

- (d) We can walk through air.
- (e) Liquids have a definite volume but no definite shape.
- (f) When a teaspoon of sugar is added to half a glass of water and stirred, the water level in the glass remains unchanged.
- (g) When an empty gas jar is inverted over a gas jar containing a coloured gas, the gas also spreads into the empty jar.

(h) A red ink drop added to a small amount of water in a glass turns the water red in some time.

9. Define :

- (a) cohesive force
- (b) diffusion
- (c) Brownian movement

10. Why is an egg kicked out of a bottle when air is blown inside the bottle ?

EFFECT OF HEAT ON MATTER

When a substance is heated, it can cause.

- Interconversion of states of matter,
- Thermal expansion of the substance and
- Chemical change.

1. INTERCONVERSION OF STATES OF MATTER

In everyday life, we come across substances that change from one state to another. *For example*, water is a liquid under ordinary conditions, but when a glass of water is kept in a deep freezer, it turns into ice. This happens because it has been cooled down. When we heat water, it starts boiling and turns into steam.

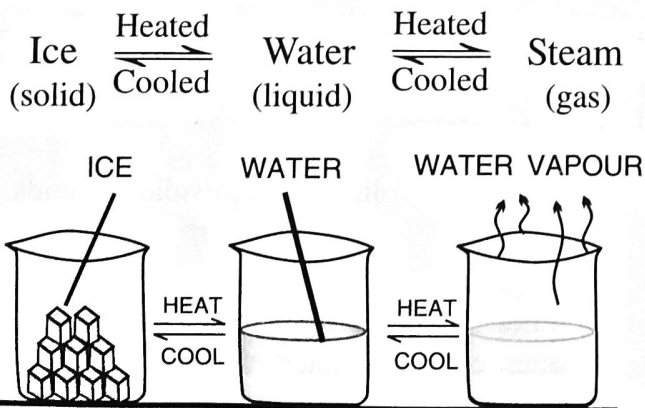


Fig. 3.3 Interconversion of states of water

Similarly, steam on cooling down, turns into liquid water, and so does ice when

kept at room temperature. But the chemical properties of water remain the same in all the three states.

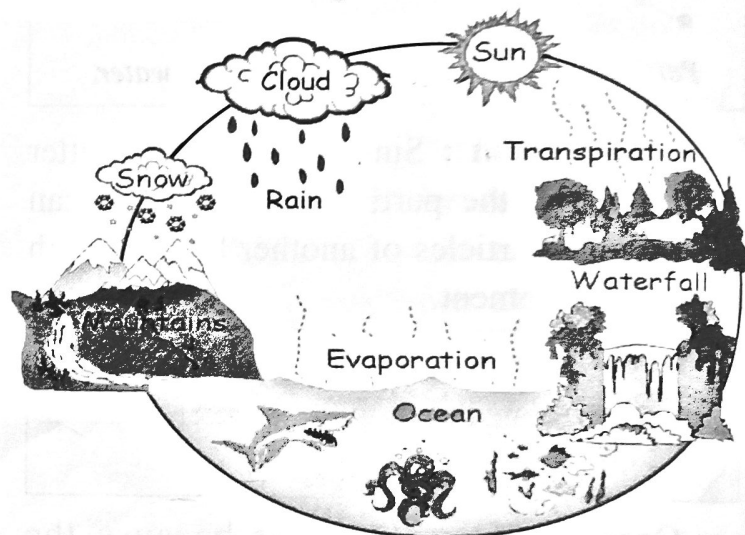


Fig. 3.4 Water cycle

[The natural, never ending cycle of different states of water.]

The above example shows that matter can change from one state to another under certain conditions of temperature and pressure. This is called **interconversion of states of matter**.

Therefore, we can define interconversion of states of matter as *the process by which matter changes from one state to another and back to the original state, without any change in its chemical composition.*

change in temperature and by
g pressure.

Activity 11

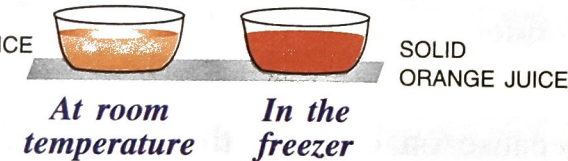
Take some butter in a pan. Heat it and stir with a spoon. The butter melts.



Butter remains in the solid state at room temperature (upto about 32°C) but when the temperature increases it changes from its solid state to a liquid.

Activity 12

Take some orange juice in a bowl as a liquid under normal condition. Put it into a freezer. After some time you take it out you will find that it has become a solid. This is because the temperature is lower in the freezer than the room temperature.



The above two activities show that when temperature changes, matter changes its state.

Pressure is also one of the important factors for the change in the state of matter.

LPG cylinders contain cooking gas in liquid state at high pressure (LPG under normal condition is a gas).

gases. Air changes to liquid state when temperature is decreased and pressure is increased. Oxygen cylinders used in the hospitals for patients contain oxygen in liquid form.

Even the hardest rocks under the earth's crust melt at a very high temperature and pressure.

Most of the substances known to us change their state when conditions are changed. Solid changes into liquid which further changes into gas when temperature is increased and when temperature is decreased, gas changes into liquid which further changes into solid.

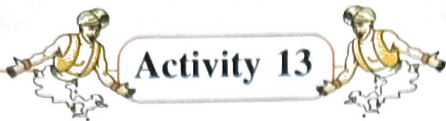


Note : There are some substances that directly change from the solid state to the gaseous state, and vice-versa, without passing through the liquid state. These substances are called **sublimable** substances and the conversion of a solid substance into its vapour without undergoing liquid state on heating is called sublimation. *For example*, camphor, iodine, dry ice (solid carbon dioxide) and naphthalene are sublimable substances. Naphthalene balls are thus used in bathrooms, wardrobes, etc., to keep the pests away. Toilet freshners are also sublimable substances.



