

UNCLASSIFIED

Index No. Y-790

ELECTROMAGNETICALLY ENRICHED ISOTOPES

Inventory, July 31, 1951

WD-6445

C. P. Keim
C. E. Normand
Boyd Weaver

July 31, 1951

ISOTOPE RESEARCH AND PRODUCTION DIVISION
C. P. Keim, Director

OAK RIDGE NATIONAL LABORATORY
Y-12 AREA
Operated By
CARBIDE AND CARBON CHEMICALS COMPANY
A DIVISION OF UNION CARBIDE AND CARBON CORPORATION
Oak Ridge, Tennessee

Contract No. W-7405-eng-26

UNCLASSIFIED

DISCLAIMER

This report was prepared as an account of work sponsored by an agency of the United States Government. Neither the United States Government nor any agency Thereof, nor any of their employees, makes any warranty, express or implied, or assumes any legal liability or responsibility for the accuracy, completeness, or usefulness of any information, apparatus, product, or process disclosed, or represents that its use would not infringe privately owned rights. Reference herein to any specific commercial product, process, or service by trade name, trademark, manufacturer, or otherwise does not necessarily constitute or imply its endorsement, recommendation, or favoring by the United States Government or any agency thereof. The views and opinions of authors expressed herein do not necessarily state or reflect those of the United States Government or any agency thereof.

DISCLAIMER

Portions of this document may be illegible in electronic image products. Images are produced from the best available original document.

UNCLASSIFIEDIndex No. Y-772

Distribution, Series A:

No. of Copies

Argonne National Laboratory	12
Armed Forces Special Weapons Project	1
Atomic Energy Commission, Washington	5
Battelle Memorial Institute	1
Brookhaven National Laboratory	8
Brush Beryllium	1
Bureau of Medicine and Surgery	1
Bureau of Ships	1
Carbide and Carbon Chemicals Company (Y-12 Area)	40
Carbide and Carbon Chemicals Company (K-25 Plant)	4
Chicago Operations Office	1
Cleveland Area	1
Columbia University (Dunning)	1
Columbia University (Faila)	1
Dow Chemical Company	1
Fisher Scientific Laboratory	1
General Electric Company, Richland	6
Idaho Operations Office	4
Iowa State College	2
Kellex Corporation	1
Knolls Atomic Power Laboratory	4
Los Alamos	3
Mallinckrodt Chemical Works	1
Massachusetts Institute of Technology (Gaudin)	1
Massachusetts Institute of Technology (Kaufmann)	3
Mound Laboratory	3
National Advisory Committee for Aeronautics	2
National Bureau of Standards (R. D. Huntoon)	2
Naval Medical Research Institute	1
Naval Radiological Defense Laboratory	2
New Brunswick Laboratory	1
New York Operations Office	3
North American Aviation, Inc.	1
Oak Ridge National Laboratory, X-10 Site	8
Patent Branch, Washington	1
Public Health Service	1
Rand Corporation	1
Sandia Corporation	1
Sylvania Electric Products, Inc.	1
Technical Information Service, Oak Ridge	15
U. S. Geological Survey (T. B. Nolan)	2
UCLA Medical Research Laboratory (Warren)	1
University of California Radiation Laboratory	6
University of Rochester	3
University of Washington	2
Western Reserve University (Friedell)	2
Westinghouse Electric Corporation	5

UNCLASSIFIED

UNCLASSIFIED

3.

Carbide and Carbon Chemicals Company, Paducah, Ky.	2
E. I. duPont de Nemours and Company	5
Eldorado Mining & Refining Ltd.	2
Atomic Energy Project, Chalk River	4
Chief of Naval Research	1
H. K. Ferguson Company	1
Harshaw Chemical Corporation	1
Isotopes Division (Mr. McCormick)	1
Library of Congress, Acquisition Department (J. W. Coram)	2
National Bureau of Standards (Library)	1
National Research Council, Ottawa	1
Naval Research Laboratory	1
Nucleonics	1
United Kingdom Scientific Mission (M. Greenhill)	10
USAF, Eglin Air Force Base (Technical Library)	1
USAF, Wright-Patterson Air Force Base (Rodney Nudenberg)	1
USAF, Wright-Patterson Air Force Base (CADO)	5
U. S. Army, Army Medical Service Graduate School (Col. W.S. Stone)	1
U. S. Army, Technical Command (Col. J. H. Rothschild, Attn: Technical Library)	1
U. S. Army, Atomic Energy Branch (Lt. Col. A. W. Betts)	1
UT-AEC Agricultural Research Program (C. L. Comar)	1
Savannah River Operations Office	1
Oak Ridge Patent Branch	1
Allegheny Observatory	1
Bartol Research Foundation	1
California Institute of Technology	2
Carnegie Institute of Technology	1
B. F. Goodrich Research Center	1
Harvard Medical School	2
Harvard University (Chemistry & Physics Dept.)	2
Ohio State University	2
ORINS	4
Presbyterian Hospital, Philadelphia	1
Princeton University	2
Reed College	2
Rice Institute	2
Rutgers University	2
State College of Washington	2
University of Buffalo	2
University of California	2
University of Indiana	2
University of Illinois	2
University of Michigan	2
University of Minnesota	2
University of Notre Dame	2
University of Southern California	2
University of Tennessee	2
University of Wisconsin	2
Washington University	2
Yale University	2

TOTAL

266

UNCLASSIFIED

UNCLASSIFIED

Carbide and Carbon Chemicals Company (Y-12 Area) internal distribution as follows:

C. E. Center	1
C. E. Larson	1
W. B. Humes	1
W. D. Lavers	1
A. M. Weinberg	1
E. D. Shipley	1
C. P. Keim	10
C. E. Normand	1
C. R. Baldock	1
J. M. Herndon	1
L. O. Love	1
John H. Frye	1
R. S. Livingston	1
R. F. Hibbs	1
G. H. Clewett	1
Boyd Weaver	10
J. R. McNally, Jr.	1
H. M. Roth	1
R. C. Briant	1
W. L. Harwell	1
Reports Office, TIC	2
Total Internal	40

Issuing Office
Technical Information Center, Y-12 Area
Date Issued: **AUG 6 1951**

UNCLASSIFIED

ABSTRACT

This inventory lists the isotopes which have been concentrated electromagnetically, along with the completed information on their enriched abundances, and the element weights and product forms available in milligram quantities to users on Atomic Energy Commission projects and in university and industrial laboratories.

UNCLASSIFIED

TABLE OF CONTENTS

Introduction	Page No. 8
Summary of Production and Shipments	9

Stable Isotopes:

<u>Atomic No.</u>	<u>Element</u>
51	Antimony - - - - 50
56	Barium - - - - 55
5	Boron - - - - 13
35	Bromine - - - - 39
48	Cadmium - - - - 46
20	Calcium - - - 20-21
6	Carbon - - - - 12
58	Cerium - - - - 57
17	Chlorine - - - - 17
24	Chromium - - - - 25
29	Copper - - - - 32
31	Gallium - - - - 34
32	Germanium - - - 35
72	Hafnium - - - - 60
49	Indium - - - - 47
26	Iron ---26-27-28-29
57	Lanthanum - - - -56
82	Lead - - - - -67-68
3	Lithium - - - 10-11
12	Magnesium - - - 14
80	Mercury- - 64-65-66
42	Molybdenum - - - 44
60	Neodymium- - - - 58
28	Nickel - - - 30-31
19	Potassium - - 18-19
75	Rhenium - - - - -62
37	Rubidium- - - - -40

TABLE OF CONTENTS (Cont'd)

Page No.

Stable Isotopes:

<u>Atomic No.</u>	<u>Element</u>
62	Samarium - - - - - 59
34	Selenium - - 36-37-38
14	Silicon - - - - - 15
47	Silver - - - - - 45
38	Strontium - - - - 41
16	Sulfur - - - - - 16
52	Tellurium - -52-53-54
81	Thallium - - - - - 65
50	Tin - - - - 48-49-50
22	Titanium - - - - - 23
74	Tungsten - - - - - 61
23	Vanadium- - - - -24
30	Zinc - - - - - - 33
40	Zirconium - - -42- 43

UNCLASSIFIED

INTRODUCTION

This report of electromagnetically enriched isotopes frequently to include all isotopes which are available for use, or are in the process of chemical refinement. The most recent information on the isotopic abundance of each enriched sample and the amount of each isotope in the inventory is also listed. The list also includes those isotopes which have been concentrated but are not available at present.

All weights reported are element weights converted from compound weights by standard gravimetric factors.

Isotopic abundance data not available upon shipment of material will be forwarded to requestor as soon as available.

Isotopic abundance data not in this report, such as concentrations of other isotopes in the sample, will be submitted upon request. On all shipments, however, complete isotopic abundance data will be forwarded together with a spectrographic analysis.

On all shipments material will be shipped in the product form shown unless special arrangements are made for further chemical processing.

Any users of isotopes who need mass analysis services should check with the Isotopes Division of the A. E. C. regarding their specific needs.

Isotopes produced by the electromagnetic process are available in milligram quantities for distribution on loan within and outside of the Atomic Energy Commission and may be requested by using A. E. C. form 100. Copies of this form may be obtained from the Isotopes Division, U. S. Atomic Energy Commission, P. O. Box "E", Oak Ridge, Tennessee. Users of Stable Isotopes who need an extension of the loan period should write The Isotopes Division, Atomic Energy Commission, Oak Ridge, Tennessee.

