Class 9 Chapter1 - Matter in Our Surroundings Important Questions with Answers

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Q1. A sample of water under study was found to boil at 102 ℃ at normal temperature and pressure. Is the water pure? Will this water freeze at 0 ℃? Comment.

Answer:

The boiling point of pure water is 100 ˚C, and the freezing point of pure water is 0 ˚C. The water sample boils at 102 ˚C at standard pressure. Thus, the water sample is not pure. It will freeze below 0 ˚C.

Q2. A student heats a beaker containing ice and water. He measures the temperature of the content of the beaker as a function of time. Which of the following (Fig. 1.1) would correctly represent the result? Justify your choice.

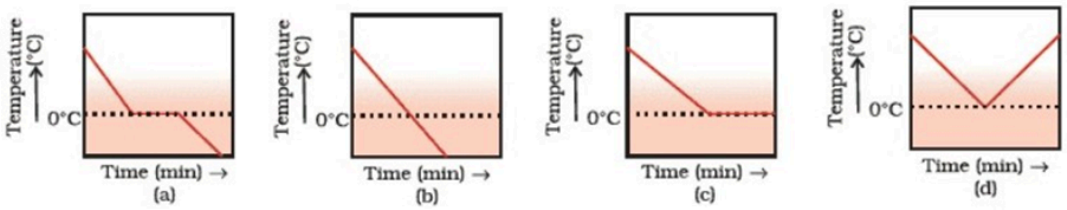

Fig. 1.2

Answer:

When we heat the mixture, the energy supplied is utilized to melt the ice, and the temperature does not change until all the ice melts because of the latent heat of fusion. On further heating, the temperature of the water would increase.

So, graph (d) correctly represents the result.

Q3. Fill in the blanks:

(a) Evaporation of a liquid at room temperature leads to a_____effect.

(b) At room temperature, the forces of attraction between the particles of solid substances are _____than those which exist in the gaseous state.

(c) The arrangement of particles is less ordered in the____state. However, there is no order in the _____state.

(d) _____is the change of gaseous state directly to solid state without going through the state.

(e) The phenomenon of the change of a liquid into the gaseous state at any temperature below its boiling point is called_____.

Answer:

(a) Evaporation of a liquid at room temperature leads to a cooling effect.

(b) At room temperature, the forces of attraction between the particles of solid substances are stronger than those which exist in the gaseous state.
(c) The arrangement of particles is less ordered in the liquid state. However, there is no order in the gaseous state.
(d) Sublimation is the change of a gaseous state directly to a solid state without going through the liquid state.
(e) The phenomenon of changes of a liquid into the gaseous state at any temperature below its boiling point is called evaporation.

Q4. Match the physical quantities given in column A to their SI units given in column B:

Column A	Column B
(a) Pressure	**(i) cubic metre**
(b) Temperature	**(ii) kilogram**
(c) Density	**(iii) pascal**
(d) Mass	**(iv) kelvin**
(e) Volume	**(v) kilogram per cubic metre**

Answer:

colmn A	Column B
(a) Pressure	(iii) pascal
(b) Temperature	(iv) kelvin
(c) Density	(v) kilogram per cubic metre
(d) Mass	(ii) kilogram
(e) Volume	(i) cubic metre

Q6. Osmosis is a special kind of diffusion. Comment.

Answer:

Osmosis is a special kind of diffusion because, in both cases, particles move from a higher concentration to a lower concentration. The only difference is that osmosis applies to the direction of the solvent only through the semi-permeable membrane where the solvent is water.

Q7. Classify the following into osmosis/diffusion

(a) Swelling up of a raisin on keeping in water.

(b) Spreading of the virus on sneezing.

(c) Earthworms die on coming in contact with common salt.

(d) Shrinking of grapes kept in thick sugar syrup.

(e) Preserving pickles in salt.

(f) Spreading of the smell of cake being baked throughout the house.

(g) Aquatic animals use oxygen dissolved in water during respiration.

Answer:

S. No.	Example	Osmosis / Diffusion
1.	Swelling up of a raisin on keeping in water.	Osmosis
2.	Spreading of the virus on sneezing.	Diffusion
3.	Earthworms die on coming in contact with common salt.	Osmosis
4.	Shrinking of grapes kept in thick sugar syrup.	Osmosis
5.	Preserving pickles in salt.	Osmosis
6.	Spreading of the smell of cake being baked throughout the house.	Diffusion
7.	Aquatic animals use oxygen dissolved in water during respiration.	Diffusion

Q8. Water as ice has a cooling effect, whereas water as steam may cause severe burns. Explain these observations.

Answer:

Water turns into ice when the temperature decreases to 0°C. Water turns into steam at 100°C when heat is supplied to the water. Water as steam has more latent heat, while water as liquid does not. Hence, water as steam may cause severe burns, while water as ice has a cooling effect.

Q9. Alka was making tea in a kettle. Suddenly she felt intense heat from the puff of steam gushing out of the spout of the kettle. She wondered whether the temperature of the steam was higher than that of the water boiling in the kettle. Comment.

Answer:

The boiling point of water is 100°C. The temperature of boiling water does not rise; instead, a continuous supply of heat is used to turn water into steam. Hence, steam has a lot of latent heat than boiling water, which can cause severe burns. That's why Alka felt intense heat from the puff of steam gushing out of the kettle's spout.

Q10. A glass tumbler containing hot water is kept in the freezer compartment of a refrigerator (temperature < 0 ^{O}C). If you could measure the temperature of the content of the tumbler, which of the following graphs (Fig. 1.2) would correctly represent the change in its temperature as a function of time.

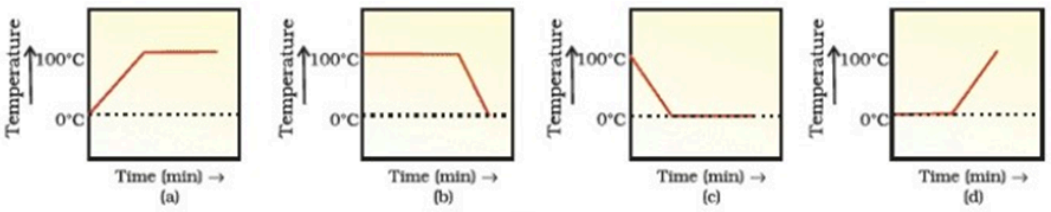

Fig. 1.1

Answer:

Graph A represents the correct change in temperature as a function of time.

As the temperature of water falls to 0 °C first. Then it will be constant till all water turns into ice, and then it will decrease.
