Cambridge IGCSE

Cambridge International Examinations
Cambridge International General Certificate of Secondary Education

CANDIDATE NAME									
CENTRE NUMBER						CANDIDATE NUMBER			

7230714520

CHEMISTRY **0620/63**

Paper 6 Alternative to Practical **May/June 2018**

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.

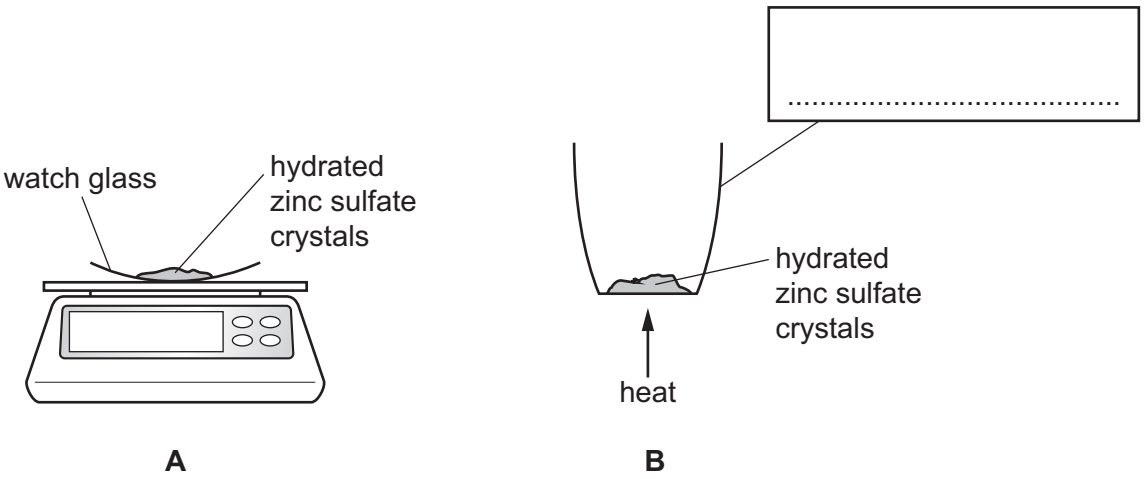
At the end of the examination, fasten all your work securely together.
The number of marks is given in brackets [ ] at the end of each question or part question.

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 Zinc sulfate crystals are hydrated. They contain water of crystallisation. A student did an experiment to find the mass of water in hydrated zinc sulfate crystals.
The hydrated zinc sulfate crystals were weighed and then heated with a Bunsen burner to remove the water as shown.



A **B**

(a) **(i)** Name the apparatus used to weigh the crystals in **A**.

..... [1]

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

(b) What position should the air hole of the Bunsen burner be in when heating the hydrated zinc sulfate crystals in **B**?

..... [1]

(c) Describe how the student could find out if all of the water of crystallisation had been removed from the hydrated zinc sulfate crystals.

.....

.....

..... [2]

(d) Describe a **chemical** test for water.

test .....

result .....
[2]

[Total: 7]

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2 A student investigated how the temperature changed when aqueous sodium hydroxide reacted with solutions of two different acids, acid **R** and acid **S**.

Two experiments were done.

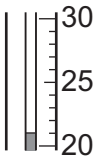
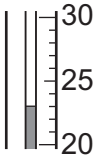
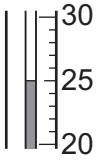
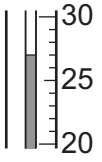
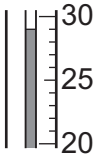
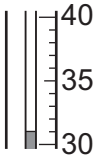
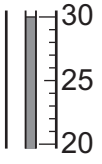
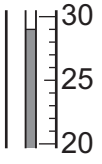
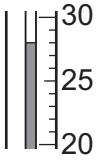
Experiment 1

- A measuring cylinder was used to pour 50 cm^3 of aqueous sodium hydroxide into a polystyrene cup. The temperature of the solution was measured.
- A burette was filled up to the 0.0 cm^3 mark with acid **R**.
- 5.0 cm^3 of acid **R** was added to the aqueous sodium hydroxide in the polystyrene cup and the solution stirred.
- The highest temperature of the solution was measured.
- A further 5.0 cm^3 of acid **R** was added to the polystyrene cup and the solution was stirred.
- The highest temperature of the solution was measured.
- Further 5.0 cm^3 portions of acid **R** were added to the polystyrene cup until a total volume of 40.0 cm^3 of acid **R** had been added. The highest temperature of the solution was measured after each addition.

