GIRLS' HIGH SCHOOL & COLLEGE, PRAYAGRAJ

WORKSHEET-3

SESSION-2020-21

CLASS-8 (A,B,C,D,E)

SUBJECT-CHEMISTRY

TOPIC: 1. Law of Conservation of mass
&
2. How changes are classified?

(Note**:** Parents are requested to guide and help their child in solving the questions related to the topic. The child can search for topic related details on internet. The child can also refer to the link given: https://youtu.be/x49BtB5dOwg, https://youtu.be/8yJST3V3pxI)

Topic ; 1. Law of conservation of mass

1. Matter can neither be created nor destroyed but can be changed from one form to another .The total mass of the substances before and after the change remains the same. This is known as the law of conservation of mass .Lavoisier gave the law of conservation of mass.

2. The law of conservation of mass is true for physical as well as chemical changes.

3. Physical Change - There is no change in the mass of a substance when it undergoes a physical change . For example, the mass of an electric bulb does not change after it remains lighted for some time. Similarly, a given mass of ice ,on melting , gives the same mass of water . And a given mass of water, on boiling, gives the same mass of water vapour.

4. Chemical changes - According to the law of conservation of mass, in a chemical change , the sum of the masses of the reactants is the same as that of products.

   Mass of the reactants = Mass of the products

   Example 1

   Burning of a piece of paper is an example of chemical change.

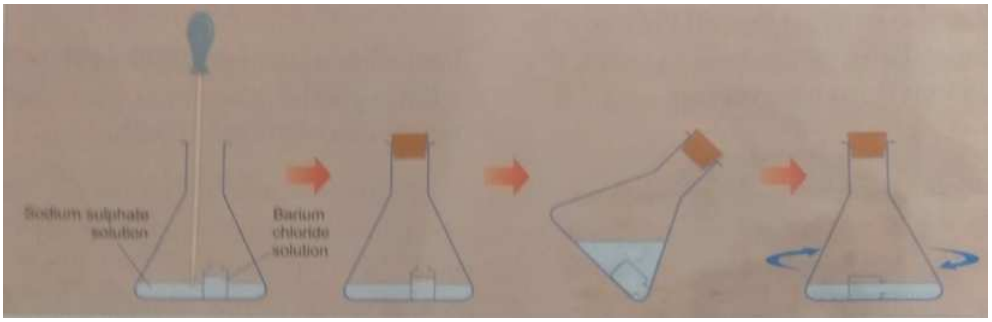
   While burning, the paper takes up some oxygen from air and forms some ash plus carbon dioxide and water vapour.

   Mass of paper + oxygen = Mass of ash + carbon dioxide + water vapour

Example 2

Experiment:

Put a small tube or bottle containing a solution of barium chloride into a conical flask. Place some sodium sulphate solution in the flask with the help of a dropper ensuring that the two substances do not come in contact with each other. Close the mouth of the flask with a cork and weigh the flask .Tilt the flask and whirl it slowly. A white precipitate is formed and there is no change in the weight of the flask.



Conservation of mass in the reaction between sodium sulphate and barium chloride

Topic – 2.How changes are classified?

1 .Reversible and Irreversible change -

A change is said to be reversible when the opposite change can be brought about by reversing the conditions.

Example- Changes in the state of matter

Solid ⇌ Liquid ⇌ Gas (or Vapours)

(Heat / Cool) (Heat / Cool)

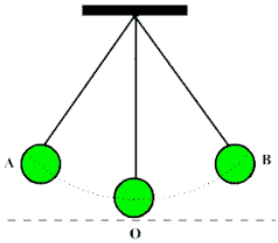
A change is said to be irreversible when the opposite change cannot be brought about by reversing the conditions.

Example - photosynthesis , digestion , charring of sugar ,burning of fuel ,curdling of milk etc.

2. Periodic and non-periodic changes-

Periodic changes are those which take place at fixed intervals of time.

Example of periodic changes - the motion of the pendulum and the phases of the moon.



The to – and –fro motion of a pendulum represents a periodic change

Non-periodic changes are those which do not take place at fixed intervals of time.
Example of non-periodic changes-
Melting of ice, vaporisation of water and curdling of milk are non-periodic changes.

3. Desirable and undesirable changes-

The changes that are useful to us are called desirable changes whereas those that are harmful are called undesirable changes.

