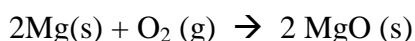


CHEMICAL REACTIONS AND EQUATIONS

GIST OF THE LESSON

- 1) **Chemical reaction**— Chemical changes or chemical reactions are the changes in which one or more new substances are formed.
- 2) **Chemical Equations** – Representation of a chemical reaction in terms of symbols and formulae of the reactants and products is known as chemical equation.
- 3) **Balanced Chemical equations** – The chemical equation in which the no. of atoms of different elements is same on both sides of the arrow is called balanced chemical equation.
- 4) The chemical reactions can be classified into different types such as—
 - a) **Combination reaction** – The reactions in which two or more substances combine to form a new substance are called combination reaction. For example,



- b) **Decomposition reaction** - The reaction in which a single compound breaks up into two or more simpler substances are called decomposition reactions. For example,

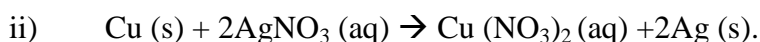
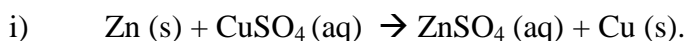


The decomposition of a substance by passing electric current through it is known as electrolysis.

The decomposition of a substance on heating is known as thermal decomposition.

The decomposition of a substance by absorbing light energy is called photochemical decomposition.

- c) **Displacement reactions** -The chemical reactions in which a more reactive element displaces a less reactive element from a compound are known as displacement reactions. For example,

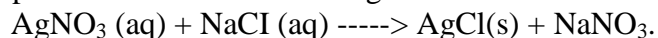


- d) **Double Displacement Reactions** - The chemical reactions in which compounds react to form two different compounds by mutual exchange of ions are called double displacement reactions.

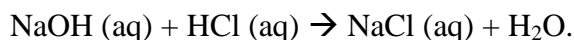
These reactions take place in solution two common types of this reaction are precipitation reactions and neutralization reactions

- i) **Precipitation reaction** : In this reactions, aqueous solution of two salts are mixed whereby

Some salts precipitate due to mutual exchange of ions between the two salts. For example



- ii) **Neutralization reaction**: In this type of reaction an acid reacts with a base to form salt and water by exchange of ions.

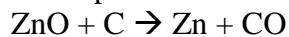


e) **Redox reaction:** Chemical reaction which shows both oxidation and reduction reaction.

Oxidation: Reaction that involves the gain of oxygen or loss of hydrogen.

Reduction: Reaction that shows the loss of oxygen or gain of hydrogen.

Both oxidation and reduction take place simultaneously and hence called redox reaction.



ZnO reduce to Zn ---- reduction

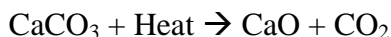
C oxidize to CO -----oxidation

f) **Exothermic reaction and endothermic reaction:** On the basis of energy changes during chemical reaction, they can be classified as

i) **Exothermic reaction:** A chemical reaction in which heat energy is produced.



ii) **Endothermic reaction:** A chemical reaction in which heat energy is absorbed.

