**Empirical Formula Calculations and Practice Problems**

**Hydrate Lab Demonstration**

Review warm up

1. How many moles of H2O are in 45 g of H2O?

**Hydrates and calculating empirical formulas**

1. What is an empirical formula?
2. Why don’t ionic compounds have an empirical formula?
3. Fill in the table below with examples from class.

|  |  |  |
| --- | --- | --- |
| **Molecular Formula** | **Empirical Formula** | **Multiple** |
| Molecule |  |  |
| Ionic compound |  |  |
| Molecule |  |  |
| Hydrate |  |  |

**Calculating empirical and molecular formula for compounds and hydrates**

**We follow the following steps when calculating the EF and MF for a compound**

**Step 1 Step 2 Step 3**

\*Find the Amount Calculate the # of moles Get the lowest

of each element of each element mole ratio

\*The amount can be given as % composition or data from a lab

Let’s try and example

1. Find the molecular formula of ethylene glycol, antifreeze. The molar mass is 62g/mol and the percent composition of each element is 38.7% C 9.7%H and 51.6%O
2. What is a hydrate?
3. What happens when you heat a hydrate?
4. How do you calculate an empirical formula for a hydrate?   
   **Step 1 Step 2 Step 3**Find the Amount Calculate the # of moles Get the lowest mole ratio
5. Let’s try calculating the EF for a hydrate with some real data in a demo from class.  
     
   Identity of the salt \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_  
     
   Mass of hydrate BEFORE heating \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_  
     
   Mass of anhydrous AFTER heating \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_  
     
   Mass of water \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_  
     
   **Step 1 Step 2 Step 3**Find the Amount Calculate the # of moles Get the lowest mole ratio