

Charges of some Common Monatomic ions

H 1+ 1-																	
Li 1+	Be 2+													N 3-	O 2-	F 1-	
Na 1+	Mg 2+												Al 3+			Cl 1-	
K 1+	Ca 2+	Sc 3+	Ti 3+ 4+	V 3+ 4+	Cr 2+ 3+	Mn 2+ 3+	Fe 2+ 3+	Co 2+ 3+	Ni 2+ 4+	Cu 1+ 2+	Zn 2+					Br 1-	
Rb 1+	Sr 2+									Pd 2+ 4+	Ag 1+	Cd 2+		Sn 2+ 4+		I 1-	
Cs 1+	Ba 2+									Pt 2+ 4+	Au 1+ 3+	Hg 2+ *		Pb 2+ 4+			
Fr 1+	Ra 2+																

Please note that many of the metals shown here can have more possibilities than I can show here. Vanadium, for example, can be 2+, 3+, 4+ or 5+. I have only shown the more common charges.

*Mercury can be 1+ in the polyatomic ion Hg_2^{2+} .

Electronegativity Values of Selected Elements

Metallic Elements			Nonmetallic Elements			
Li (1.0)	Be (1.5)	H (2.1)	C (2.5)	N (3.0)	O (3.5)	F (4.0)
Na (1.0)	Mg (1.2)	Al (1.5)	P (2.1)	S (2.5)	Cl (3.0)	
K (0.9)	Ca (1.0)	Sc (1.3)	Se (2.4)	Br (2.8)		

Electronegativity

Difference	Bond type
0-0.4	Non polar covalent
0.5-1.9	Polar Covalent
2.0 -	Ionic

Gas Laws

$$PV=nRT$$

$$K=273+^{\circ}C \quad 760 \text{ mm Hg} = 760 \text{ torr} = 1 \text{ atm}$$

$$R= 0.08206 \text{ L atm mol}^{-1}\text{K}^{-1}$$

$$\frac{P_1 V_1}{T_1} = \frac{P_2 V_2}{T_2}$$

Solubility Rules

1. All compounds containing Na^+ , K^+ , or NH_4^+ ions are soluble in water.
2. All nitrates (NO_3^-) are soluble in water.
3. Most chlorides (Cl^-), and sulfates (SO_4^{2-}) are soluble. Some important exceptions are silver chloride (AgCl), barium sulfate (BaSO_4), and lead sulfate (PbSO_4) which are insoluble.
4. Most carbonates (CO_3^{2-}), phosphates (PO_4^{3-}), sulfides (S^{2-}), and hydroxides (OH^-) are insoluble in water. Important exceptions are those of Na^+ , K^+ , and NH_4^+ , as well as barium hydroxide, $\text{Ba}(\text{OH})_2$.

Avogadro's Number:

$$6.02 \times 10^{23}$$

$$6.02 \times 10^{23} \text{ molecules} = 1 \text{ mole}$$