Surname	Centre Number	Candidate Number
First name(s)		0

GCSE

S24-3410U30-1B

MONDAY, 8 JANUARY – FRIDAY, 9 FEBRUARY 2024

CHEMISTRY – Unit 3 (3410U30)

PRACTICAL ASSESSMENT

INVESTIGATING THE EFFECT OF CONCENTRATION ON THE REACTION BETWEEN AN ACID AND AN ALKALI

SECTION B

1 hour

3410U301B
01

For Examiner's use only		
	Maximum Mark	**Mark Awarded**
Section B	**24**	

ADDITIONAL MATERIALS

A calculator and your Section **A** exam paper.

INSTRUCTIONS TO CANDIDATES

Use black ink or black ball-point pen. Do not use gel pen or correction fluid.

You may use a pencil for graphs and diagrams only.

Write your name, centre number and candidate number in the spaces at the top of this page.

Answer **all** questions.

Write your answers in the spaces provided in this booklet. If you run out of space, use the additional page(s) at the back of the booklet, taking care to number the question(s) correctly.

INFORMATION FOR CANDIDATES

The total number of marks available for this section of the task is 24.

The number of marks is given in brackets at the end of each question or part-question.

This task is in 2 sections, **A** and **B**. You will have completed Section **A** in a previous lesson.

Examiner only

SECTION B

Answer **all** questions.

2. (a) (i) State the independent variable in this experiment. [1]

.....

(ii) State the range of the independent variable. [1]

.....

(iii) State the dependent variable in this experiment. [1]

.....

(iv) Name the apparatus you used to measure the volume of **acid** and state its resolution. [1]

apparatus = ...

resolution = ...

(b) (i) Sodium chloride is made in this reaction.
State the type of reaction taking place. [1]

.....

(ii) Name the other product in the reaction. [1]

.....

(c) Use your results from Section **A** to draw a graph of the volume of acid added (vertical axis) against concentration of sodium hydroxide solution (horizontal axis) on the grid opposite. Include a point at (0,0). [5]

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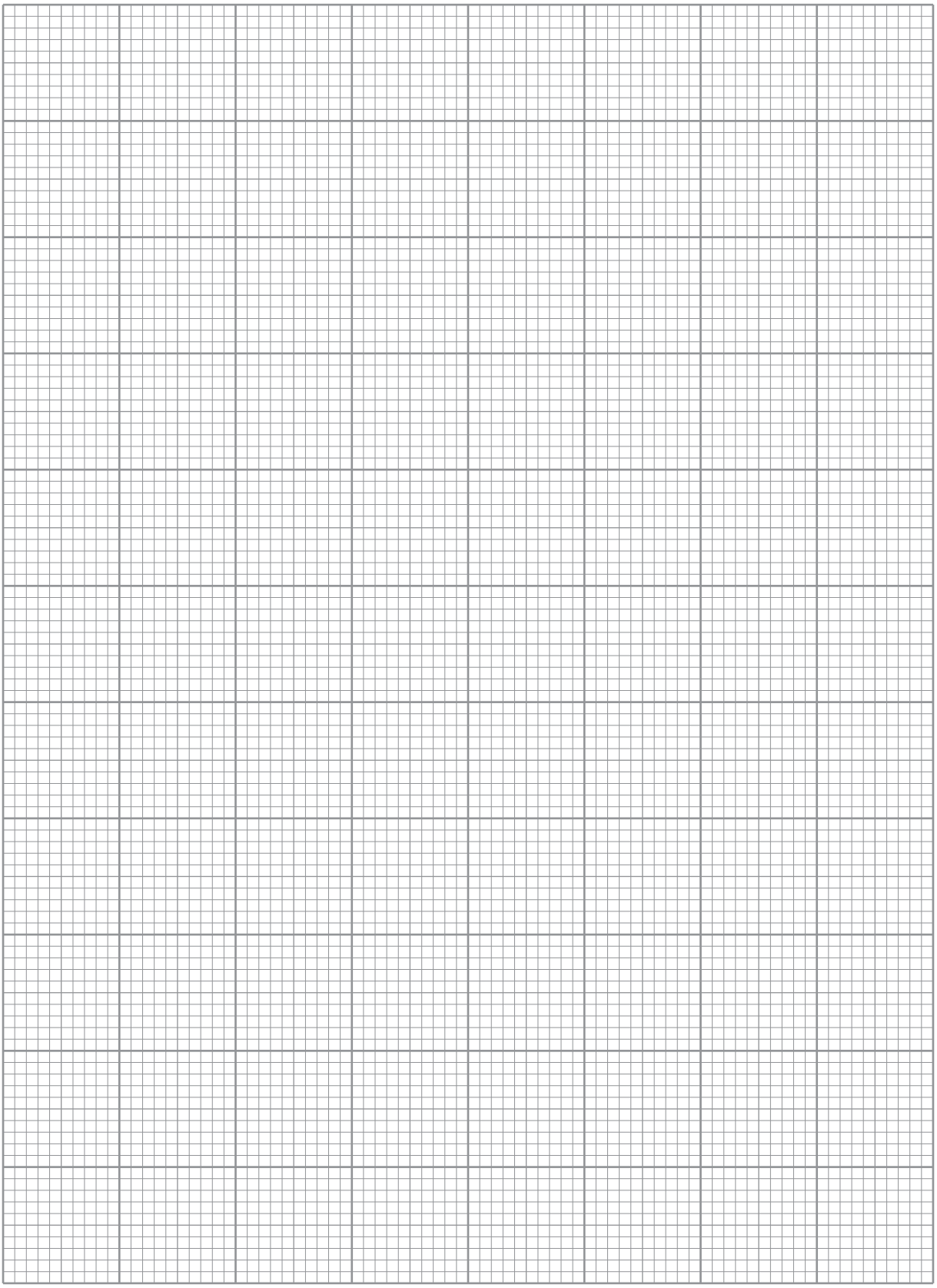

Examiner only

(d) (i) Use your graph to describe the relationship between the concentration of sodium hydroxide solution and the volume of acid added to change the colour of the indicator. [2]

.....

.....

.....

(ii) When the volume of acid added to change the colour of the indicator is **equal** to the volume of alkali in the conical flask, the concentrations of both solutions must be the same.
Use your graph to find out the concentration of the dilute hydrochloric acid. [1]

concentration = ... mol/dm^3

(iii) The true value of the concentration of the hydrochloric acid used was $0.07\,mol/dm^3$.
Comment on the accuracy of your result. [1]

.....

.....

.....

(iv) Identify **two** possible sources of inaccuracy in this experiment. [2]

1. .....

.....

2. .....

.....

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(e) Garin carried out a similar experiment using nitric acid and potassium hydroxide solution.
The results are shown in the table below.

Attempt	1	2	3	4
Volume of acid added to change the colour of the indicator using 25 cm^3 of potassium hydroxide solution (cm^3)	27.3	25.2	25.3	25.1

(i) Calculate an appropriate mean for this experiment. [1]

mean = ... cm^3

(ii) Comment on the precision of Garin's results. [2]

.....

.....

.....

.....

(iii) Name the salt produced in this experiment. [1]

.....

(iv) Describe a method that would allow you to obtain a pure, dry sample of this salt. You do not need to carry out this experiment. [3]

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END OF PAPER

24

Question number	Additional page, if required. Write the question number(s) in the left-hand margin.

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