

Los Alamos
NATIONAL LABORATORY
memorandum

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SUBJECT: Dosimetry/Activation Cross Sections for MCNP

The tally multiplier (FM) feature in MCNP allows users to calculate quantities of the form

$$C \int \phi(E)R(E)dE$$

where C is a constant, $\phi(E)$ is the fluence (n/cm^2), and $R(E)$ is a response function. The response function is often a microscopic cross section. With appropriate units for C (e.g., atom/b•cm), the quantity calculated becomes the total number of some type of reactions per unit volume. If the tally is made over a finite time interval, the quantity becomes a reaction rate per unit volume. The energy-dependent cross section for any reaction found on our standard ACE-format Monte Carlo libraries is available for use as a response function.

In addition to the large choice of reaction cross sections described above, cross sections for dosimetry or activation reactions may also be used as response functions.¹⁻³ These specially-formatted dosimetry cross sections may be used only for tallying, and not for neutron transport. The purpose of this memo is to document the availability of cross sections for nearly two thousand dosimetry reactions involving over four hundred target nuclei.

The available cross sections are from three sources: ENDF/B-V Dosimetry Tape 531, ENDF/B-V Activation Tape 532, and ACTL - an evaluated neutron activation cross-section library from the Lawrence Livermore National Laboratory (LLNL). One dosimetry cross-section library in MCNP-compatible format has been prepared from each of the three sources as described in the next paragraphs.

ENDF/B-V Tape 531

Cross sections for 36 dosimetry reactions involving 26 target nuclei are given on ENDF/B-V Tape 531. The 26 targets are listed in Table I along with their ENDF/B MAT identifiers. Cross sections for the eight targets with asterisks in Table I were not processed into dosimetry format for MCNP because the expensive resonance reconstruction would only provide cross sections that were duplicates of those already available on our normal cross-section libraries such as RMCCS.

The remaining targets were pre-processed using D. E. Cullen's LINEAR and RECENT codes⁴⁻⁶ with a linearization tolerance of 0.1% and a resonance reconstruction tolerance of 1.0%. The cross sections were then processed into dosimetry format appropriate for MCNP using P. D. Soran's DOSGEN code. A complete description of the available reactions, found in Table III, will be discussed later.

ENDF/B-V Tape 532

Cross sections for 84 activation reactions involving 53 target nuclei are given on ENDF/B-V Tape 532. The 53 targets are listed in Table II along with their ENDF/B MAT identifiers. For the reasons given above, cross sections for the 10 targets with asterisks in Table II were not processed into MCNP dosimetry format. The remaining targets were processed through the LINEAR-RECENT-DOSGEN series of codes. The available reactions are listed in Table IV. It is understood that there is some repetition in the reactions on Tape 531 and Tape 532.

ACTL

ACTL is an evaluated neutron activation cross-section library from LLNL. The evaluation techniques are described in Ref. 7 and the format of the library in Ref. 8. A wealth of cross-section data is available on the library. Cross sections are provided for over 1800 reactions involving 373 target nuclei, many of which are isomeric targets. A new code, READACT, has been written to process the ACTL library into MCNP dosimetry format. An index to the reactions available from ACTL is given in Table V.

Description of Tables III-V

ZAID: The ZAID is a unique MCNP identifier for a specific cross-section evaluation of a certain target isotope. For dosimetry cross sections, the ZAID is of the form ZZAAA.nnY, where ZZ is the atomic number and AAA is the mass number. The value of nn is 24 for those isotopes from Tape 531, 26 for those from Tape 532, and either 30 or 31 for those from ACTL. Two values of nn are necessary when cross sections are given for both the ground state and an excited state of the same target nuclide.

MT: The ENDF/B reaction type identifier.⁹ This value must be entered on an FM card to get a particular reaction cross section used as a response function. Livermore C values have been converted to ENDF/B MT values according to the prescription given in Table VI.

Target: The target isotope.

E-Targ: The level energy of the target isotope (in MeV).

Reaction: The type of reaction corresponding to the given MT. Abbreviations used are: N-neutron, G-gamma, P-proton, D-deuteron, T-triton, and A-alpha. In all cases, (N,G)

represents the radiative capture cross section and not the total gamma-production cross section.

Product: The product isotope from the nuclear reaction. In many cases, the product is radioactive.

E-Prod: The level energy of the product isotope (in MeV). "Ground" indicates that the product isotope is in its ground state: "All" indicates that the given cross section is the sum of the cross sections to all final states. Note that if reaction cross sections are given to both the ground state and an excited state of a product isotope, the MT of the second reaction is arbitrarily assigned a value 1000 greater than the MT of the first reaction.

EMIN: The minimum energy (in MeV) at which cross sections are given.

EMAX: The maximum energy (in MeV) at which cross sections are given.

NES: The number of energies at which cross sections are given. This provides an idea of the detail that has been put into the evaluation.

Using Dosimetry Cross Sections

Check Tables III-V for the availability of cross sections for the dosimetry reaction in which you are interested. You need the target ZAID and the reaction MT to fully identify a cross-section set. The FM feature is described completely in the MCNP manual;¹⁰ only a simple example will be given here. The following three cards in your input deck would result in a calculation of the total number of $^{58}\text{Ni}(n,p)^{58}\text{Co}$ reactions per unit volume in cell N.

F4	N		
FM4	C	12	103
M12	28058.26Y	1.0	

C would be the atom/b•cm density of ^{58}Ni .

Availability of Dosimetry Libraries

We next describe the availability of dosimetry cross-section libraries for MCNP at various installations. The discussion is appropriate for Version 3 of MCNP.

The MCNP user at Los Alamos does not need to manually retrieve any dosimetry libraries from the Common File System. All ZAID'S found in Tables III-V will also be found on the public directory file, XSDIR. MCNP will fetch any and all dosimetry libraries needed for a particular problem.

On the MFE network, all ZAID'S will be included on the XSDIR file. Users will have to retrieve any dosimetry libraries they need from FILEM. The libraries are named 531DOS2, 532DOS2, and LLLDOS2, and are stored under the .VER3XS subdirectory of user 5014. Procedures for accessing cross-section libraries for MCNP Version 3 at MFE are discussed in Ref. 11.

For other MCNP users, a tape with the three dosimetry libraries and a companion directory file will be sent to the Radiation Shielding Information Center (RSIC) at the Oak Ridge National Laboratory in the near future.

Summary

This memo has documented the existence of cross sections for nearly 2000 dosimetry or activation reactions involving over 400 target nuclei. These cross sections may be used with the FM feature as response functions in MCNP. Plots and tabulations of specific cross sections are available on request.

Acknowledgments

Much credit must be given to R. J. Howerton at LLNL for his evaluation work and for transmitting the ACTL library to us. P. D. Soran did the original coding allowing dosimetry cross sections to be used in MCNP.

References

1. P. D. Soran, "MCNP2C Proposal - Direct Use of Dosimetry Data," Los Alamos Scientific Laboratory internal memorandum to X-6 (Sept. 22, 1981).
2. W. L. Thompson, "MCNP Version 2C Newsletter," Los Alamos National Laboratory memorandum to MCNP Distribution (March 18, 1982).
3. R. C. Little and R. E. Seamon, "Dosimetry Cross Sections from ENDF/B-V," Los Alamos National Laboratory internal memorandum to P. D. Soran (Nov. 3, 1982).
4. D. E. Cullen, "Program LINEAR (Version 79-1): Linearize Data in the Evaluated-Nuclear-Data File/Version B (ENDF/B) Format," Lawrence Livermore National Laboratory report UCRL-50400, Vol. 17, Part A, Rev. 2 (Oct. 31, 1979).
5. D. E. Cullen, "Program RECENT: Reconstruction of Energy-Dependent Cross Sections from Resonance Parameters in the ENDF/B Format," Lawrence Livermore National Laboratory report UCRL-50400, Vol. 17, Part C (Oct. 1979).
6. D. E. Cullen, "ENDF/B Pre-processing Codes," International Atomic Energy Agency memorandum IAEA-NDS-39 to Distribution (Dec. 18, 1981).

7. M. A. Gardner and R. J. Howerton, "ACTL: Evaluated Neutron Activation Cross-Section Library - Evaluation Techniques and Reaction Index," Lawrence Livermore National Laboratory report UCRL-50400, Vol. 18, (Oct. 17, 1978).
8. R. J. Howerton, R. E. Dye, and S. T. Perkins, "Evaluated Nuclear Data Library," Lawrence Livermore National Laboratory report UCRL-50400, Vol. 4, Rev. 1 (Oct. 8, 1981).
9. R. Kinsey, "ENDF-102 Data Formats and Procedures for the Evaluated Nuclear Data File, ENDF," Brookhaven National Laboratory report BNL-NCS-50496 (ENDF 102) 2nd Edition (ENDF/B-V) (Oct. 1979).
10. Los Alamos Radiation Transport Group, "MCNP - A General Monte Carlo Code for Neutron and Photon Transport, Version 2B," Los Alamos National Laboratory manual LA-7396-M, Revised (April 1981).
11. Judi Briesmeister, "MCNP Version 3 Newsletter for NMFEEC," Los Alamos National Laboratory memorandum to NMFEEC MCNP Distribution (March 22, 1984).

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Table I: Nuclei Available on ENDF/B-V Dosimetry Tape 531

<u>Nuclide</u>	<u>MAT</u>	<u>Nuclide</u>	<u>MAT</u>
Na-23 *	6311	Ti-46	6427
Al-27	6313	Ti-47	6428
Mn-55	6325	Ti-48	6429
Co-59*	6327	Fe-54	6430
Np-237 *	6337	Fe-56	6431
Au-197 *	6379	Fe-58	6432
Th-232 *	6390	Ni-58	6433
U-235 *	6395	Ni-60	6434
U-238 *	6398	Cu-63	6435
Pu-239 *	6399	Cu-65	6436
Li-6	6424	In-115	6437
B-10	6425	I-127	6438
Sc-45	6426	S-32	6439

Table II: Nuclei Available on ENDF/B-V Dosimetry Tape 532

<u>Nuclide</u>	<u>MAT</u>	<u>Nuclide</u>	<u>MAT</u>
Li-6	7036	Ni-58	7288
Li-7	7037	Cu-63	7293
B-10	7050	Cu-65	7295
N-14	7074	Zr-90	7400
O-16	7086	Zr-92	7402
F-19	7099	Zr-94	7404
Na-23 *	7113	Nb-93 *	7413
Mg-24	7124	Mo-100	7420
Al-27	7137	Mo-92	7422
P-31	7151	Mo-98	7428
S-32	7162	Ag-109 *	7479
Ar-40	7180	In-115	7495
K-41	7191	Sn-120	7500
SC-45	7215	Sn-122	7502
Ti-50	7220	Sn-124	7504
Ti-46	7226	I-127	7537
Ti-47	7227	La-139	7579
Ti-48	7228	Dy-164	7664
Cr-50	7240	Ta-181 *	7731
Cr-52	7242	Au-197 *	7797
Mn-55 *	7255	Th-232 *	7902
Fe-54	7264	Pa-231	7911
Fe-56	7266	Pa-233	7913
Co-59 *	7279	U-238 *	7928
Ni-60	7280	Am-241 *	7951
Ni-62	7282		

*Available on standard Monte Carlo library from ENDF/B-V.

Table III: Index To Reaction Cross Sections Available on TAPE 531 (531DOS)

ZAID	MT	TARGET	E-TARG	REACTION	PRODUCT	E-PROD	EMIN	EMAX	NES
13027.24y	103	AL-27	GROUND	(N,P)	MG-27	ALL	1.90E+00	2.00E+01	306
	107	AL-27	GROUND	(N,A)	NA-24	ALL	3.25E+00	2.00E+01	272
25055.24y	16	MN-55	GROUND	(N,2N)	MN-54	ALL	1.04E+01	2.00E+01	57
3006.24y	207	LI-6	GROUND	ALPHA PRODUCTION			1.00E-11	2.00E+01	365
5010.24y	207	B-10	GROUND	ALPHA PRODUCTION			1.00E-11	2.00E+01	382
21045.24y	102	SC-45	GROUND	(N,G)	SC-46	GROUND	1.00E-11	2.00E+01	10087
22046.24y	103	TI-46	GROUND	(N,P)	SC-46	GROUND	1.62E+00	2.00E+01	24
22047.24y	28	TI-47	GROUND	(N,N')P	SC-46	GROUND	1.07E+01	2.00E+01	66
	103	TI-47	GROUND	(N,P)	SC-47	GROUND	1.00E-11	2.00E+01	34
22048.24y	28	TI-48	GROUND	(N,N')P	SC-47	GROUND	1.17E+01	2.00E+01	42
	103	TI-48	GROUND	(N,P)	SC-48	GROUND	3.27E+00	2.00E+01	26
26054.24y	103	FE-54	GROUND	(N,P)	MN-54	GROUND	1.00E-11	2.00E+01	256
26056.24y	103	FE-56	GROUND	(N,P)	MN-5G	ALL	2.97E+00	2.00E+01	222
26058.24y	102	FE-5e	GROUND	(N,G)	FE-59	GROUND	1.00E-11	2.00E+01	3536
28058.24y	16	NI-58	GROUND	(N,2N)	NI-57	ALL	1.24E+01	2.00E+01	14
	103	NI-56	GROUND	(N,P)	CO-58	ALL	1.00E-11	2.00E+01	187
28060.24y	103	NI-60	GROUND	(N,P)	CO-60	ALL	2.08E+00	2.00E+01	215
29063.24y	102	CU-63	GROUND	(N,G)	CU-64	ALL	1.00E-11	2.00E+01	1467
	107	CU-S3	GROUND	(N,A)	CO-6C	ALL	1.00E-11	2.00E+01	216
29065.24y	16	CU-65	GROUND	(N,2N)	CU-64	ALL	1.01E+01	2.00E+01	22
49115.24y	51	IN-115	GROUND	(N,N')	IN-115	3.36E-01	3.39E-01	2.00E+01	211
	102	IN-115	GROUND	(N,G)	IN-116	1.27E-01	1.00E-11	2.00E+01	12785
53127.24y	16	I-127	GROUND	(N,2N)	I-126	GROUND	9.23E+00	2.00E+01	55
16032.24y	103	S-32	GROUND	(N,P)	P-32	ALL	9.57E-01	2.00E+01	70

Table IV: Index To Reaction Cross Sections Available on the Tape 532 (532DOS)

ZAID	MT	TARGET	E-TARG	REACTION	PRODUCT	E-PROD	EMIN	EMAX	NES
3006.26y	105	LI-6	GROUND	(N,T)	HE-4	ALL	1.00E-11	2.00E+01	354
3007.26y	91	LX-7	GROUND	(N,N')T	HE-4	ALL	2.82E+00	2.00E+01	93
	102	LI-7	GROUND	(N,G)	LI-8	ALL	1.00E-11	2.00E+01	269
5010.26y	113	E-I0	GROUND	(N,T) 2A	HE-4	ALL	1.00E-11	2.00E+01	292
7014.26y	103	N-I4	GROUND	(N,P)	C-14	ALL	1.00E-11	2.00E+01	504
8016.26y	103	O-I6	GROUND	(N,P)	N-16	ALL	1.02E+01	2.00E+01	45
9019.26y	16	F-I9	GROUND	(N,2N)	F-18	ALL	1.10E+01	2.00E+01	13
12024.26y	103	MG-24	GROUND	(N,P)	NA-24	ALL	4.93E+00	2.00E+01	80
13027.26y	102	AL-27	GROUND	(N,G)	AL-28	ALL	1.00E-11	2.00E+01	292
	103	AL-27	GROUND	(N,P)	MG-27	ALL	1.90E+00	2.00E+01	306
	107	AL-27	GROUND	(N,A)	TI-24	ALL	3.25E+00	2.00E+01	272
15031.26y	103	P-3I	GROUND	(N,P)	51-31	GROUND	7.33E-01	2.00E+01	30
16032.26y	103	S-.32	GROUND	(N,P)	P-32	GROUND	9.49E-01	2.00E+01	15
18040.26y	102	AR-40	GROUND	(N,G)	AR-41	ALL	1.00E-11	2.00E+01	1928
19041.26y	103	K-4I	GROUND	(N,P)	AR-41	ALL	1.75E+00	2.00E+01	14
21045.26y	16	SC-45	GROUND	(N,2N)	SC-44	GROUND	1.16E+01	2.00E+01	14
	102	SC-45	GROUND	(N,G)	SC-46	GROUND	1.00E-11	2.00E+01	10087
22050.26y	107	TI-50	GROUND	(N,A)	CA-47	GROUND	3.51E+00	2.00E+01	14
22046.26y	103	TI-46	GROUND	(N,P)	SC-46	GROUND	1.62E+00	2.00E+01	24
22047.26y	28	TI-47	GROUND	(N,N')P	SC-46	GROUND	1.07E+01	2.00E+01	66
	103	TI-47	GROUND	(N,P)	SC-47	GROUND	1.00E-11	2.00E+01	34
22048.26y	28	TI-48	GROUND	(N,N')P	SC-47	GROUND	1.17E+01	2.00E+01	42
	103	TI-48	GROUND	(N,P)	SC-48	GROUND	3.27E+00	2.00E+01	26
	107	TI-48	GROUND	(N,A)	CA-45	GROUND	2.07E+00	2.00E+01	14
24050.26y	16	CR-50	GROUND	(N,2N)	CR-49	ALL	1.32E+01	2.00E+01	18
	102	CR-50	GROUND	(N,G)	CR-51	ALL	1.00E-11	2.00E+01	3680
24052.26y	16	CR-52	GROUND	(N,2N)	CR-51	ALL	1.23E+01	2.00E+01	11

Table IV cont.

ZAID	MT	TARGET	E-TARG	REACTION	PRODUCT	E-PROD	EMIN	EMAX	NES
26054.26y	102	FE-54	GROUND	(N,G)	FE-55	ALL	1.00E-11	2.00E+01	10393
	103	FE-54	GROUND	(N,P)	MN-54	GROUND	1.00E-11	2.00E+01	256
	107	FE-54	GROUND	(N,A)	CR-51	ALL	1.00E-11	2.00E+01	126
26056.26y	16	FE-56	GROUND	(N,2NJ)	FE-55	ALL	1.14E+01	2.00E+01	64
	103	FE-56	GROUND	(N,P)	MN-56	ALL	2.97E+00	2.00E+01	222
26058.26y	102	FE-58	GROUND	(N,G)	FE-59	GROUND	1.00E-11	2.00E+01	3546
28060.26y	16	NI-60	GROUND	(N,2N)	NI-59	GROUND	1.16E+01	2.00E+01	20
	103	NI-60	GROUND	(N,P)	CO-60	GROUND	2.08E+00	2.00E+01	215
28062.26y	102	NI-62	GROUND	(N,G)	NI-63	GROUND	1.00E-11	2.00E+01	1890
	107	NI-62	GROUND	(N,A)	FE-59	GROUND	4.42E-01	2.00E+01	29
28058.26y	16	NI-58	GROUND	(N,2N)	NI-57	GROUND	1.24E+01	2.00E+01	14
	102	NI-58	GROUND	(N,G)	NI-55	GROUND	1.00E-11	2.00E+01	1767
	103	NI-58	GROUND	(N,P)	CO-59	GROUND	1.00E-11	2.00E+01	187
	104	NI-58	GROUND	(N,O)	CO-57	GROUND	6.06E+00	2.00E+01	23
	107	NI-58	GROUND	(N,A)	FE-55	GROUND	1.00E-11	2.00E+01	38
29062.26y	102	CU-63	GROUND	(N,G)	CU-64	ALL	1.00E-11	2.00E+01	1467
	103	cu-t53	GROUND	(N,P)	NI-62	ALL	1.00E-11	2.00E+01	118
	107	CU-63	GROUND	(N,A)	CO-60	ALL	1.00E-11	2.00E+01	216
29065.26y	16	CU-65	GROUND	(N,2N)	CU-64	ALL	1.01E+01	2.00E+01	22
40090.26y	16	ZR-90	GROUND	(N,2N)	zR-e9	.CLL	1.21E+01	2.00E+01	16
40092.26y	102	ZR-92	GROUND	(N,G)	ZR-93	ALL	1.00E-11	2.00E+01	1908
40094.26y	102	ZR-94	GROUND	(N,G)	ZR-95	ALL	1.00E-11	2.00E+01	2625
42100.26y	102	MD-I00	GROUND	(N,G)	MO-101	ALL	1.00E-11	2.00E+01	2483
42092.26y	102	MO-92	GROUND	(N,G)	MO-93	GROUND	1.00E-11	2.00E+01	3905
42098.26y	102	MO-99	GROUND	(N,G)	MO-99	ALL	1.00E-11	2.00E+01	3242
49115.26y	51	IN-II5	GROUND	(N,N')	IN-115	3.36E-01	3.39E-01	2.00E+01	211
	1132	IN-II5	GROUND	(N,G)	IN-116	1.27E-01	1.00E-11	2.00E+01	12789
50120.26y	102	SN-I20	GROUND	(N,G)	SN-121	ALL	1.00E-11	2.00E+01	6438
50122.26y	102	SN-I22	GROUND	(N,G)	SN-123	ALL	1.00E-11	2.00E+01	943
50124.26y	102	SN-I24	GROUND	(N,G)	SN-125	ALL	1.00E-11	2.00E+01	844
53127.26y	16	I-I27	GROUND	(N,2N)	I-126	GROUND	9.23E+00	2.00E+01	55
	102	I-I27	GROUND	(N,G)	I-128	ALL	1.00E-11	2.00E+01	7013
57139.26y	102	LA-I39	GROUND	(N,G)	LA-140	ALL	1.00E-11	2.00E+01	7735
66164.26y	102	Dy-I64	GROUND	(N,G)	Dy-165	ALL	1.00E-11	2.00E+01	288
91231.26y	102	PA-23I	GROUND	(N,G)	PA-232	GROUND	1.00E-11	2.00E+01	1428
91233.26y	16	PA-232	GROUND	(N,2N)	PA-232	ALL	6.68E+00	2.00E+01	34
92232.26y	16	U-233	GROUND	(N,2N)	U-232	ALL	5.77E+00	2.00E+01	35

**Table V: Index To Reaction Cross Sections Available
on the ACTL (LLDOS) Library**

ZAID	MT	TARGET	E-TARG	REACTION	PRODUCT	E-PROD	EMIN	EMAX	NES
1001.30y	102	h-1	ground	(n,g)	h-2	ground	1.00E-10	2.00E+01	102
1002.30y	102	h-2	ground	(n,g)	h-3	ground	1.00E-10	2.00E+01	72
1003.30y	16	h-3	ground	(n,2n)	h-2	ground	8.36E+00	2.00E+01	11
2003.30y	103	he-3	ground	(n,p)	h-3	ground	1.00E-10	2.00E+01	102
	104	he-3	ground	(n,d)	h-2	ground	4.35E+00	2.00E+01	23
	102	he-3	ground	(n,g)	he-4	ground	1.00E-10	2.00E+01	2
3006.30y	32	li-6	ground	(n,n')t	he-4	ground	1.70E+00	2.00E+01	20
	24	li-6	ground	(n,2n)a	he-4	ground	6.61E+00	2.00E+01	5
	103	li-6	ground	(n,p)	he-6	ground	3.18E+00	2.00E+01	14
	105	li-6	ground	(n,t)	he-4	ground	1.00E-10	2.00E+01	314
	102	li-6	ground	(n,g)	li-7	ground	1.00E-10	2.00E+01	102
3007.30y	16	li-7	ground	(n,2n)	li-6	ground	8.31E+00	2.00E+01	5
	33	li-7	ground	(n,n)he3	he-4	ground	2.83E+00	2.00E+01	11
	102	li-7	ground	(n,g)	li-8	ground	1.00E-10	2.00E+01	78
4007.30y	103	be-7	ground	(n,p)	li-7	ground	1.00E-10	2.00E+01	113
	107	be-7	ground	(n,a)	he-4	ground	1.00E-10	2.00E+01	9
4009.30y	16	be-9	ground	(n,2n)	he-4	ground	1.87E+00	2.00E+01	19
	103	be-9	ground	(n,p)	li-9	ground	1.43E+01	2.00E+01	4
	104	be-9	ground	(n,d)	li-8	ground	1.63E+01	2.00E+01	9
	105	be-9	ground	(n,t)	li-7	ground	1.16E+01	2.00E+01	6
	107	be-9	ground	(n,a)	li-6	ground	6.70E-01	2.00E+01	15
	102	be-9	ground	(n,g)	be-10	ground	1.00E-10	2.00E+01	102
5010.30y	35	b-10	ground	(n,n)t2a	he-4	ground	6.70E+00	2.00E+01	5
	30	b-10	ground	(n,2n)2a	he-4	ground	9.30E+00	2.00E+01	4
	113	b-10	ground	(n,t)2a	he-4	ground	1.50E+00	2.00E+01	13
	107	b-10	ground	(n,a)	li-7	ground	1.00E-10	2.00E+01	102
	102	b-10	ground	(n,g)	b-11	ground	1.00E-10	2.00E+01	56
5011.30y	16	b-11	ground	(n,2n)	b-10	ground	1.25E+01	2.00E+01	3
	103	b-11	ground	(n,p)	be-11	ground	1.17E+01	2.00E+01	3
	105	b-11	ground	(n,t)	be-10	ground	1.04E+01	2.00E+01	3
	107	b-11	ground	(n,a)	li-8	ground	7.24E+00	2.00E+01	5
	102	b-11	ground	(n,g)	b-12	ground	1.00E-10	2.00E+01	35
6012.30y	23	c-12	ground	(n,n')3a	he-4	ground	7.98E+00	2.00E+01	10
	103	c-12	ground	(n,p)	b-12	ground	1.36E+01	2.00E+01	4
	104	c-12	ground	(n,d)	b-11	ground	1.49E+01	2.00E+01	4
	107	c-12	ground	(n,a)	be-9	ground	6.17E+00	2.00E+01	9
	102	c-12	ground	(n,g)	c-13	ground	1.00E-10	2.00E+01	11
6013.30y	16	c-13	ground	(n,2n)	c-12	ground	5.33E+00	2.00E+01	14
	22	c-13	ground	(n,n')a	be-9	ground	1.15E+01	2.00E+01	5
	103	c-13	ground	(n,p)	b-13	ground	1.38E+01	2.00E+01	12
	105	c-13	ground	(n,t)	b-11	ground	1.34E+01	2.00E+01	6
	107	c-13	ground	(n,a)	be-10	ground	4.13E+00	2.00E+01	11
	102	c-13	ground	(n,g)	c-14	ground	1.00E-10	2.00E+01	179
6014.30y	16	c-14	ground	(n,2n)	c-13	ground	8.77E+00	2.00E+01	7
	17	c-14	ground	(n,3n)	c-12	ground	1.41E+01	2.00E+01	5
	22	c-14	ground	(n,n')a	be-10	ground	1.29E+01	2.00E+01	5
	107	c-14	ground	(n,a)	be-11	ground	1.23E+01	2.00E+01	6
7014.30y	16	n-14	ground	(n,2n)	n-13	ground	1.13E+01	2.00E+01	10
	28	n-14	ground	(n,n')p	c-13	ground	8.09E+00	2.00E+01	11
	103	n-14	ground	(n,p)	c-14	ground	1.00E-10	2.00E+01	102
	104	n-14	ground	(n,d)	c-13	ground	5.70E+00	2.00E+01	18
	105	n-14	ground	(n,t)	c-12	ground	4.29E+00	2.00E+01	24
	107	n-14	ground	(n,a)	b-11	ground	1.10E+00	2.00E+01	228
	102	n-14	ground	(n,g)	n-15	ground	1.00E-10	2.00E+01	50
8016.30y	16	o-16	ground	(n,2n)	o-15	ground	1.67E+01	2.00E+01	3
	28	o-16	ground	(n,n')p	n-15	ground	1.29E+01	2.00E+01	4
	22	o-16	ground	(n,n')a	c-12	ground	7.60E+00	2.00E+01	12
	103	o-16	ground	(n,p)	n-16	ground	1.02E+01	2.00E+01	13
	104	o-16	ground	(n,d)	n-15	ground	1.05E+01	2.00E+01	4

