NCERT

CLASS-9 SCIENCE CHAPTER 1 NCERT QUESTIONS

QUESTIONS (PAGE N0-3)

Q.1. Which of the following are matter - Chair, air, love, smell, hate, almonds, thought, cold drink, cold, smell of perfume?

Ans. The following are matter: Chair, air, almonds, cold drink, smell of perfume.

Q.2. Give reasons for the following observation:

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. The particles of smell (aroma) of food diffuses with to reach our nostrils. The temperature of hot sizzling food is higher temperature particles move faster, and diffusion takes place faster. That's why, the smell of hot sizzling food reaches us several meters away, but to get the smell from cold food we have to get close.

Q.3. A diver is able to cut through water in a swimming pool. Which property of matter does this observation show?

Ans. A diver is able to cut through water in a swimming pool. It shows that particles of matter have attractive force between them. This force keeps them together.

Q.4. What are the characteristics of the particle of matter?

Ans. The particles of matter.

1. are very small in size.

2. are moving continuously, i.e., they possess the kinetic energy.

3. can intermix on their own by getting into the spaces between them.

4. possess mass.

5. attract each other. This force of attraction keeps them together.

QUESTION (PAGE NO-6)

Q.1. The mass per unit volume of a substance is called density (density=mass/volume).

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

Ans. Air<exhaust from chimneys<cotton<water<honey<chalk<iron.

Q.2. (a) Tabulate the differences in the characteristics of states of matter

Ans. The Differences in the characteristics of state of matter

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Comparison of property of three states of matter

(b) 1. rigidity is the property of matter because of which it opposes any change in its shape and size on the application of deforming forces. However, solids are rigid, liquids and gases easily change the shape when subjected to outside force and therefore, are fluids.

2. compressibility: compressibility is defined as the change in the volume of a substance in response to the pressure change.

3. fluidity the tendency of a substance to flow is called fluidity. Solids have no fluidity. Liquids and gases are fluids, but fluidity of gases is higher than that of liquids.

4. filling a gas container When a gas is gilled in a container, it occupies the whole volume of container irrespective of the shape and size of container.

5. shape: shape is a definite physical form in which an object exists. Shape of solids is fixed; liquids and gases do not have a fixed shape of their own.

6. the energy possessed by a particle because of its motion is called its kinetic energy. kinetic energy of particles of gases > liquids >solids.

7. density of a substance is its mass per unit volume. density of solid is maximum that of liquids is moderate while that of gas is minimum.

Q.3. Give reasons:

(a) A gas fill completely the vessel in which it is kept.

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

(c) Wooden table should be called a solid.

(d) We can easily move our hand in air but to do the same through a solid block of wood we need a karate expert.

Ans. (a) A gas fills completely the vessel in which it is kept because the force of attraction between the particles of gas is negligible. The particles are free to move in all directions and occupy all the available space.

(b) A gas exerts pressure on the walls of the container because gas molecules move about randomly at high speed and strike the walls of the container. Due to this, the molecules exert force and therefore, pressure on the walls of container.

(c) A Wooden table should be called a solid because particles of wood have fixed location and a definite shape and volume.

(d) We can easily move our hand in air because particles in air are far apart with negligible force of attraction between them. Therefore, it is easy to separate the particles. Whereas the force of attraction between the constituent particles of wood are very strong. I t is not to the separate these particles by applying a small force. Therefore, a karate expert is required to move his hand in wood.

Q.4. Liquids, generally, have lower density as compared to solids. But ice (a solid water) floats on water (liquid water). Why?

Ans. In ice, particles of water are arranged in a cage like pattern with vacant spaces between the particles. But vacant spaces do not exist in water. We know that density is mass per unit volume. Hence, density of ice is lower than that of water.

QUESTION (PAGE NO-9)

Q.1. Convert the following temperature to Celsius scale:

(a) 300K

(b) 573K

Ans. (a) (300-273) ºC = 27ºC

(b) (573-273) ºC = 300ºC

Q.2. What is the physical state of water at:

(a) 250ºC

(b) 100ºC

Ans. At (a) 250ºC and (b) 100ºC, water is in gaseous state.

Q.3. For any substance, why does the temperature remain constant during the change of state?

