

Board – CBSE

Class – 7th

Topic – Physical and Chemical Changes

1. Classify the changes involved in the following processes as physical or chemical changes.

- (a) Photosynthesis (b) Dissolving sugar in water (c) Burning of coal (d) Melting of wax
(e) Beating aluminium to make aluminium foil (f) Digestion of food

Ans. (a) Photosynthesis → Chemical change

(b) Dissolving sugar in water → Physical change

(c) Burning of coal → Chemical change

(d) Melting of wax → Physical change

(e) Beating aluminium to make aluminium foil → Physical change

(f) Digestion of food → Chemical change

2. State whether the following statements are true or false. In case a statement is false, write the corrected statement in your notebook.

(a) Cutting a log of wood into pieces is a chemical change. (True/False)

(b) Formation of manure from leaves is a physical change. (True/ False)

(c) Iron pipes coated with zinc do not get rusted easily. (True/False)

(d) Iron and rust are the same substances. (True/False)

(e) Condensation of steam is not a chemical change. (True/False)

Ans. (a) False

Cutting a log of wood into pieces is a physical change.

(b) False

Formation of manure from leaves is a chemical change.

(c) True

(d) False

Iron and rust are different substances. Rust is iron oxide (Fe_2O_3).

(e) True

3. Fill in the blanks in the following statements.

- (a) When carbon dioxide is passed through lime water, it turns milky due to the formation of _____.
- (b) The chemical name of baking soda is _____.
- (c) Two methods by which rusting of iron can be prevented are _____ and _____.
- (d) Changes in which only _____ properties of a substance change are called physical changes.
- (e) Changes in which new substances are formed are called _____ changes.

- Ans.** (a) When carbon dioxide is passed through limewater, it turns milky due to the formation of calcium carbonate (CaCO₃).
- (b) The chemical name of baking soda is sodium hydrogen carbonate.
- (c) Two methods by which rusting of iron can be prevented are galvanization and painting.
- (d) Changes in which only physical properties of a substance change are called physical changes.
- (e) Changes in which new substances are formed are called chemical changes.

- 4.** When baking soda is mixed with lemon juice, bubbles are formed with the evolution of a gas. What type of change is it? Explain.

- Ans.** When baking soda (Sodium hydrogen carbonate) is mixed with lemon juice (citric acid), bubbles are formed. The bubbles are formed due to the evolution of carbon dioxide gas. This is a chemical change.

In this change, citric acid contained in lemon juice reacts with sodium hydrogen carbonate which results in the evolution of carbon dioxide gas.

Lemon juice (Citric acid) + Baking soda (Sodium hydrogen carbonate) → Carbon dioxide + Other substances.

- 5.** When a candle burns, both physical and chemical changes take place. Identify these changes. Give another example of a familiar process in which both the chemical and physical changes take place.

- Ans.** When a candle burns, both physical and chemical changes take place.

Physical change → Melting of wax

Chemical change → Burning of wax

Eating of food is another example where both physical and chemical changes occur simultaneously.

Physical change → Breaking down of larger food particles into smaller particles

Chemical change → Digestion of food.

6. How would you show that setting of curd is a chemical change?

Ans. Once the curd is formed, milk cannot be re-obtained from it. Also, both milk and curd have different properties. Since these are the properties of a chemical change, setting of curd is a chemical change.

7. Explain why burning of wood and cutting it into small piece are considered as two different types of changes.

Ans. When we burn wood, a new substance, coal, is formed. Therefore, it is a chemical change. However, when we cut wood, only the shape and size of the wood are changed. No new substance is formed. Therefore, it is a physical change.

8. Describe how crystals of copper sulphate are prepared.

Ans. Crystals of copper sulphate are prepared by the method of crystallization. The process is as follows. A cupful of water is taken in a beaker. Few drops of dilute sulphuric acid are added to this. The water is then heated and when it starts boiling, copper sulphate powder is added with stirring. Copper sulphate powder should be added on till the solution becomes saturated. It is then filtered into a china dish and allowed to cool. The solution should be kept undisturbed. Slowly, the crystals of copper sulphate separate out.

9. Explain how painting of an iron gate prevents it from rusting.

Ans. Rusting is aided by both moisture (water) and air (oxygen). By painting an iron gate, we prevent its contact from the air and moisture present in the atmosphere. Hence, rusting is prevented.

10. Explain why rusting of iron objects is faster in coastal areas than in deserts.

Ans. Both air and moisture are required for rusting to take place. In coastal areas, the quantity of moisture present in air is more than that in deserts. In desert areas, the amount of moisture in air is even lower. Therefore, rusting of iron objects is faster in coastal areas than in deserts.

11. The gas we use in the kitchen is called liquefied petroleum gas (LPG). In the cylinder it exists as a liquid. When it comes out from the cylinder it becomes a gas (Change – A) then it burns (Change – B). The following statements pertain to these changes. Choose the correct one.

- (i) Process – A is a chemical change.
- (ii) Process – B is a chemical change.
- (iii) Both processes A and B are chemical changes.
- (iv) None of these processes is a chemical change.

Ans. (ii) Process – B is a chemical change.

12. Anaerobic bacteria digest animal waste and produce biogas (Change – A).

The biogas is then burnt as fuel (Change – B). The following statements pertain to these changes. Choose the correct one.

- (i) Process – A is a chemical change.
- (ii) Process – B is a chemical change.
- (iii) Both processes A and B are chemical changes.
- (iv) None of these processes is a chemical change.

Ans. (iii) Both processes A and B are chemical changes.