

Prefixes	
Meth-	1
Eth-	2
Prop-	3
But-	4
Pent-	5
Hex-	6
Hept-	7
Oct-	8
Non-	9
Dec-	10

Measurements & Units	
Mass	g
Volume	L
Mole	mol
Molarity	M mol/L
Molar Mass	g/mol
Density	g/cm <sup>3</sup> g/mL
Temperature	°C
Pressure	kPa

VSEPR Nomenclature						
		0 lone pairs	1 lone pair	2 lone pairs	3 lone pairs	4 lone pairs
Number of ligands around the central atom	2	<i>linear</i>				
	3	<i>trigonal planar</i>	<i>bent</i>			
	4	<i>tetrahedral</i>	<i>trigonal pyramidal</i>	<i>bent</i>		
	5	<i>trigonal bipyramidal</i>	<i>seesaw</i>	<i>t-shape</i>	<i>linear</i>	
	6	<i>octahedral</i>	<i>square pyramidal</i>	<i>square planar</i>	<i>t-shape</i>	<i>linear</i>

### Conversions

Avogadro's Number:  $6.022 \times 10^{23}$

1 mole = 22.4L (at STP)

1000mL = 1L

1000g = 1kg

### Equations

$$\% \text{ Purity} = \frac{\text{Mass}_{\text{pure}}}{\text{Mass}_{\text{total}}} \times 100\%$$

$$\% \text{ Yield} = \frac{\text{Yield}_{\text{actual}}}{\text{Yield}_{\text{theoretical}}} \times 100\%$$

$$c_1 V_1 = c_2 V_2$$

# The Periodic Table of the Elements (with Electronegativities)

		Atomic #																										
		Element name																										
		Symbol																										
		Avg. Mass																										
		Electronegativity																										
Alkali metals	Alkaline earth metals	Transition metals	Lanthanides	Actinides	Other metals	Metalloids (semi-metal)		Nonmetals	Halogens	Noble gases																		
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18											
Hydrogen <b>H</b> 1.01 2.1	Lithium <b>Li</b> 6.94 1.0	Sodium <b>Na</b> 22.99 0.9	Beryllium <b>Be</b> 9.01 1.5	Boron <b>B</b> 10.81 2.0	Carbon <b>C</b> 12.01 2.5	Nitrogen <b>N</b> 14.01 3.0	Oxygen <b>O</b> 16.00 3.5	Fluorine <b>F</b> 19.00 4.0	Neon <b>Ne</b> 20.18 ---	Helium <b>He</b> 4.00 ---																		
Potassium <b>K</b> 39.10 0.8	Rubidium <b>Rb</b> 85.47 0.8	Cesium <b>Cs</b> 132.91 0.7	Strontium <b>Sr</b> 87.62 1.0	Yttrium <b>Y</b> 88.91 1.2	Zirconium <b>Zr</b> 91.22 1.4	Niobium <b>Nb</b> 92.91 1.6	Molybdenum <b>Mo</b> 95.94 1.8	Technetium <b>Tc</b> (98) 1.9	Ruthenium <b>Ru</b> 101.07 2.2	Rhodium <b>Rh</b> 102.91 2.2	Palladium <b>Pd</b> 106.42 2.2	Silver <b>Ag</b> 107.87 1.9	Cadmium <b>Cd</b> 112.41 1.7	Inert Gas <b>Xe</b> 131.29 2.6	Krypton <b>Kr</b> 83.80 3.0	Xenon <b>Xe</b> 131.29 2.6	Radon <b>Rn</b> (222) 2.4											
Francium <b>Fr</b> (223) 0.7	Radium <b>Ra</b> (226) 0.9	Actinium <b>Ac</b> (227) 1.1	Thorium <b>Th</b> 232.04 1.3	Protactinium <b>Pa</b> 231.04 1.5	Uranium <b>U</b> 238.03 1.4	Nephtunium <b>Np</b> (237) 1.4	Plutonium <b>Pu</b> (244) 1.3	Americium <b>Am</b> (243) 1.3	Curium <b>Cm</b> (247) 1.3	Berkelium <b>Bk</b> (247) 1.3	Californium <b>Cf</b> (251) 1.3	Einsteinium <b>Es</b> (252) 1.3	Fermium <b>Fm</b> (257) 1.3	Mendelevium <b>Md</b> (258) 1.3	Nobelium <b>No</b> (259) 1.3	Lanthanum <b>La</b> 138.91 1.1	Cerium <b>Ce</b> 140.12 1.1	Praseodymium <b>Pr</b> 140.91 1.1	Neodymium <b>Nd</b> 144.24 1.1	Europium <b>Eu</b> 151.97 1.1	Gadolinium <b>Gd</b> 157.25 1.2	Terbium <b>Tb</b> 158.93 1.1	Dysprosium <b>Dy</b> 162.50 1.2	Hoium <b>Ho</b> 164.93 1.2	Erbium <b>Er</b> 167.26 1.2	Thulium <b>Tm</b> 168.93 1.3	Ytterbium <b>Yb</b> 173.04 1.1	Ununocium <b>Uuo</b> (294) ---