ZAID	MT	TARGET	E-TARG	REACTION	PRODUCT	E-PROD	EMIN	EMAX	NES	
8017.30y	107	o-16	ground	(n,a)	c-13	ground	2.35E+00	2.00E+01	59	
	107	o-17	ground	(n,a)	c-14	ground	1.00E-10	2.00E+01	117	
	9019.30y	16	f-19	ground	(n,2n)	f-18	ground	1.10E+01	2.00E+01	8
	28	f-19	ground	(n,n')p	o-18	ground	8.42E+00	2.00E+01	23	
	22	f-19	ground	(n,n')a	n-15	ground	5.15E+00	2.00E+01	34	
	103	f-19	ground	(n,p)	o-19	ground	4.25E+00	2.00E+01	34	
	104	f-19	ground	(n,d)	o-18	ground	6.07E+00	2.00E+01	15	
11023.30y	105	f-19	ground	(n,t)	o-17	ground	7.96E+00	2.00E+01	9	
	107	f-19	ground	(n,a)	n-16	ground	1.60E+00	2.00E+01	17	
	102	f-19	ground	(n,g)	f-20	ground	1.00E-10	2.00E+01	102	
	16	na-23	ground	(n,2n)	na-22	ground	1.30E+01	2.00E+01	13	
	28	na-23	ground	(n,n')p	ne-22	ground	9.25E+00	2.00E+01	23	
	22	na-23	ground	(n,n')a	f-19	ground	1.10E+01	2.00E+01	13	
	103	na-23	ground	(n,p)	ne-23	ground	4.00E+00	2.00E+01	106	
12023.30y	107	na-23	ground	(n,a)	f-20	ground	4.80E+00	2.00E+01	41	
	102	na-23	ground	(n,g)	na-24	ground	1.00E-10	2.00E+01	102	
	16	mg-23	ground	(n,2n)	mg-22	ground	1.37E+01	2.00E+01	15	
	28	mg-23	ground	(n,n')p	na-22	ground	9.26E+00	2.00E+01	16	
	103	mg-23	ground	(n,p)	na-23	ground	1.00E-10	2.00E+01	14	
	107	mg-23	ground	(n,a)	ne-20	ground	1.00E-02	2.00E+01	9	
	102	mg-23	ground	(n,g)	mg-24	ground	1.00E-10	2.00E+01	102	
12024.30y	16	mg-24	ground	(n,2n)	mg-23	ground	1.72E+01	2.00E+01	5	
	28	mg-24	ground	(n,n')p	na-23	ground	1.35E+01	2.00E+01	5	
	103	mg-24	ground	(n,p)	na-24	ground	4.93E+00	2.00E+01	23	
	107	mg-24	ground	(n,a)	ne-21	ground	6.00E+00	2.00E+01	9	
	102	mg-24	ground	(n,g)	mg-25	ground	1.00E-10	2.00E+01	102	
	12025.30y	16	mg-25	ground	(n,2n)	mg-24	ground	7.62E+00	2.00E+01	16
	103	mg-25	ground	(n,p)	na-25	ground	4.57E+00	2.00E+01	12	
12025.30y	107	mg-25	ground	(n,a)	ne-22	ground	3.06E+00	2.00E+01	16	
	102	mg-25	ground	(n,g)	mg-26	ground	1.00E-10	2.00E+01	102	
	12026.30y	16	mg-26	ground	(n,2n)	mg-25	ground	1.15E+01	2.00E+01	19
	17	mg-26	ground	(n,3n)	mg-24	ground	1.91E+01	2.00E+01	5	
	103	mg-26	ground	(n,p)	na-26	ground	9.61E+00	2.00E+01	16	
	107	mg-26	ground	(n,a)	ne-23	ground	9.16E+00	2.00E+01	8	
	102	mg-26	ground	(n,g)	mg-27	ground	1.00E-10	2.00E+01	102	
12027.30y	16	mg-27	ground	(n,2n)	mg-26	ground	6.68E+00	2.00E+01	21	
	17	mg-27	ground	(n,3n)	mg-25	ground	1.82E+01	2.00E+01	8	
	107	mg-27	ground	(n,a)	ne-24	ground	6.60E+00	2.00E+01	15	
	102	mg-27	ground	(n,g)	mg-28	ground	1.00E-10	2.00E+01	102	
	13026.30y	16	al-26	ground	(n,2n)	al-25	ground	1.18E+01	2.00E+01	14
	28	al-26	ground	(n,n')p	mg-25	ground	8.03E+00	2.00E+01	15	
	22	al-26	ground	(n,n')a	na-22	ground	1.38E+01	2.00E+01	14	
13026.30y	103	al-26	ground	(n,p)	mg-26	ground	1.00E-02	2.00E+01	7	
	104	al-26	ground	(n,d)	mg-25	ground	5.89E+00	2.00E+01	16	
	105	al-26	ground	(n,t)	mg-24	ground	7.03E+00	2.00E+01	16	
	107	al-26	ground	(n,a)	na-23	ground	8.76E-01	2.00E+01	23	
	102	al-26	ground	(n,g)	al-27	ground	1.00E-10	2.00E+01	102	
	13027.30y	16	al-27	ground	(n,2n)	al-26	ground	1.35E+01	2.00E+01	14
	1016	al-27	ground	(n,2n)	al-26	2.28E-01	1.38E+01	2.00E+01	7	
13027.30y	103	al-27	ground	(n,p)	mg-27	ground	2.70E+00	2.00E+01	52	
	104	al-27	ground	(n,d)	mg-26	ground	9.00E+00	2.00E+01	18	
	105	al-27	ground	(n,t)	mg-25	ground	1.40E+01	2.00E+01	11	
	107	al-27	ground	(n,a)	na-24	ground	5.00E+00	2.00E+01	27	
	102	al-27	ground	(n,g)	al-28	ground	1.00E-10	2.00E+01	102	
	14027.30y	16	si-27	ground	(n,2n)	si-26	ground	1.38E+01	2.00E+01	15
	28	si-27	ground	(n,n')p	al-26	ground	9.39E+00	2.00E+01	17	
14027.30y	22	si-27	ground	(n,n')a	mg-23	ground	1.41E+01	2.00E+01	13	
	103	si-27	ground	(n,p)	al-27	ground	1.00E-02	2.00E+01	21	
	107	si-27	ground	(n,a)	mg-24	ground	1.00E-02	2.00E+01	20	
	102	si-27	ground	(n,g)	si-28	ground	1.00E-10	2.00E+01	102	
	14028.30y	16	si-28	ground	(n,2n)	si-27	ground	1.78E+01	2.00E+01	7
	28	si-28	ground	(n,n')p	al-27	ground	1.39E+01	2.00E+01	15	
	22	si-28	ground	(n,n')a	mg-24	ground	1.47E+01	2.00E+01	13	
14028.30y	103	si-28	ground	(n,p)	al-28	ground	4.91E+00	2.00E+01	17	

ZAID	MT	TARGET	E-TARG	REACTION	PRODUCT	E-PROD	EMIN	EMAX	NES
14029.30y	107	si-28	ground	(n,a)	mg-25	ground	7.07E+00	2.00E+01	22
	102	si-28	ground	(n,g)	si-29	ground	1.00E-10	2.00E+01	102
	16	si-29	ground	(n,2n)	si-28	ground	8.76E+00	2.00E+01	15
	28	si-29	ground	(n,n')p	al-28	ground	1.44E+01	2.00E+01	15
	22	si-29	ground	(n,n')a	mg-25	ground	1.58E+01	2.00E+01	11
14030.30y	103	si-29	ground	(n,p)	al-29	ground	4.70E+00	2.00E+01	21
	107	si-29	ground	(n,a)	mg-26	ground	4.32E+00	2.00E+01	21
	102	si-29	ground	(n,g)	si-30	ground	1.00E-10	2.00E+01	99
	16	si-30	ground	(n,2n)	si-29	ground	1.10E+01	2.00E+01	15
	17	si-30	ground	(n,3n)	si-28	ground	1.97E+01	2.00E+01	3
14031.30y	28	si-30	ground	(n,n')p	al-29	ground	1.56E+01	2.00E+01	15
	22	si-30	ground	(n,n')a	mg-26	ground	1.53E+01	2.00E+01	11
	103	si-30	ground	(n,p)	al-30	ground	9.71E+00	2.00E+01	19
	107	si-30	ground	(n,a)	mg-27	ground	8.59E+00	2.00E+01	21
	102	si-30	ground	(n,g)	si-31	ground	1.00E-10	2.00E+01	99
15031.30y	16	si-31	ground	(n,2n)	si-30	ground	6.80E+00	2.00E+01	19
	17	si-31	ground	(n,3n)	si-29	ground	1.78E+01	2.00E+01	7
	22	si-31	ground	(n,n')a	mg-27	ground	1.54E+01	2.00E+01	11
	107	si-31	ground	(n,a)	mg-28	ground	6.57E+00	2.00E+01	22
	102	si-31	ground	(n,g)	si-32	ground	1.00E-10	2.00E+01	99
16031.30y	16	p-31	ground	(n,2n)	p-30	ground	1.27E+01	2.00E+01	8
	28	p-31	ground	(n,n')p	si-30	ground	7.54E+00	2.00E+01	4
	103	p-31	ground	(n,p)	si-31	ground	1.50E+00	2.00E+01	13
	107	p-31	ground	(n,a)	al-28	ground	3.00E+00	2.00E+01	8
	102	p-31	ground	(n,g)	p-32	ground	1.00E-10	2.00E+01	88
16032.30y	16	s-31	ground	(n,2n)	s-30	ground	1.34E+01	2.00E+01	14
	28	s-31	ground	(n,n')p	p-30	ground	8.23E+00	2.00E+01	17
	22	s-31	ground	(n,n')a	si-27	ground	1.45E+01	2.00E+01	13
	103	s-31	ground	(n,p)	p-31	ground	1.00E-10	2.00E+01	16
	107	s-31	ground	(n,a)	si-28	ground	1.00E-10	2.00E+01	22
16033.30y	102	s-31	ground	(n,g)	s-32	ground	1.00E-10	2.00E+01	102
	16	s-32	ground	(n,2n)	s-31	ground	1.56E+01	2.00E+01	7
	28	s-32	ground	(n,n')p	p-31	ground	9.14E+00	2.00E+01	3
	103	s-32	ground	(n,p)	p-32	ground	1.60E+00	2.00E+01	36
	105	s-32	ground	(n,t)	p-30	ground	1.31E+01	2.00E+01	3
16034.30y	107	s-32	ground	(n,a)	si-29	ground	1.00E-10	2.00E+01	45
	102	s-32	ground	(n,g)	s-33	ground	1.00E-10	2.00E+01	102
	16	s-33	ground	(n,2n)	s-32	ground	8.90E+00	2.00E+01	14
	28	s-33	ground	(n,n')p	p-32	ground	1.18E+01	2.00E+01	15
	22	s-33	ground	(n,n')a	si-29	ground	1.24E+01	2.00E+01	14
16035.30y	103	s-33	ground	(n,p)	p-33	ground	1.00E-10	2.00E+01	22
	104	s-33	ground	(n,d)	p-32	ground	9.70E+00	2.00E+01	14
	107	s-33	ground	(n,a)	si-30	ground	1.00E-10	2.00E+01	26
	102	s-33	ground	(n,g)	s-34	ground	1.00E-10	2.00E+01	98
	16	s-34	ground	(n,2n)	s-33	ground	1.18E+01	2.00E+01	15
16036.30y	28	s-34	ground	(n,n')p	p-33	ground	1.31E+01	2.00E+01	16
	22	s-34	ground	(n,n')a	si-30	ground	1.32E+01	2.00E+01	15
	103	s-34	ground	(n,p)	p-34	ground	6.46E+00	2.00E+01	21
	104	s-34	ground	(n,d)	p-33	ground	1.10E+01	2.00E+01	14
	107	s-34	ground	(n,a)	si-31	ground	6.38E+00	2.00E+01	25
16037.30y	102	s-34	ground	(n,g)	s-35	ground	1.00E-10	2.00E+01	98
	16	s-35	ground	(n,2n)	s-34	ground	7.19E+00	2.00E+01	19
	17	s-35	ground	(n,3n)	s-33	ground	1.89E+01	2.00E+01	5
	22	s-35	ground	(n,n')a	si-31	ground	1.36E+01	2.00E+01	14
	107	s-35	ground	(n,a)	si-32	ground	4.05E+00	2.00E+01	24
16038.30y	102	s-35	ground	(n,g)	s-36	ground	1.00E-10	2.00E+01	97
	16	s-36	ground	(n,2n)	s-35	ground	1.02E+01	2.00E+01	18
	17	s-36	ground	(n,3n)	s-34	ground	1.73E+01	2.00E+01	10
	22	s-36	ground	(n,n')a	si-32	ground	1.42E+01	2.00E+01	14
	102	s-36	ground	(n,g)	s-37	ground	1.00E-10	2.00E+01	96
16039.30y	16	s-37	ground	(n,2n)	s-36	ground	4.43E+00	2.00E+01	24
	17	s-37	ground	(n,3n)	s-35	ground	1.46E+01	2.00E+01	14
	102	s-37	ground	(n,g)	s-38	ground	1.00E-10	2.00E+01	95

ZAID	MT	TARGET	E-TARG	REACTION	PRODUCT	E-PROD	EMIN	EMAX	NES
17034.30y	16	cl-34	1.45E-01	(n,2n)	cl-33	ground	1.17E+01	2.00E+01	14
	28	cl-34	1.45E-01	(n,n')p	s-33	ground	7.24E+00	2.00E+01	16
	22	cl-34	1.45E-01	(n,n')a	p-30	ground	1.22E+01	2.00E+01	14
	103	cl-34	1.45E-01	(n,p)	s-34	ground	1.00E-10	2.00E+01	24
	107	cl-34	1.45E-01	(n,a)	p-31	ground	1.00E-10	2.00E+01	25
	102	cl-34	1.45E-01	(n,g)	cl-35	ground	1.00E-10	2.50E+00	95
17035.30y	16	cl-35	ground	(n,2n)	cl-34	ground	1.30E+01	2.00E+01	6
	1016	cl-35	ground	(n,2n)	cl-34	1.45E-01	1.32E+01	2.00E+01	15
	28	cl-35	ground	(n,n')p	s-34	ground	8.63E+00	2.00E+01	14
	22	cl-35	ground	(n,n')a	p-31	ground	1.27E+01	2.00E+01	14
	103	cl-35	ground	(n,p)	s-35	ground	1.00E-10	2.00E+01	44
	107	cl-35	ground	(n,a)	p-32	ground	1.00E-10	2.00E+01	27
17036.30y	102	cl-35	ground	(n,g)	cl-36	ground	1.00E-10	2.00E+01	95
	16	cl-36	ground	(n,2n)	cl-35	ground	8.82E+00	2.00E+01	14
	28	cl-36	ground	(n,n')p	s-35	ground	1.02E+01	2.00E+01	17
	22	cl-36	ground	(n,n')a	p-32	ground	1.33E+01	2.00E+01	15
	103	cl-36	ground	(n,p)	s-36	ground	1.00E-10	2.00E+01	105
	107	cl-36	ground	(n,a)	p-33	ground	2.85E+00	2.00E+01	23
17037.30y	102	cl-36	ground	(n,g)	cl-37	ground	1.00E-10	2.00E+01	95
	16	cl-37	ground	(n,2n)	cl-36	ground	1.06E+01	2.00E+01	16
	17	cl-37	ground	(n,3n)	cl-35	ground	1.94E+01	2.00E+01	3
	28	cl-37	ground	(n,n')p	s-36	ground	1.07E+01	2.00E+01	15
	22	cl-37	ground	(n,n')a	p-33	ground	1.34E+01	2.00E+01	14
	103	cl-37	ground	(n,p)	s-37	ground	6.34E+00	2.00E+01	19
17038.30y	105	cl-37	ground	(n,t)	s-35	ground	1.23E+01	2.00E+01	13
	107	cl-37	ground	(n,a)	p-34	ground	6.66E+00	2.00E+01	23
	102	cl-37	ground	(n,g)	cl-38	ground	1.00E-10	2.00E+01	84
	16	cl-38	ground	(n,2n)	cl-37	ground	6.27E+00	2.00E+01	19
	17	cl-38	ground	(n,3n)	cl-36	ground	1.69E+01	2.00E+01	9
	28	cl-38	ground	(n,n')p	s-37	ground	1.25E+01	2.00E+01	15
18036.30y	103	cl-38	ground	(n,p)	s-38	ground	4.35E+00	2.00E+01	21
	102	cl-38	ground	(n,g)	cl-39	ground	1.00E-10	2.00E+01	94
	16	ar-36	ground	(n,2n)	ar-36	ground	1.57E+01	2.00E+01	14
	103	ar-36	ground	(n,p)	cl-36	ground	2.31E+00	2.00E+01	15
	107	ar-36	ground	(n,a)	s-33	ground	3.78E+00	2.00E+01	15
	102	ar-36	ground	(n,g)	ar-37	ground	1.00E-10	2.00E+01	102
18037.30y	16	ar-37	ground	(n,2n)	ar-36	ground	9.03E+00	2.00E+01	15
	103	ar-37	ground	(n,p)	cl-37	ground	7.23E-01	2.00E+01	15
	107	ar-37	ground	(n,a)	s-34	ground	1.04E+00	2.00E+01	15
	102	ar-37	ground	(n,g)	ar-38	ground	1.00E-10	2.00E+01	102
	16	ar-38	ground	(n,2n)	ar-37	ground	1.22E+01	2.00E+01	15
	103	ar-38	ground	(n,p)	cl-38	ground	6.59E+00	2.00E+01	15
18038.30y	107	ar-38	ground	(n,a)	s-35	ground	5.99E+00	2.00E+01	15
	102	ar-38	ground	(n,g)	ar-39	ground	1.00E-10	2.00E+01	102
18039.30y	16	ar-39	ground	(n,2n)	ar-38	ground	6.77E+00	2.00E+01	20
	17	ar-39	ground	(n,3n)	ar-37	ground	1.89E+01	2.00E+01	6
	103	ar-39	ground	(n,p)	cl-39	ground	5.06E+00	2.00E+01	15
	107	ar-39	ground	(n,a)	s-36	ground	2.58E+00	2.00E+01	15
	102	ar-39	ground	(n,g)	ar-40	ground	1.00E-10	2.00E+01	102
	16	ar-40	ground	(n,2n)	ar-39	ground	1.01E+01	2.00E+01	21
18040.30y	17	ar-40	ground	(n,3n)	ar-38	ground	1.69E+01	2.00E+01	10
	103	ar-40	ground	(n,p)	cl-40	ground	9.21E+00	2.00E+01	15
	107	ar-40	ground	(n,a)	s-37	ground	8.24E+00	2.00E+01	15
	102	ar-40	ground	(n,g)	ar-41	ground	1.00E-10	2.00E+01	102
18041.30y	16	ar-41	ground	(n,2n)	ar-40	ground	6.25E+00	2.00E+01	21
	17	ar-41	ground	(n,3n)	ar-39	ground	1.64E+01	2.00E+01	12
	107	ar-41	ground	(n,a)	s-38	ground	6.23E+00	2.00E+01	15
	102	ar-41	ground	(n,g)	ar-42	ground	1.00E-10	2.00E+01	102
18042.30y	16	ar-42	ground	(n,2n)	ar-41	ground	9.65E+00	2.00E+01	24
	17	ar-42	ground	(n,3n)	ar-40	ground	1.59E+01	2.00E+01	13
	102	ar-42	ground	(n,g)	ar-43	ground	1.00E-10	2.00E+01	102
18043.30y	16	ar-43	ground	(n,2n)	ar-42	ground	5.73E+00	2.00E+01	27
	17	ar-43	ground	(n,3n)	ar-41	ground	1.59E+01	2.00E+01	12
	102	ar-43	ground	(n,g)	ar-44	ground	1.00E-10	2.00E+01	102

ZAID	MT	TARGET	E-TARG	REACTION	PRODUCT	E-PROD	EMIN	EMAX	NES
19038.30y	16	k-38	ground	(n,2n)	k-37	ground	1.24E+01	2.00E+01	17
	103	k-38	ground	(n,p)	ar-38	ground	1.00E-10	2.00E+01	72
	107	k-38	ground	(n,a)	cl-35	ground	1.00E-10	2.00E+01	102
19039.30y	102	k-38	ground	(n,g)	k-39	ground	1.00E-10	2.00E+01	102
	16	k-39	ground	(n,2n)	k-38	ground	1.34E+01	2.00E+01	16
	1016	k-39	ground	(n,2n)	k-38	1.30E-01	1.36E+01	2.00E+01	15
	28	k-39	ground	(n,n')p	ar-38	ground	9.09E+00	2.00E+01	15
	103	k-39	ground	(n,p)	ar-39	ground	2.32E+00	2.00E+01	17
	105	k-39	ground	(n,t)	ar-37	ground	1.27E+01	2.00E+01	13
	107	k-39	ground	(n,a)	cl-36	ground	2.00E+00	2.00E+01	10
19040.30y	102	k-39	ground	(n,g)	k-40	ground	1.00E-10	2.00E+01	102
	16	k-40	ground	(n,2n)	k-39	ground	8.00E+00	2.00E+01	17
	103	k-40	ground	(n,p)	ar-40	ground	1.00E-10	2.00E+01	85
	104	k-40	ground	(n,d)	ar-39	ground	8.13E+00	2.00E+01	15
	107	k-40	ground	(n,a)	cl-37	ground	1.00E-10	2.00E+01	108
19041.30y	102	k-40	ground	(n,g)	k-41	ground	1.00E-10	2.00E+01	102
	16	k-41	ground	(n,2n)	k-40	ground	1.03E+01	2.00E+01	20
	17	k-41	ground	(n,3n)	k-39	ground	1.83E+01	2.00E+01	8
	103	k-41	ground	(n,p)	ar-41	ground	4.26E+00	2.00E+01	17
	105	k-41	ground	(n,t)	ar-39	ground	1.21E+01	2.00E+01	13
	107	k-41	ground	(n,a)	cl-38	ground	6.23E+00	2.00E+01	12
	102	k-41	ground	(n,g)	k-42	ground	1.00E-10	2.00E+01	102
19042.30y	16	k-42	ground	(n,2n)	k-41	ground	7.71E+00	2.00E+01	20
	17	k-42	ground	(n,3n)	k-40	ground	1.80E+01	2.00E+01	8
	103	k-42	ground	(n,p)	ar-42	ground	2.31E+00	2.00E+01	17
	107	k-42	ground	(n,a)	cl-39	ground	5.64E+00	2.00E+01	14
	102	k-42	ground	(n,g)	k-43	ground	1.00E-10	2.00E+01	102
19043.30y	16	k-43	ground	(n,2n)	k-42	ground	9.85E+00	2.00E+01	21
	17	k-43	ground	(n,3n)	k-41	ground	1.76E+01	2.00E+01	9
	102	k-43	ground	(n,g)	k-44	ground	1.00E-10	2.00E+01	102
19044.30y	16	k-44	ground	(n,2n)	k-43	ground	7.44E+00	2.00E+01	20
	17	k-44	ground	(n,3n)	k-42	ground	1.73E+01	2.00E+01	9
	102	k-44	ground	(n,g)	k-45	ground	1.00E-10	2.00E+01	102
19045.30y	16	k-45	ground	(n,2n)	k-44	ground	9.10E+00	2.00E+01	22
	17	k-45	ground	(n,3n)	k-43	ground	1.65E+01	2.00E+01	11
	102	k-45	ground	(n,g)	k-46	ground	1.00E-10	2.00E+01	102
19046.30y	16	k-46	ground	(n,2n)	k-45	ground	7.03E+00	2.00E+01	21
	17	k-46	ground	(n,3n)	k-44	ground	1.61E+01	2.00E+01	12
	102	k-46	ground	(n,g)	k-47	ground	1.00E-10	2.00E+01	102
20039.30y	16	ca-39	ground	(n,2n)	ca-38	ground	1.37E+01	2.00E+01	5
	28	ca-39	ground	(n,n')p	k-38	ground	5.93E+00	2.00E+01	6
	22	ca-39	ground	(n,n')a	ar-35	ground	6.83E+00	2.00E+01	6
	103	ca-39	ground	(n,p)	k-39	ground	1.00E-10	2.00E+01	67
	107	ca-39	ground	(n,a)	ar-36	ground	1.00E-10	2.00E+01	102
	102	ca-39	ground	(n,g)	ca-40	ground	1.00E-10	2.00E+01	102
20040.30y	16	ca-40	ground	(n,2n)	ca-39	ground	1.60E+01	2.00E+01	6
	28	ca-40	ground	(n,n')p	k-39	ground	8.54E+00	2.00E+01	5
	22	ca-40	ground	(n,n')a	ar-36	ground	7.22E+00	2.00E+01	4
	103	ca-40	ground	(n,p)	k-40	ground	5.40E-01	2.00E+01	10
	105	ca-40	ground	(n,t)	k-38	ground	1.33E+01	2.00E+01	3
	107	ca-40	ground	(n,a)	ar-37	ground	1.00E-10	2.00E+01	10
	102	ca-40	ground	(n,g)	ca-41	ground	1.00E-10	2.00E+01	102
20041.30y	16	ca-41	ground	(n,2n)	ca-40	ground	8.57E+00	2.00E+01	7
	28	ca-41	ground	(n,n')p	k-40	ground	9.11E+00	2.00E+01	6
	22	ca-41	ground	(n,n')a	ar-37	ground	6.77E+00	2.00E+01	6
	103	ca-41	ground	(n,p)	k-41	ground	1.50E+00	2.00E+01	10
	105	ca-41	ground	(n,t)	k-39	ground	8.41E+00	2.00E+01	4
	107	ca-41	ground	(n,a)	ar-38	ground	1.00E+00	2.00E+01	7
	102	ca-41	ground	(n,g)	ca-42	ground	1.00E-10	2.00E+01	102
20042.30y	16	ca-42	ground	(n,2n)	ca-41	ground	1.17E+01	2.00E+01	5
	28	ca-42	ground	(n,n')p	k-41	ground	1.05E+01	2.00E+01	4
	22	ca-42	ground	(n,n')a	ar-38	ground	6.40E+00	2.00E+01	5
	103	ca-42	ground	(n,p)	k-42	ground	2.80E+00	2.00E+01	8
	107	ca-42	ground	(n,a)	ar-39	ground	5.00E+00	2.00E+01	6

