Cambridge International Examinations
Cambridge International General Certificate of Secondary Education

CANDIDATE NAME									
CENTRE NUMBER						CANDIDATE NUMBER			

5730558021

CHEMISTRY **0620/61**

Paper 6 Alternative to Practical **October/November 2018**

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.

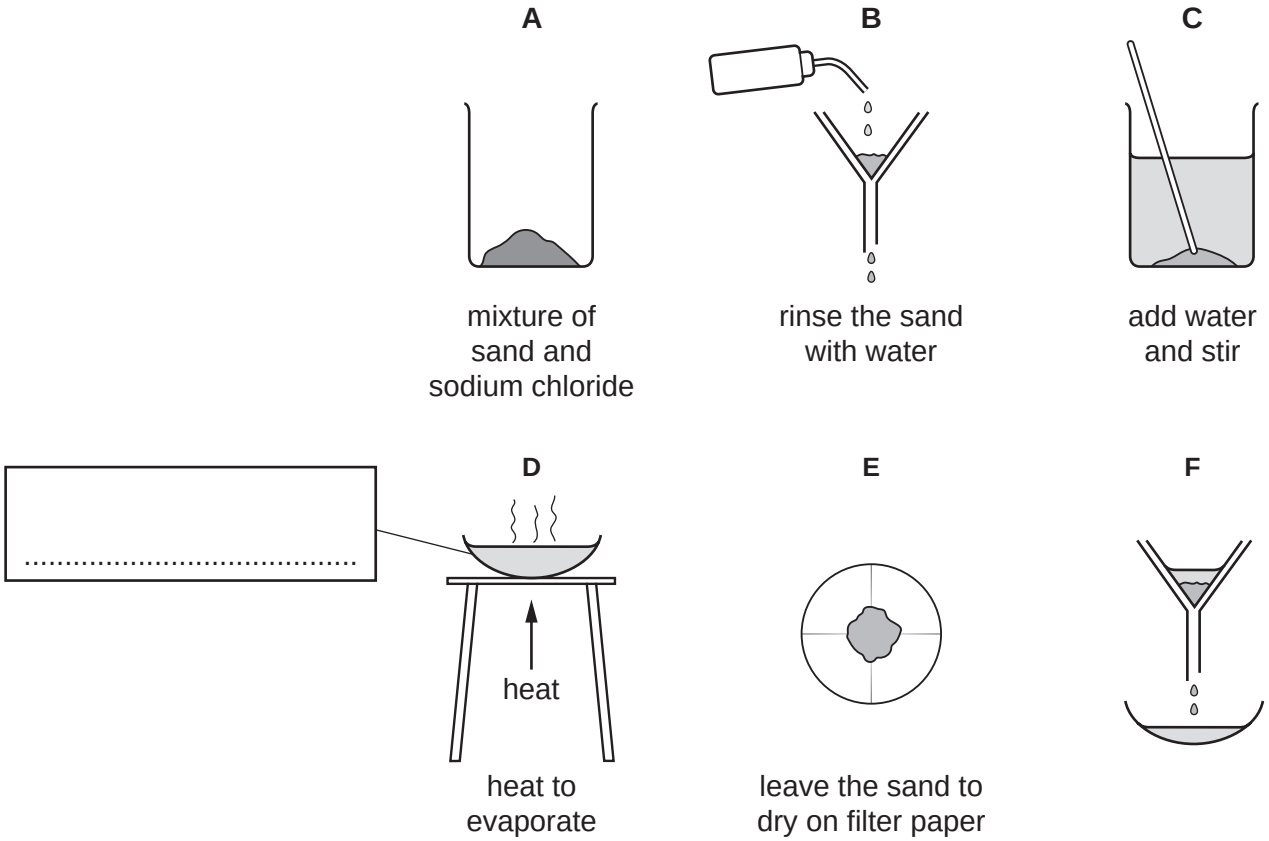
Answer **all** questions.
Electronic calculators may be used.
You may lose marks if you do not show your working or if you do not use appropriate units.

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 **9** printed pages and **3** blank pages.

1 A student obtains pure, dry samples of sand and sodium chloride from a mixture of sand and sodium chloride.
The student uses the apparatus shown. The method consists of six steps, **A**, **B**, **C**, **D**, **E** and **F**, which are shown in the wrong order.



(a) Order the steps in the method.

A → ..... → ..... → ..... → ..... → .....

[2]

(b) Complete the box to name the apparatus in **D**. [1]

(c) Why is the sand rinsed with water in **B**?

.....

..... [1]

(d) Name the process in **F**.

