

Candidate Name _____

Centre Number	Candidate Number

**International General Certificate of Secondary Education
CAMBRIDGE INTERNATIONAL EXAMINATIONS**

CHEMISTRY

PAPER 6 Alternative to Practical

0620/6

MAY/JUNE SESSION 2002

1 hour

Candidates answer on the question paper.
No additional materials are required.

TIME 1 hour

INSTRUCTIONS TO CANDIDATES

Write your name, Centre number and candidate number in the spaces at the top of this page.

Answer **all** questions.

Write your answers in the spaces provided on the question paper.

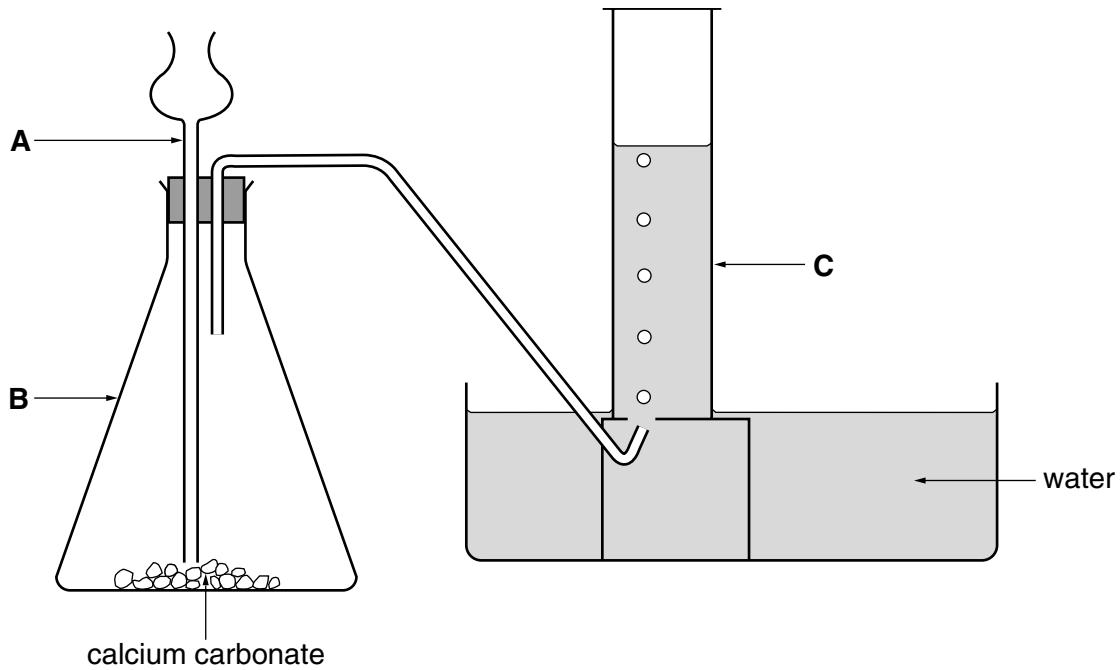
INFORMATION FOR CANDIDATES

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

FOR EXAMINER'S USE

This question paper consists of 11 printed pages and 1 blank page.

- 1 The apparatus below was used to make carbon dioxide. Dilute hydrochloric acid was added to calcium carbonate.



- (a) Identify the pieces of apparatus labelled:

A

B

C

[3]

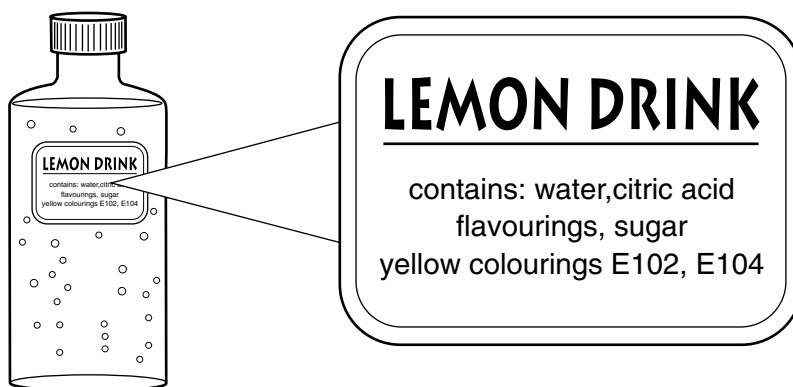
- (b) Indicate on the diagram with an arrow where the acid was added. [1]

- (c) State a test for carbon dioxide.

test

result [2]

2 The label shows the substances present in a bottle of lemon drink.



(a) A piece of litmus paper was dipped in the drink.

(i) What colour will the paper turn?

.....[1]

(ii) Why does using litmus paper give a better result than adding Universal Indicator solution to the drink?

