB/u-un5.70t	2.551E-08	296
u-un5.71t	ENDF81SaB/u-un5.71t	3.447E-08	400
u-un5.72t	ENDF81SaB/u-un5.72t	4.309E-08	500
u-un5.73t	ENDF81SaB/u-un5.73t	5.170E-08	600
u-un5.74t	ENDF81SaB/u-un5.74t	6.032E-08	700
u-un5.75t	ENDF81SaB/u-un5.75t	6.894E-08	800
u-un5.76t	ENDF81SaB/u-un5.76t	8.617E-08	1000
u-un5.77t	ENDF81SaB/u-un5.77t	1.034E-07	1200
u-un6.70t	ENDF81SaB/u-un6.70t	2.551E-08	296
u-un6.71t	ENDF81SaB/u-un6.71t	3.447E-08	400
u-un6.72t	ENDF81SaB/u-un6.72t	4.309E-08	500
u-un6.73t	ENDF81SaB/u-un6.73t	5.170E-08	600
u-un6.74t	ENDF81SaB/u-un6.74t	6.032E-08	700
u-un6.75t	ENDF81SaB/u-un6.75t	6.894E-08	800
u-un6.76t	ENDF81SaB/u-un6.76t	8.617E-08	1000
u-un6.77t	ENDF81SaB/u-un6.77t	1.034E-07	1200
u-uo1.70t	ENDF81SaB/u-uo1.70t	2.551E-08	296
u-uo1.71t	ENDF81SaB/u-uo1.71t	3.447E-08	400
u-uo1.72t	ENDF81SaB/u-uo1.72t	4.309E-08	500
u-uo1.73t	ENDF81SaB/u-uo1.73t	5.170E-08	600
u-uo1.74t	ENDF81SaB/u-uo1.74t	6.032E-08	700
u-uo1.75t	ENDF81SaB/u-uo1.75t	6.894E-08	800
u-uo1.76t	ENDF81SaB/u-uo1.76t	8.617E-08	1000
u-uo1.77t	ENDF81SaB/u-uo1.77t	1.034E-07	1200
u-uo2.70t	ENDF81SaB/u-uo2.70t	2.551E-08	296
u-uo2.71t	ENDF81SaB/u-uo2.71t	3.447E-08	400
u-uo2.72t	ENDF81SaB/u-uo2.72t	4.309E-08	500
u-uo2.73t	ENDF81SaB/u-uo2.73t	5.170E-08	600
u-uo2.74t	ENDF81SaB/u-uo2.74t	6.032E-08	700
u-uo2.75t	ENDF81SaB/u-uo2.75t	6.894E-08	800
u-uo2.76t	ENDF81SaB/u-uo2.76t	8.617E-08	1000

u-uo2.77t	ENDF81SaB/u-uo2.77t	1.034E-07	1200
u-uo3.70t	ENDF81SaB/u-uo3.70t	2.551E-08	296
u-uo3.71t	ENDF81SaB/u-uo3.71t	3.447E-08	400
u-uo3.72t	ENDF81SaB/u-uo3.72t	4.309E-08	500
u-uo3.73t	ENDF81SaB/u-uo3.73t	5.170E-08	600
u-uo3.74t	ENDF81SaB/u-uo3.74t	6.032E-08	700
u-uo3.75t	ENDF81SaB/u-uo3.75t	6.894E-08	800
u-uo3.76t	ENDF81SaB/u-uo3.76t	8.617E-08	1000
u-uo3.77t	ENDF81SaB/u-uo3.77t	1.034E-07	1200
u-uo4.70t	ENDF81SaB/u-uo4.70t	2.551E-08	296
u-uo4.71t	ENDF81SaB/u-uo4.71t	3.447E-08	400
u-uo4.72t	ENDF81SaB/u-uo4.72t	4.309E-08	500
u-uo4.73t	ENDF81SaB/u-uo4.73t	5.170E-08	600
u-uo4.74t	ENDF81SaB/u-uo4.74t	6.032E-08	700
u-uo4.75t	ENDF81SaB/u-uo4.75t	6.894E-08	800
u-uo4.76t	ENDF81SaB/u-uo4.76t	8.617E-08	1000
u-uo4.77t	ENDF81SaB/u-uo4.77t	1.034E-07	1200
u-uo5.70t	ENDF81SaB/u-uo5.70t	2.551E-08	296
u-uo5.71t	ENDF81SaB/u-uo5.71t	3.447E-08	400
u-uo5.72t	ENDF81SaB/u-uo5.72t	4.309E-08	500
u-uo5.73t	ENDF81SaB/u-uo5.73t	5.170E-08	600
u-uo5.74t	ENDF81SaB/u-uo5.74t	6.032E-08	700
u-uo5.75t	ENDF81SaB/u-uo5.75t	6.894E-08	800
