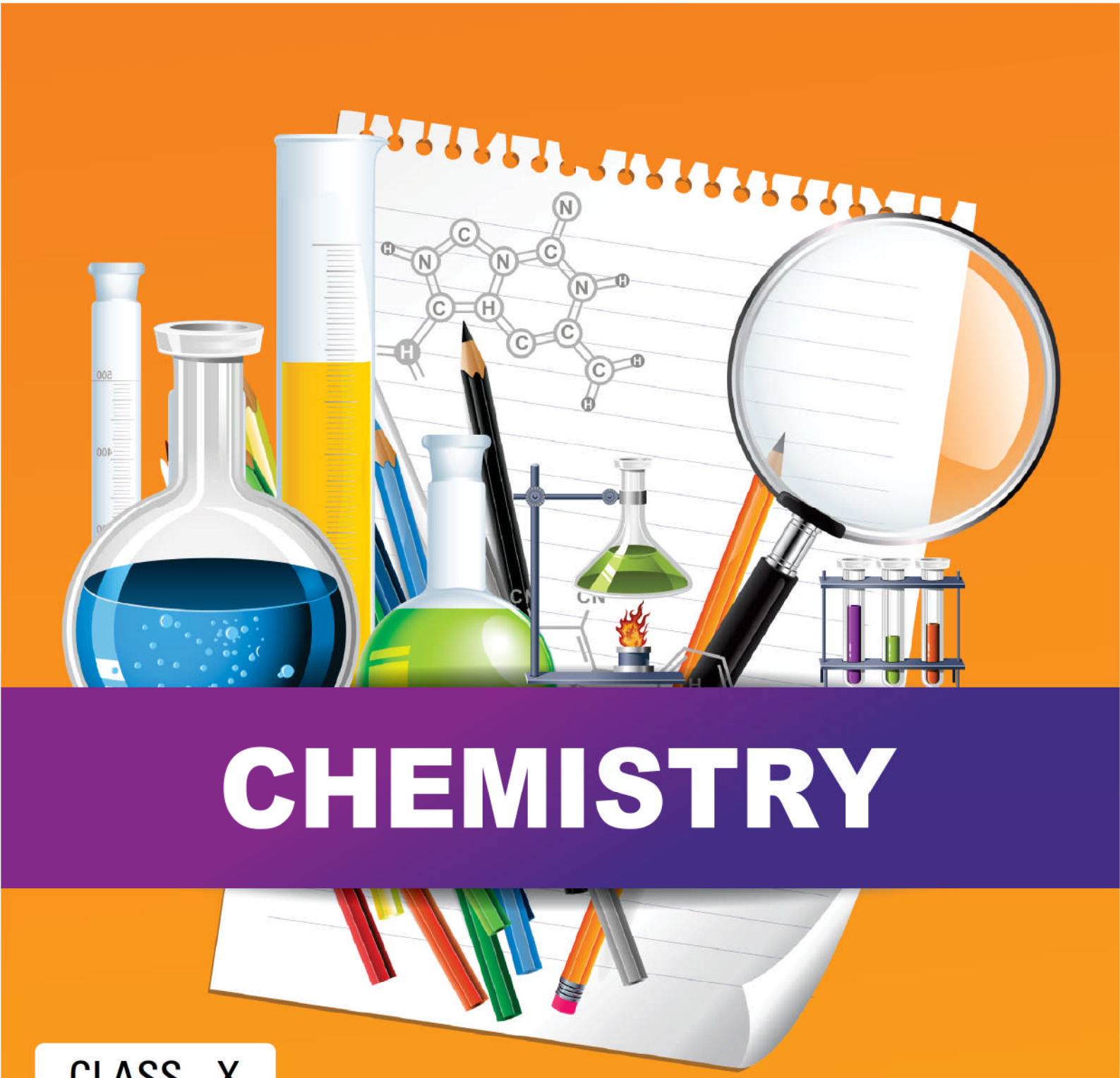

CHEMISTRY

CLASS - X

MODULE-1

– CHEMICAL REACTIONS AND EQUATIONS
– METALS & NON-METALS
– ACIDS, BASES AND SALTS

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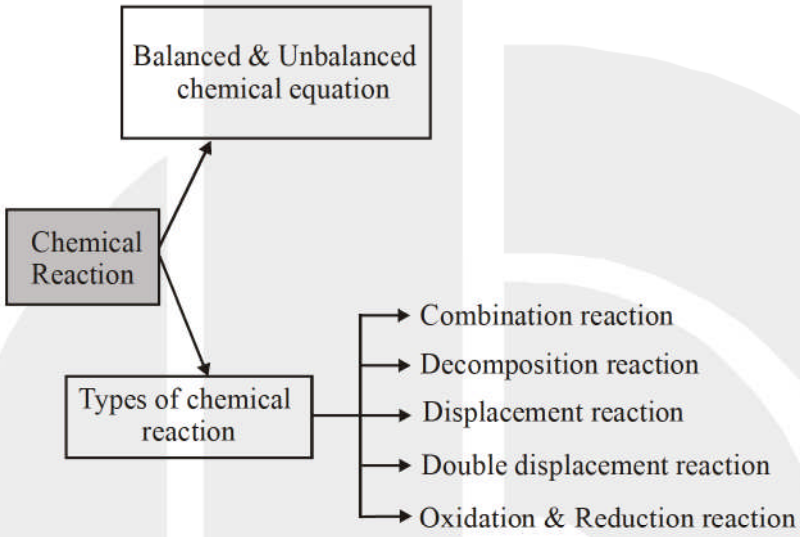
CONTENT

2. ACIDS, BASES AND SALTS

3. METALS & NON-METALS

1 CHEMICAL REACTIONS AND EQUATIONS

CONCEPT TREE



1.1 INTRODUCTION :

Any change with the formation of new substance is called chemical reaction. There are many type of chemical reaction e.g. displacement reaction, combination reaction etc. A chemical equation represents a chemical reaction. In a chemical reaction balancing is very important. It can be done by various methods. Oxidation and reduction reaction are also the types of chemical reaction. These reactions can be balanced by ion electron method and oxidation number method. Corrosion and rancidity are the effects of oxidation reactions.

Change is the law of nature.

There are so many situations of daily life, where we can observe various changes.

Like,

(i) Conversion of tea into vapours from a cup of hot tea.

(ii) Corrosion of iron articles (rusting) if exposed to humid atmosphere.

(iii) Cooking of food.

(iv) Digestion of food in our body.

(v) Breaking

(vi) Combustion of fuel in our vehicle.

Scientist classify these changes as :

⇨ Physical changes

⇨ Chemical changes.

(1) **Physical changes :** A change in which physical properties of the substance changes but the chemical composition does not change.

Examples

Freezing, melting, boiling, condensation etc.

Characteristic features of physical changes :

(i) The identity of the substances is maintained.
(ii) The change may or may not take place.
(iii) Heat change may or may not take place.
(iv) Only the physical state or some of the physical properties of the substances are changed.

(2) **Chemical Changes :** A change in which one of more substances changes into new substances with a different chemical composition.