SUMMARY OF PRODUCTION AND SHIPMENTS

February 28, 1951 - May 31, 1951

Atomic No.	Element	No. of Samples Production Completed	No. of Samples Now Available For Shipment	No. of Individual Shipments Made
3	Lithium	19	9	53
4	Beryllium	2	0	2
5	Boron	3	3	2
6	Carbon	2	2	2
8	Oxygen	2	0	0
12	Magnesium	15	11	29
14	Silicon	9	5	18
16	Sulfur	10	7	11
17	Chlorine	2	2	5
19	Potassium	29	22	39
20	Calcium	36	15	27
22	Titanium	10	12	25
23	Vanadium	2	1	0
24	Chromium	12	9	36
26	Iron	113	55	38
28	Nickel	18	9	46
29	Copper	10	9	19
30	Zinc	15	10	27
31	Gallium	2	2	7
32	Germanium	5	4	13
34	Selenium	38	21	43
35	Bromine	4	2	0
37	Rubidium	2	2	2
38	Strontium	11	5	22
40	Zirconium	19	19	40
42	Molybdenum	15	14	59
47	Silver	6	7	15
48	Cadmium	16	16	58
49	Indium	11	9	16
50	Tin	51	30	94
51	Antimony	4	2	17
52	Tellurium	29	25	71
56	Barium	7	4	25
57	Lanthanum	2	2	3
58	Cerium	9	6	14
60	Neodymium	7	6	27
62	Samarium	7	10	26
72	Hafnium	6	6	23
74	Tungsten	10	17	32
75	Rhenium	2	2	11
80	Mercury	23	36	52
81	Thallium	16	16	18
82	Lead	3	18	50
	TOTAL	614	453	1116

Natural Isotopic Abundance:

Lithium
Atomic No. 3

Li 6 - 7.43%

Li 7 - 92.57%

Electromagnetically Concentrated Isotopes

Isotope	Series	Sample	Abundance of Enriched Isotope (per cent)	AVAILABLE FOR SHIPMENT Element Weight (milligrams)	Product Form
Li 6	H	23(a)	93.91	0	
Li 6	I	25(a)	87.76	0	
Li 6	AR	139(a)	95.5	0	
Li 6	BQ	264(a)	95.4	26	Li ₂ SO ₄
Li 6	CT	376(a)	99.4	0	
Li 6	CU	378(a)	98.8	0	
Li 6	DV	499(a)	98.32	0	
Li 6	ED	537(a)	95.2	0	
Li 6	ED	537(b)	95.5	0	
Li 6	FI	667(a)	94.07	815	Li ₂ SO ₄
Li 6	FI	667(b)	94.29	1,065	LiF
Li 6	FI	667(c)	91.75	1,260	Li ₂ SO ₄
Li 6	FI	667(d)	93.39	1,105	Li ₂ SO ₄
Li 7	H	24(a)	99.89	389	Li ₂ SO ₄
Li 7	I	26(a)	99.91	110	Li ₂ SO ₄
Li 7	AR	140(a)	99.5	711	Li ₂ SO ₄
Li 7	BQ	265(a)	99.8	0	
Li 7	CT	377(a)	99.6	82	LiF

Natural Isotopic Abundance:

Lithium (Cont'd)
Atomic No. 3

Li 6 - 7.43%

Li 7 - 92.57%

Electromagnetically Concentrated Isotopes

Isotope	Series	Sample	Abundance of Enriched Isotope (per cent)	AVAILABLE FOR SHIPMENT Element Weight (milligrams)	Product Form
Li 7	CU	379(a)	98.4	4,546	Li ₂ SO ₄
Li 7	DV	500(a)	99.58	0	
Li 7	ED	538(a)	99.87	0	
Li 7	EZ	628(c)	99.52	4,518	Li ₂ SO ₄
Li 7	EZ	628(e)	99.86	10,363	Li ₂ SO ₄

Natural Isotopic Abundance:

Boron
Atomic No. 5

B 10 - 18.83%

B 11 - 81.17%

Electromagnetically Concentrated Isotopes

Isotope	Series	Sample	Abundance of Enriched Isotope (per cent)	AVAILABLE FOR SHIPMENT Element Weight (milligrams)	Product Form
B 10	DP	481(a)	Analysis Incomplete	53	H₃BO₃
B 11	EM	250(ar)	Analysis Incomplete	32	H₃BO₃
B 11	DP	482(a)	Analysis Incomplete	250	H₃BO₃

Natural Isotopic Abundance:

Carbon
Atomic No. 6

C 12 - 98.91%

C 13 - 1.09%

Electromagnetically Concentrated Isotopes

Isotope	Series	Sample	Abundance of Enriched Isotope (per cent)	AVAILABLE FOR SHIPMENT Element Weight (milligrams)	Product Form
C 12	FD	638(ah)	99.963	0	
C 12	FD	638(ai)	Analysis Incomplete	8400	C
C 12	FD	638(aj)	99.945	9900	C

Natural Isotopic Abundance:

Magnesium
Atomic No. 12

Mg 24 - 78.98%

Mg 25 - 10.03%

Mg 26 - 10.99%

Electromagnetically Concentrated Isotopes

Isotope	Series	Sample	Abundance of Enriched Isotope (per cent)	AVAILABLE FOR SHIPMENT Element Weight (milligrams)	Product Form
Mg 24	P	47(a)	99.5	600	MgO
Mg 24	Q	50(a)	98.36	192	MgO
Mg 24	BZ	288(a)	99.52	2,441	MgO
Mg 24	BZ	288(b)	99.2	132	MgO
Mg 24	BZ	288(c)	99.50	2,250	MgO
Mg 24	BZ	288(d)	99.4	1,786	MgO
Mg 24	DZ	519(a)	99.59	3,978	MgO
Mg 25	P	48(a)	83.22	0	MgO
Mg 25	Q	51(a)	62.59	0	
Mg 25	BZ	289(a)	86.8	205	MgO
Mg 25	DZ	520(a)	92.33	1,566	MgO
Mg 26	P	49(a)	96.16	0	
Mg 26	Q	52(a)	97.00	0	
Mg 26	BZ	290(a)	95.91	210	MgO
Mg 26	DZ	521(a)	98.12	834	MgO

Natural Isotopic Abundance:

Si 28 - 92.17%

Si 29 - 4.71%

Si 30 - 3.12%

Silicon
Atomic No. 14

Electromagnetically Concentrated Isotopes

Isotope	Series	Sample	Abundance of Enriched Isotope (per cent)	AVAILABLE FOR SHIPMENT Element Weight (milligrams)	Product Form
Si 28	AI-AJ	103-106(a)	99.4	1,796	SiO ₂
Si 28	BW	280(a)	98.1	7,510	SiO ₂
Si 28	EB	524(a)	99.16	9,050	SiO ₂
Si 29	AI-AJ	104-107(a)	68.6	63	SiO ₂
Si 29	BW	281(a)	63.6	0	SiO ₂
Si 29	EB	525(a)	68.62	110	SiO ₂
Si 30	AI-AJ	105-108(a)	63.9	131	SiO ₂
Si 30	BW	282(a)	49.6	0	
Si 30	EB	526(a)	64.04	48	SiO ₂

Natural Isotopic Abundance:

- S 32 - 94.89%
- S 33 - 0.80%
- S 34 - 4.29%
- S 36 - 0.02%

Sulfur
Atomic No. 16

Electromagnetically Concentrated Isotopes

Isotope	Series	Sample	Abundance of Enriched Isotope (per cent)	AVAILABLE FOR SHIPMENT Element Weight (milligrams)	Product Form
S 32	CX	391(a)	97.90	113	S
S 32	ES	596(a)	Analysis Incomplete	7,463	CdS
S 33	CX	392(a)	5.54	86	S
S 33	CX	392(b)	5.54	30	S
S 33	ES	597(a)	Analysis Incomplete	208	CdS
S 34	CX	393(a)	20.65	0	
S 34	CX	393(b)	5.38	59	S
S 34	ES	598(a)	14.92	1,124	CdS
S 36	CX	394(a)	0.319	0	
S 36	ES	599(a)	Analysis Incomplete	24	CdS

Natural Isotopic Abundance:

Chlorine
Atomic No. 17

Cl 35 - 75.4%

Cl 37 - 24.6%

Electromagnetically Concentrated Isotopes

Isotope	Series	Sample	Abundance of Enriched Isotope (per cent)	AVAILABLE FOR SHIPMENT Element Weight (milligrams)	SHIPMENT Product Form
Cl 35	AV	161(c1)	79.5	18	AgCl
Cl 35	DH	436(a)	92.4	0	
Cl 37	DH	438(a)	65.6	248	AgCl

Natural Isotopic Abundance:

K 39 - 93.25%

*K 40 - 0.011%

K 41 - 6.74%

Potassium
Atomic No. 19

Electromagnetically Concentrated Isotopes

*Radioactive

Isotope	Series	Sample	Abundance of Enriched Isotope (per cent)	AVAILABLE FOR SHIPMENT Element Weight (milligrams)	Product Form
K 39	W	67(a)	99.93	0	
K 39	BJ	237(a)	99.5	1,592	KClO ₄
K 39	CM	346(a)	99.9	35	KCl
K 39	CM	346(ar)	99.9	9,920	KCl
K 39	DA	407(a)	99.94	19,418	K ₂ SO ₄
K 39	DB	410(a)	99.74	5,659	KCl
K 39	DT	494(a)	99.89	9,374	KCl
K 39	EX	621(g)	99.96	18,470	KCl
K 39	EY	624(1)	99.94	24,977	KCl
K 39	FA	629(a)	99.83	10,473	KCl
K 40	W	68(a)	0.16	0	
K 40	BJ	238(a)	0.40	0	
K 40	CM	347(a)	0.14	0	
K 40	CM	347(ar)	0.14	0	KCl
K 40	DA	408(a)	1.31	10	KCl
K 40	DB	411(a)	0.40	124	KCl
K 40	DB	411(ar)	0.40	182	KCl
K 40	DT	495(a)	7.13	0	

Natural Isotopic Abundance:

K 39 - 93.25%

*K 40 - 0.011%

K 41 - 6.74%

Potassium (Cont'd)
Atomic No 19.

