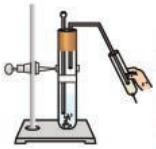
CHAPTER 2



Acids, Bases and Salts

Multiple Choice Questions

1. What happens when a solution of an acid is mixed with a solution of a base in a test tube?

(i) The temperature of the solution increases

(ii) The temperature of the solution decreases

(iii) The temperature of the solution remains the same

(iv) Salt formation takes place

(a) (i) only (b) (i) and (iii)

(c) (ii) and (iii) (d) (i) and (iv)

2. An aqueous solution turns red litmus solution blue. Excess addition of which of the following solution would reverse the change?

(a) Baking powder

(b) Lime

(c) Ammonium hydroxide solution

(d) Hydrochloric acid

3. During the preparation of hydrogen chloride gas on a humid day, the gas is usually passed through the guard tube containing calcium chloride. The role of calcium chloride taken in the guard tube is to

(a) absorb the evolved gas

(b) moisten the gas

(c) absorb moisture from the gas

(d) absorb Cl^- ions from the evolved gas

4. Which of the following salts does not contain water of crystallisation?

(a) Blue vitriol

(b) Baking soda

(c) Washing soda

(d) Gypsum

5. Sodium carbonate is a basic salt because it is a salt of

(a) strong acid and strong base
(b) weak acid and weak base
(c) strong acid and weak base
(d) weak acid and strong base

6. Calcium phosphate is present in tooth enamel. Its nature is

(a) basic
(b) acidic
(c) neutral
(d) amphoteric

7. A sample of soil is mixed with water and allowed to settle. The clear supernatant solution turns the pH paper yellowish-orange. Which of the following would change the colour of this pH paper to greenish-blue?

(a) Lemon juice
(b) Vinegar
(c) Common salt
(d) An antacid

8. Which of the following gives the correct increasing order of acidic strength?

(a) Water <Acetic acid <Hydrochloric acid
(b) Water <Hydrochloric acid <Acetic acid
(c) Acetic acid <Water <Hydrochloric acid
(d) Hydrochloric acid <Water <Acetic acid

9. If a few drops of a concentrated acid accidentally spills over the hand of a student, what should be done?

(a) Wash the hand with saline solution
(b) Wash the hand immediately with plenty of water and apply a paste of sodium hydrogencarbonate
(c) After washing with plenty of water apply solution of sodium hydroxide on the hand
(d) Neutralise the acid with a strong alkali

10. Sodium hydrogencarbonate when added to acetic acid evolves a gas. Which of the following statements are true about the gas evolved?

(i) It turns lime water milky
(ii) It extinguishes a burning splinter
(iii) It dissolves in a solution of sodium hydroxide
(iv) It has a pungent odour

(a) (i) and (ii) (b) (i), (ii) and (iii)
(c) (ii), (iii) and (iv) (d) (i) and (iv)

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11. Common salt besides being used in kitchen can also be used as the raw material for making

(i) washing soda
(ii) bleaching powder
(iii) baking soda
(iv) slaked lime

(a) (i) and (ii) (b) (i), (ii) and (iv)
(c) (i) and (iii) (d) (i), (iii) and (iv)

12. One of the constituents of baking powder is sodium hydrogencarbonate, the other constituent is

(a) hydrochloric acid
(b) tartaric acid
(c) acetic acid
(d) sulphuric acid

13. To protect tooth decay we are advised to brush our teeth regularly. The nature of the tooth paste commonly used is

(a) acidic
(b) neutral
(c) basic
(d) corrosive

14. Which of the following statements is correct about an aqueous solution of an acid and of a base?

(i) Higher the pH, stronger the acid
(ii) Higher the pH, weaker the acid
(iii) Lower the pH, stronger the base
(iv) Lower the pH, weaker the base

(a) (i) and (iii) (b) (ii) and (iii)
(c) (i) and (iv) (d) (ii) and (iv)

15. The pH of the gastric juices released during digestion is

(a) less than 7
(b) more than 7
(c) equal to 7
(d) equal to 0

16. Which of the following phenomena occur, when a small amount of acid is added to water?

(i) Ionisation
(ii) Neutralisation
(iii) Dilution
(iv) Salt formation

(a) (i) and (ii) (b) (i) and (iii)
(c) (ii) and (iii) (d) (ii) and (iv)

17. Which one of the following can be used as an acid–base indicator by a visually impared student?

(a) Litmus
(b) Turmeric
(c) Vanilla essence
(d) Petunia leaves

18. Which of the following substance will not give carbon dioxide on treatment with dilute acid?

(a) Marble
(b) Limestone
(c) Baking soda
(d) Lime

19. Which of the following is acidic in nature?

(a) Lime juice
(b) Human blood
(c) Lime water
(d) Antacid

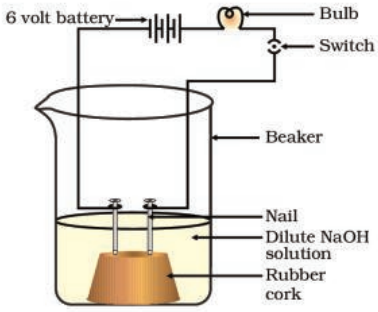


Fig. 2.1

20. In an attempt to demonstrate electrical conductivity through an electrolyte, the following apparatus (Figure 2.1) was set up.

