Cambridge IGCSE

Cambridge International Examinations
Cambridge International General Certificate of Secondary Education

CANDIDATE NAME									
CENTRE NUMBER						CANDIDATE NUMBER			

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.

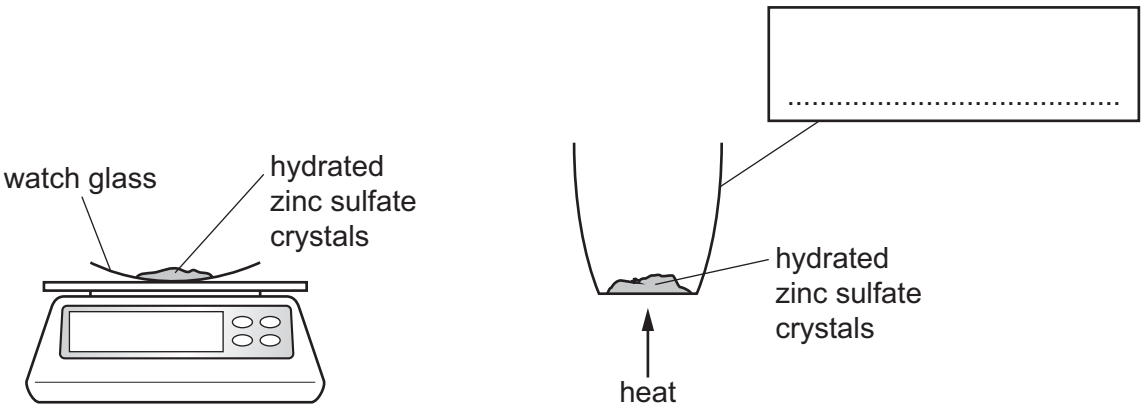
The syllabus is approved for use in England, Wales and Northern Ireland as a Cambridge International Level 1/Level 2 Certificate.

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

© UCLES 2018

CAMBRIDGE International Examinations

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**.

View solution

..... [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.

View solution

test .....

result .....
[2]

[Total: 7]

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.

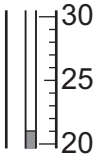
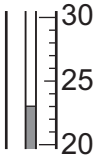
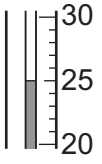
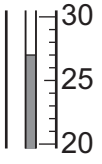
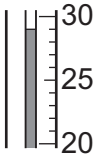
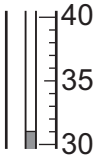
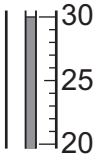
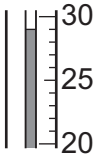
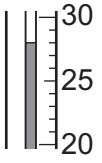
Experiment 1

- 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.

