

CHAPTER PRACTICE



MULTIPLE CHOICE QUESTIONS

- When a crystal of potassium permanganate is placed at the bottom of water in a beaker, the water in the whole beaker turns purple on its own, even without stirring. This is an example of
 - Distribution
 - Intrusion
 - Diffusion
 - Effusion
- Which one of the following statement is correct in respect of fluids?
 - Only gases behave as fluids
 - Gases and solids behave as fluids
 - Gases and liquids behave as fluids
 - Only liquids are fluids
- In which of the following conditions, the distance between the molecules of hydrogen gas would increase?
 - Increasing pressure on hydrogen contained in a closed container
 - Some hydrogen gas leaking out of the container
 - Increasing the volume of the container of hydrogen gas
 - Adding more hydrogen gas to the container without increasing the volume of the container
 - (i) and (ii)
 - (i) and (iv)
 - (ii) and (iii)
 - (ii) and (iv)
- Out of the following, an example of matter which can be termed as fluid is
 - Carbon
 - Sulphur
 - Oxygen
 - Phosphorus
- The best evidence for the existence and movement of particles in liquids was provided by
 - John Dalton
 - Ernest Rutherford
 - J.J. Thomson
 - Robert Brown
- A form of matter has no fixed shape but it has a fixed volume. An example of this form of matter is
 - Krypton
 - Kerosene
 - Carbon steel
 - Carbon dioxide
- Which of the following statement is incorrect ?
 - The particles of matter are very, small
 - The particles of matter attract one another
 - The particles of some of the matter are moving constantly
 - The particles of all the matter have spaces between them
- When a gas jar full of air is placed upside down on a gas jar full of bromine vapours, the red-brown vapours of bromine from the lower jar go upward into the jar containing air. In this experiment
 - Air is heavier than bromine
 - Both air and bromine have the same density
 - Bromine is heavier than air
 - Bromine cannot be heavier than air because it is going upwards against gravity
- When a gas jar containing colourless air is kept upside down over a gas jar full of brown-coloured bromine vapour, then after sometime, the brown colour of bromine vapour spreads into the upper gas jar making both the gas jars appear brown in colour. Which of the following conclusion obtained from these observations is incorrect ?
 - Bromine vapour is made of tiny particles which are moving
 - Air is made up of tiny particles which are moving
 - The particles of bromine are moving but those of air are not moving
 - Even though bromine vapour is heavier than air, it can move up against gravity
- Which one of the following statements is not true ?
 - The molecules in a solid vibrate about a fixed position
 - The molecules in a liquid are arranged in a regular pattern
 - The molecules in a gas exert negligibly small forces on each other, except during collisions
 - The molecules of a gas occupy all the space available

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MARK QUESTIONS

- The boiling point of water is 100°C . Express this in S.I. units (Kelvin scale).
- The Kelvin temperature is 270 K. What is the corresponding Celsius scale temperature?
- Convert the temperature of 373°C to the Kelvin scale.
- The boiling point of alcohol is 78°C . What is this temperature on Kelvin scale?
- The Kelvin scale temperature is 0 K. What is the corresponding Celsius scale temperature?
- What is the effect of temperature on latent heat?



