Centre Number	Candidate Number	Name

UNIVERSITY OF CAMBRIDGE INTERNATIONAL EXAMINATIONS
International General Certificate of Secondary Education

CHEMISTRY **0620/06**

Paper 6 Alternative to Practical

May/June 2005

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.

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

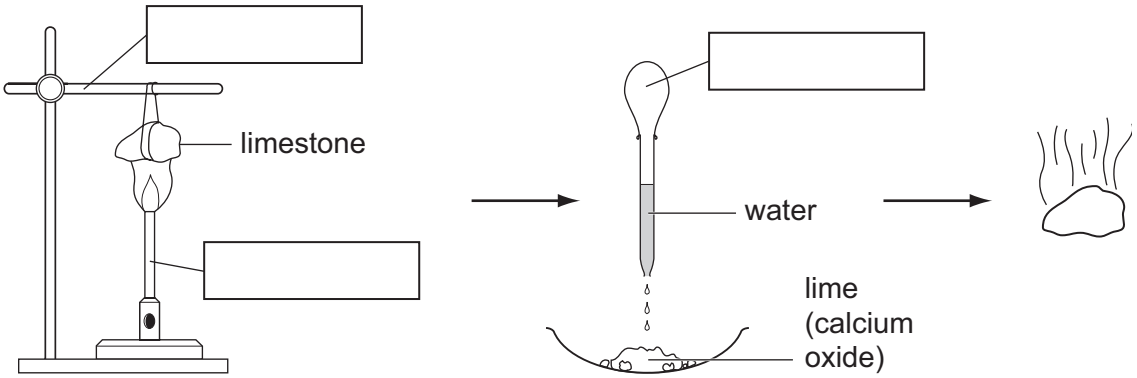
If you have been given a label, look at the details. If any details are incorrect or missing, please fill in your correct details in the space given at the top of this page.

Stick your personal label here, if provided.

FOR EXAMINER'S USE	
1	
2	
3	
4	
5	
6	
7	
8	
TOTAL	

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

1 A small piece of limestone was heated strongly and left to cool. A few drops of cold water were added. The solid expanded and gave off steam.



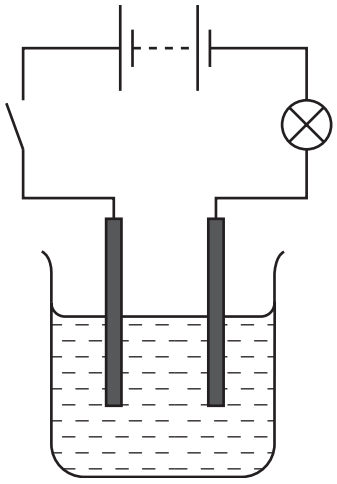
(a) Complete the empty boxes to identify the pieces of apparatus labelled. [3]

(b) What type of chemical reaction takes place when water is added?

.....

[1]

2 The diagram shows the apparatus used to find out the effect of an electric current on a concentrated aqueous solution of sodium chloride.



(a) On the diagram label the electrodes [1]

(b) Give three observations when the circuit is switched on.

1 .....

2 .....

3 ..... [3]

(c) **(i)** Name the product at the positive electrode (anode).

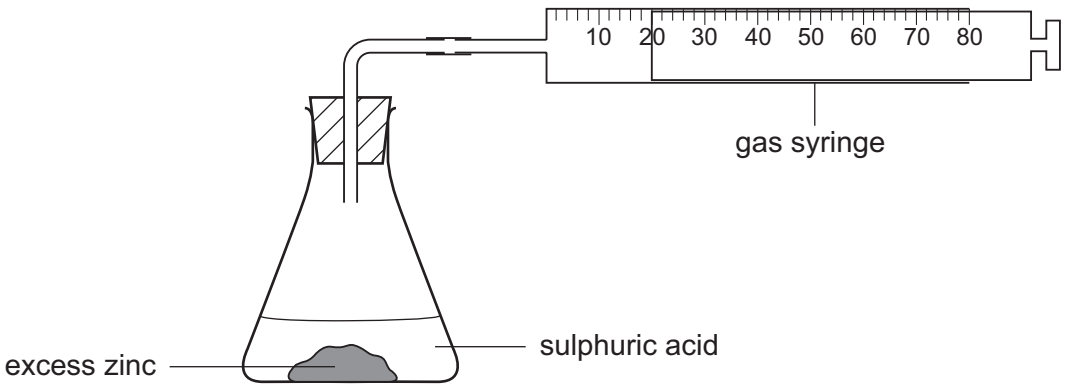
..... [1]

(ii) State a test for this product and the result of the test.

test .....

