ACIDS, BASES, AND SALTS

Neutralisation Reaction between Acids and Bases

Neutralisation is defined as a process in which an acid reacts with a base to form its salt and water, as in the reaction of hydrochloric acid with sodium hydroxide by using the indicator phenolphthalein, where the solution becomes neutral and forms sodium chloride and water.

Objective:

To study the neutralisation reaction between acids and bases.

Learning Outcomes:

- Define the neutralisation reaction.
- Explain the concept of neutralisation reaction between acids and bases with the help of an example.

Keywords

Below are the keywords from the video and their definitions.

Exothermic process

It is defined as a chemical process which releases energy in the form of heat and light.

Hydrochloric acid

It is a clear, colourless solution of hydrogen chloride in water. It is a highly corrosive, strong mineral acid and has various industrial uses.

Neutralisation reaction

It is defined as a process in which an acid reacts with a base to form its corresponding salt and water.

Phenolphthalein

It is a synthetic indicator which is colourless in a neutral solution. It remains colourless in an acidic solution and changes to pink in a basic solution.

Sodium hydroxide

It is also known as caustic soda and has the molecular formula NaOH. It is a white solid available in the form of pellets, flakes and granules.

Interesting Facts

- Toothpaste neutralises the acid in our mouth so the acid doesn't attack our teeth.
- A bee sting (acid) can be neutralised by a weak solution of sodium bicarbonate (alkali) and a wasp sting (alkali) can be neutralised by vinegar (base).
- Acidity is the build up of excess stomach acids. Tablets that provide relief from acidity are alkaline, usually containing calcium carbonate, so they neutralise the excess acid.
- The heat produced in the reaction between an acid and a base is called the heat of neutralisation.
- Neutralisation is used in agriculture. Lime fertilisers, such as powdered lime (CaO), limestone (CaCO3) or ashes of burnt wood are added to the soil to neutralise its acidity.
- Basic soil can be treated by using a compost of rotting vegetables or leaves. This is because the rotting vegetables and leaves decompose to liberate carbon dioxide gas. The acidic gas from the decomposition of compost neutralises the alkalis in basic soils.

Quiz

Question 1: Neutralisation is a process in which an acid reacts with a base to form _____ and _____ .

a) water and hydrogen
b) water and oxygen
c) salt and water
d) hydrogen and oxygen

Question 2: In the reaction between hydrochloric acid and sodium hydroxide, _____ and _____ are formed.

a) hydrogen gas and sodium chloride
b) chlorine gas and sodium chloride
c) sodium chloride and water
d) hydrogen gas and chlorine gas

Question 3: On adding 2 drops of phenolphthalein to 10 ml of sodium hydroxide, its colour will change to _____ .

a) yellow
b) blue
c) red
d) pink

Question 4: Which of the following statements is correct?

a) Phenolphthalein is a natural indicator.
b) The colour of phenolphthalein changes to pink, in acidic solutions.
c) On adding sodium hydroxide to the acidic solution with phenolphthalein, the colour of the solution will vanish.
d) Acids are corrosive in nature.

Question 5: Consider the following statements:

1) Neutralisation is mostly an exothermic process.
2) All acids are dangerous in their diluted form.
3) Acids are never stored in metal containers.
4) If concentrated sulphuric acid accidently falls on the skin, it does not cause any harm.

a) All statements are true.
b) Statement 1 and 3 are true.
c) Statement 1, 3 and 4 are true.
d) Only statement 3 is true.
e) All statements are false.

Question 6: On adding hydrochloric acid to sodium hydroxide solution, with 2 drops of phenolphthalein indicator, the colour of the solution will change to _____ .

a) pink
b) yellow
c) red
d) colourless

Question 7: The exothermic nature of a reaction is characterised by _____ .

a) absorption of heat
b) absorption of light energy
c) release of light
d) release of heat

Question 8: In order to warn people about the dangerous corrosive nature of such acids, a _____ is usually printed on their containers.

a) ceramics
b) metal
c) health sign
d) danger sign