Electromagnetically Concentrated Isotopes

			*Radioactive			
Isotope	Series	Sample	Abundance of Enriched Isotope (per cent)	AVAILABLE FOR SHIPMENT Element Weight (milligrams)	Product Form	
K 40	EX	622(u)	3.64	12	KCl	
K 40	EY	625(t)	7.75	11	KCl	
K 40	FA	630(a)	0.978	33	KCl	
K 41	W	69(a)	88.36	0		
K 41	BJ	239(a)	92.9	65	KClO ₄	
K 41	CM	348(a)	86.8	37	KCl	
K 41	DA	409(a)	95.45	0		
K 41	DB	412(a)	91.61	0		
K 41	DT	496(a)	98.94	732	KCl	
K 41	EX	623(e)	99.20	1,064	KCl	
K 41	EY	626(e)	99.21	1,745	KCl	
K 41	FA	631(a)	87.75	634	KCl	

Natural Isotopic Abundance:

Ca 40 - 96.96% Ca 44 - 2.06
 Ca 42 - 0.64% Ca 46 - 0.0033%
 Ca 43 - 0.145% Ca 48 - 0.185%

Calcium
 Atomic No. 20

Electromagnetically Concentrated Isotopes

Isotope	Series	Sample	Abundance of Enriched Isotope (per cent)	AVAILABLE FOR SHIPMENT Element Weight (milligrams)	Product Form
Ca 40	V	61(a)	99.95	0	
Ca 40	V	61(b)	98.6	114	CaO
Ca 40	X	70(a)	99.97	48	CaO
Ca 40	BN	251(a)	98.9	1,850	CaO
Ca 40	DI	441(a)	99.78	8,261	CaCO ₃
Ca 40	DI	441(c)	99.83	27,093	CaCO ₃
Ca 40	EV	613(a)	Analysis Incomplete	28,730	CaCO ₃
Ca 40	FF	648(a)	Analysis Incomplete	44,760	CaCO ₃
Ca 42	V-X	62-71(a)	61.4	0	
Ca 42	BN	252(a)	56.1	0	
Ca 42	DI	442(b)	28.3	600	CaCO ₃
Ca 42	EV	614(a)	Analysis Incomplete	212	CaCO ₃
Ca 42	FF	649(a)	Analysis Incomplete	449	CaCO ₃
Ca 43	V-X	63-72(a)	34.4	0	
Ca 43	BN	253(a)	59.9	0	
Ca 43	DI	443(b)	37.56	0	
Ca 43	EV	615(a)	Analysis Incomplete	21	CaCO ₃
Ca 43	FF	650(a)	Analysis Incomplete	78	CaCO ₃

Natural Isotopic Abundance:

Ca 40 - 96.96% Ca 44 - 2.06%
 Ca 42 - 0.64% Ca 46 - 0.0033%
 Ca 43 - 0.145% Ca 48 - 0.185%

Calcium (Cont'd)
 Atomic No. 20

Electromagnetically Concentrated Isotopes

Isotope	Series	Sample	Abundance of Enriched Isotope (per cent)	AVAILABLE FOR SHIPMENT Element Weight (milligrams)	Product Form
Ca 44	V	64(a)	95.8	0	
Ca 44	X	73(a)	21.1	0	
Ca 44	BN	254(a)	85.4	40	CaCO ₃
Ca 44	CS	373(a)	96.2	0	
Ca 44	DI	444(a)	91.9	466	CaCO ₃
Ca 44	EV	616(a)	Analysis Incomplete	733	CaCO ₃
Ca 44	FF	651(a)	Analysis Incomplete	1,153	CaCO ₃
Ca 46	V-X	65-74(a)	7.3	0	
Ca 46	CS	374(a)	4.8	0	
Ca 46	DI	445(a)	1.45	0	
Ca 46	EV	617(a)	Analysis Incomplete	0	
Ca 46	FF	652(a)	Analysis Incomplete	0	
Ca 48	V-X	66-75(a)	13.1	0	
Ca 48	BW	256(a)	83.9	0	
Ca 48	CS	375(a)	62.2	0	
Ca 48	DI	446(a)	42.32	0	

Natural Isotopic Abundance:

Ca 40 - 96.96% Ca 44 - 2.06%

Ca 42 - 0.64% Ca 46 - 0.0033%

Ca 43 - 0.145% Ca 48 - 0.185%

Calcium (Cont'd)

Atomic No. 20

Electromagnetically Concentrated Isotopes

Isotope	Series	Sample	Abundance of Enriched Isotope (per cent)	AVAILABLE FOR SHIPMENT	
				Element Weight (milligrams)	Product Form
Ca 48	EV	618(a)	Analysis Incomplete	0	
Ca 48	FF	653(a)	Analysis Incomplete	147	CaCO ₃

Natural Isotopic Abundance:

Ti 46 - 7.97% Ti 49 - 5.64%

Ti 47 - 7.41% Ti 50 - 5.48%

Ti 48 - 73.50%

Titanium

Atomic No. 22

Electromagnetically Concentrated Isotopes

Isotope	Series	Sample	Abundance of Enriched Isotope (per cent)	AVAILABLE FOR SHIPMENT Element Weight (milligrams)	Product Form
Ti 46	BF	215(a)	84.26	0	
Ti 46	BF	215(ar)	84.26	183	TiO ₂
Ti 46	EN	576(a)	82.68	1,112	TiO ₂
Ti 47	BF	216(a)	82.05	29	TiO ₂
Ti 47	BF	216(ar)	82.05	185	TiO ₂
Ti 47	EN	577(a)	63.11	1,945	TiO ₂
Ti 48	BF	217(a)	99.23	50	TiO ₂
Ti 48	EN	578(a)	98.90	25,623	TiO ₂
Ti 49	BF	218(a)	77.62	37	TiO ₂
Ti 49	BF	218(ar)	77.62	55	TiO ₂
Ti 49	EN	579(a)	77.27	523	TiO ₂
Ti 50	BF	219(a)	84.69	0	
Ti 50	BF	219(ar)	84.69	75	TiO ₂
Ti 50	EN	580(a)	81.44	576	TiO ₂

Natural Isotopic Abundance:

Vanadium
Atomic No. 23

V 50 - 0.28%

V 51 - 99.72%

Electromagnetically Concentrated Isotopes

Isotope	Series	Sample	Abundance of Enriched Isotope (per cent)	AVAILABLE FOR SHIPMENT Element Weight (milligrams)	SHIPMENT Product Form
V 50	FB	632(a)	Analysis Incomplete	0	
V 50	FM	683(a)	Refinement Incomplete		
V 51	FB	633(a)	Analysis Incomplete	2,514	V ₂ O ₅
V 51	FM	684(a)	Refinement Incomplete		

Natural Isotopic Abundance:

- Cr 50 - 4.40%
- Cr 52 - 83.73%
- Cr 53 - 9.49%
- Cr 54 - 2.38%

Chromium
Atomic No. 24

Electromagnetically Concentrated Isotopes

Isotope	Series	Sample	Abundance of Enriched Isotope (per cent)	AVAILABLE FOR SHIPMENT Element Weight (milligrams)	Product Form
Cr 50	D	10(a)	73.76	0	
Cr 50	CD	309(a)	41.2	117	Cr ₂ O ₃
Cr 50	ED	309(ar)	41.2	97	Cr ₂ O ₃
Cr 50	EU	609(a)	88.3	772	Cr ₂ O ₃
Cr 52	D	11(a)	99.14	20	Cr ₂ O ₃
Cr 52	D	11(ar)	99.14	140	Cr ₂ O ₃
Cr 52	CD	310(a)	99.1	0	
Cr 52	EU	610(a)	97.1	23,640	Cr ₂ O ₃
Cr 53	D	12(a)	88.59	0	
Cr 53	CD	311(a)	92.1	18	Cr ₂ O ₃
Cr 53	EU	611(a)	90.06	958	Cr ₂ O ₃
Cr 54	D	13(a)	61.0	0	
Cr 54	CD	312(a)	83.1	0	
Cr 54	EU	612(a)	88.95	220	Cr ₂ O ₃

Natural Isotopic Abundance:

Fe 54 - 5.90%

Fe 56 - 91.52%

Fe 57 - 2.24%

Fe 58 - 0.34%

Iron

Atomic No. 26

Electromagnetically Concentrated Isotopes

Isotope	Series	Sample	Abundance of Enriched Isotope (per cent)	AVAILABLE FOR SHIPMENT Element Weight (milligrams)	Product Form
Fe 54	B	3(a)	55.47	365	Fe ₂ O ₃
Fe 54	B	3(f)	39.0	268	Fe ₂ O ₃
Fe 54	C	6-I(a)	42.85	195	Fe ₂ O ₃
Fe 54	C	6-II(a)	38.99	0	
Fe 54	E	14(a)	81.06	17	Fe ₂ O ₃
Fe 54	F	18(a)	83.03	0	
Fe 54	AM	122(a)	49.2	343	Fe ₂ O ₃
Fe 54	AZ	183(a)	93.27	16	Fe ₂ O ₃
Fe 54	BA	187(a)	87.9	0	
Fe 54	BA	187(ar)	87.9	477	Fe ₂ O ₃
Fe 54	BB	194(a)	87.4	69	Fe ₂ O ₃
Fe 54	CI	328(a)	84.3	364	Fe ₂ O ₃
Fe 54	DO	477(a)	34.47	69,774	Fe ₂ O ₃
Fe 54	FC	634(a)	Analysis Incomplete	1,550	Fe ₂ O ₃
Fe 56	B	4(a)	98.41	3,235	Fe ₂ O ₃
Fe 56	B	4(e)	98.5	901	Fe ₂ O ₃
Fe 56	C	9(a)	98.7	2,683	Fe ₂ O ₃
Fe 56	C	9(e)	96.89	462	Fe ₂ O ₃

Natural Isotopic Abundance:

