Chapter-1: Matter in our surroundings

Give Reasons:

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

Ans: Solids diffuse at a very slow rate. But, if the temperature of the solid is increased, then the rate of diffusion of the solid particles into air increases. This is due to an increase in the kinetic energy of the solid particles. Hence, the sizzling of hot food reaches us even at a distance, but to get the smell from cold food we have to go close.

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

Ans: The ability of a diver to cut through water in a swimming pool shows that the particles of matter have intermolecular spaces. The intermolecular spaces in liquids are fair enough to let the diver pass through it.

1. What is the physical state of water at
2. 250 degree Celsius – Gaseous state
3. 100 degree Celsius – Water can exist in both liquid and gaseous form. At this temperature, after getting the heat equal to the latent heat of vaporization, water starts changing from liquid state to gaseous state.
4. What produces more severe burns, boiling water or steam?

Ans: Steam has more energy than boiling water. It possesses the additional latent heat of vaporization. Therefore, burns produced by steam are more severe than those produced by boiling water.

1. What is dry ice? Why it is known so?

Ans: Solid Carbon dioxide, it gets converted directly to gaseous state on decreasing pressure to 1 atm without changing into liquid state. This is the reason that solid carbon dioxide also known as dry ice.

1. Kelvin scale of temperature is regarded as better scale than Celsius. Why?

Ans: As it has wide range of measurement and Kelvin scale of temperature has always positive sign, hence regarded as better scale than Celsius.

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

Ans: Ice at 273 K has less energy than water (although both are at the same temperature)

Water possesses the additional latent heat of fusion. Hence, at 273 K, ice is more effective in cooling than water.

8. Comment upon the following:

**Rigidity –** can be expressed as the tendency of matter to resist a change in shape.

Compressibility – is the ability to be reduced to a lower volume when force is applied.

Fluidity – ability to flow

Kinetic energy – Energy possessed by a particle due to its motion.

Density – mass per unit volume.

Shape – definite boundary

Melting point – The constant temperature at which a solid melts to become a liquid at the atmospheric pressure

Boiling point – The constant temperature at which a liquid gets converted into its vapour state

Evaporation – The process of conversion of a liquid into its vapour even below it’s boiling point.

1. Give few examples of sublimable solids

Camphor, Benzoic acid, iodine, Ammonium chloride

1. Honey is more viscous than water. Can you suggest why?

Honey is more viscous than water, because honey has strong intermolecular attractive forces than water.

1. What are the factors affecting rate of evaporation?

It depends upon the surface area exposed to atmosphere, the temperature, the humidity and the wind speed.

1. What is plasma state?

The state of matter which consists of super energetic and super excited particles, which are in the form of ionized gases, is called plasma state.

1. What is Bose Einstein condensate and how is it formed?

It is the fifth state of matter. It is the super fluid phase. This state is formed by cooling a gas of extremely low density to super lower temperatures.

1. Explain the differences between evaporation and boiling?

Boiling is a bulk phenomenon, particles from the bulk of the liquid change into vapour state and evaporation is a surface phenomenon. It is the process of conversion of solid state into gaseous state below the boiling temperature. In the process of evaporation, particles gain enough energy to overcome the force of attraction present in the liquid change.

1. Define latent heat of vaporization

It is the heat energy required to change 1kg of a liquid to gas atmospheric pressure at its boiling point.

1. Define latent heat of fusion

It is the amount of heat energy required to change 1 kg of solid into liquid at its melting point.

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

A liquid has a larger surface area in a saucer than in a cup. Thus, it evaporates faster and cools faster in a saucer than in a cup. For this reason, we are able to sip hot tea or milk faster from a saucer than a cup.