ZAID	MT	TARGET	E-TARG	REACTION	PRODUCT	E-PROD	EMIN	EMAX	NES
20043.30y	102	ca-42	ground	(n,g)	ca-43	ground	1.00E-10	2.00E+01	102
	16	ca-43	ground	(n,2n)	ca-42	ground	8.12E+00	2.00E+01	8
	22	ca-43	ground	(n,n')a	ar-39	ground	7.76E+00	2.00E+01	6
	103	ca-43	ground	(n,p)	k-43	ground	1.06E+00	2.00E+01	8
	104	ca-43	ground	(n,d)	k-42	ground	8.64E+00	2.00E+01	4
20044.30y	107	ca-43	ground	(n,a)	ar-40	ground	1.00E+00	2.00E+01	7
	102	ca-43	ground	(n,g)	ca-44	ground	1.00E-10	2.00E+01	102
	16	ca-44	ground	(n,2n)	ca-43	ground	1.14E+01	2.00E+01	6
	103	ca-44	ground	(n,p)	k-44	ground	5.01E+00	2.00E+01	6
	104	ca-44	ground	(n,d)	k-43	ground	1.01E+01	2.00E+01	4
20045.30y	107	ca-44	ground	(n,a)	ar-41	ground	2.81E+00	2.00E+01	6
	102	ca-44	ground	(n,g)	ca-45	ground	1.00E-10	2.00E+01	102
	16	ca-45	ground	(n,2n)	ca-44	ground	7.58E+00	2.00E+01	8
	103	ca-45	ground	(n,p)	k-45	ground	3.49E+00	2.00E+01	6
	104	ca-45	ground	(n,d)	k-44	ground	1.03E+01	2.00E+01	4
20046.30y	107	ca-45	ground	(n,a)	ar-42	ground	7.60E-01	2.00E+01	5
	102	ca-45	ground	(n,g)	ca-46	ground	1.00E-10	2.00E+01	102
	16	ca-46	ground	(n,2n)	ca-45	ground	1.06E+01	2.00E+01	8
	103	ca-46	ground	(n,p)	k-46	ground	7.08E+00	2.00E+01	5
	107	ca-46	ground	(n,a)	ar-43	ground	6.00E+00	2.00E+01	4
20047.30y	102	ca-46	ground	(n,g)	ca-47	ground	1.00E-10	2.00E+01	102
	16	ca-47	ground	(n,2n)	ca-46	ground	7.43E+00	2.00E+01	7
	103	ca-47	ground	(n,p)	k-47	ground	6.10E+00	2.00E+01	6
20048.30y	102	ca-47	ground	(n,g)	ca-48	ground	1.00E-10	2.00E+01	102
	16	ca-48	ground	(n,2n)	ca-47	ground	1.02E+01	2.00E+01	7
	103	ca-48	ground	(n,p)	k-48	ground	1.20E+01	2.00E+01	4
20049.30y	102	ca-48	ground	(n,g)	ca-49	ground	1.00E-10	2.00E+01	102
	16	ca-49	ground	(n,2n)	ca-48	ground	5.25E+00	2.00E+01	8
	102	ca-49	ground	(n,g)	ca-50	ground	1.00E-10	2.00E+01	102
21044.30y	16	sc-44	ground	(n,2n)	sc-43	ground	9.93E+00	2.00E+01	15
	103	sc-44	ground	(n,p)	ca-44	ground	5.00E-02	2.00E+01	14
	107	sc-44	ground	(n,a)	k-41	ground	3.44E+00	2.00E+01	17
	102	sc-44	ground	(n,g)	sc-45	ground	1.00E-10	2.00E+01	102
21044.31y	16	sc-44	2.71E-01	(n,2n)	sc-43	ground	9.65E+00	2.00E+01	15
	103	sc-44	2.71E-01	(n,p)	ca-44	ground	5.00E-02	2.00E+01	13
	107	sc-44	2.71E-01	(n,a)	k-41	ground	3.17E+00	2.00E+01	17
	102	sc-44	2.71E-01	(n,g)	sc-45	ground	1.00E-10	2.00E+01	102
21045.30y	16	sc-45	ground	(n,2n)	sc-44	ground	1.16E+01	2.00E+01	14
	1016	sc-45	ground	(n,2n)	sc-44	2.71E-01	1.18E+01	2.00E+01	15
	103	sc-45	ground	(n,p)	ca-45	ground	2.30E+00	2.00E+01	17
	107	sc-45	ground	(n,a)	k-42	ground	7.27E+00	2.00E+01	11
	102	sc-45	ground	(n,g)	sc-46	1.42E-01	1.00E-10	2.00E+01	102
21046.30y	1102	sc-45	ground	(n,g)	sc-46	ground	1.00E-10	2.00E+01	102
	16	sc-46	ground	(n,2n)	sc-45	ground	8.96E+00	2.00E+01	15
	103	sc-46	ground	(n,p)	ca-46	ground	6.12E-01	2.00E+01	19
	107	sc-46	ground	(n,a)	k-43	ground	6.36E+00	2.00E+01	17
	102	sc-46	ground	(n,g)	sc-47	ground	1.00E-10	2.00E+01	102
21046.31y	16	sc-46	1.42E-01	(n,2n)	sc-45	ground	8.82E+00	2.00E+01	15
	103	sc-46	1.42E-01	(n,p)	ca-46	ground	4.69E-01	2.00E+01	19
	107	sc-46	1.42E-01	(n,a)	k-43	ground	6.21E+00	2.00E+01	17
	102	sc-46	1.42E-01	(n,g)	sc-47	ground	1.00E-10	2.00E+01	102
21047.30y	16	sc-47	ground	(n,2n)	sc-46	ground	1.09E+01	2.00E+01	16
	17	sc-47	ground	(n,3n)	sc-45	ground	1.98E+01	2.00E+01	3
	103	sc-47	ground	(n,p)	ca-47	ground	4.05E+00	2.00E+01	17
	107	sc-47	ground	(n,a)	k-44	ground	9.76E+00	2.00E+01	17
	102	sc-47	ground	(n,g)	sc-48	ground	1.00E-10	2.00E+01	102
21048.30y	16	sc-48	ground	(n,2n)	sc-47	ground	8.41E+00	2.00E+01	17
	17	sc-48	ground	(n,3n)	sc-46	ground	1.93E+01	2.00E+01	4
	103	sc-48	ground	(n,p)	ca-48	ground	2.28E+00	2.00E+01	17
	107	sc-48	ground	(n,a)	k-45	ground	9.04E+00	2.00E+01	17
	102	sc-48	ground	(n,g)	sc-49	ground	1.00E-10	2.00E+01	97
22045.30y	16	ti-45	ground	(n,2n)	ti-44	ground	9.74E+00	2.00E+01	16
	28	ti-45	ground	(n,n')p	sc-44	ground	1.16E+01	2.00E+01	16
	1028	ti-45	ground	(n,n')p	sc-44	2.71E-01	1.18E+01	2.00E+01	16

ZAID	MT	TARGET	E-TARG	REACTION	PRODUCT	E-PROD	EMIN	EMAX	NES
22046.30y	22	ti-45	ground	(n,n')a	ca-41	ground	1.38E+01	2.00E+01	14
	103	ti-45	ground	(n,p)	sc-45	ground	1.22E-01	2.00E+01	23
	107	ti-45	ground	(n,a)	ca-42	ground	2.01E+00	2.00E+01	23
	102	ti-45	ground	(n,g)	ti-46	ground	1.00E-10	2.00E+01	102
	16	ti-46	ground	(n,2n)	ti-45	ground	1.35E+01	2.00E+01	9
	28	ti-46	ground	(n,n')p	sc-45	ground	1.34E+01	2.00E+01	15
	22	ti-46	ground	(n,n')a	ca-42	ground	1.55E+01	2.00E+01	12
	103	ti-46	ground	(n,p)	sc-46	ground	4.63E+00	2.00E+01	21
	105	ti-46	ground	(n,t)	sc-44	ground	1.37E+01	2.00E+01	7
	107	ti-46	ground	(n,a)	ca-43	ground	7.36E+00	2.00E+01	19
22047.30y	102	ti-46	ground	(n,g)	ti-47	ground	1.00E-10	2.00E+01	98
	16	ti-47	ground	(n,2n)	ti-46	ground	9.07E+00	2.00E+01	16
	28	ti-47	ground	(n,n')p	sc-46	ground	1.35E+01	2.00E+01	17
	22	ti-47	ground	(n,n')a	ca-43	ground	1.64E+01	2.00E+01	10
	103	ti-47	ground	(n,p)	sc-47	ground	1.22E+00	2.00E+01	20
	104	ti-47	ground	(n,d)	sc-46	ground	1.15E+01	2.00E+01	14
	107	ti-47	ground	(n,a)	ca-44	ground	5.01E+00	2.00E+01	18
	102	ti-47	ground	(n,g)	ti-48	ground	1.00E-10	2.00E+01	100
	16	ti-48	ground	(n,2n)	ti-47	ground	1.19E+01	2.00E+01	16
	28	ti-48	ground	(n,n')p	sc-47	ground	1.44E+01	2.00E+01	14
22048.30y	22	ti-48	ground	(n,n')a	ca-44	ground	1.76E+01	2.00E+01	9
	103	ti-48	ground	(n,p)	sc-48	ground	4.23E+00	2.00E+01	21
	104	ti-48	ground	(n,d)	sc-47	ground	1.25E+01	2.00E+01	13
	107	ti-48	ground	(n,a)	ca-45	ground	6.97E+00	2.00E+01	18
	102	ti-48	ground	(n,g)	ti-49	ground	1.00E-10	2.00E+01	102
	16	ti-49	ground	(n,2n)	ti-48	ground	8.31E+00	2.00E+01	17
	28	ti-49	ground	(n,n')p	sc-48	ground	1.44E+01	2.00E+01	14
	22	ti-49	ground	(n,n')a	ca-45	ground	1.76E+01	2.00E+01	9
	103	ti-49	ground	(n,p)	sc-49	ground	4.21E+00	2.00E+01	21
	104	ti-49	ground	(n,d)	sc-48	ground	1.24E+01	2.00E+01	13
22049.30y	107	ti-49	ground	(n,a)	ca-46	ground	6.93E+00	2.00E+01	18
	102	ti-49	ground	(n,g)	ti-50	ground	1.00E-10	2.00E+01	98
	16	ti-50	ground	(n,2n)	ti-49	ground	1.12E+01	2.00E+01	17
	17	ti-50	ground	(n,3n)	ti-48	ground	1.95E+01	2.00E+01	4
	28	ti-50	ground	(n,n')p	sc-49	ground	1.52E+01	2.00E+01	13
	22	ti-50	ground	(n,n')a	ca-46	ground	1.81E+01	2.00E+01	9
	103	ti-50	ground	(n,p)	sc-50	ground	9.19E+00	2.00E+01	17
	107	ti-50	ground	(n,a)	ca-47	ground	1.06E+01	2.00E+01	17
	102	ti-50	ground	(n,g)	ti-51	ground	1.00E-10	2.00E+01	81
	16	ti-51	ground	(n,2n)	ti-50	ground	6.51E+00	2.00E+01	20
22051.30y	17	ti-51	ground	(n,3n)	ti-49	ground	1.77E+01	2.00E+01	8
	28	ti-51	ground	(n,n')p	sc-50	ground	1.55E+01	2.00E+01	12
	22	ti-51	ground	(n,n')a	ca-47	ground	1.72E+01	2.00E+01	10
	103	ti-51	ground	(n,p)	sc-51	ground	8.78E+00	2.00E+01	18
	107	ti-51	ground	(n,a)	ca-48	ground	6.96E+00	2.00E+01	19
	102	ti-51	ground	(n,g)	ti-52	ground	1.00E-10	2.00E+01	93
	102	v-47	ground	(n,g)	v-48	ground	1.00E-10	2.00E+01	102
	16	v-48	ground	(n,2n)	v-47	ground	1.07E+01	2.00E+01	15
	28	v-48	ground	(n,n')p	ti-47	ground	9.99E+00	2.00E+01	15
	22	v-48	ground	(n,n')a	sc-44	ground	1.70E+01	2.00E+01	10
23047.30y	1022	v-48	ground	(n,n')a	sc-44	2.71E-01	1.72E+01	2.00E+01	9
	103	v-48	ground	(n,p)	ti-48	ground	1.00E-10	2.00E+01	17
	107	v-48	ground	(n,a)	sc-45	ground	5.36E+00	2.00E+01	17
	102	v-48	ground	(n,g)	v-49	ground	1.00E-10	2.00E+01	102
	16	v-49	ground	(n,2n)	v-48	ground	1.18E+01	2.00E+01	15
	28	v-49	ground	(n,n')p	ti-48	ground	9.90E+00	2.00E+01	16
	22	v-49	ground	(n,n')a	sc-45	ground	1.72E+01	2.00E+01	9
	103	v-49	ground	(n,p)	ti-49	ground	1.75E+00	2.00E+01	22
	107	v-49	ground	(n,a)	sc-46	ground	8.17E+00	2.00E+01	17
	1107	v-49	ground	(n,a)	sc-46	1.42E-01	8.31E+00	2.00E+01	16
23050.30y	102	v-49	ground	(n,g)	v-50	ground	1.00E-10	2.00E+01	102
	16	v-50	ground	(n,2n)	v-49	ground	9.52E+00	2.00E+01	15
	28	v-50	ground	(n,n')p	ti-49	ground	1.11E+01	2.00E+01	17
	22	v-50	ground	(n,n')a	sc-46	ground	1.77E+01	2.00E+01	8

ZAID	MT	TARGET	E-TARG	REACTION	PRODUCT	E-PROD	EMIN	EMAX	NES
23051.30y	1022	v-50	ground	(n,n')a	sc-46	1.42E-01	1.78E+01	2.00E+01	9
	103	v-50	ground	(n,p)	ti-50	ground	8.18E-02	2.00E+01	21
	107	v-50	ground	(n,a)	sc-47	ground	6.79E+00	2.00E+01	17
	102	v-50	ground	(n,g)	v-51	ground	1.00E-10	2.00E+01	102
	16	v-51	ground	(n,2n)	v-50	ground	1.13E+01	2.00E+01	15
	28	v-51	ground	(n,n')p	ti-50	ground	1.12E+01	2.00E+01	15
	22	v-51	ground	(n,n')a	sc-47	ground	1.30E+01	2.00E+01	6
	103	v-51	ground	(n,p)	ti-51	ground	4.83E+00	2.00E+01	22
23052.30y	107	v-51	ground	(n,a)	sc-48	ground	9.00E+00	2.00E+01	6
	102	v-51	ground	(n,g)	v-52	ground	1.00E-10	2.00E+01	102
	16	v-52	ground	(n,2n)	v-51	ground	7.45E+00	2.00E+01	17
	17	v-52	ground	(n,3n)	v-50	ground	1.87E+01	2.00E+01	6
	28	v-52	ground	(n,n')p	ti-51	ground	1.21E+01	2.00E+01	15
	22	v-52	ground	(n,n')a	sc-48	ground	1.71E+01	2.00E+01	10
	103	v-52	ground	(n,p)	ti-52	ground	4.31E+00	2.00E+01	20
	107	v-52	ground	(n,a)	sc-49	ground	6.72E+00	2.00E+01	16
24049.30y	102	v-52	ground	(n,g)	v-53	ground	1.00E-10	2.00E+01	102
	16	cr-49	ground	(n,2n)	cr-48	ground	1.09E+01	2.00E+01	16
	28	cr-49	ground	(n,n')p	v-48	ground	1.16E+01	2.00E+01	10
	22	cr-49	ground	(n,n')a	ti-45	ground	1.71E+01	2.00E+01	8
	103	cr-49	ground	(n,p)	v-49	ground	1.00E-04	2.00E+01	22
	107	cr-49	ground	(n,a)	ti-46	ground	3.58E+00	2.00E+01	18
	102	cr-49	ground	(n,g)	cr-50	ground	1.00E-10	2.00E+01	102
	16	cr-50	ground	(n,2n)	cr-49	ground	1.32E+01	2.00E+01	11
24050.30y	28	cr-50	ground	(n,n')p	v-49	ground	1.30E+01	2.00E+01	11
	22	cr-50	ground	(n,n')a	ti-46	ground	1.68E+01	2.00E+01	10
	103	cr-50	ground	(n,p)	v-50	ground	3.60E+00	2.00E+01	23
	104	cr-50	ground	(n,d)	v-49	ground	1.13E+01	2.00E+01	14
	105	cr-50	ground	(n,t)	v-48	ground	1.35E+01	2.00E+01	12
	107	cr-50	ground	(n,a)	ti-47	ground	7.69E+00	2.00E+01	18
	102	cr-50	ground	(n,g)	cr-51	ground	1.00E-10	2.00E+01	102
	16	cr-51	ground	(n,2n)	cr-50	ground	9.44E+00	2.00E+01	15
24051.30y	28	cr-51	ground	(n,n')p	v-50	ground	1.29E+01	2.00E+01	9
	22	cr-51	ground	(n,n')a	ti-47	ground	1.71E+01	2.00E+01	9
	103	cr-51	ground	(n,p)	v-51	ground	1.76E+00	2.00E+01	23
	107	cr-51	ground	(n,a)	ti-48	ground	5.24E+00	2.00E+01	18
	102	cr-51	ground	(n,g)	cr-52	ground	1.00E-10	2.00E+01	102
	16	cr-52	ground	(n,2n)	cr-51	ground	1.23E+01	2.00E+01	12
	28	cr-52	ground	(n,n')p	v-50	ground	1.39E+01	2.00E+01	10
	22	cr-52	ground	(n,n')a	ti-48	ground	1.75E+01	2.00E+01	9
24052.30y	103	cr-52	ground	(n,p)	v-52	ground	4.50E+00	2.00E+01	16
	104	cr-52	ground	(n,d)	v-51	ground	1.19E+01	2.00E+01	14
	105	cr-52	ground	(n,t)	v-50	ground	1.40E+01	2.00E+01	11
	107	cr-52	ground	(n,a)	ti-49	ground	9.17E+00	2.00E+01	18
	102	cr-52	ground	(n,g)	cr-53	ground	1.00E-10	2.00E+01	102
	16	cr-53	ground	(n,2n)	cr-52	ground	8.09E+00	2.00E+01	14
	28	cr-53	ground	(n,n')p	v-52	ground	1.45E+01	2.00E+01	8
	22	cr-53	ground	(n,n')a	ti-49	ground	1.73E+01	2.00E+01	9
24053.30y	103	cr-53	ground	(n,p)	v-53	ground	5.97E+00	2.00E+01	19
	104	cr-53	ground	(n,d)	v-52	ground	1.25E+01	2.00E+01	13
	105	cr-53	ground	(n,t)	v-51	ground	1.36E+01	2.00E+01	14
	107	cr-53	ground	(n,a)	ti-50	ground	6.07E+00	2.00E+01	17
	102	cr-53	ground	(n,g)	cr-54	ground	1.00E-10	2.00E+01	102
	16	cr-54	ground	(n,2n)	cr-53	ground	9.90E+00	2.00E+01	17
	17	cr-54	ground	(n,3n)	cr-52	ground	1.80E+01	2.00E+01	8
	28	cr-54	ground	(n,n')p	v-53	ground	1.57E+01	2.00E+01	8
24054.30y	22	cr-54	ground	(n,n')a	ti-50	ground	1.60E+01	2.00E+01	12
	103	cr-54	ground	(n,p)	v-54	ground	9.50E+00	2.00E+01	18
	104	cr-54	ground	(n,d)	v-53	ground	1.37E+01	2.00E+01	14
	105	cr-54	ground	(n,t)	v-52	ground	1.35E+01	2.00E+01	13
	107	cr-54	ground	(n,a)	ti-51	ground	9.43E+00	2.00E+01	20
	102	cr-54	ground	(n,g)	cr-55	ground	1.00E-10	2.00E+01	102
	16	cr-55	ground	(n,2n)	cr-54	ground	6.37E+00	2.00E+01	22
	17	cr-55	ground	(n,3n)	cr-53	ground	1.63E+01	2.00E+01	13

ZAID	MT	TARGET	E-TARG	REACTION	PRODUCT	E-PROD	EMIN	EMAX	NES
24056.30y	28	cr-55	ground	(n,n')p	v-54	ground	1.59E+01	2.00E+01	8
	22	cr-55	ground	(n,n')a	ti-51	ground	1.58E+01	2.00E+01	12
	103	cr-55	ground	(n,p)	v-55	ground	8.95E+00	2.00E+01	19
	107	cr-55	ground	(n,a)	ti-52	ground	7.83E+00	2.00E+01	19
	102	cr-55	ground	(n,g)	cr-56	ground	1.00E-10	2.00E+01	102
	16	cr-56	ground	(n,2n)	cr-55	ground	8.37E+00	2.00E+01	25
	17	cr-56	ground	(n,3n)	cr-54	ground	1.47E+01	2.00E+01	15
	102	cr-56	ground	(n,g)	cr-57	ground	1.00E-10	2.00E+01	102
25051.30y	102	mn-51	ground	(n,g)	mn-52	3.77E-01	1.00E-10	2.00E+01	102
25052.30y	1102	mn-51	ground	(n,g)	mn-52	ground	1.00E-10	2.00E+01	102
	16	mn-52	ground	(n,2n)	mn-51	ground	1.07E+01	2.00E+01	16
25053.30y	28	mn-52	ground	(n,n')p	cr-51	ground	1.00E+01	2.00E+01	15
	22	mn-52	ground	(n,n')a	v-48	ground	1.73E+01	2.00E+01	9
	103	mn-52	ground	(n,p)	cr-52	ground	1.00E-10	2.00E+01	19
	107	mn-52	ground	(n,a)	v-49	ground	5.44E+00	2.00E+01	16
	102	mn-52	ground	(n,g)	mn-53	ground	1.00E-10	2.00E+01	102
	16	mn-53	ground	(n,2n)	mn-52	ground	1.23E+01	2.00E+01	16
	1016	mn-53	ground	(n,2n)	mn-52	3.77E-01	1.27E+01	2.00E+01	16
	28	mn-53	ground	(n,n')p	cr-52	ground	1.00E+01	2.00E+01	15
25054.30y	22	mn-53	ground	(n,n')a	v-49	ground	1.77E+01	2.00E+01	9
	103	mn-53	ground	(n,p)	cr-53	ground	2.07E+00	2.00E+01	23
	107	mn-53	ground	(n,a)	v-50	ground	8.17E+00	2.00E+01	17
	102	mn-53	ground	(n,g)	mn-54	ground	1.00E-10	2.00E+01	102
	16	mn-54	ground	(n,2n)	mn-53	ground	9.11E+00	2.00E+01	16
	28	mn-54	ground	(n,n')p	cr-53	ground	1.10E+01	2.00E+01	17
	22	mn-54	ground	(n,n')a	v-50	ground	1.73E+01	2.00E+01	9
	103	mn-54	ground	(n,p)	cr-54	ground	1.26E+00	2.00E+01	22
25055.30y	107	mn-54	ground	(n,a)	v-51	ground	5.98E+00	2.00E+01	17
	102	mn-54	ground	(n,g)	mn-55	ground	1.00E-10	2.00E+01	102
	16	mn-55	ground	(n,2n)	mn-54	ground	1.04E+01	2.00E+01	11
	28	mn-55	ground	(n,n')p	cr-54	ground	1.15E+01	2.00E+01	17
	22	mn-55	ground	(n,n')a	v-51	ground	1.64E+01	2.00E+01	10
	103	mn-55	ground	(n,p)	cr-55	ground	5.29E+00	2.00E+01	21
	104	mn-55	ground	(n,d)	cr-54	ground	9.55E+00	2.00E+01	14
	105	mn-55	ground	(n,t)	cr-53	ground	1.31E+01	2.00E+01	8
25056.30y	107	mn-55	ground	(n,a)	v-52	ground	8.92E+00	2.00E+01	18
	102	mn-55	ground	(n,g)	mn-56	ground	1.00E-10	2.00E+01	102
	16	mn-56	ground	(n,2n)	mn-55	ground	7.40E+00	2.00E+01	19
	17	mn-56	ground	(n,3n)	mn-54	ground	1.78E+01	2.00E+01	8
	28	mn-56	ground	(n,n')p	cr-55	ground	1.25E+01	2.00E+01	16
	22	mn-56	ground	(n,n')a	v-52	ground	1.63E+01	2.00E+01	11
	103	mn-56	ground	(n,p)	cr-56	ground	4.30E+00	2.00E+01	22
	107	mn-56	ground	(n,a)	v-53	ground	7.63E+00	2.00E+01	19
25057.30y	102	mn-56	ground	(n,g)	mn-57	ground	1.00E-10	2.00E+01	102
	16	mn-57	ground	(n,2n)	mn-56	ground	8.93E+00	2.00E+01	21
	17	mn-57	ground	(n,3n)	mn-55	ground	1.63E+01	2.00E+01	10
	28	mn-57	ground	(n,n')p	cr-56	ground	1.31E+01	2.00E+01	17
	22	mn-57	ground	(n,n')a	v-53	ground	1.66E+01	2.00E+01	9
	103	mn-57	ground	(n,p)	cr-57	ground	8.45E+00	2.00E+01	18
	107	mn-57	ground	(n,a)	v-54	ground	9.66E+00	2.00E+01	18
	102	mn-57	ground	(n,g)	mn-58	ground	1.00E-10	2.00E+01	102
25058.30y	16	mn-58	ground	(n,2n)	mn-57	ground	6.61E+00	2.00E+01	22
	17	mn-58	ground	(n,3n)	mn-56	ground	1.55E+01	2.00E+01	12
	102	mn-58	ground	(n,g)	mn-59	ground	1.00E-10	2.00E+01	102
	26053.30y	16	fe-53	ground	(n,2n)	fe-52	ground	1.09E+01	2.00E+01
28		fe-53	ground	(n,n')p	mn-52	ground	1.12E+01	2.00E+01	8
1028		fe-53	ground	(n,n')p	mn-52	3.77E-01	1.16E+01	2.00E+01	7
22		fe-53	ground	(n,n')a	cr-49	ground	1.70E+01	2.00E+01	9
103		fe-53	ground	(n,p)	mn-53	ground	1.00E-04	2.00E+01	21
107		fe-53	ground	(n,a)	cr-50	ground	3.75E+00	2.00E+01	17
102		fe-53	ground	(n,g)	fe-54	ground	1.00E-10	2.00E+01	102
26054.30y		16	fe-54	ground	(n,2n)	fe-53	ground	1.36E+01	2.00E+01
	28	fe-54	ground	(n,n')p	mn-53	ground	1.25E+01	2.00E+01	8
	22	fe-54	ground	(n,n')a	cr-50	ground	1.74E+01	2.00E+01	9

