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Argonne National Laboratory

BUILDUP OF RADIOACTIVE PRODUCTS IN THERMAL REACTORS

I. ^{237}Np Targets

by

D. C. Stewart, E. S. Macias,
L. J. Basile, and J. Milsted

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Chemistry

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INTRODUCTION

This report is another in a series[1-4] involving the use of computer techniques modified from those originally developed by Milsted and his co-workers[5] to calculate the production of higher nuclides in the neutron irradiation of transneptunium-element targets. The calculation program has as its purpose the establishment of a reference set of buildup data and curves based on the best half-lives and cross-section information currently available. The basic computing programs used have been previously presented.[4]

The primary purpose in irradiating ^{237}Np is almost invariably to produce ^{238}Pu. The current widespread interest in this isotope as a heat source has generated a large number of papers on the economics of ^{237}Np and ^{238}Pu production in power reactors, but relatively little has appeared on the direct irradiation of ^{237}Np alone. Meichle and Owsley[6] have considered the problem from the point of view of balancing four variables: flux level, flux spectrum, reactor-cycle length, and out-of-reactor holdup time, in order to optimize ^{238}Pu production. In essence, the present paper deals only with one of these variables: the effect of flux, but at the same time also considers the formation rates of a number of side products of possible interest or having a potential for being a problem during post-irradiation chemical processing. Rupp, Cox, and Binford[7] have calculated ^{238}Pu yields in various power reactors for fluxes between 10^{12} and 10^{14} n/cm^2-sec. They did not consider side products.

The data were calculated with a CDC-3600 computer. Conversion programs have been developed to permit the corresponding graphs to be drawn by use of an IBM 1620-II instrument and its associated equipment if so desired. The buildup data were formulated both in terms of relative yields (atoms of product per original atom of target) and as radioactivity (disintegrations per minute per gram of original target).

The cross-section and half-life values used are summarized in Table I, and the buildup scheme that was assumed is given in Fig. 1. Experience has shown that numerical values are more useful than graphed curves, since the latter usually must be reduced in size in publication,

making them difficult to read precisely. For this reason, the computer sheets for the relative yield data are reproduced for seven different flux levels in Tables IV-X at the end of this report. Figures 2 and 3 present typical yield and radioactivity buildup curves for a single flux (7×10^{13} n/cm^2-sec) as examples. "Comb 1" (see below) was not graphed in Fig. 2, since at this relatively low flux it is essentially identical with ^{238}Pu. In the same way, "total radioactivity" was not drawn in Fig. 3, since it is predominantly due to ^{238}Np for the first few years in the reactor. The radioactivity data at other fluxes are not reproduced in this report since they can readily be calculated for any particular time-flux situation by use of Tables IV-X and the specific activities given in Table I.

TABLE I. Nuclear Data Used for ^{237}Np Irradiation

		Cross Sections					
		Capture		Fission			Specific
Nuclide	Half-life[a]	b	Ref	b	Ref	Destruction, b	Activity, dis/sec-μg
^{234}U	2.47×10^5 yr	95	(b)	-	-	95	227
^{235}U	7.13×10^8 yr	101	(b)	557	(b)	678	0.0789
^{236}U	2.39×10^7 yr	6	(b)	-	-	6	2.34
^{237}U	6.75 day	-	-	-	-	-	3.02×10^9
^{237}Np	2.14×10^6 yr	170	(c)	0.019	(a)	170	26
^{238}Np	2.10 day	-	-	1600	(a)	1600	9.65×10^9
^{238}Pu	86.4 yr	500	(b)	17	(b)	517	6.46×10^5
^{239}Pu	24,390 yr	270	(c)	741	(b)	1011	2272
^{240}Pu	6580 yr	290	(c)	<0.08	(c)	290	8620
^{241}Pu	13.2 yr	425	(b)	950	(b)	1375	4.23×10^6
^{242}Pu	3.79×10^5 yr	29	(c)	-	-	29	144
^{243}Pu	4.98 hr	170	(b)	-	-	170	9.57×10^{10}
^{241}Am	458 yr	620 to 16 hr 120 to 152 yr	(b)	3	(a)	743	1.20×10^5
^{242}Am	16 hr	-	-	2900	(b)	2900	2.99×10^{10}
^{242m}Am	152 yr	2000	(b)	6000	(b)	8000	3.59×10^5
^{243}Am	7950 yr	180	(b)	-	-	180	6880

(a) C. M. Lederer, J. M. Holland, and I. Perlman, Table of Isotopes, 6th Ed., John Wiley & Sons, Inc., New York (1967).
(b) J. R. Stehn et al., Neutron Cross Sections, Vol. III, Z = 88 to 98, BNL 325, 2nd Ed., Suppl. 2 (Feb 1965).
(c) D. T. Goldman and J. R. Roesser, Chart of the Nuclides, 9th Ed., Rev. to July 1966, Knolls Atomic Power Laboratory.

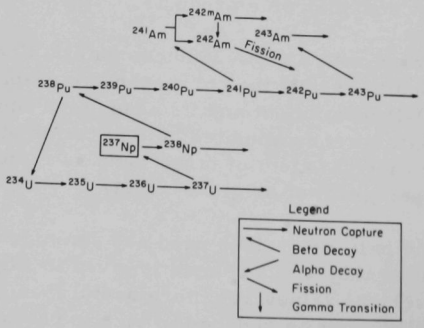

Fig. 1

Assumed Reaction Scheme for ^{237}Np Target

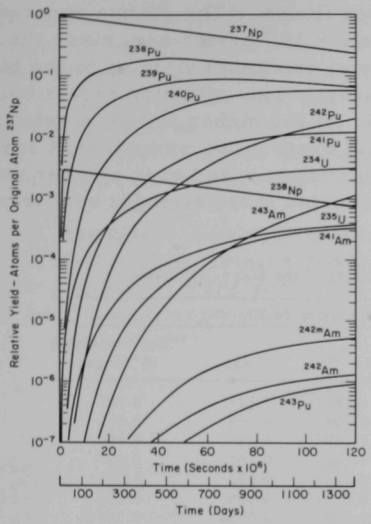

Fig. 2. Relative Yield Curve for ^{237}Np Target. Flux: 7 x 10^{13} n/cm^2-sec.

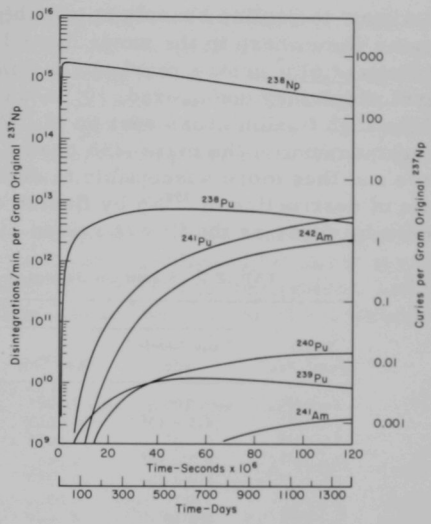

Fig. 3. Radioactivity Buildup per Gram of ^{237}Np. Flux: 7 x 10^{13} n/cm^2-sec.

In Tables IV-X, the time is given in units of 10^6 sec (ca. 11.6 days). The data were prepared by an integrative technique, that is, the computer calculated the changes for each product in a time interval Δt, then adjusted the number of atoms that were in that product's "pocket" before going on to consider the next time span. The Δt value for Tables IV-V was 2 x 10^4 sec; for VI-VII, 5 x 10^3 sec; and for VIII-X, 2 x 10^3 sec. In the data, a notation "1.30-002" indicates that 1.3 x 10^{-2} or 0.013 atom of product per original atom of target has been formed at the indicated time. "Comb 1" refers to the total chain yield for mass 238, i.e., ^{238}Np + ^{238}Pu. "Am342" is 152-yr ^{242m}Am.

DISCUSSION

If the goal of the irradiation is to produce ^{238}Pu, it is necessary to examine the combined amounts of ^{238}Np plus ^{238}Pu at any given time, since the 2.10-day half-life of the former isotope means that it will rapidly be converted to the desired product after the target is removed from the reactor. Table II summarizes the situation at the time of maximum yield for the 238 chain for the seven fluxes chosen. Intuitively, one would expect that yield would increase with available flux, but examination of Table II reveals that while the yield is essentially constant at lower fluxes, it begins to drop somewhere between 7 x 10^{13} and 3 x 10^{14} n/cm^2-sec and

continues to decline sharply at still higher fluxes. (The change apparently begins somewhere in the range from 1 to 2 x 10^{14} n/cm^2-sec, since the data of Rupp et al.,[7] show a marked constancy of maximum yield up to the highest level which they considered, 10^{14} n/cm^2-sec.) This situation arises because of the high fission cross section of ^{238}Np. At the higher fluxes, a relatively larger amount of the mass-238 chain is in the form of neptunium at any given time and thus more susceptible to destruction. Looked at in another way, the rate of destruction of ^{238}Np by fission competes more strongly with transmutation by decay as the flux is raised.

TABLE II. Maximum Obtainable Yields of the Mass-238 Chain

Flux, n/cm^2-sec	At Point of Maximum Yield				
	Time Needed, sec	As ^{238}Np	As ^{238}Pu	Total	^{237}Np Remaining in Target
3 x 10^{13}	10^8	0.0008	0.186	0.187	0.600
7 x 10^{13}	4.5 x 10^7	0.0018	0.184	0.186	0.585
3 x 10^{14}	10^7	0.0072	0.169	0.176	0.600
7 x 10^{14}	4.2 x 10^6	0.015	0.146	0.161	0.607
2 x 10^{15}	1.4 x 10^6	0.0316	0.101	0.132	0.621
5 x 10^{15}	5 x 10^5	0.0504	0.0561	0.106	0.654
1 x 10^{16}	2 x 10^5	0.0649	0.0287	0.0936	0.712

A second consideration in any production scheme, of course, is to choose conditions such that the maximum amount of ^{237}Np target can be salvaged for reuse. The data of Table II would indicate that this quantity varies relatively little at the point at which the maximum 238 yield is obtained. It will also be seen from Table II that the time taken to reach the maximum yield is essentially inversely proportional to the flux, a not unexpected result in view of the shortness of the buildup chain to that point.

The high capture cross section of ^{238}Pu is another factor which sharply limits the maximum conversion yield. This large cross section also makes it difficult to obtain ^{238}Pu free of higher plutonium isotopes, although in many applications this is not a restrictive consideration. Table III gives the composition of the plutonium fraction at the point of maximum yield of the 238 chain for the different fluxes. It will be seen

TABLE III. Composition of Plutonium Fraction at the Time of Maximum Yield of the Mass-238 Chain

Flux, n/cm^2-sec	Composition of Plutonium Fraction, a/o				
	238 Chain[a]	^{239}Pu	^{240}Pu	^{241}Pu	^{242}Pu
3 x 10^{13}	63.60	26.49	8.40	1.12	0.39
7 x 10^{13}	62.79	26.64	8.88	1.23	0.46
3 x 10^{14}	64.84	25.72	7.99	1.08	0.37
7 x 10^{14}	66.91	24.56	7.27	0.95	0.31
2 x 10^{15}	72.43	21.07	5.60	0.70	0.20
5 x 10^{15}	81.32	14.88	3.33	0.38	0.09
1 x 10^{16}	90.49	8.00	1.36	0.13	0.02

[a] ^{238}Np + ^{238}Pu.

that the contribution of the heavier nuclides is very substantial. Preparing relatively "clean" ^{238}Pu from ^{237}Np would best be done by very short irradiation cycles at high fluxes, followed by cooling to allow the ^{238}Np to decay. By this technique, most of the 238 chain is prepared and removed in the "buffer" neptunium form before capture to higher products can occur. The practical difficulties that would be encountered in preparing any sizeable amount of ^{238}Pu by this method are obvious.

An alternative approach is to produce ^{242}Cm by irradiation of ^{241}Am. The ^{242}Cm is then chemically separated and periodically "milked" for the ^{238}Pu daughter.[3] Very pure ^{238}Pu could be obtained in this fashion, although the handling of large quantities of ^{242}Cm is not without its own problems.

TABLE IV*

TARGET= NP237
DATA TYPE= YIELD ATOMS PER ATOM TARGET
FLUX= 3.0+013
TIME SPAN= 0-150

TIME	0.00500	0.01000	0.05000	0.10000	0.50000	0.80000
FLUX= 3.0+013		TARGET=NP237		DATA TYPE=YIELD		
NP237	1.00+000	1.00+000	1.00+000	9.99-001	9.97-001	9.96-001
NP238	5.10-005	1.00-004	2.36-004	4.30-004	1.13-003	1.26-003
PU238	1.95-006	5.77-006	2.78-005	9.56-005	1.44-003	2.81-003
U234	4.95-012	1.96-011	1.67-010	1.00-009	7.20-008	2.35-007
U235	1.41-016	7.00-016	9.58-015	9.42-014	2.94-011	1.55-010
U236	4.28-021	2.55-020	5.25-019	8.08-018	1.01-014	8.52-014
U237	7.70-027	5.35-026	1.57-024	3.61-023	1.60-019	2.01-018
PU239	2.92-010	1.16-009	9.84-009	5.90-008	4.23-006	1.38-005
PU240	2.37-014	1.17-013	1.61-012	1.58-011	4.91-009	2.59-008
PU241	2.06-018	1.23-017	2.53-016	3.89-015	4.86-012	4.07-011
PU242	2.63-022	1.83-021	5.39-020	1.25-018	5.90-015	7.78-014
PU243	2.28-027	1.73-026	6.12-025	1.70-023	1.13-019	1.58-018
AM241	3.43-023	2.38-022	7.03-021	1.63-019	7.69-016	1.01-014
AM242	6.37-027	5.00-026	1.94-024	6.11-023	6.50-019	1.03-017
AM342	1.23-027	9.82-027	3.99-025	1.35-023	2.25-019	4.57-018
AM243	8.84-028	7.58-027	3.64-025	1.46-023	3.55-019	7.75-018
COMB1	5.29-005	1.06-004	2.64-004	5.25-004	2.57-003	4.07-003

TIME	1.00000	1.10000	1.20000	1.40000	1.60000	1.80000
FLUX= 3.0+013		TARGET=NP237		DATA TYPE=YIELD		
NP237	9.95-001	9.94-001	9.94-001	9.93-001	9.92-001	9.91-001
NP238	1.29-003	1.30-003	1.30-003	1.31-003	1.31-003	1.31-003
PU238	3.78-003	4.26-003	4.75-003	5.73-003	6.71-003	7.69-003
U234	4.03-007	5.06-007	6.21-007	8.88-007	1.21-006	1.57-006
U235	3.36-010	4.66-010	6.27-010	1.05-009	1.65-009	2.43-009
U236	2.32-013	3.54-013	5.21-013	1.03-012	1.85-012	3.09-012
U237	6.60-018	1.09-017	1.73-017	3.86-017	7.70-017	1.41-016
PU239	2.36-005	2.96-005	3.63-005	5.18-005	7.02-005	9.14-005
PU240	5.61-008	7.78-008	1.05-007	1.76-007	2.75-007	4.06-007
PU241	1.10-010	1.69-010	2.48-010	4.89-010	8.75-010	1.46-009
PU242	2.64-013	4.43-013	7.12-013	1.64-012	3.37-012	6.33-012
PU243	5.47-018	9.26-018	1.49-017	3.48-017	7.19-017	1.36-016
AM241	3.43-014	5.77-014	9.25-014	2.13-013	4.37-013	8.21-013
AM242	3.74-017	6.46-017	1.06-016	2.54-016	5.37-016	1.03-015
AM342	1.91-017	3.52-017	6.14-017	1.64-016	3.82-016	8.03-016
AM243	3.34-017	6.22-017	1.10-016	2.98-016	7.07-016	1.51-015
COMB1	5.06-003	5.56-003	6.05-003	7.04-003	8.02-003	8.99-003

*"Am342" is 152-yr ^{242m}Am.

