Chemical Changes and Reactions

Exercise

Question 1.(1986)

Explain : Silver nitrate solution is kept in coloured reagent bottles in the laboratory.

Answer:

$$2AgNO_3 \xrightarrow{\text{sunlight}} 2Ag + 2NO_2 + O_2$$

Silver nitrate gets decomposed by sunlight. Hence silver nitrate is stored in coloured reagent bottles.

Question 1.(1987)

Give an example of an endothermic reaction.

Answer:

$N_2 + O_2 \rightleftharpoons^{\Delta} 2NO - \Delta T$ is endothermic reaction.

Question 1.(1988)

State in each case if the reaction represents oxidation or reduction

(*i*) $Fe^{++} \rightarrow Fe^{+++}$; (*ii*) $Cl^- \rightarrow Cl$; (*iii*) $Cu^{++} \rightarrow Cu$; (*iv*) $Ag \rightarrow Ag^+$; (*v*) $H \rightarrow H^+$; (*vi*) $Al \rightarrow Al^{+++}$.

Answer:

(*i*) $Fe^{++} \rightarrow Fe^{+++}$ is oxidation [∵ loss of electron]

(*ii*) $Cl^- \rightarrow Cl$ is reduction [∵ gain of electron]

(*iii*) $Cu^{++} \rightarrow Cu$ is reduction

(*iv*) $Ag \rightarrow Ag^+$ is oxidation

(*v*) $H \rightarrow H^+$ is oxidation

(*vi*) $Al \rightarrow Al^{+++}$ is oxidation

Question 1.(1989)

Reactions can be classified as : Direct combination, decomposition, simple displacement, double decomposition, Redox reactions. State which of the following types, takes place in the reactions given below

1. $Cl_2 + 2KI \rightarrow 2KCl + I_2$

2. $2Mg + O_2 \rightarrow 2MgO$
3. $SO_2 + 2H_2O + Cl_2 \rightarrow 2HCl + H_2SO_4$
4. $AgNO_3 + HCl \rightarrow AgCl + HNO_3$
5. $4HNO_3 \rightarrow 4NO_2 + 2H_2O + O_2$

Answer:

1. $Cl_2 + 2KI \rightarrow 2KCl + I_2$ — Simple displacement
2. $2Mg + O_2 \rightarrow 2MgO$ — Direct combination
3. $SO_2 + 2H_2O + Cl_2 \rightarrow 2HCl + H_2SO_4$ — Redox reaction
4. $AgNO_3 + HCl \rightarrow AgCl + HNO_3$ — Double decomposition
5. $4HNO_3 \rightarrow 4NO_2 + 2H_2O + O_2$ — Decomposition reaction

Question 1.(1990)
Give one reason why magnetizing a piece of steel is a physical change.

Answer:
There is no change in composition.

Question 1.(1993)
State whether the following are oxidation or reduction
(*i*) $Fe^{++} \rightarrow Fe^{+++}$ (*ii*) $Na \rightarrow Na^{+}$

Answer:
(*i*) $Fe^{++} \rightarrow Fe^{+++}$ — Oxidation
(*ii*) $Na \rightarrow Na^{+}$ — Oxidation

Additional Questions

Question 1.
Explain the term chemical reaction with special reference to reactants and products.

Answer:
Chemical change : "Is reprsentation of a chemical change in substances taking part and are called reactants written on left side of →

$$\underbrace{Zn + \text{dil. } 2HCl}_{\text{reactants}} \longrightarrow \underbrace{ZnCl_2 + H_2}_{\text{products}}$$

When Zn react with dil HCl, new substance ZnCl and H_2 are produced as a result of chemical change reactants are seperated by + sign and products formed are also separated by + sign.

Question 2.
Give a suitable example with equation to show the representation of a chemical reaction.

