GradeMax

* 0000800000001 * DFD

CAMBRIDGE
International Education

# Cambridge IGCSE™

CANDIDATE NAME

CENTRE NUMBER

CANDIDATE NUMBER

*9288138979*

**CHEMISTRY** **0620/63**

Paper 6 Alternative to Practical **May/June 2026**

**1 hour**

You must answer on the question paper.

No additional materials are needed.

**INSTRUCTIONS**

- Answer **all** questions.
- Use a black or dark blue pen. You may use an HB pencil for any diagrams or graphs.
- Write your name, centre number and candidate number in the boxes at the top of the page.
- Write your answer to each question in the space provided.
- Do **not** use an erasable pen. Do **not** use correction fluid or tape.
- Do **not** write on any bar codes.
- You may use a calculator.
- You should show all your working and use appropriate units.

**INFORMATION**

- The total mark for this paper is 40.
- The number of marks for each question or part question is shown in brackets [ ].
- Notes for use in qualitative analysis are provided in the question paper.

This document has **12** pages.

DC (EV/FC) 355855/3
© Cambridge University Press & Assessment 2026

**[Turn over**

GradeMax



**1** A student uses the apparatus in Figure 1.1 to investigate the electrolysis of sodium chloride.

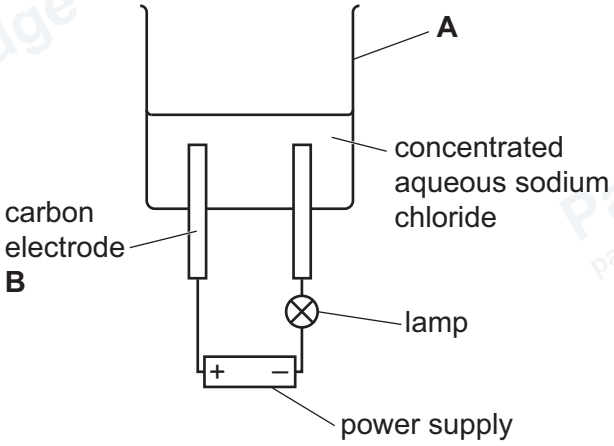



**Figure 1.1**

**(a)** Name the item of apparatus labelled **A** in Figure 1.1.

..... [1]

**(b)** State the general term used for the positive electrode, **B**, in Figure 1.1.

..... [1]

**(c)** Give **one** observation, other than effervescence, during the electrolysis in Figure 1.1.

..... [1]

**(d)** Suggest **one** change to the apparatus so the student can collect the gas made at electrode **B** in Figure 1.1.

.....

..... [1]

**(e)** Describe how the student can confirm that chlorine is made at electrode **B** in Figure 1.1.

.....

..... [2]

**(f)** Suggest **one** safety precaution the student must take when carrying out the experiment shown in Figure 1.1.

..... [1]

[Total: 7]

© Cambridge University Press & Assessment 2026 

DO NOT WRITE IN THIS MARGIN
DO NOT WRITE IN THIS MARGIN
DO NOT WRITE IN THIS MARGIN
DO NOT WRITE IN THIS MARGIN
DO NOT WRITE IN THIS MARGIN

GradeMax



DO NOT WRITE IN THIS MARGIN
DO NOT WRITE IN THIS MARGIN
DO NOT WRITE IN THIS MARGIN
DO NOT WRITE IN THIS MARGIN
DO NOT WRITE IN THIS MARGIN

**Turn over**

© Cambridge University Press & Assessment 2026

GradeMax



**2** A student investigates the temperature change when sodium thiosulfate is dissolved in water.

The student does five experiments.

Experiment 1

- Place a polystyrene cup into a 250 $cm^3$ beaker for support.
- Use a 25 $cm^3$ measuring cylinder to pour 20 $cm^3$ of distilled water into the polystyrene cup.
- Use a thermometer to measure the initial temperature of the distilled water.
- Add 1.0 g of sodium thiosulfate powder to the distilled water in the polystyrene cup and immediately start a stop-watch. Stir the mixture with the thermometer.
- Measure the temperature of the solution at 1 minute.
- Rinse out the polystyrene cup with distilled water.

