UNIVERSITY OF CAMBRIDGE INTERNATIONAL EXAMINATIONS
International General Certificate of Secondary Education

CANDIDATE NAME									
CENTRE NUMBER						CANDIDATE NUMBER				

CHEMISTRY **0620/06**

Paper 6 Alternative to Practical **May/June 2008**

1 hour

Candidates answer on the Question Paper.

No additional materials are required.

READ THESE INSTRUCTIONS FIRST

Write your, Centre number, candidate number and name on all the work you hand in.
Write in dark blue or black pen.
You may use a pencil for any diagrams, graphs or rough working.
Do not use staples, paper clips, highlighters, glue or correction fluid.
DO **NOT** WRITE IN ANY BARCODES

Answer **all** questions.

At the end of the examination, fasten all your work securely together.

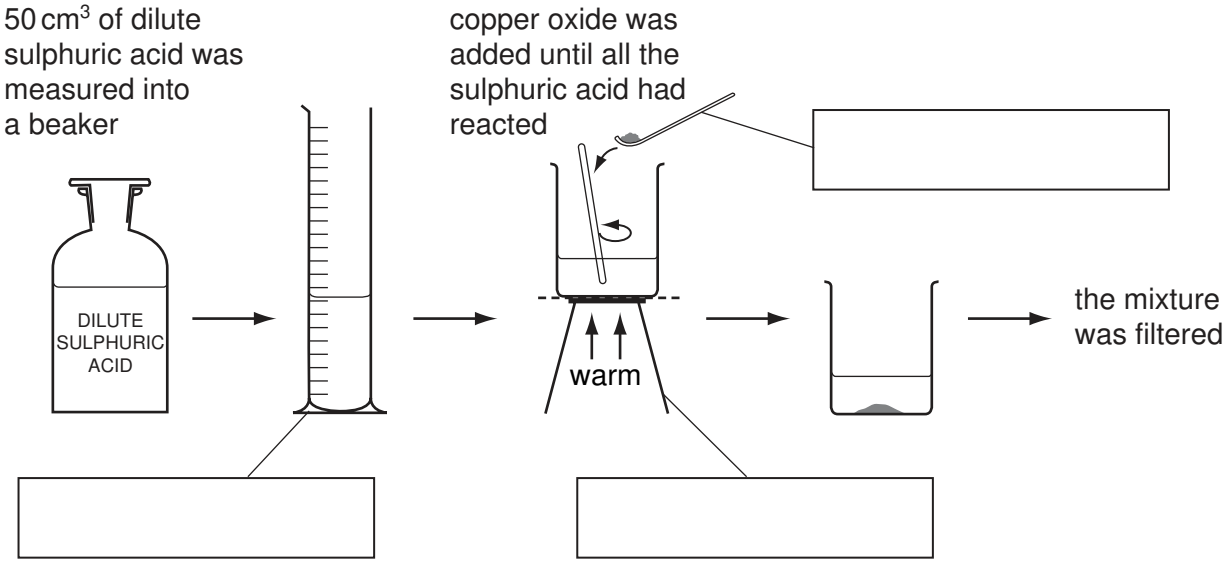
The number of marks is given in brackets [ ] at the end of each question or part question.

For Examiner's Use	
1	
2	
3	
4	
5	
6	
7	
Total	

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

For Examiner's Use

1 A solution of copper sulphate was made by reacting excess copper oxide with dilute sulphuric acid. The diagram shows the method used.



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

(b) What does the term *excess* mean?

.....

