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Cambridge IGCSE

Cambridge International Examinations
Cambridge International General Certificate of Secondary Education

CANDIDATE NAME									
CENTRE NUMBER						CANDIDATE NUMBER			

3013059835

CHEMISTRY **0620/63**

Paper 6 Alternative to Practical **October/November 2016**

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 **8** printed pages and **4** blank pages.

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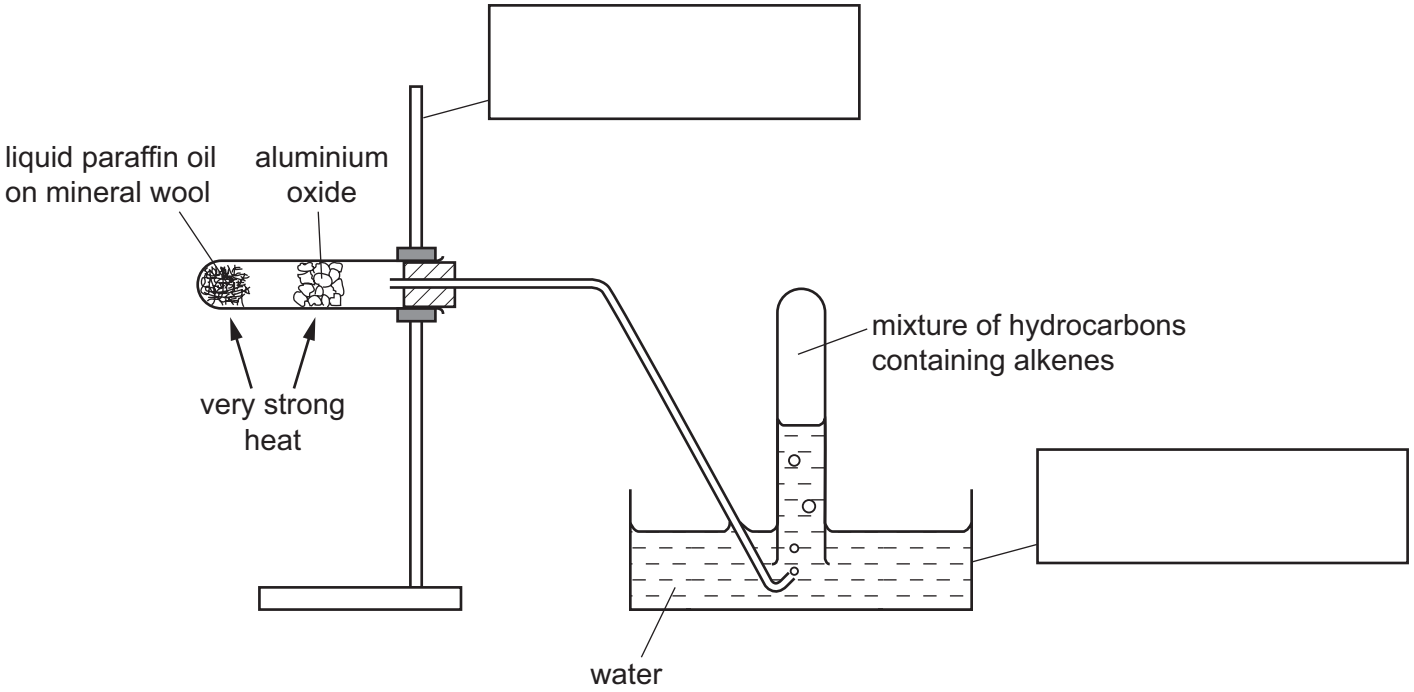
1 The diagram shows the apparatus used to crack paraffin oil. Paraffin oil vapour is passed over heated aluminium oxide to produce a mixture of hydrocarbons containing alkenes.



(a) Complete the boxes to name the apparatus. [2]

(b) What is the purpose of the mineral wool?

.....

..... [1]

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

test .....

result .....

[2]

(d) Why must the delivery tube be removed from the water when the heating is stopped?

