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1
ELECTROMAGNETICALLY ENRICHED ISOTOPES

Inventory, July 31, 1952

C. P. Keim
C. E. Normand
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July 31, 1952

ISOTOPE RESEARCH AND PRODUCTION DIVISION
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OAK RIDGE NATIONAL LABORATORY

Operated by

CARBIDE AND CARBON CHEMICALS COMPANY
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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.

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UNCLASSIFIEDINTRODUCTION

This report of electromagnetically enriched isotopes is revised 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.

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

Isotopic abundance data not in this report, such as concentrations of other isotopes in the sample, will be submitted upon request. Spectrographic analyses and complete isotopic abundance data will be forwarded with all shipments or as soon as available.

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.

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Users of Stable Isotopes who need extensions of their loan periods should write The Isotopes Division, Atomic Energy Commission, Oak Ridge, Tennessee.

All purchase orders are to be sent to Dr. C. P. Keim, Oak Ridge National Laboratory, Y-12 Area, Oak Ridge, Tennessee.

SUMMARY OF PRODUCTION AND SHIPMENTS

<u>Atomic No.</u>	<u>Element</u>	<u>Production Completed</u>	<u>No. of Samples Now Available For Shipment</u>	<u>No. of Individual Shipments Made</u>
51	Antimony	4	2	19
56	Barium	7	4	25
4	Beryllium	2	0	2
5	Boron	3	3	2
35	Bromine	2	2	0
48	Cadmium	19	18	69
20	Calcium	39	21	34
6	Carbon	3	2	2
58	Cerium	14	9	17
17	Chlorine	3	2	6
24	Chromium	14	9	47
29	Copper	13	11	21
31	Gallium	2	2	8
32	Germanium	6	4	17
72	Hafnium	6	6	28
49	Indium	12	8	22
26	Iron	79	64	59
57	Lanthanum	2	2	3
82	Lead	29	25	57
3	Lithium	24	10	72
12	Magnesium	17	15	33
80	Mercury	40	35	61
42	Molybdenum	31	26	75
60	Neodymium	7	5	35
28	Nickel	24	14	56
8	Oxygen	2	0	0
19	Potassium	31	22	45
75	Rhenium	2	2	11
37	Rubidium	2	2	3
62	Samarium	14	13	44
34	Selenium	47	43	46
14	Silicon	9	8	21
47	Silver	8	8	15
38	Strontium	14	9	28
16	Sulfur	9	6	16
52	Tellurium	42	34	78
81	Thallium	16	16	24
50	Tin	55	48	107
22	Titanium	14	10	38
74	Tungsten	18	17	38
23	Vanadium	3	2	4
30	Zinc	16	11	34
40	Zirconium	27	24	50
	TOTAL	731	538	1,374

ELECTROMAGNETICALLY CONCENTRATED ISOTOPES

Element and Isotope	ISOTOPIC ABUNDANCE (atom percent)		Series	Sample	AVAILABLE FOR SHIPMENT	
	Natural	Enriched			Element Weight (milligrams)	Product Form
Antimony						
Sb 121	57.25	99.4	AE	93(a)	0	
Sb 121	57.25	97.7	BT	274(a)	50	Sb
Sb 123	42.75	96.7	AE	94(a)	0	
Sb 123	42.75	95.6	BT	275(a)	1,379	Sb
Barium						
Ba 130	0.103	16.0	DG	429(a)	0	
Ba 130	0.103	**	FT	720(a)		
Ba 130	0.103	**	FU	727(a)		
Ba 132	0.096	7.43	DG	430(a)	0	
Ba 132	0.096	**	FT	721(a)		
Ba 132	0.096	**	FU	728(a)		
Ba 134	2.39	51.39	DG	431(a)	0	
Ba 134	2.39	**	FT	722(a)		
Ba 134	2.39	**	FU	729(a)		
Ba 135	6.55	67.32	DG	432(a)	751	BaCO ₃
Ba 135	6.55	**	FT	723(a)		
Ba 135	6.55	**	FU	730(a)		
Ba 136	7.79	50.02	DG	433(a)	183	BaCO ₃
Ba 136	7.79	**	FT	724(a)		
Ba 136	7.79	**	FU	731(a)		
Ba 137	11.25	38.98	DG	434(a)	1,116	BaCO ₃
Ba 137	11.25	**	FT	725(a)		

* - Analysis Incomplete

** - Refinement Incomplete

ELECTROMAGNETICALLY CONCENTRATED ISOTOPES

Element and Isotope	ISOTOPIC ABUNDANCE (atom percent)		Series	Sample	AVAILABLE FOR SHIPMENT	
	Natural	Enriched			Element Weight (milligrams)	Product Form
Barium (Cont'd)						
Ba 137	11.25	**	FU	732(a)		
Ba 138	71.83	98.04	DG	435(a)	1,380	BaCO ₃
Ba 138	71.83	**	FT	726(a)		
Ba 138	71.83	**	FU	733(a)		
Boron						
B 10	19.57	86.78	DP	481(a)	40	H ₃ BO ₃
B 10	19.57	**	FV	734(a)		
B 11	80.43	*	BM	250(a)	10	H ₃ BO ₃
B 11	80.43	*	DP	482(a)	200	H ₃ BO ₃
B 11	80.43	**	FV	735(a)		
Bromine						
Br 79	50.57	86.96	EJ	552(a)	342	AgBr
Br 81	49.43	96.81	EJ	553(a)	318	AgBr
Cadmium						
Cd 106	1.22	19.94	AC	88(a)	44	CdO
Cd 106	1.22	32.9	CD	314(a)	0	
Cd 108	0.89	14.2	AX	170(a)	98	CdO
Cd 108	0.89	24.8	CD	315(a)	16	CdO
Cd 110	12.43	55.8	AX	171(a)	2,027	CdO
Cd 110	12.43	70.0	CE	316(a)	1,918	CdO

* - Analysis Incomplete

** - Refinement Incomplete

ELECTROMAGNETICALLY CONCENTRATED ISOTOPES

Element and Isotope	ISOTOPIC ABUNDANCE (atom percent)		Series	Sample	AVAILABLE FOR SHIPMENT	
	Natural	Enriched			Element Weight (milligrams)	Product Form
Cadmium (Cont'd)						
Cd 111	12.86	53.3	AC	89(a)	295	CdO
Cd 111	12.86	64.5	CE	317(a)	2,941	CdO
Cd 112	23.79	79.3	AX	172(a)	1,890	CdO
Cd 112	23.79	83.5	CE	318(a)	3,414	CdO
Cd 113	12.34	25.5	AB	86(a)	376	CdO
Cd 113	12.34	54.1	CE	319(a)	1,818	CdO
Cd 114	28.81	79.52	AC	90(a)	772	CdO
Cd 114	28.81	94.2	CE	320(a)	2,817	CdO
Cd 114	28.81	94.2	CE	320(ar)	316	CdO
Cd 116	7.66	71.2	CE	321(a)	31	CdO
Cd 116	7.66	71.2	CE	321(ar)	10	CdO
Calcium						
Ca 40	96.96	98.6	V	61(b)	114	CaO
Ca 40	96.96	99.97	X	70(a)	1,048	CaO
Ca 40	96.96	98.9	BN	251(a)	5,825	CaCO ₃
Ca 40	96.96	99.83	DI	441(d)	35,259	CaCO ₃
Ca 40	96.96	*	EV	613(a)	28,720	CaCO ₃
Ca 40	96.96	99.98	FF	648(a)	44,756	CaCO ₃
Ca 40	96.96	**	FO	689(a)		
Ca 42	0.64	28.3	DI	442(b)	393	CaCO ₃
Ca 42	0.64	82.52	EV	614(a)	218	CaCO ₃
Ca 42	0.64	64.17	FF	649(a)	455	CaCO ₃

