UNIT -14. ACIDS AND BASES

Class: VIII

Subject: Science

I. Choose the best answer.

1. Acids are _____ in taste.
   a) sour b) sweet c) bitter d) salty
2. Aqueous solutions of _____ conduct electricity.
   a) acid b) base c) salt **d) All of these**
3. In acidic solutions blue litmus changes into _____ colour.
   a) blue b) green **c) red** d) white
4. Base is a substance that gives _____ on dissolving in water.
   a) OH^- b) H^+ **c) OH** d) H
5. Sodium hydroxide is a _____
   a) acid b) base c) oxide **d) alkali**
6. Red ant sting contains _____
   a) acetic acid b) sulphuric acid c) oxalic acid **d) formic acid**
7. Magnesium hydroxides are used for treating_____
   a) acidity b) head pain c) teeth decay d) None of these
8. Acid mixed with base forms _____
   a) salt and water b) salt c) water d) No reaction
9. We brush our teeth with tooth paste because it is _____ in nature.
   a) basic b) acidic c) Both a and b d) None of these
10. In basic solution turmeric indicator paper changes from yellow to _____
    a) blue b) green c) yellow **d) red**

II. Fill in the blanks.

1. Benzoic acids are used for **preservation of food.**
2. The word sour refers to **acidus** in Latin.
3. Bases are **bitter** in taste.
4. Chemical formula of calcium oxide is **CaO.**
5. Wasp sting contains **alkaline substance.**
6. Turmeric is used as a **indicator.**
7. In acidic solution the colour of the hibiscus indicator paper will change to **deep pink or deep red.**

III. State true or false. If false, correct the statement.

1. Most of the acids are not soluble in water. **True**
2. Acids are bitter in taste. **False**

3. Bases are soapy to touch when they are dry. **False**
4. Acids are corrosive in nature. **True**
5. All bases are alkalis. **False**
6. Hibiscus flower is an example for natural indicator. **True**

IV. Answer briefly.

1. Acid - Define.

A substance which contains one or more replaceable hydrogen atoms.

2. Write any four physical properties of acids.

Acids are sour in taste.

- They are corrosive in nature. Strong acids can spoil substances like human skin, clothes and paper.
- Generally acids exist in liquid state but few acids exist in solid state too. E.g. Benzoic acid.
- Acids are colourless.
- Acids change the colour of the indicators. Blue litmus paper turns red and methyl orange turns pink when treated with acids.

3. What are the similarities between acids and bases?

- They are corrosive in nature.
- They undergo ionization in aqueous solution.
- They conduct electricity in aqueous solution.
- They undergo neutralization reaction.

4. State the difference between acids and bases.

Acids:

- They produce H+ ions in water.
- They are sour in taste.
- Few acids are in solid state.
- Acids turn blue litmus paper red.

Bases:

- They produce OH- ions in water.
- They are bitter in taste.
- Most of the bases are in solid state.
- Bases turn red litmus paper blue.

5. What is an indicator?

An indicator or acid – base indicator is a chemical substance which indicates the acidic or basic nature of a solution by suitable colour change.

6. What is a neutralization reaction?

Neutralization is a chemical reaction in which an acid and a base react with each other to form water and salt.

7. Write any four physical properties of base.

- Bases generally exist in solid state but some bases exist in liquid state also. E.g. Ammonium hydroxide, calcium hydroxide.
- Bases give soapy touch only in aqueous media not in dry nature.
- Bases are bitter in taste.
- Bases are corrosive in nature. When come in contact with the skin frequently they form painful blisters.
- Bases also change the colour of the indicators. Red litmus paper turns blue when . treated with bases. Similarly, they turn methyl orange yellow and phenolphthalein pink.

V. Answer in detail

1. What are the uses of acids?

- Hydrochloric acid present in our stomach helps in the digestion of foodstuff.
- Vinegar (acetic acid) is used to preserve food materials.
- Benzoic acid is also used to preserve food materials like pickles.
- Sodium or potassium salts of higher fatty acids are used to make washing and bathing soaps.
- Sulphuric acid is called the king of chemicals. It is an effective dehydrating agent. It is used in various industries to make detergents, paints, fertilizers and many more chemicals.
- Hydrochloric acid, Nitric acid and Sulphuric acid are important laboratory reagents.
- Cells of all living organisms contain the fundamental nuclear material called nucleic acids. Animals have deoxyribo nucleic acid (DNA) whereas plants contain ribo nucleic acid (RNA).

2. What are the uses of bases?

- Potassium hydroxide is used to make bathing soaps.
- Sodium hydroxide is used to make washing soaps.
- Sodium hydroxide is also used in paper industries, textile industries and in the preparation of medicines.
- Calcium hydroxide is used for white washing.
- Aluminum hydroxide and magnesium hydroxides are used in antacids to cure acidity problems.
- Ammonium hydroxide is used to manufacture fertilizers, nylon, plastics and rubber.

3. Explain the neutralization reactions in our daily life.

1. Ant bite:

- Whenever bees or red ants bite they inject an acid called formic acid.
- These acids cause burning sensation and pain.
- To suppress the pain, a suitable base in the form of calcium hydroxide (readily available at home) is applied to neutralise the formic acid.

2. Wasp bite:

- When we are bitten by wasp, we feel the burning sensation and pain. It is due to an alkaline substance injected by the insect.
- To neutralise the alkalinity, we use vinegar which is an acid.

3. Tooth decay:

- The bacteria present in our mouth decompose the food particles stuck in the gaps between our teeth thereby causing acid formation which leads to tooth decay.
- When we brush with tooth powder or tooth paste containing weak bases, the acid gets neutralized.

4. Acidity:

- Excessive production of hydrochloric acid in our stomach causes ulcer in stomach and food pipe.
- In order to neutralize, antacids which are nothing but weak bases like aluminum and magnesium hydroxides are used.

5. Agriculture:

Farmers add lime fertilisers such as powdered lime (CaO), limestone ($CaCO_3$) or ashes of burnt wood to the soil to neutralise the acidity.

6. Industries:

Effluents from the industries contain acids such as sulphuric acid. It is

treated by adding lime to neutralise it before it is discharged into rivers and streams.

4. How will you prepare natural indicator from turmeric powder.

- Turmeric indicator is one of the natural indicator.
- By adding small amount of water to turmeric powder, a paste is prepared.
- This is applied on a blotting paper or filter paper and dried.
- These strips are used as indicators to find the nature of the solution.
- In acidic solution, turmeric indicator paper has no change in colour.
- That means, it remains yellow. In basic solution, the colour changes from yellow to red.

VI. Higher Order Thinking Questions.

1. Vinu and Priyan take their lunch at school. Vinu eats lemon rice and Priyan eats curd rice. Both lemon rice and curd rice are sour in taste. What is the reason?

- Curd contains lactic acid. The lactic acid makes curd rice sour in taste.
- Lemon juice contains citric acid. The citric acid makes lemon rice sour in taste.
- Generally acids are sour in taste.

2. Heshna and Keerthi are friends. Keerthi's teeth are white without caries, but Heshna has teeth with caries. Why? How is it formed?

- Caries is caused by the action of acids on the enamel surface.
- The acid is produced when sugar in foods or drinks react with bacteria present on the tooth surface.
- Heshna has not cleaned her teeth well after sipping sugary drinks and snacking.
- She has to brush after meals and before bed.