Cambridge IGCSE

Cambridge International Examinations
Cambridge International General Certificate of Secondary Education

CANDIDATE NAME									
CENTRE NUMBER						CANDIDATE NUMBER			

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CHEMISTRY **0620/63**

Paper 6 Alternative to Practical **May/June 2014**

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 or graphs.
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.

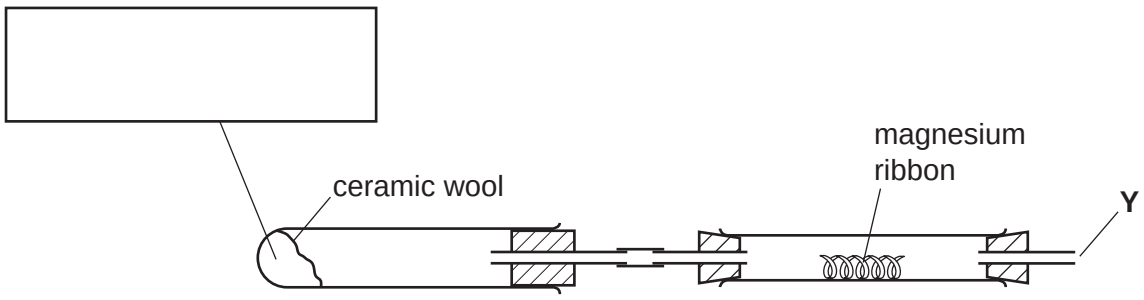
At the end of the examination, fasten all your work securely together.
The number of marks is given in brackets [ ] at the end of each question or part question.

The syllabus is approved 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.

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1 Steam was passed over heated magnesium ribbon using the apparatus below.



(a) (i) Complete the box to show the substance absorbed by the ceramic wool. [1]

(ii) Indicate on the diagram, with two arrows, where the heat is applied. [1]

(b) (i) Describe the change in the appearance of the magnesium.

..... [2]

(ii) Predict the effect of adding water and a few drops of Universal Indicator to the solid product of the reaction.

.....

..... [2]

(c) Suggest the effect of a lighted splint at point **Y**. Explain your suggestion.

.....

..... [2]

[Total: 8]

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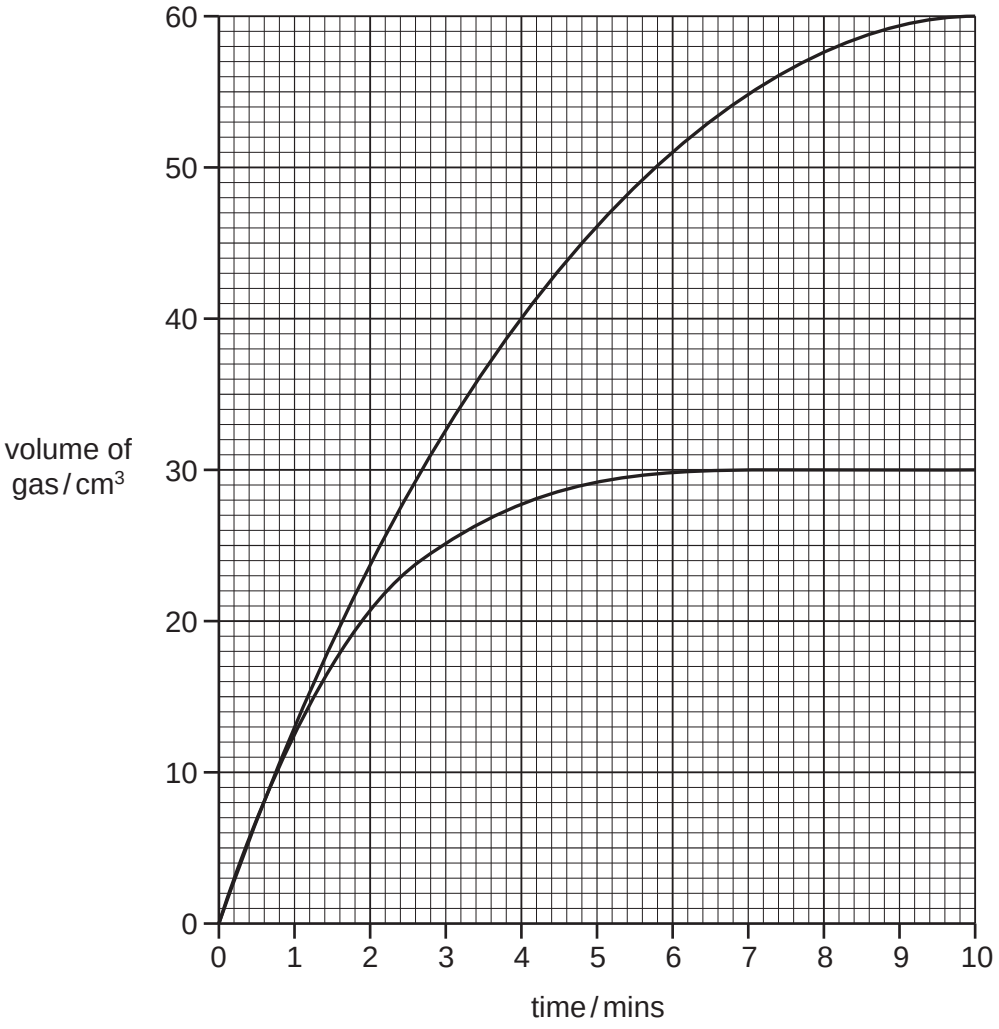
2 A student carried out three experiments to investigate the rate of reaction between dilute hydrochloric acid and zinc powder.

