INDIAN SCHOOL AL WADI AL KABIR

CLASS: VII	**DEPARTMENT: SCIENCE** **2024 - 2025**	**DATE: 09.11.2024**
WORKSHEET NO: 8 **WITH ANSWERS**	**TOPIC: PHYSICAL AND CHEMICAL CHANGES**	**NOTE: A4 FILE FORMAT**
NAME OF THE STUDENT:	**CLASS & SEC:**	**ROLL NO.**

I. OBJECTIVE TYPE QUESTIONS (1M):

1. Which of the following are indicators that a chemical change has occurred in a substance?

   a) Irreversibility of a substance after burning

   b) A substance breaking into smaller pieces of itself

   c) The expansion in size of a material upon being heated

   d) A substance not resuming its original shape, after being pressed

2. Which of the following is/are true when milk changes into curd?

   (i) Its state is changed from liquid to semi solid.

   (ii) It changes taste.

   (iii) It changes colour.

   (iv) The change cannot be reversed.

   a) (i) and (ii) are correct

   b) (ii) and (iii) are correct

   c) (i), (iii) and (iv) are correct

   d) (i), (ii) and (iv) are correct

3. A student plans to conduct an experiment to study the formation of rust on iron. The absence of which of the following will not change the result?

   a) Metallic iron

   b) Water vapor

   c) Gaseous Oxygen

   d) Gaseous Hydrogen

4. Which of the following describes the process of depositing a zinc layer on iron?

   a) Galvanisation

   b) Crystallisation

   c) Rusting

   d) None of the above

5. An alloy that does not rust and is made by mixing iron with carbon and metals like chromium, nickel and manganese is -

   a) Zinc b) Tin

   c) Stainless steel d) Gold

6. In the process of crystallization, a hot saturated solution of a substance is required. This solution is then cooled down to room temperature. Why is the solution made to lower its temperature?

   a) To dissolve the impurities in the solution

   b) To make it easier to pick up the beaker later

   c) To enable the formation of crystals

   d) To allow impurities to solidify in the solution

For the questions that follow, two statements are given- one labelled Assertion (A) and the other labelled Reason (R). Select the correct answer to these questions from the codes (i), (ii), (iii) and (iv) as given below:

i) Both A and R are true and R is the correct explanation of the assertion.
ii) Both A and R are true but R is not the correct explanation of the assertion.
iii) A is true but R is false.
iv) A is false but R is true.

7. **Assertion (A):** Freezing is the process in which water turns to ice at 100^0 C.

   Reason(R): Freezing of water is a physical change because only the physical state of water is changed.

   Ans: iv) A is false but R is true.

8. **Assertion (A):** Ozone layer protects us from the harmful ultraviolet radiation which come from the sun.

   Reason(R): Lime water turns milky by-passing carbon dioxide gas into it.

   Ans. ii) Both A and R are true but R is not the correct explanation of the assertion.

9. **Assertion (A):** Chemical change is always an irreversible change.

   Reason(R): Heat and light may be given off or absorbed during a physical change.

   Ans: iii) A is true but R is false.

10. **Assertion (A):** Taps and bicycle handles are usually chromium-plated.

    Reason (R): Coating a layer of chromium prevents the rusting of iron articles.

    Ans: i) Both A and R are true and R is the correct explanation of assertion.