* - Analysis Incomplete

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ELECTROMAGNETICALLY CONCENTRATED ISOTOPES

Element and Isotope	ISOTOPIC ABUNDANCE (atom percent)		Series	Sample	AVAILABLE FOR SHIPMENT	
	Natural	Enriched			Element Weight (milligrams)	Product Form
Calcium (Cont'd)						
Ca 42	0.64	**	FO	690(a)		
Ca 43	0.145	37.56	DI	443(b)	95	
Ca 43	0.145	72.13	EV	615(a)	15	
Ca 43	0.145	*	FF	650(a)	78	CaCO ₃
Ca 43	0.145	*	FO	691(a)	278	CaCO ₃
Ca 44	2.06	85.4	BN	254(a)	40	CaCO ₃
Ca 44	2.06	96.2	CS	373(a)	85	CaCO ₃
Ca 44	2.06	91.9	DI	444(a)	134	CaCO ₃
Ca 44	2.06	*	EV	616(a)	723	CaCO ₃
Ca 44	2.06	*	FF	651(a)	659	CaCO ₃
Ca 44	2.06	**	FO	692(a)		
Ca 46	0.0033	*	EV	617(a)	0	
Ca 46	0.0033	10.16	FF	652(a)	0	
Ca 46	0.0033	*	FO	693(a)	16	CaCO ₃
Ca 48	0.185	62.2	CS	375(a)	0	
Ca 48	0.185	*	EV	618(a)	0	
Ca 48	0.185	*	FO	694(a)	694	CaCO ₃
Ca 48	0.185	7.49	FF	653(a)	10	CaCO ₃
Carbon						
C 12	98.91	99.96	FD	638(ah)	1,140	C
C 12	98.91	99.94	FD	638(aj)	9,950	C

* - Analysis Incomplete

** - Refinement Incomplete

ELECTROMAGNETICALLY CONCENTRATED ISOTOPES

Element and Isotope	ISOTOPIIC ABUNDANCE (atom percent)		Series	Sample	AVAILABLE FOR SHIPMENT	
	Natural	Enriched			Element Weight (milligrams)	Product Form
Cerium						
Ce 136	0.195	22.29	FK	675(a)	0	
Ce 136	0.195	*	FR	706(a)	342	CeO ₂
Ce 138	0.265	4.42	DW	502(a)	290	CeO ₂
Ce 138	0.265	10.22	FK	676(a)	195	CeO ₂
Ce 138	0.265	13.10	FR	707(a)	1,088	CeO ₂
Ce 140	88.44	98.5	CW	389(a)	3,786	CeO ₂
Ce 140	88.44	98.7	DD	417(a)	8,397	CeO ₂
Ce 140	88.44	99.25	DW	503(a)	0	
Ce 140	88.44	*	FK	677(a)	7,680	CeO ₂
Ce 140	88.44	*	FR	708(a)	27,470	CeO ₂
Ce 142	11.10	87.4	DD	418(b)	29	CeO ₂
Ce 142	11.10	84.42	DW	504(a)	1,330	CeO ₂
Ce 142	11.10	*	FK	678(a)	906	CeO ₂
Ce 142	11.10	*	FR	709(a)	6,355	CeO ₂

Chlorine

Cl 35	75.4	79.5	AV	161(c1)	18	AgCl
Cl 35	75.4	92.4	DH	436(a)	0	AgCl
Cl 35	75.4	**	FW	736(a)		
Cl 37	24.6	65.6	DH	438(a)	97	AgCl
Cl 37	24.6	**	FW	737(a)		

* - Analysis Incomplete

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ELECTROMAGNETICALLY CONCENTRATED ISOTOPES

Element and Isotope	ISOTOPIC ABUNDANCE (atom percent)		Series	Sample	AVAILABLE FOR SHIPMENT	
	Natural	Enriched			Element Weight (milligrams)	Product Form
Chromium						
Cr 50	4.40	88.3	EU	609(a)	594	Cr ₂ O ₃
Cr 52	83.73	99.14	D	11(a)	510	Cr ₂ O ₃
Cr 52	83.73	99.14	D	11(ar)	140	Cr ₂ O ₃
Cr 52	83.73	99.1	CD	310(a)	3,158	Cr ₂ O ₃
Cr 52	83.73	97.1	EU	610(a)	23,140	Cr ₂ O ₃
Cr 53	9.49	88.59	D	12(a)	113	Cr ₂ O ₃
Cr 53	9.49	92.1	CD	311(a)	115	Cr ₂ O ₃
Cr 53	9.49	90.06	EU	611(a)	447	Cr ₂ O ₃
Cr 54	2.38	88.95	EU	612(a)	88	Cr ₂ O ₃
Copper						
Cu 63	69.09	97.0	A	1(a)	650	CuO
Cu 63	69.09	97.0	A	1(ar)	960	CuO
Cu 63	69.09	99.35	J-K	31-37(a)	730	CuO
Cu 63	69.09	99.77	AS-AT	145-151(a)	0	
Cu 63	69.09	98.2	AV	161(cu)	203	CuO
Cu 63	69.09	99.11	DF	426(a)	3,351	CuO
Cu 63	69.09	96.12	DL	455(a)	578	CuO
Cu 63	69.09	99.40	DU	497(a)	17,750	CuO
Cu 63	69.09	*	FJ	673(a)	9,426	CuO
Cu 65	30.91	93.81	A	2(ar)	461	CuO
Cu 65	30.91	90.6	AV	162(cu)	14	CuO
Cu 65	30.91	98.16	DU	498(a)	13,866	CuO

* - Analysis Incomplete

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ELECTROMAGNETICALLY CONCENTRATED ISOTOPES

Element and Isotope	ISOTOPIC ABUNDANCE (atom percent)		Series	Sample	AVAILABLE FOR SHIPMENT	
	Natural	Enriched			Element Weight (milligrams)	Product Form
Gallium						
Ga 69	60.00	98.42	EI	554(a)	11,827	Ga ₂ O ₃
Ga 71	40.00	98.08	EI	555(a)	2,231	Ga ₂ O ₃
Germanium						
Ge 70	20.63	88.1	BD-BE	205-210(a)	158	GeO ₂
Ge 72	27.41	89.2	BD-BE	206-211(a)	962	GeO ₂
Ge 73	7.84	68.9	BD-BE	207-212(ar)	186	GeO ₂
Ge 74	36.37	95.2	BD-BE	208-213(a)	1,562	GeO ₂
Ge 76	7.75	79.3	BD-BE	209-214(a)	0	
Hafnium						
Hf 174	0.17	7.85	ET	602(a)	73	HfO ₂
Hf 176	5.22	48.46	ET	603(a)	98	HfO ₂
Hf 177	18.53	61.71	ET	604(a)	788	HfO ₂
Hf 178	27.25	80.91	ET	605(a)	1,448	HfO ₂
Hf 179	13.67	46.57	ET	606(a)	578	HfO ₂
Hf 180	35.16	93.96	ET	607(a)	1,402	HfO ₂
Indium						
In 113	4.22	16.8	CO	354(a)	415	In ₂ O ₃
In 113	4.22	65.4	CQ	358(a)	0	
In 113	4.22	14.2	DE	419(a)	1,735	In ₂ O ₃
In 113	4.22	59.58	ER	594(a)	727	In ₂ O ₃