Experiment 2

- Repeat Experiment 1 using 2.0 g of sodium thiosulfate powder instead of 1.0 g.

Experiment 3

- Repeat Experiment 1 using 3.0 g of sodium thiosulfate powder instead of 1.0 g.

Experiment 4

- Repeat Experiment 1 using 4.0 g of sodium thiosulfate powder instead of 1.0 g.

Experiment 5

- Repeat Experiment 1 using 5.0 g of sodium thiosulfate powder instead of 1.0 g.

DO NOT WRITE IN THIS MARGIN
DO NOT WRITE IN THIS MARGIN
DO NOT WRITE IN THIS MARGIN
DO NOT WRITE IN THIS MARGIN
DO NOT WRITE IN THIS MARGIN

© Cambridge University Press & Assessment 2026 

GradeMax

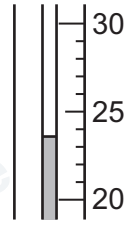
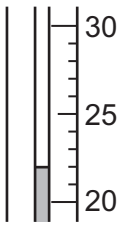
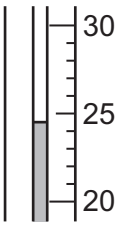
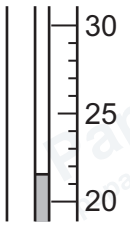
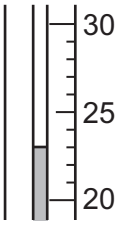
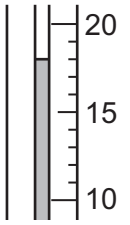
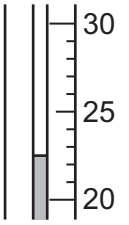
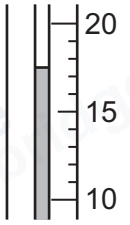
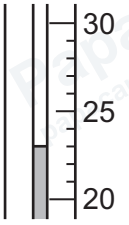
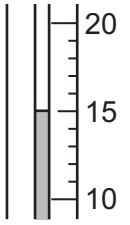


**(a)** Use the information in the description of the experiments and the thermometer diagrams to complete Table 2.1.

Calculate the temperature change using the equation shown.

temperature change = initial temperature – final temperature

**Table 2.1**

| experiment | mass of sodium thiosulfate /g | initial thermometer diagram | initial temperature /°C | final thermometer diagram | final temperature /°C | temperature change /°C |
|---|---|---|---|---|---|---|
| 1 | |   | |   | | |
| 2 | |   | |   | | |
| 3 | |   | |   | | |
| 4 | |   | |   | | |
| 5 | |   | |   | | |

[5]

DO NOT WRITE IN THIS MARGIN
DO NOT WRITE IN THIS MARGIN
DO NOT WRITE IN THIS MARGIN
DO NOT WRITE IN THIS MARGIN
DO NOT WRITE IN THIS MARGIN

GradeMax



**(b)** On Figure 2.1, write a suitable scale on the *y*-axis and plot your results from Experiments 1 to 5. Draw a line of best fit.