ZAID	MT	TARGET	E-TARG	REACTION	PRODUCT	E-PROD	EMIN	EMAX	NES
26055.30y	103	fe-54	ground	(n,p)	mn-54	ground	5.00E-02	2.00E+01	23
	104	fe-54	ground	(n,d)	mn-53	ground	1.06E+01	2.00E+01	13
	105	fe-54	ground	(n,t)	mn-52	ground	1.35E+01	2.00E+01	11
	1105	fe-54	ground	(n,t)	mn-52	3.77E-01	1.39E+01	2.00E+01	9
	107	fe-54	ground	(n,a)	cr-51	ground	5.00E-02	2.00E+01	20
	102	fe-54	ground	(n,g)	fe-55	ground	1.00E-10	2.00E+01	102
	16	fe-55	ground	(n,2n)	fe-54	ground	9.47E+00	2.00E+01	15
	28	fe-55	ground	(n,n')p	mn-54	ground	1.28E+01	2.00E+01	8
	22	fe-55	ground	(n,n')a	cr-51	ground	1.74E+01	2.00E+01	9
	103	fe-55	ground	(n,p)	mn-55	ground	2.61E+00	2.00E+01	22
26056.30y	107	fe-55	ground	(n,a)	cr-52	ground	5.08E+00	2.00E+01	18
	102	fe-55	ground	(n,g)	fe-56	ground	1.00E-10	2.00E+01	102
	16	fe-56	ground	(n,2n)	fe-55	ground	1.14E+01	2.00E+01	15
	28	fe-56	ground	(n,n')p	mn-55	ground	1.38E+01	2.00E+01	7
	22	fe-56	ground	(n,n')a	cr-52	ground	1.65E+01	2.00E+01	9
	103	fe-56	ground	(n,p)	mn-56	ground	3.50E+00	2.00E+01	19
	104	fe-56	ground	(n,d)	mn-55	ground	1.19E+01	2.00E+01	10
	105	fe-56	ground	(n,t)	mn-54	ground	1.34E+01	2.00E+01	11
	107	fe-56	ground	(n,a)	cr-53	ground	8.36E+00	2.00E+01	18
	102	fe-56	ground	(n,g)	fe-57	ground	1.00E-10	2.00E+01	102
26057.30y	16	fe-57	ground	(n,2n)	fe-56	ground	7.78E+00	2.00E+01	17
	17	fe-57	ground	(n,3n)	fe-55	ground	1.92E+01	2.00E+01	4
	28	fe-57	ground	(n,n')p	mn-56	ground	1.42E+01	2.00E+01	10
	22	fe-57	ground	(n,n')a	cr-53	ground	1.61E+01	2.00E+01	10
	103	fe-57	ground	(n,p)	mn-57	ground	5.42E+00	2.00E+01	20
	104	fe-57	ground	(n,d)	fe-56	ground	1.23E+01	2.00E+01	13
	105	fe-57	ground	(n,t)	mn-55	ground	1.33E+01	2.00E+01	10
	107	fe-57	ground	(n,a)	cr-54	ground	6.21E+00	2.00E+01	19
	102	fe-57	ground	(n,g)	fe-58	ground	1.00E-10	2.00E+01	102
	16	fe-58	ground	(n,2n)	fe-57	ground	1.02E+01	2.00E+01	18
26058.30y	17	fe-58	ground	(n,3n)	fe-56	ground	1.80E+01	2.00E+01	9
	28	fe-58	ground	(n,n')p	mn-57	ground	1.54E+01	2.00E+01	7
	22	fe-58	ground	(n,n')a	cr-54	ground	1.64E+01	2.00E+01	11
	103	fe-58	ground	(n,p)	mn-58	ground	9.00E+00	2.00E+01	20
	105	fe-58	ground	(n,t)	mn-56	ground	1.40E+01	2.00E+01	14
	107	fe-58	ground	(n,a)	cr-55	ground	1.00E+01	2.00E+01	18
	102	fe-58	ground	(n,g)	fe-59	ground	1.00E-10	2.00E+01	102
	16	fe-59	ground	(n,2n)	fe-58	ground	6.70E+00	2.00E+01	21
	17	fe-59	ground	(n,3n)	fe-57	ground	1.69E+01	2.00E+01	9
	28	fe-59	ground	(n,n')p	mn-58	ground	1.55E+01	2.00E+01	7
26059.30y	22	fe-59	ground	(n,n')a	cr-55	ground	1.67E+01	2.00E+01	10
	103	fe-59	ground	(n,p)	mn-59	ground	8.60E+00	2.00E+01	18
	107	fe-59	ground	(n,a)	cr-56	ground	8.33E+00	2.00E+01	17
	102	fe-59	ground	(n,g)	fe-60	ground	1.00E-10	2.00E+01	102
	16	fe-60	ground	(n,2n)	fe-59	ground	8.99E+00	2.00E+01	22
	17	fe-60	ground	(n,3n)	fe-58	ground	1.57E+01	2.00E+01	12
	102	fe-60	ground	(n,g)	fe-61	ground	1.00E-10	2.00E+01	102
	16	co-57	ground	(n,2n)	co-56	ground	1.16E+01	2.00E+01	8
	28	co-57	ground	(n,n')p	fe-56	ground	6.84E+00	2.00E+01	13
	22	co-57	ground	(n,n')a	mn-53	ground	9.50E+00	2.00E+01	10
27057.30y	103	co-57	ground	(n,p)	fe-57	ground	1.00E-10	2.00E+01	47
	107	co-57	ground	(n,a)	mn-54	ground	1.00E+00	2.00E+01	18
	102	co-57	ground	(n,g)	co-58	2.49E-02	1.00E-10	2.00E+01	102
	1102	co-57	ground	(n,g)	co-58	ground	1.00E-10	2.00E+01	102
	4	co-58	ground	(n,n')	co-58	2.49E-02	2.53E-02	2.00E+01	30
	16	co-58	ground	(n,2n)	co-57	ground	8.72E+00	2.00E+01	11
	28	co-58	ground	(n,n')p	fe-57	ground	1.07E+01	2.00E+01	16
	22	co-58	ground	(n,n')a	mn-54	ground	1.00E+01	2.00E+01	9
	103	co-58	ground	(n,p)	fe-58	ground	6.46E-01	2.00E+01	23
	107	co-58	ground	(n,a)	mn-55	ground	1.00E-10	2.00E+01	60
27058.31y	102	co-58	ground	(n,g)	co-59	ground	1.00E-10	2.00E+01	102
	4	co-58	2.49E-02	(n,n')	co-58	ground	1.00E-10	2.00E+01	51
	16	co-58	2.49E-02	(n,2n)	co-57	ground	8.69E+00	2.00E+01	11
	28	co-58	2.49E-02	(n,n')p	fe-57	ground	1.07E+01	2.00E+01	16

ZAID	MT	TARGET	E-TARG	REACTION	PRODUCT	E-PROD	EMIN	EMAX	NES
27059.30y	22	co-58	2.49E-02	(n,n')a	mn-54	ground	9.98E+00	2.00E+01	9
	103	co-58	2.49E-02	(n,p)	fe-58	ground	6.21E-01	2.00E+01	23
	107	co-58	2.49E-02	(n,a)	mn-55	ground	1.00E-10	2.00E+01	58
	102	co-58	2.49E-02	(n,g)	co-59	ground	1.00E-10	2.00E+01	102
	16	co-59	ground	(n,2n)	co-58	ground	1.06E+01	2.00E+01	13
	1016	co-59	ground	(n,2n)	co-58	2.49E-02	1.07E+01	2.00E+01	13
	28	co-59	ground	(n,n')p	fe-58	ground	8.19E+00	2.00E+01	11
	22	co-59	ground	(n,n')a	mn-55	ground	9.37E+00	2.00E+01	10
	103	co-59	ground	(n,p)	fe-59	ground	1.29E+00	2.00E+01	19
	104	co-59	ground	(n,d)	fe-58	ground	5.23E+00	2.00E+01	4
27060.30y	105	co-59	ground	(n,t)	fe-57	ground	9.08E+00	2.00E+01	4
	107	co-59	ground	(n,a)	mn-56	ground	4.90E+00	2.00E+01	30
	102	co-59	ground	(n,g)	co-60	5.86E-02	1.00E-10	2.00E+01	102
	1102	co-59	ground	(n,g)	co-60	ground	1.00E-10	2.00E+01	102
	4	co-60	ground	(n,n')	co-60	5.86E-02	5.96E-02	2.00E+01	29
	16	co-60	ground	(n,2n)	co-59	ground	7.62E+00	2.00E+01	12
	17	co-60	ground	(n,3n)	co-58	ground	1.82E+01	2.00E+01	2
	1017	co-60	ground	(n,3n)	co-58	2.49E-02	1.83E+01	2.00E+01	2
	28	co-60	ground	(n,n')p	fe-59	ground	1.00E+01	2.00E+01	9
	22	co-60	ground	(n,n')a	mn-56	ground	1.30E+01	2.00E+01	6
27060.31y	103	co-60	ground	(n,p)	fe-60	ground	5.00E-01	2.00E+01	20
	107	co-60	ground	(n,a)	mn-57	ground	2.00E+00	2.00E+01	17
	102	co-60	ground	(n,g)	co-61	ground	1.00E-10	2.00E+01	102
	4	co-60	5.86E-02	(n,n')	co-60	ground	1.00E-10	2.00E+01	58
	16	co-60	5.86E-02	(n,2n)	co-59	ground	7.56E+00	2.00E+01	12
	17	co-60	5.86E-02	(n,3n)	co-58	ground	1.82E+01	2.00E+01	2
	1017	co-60	5.86E-02	(n,3n)	co-58	2.49E-02	1.82E+01	2.00E+01	2
	28	co-60	5.86E-02	(n,n')p	fe-59	ground	9.94E+00	2.00E+01	9
	22	co-60	5.86E-02	(n,n')a	mn-56	ground	1.29E+01	2.00E+01	6
	103	co-60	5.86E-02	(n,p)	fe-60	ground	4.40E-01	2.00E+01	23
27061.30y	107	co-60	5.86E-02	(n,a)	mn-57	ground	1.94E+00	2.00E+01	17
	102	co-60	5.86E-02	(n,g)	co-61	ground	1.00E-10	2.00E+01	102
	16	co-61	ground	(n,2n)	co-60	ground	9.49E+00	2.00E+01	20
	1016	co-61	ground	(n,2n)	co-60	5.86E-02	9.55E+00	2.00E+01	20
	17	co-61	ground	(n,3n)	co-59	ground	1.71E+01	2.00E+01	10
	28	co-61	ground	(n,n')p	fe-60	ground	1.25E+01	2.00E+01	17
	103	co-61	ground	(n,p)	fe-61	ground	6.90E+00	2.00E+01	21
	102	co-61	ground	(n,g)	co-62	2.50E-02	1.00E-10	2.00E+01	102
	1102	co-61	ground	(n,g)	co-62	ground	1.00E-10	2.00E+01	102
	4	co-62	ground	(n,n')	co-62	2.50E-02	2.54E-02	2.00E+01	30
27062.30y	16	co-62	ground	(n,2n)	co-61	ground	6.79E+00	2.00E+01	22
	17	co-62	ground	(n,3n)	co-60	ground	1.63E+01	2.00E+01	12
	1017	co-62	ground	(n,3n)	co-60	5.86E-02	1.63E+01	2.00E+01	12
	28	co-62	ground	(n,n')p	fe-61	ground	1.35E+01	2.00E+01	17
	103	co-62	ground	(n,p)	fe-62	ground	5.88E+00	2.00E+01	22
	102	co-62	ground	(n,g)	co-63	ground	1.00E-10	2.00E+01	102
	4	co-62	2.50E-02	(n,n')	co-62	ground	1.00E-10	2.00E+01	58
	16	co-62	2.50E-02	(n,2n)	co-61	ground	6.76E+00	2.00E+01	22
	17	co-62	2.50E-02	(n,3n)	co-60	ground	1.63E+01	2.00E+01	12
	1017	co-62	2.50E-02	(n,3n)	co-60	5.86E-02	1.63E+01	2.00E+01	12
27062.31y	28	co-62	2.50E-02	(n,n')p	fe-61	ground	1.35E+01	2.00E+01	17
	103	co-62	2.50E-02	(n,p)	fe-62	ground	5.85E+00	2.00E+01	22
	102	co-62	2.50E-02	(n,g)	co-63	ground	1.00E-10	2.00E+01	102
	16	co-63	ground	(n,2n)	co-62	ground	8.53E+00	2.00E+01	23
	1016	co-63	ground	(n,2n)	co-62	2.50E-02	8.56E+00	2.00E+01	24
	17	co-63	ground	(n,3n)	co-61	ground	1.53E+01	2.00E+01	12
	102	co-63	ground	(n,g)	co-64	ground	1.00E-10	2.00E+01	102
	16	co-64	ground	(n,2n)	co-63	ground	6.42E+00	2.00E+01	23
	17	co-64	ground	(n,3n)	co-62	ground	1.49E+01	2.00E+01	14
	1017	co-64	ground	(n,3n)	co-62	2.50E-02	1.50E+01	2.00E+01	14
27064.30y	102	co-64	ground	(n,g)	co-65	ground	1.00E-10	2.00E+01	102
	16	ni-57	ground	(n,2n)	ni-56	ground	1.04E+01	2.00E+01	9
	28	ni-57	ground	(n,n')p	co-56	ground	7.98E+00	2.00E+01	11
	22	ni-57	ground	(n,n')a	fe-53	ground	1.35E+01	2.00E+01	6

ZAID	MT	TARGET	E-TARG	REACTION	PRODUCT	E-PROD	EMIN	EMAX	NES
28058.30y	103	ni-57	ground	(n,p)	co-57	ground	8.50E-02	2.00E+01	14
	107	ni-57	ground	(n,a)	fe-54	ground	1.00E-10	2.00E+01	58
	102	ni-57	ground	(n,g)	ni-58	ground	1.00E-10	2.00E+01	110
	16	ni-58	ground	(n,2n)	ni-57	ground	1.24E+01	2.00E+01	11
	28	ni-58	ground	(n,n')p	co-57	ground	8.82E+00	2.00E+01	10
	22	ni-58	ground	(n,n')a	fe-54	ground	9.75E+00	2.00E+01	10
	103	ni-58	ground	(n,p)	co-58	ground	6.00E-01	2.00E+01	23
	1103	ni-58	ground	(n,p)	co-58	2.49E-02	6.25E-01	2.00E+01	23
	104	ni-58	ground	(n,d)	co-57	ground	1.02E+01	2.00E+01	14
	105	ni-58	ground	(n,t)	co-56	ground	1.40E+01	2.00E+01	13
28059.30y	107	ni-58	ground	(n,a)	fe-55	ground	5.00E-01	2.00E+01	22
	102	ni-58	ground	(n,g)	ni-59	ground	1.00E-10	2.00E+01	110
	16	ni-59	ground	(n,2n)	ni-58	ground	9.15E+00	2.00E+01	10
	28	ni-59	ground	(n,n')p	co-58	ground	1.00E+01	2.00E+01	9
	1028	ni-59	ground	(n,n')p	co-58	2.49E-02	1.00E+01	2.00E+01	9
	22	ni-59	ground	(n,n')a	fe-55	ground	9.50E+00	2.00E+01	10
	103	ni-59	ground	(n,p)	co-59	ground	8.00E-04	2.00E+01	36
	107	ni-59	ground	(n,a)	fe-56	ground	1.00E-10	2.00E+01	58
	102	ni-59	ground	(n,g)	ni-60	ground	1.00E-10	2.00E+01	110
	16	ni-60	ground	(n,2n)	ni-59	ground	1.16E+01	2.00E+01	8
28060.30y	28	ni-60	ground	(n,n')p	co-59	ground	1.05E+01	2.00E+01	9
	22	ni-60	ground	(n,n')a	fe-56	ground	9.75E+00	2.00E+01	10
	103	ni-60	ground	(n,p)	co-60	ground	2.07E+00	2.00E+01	20
	1103	ni-60	ground	(n,p)	co-60	5.86E-02	2.13E+00	2.00E+01	19
	104	ni-60	ground	(n,d)	co-59	ground	1.16E+01	2.00E+01	14
	105	ni-60	ground	(n,t)	co-58	ground	1.34E+01	2.00E+01	12
	1105	ni-60	ground	(n,t)	co-58	2.49E-02	1.34E+01	2.00E+01	12
	107	ni-60	ground	(n,a)	fe-57	ground	2.50E+00	2.00E+01	17
	102	ni-60	ground	(n,g)	ni-61	ground	1.00E-10	2.00E+01	110
	16	ni-61	ground	(n,2n)	ni-60	ground	7.95E+00	2.00E+01	11
28061.30y	28	ni-61	ground	(n,n')p	co-60	ground	1.25E+01	2.00E+01	7
	1028	ni-61	ground	(n,n')p	co-60	5.86E-02	1.26E+01	2.00E+01	7
	22	ni-61	ground	(n,n')a	fe-57	ground	1.05E+01	2.00E+01	9
	103	ni-61	ground	(n,p)	co-61	ground	2.25E+00	2.00E+01	18
	104	ni-61	ground	(n,d)	co-60	ground	1.19E+01	2.00E+01	14
	1104	ni-61	ground	(n,d)	co-60	5.86E-02	1.19E+01	2.00E+01	13
	105	ni-61	ground	(n,t)	co-59	ground	1.32E+01	2.00E+01	13
	107	ni-61	ground	(n,a)	fe-58	ground	1.50E-01	2.00E+01	22
	102	ni-61	ground	(n,g)	ni-62	ground	1.00E-10	2.00E+01	110
	16	ni-62	ground	(n,2n)	ni-61	ground	1.08E+01	2.00E+01	9
28062.30y	28	ni-62	ground	(n,n')p	co-61	ground	1.30E+01	2.00E+01	6
	22	ni-62	ground	(n,n')a	fe-58	ground	1.17E+01	2.00E+01	8
	103	ni-62	ground	(n,p)	co-62	ground	6.50E+00	2.00E+01	13
	1103	ni-62	ground	(n,p)	co-62	2.50E-02	6.53E+00	2.00E+01	13
	104	ni-62	ground	(n,d)	co-61	ground	1.32E+01	2.00E+01	13
	105	ni-62	ground	(n,t)	co-60	ground	1.37E+01	2.00E+01	11
	1105	ni-62	ground	(n,t)	co-60	5.86E-02	1.39E+01	2.00E+01	12
	107	ni-62	ground	(n,a)	fe-59	ground	5.50E+00	2.00E+01	14
	102	ni-62	ground	(n,g)	ni-63	ground	1.00E-10	2.00E+01	110
	16	ni-63	ground	(n,2n)	ni-62	ground	6.95E+00	2.00E+01	12
28063.30y	17	ni-63	ground	(n,3n)	ni-61	ground	1.77E+01	2.00E+01	3
	28	ni-63	ground	(n,n')p	co-62	ground	1.45E+01	2.00E+01	5
	1028	ni-63	ground	(n,n')p	co-62	2.50E-02	1.45E+01	2.00E+01	5
	22	ni-63	ground	(n,n')a	fe-59	ground	1.25E+01	2.00E+01	7
	103	ni-63	ground	(n,p)	co-63	ground	5.00E+00	2.00E+01	14
	107	ni-63	ground	(n,a)	fe-60	ground	3.50E+00	2.00E+01	15
	102	ni-63	ground	(n,g)	ni-64	ground	1.00E-10	2.00E+01	110
	16	ni-64	ground	(n,2n)	ni-63	ground	9.81E+00	2.00E+01	10
	17	ni-64	ground	(n,3n)	ni-62	ground	1.67E+01	2.00E+01	3
	28	ni-64	ground	(n,n')p	co-63	ground	1.55E+01	2.00E+01	4
28064.30y	22	ni-64	ground	(n,n')a	fe-60	ground	1.35E+01	2.00E+01	6
	103	ni-64	ground	(n,p)	co-64	ground	8.50E+00	2.00E+01	11
	104	ni-64	ground	(n,d)	co-63	ground	1.38E+01	2.00E+01	14
	105	ni-64	ground	(n,t)	co-62	ground	1.38E+01	2.00E+01	10

ZAID	MT	TARGET	E-TARG	REACTION	PRODUCT	E-PROD	EMIN	EMAX	NES
28065.30y	107	ni-64	ground	(n,a)	fe-61	ground	7.00E+00	2.00E+01	12
	102	ni-64	ground	(n,g)	ni-65	ground	1.00E-10	2.00E+01	110
	16	ni-65	ground	(n,2n)	ni-64	ground	6.19E+00	2.00E+01	13
	17	ni-65	ground	(n,3n)	ni-63	ground	1.60E+01	2.00E+01	3
	28	ni-65	ground	(n,n')p	co-64	ground	1.70E+01	2.00E+01	3
	22	ni-65	ground	(n,n')a	fe-61	ground	1.45E+01	2.00E+01	5
29062.30y	103	ni-65	ground	(n,p)	co-65	ground	7.50E+00	2.00E+01	9
	107	ni-65	ground	(n,a)	fe-62	ground	4.50E+00	2.00E+01	15
	102	ni-65	ground	(n,g)	ni-66	ground	1.00E-10	2.00E+01	110
	16	cu-62	ground	(n,2n)	cu-61	ground	9.03E+00	2.00E+01	16
	28	cu-62	ground	(n,n')p	ni-61	ground	6.47E+00	2.00E+01	15
	22	cu-62	ground	(n,n')a	co-58	ground	7.87E+00	2.00E+01	13
29063.30y	1022	cu-62	ground	(n,n')a	co-58	2.49E-02	7.89E+00	2.00E+01	13
	103	cu-62	ground	(n,p)	ni-62	ground	8.50E-02	2.00E+01	12
	107	cu-62	ground	(n,a)	co-59	ground	1.00E-10	2.00E+01	58
	102	cu-62	ground	(n,g)	cu-63	ground	1.00E-10	2.00E+01	112
	16	cu-63	ground	(n,2n)	cu-62	ground	1.10E+01	2.00E+01	10
	28	cu-63	ground	(n,n')p	ni-62	ground	7.75E+00	2.00E+01	26
29064.30y	22	cu-63	ground	(n,n')a	co-59	ground	1.20E+01	2.00E+01	17
	103	cu-63	ground	(n,p)	ni-63	ground	1.00E+00	2.00E+01	27
	107	cu-63	ground	(n,a)	co-60	5.86E-02	5.36E+00	2.00E+01	25
	1107	cu-63	ground	(n,a)	co-60	ground	5.30E+00	2.00E+01	25
	102	cu-63	ground	(n,g)	cu-64	ground	1.00E-10	2.00E+01	112
	16	cu-64	ground	(n,2n)	cu-63	ground	8.04E+00	2.00E+01	18
29065.30y	17	cu-64	ground	(n,3n)	cu-62	ground	1.91E+01	2.00E+01	5
	28	cu-64	ground	(n,n')p	ni-63	ground	7.81E+00	2.00E+01	15
	22	cu-64	ground	(n,n')a	co-60	ground	1.15E+01	2.00E+01	10
	1022	cu-64	ground	(n,n')a	co-60	5.86E-02	1.16E+01	2.00E+01	10
	103	cu-64	ground	(n,p)	ni-64	ground	1.60E+00	2.00E+01	14
	107	cu-64	ground	(n,a)	co-61	ground	3.90E+00	2.00E+01	18
29066.30y	102	cu-64	ground	(n,g)	cu-65	ground	1.00E-10	2.00E+01	112
	16	cu-65	ground	(n,2n)	cu-64	ground	1.01E+01	2.00E+01	35
	17	cu-65	ground	(n,3n)	cu-63	ground	1.81E+01	2.00E+01	9
	28	cu-65	ground	(n,n')p	ni-64	ground	8.30E+00	2.00E+01	25
	22	cu-65	ground	(n,n')a	co-61	ground	1.32E+01	2.00E+01	15
	103	cu-65	ground	(n,p)	ni-65	ground	2.50E+00	2.00E+01	22
30064.30y	107	cu-65	ground	(n,a)	co-62	ground	6.50E+00	2.00E+01	25
	1107	cu-65	ground	(n,a)	co-62	2.50E-02	6.53E+00	2.00E+01	25
	102	cu-65	ground	(n,g)	cu-66	ground	1.00E-10	2.00E+01	109
	16	cu-66	ground	(n,2n)	cu-65	ground	7.17E+00	2.00E+01	14
	17	cu-66	ground	(n,3n)	cu-64	ground	1.72E+01	2.00E+01	4
	28	cu-66	ground	(n,n')p	ni-65	ground	1.10E+01	2.00E+01	10
30066.30y	22	cu-66	ground	(n,n')a	co-62	ground	1.45E+01	2.00E+01	7
	1022	cu-66	ground	(n,n')a	co-62	2.50E-02	1.45E+01	2.00E+01	7
	103	cu-66	ground	(n,p)	ni-66	ground	3.60E+00	2.00E+01	18
	107	cu-66	ground	(n,a)	co-63	ground	1.12E+01	2.00E+01	10
	102	cu-66	ground	(n,g)	cu-67	ground	1.00E-10	2.00E+01	112
	16	zn-64	ground	(n,2n)	zn-63	ground	1.24E+01	2.00E+01	74
30067.30y	28	zn-64	ground	(n,n')p	cu-63	ground	1.20E+01	2.00E+01	16
	22	zn-64	ground	(n,n')a	ni-60	ground	1.43E+01	2.00E+01	14
	103	zn-64	ground	(n,p)	cu-64	ground	1.00E-01	2.00E+01	35
	107	zn-64	ground	(n,a)	ni-61	ground	6.30E+00	2.00E+01	24
	102	zn-64	ground	(n,g)	zn-65	ground	1.00E-10	2.00E+01	102
	16	zn-66	ground	(n,2n)	zn-65	ground	1.12E+01	2.00E+01	91
30067.30y	28	zn-66	ground	(n,n')p	cu-65	ground	1.31E+01	2.00E+01	16
	22	zn-66	ground	(n,n')a	ni-62	ground	1.48E+01	2.00E+01	13
	103	zn-66	ground	(n,p)	cu-66	ground	4.15E+00	2.00E+01	22
	107	zn-66	ground	(n,a)	ni-63	ground	7.85E+00	2.00E+01	24
	102	zn-66	ground	(n,g)	zn-67	ground	1.00E-10	2.00E+01	102
	16	zn-67	ground	(n,2n)	zn-66	ground	7.16E+00	2.00E+01	16
30067.30y	28	zn-67	ground	(n,n')p	cu-66	ground	1.31E+01	2.00E+01	17
	22	zn-67	ground	(n,n')a	ni-63	ground	1.50E+01	2.00E+01	13
	103	zn-67	ground	(n,p)	cu-67	ground	4.03E+00	2.00E+01	22
	107	zn-67	ground	(n,a)	ni-64	ground	5.17E+00	2.00E+01	23

