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 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.

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

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.

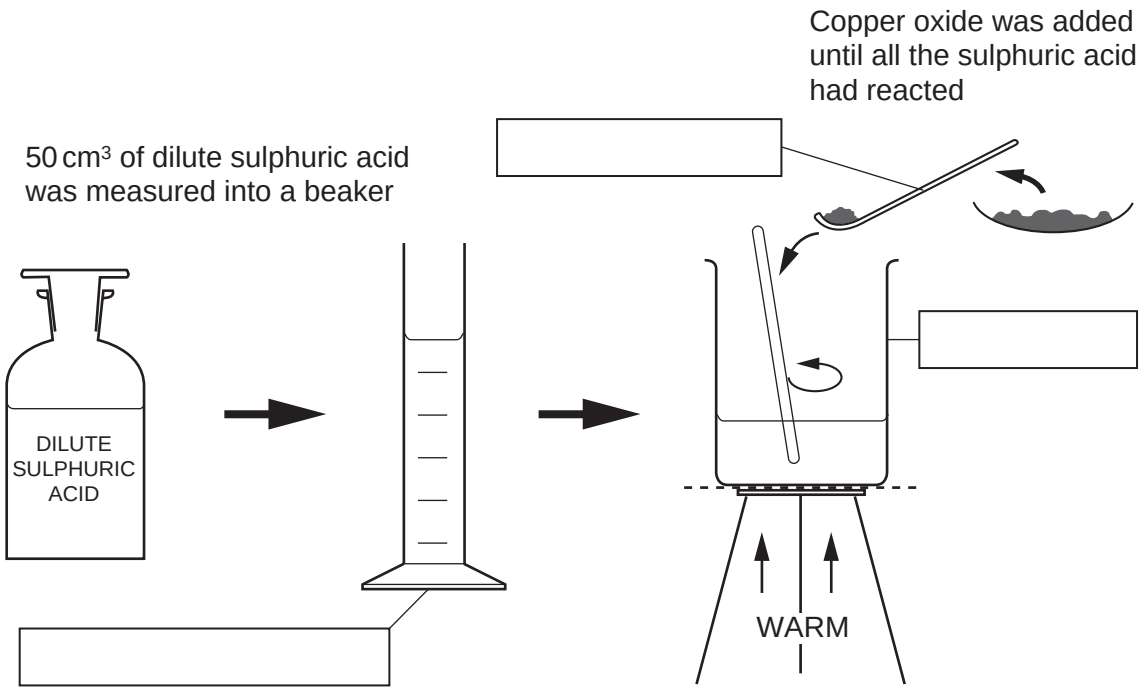
Stick your personal label here, if provided.

This document consists of **12** printed pages.

© UCLES 2005

For Examiner's Use

1 A student reacted sulphuric acid with copper(II) oxide. The diagram shows the procedure followed.



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

(b) What is the colour of the solution formed?

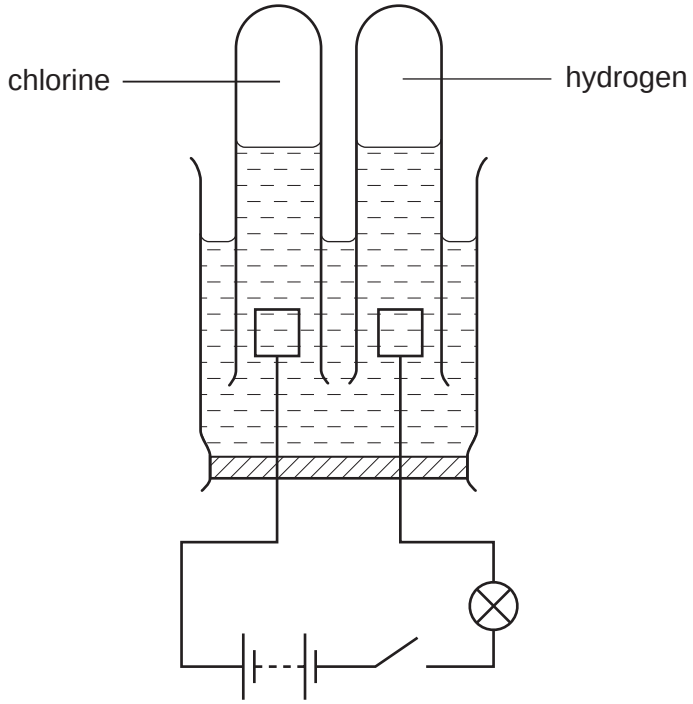
..... [1]

(c) Describe how crystals could be quickly obtained from the solution.

.....

