

Chemical Change and Chemical Bond

EXERCISE [PAGES 42 - 94]

Exercise | Q 1.1 | Page 94

Complete the statement by filling the gaps using appropriate term.

An _____ is drawn in between the reactants and products while writing the equation for a chemical reaction.

Solution: An arrow is drawn in between the reactants and products while writing the equation for a chemical reaction.

Exercise | Q 1.2 | Page 94

Complete the statement by filling the gaps using appropriate term.

Rusting of iron is a _____ chemical change.

Solution: Rusting of iron is a slow chemical change.

Exercise | Q 1.3 | Page 94

Complete the statement by filling the gaps using appropriate term

The spoiling of food is a chemical change which is recognized from the generation of certain _____ due to it.

Solution: The spoiling of food is a chemical change which is recognized from the generation of certain smell due to it.

Exercise | Q 1.4 | Page 94

Complete the statement by filling the gaps using appropriate term.

A colourless solution of calcium hydroxide in a test tube turns _____ on blowing in it through a blow tube for some time.

Solution: A colourless solution of calcium hydroxide in a test tube turns milky on blowing in it through a blow tube for some time.

Exercise | Q 1.5 | Page 94

Complete the statement by filling the gaps using appropriate term.

The white particles of baking soda disappear when put in lemon juice. This means that it is a _____ change.

Solution: The white particles of baking soda disappear when put in lemon juice. This means that it is a chemical change.

Exercise | Q 1.6 | Page 94

Complete the statement by filling the gaps using appropriate term

Oxygen is a..... in respiration.

Solution: Oxygen is a reactant in respiration.

Exercise | Q 1.7 | Page 94

Complete the statement by filling the gaps using appropriate term.

Sodium chloride is _____ compound while hydrogen chloride is _____ compound.

Solution: Sodium chloride is ionic compound while hydrogen chloride is covalent compound.

Exercise | Q 1.8 | Page 94

Complete the statement by filling the gaps using appropriate term

Electron _____ is complete in each hydrogen in a hydrogen molecule.

Solution: Electron duplet is complete in each hydrogen in a hydrogen molecule.

Exercise | Q 1.9 | Page 94

Complete the statement by filling the gaps using appropriate term

Chlorine (Cl₂) molecule is formed by..... of electrons between two chlorine atoms.

Solution: Chlorine (Cl₂) molecule is formed by sharing of electrons between two chlorine atoms.

Exercise | Q 2.1 | Page 94

Explain by writing a word equation.

Respiration is a chemical change.

Solution: Chemical change is a process in which a new substance is formed.

- Respiration is irreversible process
- During respiration, oxygen is converted into carbon-dioxide(a new substance is formed).

- During respiration, there is change in their chemical composition.
- During respiration, absorption and evolution of energy takes place.

These are characteristics of chemical reaction. Hence, respiration is a chemical reaction.

Exercise | Q 2.2 | Page 94

Explain by writing a word equation.

Hard water gets softened on mixing with a solutions of washing soda.

Solution: Sodium carbonate, Na_2CO_3 , is also known as **washing soda**. It can remove temporary and permanent hardness from **water**. Sodium carbonate is soluble but calcium carbonate and magnesium carbonate are insoluble.

The carbonate ions from sodium carbonate reacts with calcium and magnesium ions in the water to produce insoluble precipitate.

For example:



The **water** is softened because it no longer contains dissolved calcium ions and magnesium ions.

Exercise | Q 2.3 | Page 94

Explain by writing a word equation.

Lime stone powder disappears on adding to dilute hydrochloric acids.

Solution: Limestone is predominantly Calcium carbonate(CaCO_3). When calcium carbonate reacts with 10% solution of HCl. Then Calcium chloride is formed as a salt along with water and carbon dioxide gas (brisk effervescence).



In this reaction, we add hydrogen ions (H^+), which will react with the carbonate ion to form hydrogen carbonate HCO_3^- ions, which are soluble in water and the limestone will dissolve.

Exercise | Q 2.4 | Page 94

Explain by writing a word equation.

Bubbles are seen on adding lemon juice to baking soda.