ZAID	MT	TARGET	E-TARG	REACTION	PRODUCT	E-PROD	EMIN	EMAX	NES
30068.30y	102	zn-67	ground	(n,g)	zn-68	ground	1.00E-10	2.00E+01	102
	16	zn-68	ground	(n,2n)	zn-67	ground	1.03E+01	2.00E+01	15
	28	zn-68	ground	(n,n')p	cu-67	ground	1.42E+01	2.00E+01	16
	22	zn-68	ground	(n,n')a	ni-64	ground	1.55E+01	2.00E+01	12
	103	zn-68	ground	(n,p)	cu-68	ground	8.12E+00	2.00E+01	22
	1103	zn-68	ground	(n,p)	cu-68	7.21E-01	8.84E+00	2.00E+01	14
	107	zn-68	ground	(n,a)	ni-65	ground	9.29E+00	2.00E+01	22
	102	zn-68	ground	(n,g)	zn-69	4.39E-01	1.00E-10	2.00E+01	102
30070.30y	1102	zn-68	ground	(n,g)	zn-69	ground	1.00E-10	2.00E+01	102
	16	zn-70	ground	(n,2n)	zn-79	ground	9.35E+00	2.00E+01	15
	1016	zn-70	ground	(n,2n)	zn-69	1.57E-01	9.50E+00	2.00E+01	15
	22	zn-70	ground	(n,n')a	ni-66	ground	1.61E+01	2.00E+01	11
	103	zn-70	ground	(n,p)	cu-70	ground	9.66E+00	2.00E+01	14
	1103	zn-70	ground	(n,p)	cu-70	1.40E-01	9.80E+00	2.00E+01	14
	107	zn-70	ground	(n,a)	ni-67	ground	1.04E+01	2.00E+01	20
	102	zn-70	ground	(n,g)	zn-71	1.57E-01	1.00E-10	2.00E+01	102
31069.30y	1102	zn-70	ground	(n,g)	zn-71	ground	1.00E-10	2.00E+01	102
	16	ga-69	ground	(n,2n)	ga-68	ground	1.05E+01	2.00E+01	96
31071.30y	16	ga-71	ground	(n,2n)	ga-70	ground	9.70E+00	2.00E+01	104
32070.30y	102	ga-71	ground	(n,g)	ga-72	ground	1.00E-10	2.00E+01	101
	16	ge-70	ground	(n,2n)	ge-69	ground	1.17E+01	2.00E+01	14
	28	ge-70	ground	(n,n')p	ga-69	ground	1.31E+01	2.00E+01	15
	22	ge-70	ground	(n,n')a	zn-66	ground	1.49E+01	2.00E+01	14
32072.30y	103	ge-70	ground	(n,p)	ga-70	ground	5.49E+00	2.00E+01	21
	107	ge-70	ground	(n,a)	zn-67	ground	7.73E+00	2.00E+01	24
	102	ge-70	ground	(n,g)	ge-71	ground	1.00E-10	2.00E+01	102
	16	ge-72	ground	(n,2n)	ge-71	ground	1.09E+01	2.00E+01	18
	17	ge-72	ground	(n,3n)	ge-70	ground	1.84E+01	2.00E+01	7
	28	ge-72	ground	(n,n')p	ga-71	ground	1.42E+01	2.00E+01	16
	22	ge-72	ground	(n,n')a	zn-68	ground	1.58E+01	2.00E+01	12
	103	ge-72	ground	(n,p)	ga-72	ground	7.82E+00	2.00E+01	21
32073.30y	107	ge-72	ground	(n,a)	zn-69	4.39E-01	9.16E+00	2.00E+01	21
	102	ge-72	ground	(n,g)	ge-73	ground	1.00E-10	2.00E+01	102
	16	ge-73	ground	(n,2n)	ge-72	ground	6.87E+00	2.00E+01	20
	17	ge-73	ground	(n,3n)	ge-71	ground	1.78E+01	2.00E+01	8
	28	ge-73	ground	(n,n')p	ga-72	ground	1.45E+01	2.00E+01	16
	22	ge-73	ground	(n,n')a	zn-69	ground	1.60E+01	2.00E+01	11
	103	ge-73	ground	(n,p)	ga-73	ground	5.34E+00	2.00E+01	22
	107	ge-73	ground	(n,a)	zn-70	ground	6.65E+00	2.00E+01	22
32074.30y	102	ge-73	ground	(n,g)	ge-74	ground	1.00E-10	2.00E+01	102
	16	ge-74	ground	(n,2n)	ge-73	ground	1.03E+01	2.00E+01	20
	17	ge-74	ground	(n,3n)	ge-72	ground	1.72E+01	2.00E+01	11
	28	ge-74	ground	(n,n')p	ga-73	ground	1.55E+01	2.00E+01	15
	22	ge-74	ground	(n,n')a	zn-70	ground	1.70E+01	2.00E+01	10
	103	ge-74	ground	(n,p)	ga-74	ground	9.22E+00	2.00E+01	20
	107	ge-74	ground	(n,a)	zn-71	ground	1.10E+01	2.00E+01	18
	102	ge-74	ground	(n,g)	ge-75	ground	1.00E-10	2.00E+01	102
32076.30y	1102	ge-74	ground	(n,g)	ge-75	1.40E-01	1.00E-10	2.00E+01	102
	16	ge-76	ground	(n,2n)	ge-75	ground	9.55E+00	2.00E+01	21
	17	ge-76	ground	(n,3n)	ge-74	ground	1.69E+01	2.00E+01	11
	28	ge-76	ground	(n,n')p	ga-75	ground	1.56E+01	2.00E+01	15
	22	ge-76	ground	(n,n')a	zn-72	ground	1.82E+01	2.00E+01	8
	103	ge-76	ground	(n,p)	ga-76	ground	1.06E+01	2.00E+01	19
	107	ge-76	ground	(n,a)	zn-73	ground	1.31E+01	2.00E+01	17
	102	ge-76	ground	(n,g)	ge-77	ground	1.00E-10	2.00E+01	102
33075.30y	1102	ge-76	ground	(n,g)	ge-77	1.60E-01	1.00E-10	2.00E+01	102
	16	as-75	ground	(n,2n)	as-74	ground	1.04E+01	2.00E+01	98
	103	as-75	ground	(n,p)	ge-75	ground	4.10E+00	2.00E+01	160
	107	as-75	ground	(n,a)	ga-72	ground	7.60E+00	2.00E+01	125
34074.30y	102	as-75	ground	(n,g)	as-76	ground	1.00E-10	2.00E+01	102
34076.30y	16	se-74	ground	(n,2n)	se-73	ground	1.24E+01	2.00E+01	77
34080.30y	16	se-80	ground	(n,2n)	se-79	ground	1.01E+01	2.00E+01	100
34082.30y	16	se-82	ground	(n,2n)	se-81	ground	9.38E+00	2.00E+01	109

ZAID	MT	TARGET	E-TARG	REACTION	PRODUCT	E-PROD	EMIN	EMAX	NES
35079.30y	16	br-79	ground	(n,2n)	br-78	ground	1.09E+01	2.00E+01	92
	103	br-79	ground	(n,p)	se-79	ground	4.34E+00	2.00E+01	20
	107	br-79	ground	(n,a)	as-76	ground	9.60E+00	2.00E+01	13
35081.30y	16	br-81	ground	(n,2n)	br-80	ground	1.03E+01	2.00E+01	96
	1016	br-81	ground	(n,2n)	br-80	8.59E-02	1.09E+01	2.00E+01	92
	22	br-81	ground	(n,n')a	as-77	ground	1.10E+01	2.00E+01	16
	102	br-81	ground	(n,g)	br-82	ground	1.00E-10	2.00E+01	135
37085.30y	16	rb-85	ground	(n,2n)	rb-84	ground	1.07E+01	2.00E+01	94
37087.30y	16	rb-87	ground	(n,2n)	rb-86	ground	1.04E+01	2.00E+01	97
38084.30y	16	sr-84	ground	(n,2n)	sr-83	ground	1.22E+01	2.00E+01	79
38086.30y	22	sr-86	ground	(n,n')a	kr-82	ground	1.35E+01	2.00E+01	5
	107	sr-86	ground	(n,a)	kr-83	1.46E-02	1.10E+01	2.00E+01	7
39089.30y	16	y-89	ground	(n,2n)	y-88	ground	1.16E+01	2.00E+01	13
	28	y-89	ground	(n,n')p	sr-88	ground	1.24E+01	2.00E+01	17
	103	y-89	ground	(n,p)	sr-89	ground	6.23E+00	2.00E+01	21
	104	y-89	ground	(n,d)	sr-88	ground	1.02E+01	2.00E+01	15
	107	y-89	ground	(n,a)	rb-86	5.60E-01	1.18E+01	2.00E+01	13
	1107	y-89	ground	(n,a)	rb-86	ground	1.19E+01	2.00E+01	14
40089.30y	102	y-89	ground	(n,g)	y-90	ground	1.00E-10	2.00E+01	102
	16	zr-89	ground	(n,2n)	zr-88	ground	9.40E+00	2.00E+01	15
	103	zr-89	ground	(n,p)	y-89	ground	2.03E+00	2.00E+01	18
	107	zr-89	ground	(n,a)	sr-86	ground	7.54E+00	2.00E+01	17
	102	zr-89	ground	(n,g)	zr-90	ground	1.00E-10	2.00E+01	102
40090.30y	16	zr-90	ground	(n,2n)	zr-89	ground	1.21E+01	2.00E+01	11
	28	zr-90	ground	(n,n')p	y-89	ground	1.39E+01	2.00E+01	16
	103	zr-90	ground	(n,p)	y-90	ground	7.19E+00	2.00E+01	22
	104	zr-90	ground	(n,d)	y-89	ground	1.21E+01	2.00E+01	14
	107	zr-90	ground	(n,a)	sr-87	ground	1.11E+01	2.00E+01	15
	102	zr-90	ground	(n,g)	zr-91	ground	1.00E-10	2.00E+01	102
40091.30y	16	zr-91	ground	(n,2n)	zr-90	ground	7.27E+00	2.00E+01	19
	17	zr-91	ground	(n,3n)	zr-89	ground	1.94E+01	2.00E+01	4
	28	zr-91	ground	(n,n')p	y-90	ground	1.39E+01	2.00E+01	16
	103	zr-91	ground	(n,p)	y-91	ground	6.43E+00	2.00E+01	18
	104	zr-91	ground	(n,d)	y-90	ground	1.20E+01	2.00E+01	13
	107	zr-91	ground	(n,a)	sr-88	ground	7.11E+00	2.00E+01	17
	102	zr-91	ground	(n,g)	zr-92	ground	1.00E-10	2.00E+01	102
40092.30y	16	zr-92	ground	(n,2n)	zr-91	ground	8.73E+00	2.00E+01	26
	17	zr-92	ground	(n,3n)	zr-90	ground	1.60E+01	2.00E+01	13
	28	zr-92	ground	(n,n')p	y-91	ground	1.49E+01	2.00E+01	13
	103	zr-92	ground	(n,p)	y-92	ground	8.51E+00	2.00E+01	18
	104	zr-92	ground	(n,d)	y-91	ground	1.31E+01	2.00E+01	13
	107	zr-92	ground	(n,a)	sr-89	ground	9.37E+00	2.00E+01	16
	102	zr-92	ground	(n,g)	zr-93	ground	1.00E-10	2.00E+01	102
	16	zr-93	ground	(n,2n)	zr-92	ground	6.83E+00	2.00E+01	24
40093.30y	17	zr-93	ground	(n,3n)	zr-91	ground	1.56E+01	2.00E+01	14
	103	zr-93	ground	(n,p)	y-93	ground	7.76E+00	2.00E+01	18
	107	zr-93	ground	(n,a)	sr-90	ground	8.27E+00	2.00E+01	17
	102	zr-93	ground	(n,g)	zr-94	ground	1.00E-10	2.00E+01	102
	16	zr-94	ground	(n,2n)	zr-93	ground	8.28E+00	2.00E+01	25
40094.30y	17	zr-94	ground	(n,3n)	zr-92	ground	1.51E+01	2.00E+01	15
	22	zr-94	ground	(n,n')a	sr-90	ground	1.07E+01	2.00E+01	20
	103	zr-94	ground	(n,p)	y-94	ground	9.87E+00	2.00E+01	18
	107	zr-94	ground	(n,a)	sr-91	ground	1.06E+01	2.00E+01	16
	102	zr-94	ground	(n,g)	zr-95	ground	1.00E-10	2.00E+01	102
	16	zr-95	ground	(n,2n)	zr-94	ground	6.54E+00	2.00E+01	27
40095.30y	17	zr-95	ground	(n,3n)	zr-93	ground	1.48E+01	2.00E+01	14
	103	zr-95	ground	(n,p)	y-95	ground	9.28E+00	2.00E+01	18
	107	zr-95	ground	(n,a)	sr-92	ground	9.75E+00	2.00E+01	16
	102	zr-95	ground	(n,g)	zr-96	ground	1.00E-10	2.00E+01	102
	16	zr-96	ground	(n,2n)	zr-95	ground	7.94E+00	2.00E+01	26
40096.30y	16	zr-96	ground	(n,2n)	zr-95	ground	7.94E+00	2.00E+01	26
40097.30y	16	zr-97	ground	(n,2n)	zr-96	ground	5.64E+00	2.00E+01	28
	17	zr-97	ground	(n,3n)	zr-95	ground	1.36E+01	2.00E+01	15
	107	zr-97	ground	(n,a)	sr-94	ground	1.11E+01	2.00E+01	16
	102	zr-97	ground	(n,g)	zr-98	ground	1.00E-10	2.00E+01	102

ZAID	MT	TARGET	E-TARG	REACTION	PRODUCT	E-PROD	EMIN	EMAX	NES
41091.30y	16	nb-91	ground	(n,2n)	nb-90	ground	1.23E+01	2.00E+01	15
	103	nb-91	ground	(n,p)	zr-91	ground	3.77E+00	2.00E+01	18
	102	nb-91	ground	(n,g)	nb-92	1.35E-01	1.00E-10	2.00E+01	102
	1102	nb-91	ground	(n,g)	nb-92	ground	1.00E-10	2.00E+01	102
41091.31y	16	nb-91	1.05E-01	(n,2n)	nb-90	ground	1.21E+01	2.00E+01	15
	103	nb-91	1.05E-01	(n,p)	zr-91	ground	3.67E+00	2.00E+01	18
	102	nb-91	1.05E-01	(n,g)	nb-92	1.35E-01	1.00E-10	2.00E+01	102
	1102	nb-91	1.05E-01	(n,g)	nb-92	ground	1.00E-10	2.00E+01	102
41092.30y	16	nb-92	ground	(n,2n)	nb-91	1.05E-01	8.09E+00	2.00E+01	16
	103	nb-92	ground	(n,p)	zr-92	ground	3.00E+00	2.00E+01	18
	102	nb-92	ground	(n,g)	nb-93	ground	1.00E-10	2.00E+01	102
41092.31y	16	nb-92	1.35E-01	(n,2n)	nb-91	1.05E-01	7.96E+00	2.00E+01	16
	103	nb-92	1.35E-01	(n,p)	zr-92	ground	2.86E+00	2.00E+01	18
	102	nb-92	1.35E-01	(n,g)	nb-93	ground	1.00E-10	2.00E+01	102
41093.30y	4	nb-93	ground	(n,n')	nb-93	3.04E-02	3.08E-02	2.00E+01	23
	16	nb-93	ground	(n,2n)	nb-92	ground	8.93E+00	2.00E+01	21
	1016	nb-93	ground	(n,2n)	nb-92	1.35E-01	9.06E+00	2.00E+01	21
	17	nb-93	ground	(n,3n)	nb-91	ground	1.69E+01	2.00E+01	10
	1017	nb-93	ground	(n,3n)	nb-91	1.05E-01	1.70E+01	2.00E+01	11
	22	nb-93	ground	(n,n')a	y-89	9.09E-01	2.88E+00	2.00E+01	6
	103	nb-93	ground	(n,p)	zr-93	ground	5.07E+00	2.00E+01	18
	107	nb-93	ground	(n,a)	y-90	ground	4.50E+00	2.00E+01	16
	102	nb-93	ground	(n,g)	nb-94	ground	1.00E-10	2.00E+01	102
41094.30y	16	nb-94	ground	(n,2n)	nb-93	ground	7.31E+00	2.00E+01	24
	17	nb-94	ground	(n,3n)	nb-92	1.35E-01	1.64E+01	2.00E+01	13
	103	nb-94	ground	(n,p)	zr-94	ground	4.09E+00	2.00E+01	18
	102	nb-94	ground	(n,g)	nb-95	ground	1.00E-10	2.00E+01	102
41095.30y	16	nb-95	ground	(n,2n)	nb-94	ground	8.58E+00	2.00E+01	25
	17	nb-95	ground	(n,3n)	nb-93	ground	1.59E+01	2.00E+01	13
	103	nb-95	ground	(n,p)	zr-95	ground	6.12E+00	2.00E+01	18
	102	nb-95	ground	(n,g)	nb-96	ground	1.00E-10	2.00E+01	102
41096.30y	16	nb-96	ground	(n,2n)	nb-95	ground	6.96E+00	2.00E+01	25
	17	nb-96	ground	(n,3n)	nb-94	ground	1.56E+01	2.00E+01	14
	103	nb-96	ground	(n,p)	zr-96	ground	5.15E+00	2.00E+01	18
	102	nb-96	ground	(n,g)	nb-97	ground	1.00E-10	2.00E+01	102
41097.30y	16	nb-97	ground	(n,2n)	nb-96	ground	8.15E+00	2.00E+01	26
	17	nb-97	ground	(n,3n)	nb-95	ground	1.51E+01	2.00E+01	15
	103	nb-97	ground	(n,p)	zr-97	ground	7.65E+00	2.00E+01	18
	102	nb-97	ground	(n,g)	nb-98	ground	1.00E-10	2.00E+01	102
41098.30y	16	nb-98	ground	(n,2n)	nb-97	ground	6.04E+00	2.00E+01	26
	17	nb-98	ground	(n,3n)	nb-96	ground	1.42E+01	2.00E+01	16
	103	nb-98	ground	(n,p)	zr-98	ground	7.19E+00	2.00E+01	18
	102	nb-98	ground	(n,g)	nb-99	ground	1.00E-10	2.00E+01	102
41100.30y	16	nb-100	ground	(n,2n)	nb-99	ground	5.15E+00	2.00E+01	28
	17	nb-100	ground	(n,3n)	nb-98	ground	1.29E+01	2.00E+01	18
	103	nb-100	ground	(n,p)	zr-100	ground	8.52E+00	2.00E+01	18
	102	nb-100	ground	(n,g)	nb-101	ground	1.00E-10	2.00E+01	102
42090.30y	16	mo-90	ground	(n,2n)	mo-89	ground	1.34E+01	2.00E+01	24
	102	mo-90	ground	(n,g)	mo-91	ground	1.00E-10	2.00E+01	102
42091.30y	16	mo-91	ground	(n,2n)	mo-90	ground	1.02E+01	2.00E+01	34
	102	mo-91	ground	(n,g)	mo-92	ground	1.00E-10	2.00E+01	102
42092.30y	16	mo-92	ground	(n,2n)	mo-91	ground	1.28E+01	2.00E+01	25
	28	mo-92	ground	(n,n')p	nb-91	ground	1.33E+01	2.00E+01	16
	1028	mo-92	ground	(n,n')p	nb-91	1.05E-01	1.33E+01	2.00E+01	16
	103	mo-92	ground	(n,p)	nb-92	1.35E-01	5.56E+00	2.00E+01	31
	1103	mo-92	ground	(n,p)	nb-92	ground	5.57E+00	2.00E+01	21
	104	mo-92	ground	(n,d)	nb-91	1.05E-01	1.16E+01	2.00E+01	15
	105	mo-92	ground	(n,t)	nb-90	ground	1.34E+01	2.00E+01	7
	107	mo-92	ground	(n,a)	zr-89	ground	9.75E+00	2.00E+01	17
	102	mo-92	ground	(n,g)	mo-93	ground	1.00E-10	2.00E+01	102
	16	mo-93	ground	(n,2n)	mo-92	ground	8.16E+00	2.00E+01	41
	103	mo-93	ground	(n,p)	nb-93	ground	4.79E+00	2.00E+01	29
42093.30y	104	mo-93	ground	(n,d)	nb-92	1.35E-01	1.16E+01	2.00E+01	16
	107	mo-93	ground	(n,a)	zr-90	ground	5.77E+00	2.00E+01	16

ZAID	MT	TARGET	E-TARG	REACTION	PRODUCT	E-PROD	EMIN	EMAX	NES
42093.31y	102	mo-93	ground	(n,g)	mo-94	ground	1.00E-10	2.00E+01	102
	16	mo-93	2.43E+00	(n,2n)	mo-92	ground	5.70E+00	2.00E+01	49
	17	mo-93	2.43E+00	(n,3n)	mo-91	ground	1.85E+01	2.00E+01	7
	103	mo-93	2.43E+00	(n,p)	nb-93	ground	2.33E+00	2.00E+01	28
	104	mo-93	2.43E+00	(n,d)	nb-92	1.35E-01	9.19E+00	2.00E+01	16
42094.30y	107	mo-93	2.43E+00	(n,a)	zr-90	ground	3.31E+00	2.00E+01	16
	102	mo-93	2.43E+00	(n,g)	mo-94	ground	1.00E-10	2.00E+01	102
	16	mo-94	ground	(n,2n)	mo-93	ground	9.77E+00	2.00E+01	10
	1016	mo-94	ground	(n,2n)	mo-93	2.43E+00	1.22E+01	2.00E+01	6
	17	mo-94	ground	(n,3n)	mo-92	ground	1.79E+01	2.00E+01	3
	28	mo-94	ground	(n,n')p	nb-93	ground	1.43E+01	2.00E+01	16
	103	mo-94	ground	(n,p)	nb-94	ground	7.24E+00	2.00E+01	22
	104	mo-94	ground	(n,d)	nb-93	ground	1.25E+01	2.00E+01	14
	105	mo-94	ground	(n,t)	nb-92	1.35E-01	1.38E+01	2.00E+01	14
	107	mo-94	ground	(n,a)	zr-91	ground	8.24E+00	2.00E+01	16
42095.30y	102	mo-94	ground	(n,g)	mo-95	ground	1.00E-10	2.00E+01	102
	16	mo-95	ground	(n,2n)	mo-94	ground	7.45E+00	2.00E+01	43
	17	mo-95	ground	(n,3n)	mo-93	ground	1.72E+01	2.00E+01	11
	28	mo-95	ground	(n,n')p	nb-94	ground	1.44E+01	2.00E+01	16
	22	mo-95	ground	(n,n')a	zr-91	ground	1.57E+01	2.00E+01	12
	103	mo-95	ground	(n,p)	nb-95	ground	6.09E+00	2.00E+01	24
	104	mo-95	ground	(n,d)	nb-94	ground	1.26E+01	2.00E+01	14
	107	mo-95	ground	(n,a)	zr-92	ground	6.93E+00	2.00E+01	23
	102	mo-95	ground	(n,g)	mo-96	ground	1.00E-10	2.00E+01	102
	16	mo-96	ground	(n,2n)	mo-95	ground	9.25E+00	2.00E+01	37
42096.30y	17	mo-96	ground	(n,3n)	mo-94	ground	1.67E+01	2.00E+01	13
	28	mo-96	ground	(n,n')p	nb-95	ground	1.51E+01	2.00E+01	14
	22	mo-96	ground	(n,n')a	zr-92	ground	1.62E+01	2.00E+01	12
	103	mo-96	ground	(n,p)	nb-96	ground	8.36E+00	2.00E+01	20
	104	mo-96	ground	(n,d)	nb-95	ground	1.33E+01	2.00E+01	14
	107	mo-96	ground	(n,a)	zr-93	ground	9.34E+00	2.00E+01	22
	102	mo-96	ground	(n,g)	mo-97	ground	1.00E-10	2.00E+01	102
	16	mo-97	ground	(n,2n)	mo-96	ground	6.89E+00	2.00E+01	45
	17	mo-97	ground	(n,3n)	mo-95	ground	1.61E+01	2.00E+01	15
	103	mo-97	ground	(n,p)	nb-97	ground	7.07E+00	2.00E+01	25
42097.30y	107	mo-97	ground	(n,a)	zr-94	ground	7.89E+00	2.00E+01	16
	102	mo-97	ground	(n,g)	mo-98	ground	1.00E-10	2.00E+01	102
	16	mo-98	ground	(n,2n)	mo-97	ground	8.73E+00	2.00E+01	39
	17	mo-98	ground	(n,3n)	mo-96	ground	1.56E+01	2.00E+01	17
	103	mo-98	ground	(n,p)	nb-98	ground	9.76E+00	2.00E+01	26
42098.30y	107	mo-98	ground	(n,a)	zr-95	ground	1.01E+01	2.00E+01	16
	102	mo-98	ground	(n,g)	mo-99	ground	1.00E-10	2.00E+01	102
	16	mo-99	ground	(n,2n)	mo-98	ground	5.98E+00	2.00E+01	48
	17	mo-99	ground	(n,3n)	mo-97	ground	1.47E+01	2.00E+01	19
	103	mo-99	ground	(n,p)	nb-99	ground	8.20E+00	2.00E+01	27
42099.30y	107	mo-99	ground	(n,a)	zr-96	ground	8.07E+00	2.00E+01	16
	102	mo-99	ground	(n,g)	mo-100	ground	1.00E-10	2.00E+01	102
	16	mo-100	ground	(n,2n)	mo-99	ground	8.38E+00	2.00E+01	40
	17	mo-100	ground	(n,3n)	mo-98	ground	1.44E+01	2.00E+01	21
	103	mo-100	ground	(n,p)	nb-100	ground	1.11E+01	2.00E+01	24
42100.30y	107	mo-100	ground	(n,a)	zr-97	ground	1.08E+01	2.00E+01	16
	102	mo-100	ground	(n,g)	mo-101	ground	1.00E-10	2.00E+01	102
	16	mo-101	ground	(n,2n)	mo-100	ground	5.45E+00	2.00E+01	50
	17	mo-101	ground	(n,3n)	mo-99	ground	1.38E+01	2.00E+01	23
	103	mo-101	ground	(n,p)	nb-101	ground	9.33E+00	2.00E+01	22
42101.30y	107	mo-101	ground	(n,a)	zr-98	ground	9.72E+00	2.00E+01	16
	102	mo-101	ground	(n,g)	mo-102	ground	1.00E-10	2.00E+01	102
	16	tc-99	ground	(n,2n)	tc-98	ground	7.36E+00	2.00E+01	22
	17	tc-99	ground	(n,3n)	tc-97	ground	1.64E+01	2.00E+01	12
	28	tc-99	ground	(n,n')p	mo-98	ground	1.20E+01	2.00E+01	15
43099.30y	22	tc-99	ground	(n,n')a	nb-95	ground	1.01E+01	2.00E+01	5
	103	tc-99	ground	(n,p)	mo-99	ground	3.57E+00	2.00E+01	22
	104	tc-99	ground	(n,d)	mo-98	ground	1.02E+01	2.00E+01	15
	105	tc-99	ground	(n,t)	mo-97	ground	1.08E+01	2.00E+01	15