..... [2]

2 The diagram shows the apparatus used to pass an electric current through concentrated hydrochloric acid.



(a) Label the electrodes. [1]

(b) Give two observations when the current is switched on.

1 .....

2 ..... [2]

(c) Give a test for the product at the negative electrode (cathode).

test .....

result ..... [2]

For Examiner's Use

3 The green pigment chlorophyll can be obtained from grass.

Step 1 The grass is crushed with sand.

Step 2 The grass is ground with ethanol until the solution is saturated.

Step 3 The solution is separated from the rest of the mixture.

Step 4 The colours in the solution are separated.

(a) What apparatus is used in Step 1?

.....

[2]

(b) Suggest why the grass is ground with ethanol rather than water in Step 2.

.....

[1]

(c) Name the separation method in Step 3.

.....

[1]

(d) Describe how Step 4 is carried out.

.....

.....

.....

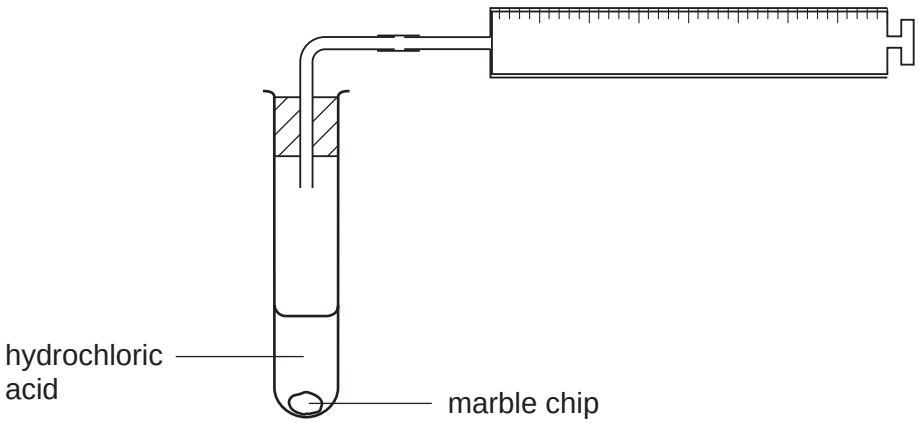
.....

[4]

© UCLES 2005

4 A student investigated the speed of reaction between aqueous hydrochloric acid and marble chips (calcium carbonate).

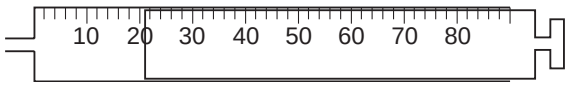
The apparatus below was used.



5 test-tubes were put in a rack. To each test-tube was added 10 cm^3 of different solutions of aqueous hydrochloric acid and a marble chip. The marble chips were the same size.

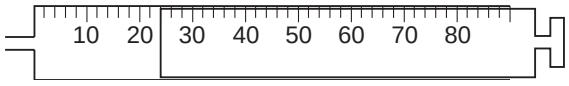
Experiment 1

By using a measuring cylinder 10 cm^3 of the solution **P** of aqueous hydrochloric acid was placed in the first test-tube. A marble chip was added and the volume of gas collected after two minutes was measured. Use the gas syringe diagram to record the volume.



Experiment 2

Experiment 1 was repeated using the solution **Q** of aqueous hydrochloric acid. Use the diagram to record the volume of gas collected in the table.

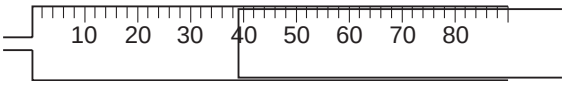


Experiments 3, 4 and 5

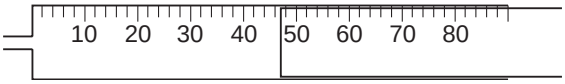
Experiment 1 was repeated using the solutions **R**, **S** and **T** of aqueous hydrochloric acid in the third, fourth and fifth test-tubes.

Use the diagrams to record the volumes in the table.

