

Your teacher may watch to see if you can:

- follow instructions carefully

## Introduction

You are going to find out how much copper oxide can be made when some copper carbonate is thermally decomposed.



(relative atomic masses: Cu = 63.5, C = 12, O = 16).

## Aim

To compare the mass of copper oxide actually produced by the thermal decomposition of copper carbonate with the mass calculated from the equation.

### Apparatus

- Bunsen burner
- heat-resistant mat
- eye protection
- mineral wool
- spatula
- test tube
- test tube holder
- copper carbonate
- access to a balance

### Safety

Wear eye protection.  
Wash your hands after doing the experiment.  
Place a plug of mineral wool in the open end of the test tube before heating.

## Method

- Find the mass of an empty test tube.
- Add two spatulas of copper carbonate to the tube and measure the new mass of the tube.
- Place a plug of mineral wool in the open end of the test tube.
- Heat the tube with a medium flame for 2 minutes.
- Allow the tube to cool completely on the heat-resistant mat.
- Find the mass of the test tube and copper oxide.

## Prediction

- While you are waiting for the test tube of copper oxide to cool, find the mass of copper carbonate in your test tube.
- Then use the balanced equation and the relative atomic masses to calculate the maximum mass of copper oxide you would expect to be made.

## Recording your results

- Draw a table to record your results.

## Considering your results/conclusions

- Calculate the mass of copper carbonate used and the mass of copper oxide produced.
- Compare the mass of copper oxide produced with the mass you calculated using the balanced equation.

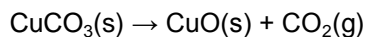
## Evaluation

- Try to explain any difference between your experimental value and your calculated mass.
- Suggest ways of improving the experiment so your experimental value is closer to your calculated mass.

Name \_\_\_\_\_ Class \_\_\_\_\_ Date \_\_\_\_\_

**Prediction**

- 1 While you are waiting for the test tube of copper oxide to cool, find the mass of copper carbonate in your test tube and record it in the table below.
- 2 Use the balanced equation and the relative atomic masses to calculate the maximum mass of copper oxide you would expect to be made, using the steps below.



(relative atomic masses: Cu = 63.5, C = 12, O = 16)

Calculate the relative formula mass of  $\text{CuCO}_3$  \_\_\_\_\_

Calculate the relative formula mass of  $\text{CuO}$  \_\_\_\_\_

Complete the following:  $\text{CuCO}_3$  makes  $\text{CuO}$ , so \_\_\_\_\_ g of  $\text{CuCO}_3$  \_\_\_\_\_ make g of  $\text{CuO}$

Write the fraction for the mass of  $\text{CuO}$  that should be formed from 1 g of  $\text{CuCO}_3$ .

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Now calculate the mass of  $\text{CuO}$  that should be formed from the mass of  $\text{CuCO}_3$  that you started with.

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**Recording your results**

- 3 Complete the table to show your results.

|  |  |
|--|--|
| Mass of empty test tube (g)              |  |
| Mass of test tube + copper carbonate (g) |  |
| Mass of test tube + copper oxide (g)     |  |
| Mass of copper carbonate used (g)        |  |
| Mass of copper oxide formed (g)          |  |

**Considering your results**

- 4 Calculate the mass of copper oxide produced and write this in the table above.
- 5 Compare the mass of copper oxide produced with the mass you calculated using the balanced equation.

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**Evaluation**

- 6 Try to explain any difference between your experimental value and your calculated mass.

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- 7 Suggest a way of improving the experiment so that your experimental value is closer to your calculated mass.

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