Cambridge IGCSE

Cambridge International Examinations
Cambridge International General Certificate of Secondary Education

CANDIDATE NAME									
CENTRE NUMBER						CANDIDATE NUMBER			

CHEMISTRY **0620/62**

Paper 6 Alternative to Practical **October/November 2017**

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.

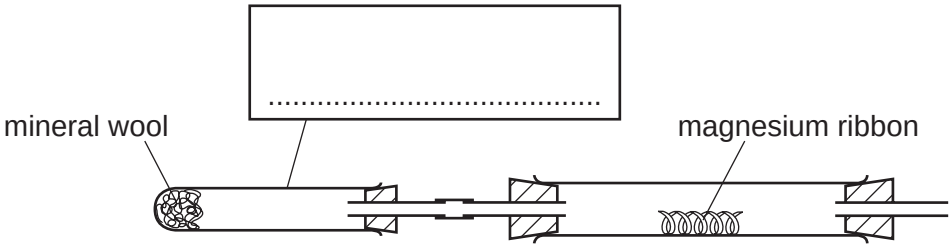
Answer **all** questions.
Electronic calculators may be used.
You may lose marks if you do not show your working or if you do not use appropriate units.

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.

1 Some magnesium ribbon was cleaned.
Steam was then passed over the magnesium ribbon as it was heated, using the apparatus shown.



(a) What liquid is absorbed on the mineral wool?

..... [1]

(b) (i) Use **two** arrows to show **two** places where heat is applied. [1]

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

(c) Suggest how the magnesium ribbon was cleaned.

..... [1]

(d) (i) Complete the diagram to show how the hydrogen produced could be collected and its volume measured. Label your diagram. [2]

(ii) State the effect of a lighted splint on the hydrogen produced.

..... [1]

(e) Suggest why the tube containing the magnesium cracks after the reaction.

.....

..... [1]

[Total: 8]

2 A student investigated what happened when two different solids, **S** and **T**, dissolved in water.

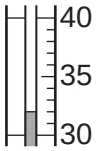
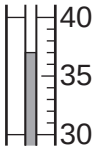
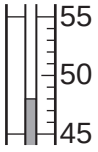
Two experiments were carried out.

Experiment 1

- Using a measuring cylinder, 30 cm^3 of distilled water were poured into a polystyrene cup. The initial temperature of the water was measured.
- 2.0 g of solid **S** were added to the polystyrene cup and the solution was stirred with a thermometer.
- The **maximum** temperature of the solution was measured.
- The solution was poured away and the polystyrene cup was rinsed out with distilled water.

- The procedure was repeated using 3.0 g of solid **S**.
- The procedure was repeated using 5.0 g of solid **S**.

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

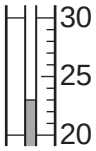
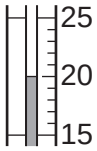
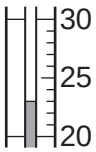
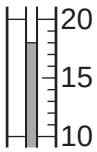
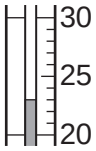
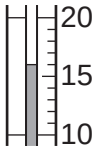
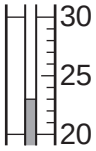
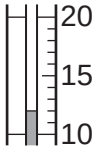
mass of solid **S** / g	thermometer diagram	initial temperature of the water / °C	thermometer diagram	maximum temperature of the solution / °C
2.0				
3.0				
5.0				

[2]