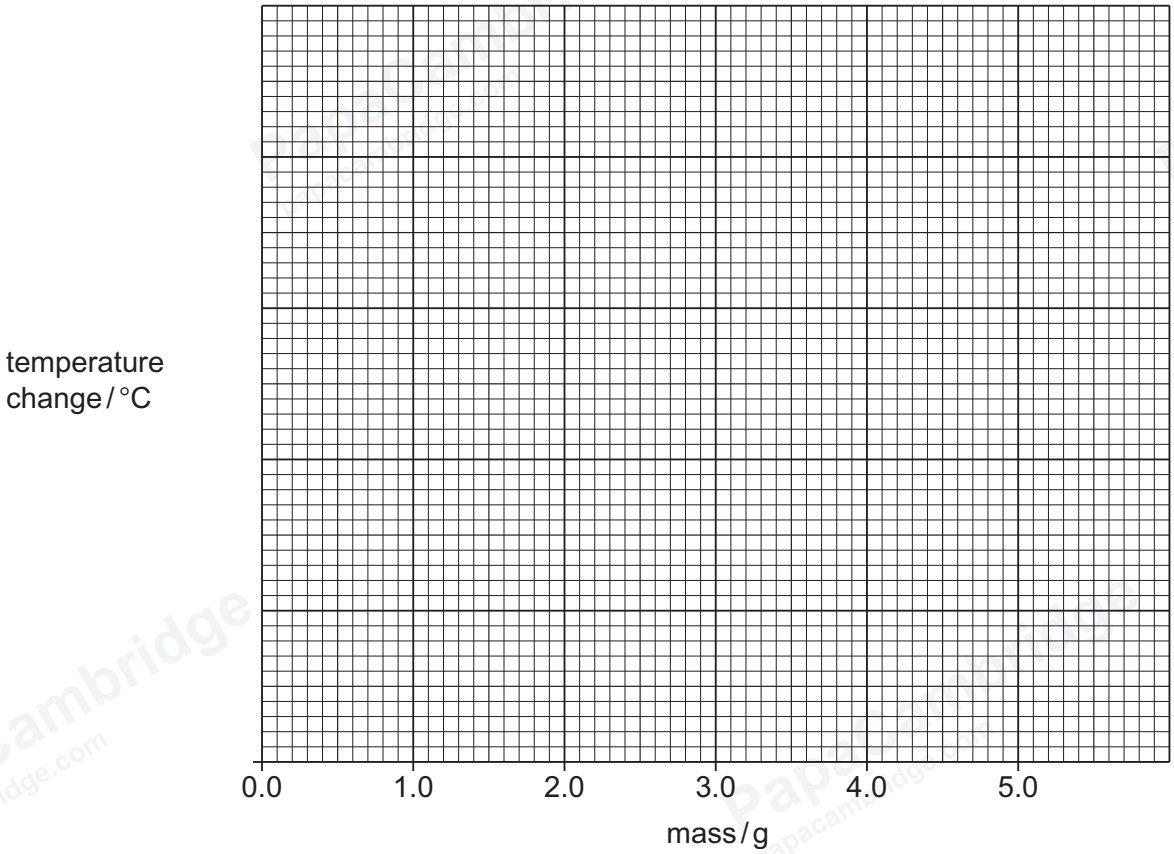



**Figure 2.1**

[4]

**(c)** On Figure 2.1, extrapolate your line of best fit to deduce the temperature change if 5.7 g of sodium thiosulfate powder is added to 20 $cm^3$ of distilled water.

Show clearly on Figure 2.1 how you worked out your answer.

temperature change = .....°C
[3]

**(d)** Suggest why sodium thiosulfate powder is used in the experiments rather than large lumps.

..... [1]

**(e)** Explain why it would be an improvement to measure the volume of distilled water in a burette rather than a measuring cylinder.

..... [1]

© Cambridge University Press & Assessment 2026 

DO NOT WRITE IN THIS MARGIN
DO NOT WRITE IN THIS MARGIN
DO NOT WRITE IN THIS MARGIN
DO NOT WRITE IN THIS MARGIN
DO NOT WRITE IN THIS MARGIN

GradeMax



**(f)** State if the energy change when sodium thiosulfate powder is dissolved in distilled water is exothermic or endothermic.

Use the results in Table 2.1 to explain your answer.

energy change .....

explanation .....

.....

[1]

**(g)** Suggest why it is an improvement to use a lid on the polystyrene cup.

.....

..... [1]

**(h)** Suggest why the initial temperature of the distilled water does **not** need to be the same in each experiment.

.....