.....
.....[1]

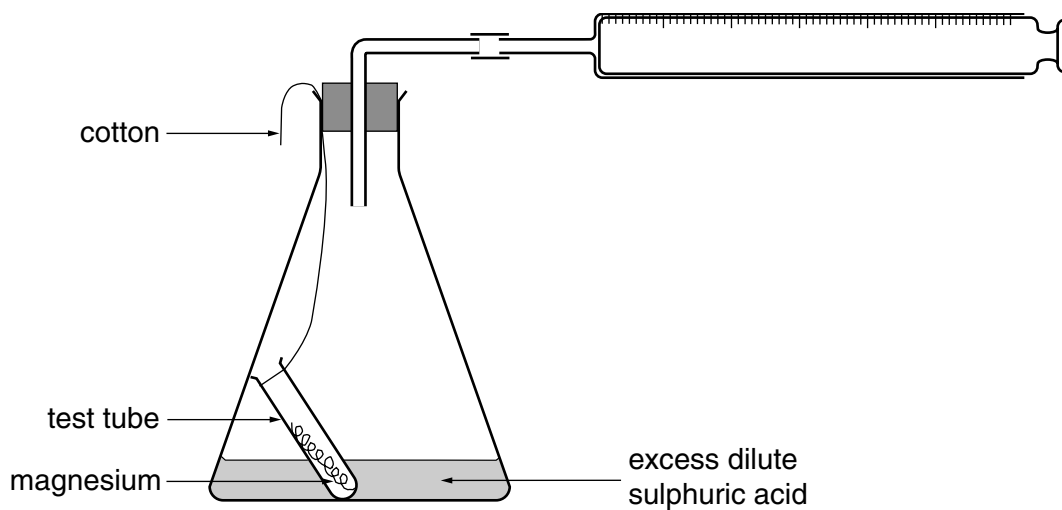
(b) How could a sample of pure water be obtained from the drink?

.....
.....
.....[2]

(c) Describe an experiment you could carry out to show that the drink contained **two** different yellow substances.

.....
.....
.....
.....[3]

- 3 The apparatus below was used to investigate the speed of the reaction between an **excess** of dilute sulphuric acid and 4 cm of magnesium ribbon.