Experiment 1

50 cm^3 of dilute hydrochloric acid were reacted with excess zinc powder. The volume of gas produced was measured every minute for ten minutes.

Experiment 2

Experiment 1 was then repeated using 100 cm^3 of the dilute hydrochloric acid.
The results for these two experiments are shown below.



(a) Label the two lines to identify each experiment. [1]

Experiment 3

Experiment 1 was repeated using 50 cm^3 of dilute hydrochloric acid which was half as concentrated as in Experiment 1.

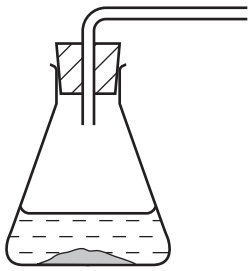
(b) (i) How could the student prepare a solution of dilute hydrochloric acid which was half as concentrated as the acid in Experiment 1?

.....

..... [2]

(ii) Sketch, on the grid on page 3, the result that would be expected in Experiment 3. [2]

(c) Complete the diagram to show how the gas could be collected and measured.



[2]

(d) Explain how the rate of reaction could be increased in Experiment 3 without changing the concentration of the dilute hydrochloric acid.

.....

.....

..... [3]

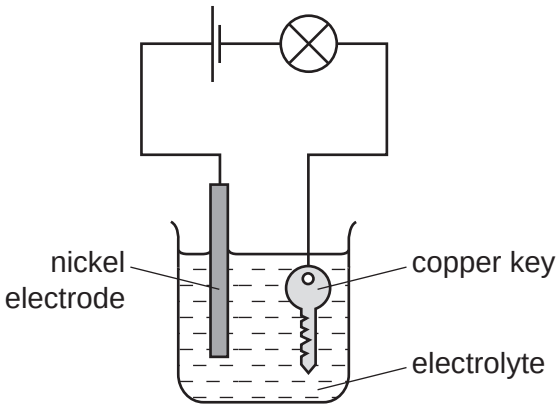
[Total: 10]

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3 A student carried out an investigation to coat a copper key with nickel. He followed these instructions.

1 Rub the copper key with sandpaper.

2 Set up the circuit as shown.



3 Switch on the circuit for ten minutes.

4 Remove the key, wash it and dry.

(a) Name the process used to coat the copper key with nickel.

..... [1]

(b) Why was the key rubbed with sandpaper?

.....

..... [2]

(c) Name a possible electrolyte that could be used.

..... [2]

(d) Give **one** expected observation during the ten minutes that the circuit was switched on.

..... [1]

(e) Describe how the key would be washed and dried.

.....

..... [1]

[Total: 7]

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[Turn over

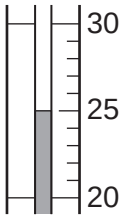
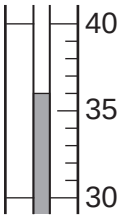
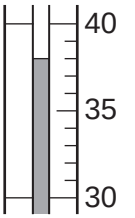
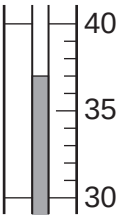
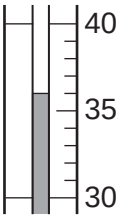
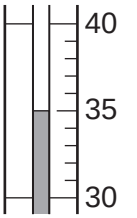
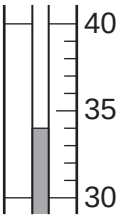
4 A student investigated what happened when two different solids, **M** and **N**, dissolved in water.