Ans. During the change of state, heat energy supplied to the substance is used up to overcome the force of attraction between the particles and in increasing the distance between the particles. That's why the temperature of substance

does not change during change of state.

Q.4. suggest a method to liquify atmospheric gases.

Ans. liquefaction is a process in which a gas change into a liquid state. The atmospheric gases liquefied by simultaneously decreasing temperature and increasing pressure. When the temperature is lowered and pressure is increased the kinetic energy of gas molecules move closer to each other. The volume occupied by the gas also decreases. If this process is continued then at some stage, the molecules come so close together that the physical state changes from gas to liquid.

QUESTION (PAGE NO-10)

Q.1. Why does a desert cooler cool better on a hot dry day?

Ans. In hot dry weather, the rate of evaporation of water is high temperature and less humidity. Since evaporation causes cooling (due to heat taken by evaporating water), so a cooler cool better on a hot dry day.

Q.2. How does the water kept in an earthen pot become cool, during summer?

Ans. During summer, water stored in the earthen pot evaporates through its pores. During the evaporation of water, heat is taken from the stored water and therefore, the temperature of water kept in the earthen pot decreases. In other words, the stored water becomes cool.

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

Ans. Acetone, petrol or perfume are volatile (evaporates easily) liquids. When we put any of these on our palm, it evaporates quite rapidly talking away heat of the palm during evaporation process. Hence, our palm feels cold, when acetone/petrol/perfume is put on it.

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

Ans. Evaporation is a surface phenomenon. Open surface of a saucer is more than a cup and evaporation of particle of tea or milk takes place at a faster rate and tea, or milk comes to lower temperature is lesser time. Therefore, we are able to sip it faster from a saucer rather than a cup.

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

Ans. During summer, we perspire more because of the sweating mechanism of our body. Now during evaporation of sweat, the molecules gain energy from our body surface and change into vapors thereby leaving our body cool. The heat energy gained from our body is equal to the latent heat of vaporization. We also know that cotton is a good absorber of water. Consequently, cotton helps in absorbing the sweat we perspire and exposing it to the atmosphere for easy evaporation. Hence, during summer, we should wear cotton clothes.

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NCERT EXERCISES:

Q.1. Convert the following temperature into Celsius scale:

(a) 300K (b) 573K

Ans. (a) (300-273) ^{o}C = 27^{o}C

(b) (573-273) ^oC = 300^oC

Q.2. Convert the following temperatures into Kelvin scale:

(a) 25^oC (b) 373^oC

Ans. (a) K = ^oC + 273

= 25 + 273 = 298K

(b) K = ^oC + 273

= 373 + 273 = 646K.

Q.3. Give reasons 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.

Ans. (a) Naphthalene is a sublime substance. Its balls directly change to gaseous state from solid state and leave no solid behind.

(b) We can get the smell of perfume sitting several meters away. The particles of aroma moving with high speeds get mixed with air and diffuse rapidly reaching several meters

away. When they reach our nostrils, we get the smell of perfume.

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

Ans. Force of attraction are in the following order: Oxygen<water<sugar.

Q.5. What is the physical state of water at:

(a) 25ºC

(b) 0ºC

(c) 100ºC

Ans.

	Temperature	Physical state of water
a)	(25ºC)	Liquid
b)	(0ºC)	Solid
c)	(10 0º)	Gas

Q.6. Give two reasons to justify that:

(a) Water at room temperature is a liquid.

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

Ans. (a) Water is a liquid at room temperature because its volume is definite, but shape is not definite. It takes the shape of a container.

(b) An iron almirah is a solid at room temperature because its volume and shape is definite.

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

Ans. Ice at 273K is more effective in cooling the water at the same temperature, because ice can absorb more heat than the water a 273K. The extra heat that ice can absorb is its latent heat of fusion.

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

Ans. Steam causes more severe burns that boiling water because steam possesses more heat than boiling water. The extra heat that

steam possesses is its latent heat of vaporization which can produce more severe burns.

Q.9.B Name A, B, C, D, E and F in the following showing state change:

Ans. A. Fusion C. Condensation E. Sublimation

B. Vaporization D. Solidification F. Deposition

NCERT Exercises Q-9 Diagram

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