

Question 1: *A substance has a definite volume but no definite shape. State whether this substance is a solid, liquid or a gas.*

Answer: The substance is a liquid. It has a definite volume but no definite shape and takes the shape of the container in which it is placed

Question 2: *A small quantity of a gas is let into a large evacuated chamber. a) How much of the chamber gets filled with the gas? b) What property of the gas helps it to do so?*

Answer: a) The entire chamber gets filled with the gas.

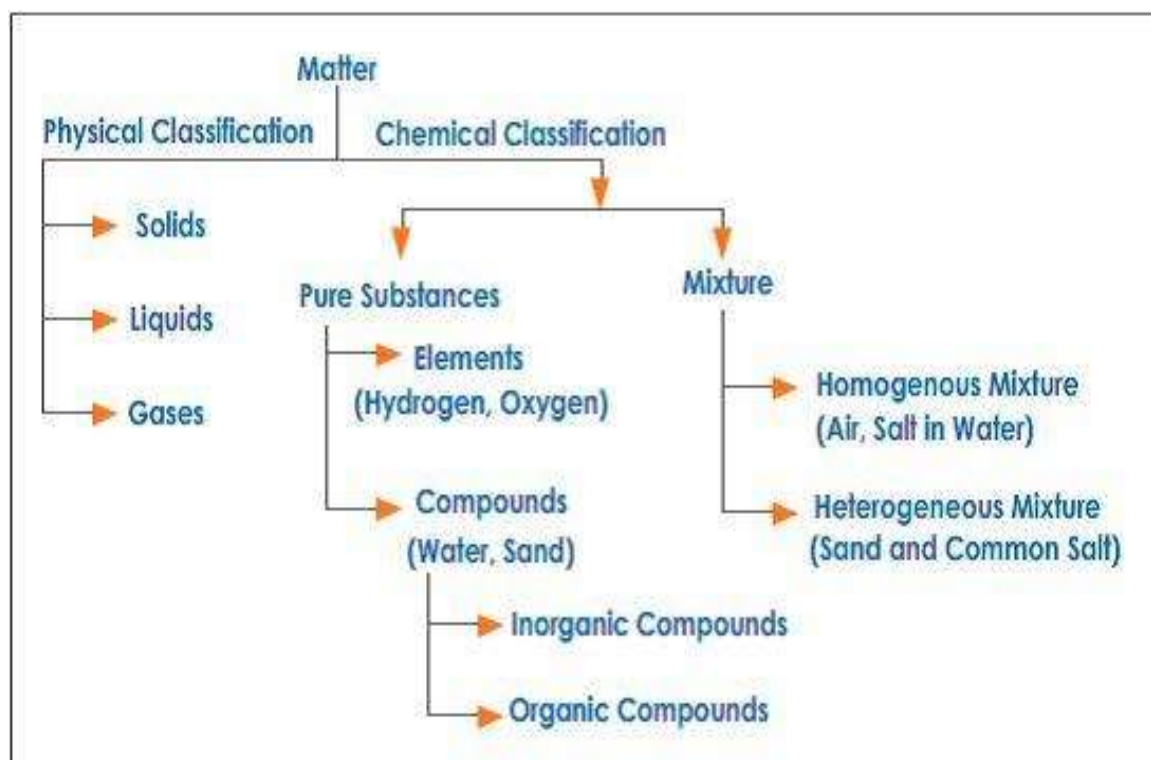
b) The gas molecules have very weak intermolecular forces of attraction. This permits the gas molecules to diffuse and fill up the entire chamber.

Question 3: *Why do solids not diffuse into one another?*

Answer: Solids have very little intermolecular spaces, there by not allowing the molecules of another solid to enter. Moreover, the intermolecular force of attraction between molecules of one solid is very high and this prevents diffusion of molecules of one solid into another solid.

Question 4: *What is matter? How is it classified?*

Answer: Matter is anything that occupies space, possesses mass, offers resistance and can be felt by one or more of our senses. Matter may be classified as shown below:



Question 5: *Among solids, liquids and gases which one has the maximum movement of molecules, the maximum intermolecular attraction and the minimum space between molecules.*

Answer: Maximum movement of molecules is seen in gases Maximum intermolecular attraction is found in solids Minimum space between molecules occur in solids.

Question 6: *Name the properties that decide whether a given substance exists as a solid, liquid or a gas.*

Answer: The properties are:

- Space between molecules
- Force of attraction between molecules
- The kinetic energy of molecules

Question 7: *List two properties that liquids have in common with gases.*

Answer: Two common properties shared by liquids and gases are

- i) Gases and liquids do not have a fixed shape
- ii) Gases and liquids flow easily

Question 8: *What happens when a liquid is heated?*

Answer: The heat is absorbed by the liquid has the following effects:

- It increases the average kinetic energy of the particles in the liquid, increasing its temperature.
- It furnishes energy for the particles to pass from liquid to vapour state. As heating continues and temperature approaches the boiling point, more and more energy is utilised for vapourising the liquid and less and less for raising the temperature.

Question 9: *Why does water boil at a lower temperature at higher altitudes?*

Answer: Boiling occurs at a point where vapour pressure is equal to the external atmospheric pressure. At higher altitudes atmospheric pressure is much less. Less thermal energy is required to get vapour pressure equal to the atmospheric pressure.

Example: cooking of potatoes take much longer at the top of a mountain because boiling temperature of water is lower.

Question 10: *What is the principle used in a pressure cooker?*

Answer: The pressure in the enclosed volume above the liquid reaches much greater values than atmospheric pressure, thus the temperature of boiling water within the cooker is greater than the normal boiling temperature. Hence, things cook much faster.

