Cambridge IGCSE

Cambridge International Examinations
Cambridge International General Certificate of Secondary Education

CANDIDATE NAME									
CENTRE NUMBER						CANDIDATE NUMBER			

0123456789

CHEMISTRY **0620/06**

Paper 6 Alternative to Practical **For Examination from 2016**

SPECIMEN PAPER

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 an HB pencil for any diagrams, graphs or rough working.
Do not use staples, paper clips, glue or correction fluid.
DO **NOT** WRITE IN ANY BARCODES.

Answer **all** questions.
Electronic calculators may be used.
You may lose marks if you do not show your working or if you do not use appropriate units.

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.

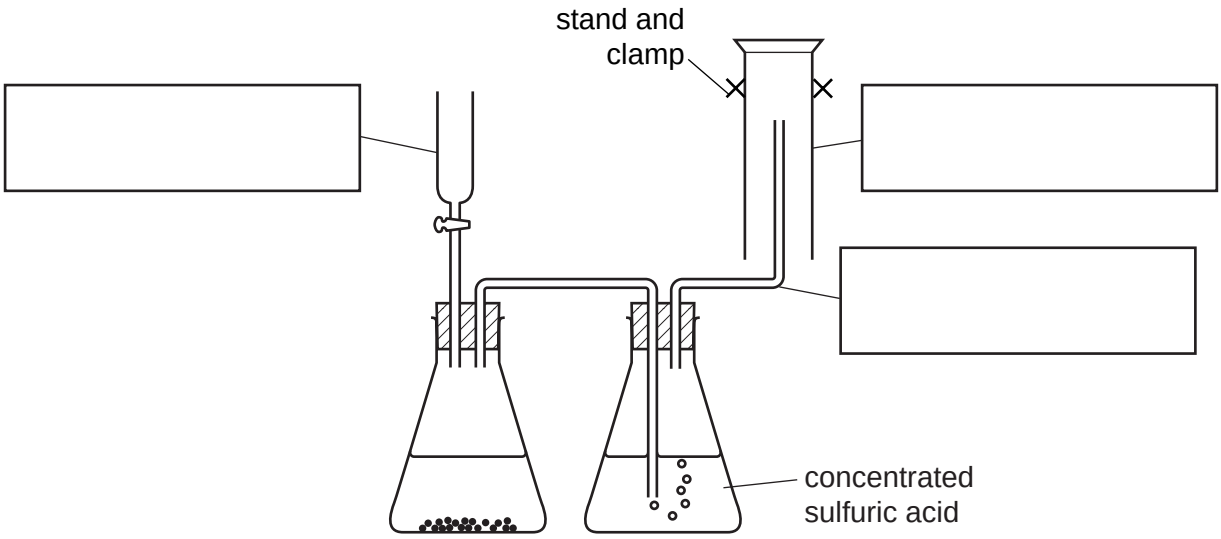
The syllabus is accredited for use in England, Wales and Northern Ireland as a Cambridge International Level 1/Level 2 Certificate.

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

CAMBRIDGE International Examinations

[Turn over

1 The diagram shows the apparatus used to prepare a dry sample of a gas. The gas is more dense than air.



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

(b) Identify **one** mistake in the apparatus.

.....

[1]

(c) Suggest a reason why the gas is passed through concentrated sulfuric acid.

.....

[1]

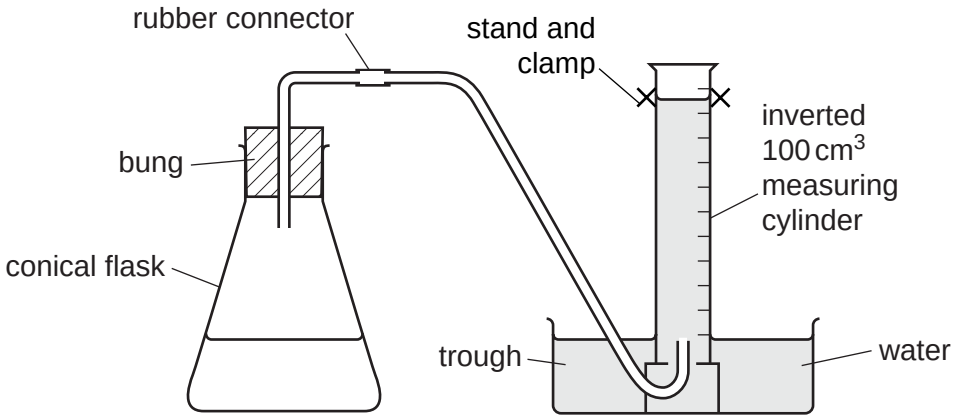
[Total: 5]

2 A student investigated the rate of reaction between excess magnesium and two different dilute acids, **X** and **Y**.

Two experiments were carried out.