TABLE IV (Contd.)

TIME	2.00000	2.20000	2.50000	3.00000	3.20000	3.50000
FLUX= 3.0+013		TARGET=NP237		DATA TYPE=YIELD		
NP237	9.90-001	9.89-001	9.87-001	9.85-001	9.84-001	9.82-001
NP238	1.31-003	1.31-003	1.30-003	1.30-003	1.30-003	1.30-003
PU238	8.66-003	9.63-003	1.11-002	1.35-002	1.44-002	1.58-002
U234	1.99-006	2.45-006	3.24-006	4.80-006	5.51-006	6.66-006
U235	3.44-009	4.69-009	7.10-009	1.27-008	1.56-008	2.07-008
U236	4.87-012	7.34-012	1.27-011	2.75-011	3.61-011	5.26-011
U237	2.40-016	3.87-016	7.31-016	1.78-015	2.44-015	3.74-015
PU239	1.15-004	1.42-004	1.87-004	2.76-004	3.16-004	3.81-004
PU240	5.73-007	7.81-007	1.18-006	2.11-006	2.59-006	3.43-006
PU241	2.30-009	3.45-009	5.94-009	1.28-008	1.68-008	2.44-008
PU242	1.11-011	1.84-011	3.62-011	9.44-011	1.32-010	2.11-010
PU243	2.40-016	3.99-016	7.89-016	2.07-015	2.90-015	4.63-015
AM241	1.44-012	2.39-012	4.69-012	1.22-011	1.71-011	2.72-011
AM242	1.85-015	3.11-015	6.23-015	1.66-014	2.34-014	3.76-014
AM342	1.56-015	2.83-015	6.27-015	1.93-014	2.88-014	4.97-014
AM243	2.96-015	5.45-015	1.23-014	3.89-014	5.83-014	1.02-013
COMB1	9.97-003	1.09-002	1.24-002	1.48-002	1.57-002	1.71-002

TIME	4.00000	4.50000	5.00000	6.00000	7.00000	8.00000
FLUX= 3.0+013		TARGET=NP237		DATA TYPE=YIELD		
NP237	9.80-001	9.77-001	9.75-001	9.70-001	9.65-001	9.60-001
NP238	1.29-003	1.29-003	1.29-003	1.28-003	1.27-003	1.27-003
PU238	1.82-002	2.05-002	2.28-002	2.73-002	3.17-002	3.60-002
U234	8.81-006	1.13-005	1.40-005	2.03-005	2.77-005	3.63-005
U235	3.14-008	4.54-008	6.28-008	1.10-007	1.75-007	2.62-007
U236	9.19-011	1.50-010	2.32-010	4.89-010	9.17-010	1.57-009
U237	7.05-015	1.22-014	1.99-014	4.57-014	9.10-014	1.64-013
PU239	5.02-004	6.39-004	7.90-004	1.14-003	1.54-003	1.99-003
PU240	5.20-006	7.48-006	1.03-005	1.80-005	2.86-005	4.26-005
PU241	4.23-008	6.86-006	1.05-007	2.20-007	4.08-007	6.93-007
PU242	4.20-010	7.70-010	1.32-009	3.34-009	7.26-009	1.42-008
PU243	9.27-015	1.70-014	2.92-014	7.41-014	1.62-013	3.16-013
AM241	5.41-011	9.90-011	1.69-010	4.27-010	9.25-010	1.80-009
AM242	7.59-014	1.40-013	2.42-013	6.17-013	1.35-012	2.64-012
AM342	1.12-013	2.28-013	4.28-013	1.26-012	3.12-012	6.76-012
AM243	2.35-013	4.89-013	9.38-013	2.88-012	7.38-012	1.66-011
COMB1	1.95-002	2.18-002	2.41-002	2.86-002	3.30-002	3.73-002

TIME	9.00000	10.00000	12.00000	14.00000	16.00000	18.00000
FLUX= 3.0+013		TARGET=NP237		DATA TYPE=YIELD		
NP237	9.55-001	9.50-001	9.41-001	9.31-001	9.22-001	9.12-001
NP238	1.26-003	1.25-003	1.24-003	1.23-003	1.22-003	1.20-003
PU238	4.02-002	4.44-002	5.24-002	6.01-002	6.74-002	7.44-002
U234	4.59-005	5.65-005	6.07-005	1.09-004	1.40-004	1.76-004
U235	3.72-007	5.09-007	8.71-007	1.36-006	2.01-006	2.81-006
U236	2.53-009	3.86-009	7.98-009	1.47-008	2.48-008	3.93-008
U237	2.74-013	4.31-013	9.36-013	1.78-012	3.10-012	5.02-012
PU239	2.50-003	3.05-003	4.28-003	5.67-003	7.19-003	8.84-003
PU240	6.03-005	8.22-005	1.39-004	2.17-004	3.16-004	4.39-004
PU241	1.10-006	1.66-006	3.35-006	6.03-006	9.97-006	1.54-005
PU242	2.55-008	4.29-008	1.05-007	2.22-007	4.23-007	7.43-007
PU243	5.68-013	9.58-013	2.35-012	4.97-012	9.47-012	1.66-011
AM241	3.22-009	5.40-009	1.31-008	2.76-008	5.21-008	9.08-008
AM242	4.75-012	8.01-012	1.96-011	4.13-011	7.83-011	1.37-010
AM342	1.33-011	2.42-011	6.74-011	1.58-010	3.26-010	6.12-010
AM243	3.38-011	6.37-011	1.89-010	4.73-010	1.04-009	2.07-009
COMB1	4.15-002	4.56-002	5.36-002	6.13-002	6.86-002	7.56-002

TIME	20.00000	22.00000	25.00000	30.00000	32.00000	35.00000
FLUX= 3.0+013		TARGET=NP237		DATA TYPE=YIELD		
NP237	9.03-001	8.94-001	8.80-001	8.58-001	8.49-001	8.37-001
NP238	1.19-003	1.18-003	1.16-003	1.13-003	1.12-003	1.10-003
PU238	8.11-002	8.75-002	9.66-002	1.10-001	1.15-001	1.23-001
U234	2.14-004	2.56-004	3.23-004	4.50-004	5.04-004	5.90-004
U235	3.79-006	4.95-006	7.05-006	1.16-005	1.38-005	1.75-005
U236	5.92-008	8.56-008	1.40-007	2.79-007	3.56-007	4.98-007
U237	7.68-012	1.13-011	1.87-011	3.82-011	4.90-011	6.92-011
PU239	1.06-002	1.24-002	1.53-002	2.04-002	2.25-002	2.56-002
PU240	5.88-004	7.62-004	1.07-003	1.74-003	2.05-003	2.57-003
PU241	2.27-005	3.21-005	5.07-005	9.58-005	1.19-004	1.62-004
PU242	1.22-006	1.92-006	3.47-006	8.02-006	1.07-005	1.61-005
PU243	2.74-011	4.30-011	7.79-011	1.80-010	2.41-010	3.61-010
AM241	1.49-007	2.31-007	4.14-007	9.38-007	1.25-006	1.84-006
AM242	2.24-010	3.49-010	6.27-010	1.42-009	1.89-009	2.80-009
AM342	1.07-009	1.75-009	3.37-009	8.37-009	1.15-008	1.77-008
AM243	3.81-009	6.62-009	1.38-008	3.87-008	5.56-008	9.16-008
COMB1	8.23-002	8.87-002	9.77-002	1.11-001	1.17-001	1.24-001

TABLE IV (Contd.)

TIME	40.00000	45.00000	50.00000	60.00000	70.00000	80.00000
FLUX= 3.0+013		TARGET=NP237		DATA TYPE=YIELD		
NP237	8.15-001	7.95-001	7.75-001	7.36-001	7.00-001	6.65-001
NP238	1.08-003	1.05-003	1.02-003	9.72-004	9.24-004	8.78-004
PU238	1.33-001	1.43-001	1.51-001	1.64-001	1.74-001	1.80-001
U234	7.44-004	9.07-004	1.08-003	1.45-003	1.83-003	2.22-003
U235	2.49-005	3.37-005	4.39-005	6.85-005	9.82-005	1.33-004
U236	8.17-007	1.26-006	1.84-006	3.53-006	6.03-006	9.51-006
U237	1.15-010	1.78-010	2.63-010	5.09-010	8.77-010	1.39-009
PU239	3.09-002	3.62-002	4.13-002	5.10-002	5.96-002	6.69-002
PU240	3.58-003	4.76-003	6.09-003	9.17-003	1.27-002	1.65-002
PU241	2.51-004	3.66-004	5.09-004	8.76-004	1.35-003	1.92-003
PU242	2.90-005	4.84-005	7.59-005	1.62-004	3.01-004	5.05-004
PU243	6.51-010	1.09-009	1.70-009	3.64-009	6.76-009	1.14-008
AM241	3.26-006	5.34-006	8.22-006	1.69-005	3.01-005	4.85-005
AM242	4.97-009	8.14-009	1.25-008	2.58-008	4.60-008	7.42-008
AM342	3.31-008	5.66-008	9.03-008	1.96-007	3.66-007	6.10-007
AM243	1.91-007	3.63-007	6.38-007	1.66-006	3.66-006	7.12-006
COMB1	1.34-001	1.44-001	1.52-001	1.65-001	1.75-001	1.81-001

TIME	90.00000	100.00000	110.00000	120.00000	130.00000	150.00000
FLUX= 3.0+013		TARGET=NP237		DATA TYPE=YIELD		
NP237	6.32-001	6.00-001	5.71-001	5.42-001	5.15-001	4.65-001
NP238	8.34-004	7.93-004	7.53-004	7.16-004	6.80-004	6.14-004
PU238	1.84-001	1.86-001	1.86-001	1.85-001	1.83-001	1.75-001
U234	2.62-003	3.01-003	3.39-003	3.76-003	4.11-003	4.77-003
U235	1.71-004	2.12-004	2.56-004	3.01-004	3.47-004	4.41-004
U236	1.41-005	1.98-005	2.69-005	3.52-005	4.50-005	6.87-005
U237	2.07-009	2.92-009	3.97-009	5.22-009	6.68-009	1.02-008
PU239	7.30-002	7.79-002	8.16-002	8.43-002	8.60-002	8.71-002
PU240	2.06-002	2.47-002	2.88-002	3.28-002	3.67-002	4.37-002
PU241	2.57-003	3.29-003	4.05-003	4.83-003	5.61-003	7.14-003
PU242	7.86-004	1.15-003	1.61-003	2.16-003	2.80-003	4.37-003
PU243	1.77-008	2.59-008	3.61-008	4.85-008	6.30-008	9.82-008
AM241	7.24-005	1.02-004	1.36-004	1.75-004	2.18-004	3.13-004
AM242	1.11-007	1.56-007	2.09-007	2.69-007	3.35-007	4.79-007
AM342	9.34-007	1.34-006	1.83-006	2.38-006	3.00-006	4.38-006
AM243	1.26-005	2.08-005	3.22-005	4.76-005	6.76-005	1.24-004
COMB1	1.85-001	1.87-001	1.87-001	1.86-001	1.83-001	1.76-001

TABLE V*

TARGET= NP237
DATA TYPE= YIELD ATOMS PER ATOM TARGET
FLUX= 7.0+013
TIME SPAN= 0-150

TIME	0.00500	0.01000	0.05000	0.10000	0.50000	0.80000
FLUX= 7.0+013		TARGET=NP237		DATA TYPE=YIELD		
NP237	1.00+000	1.00+000	9.99-001	9.99-001	9.94-001	9.91-001
NP238	1.19-004	2.33-004	5.50-004	9.99-004	2.61-003	2.88-003
PU238	4.55-006	1.35-005	6.47-005	2.22-004	3.31-003	6.44-003
U234	1.16-011	4.58-011	3.89-010	2.33-009	1.66-007	5.39-007
U235	7.68-016	3.81-015	5.21-014	5.12-013	1.58-010	8.29-010
U236	5.43-020	3.24-019	6.66-018	1.02-016	1.28-013	1.07-012
U237	2.28-025	1.59-024	4.65-023	1.07-021	4.70-018	5.88-017
PU239	1.59-009	6.30-009	5.35-008	3.20-007	2.27-005	7.32-005
PU240	3.01-013	1.49-012	2.04-011	2.00-010	6.16-008	3.22-007
PU241	6.10-017	3.64-016	7.48-015	1.15-013	1.42-010	1.18-009
PU242	1.82-020	1.26-019	3.72-018	8.62-017	4.03-013	5.27-012
PU243	3.69-025	2.79-024	9.87-023	2.73-021	1.81-017	2.50-016
AM241	1.02-021	7.07-021	2.08-019	4.82-018	2.24-014	2.93-013
AM242	4.41-025	3.45-024	1.34-022	4.21-021	4.41-017	6.91-016
AM342	8.53-026	6.78-025	2.75-023	9.25-022	1.50-017	3.00-016
AM243	1.43-025	1.22-024	5.86-023	2.35-021	5.65-017	1.23-015
COMB1	1.24-004	2.47-004	6.14-004	1.22-003	5.91-003	9.32-003

*"Am342" is 152-yr ^{242m}Am.

