**GENERAL & ANALYTICAL CHEMISTRY I**

**CHMG-141**

With Dr. Bailey Name\_\_\_\_\_\_\_\_\_\_\_\_

Recitation

Week 9

**Molecular and Empirical Formulas**

**Concepts you should know:**

1. Finding % composition of elements in a compound.
2. Chemical Composition, Empirical and Molecular Formulas
3. Convert % composition to mole composition🡪 to empirical formula 🡪 to molecular formula.
4. Determining the Formula of a Hydrocarbon by Combustion
   1. **What is the mass % of F in the compound KrF2?**
   2. **A compound contains 12.0 grams of carbon, 3.00 grams of H and 8.00 grams of O.**

**Write the empirical and molecular** **formula for the compound**

* 1. Convert the number of grams of each element into moles.
  2. Convert the mole ratio into an empirical formula
  3. If the molar mass is 92.0 grams/mole, determine the molecular formula.
  4. **Pyrophosphoric acid is made of 2.27% hydrogen and 34.80% phosphorus. The rest is oxygen. The molar mass of pyrophosphoric acid is 177.97 grams/mole.**

**Determine the empirical and molecular formula for pyrophosphoric acid.**

**Strategy:**

* 1. Determine the mass of each component in a 100.0-gram sample.
  2. How many moles of each element are in the sample?
  3. Determine the smallest whole number ratio of the number of moles of each element.
  4. Determine the empirical formula for pyrophosphoric acid.
  5. Determine the molar mass of the empirical formula for pyrophosphoric acid.
  6. Determine the molecular formula.
  7. **An unknown compound contains only carbon, hydrogen, and oxygen (Cx HyOz). Combustion of 6.50 g of this compound produced 9.53 g of carbon dioxide and 3.90 g of water.**

**Write the empirical formula for the compound**

1. How many moles of carbon, C, were in the original sample?
2. How many moles of hydrogen, H, were in the original sample?
3. How many moles of oxygen, O, were in the original sample?
4. Convert the mole ratio into an empirical formula