Experiment 1

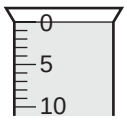
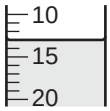
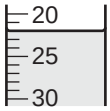
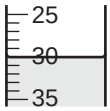
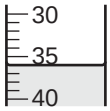
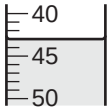
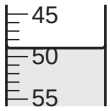
The apparatus was set up as shown in the diagram.



Using a measuring cylinder, 50 cm^3 of dilute acid **X** was poured into the conical flask.
0.5 g of magnesium ribbon was added to the conical flask and the bung added.

The timer was started and the volume of gas collected in the measuring cylinder was measured every 30 seconds for three minutes.

(a) Use the measuring cylinder diagrams to record the volumes of gas collected.

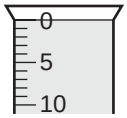
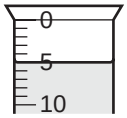
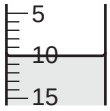
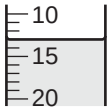
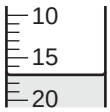
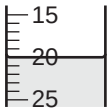
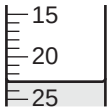
time / s	measuring cylinder diagram	total volume of gas collected / cm^3
0		
30		
60		
90		
120		
150		
180		

[2]

Experiment 2

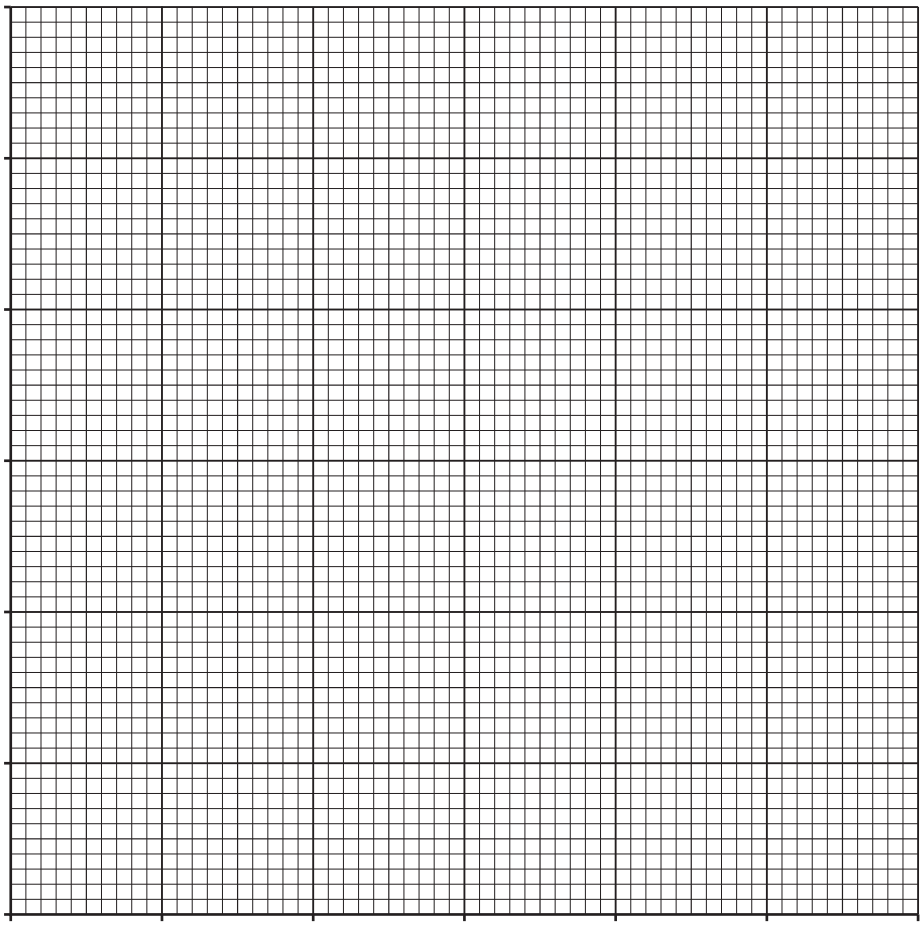
Experiment 1 was repeated using 50 cm^3 of dilute acid **Y**.

(b) Use the measuring cylinder diagrams to record the volumes of gas collected.

time / s	measuring cylinder diagram	total volume of gas collected / cm^3
0		
30		
60		
90		
120		
150		
180		

[2]

(c) Plot the results for both experiments on the grid below. For each set of results, draw a smooth line graph. Indicate clearly which line represents Experiment 1 and which line represents Experiment 2.



[4]

(d) State which experiment had the faster rate of reaction **and** suggest why the rate was faster in this experiment.

