Cambridge IGCSE

Cambridge International Examinations
Cambridge International General Certificate of Secondary Education

CANDIDATE NAME									
CENTRE NUMBER						CANDIDATE NUMBER			

CHEMISTRY **0620/61**

Paper 6 Alternative to Practical **May/June 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.

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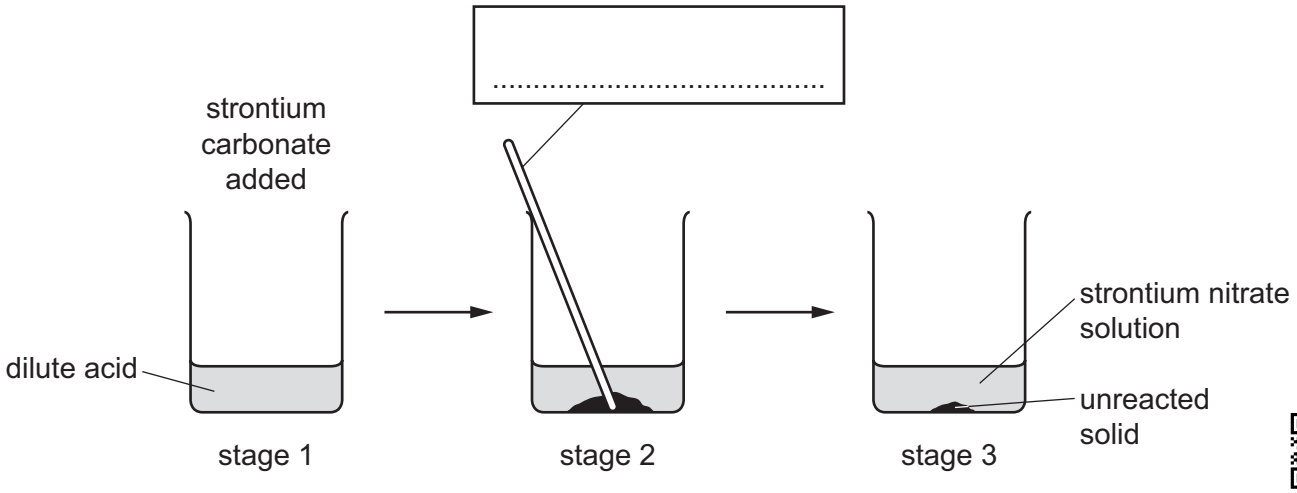
CAMBRIDGE International Examinations

1 A student prepared strontium nitrate crystals.

The diagram shows some of the stages in this preparation.



View solution

(a) (i) Complete the box to identify the apparatus. [1]

(ii) What is used to add the strontium carbonate to the acid in stage 1? View solution

..... [1]

(iii) Name the dilute acid used. View solution

..... [1]

(iv) Give **one** expected observation in stage 2. View solution

..... [1]

(b) Why is heat **not** necessary in stage 2? View solution

..... [1]

(c) Which of the reactants is in excess? Explain your answer. View solution

.....

..... [2]

(d) Describe how crystals of strontium nitrate could be obtained from the mixture in stage 3. View solution

.....

.....

..... [3]

[Total: 10]

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2 A student investigated the reaction between aqueous sodium thiosulfate and two different aqueous solutions of potassium iodate labelled solution **C** and solution **D**.

Two experiments were carried out.

Experiment 1

- A burette was filled with aqueous sodium thiosulfate. The initial burette reading was recorded.
- Using a measuring cylinder, 20 cm^3 of solution **C** were poured into a conical flask. 10 cm^3 of dilute sulfuric acid and 1 g of potassium iodide were added to the flask to form a solution of iodine. The flask was swirled to mix the contents.

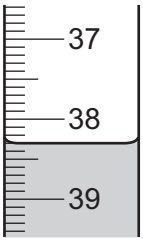
- Aqueous sodium thiosulfate was slowly added from the burette to the flask and swirled to mix thoroughly.
- When the contents of the flask turned pale yellow, starch solution was added and the solution turned blue-black.
- More aqueous sodium thiosulfate was then added slowly to the flask until the solution just turned colourless. The final burette reading was recorded.

(a) Use the burette diagrams to record the readings in the table and complete the table.

View solution



initial reading



final reading

final burette reading / cm^3	
initial burette reading / cm^3	
difference / cm^3	

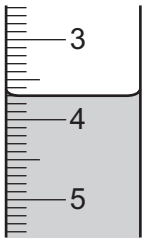
[2]

Experiment 2

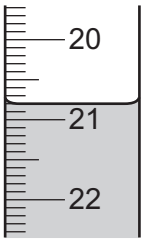
- The conical flask was emptied and rinsed with distilled water.
- Experiment 1 was repeated using solution **D** instead of solution **C**.

(b) Use the burette diagrams to record the readings in the table and complete the table.

View solution



initial reading



final reading

final burette reading / cm^3	
initial burette reading / cm^3	
difference / cm^3	

[2]

(c) (i) Which solution of potassium iodate, solution **C** or solution **D**, is the more concentrated? Explain your answer.

.....

..... [2]

(ii) How many times more concentrated is this solution of potassium iodate?

View solution

..... [1]

(d) Predict the volume of aqueous sodium thiosulfate which would be needed to react completely with 30 cm^3 of solution **D**.

.....

..... [2]

View solution

(e) (i) State **two** sources of error in the experiments.

1. .....

2. .....

[2]

(ii) Suggest **two** improvements to reduce the sources of error in **(e)(i)**.

View solution

1. .....

2. .....

[2]

[Total: 13]

3 Two solids, **E** and **F**, were analysed. Solid **F** was potassium iodide. Tests were carried out on each solid. Some of the observations on solid **E** are shown.

tests on solid **E**	observations
Appearance of solid **E**.	green solid
test 1 Solid **E** was heated gently then strongly.	the solid turned black
test 2 Dilute sulfuric acid was added to solid **E**. The gas given off was tested. Excess aqueous ammonia was then added to the mixture in the test-tube.	rapid effervescence limewater turned milky a pale blue precipitate formed, which then dissolved to form a dark blue solution
test 3 A flame test was carried out on solid **E**.	blue-green colour

(a) **Test 1** states that the solid should be heated gently then strongly.

View solution

In terms of safety, explain why it is necessary to heat gently at first.

.....

..... [1]

(b) Identify the gas given off in **test 2**.

View solution

..... [1]

(c) Identify solid **E**.

..... [2]

View solution

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tests on solid F

Complete the expected observations.

(d) Describe the appearance of solid **F**.

..... [1]

Distilled water was added to solid **F** in a test-tube and shaken to dissolve solid **F**.

(e) (i) To the first portion of the solution, an excess of aqueous sodium hydroxide was added.

observations ..... [1]

(ii) To the second portion of the solution, dilute nitric acid and aqueous silver nitrate were added.

observations ..... [2]

(f) A flame test was carried out on solid **F**.

observations ..... [1]

(g) Describe how you would carry out a flame test.

.....

.....

..... [2]

[Total: 11]

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4 A sample of furniture cleaner contains aqueous sodium chloride, aqueous ammonia and sand.

(a) Give a test to show the presence of ammonia in the mixture.

View solution

..... [1]

(b) Plan an investigation to obtain a sample of

View solution

(i) pure water from the mixture, ...

.....

.....

..... [2]

(ii) pure sand from the mixture. .....

.....

.....

.....

..... [3]

[Total: 6]

View solution

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