Solution: Bubbles are seen on adding lemon juice to baking soda because lemon juice is citric acid and baking soda is sodium bicarbonate. On adding lemon juice in baking soda, we add acid in base then neutralization reaction is taking place resulting in the formation of salt ,water and brisk effervescence of carbon-dioxide.This CO_2 is released in the form of bubbles.

$\text{H}_3\text{C}_6\text{H}_5\text{O}_7(\text{aq}) + 3 \text{NaHCO}_3(\text{aq}) \rightarrow \text{Na}_3\text{C}_6\text{H}_5\text{O}_7(\text{aq}) + 3\text{H}_2\text{O}(\text{l}) + 3\text{CO}_2(\text{g})$ citric acid + baking soda \rightarrow salt + water + carbon dioxide

Exercise | Q 3 | Page 94

Match the pairs.

a. Photosynthesis	i. Tendency to lose electrons
b. Water	ii. Reactant in combustion process
c. Sodium chloride	iii. Chemical change
d. Dissolution of salt in water	iv. Covalent bond
e. Carbon	v. Ionic bond
f. Fluorine	vi. physical change
g. Magnesium	vii. Tendency to form anion

Solution:

a. Photosynthesis	i. Chemical change
b. Water	ii. Covalent bond
c. Sodium chloride	iii. Ionic bond
d. Dissolution of salt in water	iv. Physical change
e. Carbon	v. Reactant in combustion process
f. Fluorine	vi. Tendency to form anion
g. Magnesium	vii. Tendency to lose electrons

Exercise | Q 4.1 | Page 94

Show with the help of diagram of electronic configuration how the following compound are formed from the constituent atoms.

Sodium chloride

Solution: Step 1 : Write the symbols of the radicals.

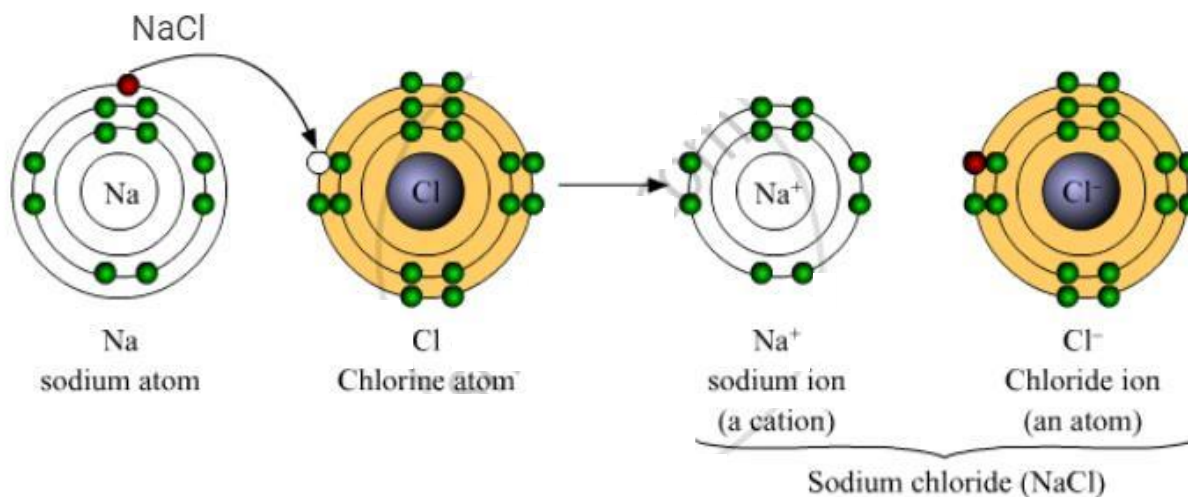
Na Cl

Step 2 : Write the valency below the respective radical.

Na Cl
1 1

Step 3 : Cross-multiply symbols of radicals with their respective valency.

Step 4 : Write down the chemical formula of the compound.



Exercise | Q 4.2 | Page 94

Show with the help of diagram of electronic configuration how the following compound are formed from the constituent atoms.

