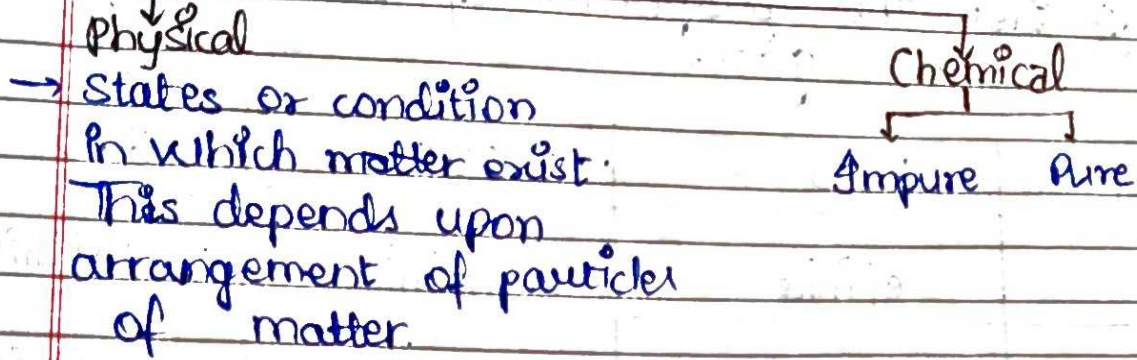



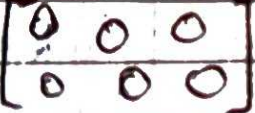
## Chapter - 1.

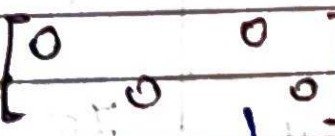
### Matter in our Surroundings

Matter - Anything that has mass and occupies space



Solid [  ] Intermolecular space  $\rightarrow$  negligible  
Intermolecular force of attraction  $\rightarrow$  high  
Kinetic Energy (least)

Liquid [  ] Intermolecular space  $\rightarrow$  moderate  
Intermolecular force of attraction  $\rightarrow$  high  
Kinetic Energy (Intermediate)

[  ] Intermolecular space  $\rightarrow$  High  
Intermolecular force of attraction  $\rightarrow$  Less  
Kinetic Energy (Maximum)  
 $\rightarrow$  Interstitial sites or nodes



Q1 Define the word 'matter'.

Ans 1: Anything that has mass and occupies some space is known as 'matter'.

Q2 List the properties of solids, liquids and gases.

Property	SOLID	LIQUID	GAS
SHAPE	Definite	Indefinite	Indefinite
VOLUME	Definite	Definite	Indefinite
Intermolecular forces of attraction	Maximum	Intermediate	Negligible
COMPRESSIBILITY	Incompressible	Almost incompressible	Highly compressible
Movement of particles	Particles can't move rather they vibrate only at their fixed position.	Particles can slide over one another.	Particles can move freely.
DENSITY	Highest	Intermediate	Lowest
FLUIDITY	Can't flow	Flow	Flow

Q3 List the attributes of particles of matter.

Ans 2: 1. Particles of matter have space between them.

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2. Particles of matter are continuously moving.
3. Particles of matter attract each other.
4. Particles of matter are very, very small.

\* Microscope

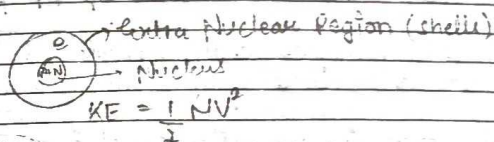
Simple Compound (SC)

Compound Microscope (CM)

Stereo/Dissecting Microscope

Electron Microscope (EM)

Scanning Tunneling Microscope (STM)



Good Write

## Matter In Our Surroundings

### \* Intext Ques (Pg-2)

Q1 Which of the following are matter?

Chair, air, love, smell, hate, almonds, thought, cold, lemon, water, smell of perfume.

Ans1: Anything which has mass and occupies space is called matter. It is made up of particles.

In above examples, chair, air, almond, lemon, water and smell of perfume are matter.

Q2 Give reason for the following observations:

The smell of hot sizzling food reaches you several metres away, but to get the smell from cold food you have to go close.

Ans2: The smell of hot sizzling food reaches us several metres away, as the particles of hot food have more kinetic energy than the cold food. So, the rate of diffusion is more in hot food compared to cold food.

Q3 A diver is able to cut through water in a swimming pool. Which property of matter does this observation show?