..... [1]

**(i)** The energy change in a reaction is calculated using the equation shown.

energy change = volume of water × 4.18 × temperature change

Calculate the energy change when sodium thiosulfate powder dissolves in Experiment 3.

energy change = ..... J [1]

[Total: 18]

DO NOT WRITE IN THIS MARGIN

© Cambridge University Press & Assessment 2026 

GradeMax



**3** A student tests two substances: solution **A** and solid **B**.

**Tests on solution A**

Table 3.1 shows the tests and the student's observations for solution **A**.

**Table 3.1**

| tests | observations |
|---|---|
| Divide solution **A** into three portions.<br><br>**test 1**<br><br>To the first portion of solution **A**, add sodium hydroxide dropwise<br>and then in excess. | <br><br><br>white precipitate<br><br>precipitate remains in excess |
| **test 2**<br><br>To the second portion of solution **A**, add 1 $cm^3$ of dilute nitric acid and a few drops of aqueous silver nitrate. | <br><br>white precipitate |
| **test 3**<br><br>To the third portion of solution **A**, add an equal depth of dilute sulfuric acid and leave to stand for 5 minutes.<br><br>Keep the contents of the test-tube for use in **test 4**. | <br><br>white precipitate |
| **test 4**<br><br>Add an equal depth of aqueous sodium carbonate to the contents of the test-tube from **test 3**.<br><br>Any gas given off is tested. | <br><br>effervescence<br><br><br>gas turns limewater milky |

**(a)** State what conclusion can be made about solution **A** from the observations in **test 1**.

.....

..... [1]

**(b)** State what conclusion can be made about solution **A** from the observations in **test 2**.

.....

..... [1]

DO NOT WRITE IN THIS MARGIN
DO NOT WRITE IN THIS MARGIN
DO NOT WRITE IN THIS MARGIN
DO NOT WRITE IN THIS MARGIN
DO NOT WRITE IN THIS MARGIN

© Cambridge University Press & Assessment 2026 

GradeMax



DO NOT WRITE IN THIS MARGIN
DO NOT WRITE IN THIS MARGIN
DO NOT WRITE IN THIS MARGIN
DO NOT WRITE IN THIS MARGIN
DO NOT WRITE IN THIS MARGIN

**(c)** A flame test is used to confirm the identity of the cation in solution **A**.

Describe how to carry out a flame test.

.....

.....

..... [2]

**(d)** Suggest what the sodium carbonate reacts with in **test 4** to produce carbon dioxide gas.

..... [1]

**Tests on solid B**

Solid **B** is zinc sulfate.

The student dissolves solid **B** in water to form solution **B**. The student divides solution **B** into three approximately equal portions into one boiling tube and two test-tubes.

Complete the expected observations.

**(e)** To the first portion of solution **B** in the boiling tube, the student adds aqueous sodium hydroxide dropwise and then in excess.

observations .....

..... [2]

**(f)** To the second portion of solution **B** in a test-tube, the student adds 1 $cm^3$ of dilute nitric acid followed by a few drops of aqueous barium nitrate.

observations ..... [1]

**(g)** To the third portion of solution **B** in a test-tube, the student adds 1 $cm^3$ of dilute nitric acid followed by a few drops of aqueous silver nitrate.

observations ..... [1]

[Total: 9]

© Cambridge University Press & Assessment 2026

GradeMax



**4** Rhubarb plant leaves contain oxalic acid. Oxalic acid is soluble in water.

Acidified aqueous potassium manganate(VII) changes from purple to colourless when it reacts with oxalic acid.

Plan an experiment to find which of two rhubarb plant leaves, **A** and **B**, contains the highest concentration of oxalic acid.

You are provided with two rhubarb plant leaves, **A** and **B**, acidified aqueous potassium manganate(VII) and common laboratory apparatus.

