

Determination of a Formula of a Compound

Lab Exercise

Chemistry II

10 points

Name: \_\_\_\_\_

Partner: \_\_\_\_\_

Date: \_\_\_\_\_ Hour: \_\_\_\_\_

**USE BLUE/BLACK INK!!!!**

Goal:

The goal of this lab is to determine the empirical formula of the copper oxide used during the lab.

Research questions: (If more room is needed to answer a question, additional pages may be attached.)

- 1) What are the two possible formulas of copper oxide? \_\_\_\_\_
- 2) What are the modern (Roman numeral) names of the two possible compounds? \_\_\_\_\_  
\_\_\_\_\_
- 3) Why are there two possible formulas for copper oxide but not sodium oxide? \_\_\_\_\_  
\_\_\_\_\_
- 4) Write the two possible equations for the double displacement reaction of copper oxide and hydrochloric acid:
  
  
  
  
  
  
  
  
  
  
- 5) Write the two separate equations for the single displacement reaction of the copper compounds produced in question 4 and zinc metal:
  
  
  
  
  
  
  
  
  
  
- 6) A piece of iron with a mass of 85.65 g was burned in air. The mass of the iron oxide produced was 118.37 g.
  - (a) Convert the mass of the initial iron to moles of iron.
  
  
  
  
  
  
  
  
  
  
  - (b) Using the law of conservation of mass, what mass of oxygen reacted with the iron?
  
  
  
  
  
  
  
  
  
  
  - (c) Calculate the number of moles of oxygen in the product.

(d) Using the moles of iron and moles of oxygen, determine the empirical formula of the iron oxide produced.

7. List at least two properties of each of the two possible copper oxides. Note any dramatic differences between the two that would allow easy identification: \_\_\_\_\_

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Materials:

- |                            |                                      |
|----------------------------|--------------------------------------|
| 2.5 g solid copper oxide   | 60 mL 3 M HCl                        |
| 3 g mossy zinc             | 1 balance                            |
| 3 100 mL beakers           | 1 filter paper                       |
| 1 glass funnel             | 1 iron ring                          |
| 1 ringstand                | 1 stirring rod with rubber policeman |
| 1-2 medium scoops          | 1 forceps                            |
| 1 massing cup              | 1 piece of shiny zinc metal          |
| 2 30 mL beakers            | 1 permanent marker                   |
| 1 25 mL graduated cylinder | 1 stopwatch                          |

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Hazards:

The student safety contract applies. As flammable hydrogen gas is formed during this lab, no flames should be used. \_\_\_\_\_

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Procedure:

1. Prepare equipment
  - a. physically and chemically clean glassware and scoops
  - b. dry glassware and scoops