.....

..... [1]

(e) From your graph, deduce the time required to collect 25 cm^3 of gas in Experiment 1.
Show clearly **on the graph** how you worked out your answer.

..... [1]

(f) The rate of this reaction can be calculated using:

$$\text{rate} = \frac{\text{volume of gas / cm}^3}{\text{time taken / s}}$$

For the experiment with the higher rate, calculate the rate of reaction for the first 30 seconds of the reaction. Deduce the units.

rate ..... [2]

(g) Give **one** advantage and **one** disadvantage of using a measuring cylinder to add the acids to the flask.

advantage .....

disadvantage ..... [2]

(h) Suggest **and** explain one improvement to this experiment.

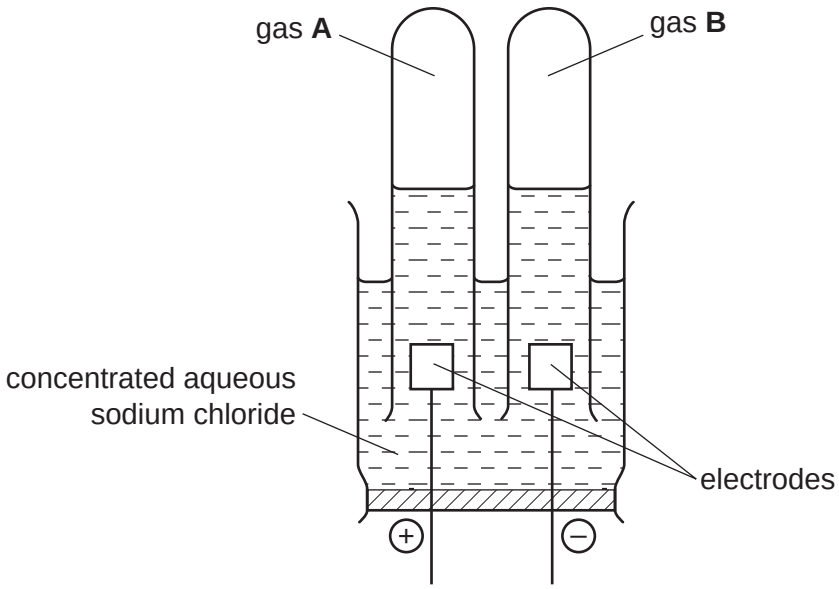
.....

.....

..... [1]

[Total: 15]

3 Concentrated aqueous sodium chloride was broken down by electricity using the apparatus shown.



(a) Suggest a suitable material from which to make the electrodes.

.....[1]

(b) Gas **A** is chlorine. Give a test for chlorine.

test .....

result ..... [2]

(c) Gas **B** pops when tested with a lighted splint. What is gas **B**?

.....[1]

[Total: 4]

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4 Solid **E** was analysed. **E** was an aluminium salt. Some of the observations are shown below.

tests on solid E	observations
Appearance of solid **E**.	white crystalline solid
test 1 A little of solid **E** was heated in a test-tube.	colourless drops of liquid formed at the top of the tube

(a) A little of solid **E** was dissolved in distilled water.

The solution was divided into four test-tubes and the following tests were carried out.

Complete the observations for **tests 2** and **3**.

(i) **test 2**

Drops of aqueous sodium hydroxide were added to the first test-tube.

observations ..... [1]

(ii) Excess sodium hydroxide was then added.

observations ..... [1]

(iii) **test 3**

Drops of aqueous ammonia solution were added to the second test-tube. Excess ammonia solution was then added.

observations .....

..... [2]

Two further tests are carried out and the following observations made.

tests on solution of E	observations
test 4 To the third test-tube of solution, dilute hydrochloric acid was added, followed by barium nitrate solution.	no reaction
test 5 To the fourth test-tube of solution, aqueous sodium hydroxide and aluminium foil were added. The mixture was warmed carefully.	effervescence pungent gas given off gas turned damp litmus paper blue

(b) What does **test 1** tell you about solid **E**?

.....

..... [1]

(c) Identify the gas given off in **test 5**.

..... [1]

(d) What conclusions can you draw about solid **E**?

.....

..... [2]

(e) **Test 5** states that the mixture should be warmed carefully.

In terms of safety, explain why it is necessary to warm carefully.

.....

.....

.....

..... [2]

[Total: 10]

5 E-numbers identify chemicals which are added to foods.

(a) E210 is benzoic acid. How could you show that a solution of benzoic acid is a weak acid?

test .....

result ..... [2]

(b) E110 is Sunset Yellow.
Outline a method you could use to show the presence of E110 in a food colouring.
You may draw a diagram to help answer the question.

.....

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.....

.....

..... [4]

[Total: 6]