

St. Andrews Scots Sr. Sec. School

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Session: 2025– 2026

(Answer Key)

^c
Class: VII

Subject: Science

Chapter: Physical and Chemical change

CHECK POINT 1

1. (T) 2. (T) 3. (F) 4. (F)

CHECK POINT 2

1. milky 2. sulphide 3. chemical 4. Air; moisture (water) 5. Supersaturated

PRACTICE TIME

A. Choose the correct options :

1. (a) 2. (b) 3. (a) 4. (d) 5. (c)

B. Assertion-Reason type questions :

1. (b) 2. (a) 3. (b) 4. (d)

C. State whether the following statements are true or false :

1. (T) 2. (T) 3. (F) 4. (F) 5. (F)

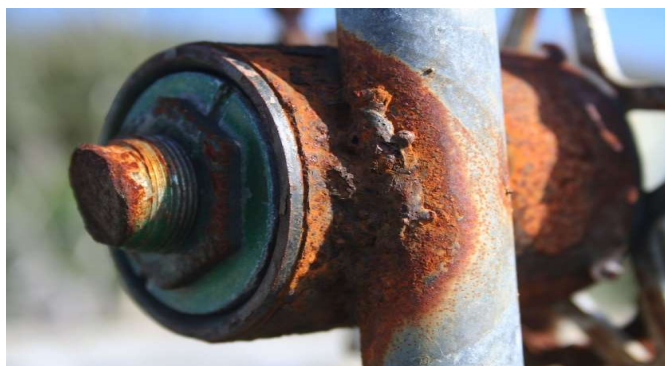
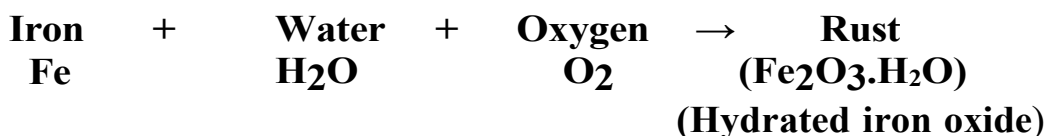
D. Very short answer type questions :

1. Magnesium burns with a dazzling white flame.
2. Stainless steel does not rust.
3. Inflating a balloon is a physical change.
4. Chemical change.
5. Spoiling of food and rotting of an egg.

E. Short answer type questions :

1. **Physical changes:** Melting of butter and stretching a rubber.
Chemical changes: Rusting of iron and burning of coal.

2. Rust is a reddish-brown substance that appears on the surface of iron articles when they are left exposed to moist air.



RUSTING OF IRON

3. Souring of milk is a chemical change because a new substance called lactic acid is formed.
4. The process of mixing two or more metals or metals and nonmetals to make alloy is called alloying.
5. The process of forming crystals from a solution is called crystallisation.
6. By galvanisation, a layer of zinc is deposited on iron article. This coating of zinc does not allow the iron article to come in contact with air and moisture, and prevents rusting.

