



Rewarding Learning

General Certificate of Secondary Education

Centre Number

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Candidate Number

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# Chemistry

Unit 3: Practical Skills

Practical Booklet B

Foundation Tier



[GCM32]

\*GCM32\*

## Assessment

### TIME

1 hour.

### Assessment Level of Control:

Tick the relevant box (✓)

Controlled Conditions	
Other	

### INSTRUCTIONS TO CANDIDATES

Write your Centre Number and Candidate Number in the spaces provided at the top of this page.

**You must answer the questions in the spaces provided.**

**Do not write outside the boxed area on each page or on blank pages.**

Complete in black ink only. **Do not write with a gel pen.**

Answer **all seven** questions.

### INFORMATION FOR CANDIDATES

The total mark for this paper is 70.

Figures in brackets printed down the right-hand side of pages indicate the marks awarded to each question or part question.

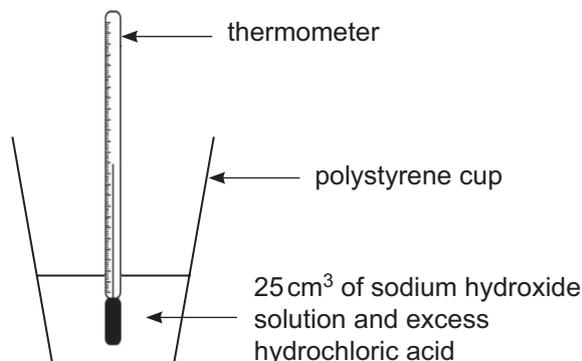
Quality of written communication will be assessed in Question 2.

A Data Leaflet, which includes a Periodic Table of the Elements, is included in this question paper.



- 1 25 cm<sup>3</sup> of 1.0 mol/dm<sup>3</sup> sodium hydroxide solution were placed in a polystyrene cup at room temperature (20 °C).

An excess (40 cm<sup>3</sup>) of 1.0 mol/dm<sup>3</sup> hydrochloric acid was added. The mixture was stirred using a thermometer. The highest temperature reached was 32 °C.



- (a) (i) Write a balanced symbol equation for the reaction between sodium hydroxide and hydrochloric acid. Include state symbols.

\_\_\_\_\_ [3]

- (ii) Calculate the temperature change in this experiment.

\_\_\_\_\_ [1]

- (iii) Explain, using evidence from the method above, whether the reaction between sodium hydroxide and hydrochloric acid is exothermic or endothermic.

\_\_\_\_\_  
\_\_\_\_\_ [1]



**(b) (i)** Explain why a polystyrene cup was used in this experiment instead of a glass beaker.

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[1]

**(ii)** State and explain one improvement which could be made to the apparatus shown in the diagram.

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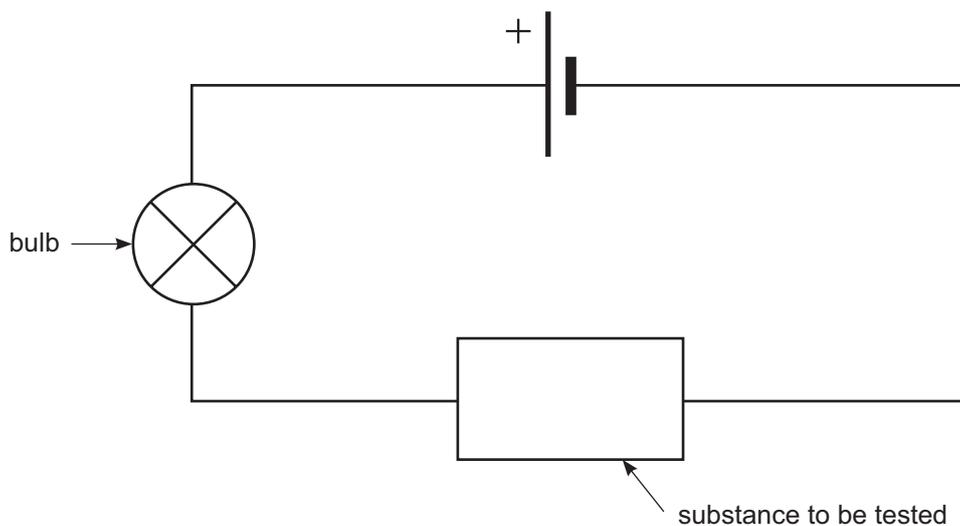
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[2]

[Turn over



- 2 In an experiment to test the electrical conductivity of some substances the apparatus was set up as shown in the diagram below.