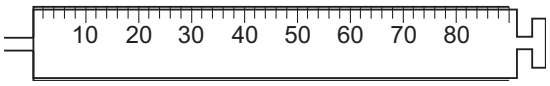
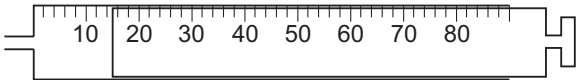
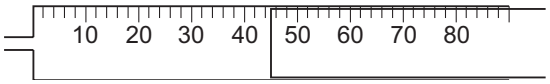
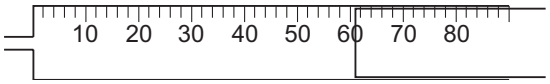
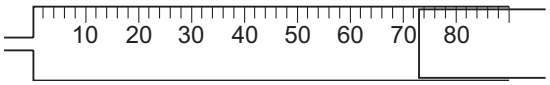
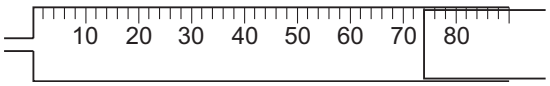
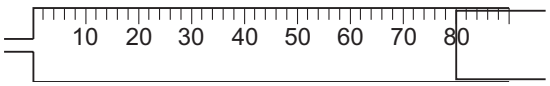
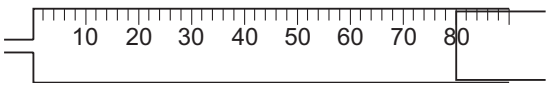
result ..... [2]

3 In a set of experiments zinc was reacted with sulphuric acid to form hydrogen. The apparatus below was used.



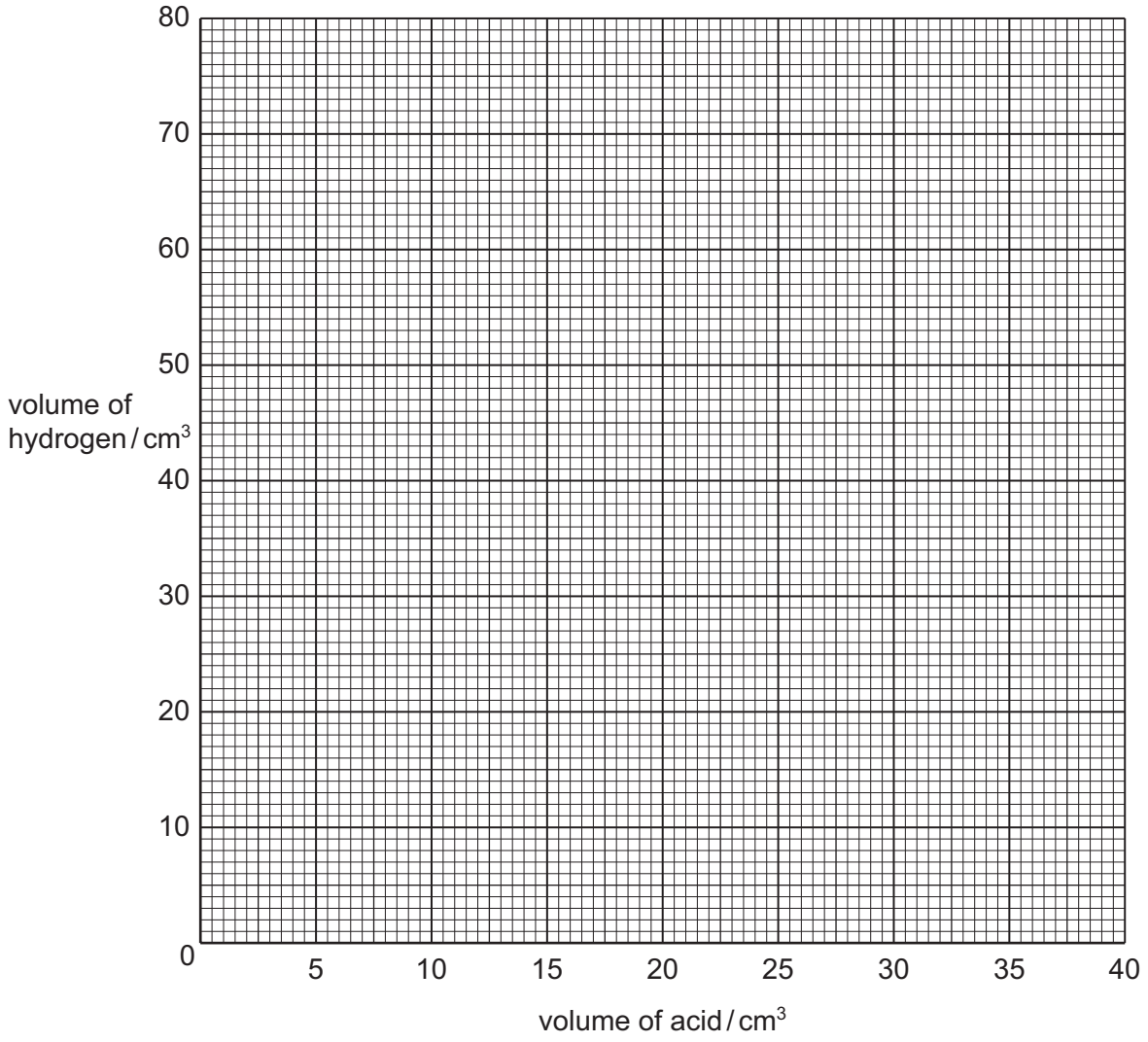
The same mass of zinc was used each time. The volume of acid used was different each time. Use the syringe diagrams to record the volume of hydrogen produced each time in the table.