F. Long answer type questions :

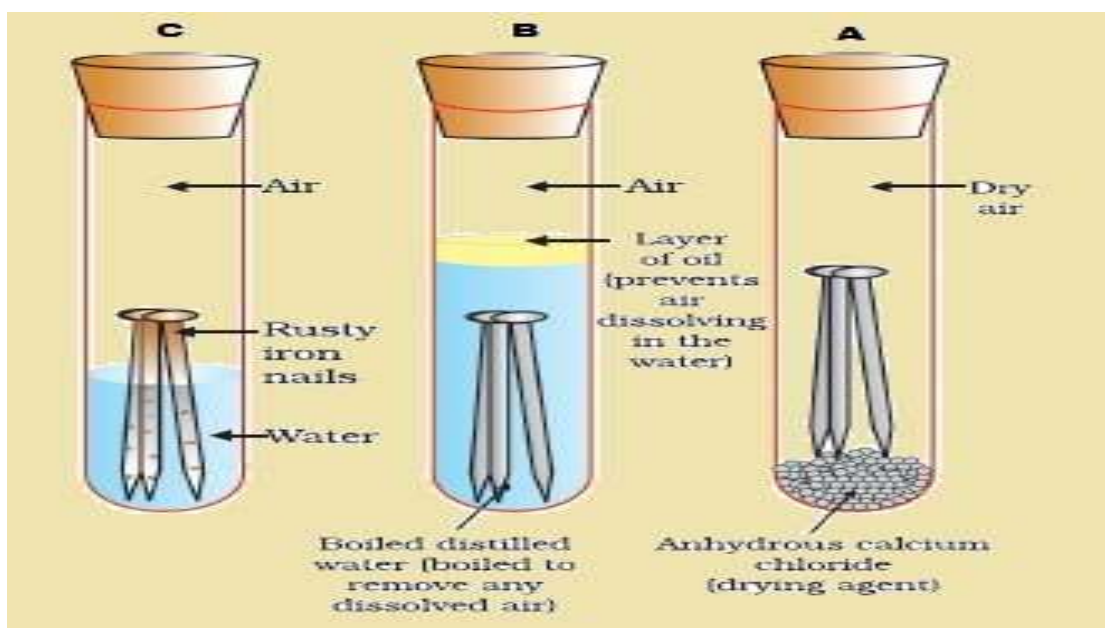
1. The conditions necessary for rusting to take place can be shown by performing following activity.

Procedure: Take three test tubes. Label them as A, B and C respectively. Now, place one clean and shiny iron nail in each of the test tubes. In test tube A, put some anhydrous calcium chloride and cork it. Anhydrous calcium chloride absorbs all the water (moisture) present in the air. This means, no moisture is left in test tube A. In test tube B, add boiled water. Boiled water is free from air. Add some oil to this test tube and cork it. A layer of oil is formed over boiled water in test tube B. This layer does not allow air to come in contact with the iron nail. In test tube C, add ordinary tap water and cork it. Leave the set-up undisturbed for 2–3 days. Observe in which test tube has the iron nail rusted.

Observation: Only the iron nail placed in test tube C has rusted.

Conclusion:

1. Test tube A has no moisture with iron nail. Dry air alone has no effect on iron nail.
2. Test tube B has no air with iron nail. Water (moisture) alone has no effect on iron nail.
3. Test tube C has both air and moisture. So, the iron nail gets rusted.
Thus, it can be concluded that both air and moisture are necessary for rusting to take place.



CONDITIONS FOR RUSTING

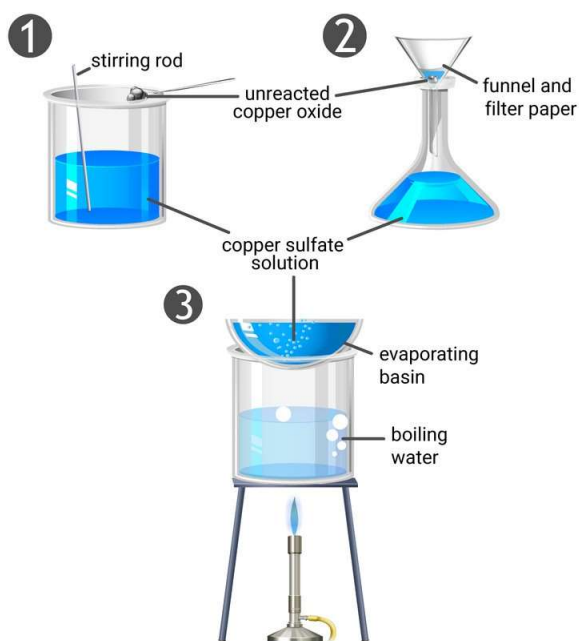
2. The various methods by which rusting can be prevented are:

- a) Coating an iron article with paint:** Applying a coat of paint on iron articles prevents them from coming in contact with air and moisture. This prevents rusting of iron article.
- b) Coating an iron article with grease:** Applying a coat of grease on an iron article cuts off its contact with air and moisture. This prevents the iron article from getting rusted.
- c) Galvanisation:** This is the process of depositing a layer of zinc on iron. The coating of zinc does not allow the iron article to come in contact with air and moisture and, thus, prevents it from rusting.
- d) Alloying:** Some metals are mixed with other metals or nonmetals to prevent them from rusting. This process is called alloying and the new substance formed is called alloy. Stainless steel is an alloy.