* - Analysis Incomplete

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ELECTROMAGNETICALLY CONCENTRATED ISOTOPES

Element and Isotope	ISOTOPIC ABUNDANCE (atom percent)		Series	Sample	AVAILABLE FOR SHIPMENT	
	Natural	Enriched			Element Weight (milligrams)	Product Form
Indium (Cont'd)						
In 115	95.78	99.56	AD	92(a)	964	In ₂ O ₃
In 115	95.78	99.6	BH	226(a)	856	In ₂ O ₃
In 115	95.78	99.6	BH	226(ar)	470	In ₂ O ₃
In 115	95.78	99.9	CO	355(a)	14,563	In ₂ O ₃
In 115	95.78	99.94	ER	595(a)	31,900	In ₂ O ₃
In 115	95.78	99.94	ER	595(ar)	11,000	In ₂ O ₃
Iron						
Fe 54	5.90	55.47	V	3(a)	57	Fe ₂ O ₃
Fe 54	5.90	39.0	B	3(f)	268	Fe ₂ O ₃
Fe 54	5.90	81.06	E	14(a)	17	Fe ₂ O ₃
Fe 54	5.90	83.03	F	18(a)	32	Fe ₂ O ₃
Fe 54	5.90	49.2	AM	122(a)	343	Fe ₂ O ₃
Fe 54	5.90	93.27	AZ	183(a)	16	Fe ₂ O ₃
Fe 54	5.90	87.9	BA	187(a)	10	Fe ₂ O ₃
Fe 54	5.90	87.4	BB	194(a)	69	Fe ₂ O ₃
Fe 54	5.90	84.3	CI	328(a)	41	Fe ₂ O ₃
Fe 54	5.90	34.47	DO	477(a)	67,252	Fe ₂ O ₃
Fe 54	5.90	93.06	FC	634(a)	540	Fe ₂ O ₃
Fe 54	5.90	**	FN	685(a)		
Fe 54	5.90	**	FN	685(b)		
Fe 56	91.52	98.41	B	4(a)	3,235	Fe ₂ O ₃
Fe 56	91.52	98.5	B	4(e)	901	Fe ₂ O ₃

* - Analysis Incomplete

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ELECTROMAGNETICALLY CONCENTRATED ISOTOPES

Element and Isotope	ISOTOPIC ABUNDANCE (atom percent)		Series	Sample	AVAILABLE FOR SHIPMENT	
	Natural	Enriched			Element Weight (milligrams)	Product Form
Iron (Cont'd)						
Fe 56	91.52	98.62	E	15(a)	10,403	Fe ₂ O ₃
Fe 56	91.52	97.42	F	19(a)	1,120	Fe ₂ O ₃
Fe 56	91.52	98.9	AM	123(a)	2,627	Fe ₂ O ₃
Fe 56	91.52	99.0	AZ	184(a)	12,451	Fe ₂ O ₃
Fe 56	91.52	98.5	BA	188(a)	35,471	Fe ₂ O ₃
Fe 56	91.52	98.3	BB	192(a)	9,818	Fe ₂ O ₃
Fe 56	91.52	96.5	CI	329(a)	51,056	Fe ₂ O ₃
Fe 56	91.52	99.84	CZ	404(f)	10,690	Fe ₂ O ₃
Fe 56	91.52	99.70	DO	478(a)	242,643	Fe ₂ O ₃
Fe 56	91.52	99.70	DO	478(ar)	76,218	Fe ₂ O ₃
Fe 56	91.52	99.70	DO	478(as)	27,594	Fe
Fe 56	91.52	*	FC	635(a)	18,171	Fe ₂ O ₃
Fe 56	91.52	*	FN	686(a)	304,226	Fe ₂ O ₃
Fe 56	91.52	**	FN	686(b)		
Fe 57	2.24	21.10	B	5(a)	62	Fe ₂ O ₃
Fe 57	2.24	30.5	B	5(f)	81	Fe ₂ O ₃
Fe 57	2.24	69.63	F	20(a)	15	Fe ₂ O ₃
Fe 57	2.24	33.2	AM	124(a)	69	Fe ₂ O ₃
Fe 57	2.24	77.6	BB	193(a)	24	Fe ₂ O ₃
Fe 57	2.24	51.91	CZ	405(f)	509	Fe ₂ O ₃
Fe 57	2.24	79.43	DK	449(a)	232	Fe ₂ O ₃
Fe 57	2.24	62.38	DL	453(a)	830	Fe ₂ O ₃
Fe 57	2.24	59.31	DL	453(d)	1,381	Fe ₂ O ₃

* - Analysis Incomplete

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ELECTROMAGNETICALLY CONCENTRATED ISOTOPES

Element and Isotope	ISOTOPIC ABUNDANCE (atom percent)		Series	Sample	AVAILABLE FOR SHIPMENT	
	Natural	Enriched			Element Weight (milligrams)	Product Form
Iron (Cont'd)						
Fe 57	2.24	31.9	DL	453(e)	1,245	Fe ₂ O ₃
Fe 57	2.24	59.3	DL	453(f)	1,122	Fe ₂ O ₃
Fe 57	2.24	43.45	DL	453(j)	2,571	Fe ₂ O ₃
Fe 57	2.24	74.6	DM	459(a)	172	Fe ₂ O ₃
Fe 57	2.24	40.61	DL	463(a)	1,687	Fe ₂ O ₃
Fe 57	2.24	45.43	DL	463(b)	1,018	Fe ₂ O ₃
Fe 57	2.24	67.3	DL	463(e)	278	Fe ₂ O ₃
Fe 57	2.24	53.53	DL	463(j)	184	Fe ₂ O ₃
Fe 57	2.24	54.23	DL	463(k)	1,766	Fe ₂ O ₃
Fe 57	2.24	63.1	DL	467(c)	165	Fe ₂ O ₃
Fe 57	2.24	87.29	DN	475(a)	0	
Fe 57	2.24	83.44	FC	636(a)	1,244	Fe ₂ O ₃
Fe 57	2.24	**	FN	687(a)		
Fe 57	2.24	**	FN	687(b)		
Fe 58	0.34	22.0	C	8(b)	15	Fe ₂ O ₃
Fe 58	0.34	10.3	AM	125(a)	44	Fe ₂ O ₃
Fe 58	0.34	23.4	DL	454(f)	39	Fe ₂ O ₃
Fe 58	0.34	71.7	DL	454(m)	92	Fe ₂ O ₃
Fe 58	0.34	79.8	DL	464(l)	0	
Fe 58	0.34	75.7	DO	480(a)	117	Fe ₂ O ₃
Fe 58	0.34	42.0	DO	480(b)	484	Fe ₂ O ₃
Fe 58	0.34	34.8	DO	480(c)	37	Fe ₂ O ₃
Fe 58	0.34	74.20	FN	688(b)	37	Fe ₂ O ₃

* - Analysis Incomplete

** - Refinement Incomplete

ELECTROMAGNETICALLY CONCENTRATED ISOTOPES

Element and Isotope	ISOTOPIC ABUNDANCE (atom percent)		Series	Sample	AVAILABLE FOR SHIPMENT	
	Natural	Enriched			Element Weight (milligrams)	Product Form
Iron (Cont'd)						
Fe 58	0.34	59.65	FN	688(c)	104	Fe ₂ O ₃
Fe 58	0.34	55.74	FN	688(d)	372	Fe ₂ O ₃
Fe 58	0.34	57.31	FN	688(f)	197	Fe ₂ O ₃
Fe 58	0.34	65.85	FN	688(g)	82	Fe ₂ O ₃
Fe 58	0.34	78.66	FN	688(i)	47	Fe ₂ O ₃
Fe 58	0.34	78.02	FN	688(j)	86	Fe ₂ O ₃
Lanthanum						
La 138	0.087	0.597	EF	544(a)	850	La ₂ O ₃
La 139	99.913	99.96	EF	545(a)	17,643	La ₂ O ₃
Lead						
Pb 204	1.37	7.8	O	43(a)	87	PbCrO ₄
Pb 204	1.37	16.69	AQ	135(ar)	38	PbCrO ₄
Pb 204	1.37	23.4	BO	257(a)	13	PbCrO ₄
Pb 204	1.37	25.70	EO	581(a)	1,574	PbO
Pb 204	1.37	5.30	FQ	702(a)	3,170	PbO
Pb 206	26.26	75.67	O	44(a)	278	PbCrO ₄
Pb 206	26.26	77.9	AQ	136(a)	255	PbCrO ₄
Pb 206	26.26	71.3	BO	258(a)	238	PbCrO ₄
Pb 206	26.26	71.3	BO	258(ar)	1,018	PbCrO ₄
Pb 206	26.26	81.0	CN	350(a)	0	
Pb 206	26.26	64.93	EO	582(a)	4,157	PbO