[1]

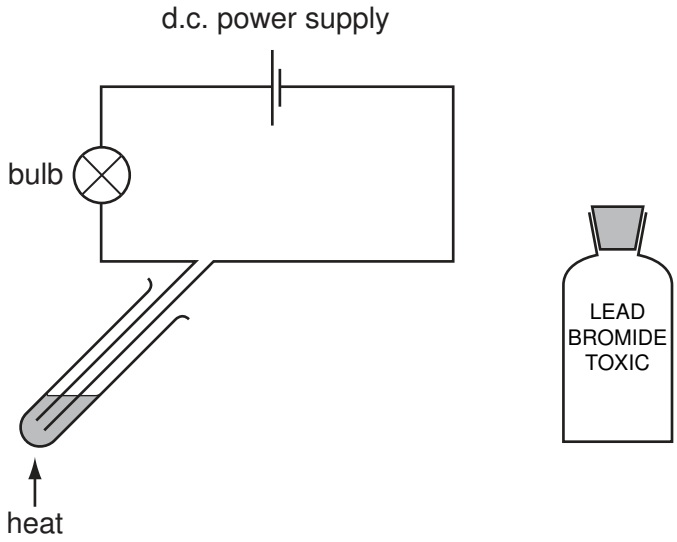
(c) Draw a labelled diagram to show how the mixture was filtered.

[2]

[Total: 6]

2 The diagram shows an experiment to pass electricity through lead bromide. Electricity has no effect on solid lead bromide.

For Examiner's Use



(a) (i) Clearly label the electrodes on the diagram. [1]

(ii) Suggest a suitable material to make the electrodes.

..... [1]

(b) Give two observations expected when the lead bromide is heated to melting point.

1. .....

2. ..... [2]

(c) State two different safety precautions when carrying out this experiment.

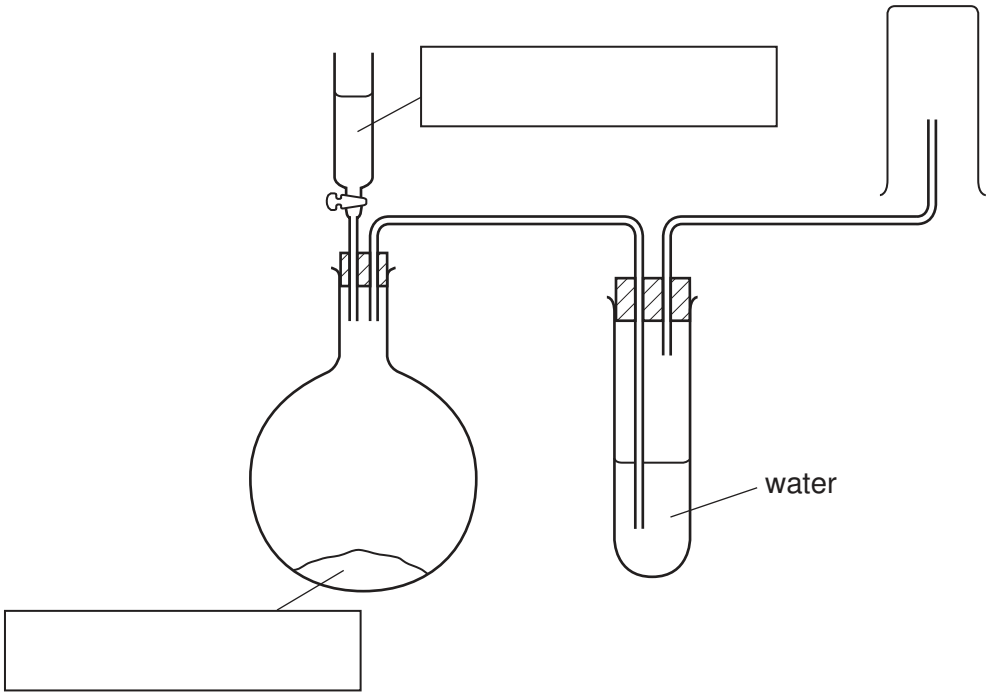
1. .....

2. ..... [2]

[Total: 6]

3 Sulphur dioxide gas is denser than air and soluble in water. A sample of sulphur dioxide can be prepared by adding dilute hydrochloric acid to sodium sulphite and warming the mixture. Study the diagram of the apparatus used.

For Examiner's Use



(a) Fill in the boxes to show the chemicals used. [2]

(b) Show by using an arrow, on the diagram, where heat is applied. [1]

(c) Identify and explain two mistakes in the diagram.

Mistake 1 .....

.....

Mistake 2 .....

