**1st June, 2020 JESUS AND MARY SCHOOL AND COLLEGE Module – 3**

**CLASS: 8**

**SUBJECT- CHEMISTRY**

**CHAPTER- PHYSICAL AND CHEMICAL CHANGES**

**CATEGORISING PHYSICAL CHANGES:**

1. **DISSLOVING:**

Dissolving is a process in which solid, liquid or gas mixes uniformly with another substance to form a solution. **Example:** When we dissolve sugar in water, the sugar particles spread out and form a solution with water. This process can be reversed by evaporating water and collecting the sugar.

1. **EVAPORATION:**

Evaporation is a process by which a substance changes from its liquid state to gaseous state at a temperature below the boiling point. **Example:** The evaporation of water in a physical state which is slow, natural, desirable and reversible. We know evaporation depends on certain factors such as temperature, surface area, humidity etc.

1. **BOILING:**

Boiling is a process by which substance changes from its liquid state to its gaseous state when heated to its boiling point. **Example:**Boiling of water is a physical change which is man-made, fast, reversible, and desirable.

1. **FREEZING:**

Freezing is a process by which a substance changes from its liquid state to its solid state on cooling. **Example:**Freezing of water into ice is a physical change which could be natural or man-made and is fast, reversible and desirable.

1. **MELTING:**

Melting is a process by which substance changes from its solid state to its liquid state on heating. **Example:** Melting of ice is a physical change which could be natural or man-made, and is fast and reversible.

1. **CONDENSATION:**

Condensation is a process by which a substance changes from its gaseous state to its liquid state on cooling. **Example:**The water vapour condenses to form clouds. This change is natural, reversible and desirable.

1. **SUBLIMATION:**

Sublimation is a process by which a substance changes directly from its solid state to its gaseous state without changing into its liquid state. **Example:**Naphthalene balls are kept in cupboards to protect woollen clothes from insects as naphthalene sublimes at room temperature.

**CHEMICAL CHANGES**:

Changes in which two substances react to form new substances with different properties are called chemical changes. They are generally irreversible in nature.In chemical changes, substances undergo chemical transformation to form new substances.

**CHARACTERSTICS OF A CHEMICAL CHANGE:**

1. A chemical change is permanent and irreversible.
2. The composition of a substance changes during a chemical change.
3. During a chemical change, one or more new substance with new sets of properties are formed.
4. There is an exchange of energy during a chemical change.
5. A chemical change is accompanied by a change in mass.

**EXAMPLES OF CHEMICAL CHANGE:**

Germination of seeds, cooking of food, curdling of milk, ripening of fruits and vegetables, burning of wood, burning of papers and fuels are some very common examples of chemical change.

**CATEGORISING CHEMICAL CHANGES:**

1. **DIGESTION OF FOOD:**

Food undergoes many chemical changes during the process of digestion. During digestion, complex molecules such as proteins, carbohydrates, fats, etc. break into simpler molecules having different structures. The original molecules cannot be obtained again from these molecules. Hence, digestion of food is a chemical change.

1. **RUSTING OF IRON:**

A piece of iron when left out in moist air comes in contact with oxygen to produce a dull brittle brown substance called rust. This process of formation of rust on the iron surface is called rusting of iron. The rust formed has different properties from that of iron and it cannot be converted back to iron by simple physical methods. Hence, rusting of iron is a chemical change.

1. **COOKING OF FOOD:**

During cooking of food, raw materials such as grains and vegetables are heated to form new substances. The cooked food cannot be converted back to raw ingredients. Hence, cooking food is a chemical change.

1. **BURNING OF PAPER:**

The paper burns immediately when brought near a flame. The burnt paper (ash) is a new substance and it cannot be changed to what it originally was. Therefore, burning of paper is a chemical change.

1. **CURDLING OF MILK:**

When we add a tablespoon of curd to a container with milk in it and leave it at room temperature overnight, we observe that the whole milk changes into curd which cannot be changed back to milk. This shows that curdling of milk is a chemical change.

1. **BAKING A CHAPATTI:**

When we take some dough of flour, roll a chapatti out of it and bake in on a griddle, we will observe that the dough changes into a baked chapatti. Now, it is not possible to get back dough of flour. This shows that baking a chapatti is a chemical change.

1. **FERMENTATION:**

Fermentation is a process by which a substance is broken down by the action of microorganisms with the release of heat and carbon dioxide. When dough is fermented, bread is made which is soft. Fermentation of dough is a chemical change which is man-made, slow and desirable. Decomposition of water into hydrogen and oxygen gas, germination of seed and burning of fuels are some more chemical changes.

**CHANGES INVOLVING ENERGY CHANGES:**

Most of the changes involve release or absorption of energy, usually in the form of heat, is either released or absorbed during such changes.

1. **Changes in which energy is absorbed:**

Physical changes may involve change of energy. Melting of ice, boiling of water and evaporation are some changes which absorb heat. This is because when a change of state occurs from solid to liquid or liquid to gas, the intermolecular force of attraction decreases resulting in ana increase in the intermolecular space. This is possible only when heat energy is absorbed by a solid or liquid. Some chemical changes like photosynthesis occur by absorbing energy in the form of sunlight.

1. **Changes in which energy is released:**

Physical changes like freezing of water releases energy in the form of heat. This is because when water freezes into ice, i.e., water changes its state from liquid to solid, the intermolecular force of attraction increases and intermolecular space decreases. This is possible only when heat energy is released by the liquid or gas. Chemical changes like combustion and digestion of food also involve release of energy.

**WORKSHEET 3**

1. **Fill in the blanks:**
2. There is an exchange of \_\_\_\_\_\_\_\_ during a chemical change.
3. The process by which a substance is broken down by the action of microorganisms with the release of heat and carbon dioxide is called \_\_\_\_\_\_\_\_\_\_\_\_.
4. Digestion is a \_\_\_\_\_\_\_\_\_\_\_\_ chemical change.
5. Cooking of food is a \_\_\_\_\_\_\_\_\_\_\_\_\_ chemical change.
6. **TRUE or FALSE:**
7. Breaking of glass plate is an example of physical change.
8. Evaporation of water is a physical change which is man-made and desirable.
9. Baking of chapatti is a chemical change.
10. Naphthalene sublimes at room temperature.
11. Combustion is a chemical change that involves release of energy.

**C. Answer the following questions in brief:**

1. What is the difference between melting and freezing?
2. Give any two examples of chemical changes.
3. Give any two examples of physical changes.
4. What is sublimation?
5. What is evaporation?
6. What is melting?
7. What is condensation?

**NOTE:**

**Please do this work in your copies which will be checked when the school reopens. Please consider this important.**