..... [1]

[Total: 6]

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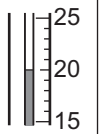
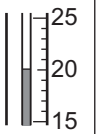
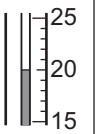
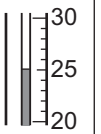
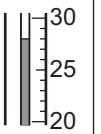
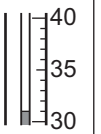
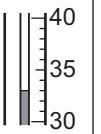
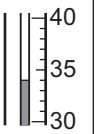
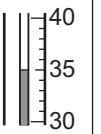
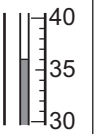
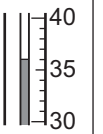
2 A student investigated what happened when two different metals, iron and magnesium, reacted with aqueous copper(II) sulfate.
Two experiments were carried out.

(a) *Experiment 1*

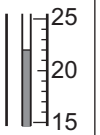
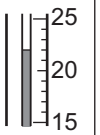
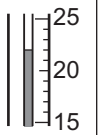
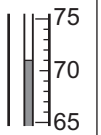
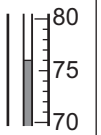
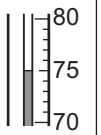
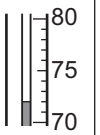
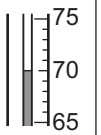
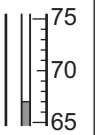
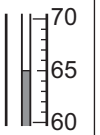
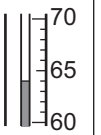
A measuring cylinder was used to pour 25 cm^3 of aqueous copper(II) sulfate into a polystyrene cup. The initial temperature of the solution was measured, then again at 30 seconds and at 60 seconds.
At 60 seconds, the iron was added to the aqueous copper(II) sulfate and the mixture stirred continuously with a thermometer.
The temperature of the mixture was measured every 30 seconds for 300 seconds (5 minutes).
Use the thermometer diagrams to record the results in the table.

time / s	0	30	60	90	120	150	180	210	240	270	300
thermometer diagram											
temperature / °C											

[2]

(b) *Experiment 2*

Experiment 1 was repeated using magnesium instead of iron.
Use the thermometer diagrams to record the results in the table.

time / s	0	30	60	90	120	150	180	210	240	270	300
thermometer diagram											
temperature / °C											

[2]

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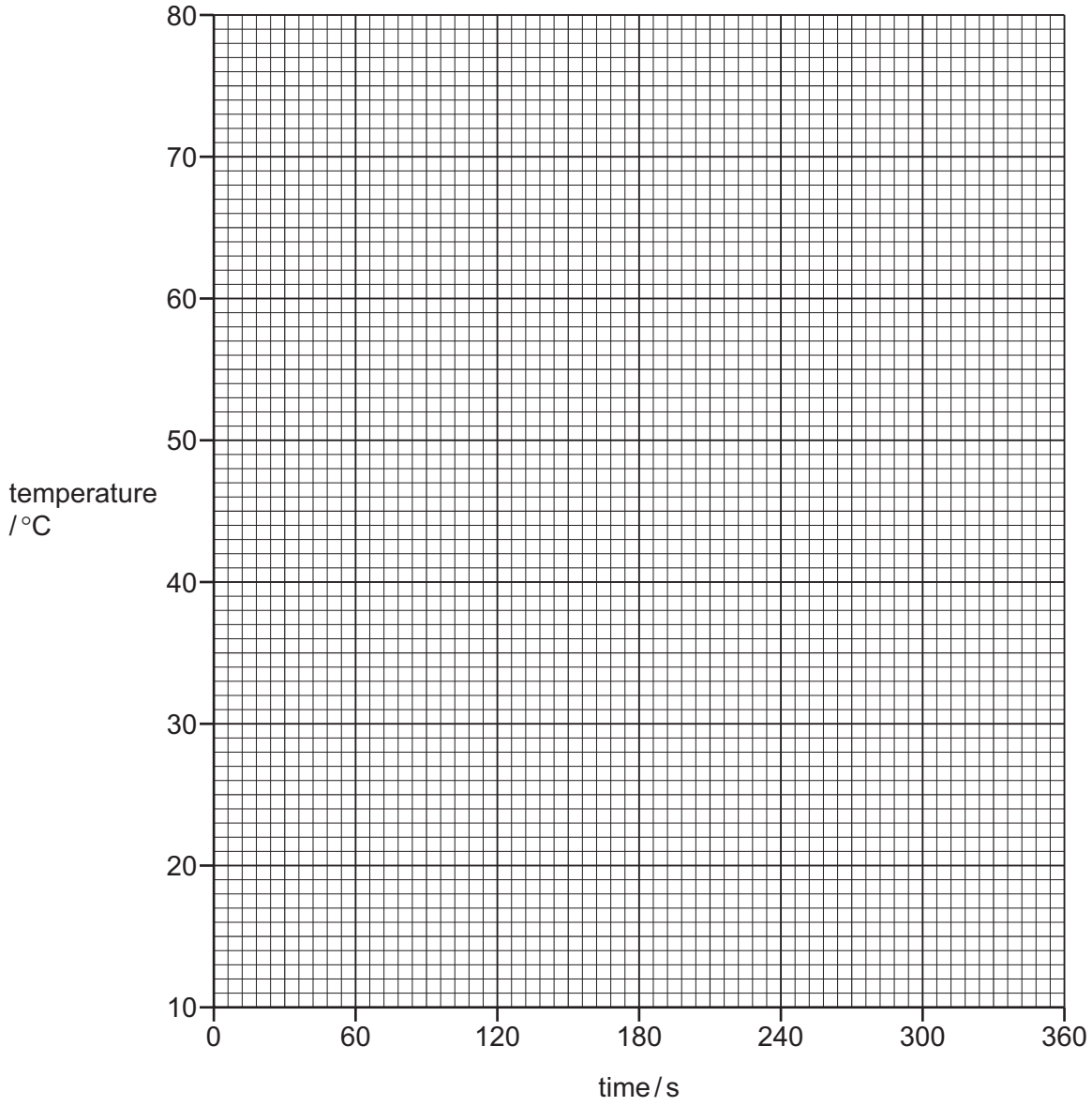
(c) Plot the results for Experiments 1 and 2 on the grid and draw **two** smooth line graphs. Clearly label the graphs.



