

Question:1

Define the following terms.

1. Acidic substances
2. Basic substances
3. Organic acids
4. Dilute acid
5. Concentrated acid
6. Indicators
7. Water of crystallization
8. Anhydrous salts

Solution:

1. Acidic Substances are the substances which contain an acid. They are the sour-tasting chemicals which are soluble in water and corrosive by nature.
2. Basic substances are the substances which contain a base. Basic substances are the bitter-tasting chemicals which may or may not be soluble in water and are soapy to touch.
3. Organic Acids are the substances with acidic properties that occur naturally in plants and animals.
4. Dilute acids are the acids which contain more amounts of water and less amounts of acid.
5. Concentrated acids are the acids which contain more amounts of acid and less amount of water.
6. Indicators are substances that change colour in the presence of an acid or a base.
7. The water molecules present in the salt crystals which gives the crystal its shape is called water of crystallization.
8. Hydrated salts which lose their water of crystallization on heating and change into a powdery substance are called anhydrous salts.

Question:2

Write two examples for the following:

- | | | |
|------------------|-------|-------|
| 1. Mineral acids | | |
| 2. Organic acids | | |
| 3. Alkalis | | |

4. Weak bases
5. Strong bases

Solution:

1. Mineral Acids: Sulphuric acid (H_2SO_4), Nitric acid (HNO_3)
2. Organic Acids: Citric acid ($C_6H_8O_7$), Acetic acid (CH_3COOH)
3. Alkalis: Potassium hydroxide (KOH), Sodium hydroxide ($NaOH$)
4. Weak Bases: Copper hydroxide [$Cu(OH)_2$], Ammonium hydroxide (NH_4OH)
5. Strong Bases: Potassium hydroxide (KOH), Sodium hydroxide ($NaOH$)

Question:3

Write T for the true statement and F for the false one. Correct the false statement(s).

1. Hydrochloric acid, nitric acid, and sulphuric acid are called organic acids.
2. Acids are bitter to taste.
3. The chemical name of washing soda is sodium bicarbonate.
4. When you use litmus as an indicator, it gives the colour red for bases.
5. A salt is formed by the neutralization of an acid with water.

Solution:

1. F. Hydrochloric acid, nitric acid and sulphuric acids are mineral acids.
2. F. Acids are sour to taste.
3. F. The chemical name of washing soda is sodium carbonate.
4. F. When litmus is used as an indicator, it gives the colour blue for bases.
5. F. A salt is formed by the neutralization of an acid with base.

Question:4

Which one of the following is not a mineral acid?

- (a) Hydrochloric acid
- (b) Tartaric acid
- (c) Nitric acid
- (d) Sulphuric acid

Solution:

- (b) Tartaric acid.

Tartaric acid is not a mineral acid. It is an organic acid sourced from grapes.

Question:5

Which one of the following is a weak acid?

- (a) Oxalic acid
- (b) Sulphuric acid
- (c) Nitric acid
- (d) Hydrochloric acid

Solution:

- (a) Oxalic acid.

Oxalic acid is an organic acid and organic acids are generally weak acids.

Question:6

Which one of the following is a base?

- (a) KOH
- (b) $\text{Zn}(\text{OH})_2$
- (c) $\text{Cu}(\text{OH})_2$
- (d) All are bases

Solution:

- (d) All are bases.

KOH, $\text{Zn}(\text{OH})_2$ and $\text{Cu}(\text{OH})_2$ are all bases.

Question:7

Which one of the following is not used as a indicator?

- (a) Vinegar
- (b) Litmus
- (c) Phenolphthalein
- (d) Methyl orange

Solution:

- (a) Vinegar.

Vinegar is not an indicator. It is a liquid containing acetic acid.

Question:8

Sodium bicarbonate, which is used in bakeries and medicines, is a/an

- (a) base
- (b) acid
- (c) salt
- (d) indicator

Solution:

(c) Salt

Sodium Bicarbonate, also called baking soda is a salt which is used in bakery and medicines.

Question:9

Differentiate between mineral and organic acids. Give two examples for each.

Solution:

Mineral acid	Organic acid
Acids which are derived chemically from inorganic minerals are called mineral acids.	Acids which occur naturally in plants and animal materials are called organic acids.
Mineral acids are generally strong acids.	Organic acids are weak acids.
Nitric acid (HNO_3) and sulphuric acid (H_2SO_4) are two examples of mineral acids.	Acetic acid (CH_3COOH) and oxalic acid ($\text{C}_2\text{H}_2\text{O}_4$) are two examples of organic acids.

Question:10

Why are most acids not stored in metal containers?

Solution:

Acids are known for their corrosive nature. When brought in contact with metals such as iron or aluminium, acid chemically reacts with the metal and tends to destroy the metal gradually. Hence, it is advisable to store acids in glassware because glass is relatively less reactive to acids as compared to metals.

Question:11

What is the difference between dilute and concentrated acids?

Solution:

Dilute acid	Concentrated acid
Dilute acids contain a large fraction of water.	Concentrated acids contain a small amount of water and larger amount of acid.
Dilute acids are less reactive and less corrosive as well.	Concentrated acids are highly reactive and corrosive and are very dangerous.

