Centre Number	Candidate Number	Name

UNIVERSITY OF CAMBRIDGE INTERNATIONAL EXAMINATIONS
International General Certificate of Secondary Education

CHEMISTRY **0620/06**

Paper 6 Alternative to Practical

October/November 2004

1 hour

Candidates answer on the Question Paper.
No additional materials required.

READ THESE INSTRUCTIONS FIRST

Write your name, Centre number and candidate number at the top of this page.
Write in dark blue or black pen in the spaces provided on the Question Paper.
You may use a pencil for any diagrams, graphs or rough working.
Do not use staples, paper clips, highlighters, glue or correction fluid.
You may use a calculator.

Answer **all** questions.
The number of marks is given in brackets [ ] at the end of each question or part question.

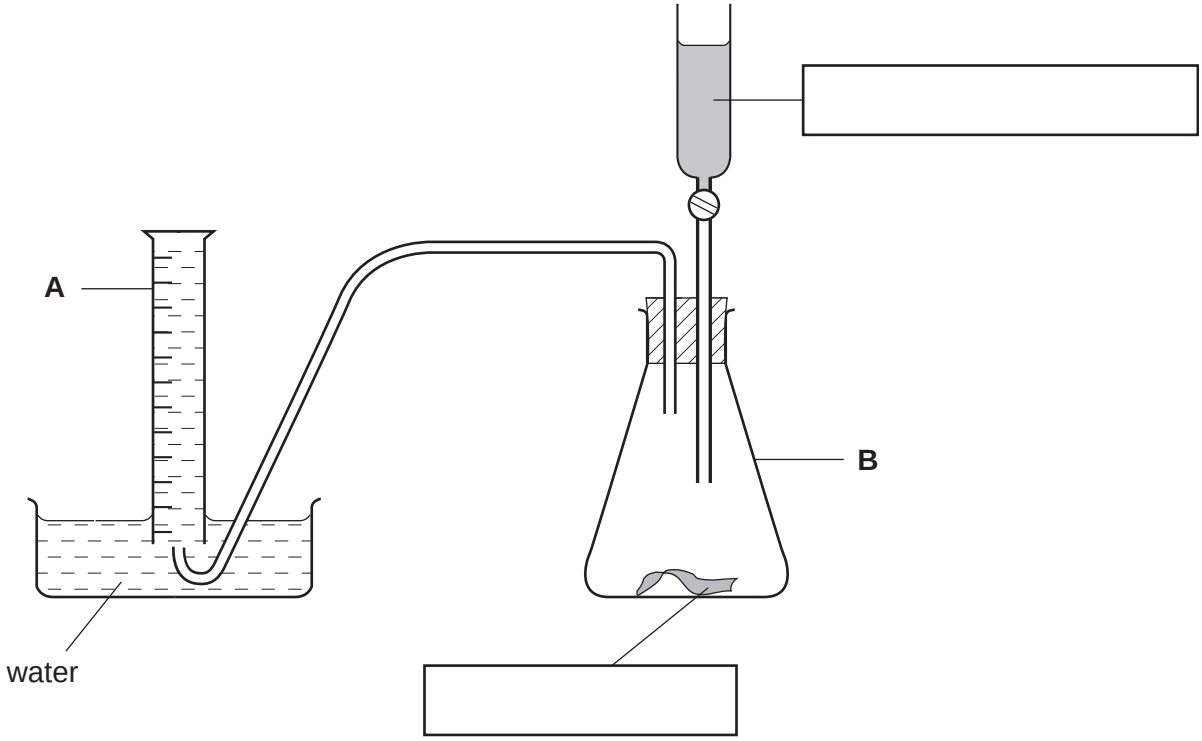
If you have been given a label, look at the details. If any details are incorrect or missing, please fill in your correct details in the space given at the top of this page.

Stick your personal label here, if provided.

FOR EXAMINER'S USE	
1	
2	
3	
4	
5	
6	
7	
TOTAL	

This document consists of **11** printed pages and **1** blank page.

