Cambridge IGCSE

Cambridge International Examinations
Cambridge International General Certificate of Secondary Education

CANDIDATE NAME	
CENTRE NUMBER	
CANDIDATE NUMBER	

9448353441

CHEMISTRY **0620/63**

Paper 6 Alternative to Practical **May/June 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.

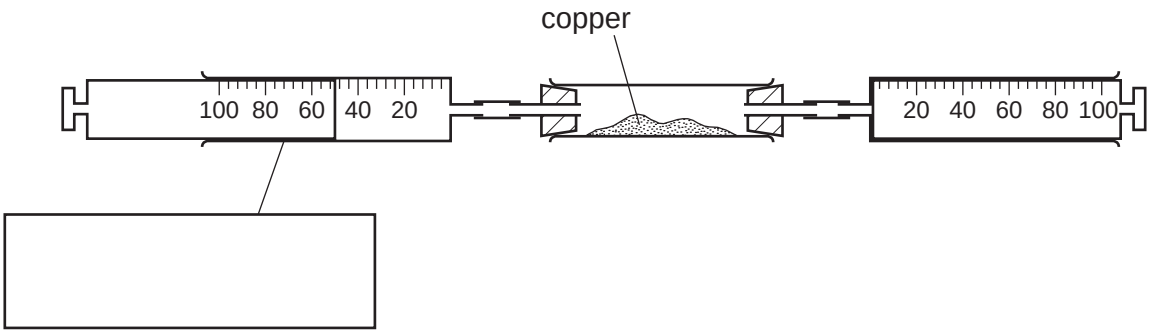
At the end of the examination, fasten all your work securely together.
The number of marks is given in brackets [ ] at the end of each question or part question.

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 **9** printed pages and **3** blank pages.

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1 Air is a mixture of gases. The diagram shows the apparatus used to find the percentage of oxygen in air.
50 cm^3 of air were passed backwards and forwards over excess heated copper until there was no further change. The apparatus was left to cool and the volume of gas remaining was 40 cm^3.



(a) Complete the box to name the apparatus. [1]

(b) Use an arrow to indicate where heat is applied. [1]

(c) The colour of the copper changed from ..... to ..... . [2]

(d) From the results, work out the percentage of oxygen in the air.

..... % [2]

[Total: 6]

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2 A student investigated what happens when dilute hydrochloric acid and copper(II) sulfate solution react with different metals.

Five experiments were carried out.

(a) *Experiment 1*

A measuring cylinder was used to pour 10 cm^3 of dilute hydrochloric acid into a boiling tube.
The temperature of the hydrochloric acid was measured.
1 g of zinc was added to the boiling tube and the mixture stirred with a thermometer.
The maximum temperature reached by the mixture was measured.

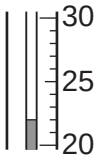
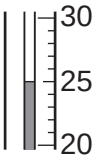
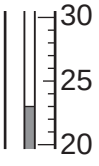
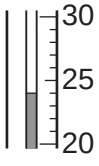
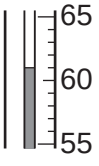
Experiment 2

Experiment 1 was repeated using 1 g of iron instead of zinc.

Experiment 3

Experiment 1 was repeated using 1 g of magnesium instead of zinc.

Use the thermometer diagrams to record the results in the table. Complete the final column in the table.

experiment	thermometer diagram	initial temperature of acid / °C	thermometer diagram	maximum temperature reached / °C	temperature rise / °C
1					
2					
3					

[3]

(b) The gas produced in experiment 3 was tested with a lighted splint and the result recorded below.

test ...lighted splint.....

result ...popped.....

Name the gas given off in experiment 3.

..... [1]

(c) *Experiment 4*

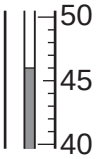
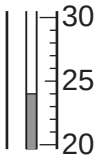
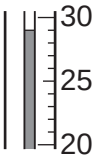
A measuring cylinder was used to pour 10 cm^3 of copper(II) sulfate solution into a boiling tube. The temperature of the solution was measured.
1 g of magnesium was added to the boiling tube and the mixture stirred with a thermometer. The maximum temperature reached by the mixture was measured.

Experiment 5

Experiment 4 was repeated using 1 g of iron instead of magnesium.
The observation was recorded below.

.....The solution turned colourless and a brown deposit formed.....

Use the thermometer diagrams to record the results in the table. Complete the final column in the table.

