

## Appendix E

### Chemical Names, symbols and relative atomic masses of the elements

- Information is largely taken from the IUPAC Technical Report: *Atomic Weights of the Elements 2001*, as published in *Pure Appl. Chem.*, 75, 1107—1122 (2003).
- In these tables, relative atomic masses (RAM) have been rounded to two decimal places.
- An integer within brackets thus [227] is strictly not an atomic mass but is the mass number of one particular isotope of the element. The mass number is however quite close to the atomic mass of that isotope. It is given in this list when all isotopes of that element are radioactive, and indicates the isotope with the longest known half-life. This is not necessarily the most common isotope. Other isotopic half-lives are listed in the IUPAC report referred to above.

For the heaviest elements, say  $Z > 100$ , this longest half-life isotope will probably change with time, as experiments may well produce data from more stable parts of the Chart of the Nuclides.

- At the time of writing, darmstadtium is the IUPAC approved name for  $Z = 110$ , and roentgenium is likely to be the approved name for  $Z = 111$ .
- Atomic masses depend on the isotopic composition of the element. This can be quite variable. Uranium, for example, is well known in this respect and its provenance is important. Commercial lithium has an atomic mass varying between 6.939 and 6.996; this is marked # in the tables. Non-terrestrial material is particularly susceptible to isotopic fractionation. See the IUPAC report for further information of great interest.

Table D.1. Ordered by name

Name	Symbol	Z	RAM
Actinium	Ac	89	[227]
Aluminum	Al	13	26.98
Americium	Am	95	[243]
Antimony	Sb	51	121.76
Argon	Ar	18	39.95
Arsenic	As	33	74.92
Astatine	At	85	[210]
Barium	Ba	56	137.33
Berkelium	Bk	97	[247]
Beryllium	Be	4	9.01
Bismuth	Bi	83	208.98
Bohrium	Bh	107	[264]
Boron	B	5	10.81
Bromine	Br	35	79.90
Cadmium	Cd	48	112.41
Calcium	Ca	20	40.08
Californium	Cf	98	[251]
Carbon	C	6	12.01
Cerium	Ce	58	140.12
Caesium	Cs	55	132.91
Chlorine	Cl	17	35.45
Chromium	Cr	24	52.00
Cobalt	Co	27	58.93
Copper	Cu	29	63.55
Curium	Cm	96	[247]
Darsmstadtium	Ds	110	[281]
Dubnium	Db	105	[262]
Dysprosium	Dy	66	162.50
Einsteinium	Es	99	[252]
Erbium	Er	68	167.26
Europium	Eu	63	151.96
Fermium	Fm	100	[257]
Fluorine	F	9	19.00
Francium	Fr	87	[223]
Gadolinium	Gd	64	157.25
Gallium	Ga	31	69.72
Germanium	Ge	32	72.64

Gold	Au	79	196.97
Hafnium	Hf	72	178.49
Hassium	Hs	108	[277]
Helium	He	2	4.00
Holmium	Ho	67	164.93
Hydrogen	H	1	1.01
Indium	In	49	114.82
Iodine	I	53	126.90
Iridium	Ir	77	192.22
Iron	Fe	26	55.85
Krypton	Kr	36	83.80
Lanthanum	La	57	138.91
Lawrencium	Lr	103	[262]
Lead	Pb	82	207.20
Lithium #	Li	3	6.94
Lutetium	Lu	71	174.97
Magnesium	Mg	12	24.31
Manganese	Mn	25	54.94
Meitnerium	Mt	109	[268]
Mendelevium	Md	101	[258]
Mercury	Hg	80	200.59
Molybdenum	Mo	42	95.94
Neodymium	Nd	60	144.24
Neon	Ne	10	20.18
Neptunium	Np	93	[237]
Nickel	Ni	28	58.69
Niobium	Nb	41	92.91
Nitrogen	N	7	14.01
Nobelium	No	102	[259]
Osmium	Os	76	190.23
Oxygen	O	8	16.00
Palladium	Pd	46	106.42
Phosphorus	P	15	30.97
Platinum	Pt	78	195.08
Plutonium	Pu	94	[244]
Polonium	Po	84	[209]
Potassium	K	19	39.10
Praseodymium	Pr	59	140.91
Promethium	Pm	61	[145]

Protactinium	Pa	91	231.04
Radium	Ra	88	[226]
Radon	Rn	86	[222]
Rhenium	Re	75	186.21
Rhodium	Rh	45	102.91
Roentgenium	Rg	111	[280]
Rubidium	Rb	37	85.47
Ruthenium	Ru	44	101.07
Rutherfordium	Rf	104	[261]
Samarium	Sm	62	150.36
Scandium	Sc	21	44.96
Seaborgium	Sg	106	[266]
Selenium	Se	34	78.96
Silicon	Si	14	28.09
Silver	Ag	47	107.87
Sodium	Na	11	22.99
Strontium	Sr	38	87.62
Sulfur	S	16	32.07
Tantalum	Ta	73	180.95
Technetium	Tc	43	[98]
Tellurium	Te	52	127.60
Terbium	Tb	65	158.93
Thallium	Tl	81	204.38
Thorium	Th	90	232.04
Thulium	Tm	69	168.93
Tin	Sn	50	118.71
Titanium	Ti	22	47.87
Tungsten	W	74	183.84
Uranium	U	92	238.03
Vanadium	V	23	50.94
Xenon	Xe	54	131.29
Ytterbium	Yb	70	173.04
Yttrium	Y	39	88.91
Zinc	Zn	30	65.41
Zirconium	Zr	40	91.22

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