Periodic Table of the Elements

1 IA												13 IIIA	14 IVA	15 VA	16 VIA	17 VIIA	18 VIIIA
1	1 **1.01** 1+ **H** 2.1 hydrogen	2 IIA															2 **4.00** **He** helium
2	3 **6.94** 1+ **Li** 1.0 lithium	4 **9.01** 2+ **Be** 1.5 beryllium										5 **10.81** 3+ **B** 2.0 boron	6 **12.01** 4+ 4- **C** 2.5 carbon	7 **14.01** 3- **N** 3.0 nitrogen	8 **16.00** 2- **O** 3.5 oxygen	9 **19.00** 1- **F** 4.0 fluorine	10 **20.18** **Ne** neon
3	11 **22.99** 1+ **Na** 0.9 sodium	12 **24.31** 2+ **Mg** 1.2 magnesium	3 IIIB	4 IVB	5 VB	6 VIB	7 VIIB	8	9 VIIIB	10	11 IB	12 IIB	13 **26.98** 3+ **Al** 1.5 aluminum	14 **28.09** **Si** 1.8 silicon	15 **30.97** 3- **P** 2.1 phosphorus	16 **32.07** 2- **S** 2.5 sulphur	17 **35.45** 1- **Cl** 3.0 chlorine	18 **39.95** **Ar** argon
4	19 **39.10** 1+ **K** 0.8 potassium	20 **40.08** 2+ **Ca** 1.0 calcium	21 **44.96** 3+ **Sc** 1.3 scandium	22 **47.87** 4+ 3+ **Ti** 1.5 titanium	23 **50.94** 5+ 4+ **V** 1.6 vanadium	24 **52.00** 3+ 2+ **Cr** 1.6 chromium	25 **54.94** 2+ 4+ **Mn** 1.5 manganese	26 **55.85** 3+ 2+ **Fe** 1.8 iron	27 **58.93** 2+ 3+ **Co** 1.8 cobalt	28 **58.69** 2+ 3+ **Ni** 1.8 nickel	29 **63.55** 2+ 1+ **Cu** 1.9 copper	30 **65.39** 2+ **Zn** 1.6 zinc	31 **69.72** 3+ **Ga** 1.6 gallium	32 **72.61** 4+ **Ge** 1.8 germanium	33 **74.92** 3- **As** 2.0 arsenic	34 **78.96** 2- **Se** 2.4 selenium	35 **79.90** 1- **Br** 2.8 bromine	36 **83.80** **Kr** 3.0 krypton
5	37 **85.47** 1+ **Rb** 0.8 rubidium	38 **87.62** 2+ **Sr** 1.0 strontium	39 **88.91** **Y** 1.2 yttrium	40 **91.22** **Zr** 1.4 zirconium	41 **92.91** **Nb** 1.6 niobium	42 **95.94** **Mo** 1.8 molybdenum	43 **[98]** **Tc** 1.9 technetium	44 **101.07** **Ru** 2.2 ruthenium	45 **102.91** **Rh** 2.2 rhodium	46 **106.42** 2+ 4+ **Pd** 2.2 palladium	47 **107.87** 1+ **Ag** 1.9 silver	48 **112.41** 2+ **Cd** 1.7 cadmium	49 **114.81** 3+ **In** 1.7 indium	50 **118.71** 4+ 2+ **Sn** 1.8 tin	51 **121.76** 3+ 5+ **Sb** 1.9 antimony	52 **127.60** 2- **Te** 2.1 tellurium	53 **126.90** 1- **I** 2.5 iodine	54 **131.29** **Xe** 2.6 xenon
6	55 **132.91** 1+ **Cs** 0.7 cesium	56 **137.32** 2+ **Ba** 0.9 barium		72 **178.49** **Hf** 1.3 hafnium	73 **180.95** **Ta** 1.5 tantalum	74 **183.94** **W** 1.7 tungsten	75 **186.21** **Re** 1.9 rhenium	76 **190.23** **Os** 2.2 osmium	77 **192.21** **Ir** 2.2 iridium	78 **195.08** 4+ 2+ **Pt** 2.2 platinum	79 **196.97** 3+ 1+ **Au** 2.4 gold	80 **200.59** 2+ 1+ **Hg** 1.9 mercury	81 **204.38** 1+ 3+ **Tl** 1.8 thallium	82 **207.20** 2+ 4+ **Pb** 1.8 lead	83 **208.98** 3+ 5+ **Bi** 1.9 bismuth	84 **[209]** 2+ 4+ **Po** 2.0 polonium	85 **[210]** 1- **At** 2.2 astatine	86 **[222]** **Rn** 2.4 Radon
7	87 **[223]** 1+ **Fr** 0.7 francium	88 **[226]** 2+ **Ra** 0.9 radium		104 **[261]** **Rf** rutherfordium	105 **[262]** **Db** dubnium	106 **[266]** **Sg** seaborgium	107 **[264]** **Bh** bohrium	108 **[277]** **Hs** hassium	109 **[268]** **Mt** meitnerium	110 **[271]** **Ds** darmstadtium	111 **[272]** **Rg** roentgenium	112 **[277]** **Uub** ununbium	113 **[284]** **Uut** ununtrium	114 **[289]** **Uuq** ununquadium	115 **[288]** **Uup** ununpentium	116 **[291]** **Uuh** ununhexium	117	118 **[294]** **Uuo** ununoctium

Average relative masses are 2001 values, rounded to two decimal places. All average masses are to be treated as measured quantities, and subject to significant figures rules. Do not round them further when performing calculations.