1 The apparatus below was used to make hydrogen. Dilute hydrochloric acid was added to zinc.



(a) Identify the pieces of apparatus labelled

A, ...

B. ..... [2]

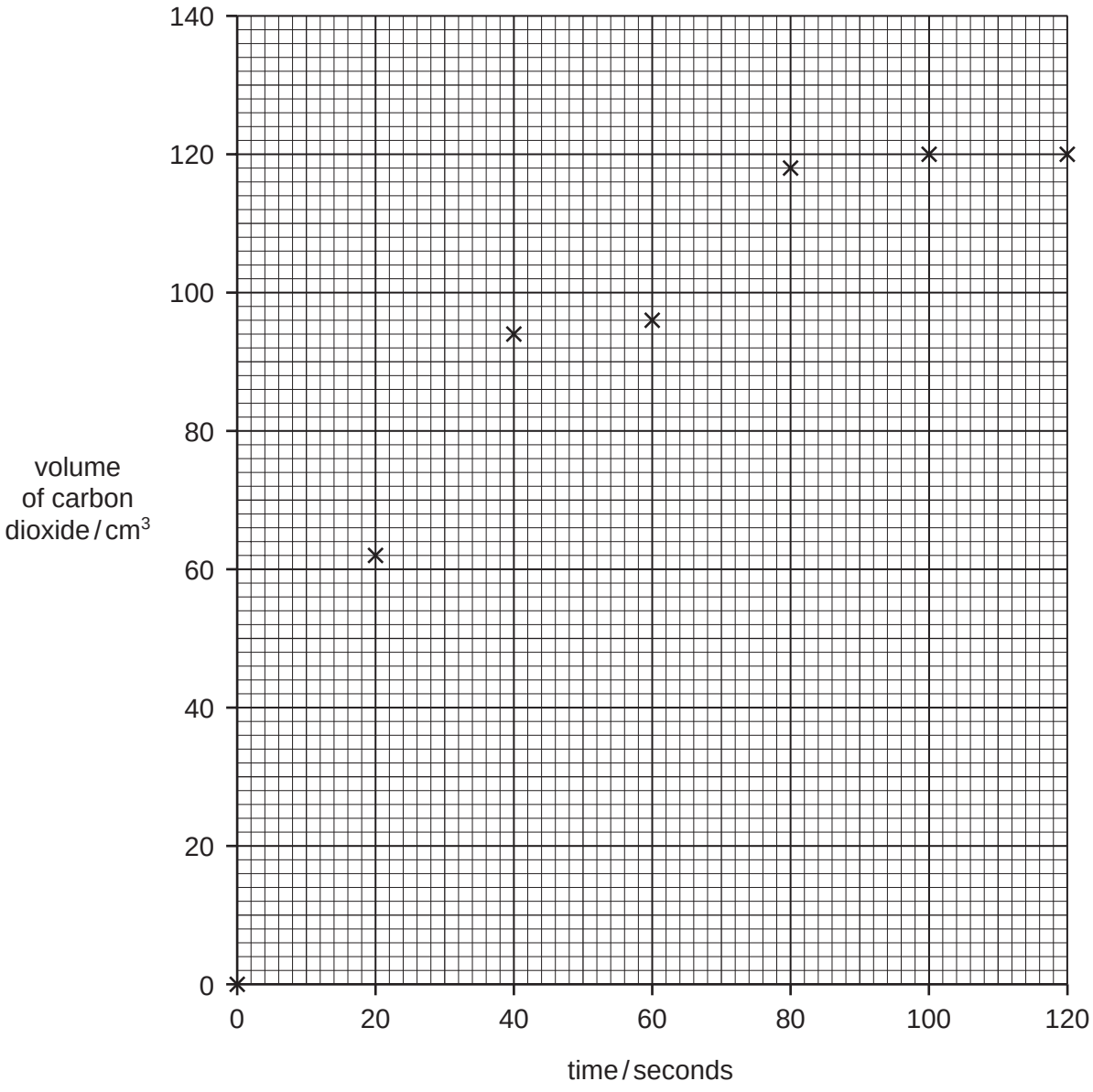
(b) Complete the boxes [1]

(c) Give a test for hydrogen.

test .....

result ..... [2]

2 The addition of calcium carbonate to excess dilute nitric acid produces carbon dioxide. The volume of carbon dioxide given off at 20 second intervals was recorded and plotted on the grid.



