Unit 5 - Outline

* Calculating molar mass from the periodic table (g/mol)
* Know which elements are diatomic
* Convert grams to moles and moles to grams (use molar mass from PT)
* Know when to use the gas constant (22.4L/mol) – STP, gas
  + Used to convert volumes into moles (or vice versa)
* Use Avogadro’s Number to convert the number of moles to the number of atoms or molecules (or vice versa)
* Density formula (D = mass/volume)
  + Know that density is normally expressed in g/L or g/mL
  + 22.4L can be used in this formula ONLY FOR GASES
  + If the mass in unknown but the number of moles are – the molar mass (PT) can be used to calculate the number of grams
  + If no mass, moles or volume is given for a gas then you can assume that you have 1 mol and the molar mass and 22.4L can be used in your density formula (ONLY FOR GASES)
* Percent composition (% of each element in a compound)
  + If no mass is given then just use the molar mass (PT) to determine percentages
  + If a mass in g is given, calculate the percent composition of each element first using the PT and then multiply these decimals by the total mass to find the number of g of each element
* Empirical Formula (formula in lowest terms)
  + Calculate the number of moles of each element and divide by the smallest one – this will give you the mole: mole ratio of each element
* Molecular Formula (actual formula)
  + N is the whole number multiple of the empirical mass
  + See formula for N below
* Molar Concentration (mol/L or M)
  + Molar concentration = moles/volume
* Dilutions (c1V1 = c2V2 )
* See Page 103 Overview and Review Questions

**Constants/Conversion Factors to Know**

22.4L/mol 6.02 x 1023atoms/mol or 6.02 x 1023molecules/mol

Density = mass/volume N = molar mass/empirical mass

M(mol/L) = moles/volume

FC = IC x IV (where FC is final concentration, IC is initial concentration, IV is the initial volume and FV is

FV the final volume)