ZAID	MT	TARGET	E-TARG	REACTION	PRODUCT	E-PROD	EMIN	EMAX	NES
43099.31y	107	tc-99	ground	(n,a)	nb-96	ground	7.53E+00	2.00E+01	8
	102	tc-99	ground	(n,g)	tc-100	ground	1.00E-10	2.00E+01	102
	16	tc-99	1.43E-01	(n,2n)	tc-98	ground	7.21E+00	2.00E+01	22
	17	tc-99	1.43E-01	(n,3n)	tc-97	ground	1.63E+01	2.00E+01	12
	28	tc-99	1.43E-01	(n,n')p	mo-98	ground	1.19E+01	2.00E+01	15
	22	tc-99	1.43E-01	(n,n')a	nb-95	ground	1.00E+01	2.00E+01	5
	103	tc-99	1.43E-01	(n,p)	mo-99	ground	3.42E+00	2.00E+01	22
	104	tc-99	1.43E-01	(n,d)	mo-98	ground	1.01E+01	2.00E+01	15
	105	tc-99	1.43E-01	(n,t)	mo-97	ground	1.07E+01	2.00E+01	15
	107	tc-99	1.43E-01	(n,a)	nb-96	ground	7.39E+00	2.00E+01	8
45103.30y	102	tc-99	1.43E-01	(n,g)	tc-100	ground	1.00E-10	2.00E+01	102
	4	rh-103	ground	(n,n')	rh-103	3.97E-02	4.02E-02	2.00E+01	29
46110.30y	16	rh-103	ground	(n,2n)	rh-102	ground	9.70E+00	2.00E+01	104
	102	pd-110	ground	(n,g)	pd-111	1.72E-01	1.00E-10	2.00E+01	102
47106.30y	1102	pd-110	ground	(n,g)	pd-111	ground	1.00E-10	2.00E+01	102
	16	ag-106	ground	(n,2n)	ag-105	ground	7.99E+00	2.00E+01	17
47106.31y	17	ag-106	ground	(n,3n)	ag-104	ground	1.79E+01	2.00E+01	6
	102	ag-106	ground	(n,g)	ag-107	ground	1.00E-10	2.00E+01	102
	16	ag-106	3.00E-01	(n,2n)	ag-105	ground	7.69E+00	2.00E+01	17
47107.30y	17	ag-106	3.00E-01	(n,3n)	ag-104	ground	1.76E+01	2.00E+01	7
	102	ag-106	3.00E-01	(n,g)	ag-107	ground	1.00E-10	2.00E+01	102
	16	ag-107	ground	(n,2n)	ag-106	ground	9.63E+00	2.00E+01	7
47108.30y	1016	ag-107	ground	(n,2n)	ag-106	3.00E-01	9.94E+00	2.00E+01	6
	17	ag-107	ground	(n,3n)	ag-105	ground	1.76E+01	2.00E+01	2
	103	ag-107	ground	(n,p)	pd-107	ground	4.50E+00	2.00E+01	20
47108.31y	107	ag-107	ground	(n,a)	rh-104	1.29E-01	5.50E+00	2.00E+01	5
	102	ag-107	ground	(n,g)	ag-108	1.10E-01	1.00E-10	2.00E+01	102
	1102	ag-107	ground	(n,g)	ag-108	ground	1.00E-10	2.00E+01	102
47109.30y	16	ag-108	ground	(n,2n)	ag-107	ground	7.34E+00	2.00E+01	20
	17	ag-108	ground	(n,3n)	ag-106	ground	1.70E+01	2.00E+01	9
	102	ag-108	ground	(n,g)	ag-109	ground	1.00E-10	2.00E+01	102
47110.30y	16	ag-108	1.10E-01	(n,2n)	ag-107	ground	7.23E+00	2.00E+01	20
	17	ag-108	1.10E-01	(n,3n)	ag-106	ground	1.69E+01	2.00E+01	9
	102	ag-108	1.10E-01	(n,g)	ag-109	ground	1.00E-10	2.00E+01	102
47110.31y	16	ag-109	ground	(n,2n)	ag-108	ground	9.27E+00	2.00E+01	21
	1016	ag-109	ground	(n,2n)	ag-108	1.10E-01	9.39E+00	2.00E+01	13
	17	ag-109	ground	(n,3n)	ag-107	ground	1.66E+01	2.00E+01	11
48106.30y	103	ag-109	ground	(n,p)	pd-109	ground	3.50E+00	2.00E+01	16
	107	ag-109	ground	(n,a)	rh-106	ground	5.50E+00	2.00E+01	12
	102	ag-109	ground	(n,g)	ag-110	1.18E-01	1.00E-10	2.00E+01	102
48111.30y	1102	ag-109	ground	(n,g)	ag-110	ground	1.00E-10	2.00E+01	102
	16	ag-110	ground	(n,2n)	ag-109	ground	6.87E+00	2.00E+01	22
	17	ag-110	ground	(n,3n)	ag-108	ground	1.61E+01	2.00E+01	13
48112.30y	102	ag-110	ground	(n,g)	ag-111	ground	1.00E-10	2.00E+01	97
	16	ag-110	1.18E-01	(n,2n)	ag-109	ground	6.75E+00	2.00E+01	23
	17	ag-110	1.18E-01	(n,3n)	ag-108	ground	1.60E+01	2.00E+01	13
48116.30y	102	ag-110	1.18E-01	(n,g)	ag-111	ground	1.00E-10	2.00E+01	98
	16	cd-106	ground	(n,2n)	cd-105	ground	1.15E+01	2.00E+01	86
	4	cd-111	ground	(n,n')	cd-111	3.96E-01	4.00E-01	2.00E+01	26
49113.30y	103	cd-111	ground	(n,p)	ag-111	ground	7.30E+00	2.00E+01	128
	107	cd-112	ground	(n,a)	pd-109	ground	9.30E+00	2.00E+01	108
	16	cd-116	ground	(n,2n)	cd-115	ground	8.80E+00	2.00E+01	113
49115.30y	16	in-113	ground	(n,2n)	in-112	ground	9.90E+00	2.00E+01	102
	28	in-113	ground	(n,n')p	cd-112	ground	1.28E+01	2.00E+01	17
	1028	in-113	ground	(n,n')p	cd-112	ground	1.30E+01	2.00E+01	17
49115.30y	103	in-113	ground	(n,p)	cd-113	2.64E-01	6.71E+00	2.00E+01	22
	1103	in-113	ground	(n,p)	cd-113	ground	6.44E+00	2.00E+01	22
	107	in-113	ground	(n,a)	ag-110	1.18E-01	1.15E+01	2.00E+01	14
49115.30y	1107	in-113	ground	(n,a)	ag-110	ground	1.14E+01	2.00E+01	14
	102	in-113	ground	(n,g)	in-114	1.90E-01	1.00E-10	2.00E+01	102
	1102	in-113	ground	(n,g)	in-114	ground	1.00E-10	2.00E+01	102
49115.30y	16	in-115	ground	(n,2n)	in-114	ground	9.30E+00	2.00E+01	108
	1016	in-115	ground	(n,2n)	in-114	1.90E-01	9.40E+00	2.00E+01	107
	28	in-115	ground	(n,n')p	cd-114	ground	1.35E+01	2.00E+01	16

ZAID	MT	TARGET	E-TARG	REACTION	PRODUCT	E-PROD	EMIN	EMAX	NES
50112.30y	1028	in-115	ground	(n,n')p	cd-114	ground	1.36E+01	2.00E+01	16
	103	in-115	ground	(n,p)	cd-115	ground	7.54E+00	2.00E+01	23
	1103	in-115	ground	(n,p)	cd-115	1.73E-01	7.72E+00	2.00E+01	23
	107	in-115	ground	(n,a)	ag-109	ground	1.23E+01	2.00E+01	13
	102	in-115	ground	(n,g)	in-116	2.90E-01	1.00E-10	2.00E+01	102
	1102	in-115	ground	(n,g)	in-116	1.27E-01	1.00E-10	2.00E+01	102
	2102	in-115	ground	(n,g)	in-116	ground	1.00E-10	2.00E+01	102
	16	sn-112	ground	(n,2n)	sn-111	ground	1.12E+01	2.00E+01	89
	28	sn-112	ground	(n,n')p	in-111	ground	1.44E+01	2.00E+01	16
	1028	sn-112	ground	(n,n')p	in-111	ground	1.46E+01	2.00E+01	15
	103	sn-112	ground	(n,p)	in-112	1.55E-01	7.14E+00	2.00E+01	19
	1103	sn-112	ground	(n,p)	in-112	ground	6.98E+00	2.00E+01	19
	104	sn-112	ground	(n,d)	in-111	ground	8.46E+00	2.00E+01	16
	102	sn-112	ground	(n,g)	sn-113	7.93E-02	1.00E-10	2.00E+01	102
50114.30y	1102	sn-112	ground	(n,g)	sn-113	ground	1.00E-10	2.00E+01	102
	16	sn-114	ground	(n,2n)	sn-113	ground	1.04E+01	2.00E+01	15
	1016	sn-114	ground	(n,2n)	sn-113	7.93E-02	1.05E+01	2.00E+01	15
	28	sn-114	ground	(n,n')p	in-113	3.92E-01	1.53E+01	2.00E+01	15
	1028	sn-114	ground	(n,n')p	in-113	3.92E-01	1.55E+01	2.00E+01	14
	103	sn-114	ground	(n,p)	in-114	ground	8.28E+00	2.00E+01	21
	1103	sn-114	ground	(n,p)	in-114	1.90E-01	8.47E+00	2.00E+01	21
	102	sn-114	ground	(n,g)	sn-115	ground	1.00E-10	2.00E+01	102
	16	sn-115	ground	(n,2n)	sn-114	ground	7.61E+00	2.00E+01	15
	28	sn-115	ground	(n,n')p	in-114	1.90E-01	1.56E+01	2.00E+01	13
	1028	sn-115	ground	(n,n')p	in-114	1.90E-01	1.59E+01	2.00E+01	13
	103	sn-115	ground	(n,p)	in-115	ground	6.76E+00	2.00E+01	20
	1103	sn-115	ground	(n,p)	in-115	3.36E-01	7.53E+00	2.00E+01	19
	102	sn-115	ground	(n,g)	sn-116	ground	1.00E-10	2.00E+01	102
50116.30y	16	sn-116	ground	(n,2n)	sn-115	ground	9.65E+00	2.00E+01	15
	28	sn-116	ground	(n,n')p	in-115	ground	1.61E+01	2.00E+01	13
	1028	sn-116	ground	(n,n')p	in-115	ground	1.62E+01	2.00E+01	13
	103	sn-116	ground	(n,p)	in-116	ground	9.55E+00	2.00E+01	21
	1103	sn-116	ground	(n,p)	in-116	1.27E-01	9.68E+00	2.00E+01	21
	102	sn-116	ground	(n,g)	sn-117	3.15E-01	1.00E-10	2.00E+01	102
	1102	sn-116	ground	(n,g)	sn-117	ground	1.00E-10	2.00E+01	102
	16	sn-117	ground	(n,2n)	sn-116	ground	7.00E+00	2.00E+01	16
	103	sn-117	ground	(n,p)	in-117	ground	7.70E+00	2.00E+01	15
	1103	sn-117	ground	(n,p)	in-117	3.15E-01	8.02E+00	2.00E+01	15
	102	sn-117	ground	(n,g)	sn-118	ground	1.00E-10	2.00E+01	102
	16	sn-118	ground	(n,2n)	sn-117	ground	9.41E+00	2.00E+01	15
	1016	sn-118	ground	(n,2n)	sn-117	3.15E-01	9.72E+00	2.00E+01	15
	103	sn-118	ground	(n,p)	in-118	ground	1.05E+01	2.00E+01	14
50119.30y	107	sn-118	ground	(n,a)	cd-115	ground	8.90E+00	2.00E+01	112
	102	sn-118	ground	(n,g)	sn-119	8.95E-02	1.00E-10	2.00E+01	102
	1102	sn-118	ground	(n,g)	sn-119	ground	1.00E-10	2.00E+01	102
	16	sn-119	ground	(n,2n)	sn-118	ground	6.54E+00	2.00E+01	16
	103	sn-119	ground	(n,p)	in-119	ground	8.55E+00	2.00E+01	15
	1103	sn-119	ground	(n,p)	in-119	9.00E-02	8.65E+00	2.00E+01	14
	102	sn-119	ground	(n,g)	sn-120	ground	1.00E-10	2.00E+01	102
	16	sn-120	ground	(n,2n)	sn-119	ground	9.18E+00	2.00E+01	15
	1016	sn-120	ground	(n,2n)	sn-119	8.95E-02	9.27E+00	2.00E+01	15
	103	sn-120	ground	(n,p)	in-120	ground	1.16E+01	2.00E+01	14
	102	sn-120	ground	(n,g)	sn-121	ground	1.00E-10	2.00E+01	102
	16	sn-122	ground	(n,2n)	sn-121	ground	8.89E+00	2.00E+01	15
	103	sn-122	ground	(n,p)	in-122	ground	1.25E+01	2.00E+01	14
	102	sn-122	ground	(n,g)	sn-123	ground	1.00E-10	2.00E+01	102
50124.30y	16	sn-124	ground	(n,2n)	sn-123	ground	8.56E+00	2.00E+01	16
	103	sn-124	ground	(n,p)	in-124	ground	1.33E+01	2.00E+01	14
	102	sn-124	ground	(n,g)	sn-125	2.75E-02	1.00E-10	2.00E+01	102
	1102	sn-124	ground	(n,g)	sn-125	ground	1.00E-10	2.00E+01	102
51121.30y	16	sb-121	ground	(n,2n)	sb-120	ground	9.60E+00	2.00E+01	105
	28	sb-121	ground	(n,n')p	sn-120	ground	1.27E+01	2.00E+01	17
	1028	sb-121	ground	(n,n')p	sn-120	ground	1.27E+01	2.00E+01	17
	103	sb-121	ground	(n,p)	sn-121	6.30E-03	6.72E+00	2.00E+01	24

ZAID	MT	TARGET	E-TARG	REACTION	PRODUCT	E-PROD	EMIN	EMAX	NES
51123.30y	1103	sb-121	ground	(n,p)	sn-121	ground	6.71E+00	2.00E+01	24
	102	sb-121	ground	(n,g)	sb-122	1.63E-01	1.00E-10	2.00E+01	102
	1102	sb-121	ground	(n,g)	sb-122	ground	1.00E-10	2.00E+01	102
	16	sb-123	ground	(n,2n)	sb-122	ground	9.30E+00	2.00E+01	108
	28	sb-123	ground	(n,n')p	sn-122	ground	1.34E+01	2.00E+01	16
	1028	sb-123	ground	(n,n')p	sn-122	ground	1.34E+01	2.00E+01	16
	103	sb-123	ground	(n,p)	sn-123	ground	7.70E+00	2.00E+01	22
	1103	sb-123	ground	(n,p)	sn-123	2.47E-02	7.73E+00	2.00E+01	22
	102	sb-123	ground	(n,g)	sb-124	3.50E-02	1.00E-10	2.00E+01	102
	1102	sb-123	ground	(n,g)	sb-124	1.07E-02	1.00E-10	2.00E+01	102
53127.30y	2102	sb-123	ground	(n,g)	sb-124	ground	1.00E-10	2.00E+01	102
	16	i-127	ground	(n,2n)	i-126	ground	9.30E+00	2.00E+01	108
55133.30y	16	cs-133	ground	(n,2n)	cs-132	ground	9.60E+00	2.00E+01	105
58140.30y	16	ce-140	ground	(n,2n)	ce-139	ground	9.30E+00	2.00E+01	108
	1016	ce-140	ground	(n,2n)	ce-139	7.54E-01	1.01E+01	2.00E+01	101
58142.30y	16	ce-142	ground	(n,2n)	ce-141	ground	7.21E+00	2.00E+01	130
59141.30y	16	pr-141	ground	(n,2n)	pr-140	ground	9.60E+00	2.00E+01	105
60142.30y	16	nd-142	ground	(n,2n)	nd-141	ground	1.00E+01	2.00E+01	101
60148.30y	16	nd-148	ground	(n,2n)	nd-147	ground	7.60E+00	2.00E+01	125
60150.30y	16	nd-150	ground	(n,2n)	nd-149	ground	7.41E+00	2.00E+01	127
62144.30y	16	sm-144	ground	(n,2n)	sm-143	ground	1.09E+01	2.00E+01	92
62148.30y	16	sm-148	ground	(n,2n)	sm-147	ground	8.20E+00	2.00E+01	120
62152.30y	16	sm-152	ground	(n,2n)	sm-151	ground	8.50E+00	2.00E+01	116
62154.30y	16	sm-154	ground	(n,2n)	sm-153	ground	8.05E+00	2.00E+01	121
63151.30y	16	eu-151	ground	(n,2n)	eu-150	ground	8.02E+00	2.00E+01	10
	1016	eu-151	ground	(n,2n)	eu-150	1.00E-01	8.02E+00	2.00E+01	10
	17	eu-151	ground	(n,3n)	eu-149	ground	1.45E+01	2.00E+01	6
	28	eu-151	ground	(n,n')p	sm-150	ground	8.00E+00	2.00E+01	13
	22	eu-151	ground	(n,n')a	pm-147	ground	8.00E+00	2.00E+01	12
	103	eu-151	ground	(n,p)	sm-151	ground	3.00E+00	2.00E+01	23
	104	eu-151	ground	(n,d)	sm-150	ground	2.68E+00	2.00E+01	20
	105	eu-151	ground	(n,t)	sm-149	ground	4.42E+00	2.00E+01	18
	106	eu-151	ground	(n,he-3)	pm-149	ground	5.48E+00	2.00E+01	8
	107	eu-151	ground	(n,a)	pm-148	ground	3.50E+00	2.00E+01	17
63153.30y	102	eu-151	ground	(n,g)	eu-152	4.85E-02	1.00E-10	2.00E+01	102
	1102	eu-151	ground	(n,g)	eu-152	ground	1.00E-10	2.00E+01	102
	16	eu-153	ground	(n,2n)	eu-152	ground	8.61E+00	2.00E+01	11
	1016	eu-153	ground	(n,2n)	eu-152	4.80E-02	8.61E+00	2.00E+01	11
	17	eu-153	ground	(n,3n)	eu-151	ground	1.50E+01	2.00E+01	7
	28	eu-153	ground	(n,n')p	sm-152	ground	5.93E+00	2.00E+01	23
	22	eu-153	ground	(n,n')a	pm-149	ground	6.00E+00	2.00E+01	20
	103	eu-153	ground	(n,p)	sm-153	ground	2.67E-02	2.00E+01	23
	104	eu-153	ground	(n,d)	sm-152	ground	3.69E+00	2.00E+01	20
	105	eu-153	ground	(n,t)	sm-151	ground	5.70E+00	2.00E+01	18
64150.30y	106	eu-153	ground	(n,he-3)	pm-151	ground	6.88E+00	2.00E+01	7
	107	eu-153	ground	(n,a)	pm-150	ground	2.53E-08	2.00E+01	18
	102	eu-153	ground	(n,g)	eu-154	ground	1.00E-10	2.00E+01	102
	16	gd-150	ground	(n,2n)	gd-149	ground	8.78E+00	2.00E+01	12
	102	gd-150	ground	(n,g)	gd-151	ground	1.00E-10	2.00E+01	102
64151.30y	16	gd-151	ground	(n,2n)	gd-150	ground	6.57E+00	2.00E+01	14
	102	gd-151	ground	(n,g)	gd-152	ground	1.00E-10	2.00E+01	102
67163.30y	16	ho-163	ground	(n,2n)	ho-162	1.00E-01	8.46E+00	2.00E+01	25
	17	ho-163	ground	(n,3n)	ho-161	ground	1.54E+01	2.00E+01	14
	103	ho-163	ground	(n,p)	dy-163	ground	8.18E+00	2.00E+01	13
	102	ho-163	ground	(n,g)	ho-164	1.40E-01	1.00E-10	2.00E+01	102
67164.30y	1102	ho-163	ground	(n,g)	ho-164	ground	1.00E-10	2.00E+01	102
	16	ho-164	ground	(n,2n)	ho-163	ground	6.72E+00	2.00E+01	27
	17	ho-164	ground	(n,3n)	ho-162	1.00E-01	1.52E+01	2.00E+01	13
	103	ho-164	ground	(n,p)	dy-164	ground	7.19E+00	2.00E+01	13
67164.31y	102	ho-164	ground	(n,g)	ho-165	ground	1.00E-10	2.00E+01	102
	16	ho-164	1.40E-01	(n,2n)	ho-163	ground	6.58E+00	2.00E+01	27
	17	ho-164	1.40E-01	(n,3n)	ho-162	1.00E-01	1.51E+01	2.00E+01	13
	103	ho-164	1.40E-01	(n,p)	dy-164	ground	7.05E+00	2.00E+01	13
	102	ho-164	1.40E-01	(n,g)	ho-165	ground	1.00E-10	2.00E+01	102

ZAID	MT	TARGET	E-TARG	REACTION	PRODUCT	E-PROD	EMIN	EMAX	NES
67165.30y	16	ho-165	ground	(n,2n)	ho-164	ground	8.04E+00	2.00E+01	25
	1016	ho-165	ground	(n,2n)	ho-164	1.40E-01	8.18E+00	2.00E+01	25
	17	ho-165	ground	(n,3n)	ho-163	ground	1.48E+01	2.00E+01	15
	103	ho-165	ground	(n,p)	dy-165	ground	9.46E+00	2.00E+01	13
	102	ho-165	ground	(n,g)	ho-166	9.00E-03	1.00E-10	2.00E+01	102
	1102	ho-165	ground	(n,g)	ho-166	ground	1.00E-10	2.00E+01	102
67166.30y	16	ho-166	ground	(n,2n)	ho-165	ground	6.28E+00	2.00E+01	27
	17	ho-166	ground	(n,3n)	ho-164	ground	1.44E+01	2.00E+01	16
	103	ho-166	ground	(n,p)	dy-166	ground	8.63E+00	2.00E+01	13
	102	ho-166	ground	(n,g)	ho-167	ground	1.00E-10	2.00E+01	102
67166.31y	16	ho-166	9.00E-03	(n,2n)	ho-165	ground	6.27E+00	2.00E+01	27
	17	ho-166	9.00E-03	(n,3n)	ho-164	ground	1.43E+01	2.00E+01	16
	103	ho-166	9.00E-03	(n,p)	dy-166	ground	8.62E+00	2.00E+01	13
	102	ho-166	9.00E-03	(n,g)	ho-167	ground	1.00E-10	2.00E+01	102
69169.30y	16	tm-169	ground	(n,2n)	tm-168	ground	8.11E+00	2.00E+01	120
	102	tm-169	ground	(n,g)	tm-170	ground	1.00E-10	2.00E+01	102
71173.30y	16	lu-173	ground	(n,2n)	lu-172	ground	8.23E+00	2.00E+01	26
	1016	lu-173	ground	(n,2n)	lu-172	4.20E-02	8.27E+00	2.00E+01	27
	17	lu-173	ground	(n,3n)	lu-171	ground	1.52E+01	2.00E+01	12
	1017	lu-173	ground	(n,3n)	lu-171	7.10E-02	1.53E+01	2.00E+01	12
	102	lu-173	ground	(n,g)	lu-174	1.71E-01	1.00E-10	2.00E+01	102
	1102	lu-173	ground	(n,g)	lu-174	ground	1.00E-10	2.00E+01	102
71174.30y	4	lu-174	ground	(n,n')	lu-174	1.71E-01	1.72E-01	2.00E+01	42
	16	lu-174	ground	(n,2n)	lu-173	ground	6.83E+00	2.00E+01	30
	17	lu-174	ground	(n,3n)	lu-172	ground	1.51E+01	2.00E+01	12
	1017	lu-174	ground	(n,3n)	lu-172	4.20E-02	1.51E+01	2.00E+01	12
	102	lu-174	ground	(n,g)	lu-175	ground	1.00E-10	2.00E+01	102
71174.31y	4	lu-174	1.71E-01	(n,n')	lu-174	ground	1.00E-10	2.00E+01	65
	16	lu-174	1.71E-01	(n,2n)	lu-173	ground	6.66E+00	2.00E+01	29
	17	lu-174	1.71E-01	(n,3n)	lu-172	ground	1.49E+01	2.00E+01	13
	1017	lu-174	1.71E-01	(n,3n)	lu-172	4.20E-02	1.49E+01	2.00E+01	13
	102	lu-174	1.71E-01	(n,g)	lu-175	ground	1.00E-10	2.00E+01	102
71175.30y	16	lu-175	ground	(n,2n)	lu-174	ground	7.70E+00	2.00E+01	29
	1016	lu-175	ground	(n,2n)	lu-174	1.71E-01	7.88E+00	2.00E+01	28
	17	lu-175	ground	(n,3n)	lu-173	ground	1.45E+01	2.00E+01	8
	102	lu-175	ground	(n,g)	lu-176	1.27E-01	1.00E-10	2.00E+01	102
	1102	lu-175	ground	(n,g)	lu-176	ground	1.00E-10	2.00E+01	102
71176.30y	4	lu-176	ground	(n,n')	lu-176	1.27E-01	1.28E-01	2.00E+01	29
	16	lu-176	ground	(n,2n)	lu-175	ground	6.33E+00	2.00E+01	30
	17	lu-176	ground	(n,3n)	lu-174	ground	1.40E+01	2.00E+01	18
	1017	lu-176	ground	(n,3n)	lu-174	1.71E-01	1.42E+01	2.00E+01	17
	102	lu-176	ground	(n,g)	lu-177	9.70E-01	1.00E-10	2.00E+01	102
	1102	lu-176	ground	(n,g)	lu-177	ground	1.00E-10	2.00E+01	102
71176.31y	4	lu-176	1.27E-01	(n,n')	lu-176	ground	1.50E-02	2.00E+01	37
	16	lu-176	1.27E-01	(n,2n)	lu-175	ground	6.20E+00	2.00E+01	31
	17	lu-176	1.27E-01	(n,3n)	lu-174	ground	1.39E+01	2.00E+01	17
	1017	lu-176	1.27E-01	(n,3n)	lu-174	1.71E-01	1.41E+01	2.00E+01	17
	102	lu-176	1.27E-01	(n,g)	lu-177	9.70E-01	1.00E-10	2.00E+01	102
	1102	lu-176	1.27E-01	(n,g)	lu-177	ground	1.00E-10	2.00E+01	102
71177.30y	16	lu-177	ground	(n,2n)	lu-176	ground	7.11E+00	2.00E+01	29
	1016	lu-177	ground	(n,2n)	lu-176	1.27E-01	7.24E+00	2.00E+01	27
	17	lu-177	ground	(n,3n)	lu-175	ground	1.34E+01	2.00E+01	16
	102	lu-177	ground	(n,g)	lu-178	2.30E-01	1.00E-10	2.00E+01	102
	1102	lu-177	ground	(n,g)	lu-178	ground	1.00E-10	2.00E+01	102
71177.31y	16	lu-177	9.70E-01	(n,2n)	lu-176	ground	6.13E+00	2.00E+01	29
	1016	lu-177	9.70E-01	(n,2n)	lu-176	1.27E-01	6.26E+00	2.00E+01	27
	17	lu-177	9.70E-01	(n,3n)	lu-175	ground	1.25E+01	2.00E+01	16
	102	lu-177	9.70E-01	(n,g)	lu-178	2.30E-01	1.00E-10	2.00E+01	102
	1102	lu-177	9.70E-01	(n,g)	lu-178	ground	1.00E-10	2.00E+01	102
72174.30y	16	hf-174	ground	(n,2n)	hf-173	ground	8.68E+00	2.00E+01	24
	17	hf-174	ground	(n,3n)	hf-172	ground	1.57E+01	2.00E+01	13
	103	hf-174	ground	(n,p)	lu-174	1.71E-01	9.20E+00	2.00E+01	14
	1103	hf-174	ground	(n,p)	lu-174	ground	9.03E+00	2.00E+01	14
72175.30y	16	hf-175	ground	(n,2n)	hf-174	ground	6.83E+00	2.00E+01	24