Question 11: *Figure given below represents a block of ice. Give few reasons why this block of ice is considered as 'matter'.*



Answer: This block of ice is considered as matter as,

- i) It has a definite mass and
- ii) It occupies space i.e., has a volume
- iii) It can be perceived by our senses

Question 12: *When some alcohol is rubbed on the hand, the area feels cold. Explain.*

Answer: Alcohol is a volatile liquid, which evaporates at room temperature. When rubbed on the hand, it draws heat from the skin and evaporates into the surroundings. Hence the hand feels cold where the alcohol is rubbed.

Question 13: *How can the boiling point of pure water be raised, without making it impure?*

Answer: Increasing the pressure of the atmosphere in which, it is being boiled can raise the boiling point of water. For e.g., in the pressure cooker, the pressure of steam is high and hence the boiling point of water is raised to about 125°C.

Question 14: *Give reasons why weight is not a property of matter.*

Answer: The weight of a body depends upon its position on the earth. Weight is the product of mass and acceleration due to gravity 'g'. As 'g' varies from place to place, so does the weight of a body vary from place to place. Hence, it is not a property of matter.

Question 15: *Explain why a gas can be compressed to a great extent.*

Answer: The molecules of a gas are very loosely packed with large intermolecular spaces. On the application of pressure, the molecules can be brought closer i.e., the gas can be compressed.

Question 16: *When a bottle of perfume is opened, the odour is experienced all around the room. Explain.*

Answer: Perfume is a highly volatile liquid. When the bottle is opened the molecules of perfume turn into the vapour state. These molecules then diffuse in the air around, as air has large intermolecular spaces. By diffusion the perfume molecules spread throughout causing the scent to spread within the room.

Question 17: *Distinguish between evaporation and boiling.*

Answer:

Evaporation	Boiling
Is a slow process	Is a fast process
Is a surface phenomenon	Involves the entire mass of the liquid
Occurs at all temperatures	Occurs at a fixed temperature i.e., the boiling point

Question 18: *What is common to dry ice and iodine?*

Answer: Both dry ice and iodine sublime on heating

Question 19: *There is no rise in temperature of a melting solid despite applying heat to it. Explain.*

Answer: The energy that is being supplied for melting the solid is used to reduce the attractive forces between molecules of the solid. In addition, the excessive heat energy is stored as potential energy in the resulting liquid in the form of latent heat energy. As a result there is no rise in temperature.

Question 20: *A gas jar containing vapours of bromine is inverted and covered mouth to mouth with another gas jar containing air. What will you observe after the two jars have remained together for some time. Give reasons for your answer.*

Answer: Bromine vapours are reddish brown in colour. On keeping the two jars together in contact, it will be observed that the brown vapours will move slowly into the lower jar containing air. Reddish brown streaks will be seen in the lower jar. Finally the two gases will mix uniformly to give a homogenous mixture, which is light red or brown in colour.

Question 21: *Explain why the volume of a gas increases when heated?*

Answer: In gases, the intermolecular forces of attraction are weak but the kinetic energy of the molecules is high. When more energy is supplied in the form of heat, the kinetic energy of the gas molecules further increase but as the attractive forces are weak, the gas molecules move and spread apart to occupy a greater volume.

Question 22: *Wet clothes when hung out in the sun, dry out. What is the process involved. Explain.*

Answer: Evaporation is the process that takes place here. On exposure to the heat of the sun, the liquid molecules of the wet clothes absorb energy and change into the gaseous state and escape from the surface of the clothes thus leaving it dry.

Question 23: *A glass beaker containing water and a large crystal of potassium permanganate.*

It is kept aside for a few hours.

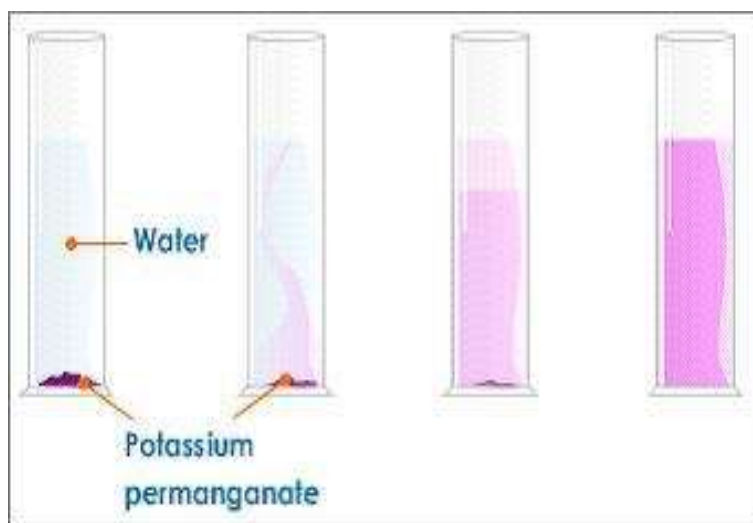
a) *What is the colour of the solution in the beginning?*

b) *What do you observe after sometime?*

c) *Why does such a change take place?*

Answer: a) The solution is colourless in the beginning.

b) After a few minutes the water at the bottom of the beaker is dark pink, while that towards the top, is light pink. After a few more minutes, the entire liquid becomes uniformly dark pink in colour.



c) The crystals of potassium permanganate sink to the bottom and dissolve in the water, giving the solution its colour. Gradually, the molecules of the solid move up in the intermolecular spaces of the liquid. By this movement of diffusion, a uniformly coloured solution is produced.