Experiment 2

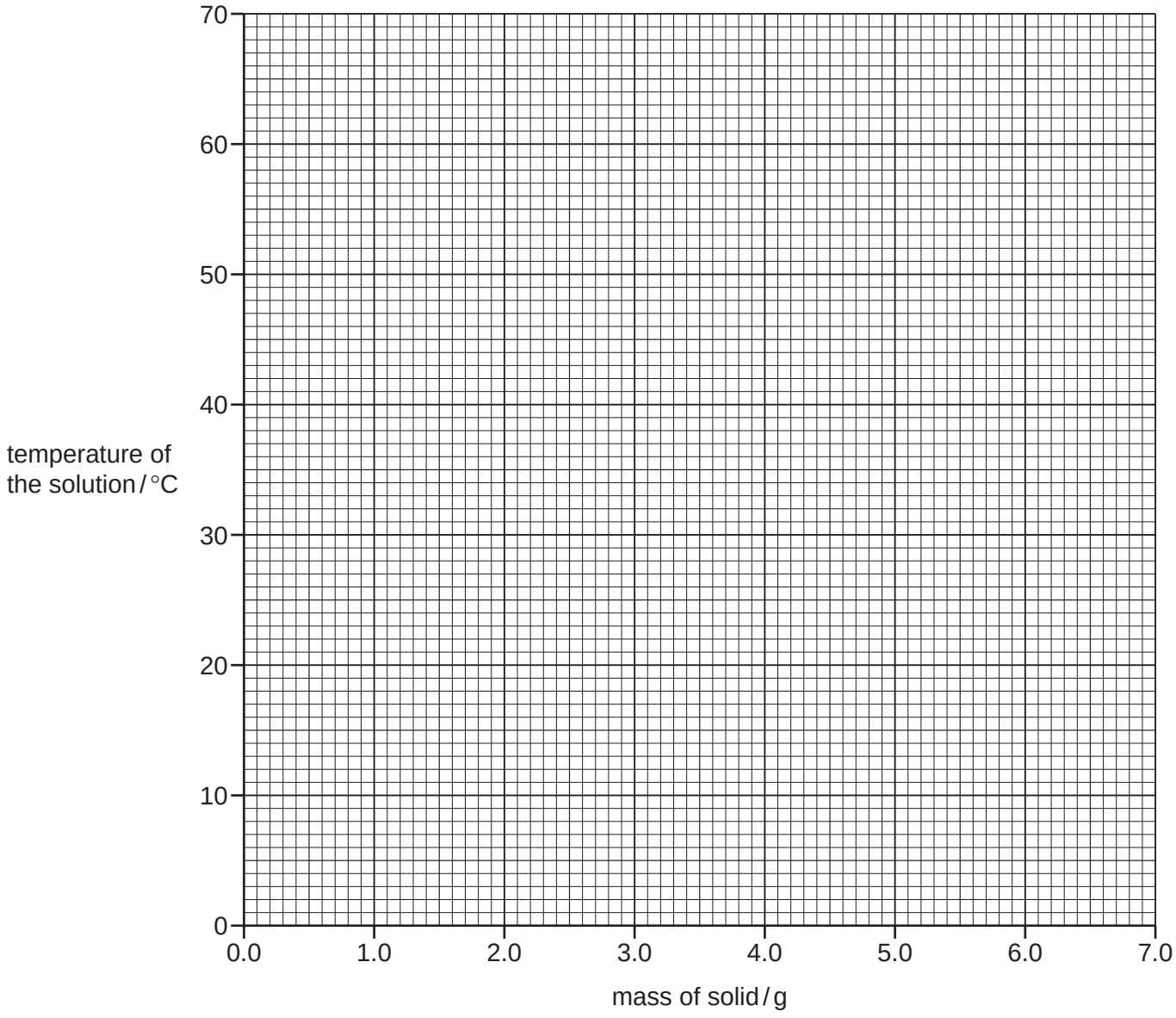
- Experiment 1 was repeated using 2.0 g, 3.0 g, 4.0 g and 6.0 g of solid **T**. The **minimum** temperature of the solution was measured in each case.

(b) Use the thermometer diagrams to record the temperatures in the table.

mass of solid **T** / g	thermometer diagram	initial temperature of the water / °C	thermometer diagram	minimum temperature of the solution / °C
2.0				
3.0				
4.0				
6.0				

[2]

(c) Plot the results of Experiment 1 (maximum temperature) and Experiment 2 (minimum temperature) on the grid. Draw **two** straight lines of best fit.
Clearly label your lines.



[4]

(d) (i) **From your graph**, deduce the maximum temperature of the solution if 6.0 g of solid **S** were added to 30 cm^3 of distilled water.

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

..... °C [2]

(ii) **From your graph**, deduce the minimum temperature of the solution if 4.5 g of solid **T** were added to 30 cm^3 of distilled water.

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

..... °C [2]

[Turn over

(e) Use the results to identify the type of energy change that occurs when solid **S** dissolves in water.

..... [1]

(f) Suggest **one** change you could make to the experiments to obtain more accurate results. Explain how this change would make the results more accurate.

change .....

explanation .....

.....
[2]

(g) Suggest how the reliability of the results could be checked.

..... [1]

(h) Explain how the temperatures measured would be different if Experiment 1 were repeated using 60 cm^3 of distilled water in each case.

.....

..... [2]

[Total: 18]

3 Two solid salts, **U** and **W**, were analysed. Solid **U** was sodium carbonate.
Tests were carried out on each solid.

tests on solid U

Complete the expected observations.

(a) Describe the appearance of solid **U**.

..... [1]

About half of solid **U** was dissolved in distilled water to produce solution **U**. Solution **U** was divided into two equal portions in two test-tubes.

(b) Dilute hydrochloric acid was added to the first portion of solution **U**.
The gas produced was tested.

observations .....

..... [3]

(c) Name the gas produced in **(b)**.

..... [1]

(d) A flame test was carried out on solid **U**.

observations ..... [1]

tests on solid W

Tests were carried out and the following observations made.

tests on solid **W**	observations
Appearance of solid **W**.	white crystals
Solid **W** was dissolved in distilled water to produce solution **W**. The solution was divided into two equal portions in two test-tubes. **test 1** Dilute nitric acid and aqueous silver nitrate were added to the first portion of solution **W**.	white precipitate formed
test 2 The second portion of solution **U** was added to the second portion of solution **W**. An excess of dilute hydrochloric acid was then added to the mixture.	white precipitate formed rapid effervescence white precipitate dissolved

(e) What conclusions can you draw about solid **W**?

..... [2]

[Total: 8]

[Turn over

4 When iron nails rust, the mass of the nails increases.
Plan an experiment to investigate if iron nails rust more quickly in tap water or in distilled water.
You are provided with new iron nails and common laboratory apparatus.

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..... [6]

[Total: 6]