Digestion of food, ripening of fruits and growth of living beings are desirable changes.

Earthquakes, rusting of iron, cyclones and volcanic eruptions are undesirable changes.

4.Physical and chemical changes-

Physical change - A change in which no new substances are formed and which can be reversed by reversing the conditions is called a physical change.

Example - The glowing of a heater or a bulb and changes in state of matter.

On being heated a substance expands, but on cooling, it contracts. No new substances are formed so the change is a physical change.

According to the kinetic theory of matter, kinetic energy of the molecules increases on heating and decreases on cooling.

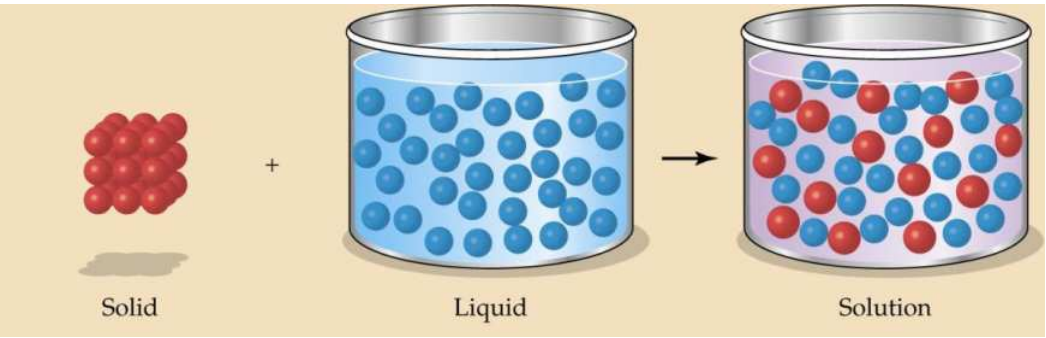
Solid $\xrightarrow{\text{Heat}}$ liquid $\xrightarrow{\text{Heat}}$ vapour (gas)

Vapour (gas) $\xrightarrow{\text{Cool}}$ liquid $\xrightarrow{\text{Cool}}$ solid

Sublimation is an example of change in state . Ammonium chloride, naphthalene, camphor or iodine directly forms vapours without melting. And when cooled, the vapours are directly converted into the solid. Sublimation is a physical and reversible change.

The dissolving of a substance in a liquid

The substance that dissolves is called the solute.
The liquid in which the substance dissolves is called the solvent.
A solute dissolves in a solvent to form a solution.



The solute molecules hide themselves in the intermolecular space of the solvent

Answer the following questions-

1. Fill in the blanks -

a) The total mass of the substance before and after the change remains the _____.
b) A solid melts on being _____.
c) On _____, a substance contracts.
d) A solute dissolves in a solvent to form a _____.
e) In a chemical change, the sum of the masses of the _____ is the same as that of _____.

2. Choose the correct option -

a) Charring of sugar is an example of _____ change. (reversible /irreversible)
b) Rusting of iron is an example of _____ change. (desirable /undesirable)
c) Glowing of an electric bulb is a _____ change. (physical /chemical)
d) The kinetic energy of the molecules ____on heating.(increases /decreases)
e) Sublimation is a _____change.(physical /chemical)

3. State whether the following statements are true or false.

a) Burning does not obey the law of conservation of mass.

b) Barium chloride on reacting with sodium sulphate forms a white precipitate.
c) Any change in state of matter is reversible.
d) Vaporisation of water is a periodic change.
e) Curdling of milk is an irreversible change.

4. Name the following -

a) The scientist who gave the law of conservation of mass.
b) The changes that are harmful to us.
c) The changes which take place at fixed intervals of time.
d) A phenomenon in which solids vaporise without melting.
e) A change in which no new substances are formed and which can be reversed by reversing the conditions.

5. Answer the following questions in short.

a) State the law of conservation of mass.
b) Differentiate between reversible and irreversible change.
c) Give three examples of undesirable change.
d) What is sublimation? Give example of three substances that sublime.
e) Define a non-periodic change. Is the swinging of a pendulum a non-periodic change?

6. Answer the following questions in detail.

a) Describe an experiment to show that the law of conservation of mass is true for chemical changes. Also draw related diagram.
b) Give reason - the volume of a liquid does not change when a solute dissolves in a solvent.
c) Explain changes in state of matter on the basis of kinetic theory.

THE END