UNIVERSITY OF CAMBRIDGE INTERNATIONAL EXAMINATIONS
International General Certificate of Secondary Education

CANDIDATE NAME

CENTRE NUMBER

CANDIDATE NUMBER

8630438523

CHEMISTRY **0620/63**

Paper 6 Alternative to Practical **October/November 2013**

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 a pencil for any diagrams, graphs or rough working.
Do not use staples, paper clips, highlighters, glue or correction fluid.
DO **NOT** WRITE IN ANY BARCODES.

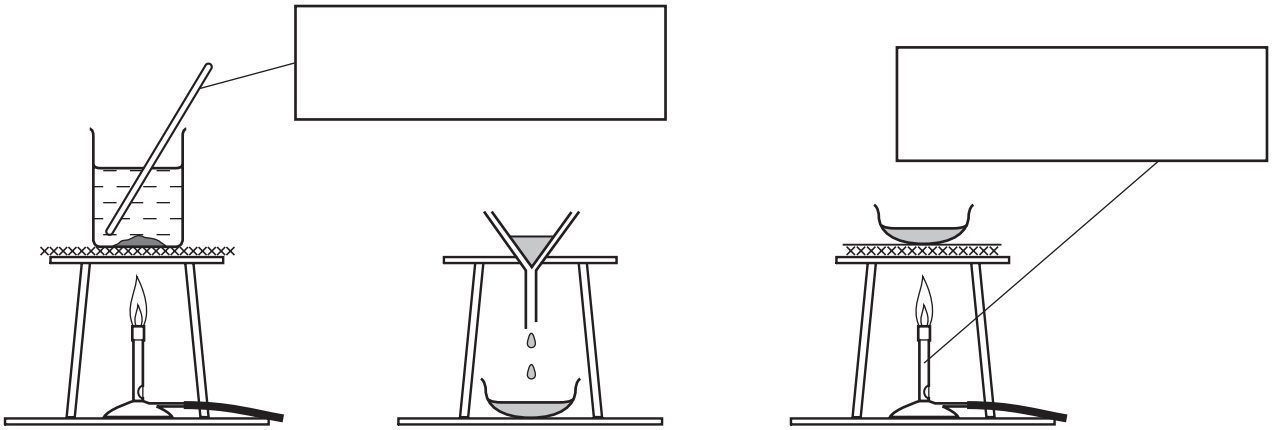
Answer **all** questions.
Electronic calculators may be used.
You may lose marks if you do not show your working or if you do not use appropriate units.

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 document consists of **9** printed pages and **3** blank pages.

For Examiner's Use

1 A student tried to separate a mixture of salt and sand. Salt, sodium chloride, is soluble in water. Sand, silicon(IV) oxide, is insoluble in water. He added the mixture to water. Three sets of apparatus are shown.



A **B** **C**

(a) Complete the boxes to identify the pieces of apparatus. [2]

(b) Fill in the blanks in the following sentences.

Liquids that dissolve substances are called ..... .

The clear liquid formed is a ..... . [2]

(c) Which set of apparatus should be used to obtain

the sand, ...

salt crystals? ..... [2]

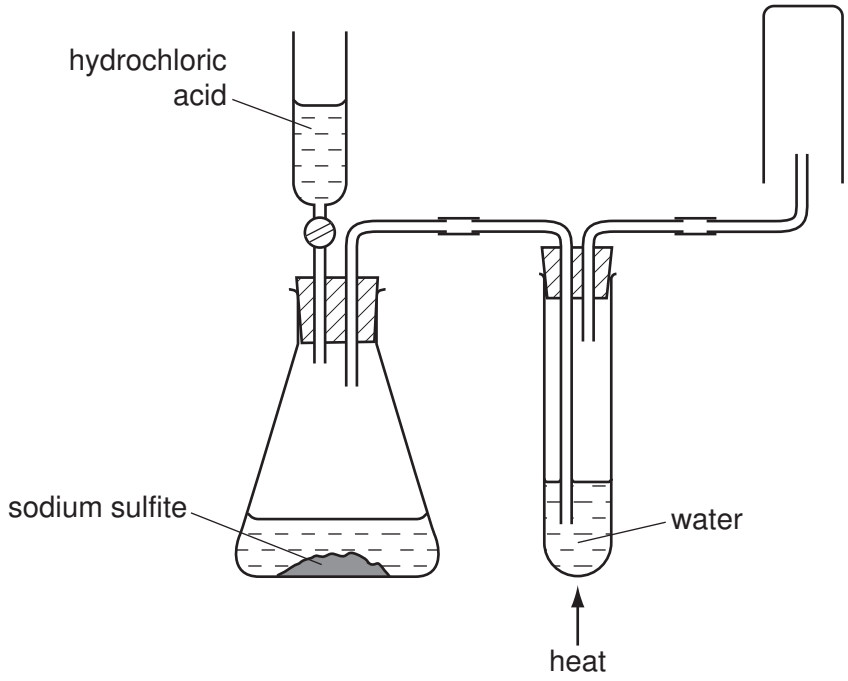
(d) What happened to the water used in the experiment?