* - Analysis Incomplete

** - Refinement Incomplete

ELECTROMAGNETICALLY CONCENTRATED ISOTOPES

Element and Isotope	ISOTOPIC ABUNDANCE (atom percent)		Series	Sample	AVAILABLE FOR SHIPMENT	
	Natural	Enriched			Element Weight (milligrams)	Product Form
Lead (Cont'd)						
Pb 206	26.26	35.02	FQ	703(a)	8,726	PbO
Pb 207	20.82	61.55	O	45(a)	181	PbCrO ₄
Pb 207	20.82	48.2	AQ	137(a)	553	PbCrO ₄
Pb 207	20.82	48.2	AQ	137(ar)	512	PbCrO ₄
Pb 207	20.82	66.8	BO	259(a)	998	PbCrO ₄
Pb 207	20.82	66.8	BO	259(ar)	529	PbCrO ₄
Pb 207	20.82	61.06	EO	583(a)	5,610	PbO
Pb 207	20.82	26.81	FQ	704(a)	8,802	PbO
Pb 208	51.51	92.1	O	46(a)	33	PbCrO ₄
Pb 208	51.51	92.1	O	46(ar)	160	PbCrO ₄
Pb 208	51.51	82.10	AQ	138(a)	846	PbCrO ₄
Pb 208	51.51	96.6	BO	260(a)	234	PbO
Pb 208	51.51	95.8	CN	352(ar)	166	PbSO ₄
Pb 208	51.51	87.97	EO	584(a)	23,395	PbO
Pb 208	51.51	*	FQ	705(a)	9,090	PbO
Lithium						
Li 6	7.43	99.4	CT	376(a)	0	
Li 6	7.43	95.2	ED	537(a)	173	Li ₂ SO ₄
Li 6	7.43	95.5	ED	537(b)	15	Li ₂ SO ₄
Li 6	7.43	88.22	EZ	627(e)	12	Li ₂ SO ₄
Li 6	7.43	94.07	FI	667(a)	25	Li ₂ SO ₄
Li 6	7.43	93.39	FI	667(d)	585	Li ₂ SO ₄

* - Analysis Incomplete

** - Refinement Incomplete

ELECTROMAGNETICALLY CONCENTRATED ISOTOPES

Element and Isotope	ISOTOPIC ABUNDANCE (atom percent)		Series	Sample	AVAILABLE FOR SHIPMENT	
	Natural	Enriched			Element Weight (milligrams)	Product Form
Lithium (Cont'd)						
Li 7	92.57	99.91	I	26(a)	10	Li ₂ SO ₄
Li 7	92.57	99.5	AR	140(a)	711	Li ₂ SO ₄
Li 7	92.57	99.8	BQ	265(ar)	216	Li ₂ SO ₄
Li 7	92.57	99.4	CU	379(a)	4,546	Li ₂ SO ₄
Li 7	92.57	99.86	EZ	628(e)	7,666	Li ₂ SO ₄
Magnesium						
Mg 24	78.98	99.5	P	47(a)	1,570	MgO
Mg 24	78.98	98.36	Q	50(a)	192	MgO
Mg 24	78.98	99.52	BZ	288(a)	2,527	MgO
Mg 24	78.98	99.2	BZ	288(b)	132	MgO
Mg 24	78.98	99.5	BZ	288(c)	2,251	MgO
Mg 24	78.98	99.4	BZ	288(d)	1,786	MgO
Mg 24	78.98	99.59	DZ	519(a)	3,804	MgO
Mg 25	10.03	62.59	Q	51(a)	20	MgO
Mg 25	10.03	65.67	Q	51(b)	14	MgO
Mg 25	10.03	86.8	BZ	289(a)	195	MgO
Mg 25	10.03	92.33	DZ	520(a)	1,490	MgO
Mg 26	10.99	96.16	P	49(a)	416	MgO
Mg 26	10.99	95.91	BZ	290(a)	213	MgO
Mg 26	10.99	98.12	DZ	521(a)	804	MgO

* - Analysis Incomplete

** - Refinement Incomplete

ELECTROMAGNETICALLY CONCENTRATED ISOTOPES

Element and Isotope	ISOTOPIC ABUNDANCE (atom percent)		Series	Sample	AVAILABLE FOR SHIPMENT	
	Natural	Enriched			Element Weight (milligrams)	Product Form
Mercury						
Hg 196	0.16	8.44	DR	485(a)	0	
Hg 196	0.16	1.46	DR	485(c)	347	Hg
Hg 198	10.02	79.11	DR	486(a)	779	Hg
Hg 198	10.02	66.11	DR	486(b)	375	Hg
Hg 198	10.02	53.37	DR	486(c)	853	Hg
Hg 198	10.02	54.35	DR	486(d)	2,930	Hg
Hg 199	16.90	73.9	DR	487(a)	45	Hg
Hg 199	16.90	72.1	DR	487(b)	28	Hg
Hg 199	16.90	65.45	DR	487(d)	43	Hg
Hg 199	16.90	62.51	DR	487(e)	340	Hg
Hg 200	23.10	91.39	DR	488(a)	97	Hg
Hg 200	23.10	86.45	DR	488(b)	119	Hg
Hg 200	23.10	80.85	DR	488(c)	749	Hg
Hg 200	23.10	74.90	DR	488(d)	3,478	Hg
Hg 200	23.10	64.66	DR	488(e)	1,420	Hg
Hg 200	23.10	76.28	DR	488(f)	1,492	Hg
Hg 201	13.20	71.8	DR	489(a)	26	Hg
Hg 201	13.20	62.48	DR	489(b)	90	Hg
Hg 201	13.20	57.90	DR	489(c)	230	Hg
Hg 201	13.20	57.3	DR	489(d)	178	Hg
Hg 201	13.20	51.48	DR	489(e)	121	Hg
Hg 202	29.76	98.3	DR	490(a)	46	Hg
Hg 202	29.76	98.06	DR	490(b)	20	Hg

* - Analysis Incomplete

** - Refinement Incomplete

ELECTROMAGNETICALLY CONCENTRATED ISOTOPES

Element and Isotope	ISOTOPIC ABUNDANCE (atom percent)		Series	Sample	AVAILABLE FOR SHIPMENT	
	Natural	Enriched			Element Weight (milligrams)	Product Form
Mercury (Cont'd)						
Hg 202	29.76	97.33	DR	490(c)	61	Hg
Hg 202	29.76	96.45	DR	490(d)	122	Hg
Hg 202	29.76	95.13	DR	490(e)	379	Hg
Hg 202	29.76	91.46	DR	490(f)	1,184	Hg
Hg 202	29.76	87.87	DR	490(g)	354	Hg
Hg 202	29.76	80.27	DR	490(h)	4,334	Hg
Hg 202	29.76	75.75	DR	490(i)	825	Hg
Hg 204	6.86	89.17	DR	491(a)	0	Hg
Hg 204	6.86	77.61	DR	491(b)	201	Hg
Hg 204	6.86	62.78	DR	491(d)	129	Hg
Hg 204	6.86	49.66	DR	491(e)	1,504	Hg
Hg 204	6.86	42.91	DR	491(f)	662	Hg
Hg 204	6.86	30.07	DR	491(g)	363	Hg
Hg 204	6.86	72.34	DR	491(h)	245	Hg
Molybdenum						
Mo 92	15.04	92.07	R-T	53(a)	24	MoO ₃
Mo 92	15.04	95.5	AW	163(ar)	225	MoO ₃
Mo 92	15.04	87.57	FP	695(a)	194	MoO ₃
Mo 94	9.35	79.1	AW	164(a)	111	MoO ₃
Mo 94	9.35	*	FP	696(a)	128	MoO ₃
Mo 95	15.78	80.75	R-T	55(a)	804	MoO ₃
Mo 95	15.78	88.0	AW	165(a)	121	MoO ₃