TABLE V (Contd.)

TIME	1.00000	1.10000	1.20000	1.40000	1.60000	1.80000
FLUX= 7.0+013		TARGET=NP237		DATA TYPE=YIELD		
NP237	9.88-001	9.87-001	9.86-001	9.83-001	9.81-001	9.79-001
NP238	2.94-003	2.96-003	2.97-003	2.97-003	2.97-003	2.97-003
PU238	8.61-003	9.71-003	1.08-002	1.30-002	1.52-002	1.73-002
U234	9.24-007	1.16-006	1.42-006	2.02-006	2.74-006	3.56-006
U235	1.79-009	2.48-009	3.33-009	5.59-009	8.70-009	1.28-008
U236	2.89-012	4.42-012	6.49-012	1.28-011	2.29-011	3.81-011
U237	1.93-016	3.19-016	5.03-016	1.12-015	2.23-015	4.06-015
PU239	1.25-004	1.56-004	1.91-004	2.71-004	3.66-004	4.74-004
PU240	6.95-007	9.61-007	1.29-006	2.16-006	3.36-006	4.94-006
PU241	3.17-009	4.83-009	7.09-009	1.39-008	2.47-008	4.10-008
PU242	1.78-011	2.98-011	4.77-011	1.09-010	2.23-010	4.18-010
PU243	8.59-016	1.45-015	2.34-015	5.41-015	1.11-014	2.10-014
AM241	9.86-013	1.65-012	2.64-012	6.05-012	1.23-011	2.31-011
AM242	2.50-015	4.30-015	7.04-015	1.67-014	3.52-014	6.73-014
AM342	1.24-015	2.26-015	3.92-015	1.03-014	2.37-014	4.93-014
AM243	5.26-015	9.78-015	1.72-014	4.65-014	1.10-013	2.33-013
COMB1	1.16-002	1.27-002	1.38-002	1.60-002	1.81-002	2.03-002

TIME	2.00000	2.20000	2.50000	3.00000	3.20000	3.50000
FLUX= 7.0+013		TARGET=NP237		DATA TYPE=YIELD		
NP237	9.76-001	9.74-001	9.71-001	9.65-001	9.63-001	9.59-001
NP238	2.96-003	2.96-003	2.95-003	2.93-003	2.92-003	2.91-003
PU238	1.94-002	2.16-002	2.47-002	2.98-002	3.18-002	3.48-002
U234	4.49-006	5.53-006	7.29-006	1.07-005	1.23-005	1.48-005
U235	1.80-008	2.45-008	3.69-008	6.56-008	8.03-008	1.06-007
U236	5.99-011	9.01-011	1.55-010	3.34-010	4.37-010	6.35-010
U237	6.91-015	1.11-014	2.09-014	5.08-014	6.92-014	1.06-013
PU239	5.96-004	7.30-004	9.56-004	1.39-003	1.59-003	1.90-003
PU240	6.94-006	9.42-006	1.41-005	2.50-005	3.06-005	4.02-005
PU241	6.41-008	9.59-008	1.64-007	3.48-007	4.54-007	6.53-007
PU242	7.30-010	1.21-009	2.35-009	6.06-009	8.45-009	1.34-008
PU243	3.68-014	6.10-014	1.20-013	3.10-013	4.32-013	6.86-013
AM241	4.02-011	6.63-011	1.29-010	3.31-010	4.60-010	7.27-010
AM242	1.20-013	2.00-013	3.97-013	1.04-012	1.46-012	2.33-012
AM342	9.44-014	1.69-013	3.68-013	1.10-012	1.62-012	2.75-012
AM243	4.56-013	8.35-013	1.87-012	5.85-012	8.74-012	1.52-011
COMB1	2.24-002	2.45-002	2.76-002	3.27-002	3.47-002	3.77-002

TIME	4.00000	4.50000	5.00000	6.00000	7.00000	8.00000
FLUX= 7.0+013		TARGET=NP237		DATA TYPE=YIELD		
NP237	9.54-001	9.48-001	9.42-001	9.31-001	9.20-001	9.09-001
NP238	2.89-003	2.88-003	2.86-003	2.83-003	2.79-003	2.76-003
PU238	3.97-002	4.44-002	4.90-002	5.79-002	6.64-002	7.44-002
U234	1.95-005	2.48-005	3.06-005	4.40-005	5.95-005	7.69-005
U235	1.60-007	2.29-007	3.15-007	5.42-007	8.52-007	1.26-006
U236	1.10-009	1.79-009	2.74-009	5.73-009	1.06-008	1.80-008
U237	1.98-013	3.42-013	5.54-013	1.26-012	2.47-012	4.41-012
PU239	2.48-003	3.11-003	3.81-003	5.36-003	7.10-003	9.00-003
PU240	6.04-005	8.61-005	1.18-004	2.01-004	3.14-004	4.58-004
PU241	1.12-006	1.79-006	2.71-006	5.52-006	9.97-006	1.65-005
PU242	2.64-008	4.78-008	8.10-008	2.00-007	4.26-007	8.13-007
PU243	1.36-012	2.47-012	4.19-012	1.04-011	2.21-011	4.23-011
AM241	1.43-009	2.58-009	4.35-009	1.07-008	2.25-008	4.26-008
AM242	4.64-012	8.46-012	1.44-011	3.57-011	7.60-011	1.45-010
AM342	6.01-012	1.19-011	2.17-011	6.05-011	1.42-010	2.92-010
AM243	3.47-011	7.13-011	1.35-010	4.06-010	1.02-009	2.25-009
COMB1	4.25-002	4.73-002	5.19-002	6.08-002	6.92-002	7.72-002

TIME	9.00000	10.00000	12.00000	14.00000	16.00000	18.00000
FLUX= 7.0+013		TARGET=NP237		DATA TYPE=YIELD		
NP237	8.98-001	8.88-001	8.67-001	8.47-001	8.27-001	8.07-001
NP238	2.73-003	2.69-003	2.63-003	2.57-003	2.51-003	2.45-003
PU238	8.21-002	8.93-002	1.03-001	1.15-001	1.25-001	1.35-001
U234	9.63-005	1.17-004	1.64-004	2.17-004	2.75-004	3.37-004
U235	1.76-006	2.37-006	3.95-006	6.01-006	8.59-006	1.17-005
U236	2.86-008	4.32-008	8.73-008	1.57-007	2.60-007	4.02-007
U237	7.28-012	1.13-011	2.41-011	4.49-011	7.62-011	1.21-010
PU239	1.10-002	1.32-002	1.77-002	2.25-002	2.74-002	3.23-002
PU240	6.36-004	8.50-004	1.39-003	2.08-003	2.92-003	3.91-003
PU241	2.55-005	3.75-005	7.20-005	1.23-004	1.94-004	2.85-004
PU242	1.43-006	2.36-006	5.53-006	1.12-005	2.05-005	3.45-005
PU243	7.45-011	1.23-010	2.89-010	5.86-010	1.07-009	1.81-009
AM241	7.42-008	1.21-007	2.80-007	5.58-007	1.00-006	1.66-006
AM242	2.54-010	4.16-010	9.66-010	1.93-009	3.48-009	5.77-009
AM342	5.46-010	9.48-010	2.41-009	5.17-009	9.83-009	1.71-008
AM243	4.48-009	8.27-009	2.36-008	5.65-008	1.19-007	2.28-007
COMB1	8.48-002	9.20-002	1.05-001	1.17-001	1.28-001	1.37-001

TABLE V (Contd.)

TIME	20.00000	22.00000	25.00000	30.00000	32.00000	35.00000
FLUX= 7.0+013		TARGET=NP237		DATA TYPE=YIELD		
NP237	7.88-001	7.70-001	7.43-001	7.00-001	6.83-001	6.59-001
NP238	2.39-003	2.34-003	2.25-003	2.12-003	2.07-003	2.00-003
PU238	1.43-001	1.50-001	1.60-001	1.71-001	1.75-001	1.79-001
U234	4.03-004	4.72-004	5.80-004	7.68-004	8.45-004	9.62-004
U235	1.53-005	1.95-005	2.67-005	4.11-005	4.76-005	5.81-005
U236	5.92-007	8.38-007	1.32-006	2.51-006	3.14-006	4.25-006
U237	1.81-010	2.59-010	4.17-010	8.08-010	1.02-009	1.39-009
PU239	3.71-002	4.18-002	4.85-002	5.86-002	6.21-002	6.70-002
PU240	5.04-003	6.29-003	8.41-003	1.24-002	1.42-002	1.69-002
PU241	4.00-004	5.38-004	7.91-004	1.33-003	1.58-003	2.00-003
PU242	5.46-005	8.22-005	1.40-004	2.94-004	3.80-004	5.37-004
PU243	2.86-009	4.30-009	7.35-009	1.54-008	1.99-008	2.81-008
AM241	2.57-006	3.80-006	6.32-006	1.26-005	1.60-005	2.20-005
AM242	8.99-009	1.33-008	2.22-008	4.44-008	5.63-008	7.74-008
AM342	2.76-008	4.21-008	7.29-008	1.54-007	1.98-007	2.78-007
AM243	4.05-007	6.75-007	1.33-006	3.40-006	4.71-006	7.35-006
COMB1	1.45-001	1.53-001	1.62-001	1.73-001	1.77-001	1.81-001

TIME	40.00000	45.00000	50.00000	60.00000	70.00000	80.00000
FLUX= 7.0+013		TARGET=NP237		DATA TYPE=YIELD		
NP237	6.21-001	5.85-001	5.52-001	4.90-001	4.35-001	3.86-001
NP238	1.89-003	1.78-003	1.67-003	1.49-003	1.32-003	1.17-003
PU238	1.83-001	1.84-001	1.84-001	1.78-001	1.68-001	1.57-001
U234	1.16-003	1.35-003	1.54-003	1.88-003	2.19-003	2.45-003
U235	7.74-005	9.82-005	1.20-004	1.66-004	2.12-004	2.55-004
U236	6.63-006	9.71-006	1.36-005	2.36-005	3.68-005	5.32-005
U237	2.19-009	3.24-009	4.55-009	8.00-009	1.26-008	1.83-008
PU239	7.37-002	7.89-002	8.25-002	8.60-002	8.57-002	8.28-002
PU240	2.16-002	2.63-002	3.10-002	3.97-002	4.71-002	5.28-002
PU241	2.78-003	3.64-003	4.55-003	6.39-003	8.12-003	9.59-003
PU242	8.85-004	1.35-003	1.94-003	3.52-003	5.59-003	8.09-003
PU243	4.64-008	7.08-008	1.02-007	1.85-007	2.93-007	4.25-007
AM241	3.46-005	5.03-005	6.89-005	1.13-004	1.62-004	2.13-004
AM242	1.22-007	1.77-007	2.43-007	4.00-007	5.75-007	7.52-007
AM342	4.49-007	6.68-007	9.32-007	1.57-006	2.30-006	3.06-006
AM243	1.41-005	2.45-005	3.96-005	8.81-005	1.67-004	2.81-004
COMB1	1.85-001	1.86-001	1.85-001	1.79-001	1.70-001	1.58-001

TIME	90.00000	100.00000	110.00000	120.00000	130.00000	150.00000
FLUX= 7.0+013		TARGET=NP237		DATA TYPE=YIELD		
NP237	3.43-001	3.04-001	2.70-001	2.40-001	2.13-001	1.68-001
NP238	1.04-003	9.23-004	8.20-004	7.28-004	6.46-004	5.09-004
PU238	1.44-001	1.31-001	1.19-001	1.07-001	9.64-002	7.72-002
U234	2.66-003	2.83-003	2.95-003	3.04-003	3.09-003	3.12-003
U235	2.95-004	3.29-004	3.58-004	3.82-004	4.00-004	4.23-004
U236	7.24-005	9.41-005	1.18-004	1.44-004	1.71-004	2.27-004
U237	2.50-008	3.26-008	4.10-008	5.00-008	5.95-008	7.95-008
PU239	7.83-002	7.29-002	6.71-002	6.13-002	5.56-002	4.51-002
PU240	5.68-002	5.92-002	6.01-002	5.99-002	5.88-002	5.44-002
PU241	1.08-002	1.16-002	1.21-002	1.23-002	1.23-002	1.17-002
PU242	1.09-002	1.40-002	1.72-002	2.05-002	2.37-002	2.98-002
PU243	5.74-007	7.35-007	9.04-007	1.07-006	1.24-006	1.56-006
AM241	2.59-004	3.00-004	3.32-004	3.56-004	3.72-004	3.80-004
AM242	9.18-007	1.06-006	1.18-006	1.26-006	1.32-006	1.35-006
AM342	3.77-006	4.39-006	4.90-006	5.29-006	5.54-006	5.70-006
AM243	4.33-004	6.26-004	8.56-004	1.12-003	1.42-003	2.08-003
COMB1	1.45-001	1.32-001	1.20-001	1.08-001	9.70-002	7.78-002

TABLE VI*

TARGET= NP237
DATA TYPE= YIELD ATOMS PER ATOM TARGET
FLUX= 3.0+014
TIME SPAN= 0-80

TIME	0.05000	0.10000	0.20000	0.30000	0.40000	0.50000
FLUX= 3.0+014		TARGET=NP237		DATA TYPE=YIELD		
NP237	9.97-001	9.95-001	9.90-001	9.85-001	9.80-001	9.75-001
NP238	2.34-003	4.21-003	6.89-003	8.60-003	9.69-003	1.04-002
PU238	2.75-004	9.38-004	3.12-003	6.07-003	9.48-003	1.32-002
U234	1.66-009	9.85-009	6.21-008	1.81-007	3.82-007	6.72-007
U235	9.51-013	9.27-012	1.05-010	4.46-010	1.24-009	2.72-009
U236	5.22-016	7.98-015	1.57-013	9.58-013	3.49-012	9.52-012
U237	1.56-020	3.57-019	1.16-017	9.86-017	4.58-016	1.51-015
PU239	9.74-007	5.78-006	3.61-005	1.05-004	2.19-004	3.82-004
PU240	1.59-009	1.55-008	1.75-007	7.41-007	2.05-006	4.49-006
PU241	2.50-012	3.81-011	7.43-010	4.48-009	1.62-008	4.37-008
PU242	5.35-015	1.23-013	4.04-012	3.45-011	1.62-010	5.39-010
PU243	6.08-019	1.67-017	6.55-016	6.10-015	3.01-014	1.04-013
AM241	6.97-017	1.60-015	5.24-014	4.46-013	2.08-012	6.92-012
AM242	1.92-019	5.95-018	2.78-016	2.91-015	1.56-014	5.71-014
AM342	3.91-020	1.29-018	6.74-017	7.78-016	4.55-015	1.80-014
AM243	3.61-019	1.44-017	9.25-016	1.21-014	7.70-014	3.26-013
COMB1	2.61-003	5.14-003	1.00-002	1.47-002	1.92-002	2.35-002

