



# SHIKSHA CLASSES

Sub. : Science

Answer Paper

Marks : 20

Std. : VIII<sup>th</sup> - S.B. 13. Chemical Change and Chemical Bond

**Q.1(A) : Choose the correct alternative**

2

1) Sodium atoms and sodium ions .....

Ans : b) have the same number of protons

2) An ionic bond is formed when .....

Ans : c) a metallic element reacts with a non-metallic element

**Q.1(B) : Solve any one of the following question**

1

1) State true or false.

The preparation of cold drink soda lemon is a physical change.

Ans : False

2) Write Correlation

Ans : K : 2,8,8,1 :: Mg : 2.8.2

3) Give two examples of ionic compounds.

Ans : Sodium Chloride(NaCl), Potassium fluoride(KF)

**Q.2(A) : Give reason (Any One)**

2

1) Ionic compounds are formed due to the combination of metallic and nonmetallic atoms.

Ans : Metallic atoms have a tendency to lose electrons from their outermost orbits to establish the octet state in their penultimate orbits. Conversely, nonmetallic atoms gain electrons to establish the octet state of their outermost orbits.

When a metallic atom and a nonmetallic atom come close together, the metallic atom loses electrons and gets converted into positively charged ion, while the nonmetallic atom gets converted into negatively charged ions so formed, develop an ionic bond and this results in the formation of an ionic compound. Hence, ionic compounds are formed due to the combination of metallic and nonmetallic atoms.

2) Combustion of fuel is a fast and irreversible chemical change.

Ans : Wood, coal, petrol or cooking gas are burnt for producing energy. Carbon is the common substance that burns in all these fuels. The product carbon dioxide is formed when carbon combines with oxygen in the air during the combustion process. We cannot obtain fuel from carbon dioxide by employing any other method. Properties of carbon dioxide are altogether different from those of fuel. Hence, this change is a irreversible chemical change.

**Word equation:**

Carbon + Oxygen → Carbon dioxide

**Q.2(B): Solve any two of the following question.**

4

**1) Match the columns:**

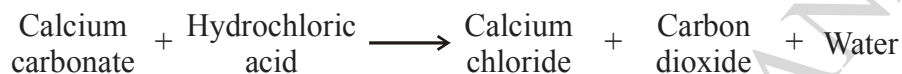
**Ans :**

Column I	Column II
1. Respiration	c. Carbon dioxide and water
2. Acid + Base	d. Salt and water
3. Photosynthesis	b. Glucose and oxygen
4. Ionic bond	a. Potassium and fluorine

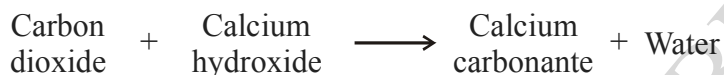
**2) Dilute hydrochloric acid is used for cleaning Shahabad tiles. Explain.**

**Ans :** The main constituent of Shahabad tile is calcium carbonate. During its cleaning with hydrochloric acid, the upper layer of the tile reacts with hydrochloric acid and three products are formed. One of them is calcium chloride, which being soluble in water, gets washed away with water. The second product is carbon dioxide, it mixes with air. The third product is water.

**Word equation:**



**3) Write a chemical equation (unbalanced) for the following reactions:**



**Ans :** **Chemical equation :**  $\text{CO}_2 + \text{Ca(OH)}_2 \rightarrow \text{CaCO}_3 + \text{H}_2\text{O}$

**4) Distinguish between the following: Physical change and Chemical change:**

**Ans :**

Physical change	Chemical change
1. Only physical changes like odour, physical state, density, volume etc. changed and chemical properties remain unchanged	1. The chemical composition and chemical properties undergo a change
2. No new substance is formed in a physical change.	2. A new substance is formed in a physical change.
3. Very little or no energy in the form of heat, light or sound is usually absorbed or given out in a physical change	3. A chemical change is always accompanied by absorption or evolution of energy
4. It is a temporary change	4. It is a permanent change
5. The original form of substance can be regained by simple physical method	5. Original substance cannot be obtained by simple physical method
6. It is reversible	6. It is irreversible

**Q.3 : Solve any Two of the following question**

6

**1) Write the difference between Ionic bond and covalent bond.**

**Ans : Ionic bond:**

The ionic bond is the electrostatic force of attraction between two oppositely charged ions. Ionic bonds join metals to non-metals.

Examples of ionic bonds are sodium chloride, magnesium chloride, magnesium oxide, etc.

**Covalent bond:**

A covalent bond is formed from the mutual sharing of one or more pairs of electrons between two atoms.

