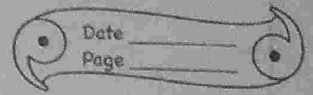


## Exercise



### 1. Objective questions

- 1) The temperature of a substance remains unaffected during its change of state. True
- 2) Ice melts at  $100^{\circ}\text{C}$ . False
- 3) Water at  $100^{\circ}\text{C}$  has more heat than steam at  $100^{\circ}\text{C}$ . True
- 4) Evaporation of a liquid causes cooling. True
- 5) Water evaporates only at  $100^{\circ}\text{C}$ .
- 6) Boiling takes place at all temperatures. False
- 7) Evaporation takes place over the entire mass of the liquid. False
- 8) The process of a gas converting directly into solid is called vapourisation. False
- 9) At high altitudes, water boils above  $100^{\circ}\text{C}$ . True
- 10) The melting point of ice is  $0^{\circ}\text{C}$ . True

2 Fill in the blank

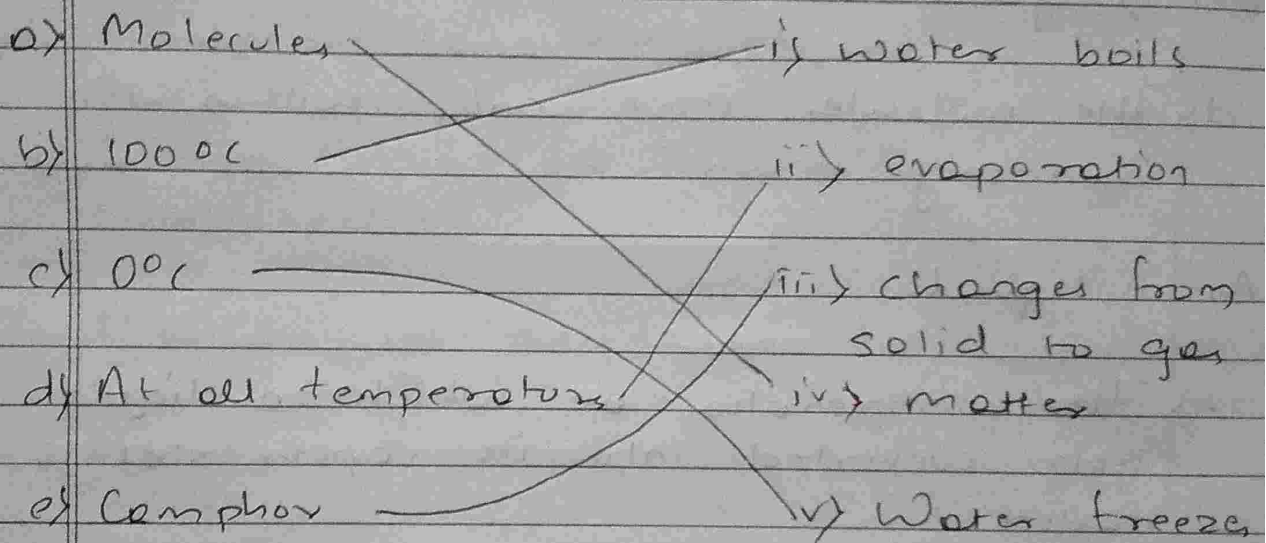
- a) Evaporation takes place at all temperatures.
- b) Freezing process is just the reverse of melting.
- c) Sublimation is a process that involves direct conversion of a solid into its vapour on heating.
- d) The temperature at which a solid converts into a liquid is called its melting point.
- e) The smallest unit of matter that exists freely in nature is called molecule.
- f) Molecules of a substance are always in a state of motion and so they possess kinetic energy.
- g) Inter-molecular space is maximum in gas, less in liquid and the least in solid.

ii) Inter-molecular force of attraction is maximum in solid, less in liquid and the least in gas.

3 Match the following

Column A

Column B



4 - Select the correct alternative

a) The inter-molecular force is maximum in

Ans i) Solids

b) The inter-molecular space is maximum in

Ans iii) gases.

c) The molecules can move freely anywhere in

Ans i) gases.

d) The molecules move only within the boundary in -

Ans i) liquids.

e) The temperature at which a liquid gets converted into its vapour state is called its

Ans ii) boiling point

f) Rapid conversion of water into steam is an example of

Ans iv) vaporization.

g) Evaporation takes place from the

Ans i) surface of the liquid.

h) Boiling takes place from

Ans ii) throughout the liquid.