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[Turn over

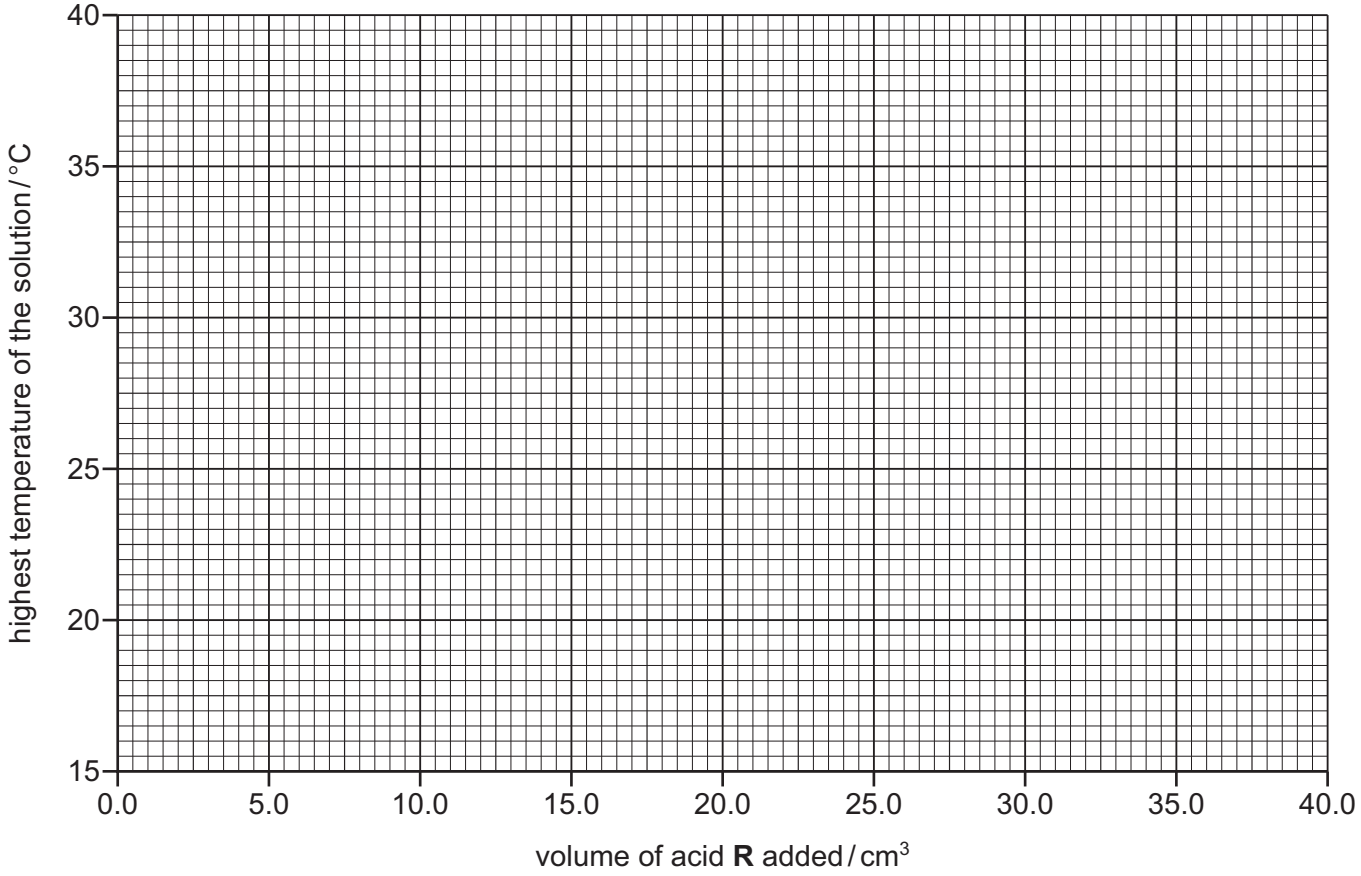
(a) Use the thermometer diagrams to record the results in the table.

volume of acid **R** added / cm^3	thermometer diagram	highest temperature of the solution / °C
0.0		
5.0		
10.0		
15.0		
20.0		
25.0		
30.0		
35.0		
40.0		

[2]

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(b) Plot the results for Experiment 1 on the grid and draw **two** intersecting straight line graphs.