© UCLES 2018

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

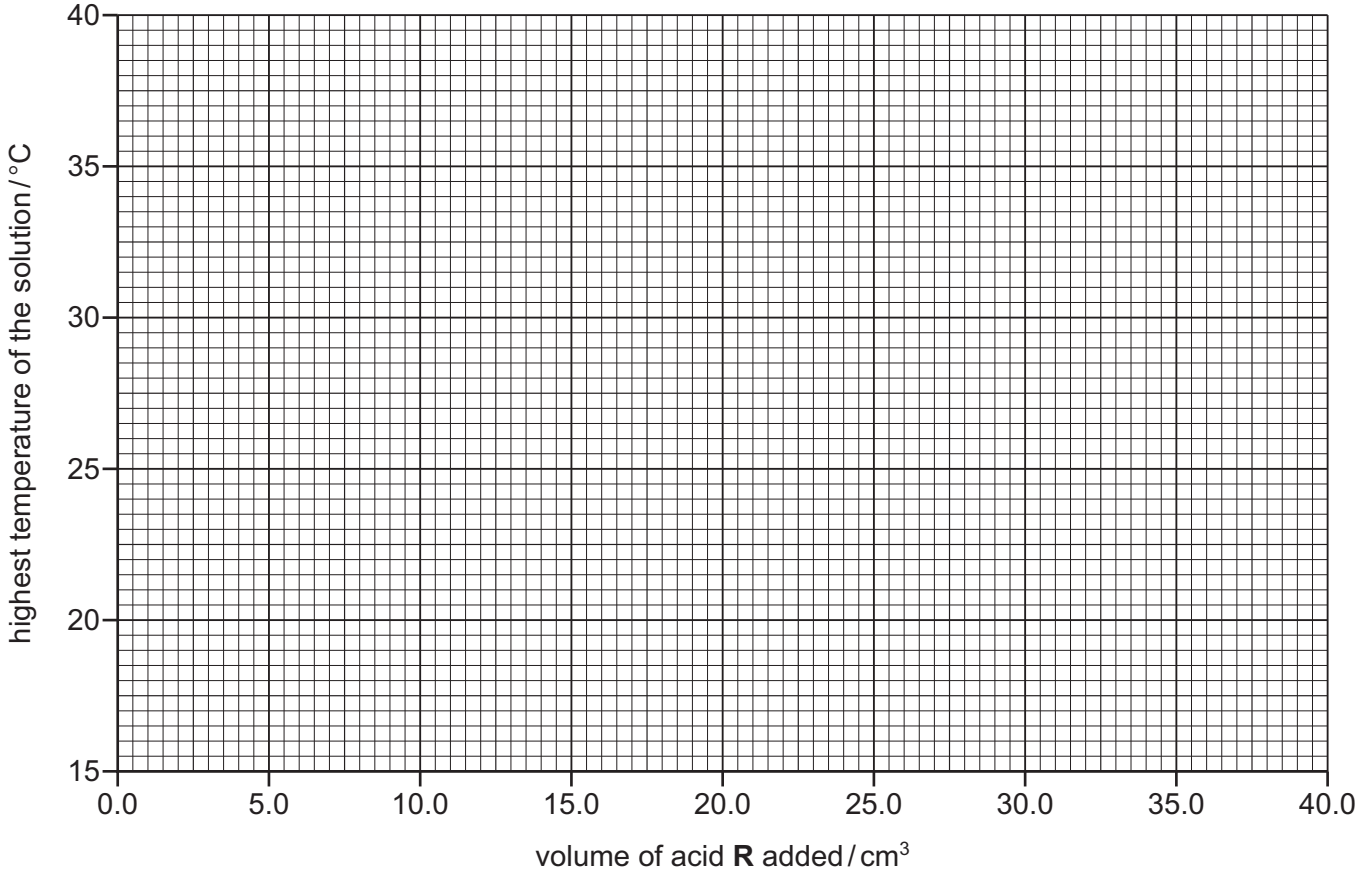
View solution

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]

© UCLES 2018

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



[2]

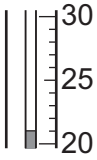
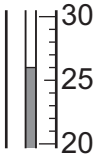
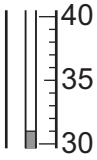
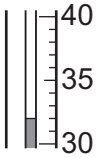
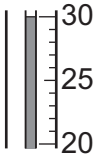
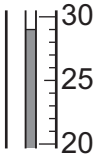
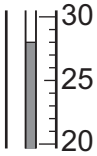
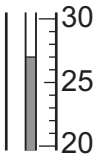
View solution

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**.