TIME	0.60000	0.80000	1.00000	1.20000	1.40000	1.60000
FLUX= 3.0+014		TARGET=NP237		DATA TYPE=YIELD		
NP237	9.70-001	9.60-001	9.50-001	9.41-001	9.31-001	9.22-001
NP238	1.08-002	1.12-002	1.13-002	1.12-002	1.11-002	1.10-002
PU238	1.70-002	2.48-002	3.24-002	3.99-002	4.71-002	5.40-002
U234	1.06-006	2.12-006	3.57-006	5.39-006	7.58-006	1.01-005
U235	5.15-009	1.38-008	2.92-008	5.32-008	8.75-008	1.34-007
U236	2.15-011	7.74-011	2.06-010	4.55-010	8.80-010	1.55-009
U237	4.01-015	1.85-014	5.96-014	1.53-013	3.36-013	6.58-013
PU239	5.97-004	1.18-003	1.95-003	2.90-003	4.00-003	5.25-003
PU240	8.46-006	2.25-005	4.73-005	8.56-005	1.40-004	2.12-004
PU241	9.78-008	3.44-007	8.97-007	1.94-006	3.67-006	6.34-006
PU242	1.44-009	6.74-009	2.21-008	5.76-008	1.28-007	2.55-007
PU243	2.84-013	1.37-012	4.58-012	1.21-011	2.73-011	5.46-011
AM241	1.84-011	8.57-011	2.79-010	7.22-010	1.60-009	3.16-009
AM242	1.64-013	8.45-013	2.94-012	8.01-012	1.84-011	3.73-011
AM342	5.54-014	3.22-013	1.24-012	3.66-012	9.03-012	1.95-011
AM243	1.06-012	6.80-012	2.84-011	9.04-011	2.38-010	5.48-010
COMB1	2.78-002	3.59-002	4.37-002	5.11-002	5.83-002	6.51-002

TIME	1.80000	2.00000	2.20000	2.50000	3.00000	3.50000
FLUX= 3.0+014		TARGET=NP237		DATA TYPE=YIELD		
NP237	9.12-001	9.03-001	8.94-001	8.80-001	8.58-001	8.36-001
NP238	1.09-002	1.08-002	1.07-002	1.06-002	1.03-002	1.00-002
PU238	6.06-002	6.70-002	7.30-002	8.16-002	9.47-002	1.06-001
U234	1.30-005	1.61-005	1.96-005	2.53-005	3.61-005	4.83-005
U235	1.93-007	2.67-007	3.57-007	5.23-007	8.90-007	1.38-006
U236	2.54-009	3.94-009	5.84-009	9.83-009	2.04-008	3.75-008
U237	1.18-012	1.98-012	3.15-012	5.80-012	1.36-011	2.75-011
PU239	6.61-003	8.09-003	9.66-003	1.22-002	1.66-002	2.13-002
PU240	3.04-004	4.17-004	5.53-004	8.01-004	1.34-003	2.03-003
PU241	1.02-005	1.54-005	2.24-005	3.64-005	7.18-005	1.25-004
PU242	4.65-007	7.90-007	1.27-006	2.38-006	5.75-006	1.19-005
PU243	1.00-010	1.71-010	2.76-010	5.20-010	1.26-009	2.62-009
AM241	5.71-009	9.63-009	1.54-008	2.86-008	6.77-008	1.38-007
AM242	6.90-011	1.19-010	1.92-010	3.64-010	8.81-010	1.82-009
AM342	3.80-011	6.84-011	1.15-010	2.30-010	5.99-010	1.31-009
AM243	1.14-009	2.17-009	3.87-009	8.35-009	2.46-008	6.04-008
COMB1	7.16-002	7.78-002	8.38-002	9.22-002	1.05-001	1.16-001

*"Am342" is 152-yr ^{242m}Am.

TABLE VI (Contd.)

TIME	4.00000	5.00000	6.00000	7.00000	8.00000	9.00000
FLUX= 3.0+014		TARGET=NP237		DATA TYPE=YIELD		
NP237	8.15-001	7.75-001	7.36-001	7.00-001	6.65-001	6.32-001
NP238	9.78-003	9.30-003	8.83-003	8.39-003	7.98-003	7.58-003
PU238	1.17-001	1.34-001	1.46-001	1.56-001	1.62-001	1.66-001
U234	6.17-005	9.15-005	1.24-004	1.59-004	1.94-004	2.30-004
U235	1.99-006	3.61-006	5.74-006	8.35-006	1.14-005	1.48-005
U236	6.29-008	1.47-007	2.87-007	4.99-007	7.96-007	1.19-006
U237	4.99-011	1.31-010	2.78-010	5.16-010	8.64-010	1.34-009
PU239	2.61-002	3.56-002	4.45-002	5.25-002	5.94-002	6.51-002
PU240	2.89-003	5.05-003	7.74-003	1.09-002	1.43-002	1.79-002
PU241	1.99-004	4.17-004	7.37-004	1.16-003	1.67-003	2.26-003
PU242	2.21-005	6.01-005	1.32-004	2.50-004	4.27-004	6.73-004
PU243	4.88-009	1.33-008	2.93-008	5.57-008	9.52-008	1.50-007
AM241	2.50-007	6.56-007	1.38-006	2.52-006	4.14-006	6.26-006
AM242	3.35-009	8.94-009	1.91-008	3.51-008	5.78-008	8.79-008
AM342	2.52-009	7.19-009	1.61-008	3.06-008	5.19-008	8.06-008
AM243	1.30-007	4.52-007	1.22-006	2.74-006	5.43-006	9.77-006
COMB1	1.26-001	1.43-001	1.55-001	1.64-001	1.70-001	1.74-001

TIME	10.00000	12.00000	14.00000	16.00000	18.00000	20.00000
FLUX= 3.0+014		TARGET=NP237		DATA TYPE=YIELD		
NP237	6.00-001	5.42-001	4.90-001	4.42-001	3.99-001	3.61-001
NP238	7.20-003	6.50-003	5.87-003	5.30-003	4.79-003	4.32-003
PU238	1.69-001	1.68-001	1.64-001	1.57-001	1.48-001	1.38-001
U234	2.65-004	3.34-004	3.98-004	4.55-004	5.05-004	5.48-004
U235	1.85-005	2.65-005	3.49-005	4.33-005	5.15-005	5.90-005
U236	1.69-006	3.04-006	4.89-006	7.24-006	1.01-005	1.34-005
U237	1.97-009	3.73-009	6.21-009	9.46-009	1.35-008	1.82-008
PU239	6.98-002	7.61-002	7.89-002	7.90-002	7.72-002	7.42-002
PU240	2.17-002	2.91-002	3.59-002	4.19-002	4.68-002	5.05-002
PU241	2.92-003	4.34-003	5.81-003	7.21-003	8.45-003	9.49-003
PU242	9.95-004	1.90-003	3.15-003	4.74-003	6.65-003	8.80-003
PU243	2.22-007	4.24-007	7.05-007	1.06-006	1.49-006	1.97-006
AM241	8.89-006	1.56-005	2.38-005	3.29-005	4.22-005	5.13-005
AM242	1.25-007	2.21-007	3.38-007	4.69-007	6.04-007	7.35-007
AM342	1.17-007	2.12-007	3.30-007	4.65-007	6.05-007	7.42-007
AM243	1.63-005	3.82-005	7.57-005	1.33-004	2.14-004	3.20-004
COMB1	1.76-001	1.75-001	1.70-001	1.62-001	1.53-001	1.43-001

TIME	25.00000	30.00000	35.00000	40.00000	45.00000	50.00000
FLUX= 3.0+014		TARGET=NP237		DATA TYPE=YIELD		
NP237	2.79-001	2.16-001	1.68-001	1.30-001	1.01-001	7.80-002
NP238	3.35-003	2.60-003	2.01-003	1.56-003	1.21-003	9.36-004
PU238	1.13-001	9.08-002	7.17-002	5.61-002	4.38-002	3.41-002
U234	6.24-004	6.61-004	6.69-004	6.55-004	6.27-004	5.89-004
U235	7.46-005	8.50-005	9.05-005	9.20-005	9.05-005	8.69-005
U236	2.34-005	3.53-005	4.83-005	6.17-005	7.49-005	8.76-005
U237	3.28-008	5.04-008	6.98-008	9.00-008	1.10-007	1.30-007
PU239	6.36-002	5.22-002	4.18-002	3.30-002	2.58-002	2.02-002
PU240	5.51-002	5.43-002	5.02-002	4.45-002	3.82-002	3.20-002
PU241	1.11-002	1.15-002	1.10-002	9.91-003	8.64-003	7.34-003
PU242	1.49-002	2.14-002	2.75-002	3.29-002	3.73-002	4.07-002
PU243	3.35-006	4.80-006	6.18-006	7.38-006	8.37-006	9.13-006
AM241	6.98-005	8.01-005	8.26-005	7.91-005	7.19-005	6.30-005
AM242	1.00-006	1.15-006	1.19-006	1.14-006	1.04-006	9.11-007
AM342	1.03-006	1.19-006	1.24-006	1.19-006	1.09-006	9.57-007
AM243	7.01-004	1.23-003	1.88-003	2.60-003	3.33-003	4.03-003
COMB1	1.17-001	9.34-002	7.37-002	5.77-002	4.50-002	3.50-002

TIME	55.00000	60.00000	65.00000	70.00000	75.00000	80.00000
FLUX= 3.0+014		TARGET=NP237		DATA TYPE=YIELD		
NP237	6.05-002	4.69-002	3.63-002	2.81-002	2.18-002	1.69-002
NP238	7.25-004	5.62-004	4.36-004	3.37-004	2.62-004	2.03-004
PU238	2.65-002	2.05-002	1.59-002	1.23-002	9.56-003	7.41-003
U234	5.47-004	5.02-004	4.56-004	4.12-004	3.70-004	3.31-004
U235	8.19-005	7.62-005	7.00-005	6.38-005	5.78-005	5.19-005
U236	9.96-005	1.11-004	1.21-004	1.30-004	1.38-004	1.45-004
U237	1.48-007	1.65-007	1.80-007	1.94-007	2.07-007	2.17-007
PU239	1.57-002	1.22-002	9.45-003	7.33-003	5.68-003	4.40-003
PU240	2.64-002	2.15-002	1.74-002	1.39-002	1.10-002	8.75-003
PU241	6.11-003	5.01-003	4.06-003	3.27-003	2.61-003	2.07-003
PU242	4.31-002	4.47-002	4.56-002	4.60-002	4.58-002	4.53-002
PU243	9.69-006	1.01-005	1.03-005	1.03-005	1.03-005	1.02-005
AM241	5.38-005	4.50-005	3.70-005	3.01-005	2.42-005	1.94-005
AM242	7.77-007	6.50-007	5.35-007	4.35-007	3.50-007	2.80-007
AM342	8.18-007	6.85-007	5.64-007	4.59-007	3.70-007	2.96-007
AM243	4.68-003	5.25-003	5.73-003	6.12-003	6.43-003	6.64-003
COMB1	2.72-002	2.11-002	1.64-002	1.27-002	9.83-003	7.62-003

TABLE VII*

TARGET= NP237
DATA TYPE= YIELD-ATOMS PER ATOM TARGET
FLUX= 7.0+014
TIME SPAN= 0- 10

TIME	0.00500	0.01000	0.05000	0.10000	0.20000	0.40000
FLUX= 7.0+014		TARGET=NP237		DATA TYPE=YIELD		
NP237	9.99-001	9.99-001	9.94-001	9.88-001	9.76-001	9.54-001
NP238	5.95-004	1.17-003	5.31-003	9.42-003	1.50-002	2.02-002
PU238	1.14-005	3.38-005	5.76-004	2.02-003	6.68-003	1.96-002
U234	1.44-011	5.74-011	2.99-009	1.96-008	1.29-007	7.88-007
U235	4.80-015	2.39-014	3.25-012	3.80-011	4.74-010	5.73-009
U236	1.70-018	1.01-017	3.25-015	6.57-014	1.53-012	3.65-011
U237	3.56-023	2.48-022	1.70-019	5.73-018	2.39-016	1.07-014
PU239	1.99-008	7.89-008	4.08-006	2.65-005	1.71-004	1.01-003
PU240	1.88-011	9.33-011	1.27-008	1.48-007	1.83-006	2.18-005
PU241	1.91-014	1.14-013	3.61-011	7.23-010	1.64-008	3.74-007
PU242	2.84-017	1.97-016	1.35-013	4.55-012	1.89-010	8.39-009
PU243	2.88-021	2.24-020	2.57-017	1.16-015	6.32-014	3.41-012
AM241	1.59-019	1.10-018	7.55-016	2.53-014	1.04-012	4.56-011
AM242	3.44-022	2.72-021	3.49-018	1.76-016	1.12-014	7.22-013
AM342	6.66-023	5.28-022	7.07-019	3.74-017	2.59-015	1.91-013
AM243	5.57-022	4.88-021	1.09-017	7.98-016	7.81-014	8.16-012
COMB1	6.06-004	1.21-003	5.89-003	1.14-002	2.17-002	3.98-002

