

CLASS-IX (CHEMISTRY)

CH-1: MATTER IN OUR SURROUNDINGS

(INTEXT QUESTIONS AND ANSWERS)

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1. Which of the following are matter?

Chair, air, love, smell, hate, almonds, thought, cold, cold drink, smell of perfume.

Chair, air, almonds, cold drink, smell of perfume

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.

It is because the particles of the smell of the hot food are at higher temperature and hence they are having high kinetic energy and diffuse faster than the particles of the smell of the cold food.

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

A driver is able to cut through water in a swimming pool. It shows that particles of water are having greater space or gaps between them. And also they have lesser force of attraction between them.

4. What are the characteristics of the particles of matter?

The three characteristics of the particles of matter are as follows:

- (a) Particles of matter have space/gap between them.
 - (b) Particles of matter are continuously moving.
 - (c) Particles of matter attract each other.
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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.

Increasing order of density:

air < exhaust from chimney < cotton < water < honey < chalk < iron

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

(a)	SOLID	LIQUID	GAS
1.MOLECULAR ARRANGEMENT	tightly packed	loosely packed	highly disordered
2.RIGIDITY	rigid	not rigid	not rigid
3.SHAPE AND VOLUME	fixed shape and fixed volume	no fixed shape but fixed volume	no fixed shape and no fixed volume
4.DENSITY	high	low	lowest
5.INTERMOLECULAR SPACE	least/negligible	greater	greatest
6.INTERMOLECULAR FORCE OF ATTRACTION	high	low	least
7.COMPRESSIBILITY	least/negligible	slightly compressible	highly compressible
8.FLUIDITY	can't flow	can flow	can flow faster
9.MOLECULAR MOTION	vibrates slowly	moves freely	moves randomly
10.DIFFUSION	negligible	faster	fastest

(b) Comment upon the following: rigidity, compressibility, fluidity, filling a gas container, shape, kinetic energy and density.

Rigidity-The tendency of a matter to resist a change in shape.

Compressibility-The ability to reduce in volume when force is applied.

Fluidity-It is the ability of a matter to flow. Only liquids and gases are called fluid.

Filling a gas container-Gas neither has definite shape nor definite volume. It takes the shape of the container in which they are kept.

Shape-It is defined by definite boundaries.

Kinetic energy-The energy possessed by an object by virtue of its motion.

Density-It is defined as mass per unit volume.

3. Give reasons:

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

Gas has no definite shape and no fixed volume. The gas particles move randomly in all directions due to least force of attraction between the particles. Hence gas fills completely the vessel in which it is kept.

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

The gas particles move randomly in all directions. During this motion, with high kinetic energy these gaseous particles continuously collide among themselves and also hit the walls of the container in which they are kept. Thus gas exerts pressure on the walls of the container.

(c) A wooden table should be called a solid.

A wooden table has rigid shape and definite volume. It cannot be compressed. Also it cannot flow. Since these all are the characteristics of a solid, a 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.

It is because air particles have large space in between them due to the least force of attraction between them. Whereas, wood has negligible or no space between the particles due to high force of attraction between them.

4. Liquids generally have lower density as compared to solids. But you must have observed that ice floats on water. Find out why.

It is because volume of ice is more than that of the equal amount of water. And as we know $\text{Density} = \text{Mass} / \text{Volume}$, therefore ice is having less density than that of water. Hence ice floats on water.

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1. Convert the following temperature to Celsius scale:

(a) 300 K (b) 573 K.

(a) Given: Temperature in Kelvin scale=300 K

we know, $K=C+273$

or, $C=K-273$

or, $C=300-273$

or, $C=27$

therefore, 300 K = 27°C

(b) Given: Temperature in Kelvin scale=573 K

we know, $K=C+273$

or, $C=K-273$

or, $C=573-273$

or, $C=300$

therefore, 573 K = 300°C

2. What is the physical state of water at:

(a) 250°C (b) 100°C?

(a) Boiling point of water is 100°C. Above this temperature water exists in gaseous form. Thus water at 250°C is in gaseous state.

(b) At 100°C, water can exist in both liquid and gaseous state.

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

During the change of state, the temperature remains constant because that time heat (latent heat) is being utilized to overcome the force of attraction between the particles. Since that time there is no increase in the kinetic energy of the particles, the temperature is remaining constant.

4. Suggest a method to liquefy atmospheric gases.

Atmospheric gases can be liquefied by applying pressure and reducing the temperature.

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

On a hot dry day, there is much less humidity and temperature is high. Thus on a hot dry day, the rate of evaporation increases and hence causing a better cooling effect by the desert cooler.

2. How does the water kept in an earthen pot (matka) become cool during summer?

Earthen pot contains small pores. In hot summer days, water gets evaporated quickly through the pores by absorbing heat energy from the water inside the pot. That makes the water inside the earthen pot cool.

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

Acetone, petrol and perfume are volatile in nature. When we put them on our palm, they evaporate taking away the heat from our palm and nearby surroundings. Hence cause our palm to feel cold.

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

Hot tea or milk in a saucer has larger surface area than in a cup. Hence evaporation is faster from the saucer than from the cup. Thus the hot tea or milk cools faster in the saucer than in a cup. That's why we are able to sip hot tea or milk faster from a saucer rather than in a cup.

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

We should wear light coloured cotton clothes in summer. Light colour as it reflects heat. And cotton clothes because it can absorb more sweat as it has pores and expose it to atmosphere for faster evaporation and hence cause a cooling effect.
