Periodic Table of the Elements

1 IA 1A	2 IIA 2A	3 IIIB 3B	4 IVB 4B	5 VB 5B	6 VIB 6B	7 VIIB 7B	8	9 VIII 8	10	11 IB 1B	12 IIB 2B	13 IIIA 3A	14 IVA 4A	15 VA 5A	16 VIA 6A	17 VIIA 7A	18 VIIIA 8A
1 **H** Hydrogen 1.008																	2 **He** Helium 4.003
3 **Li** Lithium 6.941	4 **Be** Beryllium 9.012											5 **B** Boron 10.811	6 **C** Carbon 12.011	7 **N** Nitrogen 14.007	8 **O** Oxygen 15.999	9 **F** Fluorine 18.998	10 **Ne** Neon 20.180
11 **Na** Sodium 22.990	12 **Mg** Magnesium 24.305											13 **Al** Aluminum 26.982	14 **Si** Silicon 28.086	15 **P** Phosphorus 30.974	16 **S** Sulfur 32.066	17 **Cl** Chlorine 35.453	18 **Ar** Argon 39.948
19 **K** Potassium 39.098	20 **Ca** Calcium 40.078	21 **Sc** Scandium 44.956	22 **Ti** Titanium 47.867	23 **V** Vanadium 50.942	24 **Cr** Chromium 51.996	25 **Mn** Manganese 54.938	26 **Fe** Iron 55.845	27 **Co** Cobalt 58.933	28 **Ni** Nickel 58.693	29 **Cu** Copper 63.546	30 **Zn** Zinc 65.38	31 **Ga** Gallium 69.723	32 **Ge** Germanium 72.631	33 **As** Arsenic 74.922	34 **Se** Selenium 78.971	35 **Br** Bromine 79.904	36 **Kr** Krypton 83.798
37 **Rb** Rubidium 85.468	38 **Sr** Strontium 87.62	39 **Y** Yttrium 88.906	40 **Zr** Zirconium 91.224	41 **Nb** Niobium 92.906	42 **Mo** Molybdenum 95.95	43 **Tc** Technetium 98.907	44 **Ru** Ruthenium 101.07	45 **Rh** Rhodium 102.906	46 **Pd** Palladium 106.42	47 **Ag** Silver 107.868	48 **Cd** Cadmium 112.414	49 **In** Indium 114.818	50 **Sn** Tin 118.711	51 **Sb** Antimony 121.760	52 **Te** Tellurium 127.6	53 **I** Iodine 126.904	54 **Xe** Xenon 131.294
55 **Cs** Cesium 132.905	56 **Ba** Barium 137.328	57-71	72 **Hf** Hafnium 178.49	73 **Ta** Tantalum 180.948	74 **W** Tungsten 183.84	75 **Re** Rhenium 186.207	76 **Os** Osmium 190.23	77 **Ir** Iridium 192.217	78 **Pt** Platinum 195.085	79 **Au** Gold 196.967	80 **Hg** Mercury 200.592	81 **Tl** Thallium 204.383	82 **Pb** Lead 207.2	83 **Bi** Bismuth 208.980	84 **Po** Polonium [208.982]	85 **At** Astatine 209.987	86 **Rn** Radon 222.018
87 **Fr** Francium 223.020	88 **Ra** Radium 226.025	89-103	104 **Rf** Rutherfordium [261]	105 **Db** Dubnium [262]	106 **Sg** Seaborgium [266]	107 **Bh** Bohrium [264]	108 **Hs** Hassium [269]	109 **Mt** Meitnerium [278]	110 **Ds** Darmstadtium [281]	111 **Rg** Roentgenium [280]	112 **Cn** Copernicium [285]	113 **Nh** Nihonium [286]	114 **Fl** Flerovium [289]	115 **Mc** Moscovium [289]	116 **Lv** Livermorium [293]	117 **Ts** Tennessine [294]	118 **Og** Oganesson [294]

Lanthanide Series	57 **La** Lanthanum 138.905	58 **Ce** Cerium 140.116	59 **Pr** Praseodymium 140.908	60 **Nd** Neodymium 144.243	61 **Pm** Promethium 144.913	62 **Sm** Samarium 150.36	63 **Eu** Europium 151.964	64 **Gd** Gadolinium 157.25	65 **Tb** Terbium 158.925	66 **Dy** Dysprosium 162.500	67 **Ho** Holmium 164.930	68 **Er** Erbium 167.259	69 **Tm** Thulium 168.934	70 **Yb** Ytterbium 173.055	71 **Lu** Lutetium 174.967
Actinide Series	89 **Ac** Actinium 227.028	90 **Th** Thorium 232.038	91 **Pa** Protactinium 231.036	92 **U** Uranium 238.029	93 **Np** Neptunium 237.048	94 **Pu** Plutonium 244.064	95 **Am** Americium 243.061	96 **Cm** Curium 247.070	97 **Bk** Berkelium 247.070	98 **Cf** Californium 251.080	99 **Es** Einsteinium [254]	100 **Fm** Fermium 257.095	101 **Md** Mendelevium 258.1	102 **No** Nobelium 259.101	103 **Lr** Lawrencium [262]

name	symbol	meaning
deca	da	10^{1}
hecto	h	10^{2}
kilo	k	10^{3}
mega	M	10^{6}
giga	G	10^{9}
tera	T	10^{12}
peta	P	10^{15}
exa	E	10^{18}
zetta	Z	10^{21}
yotta	Y	10^{24}

name	symbol	meaning
deci	d	10^{-1}
centi	c	10^{-2}
milli	m	10^{-3}
micro	μ	10^{-6}
nano	n	10^{-9}
pico	p	10^{-12}
femto	f	10^{-15}
atto	a	10^{-18}
zepto	z	10^{-21}
yocto	y	10^{-24}