[4]

(d) (i) **From your graph**, deduce the temperature of the mixture in Experiment 1 after 135 seconds.
Show clearly **on the grid** how you worked out your answer.

..... °C [2]

(ii) **From your graph**, deduce the time taken for the temperature of the mixture in Experiment 2 to change by 30 °C **after the magnesium was added**.
Show clearly **on the grid** how you worked out your answer.

..... s [2]

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[Turn over

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(e) Predict the temperature of the mixture in Experiment 2 after one hour. Explain your answer.

.....

..... [2]

(f) Suggest an advantage of taking the temperature readings every 15 seconds.

.....

..... [2]

(g) Explain why a polystyrene cup is used in the experiments and **not** a copper can.

.....

..... [2]

[Total: 18]

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3 Two solutions, solution **Q** and solution **R**, were analysed. Solution **Q** was aqueous sulfuric acid.

tests on solution Q

(a) Solution **Q** was divided into four equal portions in four test-tubes. The following tests were carried out.

Complete the observations for **tests 1–4**.

(i) test 1

The pH of the first portion of solution **Q** was measured.

pH ..... [1]

(ii) test 2

Magnesium ribbon was added to the second portion of solution **Q**. The gas given off was tested.

observations .....

..... [3]

(iii) test 3

Sodium carbonate was added to the third portion of solution **Q**. The gas given off was tested.

observations .....

..... [3]

(iv) test 4

Dilute nitric acid and aqueous barium nitrate were added to the fourth portion of solution **Q**.

observations ..... [1]

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tests on solution R

Solution **R** was divided into three equal portions in three test-tubes.
The following tests were carried out.

tests	observations
test 5 The pH of the first portion of solution **R** was measured.	pH = 10
test 6 Drops of aqueous sodium hydroxide were added to the second portion of solution **R** and the test-tube shaken. Excess aqueous sodium hydroxide was then added to the test-tube.	white precipitate no visible change
test 7 Aqueous iron(II) sulfate was added to the third portion of solution **R** and the mixture shaken.	green precipitate formed

(b) Identify solution **R**.

.....

..... [2]

[Total: 10]

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4 A liquid cleaner is a mixture of three substances. These substances are shown in the table.

name of substance	properties of substance
water	liquid, boiling point 100 °C
sodium carbonate	solid, soluble in water
silica	solid, insoluble in water

Plan an experiment to obtain separate pure samples of each substance from the mixture in the liquid cleaner. You are provided with common laboratory apparatus.

.....

.....

.....

.....

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.....

.....

..... [6]

[Total: 6]

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