

**06b Empirical Formula of a Compound Lab (1823684)**

Question

[1](#) [2](#) [3](#) [4](#)**Instructions**

Introduction: An oxide of copper may be decomposed into copper and oxygen by reacting it with methane and applying high heat for several minutes. Carbon dioxide and water escape into the atmosphere leaving behind the copper.

Objective: To determine the empirical formula of a compound containing copper and oxygen using percentages determined experimentally.

Materials and Apparatus: test tube, clamp, 2 ring stands, Fisher burner, glass tube + hose, plastic tubing, balance, an oxide of copper, safety goggles

Procedure: (while wearing safety goggles)

1. Measure the mass of a clean, dry large test tube. Use an electronic balance.
2. Place a fourth of a small spoonful (about 15 pieces) of the oxide of copper into the test tube. Using the electronic balance, record the mass of the copper oxide.
3. Clamp the test tube in a horizontal position onto a ring stand.
4. Attach the glass tube with plastic tubing to the gas outlet. Position the glass tube into the opening of the test tube.
5. Attach the Fisher burner to the gas outlet on the other side of the table and position it under the closed end of the test tube.
6. Turn on the gas outlet attached to the glass tubing and light the methane coming out of the end of the test tube. Adjust the gas flow so that the flame coming out of the end of the tube is fairly small.
7. Have your lab partner go around to the other side of the table and turn on the gas to the Fisher burner as you light it. Position the test tube so that the top of the blue cones are near to the test tube.
8. Heat the oxide of copper vigorously for about 30 minutes. The Fisher burner may get so hot that the test tube starts to melt. If this occurs, remove the heat for a few seconds and heat it carefully so as not to further melt the test tube.
9. If the oxide of copper has turned to a copper color, turn off the Fisher burner, otherwise continue heating. Do NOT turn off the gas supplied to the glass tube.
10. Allow the test tube to cool for three minutes with the methane still burning at the open end of the test tube.
11. Turn off the gas to the test tube and allow the test tube to cool for another two minutes.
12. Find the mass of the test tube with its copper contents.
13. To clean up, place the test tube and copper in the glass waste receptacle.
14. After completing your calculations, enter your results into the computer.

Data:

Mass of test tube \_\_\_\_\_

Mass of test tube and oxide of copper before heating \_\_\_\_\_

Calculated mass of the oxide of copper \_\_\_\_\_

Mass of test tube and copper after heating \_\_\_\_\_

Calculated mass of the copper \_\_\_\_\_

Calculations:

1. Calculate the percent of oxygen in the oxide of copper \_\_\_\_\_%

Calculate the percent of copper in the oxide of copper \_\_\_\_\_%

2. Determine the empirical formula and name of the oxide of copper based on your percentages of copper and oxygen.

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1. Question Details

Lab Partners [1837468]

Enter the name(s) of your lab partner(s). (If you worked by yourself, enter "none").

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2. Question Details

Empirical Formula Copper Oxide Lab Data [1767459]

a. Enter the experimental mass(from the balance) of the empty test tube:  g

b. Enter the mass of the test tube plus the copper oxide:  g

c. Calculate the mass of the copper oxide:  g

d. Enter the mass of the test tube and copper after heating:  g

e. Calculate the mass of the copper:  g

f. Calculate the percent of oxygen in the copper oxide:  %

i. Calculate the the percent of copper in the copper oxide:  %

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3. Question Details

Empirical Formula of a compound Lab (Formula) [1767471]

Determine the empirical formula for the oxide of copper using your data. It is not necessary to use subscripts (for example water could be written as H2O).

## 4. Question Details

Error discussion [3413763]

What are some specific sources of error, and how do they influence the data? Which measurement was the least precise? Does the error make the final value obtained larger or smaller than it should be (give at least one example and trace the steps)? If your calculated percent errors are significant, you must propose valid explanations here.

Instrumental error and human error exist in all experiments, and should not be mentioned as a source of error unless they caused a significant fault. Significant digits and mistakes in calculations are NOT a valid source of error. In writing this section it is sometimes helpful to ask yourself what you would do differently if you were to repeat the experiment and wanted to obtain better precision and accuracy. Use complete sentences.



## Assignment Details

Name (AID): **06b Empirical Formula of a Compound Lab (1823684)**Submissions Allowed: **5**Category: **Homework**

Code:

Locked: **Yes**Author: **Ryan, Matt** ( [mryan@allsaintsschool.org](mailto:mryan@allsaintsschool.org) )Last Saved: **Dec 15, 2017 09:18 AM CST**Group: **Coronado High School**Randomization: **Person**Which graded: **Last**

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