ZAID	MT	TARGET	E-TARG	REACTION	PRODUCT	E-PROD	EMIN	EMAX	NES
72176.30y	17	hf-175	ground	(n,3n)	hf-173	ground	1.55E+01	2.00E+01	15
	103	hf-175	ground	(n,p)	lu-175	ground	8.13E+00	2.00E+01	15
	16	hf-176	ground	(n,2n)	hf-175	ground	8.14E+00	2.00E+01	25
	17	hf-176	ground	(n,3n)	hf-174	ground	1.50E+01	2.00E+01	15
	103	hf-176	ground	(n,p)	lu-176	ground	9.92E+00	2.00E+01	14
72177.30y	1103	hf-176	ground	(n,p)	lu-176	1.27E-01	1.00E+01	2.00E+01	14
	16	hf-177	ground	(n,2n)	hf-176	ground	6.42E+00	2.00E+01	26
	17	hf-177	ground	(n,3n)	hf-175	ground	1.46E+01	2.00E+01	16
	103	hf-177	ground	(n,p)	lu-177	ground	9.21E+00	2.00E+01	14
	1103	hf-177	ground	(n,p)	lu-177	9.70E-01	1.02E+01	2.00E+01	14
72178.30y	16	hf-178	ground	(n,2n)	hf-177	ground	7.67E+00	2.00E+01	25
	17	hf-178	ground	(n,3n)	hf-176	ground	1.55E+01	2.00E+01	15
	103	hf-178	ground	(n,p)	lu-178	ground	1.08E+01	2.00E+01	14
	1103	hf-178	ground	(n,p)	lu-178	3.00E-01	1.11E+01	2.00E+01	14
72179.30y	16	hf-179	ground	(n,2n)	hf-178	ground	6.13E+00	2.00E+01	48
	17	hf-179	ground	(n,3n)	hf-177	ground	1.38E+01	2.00E+01	23
	103	hf-179	ground	(n,p)	lu-179	ground	1.00E+01	2.00E+01	35
	102	hf-179	ground	(n,g)	hf-180	ground	1.00E-10	2.00E+01	102
	16	hf-180	ground	(n,2n)	hf-179	ground	7.43E+00	2.00E+01	43
72180.30y	17	hf-180	ground	(n,3n)	hf-178	ground	1.36E+01	2.00E+01	23
	103	hf-180	ground	(n,p)	lu-180	ground	1.20E+01	2.00E+01	28
	102	hf-180	ground	(n,g)	hf-181	ground	1.00E-10	2.00E+01	102
	16	hf-181	ground	(n,2n)	hf-180	ground	5.72E+00	2.00E+01	49
	17	hf-181	ground	(n,3n)	hf-179	ground	1.32E+01	2.00E+01	25
72183.30y	102	hf-181	ground	(n,g)	hf-182	ground	1.00E-10	2.00E+01	102
	16	hf-183	ground	(n,2n)	hf-182	ground	5.42E+00	2.00E+01	50
	17	hf-183	ground	(n,3n)	hf-181	ground	1.21E+01	2.00E+01	28
	102	hf-183	ground	(n,g)	hf-184	ground	1.00E-10	2.00E+01	102
	16	ta-179	ground	(n,2n)	ta-178	ground	7.93E+00	2.00E+01	42
73179.30y	17	ta-179	ground	(n,3n)	ta-177	ground	1.49E+01	2.00E+01	19
	103	ta-179	ground	(n,p)	hf-179	ground	8.70E+00	2.00E+01	39
	102	ta-179	ground	(n,g)	ta-180	2.12E-01	1.00E-10	2.00E+01	102
	1102	ta-179	ground	(n,g)	ta-180	ground	1.00E-10	2.00E+01	102
	16	ta-180	ground	(n,2n)	ta-179	ground	6.62E+00	2.00E+01	46
73180.30y	17	ta-180	ground	(n,3n)	ta-178	ground	1.46E+01	2.00E+01	20
	28	ta-180	ground	(n,n')p	hf-179	1.11E+00	1.61E+01	2.00E+01	12
	103	ta-180	ground	(n,p)	hf-180	1.14E+00	9.02E+00	2.00E+01	38
	104	ta-180	ground	(n,d)	hf-179	1.11E+00	1.37E+01	2.00E+01	13
	107	ta-180	ground	(n,a)	lu-177	ground	1.11E+01	2.00E+01	16
73180.31y	102	ta-180	ground	(n,g)	ta-181	ground	1.00E-10	2.00E+01	102
	16	ta-180	2.12E-01	(n,2n)	ta-179	ground	6.40E+00	2.00E+01	47
	17	ta-180	2.12E-01	(n,3n)	ta-178	ground	1.43E+01	2.00E+01	21
	103	ta-180	2.12E-01	(n,p)	hf-180	1.14E+00	8.80E+00	2.00E+01	39
	102	ta-180	2.12E-01	(n,g)	ta-181	ground	1.00E-10	2.00E+01	102
73181.30y	16	ta-181	ground	(n,2n)	ta-180	ground	7.67E+00	2.00E+01	43
	1016	ta-181	ground	(n,2n)	ta-180	2.12E-01	7.89E+00	2.00E+01	42
	17	ta-181	ground	(n,3n)	ta-179	ground	1.43E+01	2.00E+01	21
	22	ta-181	ground	(n,n')a	lu-177	ground	1.27E+01	2.00E+01	15
	103	ta-181	ground	(n,p)	hf-181	ground	1.00E+01	2.00E+01	5
73182.30y	102	ta-181	ground	(n,g)	ta-182	5.03E-01	1.00E-10	2.00E+01	75
	1102	ta-181	ground	(n,g)	ta-182	ground	1.00E-10	2.00E+01	142
	16	ta-182	ground	(n,2n)	ta-181	ground	6.09E+00	2.00E+01	48
	17	ta-182	ground	(n,3n)	ta-180	2.12E-01	1.40E+01	2.00E+01	22
	103	ta-182	ground	(n,p)	hf-182	ground	9.28E+00	2.00E+01	37
73182.31y	102	ta-182	ground	(n,g)	ta-183	ground	1.00E-10	2.00E+01	102
	16	ta-182	5.03E-01	(n,2n)	ta-181	ground	5.59E+00	2.00E+01	50
	17	ta-182	5.03E-01	(n,3n)	ta-180	2.12E-01	1.35E+01	2.00E+01	24
	103	ta-182	5.03E-01	(n,p)	hf-182	ground	8.77E+00	2.00E+01	39
	102	ta-182	5.03E-01	(n,g)	ta-183	ground	1.00E-10	2.00E+01	102
73183.30y	16	ta-183	ground	(n,2n)	ta-182	ground	6.97E+00	2.00E+01	45
	17	ta-183	ground	(n,3n)	ta-181	ground	1.31E+01	2.00E+01	25
	103	ta-183	ground	(n,p)	hf-183	ground	1.08E+01	2.00E+01	32
	102	ta-183	ground	(n,g)	ta-184	ground	1.00E-10	2.00E+01	102
	16	ta-184	ground	(n,2n)	ta-183	ground	5.48E+00	2.00E+01	50

ZAID	MT	TARGET	E-TARG	REACTION	PRODUCT	E-PROD	EMIN	EMAX	NES
73186.30y	17	ta-184	ground	(n,3n)	ta-182	ground	1.24E+01	2.00E+01	27
	102	ta-184	ground	(n,g)	ta-185	ground	1.00E-10	2.00E+01	102
	16	ta-186	ground	(n,2n)	ta-185	ground	5.29E+00	2.00E+01	51
74179.30y	17	ta-186	ground	(n,3n)	ta-184	ground	1.21E+01	2.00E+01	29
	102	ta-186	ground	(n,g)	ta-187	ground	1.00E-10	2.00E+01	102
	16	w-179	ground	(n,2n)	w-178	ground	8.66E+00	2.00E+01	17
74180.30y	17	w-179	ground	(n,3n)	w-177	ground	1.60E+01	2.00E+01	6
	102	w-179	ground	(n,g)	w-180	ground	1.00E-10	2.00E+01	102
	16	w-180	ground	(n,2n)	w-179	ground	8.66E+00	2.00E+01	17
74181.30y	17	w-180	ground	(n,3n)	w-178	ground	1.54E+01	2.00E+01	6
	28	w-180	ground	(n,n')p	ta-179	ground	1.60E+01	2.00E+01	11
	103	w-180	ground	(n,p)	ta-180	ground	9.65E+00	2.00E+01	18
74182.30y	104	w-180	ground	(n,d)	ta-179	ground	1.36E+01	2.00E+01	13
	107	w-180	ground	(n,a)	hf-177	2.74E+00	8.87E+00	2.00E+01	17
	102	w-180	ground	(n,g)	w-181	ground	1.00E-10	2.00E+01	102
74183.30y	16	w-181	ground	(n,2n)	w-180	ground	6.68E+00	2.00E+01	17
	17	w-181	ground	(n,3n)	w-179	ground	1.53E+01	2.00E+01	6
	102	w-181	ground	(n,g)	w-182	ground	1.00E-10	2.00E+01	102
74184.30y	16	w-182	ground	(n,2n)	w-181	ground	8.10E+00	2.00E+01	18
	17	w-182	ground	(n,3n)	w-180	ground	1.48E+01	2.00E+01	7
	22	w-182	ground	(n,n')a	hf-178	2.45E+00	1.26E+01	2.00E+01	12
74185.30y	103	w-182	ground	(n,p)	ta-182	ground	1.03E+00	2.00E+01	27
	107	w-182	ground	(n,a)	hf-179	ground	1.10E+01	2.00E+01	29
	102	w-182	ground	(n,g)	w-183	ground	1.00E-10	2.00E+01	102
74186.30y	16	w-183	ground	(n,2n)	w-182	ground	6.25E+00	2.00E+01	18
	17	w-183	ground	(n,3n)	w-181	ground	1.43E+01	2.00E+01	7
	28	w-183	ground	(n,n')p	ta-182	ground	1.17E+01	2.00E+01	30
74187.30y	22	w-183	ground	(n,n')a	hf-179	1.11E+00	1.14E+01	2.00E+01	13
	103	w-183	ground	(n,p)	ta-183	ground	1.00E+01	2.00E+01	24
	104	w-183	ground	(n,d)	ta-182	ground	1.32E+01	2.00E+01	13
74188.30y	107	w-183	ground	(n,a)	hf-180	ground	1.10E+01	2.00E+01	26
	102	w-183	ground	(n,g)	w-184	ground	1.00E-10	2.00E+01	102
	16	w-184	ground	(n,2n)	w-183	ground	7.45E+00	2.00E+01	18
74189.30y	17	w-184	ground	(n,3n)	w-182	ground	1.37E+01	2.00E+01	7
	28	w-184	ground	(n,n')p	ta-183	ground	1.71E+01	2.00E+01	10
	103	w-184	ground	(n,p)	ta-184	ground	2.26E+00	2.00E+01	27
74190.30y	104	w-184	ground	(n,d)	ta-183	ground	1.37E+01	2.00E+01	13
	107	w-184	ground	(n,a)	hf-181	ground	1.00E-11	2.00E+01	30
	102	w-184	ground	(n,g)	w-185	ground	1.00E-10	2.00E+01	102
74191.30y	16	w-185	ground	(n,2n)	w-184	ground	5.78E+00	2.00E+01	18
	17	w-185	ground	(n,3n)	w-183	ground	1.32E+01	2.00E+01	7
	102	w-185	ground	(n,g)	w-186	ground	1.00E-10	2.00E+01	102
74192.30y	16	w-186	ground	(n,2n)	w-185	ground	7.25E+00	2.00E+01	19
	17	w-186	ground	(n,3n)	w-184	ground	1.30E+01	2.00E+01	8
	22	w-186	ground	(n,n')a	hf-182	ground	1.39E+01	2.00E+01	13
74193.30y	103	w-186	ground	(n,p)	ta-186	ground	1.14E+01	2.00E+01	23
	107	w-186	ground	(n,a)	hf-183	ground	1.10E+01	2.00E+01	29
	102	w-186	ground	(n,g)	w-187	ground	1.00E-10	2.00E+01	102
74194.30y	16	w-187	ground	(n,2n)	w-186	ground	5.50E+00	2.00E+01	19
	17	w-187	ground	(n,3n)	w-185	ground	1.27E+01	2.00E+01	8
	37	w-187	ground	(n,4n)	w-183	ground	1.85E+01	2.00E+01	2
74195.30y	102	w-187	ground	(n,g)	w-188	ground	1.00E-10	2.00E+01	102
	16	w-188	ground	(n,2n)	w-187	ground	6.88E+00	2.00E+01	19
	17	w-188	ground	(n,3n)	w-186	ground	1.24E+01	2.00E+01	8
75184.30y	102	w-188	ground	(n,g)	w-189	ground	1.00E-10	2.00E+01	102
	16	re-184	ground	(n,2n)	re-183	ground	6.54E+00	2.00E+01	24
	17	re-184	ground	(n,3n)	re-182	ground	1.56E+01	2.00E+01	14
75184.31y	103	re-184	ground	(n,p)	w-184	ground	7.88E+00	2.00E+01	17
	102	re-184	ground	(n,g)	re-185	ground	1.00E-10	2.00E+01	102
	16	re-184	1.88E-01	(n,2n)	re-183	ground	6.35E+00	2.00E+01	25
75185.30y	17	re-184	1.88E-01	(n,3n)	re-182	ground	1.54E+01	2.00E+01	15
	103	re-184	1.88E-01	(n,p)	w-184	ground	7.69E+00	2.00E+01	17
	102	re-184	1.88E-01	(n,g)	re-185	ground	1.00E-10	2.00E+01	102
75186.30y	16	re-185	ground	(n,2n)	re-184	ground	7.85E+00	2.00E+01	27

ZAID	MT	TARGET	E-TARG	REACTION	PRODUCT	E-PROD	EMIN	EMAX	NES
75186.30y	1016	re-185	ground	(n,2n)	re-184	1.88E-01	8.04E+00	2.00E+01	16
	17	re-185	ground	(n,3n)	re-183	ground	1.45E+01	2.00E+01	15
	103	re-185	ground	(n,p)	w-185	ground	9.43E+00	2.00E+01	16
	102	re-185	ground	(n,g)	re-186	ground	1.00E-10	2.00E+01	102
	16	re-186	ground	(n,2n)	re-185	ground	6.21E+00	2.00E+01	29
	17	re-186	ground	(n,3n)	re-184	ground	1.38E+01	2.00E+01	16
	1017	re-186	ground	(n,3n)	re-184	1.88E-01	1.38E+01	2.00E+01	16
	103	re-186	ground	(n,p)	w-186	ground	8.38E+00	2.00E+01	17
	102	re-186	ground	(n,g)	re-187	ground	1.00E-10	2.00E+01	102
	16	re-187	ground	(n,2n)	re-186	ground	7.36E+00	2.00E+01	26
75187.30y	17	re-187	ground	(n,3n)	re-185	ground	1.36E+01	2.00E+01	17
	103	re-187	ground	(n,p)	w-187	ground	1.03E+01	2.00E+01	16
	102	re-187	ground	(n,g)	re-188	1.72E-01	1.00E-10	2.00E+01	102
	1102	re-187	ground	(n,g)	re-188	ground	1.00E-10	2.00E+01	102
75188.30y	16	re-188	ground	(n,2n)	re-187	ground	5.90E+00	2.00E+01	27
	17	re-188	ground	(n,3n)	re-186	ground	1.33E+01	2.00E+01	16
	103	re-188	ground	(n,p)	w-188	ground	9.30E+00	2.00E+01	16
	102	re-188	ground	(n,g)	re-189	ground	1.00E-10	2.00E+01	102
75188.31y	16	re-188	1.72E-01	(n,2n)	re-187	ground	5.73E+00	2.00E+01	28
	17	re-188	1.72E-01	(n,3n)	re-186	ground	1.32E+01	2.00E+01	16
	103	re-188	1.72E-01	(n,p)	w-188	ground	9.13E+00	2.00E+01	16
	102	re-188	1.72E-01	(n,g)	re-189	ground	1.00E-10	2.00E+01	102
77191.30y	16	ir-191	ground	(n,2n)	ir-190	ground	8.50E+00	2.00E+01	116
77193.30y	16	ir-193	ground	(n,2n)	ir-192	ground	8.20E+00	2.00E+01	119
77194.30y	16	ir-194	ground	(n,2n)	ir-193	ground	6.10E+00	2.00E+01	48
	17	ir-194	ground	(n,3n)	ir-192	ground	1.40E+01	2.00E+01	22
	103	ir-194	ground	(n,p)	os-194	ground	9.21E+00	2.00E+01	30
78190.30y	102	ir-194	ground	(n,g)	ir-195	ground	1.00E-10	2.00E+01	102
	16	pt-190	ground	(n,2n)	pt-189	ground	8.87E+00	2.00E+01	24
	17	pt-190	ground	(n,3n)	pt-188	ground	1.58E+01	2.00E+01	15
	103	pt-190	ground	(n,p)	ir-190	1.75E-01	1.01E+01	2.00E+01	14
78192.30y	1103	pt-190	ground	(n,p)	ir-190	ground	9.93E+00	2.00E+01	14
	16	pt-192	ground	(n,2n)	pt-191	ground	8.70E+00	2.00E+01	25
	17	pt-192	ground	(n,3n)	pt-190	ground	1.52E+01	2.00E+01	15
	103	pt-192	ground	(n,p)	ir-192	ground	1.07E+01	2.00E+01	14
78193.30y	1103	pt-192	ground	(n,p)	ir-192	1.61E-01	1.09E+01	2.00E+01	14
	16	pt-193	ground	(n,2n)	pt-192	ground	6.28E+00	2.00E+01	26
	17	pt-193	ground	(n,3n)	pt-191	ground	1.50E+01	2.00E+01	15
	103	pt-193	ground	(n,p)	ir-193	ground	9.21E+00	2.00E+01	14
78193.31y	16	pt-193	1.50E-01	(n,2n)	pt-192	ground	6.13E+00	2.00E+01	26
	17	pt-193	1.50E-01	(n,3n)	pt-191	ground	1.48E+01	2.00E+01	15
	103	pt-193	1.50E-01	(n,p)	ir-193	ground	9.06E+00	2.00E+01	14
78194.30y	16	pt-194	ground	(n,2n)	pt-193	ground	8.42E+00	2.00E+01	26
	1016	pt-194	ground	(n,2n)	pt-193	1.50E-01	8.57E+00	2.00E+01	27
	17	pt-194	ground	(n,3n)	pt-192	ground	1.47E+01	2.00E+01	14
	103	pt-194	ground	(n,p)	ir-194	ground	1.15E+01	2.00E+01	14
78195.30y	1103	pt-194	ground	(n,p)	ir-194	4.50E-01	1.20E+01	2.00E+01	14
	16	pt-195	ground	(n,2n)	pt-194	ground	6.14E+00	2.00E+01	26
	17	pt-195	ground	(n,3n)	pt-193	ground	1.46E+01	2.00E+01	16
	103	pt-195	ground	(n,p)	ir-195	ground	1.04E+01	2.00E+01	14
78196.30y	1103	pt-195	ground	(n,p)	ir-195	1.20E-01	1.05E+01	2.00E+01	14
	16	pt-196	ground	(n,2n)	pt-195	ground	7.96E+00	2.00E+01	27
	17	pt-196	ground	(n,3n)	pt-194	ground	1.44E+01	2.00E+01	15
	103	pt-196	ground	(n,p)	ir-196	ground	1.25E+01	2.00E+01	14
78197.30y	1103	pt-196	ground	(n,p)	ir-196	4.30E-01	1.29E+01	2.00E+01	14
	16	pt-197	ground	(n,2n)	pt-196	ground	5.88E+00	2.00E+01	49
	17	pt-197	ground	(n,3n)	pt-195	ground	1.38E+01	2.00E+01	23
	103	pt-197	ground	(n,p)	ir-197	ground	1.12E+01	2.00E+01	31
78197.31y	102	pt-197	ground	(n,g)	pt-198	ground	1.00E-10	2.00E+01	102
	16	pt-197	4.00E-01	(n,2n)	pt-196	ground	5.48E+00	2.00E+01	28
	17	pt-197	4.00E-01	(n,3n)	pt-195	ground	1.34E+01	2.00E+01	16
	103	pt-197	4.00E-01	(n,p)	ir-197	ground	1.08E+01	2.00E+01	14
78198.30y	16	pt-198	ground	(n,2n)	pt-197	ground	7.60E+00	2.00E+01	27
	1016	pt-198	ground	(n,2n)	pt-197	4.00E-01	8.00E+00	2.00E+01	28

ZAID	MT	TARGET	E-TARG	REACTION	PRODUCT	E-PROD	EMIN	EMAX	NES
78199.30y	17	pt-198	ground	(n,3n)	au-196	ground	1.35E+01	2.00E+01	14
	103	pt-198	ground	(n,p)	ir-198	ground	1.36E+01	2.00E+01	14
	16	pt-199	ground	(n,2n)	pt-198	ground	5.60E+00	2.00E+01	29
78199.31y	17	pt-199	ground	(n,3n)	pt-197	ground	1.32E+01	2.00E+01	16
	16	pt-199	4.24E-01	(n,2n)	pt-198	ground	5.17E+00	2.00E+01	29
	17	pt-199	4.24E-01	(n,3n)	pt-197	ground	1.28E+01	2.00E+01	16
79193.30y	102	au-193	ground	(n,g)	au-194	ground	1.00E-10	2.00E+01	102
79194.30y	16	au-194	ground	(n,2n)	au-193	ground	6.80E+00	2.00E+01	15
79195.30y	17	au-194	ground	(n,3n)	au-192	ground	1.57E+01	2.00E+01	7
	102	au-194	ground	(n,g)	au-195	ground	1.00E-10	2.00E+01	102
	16	au-195	ground	(n,2n)	au-194	ground	8.39E+00	2.00E+01	15
79196.30y	17	au-195	ground	(n,3n)	au-193	ground	1.55E+01	2.00E+01	7
	102	au-195	ground	(n,g)	au-196	ground	1.00E-10	2.00E+01	102
	16	au-196	ground	(n,2n)	au-195	ground	6.70E+00	2.00E+01	16
79196.31y	17	au-196	ground	(n,3n)	au-194	ground	1.51E+01	2.00E+01	8
	102	au-196	ground	(n,g)	au-197	ground	1.00E-10	2.00E+01	102
	16	au-196	5.96E-01	(n,2n)	au-195	ground	6.10E+00	2.00E+01	16
79197.30y	17	au-196	5.96E-01	(n,3n)	au-194	ground	1.45E+01	2.00E+01	8
	102	au-196	5.96E-01	(n,g)	au-197	ground	1.00E-10	2.00E+01	102
	16	au-197	ground	(n,2n)	au-196	ground	8.13E+00	2.00E+01	12
79198.30y	1016	au-197	ground	(n,2n)	au-196	5.96E-01	8.70E+00	2.00E+01	7
	17	au-197	ground	(n,3n)	au-195	ground	1.48E+01	2.00E+01	5
	103	au-197	ground	(n,p)	pt-197	ground	1.00E+01	2.00E+01	9
79199.30y	107	au-197	ground	(n,a)	ir-194	ground	7.00E+00	2.00E+01	6
	102	au-197	ground	(n,g)	au-198	ground	1.00E-10	2.00E+01	102
	16	au-198	ground	(n,2n)	au-197	ground	6.55E+00	2.00E+01	16
79200.30y	17	au-198	ground	(n,3n)	au-196	ground	1.47E+01	2.00E+01	8
	102	au-198	ground	(n,g)	au-199	ground	1.00E-10	2.00E+01	102
	16	au-199	ground	(n,2n)	au-198	ground	7.61E+00	2.00E+01	17
80202.30y	17	au-199	ground	(n,3n)	au-197	ground	1.41E+01	2.00E+01	9
	102	au-199	ground	(n,g)	au-200	ground	1.00E-10	2.00E+01	102
	16	au-200	ground	(n,2n)	au-199	ground	6.32E+00	2.00E+01	17
80203.30y	16	hg-202	ground	(n,2n)	hg-201	ground	7.79E+00	2.00E+01	26
	17	hg-202	ground	(n,3n)	hg-200	ground	1.41E+01	2.00E+01	17
	28	hg-202	ground	(n,n')p	au-201	ground	1.81E+01	2.00E+01	8
80204.30y	103	hg-202	ground	(n,p)	au-202	ground	1.29E+01	2.00E+01	16
	107	hg-202	ground	(n,a)	pt-199	ground	1.10E+01	2.00E+01	9
	102	hg-202	ground	(n,g)	hg-203	ground	1.00E-10	2.00E+01	102
81202.30y	16	hg-203	ground	(n,2n)	hg-202	ground	6.02E+00	2.00E+01	26
	17	hg-203	ground	(n,3n)	hg-201	ground	1.38E+01	2.00E+01	16
	28	hg-203	ground	(n,n')p	au-202	ground	1.86E+01	2.00E+01	7
81203.30y	103	hg-203	ground	(n,p)	au-203	ground	1.17E+01	2.00E+01	16
	107	hg-203	ground	(n,a)	pt-200	ground	1.10E+01	2.00E+01	10
	102	hg-203	ground	(n,g)	hg-204	ground	1.00E-10	2.00E+01	102
81204.30y	16	hg-204	ground	(n,2n)	hg-203	ground	7.53E+00	2.00E+01	27
	17	hg-204	ground	(n,3n)	hg-202	ground	1.36E+01	2.00E+01	14
	28	hg-204	ground	(n,n')p	au-203	ground	1.89E+01	2.00E+01	6
81205.30y	103	hg-204	ground	(n,p)	au-204	ground	1.39E+01	2.00E+01	14
	107	hg-204	ground	(n,a)	pt-201	ground	1.20E+01	2.00E+01	7
	102	hg-204	ground	(n,g)	hg-205	ground	1.00E-10	2.00E+01	102
81206.30y	16	tl-202	ground	(n,2n)	tl-201	ground	6.91E+00	2.00E+01	26
	17	tl-202	ground	(n,3n)	tl-200	ground	1.51E+01	2.00E+01	15
	28	tl-202	ground	(n,n')p	hg-201	ground	1.56E+01	2.00E+01	15
81207.30y	103	tl-202	ground	(n,p)	hg-202	ground	8.15E+00	2.00E+01	20
	102	tl-202	ground	(n,g)	tl-203	ground	1.00E-10	2.00E+01	102
	16	tl-203	ground	(n,2n)	tl-202	ground	7.89E+00	2.00E+01	26
81208.30y	17	tl-203	ground	(n,3n)	tl-201	ground	1.48E+01	2.00E+01	14
	28	tl-203	ground	(n,n')p	hg-202	ground	1.57E+01	2.00E+01	15
	103	tl-203	ground	(n,p)	hg-203	ground	1.00E+01	2.00E+01	20
81209.30y	102	tl-203	ground	(n,g)	tl-204	ground	1.00E-10	2.00E+01	102
	16	tl-204	ground	(n,2n)	tl-203	ground	6.69E+00	2.00E+01	26
	17	tl-204	ground	(n,3n)	tl-202	ground	1.46E+01	2.00E+01	15
81210.30y	28	tl-204	ground	(n,n')p	hg-203	ground	1.63E+01	2.00E+01	14
	103	tl-204	ground	(n,p)	hg-204	ground	9.14E+00	2.00E+01	19