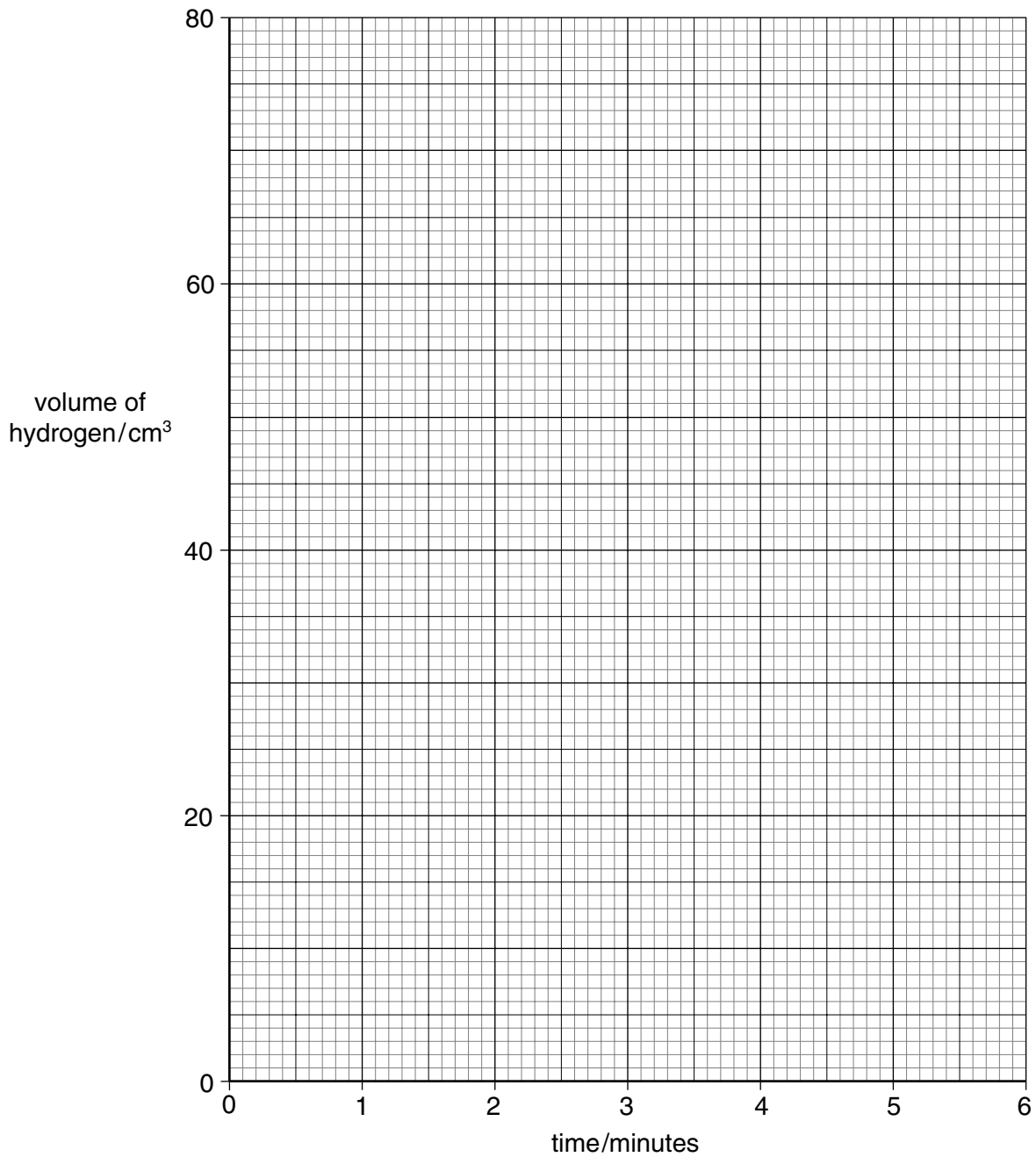


- (a) (i) What is the purpose of the test-tube?
[1]
- (ii) What is the purpose of the gas syringe?
[1]
- (b) How was the reaction started?
[1]
- (c) What does an *excess* of sulphuric acid mean?
[1]

The reaction produced hydrogen. The results obtained are shown in the table.

Time/minutes	0	1	2	3	4	5	6
Volume of hydrogen /cm ³	0	28	42	64	76	80	80

(d) Plot the results on the grid below and draw a smooth line graph.



[3]

(e) Which result appears to be incorrect? Why have you selected this result?

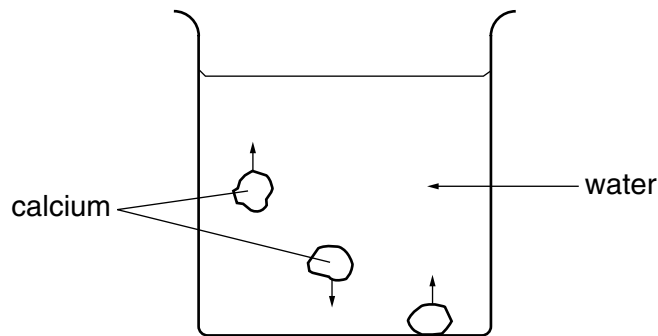
.....
 [2]

(f) From the graph work out the volume of hydrogen produced after 30 seconds. Indicate clearly on the grid how you used the graph.

..... [2]

(g) Sketch on the grid the graph you would expect if the experiment were repeated using 2 cm of magnesium. Label this graph **M**. [1]

- 4 Small pieces of calcium are added to a beaker of cold water. The pieces of calcium move up and down.



- (a) Give **one** other observation expected in this reaction.

.....[1]

- (b) Suggest why the pieces of calcium move up and down.

.....[1]

- (c) Suggest a value for the pH of the solution formed.

.....[1]

- 5 A student investigated the redox reaction between potassium manganate(VII) and iron(II) ions. Two different aqueous solutions of potassium manganate(VII), **A** and **B**, were used.

Experiment 1

A burette was filled to the 0.0 cm³ mark with the solution **A** of aqueous potassium manganate(VII). A 25 cm³ sample of aqueous iron(II) ions was added into a conical flask from a measuring cylinder.

Solution **A** was gradually added until there was just a **permanent** pale pink colour in the contents of the flask.

Use the burette diagram to read the volume added and record the volume in the table.

Experiment 2

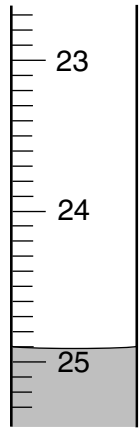
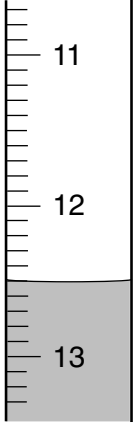
Experiment 1 was repeated using the solution **B** of potassium manganate(VII) instead of solution **A**.

Use the burette diagram to read the volume added and complete the table.

A little of the contents of the flask were poured into a test-tube. Excess aqueous sodium hydroxide was added to the tube.

A red-brown precipitate was formed.

Table of results

Burette readings/cm ³				
	Experiment 1		Experiment 2	
Final reading				
Initial reading	0.0		0.0	
Difference				

[2]

- (a) (i) In which Experiment was the greatest volume of aqueous potassium manganate(VII) used?

.....[1]

- (ii) Compare the volumes of potassium manganate(VII) used in Experiments 1 and 2.

.....

.....[2]

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

.....

.....[1]

- (iv) Predict the volume of solution **B** which would be needed to completely react with 50 cm³ of the solution of iron(II) ions.

.....

.....[2]

- (b) What product is formed in the flask at the end of the reaction? Give a reason for your answer.

product

reason[2]

- (c) Explain **one** change you could make to the **apparatus** used in the experiments to obtain more accurate results.

change

explanation.....[2]

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

.....[1]

(f) Name the gas given off in test (c)(i).

.....[1]

(g) What conclusions can you draw about solid T?

.....
.....
.....[2]

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

potassium chloride and potassium iodide

test: add aqueous lead(II) nitrate

result: potassium chloride gives a white precipitate, potassium iodide gives a yellow precipitate

(a) hydrochloric acid and aqueous sodium chloride

test

result

.....[2]

(b) propane and propene

test

result

.....[2]

(c) sulphuric acid and nitric acid

test

result

.....[2]