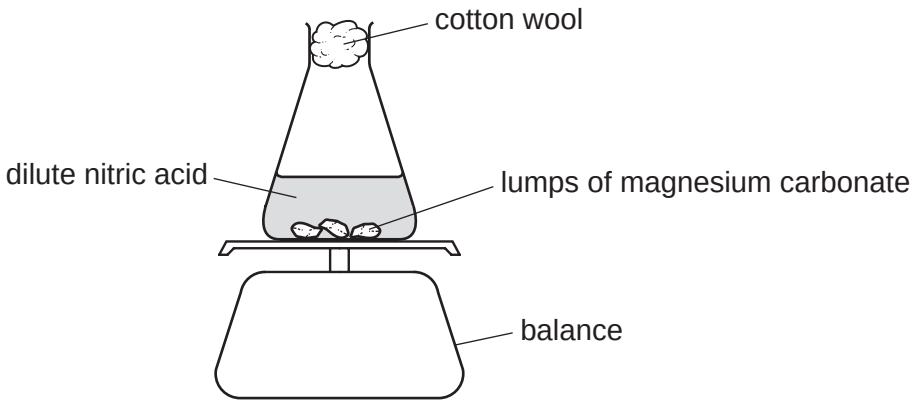
..... [1]

(e) How could the purity of the sodium chloride obtained be checked?

..... [1]

[Total: 6]

2 A student investigated the rate of reaction between dilute nitric acid and lumps of magnesium carbonate. The apparatus shown was used.

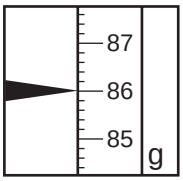
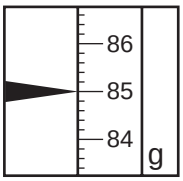
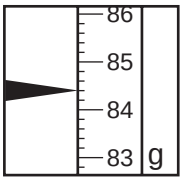
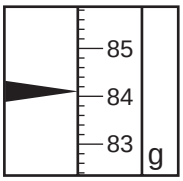
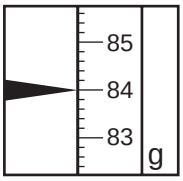
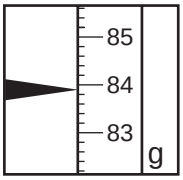
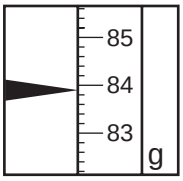
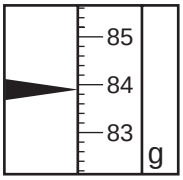


Lumps of magnesium carbonate were added to a conical flask. 40 cm^3 of dilute nitric acid was then poured into the conical flask using a measuring cylinder. The magnesium carbonate was in **excess**.

The conical flask was placed on a balance. Cotton wool was placed in the top of the conical flask.

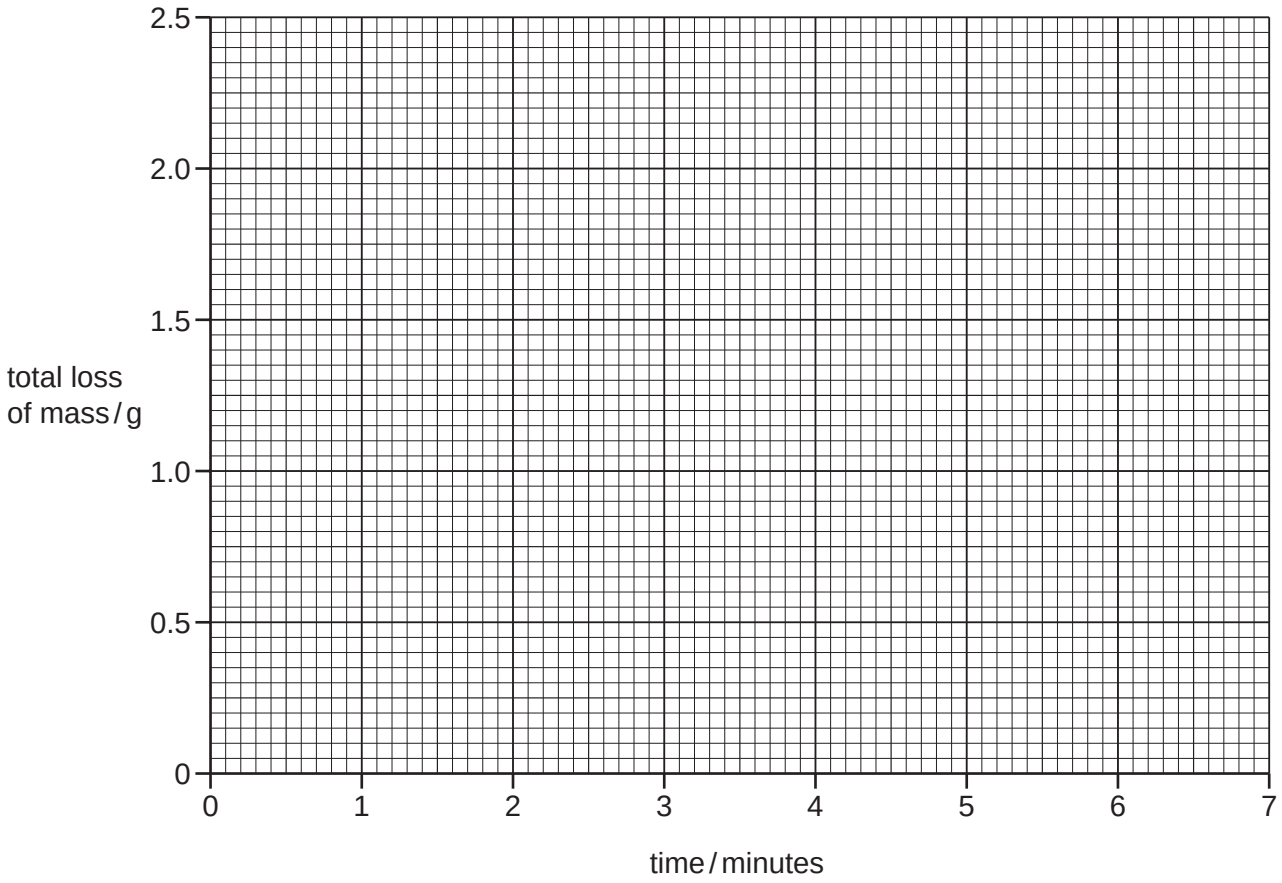
The mass of the conical flask and its contents was measured and a timer was started. The mass of the conical flask and its contents was measured every minute for 7 minutes.

