

*Third Report of the Committee on Atoms of the International Union
of Chemistry.*

Chairman : F. W. ASTON.

Members : N. BOHR, O. HAHN, W. D. HARKINS, G. URBAIN.

During the past year accurate knowledge of the relative abundance of isotopes has been greatly advanced by the fine work of Nier with an apparatus specially designed for the purpose. The following changes are recommended.

KRYPTON and XENON.—The percentage figures deduced from Nier's electrical measurements are adopted in place of those obtained by photometry ten years ago. The changes are small (A. O. Nier, *Physical Rev.*, 1937, **52**, 933).

NEODYMIUM.—More accurate photometric measurements are now available (J. Mat-
tauch and V. Hauk, *Naturwiss.*, 1937, **25**, 780).

TUNGSTEN.—A new rare isotope 180 has been discovered (A. J. Dempster, *Physical Rev.*, 1937, **52**, 1074).

OSMIUM.—Better determinations of relative abundance are now available and a new, very rare isotope 184 has been discovered (A. O. Nier, *ibid.*, p. 885).

MERCURY.—Electrical measurements indicate the absence of isotopes 197 and 203 previously reported and give more reliable figures for the abundance of the others (A. O. Nier, *ibid.*, p. 933).

LEAD.—Accurate analyses of ordinary lead have revealed unexpected variations in its isotopic constitution. The figures for the geologically oldest samples are, however, constant and these have been adopted (A. O. Nier, *Bull. Amer. Phys. Soc.*, 1938, **13**, 17).

International Table of Stable Isotopes for 1938.

(Numbers in italics are rough or indirect measurements, in parentheses doubtful. w = weak isotope, abundance not determined.)

Symbol.	Atomic Number (Z).	Mass Number (M).	Relative Abundance (%).	Symbol.	Atomic Number (Z).	Mass Number (M).	Relative Abundance (%).
H	1	1	99.98	Al	13	27	100
D		2	0.02	Si	14	28	89.6
He	2	4	100			29	6.2
Li	3	6	7.9			30	4.2
		7	92.1	P	15	31	100
Be	4	9	100	S	16	32	96
						33	1
						34	3
B	5	10	20	Cl	17	35	76
		11	80			37	24
C	6	12	99.3	A	18	36	0.31
		13	0.7			38	0.06
N	7	14	99.62			40	99.63
		15	0.38	K	19	39	93.4
O	8	16	99.76			40	0.01
		17	0.04			41	6.6
		18	0.20	Ca	20	40	96.76
F	9	19	100			42	0.77
Ne	10	20	90.00			43	0.17
		21	0.27			44	2.30
		22	9.73	Sc	21	45	100
Na	11	23	100	Ti	22	46	8.5
Mg	12	24	77.4			47	7.8
		25	11.5			48	71.3
		26	11.1			49	5.5
						50	6.9

Symbol.	Atomic Number (Z).	Mass Number (M).	Relative Abundance (%).	Symbol.	Atomic Number (Z).	Mass Number (M).	Relative Abundance (%).		
V	23	51	100	Ru	44	96	5		
Cr	24	50	4.9			(98)			
		52	81.6			99	12		
		53	10.4			100	14		
		54	3.1			101	22		
Mn	25	55	100			102	30		
						104	17		
Fe	26	54	6.5	Rh	45	101	0.1		
		56	90.2			103	99.9		
		57	2.8						
		58	0.5						
Co	27	57	0.2	Pd	46	102	0.8		
		59	99.8			104	9.3		
						105	22.6		
		106	27.2						
Ni	28	58	66.4			108	26.8		
		60	26.7			110	13.5		
		61	1.6	Ag	47	107	52.5		
		62	3.7			109	47.5		
64	1.6								
Cu	29	63	68	Cd	48	106	1.5		
		65	32			108	1.0		
Zn	30	64	50.4			110	15.6		
		66	27.2			111	15.2		
		67	4.2			112	22.0		
		68	17.8			113	14.7		
		70	0.4			114	24.0		
Ga	31	69	61.2	In	49	116	6.0		
		71	38.8			113	4.5		
						115	95.5		
Ge	32	70	21.2	Sn	50	112	1.1		
		72	27.3			114	0.8		
		73	7.9			115	0.4		
		74	37.1			116	15.5		
		76	6.5			117	9.1		
As	33	75	100			118	22.5		
Se	34	74	0.9			119	9.8		
		76	9.5			120	28.5		
		77	8.3			122	5.5		
		78	24.0			124	6.8		
		80	48.0	Sb	51	121	56		
		82	9.3			123	44		
		Br	35	79	50.6	Te	52	120	w
81	49.4			122	2.9				
Kr	36	78	0.35	123	1.6				
		80	2.01	124	4.5				
		82	11.53	125	6.0				
		83	11.53	126	19.0				
		84	57.11	128	32.8				
		86	17.47	130	33.1				
Rb	37	85	72.8	I	53			127	100
		87	27.2						
Sr	38	84	0.5	Xe	54	124	0.094		
		86	9.6			126	0.088		
		87	7.5			128	1.90		
		88	82.4			129	26.23		
Y	39	89	100					130	4.07
								131	21.17
								132	26.96
Zr	40	90	48					134	10.54
		91	11.5					136	8.95
		92	22			Cs	55	133	100
		94	17						
		96	1.5						
Nb [Cb]	41	93	100	Ba	56	130	0.16		
		92	14.2			132	0.015		
Mo	42	94	10.0			134	1.72		
		95	15.5			135	5.7		
		96	17.8			136	8.5		
		97	9.6			137	10.8		
		98	23.0			138	73.1		
				100	9.8	La	57	139	100

Symbol.	Atomic Number (Z).	Mass Number (M).	Relative Abundance (%).	Symbol.	Atomic Number (Z).	Mass Number (M).	Relative Abundance (%).		
Ce	58	136	w	Hf	72	176	5		
		138	w			177	19		
		140	89			178	28		
		142	11			179	18		
Pr	59	141	100			180	30		
Nd	60	142	25.95	Ta	73	181	100		
		143	13.0	W	74	180	0.2		
		144	22.6			182	22.6		
		145	9.2			183	17.3		
		146	16.5			184	30.1		
		148	6.8			186	29.8		
		150	5.95			Re	75	185	38.2
Sm	62	144	3			187	61.8		
		147	17	Os	76	184	0.018		
		148	14			186	1.58		
		149	15			187	1.64		
		150	5			188	13.3		
		152	26			189	16.2		
		154	20			190	26.4		
Eu	63	151	50.6			192	40.9		
		153	49.4	Ir	77	191	38.5		
Gd	64	155	21			193	61.5		
		156	23	Pt	78	192	0.8		
		157	17			194	30.2		
		158	23			195	35.3		
		160	16			196	26.6		
		198	7.2						
Tb	65	159	100	Au	79	197	100		
Dy	66	161	22	Hg	80	196	0.15		
		162	25			198	10.11		
		163	25			199	17.03		
		164	28			200	23.26		
Ho	67	165	100			201	13.17		
Er	68	166	36			202	29.56		
		167	24			204	6.72		
		168	30	Tl	81	203	29.4		
		170	10			205	70.6		
Tm	69	169	100	Pb	82	204	1.5		
						206	23.5		
Yb	70	171	9					207	22.7
		172	24					208	52.3
		173	17	Bi	83	209	100		
		174	38	Th	90	232	(100)		
		176	12	U	92	235	< 1		
Lu [Cp]	71	175	100			238	> 99		