Answer:

Iron and sulphuric acid dilute which react to produce ferrous sulphate and hydrogen gas can be represented by a chemical equation.
Iron + dil. sulphuric acid → ferruous sulphate and hydrogen

$$\underset{\text{reactants}}{Fe + \text{dil. } H_2SO_4} \longrightarrow \underset{\text{products}}{FeSO_4 + H_2}$$

Question 3.
A chemical reaction is often accompanied by external indications or characteristics.
Give two examples where a chemical reaction is accompanied by a change in colour of the reactants & products on completion of the reaction.
Answer:
A chemical reaction is accompanied by change in colour of reactants and products

(i) $\underset{\text{magnesium}}{Mg} + \underset{\substack{\text{Blue}\\ \text{copper sulphate}}}{CuSO_4} \longrightarrow \underset{\substack{\text{colourless}\\ \text{magnesium sulphate}}}{MgSO_4} + \underset{\text{copper}}{Cu}$

(ii) $2Pb[NO_3]_2 \longrightarrow \underset{\substack{\text{litharge}\\ \text{(yellow)}}}{2PbO} + 4NO_2 + O_2$

(iii) $\underset{\text{colourless}}{Pb[NO_3]} + 2KI \longrightarrow \underset{\text{yellow ppt.}}{PbI_2 \downarrow} + 2KNO_3$

Question 4.
Give balanced equations for reactions involving evolution of a gas on addition of dilute acid to

(a) sodium sulphite
(b) calcium carbonate.

Answer:
(a) Sodium sulphite when react with dil. H_2SO_4 evolves gas SO_2.

$$\underbrace{Na_2SO_3 + \text{dil. } H_2SO_4} \longrightarrow Na_2SO_4 + H_2O + SO_2\,(g)$$

(b) When sodium carbonate reacts with dil. H_2Cl, gas evolved in CO_2

$$\overbrace{Na_2CO_3 + 2HCl \text{ dil.}} \longrightarrow 2NaCl + H_2O + CO_2\,(g)$$

Question 5.
Give a balanced equation for conversion of

(a) an ammonium salt to a basic gas
(b) a soluble lead salt to an insoluble lead salt – formed as a white precipitate.

Answer:
(a) Ammonium salt [NH_4Cl] on heating produces $NH_3(g)$ which is a basic gas

$$NH_4Cl \underset{cool}{\overset{heat}{\rightleftharpoons}} NH_3 + HCl$$

(ammonia gas)

(b) Lead nitrate when reacts with sodium chloride insoluble white ppt. of lead chloride is formed

$$Pb[NO_3]_2 + 2NaCl \longrightarrow PbCl_2 \downarrow + 2NaNO_3$$

colourless — white ppt.

Question 6.
Chemical reactions may proceed with evolution or absorption of heat. Give an example of each.

Answer:
Chemical reaction is characterised by evolution of heat :

$$C + O_2 \longrightarrow CO_2 + Heat$$

carbon — oxygen — carbon dioxide

Chemical reaction is characterised by absorption of heat :

$$N_2 + O_2 + \xrightarrow{3000^\circ C} 2NO\ (g)$$

nitrogen — oxygen — nitrogen monoxide

Question 7.
Define the following types of chemical changes or reactions with a suitable example each.

(a) Direct combination reaction or synthesis
(b) Decomposition reaction
(c) Displacement reaction or substitution reaction
(d) Double decomposition reaction

Answer:
(a) Direct Combination Reaction Of Synthesis :
"Those reactions in which two or more substances [element or elements and compound or compounds] combine and form a new substance"
$H_2 + O_2 \rightarrow H_2O$ Hydrogen combines with oxygen to produce a new substance water.
(b) Decomposition Reaction :
"Those reactions in which a compound splits up into two or more simpler substances"

$$CaCO_3 \xrightarrow[\text{Decomposition}]{\Delta} CaO + CO_2$$

calcium carbonate (lime stone) — calcium oxide (quick lime) — carbon dioxide

(c) Displacement Reaction Or Substitution Reaction :

"Those reactions in which one element takes place of another element in a compound, are known as substitution reactions."

$$Zn + CuSO_4 \longrightarrow ZnSO_4 + Cu$$

silver white — blue solution — colourless solution — red brown

(d) Double-De-Composition Reaction :

"Those reactions in which two compounds react by an exchange of ions to form two new compounds are called double displacement reactions."

$$AgNO_3 + NaCl \longrightarrow AgCl + NaNO_3$$

silver nitrate — sodium chloride — white ppt. (silver chloride) — sodium nitrate

Question 8.

