

Class 7 Solutions Science Chapter 5 Changes Around Us: Physical and Chemical

Let Us Enhance Our Learning

Q1. Which of the following statements are the characteristics of a physical change?

- (i) The state of the substance may or may not change.
- (ii) A substance with different properties is formed.
- (iii) No new substance is formed.
- (iv) The substance undergoes a chemical reaction.

Answer:

(c) (i) and (iii)

In a physical change, the substance undergoes a change in physical properties such as size, shape, or state (e.g., solid to liquid) but no new substance is formed. No chemical reaction occurs.

Physical Changes



Q2. Predict which of the following changes can be reversed and which cannot be reversed. If you are not sure, you may write that down. Why are you not sure about these?

- (i) Stitching cloth to a shirt
- (ii) Twisting of straight string
- (iii) Making idlis from a batter
- (iv) Dissolving sugar in water
- (v) Drawing water from a well
- (vi) Ripening of fruits
- (vii) Boiling water in an open pan
- (viii) Rolling up a mat
- (ix) Grinding wheat grains to flour
- (x) Forming of soil from rocks



Answer:

Reversible Changes	Irreversible Changes
(ii) Twisting of straight string (can untwist)	(i) Stitching cloth to a shirt (cannot unstitched without damage)
(iv) Dissolving sugar in water (can be reversed by evaporation)	(iii) Making idlis from a batter (cannot return to its original batter)
(v) Drawing water from a well (water can be replaced)	(vi) Ripening of fruits (cannot reverse the ripening)
(viii) Rolling up a mat (can be unrolled)	(vii) Boiling water in an open pan (cannot return to its original liquid form)
	(ix) Grinding wheat grains to flour (irreversible)
	(x) Forming of soil from rocks (occurs over a long period and cannot be reversed)

Q3. State whether the following statements are True or False. In case a statement is False, write the correct statement.

(i) Melting of wax is necessary for burning a candle.

Answer: True

(ii) Collecting water vapour by condensing involves a chemical change.

Answer: False

Collecting water vapour by condensing is a physical change.



(iii) The process of converting leaves into compost is a chemical change.

Answer: True

(iv) Mixing baking soda with lemon juice is a chemical change.

Answer: True

Q4. Fill in the blanks in the following statements:

(i) Nalini observed that the handle of her cycle has got brown deposits. The brown deposits are due to _____, and this is a _____ change.

Answer: Rusting, chemical



(ii) Folding a handkerchief is a _____ change and can be _____.

Answer: Physical, reversed

(iii) A chemical process in which a substance reacts with oxygen with evolution of heat is called _____, and this is a _____ change.

Answer: Combustion, chemical

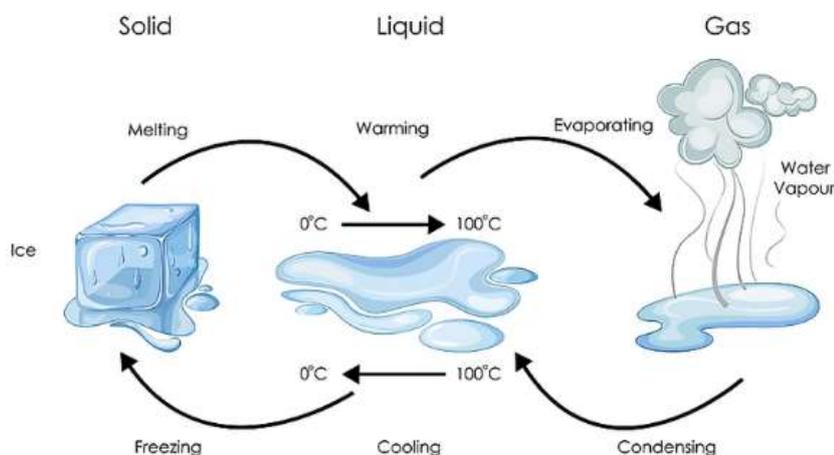


(iv) Magnesium, when burnt in air, produces a substance called _____. The substance formed is _____ in nature. Burning of magnesium is a _____ change.

Answer: Magnesium oxide, basic, chemical

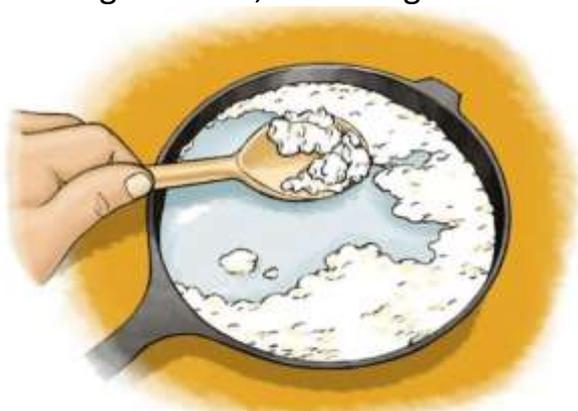
Q5. Are the changes of water to ice and water to steam, physical or chemical? Explain.

Answer: Both are **physical changes** because no new substances are formed when water changes its state. Water changes from a liquid to a solid (ice) when frozen, and from a liquid to a gas (steam) when heated. In both cases, the molecular structure of water remains the same.



Q6. Is curdling of milk a physical or chemical change? Justify your statement.

Answer: When milk curdles, it changes its chemical structure. The proteins in the milk react with **acid** (like lemon juice or vinegar) or the natural **bacteria** (as in the case of yogurt) and form curds. This process is not reversible—once the milk curdles, you cannot change it back to its original form, indicating a **chemical change**.



In a **physical change**, the substance's state or appearance might change, but no new substance is formed. However, curdling results in the formation of new substances, so it is a chemical change.

Q7. Natural factors, such as wind, rain, etc., help in the formation of soil from rocks. Is this change physical or chemical and why?

Answer: The process of soil formation from rocks, influenced by natural factors such as wind, rain, and temperature changes, involves both **physical and chemical changes**. Here's why:

Physical Change

The **breaking down** of rocks into smaller particles due to weathering by wind, rain, and temperature is a **physical change**. The rock is simply being broken into smaller pieces without any change in its chemical composition.

Chemical Change

Over time, water, air, and other substances can react with the minerals in the rocks, leading to the **chemical weathering** of rocks. For example, rainwater, which is slightly acidic, can react with minerals like calcium in the rocks to form new compounds, like calcium carbonate, causing a **chemical change** in the rock.

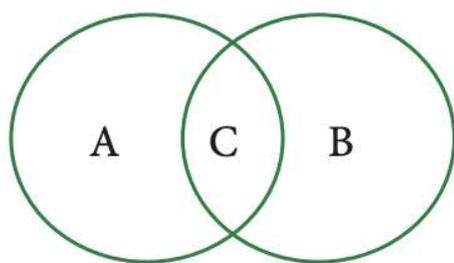
Q8. Read the following story titled 'Eco-friendly Prithvi', and tick the most appropriate option(s) given in the brackets. Provide a suitable title of your choice for the story.

Prithvi is preparing a meal in the kitchen. He chops vegetables, peels potatoes, and cuts fruits (**physical changes/chemical changes**). He collects the seeds, fruits, and vegetable peels into a clay pot (**physical changes/chemical changes**). The fruits, vegetable peels, and other materials begin to decompose due to the action of bacteria and fungi, forming compost (**physical change/chemical change**). He decides to plant seeds in the compost and water them regularly. After a few days, he notices that the seeds begin to germinate and small plants start to grow, eventually blooming into colourful flowers (**physical change/chemical change**). His efforts are appreciated by all his family members.