Solid samples of graphite, titanium, sulfur, sodium chloride and iodine were tested in the circuit and the results recorded in the table below.

Substance	Does the bulb light?
Graphite	Yes
Titanium	Yes
Sulfur	No
Sodium chloride	No
Iodine	No







(c) State two reasons why the percentage yield of hydrated copper(II) chloride is less than 100% in this preparation.

1. \_\_\_\_\_

\_\_\_\_\_

2. \_\_\_\_\_

\_\_\_\_\_ [2]

(d) Complete the passage below to describe how a flame test may be carried out on a sample of solid copper(II) chloride to prove that it contained copper(II) ions.

Dip a piece of \_\_\_\_\_ wire into concentrated

\_\_\_\_\_ and then into the solid sample and hold in a

\_\_\_\_\_ Bunsen burner flame. A \_\_\_\_\_

flame indicates the presence of copper(II) ions. [4]

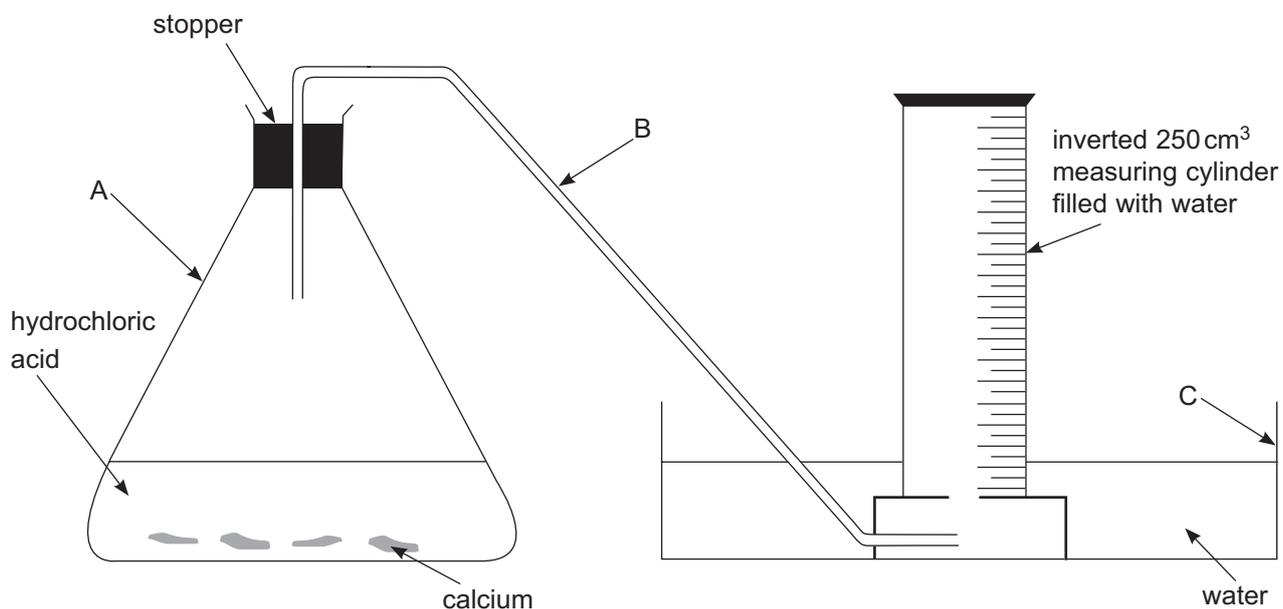
(e) A few drops of silver nitrate solution are added to a solution of copper(II) chloride and a precipitate is formed. What is the colour of the precipitate?

\_\_\_\_\_ [1]

[Turn over



- 4 (a) The apparatus shown below can be used to measure the volume of hydrogen gas produced in the reaction between calcium and hydrochloric acid. To start the experiment the calcium is dropped into the flask and the stopper quickly replaced.



- (i) Suggest one error which may occur in this experimental method.

\_\_\_\_\_ [1]

- (ii) What labels should be placed at A, B and C on the diagram?

A \_\_\_\_\_  
B \_\_\_\_\_  
C \_\_\_\_\_ [3]



(iii) Describe a test to prove that hydrogen gas has been produced.

\_\_\_\_\_

\_\_\_\_\_ [1]

(iv) Name one other piece of apparatus which could be used to measure the volume of hydrogen gas collected.

\_\_\_\_\_ [1]

(v) Write a balanced symbol equation for the reaction of calcium with hydrochloric acid.