* - Analysis Incomplete

** - Refinement Incomplete

ELECTROMAGNETICALLY CONCENTRATED ISOTOPES

Element and Isotope	ISOTOPIC ABUNDANCE (atom percent)		Series	Sample	AVAILABLE FOR SHIPMENT	
	Natural	Enriched			Element Weight (milligrams)	Product Form
Molybdenum (Cont'd)						
Mo 95	15.78	88.0	AW	165(ar)	182	MoO ₃
Mo 95	15.78	*	FP	697(a)	156	MoO ₃
Mo 95	15.78	91.27	FP	697(b)	94	MoO ₃
Mo 96	16.56	85.94	R-T	56(a)	2,797	MoO ₃
Mo 96	16.56	90.6	AW	166(a)	81	MoO ₃
Mo 96	16.56	92.0	FP	698(a)	362	MoO ₃
Mo 97	9.60	77.97	R-T	57(a)	474	MoO ₃
Mo 97	9.60	77.97	R-T	57(ar)	284	MoO ₃
Mo 97	9.60	75.4	AW	167(a)	510	MoO ₃
Mo 97	9.60	*	FP	699(a)	74	MoO ₃
Mo 97	9.60	89.63	FP	699(b)	103	MoO ₃
Mo 98	24.00	95.0	R-T	58(a)	486	MoO ₃
Mo 98	24.00	89.9	R-T	58(b)	393	MoO ₃
Mo 98	24.00	96.3	AW	168(a)	459	MoO ₃
Mo 98	24.00	*	FP	700(a)	536	MoO ₃
Mo 100	9.67	90.24	R-T	59(ar)	200	MoO ₃
Mo 100	9.67	90.20	R-T	59(b)	240	MoO ₃
Mo 100	9.67	93.0	AW	169(a)	25	MoO ₃
Mo 100	9.67	86.65	FP	701(a)	203	MoO ₃
Neodymium						
Nd 142	26.83	93.00	EQ	587(a)	70	Nd ₂ O ₃
Nd 142	26.83	**	FX	738(a)		

* - Analysis Incomplete

** - Refinement Incomplete

ELECTROMAGNETICALLY CONCENTRATED ISOTOPES

Element and Isotope	ISOTOPIC ABUNDANCE (atom percent)		Series	Sample	AVAILABLE FOR SHIPMENT	
	Natural	Enriched			Element Weight (milligrams)	Product Form
Neodymium (Cont'd)						
Nd 143	12.10	83.93	EQ	588(a)	102	Nd ₂ O ₃
Nd 143	12.10	**	FX	739(a)		
Nd 144	23.95	93.45	EQ	589(a)	91	Nd ₂ O ₃
Nd 144	23.95	**	FX	740(a)		
Nd 145	8.36	78.60	EQ	590(a)	187	Nd ₂ O ₃
Nd 145	8.36	**	FX	741(a)		
Nd 146	17.29	95.60	EQ	591(a)	62	Nd ₂ O ₃
Nd 146	17.29	**	FX	742(a)		
Nd 148	5.80	89.85	EQ	592(a)	0	
Nd 148	5.80	**	FX	743(a)		
Nd 150	5.67	94.76	EQ	593(a)	0	
Nd 150	5.67	**	FX	744(a)		
Nickel						
Ni 58	67.4	98.51	K	33(a)	12	NiO
Ni 58	67.4	99.3	AS-AT	141-147(a)	34	NiO
Ni 58	67.4	98.36	DF	422(a)	5,485	NiO
Ni 58	67.4	**	FJ	669(a)		
Ni 60	26.7	94.4	J	28(a)	18	NiO
Ni 60	26.7	94.4	J	28(ar)	190	NiO
Ni 60	26.7	87.10	K	34(a)	680	NiO
Ni 60	26.7	97.7	AS-AT	142-148(a)	0	
Ni 60	26.7	**	FJ	670(a)		

* - Analysis Incomplete

** - Refinement Incomplete

ELECTROMAGNETICALLY CONCENTRATED ISOTOPES

Element and Isotope	ISOTOPIIC ABUNDANCE (atom percent)		Series	Sample	AVAILABLE FOR SHIPMENT	
	Natural	Enriched			Element Weight (milligrams)	Product Form
Nickel (Cont'd)						
Ni 61	1.2	34.42	K	35(a)	28	NiO
Ni 61	1.2	80.9	AS-AT	143-149(a)	0	
Ni 61	1.2	*	FJ	671(a)	570	NiO
Ni 62	3.8	67.99	K	36(a)	50	NiO
Ni 62	3.8	94.7	AS-AT	144-150(a)	20	NiO
Ni 62	3.8	*	DF	425(br)	30	Ni
Ni 62	3.8	*	FJ	672(a)	1,863	NiO
Ni 64	0.88	85.10	J	32(a)	10	NiO
Ni 64	0.88	97.4	AS-AT	146-152(a)	0	
Ni 64	0.88	*	FJ	674(a)	181	NiO
Potassium						
K 39	93.25	99.5	BJ	237(a)	1,592	KClO ₄
K 39	93.25	99.9	CM	346(a)	35	KCl
K 39	93.25	99.9	CM	346(ar)	9,920	KCl
K 39	93.25	99.94	DA	407(a)	19,428	K ₂ SO ₄
K 39	93.25	99.74	DB	410(a)	5,659	KCl
K 39	93.25	99.89	DT	494(a)	9,384	KCl
K 39	93.25	99.96	EX	621(g)	18,470	KCl
K 39	93.25	99.94	EY	624(i)	24,977	KCl
K 39	93.25	99.83	FA	629(a)	10,473	KCl
K 40	0.011	1.31	DA	408(a)	10	KCl
K 40	0.011	0.40	DB	411(a)	150	KCl

* - Analysis Incomplete

** - Refinement Incomplete

ELECTROMAGNETICALLY CONCENTRATED ISOTOPES

Element and Isotope	ISOTOPIC ABUNDANCE (atom percent)		Series	Sample	AVAILABLE FOR SHIPMENT	
	Natural	Enriched			Element Weight (milligrams)	Product Form
Potassium (Cont'd)						
K 40	0.011	0.40	DB	411(ar)	318	KCl
K 40	0.011	7.13	DT	495(a)	0	
K 40	0.011	3.64	EX	622(u)	7	KCl
K 40	0.011	7.75	EY	625(t)	10	K ₂ SO ₄
K 40	0.011	0.978	FA	630(a)	33	KCl
K 41	6.74	92.9	BJ	239(a)	65	KClO ₄
K 41	6.74	86.8	CM	348(a)	37	KCl
K 41	6.74	98.94	DT	496(a)	604	KCl
K 41	6.74	98.94	DT	496(ar)	65	KCl
K 41	6.74	99.20	EX	623(e)	69	KCl
K 41	6.74	99.21	EY	626(e)	750	KCl
K 41	6.74	87.75	FA	631(a)	540	KCl
Rhenium						
Re 185	37.31	85.38	CP	356(a)	2,512	Re
Re 187	62.69	98.22	CP	357(a)	715	Re
Rubidium						
Rb 85	72.27	95.97	EW	619(a)	3,109	RbCl
Rb 87	27.73	89.62	EW	620(a)	2,025	RbCl
Samarium						
Sm 144	3.13	72.13	EM	567(a)	0	