Experiment 3



Experiment 4



Experiment 5

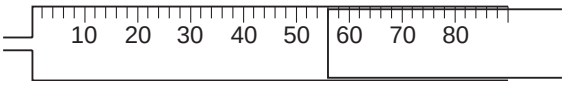


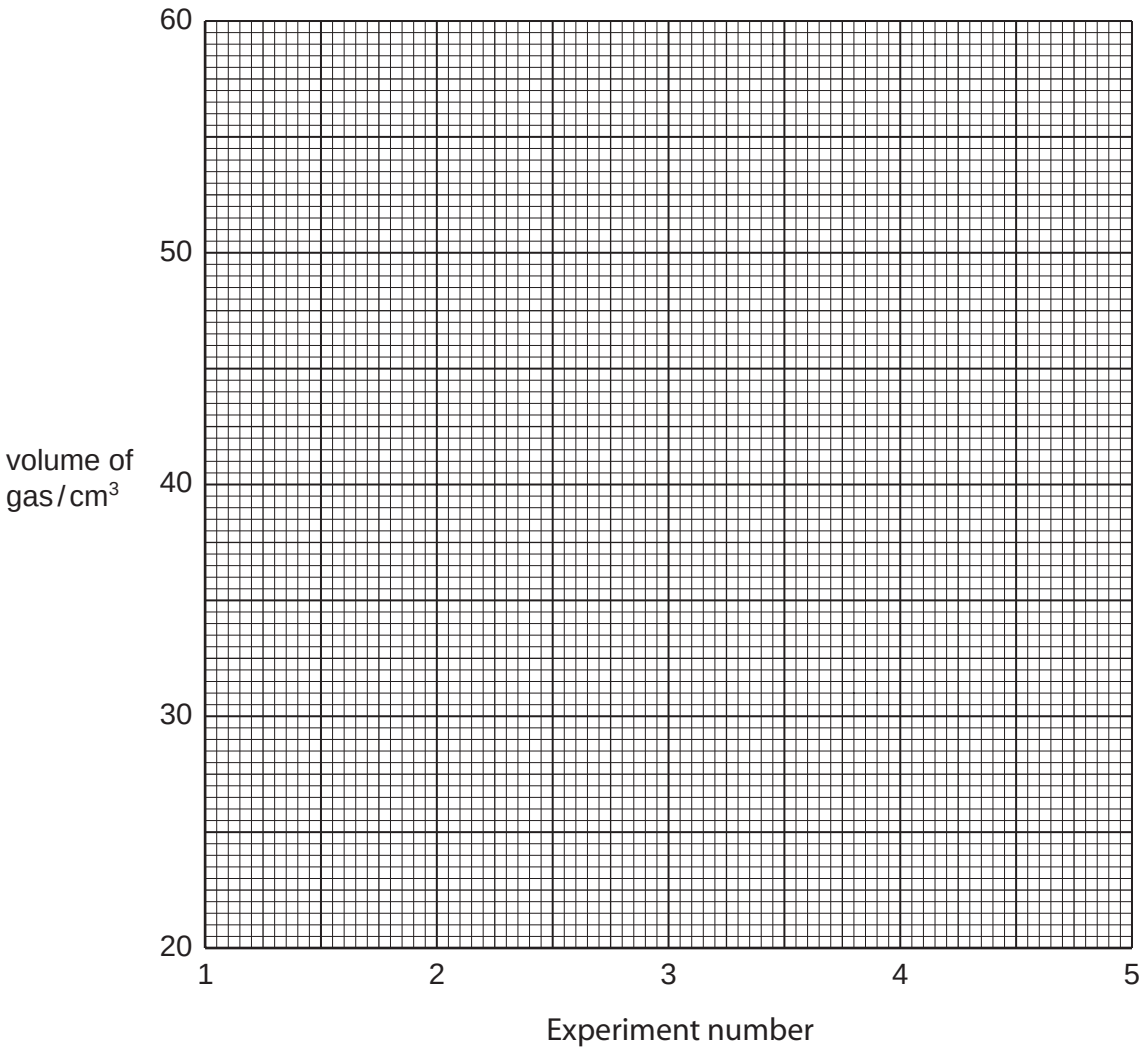
Table of results

Experiment	solution of hydrochloric acid	volume of gas collected / cm^3
1	**P**	
2	**Q**	
3	**R**	
4	**S**	
5	**T**	

[3]

© UCLES 2005

(a) Plot your results on the grid. Draw a straight line graph.



[4]

(b) Which result appears inaccurate? Give a reason for your choice.

Experiment .....

reason ..... [2]

(c) **(i)** Which Experiment had the fastest rate of reaction?

..... [1]

(ii) Suggest why this Experiment was the fastest.

.....

.....

..... [2]

© UCLES 2005

[Turn over

(d) How would the student know which of the reactants in the Experiment was in *excess*?

.....

..... [2]

(e) (i) State **one** possible source of error in the Experiments.

.....

..... [1]

(ii) Suggest **one** improvement to reduce this source of error in the Experiments.

.....

..... [1]

© UCLES 2005

5 A solid compound **X** was analysed. Solid **X** was an aluminium salt. The tests on **X** and some of the observations are in the following table.