..... [2]

[Total: 5]

For Examiner's Use

4 A student investigated the reaction between potassium manganate(VII) and a metallic salt solution.

Two experiments were carried out.

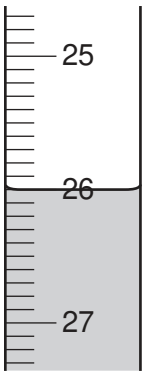
Experiment 1

(a) About 1 cm^3 of aqueous sodium hydroxide was added to a little of the salt solution **A** and the observation noted.

observation *green precipitate formed*

(b) A burette was filled with potassium manganate(VII) solution up to the 0.0 cm^3 mark.
By using a measuring cylinder, 25 cm^3 of solution **A** of the salt was placed into a conical flask. The flask was shaken to mix the contents.
The potassium manganate(VII) solution was added to the flask, and shaken to mix thoroughly. Addition of potassium manganate(VII) solution was continued until there was a pale pink colour in the contents of the flask.

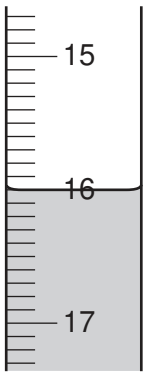
Use the burette diagram to record the volume in the table and complete the column.



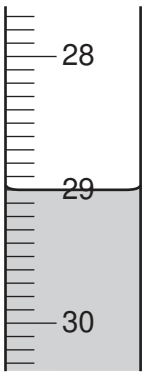
final reading

Experiment 2

(c) Experiment **1(b)** was repeated using a different solution **B** of the salt, instead of solution **A**. Use the burette diagrams to record the volumes in the table and complete the table.



initial reading



final reading

(d) About 1 cm^3 of aqueous sodium hydroxide was added to a little of the solution in the flask and the observation noted.

observation *red-brown precipitate*

Table of results

Burette readings / cm^3

	Experiment 1	**Experiment 2**
final reading		
initial reading		
difference		

[4]

(e) **(i)** In which Experiment was the greatest volume of potassium manganate(VII) solution used?

..... [1]

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

.....

..... [2]

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

.....

..... [2]

(f) Predict the volume of potassium manganate(VII) solution which would be needed to react completely with 50 cm^3 of solution **B**.

.....

..... [2]

(g) Explain one change that could be made to the experimental method to obtain more accurate results.

For Examiner's Use

change .....

explanation ..... [2]

(h) What conclusion can you draw about the salt solution from

(i) experiment **1(a)**,

..... [1]

(ii) experiment **2(d)**?

..... [1]

[Total: 15]

5 Two different solids, **T** and **V**, were analysed. **T** was a calcium salt.
The tests on the solids and some of the observations are in the following table.
Complete the observations in the table.

For Examiner's Use

tests	observations
tests on solid **T**	
(a) Appearance of solid **T.**	white solid
(b) A little of solid **T** was dissolved in distilled water. The solution was divided into three test-tubes.	
(i) The pH of the first portion of the solution was tested.	colour orange pH 5
(ii) To the second portion of solution was added excess aqueous sodium hydroxide.	..... [2]
(iii) To the third portion of solution was added excess ammonia solution.	..... [2]

tests	observations
<u>tests on solid **V**</u> **(c)** Appearance of solid **V**.	green crystals
(d) A little of solid **V** was dissolved in distilled water. The solution was divided into three test-tubes. The smell of the solution was noted.	smells of vinegar
(i) Test **(b)(i)** was repeated using the first portion of solution.	colour orange pH 6
(ii) Test **(b)(ii)** was repeated using the second portion of the solution.	pale blue precipitate
(iii) Test **(b)(iii)** was repeated using the third portion of solution.	pale blue precipitate soluble in excess to form a dark blue solution.

For Examiner's Use

(e) What do **tests (b)(i)** and **(d)(i)** tell you about solutions **T** and **V**?

.....

.....

[2]

(f) What additional conclusions can you draw about solid **V**?

.....

.....

