

# Boys' High School and College , Prayagraj

## Subject – Chemistry

### Chapter – Matter

15<sup>th</sup> April-15<sup>th</sup> May

### Class VI

#### Introduction

You see a number of things around you . At school you see tables , chairs , desks and benches . They all are made of wood , which is a material found in nature . Materials are made of matter . In a simple way , you can understand that matter is anything .

**Matter is defined as anything that has mass and occupies space .** Everything around us is made of matter . It is made up of **atoms** .

#### Classification of matter

Matter exists in three forms –

1. Solid
2. Liquid
3. Gas

**All three forms of matter are made up of very small particles which can exist independently . These particles are called molecules .**

## Intermolecular force and intermolecular space

- The force of attraction between molecules is called **intermolecular force of attraction** .
- The space between any two molecules is called **intermolecular space** .

### Solids

Molecules are closely packed in a solid with little or no intermolecular space and very high intermolecular force of attraction .

### Properties of solids

1. Solids have a fixed volume .
2. Solids cannot flow .
3. They are incompressible .
4. They can have any number of free surfaces depending on their shape .

### Liquids

Molecules are not tightly packed and their position is not fixed . The attraction between molecules is less , but not so less that they move in any direction .

### Properties of liquids

1. Liquids don't have a definite shape but takes the shape of container in which they are kept .
2. Liquids have a fixed volume .

3. Liquids flow a higher level to a lower level under normal conditions .
4. Liquids can be slightly compressed because they have a definite volume .
5. Liquids , unlike solids , have only one free surface .

## Gases

In gases , molecules are far apart from each other . Their is maximum intermolecular space and minimum intermolecular force of attraction .

## Properties of gases

1. Gases have no definite shape .
2. Air occupies space .
3. Gases have no definite volume .
4. Gases are highly compressible .
5. Gases have no free surface .

## Change of state

A substance can exist in any of the physical states . We can change the physical state by changing the temperature or pressure .

- Conversion of solid into liquid on heating is called **melting** .
- Conversion of liquid to vapour is called **vapourisation** .
- Conversion of vapour into liquid on cooling is called **condensation** .
- Conversion of liquid into solid on cooling is called **freezing** .
- Some substances change directly from solid to gas on heating . Such a conversion is called **sublimation** .
- A direct change of state from a gas to a solid is called **deposition** .

## Worksheet 1

Note : To be done in an interleaf notebook .

### Chapter : Matter

#### A. Fill in the blanks with suitable words :

1. A solid can have any number of free surfaces .
2. Molecular attraction between gaseous molecules are very less .
3. Any material which has a definite volume but no definite shape is called a liquid .
4. An atom is the tiny particle of which everything around us is made .
5. Gases have no definite shape .

#### B. Write True or False for the following statements :

1. Increase of length , size or volume on heating is called thermal expansion . True
2. Solids have a definite shape and occupy indefinite space . False
3. Solids are incompressible . True
4. Gases have very high attraction between their molecules . False

5. Solids do not expand on heating . **False**

**C. Answer the following in short :**

**1. What is the difference between an atom and a molecule ?**

Ans. **Atom**

An atom is the smallest particle of an element which may or may not have an independent existence but always takes part in a chemical reaction .

**Molecule**

All three forms of matter are made up of very small particles which can exist independently . These particles are called molecules .

**2. Identify 'A' , 'B' and 'C' by the characteristics given below :**

- a. 'A' is a solid at 0°C .
- b. 'B' is a liquid at room temperature and is most essential for life .
- c. 'C' is white solid that turns directly into gas on heating .

Ans. a. Ice  
b. Water  
c. Naphthalene

**3. Why can't a metallic ball pass through a metallic ring when it is heated ?**

Ans. The diameter of metallic ball increases on heating due to thermal expansion . Hence it cannot pass through a metallic ring .

#### 4. Define chemical change .

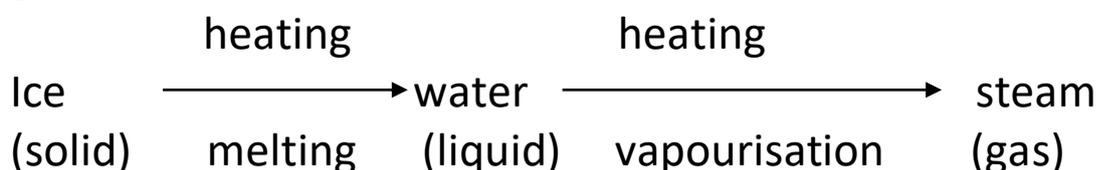
Ans. A change in which new substances are formed is called chemical change . In chemical change , the chemical composition of a substance changes . Example – Burning of candle wick .

#### D. Answer the following in detail :

##### 1. What is matter ? How can you change the state of matter ?

Ans. Anything that has mass and occupies space is called matter .

We can change the physical state by changing the temperature or pressure .For example – water can be changed from liquid to solid at  $0^{\circ}\text{C}$  , and from liquid to gaseous state at  $100^{\circ}\text{C}$ .



##### 2. Why do solids have a fixed shape while liquids and gases do not have fixed shape ?

Ans. Molecules are closely packed in a solid , they have the least intermolecular space and strong intermolecular force of attraction . They cannot move from their place , giving solids a definite shape whereas in case of liquids and gases , molecules are not tightly packed , they can easily move in any direction and thus they can take the shape of the container in which they are kept .

### **3. Why can liquids flow but solids cannot ?**

Ans. In case of liquids there is greater intermolecular space and lesser intermolecular force of attraction due to which they can flow whereas in case of solids the molecules are closely packed with little or no intermolecular space and very high intermolecular force of attraction due to which they cannot flow .

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## Worksheet 2

**Note: Exercises to be done in notebook .**

**A. Answer the following questions :**

1. What are the various states of matter ?
2. What is the difference between freezing and melting ?
3. Why do liquids have a fixed volume but gases do not have a fixed volume ?
4. Briefly describe an experiment to prove that air expands on heating ?
5. Define the following terms –
  - a. Intermolecular force of attraction
  - b. Deposition
  - c. Sublimation
  - d. Thermal expansion

**B. Fill in the blanks :**

1. The smallest unit of matter is .....
2. Gases have least ..... but maximum ..... while solids have least ..... but maximum .....

3. .... have a definite shape and they occupy .....
4. .... attract each other with a force called intermolecular force .
5. Application of heat can also cause an irreversible ..... change .

**C. Match the following :**

**Column A**

1. Molecules
2. Free surface
3. Intermolecular force of attraction .
4. Volume
5. Solid to gas

**Column B**

- a. Space occupied by matter .
- b. As many as possible in solids .
- c. Sublimation .
- d. Least in gases .
- e. Have independent existence .

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