Fe 54 - 5.90%

Fe 56 - 91.52%

Fe 57 - 2.24%

Fe 58 - 0.34%

Iron (Cont'd)
Atomic No. 26

Electromagnetically Concentrated Isotopes

Isotope	Series	Sample	Abundance of Enriched Isotope (per cent)	AVAILABLE FOR SHIPMENT Element Weight (milligrams)	Product Form
Fe 56	E	15(a)	98.62	10,403	Fe ₂ O ₃
Fe 56	F	19(a)	97.42	1,120	Fe ₂ O ₃
Fe 56	AM	123(a)	98.9	2,627	Fe ₂ O ₃
Fe 56	AZ	184(a)	99.0	12,451	Fe ₂ O ₃
Fe 56	BA	188(a)	98.5	35,474	Fe ₂ O ₃
Fe 56	BB	192(a)	98.3	9,818	Fe ₂ O ₃
Fe 56	CI	329(a)	96.5	51,056	Fe ₂ O ₃
Fe 56	CZ	404(f)	99.84	13,892	Fe ₂ O ₃
Fe 56	DO	478(a)	99.70	346,494	Fe ₂ O ₃
Fe 56	FC	635(a)	Analysis Incomplete	18,172	Fe ₂ O ₃
Fe 57	B	5(a)	21.10	62	Fe ₂ O ₃
Fe 57	B	5(f)	30.5	81	Fe ₂ O ₃
Fe 57	C	7(b)	56.13	0	
Fe 57	E	16(a)	73.01	0	
Fe 57	F	20(a)	69.63	15	Fe ₂ O ₃
Fe 57	AM	124(a)	33.2	69	Fe ₂ O ₃
Fe 57	AZ	185(a)	67.7	0	
Fe 57	BA	189(a)	75.8	0	

Natural Isotopic Abundance:

Fe 54 - 5.90%

Fe 56 - 91.52%

Fe 57 - 2.24%

Fe 58 - 0.34%

Iron (Cont'd)
Atomic No. 26

Electromagnetically Concentrated Isotopes

Isotope	Series	Sample	Abundance of Enriched Isotope (per cent)	AVAILABLE FOR SHIPMENT Element Weight (milligrams)	Product Form
Fe 57	BB	193(a)	77.6	24	Fe ₂ O ₃
Fe 57	CI	330(a)	50.7	0	
Fe 57	CZ	405(f)	51.91	509	Fe ₂ O ₃
Fe 57	DK	449(a)	79.43	232	Fe ₂ O ₃
Fe 57	DL	453(a)	62.38	830	Fe ₂ O ₃
Fe 57	DL	453(d)	59.31	1,381	Fe ₂ O ₃
Fe 57	DL	453(e)	31.9	1,245	Fe ₂ O ₃
Fe 57	DL	453(f)	59.3	1,122	Fe ₂ O ₃
Fe 57	DL	453(j)	43.45	2,571	Fe ₂ O ₃
Fe 57	DM	459(a)	74.6	190	Fe ₂ O ₃
Fe 57	DL	463(a)	40.61	1,687	Fe ₂ O ₃
Fe 57	DL	463(b)	45.43	1,018	Fe ₂ O ₃
Fe 57	DL	463(e)	67.3	278	Fe ₂ O ₃
Fe 57	DL	463(j)	53.53	2,184	Fe ₂ O ₃
Fe 57	DL	463(k)	54.23	2,569	Fe ₂ O ₃
Fe 57	DL	467(c)	63.1	165	Fe ₂ O ₃
Fe 57	DN	471(a)	84.78	451	Fe ₂ O ₃
Fe 57	DN	475(a)	87.29	370	Fe ₂ O ₃

Natural Isotopic Abundance:

Fe 54 - 5.90%

Fe 56 - 91.52%

Fe 57 - 2.24%

Fe 58 - 0.34%

Iron (Cont'd)
Atomic No. 26

Electromagnetically Concentrated Isotopes

Isotope	Series	Sample	Abundance of Enriched Isotope (per cent)	AVAILABLE FOR SHIPMENT Element Weight (milligrams)	Product Form
Fe 58	B	8(a)	22.0	0	
Fe 58	E	17(b)	40.7	0	
Fe 58	AM	125(a)	10.3	44	Fe ₂ O ₃
Fe 58	BA	190(a)	35.1	0	
Fe 58	CI	331(a)	46.0	0	
Fe 58	DL	454(f)	23.4	189	Fe ₂ O ₃
Fe 58	DL	454(m)	71.7	92	Fe ₂ O ₃
Fe 58	DL	464(l)	79.8	24	Fe ₂ O ₃
Fe 58	DL	464(p)	71.8	25	Fe ₂ O ₃
Fe 58	DO	480(a)	75.7	0	
Fe 58	DO	480(b)	42.0	0	
Fe 58	DO	480(c)	34.8	37	Fe ₂ O ₃
Fe 58	FC	637(i)	60.62	0	Fe ₂ O ₃
Fe 58	FC	637(j)	76.13	0	Fe ₂ O ₃

Natural Isotopic Abundance:

Ni 58 - 67.4% Ni 62 - 3.8%
 Ni 60 - 26.7% Ni 64 - 0.88%
 Ni 61 - 1.2%

Nickel
 Atomic No. 28

Electromagnetically Concentrated Isotopes

Isotope	Series	Sample	Abundance of Enriched Isotope (per cent)	AVAILABLE FOR SHIPMENT Element Weight (milligrams)	Product Form
Ni 58	J	27(a)	98.05	0	
Ni 58	K	33(a)	98.51	12	NiO
Ni 58	AS-AT	141-147(a)	99.3	434	NiO
Ni 58	DF	422(a)	92.7	6,386	NiO
Ni 58	FJ	669(a)	Refinement Incomplete		
Ni 60	J	28(a)	94.4	22	NiO
Ni 60	K	34(a)	87.10	390	NiO
Ni 60	AS-AT	142-148(a)	97.7	175	NiO
Ni 60	DF	423(a)	95.0	40	NiO
Ni 60	FJ	670(a)	Refinement Incomplete		
Ni 61	J	29(a)	78.83	0	
Ni 61	AS-AT	143-149(a)	80.9	0	
Ni 61	DF	424(a)	72.2	40	NiO
Ni 61	FJ	671(a)	Refinement Incomplete		
Ni 62	AS-AT	144-150(a)	94.7	20	NiO
Ni 62	DF	425(a)	91.2	23	NiO
Ni 62	FJ	672(a)	Refinement Incomplete		
Ni 64	J	32(a)	85.10	0	

Natural Isotopic Abundance:

Ni 58 - 67.4% Ni 62 - 3.8%

Ni 60 - 26.7% Ni 64 - 0.88%

Ni 61 - 1.2%

Nickel (Cont'd)

Atomic No. 28

Electromagnetically Concentrated Isotopes

Isotope	Series	Sample	Abundance of Enriched Isotope (per cent)	AVAILABLE FOR SHIPMENT Element Weight (milligrams)	Product Form
Ni 64	K	38(a)	64.2	0	
Ni 64	AS-AT	146-152(a)	97.4	0	
Ni 64	DF	427(a)	80.6	0	
Ni 64	FJ	674(a)	Refinement Incomplete		

Natural Isotopic Abundance:

Copper
Atomic No. 29

Cu 63 - 69.09%

Cu 65 - 30.91%

Electromagnetically Concentrated Isotopes

Isotope	Series	Sample	Abundance of Enriched Isotope (per cent)	AVAILABLE FOR SHIPMENT Element Weight (milligrams)	Product Form
Cu 63	A	1(a)	97.0	151	CuO
Cu 63	A	1(ar)	97.0	960	CuO
Cu 63	J-K	31-37(a)	99.35	249	CuO
Cu 63	AS-AT	145-151(a)	99.77	0	
Cu 63	AV	161(cu)	98.2	203	CuO
Cu 63	DF	426(a)	99.11	3,351	CuO
Cu 63	DL	455(a)	96.12	578	CuO
Cu 63	DU	497(a)	99.40	19,754	CuO
Cu 63	FJ	673(a)	Refinement Incomplete		
Cu 65	A	2(a)	93.81	0	
Cu 65	AV	162(cu)	90.6	14	CuO
Cu 65	DU	498(a)	98.16	14,867	CuO

Natural Isotopic Abundance:

Zn 64 - 49.18% Zn 68 - 18.40%

Zn 66 - 27.76% Zn 70 - 0.61%

Zn 67 - 4.05%

Zinc
Atomic No. 30

Electromagnetically Concentrated Isotopes

Isotope	Series	Sample	Abundance of Enriched Isotope (per cent)	AVAILABLE FOR SHIPMENT Element Weight (milligrams)	Product Form
Zn 64	AG	97(a)	83.8	394	ZnO
Zn 64	BK	240(a)	93.4	0	
Zn 64	EK	556(a)	93.12	10,312	ZnO
Zn 66	AH	100(a)	78.4	712	ZnO
Zn 66	BK	241(a)	76.1	0	
Zn 66	EK	557(a)	93.79	7,881	ZnO
Zn 67	AG	98(a)	62.6	0	
Zn 67	BK	242(a)	56.0	102	ZnO
Zn 67	EK	558(a)	60.46	1,023	ZnO
Zn 68	AH	101(a)	72.6	0	
Zn 68	BK	243(a)	93.9	18	ZnO
Zn 68	EK	559(a)	95.47	5,129	ZnO
Zn 70	AH	102(a)	32.9	0	
Zn 70	BK	244(a)	32.0	39	ZnO
Zn 70	BK	244(ar)	32.0	0	
Zn 70	EK	560(a)	48.40	381	ZnO

Natural Isotopic Abundance:

Gallium
Atomic No. 31

Ga 69 - 60.00%

Ga 71 - 40.00%

Electromagnetically Concentrated Isotopes

Isotope	Series	Sample	Abundance of Enriched Isotope (per cent)	AVAILABLE FOR SHIPMENT Element Weight (milligrams)	Product Form
Ga 69	EI	554(a)	98.42	11,878	Ga ₂ O ₃
Ga 71	EI	555(a)	98.08	187	Ga ₂ O ₃

Natural Isotopic Abundance:

Ge 70 - 20.63% Ge 74 - 36.37%

Ge 72 - 27.41% Ge 76 - 7.75%

Ge 73 - 7.84%

Germanium
Atomic No. 32

Electromagnetically Concentrated Isotopes

Isotope	Series	Sample	Abundance of Enriched Isotope (per cent)	AVAILABLE FOR SHIPMENT Element Weight (milligrams)	Product Form
Ge 70	ED-BE	205-210(a)	88.1	460	GeO ₂
Ge 72	ED-BE	206-211(a)	89.2	1,262	GeO ₂
Ge 73	ED-BE	207-212(a)	68.9	0	
Ge 74	ED-BE	208-213(a)	95.2	2,364	GeO ₂
Ge 76	ED-BE	209-214(a)	79.3	19	GeO ₂

Natural Isotopic Abundance:

Se 74 - 0.84% Se 78 - 23.62%

Se 76 - 9.15% Se 80 - 49.97%

Se 77 - 7.53% Se 82 - 8.89%

Selenium
Atomic No. 34

Electromagnetically Concentrated Isotopes

Isotope	Series	Sample	Abundance of Enriched Isotope (per cent)	AVAILABLE FOR SHIPMENT Element Weight (milligrams)	Product Form
Se 74	AK	109(a)	6.5	10	Se
Se 74	BS	268(a)	14.1	0	
Se 74	CY	397(a)	12.3	0	
Se 74	CY	397(ar)	12.3	255	Se
Se 74	DY	513(a)	12.08	143	Se
Se 74	FG	654(a)	18.02	90	Se
Se 74	FG	654(b)	33.06	15	Se
Se 76	AN	126(a)	43.5	10	Se
Se 76	BS	269(a)	41.5	600	Se
Se 76	CY	398(a)	54.8	542	Se
Se 76	CY	398(ar)	54.8	390	Se
Se 76	DY	514(a)	57.40	89	Se
Se 76	FG	655(a)	74.20	374	Se
Se 76	FG	655(b)	88.51	159	Se
Se 77	AK	110(a)	50.1	49	Se
Se 77	BS	270(a)	53.6	143	Se
Se 77	BS	270(ar)	53.6	40	Se
Se 77	CY	399(a)	49.4	408	Se

Natural Isotopic Abundance:

Se 74 - 0.84% Se 78 - 23.62%
 Se 76 - 9.15% Se 80 - 49.97%
 Se 77 - 7.53% Se 82 - 8.89%

Selenium (Cont'd)
 Atomic No. 34

Electromagnetically Concentrated Isotopes

Isotope	Series	Sample	Abundance of Enriched Isotope (per cent)	AVAILABLE FOR SHIPMENT Element Weight (milligrams)	Product Form
Se 77	DY	515(a)	58.40	52	Se
Se 77	FG	656(c)	74.22	203	Se
Se 77	FG	656(d)	83.16	16	Se
Se 77	FG	656(e)	86.58	18	Se
Se 77	FG	656(f)	91.73	25	Se
Se 78	AN	127(a)	79.3	68	Se
Se 78	AN	127(ar)	79.3	104	Se
Se 78	BS	271(a)	72.7	1,853	Se
Se 78	CY	400(a)	81.7	700	Se
Se 78	CY	400(ar)	81.7	1,026	Se
Se 78	DY	516(a)	82.56	52	Se
Se 78	FG	657(b)	90.24	667	Se
Se 78	FG	657(d)	96.55	174	Se
Se 80	AK	111(a)	86.7	0	
Se 80	BS	272(a)	94.6	918	Se
Se 80	CY	401(a)	91.7	1,136	Se
Se 80	DY	517(a)	93.76	41	Se

Natural Isotopic Abundance:

Se 74 - 0.84% Se 78 - 23.62%

Se 76 - 9.15% Se 80 - 49.97%

Se 77 - 7.53% Se 82 - 8.89%

Selenium (Cont'd)
Atomic No. 34

Electromagnetically Concentrated Isotopes

Isotope	Series	Sample	Abundance of Enriched Isotope (per cent)	AVAILABLE FOR SHIPMENT Element Weight (milligrams)	Product Form
Se 80	FG	658(a)	96.94	1,506	Se
Se 80	FG	658(b)	98.39	11,609	Se
Se 82	AN	128(a)	49.6	96	Se
Se 82	BS	273(a)	44.4	0	
Se 82	BS	273(ar)	44.4	1,087	Se
Se 82	CY	402(a)	51.6	314	Se
Se 82	CY	518(a)	52.36	1,081	Se
Se 82	FG	659(a)	75.74	460	Se
Se 82	FG	659(b)	89.87	140	Se

Natural Isotopic Abundance:

Bromine
Atomic No. 35

Br 79 - 50.57%

Br 81 - 49.43%

Electromagnetically Concentrated Isotopes

Isotope	Series	Sample	Abundance of Enriched Isotope (per cent)	AVAILABLE FOR SHIPMENT Element Weight (milligrams)	SHIPMENT Product Form
Br 79	EJ	552(a)	86.98	342	AgBr
Br 81	EJ	553(a)	96.81	318	AgBr

Natural Isotopic Abundance:

Rubidium
Atomic No. 37

Rb 85 - 72.27%

Rb 87 - 27.73%

Electromagnetically Concentrated Isotopes

Isotope	Series	Sample	Abundance of Enriched Isotope (per cent)	AVAILABLE FOR SHIPMENT Element Weight (milligrams)	Product Form
Rb 85	EW	619(a)	95.97	3,109	RbCl
Rb 87	EW	620(a)	89.62	2,056	RbCl

Natural Isotopic Abundance:

Sr 84 - 0.56%

Sr 86 - 9.86%

Sr 87 - 7.02%

Sr 88 - 82.6%

Strontium
Atomic No. 38

Electromagnetically Concentrated Isotopes

Isotope	Series	Sample	Abundance of Enriched Isotope (per cent)	AVAILABLE FOR SHIPMENT Element Weight (milligrams)	Product Form
Sr 84	Z	77(a)	27.2	0	
Sr 84	BL	245(a)	61.6	0	
Sr 84	EH	548(a)	63.68	0	
Sr 86	Z	78(a)	69.9	0	
Sr 86	Z	78(ar)	69.9	490	SrO
Sr 86	BL	246(a)	88.2	0	
Sr 86	EH	549(a)	89.02	34	Sr(NO ₃) ₂
Sr 87	BL	247(a)	73.1	0	
Sr 87	EH	550(a)	60.03	1,939	SrCO ₃
Sr 88	Z	79(a)	98.9	1,049	SrO
Sr 88	BL	248(a)	99.5	322	SrSO ₄
Sr 88	EH	551(a)	99.67	39	Sr(NO ₃) ₂

Natural Isotopic Abundance:

Zr 90 - 50.83% Zr 94 - 17.79%

Zr 91 - 11.21% Zr 96 - 2.99%

Zr 92 - 17.18%

Zirconium
Atomic No. 40

Electromagnetically Concentrated Isotopes

Isotope	Series	Sample	Abundance of Enriched Isotope (per cent)	AVAILABLE FOR SHIPMENT Element Weight (milligrams)	Product Form
Zr 90	AA	80(a)	91.7	18	ZrO ₂
Zr 90	CK	334(a)	98.0	6,564	ZrO ₂
Zr 90	CK	334(ar)	98.0	1,903	ZrO ₂
Zr 90	CV	381(a)	95.6	3,612	ZrO ₂
Zr 90	EE	539(a)	98.66	11,987	ZrO ₂
Zr 91	AA	81(a)	54.4	0	
Zr 91	CK	335(a)	86.6	33	ZrO ₂
Zr 91	CK	335(ar)	86.6	1,956	ZrO ₂
Zr 91	CV	382(a)	75.1	839	ZrO ₂
Zr 91	EE	540(a)	86.89	2,099	ZrO ₂
Zr 92	AA	82(a)	3.8	0	
Zr 92	CK	336(a)	92.7	387	ZrO ₂
Zr 92	CK	336(ar)	92.7	1,951	ZrO ₂
Zr 92	CV	383(a)	89.8	1,099	ZrO ₂
Zr 92	EE	541(a)	95.38	5,577	ZrO ₂
Zr 94	AA	83(a)	82.1	94	ZrO ₂
Zr 94	CK	337(a)	92.8	68	ZrO ₂
Zr 94	CK	337(ar)	92.8	1,794	ZrO ₂

Natural Isotopic Abundance:

Zr 90 - 50.83% Zr 94 - 17.79%

Zr 91 - 11.21% Zr 96 - 2.99%

Zr 92 - 17.18%

Zirconium (Cont'd)

Atomic No. 40

Electromagnetically Concentrated Isotopes

Isotope	Series	Sample	Abundance of Enriched Isotope (per cent)	AVAILABLE FOR SHIPMENT Element Weight (milligrams)	Product Form
Zr 94	CV	384(a)	80.9	861	ZrO ₂
Zr 94	EE	542(a)	97.92	5,325	ZrO ₂
Zr 96	AA	84(a)	40.6	0	
Zr 96	CK	338(a)	74.6	0	
Zr 96	CV	385(a)	43.6	0	
Zr 96	EE	543(a)	89.48	192	ZrO ₂

Natural Isotopic Abundance:

Molybdenum
Atomic No. 42

- Mo 92 - 15.04% Mo 97 - 9.60%
- Mo 94 - 9.35% Mo 98 - 24.00%
- Mo 95 - 15.78% Mo 100 - 9.67%
- Mo 96 - 16.56%