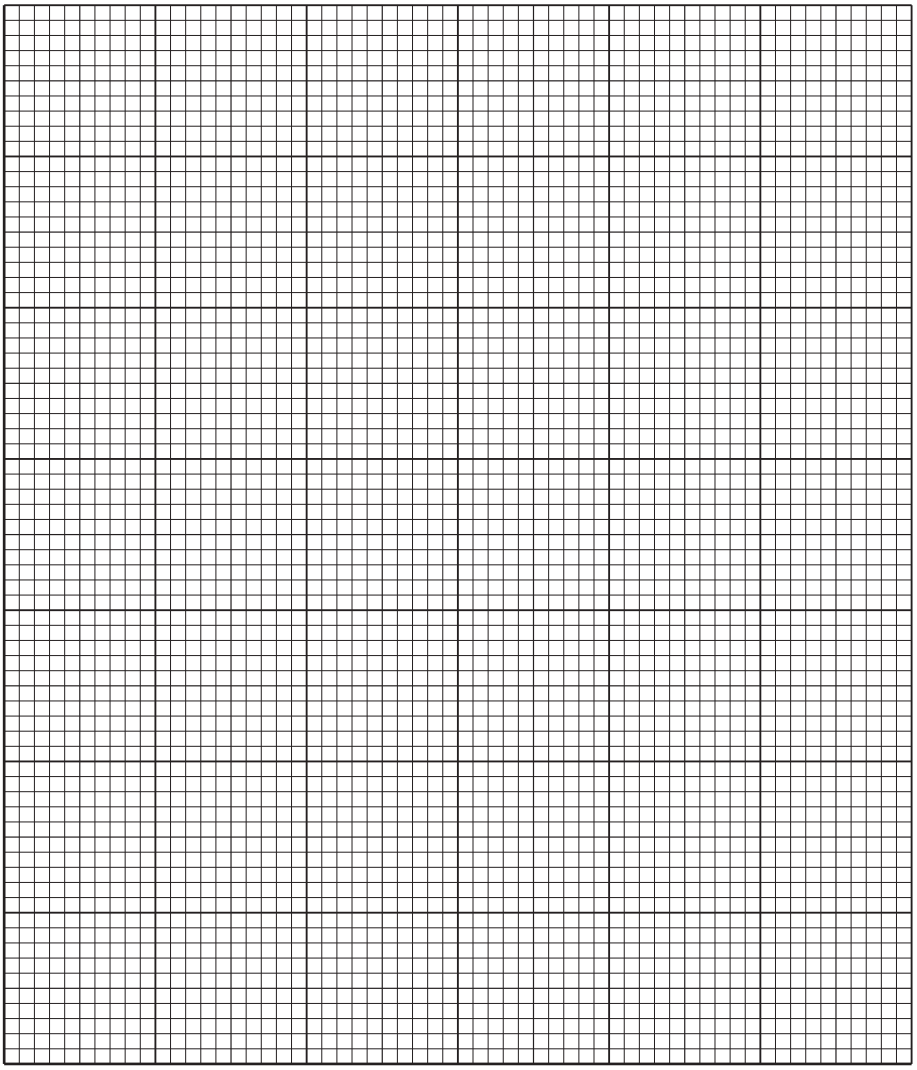
experiment	thermometer diagram	initial temperature of acid / °C	thermometer diagram	maximum temperature reached / °C	temperature rise / °C
4					
5					

[2]

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(d) Draw a labelled bar chart for the results of experiments 1, 2, 3, 4 and 5 on the grid below.

temperature rise / °C



[3]

(e) Use the results for experiments 1, 2 and 3 to answer the following questions.

(i) Which experiment, 1, 2 or 3, produced the largest temperature rise?

..... [1]

(ii) Suggest why this experiment produced the largest temperature rise.

.....

..... [1]

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[Turn over

(f) Explain the observations in experiment 5.

.....

.....

..... [2]

(g) Suggest why potassium was **not** used as one of the metals in these experiments.

..... [1]

(h) Give **one** advantage of using a measuring cylinder to add the hydrochloric acid to the boiling tube.

..... [1]

(i) Suggest and explain **one** improvement to increase the accuracy of these experiments.

.....

.....

..... [2]

[Total: 17]

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3 A mixture of two solids, **G** and **H**, was analysed. Solid **G** was zinc nitrate, which is water soluble, and solid **H** is insoluble in water.
The tests on the mixture, and some of the observations, are shown.

Distilled water was added to the mixture in a boiling tube and shaken. The contents of the boiling tube were filtered keeping the filtrate and the residue.

tests on filtrate

(a) The filtrate was divided into four test-tubes and the following tests carried out.

(i) Drops of aqueous sodium hydroxide were added to the first portion of the solution.
Excess aqueous sodium hydroxide was then added to the test-tube.

observations .....

.....

..... [3]

(ii) Using the second portion of the solution, the test in **(a)(i)** was repeated using aqueous ammonia instead of aqueous sodium hydroxide.

observations .....

..... [2]

(iii) Dilute nitric acid was added to the third portion of the solution followed by aqueous silver nitrate.

observations ..... [1]

(iv) Aqueous sodium hydroxide and aluminium foil were added to the fourth portion of the solution.
The mixture was warmed and the gas given off was tested.

observations .....

.....

..... [3]

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[Turn over

tests on residue

Two tests are carried out and the following observations made.

tests	observations
A spatula was used to transfer some of the residue into a test-tube. Dilute hydrochloric acid was added to the residue. The gas given off was tested.	rapid effervescence, limewater turned milky
A flame test was carried out on the residue.	red flame colour

(b) Identify solid **H**.

.....

..... [2]

[Total: 11]

4 Nickel sulfate-6-water, $NiSO_4.6H_2O$, is a blue crystalline salt.

Plan an experiment to obtain a sample of pure water from this salt. Your answer should include a diagram of the apparatus, any expected observations and a test to show the presence of pure water.
You are provided with common laboratory apparatus.

.....

.....

.....

.....

.....

.....

..... [6]

[Total: 6]

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