Rusting of Iron and Crystallization

A. Choose the Correct Answer:

1. What is rusting of iron?

A) A process of painting metal
B) The reaction of iron with oxygen and water to form iron oxide
C) A method of preserving iron
D) The process of melting iron

2. Which of the following conditions speed up rusting?

A) Dry air and high temperature
B) Presence of oxygen and moisture
C) Exposure to strong sunlight
D) Keeping iron in a vacuum

3. What is crystallization?

A) The process of converting solids into gases
B) The formation of solid crystals from a solution or molten state
C) The rusting of metals
D) The breaking down of substances into smaller particles

4. Which of the following is an example of crystallization?

A) Formation of ice cubes from water
B) Cooking rice
C) Formation of salt crystals from evaporated seawater
D) Rusting of iron

B. Fill in the Blanks:

1. Rusting of iron occurs due to the reaction between iron, _____, and _____.
2. The chemical formula for rust is _____.
3. The process of obtaining pure crystals from a solution is called _____.
4. To prevent rusting, iron can be coated with a layer of _____ or _____.
5. Common substances that undergo crystallization include _____ and _____.

C. Case Study:

A scientist, Dr. Mehta, conducted an experiment to study rusting. He took three identical iron nails and placed them in different conditions:

- Nail A was kept in dry air.
- Nail B was placed in water.
- Nail C was placed in saltwater.

After a week, he observed:

- Nail A remained the same.
- Nail B had a thin layer of rust.
- Nail C had a thick and flaky rust coating.

In another experiment, Dr. Mehta studied crystallization. He dissolved common salt in water and let the solution evaporate slowly. After a few days, he observed the formation of small salt crystals.

Case Study Questions:

1. What was Dr. Mehta trying to analyze through his experiments?
2. Why did Nail C rust more than Nail B?
3. What was the role of evaporation in the crystallization process?
4. Based on the experiment, suggest two ways to prevent rusting.

D. Short Answer Questions:

1. Why does iron rust when exposed to air and moisture?
2. How is crystallization useful in daily life?
3. What is the difference between rusting and crystallization?

E. Long Answer Questions:

1. Explain the process of rusting of iron with the chemical reaction involved.
2. Describe how crystallization is used in the purification of substances with examples.
3. Discuss various methods used to prevent rusting and their effectiveness.