

Chemical Reactions and Equations

CHAPTER 1



TRY YOURSELF

ANSWERS

1. When a chemical reaction takes place, some changes are observed. The easily observable changes such as change in physical state, change in colour, evolution of a gas that take place in a chemical reaction are called the characteristics of the chemical reaction.

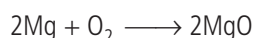
2. The food that we eat is broken down into simpler substances like glucose on digestion. The air we breathe during respiration oxidises glucose into CO_2 and water along with release of heat that provides us required energy. As energy is released, the reaction is exothermic.

Photosynthesis is considered to be an endothermic reaction because it absorbs the Sun's energy to enable the reaction to happen.

3. When quick lime is added to water, slaked lime, Ca(OH)_2 is formed. Heat is evolved in this reaction.

4. A balanced chemical equation is the equation which contains an equal number of atoms of each element on both the sides of the equation.

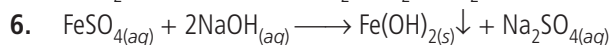
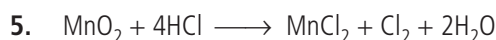
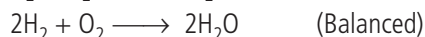
For example, balanced chemical equation for burning of magnesium with oxygen to form magnesium oxide is written as :



A balanced chemical equation must obey the law of conservation of mass. This means that the total mass of the reactants and products participating in an equation must be the same.

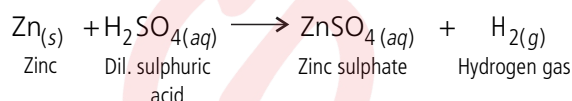
An unbalanced chemical equation is the equation in which the number of atoms of the elements on the both sides of the equation is not the same.

For example, formation of water by the reaction between hydrogen and oxygen.



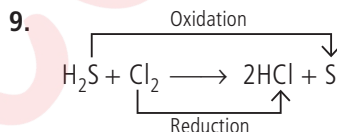
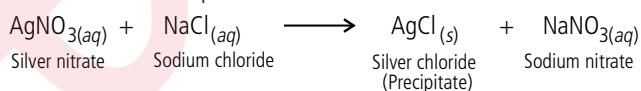
7. Oxidation or reduction cannot take place alone. This is because if one substance loses oxygen, *i.e.*, undergoes reduction, there must be another substance to take up this oxygen, *i.e.*, undergoes oxidation. Similarly, if one substance loses hydrogen, *i.e.*, undergoes oxidation, there must be another substance to take up this hydrogen, *i.e.*, undergoes reduction. Hence, oxidation and reduction always take place together. That is why, these reactions are called redox reactions.

8. A displacement reaction may be defined as, "the chemical reaction in which one element takes the position or place of another element present in a compound." In these reactions, an atom or group of atoms in a molecule is replaced by another atom or a group of atoms. These reactions occur mostly in solution form and a more active metal displaces or removes another less active element or metal to form a compound.



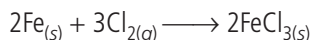
In this case, H^+ ions (in H_2SO_4) are replaced by Zn^{2+} ions (in ZnSO_4).

A double displacement reaction may be defined as, "the chemical reaction in which two reactants exchange ions to form two new compounds."

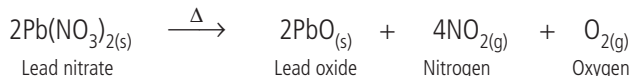


Oxidising agent : Cl_2 , Reducing agent : H_2S

10. A combination reaction may be defined as, "the reaction in which two or more substances combine to form a single substance under suitable conditions."



A decomposition reaction may be defined as, "the reaction in which a single substance splits into two or more simple substances under suitable conditions."



11. The presence of water and oxygen are necessary conditions for rusting of an iron article.

12. The slow oxidation of oils and fats present in food materials resulting in some bad smelling compounds is called rancidity.

13. (i) Painting the iron article.

(ii) Greasing or oiling the iron article. Both cover the surface of iron and cut off direct contact of air and moisture with the iron surface.

14. In the rainy season, due to attack of oxygen, carbon dioxide and water vapours on copper, a green coloured basic copper carbonate, $\text{CuCO}_3 \cdot \text{Cu(OH)}_2$ is formed on the copper vessel.