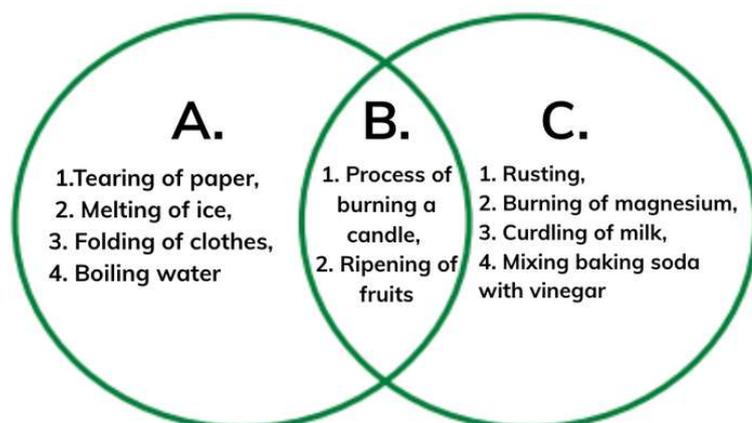
Answer:

- Chopping vegetables, peeling potatoes, and cutting fruits: **Physical changes**
- Collecting seeds, fruits, and vegetable peels into a clay pot: **Physical change**
- Decomposing and forming compost: **Chemical change**
- Germination and blooming flowers: **Chemical change**

Q9. Some changes are given here. Write physical changes in the area marked 'A' and chemical changes in the area marked 'B'. Enter the changes which are both physical and chemical in the area marked 'C'.



Answer:



Q10. The experiments shown in Fig. 5.11a, b, c, and d were performed. Find out in which case(s) did lime water turn milky and why?

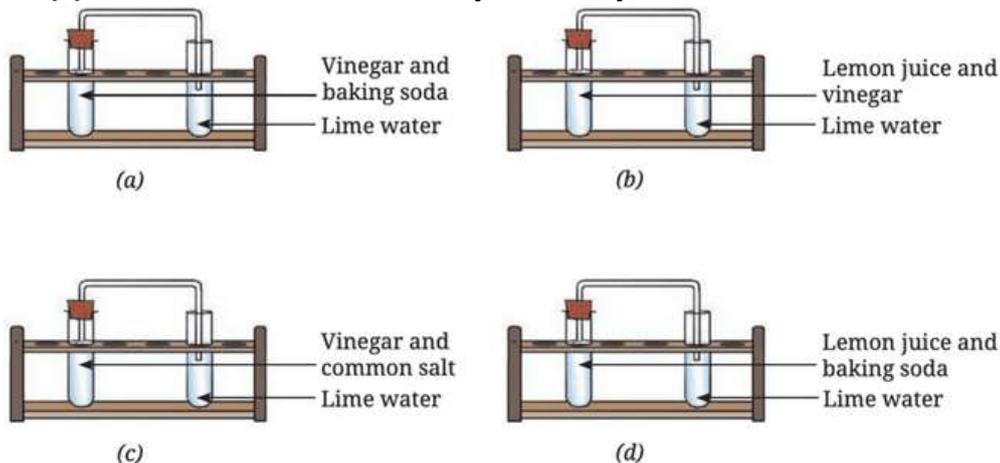


Fig. 5.11

Answer:

Vinegar and Baking Soda (a):

- When **baking soda** reacts with **vinegar (acetic acid)**, it produces **carbon dioxide gas (CO₂)**.
- The CO₂ will react with the lime water and turn it **milky** because calcium hydroxide in lime water reacts with CO₂ to form calcium carbonate.

Vinegar and Common Salt (b):

- There is no reaction between **vinegar** and **common salt** that produces carbon dioxide.
- Therefore, **lime water will not turn milky** in this case.

Lemon Juice and Vinegar (c):

- Both **lemon juice** and **vinegar** are acids, but they do not produce carbon dioxide when mixed.
- Therefore, **lime water will not turn milky** in this case.

Lemon Juice and Baking Soda (d):

- **Baking soda** reacts with **lemon juice (citric acid)** to produce **carbon dioxide gas**.
- The CO₂ will react with the lime water, causing it to turn **milky**.

Conclusion

Lime water turns milky in experiment **(a) (Vinegar and Baking Soda)** and experiment **(d)**

(Lemon Juice and Baking Soda) because these reactions produce carbon dioxide, which reacts with lime water to form calcium carbonate.