Give a balanced equation for a direct combination reaction involving :

(a) Two elements — one of which is a neutral gas and the other a yellow non¬metal
(b) Two elements – one of which is a neutral gas and the other a monovalent metal
(c) Two compounds – resulting in formation of a weak acid

Answer:

(a) Direct Combination of two elements one of which is a neutral gas and the other a yellow non-metal

$$S + O_2 \longrightarrow SO_2$$

sulphur (yellow-non-metal) — neutral gas — sulphur dioxide

(b) Direct Combination of two elements one of which is a neutral and the other a monovalent metal

$$4Na + O_2 \longrightarrow 2Na_2O$$

(sodium monovalent metal) — neutral gas — sodium oxide

(c) Direct Combination of two compounds to form weak acid.

$$\underset{\text{compound}}{CO_2} + \underset{\text{compound}}{H_2O} \longrightarrow \underset{\text{carbonic acid (a weak acid)}}{H_2CO_3}$$

Question 9.
Give balanced equations for the following reactions of synthesis involving formation of :

(a) An acid – from sulphur dioxide gas
(b) An alkali – from a basic oxide – sodium oxide
(c) A salt – from a trivalent metal and a coloured gas.

Answer:

(a) Acid from sulphur dioxide gas.

$$SO_2 + H_2O \longrightarrow \underset{\text{sulphurous acid}}{H_2SO_3}$$

Or

$$2SO_2 + O_2 \longrightarrow \underset{\text{sulphur trioxide}}{2SO_3}$$

When SO_3 is dissolved in water

$$SO_3 + H_2O \longrightarrow \underset{\text{sulphuric acid}}{H_2SO_4}$$

Or Oxidation of aqueous solution of sulphur dioxide with oxygen.

$$2SO_2 + 2H_2O + O_2 \longrightarrow 2H_2SO_4$$

(b) Na_2O (metal oxide) is basic oxide

To obtain alkali from Na_2O, dissolve basic oxide in water

$$Na_2O + H_2O \longrightarrow \underset{\text{alkali}}{2NaOH}$$

(c) A salt from trivalent metal Fe^{3+} or Al^{3+} and Cl_2 (coloured gas)

$$2Al + 3Cl_2 \longrightarrow \underset{\text{salt (aluminium chloride)}}{2AlCl_3}$$

$$2Fe + 3Cl_2 \longrightarrow \underset{\text{salt (ferric chloride)}}{2FeCl_3}$$

Question 10.
Convert — **(a)** nitrogen to ammonia **(b)** hydrogen to hydrogen chloride – by a direct combination reaction.
Answer:
By direct combination reaction :
(a) Nitrogen to ammonia

$$N_2 + 3H_2 \underset{}{\overset{\Delta}{\rightleftharpoons}} 2NH_3 + \Delta$$

ammonia

(b) Hydrogen to hydrogen chloride

$$H_2 + Cl_2 \xrightarrow[\text{sun light}]{\text{diffused}} 2HCl$$

hydrogen chloride

Question 11.
Give balanced equations for thermal decomposition of :

(a) lead carbonate
(b) lead nitrate
(c) ammonium dichromate
(d) mercury [II] oxide
(e) calcium hydroxide

Answer:
Decomposition of :

(a) Lead carbonate $[PbCO_3]$

$$PbCO_3 \longrightarrow PbO + CO_2$$

(b) Lead nitrate $Pb[NO_3]_2$

$$2Pb[NO_3]_2 \xrightarrow{\text{heat}} 2PbO + 4NO_2 + O_2$$

(c) Ammonium dichromate $[(NH_4)_2\ Cr_2\ O_7]$

$$(NH_4)_2\ Cr_2\ O_7 \longrightarrow Cr_2O_3 + 4H_2O + N_2$$

(d) Mercury [II] oxide [HgO]

$$2HgO \xrightarrow{\Delta} 2Hg + O_2$$

Question 12.
Define – a thermal dissociation reaction with a suitable example. Give an example of a photochemical decomposition reaction. Name a metallic oxide which on thermal decomposition is reduced to a metal.

Answer:
Thermal Dissociation :
"A decomposition reaction — in which a substance dissociates — into two or more simpler substances on application of heat."

$$NH_4Cl \underset{\text{cool}}{\overset{\text{heat}}{\rightleftharpoons}} NH_3 + HCl$$

Photochemical decomposition reaction : decomposition in presence of light.

$$2H_2O_2 \xrightarrow{\text{sun light}} 2H_2O + O_2$$

hydrogen per oxide

Metal oxide on thermal decomposition reduces to metal :

$$2HgO \xrightarrow{\Delta} 2Hg + O_2$$

mercury (II) oxide metal mercury

$$2Ag_2O \xrightarrow{\Delta} 4Ag + O_2$$

Question 13.
Define a displacement reaction with a suitable example. State how it is represented. Give a reason why zinc displaces hydrogen from dilute sulphuric acid but copper docs not.

Answer:
Displacement reaction : "Is a chemical reaction in which an element [or radical] replaces another element in a compound."

$$Cl_2 + 2KBr \longrightarrow 2KCl + Br_2$$

Displacement reaction is represented by

$$A + BC \longrightarrow B + AC$$

Zinc (more electropositive) and being above [H] in activity series displaces hydrogen from dilute sulphuric acid but copper is below [H] in electrochemical series cannot displace hydrogen from sulphuric acid.

Question 14.
Explain the term double decomposition — precipitation reaction. Give a balanced equation for the preparation of two different insoluble lead salts from their salt solutions by — double decomposition — precipitation.

Answer:
Double decomposition reaction is precipitation reaction.
i. e. in which ppt. is formed

"Reaction between two compounds in aqueous state, to give two new compounds one of which is precipitate (or insoluble)."

(i) $Pb[NO_3] + Na_2SO_4 \longrightarrow 2NaNO_3 + PbSO_4 \downarrow$

lead nitrate sol. sodium sulphate sol. soluble salt sod. nitrate ppt. lead sulphate

(ii) $Pb[NO_3]_2 + 2NaCl \longrightarrow 2NaNO_3 + PbCl_2 \downarrow$

sodium chloride sol. sodium nitrate (soluble) lead (II) chloride ppt.

Question 15.
Explain with the help of balanced equations, how precipitation reactions are used for identifying the positive radicals in three different salts, each having a different cation [positive ion].

Answer:
Precipitation reactions are used to identify the positive ions from their colours.

$CuSO_4 + 2NaOH \longrightarrow Na_2SO_4 + Cu[OH]_2 \downarrow$

pale blue ppt.

identified ion is Cu^{2+}

$FeCl_3 + 3NaOH \longrightarrow 3NaCl + Fe[OH]_3 \downarrow$

reddish brown ppt.

identified ion is Fe^{3+}

$Pb[NO_3] + 2NaOH \longrightarrow 2NaNO_3 + Pb[OH]_2 \downarrow$

chalky white ppt.

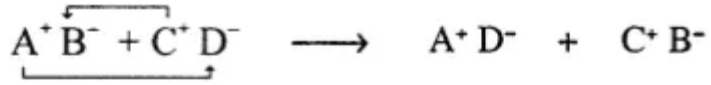
identified ion is Pb^{2+}

Question 16.
Define the term – double decomposition – neutralization reaction with a suitable representation.

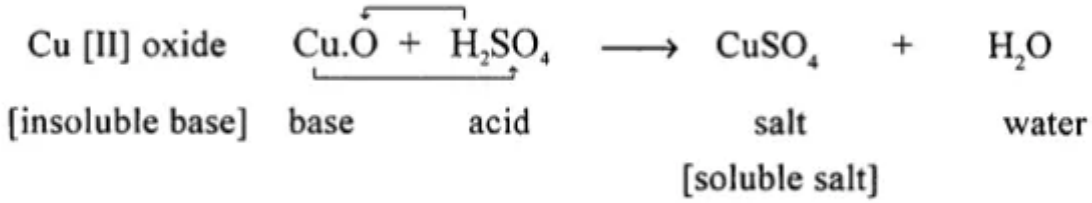
Convert :
(a) an insoluble base
(b) a soluble base to their respective soluble salts by neutralization reaction.

Answer:
When acid reacts with a base salt and water are formed and this is called Neutralisation.
Double-decomposition — Neutralisation reaction :
"Is the chemical reaction between two compounds (acid and base) to interchange radicals and produce salt and water."

