Exercise Page 12

Question 1:

Convert the following temperatures to Celsius scale.

(a) 300 K

(b) 573 K

Answer:

Kelvin is an SI unit of temperature, where 0°C = 273.16 K (approximately 273 K)

(a) 300 K = (300 − 273) °C

= 27 °C

(b) 573 K = (573 − 273) °C

= 300 °C

Question 2:

Convert the following temperatures to Kelvin scale.

(a) 25°C

(b) 373°C

Answer:

Kelvin is an SI unit of temperature, where 0°C = 273.16 K (approximately 273 K)

(a) 25 °C = (25 + 273) K

= 298 K

(b) 373 °C = (373 + 273) K

= 646 K

Question 3:

Give reason for the following observations.

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

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

Answer:

(a) Naphthalene undergoes sublimation easily i.e., the change of state of naphthalene from solid to gas takes place easily. Thus, naphthalene balls disappear with time without leaving any solid.

(b) Gaseous particles possess high speed and large spaces between them. Particles of perfume diffuse into these gaseous particles at a very fast rate and reach our nostrils. This enables us to smell the perfume from a distance.

Question 4:

Arrange the following substances in increasing order of forces of attraction between particles–– water, sugar, and oxygen.

Answer:

Sugar is a solid; the forces of attraction between the particles of sugar are strong. Water is a liquid; the forces of attraction here are weaker than sugar. Oxygen is a gas; the forces of attraction are the weakest in gases.

Thus, the increasing order of forces of attraction between the particles of water, sugar and oxygen is

Oxygen < Water < Sugar

Question 5:

What is the physical state of water at−−

(a) 25°C

(b) 0°C

(c) 100°C

Answer:

(a) Water at 25°C is present in the liquid state.

(b) At 0 °C, water can exist as both solid and liquid. At this temperature, after getting the heat equal to the latent heat of fusion, the solid form of water i.e., ice starts changing into its liquid form i.e., water.

(c) At 100 °C, water can exist as both liquid and gas. At this temperature, after getting the heat equal to the latent heat of vaporization, water starts changing from its liquid state to its gaseous state, i.e., water vapours.

Question 6:

Give two reasons to justify−

(a) Water at room temperature is a liquid.

(b) An iron almirah is a solid at room temperature.

Answer:

(a) At room temperature (25 °C), water is a liquid because it has the following characteristic of liquid:

(i) At room temperature, water has no shape but has a fixed volume that is, it occupies the shape of the container in which it is kept.

(ii) At room temperature, water flows.

(b) An iron almirah is a solid at room temperature (25 °C) because:

(i) it has a definite shape and volume like a solid at room temperature.

(ii) it is rigid as solid at room temperature.

Question 7:

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

Answer:

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.

Question 8:

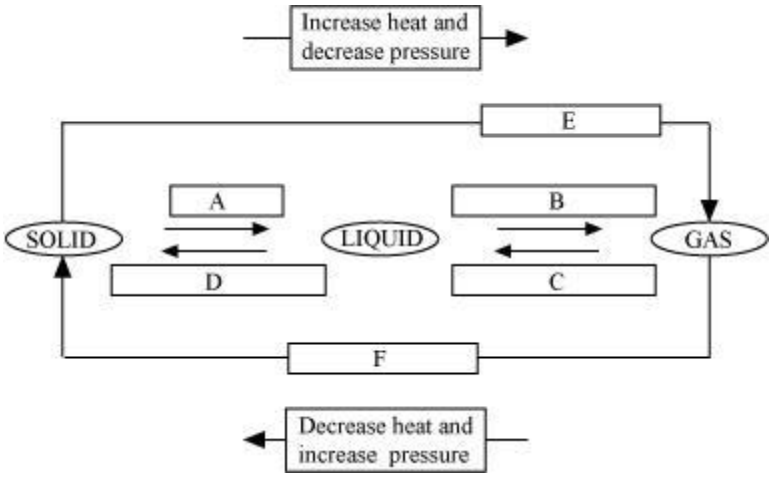
What produces more severe burns, boiling water or steam?

Answer:

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.

Question 9:

Name A, B, C, D, E and F in the following diagram showing change in its state.



Answer: