**CHEM 1412 Formulas and Constants**

**mass of proton = 1.00728 amu mass of neutron = 1.00866 amu**

**c = 3.00 X 108 m/s F = 96500 C/(mol of e-) = 96500 J/(V mol of e-)**

**K = oC + 273.15 R = 0.08206 (L atm)/(mol K) = 8.314 J/(mol K)**

**1 g = 6.022 X 1023 amu**

**Sg = kPg PA = XAPAo Tf = Kf m Tb = Kbm**

** = MRT PV = nRT**

**ln[A]t = -kt + ln[A]o t1/2 = 0.693 / k 1/[A]t = kt + 1/[A]o t1/2 = 1 / (k[A]o)**

**k = Ae-Ea/RT ln(k1/k2) = Ea/R (1/T2 - 1/T1)**

**[H+][OH-] = 1.0 X 10-14 pH + pOH = 14 Ka Kb = Kw = 1.0 X 10-14**

**pH = pKa + log([base]/[acid]) Go = Ho - T So Go = -RT ln Keq**

**G = Go + RT lnQ Go = -nFEo E = Eo - (0.0592/n) log Q**

**E = mc2 Coulombs = Amps X seconds**

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| **Soluble Compounds** | **Important Exceptions** |
| Compounds containing NO3− | none |
| Compounds containing C2H3O2− | none |
| Compounds containing Cl− | Salts of Ag+, Hg22+, Pb2+ |
| Compounds containing Br− | Salts of Ag+, Hg22+, Pb2+ |
| Compounds containing I− | Salts of Ag+, Hg22+, Pb2+ |
| Compounds containing SO42− | Salts of Ca2+, Sr2+, Ba2+, Hg22+, Pb2+ |
| **Insoluble compounds** | **Important Exceptions** |
| Compounds containing S2− | Salts of ammonium, alkali metal cations and Ca2+, Sr2+, Ba2+ |
| Compounds containing CO32− | Salts of ammonium, alkali metal cations |
| Compounds containing PO43− | Salts of ammonium, alkali metal cations |
| Compounds containing OH− | Salts of ammonium, alkali metal cations and Ca2+, Sr2+, Ba2+ |