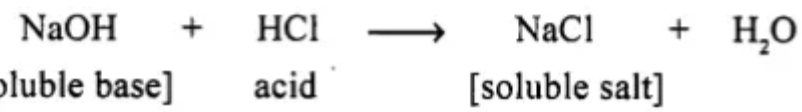
This is represented as :



(a) **To convert :** Insoluble base to soluble salt :



(b) **Soluble base to soluble salt :**



Question 17.
Explain the term energy changes in a chemical change or reaction. Give an example with a balanced equation, for each of the following reactions:

(a) exothermic reaction
(b) endothermic reaction
(c) photochemical reaction
(d) electrochemical reaction.

Answer:
Energy Changes In A Chemical Reaction :
"Is the difference between the chemical energy of the REACTANTS and the PRODUCTS".

Example of :

(a) Exothermic reaction :

(i) $N_2 + 3H_2 \underset{}{\overset{\Delta}{\rightleftharpoons}} 2NH_3 + \text{Heat}$

(ii) $4NH_3 + 5O_2 \xrightarrow{\Delta} 4NO + 6H_2O + \Delta T$

(b) Endothermic reaction :

(i) $N_2 + O_2 \xrightarrow{\Delta} 2NO - \Delta T$

(ii) $C + H_2O \xrightarrow{\Delta} CO + H_2 - \Delta T$

(c) Photochemical reaction :

(i) $H_2 + Cl_2 \xrightarrow{\text{sun light}} 2\,HCl$

Slow reaction in diffused sun light

Explosive reaction in direct sun light

(ii) $6CO_2 + 12H_2O \xrightarrow[\text{sun light}]{\text{chlorophyll}} C_6H_{12}O_6 + 6H_2O + 6H_2$

(d) Electro chemical reaction :

(i) $2H_2O \xrightarrow[\text{current}]{\text{electric}} 2H_2 + O_2$

acidified — at cathode — at anode

(ii) $NaCl \underset{\text{fused}}{\overset{\text{electric current}}{\rightleftharpoons}} \underbrace{Na^{1+} + Cl^{1-}}_{\text{Ions}}$

At Cathode : $Na^{1+} + e^- \longrightarrow Na$ (metal)

At Anode : $2Cl^{1-} - 2e^- \longrightarrow Cl_2$

Question 18.
Supply of energy maybe required to initiate a reaction. State the different forms with a suitable example of reactions initiated by supply of energy.

Answer:

To Start A Reaction Energy Needed In The Form :

(i) Heat : $CaCO_3 \xrightleftharpoons{\Delta} CaO + CO_2 - \Delta T$

(ii) Sunlight : $H_2 + Cl_2 \xrightarrow{\text{sun light}} 2HCl$

$4\,Ag\,Br \xrightarrow{\text{sun light}} 2Ag_2\,Br + Br_2$

(iii) Electric current : $2H_2O \xrightarrow[\text{(Acidified)}]{\text{electric current}} 2H_2 + O_2$

$NaCl \xrightleftharpoons{\text{electric current}} Na^{1+} + Cl^{1-}$

fused [ions]

Chemical Changes & Reactions – Unit Test Paper 2

Q.1. Complete the statements by filling in the blank with the correct word/s :

Question 1.
Direct combination reaction of sulphur dioxide with water gives [H_2SO_4/H_2SO_3/$H_2S_2O_7$].

Answer:
Direct combination reaction of sulphur dioxide with water gives **H_2SO_3.**

Question 2.
Formation of hydrogen chloride from hydrogen and chlorine is an example of [photochemical reaction/electrochemical reaction].

Answer:
Formation of hydrogen chloride from hydrogen and chlorine is an example of **photochemical reaction.**

Question 3.
The reaction of hydrogen burning in oxygen to give a neutral liquid is an example of [exothermic/ endothermic] reaction.

Answer:
The reaction of hydrogen burning in oxygen to give a neutral liquid is an example of **exothermic** reaction.

Question 4.
The neutral gas evolved when lead nitrate undergoes thermal decomposition is [nitrogen dioxide/oxygen/nitrogen].