Three experiments were carried out.

(a) *Experiment 1*

Using a measuring cylinder, 25 cm^3 of distilled water were poured into a polystyrene cup. The temperature of the water was measured. Solid **M** was added to the water, the timer started and the mixture stirred with a thermometer. The temperature of the solution was measured every 30 seconds for three minutes.
Use the thermometer diagrams to record the results in the table.

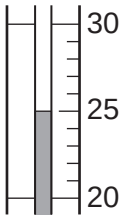
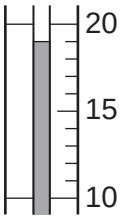
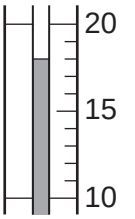
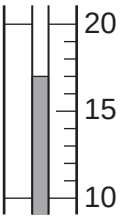
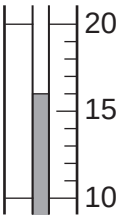
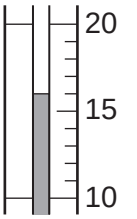
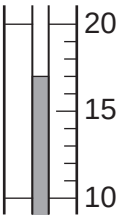
A little of the solution was poured into a test-tube for Experiment 3.

time / s	0	30	60	90	120	150	180
thermometer diagram							
temperature / °C							

[2]

(b) *Experiment 2*

Experiment 1 was repeated using solid **N**.
The temperature of the solution was measured every 30 seconds for three minutes.
Use the thermometer diagrams to record the results in the table.

time / s	0	30	60	90	120	150	180
thermometer diagram							
temperature / °C							

[2]