TIME	0.60000	0.80000	1.00000	1.20000	1.40000	1.60000
FLUX= 7.0+014		TARGET=NP237		DATA TYPE=YIELD		
NP237	9.31-001	9.09-001	8.88-001	8.67-001	8.46-001	8.27-001
NP238	2.17-002	2.20-002	2.17-002	2.13-002	2.09-002	2.04-002
PU238	3.39-002	4.77-002	6.05-002	7.21-002	8.26-002	9.21-002
U234	2.14-006	4.18-006	6.87-006	1.01-005	1.39-005	1.82-005
U235	2.34-008	6.12-008	1.26-007	2.23-007	3.56-007	5.28-007
U236	2.26-010	8.03-010	2.10-009	4.54-009	8.61-009	1.48-008
U237	9.58-014	4.42-013	1.41-012	3.57-012	7.72-012	1.49-011
PU239	2.65-003	4.99-003	7.89-003	1.12-002	1.48-002	1.86-002
PU240	8.73-005	2.25-004	4.55-004	7.91-004	1.24-003	1.81-003
PU241	2.21-006	7.49-006	1.87-005	3.85-005	6.94-005	1.14-004
PU242	7.50-008	3.44-007	1.09-006	2.75-006	5.90-006	1.13-005
PU243	3.31-011	1.58-010	5.16-010	1.32-009	2.88-009	5.56-009
AM241	4.01-010	1.81-009	5.66-009	1.40-008	2.96-008	5.56-008
AM242	7.65-012	3.85-011	1.29-010	3.37-010	7.39-010	1.43-009
AM342	2.23-012	1.21-011	4.33-011	1.18-010	2.69-010	5.38-010
AM243	1.19-010	7.67-010	3.16-009	9.85-009	2.53-008	5.65-008
COMB1	5.56-002	6.96-002	8.22-002	9.34-002	1.03-001	1.12-001

TIME	1.80000	2.00000	2.22000	2.40000	2.60000	2.80000
FLUX= 7.0+014		TARGET=NP237		DATA TYPE=YIELD		
NP237	8.07-001	7.88-001	7.68-001	7.51-001	7.34-001	7.17-001
NP238	1.99-002	1.94-002	1.89-002	1.85-002	1.81-002	1.77-002
PU238	1.00-001	1.08-001	1.15-001	1.20-001	1.25-001	1.30-001
U234	2.28-005	2.78-005	3.36-005	3.85-005	4.42-005	5.01-005
U235	7.41-007	9.96-007	1.33-006	1.63-006	2.01-006	2.43-006
U236	2.38-008	3.60-008	5.40-008	7.28-008	9.85-008	1.30-007
U237	2.62-011	4.31-011	7.00-011	1.00-010	1.43-010	1.99-010
PU239	2.24-002	2.63-002	3.05-002	3.38-002	3.74-002	4.08-002
PU240	2.50-003	3.31-003	4.32-003	5.24-003	6.35-003	7.55-003
PU241	1.74-004	2.52-004	3.58-004	4.62-004	5.96-004	7.50-004
PU242	1.98-005	3.23-005	5.20-005	7.38-005	1.05-004	1.44-004
PU243	9.81-009	1.61-008	2.61-008	3.72-008	5.30-008	7.33-008
AM241	9.57-008	1.54-007	2.43-007	3.39-007	4.73-007	6.40-007
AM242	2.52-009	4.12-009	6.61-009	9.33-009	1.32-008	1.80-008
AM342	9.73-010	1.63-009	2.67-009	3.82-009	5.48-009	7.57-009
AM243	1.13-007	2.09-007	3.80-007	5.90-007	9.20-007	1.38-006
COMB1	1.20-001	1.27-001	1.34-001	1.39-001	1.44-001	1.48-001

*"Am342" is 152-yr ^{242m}Am.

TABLE VII (Contd.)

TIME	3.00000	3.20000	3.40000	3.60000	3.80000	4.00000
FLUX= 7.0+014		TARGET=NP237		DATA TYPE=YIELD		
NP237	7.00-001	6.83-001	6.67-001	6.51-001	6.36-001	6.21-001
NP238	1.73-002	1.69-002	1.65-002	1.61-002	1.57-002	1.53-002
PU238	1.34-001	1.37-001	1.40-001	1.42-001	1.44-001	1.45-001
U234	5.61-005	6.22-005	6.84-005	7.46-005	8.08-005	8.70-005
U235	2.88-006	3.38-006	3.90-006	4.46-006	5.04-006	5.65-006
U236	1.67-007	2.11-007	2.63-007	3.22-007	3.89-007	4.64-007
U237	2.69-010	3.54-010	4.58-010	5.81-010	7.25-010	8.92-010
PU239	4.40-002	4.71-002	4.99-002	5.25-002	5.49-002	5.71-002
PU240	8.82-003	1.02-002	1.15-002	1.30-002	1.45-002	1.59-002
PU241	9.22-004	1.11-003	1.32-003	1.54-003	1.78-003	2.03-003
PU242	1.94-004	2.53-004	3.24-004	4.08-004	5.05-004	6.17-004
PU243	9.84-008	1.29-007	1.66-007	2.09-007	2.59-007	3.16-007
AM241	8.41-007	1.08-006	1.36-006	1.68-006	2.04-006	2.44-006
AM242	2.38-008	3.08-008	3.90-008	4.85-008	5.92-008	7.12-008
AM342	1.02-008	1.33-008	1.70-008	2.12-008	2.61-008	3.16-008
AM243	2.00-006	2.83-006	3.89-006	5.22-006	6.89-006	8.92-006
COMB1	1.51-001	1.54-001	1.56-001	1.58-001	1.59-001	1.60-001

TIME	4.20000	4.40000	4.60000	4.80000	5.00000	5.20000
FLUX= 7.0+014		TARGET=NP237		DATA TYPE=YIELD		
NP237	6.07-001	5.92-001	5.78-001	5.65-001	5.51-001	5.38-001
NP238	1.50-002	1.46-002	1.43-002	1.39-002	1.36-002	1.33-002
PU238	1.46-001	1.47-001	1.47-001	1.47-001	1.47-001	1.47-001
U234	9.32-005	9.94-005	1.06-004	1.12-004	1.18-004	1.23-004
U235	6.29-006	6.94-006	7.62-006	8.31-006	9.01-006	9.72-006
U236	5.48-007	6.41-007	7.44-007	8.56-007	9.77-007	1.11-006
U237	1.08-009	1.30-009	1.55-009	1.82-009	2.12-009	2.46-009
PU239	5.91-002	6.08-002	6.24-002	6.38-002	6.50-002	6.60-002
PU240	1.75-002	1.90-002	2.05-002	2.20-002	2.35-002	2.50-002
PU241	2.29-003	2.57-003	2.85-003	3.14-003	3.43-003	3.73-003
PU242	7.43-004	8.84-004	1.04-003	1.22-003	1.41-003	1.61-003
PU243	3.82-007	4.55-007	5.36-007	6.26-007	7.25-007	8.32-007
AM241	2.89-006	3.37-006	3.90-006	4.46-006	5.06-006	5.69-006
AM242	8.45-008	9.90-008	1.15-007	1.32-007	1.50-007	1.69-007
AM342	3.77-008	4.45-008	5.18-008	5.98-008	6.83-008	7.73-008
AM243	1.14-005	1.43-005	1.78-005	2.18-005	2.64-005	3.17-005
COMB1	1.61-001	1.61-001	1.61-001	1.61-001	1.61-001	1.60-001

TIME	5.40000	5.60000	5.80000	6.00000	6.20000	6.40000
FLUX= 7.0+014		TARGET=NP237		DATA TYPE=YIELD		
NP237	5.26-001	5.13-001	5.01-001	4.90-001	4.78-001	4.67-001
NP238	1.30-002	1.27-002	1.24-002	1.21-002	1.18-002	1.15-002
PU238	1.46-001	1.45-001	1.44-001	1.43-001	1.42-001	1.41-001
U234	1.29-004	1.35-004	1.40-004	1.46-004	1.51-004	1.56-004
U235	1.04-005	1.12-005	1.19-005	1.27-005	1.34-005	1.41-005
U236	1.25-006	1.40-006	1.56-006	1.74-006	1.92-006	2.11-006
U237	2.82-009	3.22-009	3.65-009	4.12-009	4.62-009	5.16-009
PU239	6.68-002	6.75-002	6.81-002	6.85-002	6.88-002	6.89-002
PU240	2.65-002	2.79-002	2.93-002	3.06-002	3.19-002	3.32-002
PU241	4.02-003	4.32-003	4.62-003	4.92-003	5.21-003	5.50-003
PU242	1.84-003	2.08-003	2.33-003	2.61-003	2.90-003	3.21-003
PU243	9.49-007	1.07-006	1.21-006	1.35-006	1.50-006	1.66-006
AM241	6.36-006	7.05-006	7.77-006	8.51-006	9.28-006	1.01-005
AM242	1.89-007	2.10-007	2.32-007	2.55-007	2.78-007	3.02-007
AM342	8.69-008	9.69-008	1.07-007	1.18-007	1.29-007	1.41-007
AM243	3.78-005	4.46-005	5.22-005	6.07-005	7.02-005	8.05-005
COMB1	1.59-001	1.58-001	1.57-001	1.55-001	1.54-001	1.52-001

TIME	6.60000	6.80000	7.00000	7.20000	7.40000	7.60000
FLUX= 7.0+014		TARGET=NP237		DATA TYPE=YIELD		
NP237	4.56-001	4.45-001	4.35-001	4.24-001	4.14-001	4.05-001
NP238	1.12-002	1.10-002	1.07-002	1.05-002	1.02-002	9.98-003
PU238	1.39-001	1.38-001	1.36-001	1.34-001	1.33-001	1.31-001
U234	1.61-004	1.66-004	1.71-004	1.75-004	1.80-004	1.84-004
U235	1.49-005	1.56-005	1.63-005	1.70-005	1.78-005	1.85-005
U236	2.32-006	2.53-006	2.75-006	2.99-006	3.23-006	3.48-006
U237	5.73-009	6.33-009	6.97-009	7.65-009	8.36-009	9.11-009
PU239	6.90-002	6.89-002	6.87-002	6.85-002	6.82-002	6.78-002
PU240	3.44-002	3.56-002	3.67-002	3.78-002	3.88-002	3.98-002
PU241	5.79-003	6.07-003	6.34-003	6.61-003	6.86-003	7.11-003
PU242	3.53-003	3.87-003	4.22-003	4.59-003	4.97-003	5.36-003
PU243	1.83-006	2.01-006	2.19-006	2.38-006	2.58-006	2.79-006
AM241	1.09-005	1.17-005	1.25-005	1.33-005	1.41-005	1.49-005
AM242	3.27-007	3.52-007	3.77-007	4.02-007	4.27-007	4.52-007
AM342	1.53-007	1.64-007	1.77-007	1.89-007	2.01-007	2.13-007
AM243	9.19-005	1.04-004	1.18-004	1.32-004	1.48-004	1.65-004
COMB1	1.51-001	1.49-001	1.47-001	1.45-001	1.43-001	1.41-001

TABLE VII (Contd.)

TARGET=NP237 DATA TYPE=YIELD

TIME	7.80000	8.00000	8.20000	8.40000	8.60000	8.80000
FLUX= 7.0+014						
NP237	3.95-001	3.86-001	3.77-001	3.68-001	3.59-001	3.51-001
NP238	9.75-003	9.52-003	9.29-003	9.08-003	8.86-003	8.65-003
PU238	1.29-001	1.27-001	1.25-001	1.23-001	1.21-001	1.19-001
U234	1.88-004	1.92-004	1.96-004	2.00-004	2.03-004	2.07-004
U235	1.92-005	1.98-005	2.05-005	2.12-005	2.18-005	2.24-005
U236	3.75-006	4.02-006	4.30-006	4.59-006	4.89-006	5.20-006
U237	9.90-009	1.07-008	1.16-008	1.25-008	1.34-008	1.43-008
PU239	6.73-002	6.68-002	6.62-002	6.55-002	6.49-002	6.41-002
PU240	4.07-002	4.15-002	4.23-002	4.30-002	4.37-002	4.44-002
PU241	7.35-003	7.58-003	7.80-003	8.01-003	8.21-003	8.39-003
PU242	5.77-003	6.19-003	6.62-003	7.07-003	7.52-003	7.98-003
PU243	3.00-006	3.22-006	3.44-006	3.67-006	3.91-006	4.15-006
AM241	1.57-005	1.65-005	1.73-005	1.81-005	1.89-005	1.97-005
AM242	4.77-007	5.02-007	5.27-007	5.51-007	5.75-007	5.99-007
AM342	2.25-007	2.38-007	2.50-007	2.62-007	2.73-007	2.85-007
AM243	1.83-004	2.02-004	2.23-004	2.45-004	2.68-004	2.92-004
COMB1	1.39-001	1.37-001	1.34-001	1.32-001	1.30-001	1.28-001

TARGET=NP237 DATA TYPE=YIELD

TIME	9.00000	9.20000	9.40000	9.60000	9.80000	10.00000
FLUX= 7.0+014						
NP237	3.43-001	3.34-001	3.27-001	3.19-001	3.11-001	3.04-001
NP238	8.45-003	8.25-003	8.06-003	7.87-003	7.68-003	7.50-003
PU238	1.17-001	1.15-001	1.13-001	1.11-001	1.09-001	1.07-001
U234	2.10-004	2.13-004	2.16-004	2.19-004	2.21-004	2.24-004
U235	2.30-005	2.36-005	2.42-005	2.48-005	2.53-005	2.59-005
U236	5.52-006	5.84-006	6.18-006	6.52-006	6.87-006	7.22-006
U237	1.53-008	1.63-008	1.74-008	1.85-008	1.96-008	2.07-008
PU239	6.34-002	6.26-002	6.18-002	6.09-002	6.00-002	5.92-002
PU240	4.49-002	4.55-002	4.59-002	4.64-002	4.67-002	4.71-002
PU241	8.57-003	8.74-003	8.89-003	9.04-003	9.17-003	9.30-003
PU242	8.45-003	8.93-003	9.42-003	9.92-003	1.04-002	1.09-002
PU243	4.40-006	4.65-006	4.90-006	5.16-006	5.42-006	5.69-006
AM241	2.04-005	2.11-005	2.18-005	2.25-005	2.32-005	2.38-005
AM242	6.22-007	6.45-007	6.66-007	6.88-007	7.08-007	7.28-007
AM342	2.96-007	3.07-007	3.18-007	3.29-007	3.39-007	3.49-007
AM243	3.17-004	3.44-004	3.72-004	4.01-004	4.32-004	4.64-004
COMB1	1.26-001	1.23-001	1.21-001	1.19-001	1.17-001	1.14-001

TABLE VIII*

TARGET= NP237
DATA TYPE= YIELD ATOMS PER ATOM TARGET
FLUX= 2.0+015
TIME SPAN= 0-5

TARGET=NP237 DATA TYPE=YIELD

TIME	0.00500	0.00800	0.01000	0.05000	0.08000	0.10000
FLUX= 2.0+015						
NP237	9.99-001	9.97-001	9.97-001	9.83-001	9.73-001	9.67-001
NP238	1.35-003	2.66-003	3.30-003	1.43-002	2.06-002	2.41-002
PU238	1.55-005	5.11-005	7.62-005	1.48-003	3.44-003	5.08-003
U234	1.05-011	5.21-011	9.08-011	6.98-009	2.57-008	4.76-008
U235	5.00-015	3.47-014	6.91-014	1.87-011	1.06-010	2.43-010
U236	2.42-018	2.25-017	5.04-017	4.45-014	3.88-013	1.09-012
U237	6.79-023	8.09-022	2.02-021	5.35-018	7.01-017	2.42-016
PU239	4.13-008	2.04-007	3.56-007	2.68-005	9.76-005	1.79-004
PU240	5.58-011	3.87-010	7.71-010	2.07-007	1.17-006	2.66-006
PU241	7.77-014	7.19-013	1.61-012	1.38-009	1.18-008	3.30-008
PU242	1.54-016	1.84-015	4.57-015	1.20-011	1.55-010	5.30-010
PU243	2.03-020	2.96-019	8.03-019	4.99-015	8.56-014	3.33-013
AM241	3.02-019	3.59-018	8.93-018	2.32-014	2.98-013	1.02-012
AM242	8.52-022	1.26-020	3.43-020	2.32-016	4.20-015	1.68-014
AM342	1.65-022	2.44-021	6.65-021	4.54-017	8.26-016	3.32-015
AM243	1.77-021	3.16-020	9.37-020	1.59-015	4.08-014	1.94-013
COMB1	1.36-003	2.71-003	3.38-003	1.58-002	2.40-002	2.92-002

*"Am342" is 152-yr ^{242m}Am.