Electromagnetically Concentrated Isotopes

Isotope	Series	Sample	Abundance of Enriched Isotope (per cent)	AVAILABLE FOR SHIPMENT Element Weight (milligrams)	Product Form
Mo 92	R and T	53(a)	92.07	45	MoO ₃
Mo 92	AW	163(a)	95.5	0	MoO ₃
Mo 94	R and T	54(a)	74.68	0	
Mo 94	AW	164(a)	79.1	120	MoO ₃
Mo 95	R and T	55(a)	80.75	1,405	MoO ₃
Mo 95	AW	165(a)	88.0	121	MoO ₃
Mo 96	R and T	56(a)	85.94	3,397	MoO ₃
Mo 96	AW	166(a)	90.6	581	MoO ₃
Mo 97	R and T	57(a)	77.97	474	MoO ₃
Mo 97	AW	167(a)	75.4	1,110	MoO ₃
Mo 98	R and T	58(a)	95.0	738	MoO ₃
Mo 98	AW	168(a)	96.3	1,109	MoO ₃
Mo 100	R and T	59(b)	90.20	43	MoO ₃
Mo 100	AW	169(a)	93.0	25	MoO ₃

Natural Isotopic Abundance:

Silver
Atomic No. 47

Ag 107 - 51.86%

Ag 109 - 48.14%

Electromagnetically Concentrated Isotopes

Isotope	Series	Sample	Abundance of Enriched Isotope (per cent)	AVAILABLE FOR SHIPMENT Element Weight (milligrams)	Product Form
Ag 107	N	41(a)	98.96	39	AgCl
Ag 107	S and U	41(b)	90.26	115	AgCl
Ag 107	S and U	41(br)	90.26	1,572	Ag
Ag 107	EA	522(a)	96.10	2,131	AgCl
Ag 109	N	42(a)	95.88	0	
Ag 109	S and U	42(b)	92.16	22	AgCl
Ag 109	S and U	42(br)	92.16	1,349	Ag
Ag 109	EA	523(a)	99.54	1,736	AgCl

Natural Isotopic Abundance:

ca 106 - 1.22% ca 112 - 23.79%
 ca 108 - 0.89% ca 113 - 12.34%
 ca 110 - 12.43% ca 114 - 28.81%
 ca 111 - 12.86% ca 116 - 7.66%

Cadmium
 Atomic No. 48

Electromagnetically Concentrated Isotopes

Isotope	Series	Sample	Abundance of Enriched Isotope (per cent)	AVAILABLE FOR SHIPMENT Element Weight (milligrams)	Product Form
ca 106	AC	88(a)	19.94	18	CaO
ca 106	CD	314(a)	32.9	0	
ca 108	AX	170(a)	14.2	438	CaO
ca 108	CD	315(a)	24.8	22	CaO
ca 110	AX	171(a)	55.8	1,930	CaO
ca 110	CE	316(a)	70.0	2,569	CaO
ca 111	AC	89(a)	53.3	0	
ca 111	CE	317(a)	64.5	3,645	CaO
ca 112	AX	172(a)	79.3	903	CaO
ca 112	CE	318(a)	83.5	4,013	CaO
ca 113	AR	86(a)	25.5	21	CaO
ca 113	CE	319(a)	54.1	2,418	CaO
ca 114	AC	90(a)	79.52	96	CaO
ca 114	CE	320(a)	94.2	3,419	CaO
ca 114	CE	320(ar)	94.2	818	CaO
ca 116	AB	87(a)	24.01	401	CaO
ca 116	CE	321(a)	71.2	31	CaO
ca 116	CE	321(ar)	71.2	485	CaO

Natural Isotopic Abundance:

In 113 - 4.22%

In 115 - 95.78%

Indium
Atomic No. 49

Electromagnetically Concentrated Isotopes

Isotope	Series	Sample	Abundance of Enriched Isotope (per cent)	AVAILABLE FOR SHIPMENT Element Weight (milligrams)	Product Form
In 113	BH	225(a)	22.8	230	In ₂ O ₃
In 113	CO	354(a)	16.8	415	In ₂ O ₃
In 113	CQ	358(a)	65.4	0	
In 113	DE	419(a)	14.2	735	In ₂ O ₃
In 113	ER	594(a)	59.58	1,340	In ₂ O ₃
In 115	AD	92(a)	99.56	0	
In 115	BH	226(a)	99.6	756	In ₂ O ₃
In 115	BH	226(ar)	99.6	470	In ₂ O ₃
In 115	CO	355(a)	99.9	14,563	In ₂ O ₃
In 115	CQ	359(a)	99.8	12,379	In ₂ O ₃
In 115	DE	420(a)	99.92	0	
In 115	ER	595(a)	99.94	42,908	In ₂ O ₃

Natural Isotopic Abundance:

Sn 112 - 1.00% Sn 118 - 24.07%

Sn 114 - 0.68% Sn 119 - 8.63%

Sn 115 - 0.44% Sn 120 - 32.53%

Sn 116 - 14.40% Sn 122 - 4.68%

Sn 117 - 7.68% *Sn 124 - 5.89%

Tin

Atomic No. 50

Electromagnetically Concentrated Isotopes

*Radioactive

Isotope	Series	Sample	Abundance of Enriched Isotope (per cent)	AVAILABLE FOR SHIPMENT Element Weight (milligrams)	Product Form
Sn 112	EI	227(a)	30.8	0	
Sn 112	CR	360(a)	45.5	0	
Sn 112	EC	527(a)	72.49	12	SnO ₂
Sn 114	AL	113(a)	32.7	0	
Sn 114	BI	228(a)	19.2	0	
Sn 114	CR	361(a)	24.1	0	
Sn 114	EC	528(a)	50.03	210	SnO ₂
Sn 115	BI	229(a)	4.5	28	SnO ₂
Sn 115	CR	362(a)	12.1	0	
Sn 115	EC	529(a)	14.0	535	SnO ₂
Sn 116	AL	115(a)	76.3	0	
Sn 116	AY	176(a)	74.5	116	SnO ₂
Sn 116	BC	198(a)	58.4	388	SnO ₂
Sn 116	BI	230(a)	43.2	304	SnO ₂
Sn 116	CR	363(a)	89.57	3,827	SnO ₂
Sn 116	EC	530(a)	92.64	7,284	SnO ₂
Sn 117	AL	116(a)	69.8	0	
Sn 117	BI	231(b)	75.3	288	SnO ₂

Natural Isotopic Abundance:
 Sn 112 - 1.00% Sn 118 - 24.07%
 Sn 114 - 0.68% Sn 119 - 8.63%
 Sn 115 - 0.44% Sn 120 - 32.53%
 Sn 116 - 14.40% Sn 122 - 4.68%
 Sn 117 - 7.68% *Sn 124 - 5.89%

Tin (Cont'd)
 Atomic No. 50

Electromagnetically Concentrated Isotopes

*Radioactive

Isotope	Series	Sample	Abundance of Enriched Isotope (per cent)	AVAILABLE FOR SHIPMENT Element Weight (milligrams)	Product Form
Sn 117	CR	364(a)	73.93	4,728	SnO ₂
Sn 117	EC	531(a)	77.07	4,482	SnO ₂
Sn 118	AL	117(a)	69.3	918	SnO ₂
Sn 118	AY	178(a)	90.1	1,014	SnO ₂
Sn 118	BC	200(a)	91.8	63	SnO ₂
Sn 118	BI	232(a)	84.6	1,020	SnO ₂
Sn 118	CR	365(a)	93.26	8,510	SnO ₂
Sn 118	EC	532(a)	94.91	13,126	SnO ₂
Sn 119	AL	118(a)	68.3	0	
Sn 119	AY	179(a)	77.1	93	SnO ₂
Sn 119	BC	201(a)	64.4	382	SnO ₂
Sn 119	BI	233(a)	78.5	166	SnO ₂
Sn 119	CR	366(a)	78.25	5,024	SnO ₂
Sn 119	EC	533(a)	79.82	18,057	SnO ₂
Sn 120	AL	119(a)	93.5	325	SnO ₂
Sn 120	AY	180(a)	95.4	1,588	SnO ₂
Sn 120	BC	202(a)	72.6	3,155	SnO ₂
Sn 120	BI	234(a)	53.6	1,760	SnO ₂

Natural Isotopic Abundance:

Tin (Cont'd)
Atomic No. 50

Sn 112 - 1.00% Sn 118 - 24.07%

Sn 114 - 0.68% Sn 119 - 8.63%

Sn 115 - 0.44% Sn 120 - 32.53%

Sn 116 - 14.40% Sn 122 - 4.68%

Sn 117 - 7.68% *Sn 124 - 5.89%

Electromagnetically Concentrated Isotopes

*Radioactive

Isotope	Series	Sample	Abundance of Enriched Isotope (per cent)	AVAILABLE FOR SHIPMENT Element Weight (milligrams)	Product Form
Sn 120	CR	367(a)	97.01	18,120	SnO ₂
Sn 120	EC	534(a)	Analysis Incomplete	18,047	SnO ₂
Sn 122	AL	120(a)	61.0	0	
Sn 122	AY	181(a)	70.7	0	
Sn 122	BC	203(a)	42.9	0	
Sn 122	BI	235(a)	45.8	13	SnO ₂
Sn 122	CR	368(a)	83.66	2,695	SnO ₂
Sn 122	EC	535(a)	88.92	2,487	SnO ₂
Sn 124	AL	121(a)	64.5	0	
Sn 124	BC	204(a)	52.0	0	
Sn 124	BI	236(a)	71.0	0	
Sn 124	CR	369(au)	83.1	0	
Sn 124	CR	369(ar)	83.1	0	
Sn 124	EC	536(a)	95.04	41	SnO ₂

Natural Isotopic Abundance:

Antimony
Atomic No. 51

Sb 121 - 57.25%

Sb 123 - 42.75%

Electromagnetically Concentrated Isotopes

Isotope	Series	Sample	Abundance of Enriched Isotope (per cent)	AVAILABLE FOR SHIPMENT Element Weight (milligrams)	Product Form
Sb 121	AE	93(a)	99.4	0	
Sb 121	BT	274(a)	97.7	12	Sb
Sb 123	AE	94(a)	96.7	0	
Sb 123	BT	275(a)	95.6	1,379	Sb

Natural Isotopic Abundance:

Te 120 - 0.094% Te 125 - 6.97%
 Te 122 - 2.46% Te 126 - 18.69%
 Te 123 - 0.86% Te 128 - 31.81%
 Te 124 - 4.67% Te 130 - 34.44%