Examples.

Burning of candle, rusting of iron, calcination of lime stone etc.

Characteristic features of chemical changes :

(i) The identity of original substance is completely lost.
(ii) The change is permanent.
(iii) The change is generally accompanied by energy change.
(iv) The change cannot be reversed.

1.2 CHEMICAL REACTION :

A chemical reaction is a process which transforms one or more substances into new substances. During chemical reactions, new substances with new properties are formed . The substances which take part in chemical reactions are called **reactants** and the substances which are formed as a result of chemical reactions are called **products**. For example, in the reaction between sodium hydroxide and hydrochloric acid to give sodium chloride and water.

$$\underset{\text{Sodium Hydroxide}}{NaOH} + \underset{\text{Hydrochloric acid}}{HCl} \rightarrow \underset{\text{Sodium Chloride}}{NaCl} + \underset{\text{Water}}{H_2O}$$

(Reactants) (Products)

The chemical reactions involves the breaking of bonds between the atoms of the reacting substances and making of new bonds between atoms of products.

Reactant : Substances which take part in a chemical reaction.

Product : The new substances which is formed as a result of chemical reaction.

The following observation helps us to determine whether a chemical reaction has taken place.

⇨ change in state ⇨ change in colour
⇨ evolution of a gas ⇨ change in temperature
⇨ formation of precipitate

The important characteristics of a chemical reaction : -

(i) **Change in state :** The physical state of the substance normally changes.

e.g. (a) Formation of solid MgO from solid Mg and gaseous O_2.
(b) Formation of solid PbI_2(ppt) from liquid solutions of $Pb(NO_3)_2$ and KI.
(c) Formation of H_2 gas form the reaction of solid Zn with liquid H_2SO_4.