Exercise Questions **Page Number: 56-57**

1. State differences between acids and bases.

Solution:

Acids	**Bases**
Acids are sour in taste	Bases are bitter in taste
Acids turn blue litmus paper into red colour	The base does not change the colour of blue litmus paper
Acids does not change the colour of the red litmus	Bases turn red litmus paper to blue colour
Acids do not change the colour of turmeric	Bases turn turmeric to red

2. Ammonia is found in many household products, such as window cleaners. It turns red litmus blue. What is its nature?

Solution:

The answer is it is basic in nature.

3. Name the source from which litmus solution is obtained. What is the use of this solution?

Solution:

Litmus solution is extracted from lichens. Litmus solution is used as an indicator to find acidic and basic nature of a solution.

4. Is the distilled water acidic/basic/neutral? How would you verify it?

Solution:

Distilled water is neutral in nature, and this can be tested by using red and blue litmus paper. In either of the cases, colour remains unchanged.

5. Describe the process of neutralisation with the help of an example.

Solution:

Neutralisation is a reaction between an acid and a base. Here, both acids and bases get neutralised. For example, when sodium hydroxide (NaOH) is added to hydrochloric acid (HCl), sodium chloride (NaCl) and water (H_2O) are obtained.

$NaOH + HCl \rightarrow NaCl + H_2O + Heat$

6. Mark 'T' if the statement is true and 'F' if it is false.

(i) Nitric acid turns red litmus blue. (T/F)

(ii) Sodium hydroxide turns blue litmus red. (T/F)

(iii) Sodium hydroxide and hydrochloric acid neutralise each other and form salt and water. (T/F)

(iv) Indicator is a substance which shows different colours in acidic and basic solutions. (T/F)

(v) Tooth decay is caused by the presence of a base. (T/F)

Solution:

i) False

ii) False

iii) True

iv) True

v) False

7. Dorji has a few bottles of soft drinks in his restaurant. But, unfortunately, these are not labelled. He has to serve the drinks on the demand of customers. One customer wants an acidic drink, another wants a basic drink, and the third one wants a neutral drink. How will Dorji decide which drink is to be served to whom?

Solution:

Dorji can taste a few drops out of soft drinks bottles; the acidic solution is sour in taste, the basic solution is bitter in taste, and the neutral solution has no taste. Along with tasting, Dorji can use litmus paper to test the nature of the soft drinks. He should use blue litmus paper to test the acidic solution. Dorji has to put a drop of solution on blue litmus. If it turns red, then the solution will be acidic in nature.

Similarly, he can use red litmus paper to test the basic solution. He has to put a drop of solution on red litmus. If it turns blue, then the solution will be basic in nature.

8. Explain why

(a) An antacid tablet is taken when you suffer from acidity

(b) Calamine solution is applied on the skin when an ant bites.

(c) Factory waste is neutralised before disposing it into the water bodies.

Solution:

1. The antacid tablet contains base-like milk of magnesia, which neutralises the acid produced in the stomach. Hence, it is used while suffering from acidity.

2. When ant bites, it injects formic acid inside the skin. Calamine consists of Zinc carbonate which is basic in nature. Hence, calamine neutralises the effect of formic acid to bring relief for the affected person.
3. Factory wastes are acidic in nature which may cause harm to aquatic life. Hence, they are neutralised by using a base before disposing it into the water bodies.

9. Three liquids are given to you. One is hydrochloric acid, another is sodium hydroxide, and the third is a sugar solution. How will you identify them? You have only turmeric indicator.

Solution:

The following steps are taken to test the given liquids:

- Put a drop of provided liquid on the turmeric indicator. The solution that changes the colour of the indicator to red is sodium hydroxide, which is basic in nature.
- Now, to make two mixtures, add a drop of sodium hydroxide on the other two liquids individually.
- The drop of each combination added to the turmeric indicator one after another.
- The mixture that changes the indicator to red colour includes a neutral solution of sugar.
- While the mixture contains hydrochloric acid that has been neutralised by the addition of sodium hydroxide, which does not show any colour change in the indicator.

10. Blue litmus paper is dipped in a solution. It remains blue. What is the nature of the solution? Explain.

Solution:

The above solution may be neutral or basic in nature as both will not change the colour of the blue litmus paper.

11. Consider the following statements:

(a) Both acids and bases change colour of all indicators.

(b) If an indicator gives a colour change with an acid, it does not give a change with a base.

(c) If an indicator changes colour with a base, it does not change colour with an acid.

(d) Change of colour in an acid and a base depends on the type of the indicator.

Which of these statements are correct?

(i) All four

(ii) a and d

(iii) b, c and d

(iv) only d

Solution:

(iv) Only d is correct