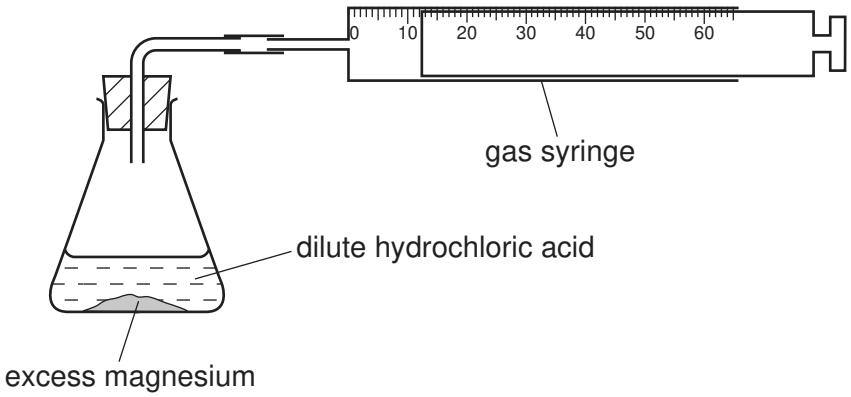
.....

[2]

[Total: 8]

For Examiner's Use

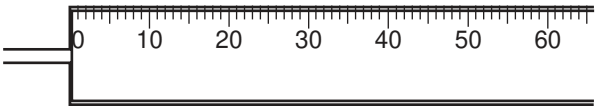
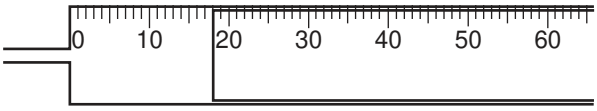
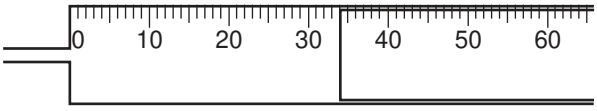
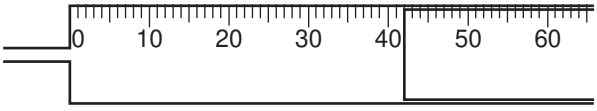
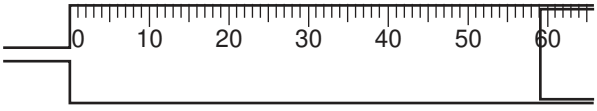
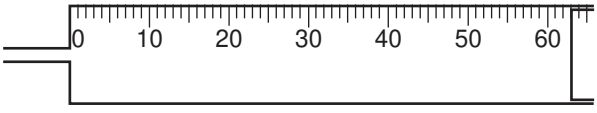
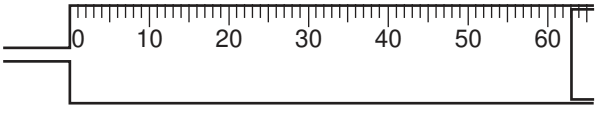
6 The speed of reaction between excess magnesium and dilute hydrochloric acid was investigated using the apparatus below.



The volume of hydrogen produced was measured every minute for six minutes.

(a) Use the gas syringe diagrams to complete the table.