Table of results

volume of sulphuric acid/cm^3	syringe diagram	volume of hydrogen/cm^3
0		
5		
15		
20		
25		
30		
35		
40		

[4]

(a) Plot the results on the grid below. Draw a smooth line graph.



[4]

(b) Use the graph to find the volume of sulphuric acid that will produce 33 cm^3 of gas.

.....

[1]

(c) What volume of gas is produced if 10 cm^3 of sulphuric acid is used?

.....

[1]

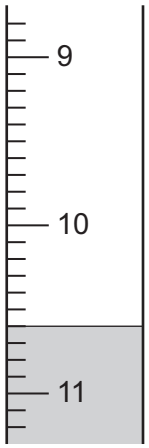
4 A student investigated an aqueous solution of calcium hydroxide and water.

Two experiments were carried out.

Experiment 1

By using a measuring cylinder 25 cm^3 of the aqueous solution of calcium hydroxide was placed in a flask. Phenolphthalein indicator was added to the flask. A burette was filled to the 0.0 cm^3 mark with solution **M** of hydrochloric acid.

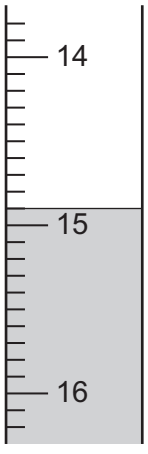
Solution **M** was added slowly to the flask until the colour just disappeared. Use the burette diagram to record the volume in the table and complete the column.



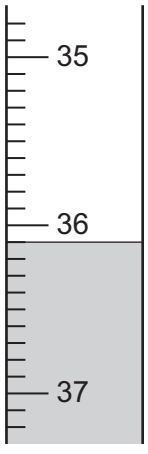
Experiment 2

Experiment 1 was repeated using a different solution, **N**, of hydrochloric acid.

Use the burette diagrams to record the volumes in the table and complete the table.



initial



final

Table of results

burette readings/cm^3	Experiment 1	Experiment 2
final reading		
initial reading	0.0	
difference		

[4]

(a) What type of chemical reaction occurs when hydrochloric acid reacts with calcium hydroxide?

.....

[1]

(b) **(i)** In which experiment was the greater volume of hydrochloric acid used?

.....

[1]

(ii) Compare the volumes of acid used in Experiments 1 and 2.

.....

.....

[2]

(iii) Suggest an explanation for the difference in volumes.

.....

.....

[2]

(c) Predict the volume of hydrochloric acid **M** that would be needed to react completely if Experiment 1 was repeated with 50 cm^3 of calcium hydroxide solution?

volume of solution .....

explanation .....

.....

[3]

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

.....

.....

[1]

5 A sample of a solution of acid **A** was analysed.

The tests on **A**, and some of the observations are in the following table.

Complete the observations in the table.

tests	observations
(a) The pH of the solution was tested using indicator paper	colour orange pH 4
(b) The solution was divided into three test-tubes **(i)** To the first portion was added a piece of magnesium ribbon. The gas was tested with a lighted splint.	..... [2]
(ii) To the second portion of **A** was added sodium carbonate. The gas was tested with limewater.	..... [2]
(iii) To the third portion of liquid **A** was added a spatula measure of solid **B**. The mixture was boiled gently. By using a teat pipette the solution was transferred to another test tube. Excess aqueous ammonia was added.	green solution formed dark blue solution formed

(c) What does test **(a)** tell you about the type of acid in solution **A**?

..... [1]

(d) **(i)** Name the gas given off in test **(b)(i)**.

..... [1]

(ii) Name the gas given off in test **(b)(ii)**.

..... [1]

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

.....

..... [2]

6 The label below is from a bottle of concentrated lemon drink.

Concentrated lemon drink
Ingredients: Water, sugar, citric acid, preservatives, potassium sorbate (artificial sweetener). Yellow colourings E102 and E104.

