

# Physical and Chemical Changes

**Q.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 aluminum to make aluminum foil.
- (f) Digestion of food

**Sol:**

- (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 aluminum to make aluminum foil.-Physical Change
- (f) Digestion of food- Chemical Change

**Q.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 of 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 same substance. (True/False)
- (e) Condensation of steam is not a chemical change. (True/False)

**Sol:**

- (a) Cutting of log of wood into pieces is a chemical change. (False)  
Correct Statement: Cutting of log of wood into pieces is a physical change.
- (b) Formation of manure from leaves is a physical change. (False)  
Correct Statement: Formation of manure from leaves is a chemical change.
- (c) Iron pipes coated with zinc do not get rusted easily. (True)
- (d) Iron and rust are same substance. (False)  
Correct Statement: Iron and rust are two different chemical substances.
- (e) Condensation of steam is not a chemical change. (True)

**Q.3 Fill in the blanks in the following statements:**

- (a) When carbon dioxide is passed through lime water, it turns milky due to 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.

**Sol:** Fill in the blanks in the following statements:

- (a) When carbon dioxide is passed through lime water, it turns milky due to formation of **calcium carbonate**.
- (b) The chemical name of baking soda is **sodium hydrogen carbonate**.
- (c) Two methods by which rusting of iron can be prevented are **painting or greasing** and **galvanization**.
- (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**.

**Q.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.**

**Sol:** When baking soda is mixed with lemon juice, bubbles are formed with the evolution of a gas. It is a chemical change. Here, a new substance carbon dioxide is formed.

Lemon juice + Baking soda -----> CO<sub>2</sub> (Gas) + Other substance (Sodium hydrogen carbonate)

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

**Sol:** When candle burns, both physical and chemical changes occur. The wax of the candle first melts then vaporizes and burns.

Melting of wax is a physical and when wax burns, smoke and carbon dioxide gas is formed which are new substances. So, it is also a chemical change.

LPG is another example of physical and chemical change. When LPG comes out from a cylinder, it converts from liquid to gas. And when we burn it in air, it is a chemical change.

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

**Sol:** When we add some curd to milk and keep it overnight, it turns into curd. We cannot get the original substance milk back from this curd. Curd is a different substance than milk. Therefore, formation of curd is a chemical change.

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

**Sol:** If we burn the wood, this process produces ash and smoke. The properties of wood are changed and new substances are formed. So, it is a chemical change.

When a wood is cut into small pieces, there is no new substance formed. Each small piece is wood. So, it is a physical change. So, burning and cutting of wood are two different types of changes.

**Q.8 Describe how crystals of copper sulphate are prepared.**

**Sol:** Take a cup of water in a beaker and a few drops of dilute sulphuric acid are added into it. The water is heated. When it starts boiling add copper sulphate powder slowly till then no more powder can be dissolved. Now, the solution is allowed to cool down. Crystals of copper sulphate slowly form at the bottom of the beaker.

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

**Sol:** When an iron gate is painted the layer of paint prevents the contact between air, moisture and iron. For rusting, iron must be in contact with both air and moisture. Thus, it prevents rusting.

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

**Sol:** For rusting, iron must be in contact with both air and moisture. In coastal areas there is lots of moisture in the environment due to the sea. But, in desert air is almost dry due to lack of water. So, rusting is faster in coastal areas than in deserts.

**Q.11 The gas we use in the kitchen is called liquefied petroleum gas (LPG). In the cylinder it exists as 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.

**Sol:** (ii) Process – B is a chemical change.

**Q.12 Aerobic 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.

**Sol:** (iii) Both processes A and B are chemical changes.