The composition and formula of water

Learning objectives

1 Describe how water is formed during the redox reaction of copper oxide with hydrogen.

2 Accurately record experimental observations and data.

3 Determine the formula of water from the experimental data.

Introduction

Your teacher will demonstrate the reaction between copper oxide and hydrogen gas, in which water is a product. During the demonstration you will record your observations and use then use the experimental data to determine the formula of water.
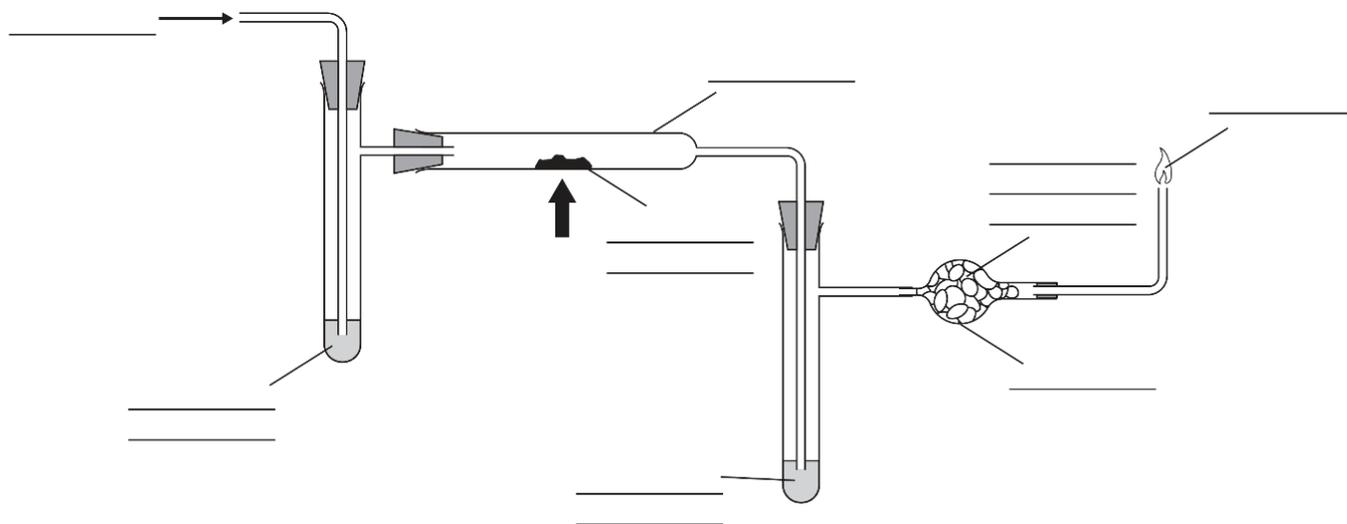
Questions

1. Write the word equation for the reaction.

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2. Describe what happens during a redox reaction. Include what is oxidised and what is reduced in this experiment.

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_____

_____

3. Label the diagram

4. State why concentrated sulfuric acid was added to the side arms.

_____

_____

5. List two safety precautions taken during the reaction

    i.   _____

    ii.   _____

6. Record the masses in the table

	Mass before heating / g	Mass after heating / g
Mass of combustion tube and contents		
Mass of combustion tube, side arm and contents		

7. Note your observations in the table.
Use the final column to explain your observation.

	Observation	**Explanation**
Before heating		
During heating		
After heating		

8. Use the data recorded in your table to calculate:

(a) The mass of oxygen lost from the copper oxide _____ g
(b) The mass of water formed during the reaction _____ g
(c) The mass of hydrogen in the water formed _____ g

9. The relative atomic mass of oxygen is 16 and the relative atomic mass (A_r) of hydrogen is 1.
Calculate:
(a) The number of moles of oxygen in the water = _____ mol
(b) The number of moles of hydrogen in the water = _____ mol
(c) The mole ratio of H:O in the water = _____

10. Write the formula of water and describe its composition.

_____

_____

11. Write the balanced symbol equation for the reaction.

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