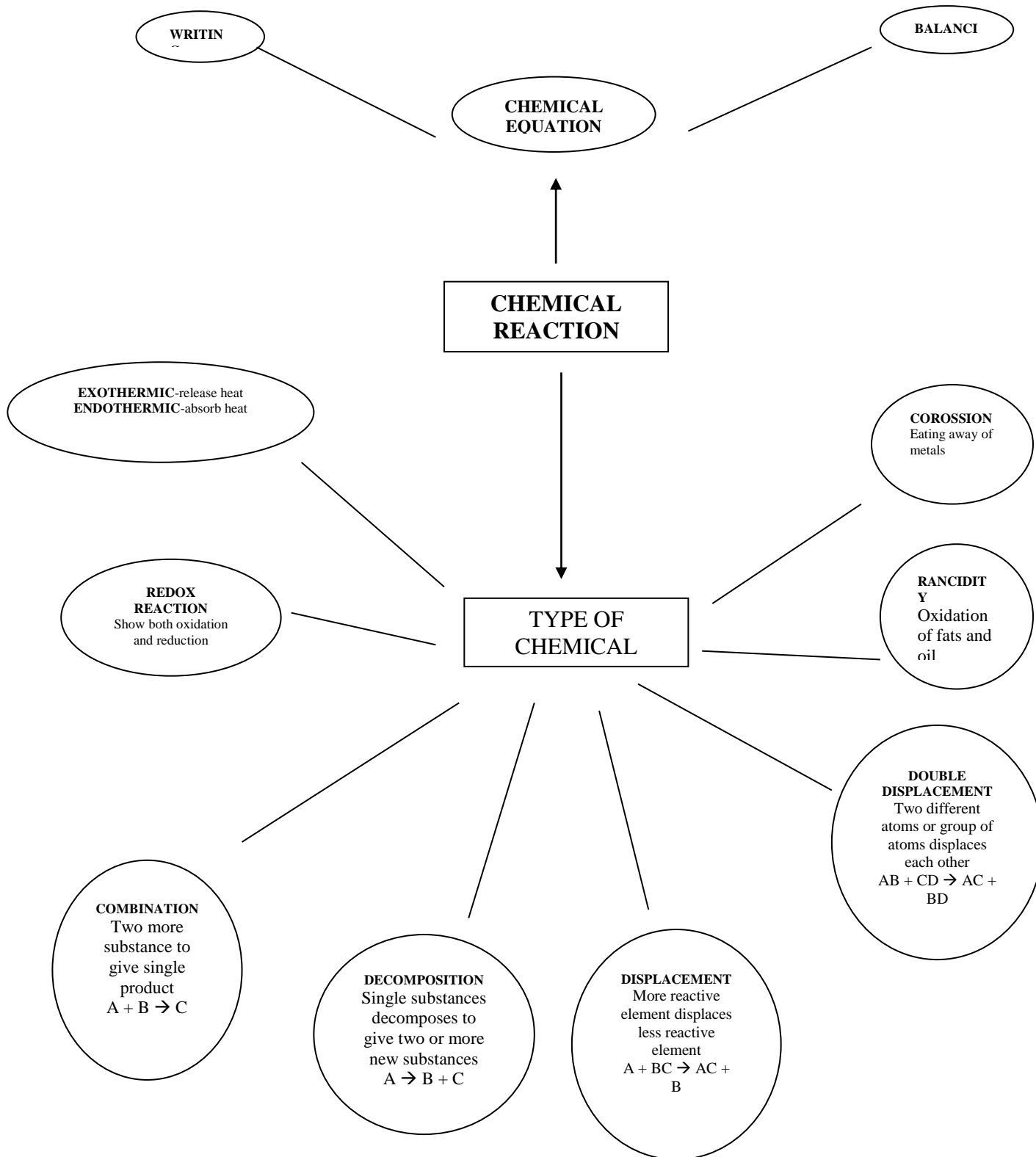


5 Corrosion – The process of slow conversion of metals into their undesirable compounds due to their reaction with oxygen, water, acids, gases etc. present in the atmosphere is called corrosion.
Rusting – Iron when reacts with oxygen and moisture forms red substance called rust.

6 Rancidity – The taste and odour of food materials containing fat and oil changes when they are left exposed to air for long time. This is called rancidity. It is caused due to oxidation of fat and oil present in food material.

It can be prevented by using various methods such as by adding antioxidants to the food materials, Storing food in air tight container and by flushing out air with nitrogen.

MIND MAP



FA I
CHEMICAL REACTIONS AND EQUATIONS
FORMATIVE ASSESSMENT I
Q. PAPER

MARKS-30

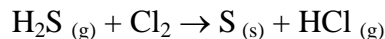
TIME- 70 MINUTES

Instructions:

- Questions : 1 to 5 – 1 Mark each
- Questions : 6 to 9 – 2 Marks each
- Questions : 10 to 13 – 3 Marks each
- Question 14 – 5 Marks

1. On what chemical law, balancing of chemical equation is based?

2. Identify the compound oxidized in the following reaction:



3. Give an example of photochemical reaction.

4. Name the reaction which forms insoluble salts.

5. Name the product obtained and type of reaction given below:



6. Explain the following in terms of gain or loss of oxygen with one example:

- a. Oxidation
- b. Reduction

7. A copper coin is kept in a solution of silver nitrate for some time, what will happen to the coin and the colour of the solution?

8. Why do we apply paint on iron articles?

9. What happens chemically when quicklime is added to water?

10. What is rancidity? Write the common methods to prevent it.

11. What is corrosion? State the conditions necessary for rusting of iron. How rusting is harmful?

12. Name the type of reactions in the following cases:

- a. Garbage producing foul smell
- b. Burning of natural gas.
- c. Carbon dioxide gas passed through lime water.