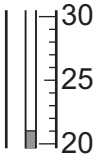
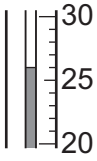
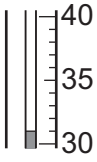
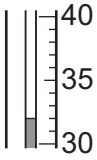
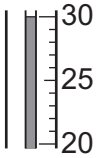
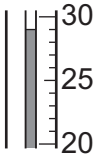
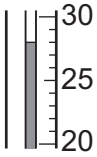
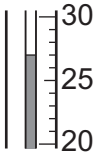


[2]

Experiment 2

- The burette was rinsed with distilled water and then with acid **S**.
- Experiment 1 was repeated but using acid **S** instead of acid **R**.

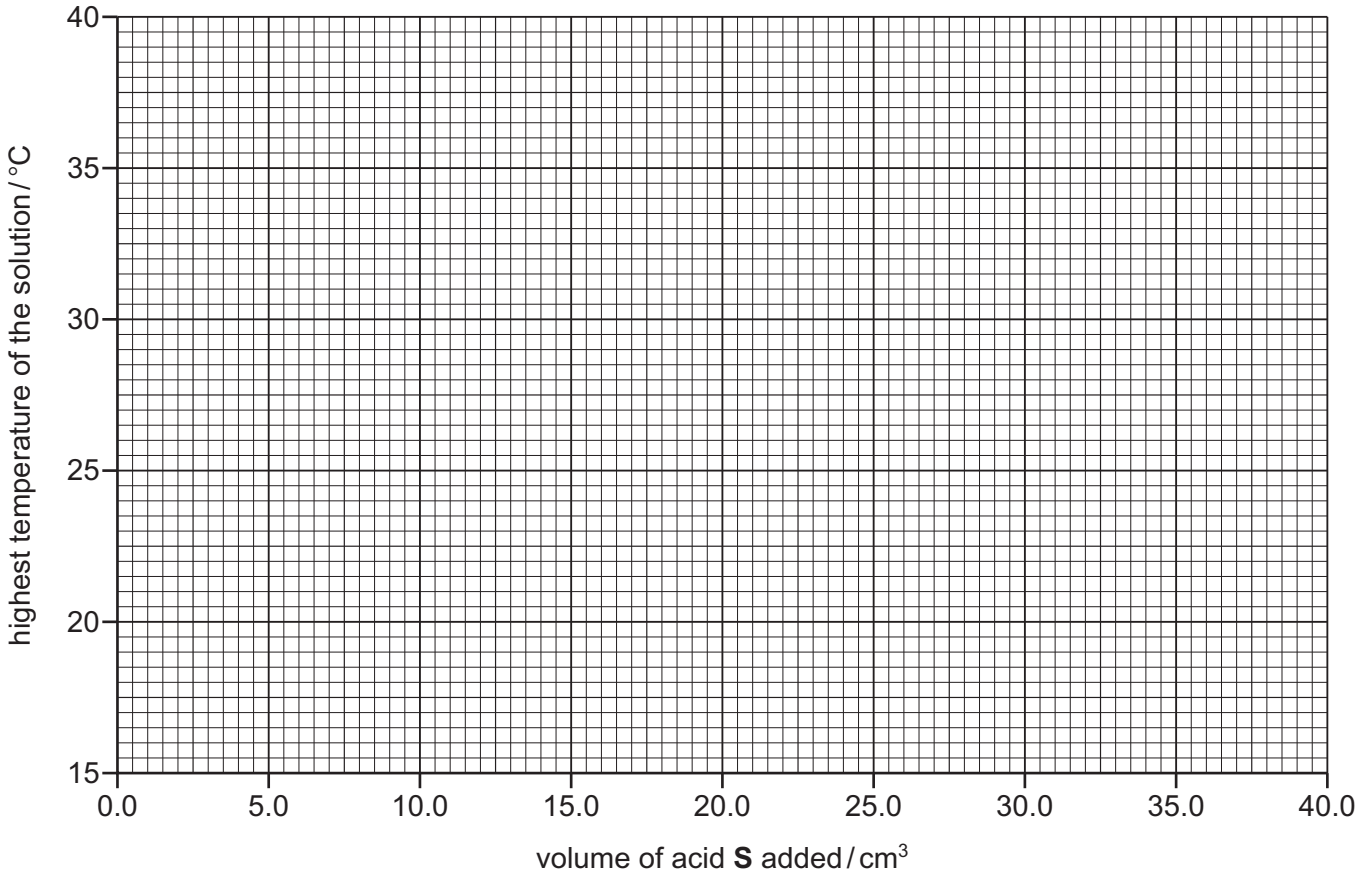
(c) Use the thermometer diagrams to record the results in the table.

