

Class Notes

Class-8 Chemistry

Chapter-2 Physical and Chemical Changes

Long – Answer Questions:

Q1. Give two examples to show that the mass of the individual substances undergoing a chemical change is altered. How do these changes obey the law of conservation of mass?

A1. The mass of the individual substances undergoing a chemical change is altered is proved by following two examples-

Example-1: When carbon is burnt in air, the mass of carbon is reduced and finally the carbon vanishes. In fact, all the carbon gets converted to carbon dioxide. But the mass of the carbon used plus the mass of the oxygen taken up from air is the same as that of the carbon dioxide formed.

Example-2: The mass of an iron nail increases when the nail rusts. But the mass of the original nail plus that of the oxygen and moisture taken up from the air is the same as that of the rusted nail.

From the above two examples it is clear that total mass of the reactants is the same as that of the products. Thus, these changes obey the law of conservation of mass.

Q2. State the differences between physical and chemical changes.

A2.

Physical change	Chemical change
1. A physical change is temporary.	1. A chemical change is permanent.
2. A physical change is reversible.	2. A chemical change is irreversible.
3. No new substances are formed after a physical change.	3. New substances are formed after a chemical change.
4. After a physical change, the mass of the substances remains unaltered.	4. The mass of the individual substances undergoing a chemical change is altered.

Q3. Discuss an example to show that physical and chemical changes can occur together.

A3. When a candle burns the wax under the wick melts. The molten wax flows down and solidifies. These are changes in state and, therefore, physical change. A part of the molten wax that vaporizes burns to form carbon dioxide and water vapour. The burning of wax is a chemical change.

Thus, physical and chemical changes can occur together.

Q4. Giving one example of each kind, show that a change in energy takes place when a physical or a chemical change occurs.

A4. Example for energy change in a physical change -

Change in state- Energy changes take place during a change in state. A solid absorbs heat in order to melt and a liquid absorbs heat in order to change into vapour. Thus, these are endothermic changes.

On being cooled, gases and vapours condense and liquids freeze. Heat is given out in these processes. So, these are exothermic changes.

Example for energy change in a chemical change-

Photosynthesis- In photosynthesis, chlorophyll absorbs sunlight (energy), and helps the plant produce glucose and oxygen from water and carbon dioxide.

Q5. Explain why there is an energy change in a change of state of matter as well as in a chemical change.

A5. Why an energy change in a change of state- This happens because the kinetic energy possessed by the molecules of a substance is different in different states. It is the lowest in the solid state, higher in the liquid state and the highest in the gaseous state. So, energy (heat) will be absorbed by a solid to melt and a liquid to boil or vaporise. And heat will be evolved by vapours to condense and a liquid to freeze.

Why an energy change in a chemical change- A chemical change involves a rearrangement of atoms. The reactant molecules break up and the product molecules are formed. These processes are not only opposite in nature but involve different amounts of energy too. So, in the overall process, there is either a surplus or a deficit of energy. If there is a surplus, energy will be given out and if there is a deficit, energy will be taken in. So, there is a change in energy in a chemical change.