

6.1: Atomic Weights

Atomic Weights

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[2016. Scaled to an atomic weight of 12 for carbon-12 (^{12}C), where ^{12}C is a neutral atom in its nuclear and electronic ground state, having the result that atomic weight values are dimensionless.]

The atomic weights of many elements are not invariant, but depend on the origin and treatment of the material. The standard atomic weights apply to elements of natural terrestrial origin. Although the atomic weights of some elements in some naturally occurring materials may differ from given values because of a variation in the mole fractions of an element's stable isotopes, the last significant figure of each tabulated value is considered reliable to ± 1 except for zinc, which is ± 2 . For twelve of these elements, both a conventional atomic weight and an atomic weight interval is given with the symbol [a, b] to denote the set of atomic weight values in normal materials; thus, $a \leq \text{atomic weight} \leq b$. For lithium, the conventional atomic weight is only three digits because of the large variation found in lithium-bearing reagents.

Atomic Number	Element Name	Symbol	Standard Atomic Weight	Conventional Atomic Weight
1	hydrogen	H	[1.007, 1.009]	1.008
2	helium	He	4.003	
3	lithium	Li	[6.938, 6.997]	6.94
4	beryllium	Be	9.012	
5	boron	B	[10.80, 10.83]	10.81
6	carbon	C	[12.00, 12.02]	12.01
7	nitrogen	N	[14.00, 14.01]	14.01
8	oxygen	O	[15.99, 16.00]	16.00
9	fluorine	F	19.00	
10	neon	Ne	20.18	
11	sodium	Na	22.99	
12	magnesium	Mg	[24.30, 24.31]	24.31
13	aluminium (aluminum)	Al	26.98	
14	silicon	Si	[28.08, 28.09]	28.09
15	phosphorus	P	30.97	
16	sulfur	S	[32.05, 32.08]	32.06
17	chlorine	Cl	[35.44, 35.46]	35.45
18	argon	Ar	39.95	
19	potassium	K	39.10	
20	calcium	Ca	40.08	
21	scandium	Sc	44.96	
22	titanium	Ti	47.87	
23	vanadium	V	50.94	

Atomic Number	Element Name	Symbol	Standard Atomic Weight	Conventional Atomic Weight
24	chromium	Cr	52.00	
25	manganese	Mn	54.94	
26	iron	Fe	55.85	
27	cobalt	Co	58.93	
28	nickel	Ni	58.69	
29	copper	Cu	63.55	
30	zinc	Zn	65.38	
31	gallium	Ga	69.72	
32	germanium	Ge	72.63	
33	arsenic	As	74.92	
34	selenium	Se	78.97	
35	bromine	Br	[79.90, 79.91]	79.90
36	krypton	Kr	83.80	
37	rubidium	Rb	85.47	
38	strontium	Sr	87.62	
39	yttrium	Y	88.91	
40	zirconium	Zr	91.22	
41	niobium	Nb	92.91	
42	molybdenum	Mo	95.95	
43	technetium*	Tc		
44	ruthenium	Ru	101.1	
45	rhodium	Rh	102.9	
46	palladium	Pd	106.4	
47	silver	Ag	107.9	
48	cadmium	Cd	112.4	
49	indium	In	114.8	
50	tin	Sn	118.7	
51	antimony	Sb	121.8	
52	tellurium	Te	127.6	
53	iodine	I	126.9	
54	xenon	Xe	131.3	
55	caesium (cesium)	Cs	132.9	
56	barium	Ba	137.3	
57	lanthanum	La	138.9	

Atomic Number	Element Name	Symbol	Standard Atomic Weight	Conventional Atomic Weight
58	cerium	Ce	140.1	
59	praseodymium	Pr	140.9	
60	neodymium	Nd	144.2	
61	promethium*	Pm		
62	samarium	Sm	150.4	
63	europium	Eu	152.0	
64	gadolinium	Gd	157.3	
65	terbium	Tb	158.9	
66	dysprosium	Dy	162.5	
67	holmium	Ho	164.9	
68	erbium	Er	167.3	
69	thulium	Tm	168.9	
70	ytterbium	Yb	173.1	
71	lutetium	Lu	175.0	
72	hafnium	Hf	178.5	
73	tantalum	Ta	180.9	
74	tungsten	W	183.8	
75	rhenium	Re	186.2	
76	osmium	Os	190.2	
77	iridium	Ir	192.2	
78	platinum	Pt	195.1	
79	gold	Au	197.0	
80	mercury	Hg	200.6	
81	thallium	Tl	[204.3, 204.4]	204.4
82	lead	Pb	207.2	
83	bismuth*	Bi	209.0	
84	polonium*	Po		
85	astatine*	At		
86	radon*	Rn		
87	francium*	Fr		
88	radium*	Ra		
89	actinium*	Ac		
90	thorium*	Th	232.0	
91	protactinium*	Pa	231.0	

Atomic Number	Element Name	Symbol	Standard Atomic Weight	Conventional Atomic Weight
92	uranium*	U	238.0	
93	neptunium*	Np		
94	plutonium*	Pu		
95	americium*	Am		
96	curium*	Cm		
97	berkelium*	Bk		
98	californium*	Cf		
99	einsteinium*	Es		
100	fermium*	Fm		
101	mendelevium*	Md		
102	nobelium*	No		
103	lawrencium*	Lr		
104	rutherfordium*	Rf		
105	dubnium*	Db		
106	seaborgium*	Sg		
107	bohrium*	Bh		
108	hassium*	Hs		
109	meitnerium*	Mt		
110	darmstadtium*	Ds		
111	roentgenium*	Rg		
112	copernicium*	Cn		
113	nihonium*	Nh		
114	flerovium*	Fl		
115	moscovium*	Mc		
116	livermorium*	Lv		
117	tennessine*	Ts		
118	oganeson*	Og		

*Element has no stable isotopes, only radioactive isotopes, and an atomic weight cannot be determined. However, four such elements (Bi, Th, Pa, and U) do have a characteristic terrestrial isotopic composition, and for these a standard atomic weight is tabulated.

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