



STEPPING STONE
SCHOOL (HIGH)

CLASS :8

Subject: physics
Topic: Matter

Date:01.05.2020
Time Limit:30 min

Worksheet No.:3

[Copy the questions following the notes and solve them on a sheet of paper date wise. Keep the worksheets ready in a file to be submitted on the opening day.]

KINETIC THEORY OF MATTER

In the previous Worksheet we had studied about inter molecular force of attraction, inter molecular space. In this Worksheet we will learn about different types of inter molecular force of attraction and the effect of heat energy on it. So let us start

DIFFERENT TYPES OF INTER MOLECULAR FORCE OF ATTRACTION

Inter molecular force of attraction are of two types

- 1) Cohesive force of attraction
- 2) Adhesive force of attraction

Cohesive force of attraction = The inter molecular forces of attraction that take place between two like molecules are known as Cohesive force of attraction.

Example –The force of attraction between two water molecules
The force of attraction between two oxygen molecules etc.

Adhesive force of attraction = The inter molecular force of attraction that takes place between two unlike molecules are known as adhesive force of attraction.

Example = When water is kept in a glass tumbler, the inter molecular forces of attraction that take place between the glass molecules and the water molecules against the glass wall is Adhesive force of attraction.

MOVEMENT OF PARTICLES IN THE THREE STATES OF MATTER.

- 1) The inter molecular forces of attraction between solid molecules is maximum so the molecules stay very close to one another and are tightly packed. The molecules of solid cannot move freely but vibrate about their mean position. When heat energy is imparted to solid the molecules start gaining energy and as a result their kinetic energy increases and they start vibrating with greater amplitude. The molecules now collide with the neighbouring molecules and transfer some energy to them and the neighbouring molecules start vibrating with greater amplitude. This process takes place throughout the solid substance. Due to vigorous collision the space between the molecules increases and a time comes when the solid changes into liquid.
- 2) The inter molecular force of attraction between liquid molecules are less than solid so the molecules are little bit far away from one another. The molecules of liquid vibrate about their mean position as well as moves in the entire volume of liquid. The moving molecules collide with each other and also with the wall of the container. As such a pressure is created on the wall of the container. The pressure on the wall of the container depends on the number of collisions per unit area of the wall of the container and also on the speed of collision. When heat energy is given to liquid the molecules gain kinetic energy and start moving with more speed. The molecules collide more with one another as well as with the wall of the container. The pressure acting on the wall of the container increases. As the number of collision between liquid molecules increases the inter molecular force of attraction decreases and the molecules move far away from one another and a time comes when the liquid substance changes into gas.
- 3) The inter molecular forces of attraction between gas molecules are very less than liquid so the molecules are very far away from one another. The molecules of gas vibrate about their mean position as well as moves in the entire volume available to them. The moving molecules collide with each other and also with the wall of the container as such a pressure is created on the wall of the container. The pressure on the wall of the container depends on the number of collisions per unit area of the wall of the container and also on the speed of collision. When heat energy is

given to gas the molecules gain kinetic energy and start moving with more speed. The molecules collide more with one another as well as with the wall of the container. The pressure acting on the wall of the container increases. As the number of collision between gas molecules increases the intermolecular force of attraction decreases and the molecules move far away from one another and expands tremendously.

Note :- The reverse process takes place when the substances are cooled. The molecules loose kinetic energy and their speed decreases. The rate of collision with the wall of the container decreases so the pressure on the container also decreases. As the speed decreases the number of collision between the molecules decreases which increases the intermolecular forces of attraction and the molecules come close to one another. If cooling is continued gases change into liquid and liquid change into solid.

ANSWER THE FOLLOWING QUESTIONS

- 1) Name and define different types of intermolecular forces of attraction.
- 2) What happens to the intermolecular forces of attraction when a substance is heated and why.
- 3) Explain briefly how solid changes into liquid on heating.
- 4) How liquid changes to gas on heating.
- 5) How pressure acting on the wall of a container can be increased or decreased.
- 6) Why gases exert more pressure on the walls of the container on heating
- 7) Explain briefly how gases change to liquid on cooling.
- 8) Why solids are not easy to compress.
- 9) Explain briefly the process when liquid is cooled.
- 10) Why the fragrance of perfume is felt in one room when it is sprayed in another room

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