(a) Draw a smooth line graph on the grid. [1]

(b) Circle the result which appears to be incorrect? Why have you selected this result?

.....

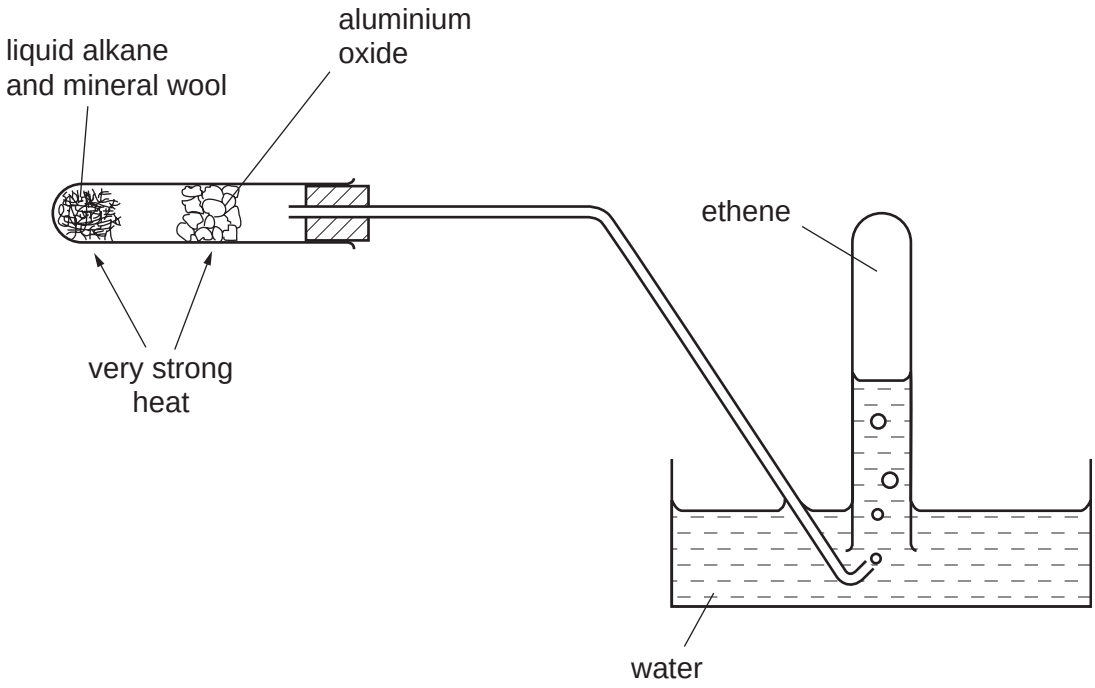
.....

..... [2]

(c) Why does the reaction slow down?

..... [1]

3 A liquid alkane was passed over heated aluminium oxide to make ethene.



(a) What is the purpose of the mineral wool?

.....

[1]

(b) What is this type of chemical reaction called?

.....

[1]

(c) Give a test for ethene.

test .....

result ..... [2]

(d) What precaution should be taken in the experiment when the heat is removed? Explain.

.....

.....

..... [2]

4 A student investigated what happened when sodium thiosulphate dissolved in water.

Experiment 1

By using a measuring cylinder, 20 cm^3 of distilled water was poured into a polystyrene cup. Use the thermometer diagram to record the temperature of the water in the table.

