

Acids, Bases and Salts

Question Paper 6

Level	IGCSE
Subject	Chemistry
Exam Board	CIE
Topic	Acids, Bases and Salts
Sub-Topic	
Paper Type	Alternative to Practical
Booklet	Question Paper 6

Time Allowed: 41 minutes

Score: /34

Percentage: /100

1 The information in the box is about the preparation of zinc nitrate crystals.

Step 1: Add a small amount of zinc oxide to some hot dilute nitric acid, and stir.

Step 2: Keep adding zinc oxide until it is in excess.

Step 3: Remove the excess zinc oxide to leave colourless zinc nitrate solution.

Step 4: Evaporate the zinc nitrate solution until it is *saturated*.

Step 5: Leave the *saturated solution* to cool. White crystals form on cooling.

Step 6: Remove the crystals from the remaining solution.

Step 7: Dry the crystals on a piece of filter paper.

(a) Suggest a reason for using excess zinc oxide in Step 2.

.....
..... [1]

(b) Suggest how the excess zinc oxide can be removed from the solution in Step 3.

..... [1]

(c) (i) What is meant by the term *saturated solution*?

.....
..... [2]

(ii) What practical method could show the solution to be saturated?

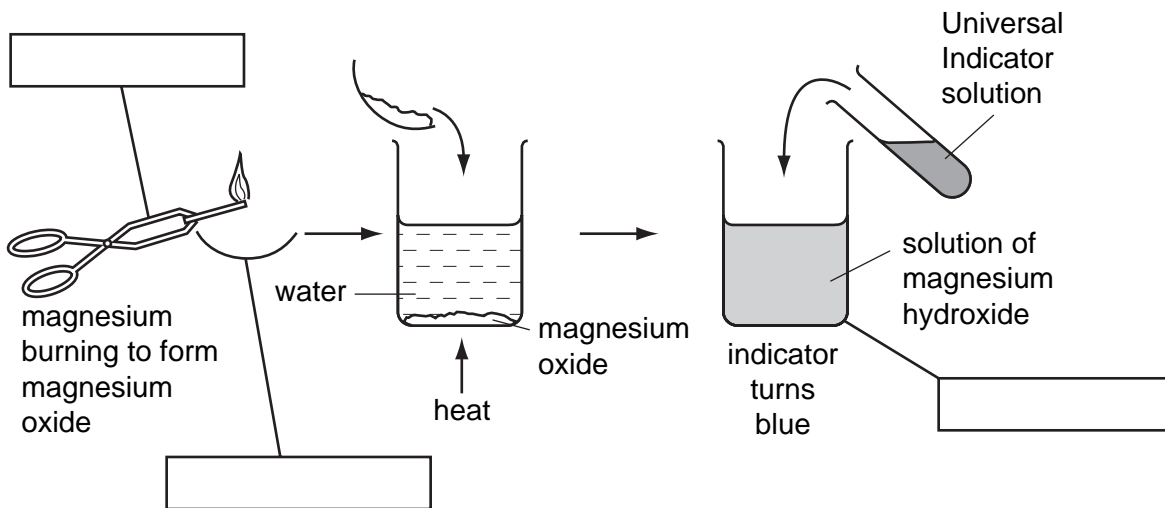
.....
..... [1]

(d) Why are the crystals dried in Step 7 using filter paper instead of by heating?

.....
..... [1]

[Total: 6]

2 The diagram shows the formation of a solution of magnesium hydroxide from magnesium.



(a) Complete the empty boxes to name the pieces of apparatus. [3]

(b) What type of chemical reaction is the burning of magnesium?

..... [1]

(c) Suggest a pH for the solution of magnesium hydroxide.

..... [1]

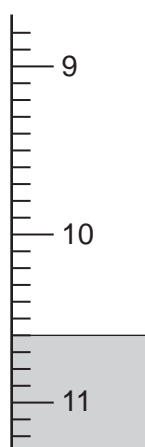
- 3 A student investigated an aqueous solution of calcium hydroxide and water.

Two experiments were carried out.

Experiment 1

By using a measuring cylinder 25 cm^3 of the aqueous solution of calcium hydroxide was placed in a flask. Phenolphthalein indicator was added to the flask. A burette was filled to the 0.0 cm^3 mark with solution **M** of hydrochloric acid.

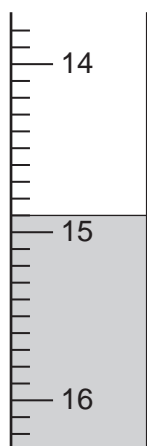
Solution **M** was added slowly to the flask until the colour just disappeared. Use the burette diagram to record the volume in the table and complete the column.



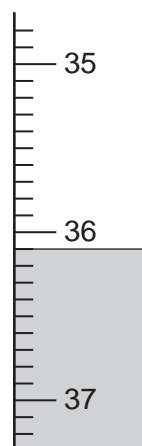
Experiment 2

Experiment 1 was repeated using a different solution, **N**, of hydrochloric acid.

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



initial



final

Table of results

burette readings/cm ³	Experiment 1	Experiment 2
final reading		
initial reading	0.0	
difference		

[4]

(a) What type of chemical reaction occurs when hydrochloric acid reacts with calcium hydroxide?

..... [1]

(b) (i) In which experiment was the greater volume of hydrochloric acid used?

..... [1]

(ii) Compare the volumes of acid used in Experiments 1 and 2.

.....
 [2]

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

.....
 [2]

(c) Predict the volume of hydrochloric acid **M** that would be needed to react completely if Experiment 1 was repeated with 50 cm³ of calcium hydroxide solution?

volume of solution

explanation

..... [3]

(d) Suggest **one** change you could make to the **apparatus** used in the experiments to obtain more accurate results.

.....

..... [1]

4 A sample of a solution of acid **A** was analysed.

The tests on **A**, and some of the observations are in the following table.

Complete the observations in the table.

tests	observations	
<p>(a) The pH of the solution was tested using indicator paper</p>	colour	orange
	pH	4
<p>(b) The solution was divided into three test-tubes</p> <p>(i) To the first portion was added a piece of magnesium ribbon. The gas was tested with a lighted splint.</p> <p>(ii) To the second portion of A was added sodium carbonate. The gas was tested with limewater.</p> <p>(iii) To the third portion of liquid A was added a spatula measure of solid B. The mixture was boiled gently. By using a teat pipette the solution was transferred to another test tube. Excess aqueous ammonia was added.</p>	<p>.....</p> <p>..... [2]</p>	
	<p>.....</p> <p>..... [2]</p>	
		<p>green solution formed</p> <p>dark blue solution formed</p>

(c) What does test **(a)** tell you about the type of acid in solution **A**?

..... [1]

(d) (i) Name the gas given off in test **(b)(i)**.

..... [1]

(ii) Name the gas given off in test **(b)(ii)**.

..... [1]

(e) Explain the observations in test **(b)(iii)**.

.....

..... [2]