constant	symbol	value
Avogadro's number	N_A	6.02214×10^{23}
gas constant	R	$0.0820574\ \text{L·atm·mol}^{-1}\text{·K}^{-1}$ $8.31446\ \text{J·mol}^{-1}\text{·K}^{-1}$
speed of light in a vacuum	c	$299792458\ \text{m·s}^{-1}$ (exact)
Planck constant	h	$6.62607\times10^{-34}\ \text{J·s}$
Rydberg energy	R_y	$2.17987\times10^{-18}\ \text{J}$
Boltzmann constant	k_B	$1.38065\times10^{-23}\ \text{J·K}^{-1}$
elementary charge	e	$1.60218\times10^{-19}\ \text{C}$
mass of electron	m_e	$9.10938\times10^{-31}\ \text{kg}$
atomic mass unit	u	$1.66054\times10^{-27}\ \text{kg}$
standard acceleration due to Earth's gravity	g	$9.80665\ \text{m·s}^{-2}$ (exact)
ion product of water	K_w	$1.01158\times10^{-14}\ M^2$
Faraday constant	F	$96485.3\ \text{C·mol}^{-1}$
Coulomb constant	k	$8.98755\times10^{9}\ \text{N·m}^2\text{·C}^{-2}$
permittivity of free space	ε_0	$8.85419\times10^{-12}\ \text{N}^{-1}\text{·m}^{-2}\text{·C}^2$

		anions										
		chloride Cl^-	**bromide** Br^-	**iodide** I^-	**oxide** O^{2-}	**sulfide** S^{2-}	**hydroxide** OH^-	**carbonate** CO_3^{2-}	**chromate** CrO_4^{2-}	**sulfate** SO_4^{2-}	**acetate** $CH_3CO_2^-$	**nitrate** NO_3^-
cations	NH_4^+	yes	yes	yes	--	yes	yes	yes	yes	yes	yes	yes
	Na^+	yes	yes	yes	rxn	yes	yes	yes	yes	yes	yes	yes
	K^+	yes	yes	yes	rxn	yes	yes	yes	yes	yes	yes	yes
	Mg^{2+}	yes	yes	yes	NO	rxn	NO	slight	--	yes	yes	yes
	Ca^{2+}	yes	yes	yes	rxn	rxn	slight	NO	slight	slight	yes	yes
	Ba^{2+}	yes	yes	yes	yes	yes	yes	NO	NO	NO	yes	yes
	Mn^{2+}	yes	yes	yes	NO	NO	NO	NO	--	yes	yes	yes
	Fe^{2+}	yes	yes	yes	NO	NO	NO	NO	--	yes	yes	yes
	Fe^{3+}	yes	yes	--	NO	--	NO	--	NO	yes	NO	yes
	Cu^{2+}	yes	yes	--	NO	NO	NO	NO	NO	yes	yes	yes
	Ni^{2+}	yes	yes	yes	NO	NO	NO	NO	NO	yes	yes	yes
	Cd^{2+}	yes	yes	yes	NO	NO	NO	NO	NO	yes	yes	yes
	Zn^{2+}	yes	yes	yes	NO	NO	NO	NO	yes	yes	yes	yes
	Sn^{2+}	yes	yes	slight	NO	NO	NO	--	--	yes	yes	--
	Hg^{2+}	yes	slight	NO	NO	NO	NO	NO	NO	rxn	yes	yes
	Pb^{2+}	slight	slight	NO	NO	NO	NO	NO	NO	NO	yes	yes
	Ag^+	NO	NO	NO	NO	NO	--	NO	NO	slight	slight	yes

yes	=	soluble (s > 10 g/L)
slight	=	slightly soluble (1 g/L < s < 10 g/L)
NO	=	insoluble (s < 1 g/L)
--	=	no data
rxn	=	compound reacts with water

water soluble components	insoluble exceptions
All common compounds of Group 1 (1A) metal cations (Li^+, Na^+, K^+, etc.)	None
All common compounds of ammonium ion (NH_4^+)	None
All common compounds of nitrate (NO_3^-)	None
All common compounds of acetate (CH_3COO^-)	None
All common compounds of chlorate (ClO_3^-)	None
All common compounds of perchlorate (ClO_4^-)	None
All common compounds of bromide (Br^-)	Bromides of Ag^+, Hg_2^{2+}, and Pb^{2+}
All common compounds of chloride (Cl^-)	Chlorides of Ag^+, Hg_2^{2+}, and Pb^{2+}
All common compounds of iodide (I^-)	Iodides of Ag^+, Cu^+, Hg_2^{2+}, and Pb^{2+}
All common compounds of sulfates (SO_4^{2-})	Sulfates of Ag^+, Ca^{2+}, Hg_2^{2+}, Pb^{2+}, Sr^{2+}, and Ba^{2+}

water insoluble components	soluble exceptions
Compounds of carbonate (CO_3^{2-})	Carbonates of Group 1 (1A) cations and NH_4^+
Compounds of chromate (CrO_4^{2-})	Chromates of Group 1 (1A) cations, NH_4^+, Ca^{2+}, and Mg^{2+}
Compounds of fluoride (F^-)	Fluorides of Group 1 (1A) cations, NH_4^+, Ag^+, Sn^{2+}, Sr^{2+}, and Zn^{2+}
Compounds of hydroxide (OH^-)	Hydroxides of Group 1 (1A) cations, NH_4^+, Ba^{2+}, Ca^{2+}, and Sr^{2+}
Compounds of phosphate (PO_4^{3-})	Phosphates of Group 1 (1A) and NH_4^+