

L-1Exercises

1. Convert the following temperatures to the Celsius scale.

a) 293 K

$$K = ^\circ C + 273$$

$$293 K = ^\circ C + 273$$

$$^\circ C = 293 - 273$$

$$^\circ C = 20$$

$$\therefore 20^\circ C$$

b) 470 K

$$K = ^\circ C + 273$$

$$470 K = ^\circ C + 273$$

$$^\circ C = 470 - 273$$

$$^\circ C = 197$$

$$\therefore 197^\circ C$$

2. Convert the following temperatures to the Kelvin scale.

a) 25°C

$$K = ^\circ C + 273$$

$$= 25 + 273$$

$$= 298$$

$$\therefore 298 K$$

b) $373^\circ C$

$$K = ^\circ C + 273$$

$$= 373 + 273$$

$$= 646 K$$

3. Give reason for the following observations.

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

\Rightarrow Because naphthalene balls can sublimed. It can directly change into vapour without converting into liquid & vice-versa.

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

\Rightarrow Because vapours of highly volatile liquids present in perfume diffuse in air & reach us sitting several metres away.

4. Arrange the following substances in increasing order of forces of attraction b/w the particles - water, sugar, oxygen.
Oxygen < water < sugar

5. What is the physical state of water at -

- a) 25°C = liquid
- b) 0°C = solid (ice), liquid
- c) 100°C = steam, liquid

6. Give two reasons to justify -

a) Water at room temperature is a liquid.

⇒ Water at room temperature is a liquid:

- i) It has a fixed volume but does not have a definite shape.
- ii) It can easily flow from one vessel to another. So, it has fluidity.

b) An iron almirah is a solid at room temp.

⇒ An iron almirah is a solid at room temp. because

- i) It has a fixed volume and definite shape.
- ii) It cannot be compressed and it has distinct boundaries.
- iii) It cannot flow like water. So it does not possess fluidity.

7. Why is ice at 273 K more effective in cooling than water at the same temp?

\Rightarrow Water at ~~273~~ temp. of 273 K would just absorb heat energy to achieve room temp. Thus, water at 273 K will absorb less environmental heat energy than ice at 273 K . Therefore, ice at 273 K is more effective in cooling than water at the same temp.

8. What produces more severe burns, boiling water or steam?

\Rightarrow Steam produces more severe burns.

9. Name A, B, C, D, E and F in the following diagram.

- A) Solid to liquid \Rightarrow Fusion
- B) Liquid to gas \Rightarrow Vapourisation
- C) Gas to liquid \Rightarrow Condensation
- D) Liquid to Solid \Rightarrow Solidification
- E) Solid to Gas \Rightarrow Sublimation
- F) Gas to Solid \Rightarrow Sublimation

C.W.

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Page _____
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Plasma - Scientists are reported to have discovered ^{which is} any state of matter commonly known as plasma state of matter. This state ~~does~~ is also known as fourth state of matter.

It consist of highly ionized gas in which particles exist in super energetic and super excited states. ~~At~~ The discovery of plasma have some practical applications such as fluorescent tubes and neon sign bulbs. The fluorescent tubes contains helium or some other gas. When electric current is passed through gas, it produces glowing plasma having a characteristic colour depend upon the nature of the gas. Plasma is also produced in the sun and star due to ~~which~~ high temp which makes them glow.

Bose Einstein Condensate (BEC) - In 1920, an Indian scientist Satendra Nath Bose on the basis of his ~~the~~ statistical calculation gave a concept of fifth state of matter which is commonly known as BEC. Einstein also predicted the possibility of such state. Later on

Three american scientist succeeded in obtaining this state by super cooling gas of extremely low density. This process is called Bose Einstein Condensation and this state of matter is called Bose Einstein Condensate.