Cambridge IGCSE

Cambridge Assessment International Education
Cambridge International General Certificate of Secondary Education

CANDIDATE NAME									
CENTRE NUMBER						CANDIDATE NUMBER			

9615262731

CHEMISTRY **0620/62**

Paper 6 Alternative to Practical **October/November 2019**

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.

This syllabus is regulated 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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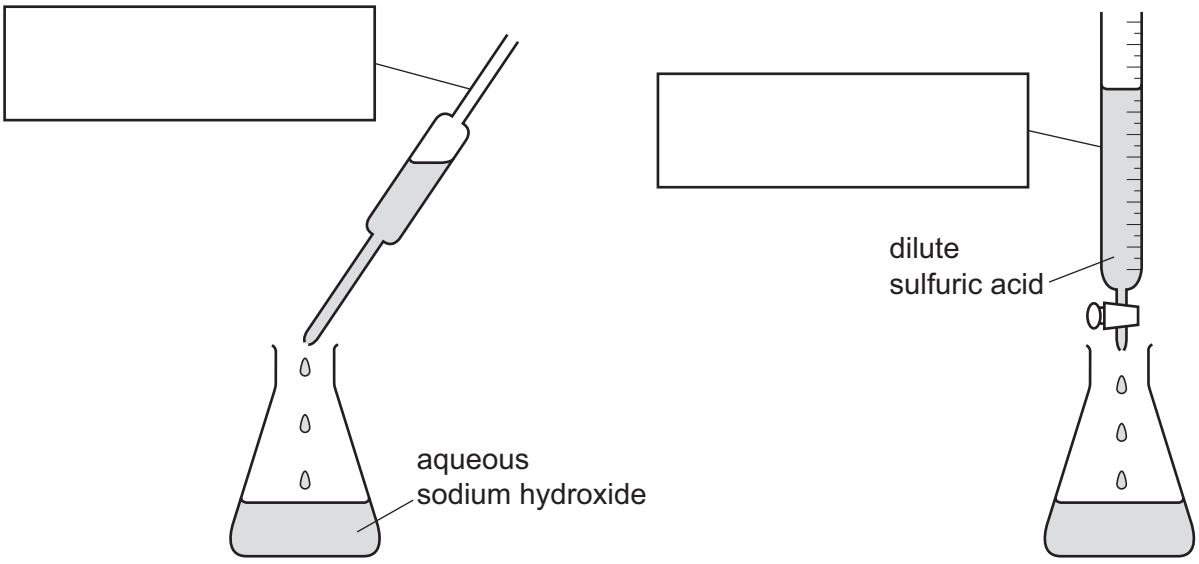
1 A student did a single titration to find the concentration of a solution of dilute sulfuric acid.

The student added 25.0 cm^3 of aqueous sodium hydroxide to a conical flask, followed by a few drops of indicator. Dilute sulfuric acid was then added to the aqueous sodium hydroxide until the solution was neutral.

The apparatus used is shown in the diagram.



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

(b) Name a suitable indicator to use in the titration and give the colour change.

indicator .....

colour change from ..... to .....
[2]

(c) What readings should the student take when doing this single titration?

..... [2]

(d) After the titration, the student discarded the contents of the conical flask and rinsed the conical flask with distilled water.

Suggest and explain what would be the effect, if any, on the titration values if the conical flask was not dried before repeating the titration.

.....

.....

..... [2]

[Total: 8]

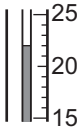
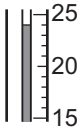
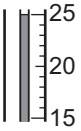
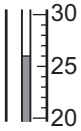
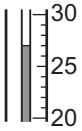
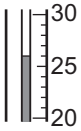
[Turn over

2 A student investigated the temperature changes when two different solids, **N** and **O**, dissolve in water.
Two experiments were done.

Experiment 1

- Using a measuring cylinder, 30 cm^3 of distilled water was poured into a polystyrene cup.
- The initial temperature of the distilled water was measured.
- Solid **N** was added to the distilled water, a timer started and the mixture was stirred with a stirring thermometer.
- The temperature of the mixture was measured every 30 seconds for three minutes (180 seconds).

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

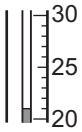
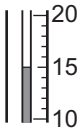
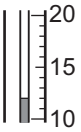
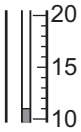
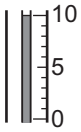
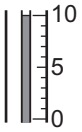
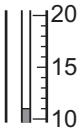
time / s	0	30	60	90	120	150	180
thermometer diagram							
temperature of mixture / °C							

[2]