Naphthalene balls kept alongwith woollen clothes, with passage of time, become smaller because they sublime and change into vapour state.

Do all the substances change their state ?



Activity 13

- Take a piece of paper. Put it over a flame.
 - Heat a spoon of sugar in a pan.
 - Heat $\frac{3}{4}$ th cup of butter in a pan.
- What do you observe ?

Paper and sugar get burnt while butter melts.

SOME TERMS RELATED TO INTER-CONVERSION OF STATES OF MATTER

Melting or Fusion : The process by which a substance changes from solid state to liquid state is called **melting** or **fusion**.

This change occurs on heating a solid because the particles of solid gain energy and start vibrating more vigorously. A point is reached where particles gain enough energy to overcome force of attraction and they start moving. Hence, with reducing intermolecular force of attraction, a solid changes into a liquid.

Melting Point : The fixed temperature at which a solid changes into a liquid at a given pressure is called its **melting point**. The temperature remains constant as long as the conversion is going on.

Different materials have different melting points in their pure state. *Example :* Melting point of ice is 0°C .

Vaporisation or Evaporation : The process by which a substance changes from a liquid state to vapour state is called **vaporisation** or **evaporation**. Evaporation takes place even at room temperature but it becomes faster on heating, that is on increasing the temperature.

The change of state of a liquid into vapour state on heating is called **boiling**.

Boiling is the extreme form of vaporisation.

As a liquid is heated, its particles start gaining energy and move more vigorously which increases the gaps between the particles and decrease the force of attraction. Ultimately a liquid changes into gaseous state.

Boiling point : The fixed temperature at which a liquid starts changing into gaseous state is called its **boiling point**. The temperature remains constant till the whole of the liquid changes into gaseous state.

For example, the temperature of water will remain 100°C till all the boiling water converts into steam at normal atmospheric pressure.



Do You Know ?

Wet ink becomes dry because water in it turns into vapour and evaporates into air. Similarly a cut fruit left exposed to air dries up in a short time. We spread wet clothes under the sun to dry them fast.

Condensation or Liquefaction : “The process by which a substance in gaseous state changes into its liquid state is called **condensation or liquefaction**.”

This process occurs when a gas is cooled because on cooling, the energy of particles decreases and their movement becomes slow. The gaps between the particles decrease and the force of attraction between them increases, as a result they change from gas to liquid.

Condensation Point : It is the temperature at which a gas starts changing into its liquid state. *Example :* Condensation point of steam is 100°C .

Freezing or Solidification : The process by which a substance in liquid state changes into a solid state is called **freezing or solidification**.

This occurs when a liquid is cooled because on cooling the particles lose energy, their movement becomes slow and they come closer decreasing the intermolecular distance with increasing intermolecular force of attraction, ultimately the liquid changes into a solid.

Freezing Point : The temperature at which a liquid starts changing into its solid state is called its **freezing point**.

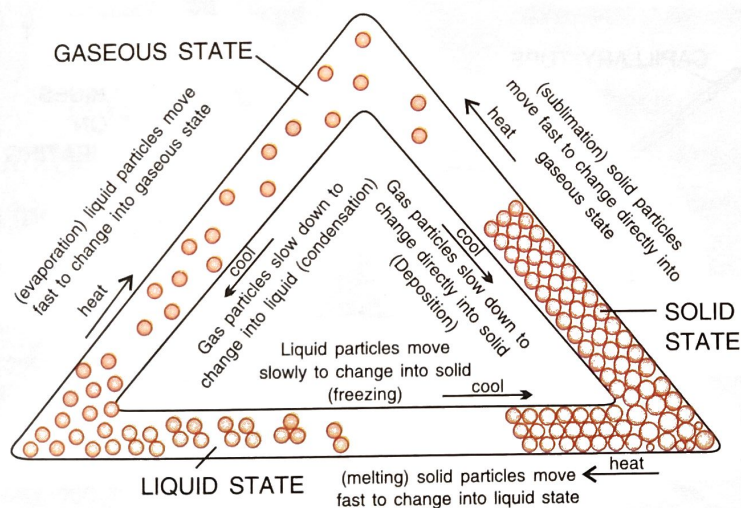


Fig. 3.5 Arrangement of particles in three states of matter and their interconversion

Note : Conversion of a solid to liquid by heating is called melting (or fusion).

Melting : Solid + Heat \rightarrow Liquid

On cooling, liquid freezes into solid

Freezing : Liquid - Heat \rightarrow Solid

The fixed temperature at which a solid melts to liquid is called its **melting point**.

The fixed temperature at which a liquid boils is called its **boiling point**.

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2020 JULY

DAY 193 - 173 WEEK 28

SATURDAY

07

July 2020

Wk	M	T	W	T	F	S	S
27			1	2	3	4	5
28	6	7	8	9	10	11	12
29	13	14	15	16	17	18	19
30	20	21	22	23	24	25	26
31	27	28	29	30	31		

APPOINTMENT / MEETING

Class VI

Date - 2-6-20

Chapter-3 Matter (Part-3)
Subject Chemistry

- ① What is interconversion of state of matter? Give an eg.
- ② Give an eg. where you can change the state of matter by changing the temperature.
- ③ Give an eg. where you can change the state of matter by applying pressure.
- ④ What is sublimation? Give an eg.
- ⑤ What is sublimable substance? Give an eg.
- ⑥ What is melting and melting point?
- ⑦ What is evaporation and boiling?
- ⑧ What is boiling point?
- ⑨ What is Condensation and Condensation point?
- ⑩ What is freezing and freezing point?

Sunday 12

P. S. 2-6-20