

**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, plus your additional time allowance

Surname _____

First name(s) _____

Centre Number _____

Candidate Number 0 _____

ADDITIONAL MATERIALS

A calculator and your Section A exam paper.

INSTRUCTIONS TO CANDIDATES

Use black ink, black ball-point pen or your usual method.

Write your name, centre number and candidate number in the spaces provided on the front cover.

Answer ALL questions.

Write your answers in the spaces provided in this booklet. If you run out of space, use the additional pages 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.

For Examiner’s use only		
	Maximum Mark	Mark Awarded
Section B	24	

SECTION B

Answer ALL questions.

2 (a)(i)

State the independent variable in this experiment. [1 mark]

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

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

(Turn over)

2 (a)(iv)

Name the apparatus you used to measure the volume of ACID and state its resolution. [1 mark]

apparatus = _____

resolution = _____

(Turn over)

2 (b)(i)

Sodium chloride is made in this reaction.

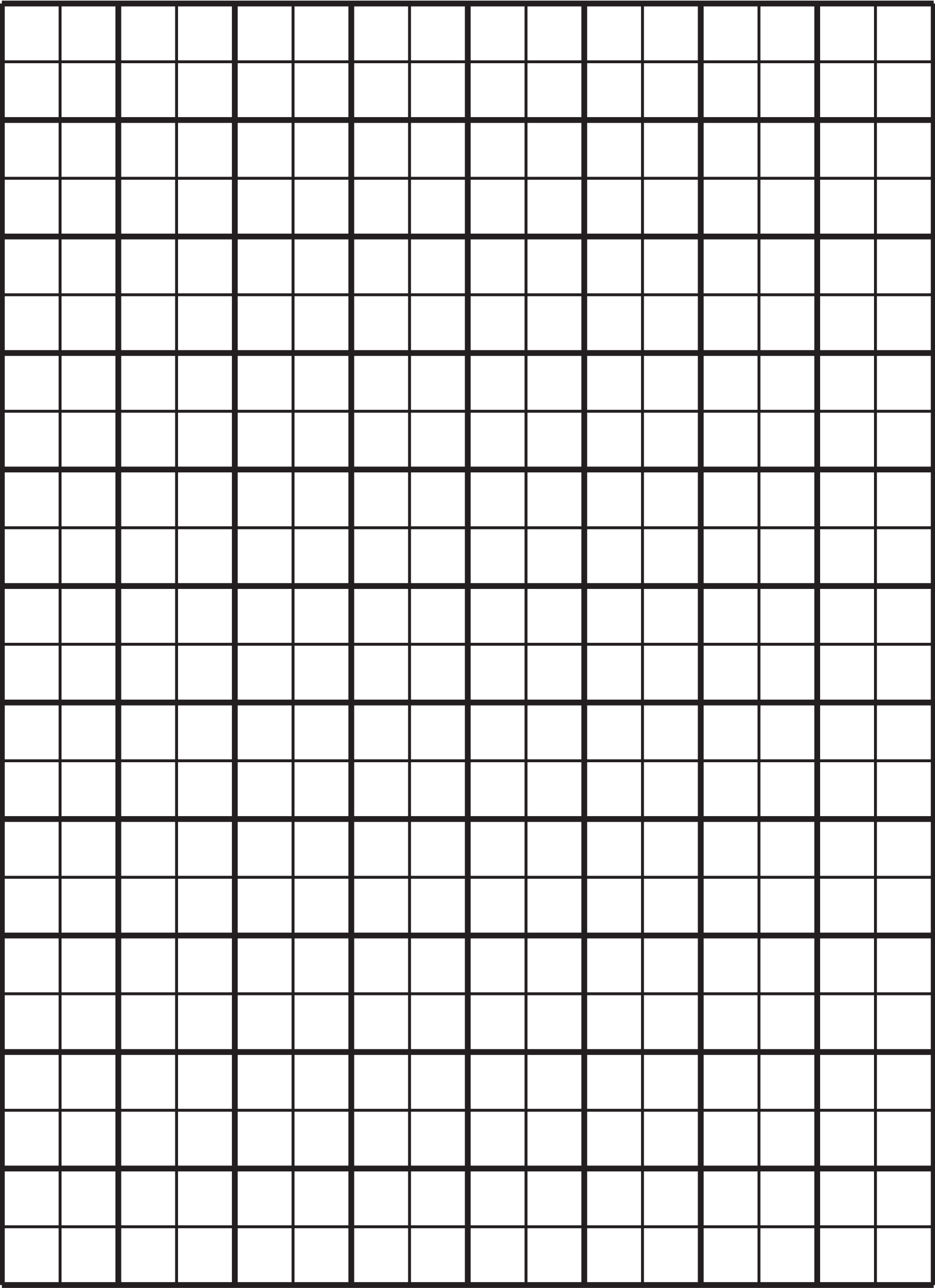
State the type of reaction taking place. [1 mark]

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

(Turn over)

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TURN OVER



2 (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 on the opposite page. Include a point at (0,0). [5 marks]

(Turn over)

2 (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 marks]

(Turn over)

2 (d)(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 mark]

concentration = _____ mol/dm³

(Turn over)

2 (d)(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 mark]

(Turn over)

2 (d)(iv)

**Identify TWO possible sources
of inaccuracy in this experiment.
[2 marks]**

1. _____

2. _____

(Turn over)

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TURN OVER

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

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

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

mean = _____ cm³

(Turn over)

2 (e)(ii)

Comment on the precision of Garin's results. [2 marks]

(Turn over)

2 (e)(iii)

Name the salt produced in this experiment. [1 mark]

(Turn over)

2 (e)(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 marks]

continue answer on next page (Turn over)

24

END OF PAPER

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

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