Answer:
The neutral gas evolved when lead nitrate undergoes thermal decomposition is nitrogen **dioxide.**

Question 5.
The reddish brown precipitate obtained during a double decomposition precipitation reaction between an iron salt and an alkali is [iron [III] hydroxide/iron [III] hydroxide]

Answer:
The reddish brown precipitate obtained during a double decomposition – precipitation reaction between an iron salt and an alkali is iron **[III] hydroxide.**

Q.2. Select the correct answer from A, B, C, D and E for each statement given below :
A : Ammonia
B : Hydrogen chloride
C : Hydrogen
D : Nitrogen dioxide
E : Nitric oxide
State the gaseous product formed, when

Question 1.
An active metal reacts with dilute sulphuric acid.

Answer:
C : Hydrogen

Question 2.
A metallic nitrate undergoes thermal decomposition giving a coloured gas.

Answer:
D : Nitrogen dioxide

Question 3.
Two gases one of them neutral, combines by absorption of light energy.

Answer:
B : Hydrogen chloride

Question 4.
An ammonium salt reacts with an alkali.

Answer:
A: Ammonia

Question 5.
An exothermic reaction takes place between ammonia and a neutral gas.

Answer:
E : Nitric oxide

Q.3. Give a balanced equation for each of the following types of reactions :

Question 1.
A direct combination reaction between phosphorus and a neutral gas.

Answer:
Phosphorus with neutral gas (O_2)

$$4P + 5O_2 \longrightarrow 2P_2O_5$$

phosphorus pentoxide

Question 2.
A soluble salt of lead formed from an insoluble base by double decomposition – neutralisation.

Answer:
Soluble salt of lead formed from insoluble base by double-decomposition by neutralization.

$$PbO + 2HNO_3 \longrightarrow Pb[NO_3]_2 + H_2O$$

insoluble base nitric acid salt

Question 3.
A thermal decomposition reaction of a salt – which results in the formation of nitrogen gas.

Answer:
Thermal decomposition of a salt with the formation of nitrogen gas.

$$(NH_4)_2Cr_2O_7 \xrightarrow{\Delta} Cr_2O_3 + 4H_2O + N_2$$

ammonium dichromate (orange) chromic oxide (green) nitrogen gas

Question 4.
A synthesis reaction between a metal & a non-metal resulting in formation of an insoluble salt of iron.

Answer:
Synthesis reaction between a metal and non-metal to form insoluble salt of iron [FeS]

$$Fe + S \longrightarrow FeS$$

metal non-metal iron sulphide

Question 5.
A decomposition reaction of a salt which leaves behind a silvery metal.

Answer:

Decomposition reaction of a salt leaving behind a silvery metal.

$$2AgNO_3 \xrightarrow{\Delta} 2Ag + 2NO_2 + O_2$$

silvery residue

$$2AgCl \xrightarrow{\text{sun light}} 2Ag + Cl_2$$

silvery residue

Q.4. Differentiate between the following :

Question 1.
Synthesis reaction & a substitution reaction.

Answer:
Synthesis and substitution reaction :

- **Synthesis reaction :** "Is a chemical reaction in which two or more elements or an element and a compound or two compound combine to form a new compound."

  $$2Al + 3Cl_2 \longrightarrow 2AlCl_3$$

- **Substitution reaction :** "Is a chemical reaction takes place when an element or radical (more reactive) replaces another element in a compound."

  $$A + BC \longrightarrow B + AC$$

  $$Mg + CuSO_4 \longrightarrow Cu + MgSO_4$$

Question 2.
Electrolytic decomposition & photochemical decomposition.

Answer:
Electrolytic decomposition and photochemical decomposition :

- **Electrolytic decomposition :** "A chemical reaction which takes place with absorption of — electrical energy"

  $$2H_2O \xrightarrow[\text{current}]{\text{electric}} 2H_2 + O_2$$

  collected at cathode anode

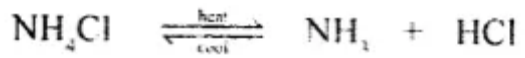
- **Photochemical decomposition :** "A chemical reaction which takes place with absorption of light energy :

  $$H_2 + Cl_2 \xrightarrow{\text{sunlight}} 2HCl$$

Question 3.
Thermal decomposition & thermal dissociation.