volume of acid **S** added / cm^3	thermometer diagram	highest temperature of the solution / °C
0.0		
5.0		
10.0		
15.0		
20.0		
25.0		
30.0		
35.0		
40.0		

[2]

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(d) Plot the results for Experiment 2 on the grid and draw **two** intersecting straight line graphs.



[2]

(e) (i) **Use your graph** to estimate the volume of acid **S** which must be added to neutralise 50 cm^3 of aqueous sodium hydroxide.

Show clearly **on the grid** how you worked out your answer.

..... cm^3 [2]

(ii) Suggest how the volume in **(e)(i)** would differ if the experiment were repeated using 25 cm^3 instead of 50 cm^3 of aqueous sodium hydroxide.
Explain your answer.

.....

..... [2]

(f) What type of energy change occurs when acid **S** reacts with aqueous sodium hydroxide?

..... [1]

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[Turn over

(g) (i) In Experiment 2, why was the burette rinsed with distilled water?

..... [1]

(ii) Why was the burette then rinsed with acid **S**?

..... [1]

(h) Describe **one** source of error in Experiment 2. Suggest an improvement to reduce this source of error.

source of error .....

improvement .....
[2]

[Total: 17]

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3 Solution **T** and liquid **U** were analysed. Solution **T** was aqueous sodium hydroxide.
Tests were done on solution **T** and liquid **U**.

tests on solution T

Complete the expected observations.

Solution **T** was divided into four portions in three test-tubes and one boiling tube.

(a) (i) A flame test was done on the first portion of solution **T**.

observations ..... [1]

(ii) The pH of the first portion of solution **T** was tested.

pH = ... [1]

(b) ● A few drops of aqueous zinc sulfate were added to the second portion of solution **T** in a test-tube. The test-tube was shaken to mix the solutions.

observations .....

● An excess of aqueous zinc sulfate was then added to the mixture.

observations .....
[3]

(c) Ammonium chloride was added to the third portion of solution **T** in a boiling tube. The mixture was heated and the gas produced was tested.

test .....

observations .....
[2]

(d) An excess of aqueous chromium(III) chloride was added to the fourth portion of solution **T** in a test-tube.

observations ..... [2]

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[Turn over

tests on liquid U

Some of the tests and observations are shown.

tests on liquid **U**	observations
The appearance of liquid **U** was studied.	colourless, pleasant smelling
A few drops of liquid **U** were placed on to a watch glass. The surface of the liquid was touched with a lighted splint.	burned with a blue flame

(e) What conclusion can you draw about liquid **U**?

..... [1]

[Total: 10]

4 Some trees have purple leaves. The purple colour is a mixture of coloured pigments.

Plan an experiment to extract and separate the coloured pigments present in the purple leaves.

You are provided with some purple leaves, sand, ethanol and common laboratory apparatus.
You may draw a diagram to help you answer the question.

.....

.....

.....

.....

.....

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.....

.....

..... [6]

[Total: 6]

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