TABLE VIII (Contd.)

TIME	0.20000	0.30000	0.40000	0.50000	0.60000	0.70000
FLUX= 2.0+015		TARGET=NP237		DATA TYPE=YIELD		
NP237	9.34-001	9.03-001	8.73-001	8.44-001	8.15-001	7.88-001
NP238	3.51-002	3.98-002	4.14-002	4.14-002	4.07-002	3.97-002
PU238	1.57-002	2.79-002	4.00-002	5.11-002	6.10-002	6.97-002
U234	3.05-007	8.51-007	1.70-006	2.82-006	4.18-006	5.75-006
U235	3.05-009	1.27-008	3.36-008	6.95-008	1.23-007	1.96-007
U236	2.72-011	1.73-010	6.22-010	1.64-009	3.56-009	6.76-009
U237	1.16-014	1.08-013	5.17-013	1.70-012	4.40-012	9.68-012
PU239	1.09-003	2.89-003	5.48-003	8.64-003	1.22-002	1.59-002
PU240	3.27-005	1.33-004	3.44-004	6.95-004	1.20-003	1.87-003
PU241	7.70-007	4.57-006	1.54-005	3.81-005	7.73-005	1.37-004
PU242	2.43-008	2.20-007	1.01-006	3.19-006	7.96-006	1.69-005
PU243	2.15-011	2.27-010	1.14-009	3.80-009	9.85-009	2.15-008
AM241	4.57-011	4.04-010	1.81-009	5.60-009	1.36-008	2.83-008
AM242	1.22-012	1.38-011	7.19-011	2.46-010	6.48-010	1.42-009
AM342	2.45-013	2.79-012	1.47-011	5.08-011	1.34-010	2.96-010
AM243	2.46-011	3.92-010	2.66-009	1.13-008	3.58-008	9.26-008
COMB1	5.08-002	6.78-002	8.14-002	9.26-002	1.02-001	1.09-001

TIME	0.80000	0.90000	1.00000	1.10000	1.20000	1.30000
FLUX= 2.0+015		TARGET=NP237		DATA TYPE=YIELD		
NP237	7.62-001	7.36-001	7.12-001	6.88-001	6.65-001	6.43-001
NP238	3.86-002	3.74-002	3.62-002	3.50-002	3.38-002	3.27-002
PU238	7.70-002	8.32-002	8.84-002	9.26-002	9.60-002	9.86-002
U234	7.50-006	9.38-006	1.14-005	1.34-005	1.56-005	1.77-005
U235	2.90-007	4.03-007	5.37-007	6.90-007	8.61-007	1.05-006
U236	1.16-008	1.86-008	2.81-008	4.04-008	5.61-008	7.53-008
U237	1.90-011	3.39-011	5.65-011	8.90-011	1.34-010	1.93-010
PU239	1.97-002	2.34-002	2.69-002	3.02-002	3.32-002	3.60-002
PU240	2.70-003	3.68-003	4.79-003	6.02-003	7.34-003	8.74-003
PU241	2.21-004	3.31-004	4.68-004	6.32-004	8.21-004	1.03-003
PU242	3.19-005	5.51-005	8.85-005	1.35-004	1.95-004	2.73-004
PU243	4.15-008	7.29-008	1.19-007	1.83-007	2.68-007	3.77-007
AM241	5.21-008	8.77-008	1.38-007	2.04-007	2.89-007	3.93-007
AM242	2.74-009	4.78-009	7.71-009	1.17-008	1.69-008	2.34-008
AM342	5.73-010	1.00-009	1.62-009	2.47-009	3.58-009	4.96-009
AM243	2.07-007	4.15-007	7.62-007	1.31-006	2.11-006	3.26-006
COMB1	1.16-001	1.21-001	1.25-001	1.28-001	1.30-001	1.31-001

TIME	1.40000	1.50000	1.60000	1.70000	1.80000	1.90000
FLUX= 2.0+015		TARGET=NP237		DATA TYPE=YIELD		
NP237	6.21-001	6.00-001	5.80-001	5.61-001	5.42-001	5.24-001
NP238	3.16-002	3.05-002	2.95-002	2.85-002	2.76-002	2.67-002
PU238	1.01-001	1.02-001	1.03-001	1.03-001	1.03-001	1.03-001
U234	1.99-005	2.21-005	2.42-005	2.64-005	2.85-005	3.05-005
U235	1.25-006	1.47-006	1.69-006	1.93-006	2.17-006	2.42-006
U236	9.84-008	1.26-007	1.58-007	1.94-007	2.35-007	2.81-007
U237	2.70-010	3.67-010	4.87-010	6.31-010	8.04-010	1.01-009
PU239	3.84-002	4.06-002	4.24-002	4.40-002	4.53-002	4.63-002
PU240	1.02-002	1.17-002	1.32-002	1.47-002	1.62-002	1.77-002
PU241	1.27-003	1.52-003	1.79-003	2.07-003	2.36-003	2.66-003
PU242	3.69-004	4.85-004	6.23-004	7.83-004	9.66-004	1.17-003
PU243	5.13-007	6.79-007	8.76-007	1.11-006	1.37-006	1.67-006
AM241	5.17-007	6.62-007	8.28-007	1.01-006	1.22-006	1.44-006
AM242	3.13-008	4.06-008	5.14-008	6.35-008	7.70-008	9.17-008
AM342	6.65-009	8.64-009	1.09-008	1.35-008	1.64-008	1.96-008
AM243	4.84-006	6.93-006	9.64-006	1.31-005	1.73-005	2.25-005
COMB1	1.32-001	1.32-001	1.32-001	1.32-001	1.31-001	1.30-001

TIME	2.00000	2.10000	2.20000	2.30000	2.40000	2.50000
FLUX= 2.0+015		TARGET=NP237		DATA TYPE=YIELD		
NP237	5.06-001	4.90-001	4.73-001	4.57-001	4.42-001	4.27-001
NP238	2.58-002	2.49-002	2.41-002	2.33-002	2.25-002	2.17-002
PU238	1.02-001	1.01-001	1.00-001	9.91-002	9.77-002	9.61-002
U234	3.26-005	3.45-005	3.64-005	3.82-005	4.00-005	4.17-005
U235	2.68-006	2.94-006	3.19-006	3.45-006	3.71-006	3.97-006
U236	3.33-007	3.89-007	4.50-007	5.17-007	5.89-007	6.65-007
U237	1.24-009	1.51-009	1.82-009	2.16-009	2.55-009	2.97-009
PU239	4.71-002	4.77-002	4.81-002	4.84-002	4.84-002	4.83-002
PU240	1.92-002	2.06-002	2.19-002	2.32-002	2.44-002	2.56-002
PU241	2.96-003	3.25-003	3.55-003	3.84-003	4.13-003	4.41-003
PU242	1.41-003	1.66-003	1.94-003	2.24-003	2.57-003	2.91-003
PU243	2.01-006	2.38-006	2.78-006	3.23-006	3.70-006	4.21-006
AM241	1.67-006	1.92-006	2.19-006	2.46-006	2.74-006	3.02-006
AM242	1.08-007	1.24-007	1.42-007	1.61-007	1.80-007	1.99-007
AM342	2.30-008	2.66-008	3.04-008	3.44-008	3.85-008	4.27-008
AM243	2.87-005	3.60-005	4.46-005	5.44-005	6.57-005	7.84-005
COMB1	1.28-001	1.26-001	1.24-001	1.22-001	1.20-001	1.18-001

TABLE VIII (Contd.)

TIME	2.60000	2.70000	2.80000	2.90000	3.00000	3.10000
FLUX= 2.0+015		TARGET=NP237		DATA TYPE=YIELD		
NP237	4.13-001	3.99-001	3.86-001	3.73-001	3.60-001	3.48-001
NP238	2.10-002	2.03-002	1.96-002	1.90-002	1.83-002	1.77-002
PU238	9.44-002	9.26-002	9.07-002	8.88-002	8.69-002	8.49-002
U234	4.33-005	4.48-005	4.63-005	4.77-005	4.90-005	5.02-005
U235	4.22-006	4.47-006	4.71-006	4.95-006	5.18-006	5.41-006
U236	7.47-007	8.34-007	9.26-007	1.02-006	1.12-006	1.23-006
U237	3.44-009	3.95-009	4.51-009	5.11-009	5.75-009	6.44-009
PU239	4.81-002	4.77-002	4.73-002	4.68-002	4.62-002	4.55-002
PU240	2.66-002	2.76-002	2.86-002	2.94-002	3.02-002	3.08-002
PU241	4.67-003	4.93-003	5.17-003	5.40-003	5.61-003	5.81-003
PU242	3.28-003	3.67-003	4.08-003	4.50-003	4.94-003	5.40-003
PU243	4.75-006	5.32-006	5.92-006	6.54-006	7.19-006	7.87-006
AM241	3.31-006	3.59-006	3.88-006	4.16-006	4.44-006	4.71-006
AM242	2.19-007	2.39-007	2.59-007	2.79-007	2.98-007	3.17-007
AM342	4.70-008	5.13-008	5.56-008	5.98-008	6.41-008	6.82-008
AM243	9.27-005	1.09-004	1.26-004	1.45-004	1.66-004	1.89-004
COMB1	1.15-001	1.13-001	1.10-001	1.08-001	1.05-001	1.03-001

TIME	3.20000	3.30000	3.40000	3.50000	3.60000	3.80000
FLUX= 2.0+015		TARGET=NP237		DATA TYPE=YIELD		
NP237	3.37-001	3.26-001	3.15-001	3.04-001	2.94-001	2.75-001
NP238	1.71-002	1.66-002	1.60-002	1.55-002	1.49-002	1.40-002
PU238	8.28-002	8.08-002	7.88-002	7.67-002	7.47-002	7.07-002
U234	5.14-005	5.25-005	5.35-005	5.45-005	5.53-005	5.69-005
U235	5.63-006	5.84-006	6.04-006	6.23-006	6.42-006	6.76-006
U236	1.34-006	1.45-006	1.57-006	1.69-006	1.82-006	2.08-006
U237	7.17-009	7.95-009	8.78-009	9.64-009	1.06-008	1.25-008
PU239	4.47-002	4.39-002	4.31-002	4.23-002	4.14-002	3.95-002
PU240	3.15-002	3.20-002	3.25-002	3.28-002	3.32-002	3.36-002
PU241	5.99-003	6.16-003	6.31-003	6.45-003	6.57-003	6.78-003
PU242	5.87-003	6.35-003	6.84-003	7.34-003	7.85-003	8.89-003
PU243	8.56-006	9.27-006	1.00-005	1.07-005	1.15-005	1.30-005
AM241	4.97-006	5.23-006	5.47-006	5.70-006	5.92-006	6.33-006
AM242	3.36-007	3.54-007	3.71-007	3.88-007	4.04-007	4.32-007
AM342	7.22-008	7.61-008	7.98-008	8.34-008	8.68-008	9.31-008
AM243	2.14-004	2.40-004	2.68-004	2.98-004	3.30-004	3.99-004
COMB1	1.00-001	9.74-002	9.48-002	9.22-002	8.97-002	8.47-002

TIME	4.00000	4.20000	4.40000	4.60000	4.80000	5.00000
FLUX= 2.0+015		TARGET=NP237		DATA TYPE=YIELD		
NP237	2.57-001	2.40-001	2.24-001	2.09-001	1.95-001	1.83-001
NP238	1.30-002	1.22-002	1.14-002	1.06-002	9.94-003	9.29-003
PU238	6.68-002	6.30-002	5.93-002	5.58-002	5.25-002	4.93-002
U234	5.82-005	5.93-005	6.01-005	6.07-005	6.12-005	6.14-005
U235	7.08-006	7.35-006	7.59-006	7.80-006	7.98-006	8.13-006
U236	2.36-006	2.64-006	2.94-006	3.24-006	3.55-006	3.87-006
U237	1.46-008	1.69-008	1.93-008	2.18-008	2.45-008	2.72-008
PU239	3.77-002	3.58-002	3.39-002	3.21-002	3.03-002	2.86-002
PU240	3.38-002	3.38-002	3.36-002	3.33-002	3.28-002	3.21-002
PU241	6.92-003	7.01-003	7.05-003	7.05-003	7.01-003	6.94-003
PU242	9.95-003	1.10-002	1.21-002	1.31-002	1.42-002	1.52-002
PU243	1.46-005	1.62-005	1.78-005	1.93-005	2.09-005	2.24-005
AM241	6.67-006	6.96-006	7.20-006	7.38-006	7.51-006	7.59-006
AM242	4.58-007	4.79-007	4.96-007	5.10-007	5.20-007	5.26-007
AM342	9.86-008	1.03-007	1.07-007	1.10-007	1.12-007	1.13-007
AM243	4.74-004	5.57-004	6.45-004	7.39-004	8.38-004	9.41-004
COMB1	7.98-002	7.52-002	7.07-002	6.65-002	6.24-002	5.86-002