\*lanthanides

\*\*actinides

## NAMES, FORMULAE, AND CHARGES OF SOME COMMON IONS

\* *Aqueous solutions are readily oxidized by air.*

\*\* *Not stable in aqueous solutions.*

<b>Positive Ions (Cations)</b>			
$\text{Al}^{3+}$	Aluminum	$\text{Pb}^{4+}$	Lead(IV), plumbic
$\text{NH}_4^+$	Ammonium	$\text{Li}^+$	Lithium
$\text{Ba}^{2+}$	Barium	$\text{Mg}^{2+}$	Magnesium
$\text{Ca}^{2+}$	Calcium	$\text{Mn}^{2+}$	Manganese(II), manganous
$\text{Cr}^{2+}$	Chromium(II), chromous	$\text{Mn}^{4+}$	Manganese(IV)
$\text{Cr}^{3+}$	Chromium(III), chromic	$\text{Hg}_2^{2+}$	Mercury(I)*, mercurous
$\text{Cu}^+$	Copper(I)*, cuprous	$\text{Hg}^{2+}$	Mercury(II), mercuric
$\text{Cu}^{2+}$	Copper(II), cupric	$\text{K}^+$	Potassium
$\text{H}^+$	Hydrogen	$\text{Ag}^+$	Silver
$\text{H}_3\text{O}^+$	Hydronium	$\text{Na}^+$	Sodium
$\text{Fe}^{2+}$	Iron(II)*, ferrous	$\text{Sn}^{2+}$	Tin(II)*, stannous
$\text{Fe}^{3+}$	Iron(III), ferric	$\text{Sn}^{4+}$	Tin(IV), stannic
$\text{Pb}^{2+}$	Lead(II), plumbous	$\text{Zn}^{2+}$	Zinc

<b>Negative Ions (Anions)</b>			
$\text{Br}^-$	Bromide	$\text{OH}^-$	Hydroxide
$\text{CO}_3^{2-}$	Carbonate	$\text{ClO}^-$	Hypochlorite
$\text{ClO}_3^-$	Chlorate	$\text{I}^-$	Iodide
$\text{Cl}^-$	Chloride	$\text{HPO}_4^{2-}$	Monohydrogen phosphate
$\text{ClO}_2^-$	Chlorite	$\text{NO}_3^-$	Nitrate
$\text{CrO}_4^{2-}$	Chromate	$\text{NO}_2^-$	Nitrite
$\text{CN}^-$	Cyanide	$\text{C}_2\text{O}_4^{2-}$	Oxalate
$\text{Cr}_2\text{O}_7^{2-}$	Dichromate	$\text{O}^{2-}$	Oxide**
$\text{H}_2\text{PO}_4^-$	Dihydrogen phosphate	$\text{ClO}_4^-$	Perchlorate
$\text{CH}_3\text{COO}^-$	Ethanoate, acetate	$\text{MnO}_4^-$	Permanganate
$\text{F}^-$	Fluoride	$\text{PO}_4^{3-}$	Phosphate
$\text{HCO}_3^-$	Hydrogen carbonate, bicarbonate	$\text{SO}_4^{2-}$	Sulphate
$\text{HC}_2\text{O}_4^-$	Hydrogen oxalate, binoxalate	$\text{S}^{2-}$	Sulphide
$\text{HSO}_4^-$	Hydrogen sulphate, bisulphate	$\text{SO}_3^{2-}$	Sulphite
$\text{HS}^-$	Hydrogen sulphide, bisulphide	$\text{SCN}^-$	Thiocyanate
$\text{HSO}_3^-$	Hydrogen sulphite, bisulphite		

## SOLUBILITY OF COMMON COMPOUNDS IN WATER

*The term soluble here means > 0.1 mol/L at 25°C.*

Negative Ions (Anions)	Positive Ions (Cations)	Solubility of Compounds
All	Alkali ions: $\text{Li}^+$ , $\text{Na}^+$ , $\text{K}^+$ , $\text{Rb}^+$ , $\text{Cs}^+$ , $\text{Fr}^+$	Soluble
All	Hydrogen ion: $\text{H}^+$	Soluble
All	Ammonium ion: $\text{NH}_4^+$	Soluble
Nitrate, $\text{NO}_3^-$	All	Soluble
Chloride, $\text{Cl}^-$ or Bromide, $\text{Br}^-$ or Iodide, $\text{I}^-$	All others	Soluble
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	$\text{Ag}^+$ , $\text{Pb}^{2+}$ , $\text{Cu}^+$	Low Solubility
Sulphate, $\text{SO}_4^{2-}$	All others	Soluble
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	$\text{Ag}^+$ , $\text{Ca}^{2+}$ , $\text{Sr}^{2+}$ , $\text{Ba}^{2+}$ , $\text{Pb}^{2+}$	Low Solubility
Sulphide, $\text{S}^{2-}$	Alkali ions, $\text{H}^+$ , $\text{NH}_4^+$ , $\text{Be}^{2+}$ , $\text{Mg}^{2+}$ , $\text{Ca}^{2+}$ , $\text{Sr}^{2+}$ , $\text{Ba}^{2+}$	Soluble
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	All others	Low Solubility
Hydroxide, $\text{OH}^-$	Alkali ions, $\text{H}^+$ , $\text{NH}_4^+$ , $\text{Sr}^{2+}$	Soluble
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	All others	Low Solubility
Phosphate, $\text{PO}_4^{3-}$ or Carbonate, $\text{CO}_3^{2-}$ or Sulphite, $\text{SO}_3^{2-}$	Alkali ions, $\text{H}^+$ , $\text{NH}_4^+$	Soluble
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	All others	Low Solubility