Which among the following statement(s) is(are) correct?

(i) Bulb will not glow because electrolyte is not acidic
(ii) Bulb will glow because NaOH is a strong base and furnishes ions for conduction.
(iii) Bulb will not glow because circuit is incomplete
(iv) Bulb will not glow because it depends upon the type of electrolytic solution

(a) (i) and (iii) (b) (ii) and (iv)
(c) (ii) only (c) (iv) only

21. Which of the following is used for dissolution of gold?

(a) Hydrochloric acid
(b) Sulphuric acid
(c) Nitric acid
(d) Aqua regia

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22. Which of the following is not a mineral acid?

(a) Hydrochloric acid
(b) Citric acid
(c) Sulphuric acid
(d) Nitric acid

23. Which among the following is not a base?

(a) NaOH
(b) KOH
(c) NH_4OH
(d) C_2H_5OH

24. Which of the following statements is not correct?

(a) All metal carbonates react with acid to give a salt, water and carbon dioxide
(b) All metal oxides react with water to give salt and acid
(c) Some metals react with acids to give salt and hydrogen
(d) Some non metal oxides react with water to form an acid

25. Match the chemical substances given in Column (A) with their appropriate application given in Column (B)

Column (A)	**Column (B)**
(A) Bleaching powder	(i) Preparation of glass
(B) Baking soda	(ii) Production of H_2 and Cl_2
(C) Washing soda	(iii) Decolourisation
(D) Sodium chloride	(iv) Antacid

(a) A—(ii), B—(i), C—(iv), D—(iii)
(b) A—(iii), B—(ii), C—(iv), D—(i)
(c) A—(iii), B—(iv), C—(i), D—(ii)
(d) A—(ii), B—(iv), C—(i), D—(iii)

26. Equal volumes of hydrochloric acid and sodium hydroxide solutions of same concentration are mixed and the pH of the resulting solution is checked with a pH paper. What would be the colour obtained? (You may use colour guide given in Figure 2.2



Figure 2.2

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(a) Red
(b) Yellow
(c) Yellowish green
(d) Blue

27. Which of the following is(are) true when HCl (g) is passed through water?

(i) It does not ionise in the solution as it is a covalent compound.
(ii) It ionises in the solution
(iii) It gives both hydrogen and hydroxyl ion in the solution
(iv) It forms hydronium ion in the solution due to the combination of hydrogen ion with water molecule

(a) (i) only (b) (iii) only
(c) (ii) and (iv) (d) (iii) and (iv)

28. Which of the following statements is true for acids?

(a) Bitter and change red litmus to blue
(b) Sour and change red litmus to blue
(c) Sour and change blue litmus to red
(d) Bitter and change blue litmus to red

29. Which of the following are present in a dilute aqueous solution of hydrochloric acid?

(a) $H_3O^+ + Cl^-$
(b) $H_3O^+ + OH^-$
(c) $Cl^- + OH^-$
(d) unionised HCl

30. Identify the correct representation of reaction occurring during chloralkali process

(a) $2NaCl(l) + 2H_2O(l) \rightarrow 2NaOH(l) + Cl_2(g) + H_2(g)$
(b) $2NaCl(aq) + 2H_2O(aq) \rightarrow 2NaOH(aq) + Cl_2(g) + H_2(g)$
(c) $2NaCl(aq) + 2H_2O(l) \rightarrow 2NaOH(aq) + Cl_2(aq) + H_2(aq)$
(d) $2NaCl\ (aq) + 2H_2O\ (l) \rightarrow 2NaOH\ (aq) + Cl_2(g) + H_2(g)$

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Short Answer Questions

31. Match the acids given in Column (A) with their correct source given in Column (B)

Column (A)	Column (B)
(a) Lactic acid	(i) Tomato
(b) Acetic acid	(ii) Lemon
(c) Citric acid	(iii) Vinegar
(d) Oxalic acid	(iv) Curd

32. Match the important chemicals given in Column (A) with the chemical formulae given in Column (B)

Column (A)	Column (B)
(a) Plaster of Paris	(i) $Ca(OH)_2$
(b) Gypsum	(ii) $CaSO_4.1/2\ H_2O$
(c) Bleaching Powder	(iii) $CaSO_4.2H_2O$
(d) Slaked Lime	(iv) $CaOC1_2$

33. What will be the action of the following substances on litmus paper?

Dry HCl gas, Moistened NH_3 gas, Lemon juice, Carbonated soft drink, Curd, Soap solution.