Good Write

Ans3: The diver is able to easily cut through the water in swimming pool because of the weak force of attraction between water molecules. It is the property of water that attributes to easy diving.

Q4 What are the characteristics of particles of matter?

Ans4: (i) The particles of matter are very, very small.  
(ii) Particles of matter are continuously moving.  
(iii) Particles of matter attract each other.  
(iv) Particles of matter have space between them.

### \* Intext Ques (Pg-6)

Q1 Arrange the following in order of increasing density: air, exhaust from the chimneys, honey, water, chalk, cotton and iron.

Ans1: The following substances are arranged in increasing density:  
Air, exhaust from chimney, cotton, water, honey, chalk, Iron.

Q2(b) Comment upon the following - Compressibility, fluidity, filling a gas container, shape, Kinetic energy and Density.

Ans2(b) (i) Rigidity: It is the property of matter to continue to remain in its shape, when treated with an external force.

Good Write



(iii) Fluidity - It is the ability of a substance to flow or move freely (liquids & gases).  
 (iv) Filling a gas container - The particles in a container take their shape as they randomly vibrate in all possible directions.

(v) Shape - It is the definite structure of an obj. within an external boundary.

(vi) Kinetic Energy - Motion allows particles to possess energy which is referred to as kinetic energy. The increasing order of kinetic energy possessed by various states of matter are:  
 Solids < Liquids < Gases

$$KE = \frac{1}{2}mv^2 \quad m = \text{mass,} \\ v = \text{velocity}$$

(vii) Density - It is the mass per unit volume of a substance.

$$d = \frac{M}{V}$$

Q3 Give reasons:

- (a) A gas fills completely the vessel in which it is kept.  
 ⇒ There is a low force of attraction between gas particles and therefore, the particles in the filled vessel are free to move about (rest parts ahead →)

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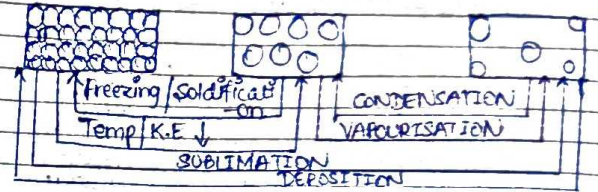
31/07/25

Chapter-1

Matter in Our Surroundings

⇒ Factors affecting Matter:

- Temperature
- Pressure



$$\text{Density} = \frac{\text{Mass of substance}}{\text{Volume of substance}} = \frac{\text{Kg}}{\text{m}^3} \text{ \& Kg m}^{-3}$$

Q Liquids have lower density than solids, why ice floats on water?

Sol ⇒ While liquids generally have lower density than solids, ice floats on water because it has a unique crystalline nature with open space which creates larger spaces between water molecules compared to liquid water.

Good Write

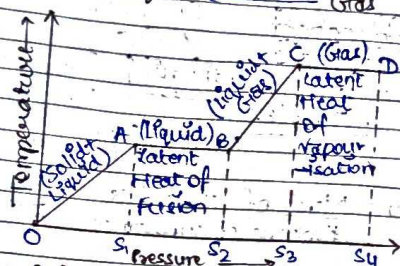
## Home-work

DATE 28/25

### Ch-1 (Matter in our surroundings)

# Latent Heat (Hidden Heat) → Change in state

Solid  $\xrightarrow{\text{Heat}}$  Liquid  $\xrightarrow{\text{Heat}}$  Gas  
 Solid  $\xleftarrow{\text{Freezer}}$  Liquid  $\xleftarrow{\text{Freezer}}$  Gas



Boiling Point - (Water) =  $100^{\circ}\text{C}$  [Temp. at which vapour pressure becomes equal to the atm. pressure]

Atmospheric Pressure: (1 atm = 760 mm Hg)  
 105 pa (101325)

1. To measure the atm. pressure = Barometer
2. To measure the blood pressure = Sphygmomanometer
3. To measure the Gas pressure = Manometer

# Freezing point = Temp. where the liquid vapour pressure becomes equal to solid vapour pressure)

\* Freezing / Melting point =  $0^{\circ}\text{C}$

Good Write

Boiling Point - (Water) →  $100^{\circ}\text{C} = 373.15\text{K}$   
 (Temp. at which vapour pressure of the liquid becomes equal to the atmospheric pressure)

•  $^{\circ}\text{C}$  to  $^{\circ}\text{F}$ :  $\frac{9}{5}^{\circ}\text{C} + 32$

$^{\circ}\text{C}$  to  $\text{K}$ :

$\text{Celsius} + 273.15$

### Intext Ques (Pg 6)

Q3 (b) A gas exerts pressure on the walls of container.

