

Multiple Choice Questions

- Which one of the following types of medicines are used for treating acidity?
(a) Antacid (b) Analgesic
(c) Antibiotic (d) Antiseptic
- Name the substance which on treatment with chlorine (Cl) yields bleaching powder :
(a) CaO (b) Ca(OH)_2
(c) CuO (d) CaCO_3
- Washing soda has the formula-
(a) $\text{Na}_2\text{CO}_3 \cdot 7\text{H}_2\text{O}$ (b) Na_2CO_3
(c) $\text{Na}_2\text{CO}_3 \cdot \text{H}_2\text{O}$ (d) $\text{Na}_2\text{CO}_3 \cdot 10\text{H}_2\text{O}$
- Which of the following gives the correct increasing order of acidic strength?
(a) Hydrochloric acid < Water < Acetic acid (b) Water < Acetic acid < Hydrochloric acid
(c) Water < Hydrochloric acid < Acetic acid (d) Acetic acid < Water < Hydrochloric acid
- The compounds used to prepare NaHCO_3 are?
(a) Na_2CO_3 , CO_2 , H_2O , O_2 (b) NaCl , NH_3 , CO_2 , H_2O
(c) NaCl , NaOH , CO_2 , H_2O (d) NaCl , Ca(OH)_2 , H_2O , CO_2
- Select a pair of natural indicator from the following :
(a) Litmus and methyl orange (b) Phenolphthalein and methyl orange
(c) Methyl orange and Turmeric (d) Turmeric and Litmus
- Which of the following will allow the electricity to flow through it/them?
i. Glucose ii. Dry HCl gas
iii. Alcohol iv. Dil. H_2SO_4
(a) (ii) and (iv) only (b) (ii), (iii) and (iv)
(c) (iv) only (d) (i) and (iii) only
- For dilution of concentrated acids, we should add -
(a) Concentrated acid to water
(b) Water to concentrated acid
(c) First water into acid and then more acid
(d) Both water to concentrated acid and concentrated acid to water

9. Two salts X and Y are dissolved in water separately. When phenolphthalein is added to these two solutions, the solution X turns pink and the solution Y does not show any change in colour, therefore X and Y are ?

	(X)	(Y)
(i)	Na_2CO_3	NH_4Cl
(ii)	Na_2SO_4	NaHCO_3
(iii)	NH_4Cl	Na_2SO_4
(iv)	NaNO_3	Na_2SO_4

- (a) Option (i) (b) Option (iv)
(c) Option (ii) (d) Option (iii)
10. Soda-lime is a mixture of NaOH and CaO. What is the ratio of NaOH and CaO in soda-lime?
- (a) 2 : 4 (b) 3 : 1
(c) 1.5 (d) 2 : 1

Fill in the blanks

11. The point at which the indicator shows colour change is called _____.
12. Acids change the colour of litmus solution to _____.

True / False

13. Bleaching powder is used for softening hard water.
14. Sulphuric acid helps in the digestion of food without harming the stomach.

Very Short Type Questions

15. Give the name and formula of two :
(i) strong monobasic acids
(ii) two weak dibasic acids
16. (i) What does pH scale measure?
(ii) Write its range.
(iii) State the significance of highest and lowest values of pH scale.

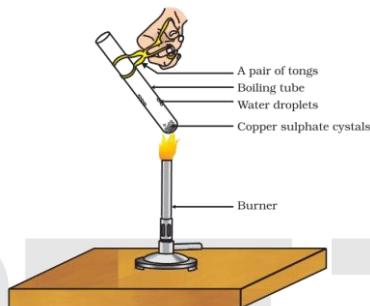
Short Type Questions

17. Which gas is usually liberated when an acid reacts with a metal? Illustrate with an example. How will you test for the presence of this gas.
18. What is 'baking powder'? How does it make the cake soft and spongy?

Essay Type Questions

19. Read the following text carefully and answer the questions that follow:

Copper sulphate crystal contains water of crystallisation when the crystal is heated the water is removed and salt turns white. The crystal can be moistened again with water. The water of crystallisation is the fixed number of water molecules present in 1 formula unit of copper sulphate. On heating gypsum at 373K, it loses water molecules and became calcium sulphate hemihydrate.