..... [1]

[Total: 7]

For Examiner's Use

2 Sulfur dioxide is a poisonous gas which is denser than air and soluble in water.
Sulfur dioxide can be prepared by adding dilute hydrochloric acid to sodium sulfite and warming the mixture.
Study the diagram of the apparatus used.



(a) Identify and explain **three** mistakes in the diagram.

1 mistake .....

reason ..... [2]

2 mistake .....

reason ..... [2]

3 mistake .....

reason ..... [2]

(b) State **one** precaution that should be taken when carrying out this experiment.

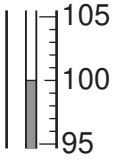
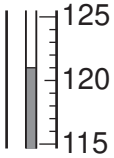
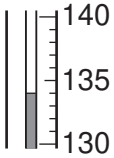
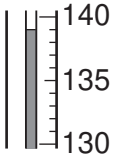
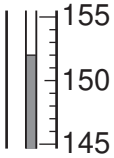
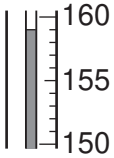
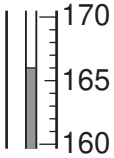
..... [1]

[Total: 7]

For Examiner's Use

3 A scientist measured the boiling point of water at different pressures.

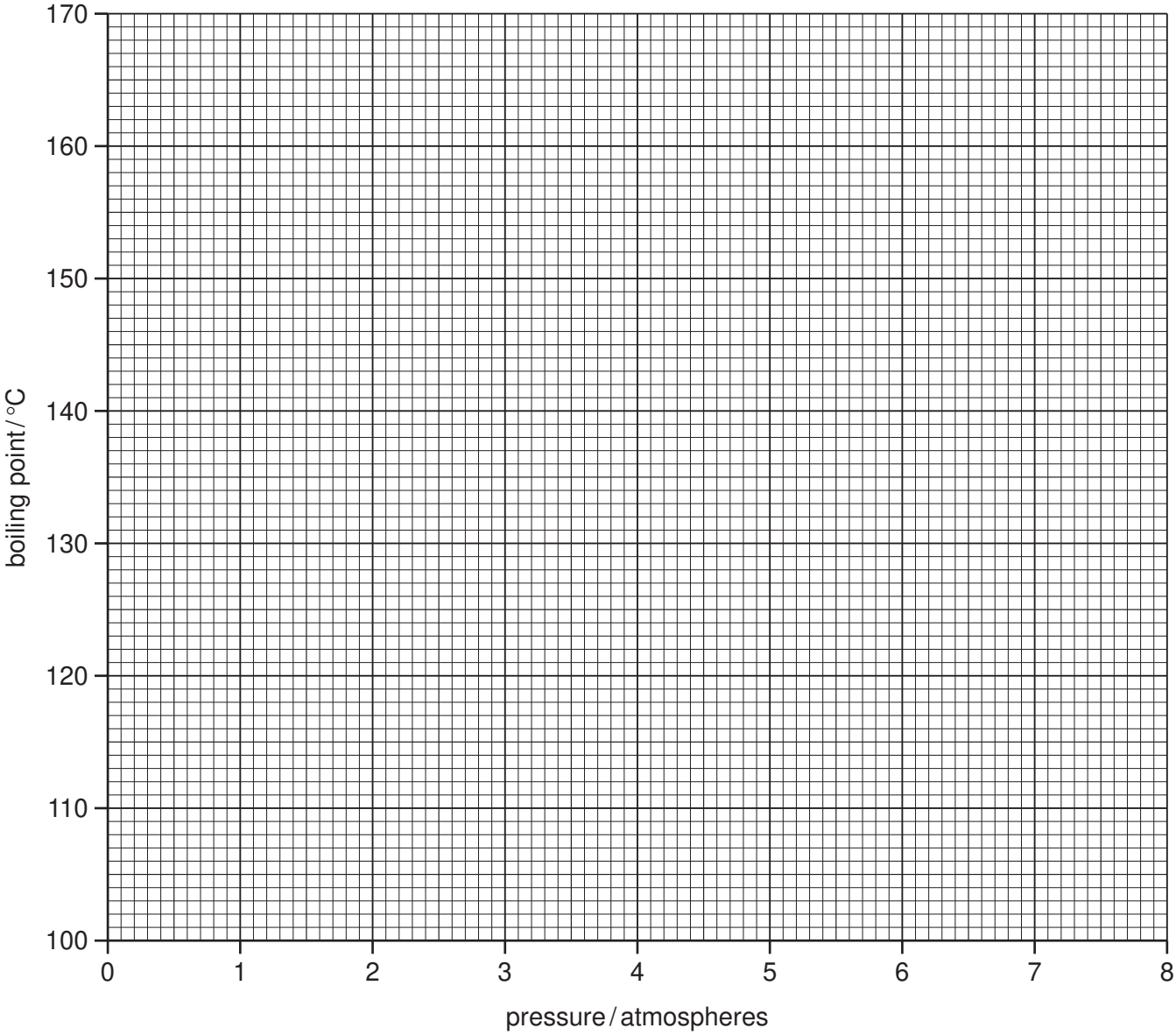
(a) Use the thermometer diagrams in the table to complete the boiling point temperatures.

pressure / atmospheres	thermometer diagram	boiling point / °C
1		
2		
3		
4		
5		
6		
7		

[3]

For Examiner's Use

(b) Plot the points on the grid and draw a smooth line graph.