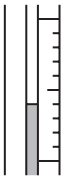
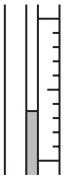
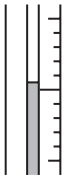
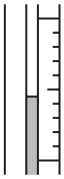
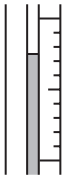
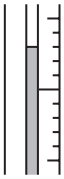
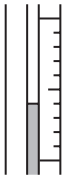
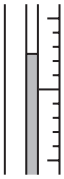
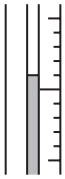
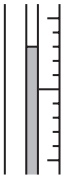
1 g of powdered sodium thiosulphate was added to the cup and the mixture stirred with a thermometer. Use the thermometer diagram to record the temperature of the solution.

Experiment 2

Experiment 1 was repeated using 2 g of powdered sodium thiosulphate. Record the temperature in the table.

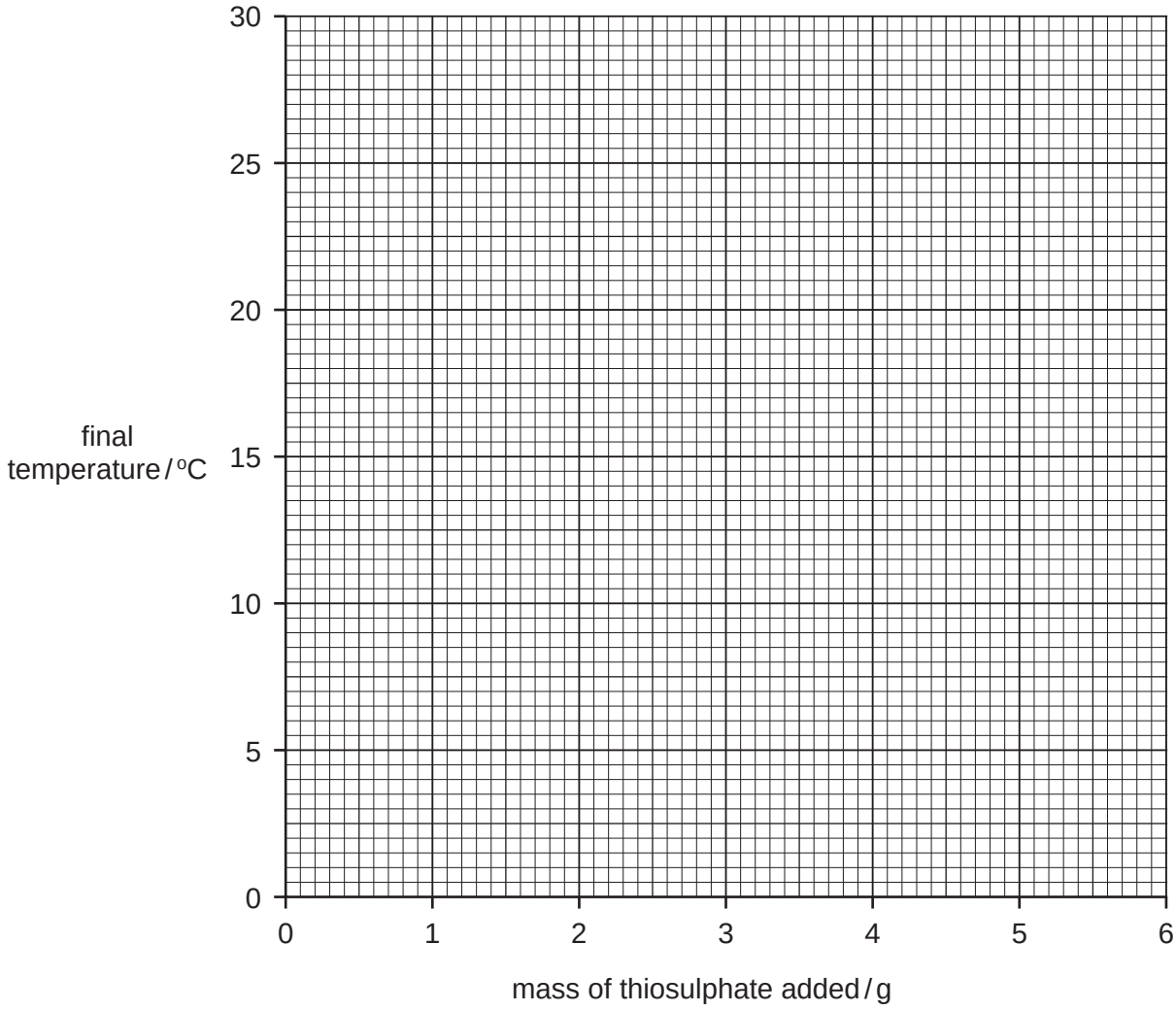
Experiments 3, 4 and 5

Experiment 1 was repeated using 3 g, 4 g and 5 g of powdered sodium thiosulphate respectively. Record the temperatures in the table.

mass of sodium thiosulphate / g	temperature / °C			
	initial		final	
0				
1				
2				
3				
4				
5				

[5]

(a) Plot the results of the experiments on the grid below. Draw a straight line graph. Clearly label the graph. [5]



(b) (i) **Use your graph** to estimate the temperature of the reaction mixture if 3.5 g of powdered sodium thiosulphate were added to 20 cm^3 of water.

Indicate **clearly** on the graph how you obtained your answer.

..... [2]

(ii) From your graph work out the temperature of the reaction mixture if 6 g of powdered sodium thiosulphate were added to 20 cm^3 of water.

Indicate **clearly** how you used your graph.

..... [2]

(c) What type of chemical reaction occurs when sodium thiosulphate dissolves in water?

..... [1]

(d) Explain how the temperature changes would differ in the experiments if 40 cm^3 of water were used.

.....

.....

..... [2]

(e) Explain why the sodium thiosulphate was powdered before being used.

.....

..... [2]

(f) Predict what the temperature of the reaction mixture in *Experiment 5* would be after 1 hour. Explain your answer.

.....

..... [2]

(g) Suggest **one** change you could make to the **apparatus** used in the experiments to obtain more accurate results.

.....

..... [1]