TABLE IX*

TARGET= NP237
DATA TYPE= YIELD ATOMS PER ATOM TARGET
FLUX= 5.0+015
TIME SPAN= 0-5

TIME	0.00500	0.00800	0.01000	0.05000	0.08000	0.10000
FLUX= 5.0+015		TARGET=NP237		DATA TYPE=YIELD		
NP237	9.97-001	9.93-001	9.92-001	9.58-001	9.34-001	9.18-001
NP238	3.35-003	6.53-003	8.07-003	3.16-002	4.26-002	4.77-002
PU238	3.85-005	1.26-004	1.87-004	3.32-003	7.26-003	1.03-002
U234	2.62-011	1.29-010	2.24-010	1.60-008	5.63-008	1.01-007
U235	3.11-014	2.14-013	4.25-013	1.07-010	5.78-010	1.28-009
U236	3.77-017	3.47-016	7.77-016	6.46-013	5.39-012	1.48-011
U237	2.64-021	3.13-020	7.79-020	1.96-016	2.48-015	8.34-015
PU239	2.57-007	1.26-006	2.18-006	1.49-004	5.05-004	8.83-004
PU240	8.68-010	5.97-009	1.18-008	2.91-006	1.55-005	3.38-005
PU241	3.02-012	2.76-011	6.16-011	4.80-008	3.81-007	1.01-006
PU242	1.50-014	1.77-013	4.38-013	1.05-009	1.28-008	4.21-008
PU243	4.92-018	7.13-017	1.93-016	1.11-012	1.79-011	6.69-011
AM241	1.17-017	1.38-016	3.42-016	8.04-013	9.62-012	3.13-011
AM242	8.26-020	1.20-018	3.26-018	1.94-014	3.21-013	1.21-012
AM342	1.59-020	2.30-019	6.22-019	3.50-015	5.57-014	2.06-013
AM243	4.29-019	7.63-018	2.25-017	3.56-013	8.64-012	3.97-011
COMB1	3.39-003	6.66-003	8.25-003	3.49-002	4.98-002	5.79-002

TIME	0.20000	0.30000	0.40000	0.50000	0.60000	0.70000
FLUX= 5.0+015		TARGET=NP237		DATA TYPE=YIELD		
NP237	8.44-001	7.75-001	7.12-001	6.54-001	6.00-001	5.51-001
NP238	5.82-002	5.78-002	5.44-002	5.04-002	4.64-002	4.26-002
PU238	2.64-002	4.01-002	4.99-002	5.61-002	5.96-002	6.09-002
U234	5.59-007	1.37-006	2.44-006	3.65-006	4.92-006	6.19-006
U235	1.36-008	4.89-008	1.13-007	2.05-007	3.21-007	4.55-007
U236	3.22-010	1.80-009	5.78-009	1.37-008	2.69-008	4.64-008
U237	3.54-013	2.98-012	1.29-011	3.84-011	9.09-011	1.84-010
PU239	4.32-003	9.35-003	1.47-002	1.94-002	2.31-002	2.58-002
PU240	3.42-004	1.16-003	2.53-003	4.34-003	6.45-003	8.66-003
PU241	1.88-005	8.94-005	2.44-004	4.94-004	8.29-004	1.23-003
PU242	1.59-006	1.19-005	4.56-005	1.22-004	2.59-004	4.72-004
PU243	3.57-009	3.13-008	1.31-007	3.70-007	8.18-007	1.53-006
AM241	1.12-009	7.88-009	2.85-008	7.14-008	1.42-007	2.43-007
AM242	6.63-011	5.76-010	2.35-009	6.40-009	1.35-008	2.40-008
AM342	1.04-011	8.59-011	3.39-010	9.00-010	1.86-009	3.27-009
AM243	4.21-009	5.68-008	3.27-007	1.19-006	3.24-006	7.27-006
COMB1	8.46-002	9.79-002	1.04-001	1.06-001	1.06-001	1.04-001

TIME	0.80000	0.90000	1.00000	1.10000	1.20000	1.30000
FLUX= 5.0+015		TARGET=NP237		DATA TYPE=YIELD		
NP237	5.06-001	4.65-001	4.27-001	3.92-001	3.60-001	3.31-001
NP238	3.92-002	3.60-002	3.30-002	3.03-002	2.79-002	2.56-002
PU238	6.08-002	5.95-002	5.75-002	5.51-002	5.23-002	4.93-002
U234	7.42-006	8.57-006	9.63-006	1.06-005	1.14-005	1.22-005
U235	6.01-007	7.53-007	9.05-007	1.05-006	1.20-006	1.33-006
U236	7.29-008	1.07-007	1.48-007	1.97-007	2.54-007	3.17-007
U237	3.32-010	5.49-010	8.50-010	1.24-009	1.75-009	2.36-009
PU239	2.75-002	2.84-002	2.86-002	2.83-002	2.76-002	2.66-002
PU240	1.09-002	1.29-002	1.47-002	1.63-002	1.76-002	1.86-002
PU241	1.66-003	2.10-003	2.52-003	2.91-003	3.25-003	3.54-003
PU242	7.70-004	1.16-003	1.63-003	2.18-003	2.80-003	3.48-003
PU243	2.55-006	3.89-006	5.55-006	7.51-006	9.73-006	1.22-005
AM241	3.71-007	5.19-007	6.82-007	8.51-007	1.02-006	1.18-006
AM242	3.78-008	5.44-008	7.29-008	9.24-008	1.12-007	1.31-007
AM342	5.10-009	7.26-009	9.66-009	1.22-008	1.47-008	1.71-008
AM243	1.42-005	2.49-005	4.02-005	6.10-005	8.77-005	1.21-004
COMB1	9.99-002	9.55-002	9.06-002	8.54-002	8.01-002	7.49-002

*"Am342" is 152-yr ^{242m}Am.

TABLE IX (Contd.)

TIME	1.40000	1.50000	1.60000	1.70000	1.80000	1.90000
FLUX= 5.0+015		TARGET=NP237		DATA TYPE=YIELD		
NP237	3.04-001	2.79-001	2.56-001	2.35-001	2.16-001	1.99-001
NP238	2.35-002	2.16-002	1.98-002	1.82-002	1.67-002	1.54-002
PU238	4.63-002	4.33-002	4.04-002	3.76-002	3.49-002	3.23-002
U234	1.28-005	1.33-005	1.37-005	1.40-005	1.43-005	1.45-005
U235	1.45-006	1.56-006	1.66-006	1.74-006	1.81-006	1.87-006
U236	3.86-007	4.61-007	5.41-007	6.25-007	7.13-007	8.03-007
U237	3.09-009	3.95-009	4.93-009	6.03-009	7.25-009	8.59-009
PU239	2.54-002	2.41-002	2.27-002	2.13-002	1.99-002	1.86-002
PU240	1.93-002	1.98-002	2.00-002	2.01-002	1.99-002	1.96-002
PU241	3.78-003	3.96-003	4.08-003	4.16-003	4.18-003	4.17-003
PU242	4.20-003	4.96-003	5.74-003	6.52-003	7.31-003	8.09-003
PU243	1.48-005	1.75-005	2.04-005	2.33-005	2.62-005	2.90-005
AM241	1.32-006	1.45-006	1.56-006	1.65-006	1.72-006	1.77-006
AM242	1.49-007	1.64-007	1.78-007	1.89-007	1.98-007	2.05-007
AM342	1.94-008	2.14-008	2.31-008	2.45-008	2.56-008	2.64-008
AM243	1.60-004	2.07-004	2.59-004	3.18-004	3.82-004	4.51-004
COMB1	6.98-002	6.49-002	6.02-002	5.58-002	5.16-002	4.77-002

TIME	2.00000	2.10000	2.20000	2.30000	2.40000	2.50000
FLUX= 5.0+015		TARGET=NP237		DATA TYPE=YIELD		
NP237	1.82-001	1.68-001	1.54-001	1.41-001	1.30-001	1.19-001
NP238	1.41-002	1.30-002	1.19-002	1.09-002	1.00-002	9.22-003
PU238	2.99-002	2.76-002	2.55-002	2.35-002	2.17-002	2.00-002
U234	1.46-005	1.46-005	1.46-005	1.45-005	1.44-005	1.42-005
U235	1.92-006	1.95-006	1.98-006	2.00-006	2.01-006	2.01-006
U236	8.97-007	9.92-007	1.09-006	1.19-006	1.28-006	1.38-006
U237	1.00-008	1.16-008	1.32-008	1.50-008	1.68-008	1.87-008
PU239	1.73-002	1.60-002	1.49-002	1.37-002	1.27-002	1.17-002
PU240	1.92-002	1.87-002	1.80-002	1.74-002	1.67-002	1.59-002
PU241	4.13-003	4.06-003	3.96-003	3.84-003	3.71-003	3.57-003
PU242	8.85-003	9.58-003	1.03-002	1.10-002	1.16-002	1.22-002
PU243	3.18-005	3.45-005	3.72-005	3.97-005	4.21-005	4.43-005
AM241	1.80-006	1.81-006	1.80-006	1.79-006	1.76-006	1.72-006
AM242	2.09-007	2.11-007	2.11-007	2.09-007	2.06-007	2.02-007
AM342	2.69-008	2.71-008	2.71-008	2.69-008	2.64-008	2.59-008
AM243	5.25-004	6.03-004	6.84-004	7.68-004	8.53-004	9.39-004
COMB1	4.40-002	4.06-002	3.74-002	3.44-002	3.17-002	2.92-002

TIME	2.60000	2.70000	2.80000	2.90000	3.00000	3.10000
FLUX= 5.0+015		TARGET=NP237		DATA TYPE=YIELD		
NP237	1.09-001	1.01-001	9.24-002	8.48-002	7.79-002	7.16-002
NP238	8.47-003	7.78-003	7.14-003	6.56-003	6.03-003	5.54-003
PU238	1.84-002	1.69-002	1.56-002	1.43-002	1.32-002	1.21-002
U234	1.41-005	1.38-005	1.36-005	1.33-005	1.31-005	1.28-005
U235	2.00-006	1.99-006	1.97-006	1.94-006	1.92-006	1.89-006
U236	1.48-006	1.57-006	1.67-006	1.76-006	1.85-006	1.94-006
U237	2.06-008	2.26-008	2.47-008	2.68-008	2.89-008	3.10-008
PU239	1.08-002	9.96-003	9.18-003	8.45-003	7.78-003	7.15-003
PU240	1.52-002	1.44-002	1.36-002	1.29-002	1.21-002	1.14-002
PU241	3.42-003	3.26-003	3.10-003	2.94-003	2.79-003	2.63-003
PU242	1.28-002	1.33-002	1.38-002	1.42-002	1.46-002	1.50-002
PU243	4.64-005	4.83-005	5.01-005	5.18-005	5.33-005	5.46-005
AM241	1.67-006	1.61-006	1.55-006	1.49-006	1.43-006	1.36-006
AM242	1.97-007	1.91-007	1.84-007	1.77-007	1.69-007	1.61-007
AM342	2.52-008	2.44-008	2.35-008	2.26-008	2.16-008	2.06-008
AM243	1.03-003	1.11-003	1.20-003	1.29-003	1.37-003	1.45-003
COMB1	2.68-002	2.47-002	2.27-002	2.09-002	1.92-002	1.76-002

TIME	3.20000	3.30000	3.40000	3.50000	3.60000	3.80000
FLUX= 5.0+015		TARGET=NP237		DATA TYPE=YIELD		
NP237	6.57-002	6.04-002	5.54-002	5.09-002	4.68-002	3.94-002
NP238	5.08-003	4.67-003	4.29-003	3.94-003	3.62-003	3.05-003
PU238	1.11-002	1.02-002	9.39-003	8.63-003	7.93-003	6.70-003
U234	1.25-005	1.22-005	1.18-005	1.15-005	1.12-005	1.05-005
U235	1.85-006	1.81-006	1.78-006	1.73-006	1.69-006	1.60-006
U236	2.03-006	2.12-006	2.20-006	2.28-006	2.36-006	2.52-006
U237	3.32-008	3.54-008	3.75-008	3.97-008	4.18-008	4.60-008
PU239	6.58-003	6.05-003	5.56-003	5.11-003	4.70-003	3.97-003
PU240	1.07-002	1.01-002	9.41-003	8.79-003	8.21-003	7.13-003
PU241	2.48-003	2.33-003	2.19-003	2.05-003	1.92-003	1.67-003
PU242	1.53-002	1.56-002	1.58-002	1.60-002	1.62-002	1.65-002
PU243	5.58-005	5.69-005	5.79-005	5.87-005	5.94-005	6.05-005
AM241	1.29-006	1.22-006	1.16-006	1.09-006	1.03-006	9.05-007
AM242	1.54-007	1.46-007	1.38-007	1.30-007	1.23-007	1.08-007
AM342	1.96-008	1.86-008	1.76-008	1.66-008	1.56-008	1.38-008
AM243	1.53-003	1.61-003	1.68-003	1.75-003	1.82-003	1.95-003
COMB1	1.62-002	1.49-002	1.37-002	1.26-002	1.15-002	9.75-003

TABLE IX (Contd.)