(a) Use the balance diagrams to record the mass of the conical flask and its contents in the table. Complete the table to work out the total loss of mass of the conical flask and its contents since the start of the experiment.

time / minutes	balance diagram	mass of conical flask and its contents / g	total loss of mass / g
0			
1			
2			
3			
4			
5			
6			
7			

[3]

(b) Plot the results on the grid. Draw a smooth line graph.



[3]

(c) The average rate of reaction can be calculated using the equation shown.

$$\text{average rate of reaction} = \frac{\text{total loss of mass / g}}{\text{time taken / s}}$$

Calculate the average rate of reaction for the first 30 **seconds** of the reaction.
Deduce the unit.

rate = ...

unit = ...
[3]

(d) The experiment is repeated using an excess of powdered magnesium carbonate. All other conditions are kept the same.

Sketch on the grid the graph you would expect. [2]

(e) (i) Why does the mass of the conical flask and its contents decrease?

.....

..... [1]

(ii) Suggest the purpose of the cotton wool.

.....

.....

..... [2]

(iii) Why does the graph level off? Explain your answer.

.....

..... [2]

(f) Give **one** advantage and **one** disadvantage of using a burette instead of a measuring cylinder to add the dilute nitric acid to the conical flask.

advantage .....

disadvantage .....
[2]

[Total: 18]

3 Two solid salts, solid **G** and solid **H**, were analysed. Tests were done on each solid.

tests on solid G

Some of the tests and observations are shown.

tests on solid **G**	observations
test 1 A flame test was done on solid **G**.	lilac colour
Solid **G** was dissolved in distilled water. **test 2** Dilute hydrochloric acid was added to the solution. The solution was warmed gently. The gas produced was tested with filter paper which had been dipped in acidified aqueous potassium manganate(VII).	filter paper turned from purple to colourless

(a) Name the gas produced in **test 2**.

..... [1]

(b) Identify solid **G**.

.....

..... [2]

tests on solid H

Solid **H** was calcium nitrate.

Complete the expected observations.

Solid **H** was added to distilled water in a test-tube. The test-tube was shaken to dissolve solid **H**. The solution was divided into four portions in four test-tubes.

(c) (i) Drops of aqueous sodium hydroxide were added to the first portion of the solution.

observations ..... [2]

(ii) An excess of aqueous sodium hydroxide was then added to the mixture from **(c)(i)**.

observations ..... [1]

(d) An excess of aqueous ammonia was added to the second portion of the solution.

observations ..... [1]

(e) Dilute nitric acid and aqueous silver nitrate were added to the third portion of the solution.

observations ..... [1]

(f) Aluminium foil and aqueous sodium hydroxide were added to the fourth portion of the solution. The mixture was warmed and the gas produced was tested.

observations .....

..... [2]

[Total: 10]

4 Propanone and ethyl ethanoate are both solvents which can be used to remove paint.

Plan an investigation to determine which of these **two** solvents is better to use to remove paint.

You are provided with glass slides, paint, the two solvents and common laboratory apparatus.

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..... [6]

[Total: 6]

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