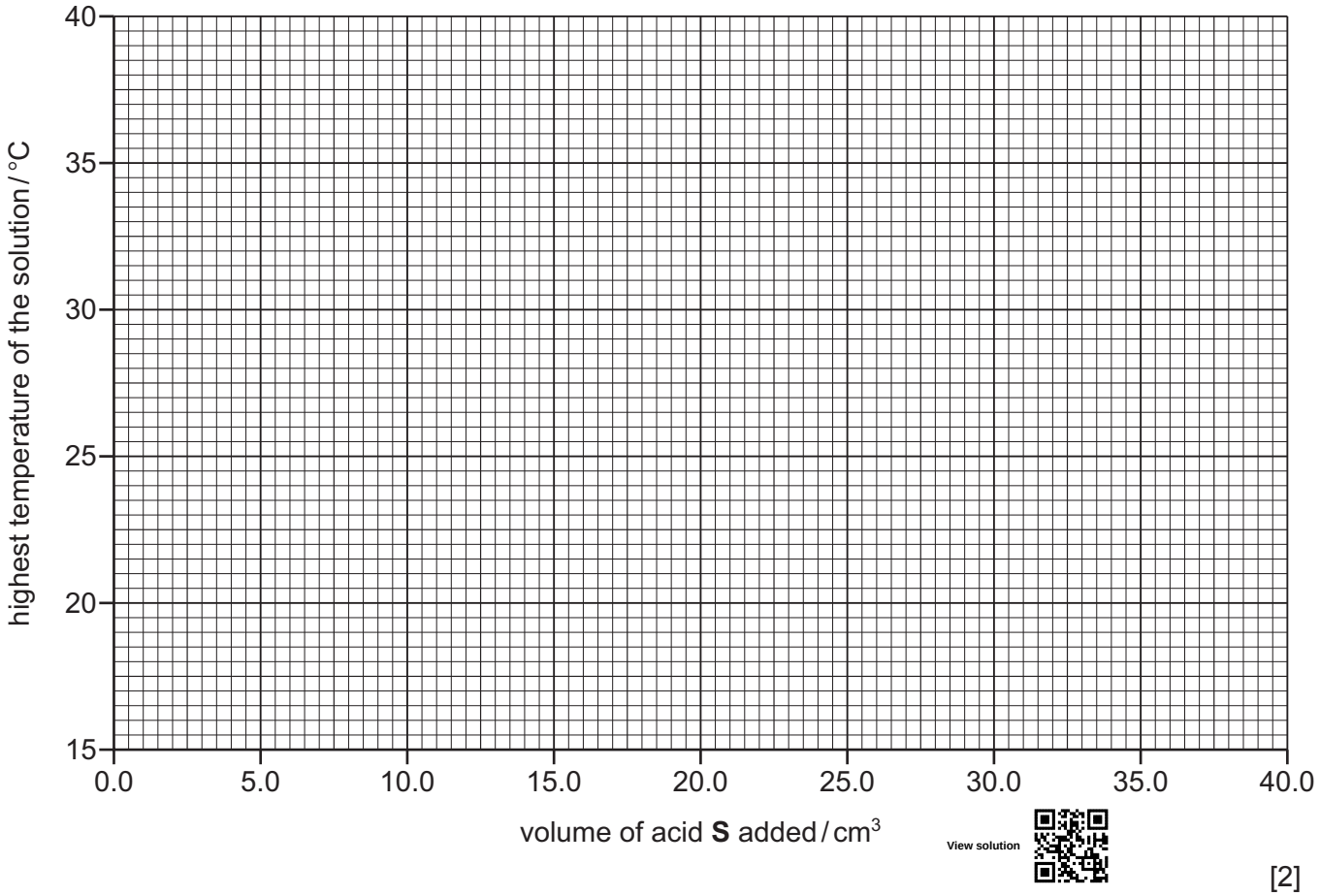
(c) Use the thermometer diagrams to record the results in the table.

View solution

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]

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



View solution

[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.

View solution

..... 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.

View solution

.....

..... [2]

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

View solution

..... [1]

© UCLES 2018

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

..... [1]

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

View solution

..... [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]

View solution

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**.

View solution

observations ..... [1]

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

View solution

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.

View solution

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 .....

View solution [2]

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

observations ..... [2]

View solution

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]



View solution

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.

View solution

.....

.....

.....

.....

.....

.....

.....

.....

..... [6]

[Total: 6]

BLANK PAGE

Permission to reproduce items where third-party owned material protected by copyright is included has been sought and cleared where possible. Every reasonable effort has been made by the publisher (UCLES) to trace copyright holders, but if any items requiring clearance have unwittingly been included, the publisher will be pleased to make amends at the earliest possible opportunity.

To avoid the issue of disclosure of answer-related information to candidates, all copyright acknowledgements are reproduced online in the Cambridge International Examinations Copyright Acknowledgements Booklet. This is produced for each series of examinations and is freely available to download at www.cie.org.uk after the live examination series.

Cambridge International Examinations is part of the Cambridge Assessment Group. Cambridge Assessment is the brand name of University of Cambridge Local Examinations Syndicate (UCLES), which is itself a department of the University of Cambridge.