II. VERY SHORT ANSWER TYPE QUESTIONS (2M):

1. What is meant by a change? **[Hint: A change refers to a noticeable difference in shape, size, colour, state, internal structure or any other property.]**
2. Name the metals involved in making stainless steel.
   [Hint: Chromium, nickel and manganese.]
3. Give two examples for each of the following cases:
   a) Physical changes which are reversible. **[Hint: Blowing a balloon, folding paper]**
   b) Physical changes which are not reversible. **[Hint: Chopping of vegetables, breaking of a glass tumbler]**
4. Is cloud formation a chemical or physical change? Explain. **[Hint: Physical change. Clouds are formed by the condensation of water vapours present in the atmosphere. When rainwater goes back to the earth, no new substance is formed.]**
5. Justify the following statement- Photosynthesis and digestion of food are chemical changes.
   [Hint: During Photosynthesis, plants use carbon dioxide and water in the presence of sunlight and chlorophyll to form new substances- glucose and oxygen. During digestion, various food materials are broken down to form new substances which can be absorbed by the body.
6. Why formation of manure from leaves is a chemical change?
   [Hint: Formation of manure from leaves is a chemical change because manure formed has a different composition from leaves.]
7. A sheet of paper was torn into pieces and then burned. What changes does this sheet of paper undergo? Explain**. [Hint: When the paper is torn into pieces, it undergoes a physical change as only the size of the paper changes and no new substance is formed whereas when a paper is burned, a new substance ash is formed, it is a chemical change]**
8. Mention the different ways by which rusting or iron can be prevented. **[Hint: By oiling, painting, greasing the iron objects, galvanisation, chromium plating, alloying.]**
9. Write three differences between physical and chemical changes.
   [Hint: Physical changes- No new substance is formed. Usually temporary and mostly reversible in nature. Heat or light is generally not involved.
   Chemical changes- One or more new substances are formed. Usually permanent and irreversible in nature. Heat or light is absorbed or released.]

III. SHORT ANSWER TYPE QUESTIONS (3M):

1. How does the ozone layer act as a protective shield?

   [Hint: The Ozone layer protects us from ultraviolet radiation which comes from the sun. Ozone absorbs ultraviolet radiation and breaks down to form oxygen. If not absorbed by ozone, it would reach the earth's surface and cause harm to us and other life forms. In this way, the ozone layer absorbs harmful ultraviolet radiation.]

2. Explain the process of rusting.

   [Hint: When an iron object is left in damp air (or water) for a considerable time, it gets covered with a red-brown flaky substance called rust. This is called rusting of iron. During the rusting of iron, iron metal combines with the oxygen (of air) in the presence of water (moisture) to form a compound iron oxide.]

3. Give an example of a chemical reaction for each of the following situations:

   a) A change in colour is observed. **[Hint: Browning of an apple]**

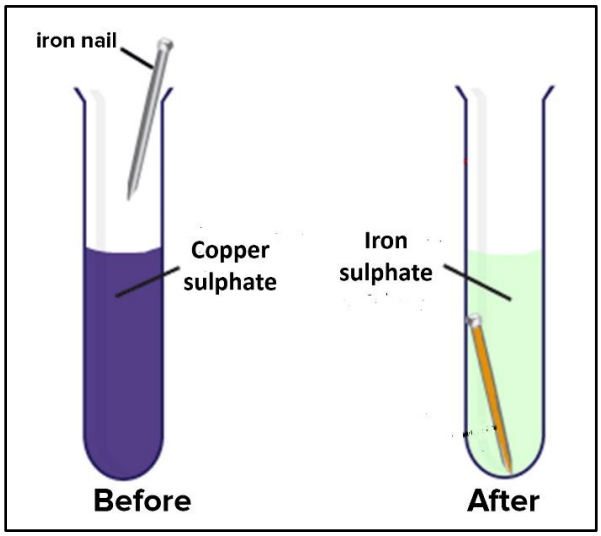
   b) A gas is evolved. **[Hint: During a reaction between vinegar and baking soda, carbon dioxide gas is evolved]**

   c) Sound is produced**. [Hint: Bursting of firecrackers]**

   d) A change in smell. **[Hint: Spoilage of food]**

   e) Heat is given out. **[Hint: Bursting of firecrackers]**

4. Observe the given picture and answer the questions.



   a) What change will you observe in the colour of the solution after dropping an iron nail into it? **[Hint: blue to green]**

b) Why do we observe the colour change in the solution?

[Hint: formation of iron sulphate]

c) What causes brown deposition on the iron nail? **[Hint: formation of copper]**

d) Write the word equation involved in the above reaction.

[Copper sulphate + Iron ⟶ Iron sulphate + Copper]

5. The same iron wires are kept in the following different places –

a) On the moon. b) Near the beach in Mumbai. c) In Delhi.

Compare the degree of rust formation in the three places.

[Hint: a) The moon has no air. In the absence of air, no rust will form.

b) Mumbai is a coastal region which has more water vapour in the air and rusting will occur faster.