* - Analysis Incomplete

** - Refinement Incomplete

ELECTROMAGNETICALLY CONCENTRATED ISOTOPES

Element and Isotope	ISOTOPIC ABUNDANCE (atom percent)		Series	Sample	AVAILABLE FOR SHIPMENT	
	Natural	Enriched			Element Weight (milligrams)	Product Form
Samarium (Cont'd)						
Sm 144	3.13	58.93	FH	660(a)	14	Sm ₂ O ₃
Sm 147	15.12	81.63	EM	569(a)	14	Sm ₂ O ₃
Sm 147	15.12	78.35	FH	661(a)	296	Sm ₂ O ₃
Sm 148	11.29	76.01	EM	570(a)	679	Sm ₂ O ₃
Sm 148	11.29	62.40	FH	662(a)	649	Sm ₂ O ₃
Sm 149	13.87	71.53	EM	571(a)	34	Sm ₂ O ₃
Sm 149	13.87	73.01	FH	663(a)	22	Sm ₂ O ₃
Sm 150	7.38	74.09	EM	572(a)	298	Sm ₂ O ₃
Sm 150	7.38	68.04	FH	664(a)	907	Sm ₂ O ₃
Sm 152	26.59	89.90	EM	573(a)	3,261	Sm ₂ O ₃
Sm 152	26.59	93.92	FH	665(a)	138	Sm ₂ O ₃
Sm 154	22.62	92.10	EM	574(a)	2,579	Sm ₂ O ₃
Sm 154	22.62	96.05	FH	666(a)	30	Sm ₂ O ₃
Selenium						
Se 74	0.84	6.5	AK	109(a)	10	Se
Se 74	0.84	12.3	CY	397(ar)	255	Se
Se 74	0.84	12.08	DY	513(a)	143	Se
Se 74	0.84	18.02	FG	654(a)	90	Se
Se 74	0.84	33.06	FG	654(b)	0	Se
Se 76	9.15	43.5	AN	126(a)	10	Se
Se 76	9.15	41.5	BS	269(a)	600	Se
Se 76	9.15	54.8	CY	398(a)	542	Se

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ELECTROMAGNETICALLY CONCENTRATED ISOTOPES

Element and Isotope	ISOTOPIC ABUNDANCE (atom percent)		Series	Sample	AVAILABLE FOR SHIPMENT	
	Natural	Enriched			Element Weight (milligrams)	Product Form
Selenium (Cont'd)						
Se 76	9.15	54.8	CY	398(ar)	390	Se
Se 76	9.15	57.40	DY	514(a)	89	Se
Se 76	9.15	74.20	FG	655(a)	374	Se
Se 76	9.15	88.51	FG	655(b)	148	Se
Se 77	7.53	50.1	AK	110(a)	99	Se
Se 77	7.53	53.6	BS	270(a)	143	Se
Se 77	7.53	53.6	BS	270(ar)	500	Se
Se 77	7.53	49.4	CY	399(a)	408	Se
Se 77	7.53	58.40	DY	515(a)	52	Se
Se 77	7.53	74.22	FG	656(c)	203	Se
Se 77	7.53	83.16	FG	656(d)	10	Se
Se 77	7.53	86.58	FG	656(e)	10	Se
Se 77	7.53	91.73	FG	656(f)	25	Se
Se 77	7.53	86.00	FG	656(g)	8	Se
Se 78	23.62	79.3	AN	127(a)	68	Se
Se 78	23.62	79.3	AN	127(ar)	104	Se
Se 78	23.62	72.7	BS	271(a)	1,853	Se
Se 78	23.62	81.7	CY	400(a)	707	Se
Se 78	23.62	81.7	CY	400(ar)	1,026	Se
Se 78	23.62	82.56	DY	516(a)	52	Se
Se 78	23.62	90.24	FG	657(b)	376	Se
Se 78	23.62	96.55	FG	657(d)	145	Se
Se 80	49.97	86.7	AK	111(a)	281	Se

* - Analysis Incomplete

** - Refinement Incomplete

ELECTROMAGNETICALLY CONCENTRATED ISOTOPES

Element and Isotope	ISOTOPIC ABUNDANCE (atom percent)		Series	Sample	AVAILABLE FOR SHIPMENT	
	Natural	Enriched			Element Weight (milligrams)	Product Form
Selenium (Cont'd)						
Se 80	49.97	94.6	BS	272(a)	1,120	Se
Se 80	49.97	94.6	BS	272(ar)	257	Se
Se 80	49.97	91.7	CY	401(a)	1,136	Se
Se 80	49.97	93.76	DY	517(a)	41	Se
Se 80	49.97	96.94	FG	658(a)	1,506	Se
Se 80	49.97	98.39	FG	658(b)	851	Se
Se 82	8.89	49.6	AN	128(a)	96	Se
Se 82	8.89	44.4	BS	273(ar)	1,087	Se
Se 82	8.89	51.6	CY	402(a)	314	Se
Se 82	8.89	51.6	CY	402(ar)	260	Se
Se 82	8.89	52.36	DY	518(a)	1,081	Se
Se 82	8.89	75.74	FG	659(a)	460	Se
Se 82	8.89	89.87	FG	659(b)	140	Se
Silicon						
Si 28	92.17	99.4	AI-AJ	103-106(a)	1,796	SiO ₂
Si 28	92.17	98.1	BW	280(a)	7,510	SiO ₂
Si 28	92.17	99.16	EB	524(a)	9,041	SiO ₂
Si 29	4.71	68.6	AI-AJ	104-107(a)	13	SiO ₂
Si 29	4.71	68.62	EB	525(a)	90	SiO ₂
Si 30	3.12	63.9	AI-AJ	105-108(a)	100	SiO ₂
Si 30	3.12	49.6	BW	282(a)	550	SiO ₂
Si 30	3.12	64.04	EB	526(a)	48	SiO ₂

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** - Refinement Incomplete

ELECTROMAGNETICALLY CONCENTRATED ISOTOPES

Element and Isotope	ISOTOPIC ABUNDANCE (atom percent)		Series	Sample	AVAILABLE FOR SHIPMENT	
	Natural	Enriched			Element Weight (milligrams)	Product Form
Silver						
Ag 107	51.86	98.96	N	41(a)	39	AgCl
Ag 107	51.86	90.26	S-U	41(b)	115	AgCl
Ag 107	51.86	90.26	S-U	41(br)	2,143	Ag
Ag 107	51.86	96.10	EA	522(a)	2,131	AgCl
Ag 109	48.14	95.88	N	42(a)	31	AgCl
Ag 109	48.14	92.16	S-U	42(b)	22	AgCl
Ag 109	48.14	92.16	S-U	42(br)	1,644	Ag
Ag 109	48.14	99.54	EA	523(a)	1,736	AgCl
Strontium						
Sr 84	0.56	63.68	EH	548(a)	0	
Sr 84	0.56	45.95	FL	679(a)	245	SrCO ₃
Sr 86	9.86	69.9	Z	78(ar)	290	SrO
Sr 86	9.86	89.02	EH	549(a)	23	Sr(NO ₃) ₂
Sr 86	9.86	*	FL	680(a)	1,380	SrCO ₃
Sr 87	7.02	60.03	EH	550(a)	0	
Sr 87	7.02	*	FL	681(a)	1,460	SrCO ₃
Sr 88	82.6	98.9	Z	79(a)	1,049	SrO
Sr 88	82.6	99.5	BL	248(a)	322	SrSO ₄
Sr 88	82.6	99.67	EH	551(a)	39	Sr(NO ₃) ₂
Sr 88	82.6	99.63	FL	682(a)	13,480	SrCO ₃