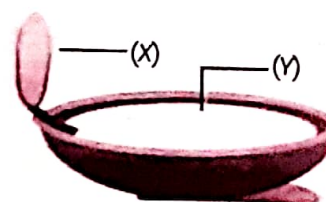
7. What is the (i) common unit of temperature, and (ii) S.I. unit of temperature?
8. Write the relation between Kelvin scale and Celsius scale of temperature.
9. What should be added to a Celsius scale reading so as to obtain the corresponding Kelvin scale reading?
10. Name the temperature at which,
 - (a) A liquid changes into a gas
 - (b) A solid changes into a liquid.
11. Name one common substance which can be easily changed from one state to another by heating or cooling.
12. Name one property which is shown by ammonium chloride but not by sodium chloride.
13. Why is solid carbon dioxide known as dry ice?
14. State one condition necessary to liquefy gases (other than applying high pressure).
15. State whether the following statement is true or false: Solid carbon dioxide is stored under low pressure.
16. What are the conditions for 'something' to be called 'matter'?
17. Name two processes which provide the best evidence for the motion of particles in matter.
18. Which single term is used to describe the mixing of copper sulphate and water kept in a beaker, on its own?
19. Even two or three crystals of potassium permanganate can impart colour to a very large volume of water. Which characteristic of particles of matter is illustrated by this observation?
20. When an incense stick (agarbatti) is lighted in one corner of a room, its fragrance spreads in the whole room quickly. Which characteristic of the particles of matter is illustrated by this observation?
21. What is the scientific name of particles which make up matter?
22. Name the process by which a drop of ink spreads in a beaker of water.
23. What is the general name of (i) rigid form of matter? (ii) fluid forms of matter?
24. Out of solids, liquids and gases, which one has
 - (i) Maximum movement of particles?
 - (ii) Maximum inter-particle attractions?
 - (iii) Minimum spaces between particles?
25. 'A substance has a definite volume but no definite shape'. State whether this substance is a solid, a liquid or a gas.
26. Name the physical state of matter which can be easily compressed.
27. 'A substance has a definite shape as well as a definite volume'. Which physical state is represented by this statement?
28. A substance has neither a fixed shape nor a fixed volume. State whether it is a solid, a liquid or a gas.
29. Name two gases which are supplied in compressed form in homes and hospitals.
30. Which of the two diffuses slower, bromine vapour into air or copper sulphate into water?
31. If water is boiling and the flame supplying the heat is turned up, does the water become hotter? What happens?

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MARK QUESTIONS

1. Imagine two jars, Jar A contains a Red-brown gas whereas Jar B contains a colourless gas. The two gas jars are separated by a glass plate placed between them
 - (a) What will happen when the glass plate between the two jars is pulled away?
 - (b) What name is given to the phenomenon which takes place?
 - (c) Name the brown gas which could be in jar A.
 - (d) Which is the colorless gas most likely to be present in jar B?
 - (e) Name one coloured solid and one colourless liquid which can show the same phenomenon.
2. Why is a liquid (the hydraulic fluid) used to operate the brakes in a car?
3. Explain why, a small volume of water in a kettle can fill a kitchen with steam.
4. A student placed a gas jar containing air in the upside down position over a gas jar full of red-brown bromine vapours. He observed that the red brown colour spread upwards into the jar containing air. Based on this observation, the student concluded that it is only the bromine vapour which moves up and diffuses into air in the upper jar, the air from the upper jar does not move down by diffusion into the lower jar containing bromine vapours. Do you agree with this conclusion of the student? Give reason for your.
5. What is meant by saying that the latent heat of fusion of ice is $3.34 \times 10^5 \text{ J/kg}$?
6. What is meant by saying that the latent heat of vaporization of water is $22.5 \times 10^5 \text{ J/kg}$?
7. Name the scientist who studied the movement of pollen grains suspended in water through a microscope. What is this phenomenon known as?