⇒ Gaseous particles move about randomly at high speed due to weak intermolecular forces of attraction. Due to this random movement, particles hit each other and also the walls of container. The pressure exerted by gas is because of the force exerted by gas particles per unit area on the walls of container.

(c) A wooden table should be called a solid.  
 ⇒ The particles of a wooden table should be called a solid because it has a definite shape, fixed volume and definite boundaries. Also, it can not flow and is incompressible.

(d) We can easily move hand in the air but to do

Good Write



the same through a solid block of wood. We need a Karate expert.

⇒ This is so because there is less force of attraction between the particles. So, very less amount of external force can break it. But in the case of solid, the force of attraction is very strong and the molecular space is so high. Hence a large amount of force is required to break it.

### Home-work

#### Matter in Our Surroundings

4/8/25

#### \* Intext Ques (Pg 9)

Q1  $K \rightarrow ^\circ C$

(a) 300K

(b) 573K

$$\Rightarrow 300K = (300 - 273)^\circ C = 27^\circ C$$

$$\Rightarrow 573K = (573 - 273)^\circ C = 300^\circ C$$

Q2 What is the physical state of water at:

(a)  $25^\circ C \Rightarrow$  Gas

(b)  $100^\circ C \Rightarrow$  Can be Gas as well as liquid.

Q3 for any substance, why does the temperature remain constant during the change of state?

Ans 3: The temperature of the substance does not change because the heat is used to overcome the forces of attraction. This heat energy is known as latent heat.

Good Write

#### Intext Matter in Our Surroundings

Q4 Suggest a method to liquefy atmospheric gases.

Ans 4: The atmospheric gases are transferred into a cylinder with a piston attached on it. By cooling and applying external pressure (by pushing the piston) on them. This way gases can be liquefied.

#### \* Intext Ques (Pg-10)

Q1 Why a desert cooler cool better on a hot dry day?

Ans 1: It is because the inner walls of the cooler get sprinkled by the water continuously and due to warm, dry weather, this water gets evaporated. Evaporation cause cooling of the present air inside of the cooler. This cold air is sent in the room by a fan.

Q2 How does the water kept in an earthen pot (matka) become cool during summer?

Ans 2: The earthen pot is porous with a lot of pores in it. So, water comes out on the surface of the earthen pot, and this water gets evaporated and thus the temp of water present inside than the pot has a much lower temp. than outside, and hence water becomes cold.

Good Write

Q.3 Why does our palm feel cold when we put some acetone or petrol or perfume on it?

Ans.3: When we put some acetone, petrol or perfume on our palm, they come into contact with the air and hence evaporation causes a cooling effect on our palm.

Q.4 Why are we able to sip hot tea or milk faster from a saucer than a cup?

Ans.4: As we know, evaporation rate is faster with increased surface area. Tea in a saucer has a larger surface area than in a cup. Therefore, the cooling of tea is more rapid than in a saucer, and thus we sip hot tea or milk faster from a saucer than a cup.

Q.5 What type of clothes should we wear in summer?

Ans.5: We should wear light coloured cotton clothes because the light colours reflect the solar radiation and cotton clothes have more porosity so that it allows sweat through it to evaporate faster, thereby causing a cooling effect.

Good Write

### \* Back Exercises:

Q.1 K  $\rightarrow$   $^{\circ}$ C

(a) 293 K

$$\Rightarrow 293 \text{ K} = (293 - 273)^{\circ}\text{C} = 20^{\circ}\text{C}$$

(b) 473 K

$$\Rightarrow 473 \text{ K} = (473 - 273)^{\circ}\text{C} = 200^{\circ}\text{C}$$

Q.2  $^{\circ}\text{C} \rightarrow \text{K}$

(a) 25  $^{\circ}\text{C}$

$$\Rightarrow 25^{\circ}\text{C} = (25 + 273) \text{ K} = 298 \text{ K}$$

(b) 373  $^{\circ}\text{C}$

$$\Rightarrow 373^{\circ}\text{C} = (373 + 273) \text{ K} = 646 \text{ K}$$

Q.3 Give reason:

(a) Naphthalene balls disappear with time without leaving any residue/solid.

$\Rightarrow$  Because it can sublime and can get directly converted to gaseous state without leaving any solid.

(b) We can get the smell of perfume sitting several metres away.

$\Rightarrow$  Perfumes contain a volatile solvent which diffuses very faster, and due to this we can get the smell of perfume several metres away.

