[Appendix]

Atomic Weight Table(1983) (12C=12)

Atomic weights of many elements are not conserved. They depend on the origins and their processing. Footnotes show the types of atomic weight changes conceivable for each element in detail. The values of atomic weights, Ar(E), are applicable for the elements that are naturally occurring on Earth or for those few artificial ones. Although, it is considered appropriately in the footnotes, the reliability of the value can be considered to be ±1 at the last effective number.

※ Footnotes

G : There is a known geological exception, which exceeds the limit of a normal material, in an isotope composition for the element. It may exceed, to a certain degree, the reasonable uncertainty (the difference between the atomic weight of the element and the tabulated value).

M : Due to unknown causes or carelessness during isotope separation, it is possible to find some commercial products with an isotope composition that is different from commonly known value. Therefore, the atomic weight of the element may differ from the indicated vale.

R : Since there is a variation in isotope composition for a normal material on earth, it is impossible to have atomic weight value with a greater accuracy. Ar(E) value applies to all normal materials.

A : This denotes a radioactive elementon earth that does not have a characteristic isotope composition. Nuclide mass and half-life of one (or more) well known isotope are indicated with a asterisk.

X : It has been confirmed that thorium consists of a single nuclide with rare exceptions. However, there are cases where measurable amount of 230 Th (ionium) is discovered in some places (most frequent in oceanic water).

Y : Uranium does not have a stable isotope. However, it is the only element

in nature that has an long life time isotope with a unique composition so that a meaningful atomic weight can be determined.

* : Elements with no stable isotopes

The number in ( )represents the mass of an isotope which has the longest known half life for that element.

Element Name	Atomic Symbol	Atomic Number	Atomic Weight	Foot Note	Element Name	Atomic Symbol	Atomic Number	Atomic Weight	Foot Note
Actinium	Ac	89	227.0278	A*	Nickel	Ni	28	58.69	
Aluminum	Al	13	26.98154		Niobium	Nb	41	92.9064	
Americium	Am	95	(243)	A*	Nitrogen	N	7	14.0067	G
Antimony	Sb	51	121.75±3		Nobelium	No	102	(259)	A*
Argon	Ar	18	39.948	G, R	Osmium	Os	76	190.2	G
Arsenic	As	33	74.9216		Oxygen	O	8	15.9994±3	G, R
Astatine	At	85	(210)	A*	Palladium	Pd	46	106.42	G
Barium	Ba	56	137.77 g		Phosphorus	P	15	30.97376	
Berkelium	Bk	97	(247)	A*	Platinum	Pt	78	195.08±3	
Berylium	Be	4	9.01218		Plutonium	Pu	94	(244)	A*
Bismuth	Bi	83	208.9804		Polonium	Po	84	(209)	A*
Boron	B	5	10.811±5	M, R	Potassium	K	19	39.0983	
Bromine	Br	35	79.904		Praseodymium	Pr	59	140.9077	
Cadmium	Cd	48	112.41	G	Promethium	Pm	61	(145)	A*
Calcium	Ca	20	40.078±4	G	Protactinium	Pa	91	(231.0369)	A*
Califomium	Cf	98	(251)	A*	Radium	Ra	88	(226.0254)	A*
Carbon	C	6	12.011	R	Radon	Rn	86	(222)	A*
Cerium	Ce	58	140.12	G	Rhenium	Re	75	186.207	
Cesium	Cs	55	132.9054		Rhodium	Rh	45	102.9055	
Chlorine	Cl	17	35.453		Rubidium	Rb	37	85.4678±3	G
Chromium	Cr	24	51.9961±6		Ruthenium	Ru	44	101.07±2	G
Cobalt	Co	27	58.9332		Samarium	Sm	62	150.36±3	G
Copper	Cu	29	63.546±3	R	Scandium	Sc	21	44.95591	
Curium	Cm	96	(247)	A*	Selenium	Se	34	78.96±3	
Dysprosium	Dy	66	162.50±3	G	Silicon	Si	14	28.0855±3	R
Einsteinium	Es	99	(252)	A*	Silver	Ag	47	107.8682±3	G
Erbium	Er	68	167.26±3 g		Fluorine	F	9	18.998403	
Europium	Eu	63	151.96	G	Francium	Fr	87	(223)	A*
Fermium	Fm	100	(257)	A*	Gadolinium	Gd	64	157.25±3	G
Neodymium	Nd	60	144.24±3	G	Gallium	Ga	31	69.723±4	
Neon	Ne	10	20.179	G, M	Germanium	Ge	32	72.59±3	
Neptunium	Np	93	237.0482	A*	Gold	Au	79	196.9665	

Element Name	Atomic Symbol	Atomic Number	Atomic Weight	Foot Note	Element Name	Atomic Symbol	Atomic Number	Atomic Weight	Foot Note
Hafnium	Hf	72	178.49±3		Strontium	Sr	38	87.62	G
Helium	He	2	4.002602±2	G, R	Sulfur	S	16	32.066±6	R
Holmium	Ho	67	164.9304		Tantalum	Ta	73	180.9479	
Hydrogen	H	1	1.00794±7	G, M, R	Technetium	Tc	43	(98)	A*
Indium	In	49	114.82	G	Tellurium	Te	52	127.60±3	G
Iodine	I	53	126.9045		Terbium	Tb	65	158.9254	
Iridium	Ir	77	192.22±3		Thallium	Tl	81	204.383	
Iron	Fe	26	55.847±3		Thorium	Th	90	232.0381	G, X*
Krypton	Kr	36	83.80	G, M	Thulium	Tm	69	168.9342	
Lanthanum	La	57	138.9055±3	G	Tin	Sn	50	118.710±7	
Lawrencium	Lr	103	(206)	A*	Titanium	Ti	22	47.88±3	
Lead	Pb	82	207.2	G, R	Tungsten	W	74	183.85±3	
Lithium	Li	3	6.941±2	G, M, R	Uranium	U	92	238.0289	G, M, Y*
Lutetium	Lu	71	174.967	G	Vansdium	V	23	50.9415	
Magnesium	Mg	12	24.305	X	Xenon	Xe	54	131.29±3	G, M
Manganese	Mn	25			Ytterbium	Yb	70	173.04±3	G
Mendelevium	Md	101	(258)	A*	Yttrium	Y	39	88.9059	
Mercury	Hg	80	200.59±3		Zinc	Zn	30	65.39±3	
Molybdenum	Mo	42	95.94		Zirconium	Zr	40	91.224±2	G
Sodium	Na	11	22.98977						