8. When a crystal of potassium permanganate is placed in a beaker, its purple colour spreads throughout the water. What does this observation tell us about the nature of potassium permanganate and water?
9. Describe in your own words, what happens to the particles when salt dissolves in water?
10. Give one example of the diffusion of a solid in another solid.
11. Which of the following diffuses fastest and which the slowest? Solid, Liquid, Gas. Give reasons for your.
12. Name the three states of matter. Give one example of each.
13. State two characteristic properties each of (a) a solid (b) a liquid (c) a gas
14. Arrange the following substances in increasing order of force of attraction between their particles (keeping the substance having them in maximum force of attraction first) Water, Sugar, Oxygen
15. Give two reasons to justify that
 - (a) Water is a liquid at room temperature.
 - (b) An iron almirah is a solid.
16. When a crystal of copper sulphate is placed at the bottom of a beaker containing water, the water slowly turns blue. Why?
17. Honey is more viscous than water. Can you suggest why?
18. Explain why
 - (a) Air is used to in late tyres.
 - (b) Steel is used to make railway lines.
19. Why does ice not deposited in the freezer of a refrigerator equipped with defrosting technique. Explain?
20. When a jar of coffee is opened, people in all parts of the room soon notice the smell. Explain why this happens?
7. Sponge is compressible, but considered as a solid. why?
8. Bromine and air take about 15 minutes to diffuse completely but bromine diffuses into a vacuum very rapidly. Why is this so?
9. Bromine particles are almost twice as heavy as chlorine particles. Which gas will diffuse faster; bromine(vapour) or chlorine? Explain your.
10. An inflated balloon full of air goes down slowly (becomes smaller and smaller slowly) even though the knot at the mouth of the balloon is air tight. And after a week all the air has escaped from the balloon. Explain how the air particles got out of the balloon.
11. When extremely small particles X derived from the another of a flower were suspended in a liquid Y and observed through a microscope, it was found that the particles X were moving throughout the liquid Y in a very zig zag way. It was also observed that warmer the liquid Y, faster the particles X moved on its surface.
 - (a) What could particles X be?
 - (b) What do you think liquid Y is?
 - (c) What is the zig-zag movement of X known as?
 - (d) What is causing the zig-zag movement of particles X?
 - (e) Name the scientist who discovered this phenomenon?
 - (f) What does this experiment tell us about the nature of liquid Y?
12. When a beam of sunlight enters a room through a window, we can see tiny particles X suspended in a gas (or rather a mixture of gases) Y which are moving rapidly in a very haphazard manner.
 - (a) What could the particles X be?
 - (b) Name the gas (or mixture of gases) Y.
 - (c) What is the phenomenon exhibited by particles X known as?
 - (d) What is causing the movement of particles X?
 - (e) What conclusion does the existence of this phenomenon give us about the nature of matter?
13. The diagram below shows burning of an oil lamp. Draw the arrangement of particles of position 'X' and 'Y' when the lamp is burning.



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

3 MARK QUESTIONS

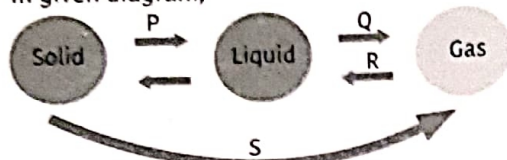
1. What are the supercooled liquid?
2. A piece of chalk can be broken into small particles on hammering, but it is not possible to break a piece of iron in the same fashion. Why?
3. Is dry ice the same as ordinary ice? Give Reason.
4. Cotton is solid, but it floats on water. Why?
5. A balloon when kept in sun, bursts after some time. Why?
6. Out of four gases Cl_2 , CO_2 , CH_4 , N_2 , which of these gas would diffuse most rapidly and why?

15. (i) You are given the following substances with their melting and boiling points.

Substance	Melting Point (°C)	Boiling Point (°C)
X	-219	-183
Y	119	445
Z	-15	78

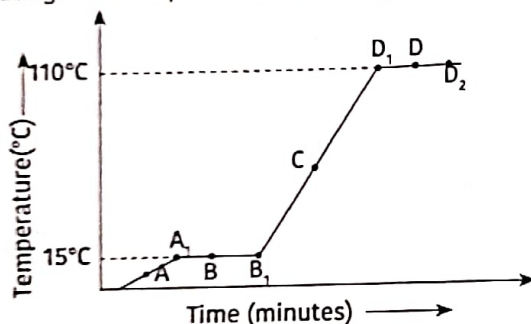
Identify the physical status of X, Y and Z at room temperature (30°C).

- (ii) In given diagram,



- (a) Name the changes in the terms of processes P, Q, R and S.
 (b) Which of the changes are exothermic and endothermic?