Potassium fluoride

Solution: Step 1 : Write the symbols of the radicals.

K F

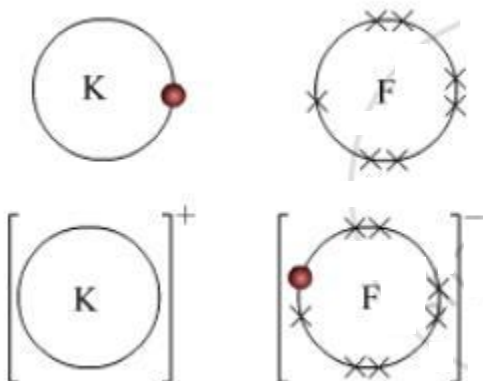
Step 2 : Write the valency below the respective radical.

K F
1 1

Step 3 : Cross-multiply symbols of radicals with their respective valency.

Step 4 : Write down the chemical formula of the compound.

KF



K F

The compound potassium fluoride consists of potassium (K⁺) ion and fluoride (F⁻) ion

Exercise | Q 4.3 | Page 94

Show with the help of diagram of electronic configuration how the following compound are formed from the constituent atoms.

Water

Solution: Step 1 : Write the symbols of the radicals.

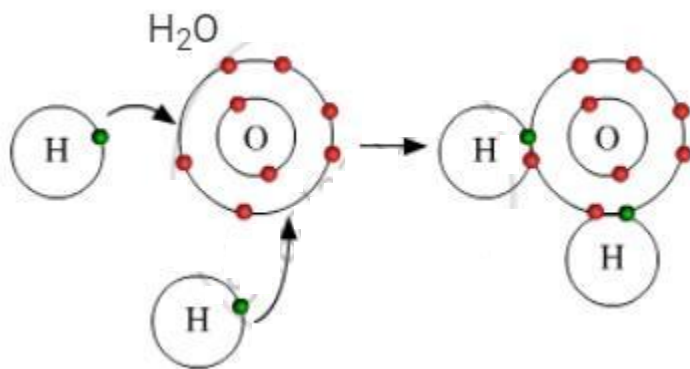
H	O
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Step 2 : Write the valency below the respective radical.

H	O
1	2

Step 3 : Cross-multiply symbols of radicals with their respective valency.

Step 4 : Write down the chemical formula of the compound.



Exercise | Q 4.4 | Page 94

Show with the help of diagram of electronic configuration how the following compound are formed from the constituent atoms.

Hydrogen chloride

Solution: Step 1 : Write the symbols of the radicals.

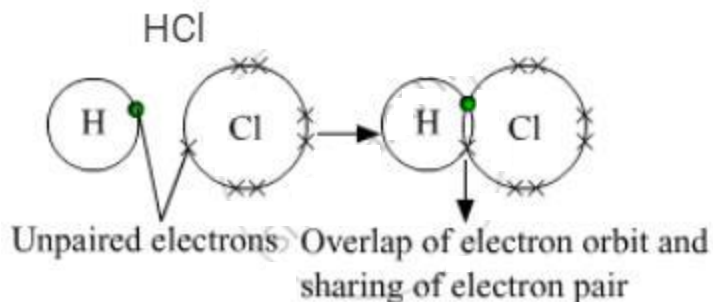
H	Cl
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Step 2 : Write the valency below the respective radical.

H	Cl
1	1

Step 3 : Cross-multiply symbols of radicals with their respective valency.

Step 4 : Write down the chemical formula of the compound.



Exercise | Q 7.1 | Page 42

In term of electron transfer, define Oxidation

Solution: Oxidation is the loss of electrons during a reaction by a molecule, atom or ion. In terms of electron transfer, oxidation is defined as the phenomenon in which an atom loses electron to form a positively charged cation.

During formation of ionic bond one atom undergoes oxidation while another atom undergoes reduction.

Exercise | Q 7.2 | Page 42

In term of electron transfer, define Reduction

Solution: Reduction is defined as the phenomenon in which an atom gains electron to form a negatively charged ion called anion.

During formation of ionic bond one atom undergoes oxidation while another atom undergoes reduction.