[4]

(c) State which point is inaccurate. Why have you chosen this point?

.....

..... [2]

(d) **Use your graph** to find the boiling point of water at a pressure of 7.5 atmospheres. Show clearly **on the grid** how you obtained your answer.

..... [3]

(e) State a chemical test for water.

test .....

result ..... [2]

[Total: 14]

For Examiner's Use

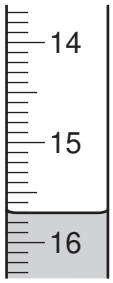
4 A student investigated the reaction between aqueous potassium manganate(VII), which is purple, and two different colourless acidic solutions, **D** and **E**.

Three experiments were carried out.

(a) *Experiment 1*

A burette was filled with the solution of potassium manganate(VII) to the 0.0 cm^3 mark. Using a measuring cylinder, 25 cm^3 of solution **D** was poured into a conical flask.

Potassium manganate(VII) solution was added to the flask until the mixture just turned permanently pink.
Use the burette diagram to record the final volume in the table and complete the table.



final reading

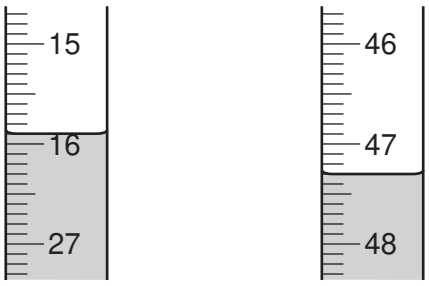
	burette reading
final burette reading / cm^3	
initial burette reading / cm^3	
difference / cm^3	

[2]

(b) *Experiment 2*

Experiment 1 was repeated using 25 cm^3 of solution **E** instead of solution **D**.

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



initial reading final reading

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

[2]

For Examiner's Use

(c) *Experiment 3*

Aqueous ammonia was added to solution **E** in a test-tube. A green precipitate was observed.
The mixture was left to stand for 5 minutes. The surface of the precipitate turned brown.

What conclusions can you draw from these observations?

.....

..... [3]

(d) (i) What colour change was observed as potassium manganate(VII) solution was added to the flask in Experiment 1?

..... [1]

(ii) Why was an indicator not added to the flask?

..... [1]

(e) (i) In which experiment was the greatest volume of potassium manganate(VII) solution used?

..... [1]

(ii) Compare the volumes of potassium manganate(VII) used in Experiments 1 and 2.

..... [1]

(iii) Suggest an explanation for the difference in volumes.

.....

.....

..... [2]

(f) If Experiment 2 was repeated using 12.5 cm^3 of solution **E**, what volume of potassium manganate(VII) solution would be used? Explain your answer.

.....

..... [2]

(g) Give one advantage and one disadvantage of using a measuring cylinder for solutions **D** and **E**.

advantage .....

disadvantage ..... [2]

[Total: 17]

[Turn over

For Examiner's Use

5 Two liquids, **F** and **G**, were analysed. **G** was an aqueous solution of potassium chloride. The tests on the liquids and some of the observations are in the following table. Complete the observations in the table.

tests	observations
<u>tests on liquid **F**</u>	
(a) (i) Appearance of liquid **F**.	yellow solution
The pH of the liquid was tested.	pH = 7
(ii) An equal volume of dilute sulfuric acid was added to liquid **F**.	solution turned orange
Excess aqueous sodium hydroxide was then added to the mixture.	solution turned from orange to yellow
(b) Dilute sulfuric acid was added to liquid **F** followed by hydrogen peroxide.	rapid effervescence
The mixture was shaken and the gas given off tested with a splint.	glowing splint relit
<u>tests on liquid **G**</u>	
(c) Dilute nitric acid was added to liquid **G** followed by aqueous barium nitrate.	..... [1]
(d) Dilute nitric acid was added to liquid **G** followed by aqueous silver nitrate.	..... [2]

(e) What does test **(a)(i)** tell you about liquid **F**?

.....

..... [2]

(f) What type of reaction happened in test **(a)(ii)**? Explain your answer.

type of reaction .....

explanation .....

..... [2]

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

..... [1]

[Total: 8]

6

For Examiner's Use

Indigestion tablets

Indigestion pain is caused by too much acid in your stomach. The acid is hydrochloric acid. Indigestion tablets contain a base which neutralises the acid.

You are provided with two different brands of indigestion tablets, Painremuve and Indcure.

Plan an investigation to compare which of these brands of tablet is the most effective. You are provided with dilute hydrochloric acid and common laboratory apparatus.

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.....

.....

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.....

.....

..... [7]

[Total: 7]

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