B) Short/long answer question

1) Define the term matter? What is it composed of?

Ans. Matter is anything that occupies space and has mass.

It is composed of very tiny particles called molecules. Molecules are made from atoms.

2) State three properties of molecules of matter

Ans Three properties of molecules are:  
=> They are very small in size.  
=> They have spaces between them.

They are in constant random motion and possess kinetic energy.

3) What do you mean by inter-molecular spaces? How do they vary in different states of matter?

Ans. The spaces between the molecules of matter are called intermolecular spaces. They are maximum in gas, less in liquid and least in solid.

4) What is meant by the inter-molecular forces of attraction? How do they vary in solids, liquids and gases?

Ans. The forces of attraction between the molecules of matter are called inter-molecular forces of attraction.

The intermolecular force is maximum in solids, less in liquids, least in gases.

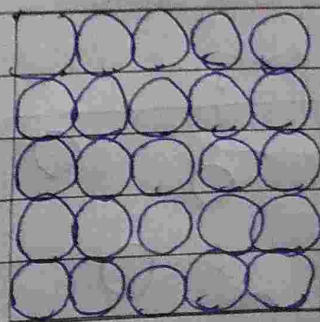
5) Which of the following are correct?

Ans a) Solids have definite shape and definite volume.  
b) Liquids have definite volume but no definite shape.

6) Discuss the three states of matter: solid, liquids and gas on the basis of molecular model.

Ans Solids

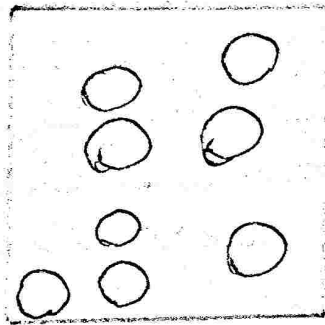
- ⇒ molecules are very closely packed.
- ⇒ maximum force of attraction between molecules.
- ⇒ minimum space between the molecules.
- ⇒ kinetic energy is least.



## Liquids

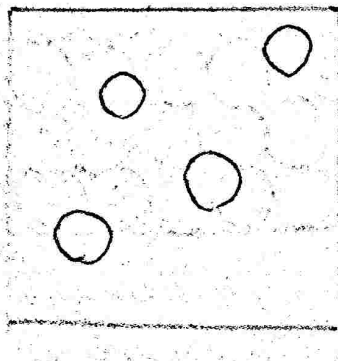
- ⇒ molecules are less tightly packed.
- ⇒ less force of attraction.
- ⇒ more spaces between the molecules.
- ⇒ kinetic energy is max.

~~Diagram~~



## Gases

- ⇒ molecules are freely packed.
- ⇒ least force of attraction.
- ⇒ most inter-molecular free space.
- ⇒ kinetic energy is most.

