Molecular Geometry				
total pairs	**bonding pairs**	**nonbonding pairs**	**geometry**	**hybridization**
2	2	0	linear	sp
3	3	0	trigonal planar	sp^2
3	2	1	bent	sp^2
4	4	0	tetrahedral	sp^3
4	3	1	pyramidal	sp^3
4	2	2	bent	sp^3
5	5	0	trigonal bipyramidal	dsp^3
5	4	1	seesaw	dsp^3
5	3	2	t-shaped	dsp^3
5	2	3	linear	dsp^3
6	6	0	octahedral	d^2sp^3
6	5	1	square pyramidal	d^2sp^3
6	4	2	square planar	d^2sp^3

1 mole = 6.02×10^{23}		**PV = nRT**	**R = 0.0821 (L·atm/mol·K)**	
$(P_1V_1/n_1T_1) = (P_2V_2/n_2T_2)$			**$PV = gRT/M_m$**	**$^oC + 273 = K$**
1 atm = 760 mm Hg = 760 T = 101,325 Pa			**$P_{tot} = P_1 + P_2 + P_3 + ...$**	
X_A = mol A/total moles			**$P_A = X_AP_{Total}$**	
$E = h\upsilon$	**$c = \lambda\upsilon$**	**$c = 2.998 \times 10^{10}$ cm/s**	**$M_1V_1 = M_2V_2$**	**M = mol/L**
formal charge = VE - 1/2(BE) - NBE			**h = 6.626×10^{-34} J·s**	

Electronegativities			
Fluorine - 4.0	**Chlorine - 3.0**	**Bromine - 2.8**	**Iodine - 2.5**
Oxygen - 3.5	**Sulfur - 2.5**	**Selenium - 2.4**	**Tellurium - 2.1**
Nitrogen - 3.0	**Phosphorus - 2.1**	**Arsenic - 2.0**	**Carbon - 2.5**
Hydrogen - 2.1	**Krypton - 0.0**	**Xenon - 0.0**	

Solubility Rules

Rule 1: ionic compounds with Group I cations and ammonium ion are always soluble

Rule 2: ionic compounds with acetate, nitrate, and perchlorate as anions are always soluble

Rule 3: ionic compounds with halogens as anions are always soluble unless the cation is Ag^{+}, Hg_2^{2+}, Hg^{2+}, or Pb^{2+}

Rule 4: ionic compounds with sulfate as an anions are always soluble unless the cation is Ag^{+}, Hg_2^{2+}, Hg^{2+}, Pb^{2+}, Ca^{2+}, Sr^{2+}, or Ba^{2+}

Rule 5: ionic compounds with carbonate, phosphate, sulfide, and hydroxide as anions are always insoluble unless the cation is a Group 1 cation or ammonium ion or unless the compound is a strong base

Rules for determining oxidation numbers

Rule 1: the oxidation number of atoms in their elemental state is zero

Rule 2: the oxidation number of a monatomic ion is equal to its charge

Rule 3: the oxidation number of oxygen is always equal to -2 unless in it's molecular form (see rule 1) or in a peroxide (we will not discuss peroxides in this class, but O in peroxides has an oxidation number = -1)

Rule 4: the oxidation number of hydrogen is always +1 unless in it's molecular form (see rule 1) or in a hydride (we will not discuss hydrides in this class, but H in hydrides has an oxidation number = -1)

Rule 5: Fluorine always has an oxidation number of -1. The other halogens always have an oxidation of -1 as anions in ionic compounds or as the second named atom in binary molecular compounds. Halogens listed as the first member of a binary molecular compound or involved in oxyanions have positive oxidation numbers.

Rule 6: for either a neutral compound or for any polyatomic ion, the sum of the oxidation numbers of the atoms in the molecule is equal to the net charge on the specie