16. The temperature-time graph given alongside shows the heating curve for pure wax. From the graph the following



- (a) What is the physical state of the substance at the point A, B, C and D?
 (b) What is the melting point of the substance?
 (c) What is the boiling point?
 (d) Which portions of the graph indicates that change to state is taking place?
 (e) Name the terms used for heat absorbed during change of states involved in above process.
17. Water as ice has a cooling effect, whereas water as steam may cause severe burns. Explain these observations.

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MARK QUESTIONS

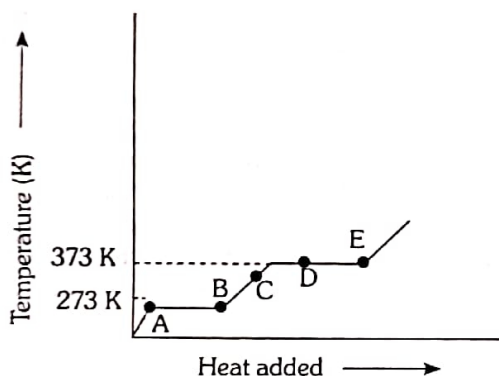
1. (a) What is meant by 'diffusion'? Give one example of diffusion in gases.
 (b) Why do gases diffuse very fast?
 (c) Name two gases of air which dissolve in water by diffusion. What is the importance of this process in nature?
2. (a) Why does a gas exert pressure?
 (b) Why does a gas fill a vessel completely?
 (c) Why are gases so easily compressible whereas it is almost impossible to compress a solid or a liquid?

3. (a) Define matter. Give four examples of matter.
 (b) What are the characteristics of matter?
4. (a) What is Brownian motion? Draw a diagram to show the movement of a particle (like a pollen grain) during Brownian motion.
 (b) In a beam of sunlight entering a room, we can sometimes see dust particles moving in a haphazard way in the air. Why do these dust particles move?
5. Fill in the following blanks with suitable words
- (a) The best evidence that the particles of matter are constantly moving comes from the studies of _____ and _____
 (b) The smell of perfume gradually spreads across a room due to _____
 (c) Solid, liquid and gas are the three _____ of matter.
 (d) At room temperature, the forces of attraction between the particles of solid substances are _____ than those which exist in the gaseous state.
 (e) The arrangement of particles is less ordered in the _____ state. However, there is no order in the _____ state.
 (f) _____ can be classified chemically into pure substances and mixtures.
 (g) Both elements and compounds are _____ substance.
 (h) Magnesium sulphate in water is a _____ mixture.
 (i) During separation of CO_2 and O_2 by the process of preferential liquefaction, the component _____ liquefies.
 (j) Soda water can be separated by _____ the pressure.
6. What is the difference between gas & vapour?
7. A student spilled a bottle of ammonia in one corner of the laboratory. Soon the whole laboratory was filled with pungent irritating smell. The students immediately opened the windows and doors and switched on the exhaust fans. After sometime, students got relief. Explain what did actually happen?
8. Explain why, osmosis can be considered to be a special kind of diffusion. Classify the following into (i) osmosis, and (ii) diffusion
- (a) swelling up of a raisin on keeping in water
 (b) spreading of virus on sneezing
 (c) earthworm dying on coming in contact with common salt
 (d) shrinking of grapes kept in thick sugar syrup
 (e) preserving of pickles in salt
 (f) spreading of smell of cake being baked in the kitchen
 (g) aquatic animals using oxygen dissolved in water during respiration



HOTS QUESTIONS

1. Does ice sublime? comment
2. What is superheated steam? Why is it invisible? Can it initiate a match stick when placed in its path?
3. Two cubes of ice are pressed hard between the palms, when the pressure is released, the two cubes join together. Explain.
4. The flame under a whistling cooker is suddenly put off. The whistle is then removed to release the steam and the lid is forcibly opened. You see water still boiling in the cooker even when no flame is underneath it. Explain why?
5. Ordinary water boils at 100°C . Can it be made to boil at 95°C or 105°C ?
6. The heating curve of a pure substance at one atmosphere pressure is shown in figure:



- (a) What is the physical state of the substance at points A, B, C, D and E.
- (b) What is the melting point of the substance?
- (c) What is the boiling point of the substance?
- (d) What happens to the temperature when the substance is changing its state?
- (e) Can the given substance be ice at point A?