* - Analysis Incomplete

** - Refinement Incomplete

ELECTROMAGNETICALLY CONCENTRATED ISOTOPES

Element and Isotope	ISOTOPIC ABUNDANCE (atom percent)		Series	Sample	AVAILABLE FOR SHIPMENT	
	Natural	Enriched			Element Weight (milligrams)	Product Form
Sulfur						
S 32	94.89	97.90	CX	391(a)	215	S
S 32	94.89	98.45	ES	596(a)	7,463	CdS
S 33	0.80	5.54	CX	392(a)	66	S
S 33	0.80	9.8	ES	597(a)	0	
S 34	4.29	20.65	CX	393(a)	0	
S 34	4.29	5.38	CX	393(b)	59	S
S 34	4.29	14.92	ES	598(a)	1,099	CdS
S 36	0.02	0.88	ES	599(a)	24	CdS
Tellurium						
Te 120	0.094	22.3	DX	505(a)	0	
Te 120	0.094	19.90	FE	640(a)	12	Te
Te 122	2.46	77.8	AU	154(a)	19	Te
Te 122	2.46	86.24	DX	506(a)	140	Te
Te 122	2.46	81.72	FE	641(a)	240	Te
Te 123	0.86	34.9	AU	155(a)	7	Te
Te 123	0.86	60.91	DX	507(a)	67	Te
Te 123	0.86	48.58	FE	642(a)	114	Te
Te 124	4.67	72.5	AU	156(a)	56	Te
Te 124	4.67	83.9	CA	295(a)	198	Te
Te 124	4.67	21.8	CA	295(b)	225	Te
Te 124	4.67	76.47	DX	508(a)	555	Te
Te 124	4.67	81.34	FE	643(a)	650	Te

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ELECTROMAGNETICALLY CONCENTRATED ISOTOPES

Element and Isotope	ISOTOPIC ABUNDANCE (atom percent)		Series	Sample	AVAILABLE FOR SHIPMENT	
	Natural	Enriched			Element Weight (milligrams)	Product Form
Tellurium (Cont'd)						
Te 125	6.97	81.1	AU	157(a)	38	Te
Te 125	6.97	87.9	CA	296(ar)	2,130	Te
Te 125	6.97	40.5	CA	296(b)	264	Te
Te 125	6.97	80.53	FE	644(a)	1,262	Te
Te 126	18.69	93.2	AU	158(a)	1,496	Te
Te 126	18.69	95.4	CA	297(a)	1,547	Te
Te 126	18.69	95.4	CA	297(ar)	943	Te
Te 126	18.69	79.0	CA	297(b)	914	Te
Te 126	18.69	89.68	DX	510(b)	4,411	Te
Te 126	18.69	93.46	FE	645(a)	3,261	Te
Te 128	31.81	93.5	AU	159(a)	1,156	Te
Te 128	31.81	94.4	CA	298(a)	8,795	Te
Te 128	31.81	94.4	CA	298(ar)	714	Te
Te 128	31.81	91.8	CA	298(b)	1,594	Te
Te 128	31.81	94.0	CA	298(c)	111	Te
Te 128	31.81	82.32	DX	511(a)	5,760	Te
Te 128	31.81	96.47	FE	646(a)	4,881	Te
Te 130	34.44	93.0	AU	160(a)	530	Te
Te 130	34.44	97.4	CA	299(a)	7,905	Te
Te 130	34.44	93.5	CA	299(br)	950	Te
Te 130	34.44	78.23	DX	512(a)	4,936	Te
Te 130	34.44	97.78	FE	647(a)	4,412	Te

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ELECTROMAGNETICALLY CONCENTRATED ISOTOPES

Element and Isotope	ISOTOPIC ABUNDANCE (atom percent)		Series	Sample	AVAILABLE FOR SHIPMENT	
	Natural	Enriched			Element Weight (milligrams)	Product Form
Thallium						
Tl 203	29.51	75.6	BV-3	278(a)	194	Tl ₂ O ₃
Tl 203	29.51	47.9	BY-3	286(a)	6,875	Tl ₂ O ₃
Tl 203	29.51	58.8	CC-3	307(a)	601	Tl ₂ O ₃
Tl 203	29.51	86.0	CF-3	322(a)	1,170	Tl ₂ O ₃
Tl 203	29.51	34.1	CG-3	324(a)	106	Tl ₂ O ₃
Tl 205	70.49	89.5	BR-3	267(a)	1,436	Tl ₂ O ₃
Tl 205	70.49	95.2	BV-3	279(a)	1,047	Tl ₂ O ₃
Tl 205	70.49	98.7	BX	285(a)	940	Tl ₂ O ₃
Tl 205	70.49	86.1	CC-3	308(a)	577	Tl ₂ O ₃
Tl 205	70.49	95.6	CF-3	323(a)	176	Tl ₂ O ₃
Tl 205	70.49	91.8	CH-3	327(a)	1,594	Tl ₂ O ₃
Tl 205	70.49	90.5	CJ-3	333(a)	3,818	Tl ₂ O ₃
Tin						
Sn 112	1.00	72.49	EC	527(a)	0	
Sn 112	1.00	72.49	EC	527(au)	42	Sn
Sn 112	1.00	*	FS	710(a)	180	SnO ₂
Sn 114	0.68	50.03	EC	528(a)	138	SnO ₂
Sn 114	0.68	*	FS	711(a)	77	SnO ₂
Sn 115	0.44	4.5	BI	229(a)	28	SnO ₂
Sn 115	0.44	14.0	EC	529(a)	535	SnO ₂
Sn 115	0.44	*	FS	712(a)	57	SnO ₂
Sn 115	0.44	**	FS	712(b)		

* - Analysis Incomplete

** - Refinement Incomplete

ELECTROMAGNETICALLY CONCENTRATED ISOTOPES

Element and Isotope	ISOTOPIC ABUNDANCE (atom percent)		Series	Sample	AVAILABLE FOR SHIPMENT	
	Natural	Enriched			Element Weight (milligrams)	Product Form
Tin (Cont'd)						
Sn 116	14.40	74.5	AY	176(a)	116	SnO ₂
Sn 116	14.40	58.4	BC	198(a)	388	SnO ₂
Sn 116	14.40	43.2	BI	230(a)	304	SnO ₂
Sn 116	14.40	89.57	CR	363(a)	4,144	SnO ₂
Sn 116	14.40	92.64	EC	530(a)	7,284	SnO ₂
Sn 116	14.40	*	FS	713(a)	4,420	SnO ₂
Sn 116	14.40	**	FS	713(b)		
Sn 117	7.68	75.3	BI	231(b)	288	SnO ₂
Sn 117	7.68	73.93	CR	364(a)	4,748	SnO ₂
Sn 117	7.68	77.07	EC	531(a)	4,482	SnO ₂
Sn 117	7.68	*	FS	714(a)	2,604	SnO ₂
Sn 117	7.68	**	FS	714(b)		
Sn 118	24.07	69.3	AL	117(a)	918	SnO ₂
Sn 118	24.07	90.1	AY	178(a)	1,014	SnO ₂
Sn 118	24.07	91.8	BC	200(a)	63	SnO ₂
Sn 118	24.07	84.6	BI	232(a)	1,020	SnO ₂
Sn 118	24.07	93.26	CR	365(a)	8,510	SnO ₂
Sn 118	24.07	94.91	EC	532(a)	13,126	SnO ₂
Sn 118	24.07	*	FS	715(a)	11,804	SnO ₂
Sn 118	24.07	**	FS	715(b)		
Sn 119	8.63	77.1	AY	179(a)	93	SnO ₂
Sn 119	8.63	64.4	BC	201(a)	382	SnO ₂
Sn 119	8.63	78.5	BI	233(a)	166	SnO ₂