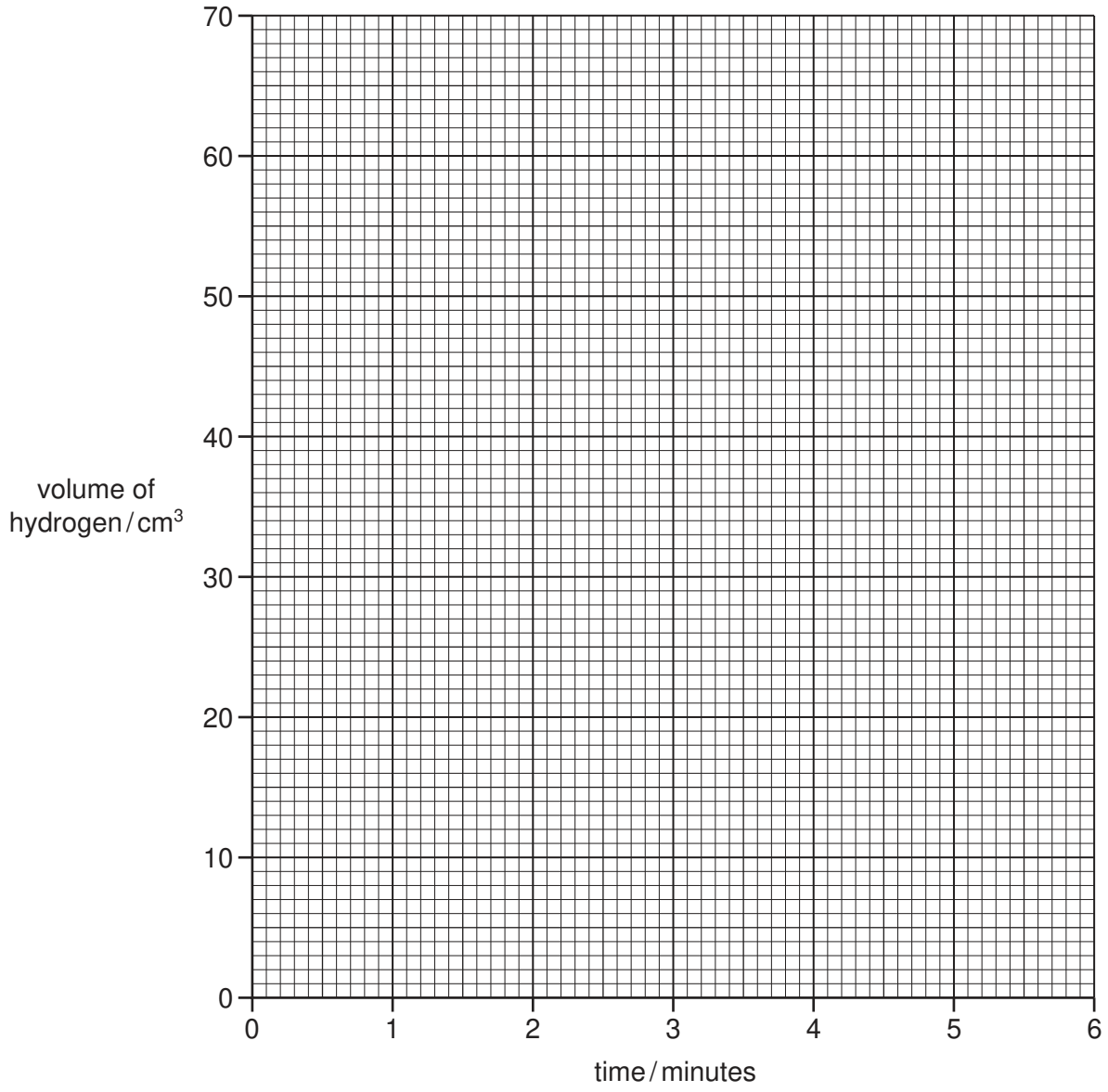
Table of results

time / minutes	gas syringe diagram	volume of hydrogen / cm^3
0		
1		
2		
3		
4		
5		
6		

[4]

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

For Examiner's Use



[4]

(c) Why is the volume of gas given off the same at 5 minutes and 6 minutes?

.....

..... [1]

(d) Which point appears to be inaccurate? Explain why.

.....

..... [2]

(e) Sketch on the grid the graph you would expect if the experiment were repeated using the same volume of acid which was half as concentrated. [2]

[Total: 13]

For Examiner's Use

7 This label is from a container of 'Bite Relief' solution.

BITE RELIEF

FOR FAST RELIEF FROM INSECT BITES AND STINGS

Active ingredient: Ammonia
Also contains water and alcohol

DIRECTIONS FOR USE: Use cotton wool to dab the solution on the affected area of the skin

(a) Give a chemical test to show the presence of ammonia in Bite Relief solution.

test .....

result ..... [2]

(b) What practical method could be used to separate the mixture of alcohol (bp 78°C) and water (bp 100°C)?

..... [2]

(c) Give a chemical test to show the presence of water.

test .....

result ..... [2]

(d) What would be the effect of touching the alcohol with a lighted splint?

..... [1]

[Total: 7]