13. Blue crystals of copper sulphate on heating in a dry test tube become colourless. Give reasons.



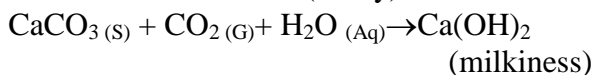
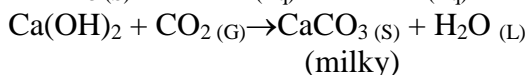
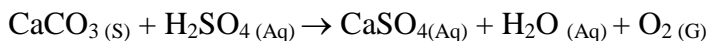
14.

- Why can not a chemical change be normally reversed?
- Why is it always essential to balance a chemical equation?
- What happens when CO_2 gas is passed through lime water and why does it disappear on passing excess CO_2 ?
- Can rusting of iron take place in distilled water?

HOTS QUESTIONS (SOLVED)

Q.1. A water insoluble substance 'X' on reacting with dilute H_2SO_4 released a colourless and odourless gas accompanied by brisk effervescence. When the gas was passed through water, the solution obtained turned blue litmus red. On bubbling the gas through lime water, it initially became milky and milkiness disappeared when the gas was passed in excess. Identify the substance 'X'. Write its chemical equations of the reactions involved.

Ans. The water insoluble substance 'X' is metal carbonate CaCO_3 .



Q.2. Ahmad took a magnesium ribbon (cleaned) and burned it on a flame. The white powder formed was taken in a test tube and water was added to it. He then tested the solution formed with red and blue litmus paper. What change was seen? Why?

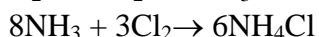
Ans. Red litmus paper turned blue.

Blue litmus paper remained blue.

This is because the magnesium ribbon on burning in air forms the white magnesium oxide. Which dissolved in water, it forms magnesium hydroxide, which is Basic in nature.

Q.3. Give one example of a combination reaction in which an element combines with a compound to give you a new compound.

Ans. $\text{O}_2 + 2\text{SO}_2 \rightarrow 2\text{SO}_3$



Q.4. Marble statues often slowly get corroded when kept in open for a long time. Assign a suitable explanation.

Q.5. Mohan took pure water for the electrolytic decomposition of water but did not see any bubbles near the electrodes. Explain why?

Q.6. Rancidity is a process used for spoiling of cooked food materials like vegetables, etc. When kept for long time in open. How can you prevent such process to proceed? Give an example.

Q.7. A substance 'X' displaces 'Y' from its solution in water. It is called displacement reaction. What other chemical name can be given to such type of reactions? Explain, giving an example?

Q.8. A grey coloured metal 'Z' (Atomic weight=65) is used in making dry cell. It reacts with dil. HCl to liberate a gas. What is the gas evolved? Calculate the minimum amount of 'Z' required to produce 100 l of gas?



- Q. 9 Why is respiration considered an exothermic reaction? Explain.
- Q. 10 Why is respiration considered an exothermic reaction? Explain.
- Q. 11 Why are decomposition reactions called opposite of combination reactions? Write equations for these reactions.
- Q. 12 A shiny brown colored element 'X' on heating in air becomes a black coloured compound. Name the element 'X' & black the coloured compound formed. Also write the equation

FA II

CHEMICAL REACTION AND EQUATIONS

Oral questions (Conversation type)

1.
 - a) How do you represent chemical changes in chemistry?
 - b) What should you know to write a chemical equation?
 - c) How are reactants and products separated in a chemical equation?
2.
 - a) Is it essential to write balanced chemical equation?
 - b) What will happen if it is not balance?
 - c) How do you know that the equation is not balance?
3.
 - a) What happens when calcium carbonate is heated?
 - b) What is this reaction called?
 - c) Does decomposition take place only on heating?
4.
 - a) What is oxidation?
 - b) Can we call a chemical reaction an oxidation reaction in which hydrogen is removed?
 - c) Give an example of everyday life where redox reaction takes place.
5.
 - a) What is corrosion?
 - b) Give an example.
 - c) What are the requirements for corrosion?

ORAL QUESTIONS

1. What is opposite to combination reaction?
2. To pack food articles, why do manufacturers flush out oxygen with nitrogen?
3. What is spoiling of food called when kept for a long time?
4. What is the chemical reaction called in which heat is evolved?
5. Silver articles get black coating. Name the phenomenon.
6. Which gas is evolved when acid is added to lime water?
7. When a more reactive metal displaces a less reactive metal in solution, what is the reaction called?
8. What sign (+ or -) is given to exothermic reaction?