Standard Atomic Weights of the Elements (1988)

The atomic weights listed below are in atomic mass units (amu) relative to $^{12}C = 12$. The atomic weights of many elements are not invariant but depend on the origin and treatment of the material. The footnotes given below elaborate the types of variation to be expected for individual elements. The values given apply to elements as they exist naturally on earth and to certain artificial elements. When used with due regard to the footnotes they are considered reliable to ±1 in the last digit unless another error limit is mentioned under "Comments." Values in parentheses are used for radioactive elements whose atomic weights cannot be quoted precisely without knowledge of the origin of the elements; the value given is the atomic mass number of the isotope of that element of longest known half-life.

Footnotes to Table

Source: International Union of Pure and Applied Chemistry.

(a) Radioactive element that lacks a characteristic terrestrial isotopic composition. (b) Geologically exceptional specimens are known in which the element has an isotopic composition outside the limits for "normal" material. The difference between the atomic weight of the element in such specimens and that given in the table may exceed considerably the implied uncertainty. (c) Range in isotopic composition of normal terrestrial material prevents a more precise atomic weight being given; tabulated value should be applicable to any "normal" material. (d) Modified isotopic compositions may be found in commercially available material because it has been subjected to an undisclosed or inadvertent isotopic separation. Substantial deviations in atomic weight of the element from that given in the table can occur. (e) An element without stable nuclide(s), exhibiting a range of characteristic terrestrial compositions of long-lived radionuclide(s) such that a meaningful atomic weight can be given.

Symbol	Atomic number	Atomic weight	Comments
Ac*	89	227.0278	(a)
Ag	47	107.8682	(b), ±2
Al	13	26.981539	±5
Am*	95	(243.0614)	(a)
Ar	18	39.948	(b,c)
As	33	74.92159	±2
At*	85	(209.9871)	(a)
Au	79	196.96654	±3
B	5	10.811	(b,c,d), ±5
Ba	56	137.327	±7
Be	4	9.012182	±3
Bi	83	208.98037	±3
Bk*	97	(247.0703)	(a)
Br	35	79.904	
C	6	12.011	(c)
Ca	20	40.078	(b), ±4
Cd	48	112.411	(b), ±8
Ce	58	140.115	(b), ±4
Cf*	98	(251.0796)	(a)
Cl	17	35.4527	±9
Cm*	96	(247.0703)	(a)
Co	27	58.93320	
Cr	24	51.9961	±6
Cs	55	132.90543	±5
Cu	29	63.546	(c), ±3
Dy	66	162.50	(b), ±3
Er	68	167.26	(b), ±3
Es*	99	(252.083)	(a)
Eu	63	151.965	(b), ±9
F	9	18.9984032	±9
Fe	26	55.847	±3
Fm*	100	(257.0951)	(a)
Fr*	87	(223.0197)	(a)
Ga	31	69.723	±4
Gd	64	157.25	(b), ±3
Ge	32	72.61	(a), ±2
H	1	1.00794	(b,c,d), ±7
He	2	4.002602	(b,c), ±2
Hf	72	178.49	±2
Hg	80	200.59	±3
Ho	67	164.93032	±3
I	53	126.90447	±3
In	49	114.82	
Ir	77	192.22	±3
K	19	39.0983	
Kr	36	83.80	(b,d)
La	57	138.9055	(b), ±2
Li	3	6.941	(b,c,d), ±2
Lr*	103	(260.105)	(a)
Lu	71	174.967	(b)
Md*	101	(258.10)	(a)
Mg	12	24.3050	±6
Mn	25	54.93805	
Mo	42	95.94	(b,c), ± 7
N	7	14.00674	(b,c), ±7
Na	11	22.989768	
Nb	41	92.90638	±2
Nd	60	144.24	(b), ±3
Ne	10	20.1797	(b,d), ±6
Ni	28	58.69	
No*	102	(259.1009)	(a)
Np*	93	237.0482	(a)
O	8	15.9994	(b,c), ±3
Os	76	190.2	(b)
P	15	30.973762	±4
Pa*	91	231.03588	(e), ±2
Pb	82	207.2	(b,c)
Pd	46	106.42	(b)
Pm*	61	(144.9127)	(a)
Po*	84	(208.9824)	(a)
Pr	59	140.90765	±3
Pt	78	195.08	±3
Pu*	94	(244.0642)	(a)
Ra*	88	226.0254	(a,b)
Rb	37	85.4678	(b), ±3
Re	75	186.207	
Rh	45	102.90550	±3
Rn*	86	(222.0716)	(a)
Ru	44	101.07	(b), ±2
S	16	32.066	(c), ±6
Sb	51	121.75	±3
Sc	21	44.955910	±9
Se	34	78.96	±3
Si	14	28.0855	(c), ±3
Sm	62	150.36	(b), ±3
Sn	50	118.710	(b), ±7
Sr	38	87.62	(b,c)
Ta	73	180.9479	
Tb	65	158.92534	±3
Tc*	43	(97.9072)	(a)
Te	52	127.60	(b), ±3
Th*	90	232.0381	(b,c,e)
Ti	22	47.88	±3
Tl	81	204.3833	(a), ±2
Tm	69	168.93421	±3
U*	92	238.0289	(b,d,e)
(Unh)*	106	(263.118)	(a)
(Unp)*	105	(262.114)	(a)
(Unq)*	104	(261.11)	(a)
(Uns)*	107	(262.12)	(a)
V	23	50.9415	
W	74	183.85	±3
Xe	54	131.29	(b,d), ±2
Y	39	88.90585	±2
Yb	70	173.04	(b), ±3
Zn	30	65.39	±2
Zr	40	91.224	(b), ±2

* ≡ element with no stable nuclides.