Tellurium
 Atomic No. 52

Electromagnetically Concentrated Isotopes

Isotope	Series	Sample	Abundance of Enriched Isotope (per cent)	AVAILABLE FOR SHIPMENT Element Weight (milligrams)	Product Form
Te 120	AU	153(a)	18.0	0	
Te 120	CA	292(a)	13.7	0	
Te 120	DX	505(a)	22.3	0	
Te 120	FE	640(a)	19.90	11	Te
Te 122	AU	154(a)	77.8	19	Te
Te 122	CA	293(a)	79.4	0	
Te 122	DX	506(a)	86.24	0	
Te 122	FE	641(a)	81.72	240	Te
Te 123	AU	155(a)	34.9	0	
Te 123	CA	294(a)	45.8	0	
Te 123	DX	507(a)	60.91	67	Te
Te 123	FE	642(a)	48.58	114	Te
Te 124	AU	156(a)	72.5	56	Te
Te 124	CA	295(a)	83.9	22	Te
Te 124	CA	295(b)	21.8	225	Te
Te 124	DX	508(a)	76.47	100	Te
Te 124	FE	643(a)	Analysis Incomplete	650	Te
Te 125	AU	157(a)	81.1	38	Te

Natural Isotopic Abundance:

Te 120 - 0.094% Te 125 - 6.97%
 Te 122 - 2.46% Te 126 - 18.69%
 Te 123 - 0.86% Te 128 - 31.81%
 Te 124 - 4.67% Te 130 - 34.44%

Tellurium (Cont'd)

Atomic No. 52

Electromagnetically Concentrated Isotopes

Isotope	Series	Sample	Abundance of Enriched Isotope (per cent)	AVAILABLE FOR SHIPMENT Element Weight (milligrams)	Product Form
Te 125	CA	296(a)	87.9	0	
Te 125	CA	296(b)	40.5	264	Te
Te 125	CA	296(ar)	87.9	2,130	Te
Te 125	DX	509(a)	81.65	0	
Te 125	FE	644(a)	Analysis Incomplete	1,270	Te
Te 126	AU	158(a)	93.2	1,496	Te
Te 126	CA	297(a)	95.4	1,473	Te
Te 126	CA	297(ar)	95.4	943	Te
Te 126	CA	297(b)	79.0	914	Te
Te 126	DX	519(a)	89.68	4,436	Te
Te 126	FE	645(a)	Analysis Incomplete	3,270	Te
Te 128	AU	159(a)	93.5	1,656	Te
Te 128	CA	298(a)	94.4	8,767	Te
Te 128	CA	298(ar)	94.4	714	Te
Te 128	CA	298(b)	91.8	1,594	Te
Te 128	CA	298(c)	94.0	111	Te
Te 128	DX	511(a)	82.32	5,760	Te
Te 130	AU	160(a)	93.0	630	Te

Natural Isotopic Abundance:

Te 120 - 0.094% Te 125 - 6.97%

Te 122 - 2.46% Te 126 - 18.69%

Te 123 - 0.86% Te 128 - 31.81%

Te 124 - 4.67% Te 130 - 34.44%

Tellurium (Cont'd)
Atomic No. 52

Electromagnetically Concentrated Isotopes

Isotope	Series	Sample	Abundance of Enriched Isotope (per cent)	AVAILABLE FOR SHIPMENT Element Weight (milligrams)	Product Form
Te 130	CA	299(a)	97.4	7,882	Te
Te 130	CA	299(b)	93.5	506	Te
Te 130	CA	299(br)	93.5	950	Te
Te 130	DX	512(a)	78.23	4,936	Te

Natural Isotopic Abundance:

Ba 130 - 0.103% Ba 136 - 7.79%
 Ba 132 - 0.096% Ba 137 - 11.25%
 Ba 134 - 2.39% Ba 138 - 71.83%
 Ba 135 - 6.55%

Barium
Atomic No. 56

Electromagnetically Concentrated Isotopes

Isotope	Series	Sample	Abundance of Enriched Isotope (per cent)	AVAILABLE FOR SHIPMENT Element Weight (milligrams)	Product Form
Ba 130	DG	429(a)	16.0	0	
Ba 132	DG	430(a)	7.43	0	
Ba 134	DG	431(a)	51.39	0	
Ba 135	DG	432(a)	67.32	451	BaCO ₃
Ba 136	DG	433(a)	50.02	183	BaCO ₃
Ba 137	DG	434(a)	38.98	917	BaCO ₃
Ba 138	DG	435(a)	98.04	1,380	BaCO ₃

Natural Isotopic Abundance:

La 138 - 0.097%

La 139 - 99.903%

Lanthanum
Atomic No. 57

Electromagnetically Concentrated Isotopes

Isotope	Series	Sample	Abundance of Enriched Isotope (per cent)	AVAILABLE FOR SHIPMENT Element Weight (milligrams)	Product Form
La 138	EF	544(a)	0.597	351	La ₂ O ₃
La 139	EF	545(a)	99.96	17,643	La ₂ O ₃

Natural Isotopic Abundance:

Ce 136 - 0.195%

Ce 138 - 0.265%

Ce 140 - 88.44%

Ce 142 - 11.10%

Cerium
Atomic No. 58

Electromagnetically Concentrated Isotopes

Isotope	Series	Sample	Abundance of Enriched Isotope (per cent)	AVAILABLE FOR SHIPMENT Element Weight (milligrams)	Product Form
Ce 136	DD	415(a)	16.6	0	
Ce 136	DW	501(a)	8.94	0	
Ce 136	FK	675(a)	Refinement Incomplete		
Ce 138	DD	416(a)	8.9	0	
Ce 138	DW	502(a)	4.42	203	CeO ₂
Ce 138	FK	676(a)	Refinement Incomplete		
Ce 140	CW	389(a)	98.5	3,786	CeO ₂
Ce 140	DD	417(a)	98.7	8,397	CeO ₂
Ce 140	DW	503(a)	99.25	8,530	CeO ₂
Ce 140	FK	677(a)	Refinement Incomplete		
Ce 142	DD	418(b)	87.4	29	CeO ₂
Ce 142	DW	504(a)	84.42	516	CeO ₂
Ce 142	FK	678(a)	Refinement Incomplete		

Natural Isotopic Abundance:

Nd 142 - 26.83% Nd 146 - 17.29%

Nd 143 - 12.10% Nd 148 - 5.80%

Nd 144 - 23.95% Nd 150 - 5.67%

Nd 145 - 8.36%

Neodymium
Atomic No. 60

Electromagnetically Concentrated Isotopes

Isotope	Series	Sample	Abundance of Enriched Isotope (per cent)	AVAILABLE FOR SHIPMENT Element Weight (milligrams)	Product Form
Nd 142	EQ	587(a)	93.00	1,810	Nd ₂ O ₃
Nd 143	EQ	588(a)	83.93	28	Nd ₂ O ₃
Nd 144	EQ	589(a)	93.45	1,862	Nd ₂ O ₃
Nd 145	EQ	590(a)	78.60	49	Nd ₂ O ₃
Nd 146	EQ	591(a)	95.60	64	Nd ₂ O ₃
Nd 148	EQ	592(a)	89.85	0	
Nd 150	EQ	593(a)	94.76	0	

Natural Isotopic Abundance:

Sm 144 - 3.13% Sm 150 - 7.38%
 Sm 147 - 15.12% Sm 152 - 26.59%
 Sm 148 - 11.29% Sm 154 - 22.62%
 Sm 149 - 13.87%

Samarium
 Atomic No. 62

Electromagnetically Concentrated Isotopes

Isotope	Series	Sample	Abundance of Enriched Isotope (per cent)	AVAILABLE FOR SHIPMENT Element Weight (milligrams)	Product Form
Sm 144	EM	567(a)	72.13	17	Sm ₂ O ₃
Sm 144	FH	660(a)	58.93	234	Sm ₂ O ₃
Sm 147	EM	569(a)	81.63	0	
Sm 147	FH	661(a)	Analysis Incomplete	900	Sm ₂ O ₃
Sm 148	EM	570(a)	76.01	729	Sm ₂ O ₃
Sm 148	FH	662(a)	Analysis Incomplete	668	Sm ₂ O ₃
Sm 149	EM	571(a)	71.53	0	
Sm 149	FH	663(a)	Analysis Incomplete	647	Sm ₂ O ₃
Sm 150	EM	572(a)	74.09	369	Sm ₂ O ₃
Sm 150	FH	664(a)	Analysis Incomplete	910	Sm ₂ O ₃
Sm 152	EM	573(a)	89.90	4,496	Sm ₂ O ₃
Sm 152	FH	665(a)	Analysis Incomplete	4,798	Sm ₂ O ₃
Sm 154	EM	574(a)	92.10	3,150	Sm ₂ O ₃
Sm 154	FH	666(a)	Analysis Incomplete	2,638	Sm ₂ O ₃

Natural Isotopic Abundance:

Hafnium
Atomic No. 72

Hf 174 - 0.17% Hf 179 - 13.67%

Hf 176 - 5.22% Hf 180 - 35.16%

Hf 177 - 18.53%

Hf 178 - 27.25%

Electromagnetically Concentrated Isotopes

Isotope	Series	Sample	Abundance of Enriched Isotope (per cent)	AVAILABLE FOR SHIPMENT Element Weight (milligrams)	Product Form
Hf 174	ET	602(a)	7.85	83	HfO ₂
Hf 176	ET	603(a)	48.46	98	HfO ₂
Hf 177	ET	604(a)	61.71	788	HfO ₂
Hf 178	ET	605(a)	80.91	1,448	HfO ₂
Hf 179	ET	606(a)	46.57	578	HfO ₂
Hf 180	ET	607(a)	93.96	1,443	HfO ₂

Natural Isotopic Abundance:

W 180 - 0.16% W 184 - 30.61%

W 182 - 26.21% W 186 - 28.69%

W 183 - 14.33%

Tungsten
Atomic No. 74

Electromagnetically Concentrated Isotopes

Isotope	Series	Sample	Abundance of Enriched Isotope (per cent)	AVAILABLE FOR SHIPMENT Element Weight (milligrams)	Product Form
W 180	BG	220(a)	9.00	0	
W 180	CL	340(a)	4.95	41	WO ₃
W 180	CL	340(ar)	4.95	54	WO ₃
W 180	EL	561(a)	6.95	275	WO ₃
W 182	BG	221(a)	94.25	46	WO ₃
W 182	CL	341(a)	91.58	1,639	WO ₃
W 182	EL	562(a)	92.33	11,003	WO ₃
W 183	BG	222(a)	86.21	217	WO ₃
W 183	CL	342(a)	82.01	745	WO ₃
W 183	EL	563(a)	82.63	6,164	WO ₃
W 184	BG	223(a)	95.72	240	WO ₃
W 184	CL	343(a)	91.14	106	WO ₃
W 184	CL	343(ar)	91.14	2,980	WO ₃
W 184	EL	564(a)	95.06	1,074	WO ₃
W 186	BG	224(a)	97.94	92	WO ₃
W 186	CL	344(a)	97.17	616	WO ₃
W 186	CL	344(ar)	97.17	372	WO ₃
W 186	EL	565(a)	97.54	11,745	WO ₃

Natural Isotopic Abundance:

Rhenium
Atomic No. 75

Re 185 - 37.31%

Re 187 - 62.69%

Electromagnetically Concentrated Isotopes

Isotope	Series	Sample	Abundance of Enriched Isotope (per cent)	AVAILABLE FOR SHIPMENT Element Weight (milligrams)	Product Form
Re 185	CP	356(a)	85.38	2,490	Re
Re 187	CP	357(a)	98.22	715	Re

Natural Isotopic Abundance:

Hg 196 - 0.16% Hg 201 - 13.20%

Hg 198 - 10.02% Hg 202 - 29.76%

Hg 199 - 16.90% Hg 204 - 6.86%

Hg 200 - 23.10%

Mercury

Atomic No. 80

Electromagnetically Concentrated Isotopes

Isotope	Series	Sample	Abundance of Enriched Isotope (per cent)	AVAILABLE FOR SHIPMENT Element Weight (milligrams)	Product Form
Hg 196	DR	485(a)	8.44	0	
Hg 196	DR	485(b)	1.90	0	
Hg 196	DR	485(c)	1.46	400	Hg
Hg 198	DR	486(a)	79.11	626	Hg
Hg 198	DR	486(b)	66.11	375	Hg
Hg 198	DR	486(c)	53.37	853	Hg
Hg 198	DR	486(d)	54.35	2,930	Hg
Hg 199	DR	487(a)	73.9	45	Hg
Hg 199	DR	487(b)	72.1	28	Hg
Hg 199	DR	487(c)	68.0	0	
Hg 199	DR	487(d)	65.45	43	Hg
Hg 199	DR	487(e)	62.51	177	Hg
Hg 200	DR	488(a)	91.39	228	Hg
Hg 200	DR	488(b)	86.45	119	Hg
Hg 200	DR	488(c)	80.85	749	Hg
Hg 200	DR	488(d)	74.90	3,478	Hg
Hg 200	DR	488(e)	64.66	1,420	Hg
Hg 200	DR	488(f)	76.28	1,492	Hg

Natural Isotopic Abundance:
 Hg 196 - 0.16% Hg 201 - 13.20%
 Hg 198 - 10.02% Hg 202 - 29.76%
 Hg 199 - 16.90% Hg 204 - 6.86%
 Hg 200 - 23.10%

Mercury (Cont'd)
 Atomic No. 80

Electromagnetically Concentrated Isotopes

Isotope	Series	Sample	Abundance of Enriched Isotope (per cent)	AVAILABLE FOR SHIPMENT Element Weight (milligrams)	Product Form
Hg 201	DR	489(a)	71.8	26	Hg
Hg 201	DR	489(b)	62.48	90	Hg
Hg 201	DR	489(c)	57.90	230	Hg
Hg 201	DR	489(d)	57.3	178	Hg
Hg 201	DR	489(e)	51.48	121	Hg
Hg 202	DR	490(a)	98.3	75	Hg
Hg 202	DR	490(b)	98.06	20	Hg
Hg 202	DR	490(c)	97.33	55	Hg
Hg 202	DR	490(d)	96.45	122	Hg
Hg 202	DR	490(e)	95.13	379	Hg
Hg 202	DR	490(f)	91.46	1,447	Hg
Hg 202	DR	490(g)	87.87	354	Hg
Hg 202	DR	490(h)	80.27	4,300	Hg
Hg 202	DR	490(i)	75.75	825	Hg
Hg 204	DR	491(a)	89.17	58	Hg
Hg 204	DR	491(b)	77.61	255	Hg
Hg 204	DR	491(c)	69.80	0	
Hg 204	DR	491(d)	62.78	129	Hg

Natural Isotopic Abundance:

Hg 196 - 0.16% Hg 201 - 13.20%
 Hg 198 - 10.02% Hg 202 - 29.76%
 Hg 199 - 16.90% Hg 204 - 6.86%
 Hg 200 - 23.10%

Mercury (Cont'd)
 Atomic No. 80

Electromagnetically Concentrated Isotopes

Isotope	Series	Sample	Abundance of Enriched Isotope (per cent)	AVAILABLE FOR SHIPMENT Element Weight (milligrams)	SHIPMENT Product Form
Hg 204	DR	491(e)	49.66	1,346	Hg
Hg 204	DR	491(f)	42.91	662	Hg
Hg 204	DR	491(g)	30.07	363	Hg
Hg 204	DR	491(h)	72.34	93	Hg

Natural Isotopic Abundance:

Tl 203 - 29.51%

Tl 205 - 70.49%

Thallium
Atomic No. 81

Electromagnetically Concentrated Isotopes

Isotope	Series	Sample	Abundance of Enriched Isotope (per cent)	AVAILABLE FOR SHIPMENT Element Weight (milligrams)	Product Form
Tl 203	BV-3	278(a)	75.6	194	Tl ₂ O ₃
Tl 203	BX	284(a)	61.1	5,899	Tl ₂ O ₃
Tl 203	BY-3	286(a)	47.9	6,875	Tl ₂ O ₃
Tl 203	CC-3	307(a)	58.8	601	Tl ₂ O ₃
Tl 203	CF-3	322(a)	86.0	1,189	Tl ₂ O ₃
Tl 203	CG-3	324(a)	34.1	104	Tl ₂ O ₃
Tl 203	CH-3	326(a)	61.0	1,892	Tl ₂ O ₃
Tl 205	BR-3	267(a)	89.5	1,436	Tl ₂ O ₃
Tl 205	BU-3	277(a)	92.8	4,776	Tl ₂ O ₃
Tl 205	BV-3	279(a)	95.2	1,047	Tl ₂ O ₃
Tl 205	BX	285(a)	98.7	940	Tl ₂ O ₃
Tl 205	BY-3	287(a)	92.8	2,715	Tl ₂ O ₃
Tl 205	CC-3	308(a)	86.1	568	Tl ₂ O ₃
Tl 205	CF-3	323(a)	95.6	176	Tl ₂ O ₃
Tl 205	CH-3	327(a)	91.8	1,594	Tl ₂ O ₃
Tl 205	CJ-3	333(a)	90.5	3,818	Tl ₂ O ₃

Natural Isotopic Abundance:

Pb 204 - 1.37%

Pb 206 - 26.26%

Pb 207 - 20.82%

Pb 208 - 51.51%

Lead
Atomic No. 82

Electromagnetically Concentrated Isotopes

Isotope	Series	Sample	Abundance of Enriched Isotope (per cent)	AVAILABLE FOR SHIPMENT Element Weight (milligrams)	Product Form
Pb 204	O	43(a)	7.8	0	
Pb 204	AQ	135(a)	16.69	0	
Pb 204	AQ	135(ar)	16.69	38	PbCrO ₄
Pb 204	BO	257(a)	23.4	13	PbCrO ₄
Pb 204	CN	349(a)	27.0	0	
Pb 204	EO	581(a)	25.70	2,826	PbO
Pb 206	O	44(a)	75.67	14	PbCrO ₄
Pb 206	AQ	136(a)	77.9	18	PbCrO ₄
Pb 206	BO	258(a)	71.3	238	PbCrO ₄
Pb 206	BO	258(ar)	71.3	1,018	PbCrO ₄
Pb 206	CN	350(a)	81.0	0	
Pb 206	EO	582(a)	64.93	4,207	PbO
Pb 207	O	45(a)	61.55	0	
Pb 207	AQ	137(a)	48.2	323	PbCrO ₄
Pb 207	AQ	137(ar)	48.2	512	PbCrO ₄
Pb 207	BO	259(a)	66.8	1,299	PbCrO ₄
Pb 207	BO	259(ar)	66.8	529	PbCrO ₄
Pb 207	CN	351(a)	61.6	0	

Natural Isotopic Abundance:

Pb 204 - 1.37%

Pb 206 - 26.26%

Pb 207 - 20.82%

Pb 208 - 51.51%

Lead (Cont'd)
Atomic No. 82

Electromagnetically Concentrated Isotopes

Isotope	Series	Sample	Abundance of Enriched Isotope (per cent)	AVAILABLE FOR SHIPMENT Element Weight (milligrams)	Product Form
Pb 207	EO	583(a)	61.06	5,660	PbO
Pb 208	O	46(a)	92.1	33	PbCrO ₄
Pb 208	O	46(ar)	92.1	160	PbCrO ₄
Pb 208	AQ	138(a)	82.10	322	PbCrO ₄
Pb 208	BO	260(a)	96.6	0	
Pb 208	CN	352(ar)	95.8	166	PbSO ₄
Pb 208	EO	584(a)	87.97	23,445	PbO