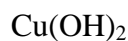


## ***Packet 8***

1. How many moles of  $\text{AgNO}_3$  are contained in 15.0 g?
2. What is the mass of  $1.50 \times 10^{-5}$  moles of  $\text{Mg}(\text{OH})_2$ ?
3. How many molecules of  $\text{H}_2\text{O}$  contained in  $4.50 \times 10^4$  g?
4. How many moles  $\text{Na}_2\text{CO}_3$  are contained in  $9.35 \times 10^6$  g?
5. What is the mass of 5.36 moles of  $\text{C}_6\text{H}_{12}\text{O}_6$ ?
6. How many molecules of  $\text{CH}_3\text{COCOOH}$  (pyruvate – supplies energy to living cells)
7. Calculate the percent composition for each of the following compounds:



8. Serotonin transmits nerve impulses between neurons in the human brain. It has a molar mass of 176 g/mol and is composed of 68.2% C, 6.86% H, 15.9% N, and 9.08% O. What is the molecular formula for serotonin?
9. Narceine is a the narcotic in opium and crystalizes as a hydrate that is 10.8%  $\text{H}_2\text{O}$  and has a molar mass of 499.52 g/mol. Determine the number of water molecules associated with the compound.
10. Find the empirical formula for a compound that is 63% Mn and 37% O?
11. A compound was analyzed and found to contain 13.5g Ca, 10.8g O, and 0.675g H. What is the empirical formula?
12. The molar mass of NutraSweet is 294.30g/mol. NutraSweet is 57.14% C, 6.16% H, 9.52% N, and 27.18% O, what is the chemical formula for NutraSweet?
13. A compound contains 18.8% sodium, 29.0% chlorine, and 52.2% oxygen, by mass. If the molar mass of the compound is 122.44 g/mol, determine the empirical and molecular formulas.
14. A 4.99 gram sample of a compound contains 1.52 grams of nitrogen atoms and 3.47 grams of oxygen atoms. The molar mass of the compound is between 90.0 g and 95.0 g. Determine the empirical and molecular formulas. Also, calculate the actual molar mass of this compound.

### **Assignment**

Tonight, look at the side of some sort of household product, food included. On the label look to see what some of the preservatives are and calculate the molar mass for that particular preservative.

## **Lab**

### **Introduction/Background Research**

What two elements compose copper oxide?

How are those elements connected in this compound?

What are some uses for copper oxide?

What is the goal of the experiment?

Why is the reaction done in an atmosphere of methane?

### **Materials and Set-up**

Copper oxide	large test tube	rubber hose
glass tubes	two holed rubber stopper	Bunsen burner

See the board for the proper setup, you **MUST** see me before starting the experiment, I need to make sure your apparatus is properly put together.

### **Method**

1. Put together apparatus and check to see if Bunsen burner will light.
2. Mass test tube.
3. Obtain between 1.5 g and 3.0 g of copper oxide.
4. Place copper oxide in test tube, be sure to spread out the black powder, if the compound clumps up in the test tube you will run into trouble a little later.
5. Place test tube in clamp and ignite Bunsen burner. Start with a low flame and gradually increase the temperature of the flame. **BE CAREFUL** if you heat the test tube too much the tube will start to melt and I will be forced to take punitive measures.
6. Stop flame and allow test tube to cool for 2-3 minutes. Using a test tube hold mass the test tube and substance inside.

### **Qualitative and Quantitative Observations**

You are going to want to create a data table of all your measurements.

### **Analysis/Calculations**

1. How many moles of oxygen were removed from the compound?
2. How many moles of copper remain?
3. What is the formula for the compound?
4. What is the mass percent of the copper oxide that you decomposed?
5. Copper (I) oxide ( $\text{Cu}_2\text{O}$ ) and copper (II) oxide ( $\text{CuO}$ ) are two different compounds composed of the same elements. Which compound do you believe you started with?
6. Calculate the mass percent of each of the copper oxide compounds.

7. What is the percent error of your experiment?

**Conclusions**

**Paragraph 1: Results Discussion (3-5 sentences)** Explain what happened in the lab

**Paragraph 2: Sources of error – at least 3, written in paragraph form WITH EXPLANATION of how the error effected your results and how the error could be avoided**

**Paragraph 3: Extensions/Questions for further investigation (At least 2)**

**References**

**Written in APA style format (need at least 2 reputable sources)**

**See Purdue Owl for help w/APA Format:**

**<https://owl.english.purdue.edu/owl/resource/560/01/>**