

Q 1.

Which of the following are matter?

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

SOLUTION:

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

Q 2

Give reasons for the following observation:

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

SOLUTION:

This happens because rate of diffusion of gas increases with increase in temperature. In case of hot food, diffusion of smell is faster whereas in case of cold food, diffusion is slower.

Q 3.

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

SOLUTION:

The particles of water are held together by forces of attraction. It is the reason that the diver is able to cut through water in a swimming pool.

Q 4.

(A) Tabulate the differences in the characteristics of states of matter.

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

SOLUTION:

(A)

	Property	Solid	Liquid	Gas
1.	Shape and volume	They have a definite shape as well as definite volume.	They have a definite volume but no definite shape.	They have neither a definite shape nor a definite volume.
2.	Compressibility	Solids are completely incompressible.	Liquids are almost incompressible.	Gases are highly compressible.
3.	Rigidity/ Fluidity	Solids possess rigidity.	Liquids can flow, therefore they possess fluidity which is lower than that of gases	Gases flow more easily than liquids and thus have the highest fluidity.
4.	Energy	Their particles have minimum energy.	Their particles have energy higher than those of solids.	Their particles have highest energy.
5.	Density	They have high density.	Their density is lower than those of solids but much higher than those of gases.	They generally have very low densities.
6.	Diffusion	They normally do not show the property of diffusion although some rare examples of diffusion of one solid into another are known.	They show the property of diffusion. As a result, solids, liquids and gases all can diffuse into liquids.	They diffuse very rapidly. The rate of diffusion of a gas is, however, inversely proportional to the square root of its density. Thus, lighter gas diffuses more rapidly than the heavier one.

(B) (i) **Rigidity** : It is the property which helps a substance to retain its shape when force is applied to it. Solids are rigid while gases and liquids are not.

(ii) **Compressibility** : The property due to which the particles of matter can be compressed or reduced in volume by applying force or pressure. Gases are highly compressible.

(iii) **Fluidity** : It is the tendency of a substance to flow. Liquids and gases possess fluidity while solids are rigid.

(iv) **Filling a gas container** : The molecules of a gas move in all directions and due to negligible interparticle force of attraction can fill the container.

(v) **Shape** : Solids have definite shape whereas liquids take the shape of the container in which they are placed and gases do not have any shape.

(vi) **Kinetic energy** : It is the energy possessed by the particles due to their motion. The particles of a gas have maximum kinetic energy due to free motion of gas particles in all directions. Solids have minimum kinetic energy due to least movement of particles.

(vii) **Density** : Density is the mass of a substance per unit volume. Solids have highest density since their molecules are closely packed.