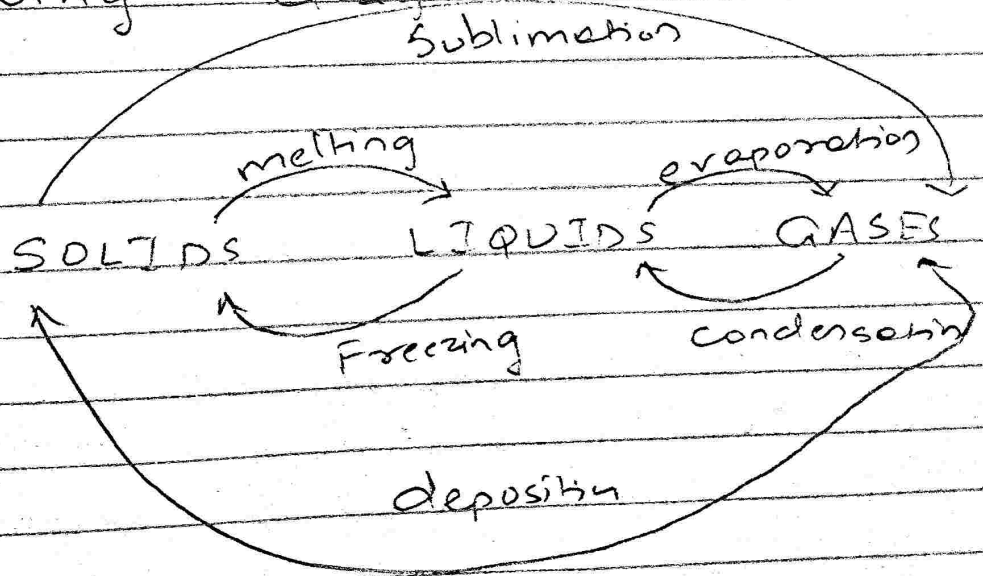




7) What do you mean by the change of state? Write the flow chart showing the complete cycle of change of state.

Ans. The process of change from one state to another either by absorption or by rejection of heat at a constant temperature is called the change of state.

It is represented by the following diagram.



8) Differentiate between melting point and boiling point, giving at least one example of each.

Ans. The temperature at which a solid starts changing into liquid without further increase in temperature is called its melting point. E.g. melting point of ice is  $0^{\circ}\text{C}$ .

The temperature at which a ~~solid~~ liquid starts changing into gas without change in temperature is called boiling point. E.g. boiling point of water is  $100^{\circ}\text{C}$ .

9) Describe the process of condensation and sublimation with examples.

Ans. The process through which a solid changes into gas directly without undergoing a liquid state is called sublimation. E.g. Camphor.

The process by which a gas changes into liquid on cooling is called condensation. E.g. dew.

10 Explain the terms melting and melting point.

Ans Melting- The process by which a solid changes into liquid is called melting but, when a solid changes into liquid at a fixed temperature without any further decrease in temperature.

11) Describe one experiment to demonstrate that a substance absorbs heat during melting without change in its temperature!

Ans AIM- to show that a substance absorbs heat without change in its temperature.

Materials required- Vertical stand, Thermometer, Beaker, Wax, Burner, Tripod stand, Wire gauge, Test tube

Procedure- Take a test tube. Put some wax in the test tube. Clamp the test tube in a vertical stand and place the test tube in a beaker.

of water placed on a wire gauze of tripod stand clamp a thermometer in the same vertical stand and insert the thermometer in the bulb of the thermometer is inside the wax as shown. Heat the beaker over the flame of a burner and record ~~your~~ the temperature of the wax after every minute.

### Observations.

Time (in min.)	Temperature of wax (in °C)
0	25
1	30
2	35
3	40
4	45
5	50
6	55
7	55
8	55
9	55
10	60
11	65
12	70

Conclusion. - From the above observations you will note that wax melts at  $55^{\circ}\text{C}$  during which heat is supplied, but temperature does not rise. Thus the melting point of wax is  $55^{\circ}\text{C}$ . After the melting of the whole wax, the temp. begins to rise.

12 Explain the terms vaporization and boiling point?

Ans The process through which a liquid changes its state and turns into its vapour state is called vaporisation. But when a liquid changes into steam <sup>only</sup> without ~~change~~ in its ~~tempe~~ at a specific temperature it's called its boiling point.

13 A liquid can change into vapour state. Name the processes involved.

a) at a fixed temp.  $\rightarrow$  boiling.

b) at all temperatures  $\rightarrow$  evaporation.

15 Describe an experiment to demonstrate that water absorbs heat during boiling at a constant temperature.

Ans - AIM - to show that water absorbs heat during boiling at a constant temperature.

Materials required - Vertical stand, Thermometer, Beaker, Wire gauze, Burner, Tripod stand.

Procedure - Take a beaker. Pour some water in the Beaker. Place the beaker on a wire gauge placed over a tripod stand. Clamp a thermometer in a vertical stand and insert it in the beaker as shown in. Heat the beaker over the flame of a burner and record the temperature of water after every minute.

It is noticed that the temperature of water rises continuously till the water starts boiling at  $100^{\circ}\text{C}$ . Once the water starts boiling its temperature does not rise further, although the heat is still being supplied. Now the bubbles formed through the water are seen. At these temperature water begins to boil and changes into steam, Thus, the boiling point of water is  $100^{\circ}\text{C}$ .

16. State (a) melting point of ice and (b) the boiling point of water

Ans (a)  $0^{\circ}\text{C}$   
by  $100^{\circ}\text{C}$ .