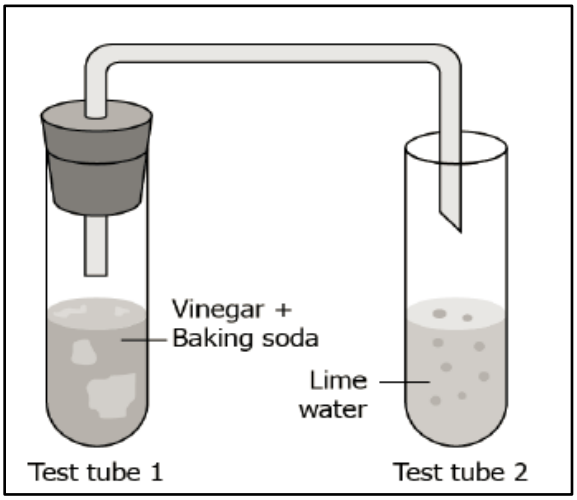
c) Delhi is far away from the sea coast. The amount of water vapour in the air is less. Thus, the rusting process will be slow.]

IV. LONG ANSWER TYPE QUESTIONS (5M):

1. Classify the following changes as physical or chemical changes and give a reason for it-

SL. NO.	ACTIVITY	KIND OF CHANGE	REASON
I	Rotting of eggs	**Chemical change**	**Change in composition takes place and is an irreversible process. The smell of rotten eggs is different from fresh eggs.**
II	Burning of coal	**Chemical change**	**When coal is burnt, a new substance carbon dioxide is formed.**
III	Evaporation of seawater	**Physical change**	**When water evaporates, it changes from the liquid state to the gaseous state, but it is still water; it has not changed into any other substance.**
IV	Crystallisation	**Physical change**	**In forming a crystal no change occurs in the chemical properties of the substance only the shape changes.**

2. Observe the given activity and answer the questions –



a) Name the acid present in vinegar used in this activity. **[Hint: Acetic acid]**

b) Which gas is produced when baking soda reacts with vinegar? **[Hint: Carbon dioxide]**

c) What change will you observe in lime water and why? **[Hint: Lime water turns milky on passing carbon dioxide gas through it due to the formation of calcium carbonate]**

d) Write word equations for both chemical changes**. [Hint: Carbon dioxide gas is given off in the reaction between vinegar (acetic acid) and baking soda (sodium hydrogen carbonate).**

Acetic acid + Sodium hydrogen carbonate ⟶ Carbon dioxide + Other substances

When carbon dioxide gas is passed through lime water (Calcium hydroxide), it turns milky due to the formation of calcium carbonate.

Calcium hydroxide + carbon dioxide ⟶ Calcium carbonate + Water]

V. CASE STUDY- BASED QUESTIONS/ PASSAGE-BASED QUESTIONS:

A chemical change results in a substance that was not there before. Chemical changes occur when a substance combines with another to form a new substance, or, chemical decomposition into two or more different substances. These processes are called chemical reactions. Chemical changes are very important in our lives. All new substances are formed as a result of chemical changes. For example, if a metal is to be extracted from an ore, such as iron from iron ore, we need to carry out a series of chemical changes. A medicine is the end product of a chain of chemical reactions. Useful new materials, such as plastics and detergents, are produced by chemical reactions. Indeed, every new material is discovered by studying chemical changes

1. Describe two changes that are harmful. Explain why you consider them harmful. How can you prevent them? **[Hint: Two harmful changes are rusting of iron, which weakens metal structures, and spoilage of food, which can lead to health issues. Rusting can be prevented by painting or galvanizing, while spoilage can be prevented by proper storage and preservation.]**
2. Why can't a chemical change be normally reversed? **[Hint: A chemical change cannot be normally reversed because it results in the formation of new substances with different properties, making it difficult to revert to the original substances.]**
3. "Chemical changes are very important in our life." Give two examples to support it. **[Hint: extraction of metal from ore, production of medicine]**
4. Rahul was a student of Class VII. His father purchased a new bicycle for him on his birthday. After a few months, he found that the cycle chain and even the handle were rusted. His father advised him to apply a coating of paint to the cycle and not to keep it in the open in future. Why does his cycle get rusted?

   [Hint: Rahul's cycle was kept in the open for a longer time, as air contains both oxygen and moisture. Thus, in the presence of oxygen and water, his cycle slowly gets rusted.]

   Iron + Oxygen + Water → Rust (hydrated Iron oxide)

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