TIME	4.00000	4.20000	4.40000	4.60000	4.80000	5.00000
FLUX= 5.0+015		TARGET=NP237		DATA TYPE=YIELD		
NP237	3.33-002	2.81-002	2.37-002	2.00-002	1.68-002	1.42-002
NP238	2.57-003	2.17-003	1.83-003	1.54-003	1.30-003	1.10-003
PU238	5.65-003	4.77-003	4.02-003	3.39-003	2.86-003	2.42-003
U234	9.86-006	9.22-006	8.60-006	8.00-006	7.42-006	6.88-006
U235	1.51-006	1.42-006	1.33-006	1.25-006	1.16-006	1.08-006
U236	2.66-006	2.79-006	2.91-006	3.02-006	3.13-006	3.22-006
U237	5.01-008	5.41-008	5.79-008	6.15-008	6.49-008	6.82-008
PU239	3.35-003	2.83-003	2.39-003	2.01-003	1.70-003	1.43-003
PU240	6.17-003	5.32-003	4.57-003	3.92-003	3.36-003	2.87-003
PU241	1.45-003	1.25-003	1.08-003	9.29-004	7.96-004	6.81-004
PU242	1.67-002	1.68-002	1.68-002	1.67-002	1.66-002	1.64-002
PU243	6.12-005	6.16-005	6.16-005	6.14-005	6.10-005	6.04-005
AM241	7.93-007	6.91-007	5.99-007	5.18-007	4.46-007	3.84-007
AM242	9.49-008	8.27-008	7.19-008	6.21-008	5.36-008	4.61-008
AM342	1.21-008	1.05-008	9.14-009	7.90-009	6.81-009	5.86-009
AM243	2.06-003	2.15-003	2.23-003	2.30-003	2.36-003	2.40-003
COMB1	8.22-003	6.94-003	5.85-003	4.94-003	4.17-003	3.52-003

TABLE X*

TARGET= NP237
DATA TYPE= YIELD ATOMS PER ATOM TARGET
FLUX= 1.0+016
TIME SPAN= 0-2

TIME	0.00100	0.00500	0.00800	0.01000	0.05000	0.10000
FLUX= 1.0+016		TARGET=NP237		DATA TYPE=YIELD		
NP237	9.98-001	9.92-001	9.86-001	9.83-001	9.18-001	8.44-001
NP238	1.70-003	8.13-003	1.26-002	1.54-002	5.16-002	6.64-002
PU238	6.48-006	9.38-005	2.19-004	3.29-004	5.43-003	1.45-002
U234	1.65-012	5.61-011	1.88-010	3.41-010	2.63-008	1.50-007
U235	1.57-015	1.07-013	4.92-013	1.05-012	3.30-010	3.62-009
U236	1.58-018	1.95-016	1.20-015	3.01-015	3.80-012	8.47-011
U237	9.49-023	1.95-020	1.57-019	4.54-019	2.15-015	9.43-014
PU239	3.24-008	1.09-006	3.65-006	6.56-006	4.60-004	2.33-003
PU240	8.75-011	5.93-009	2.73-008	5.83-008	1.75-005	1.82-004
PU241	2.54-013	3.09-011	1.89-010	4.69-010	5.21-007	9.89-006
PU242	1.08-015	2.20-013	1.75-012	5.04-012	2.16-008	8.31-007
PU243	3.13-019	9.85-017	9.89-016	3.22-015	4.14-011	2.55-009
AM241	4.22-019	8.56-017	6.82-016	1.95-015	8.02-012	2.92-010
AM242	2.62-021	8.21-019	8.22-018	2.67-017	3.30-013	1.93-011
AM342	5.07-022	1.56-019	1.54-018	4.95-018	5.27-014	2.72-012
AM243	1.21-020	5.74-018	7.23-017	2.67-016	1.20-011	1.46-009
COMB1	1.70-003	8.22-003	1.28-002	1.57-002	5.70-002	8.09-002

TIME	0.15000	0.20000	0.25000	0.30000	0.35000	0.40000
FLUX= 1.0+016		TARGET=NP237		DATA TYPE=YIELD		
NP237	7.75-001	7.12-001	6.54-001	6.00-001	5.51-001	5.06-001
NP238	6.79-002	6.49-002	6.06-002	5.60-002	5.15-002	4.74-002
PU238	2.26-002	2.87-002	3.27-002	3.51-002	3.61-002	3.62-002
U234	3.77-007	6.82-007	1.03-006	1.41-006	1.79-006	2.15-006
U235	1.33-008	3.11-008	5.72-008	9.06-008	1.30-007	1.72-007
U236	4.83-010	1.57-009	3.78-009	7.48-009	1.30-008	2.06-008
U237	8.15-013	3.59-012	1.10-011	2.65-011	5.46-011	1.00-010
PU239	5.17-003	8.27-003	1.11-002	1.34-002	1.51-002	1.62-002
PU240	6.30-004	1.40-003	2.44-003	3.66-003	4.96-003	6.26-003
PU241	4.81-005	1.34-004	2.74-004	4.66-004	6.96-004	9.49-004
PU242	6.33-006	2.47-005	6.68-005	1.44-004	2.64-004	4.34-004
PU243	2.47-008	1.11-007	3.32-007	7.64-007	1.48-006	2.53-006
AM241	2.10-009	7.72-009	1.96-008	3.96-008	6.82-008	1.05-007
AM242	1.76-010	7.49-010	2.10-009	4.55-009	8.28-009	1.33-008
AM342	2.29-011	9.17-011	2.47-010	5.17-010	9.17-010	1.44-009
AM243	2.16-008	1.34-007	5.12-007	1.46-006	3.39-006	6.79-006
COMB1	9.05-002	9.36-002	9.33-002	9.10-002	8.76-002	8.36-002

*"Am342" is 152-yr ^{242m}Am.

TABLE X (Contd.)

TARGET=NP237 DATA TYPE=YIELD

TIME	0.45000	0.50000	0.55000	0.60000	0.65000	0.70000
FLUX=	1.0+016					
NP237	4.65-001	4.27-001	3.92-001	3.60-001	3.31-001	3.04-001
NP238	4.35-002	4.00-002	3.67-002	3.37-002	3.10-002	2.85-002
PU238	3.56-002	3.45-002	3.30-002	3.14-002	2.97-002	2.79-002
U234	2.50-006	2.82-006	3.11-006	3.36-006	3.59-006	3.78-006
U235	2.17-007	2.63-007	3.07-007	3.50-007	3.90-007	4.26-007
U236	3.04-008	4.24-008	5.67-008	7.31-008	9.16-008	1.12-007
U237	1.69-010	2.65-010	3.94-010	5.61-010	7.69-010	1.02-009
PU239	1.68-002	1.70-002	1.69-002	1.65-002	1.59-002	1.52-002
PU240	7.49-003	8.60-003	9.56-003	1.04-002	1.10-002	1.14-002
PU241	1.21-003	1.46-003	1.70-003	1.91-003	2.08-003	2.23-003
PU242	6.56-004	9.29-004	1.25-003	1.61-003	2.01-003	2.44-003
PU243	3.95-006	5.74-006	7.88-006	1.03-005	1.31-005	1.61-005
AM241	1.48-007	1.96-007	2.46-007	2.96-007	3.43-007	3.87-007
AM242	1.93-008	2.62-008	3.36-008	4.12-008	4.85-008	5.54-008
AM342	2.07-009	2.77-009	3.51-009	4.26-009	4.99-009	5.66-009
AM243	1.22-005	2.01-005	3.10-005	4.52-005	6.31-005	8.47-005
COMB1	7.91-002	7.45-002	6.98-002	6.52-002	6.07-002	5.64-002

TARGET=NP237 DATA TYPE=YIELD

TIME	0.75000	0.80000	0.85000	0.90000	0.95000	1.00000
FLUX=	1.0+016					
NP237	2.79-001	2.56-001	2.35-001	2.16-001	1.99-001	1.82-001
NP238	2.61-002	2.40-002	2.21-002	2.03-002	1.86-002	1.71-002
PU238	2.61-002	2.44-002	2.27-002	2.11-002	1.95-002	1.81-002
U234	3.94-006	4.07-006	4.17-006	4.25-006	4.30-006	4.34-006
U235	4.60-007	4.89-007	5.15-007	5.37-007	5.55-007	5.69-007
U236	1.34-007	1.57-007	1.82-007	2.08-007	2.35-007	2.63-007
U237	1.32-009	1.67-009	2.07-009	2.52-009	3.02-009	3.57-009
PU239	1.45-002	1.37-002	1.28-002	1.20-002	1.12-002	1.04-002
PU240	1.17-002	1.19-002	1.19-002	1.19-002	1.17-002	1.15-002
PU241	2.34-003	2.42-003	2.47-003	2.49-003	2.49-003	2.47-003
PU242	2.89-003	3.35-003	3.82-003	4.28-003	4.75-003	5.20-003
PU243	1.92-005	2.25-005	2.58-005	2.92-005	3.25-005	3.58-005
AM241	4.26-007	4.60-007	4.87-007	5.09-007	5.24-007	5.34-007
AM242	6.17-008	6.71-008	7.17-008	7.54-008	7.81-008	8.00-008
AM342	6.27-009	6.79-009	7.22-009	7.56-009	7.81-009	7.98-009
AM243	1.10-004	1.39-004	1.72-004	2.08-004	2.48-004	2.90-004
COMB1	5.23-002	4.84-002	4.47-002	4.13-002	3.81-002	3.51-002

TARGET=NP237 DATA TYPE=YIELD

TIME	1.05000	1.10000	1.15000	1.20000	1.25000	1.30000
FLUX=	1.0+016					
NP237	1.68-001	1.54-001	1.41-001	1.30-001	1.19-001	1.09-001
NP238	1.57-002	1.44-002	1.32-002	1.22-002	1.12-002	1.03-002
PU238	1.67-002	1.54-002	1.42-002	1.31-002	1.21-002	1.11-002
U234	4.35-006	4.35-006	4.33-006	4.30-006	4.25-006	4.20-006
U235	5.81-007	5.89-007	5.95-007	5.97-007	5.98-007	5.96-007
U236	2.91-007	3.20-007	3.49-007	3.78-007	4.07-007	4.36-007
U237	4.18-009	4.83-009	5.52-009	6.26-009	7.05-009	7.87-009
PU239	9.68-003	8.98-003	8.31-003	7.68-003	7.09-003	6.54-003
PU240	1.12-002	1.08-002	1.04-002	1.00-002	9.57-003	9.12-003
PU241	2.43-003	2.37-003	2.30-003	2.23-003	2.14-003	2.05-003
PU242	5.64-003	6.07-003	6.47-003	6.86-003	7.22-003	7.56-003
PU243	3.90-005	4.22-005	4.51-005	4.80-005	5.06-005	5.32-005
AM241	5.38-007	5.38-007	5.33-007	5.25-007	5.13-007	5.00-007
AM242	8.10-008	8.13-008	8.09-008	7.99-008	7.84-008	7.65-008
AM342	8.06-009	8.07-009	8.01-009	7.90-009	7.74-009	7.54-009
AM243	3.34-004	3.80-004	4.29-004	4.78-004	5.28-004	5.79-004
COMB1	3.24-002	2.98-002	2.75-002	2.53-002	2.32-002	2.14-002

TARGET=NP237 DATA TYPE=YIELD

TIME	1.35000	1.40000	1.45000	1.50000	1.55000	1.60000
FLUX=	1.0+016					
NP237	1.01-001	9.24-002	8.48-002	7.79-002	7.16-002	6.57-002
NP238	9.42-003	8.65-003	7.95-003	7.30-003	6.70-003	6.16-003
PU238	1.02-002	9.42-003	8.66-003	7.97-003	7.32-003	6.73-003
U234	4.14-006	4.07-006	3.99-006	3.91-006	3.82-006	3.73-006
U235	5.93-007	5.87-007	5.81-007	5.73-007	5.64-007	5.54-007
U236	4.64-007	4.93-007	5.21-007	5.48-007	5.75-007	6.02-007
U237	8.73-009	9.62-009	1.05-008	1.15-008	1.25-008	1.35-008
PU239	6.03-003	5.55-003	5.11-003	4.71-003	4.33-003	3.98-003
PU240	8.66-003	8.20-003	7.75-003	7.31-003	6.88-003	6.46-003
PU241	1.96-003	1.87-003	1.77-003	1.68-003	1.58-003	1.49-003
PU242	7.87-003	8.16-003	8.43-003	8.67-003	8.89-003	9.09-003
PU243	5.55-005	5.77-005	5.97-005	6.15-005	6.31-005	6.46-005
AM241	4.84-007	4.66-007	4.48-007	4.28-007	4.08-007	3.88-007
AM242	7.42-008	7.17-008	6.89-008	6.61-008	6.31-008	6.01-008
AM342	7.31-009	7.05-009	6.78-009	6.49-009	6.19-009	5.89-009
AM243	6.30-004	6.80-004	7.30-004	7.79-004	8.28-004	8.75-004
COMB1	1.97-002	1.81-002	1.66-002	1.53-002	1.40-002	1.29-002

TABLE X (Contd.)

TIME	1.65000	1.70000	1.75000	1.80000	1.90000	2.00000
FLUX= 1.0+016		TARGET=NP237		DATA TYPE=YIELD		
NP237	6.04-002	5.54-002	5.09-002	4.68-002	3.94-002	3.33-002
NP238	5.65-003	5.19-003	4.77-003	4.38-003	3.69-003	3.12-003
PU238	6.19-003	5.69-003	5.23-003	4.80-003	4.05-003	3.42-003
U234	3.64-006	3.54-006	3.45-006	3.35-006	3.15-006	2.96-006
U235	5.43-007	5.31-007	5.19-007	5.07-007	4.81-007	4.54-007
U236	6.27-007	6.53-007	6.77-007	7.01-007	7.47-007	7.89-007
U237	1.45-008	1.55-008	1.66-008	1.76-008	1.97-008	2.19-008
PU239	3.66-003	3.37-003	3.10-003	2.85-003	2.40-003	2.03-003
PU240	6.06-003	5.67-003	5.31-003	4.95-003	4.31-003	3.73-003
PU241	1.40-003	1.32-003	1.24-003	1.16-003	1.01-003	8.76-004
PU242	9.26-003	9.41-003	9.55-003	9.66-003	9.84-003	9.95-003
PU243	6.59-005	6.71-005	6.81-005	6.90-005	7.04-005	7.13-005
AM241	3.68-007	3.48-007	3.28-007	3.09-007	2.73-007	2.39-007
AM242	5.70-008	5.40-008	5.10-008	4.81-008	4.25-008	3.73-008
AM342	5.59-009	5.29-009	4.99-009	4.70-009	4.15-009	3.64-009
AM243	9.20-004	9.64-004	1.01-003	1.05-003	1.12-003	1.19-003
COMB1	1.18-002	1.09-002	1.00-002	9.18-003	7.75-003	6.54-003

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