**For Example :**  $\text{Glucose} + \text{Oxygen} \xrightarrow{\text{respiration}} \text{Carbon dioxide} + \text{Water}$

$\text{O}_2, \text{N}_2, \text{Cl}_2$

**2) Write a word equation for**

**a) Hard water gets softened on mixing with a solution of washing soda**

**Ans :** Calcium Chloride + Sodium Carbonate  $\rightarrow$  Calcium Carbonate + Sodium Chloride

**b) Bubbles are seen on adding lemon juice to baking soda.**

**Ans :** Citric acid + Sodium bicarbonate  $\rightarrow$  Carbon dioxide + Sodium bicarbonate

**c) Respiration is a chemical change.**

**Ans :** Glucose + Oxygen  $\rightarrow$  Carbon dioxide + water

**3) Define the following:**

**Ans :** **a) Chemical change :** In a chemical change, the chemical composition of the original matter changes and new substances having different properties and different chemical composition are formed.

**b) Ionic bond:** The chemical bond formed due to an electrostatic force of attraction between the oppositely charged cation and anion is called an ionic bond or an electrovalent bond.

**c) Covalent bond:** The chemical bond formed by sharing of valence electrons of two atoms with each other is called a covalent bond.

**4) Explain softening of hard water.**

**Ans :** Some wells or tube wells have hard water. It is brackish to taste and does not form lather with soap. This is because of hard water contains the chloride and sulphate salts of calcium and magnesium in dissolved state. To soften the hard water a solution of washing soda is added to it. This results in a chemical reaction to form a precipitate of insoluble carbonate salts of calcium and magnesium. As the dissolved salts of calcium and magnesium go out in the form of precipitate of the carbonate salts the water is softened. The following equation can be written for this chemical change.

**word equation:**

Calcium Chloride + Sodium Carbonate  $\rightarrow$  Calcium Carbonate + Sodium Chloride

**Q.4 : Solve any One of the following question.**

5

**1) Classify the following changes into physical and chemical change.**

**Ans :** **a) Ripening of mango** - Chemical change

**b) melting of ice** - Physical change

**c) boiling of water** - Physical change

**d) dissolution of salt in water** - Physical change

**e) Ripening of banana** - Chemical change

f) fragrance on ripening fruit -Chemical change

g) darkening of a cut potato -Chemical change

h) bursting of an inflated balloon-Chemical change

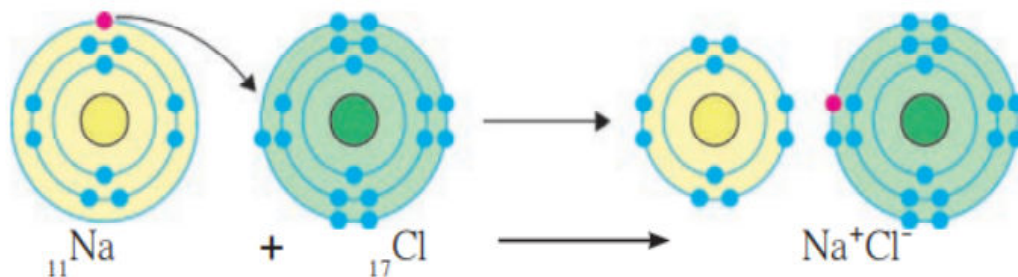
i) sound of bursting fire cracker -Chemical change

j) foul smell from a portion of spoiled food-Chemical change

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

a) Sodium Chloride

Ans:



1. Sodium has atomic number 11 and electronic configuration 2, 8, 1.

2. Sodium atom has 1 electron in its outermost shell.

3. It loses one electron from its outermost shell, i.e., M shell. Then its L shell becomes the outermost shell with a stable octet. The nucleus of sodium atom has 11 protons but the number of electrons in the atom has become 10. So, there is a net unit positive charge giving a sodium cation (Na<sup>+</sup>).

4. On the other hand, chlorine has electronic configuration 2, 8, 7. Chlorine atom has 7 electrons in its outermost shell and requires one electron to complete its octet.

5. Thus, the electron lost by sodium is taken up by chlorine.

6. When chlorine atom gains one electron, octet of chlorine is completed and its K, L, M shells have together 18 electrons and the nucleus has 17 protons. This leads to the formation of an ion (Cl<sup>-</sup>).

7. Thus, a chlorine atom accepts one electron from a sodium atom and consequently a chloride ion with one unit negative charge and a sodium ion with one unit positive charge are formed.

8. Sodium and chloride ions, being oppositely charged, attract each other due to the electrostatic force of attraction. An ionic bond is formed and this results in the formation of sodium chloride (NaCl) molecule.

\* \* \*

# BECOME AN ACE IN JEE & NEET



**SHIKSHA CLASSES**

Believe & Achieve

**JEE | NEET | Previsa (8-10)**

📞 8625055707 | 8623085707    🌐 [shikshaclasses.co.in](https://shikshaclasses.co.in)

M-19, MHADA Colony, Khat Road, Bhandara



Learn with Jaiswal sir