\_\_\_\_\_ [3]

(b) Oxygen gas may be prepared by the catalytic decomposition of hydrogen peroxide.

(i) Name the catalyst used in this preparation and describe its appearance.

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

Appearance: \_\_\_\_\_ [3]

(ii) Describe the appearance of the hydrogen peroxide used to prepare oxygen gas.

\_\_\_\_\_ [2]

(iii) Describe the test for oxygen gas.

\_\_\_\_\_

\_\_\_\_\_ [1]

[Turn over



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- 5 The table below shows the results of tests using chemicals which are referred to as **Q**, **R**, **S** and **T**. Use the information in the table to identify each of the chemicals.

Chemical	Test results
<b>Q</b>	<b>Q</b> changes from colourless to milky when carbon dioxide gas is bubbled through it
<b>R</b>	<b>R</b> changes from orange to colourless when ethene gas is bubbled through it
<b>S</b>	White fumes are produced when a glass rod dipped in <b>S</b> is applied to a sample of ammonia gas
<b>T</b>	<b>T</b> changes from colourless to pink when added to sodium hydroxide solution

Identify **Q**, **R**, **S** and **T**.

**Q** \_\_\_\_\_ [1]

**R** \_\_\_\_\_ [2]

**S** \_\_\_\_\_ [2]

**T** \_\_\_\_\_ [1]

[Turn over



**6** 25.0 cm<sup>3</sup> of sodium carbonate were placed in a conical flask with a few drops of methyl orange indicator and titrated against hydrochloric acid.

**(a)** Name the products of the reaction which occurs in this titration.

\_\_\_\_\_ [3]  
\_\_\_\_\_

**(b)** What piece of apparatus is used to measure out 25.0 cm<sup>3</sup> of sodium carbonate solution?

\_\_\_\_\_ [1]



(c) Draw a labelled diagram of the assembled apparatus used to carry out this titration.

[4]

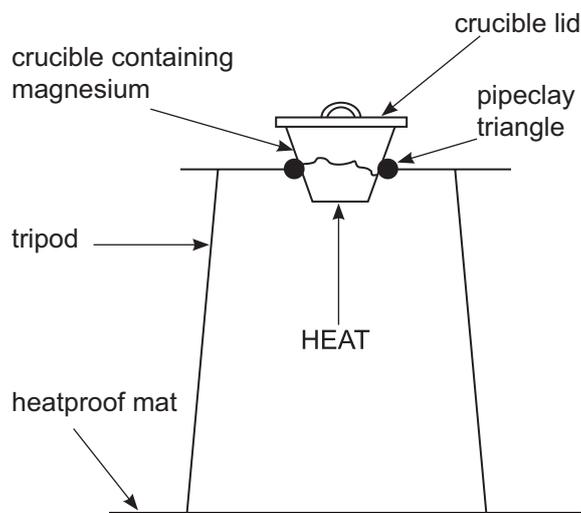
(d) State the colour change of the methyl orange indicator at the end point.

From \_\_\_\_\_ to \_\_\_\_\_ [2]

[Turn over



- 7 A sample of magnesium was heated in a crucible as shown in the diagram below. The magnesium reacted to form magnesium oxide.



The following measurements were recorded:

Mass of empty crucible with lid = 36.60 g

Mass of crucible containing magnesium, with lid = 38.76 g

Mass of crucible containing the product, with lid = 40.20 g

- (a) Write a balanced symbol equation for the formation of magnesium oxide from magnesium.

\_\_\_\_\_ [3]

- (b) During the experiment, the crucible lid is lifted occasionally.

- (i) Name the piece of apparatus used to lift the crucible lid.

\_\_\_\_\_ [1]

- (ii) Suggest why the crucible lid is lifted occasionally.

\_\_\_\_\_  
\_\_\_\_\_ [1]



**(c) (i)** Calculate the mass of magnesium in the crucible at the start of the experiment.

mass of magnesium = \_\_\_\_\_ g [1]

**(ii)** Calculate the number of moles of magnesium in the crucible at the start of the experiment.

moles of magnesium = \_\_\_\_\_ [1]

**(iii)** Calculate the mass of product formed using the mass measurements taken.

mass of product = \_\_\_\_\_ g [1]

**(d)** Describe how you would ensure that all of the magnesium had reacted.

\_\_\_\_\_  
\_\_\_\_\_ [1]



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**THIS IS THE END OF THE QUESTION PAPER**

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For Examiner's use only	
Question Number	Marks
1	
2	
3	
4	
5	
6	
7	

<b>Total Marks</b>	
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Examiner Number

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