

Science

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(Chapter – 6) (Physical and Chemical Changes)

(Class – VII)

Exercises

Question 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

Answer 1:

Physical Changes:

(b) Dissolving sugar in water, (d) Melting of wax, (e) Beating Aluminium to make Aluminium foil.

Chemical Changes:

(a) Photosynthesis, (c) Burning of coal, (f) Digestion of food

Question 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)

Answer 2:

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

Question 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.

Answer 3:

- (a) When carbon dioxide is passed through lime water, it turns milky due to the formation of **Calcium carbonate (CaCO₃)**.
- (b) The chemical name of baking soda is **Sodium bicarbonate (NaHCO₃)**.
- (c) Two methods by which rusting of iron can be prevented are **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.

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Question 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.

Answer 4:

This is a chemical change as new products are formed.

Baking soda + Lemon juice -----> Salt + Carbon dioxide + Water

When acid reacts with carbonates, salt is formed releasing carbon dioxide and water.

Question 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.

Answer 5:

Physical Changes: On heating, candle wax gets melted is a physical change. Since it again turns into solid wax on cooling.

Chemical Changes: The wax near to flame burns and gives new substances like Carbon Dioxide, Carbon soot, water vapour, heat and light.

Cooking of food, is another example where both physical and chemical changes occur.

Question 6:

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

Answer 6:

Setting of curd is a chemical change since a new substance (lactic acid) is formed which differs in taste from the original substance (fats and proteins) i.e. milk. Also the change is irreversible (curd cannot be converted into milk).

Question 7:

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

Answer 7:

Burning of wood is a chemical change because wood on burning converted to new substances like ash (carbon), carbon dioxide gas, water vapour, heat and light. The change is irreversible.

While cutting of wood in smaller pieces is a physical change because the original composition of wood does not change. No new substances are formed.

Question 8:

Describe how crystals of copper sulphate are prepared.

Answer 8:

Crystals of copper sulphate are prepared as follows:

- Take a water in a beaker and add a few drops of dilute sulphuric acid.
- Heat the water. When it starts boiling add copper sulphate powder slowly with continuous stirring.
- Continue adding copper sulphate powder till saturation level.
- Filter the solution and left for cooling.
- Leave undisturbed the solution when it is cooling.
- We can observe the crystals of copper sulphate after few hours.

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Question 9:

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

Answer 9:

For rusting, the presence of both oxygen and water (or water vapour) is required. The coat of the paint prevents direct contact of iron with air and oxygen and thus prevents it from rusting.

Question 10:

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

Answer 10:

For rusting, the presence of both oxygen and moisture (water vapour) is required. In coastal areas the quantity of moisture content in air is high (highly humid) as compared to desert regions (low humid), so the rusting becomes faster in coastal areas.

Question 11:

The gas we use in the kitchen is called liquified petroleum gas (LPG). In the cylinder it exist 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.

Answer 11:

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

Question 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.

Answer 12:

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