- If the crystal is moistened with water, then which colour of the crystal reappears?
- What is the commercial name of calcium sulphate hemihydrate?
- How many water molecules are present in one formula unit of copper sulphate?
- What is obtained when gypsum is heated at 373K?

Or

Read the following text carefully and answer the questions that follow:

Salt of a strong acid and strong base is neutral with a pH value of 7. NaCl common salt is formed by a combination of hydrochloride and sodium hydroxide solution. This is the salt that is used in food. Some salt is called rock salt, bed of rock salt was formed when seas of bygone ages dried up. The common salt thus obtained is an important raw material for various materials of daily use, such as sodium hydroxide, baking soda, washing soda, and bleaching powder.

- If given acids are phosphoric acid, carbonic acid, hydrochloric acid and sulphuric acid, then which acid does not form an acidic salt?
 - What is the formula of baking soda?
 - Name the substance which on treatment with chlorine to obtain bleaching powder.
 - Which salt is used for removing the permanent hardness of water?
- 20.** An acid X and an alcohol Y react with each other in the presence of an acid catalyst to form a sweet smelling substance Z. Identify X, Y and Z. Write the chemical equation for the reaction involved and name it. The substance Z on treatment with sodium hydroxide produces back the alcohol Y and sodium ethanoate. Write the chemical equation for the reaction involved and name it, giving justification for the name.

OR

Discuss the role of pH in (a) digestive system (b) causes of tooth decay.

21. **Assertion (A)** : Dry Ammonia gas has no effect on dry red litmus paper.

Reason (R) : Moisture is required for ammonia to release OH^- ions.

- (a) Both A and R are true, and R is the correct explanation of A.
- (b) Both A and R are true, but R is not the correct explanation of A.
- (c) A is true, but R is false.
- (d) A is false, but R is true

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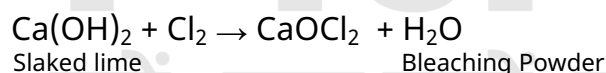


1. (a)

Antacids are mild bases, which when given to a person who is suffering from acidity, neutralizes the effect of excess acid produced in the stomach and gives relief

2. (b)

Bleaching powder is prepared by passing chlorine gas over dry slaked lime.



3. (d)

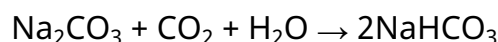
Washing soda is sodium carbonate which in this form is also known as soda ash. It is called sodium carbonate decahydrate. The formula is $\text{Na}_2\text{CO}_3 \cdot 10\text{H}_2\text{O}$.

4. (b)

Water < Acetic acid < Hydrochloric acid
Distilled water is neutral. Acetic acid is an organic acid so it is less acidic than hydrochloric acid which is an inorganic acid.

5. (a)

The reaction between sodium carbonate (Na_2CO_3) and carbon dioxide (CO_2) in the presence of water and heat. Here's the balanced chemical equation for this reaction:



6. (d)

Turmeric and Litmus.

7. (c)

Acids dissociate into ions in water, which allows them to conduct electricity.

- Glucose cannot produce electrons so electricity does not pass through it.
- Dry HCl gas cannot conduct electricity due to absence of moisture.
- Alcohol cannot produce electrons so electricity does not pass through it.

8. (b)

water to concentrated acid.

9. (a)

An indicator, phenolphthalein is a substance that changes colour when it interacts with an acid or a base. It will be pink in basic solutions and clear in acidic ones. When phenolphthalein is added, X turns pink, indicating that it is basic in nature, whereas Y does not change colour, indicating that it is acidic in nature.

The reaction of sodium hydroxide (strong base) and carbonic acid (weak acid) produces sodium carbonate. As a result, it is basic in nature.

The salt of a strong acid, hydrochloric acid (HCl), and a weak base, ammonium hydroxide (NH₄ OH), is ammonium chloride (NH₄Cl). As a result, an ammonium chloride aqueous solution is acidic in nature.