Answer:
Thermal decomposition and thermal dissociation.

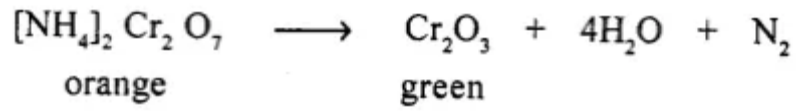
- **Thermal decomposition :** "A chemical reaction in which a compound decomposes into two new substance by heat." It is not reversible reaction.
  $CaCO_3 \xrightarrow{\triangle} Cao + CO_2$
- **Thermal dissociation :** "Is decomposition of a compound into two or more new substances by heat energy." It is reversible reaction.



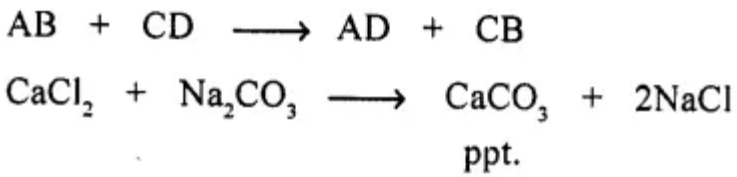
Question 4.
Decomposition reaction & a double decomposition reaction

Answer:
Decomposition reaction and double decomposition reaction :

- **Decomposition reaction :** A compound decomposes into two or more new substances.



- **Double-decomposition :** "Two substances exchange their ions and two new substances are produced one of which is insoluble i.e. ppt."



Question 5.
Neutralization reaction & a precipitation reaction.

Answer:
Neutralization reaction and a precipitation reaction :
Neutralization reaction "is a double — decomposition reaction in which acid neutralizes a base and salt and water is formed."

$$\underset{\text{Base}}{NaOH} + \underset{\text{acid}}{HCl} \longrightarrow \underset{\text{salt}}{NaCl} + \underset{\text{water}}{H_2O}$$

Precipitation reaction : "is a double-decomposition reaction in which one product is ppt."

$$\underset{\text{ferrous sulphate}}{FeSO_4} + \underset{\text{sodium hydroxide}}{2NaOH} \longrightarrow Na_2SO_4 + \underset{\text{ppt. dirty green}}{Fe[OH]_2 \downarrow}$$

Q.5. Match the chemical reactions in List I with the appropriate answer in List II. List I

List I	List II
1. $AB \underset{}{\overset{heat}{\rightleftharpoons}} A + B$	A : Double decomposition
2. $AB \longrightarrow A + B$	B : Thermal dissociation
3. $X^+Y^- + AB^+B^- \rightarrow X^+B^- + A^+Y^-$	C : Endothermic reaction
4. $X + YZ \rightarrow XZ + Y$	D : Displacement reaction
5. $X + Y \xrightarrow{heat} XY - \Delta$	E : Decomposition reaction

Answer:

(i) $AB \underset{}{\overset{Heat}{\rightleftharpoons}} A + B$	B : Thermal dissociation
(ii) $AB \longrightarrow A + B$	E : Decomposition reaction
(iii) $X^+Y^- + A^+B^- \longrightarrow X^+B^- + A^+Y^-$	A : Double-decomposition
(iv) $X + YZ \longrightarrow XZ + Y$	D : D is placement reaction
(v) $X + Y \xrightarrow{heat} XY - \Delta$	C : Endothermic reaction

Q.6. Name the solid residual product formed in each reaction and state its colour during – thermal decomposition of the following substances.

1. Copper nitrate.
2. Ammonium dichromate.
3. Zinc carbonate.
4. Lead nitrate.
5. Calcium hydroxide.

Answer:
Solid residual product of thermal decomposition of :

(i)	Copper nitrate is copper oxide	CuO	Black
(ii)	Ammonium dichromate is	Cr_2O_3	Green
		chromium oxide or chromic oxide	
(iii)	Zinc carbonate	ZnO	White
		zinc oxide	
(iv)	Lead nitrate	PbO	Yellow
		litharge lead oxide	
(v)	Calcium hydroxide	CaO	White
		calcium oxide (quick lime)	