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SAMPLE QUESTIONS

Acid,Bases & Salts

Question 1

You have been provided with three test-tubes. One of them contains distilled water and the other two contain an acidic solution and a basic solution, respectively. If you are given only red litmus paper, how will you identify the contents of each test-tube ?

Solution

(i) Put the red litmus paper in all the test-tubes, turn by turn. The solution which turns red litmus to blue will be a basic solution. The blue litmus paper formed here can now be used to test the acidic solution.

(ii) Put the blue litmus paper (obtained above) in the remaining two test-tubes, one by one. The solution which turns the blue litmus paper to red will be the acidic solution.

(iii) The solution which has no effect on any litmus paper will be neutral and hence it will be distilled water.

Question 2

Metal compound A reacts with dilute hydrochloric acid to produce effervescence. The gas evolved extinguishes a burning candle. Write a balanced chemical equation for the reaction if one of the compounds formed is calcium chloride.

Answer

the metal compound A is calcium carbonate ($CaCO_3$). Calcium carbonate reacts with dilute hydrochloric acid to form calcium chloride, carbon dioxide and water.

$$CaCO_3\ (s) + 2HCl\ (aq) \longrightarrow CaCl_2\ (aq) + CO_2\ (g) + H_2O\ (l)$$

Question 3

A solution reacts with crushed egg-shells to give a gas that turns lime water milky. The solution contains : (a) NaCl (b) HCl (c) LiCl (d) KCl

Answer

The egg shells are made of calcium carbonate and the gas which turns lime water milky is carbon dioxide. Carbon dioxide gas can be formed by the action of an acid solution on calcium carbonate (or egg shells). So, the solution contains HCl.

Question 4
Equal lengths of magnesium ribbons are taken in test-tubes A and B. Hydrochloric acid (HCl) is added to test-tube A while acetic acid (CH3COOH) is added to test-tube B. In which test-tube will the fizzing occur more vigorously and why ?

Answer
Hydrochloric acid (HCl) is a strong acid whereas acetic acid (CH3COOH) is a weak acid. Being a strong acid, the hydrochloric acid solution contains a much greater amount of hydrogen ions in it due to which the fizzing will occur more vigorously in test-tube A . The fizzing is due to the evolution of hydrogen gas which is formed by the action of acid on the magnesium metal .

Question 5
How will you test for the gas which is liberated when hydrochloric acid reacts with an active metal ?

Question 6
Name the gas evolved when dilute HCl reacts with sodium hydrogencarbonate. How is it recognized ?

Question 7
What happens when an acid reacts with a metal ? Give chemical equation of the reaction involved. Which gas is usually liberated when an acid reacts with a metal ? How will you test for the presence of this gas ?

Question 8
What happens when an acid reacts with a metal hydrogencarbonate ? Write equation of the reaction which takes place.

Question 9
What happens when an acid reacts with a base ? Explain by taking the example of hydrochloric acid and sodium hydroxide. Give equation of the chemical reaction which takes place. What is the special name of such a reaction ?

Question 10
What happens when an acid reacts with a metal carbonate ? Explain with the help of an example. Write chemical equation of the reaction involved.

What happens when carbon dioxide gas is passed through lime water : (i) for a short time ? (ii) for a considerable time ?

Question 11
You have two solutions A and B. The pH of solution A is 6 and pH of solution B is 8. (a) Which solution has more hydrogen ion concentration ? (b) Which of the solutions is acidic and which one is basic ?
Answer
(a) the pH of a solution is inversely proportional to its hydrogen ion concentration. This means that the solution having lower pH will have more hydrogen ion concentration. In this case, solution A will have more hydrogen ion concentration. (b) Solution A is acidic and solution B is basic.

Question 12
Name the gas evolved when zinc granules are treated/heated with :
(a) hydrochloric acid solution
(b) sodium hydroxide solution

Question 13
(a) What is a universal indicator ? For what purpose is it used ?
(b) How does a universal indicator work ?
(c) Water is a neutral substance. What colour will you get when you add a few drops of universal indicator to a test-tube containing water ?

Question 14
(a) What happens when zinc granules are heated with sodium hydroxide solution ? Write equation of the reaction which takes place.
(b) What happens when bases react with non-metal oxides ? Explain with the help of an example. What does this reaction tell us about the nature of non-metal oxides ?

Question 15
What is the chemical formula of (a) baking soda, and (b) washing soda ?

Question 16
Name the product formed when Cl_2 and H_2 produced during the electrolysis of brine are made to combine.

Question 17
What is washing soda ? State two properties and two uses of washing soda.

Question 18
What is baking soda ? Write the chemical name of baking soda. Give the important uses of baking soda. How does baking soda differ chemically from washing soda ?

Question 19
(a) What is the common name of sodium hydrogen carbonate ? (b) What happens when a solution of sodium hydrogen carbonate is heated ? Write equation of the reaction involved. (c) Explain why, sodium hydrogen carbonate is used as an antacid.

Question 20
(a) What happens when a concentrated solution of sodium chloride (brine) is electrolysed ? Write the equation of the reaction involved. (b) Why is the electrolysis of a concentrated solution of sodium chloride known as chlor-alkali process ? (c) Name three products of the chlor-alkali process. State two uses of each of these products.

Question 21
(a) What is bleaching powder ? How is bleaching powder prepared ? Write chemical equation of the reaction involved in the preparation of bleaching powder. (b) What happens when bleaching powder reacts with dilute sulphuric acid ? Give equation of the reaction involved. (c) State two important uses of bleaching powder.

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