CHEMISTRY STUDY MATERIALS FOR CLASS 10
(NCERT Based notes of Chapter -02)

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ACIDS, BASES AND SALTS

ACIDIC, BASIC AND NEUTRAL SALTS

NEUTRAL SALT

Salts produced because of reaction between strong acid and strong base are neutral in nature. The pH of value of such salts is equal to 7, i.e. neutral.

Example; Sodium chloride, sodium sulphate, potassium chloride, etc

Sodium chloride (NaCl) is formed after the reaction between hydrochloric acid (a strong acid) and sodium hydroxide (a strong base).

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

SODIUM SULPHATE (Na_2SO_4)

It is formed after the reaction between sodium hydroxide (a strong base) and sulphuric acid (a strong acid). $2NaOH + H_2SO_4 \rightarrow Na_2SO_4 + 2H_2O$

Potassium chloride (KCl): It is formed after the reaction between potassium hydroxide (a strong base) and hydrochloric acid (a strong acid).

$KOH + HCl \rightarrow KCl + H_2O$

ACIDIC SALT

Salts which are formed after the reaction between a strong acid and weak base are called acidic salt. The pH value of acidic salt is lower than 7.

Example: ammonium sulphate, ammonium chloride, etc.

Ammonium chloride is formed after reaction between hydrochloric acid (a strong acid) and ammonium hydroxide (a weak base).

$$NH_4OH + HCl \rightarrow NH_4Cl + H_2O$$

Ammonium sulphate is formed after reaction between ammonium hydroxide (weak base) and sulphuric acid (a strong acid).

$$2NH_4OH + H_2SO_4 \rightarrow (NH_4)_2SO_4 + 2H_2O$$

BASIC SALT

Salts which are formed after the reaction between weak acid and strong base are called basic salt. For example; sodium carbonate, sodium acetate, etc.

Sodium carbonate is formed after the reaction between sodium hydroxide (a strong base) and carbonic acid (a weak base).

$$H_2CO_3 + 2NaOH \rightarrow Na_2CO_3 + 2H_2O$$

Sodium acetate is formed after the reaction between a strong base, sodium hydroxide and a weak acid, acetic acid.

$$CH_3COOH + NaOH \rightarrow CH_3COONa + H_2O$$

CAUSE OF FORMATION OF ACIDIC, BASIC AND NEUTRAL SALT:

When a strong acid reacts with a weak base, the base is unable to fully neutralize the acid. Due to this an acidic salt is formed in this case.

When a strong base reacts with a weak acid, the acid is unable to fully neutralize the base. Due to this a basic salt is formed in this case.

When equally strong acid and base react they fully neutralize each other. Due to this a neutral salt is formed in this case.

pH Value Of Salt:

- Neutral salt: The pH value of a neutral salt is almost equal to 7.
- Acidic salt: The pH value of an acidic salt is less than 7.
- Basic salt: The pH value of a basic salt is more than 7.

COMMON SALT (SODIUM CHLORIDE)

Sodium chloride (NaCl) is also known as common or table salt. It is formed after the reaction between sodium hydroxide and hydrochloric acid. It is a neutral salt. The pH value of sodium chloride is about 7. Sodium chloride is used to enhance the taste of food. Sodium chloride is used in manufacturing of many chemicals.

IMPORTANT CHEMICALS FROM SODIUM CHLORIDE:

SODIUM HYDROXIDE (NaOH)

Sodium hydroxide is a strong base. It is also known as caustic soda or lye. It is obtained by the electrolytic decomposition of solution of sodium chloride (brine). In the process of electrolytic decomposition of brine (aqueous solution of sodium chloride), brine decomposes to form sodium hydroxide. In this process, chlorine is obtained at anode and hydrogen gas is obtained at cathode as byproducts. This whole process is known as Chlor-Alkali process.

$$2NaCl + 2H_2O \rightarrow 2NaOH + Cl_2 + H_2$$

USE OF PRODUCTS AFTER THE ELECTROLYSIS OF BRINE:

- Hydrogen gas is used as fuel, margarine, in making of ammonia for fertilizer, etc.
- Chlorine gas is used in water treatment, manufacturing of PVC, disinfectants, CFC, pesticides. It is also used in manufacturing of bleaching powder and hydrochloric acid.

- Sodium hydroxide is used for de-greasing of metals, manufacturing of paper, soap, detergents, artificial fibres, bleach, etc.

BLEACHING POWDER ($CaOCl_2$):

Bleaching powder is also known as chloride of lime. It is a solid and yellowish white in colour. Bleaching powder can be easily identified by the strong smell of chlorine.

When calcium hydroxide (slaked lime) reacts with chlorine, it gives calcium oxychloride (bleaching powder) and water is formed.

$$Ca(OH)_2 + Cl_2 \rightarrow CaOCl_2 + H_2O$$

Aqueous solution of bleaching powder is basic in nature. The term bleach means removal of colour. Bleaching powder is often used as bleaching agent. It works because of oxidation. Chlorine in the bleaching powder is responsible for bleaching effect.

USE OF BLEACHING POWDER:

- Bleaching powder is used as disinfectant to clean water, moss remover, weed killers, etc.
- Bleaching powder is used for bleaching of cotton in textile industry, bleaching of wood pulp in paper industry.
- Bleaching powder is used as oxidizing agent in many industries, such as textiles industry, paper industry, etc.

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