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

..... [6]

DO NOT WRITE IN THIS MARGIN
DO NOT WRITE IN THIS MARGIN
DO NOT WRITE IN THIS MARGIN
DO NOT WRITE IN THIS MARGIN
DO NOT WRITE IN THIS MARGIN

© Cambridge University Press & Assessment 2026 

GradeMax



DO NOT WRITE IN THIS MARGIN
DO NOT WRITE IN THIS MARGIN
DO NOT WRITE IN THIS MARGIN
DO NOT WRITE IN THIS MARGIN
DO NOT WRITE IN THIS MARGIN

## Notes for use in qualitative analysis

### Tests for anions

| anion | test | test result |
|---|---|---|
| carbonate, $CO_3^{2-}$ | add dilute acid, then test for carbon dioxide gas | effervescence, carbon dioxide produced |
| chloride, $Cl^-$ [in solution] | acidify with dilute nitric acid, then add aqueous silver nitrate | white ppt. |
| bromide, $Br^-$ [in solution] | acidify with dilute nitric acid, then add aqueous silver nitrate | cream ppt. |
| iodide, $I^-$ [in solution] | acidify with dilute nitric acid, then add aqueous silver nitrate | yellow ppt. |
| nitrate, $NO_3^-$ [in solution] | add aqueous sodium hydroxide, then aluminium foil; warm carefully | ammonia produced |
| sulfate, $SO_4^{2-}$ [in solution] | acidify with dilute nitric acid, then add aqueous barium nitrate | white ppt. |
| sulfite, $SO_3^{2-}$ | add a small volume of acidified aqueous potassium manganate(VII) | the acidified aqueous potassium manganate(VII) changes colour from purple to colourless |

### Tests for aqueous cations

| cation | effect of aqueous sodium hydroxide | effect of aqueous ammonia |
|---|---|---|
| aluminium, $Al^{3+}$ | white ppt., soluble in excess, giving a colourless solution | white ppt., insoluble in excess |
| ammonium, $NH_4^+$ | ammonia produced on warming | – |
| calcium, $Ca^{2+}$ | white ppt., insoluble in excess | no ppt. or very slight white ppt. |
| chromium(III), $Cr^{3+}$ | green ppt., soluble in excess | green ppt., insoluble in excess |
| copper(II), $Cu^{2+}$ | light blue ppt., insoluble in excess | light blue ppt., soluble in excess, giving a dark blue solution |
| iron(II), $Fe^{2+}$ | green ppt., insoluble in excess, ppt. turns brown near surface on standing | green ppt., insoluble in excess, ppt. turns brown near surface on standing |
| iron(III), $Fe^{3+}$ | red-brown ppt., insoluble in excess | red-brown ppt., insoluble in excess |
| zinc, $Zn^{2+}$ | white ppt., soluble in excess, giving a colourless solution | white ppt., soluble in excess, giving a colourless solution |

© Cambridge University Press & Assessment 2026 

## Tests for gases

| gas | test and test result |
|---|---|
| ammonia, $NH_3$ | turns damp red litmus paper blue |
| carbon dioxide, $CO_2$ | turns limewater milky |
| chlorine, $Cl_2$ | bleaches damp litmus paper |
| hydrogen, $H_2$ | 'pops' with a lighted splint |
| oxygen, $O_2$ | relights a glowing splint |
| sulfur dioxide, $SO_2$ | turns acidified aqueous potassium manganate(VII) from purple to colourless |

## Flame tests for metal ions

| metal ion | flame colour |
|---|---|
| lithium, $Li^+$ | red |
| sodium, $Na^+$ | yellow |
| potassium, $K^+$ | lilac |
| calcium, $Ca^{2+}$ | orange-red |
| barium, $Ba^{2+}$ | light green |
| copper(II), $Cu^{2+}$ | blue-green |

DO NOT WRITE IN THIS MARGIN

DO NOT WRITE IN THIS MARGIN

DO NOT WRITE IN THIS MARGIN

DO NOT WRITE IN THIS MARGIN

DO NOT WRITE IN THIS MARGIN

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 (Cambridge University Press & Assessment) 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 our Copyright Acknowledgements Booklet. This is produced for each series of examinations and is freely available to download at www.cambridgeinternational.org after the live examination series.

Cambridge International Education is the name of our awarding body and a part of Cambridge University Press & Assessment, which is a department of the University of Cambridge.

© Cambridge University Press & Assessment 2026 