Percent Composition

% Composition Formula:

Example 1: What percentage of ammonium phosphate is hydrogen?

Example 2: Which of the following compounds contains the greatest percentage of iron by mass?

(a) $FeCl_3$

(b) FeO

(c) Fe_2O_3

(d) $FeCl_2$

Molecular Formula vs Empirical Formula

An empirical formula is:

A molecular formula is:

CH_2O is a _____ **$C_6H_{12}O_6$ is a** _____

- Empirical Formula is a _____form of Molecular formula
- Different compounds can have the _____**empirical formula** but _____ **molecular formulas**.

Empirical Formulas

Step 1: Change ___ sign to _____ - *if you are given grams, skip this step*
Step 2: Convert masses to moles using _____
Step 3: _____ all # of moles by the _____ value.
Step 4: **If dividing gave you** _____, then multiply by _____
Step 5: I**f dividing gave you** ____ **or** ____, then multiply by _____
Step 6: If step 5 or 6 do not apply, then _____ step 3 values to a _____number
Step 7: **Once you know the** _____**, place them as** _____ **in the formula**

Practice Problems:

1. A compound contains 3.26g of arsenic and 1.04g of oxygen. What is the empirical formula?

2. Find the empirical formula of a compound that is 33.38% Na, 22.65% S, and 44.90% O.

3. What is the empirical formula of a compound that is 62.10% C, 13.80% H, and 24.10% N?

Molecular Formulas

To find the molecular formula you must:

1. Find the _____ if not given

2. Determine the _____ of the _____

3. $\frac{\textbf{MM molecular formula}}{\textbf{MM empirical formula}}$ **= X**

4. _____ each _____ in the empirical formula by "X"

Practice Problems

1. The empirical formula of a compound is CH; the molecular molar mass is 78.11 g/mol. What is its molecular formula?

2. A compound has an empirical formula of CH_3O and a molecular mass of 62.00 g/mol. What is its molecular formula?

3. A compound is 26.70%C, 2.20% H, and 71.10% O. Its molecular mass is 90.00 g/mol. What is its molecular formula?

Summary

Determine the molecular and empirical formula for each:

a. C_6H_8 b. N_2O_6 c. $C_6H_{12}O_6$ d. BCl_3