34. Name the acid present in ant sting and give its chemical formula. Also give the common method to get relief from the discomfort caused by the ant sting.

35. What happens when nitric acid is added to egg shell?

36. A student prepared solutions of (i) an acid and (ii) a base in two separate beakers. She forgot to label the solutions and litmus paper is not available in the laboratory. Since both the solutions are colourless, how will she distinguish between the two?

37. How would you distinguish between baking powder and washing soda by heating?

38. Salt A commonly used in bakery products on heating gets converted into another salt B which itself is used for removal of hardness of water and a gas C is evolved. The gas C when passed through lime water, turns it milky. Identify A, B and C.

39. In one of the industrial processes used for manufacture of sodium hydroxide, a gas X is formed as by product. The gas X reacts with lime water to give a compound Y which is used as a bleaching agent in chemical industry. Identify X and Y giving the chemical equation of the reactions involved.

40. Fill in the missing data in the following table

Name of the salt	Formula	Salt obtained from	
		Base	Acid
(i) Ammonium chloride	NH_4Cl	NH_4OH	—
(ii) Copper sulphate	—	—	H_2SO_4
(iii) Sodium chloride	NaCl	NaOH	—
(iv) Magnesium nitrate	$Mg(NO_3)_2$	—	HNO_3
(v) Potassium sulphate	K_2SO_4	—	—
(vi) Calcium nitrate	$Ca(NO_3)_2$	$Ca(OH)_2$	—

41. What are strong and weak acids? In the following list of acids, separate strong acids from weak acids.
Hydrochloric acid, citric acid, acetic acid, nitric acid, formic acid, sulphuric acid.

42. When zinc metal is treated with a dilute solution of a strong acid, a gas is evolved, which is utilised in the hydrogenation of oil. Name the gas evolved. Write the chemical equation of the reaction involved and also write a test to detect the gas formed.

Long Answer Questions

43. In the following schematic diagram for the preparation of hydrogen gas as shown in Figure 2.3, what would happen if following changes are made?

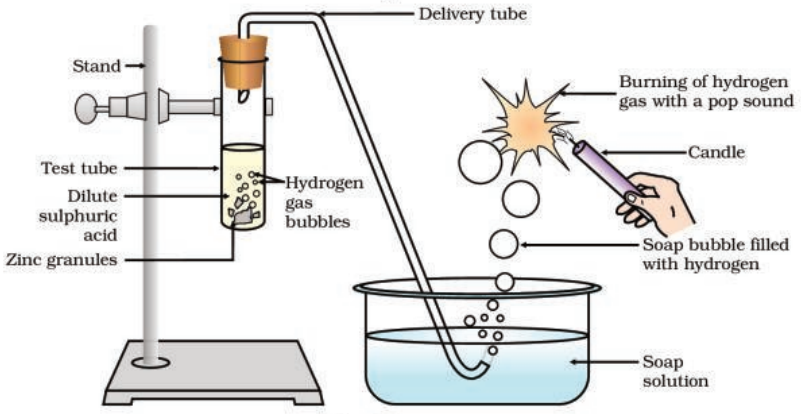


Fig. 2.3

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(a) In place of zinc granules, same amount of zinc dust is taken in the test tube

(b) Instead of dilute sulphuric acid, dilute hydrochloric acid is taken

(c) In place of zinc, copper turnings are taken

(d) Sodium hydroxide is taken in place of dilute sulphuric acid and the tube is heated.

44. For making cake, baking powder is taken. If at home your mother uses baking soda instead of baking powder in cake,

(a) how will it affect the taste of the cake and why?

(b) how can baking soda be converted into baking powder?

(c) what is the role of tartaric acid added to baking soda?

45. A metal carbonate X on reacting with an acid gives a gas which when passed through a solution Y gives the carbonate back. On the other hand, a gas G that is obtained at anode during electrolysis of brine is passed on dry Y, it gives a compound Z, used for disinfecting drinking water. Identity X, Y, G and Z.

46. A dry pellet of a common base B, when kept in open absorbs moisture and turns sticky. The compound is also a by–product of chloralkali process. Identify B. What type of reaction occurs when B is treated with an acidic oxide? Write a balanced chemical equation for one such solution.

47. A sulphate salt of Group 2 element of the Periodic Table is a white, soft substance, which can be moulded into different shapes by making its dough. When this compound is left in open for some time, it becomes a solid mass and cannot be used for moulding purposes. Identify the sulphate salt and why does it show such a behaviour? Give the reaction involved.

48. Identify the compound X on the basis of the reactions given below. Also, write the name and chemical formulae of A, B and C.

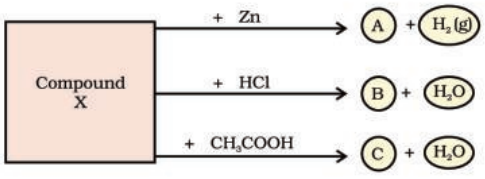


Fig. 2.4