* - Analysis Incomplete

** - Refinement Incomplete

ELECTROMAGNETICALLY CONCENTRATED ISOTOPES

Element and Isotope	ISOTOPIC ABUNDANCE (atom percent)		Series	Sample	AVAILABLE FOR SHIPMENT	
	Natural	Enriched			Element Weight (milligrams)	Product Form
Tin (Cont'd)						
Sn 119	8.63	78.25	CR	366(a)	5,024	SnO ₂
Sn 119	8.63	79.82	EC	533(a)	18,057	SnO ₂
Sn 119	8.63	*	FS	716(a)	4,400	SnO ₂
Sn 119	8.63	**	FS	716(b)		
Sn 120	32.53	93.5	AL	119(a)	420	SnO ₂
Sn 120	32.53	95.4	AY	180(a)	1,588	SnO ₂
Sn 120	32.53	72.6	BC	202(a)	3,155	SnO ₂
Sn 120	32.53	53.6	BI	234(a)	1,760	SnO ₂
Sn 120	32.53	97.01	CR	367(a)	18,120	SnO ₂
Sn 120	32.53	98.14	EC	534(a)	18,026	SnO ₂
Sn 120	32.53	*	FS	717(a)	16,587	SnO ₂
Sn 120	32.53	**	FS	717(b)		
Sn 122	4.68	45.8	BI	235(a)	13	SnO ₂
Sn 122	4.68	83.66	CR	368(a)	2,545	SnO ₂
Sn 122	4.68	88.92	EC	535(a)	2,235	SnO ₂
Sn 122	4.68	88.92	EC	535(au)	241	Sn
Sn 122	4.68	*	FS	718(a)	493	SnO ₂
Sn 122	4.68	**	FS	718(b)		
Sn 124	5.89	71.0	BI	236(ar)	125	SnO ₂
Sn 124	5.89	83.1	CR	369(au)	49	Sn
Sn 124	5.89	95.04	EC	536(a)	30	SnO ₂
Sn 124	5.89	95.04	EC	536(as)	1,410	Sn
Sn 124	5.89	*	FS	719(a)	531	SnO ₂

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ELECTROMAGNETICALLY CONCENTRATED ISOTOPES

Element and Isotope	ISOTOPIC ABUNDANCE (atom percent)		Series	Sample	AVAILABLE FOR SHIPMENT	
	Natural	Enriched			Element Weight (milligrams)	Product Form
Tin (Cont'd)						
Sn 124	5.89	**	FS	719(b)		
Titanium						
Ti 46	7.97	84.26	BF	215(ar)	83	TiO ₂
Ti 46	7.97	82.68	EN	576(a)	309	TiO ₂
Ti 47	7.41	82.05	BF	216(a)	28	TiO ₂
Ti 47	7.41	82.05	BF	216(ar)	99	TiO ₂
Ti 47	7.41	63.11	EN	577(a)	944	TiO ₂
Ti 48	73.50	99.23	BF	217(a)	50	TiO ₂
Ti 48	73.50	98.90	EN	578(a)	22,908	TiO ₂
Ti 49	5.64	77.62	BF	218(a)	37	TiO ₂
Ti 49	5.64	77.62	BF	218(ar)	55	TiO ₂
Ti 50	5.48	84.69	BF	219(a)	0	
Ti 50	5.48	81.44	EN	580(a)	380	TiO ₂
Tungsten						
W 180	0.16	9.00	BG	220(a)	0	
W 180	0.16	4.95	CL	340(a)	41	WO ₃
W 180	0.16	4.95	CL	340(ar)	54	WO ₃
W 180	0.16	6.95	EL	561(a)	275	WO ₃
W 182	26.21	94.25	BG	221(a)	46	WO ₃
W 182	26.21	91.58	CL	341(a)	1,639	WO ₃
W 182	26.21	92.33	EL	562(a)	10,990	WO ₃

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ELECTROMAGNETICALLY CONCENTRATED ISOTOPES

Element and Isotope	ISOTOPIC ABUNDANCE (atom percent)		Series	Sample	AVAILABLE FOR SHIPMENT	
	Natural	Enriched			Element Weight (milligrams)	Product Form
Tungsten (Cont'd)						
W 183	14.33	86.21	BG	222(a)	217	WO ₃
W 183	14.33	82.01	CL	342(a)	745	WO ₃
W 183	14.33	82.63	EL	563(a)	5,664	WO ₃
W 184	30.61	95.72	BG	223(a)	390	WO ₃
W 184	30.61	91.14	CL	343(a)	106	WO ₃
W 184	30.61	91.14	CL	343(ar)	2,579	WO ₃
W 184	30.61	95.06	EL	564(a)	10,974	WO ₃
W 186	28.69	97.94	BG	224(a)	92	WO ₃
W 186	28.69	97.17	CL	344(a)	616	WO ₃
W 186	28.69	97.17	CL	344(ar)	372	WO ₃
W 186	28.69	97.54	EL	565(a)	10,441	WO ₃
Vanadium						
V 50	0.28	22.83	FM	683(b)	50	V ₂ O ₅
V 51	99.72	*	FB	633(a)	2,500	V ₂ O ₅
V 51	99.72	*	FM	684(a)	26,250	V ₂ O ₅
Zinc						
Zn 64	49.18	83.8	AG	97(a)	394	ZnO
Zn 64	49.18	93.12	EK	556(a)	7,472	ZnO
Zn 66	27.76	78.4	AH	100(a)	712	ZnO
Zn 66	27.76	93.79	EK	557(a)	7,700	ZnO
Zn 67	4.05	56.0	BK	242(a)	102	ZnO

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ELECTROMAGNETICALLY CONCENTRATED ISOTOPES

Element and Isotope	ISOTOPIC ABUNDANCE (atom percent)		Series	Sample	AVAILABLE FOR SHIPMENT	
	Natural	Enriched			Element Weight (milligrams)	Product Form
Zinc (Cont'd)						
Zn 67	4.05	60.46	EK	558(a)	1,303	ZnO
Zn 68	18.40	95.47	EK	559(a)	6,328	ZnO
Zn 70	0.61	32.9	AH	102(a)	20	ZnO
Zn 70	0.61	32.0	BK	244(a)	39	ZnO
Zn 70	0.61	48.40	EK	560(a)	180	ZnO
Zirconium						
Zr 90	50.83	91.7	AA	80(a)	18	ZrO ₂
Zr 90	50.83	91.7	AA	80(ar)	460	ZrO ₂
Zr 90	50.83	98.0	CK	334(a)	7,045	ZrO ₂
Zr 90	50.83	98.0	CK	334(ar)	1,878	ZrO ₂
Zr 90	50.83	95.6	CV	381(a)	3,612	ZrO ₂
Zr 90	50.83	98.66	EE	539(a)	11,487	ZrO ₂
Zr 91	11.21	54.4	AA	81(a)	50	ZrO ₂
Zr 91	11.21	54.4	AA	81(ar)	100	ZrO ₂
Zr 91	11.21	86.6	CK	335(a)	33	ZrO ₂
Zr 91	11.21	86.6	CK	335(ar)	1,856	ZrO ₂
Zr 91	11.21	75.1	CV	382(a)	839	ZrO ₂
Zr 92	17.18	92.7	CK	336(a)	287	ZrO ₂
Zr 92	17.18	92.7	CK	336(ar)	1,951	ZrO ₂
Zr 92	17.18	89.8	CV	383(a)	1,099	ZrO ₂
Zr 92	17.18	95.38	EE	541(a)	5,562	ZrO ₂
Zr 94	17.79	82.1	AA	83(a)	94	ZrO ₂

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ELECTROMAGNETICALLY CONCENTRATED ISOTOPES

Element and Isotope	ISOTOPIC ABUNDANCE (atom percent)		Series	Sample	AVAILABLE FOR SHIPMENT	
	Natural	Enriched			Element Weight (milligrams)	Product Form
Zirconium (Cont'd)						
Zr 94	17.79	82.1	AA	83(ar)	40	ZrO ₂
Zr 94	17.79	92.8	CK	337(a)	68	ZrO ₂
Zr 94	17.79	92.8	CK	337(ar)	1,694	ZrO ₂
Zr 94	17.79	80.9	CV	384(a)	861	ZrO ₂
Zr 94	17.79	97.92	EE	542(a)	5,269	ZrO ₂
Zr 96	2.99	40.6	ZZ	84(a)	22	ZrO ₂
Zr 96	2.99	74.6	CK	388(ar)	20	ZrO ₂
Zr 96	2.99	89.48	EE	543(a)	0	ZrO ₂

* - Analysis Incomplete

** - Refinement Incomplete