



All the things around us are made up of matter. Matter is defined as anything that occupies space and has weight. The amount of space any matter takes up is called its volume. Matter itself is made of small particles called molecules. They are so small that we cannot see them with naked eyes. Molecules are arranged differently in different substances.

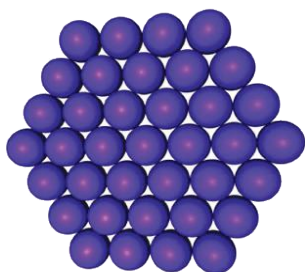
STATES OF MATTER

Matter exists in the following three states :

1. Solids

2. Liquids

3. Gases



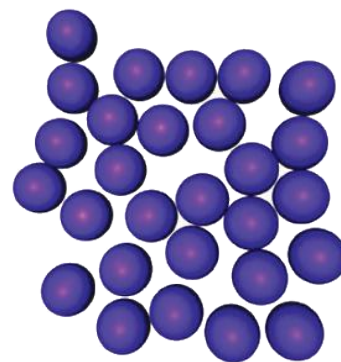
Atoms in solids

Solids

In solids, the molecules are packed very close to each other. As there is very little space between the molecules, they cannot move about freely. For this reason, all solids have a definite shape and volume.

Liquids

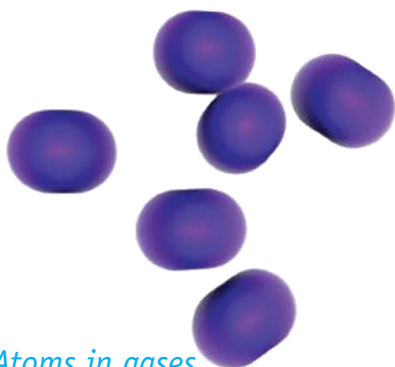
Matter can also be in liquid state. In liquid state, the molecules that make up the matter are not tightly packed together. They can actually slide past one another and change places, and the bond between them is not so strong. For this reason, matter in a liquid does not have a definite shape. Its shape changes according to the container in which it is kept.



Atoms in liquids

Gases

In gases, the molecules are very loosely packed. They have a lot of spaces between the molecules which allow them to move about freely. Gases do not have a fixed shape or volume due to the free movement of their molecules. They expand or compress according to the available space.



Atoms in gases

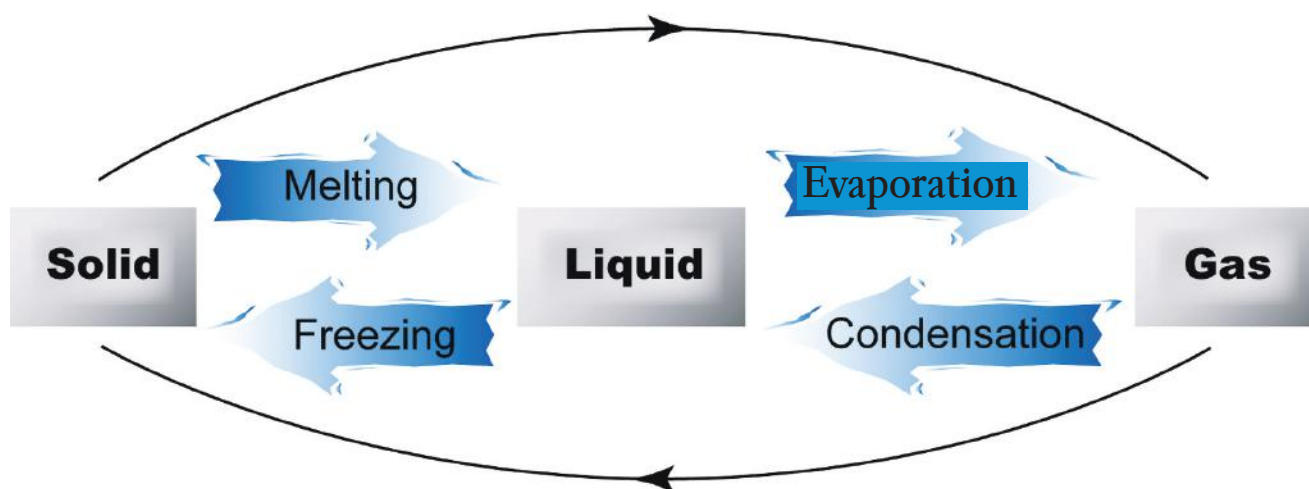
Do You Know ?