Experiment 2

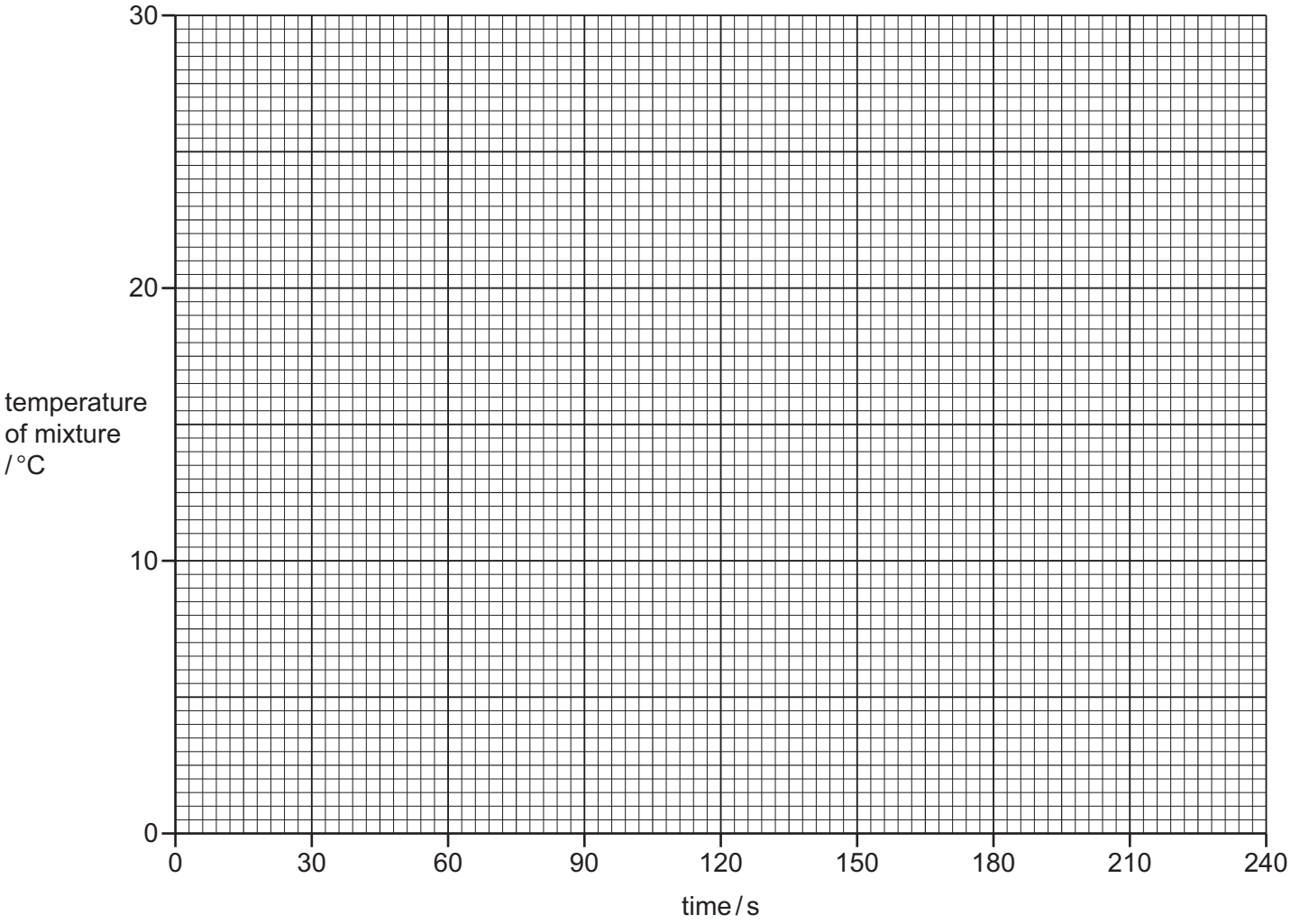
Experiment 1 was repeated using a new polystyrene cup and solid **O** instead of solid **N**.

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

time / s	0	30	60	90	120	150	180
thermometer diagram							
temperature of mixture / °C							

[2]

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



[3]

(d) (i) **From your graph**, deduce the time taken for the initial temperature of the solution in Experiment 2 to change by 3 °C.

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

..... s [3]

(ii) Extend your graph for Experiment 1 to give the expected temperature of the mixture after 240 seconds.

..... °C [2]

(e) Is the energy change in Experiment 2 exothermic or endothermic? Explain your answer.

.....

..... [1]

[Turn over

(f) State **two** possible sources of error in these experiments. Suggest **two** improvements to reduce each of these sources of error.

source of error 1 .....

improvement 1 .....

source of error 2 .....

improvement 2 .....

[4]

[Total: 17]

3 Two substances, solid **P** and solid **Q**, were analysed. Solid **P** was copper(II) nitrate.
Tests were done on solid **P** and solid **Q**.

tests on solid P

Complete the expected observations.

(a) A flame test was done on solid **P**.

observations ..... [1]

Solid **P** was added to distilled water and the mixture shaken to dissolve solid **P** and form solution **P**.
Solution **P** was divided into three equal portions in two test-tubes and one boiling tube.

(b) An excess of aqueous sodium hydroxide was added to the first portion of solution **P** in a test-tube.

observations ..... [1]

(c) (i) A few drops of aqueous ammonia were added to the second portion of solution **P** in a test-tube.

observations ..... [1]

(ii) An excess of aqueous ammonia was then added to this mixture.

observations ..... [2]

(d) Aluminium foil and aqueous sodium hydroxide were added to the third portion of solution **P** in a boiling tube. The mixture was heated and the gas produced tested.

observations .....

..... [2]

[Turn over

tests on solid Q

Some of the tests and observations are shown.

tests on solid **Q**	observations
test 1 A flame test was done on solid **Q**.	lilac colour
test 2 Solid **Q** was dissolved in water. Dilute nitric acid and aqueous silver nitrate were added to the solution.	cream precipitate formed

(e) Identify solid **Q**.

..... [2]

[Total: 9]

4 The table gives some information about the properties of three substances found in a hand cream.

substance	reaction with dilute nitric acid
polystyrene beads	no reaction
calcium carbonate	reacts and dissolves
sodium fluoride	dissolves

Use the information in the table to plan an experiment to obtain a pure, dry sample of polystyrene beads from this mixture of substances.

You are provided with a mixture of the three substances and common laboratory apparatus.

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..... [6]

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