(a) What is meant by the term *concentrated*?

..... [1]

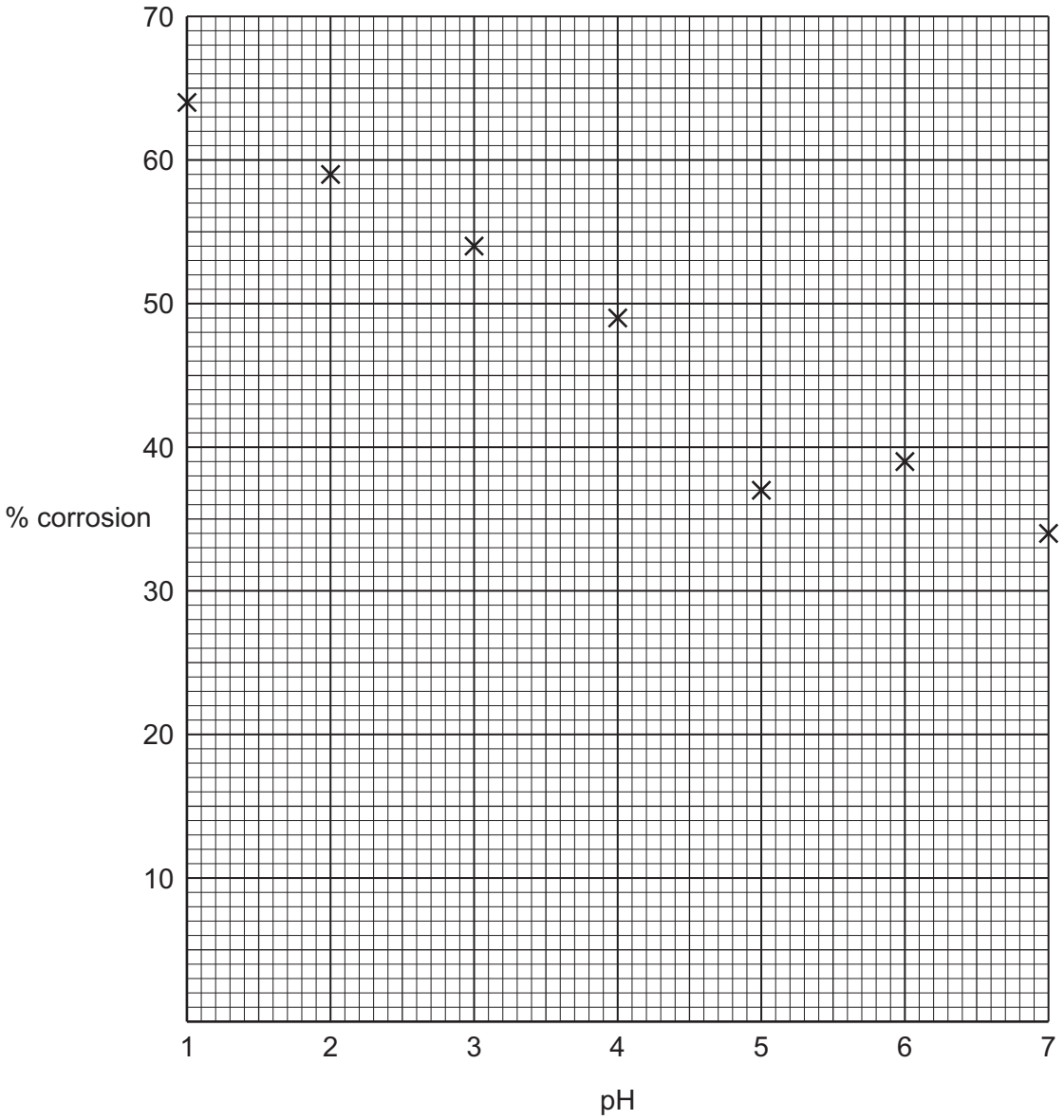
(b) Predict the pH of the lemon drink.

..... [1]

(c) Describe an experiment to show that two different yellow colourings are present in the drink.

[4]

7 Samples of concrete were placed in solutions of different pH. The graph shows the percentage corrosion of the samples.



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

(b) Which point on the grid appears to be inaccurate? Explain your reason for identifying this point.

.....

..... [2]

(c) What happens to the percentage corrosion as the pH changes from 1 to 7?

..... [1]

8 An aqueous solution of hydrogen peroxide decomposes very slowly to form oxygen. The speed of decomposition can be increased by using a catalyst. Two possible catalysts are the solids copper(II) oxide and chromium(III) oxide.

Plan an investigation to find out which of these two oxides is the better catalyst for this decomposition.

The space below can be used for a diagram.

.....

.....

.....

.....

.....

..... [6]

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