Question:12

Write a short note on natural indicators.

Solution:

Natural Indicators are the solutions prepared from various brightly coloured parts of plants such as flowers, stems, roots and leaves. The solutions are prepared by boiling the coloured parts in water for some time and thereafter straining the part. These indicator solutions show a change in colour in the presence of an acid or a base. Example: Red cabbage juice changes to deep red in acids and in the presence of bases, it changes to green and yellow.

Question:13

Why is magnesium hydroxide used as an antacid?

Solution:

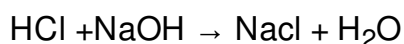
Magnesium hydroxide is a weak base having low solubility in water. It reacts moderately with acids or water and is chemically safe to be consumed. Therefore, to relieve indigestion, it is used as an antacid as it helps in neutralizing excess acidity in the stomach.

Question:14

What is a neutralization reaction? Give one example.

Solution:

A reaction in which an acid and a base react with each other to form a salt is called a neutralization reaction. For example: Hydrochloric acid (acid) reacts with sodium hydroxide (a base) to form sodium chloride (common salt) and water. The chemical equation looks like this:



Question:15

How can a hydrated salt be converted into anhydrous salt?

Solution:

Hydrated salts are the salt crystals which contain water molecules in them. These water molecules which give the crystal its shape is called water of crystallization. However, on heating, the hydrated salts lose their water of crystallization, shape and colour and get converted into a powdery substance called anhydrous salts.

Question:16

List some properties of acids and bases.

Solution:

Properties of Acids:

- Acids are sour-tasting chemicals.
- Acids are corrosive by nature and react strongly with metals.
- Most of the acids are soluble in water and form clear solutions on heating or at room temperature.

Properties of Bases:

- Bases are bitter-tasting chemicals
- Bases are soapy to touch
- Bases may or may not dissolve in water. The bases which are soluble in water are called alkalis.

Question:17

Give any three examples of acids. Give any two uses of each of them.

Solution:

The three examples of acids are:

a. Hydrochloric acid (HCl):

Uses:

- (i) Hydrochloric acid is contained in sanitary ware cleaners which is used for cleaning purposes at homes.
- (ii) Dilute hydrochloric acid is used to remove deposits from the inside of the heating appliances such as boilers.

b. Sulphuric acid (H₂SO₄):

Uses:

- (i) Sulphuric acid is used in the production of fertilizers.
- (ii) Sulphuric acid, also known as the king of chemicals is used in the manufacture of various

chemicals, dyes and drugs.

c. Nitric acid (HNO_3):

Uses:

- (i) Nitric acid is used in producing fertilizers such as Ammonium Nitrate
- (ii) It is used for cleaning gold and silver ornaments.

Question:18

Give any three example of bases. Give any two uses of each of them.

Solution:

Three examples of bases:

a. Calcium Hydroxide [$\text{Ca}(\text{OH})_2$]:

- (i) Calcium hydroxide is an ingredient in mortar, cement and whitewash.
- (ii) It is used as a chemical reagent in Bordeaux mixture to protect crops from pests.

b. Sodium Hydroxide (NaOH):

- (i) Sodium hydroxide is used in the manufacture of detergents and also in the textile industry.
- (ii) It is used at homes as a drain cleaner to unclog the drains.

c. Magnesium Hydroxide [$\text{Mg}(\text{OH})_2$]:

- (i) Magnesium hydroxide is used as an antacid as it is effective in neutralizing acids in the stomach.
- (ii) It is also used as a laxative in relieving constipation.

Question:19

What is the effect of sulphuric acid on the following?

- (a) Red litmus
- (b) Blue litmus
- (c) Phenolphthalein

Solution:

Acids turn blue litmus paper to red. Sulphuric acid belongs to the category of acids. Let us see the effect of sulphuric acid on

- (a) Red litmus: If the litmus paper is red, sulphuric acid will not have any effect on the paper. The litmus paper will remain red.
- (b) Blue litmus: The blue litmus paper changes to red in the presence of sulphuric acid.
- (c) Phenolphthalein: Phenolphthalein is an indicator solution which turns colourless in the presence of acids. Therefore, in the presence of sulphuric acid, phenolphthalein turns colourless.

Question:20

Explain the following:

- (a) Calamine lotion is applied on bee stings.
- (b) Antacids are taken in case of acidity in stomach.
- (c) Slaked lime is added to factory waste before it is discharged into rivers.

Solution:

(a) Calamine lotion contains a base called zinc carbonate which has a neutralizing effect on acids. A bee sting releases an acidic liquid into the skin. In order to neutralize the effect of the bee sting, calamine lotion is rubbed on the skin.

(b) In case of acidity in stomach, an antacid such as magnesium hydroxide is taken. Magnesium Hydroxide is a base which is known to be very effective in neutralizing acids. Therefore, to relieve indigestion, an antacid is taken as it helps in correcting the excess acidity in the stomach.

(c) Calcium hydroxide or slaked lime is a base which has a neutralizing effect on acids. It is added to the factory waste before being discharged into rivers because the factory waste contains many acids. The acids are very toxic and will destroy the aquatic life. In order to neutralize the acidic components in the waste, slaked lime is added to it.