Q.4 Arrange the following substances in increasing order of forces of attraction between particles: water, sugar, oxygen.

Ans.4: The general increasing order of forces of attraction in three states of matter is gas < liquid < solid.

Good Write



∴ increasing order for the given substances is -  
Oxygen < water < sugar

Q5 What is the physical state of water at -

- (a)  $25^{\circ}\text{C} \Rightarrow$  Liquid
- (b)  $0^{\circ}\text{C} \Rightarrow$  Liquid or solid
- (c)  $100^{\circ}\text{C} \Rightarrow$  Liquid or gas

Q6 Give two reasons to justify -

(a) Water at room temp is a liquid.

- $\Rightarrow$  1. Below  $0^{\circ}\text{C}$  it converts to ice. (solid)
- 2. Above  $100^{\circ}\text{C}$  it converts to gaseous state.

(b) an iron almirah is a solid at room temp.

- $\Rightarrow$  1) At room temp, it has definite shape and boundaries. Also it has a fixed volume.

Q7 Why is ice at  $273\text{K}$  more effective in cooling than water at the same temp?

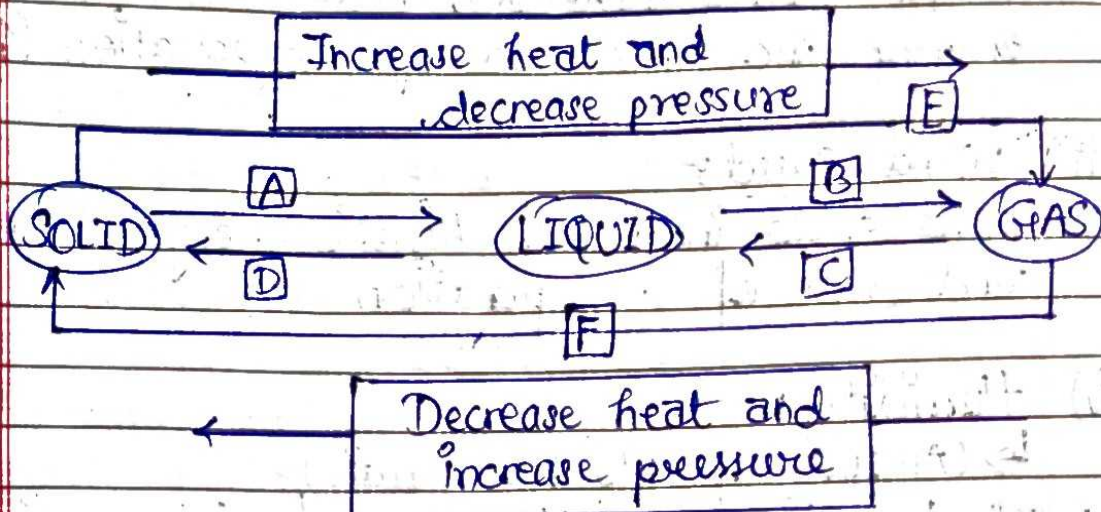
Ans 7: At  $273\text{K}$  ice can easily absorb more heat energy from the surrounding in the form of latent heat of fusion to become water. Water don't absorb extra heat from the medium. Thus, the cooling effect of ice is more than water at the same temperature.

Q8 What produces more severe burns, boiling water or steam?



Ans 8: Steam at  $100^{\circ}\text{C}$  produces more severe burns. It is extra heat is hidden it is called latent heat of vapourisation, whereas the boiling water doesn't have any this hidden heat.

Q9 Name A, B, C, D, E & F in the following diagram.



Ans 9: A = Fusion / melting / liquefaction  
 B = Vapourisation / evaporation  
 C = Condensation  
 D = Solidification  
 E = F = Sublimation

\* NOTES -

⇒ Factors affecting evaporation -

(i) Nature of Liquid:

\* VOLATILE → Weak Intermolecular force of attraction → easily vapourised  
 Ex - Alcohol, petrol, acetone, etc.



\* **NON-VOLATILE** → Strong intermolecular force of attraction → hard to vapourise  
Ex- sugar solution, water.

## (i) Surface Area

\* Surface area increases, heat increases, kinetic energy inc. and rate of evaporation (↑).

## (ii) Wind Speed

\* Wind speed increases, kinetic energy increases, and rate of evaporation (↑)

## (iii) Humidity

↳ (Amount of Moisture in air)

\* If humidity inc (↑), rate of evaporation dec (↓).  
\* If humidity dec (↓), rate of evaporation inc (↑)