u-uo5.76t	ENDF81SaB/u-uo5.76t	8.617E-08	1000
u-uo5.77t	ENDF81SaB/u-uo5.77t	1.034E-07	1200
u-uo6.70t	ENDF81SaB/u-uo6.70t	2.551E-08	296
u-uo6.71t	ENDF81SaB/u-uo6.71t	3.447E-08	400
u-uo6.72t	ENDF81SaB/u-uo6.72t	4.309E-08	500
u-uo6.73t	ENDF81SaB/u-uo6.73t	5.170E-08	600
u-uo6.74t	ENDF81SaB/u-uo6.74t	6.032E-08	700
u-uo6.75t	ENDF81SaB/u-uo6.75t	6.894E-08	800
u-uo6.76t	ENDF81SaB/u-uo6.76t	8.617E-08	1000
u-uo6.77t	ENDF81SaB/u-uo6.77t	1.034E-07	1200
y-yh2.70t	ENDF81SaB/y-yh2.70t	2.530E-08	293.6
y-yh2.71t	ENDF81SaB/y-yh2.71t	3.447E-08	400
y-yh2.72t	ENDF81SaB/y-yh2.72t	4.309E-08	500
y-yh2.73t	ENDF81SaB/y-yh2.73t	5.170E-08	600
y-yh2.74t	ENDF81SaB/y-yh2.74t	6.032E-08	700
y-yh2.75t	ENDF81SaB/y-yh2.75t	6.894E-08	800

y-yh2.76t	ENDF81SaB/y-yh2.76t	8.617E-08	1000
y-yh2.77t	ENDF81SaB/y-yh2.77t	1.034E-07	1200
y-yh2.78t	ENDF81SaB/y-yh2.78t	1.206E-07	1400
y-yh2.79t	ENDF81SaB/y-yh2.79t	1.379E-07	1600
zr-dzh.70t	ENDF81SaB/zr-dzh.70t	2.530E-08	293.6
zr-dzh.71t	ENDF81SaB/zr-dzh.71t	6.635E-09	77
zr-dzh.72t	ENDF81SaB/zr-dzh.72t	3.447E-08	400
zr-dzh.73t	ENDF81SaB/zr-dzh.73t	4.309E-08	500
zr-dzh.74t	ENDF81SaB/zr-dzh.74t	5.170E-08	600
zr-dzh.75t	ENDF81SaB/zr-dzh.75t	6.032E-08	700
zr-dzh.76t	ENDF81SaB/zr-dzh.76t	6.894E-08	800
zr-dzh.77t	ENDF81SaB/zr-dzh.77t	8.617E-08	1000
zr-dzh.78t	ENDF81SaB/zr-dzh.78t	1.034E-07	1200
zr-ezh.70t	ENDF81SaB/zr-ezh.70t	2.530E-08	293.6
zr-ezh.71t	ENDF81SaB/zr-ezh.71t	6.635E-09	77
zr-ezh.72t	ENDF81SaB/zr-ezh.72t	3.447E-08	400
zr-ezh.73t	ENDF81SaB/zr-ezh.73t	4.309E-08	500
zr-ezh.74t	ENDF81SaB/zr-ezh.74t	5.170E-08	600
zr-ezh.75t	ENDF81SaB/zr-ezh.75t	6.032E-08	700
zr-ezh.76t	ENDF81SaB/zr-ezh.76t	6.894E-08	800
zr-ezh.77t	ENDF81SaB/zr-ezh.77t	8.617E-08	1000
zr-ezh.78t	ENDF81SaB/zr-ezh.78t	1.034E-07	1200
zr-zrc.70t	ENDF81SaB/zr-zrc.70t	2.530E-08	293.6
zr-zrc.71t	ENDF81SaB/zr-zrc.71t	6.635E-09	77
zr-zrc.72t	ENDF81SaB/zr-zrc.72t	3.447E-08	400
zr-zrc.73t	ENDF81SaB/zr-zrc.73t	4.309E-08	500
zr-zrc.74t	ENDF81SaB/zr-zrc.74t	5.170E-08	600
zr-zrc.75t	ENDF81SaB/zr-zrc.75t	6.032E-08	700
zr-zrc.76t	ENDF81SaB/zr-zrc.76t	6.894E-08	800
zr-zrc.77t	ENDF81SaB/zr-zrc.77t	8.617E-08	1000
zr-zrc.78t	ENDF81SaB/zr-zrc.78t	1.034E-07	1200
zr-zrc.79t	ENDF81SaB/zr-zrc.79t	1.206E-07	1400
zr-zrc.80t	ENDF81SaB/zr-zrc.80t	1.379E-07	1600
zr-zrc.81t	ENDF81SaB/zr-zrc.81t	1.551E-07	1800
zr-zrc.82t	ENDF81SaB/zr-zrc.82t	1.724E-07	2000