10. (b) 3 : 1

11. **Fill in the blank** : The End point

12. **Fill in the blank** : Red

13. **True and False** : False

14. **True and False** : False

15. Hydrochloric acid (HCl), Nitric acid (HNO₃).

Carbonic acid (H₂CO₃), oxalic acid (C₂H₄O₄).

16.

a. pH scale measures the hydrogen ion concentration in a solution thus indicating acidic/ basic nature of a solution.

b. From 0 to 14

where 0 – 7 Acid

7 – 14 Base (7 to 14)

c. Significance: Highest value - very basic/alkaline solution.

Lowest value (0 to 7) - very acidic solution.

17. When acids react with metal generally hydrogen gas is produced.

Metal + Acid → Salt + Hydrogen

eg : $\text{Mg} + 2\text{HCl}(\text{dil}) \rightarrow \text{MgCl}_2 + \text{H}_2\uparrow$

Pass this gas (H₂) through soap solution.

The soap bubbles filled with the gas will rise up. If a burning splinter is brought near the gas, the bubble will burn with a 'pop' sound.

18. Baking powder is a mixture of baking soda (NaHCO₃) and an edible acid like tartaric acid (CH(OH)COOH)₂. Tartaric acid is also known as dihydroxy butanedioic acid.

Baking powder on heating produces carbon dioxide gas which causes bread or cake to rise making it soft and spongy.

$2\text{NaHCO}_3 + \text{H}_2\text{C}_4\text{H}_4\text{O}_6 \rightarrow$

$\text{Na}_2 + \text{C}_4\text{H}_4\text{O}_6$

19.

i. If the crystal is moistened with water, then the blue colour of the crystal reappears.

ii. The commercial name of calcium sulphate hemihydrate is Plaster of Paris.

iii. Five water molecules are present in one formula unit of copper sulphate. CuSO₄.5H₂O

iv. CaSO₄. $\frac{1}{2}$ H₂O is obtained when gypsum is heated at 373K.

v. Heating gypsum at 373K results in loss of water in crystallization, forming plaster of Paris as the product.

OR

- i. Carbonic acid does not form an acidic salt.
- ii. Sodium bicarbonate, commonly known as baking soda is a chemical compound with the formula NaHCO_3 .
- iii. Ca(OH)_2 treatment with chlorine to obtain bleaching powder.
- iv. $\text{Ca(OH)}_2 + \text{Cl}_2 \rightarrow \text{CaOCl}_2 + \text{H}_2\text{O}$

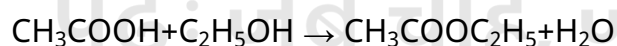
Washing soda is used for removing the permanent hardness of the water.

20. $\text{X} \rightarrow$ a carboxylic acid

$\text{Y} \rightarrow$ an alcohol

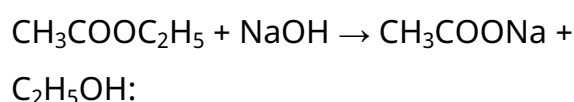
$\text{Z} \rightarrow$ ester compound

Chemical reaction involve is:



This reaction is called esterification.

When the substance Z treated with sodium hydroxide produces back the alcohol Y and sodium ethanoate the chemical reaction is as follows:



OR

- a. Our stomach produces HCl which helps in the digestion of food without harming the stomach. During indigestion the stomach produces too much acid which causes pain and irritation that can be combated by the intake of an antacid. These antacids neutralize the excess acid.

Example: Mg(OH)_2 (milk of Magnesia)

- b. Tooth decay starts when the pH of the mouth is lower than 5.5. Tooth enamel i.e calcium phosphate is corroded when the pH in the mouth is below 5.5. Bacteria present in the mouth produce acids by degradation of sugar and food particles remaining in the mouth after eating. Using toothpaste which are generally basic for cleaning the teeth can neutralize the excess acid and prevent tooth decay.

21. (A)

Ammonia shows basic properties only in the presence of water, where it forms ammonium hydroxide (NH_4OH), releasing OH^- ions. Without moisture, no ionization occurs.