ZAID	MT	TARGET	E-TARG	REACTION	PRODUCT	E-PROD	EMIN	EMAX	NES
81205.30y	102	tl-204	ground	(n,g)	tl-205	ground	1.00E-10	2.00E+01	102
	16	tl-205	ground	(n,2n)	tl-204	ground	7.59E+00	2.00E+01	26
	17	tl-205	ground	(n,3n)	tl-203	ground	1.43E+01	2.00E+01	15
	28	tl-205	ground	(n,n')p	hg-204	ground	1.64E+01	2.00E+01	13
82203.30y	103	tl-205	ground	(n,p)	hg-205	ground	1.10E+01	2.00E+01	18
	102	tl-205	ground	(n,g)	tl-206	ground	1.00E-10	2.00E+01	102
	16	pb-203	ground	(n,2n)	pb-202	ground	6.85E+00	2.00E+01	14
	17	pb-203	ground	(n,3n)	pb-201	ground	1.56E+01	2.00E+01	6
82204.30y	102	pb-203	ground	(n,g)	pb-204	ground	1.00E-10	2.00E+01	102
	4	pb-204	ground	(n,n')	pb-204	2.19E+00	2.20E+00	2.00E+01	40
	16	pb-204	ground	(n,2n)	pb-203	ground	8.45E+00	2.00E+01	15
	17	pb-204	ground	(n,3n)	pb-202	ground	1.53E+01	2.00E+01	6
82205.30y	103	pb-204	ground	(n,p)	tl-204	ground	1.04E+01	2.00E+01	17
	105	pb-204	ground	(n,t)	tl-202	ground	1.20E+01	2.00E+01	10
	102	pb-204	ground	(n,g)	pb-205	ground	1.00E-10	2.00E+01	102
	16	pb-205	ground	(n,2n)	pb-204	ground	6.80E+00	2.00E+01	14
82206.30y	17	pb-205	ground	(n,3n)	pb-203	ground	1.52E+01	2.00E+01	6
	102	pb-205	ground	(n,g)	pb-206	ground	1.00E-10	2.00E+01	102
	16	pb-206	ground	(n,2n)	pb-205	ground	8.12E+00	2.00E+01	15
	17	pb-206	ground	(n,3n)	pb-204	ground	1.49E+01	2.00E+01	6
82207.30y	103	pb-206	ground	(n,p)	tl-206	ground	1.11E+01	2.00E+01	16
	105	pb-206	ground	(n,t)	tl-204	ground	1.20E+01	2.00E+01	10
	107	pb-206	ground	(n,a)	hg-203	ground	1.19E+01	2.00E+01	12
	102	pb-206	ground	(n,g)	pb-207	ground	1.00E-10	2.00E+01	102
82208.30y	16	pb-207	ground	(n,2n)	pb-206	ground	6.78E+00	2.00E+01	14
	17	pb-207	ground	(n,3n)	pb-205	ground	1.49E+01	2.00E+01	6
	22	pb-207	ground	(n,n')a	hg-203	ground	1.20E+01	2.00E+01	4
	103	pb-207	ground	(n,p)	tl-207	ground	1.10E+01	2.00E+01	15
82209.30y	107	pb-207	ground	(n,a)	pb-204	ground	1.11E+01	2.00E+01	13
	102	pb-207	ground	(n,g)	pb-208	ground	1.00E-10	2.00E+01	102
	16	pb-208	ground	(n,2n)	pb-207	ground	7.41E+00	2.00E+01	16
	17	pb-208	ground	(n,3n)	pb-206	ground	1.42E+01	2.00E+01	7
82210.30y	102	pb-208	ground	(n,g)	pb-209	ground	1.00E-10	2.00E+01	102
	16	pb-209	ground	(n,2n)	pb-208	ground	3.96E+00	2.00E+01	18
	17	pb-209	ground	(n,3n)	pb-207	ground	1.14E+01	2.00E+01	9
	37	pb-209	ground	(n,4n)	pb-206	ground	1.81E+01	2.00E+01	2
83208.30y	102	pb-209	ground	(n,g)	pb-210	ground	1.00E-10	2.00E+01	102
	16	pb-210	ground	(n,2n)	pb-209	ground	5.21E+00	2.00E+01	27
	17	pb-210	ground	(n,3n)	pb-208	ground	9.16E+00	2.00E+01	15
	28	pb-210	ground	(n,n')p	tl-209	ground	1.84E+01	2.00E+01	7
83209.30y	103	pb-210	ground	(n,p)	tl-210	ground	1.51E+01	2.00E+01	14
	102	pb-210	ground	(n,g)	pb-211	ground	1.00E-10	2.00E+01	102
	16	bi-208	ground	(n,2n)	bi-207	ground	6.93E+00	2.00E+01	24
	17	bi-208	ground	(n,3n)	bi-206	ground	1.51E+01	2.00E+01	14
83210.30y	28	bi-208	ground	(n,n')p	pb-207	ground	1.38E+01	2.00E+01	15
	22	bi-208	ground	(n,n')a	tl-204	ground	1.92E+01	2.00E+01	3
	103	bi-208	ground	(n,p)	pb-208	ground	6.80E+00	2.00E+01	19
	107	bi-208	ground	(n,a)	tl-205	ground	1.16E+01	2.00E+01	13
83210.31y	102	bi-208	ground	(n,g)	bi-209	ground	1.00E-10	2.00E+01	102
	16	bi-209	ground	(n,2n)	bi-208	ground	7.44E+00	2.00E+01	23
	17	bi-209	ground	(n,3n)	bi-207	ground	1.43E+01	2.00E+01	9
	22	bi-209	ground	(n,n')a	tl-205	ground	1.00E-11	2.00E+01	7
83210.30y	103	bi-209	ground	(n,p)	pb-209	ground	9.90E+00	2.00E+01	12
	107	bi-209	ground	(n,a)	tl-206	ground	1.29E+01	2.00E+01	6
	102	bi-209	ground	(n,g)	bi-210	ground	1.00E-10	2.00E+01	102
	1102	bi-209	ground	(n,g)	bi-210	2.71E-01	1.00E-10	2.00E+01	102
83210.31y	16	bi-210	ground	(n,2n)	bi-209	ground	4.63E+00	2.00E+01	27
	17	bi-210	ground	(n,3n)	bi-208	ground	1.21E+01	2.00E+01	16
	28	bi-210	ground	(n,n')p	pb-209	ground	1.46E+01	2.00E+01	14
	22	bi-210	ground	(n,n')a	tl-206	ground	1.72E+01	2.00E+01	9
83210.31y	103	bi-210	ground	(n,p)	pb-210	ground	9.73E+00	2.00E+01	20
	107	bi-210	ground	(n,a)	tl-207	ground	1.03E+01	2.00E+01	17
	102	bi-210	ground	(n,g)	bi-211	ground	1.00E-10	2.00E+01	93
	16	bi-210	2.71E-01	(n,2n)	bi-209	ground	4.35E+00	2.00E+01	27

ZAID	MT	TARGET	E-TARG	REACTION	PRODUCT	E-PROD	EMIN	EMAX	NES
84210.30y	17	bi-210	2.71E-01	(n,3n)	bi-208	ground	1.19E+01	2.00E+01	16
	28	bi-210	2.71E-01	(n,n')p	pb-209	ground	1.40E+01	2.00E+01	14
	22	bi-210	2.71E-01	(n,n')a	tl-206	ground	1.70E+01	2.00E+01	9
	103	bi-210	2.71E-01	(n,p)	pb-210	ground	9.80E+00	2.00E+01	20
	107	bi-210	2.71E-01	(n,a)	tl-207	ground	1.00E+01	2.00E+01	17
	102	bi-210	2.71E-01	(n,g)	bi-211	ground	1.00E-10	2.00E+01	93
	16	po-210	ground	(n,2n)	po-209	ground	7.70E+00	2.00E+01	26
	17	po-210	ground	(n,3n)	po-208	ground	1.47E+01	2.00E+01	16
	28	po-210	ground	(n,n')p	bi-209	ground	1.52E+01	2.00E+01	13
	22	po-210	ground	(n,n')a	pb-206	ground	1.71E+01	2.00E+01	11
90230.30y	103	po-210	ground	(n,p)	bi-210	ground	1.10E+01	2.00E+01	20
	107	po-210	ground	(n,a)	pb-207	ground	1.03E+01	2.00E+01	18
	102	po-210	ground	(n,g)	po-211	ground	1.00E-10	2.00E+01	102
	102	th-230	ground	(n,g)	th-231	ground	1.00E-10	2.00E+01	102
90231.30y	16	th-231	ground	(n,2n)	th-230	ground	5.15E+00	2.00E+01	19
	17	th-231	ground	(n,3n)	th-229	ground	1.20E+01	2.00E+01	11
	37	th-231	ground	(n,4n)	th-228	ground	1.72E+01	2.00E+01	5
	18	th-231	ground	(n,f)	f-prod	ground	1.00E-10	2.00E+01	152
90232.30y	102	th-231	ground	(n,g)	th-232	ground	1.00E-10	2.00E+01	102
	16	th-232	ground	(n,2n)	th-231	ground	6.50E+00	2.00E+01	17
	17	th-232	ground	(n,3n)	th-230	ground	1.16E+01	2.00E+01	8
	37	th-232	ground	(n,4n)	th-229	ground	1.85E+01	2.00E+01	2
90233.30y	18	th-232	ground	(n,f)	f-prod	ground	1.00E+00	2.00E+01	34
	102	th-232	ground	(n,g)	th-233	ground	1.00E-10	2.00E+01	102
	16	th-233	ground	(n,2n)	th-232	ground	4.81E+00	2.00E+01	19
	17	th-233	ground	(n,3n)	th-231	ground	1.13E+01	2.00E+01	14
90234.30y	37	th-233	ground	(n,4n)	th-230	ground	1.63E+01	2.00E+01	5
	18	th-233	ground	(n,f)	f-prod	ground	1.00E-10	2.00E+01	130
	102	th-233	ground	(n,g)	th-234	ground	1.00E-10	2.00E+01	102
	16	th-234	ground	(n,2n)	th-233	ground	6.20E+00	2.00E+01	16
91233.30y	16	pa-233	ground	(n,2n)	pa-232	ground	6.68E+00	2.00E+01	15
	17	pa-233	ground	(n,3n)	pa-230	ground	1.22E+01	2.00E+01	13
	18	pa-233	ground	(n,f)	f-prod	ground	4.80E-01	2.00E+01	42
	102	pa-233	ground	(n,g)	pa-234	ground	1.00E-10	2.00E+01	102
92233.30y	16	u-233	ground	(n,2n)	u-232	ground	5.76E+00	2.00E+01	12
	17	u-233	ground	(n,3n)	u-231	ground	1.31E+01	2.00E+01	6
	18	u-233	ground	(n,f)	f-prod	ground	1.00E-10	2.00E+01	102
	102	u-233	ground	(n,g)	u-234	ground	1.00E-10	2.00E+01	102
92234.30y	16	u-234	ground	(n,2n)	u-233	ground	6.87E+00	2.00E+01	13
	17	u-234	ground	(n,3n)	u-232	ground	1.26E+01	2.00E+01	7
	18	u-234	ground	(n,f)	f-prod	ground	1.00E-01	2.00E+01	40
	102	u-234	ground	(n,g)	u-235	ground	1.00E-10	2.00E+01	128
92235.30y	16	u-235	ground	(n,2n)	u-234	ground	5.32E+00	2.00E+01	16
	17	u-235	ground	(n,3n)	u-233	ground	1.25E+01	2.00E+01	7
	37	u-235	ground	(n,4n)	u-232	ground	1.80E+01	2.00E+01	3
	18	u-235	ground	(n,f)	f-prod	ground	1.00E-10	2.00E+01	1511
92236.30y	102	u-235	ground	(n,g)	u-236	ground	1.00E-10	2.00E+01	767
	16	u-236	ground	(n,2n)	u-235	ground	6.58E+00	2.00E+01	14
	17	u-236	ground	(n,3n)	u-234	ground	1.19E+01	2.00E+01	8
	18	u-236	ground	(n,f)	f-prod	ground	1.00E-10	2.00E+01	40
92237.30y	102	u-236	ground	(n,g)	u-237	ground	1.00E-10	2.00E+01	127
	16	u-237	ground	(n,2n)	u-236	ground	5.14E+00	2.00E+01	11
	17	u-237	ground	(n,3n)	u-235	ground	1.17E+01	2.00E+01	7
	18	u-237	ground	(n,f)	f-prod	ground	1.00E-10	2.00E+01	104
92238.30y	102	u-237	ground	(n,g)	u-238	ground	1.00E-10	2.00E+01	174
	16	u-238	ground	(n,2n)	u-237	ground	6.18E+00	2.00E+01	15
	17	u-238	ground	(n,3n)	u-236	ground	1.15E+01	2.00E+01	9
	37	u-238	ground	(n,4n)	u-235	ground	1.80E+01	2.00E+01	3
92239.30y	18	u-238	ground	(n,f)	f-prod	ground	4.50E-01	2.00E+01	41
	102	u-238	ground	(n,g)	u-239	ground	1.00E-10	2.00E+01	1473
	16	u-239	ground	(n,2n)	u-238	ground	4.82E+00	2.00E+01	14
	17	u-239	ground	(n,3n)	u-237	ground	1.10E+01	2.00E+01	12
	37	u-239	ground	(n,4n)	u-236	ground	1.61E+01	2.00E+01	5
	18	u-239	ground	(n,f)	f-prod	ground	1.00E-10	2.00E+01	160

ZAID	MT	TARGET	E-TARG	REACTION	PRODUCT	E-PROD	EMIN	EMAX	NES
92240.30y	102	u-239	ground	(n,g)	u-240	ground	1.00E-10	2.00E+01	211
	16	u-240	ground	(n,2n)	u-239	ground	5.96E+00	2.00E+01	13
	17	u-240	ground	(n,3n)	u-238	ground	1.08E+01	2.00E+01	10
	37	u-240	ground	(n,4n)	u-237	ground	1.70E+01	2.00E+01	5
	18	u-240	ground	(n,f)	f-prod	ground	1.00E+00	2.00E+01	17
93237.30y	102	u-240	ground	(n,g)	u-241	ground	1.00E-10	2.00E+01	139
	16	np-237	ground	(n,2n)	np-236	ground	6.57E+00	2.00E+01	21
	17	np-237	ground	(n,3n)	np-235	ground	1.24E+01	2.00E+01	9
	18	np-237	ground	(n,f)	f-prod	ground	1.00E-10	2.00E+01	174
	102	np-237	ground	(n,g)	np-238	ground	1.00E-10	2.00E+01	102
94237.30y	16	pu-237	ground	(n,2n)	pu-236	ground	5.90E+00	2.00E+01	22
	17	pu-237	ground	(n,3n)	pu-235	ground	1.32E+01	2.00E+01	9
	18	pu-237	ground	(n,f)	f-prod	ground	1.00E-10	2.00E+01	102
94238.30y	102	pu-237	ground	(n,g)	pu-238	ground	1.00E-10	2.00E+01	102
	16	pu-238	ground	(n,2n)	pu-237	ground	7.05E+00	2.00E+01	12
	17	pu-238	ground	(n,3n)	pu-236	ground	1.29E+01	2.00E+01	5
	18	pu-238	ground	(n,f)	f-prod	ground	1.00E-10	2.00E+01	102
	102	pu-238	ground	(n,g)	pu-239	ground	1.00E-10	2.00E+01	102
94239.30y	16	pu-239	ground	(n,2n)	pu-238	ground	5.64E+00	2.00E+01	22
	17	pu-239	ground	(n,3n)	pu-237	ground	1.26E+01	2.00E+01	10
	37	pu-239	ground	(n,4n)	pu-236	ground	1.86E+01	2.00E+01	2
	18	pu-239	ground	(n,f)	f-prod	ground	1.00E-10	2.00E+01	102
	102	pu-239	ground	(n,g)	pu-240	ground	1.00E-10	2.00E+01	102
94240.30y	16	pu-240	ground	(n,2n)	pu-239	ground	6.60E+00	2.00E+01	17
	17	pu-240	ground	(n,3n)	pu-238	ground	1.22E+01	2.00E+01	10
	18	pu-240	ground	(n,f)	f-prod	ground	1.00E-10	2.00E+01	102
	102	pu-240	ground	(n,g)	pu-241	ground	1.00E-10	2.00E+01	102
94241.30y	16	pu-241	ground	(n,2n)	pu-240	ground	5.30E+00	2.00E+01	13
	17	pu-241	ground	(n,3n)	pu-239	ground	1.19E+01	2.00E+01	8
	37	pu-241	ground	(n,4n)	pu-238	ground	1.76E+01	2.00E+01	4
	18	pu-241	ground	(n,f)	f-prod	ground	1.00E-10	2.00E+01	124
	102	pu-241	ground	(n,g)	pu-242	ground	1.00E-10	2.00E+01	120
94242.30y	16	pu-242	ground	(n,2n)	pu-241	ground	6.33E+00	2.00E+01	23
	17	pu-242	ground	(n,3n)	pu-240	ground	1.16E+01	2.00E+01	13
	37	pu-242	ground	(n,4n)	pu-239	ground	1.81E+01	2.00E+01	2
	18	pu-242	ground	(n,f)	f-prod	ground	1.00E-10	2.00E+01	102
	102	pu-242	ground	(n,g)	pu-243	ground	1.00E-10	2.00E+01	102
94243.30y	16	pu-243	ground	(n,2n)	pu-242	ground	5.06E+00	2.00E+01	20
	17	pu-243	ground	(n,3n)	pu-241	ground	1.14E+01	2.00E+01	14
	37	pu-243	ground	(n,4n)	pu-240	ground	1.66E+01	2.00E+01	7
	18	pu-243	ground	(n,f)	f-prod	ground	1.00E-10	2.00E+01	102
	102	pu-243	ground	(n,g)	pu-244	ground	1.00E-10	2.00E+01	102
95241.30y	16	am-241	ground	(n,2n)	am-240	ground	5.95E+00	2.00E+01	15
	17	am-241	ground	(n,3n)	am-239	ground	1.26E+01	2.00E+01	5
	18	am-241	ground	(n,f)	f-prod	ground	1.00E-10	2.00E+01	102
	102	am-241	ground	(n,g)	am-242	4.82E-02	1.00E-10	2.00E+01	102
	1102	am-241	ground	(n,g)	am-242	ground	1.00E-10	2.00E+01	102
95242.30y	16	am-242	4.82E-02	(n,2n)	am-241	ground	5.60E+00	2.00E+01	11
	17	am-242	4.82E-02	(n,3n)	am-240	ground	1.13E+01	2.00E+01	8
	37	am-242	4.82E-02	(n,4n)	am-239	ground	1.82E+01	2.00E+01	3
	18	am-242	4.82E-02	(n,f)	f-prod	ground	1.00E-10	2.00E+01	102
	102	am-242	4.82E-02	(n,g)	am-243	ground	1.00E-10	2.00E+01	102
95243.30y	16	am-243	ground	(n,2n)	am-242	ground	6.41E+00	2.00E+01	18
	17	am-243	ground	(n,3n)	am-241	ground	1.19E+01	2.00E+01	10
	37	am-243	ground	(n,4n)	am-240	ground	1.85E+01	2.00E+01	3
	18	am-243	ground	(n,f)	f-prod	ground	1.00E-10	2.00E+01	72
	102	am-243	ground	(n,g)	am-244	ground	1.00E-10	2.00E+01	102
96242.30y	16	cm-242	ground	(n,2n)	cm-241	ground	7.00E+00	2.00E+01	14
	17	cm-242	ground	(n,3n)	cm-240	ground	1.31E+01	2.00E+01	7
	18	cm-242	ground	(n,f)	f-prod	ground	1.00E-10	2.00E+01	102
	102	cm-242	ground	(n,g)	cm-243	ground	1.00E-10	2.00E+01	102
96243.30y	16	cm-243	ground	(n,2n)	cm-242	ground	5.72E+00	2.00E+01	10
	17	cm-243	ground	(n,3n)	cm-241	ground	1.27E+01	2.00E+01	6
	37	cm-243	ground	(n,4n)	cm-240	ground	1.88E+01	2.00E+01	2

ZAID	MT	TARGET	E-TARG	REACTION	PRODUCT	E-PROD	EMIN	EMAX	NES
96244.30y	18	cm-243	ground	(n,f)	f-prod	ground	1.00E-10	2.00E+01	102
	102	cm-243	ground	(n,g)	cm-244	ground	1.00E-10	2.00E+01	102
	16	cm-244	ground	(n,2n)	cm-243	ground	6.83E+00	2.00E+01	15
	17	cm-244	ground	(n,3n)	cm-242	ground	1.26E+01	2.00E+01	10
	37	cm-244	ground	(n,4n)	cm-241	ground	1.95E+01	2.00E+01	2
96245.30y	18	cm-244	ground	(n,f)	f-prod	ground	1.00E-10	2.00E+01	102
	102	cm-244	ground	(n,g)	cm-245	ground	1.00E-10	2.00E+01	102
	16	cm-245	ground	(n,2n)	cm-244	ground	5.60E+00	2.00E+01	10
	17	cm-245	ground	(n,3n)	cm-243	ground	1.24E+01	2.00E+01	6
	37	cm-245	ground	(n,4n)	cm-242	ground	1.82E+01	2.00E+01	2
96246.30y	18	cm-245	ground	(n,f)	f-prod	ground	1.00E-10	2.00E+01	102
	102	cm-245	ground	(n,g)	cm-246	ground	1.00E-10	2.00E+01	102
	16	cm-246	ground	(n,2n)	cm-245	ground	6.48E+00	2.00E+01	17
	17	cm-246	ground	(n,3n)	cm-244	ground	1.20E+01	2.00E+01	11
	37	cm-246	ground	(n,4n)	cm-243	ground	1.88E+01	2.00E+01	3
96247.30y	18	cm-246	ground	(n,f)	f-prod	ground	1.00E-10	2.00E+01	102
	102	cm-246	ground	(n,g)	cm-247	ground	1.00E-10	2.00E+01	102
	16	cm-247	ground	(n,2n)	cm-246	ground	5.18E+00	2.00E+01	17
	17	cm-247	ground	(n,3n)	cm-245	ground	1.16E+01	2.00E+01	10
	37	cm-247	ground	(n,4n)	cm-244	ground	1.72E+01	2.00E+01	4
96248.30y	18	cm-247	ground	(n,f)	f-prod	ground	1.00E-10	2.00E+01	102
	102	cm-247	ground	(n,g)	cm-248	ground	1.00E-10	2.00E+01	102
	16	cm-248	ground	(n,2n)	cm-247	ground	6.23E+00	2.00E+01	15
	17	cm-248	ground	(n,3n)	cm-246	ground	1.14E+01	2.00E+01	13
	37	cm-248	ground	(n,4n)	cm-245	ground	1.79E+01	2.00E+01	5
97249.30y	18	cm-248	ground	(n,f)	f-prod	ground	1.00E-10	2.00E+01	102
	102	cm-248	ground	(n,g)	cm-249	ground	1.00E-10	2.00E+01	102
	16	bk-249	ground	(n,2n)	bk-248	ground	6.23E+00	2.00E+01	18
	17	bk-249	ground	(n,3n)	bk-247	ground	1.18E+01	2.00E+01	12
	37	bk-249	ground	(n,4n)	bk-246	ground	1.79E+01	2.00E+01	5
98249.30y	18	bk-249	ground	(n,f)	f-prod	ground	1.00E-10	2.00E+01	125
	102	bk-249	ground	(n,g)	bk-250	ground	1.00E-10	2.00E+01	102
	16	cf-249	ground	(n,2n)	cf-248	ground	5.62E+00	2.00E+01	16
	17	cf-249	ground	(n,3n)	cf-247	ground	1.18E+01	2.00E+01	11
	37	cf-249	ground	(n,4n)	cf-246	ground	1.87E+01	2.00E+01	4
98250.30y	18	cf-249	ground	(n,f)	f-prod	ground	1.00E-10	2.00E+01	102
	102	cf-249	ground	(n,g)	cf-250	ground	1.00E-10	2.00E+01	102
	16	cf-250	ground	(n,2n)	cf-249	ground	6.64E+00	2.00E+01	18
	17	cf-250	ground	(n,3n)	cf-248	ground	1.23E+01	2.00E+01	11
	37	cf-250	ground	(n,4n)	cf-247	ground	1.87E+01	2.00E+01	4
98251.30y	18	cf-250	ground	(n,f)	f-prod	ground	1.00E-10	2.00E+01	22
	102	cf-250	ground	(n,g)	cf-251	ground	1.00E-10	2.00E+01	102
	16	cf-251	ground	(n,2n)	cf-250	ground	5.13E+00	2.00E+01	15
	17	cf-251	ground	(n,3n)	cf-249	ground	1.18E+01	2.00E+01	8
	37	cf-251	ground	(n,4n)	cf-248	ground	1.74E+01	2.00E+01	5
98252.30y	18	cf-251	ground	(n,f)	f-prod	ground	1.00E-10	2.00E+01	102
	102	cf-251	ground	(n,g)	cf-252	ground	1.00E-10	2.00E+01	102
	16	cf-252	ground	(n,2n)	cf-251	ground	6.25E+00	2.00E+01	9
	17	cf-252	ground	(n,3n)	cf-250	ground	1.14E+01	2.00E+01	8
	37	cf-252	ground	(n,4n)	cf-249	ground	1.80E+01	2.00E+01	2
	18	cf-252	ground	(n,f)	f-prod	ground	1.00E-10	2.00E+01	102
	102	cf-252	ground	(n,g)	cf-253	ground	1.00E-10	2.00E+01	102