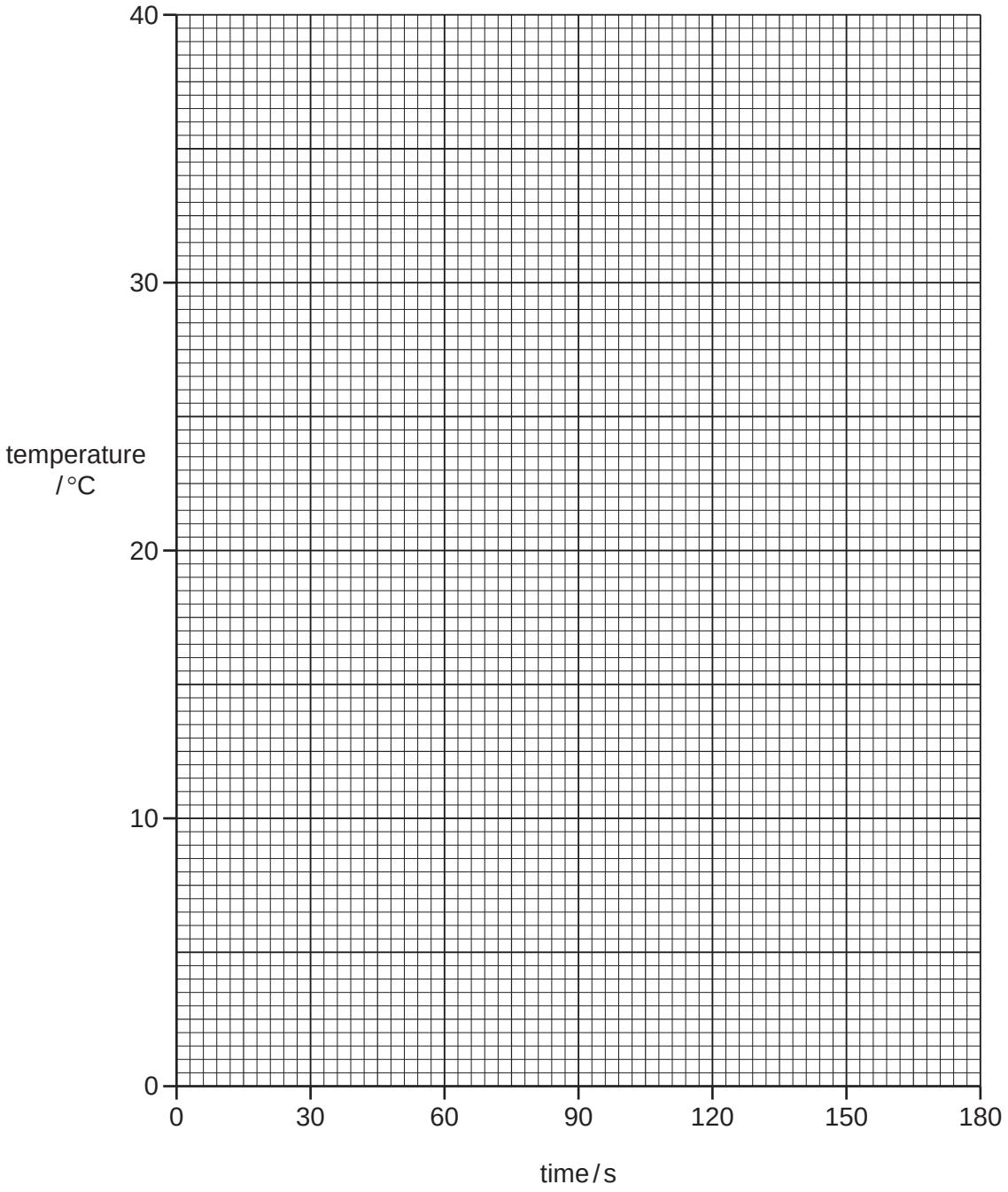
(c) *Experiment 3*

Dilute sulfuric acid was added to the solution from Experiment 1.

Rapid effervescence was observed.

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(d) Plot the results for Experiments 1 and 2 on the grid and draw two smooth line graphs. Clearly label your graphs.



[6]

(e) (i) **From your graph**, deduce the temperature of the solution in Experiment 1 after 45 seconds.
Show clearly **on the graph** how you worked out your answer.

..... °C [2]

(ii) **From your graph**, deduce how long it takes for the initial temperature of the solution in Experiment 2 to change by 2 °C.
Show clearly **on the graph** how you worked out your answer.

..... s [2]

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[Turn over

(f) From the results in Experiment 2, what type of chemical process occurs when substance **N** dissolves in water?

..... [1]

(g) What conclusion can you draw from Experiment 3?

..... [1]

(h) Suggest the effect on the results if Experiment 1 was repeated using 50 cm^3 of water.

.....

..... [2]

(i) Predict the temperature of the solution in Experiment 2 after 1 hour. Explain your answer.

.....

..... [2]

(j) When carrying out the experiments, what would be the advantage of taking the temperature readings every 10 seconds?

.....

..... [1]

[Total: 21]

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5 Two solids, **P** and **Q**, were analysed. **P** was a metal compound and **Q** was calcium iodide. Tests were carried out on **P** and **Q** and some of the observations are in the following table. Complete the observations for solid **Q**.

tests	observations
<u>tests on solid **P**</u> **(a)** Appearance of solid **P**.	black solid
(b) **(i)** Dilute sulfuric acid was added to solid **P** and the mixture warmed. The solution was divided into two equal portions in test-tubes. The following tests were carried out.	the solid reacted and a blue solution was formed
(ii) Drops of aqueous sodium hydroxide were added to the first portion of the solution.	blue precipitate formed
Excess sodium hydroxide was then added to the mixture in the test-tube.	blue precipitate insoluble
(iii) Aqueous ammonia was added to the second portion of the solution until no further change was seen.	blue precipitate formed which dissolved to form a deep blue solution

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[Turn over

tests	observations
<u>tests on solid **Q**</u> **(c)** Distilled water was added to solid **Q** and the mixture shaken to dissolve solid **Q**. The solution was divided into three equal portions in separate test-tubes. **(i)** Aqueous sodium hydroxide was added to the first portion until no further change was seen. **(ii)** Aqueous ammonia was added to the second portion until no further change was seen. **(iii)** Dilute nitric acid and aqueous silver nitrate were added to the third portion.	..... [3] ..... [1] ..... [1]

(d) Identify solid **P**.

..... [2]

[Total: 7]

6 Vinegar contains ethanoic acid. Different brands of vinegar contain different concentrations of ethanoic acid. The concentration of ethanoic acid in the vinegar can be determined by reaction with aqueous sodium hydroxide.

Plan an experiment to show which of two different brands of colourless vinegar, **C** and **D**, contain the highest concentration of ethanoic acid.
You are provided with common laboratory apparatus.
You may use the space below to draw a diagram.

.....

.....

.....

.....

.....

.....

.....

..... [7]

[Total: 7]

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