17. What is evaporation?

Ans. The process by which ~~water~~ <sup>water</sup> ~~liquid~~ <sup>liquid</sup> turns into ~~the~~ ~~water~~ <sup>water</sup> vapour is called Evaporation.

18) State three factors which affect the rate of evaporation of liquid.

Ans Three  
rate of

$\Rightarrow$  humidity  
 $\rightarrow$  wind  
 $\rightarrow$  nature.

19) Wet &  
warm  
day. E

Ans Wet  
warm  
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20) Water  
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Ans Water  
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Ans Three factors which affect the rate of evaporation of a liquid

- ⇒ humidity
- ⇒ wind
- ⇒ nature.

19) Wet clothes dry more quickly on a warm day than on a cold humid day. Explain.

Ans Wet clothes dry more quickly on a warm day than on a cold humid day. This happens due to presence of moisture in the air. On a cold day the moisture content is more than of a warm day.

20) Water in a dish evaporates faster than in a bottle. Give reason.

Ans Water in a dish evaporates faster than in a bottle. This happens because of surface area of the liquid. Surface area of water in

a dish is more exposed to the environment than water in a cup.

21. Why are volatile liquids such as alcohol and spirit kept in tightly closed bottles?

Ans. Volatile liquids are stored in tightly closed bottles because they get evaporated easily.

22. A certain quantity of water is heated from  $20^{\circ}\text{C}$  to  $100^{\circ}\text{C}$ . The temperature is recorded after each minute.

The observation is

Time (In minutes)	Temp. (in $^{\circ}\text{C}$ )
0	20
1	30
2	40
3	50
4	60
5	70
6	80
7	90
8	100

9	100
10	100
11	100
12	100

What conclusion do you draw from the above table about the boiling point of water? Explain.

The temperature

Ans Boiling point of water is  $100^{\circ}\text{C}$ .  
 it becomes <sup>constant</sup> a heat is being supplied.  
 This heat is used to convert the water into steam.

23 Why is cooling produced on the evaporation of a liquid.

Ans When a liquid evaporates it uses the heat of the surrounding thus cooling the liquid to evaporate, thus cooling the surrounding.

24 Explain with an example that when a liquid evaporates, it takes heat from the surrounding.

Ans. When a liquid evaporates, it takes heat from the surroundings.

E.g. When we have fever, then we put strips of wet cloth on our head. This is done because when the water evaporates, it takes heat from the surroundings, thus cooling the body.

25 Give two applications of evaporation.

Ans. We often pour tea in a saucer to cool it faster because the surface area of the tea is more exposed to the surroundings than the cup.

Also, water when kept in an earthen pot stays cool, as the water gets into the small pores of the pot, it evaporates taking the heat from the surroundings, thus cooling the water.

26 Explain why in hot summer days water remains cool in earthen pots.

Ans Water remains cool in earthen pots because when the water gets into the small pores of the pot, it gets evaporated taking the heat from the surroundings, thus cooling the water inside it.

27 A patient suffering from high fever is advised to put wet cloth strips on his forehead.

Ans A patient is advised because when he puts wet cloth on his forehead, the water when gets evaporated it takes heat from the surrounding, thus cooling the body.

28 What do you mean by sublimation? Explain with an example.

Ans The process through which solid directly changes into ~~to~~ gas without undergoing liquid state is called sublimation.  
Ex. Camphor, Naphthalene Balls.

29 Why does the size of naphthalene balls decrease when left open?

Ans. The size of the naphthalene balls decrease due to sublimation. When they are left open they sublime and directly change into its gas state without undergoing liquid state.

30 Describe an experiment to demonstrate the process of sublimation.

Ans. Aim - to demonstrate the process of sublimation.

Materials Required - Ammonium Chloride powder, China dish, funnel, Burner, Tripod stand, Cotton pipe.

Procedure - First a dish is kept on a wire mesh. ~~Over~~ <sup>In</sup> the dish, ammonium chloride is kept. It is covered with an inverted funnel. The setup is placed over a tripod stand with a burner ~~to~~ <sup>at</sup>. ~~It is observed~~ The funnel tip is covered with cotton pipe. It is observed that the ammonium powder turns into ~~gas~~ vapour and then again

changes in state like solid other  
changing into vapor.