Atoms join to form molecules. Some molecules, like table salt, are made of only two atoms. Other molecules are larger. For example, a sugar molecule has 45 atoms.

CHANGE OF STATES

Matter can change its state on heating or cooling. The space between the molecules also changes with the change in state. The conversion of matter from one state to another because of change of temperature is called interconversion of matter.

- When a solid is heated or its temperature is increased, it changes into its liquid form. This process is called melting.
- When a liquid is heated or its temperature is increased, it changes into a gas. This process is called evaporation if the heating is slow and it is called boiling if the heating is fast.
- When a gas is cooled down or its temperature is reduced, it becomes a liquid. This process is called condensation.
- When a liquid is cooled down or its temperature is reduced, it becomes a solid. This process is called freezing.



Inter-conversion of states of matter

PHYSICAL AND CHEMICAL CHANGES

All matters can undergo changes. There are basically two ways in which matter can change : **physical change** and **chemical change**.

Physical Change

A matter can undergo physical changes. A **physical change is a change in the shape, size or state of matter**. When water changes from solid to gas, it has undergone a physical change. When weathering has caused a rock to be broken into smaller pieces, it has undergone a physical change. It is a temporary change.



Weathering in soil



Burning of paper

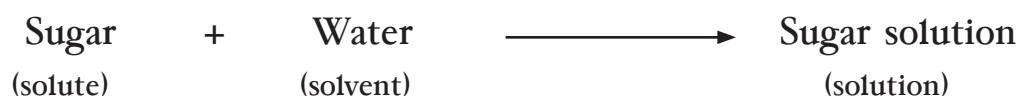
Chemical Change

Matter can undergo chemical changes. A **chemical change is a change that turns the original substance into completely different type of matter**. For example, burning of paper is a chemical change. Molecules of paper are different from those of ash.

SOLUTE, SOLVENT AND SOLUTION

Some solids dissolve in liquids. A solid that dissolves in a liquid is called the solute. The liquid in which the solute dissolves is called the solvent.

The mixture of the solute and the solvent is called the solution.



Stirring and heating increases the rate of solubility of a solid in a liquid. For example, sugar crystals dissolve faster in hot water than in cold water. Generally, dissolving a solid in a liquid does not increase its volume because the molecules of the solute occupy the space between the molecules of the solvent.

Activity

Take a glass of water and add two teaspoons of sugar in it. Stir it well. What do you see?

After some time, we cannot see the sugar. Taste the water. It tastes sweet. Why? Because sugar has dissolved in water. This liquid is known as sugar solution.



Solution of sugar



Know the Keywords :

- Matter : Anything that occupies space and has mass.
Solute : A substance that dissolves in a liquid.
Solvent : A liquid in which a solute can dissolve.
Solution : A mixture of a solute and solvent.

Point to Remember

- All matters are made up of atoms. Atoms combine to form molecules. The atoms and molecules cannot be seen with the naked eyes.
- There are three states of matter— Solid, Liquid and Gas.
- Solids have definite shape; liquids take the shape of the container in which they are kept and gases do not possess any definite shape.
- A physical change is a change in which no new substance is formed. Whereas in a chemical change, a new substance is formed.
- Stirring and heating increases the rate of solubility of a solid in a liquid.

EXERCISE TIME

A. Multiple choice questions (MCQs).

Tick (✓) the correct option :

1. Matter _____.

- a. occupies space b. has no weight c. does not occupy space

2. Matter exists in _____ states.

- a. two b. three c. five

3. A solid that is soluble in liquid is called _____.

- a. solute b. solvent c. solution

4. Burning of paper is a _____ change.

- a. chemical b. physical c. both a. and b.

B. Fill in the blanks :

1. The liquid in which the solute dissolves is called the _____.

(solute/solvent)

2. A _____ has a fixed shape and definite volume. (liquid/solid)
3. The change of liquid into solid on cooling is called _____. (freezing/melting)
4. _____ change is a temporary change. (chemical/physical)

C. Write 'T' for true and 'F' for false :

1. In solids, the molecules are closely packed together.
2. Physical and chemical change cannot occur simultaneously.
3. Gases expand or compress according to the available space.
4. A physical change is a change in which new substance is formed with different chemical properties.

D. Answer the following questions :

1. What is matter?
2. Why do solids have definite shape?
3. How can the three states of water be interchanged?
4. Differentiate between physical change and chemical change.
5. Define the following :
- (a) Solute (b) Solvent (c) Solution



Creative Work

- Visit to the internet site Google and find the answer of the following question :
Why does water droplets form on the outer side of a glass of lemonade?
