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]

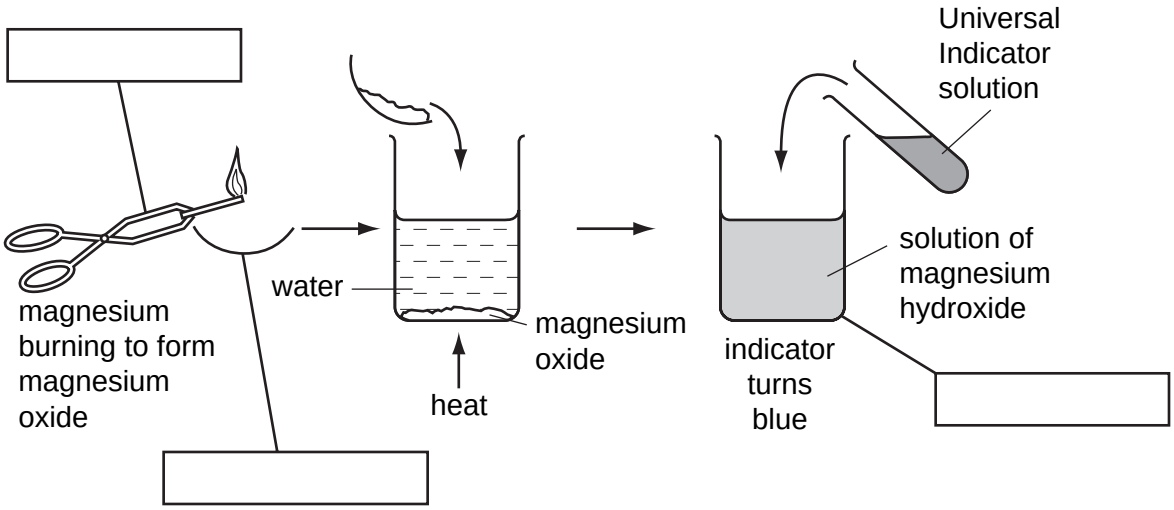
(d) Why are the crystals dried in Step 7 using filter paper instead of by heating?

.....

..... [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]

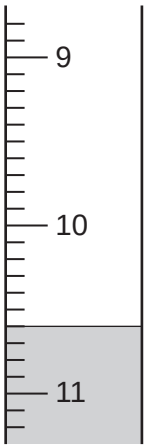
3 A student investigated an aqueous solution of calcium hydroxide and water.

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.

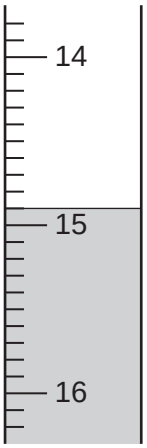
Solution **M** was added slowly to the flask until the colour just disappeared. Use the burette diagram to record the volume in the table and complete the column.



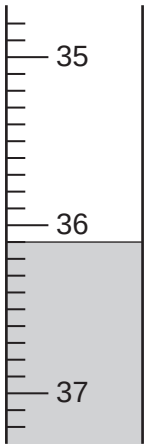
Experiment 2

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 cm^3 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
(a) The pH of the solution was tested using indicator paper	colour orange pH 4
(b) The solution was divided into three test-tubes **(i)** To the first portion was added a piece of magnesium ribbon. The gas was tested with a lighted splint.	..... [2]
(ii) To the second portion of **A** was added sodium carbonate. The gas was tested with limewater.	..... [2]
(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.	green solution formed dark blue solution formed

(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]