3. Crystals of copper sulphate can be made by performing following activity:

Procedure: Fill a test tube half with water and heat it. When the water starts boiling, add a teaspoonful of copper sulphate to it. Stir well and keep adding copper sulphate till no more amount of powder can be dissolved. Filter the solution using a filter paper and collect it in a test tube. Cover the filtrate with a filter paper and place the solution in a test-tube stand. Leave the test-tube stand in a place where it cannot be disturbed. Allow it to cool to the room temperature. At this temperature, filtrate will behave as supersaturated solution because we prepare a saturated solution at higher temperature. Observe the solution after few hours.

Observation: Blue-coloured crystals of copper sulphate are formed.



CRYSTALS OF COPPER SULPHATE

4. The characteristics of a chemical change are:

- A new substance is formed in a chemical change.
- Heat, light or any other radiation may be released or absorbed in this change.
- Sound is also produced in some chemical changes.
- There is also change in colour.
- There is also change in smell.
- Sometimes, evolution of a gas also occurs.
- Most chemical changes are irreversible changes.

5. Differences between physical and chemical changes:

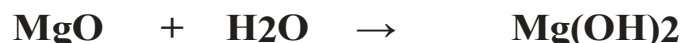
Physical change	Chemical change
1. A change in which no new substance is formed is called a physical change.	1. A change in which a new substance is formed is called a chemical change.

2. A physical change is usually accompanied by a change in shape, size or state. For example, dissolving salt in water, inflating a balloon, etc.	2. A chemical change is usually accompanied by a change in colour, release or absorption of heat or light, evolution of a gas, production of sound or a gas or change in smell. For example, rusting of iron, spoiling of food, burning of coal, etc.
3. Most physical changes are reversible changes.	3. Most chemical changes are irreversible changes.

6. (a) Carbon dioxide is released in test tube A and hydrogen gas is released in test tube B.
- (b) (i) To identify carbon dioxide, it is passed into freshly prepared limewater. It turns limewater milky.
- (ii) To identify hydrogen gas, a burning matchstick is brought near it. Since hydrogen gas is inflammable, it burns with a pop sound.
7. (a) When magnesium ribbon is burnt, magnesium oxide is formed.



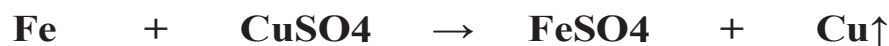
- (b) When magnesium oxide is mixed with water, magnesium hydroxide is formed.



- (c) When zinc reacts with dilute hydrochloric acid, hydrogen gas is evolved.



- (d) When an iron nail is dipped in copper sulphate solution, copper is displaced from its solution and iron sulphate is formed



- (f) When iron filings react with sulphur, iron sulphide is obtained.



G HOTS

1. When carbon dioxide gas comes in contact with limewater, a white solid substance called calcium carbonate (CaCO_3) is formed which makes the solution milky. It is a chemical change.

2. In coastal region, the air has moisture in it which causes rusting of iron articles faster.
3. In set-up A, it is a physical change because no new substance is formed in this case. In set-up B, it is a chemical change because a new substance called iron sulphide is Formed on heating the mixture.

Passage/Case-based questions

1. Two types of changes are physical changes and chemical changes.
2. We should not burst crackers because they cause air and sound pollution. We can use green crackers which produce less pollution.

K. Value-based question :

- (a). His cycle got rusted because it is made of iron and came in contact with air and water.
- (b). Rusting of iron is a chemical change that damages iron articles.
- (c). Harry's father has a caring and helping nature.