Complete the observations in the table.

tests	observations
(a) One spatula measure of **X** was placed into a hard-glass test-tube. The solid was heated gently then strongly. The gas was tested with pH indicator paper.	condensation at top of tube paper went red
Distilled water was added to **X** and shaken to dissolve. The solution was divided into five portions in test-tubes. **(b) (i)** To the first portion, drops of aqueous sodium hydroxide were added. Excess aqueous sodium hydroxide was then added.	.... [3]
(ii) To the second portion, drops of aqueous ammonia were added. Excess ammonia was then added.	.... [3]
(iii) To the third portion of solution, hydrochloric acid and barium chloride solution were added.	no visible change
(iv) To the fourth portion of solution, nitric acid and lead nitrate solution were added.	no visible change
(v) To the fifth portion, aqueous sodium hydroxide and a spatula measure of aluminium granules were added. The mixture was warmed and the gas tested with indicator paper.	pungent gas paper went blue, pH 10

© UCLES 2005

(c) What does test **(a)** tell you about the gas given off?

.....

[1]

(d) What conclusions can you draw about **X** from tests **(b)(iii)** and **(iv)**?

(b)(iii) .....

(b)(iv) .....

[2]

(e) Identify the gas in **(b)(v)**.

.....

[1]

(f) What conclusions can you draw about substance **X**?

.....

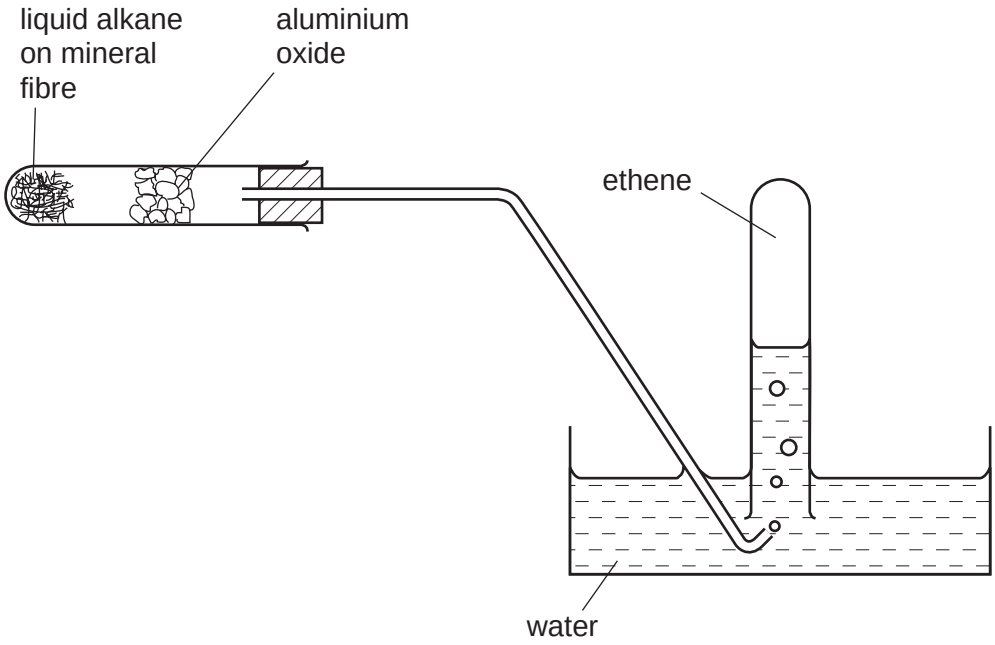
.....

[2]

© UCLES 2005

For Examiner's Use

6 The diagram shows how ethene can be made by cracking liquid alkanes.



(a) Indicate with arrows on the diagram where heat is applied. [2]

(b) Give a chemical test to show the presence of ethene.

test .....

result ..... [2]

(c) Why must the delivery tube be removed from the water before the heat is turned off?

..... [2]

For Examiner's Use

7 Some plants do not grow well in acidic soil.
A farmer gives you a small sample of soil from a corner of one of his fields.

(a) Plan an investigation to find out the pH of the soil sample.

You are provided with Universal Indicator solution and common laboratory apparatus.

.....

.....

.....

.....

.....

..... [5]

(b) Why would further experiments be necessary to inform the farmer which plants should be grown in each of his fields?

.....

..... [2]

Permission to reproduce items where third-party owned material protected by copyright is included has been sought and cleared where possible. Every reasonable effort has been made by the publisher (UCLES) to trace copyright holders, but if any items requiring clearance have unwittingly been included, the publisher will be pleased to make amends at the earliest possible opportunity.

University of Cambridge International Examinations is part of the University of Cambridge Local Examinations Syndicate (UCLES), which is itself a department of the University of Cambridge.

© UCLES 2005