5 Salt **E**, which is ammonium chloride was tested.

Record all observations in the table.

tests	observations
(a) Describe the appearance of **E**	..... [2]
(b) Using a spatula salt **E** was placed in a hard glass test-tube. Inside the top of the tube was suspended a piece of damp blue litmus paper next to a piece of damp red litmus paper. **E** was heated gently until gas came out of the tube.	red litmus went blue then blue litmus went red
(c) **E** was dissolved in water to make an aqueous solution. The solution was divided into three test-tubes **(i)** To the first portion, was added a few drops of dilute nitric acid and about 1cm^3 of aqueous silver nitrate. **(ii)** To the second portion of solution **E**, was added about 1 cm^3 of lead nitrate solution. **(iii)** To the third portion of solution **E**, was added about 1 cm^3 of aqueous sodium hydroxide. The mixture was boiled gently and the gas given off was tested with indicator paper	.... [2] ..... [2] .... [2]

(d) Name the gas given off in test **(c)(iii)**.

..... [1]

(e) Explain the observations in test **(b)**.

.....

..... [2]

6 Describe a chemical test to distinguish between each of the following pairs of substances. An example is given.

oxygen and carbon dioxide

test: glowing splint

result: re-lights in oxygen, no effect with carbon dioxide

(a) aqueous chlorine and aqueous sodium chloride

test .....

result with chlorine .....

result with sodium chloride ..... [2]

(b) aqueous iron(II) chloride and aqueous iron(III) chloride

test .....

result with iron(II) chloride .....

result with iron(III) chloride ..... [2]

(c) copper sulphate and copper carbonate

test .....

result with copper sulphate .....

result with copper carbonate ..... [2]

7 Forged Banknote

A fake banknote can be investigated by dissolving the ink off the paper.

You are provided with four different inks from four different criminals. Describe an experiment to show which one of these inks is the same as the ink from the banknote.

You can use a labelled diagram to help you answer the question.

.....

.....

.....

.....

.....

..... [6]

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