Elements 43, 61, and 84 through 118 are unstable and radioactive. The most stable isotope is listed inside parentheses for radioactive elements.

ELEMENT KEY

Atomic Number → 50 **118.71** ← Atomic Mass
Atomic Symbol → **Sn** 4+ 2+ ← Ionic Charge *(top: most common)*
Element Name → tin 1.8 ← Electronegativity

6	57 **138.91** 3+ **La** 1.1 lanthanum	58 **140.12** 3+ **Ce** 1.1 cerium	59 **140.91** 3+ **Pr** 1.1 praseodymium	60 **144.24** 3+ **Nd** 1.1 neodymium	61 **[145]** 3+ **Pm** 1.1 promethium	62 **150.36** 3+ **Sm** 1.2 samarium	63 **151.96** 3+ 2+ **Eu** 1.1 europium	64 **157.25** 3+ **Gd** 1.2 gadolinium	65 **158.93** 3+ **Tb** 1.1 terbium	66 **162.50** 3+ **Dy** 1.2 dysprosium	67 **164.93** 3+ **Ho** 1.2 holmium	68 **167.26** 3+ **Er** 1.2 erbium	69 **168.93** 3+ **Tm** 1.3 thulium	70 **173.04** 3+ **Yb** 1.1 ytterbium	71 **174.97** 3+ **Lu** 1.1 lutetium
7	89 **[227]** 3+ **Ac** 1.1 actinium	90 **232.04** 4+ **Th** 1.3 thorium	91 **231.04** 5+ **Pa** 1.5 protactinium	92 **238.00** 6+ 4+ **U** 1.4 uranium	93 **237** 5+ **Np** 1.4 neptunium	94 **[244]** 4+ 6+ **Pu** 1.3 plutonium	95 **[243]** 3+ **Am** 1.3 americium	96 **[247]** 3+ **Cm** 1.3 curium	97 **[247]** 3+ **Bk** 1.3 berkelium	98 **[251]** 3+ **Cf** 1.3 californium	99 **[252]** **Es** 1.3 einsteinium	100 **[257]** **Fm** 1.3 fermium	101 **[258]** **Md** 1.3 mendelevium	102 **[259]** **No** 1.3 nobelium	103 **[262]** **Lr** lawrencium

Activity Series of Common Metals

reacts with water: Li, Cs, Rb, K, Ba, Sr, Ca, Na

reacts with acid: Na, Mg, Al, Mn, Zn, Cr, Fe, Co, Ni, Sn, Pb

H

Cu, Ag, Hg, Pt, Au

Common Prefixes

1	mono-	6	hexa-
2	di-	7	hepta-
3	tri-	8	octa-
4	tetra-	9	nona-
5	penta-	10	deca-

Polyatomic Ion Chart

To be memorized

acetate	$C_2H_3O_2^-$ / CH_3COO^-	arsenate	AsO_4^{3-}
		benzoate	$C_6H_5COO^-$
ammonium	NH_4^+	borate	BO_3^{3-}
bromate	BrO_3^-	cyanate	OCN^-
carbonate	CO_3^{2-}	cyanide	CN^-
chlorate	ClO_3^-	dichromate	$Cr_2O_7^{2-}$
chromate	CrO_4^{2-}	glutamate	$C_5H_8NO_4^-$
hydroxide	OH^-	oxalate	$C_2O_4^{2-}$
hydronium	H_3O^+	peroxide	O_2^{2-}
iodate	IO_3^-	silicate	SiO_3^{2-}
nitrate	NO_3^-	tetraborate	$B_4O_7^{2-}$
permanganate	MnO_4^-	thiocyanate	SCN^-
phosphate	PO_4^{3-}	thiosulphate	$S_2O_3^{2-}$
sulphate	SO_4^{2-}	tripolyphosphate	$P_3O_{10}^{5-}$

Solubility of Ionic Compounds at SATP

		ANIONS						
		Cl^-, Br^-, I^-	S^{2-}	OH^-	SO_4^{2-}	CO_3^{2-}, PO_4^{3-}, SO_3^{2-}	$C_2H_3O_2^-$	NO_3^-
CATIONS	high solubility (aq) ≥0.1mol/L (at SATP)	Most	Group 1, NH_4^+, Group 2	Group 1, NH_4^+, Sr^{2+}, Ba^{2+}, Tl^+	Most	Group 1, NH_4^+	Most	All
		All group 1 compounds, including acids, and all ammonium compounds are assumed to have high solubility in water.						
	low solubility (s) ≤0.1mol/L (at SATP)	Ag^+, Pb^{2+}, Tl^+, Hg_2^{2+} (Hg^+), Cu^+	Most	Most	Ag^+, Pb^{2+}, Ca^{2+}, Ba^{2+}, Sr^{2+}, Ra^{2+}	Most	Ag^+	None

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