7. Some substances cannot exist in the gaseous state others cannot exist in the liquid state, and some cannot exist either in the gaseous or the liquid state. Giving suitable example to justify the above statement.

8. Small quantities of water and ether are placed on the palms of both the ends. Which will experience more cooling?
9. In severe cold weather, a family burnt wood in the room during the night by keeping the windows close after sometime, they felt suffocated. They immediately opened the windows and got relief. What did actually happen?
10. Why we close the bottle of nail polish remover immediately after using it?
11. Which diffuses faster, the bad smell from a cat-pan due to ammonia or an expensive French perfume with an average molecular weight of 170 g/mol ? Which one diffuse faster?
12. Ethyl chloride boils at 13°C . When it is sprayed on the skin, it freezes a small part of the skin and thus, serves as a local anaesthetic. Explain how it cools the skin?
13. Why do the doctors advice to put strips of wet cloth on the forehead of a person having high temperature?
14. When we smell the odour of a rose, our olfactory nerves are sensing molecules of the scent. Explain how smelling a rose demonstrates that molecules are always moving?
15. Why does solid ice float on water?
16. When ice at -10°C is slowly heated, temperature of ice gradually increases till 0°C , the temperature of the system remains constant when the ice change into water and then further rises. Explain the observation.
17. Neha by mistake spilled a glass of water on the floor. Her mother suggested her to switch on the fan and after few minutes she found that all water disappears. She asked her mother how this happened and where all water has disappeared. On the basis of this, the followings
 - (i) What was the phenomenon associated with disappearance of water?
 - (ii) Why her mother suggested Neha to switch on the fan?
 - (iii) What are the values associated with her mother?



CASE BASED QUESTIONS

Read the following and answer any four questions from (I-V)

Case-1: A matter is anything that has mass and occupies space. Pen, paper, clips, sand, air, ice, etc. are different forms of matter. Every matter is made up of small particles. These particles are so tiny that they can't be seen with naked eyes. Let's see about the different characteristics of particles of matter.

- All matter is made up of very small particles.
- Particles of matter has spaces between them.
- Particles of matter are continuously moving.
- Particles of matter attract each other.

Answer the following questions by referring above paragraph

- I. Which of following is not matter ?
 (a) Pen (b) Air
 (c) Smell of perfume (d) None of these
- II. Thoughts coming in our mind are example of matter. The given statement is;
 (a) True (b) False
 (c) None of these (d) Both (a) and (b)
- III. Which of the following is true about particles of matter ?
 (a) Particles of matter has spaces between them
 (b) Particles of matter are continuously moving
 (c) Particles of matter attract each other
 (d) All of these
- IV. Gases can Compress because
 (a) Their particles have spaces between them
 (b) Particles are in random motion
 (c) Their particles are very tiny.
 (d) Particles of gases can attract each other.
- V. Which of following is a matter ?
 (a) Feeling good (b) Milk
 (c) Sound (d) Gravity.

Read the following and answer any four questions from (I-V)

Case - 2: There are three states of matter — solid, liquid and gas.

Solids have a definite shape, distinct boundaries and fixed volumes, that is, have negligible compressibility. Solids have a tendency to maintain their shape when subjected to outside force. Solids may break under force but it is difficult to change their shape, so they are rigid.

Liquids have no fixed shape but have a fixed volume. They take up the shape of the container in which they are kept. Liquids flow and change shape, so they are not rigid but can be called fluid.

Gas has indefinite shape, no fixed volume. Gas gets the shape and volume of container. Gas has very low density hence are light. Gas can flow easily and hence are called fluid.

- I. Which of the following state of matter takes shape of container in which it is filled ?
 (a) Solid (b) Liquid
 (c) Gas (d) Both (b) and (c)
- II. Distance between particles of matter least in
 (a) Solid (b) Liquid
 (c) Gas (d) None of these
- III. Compressibility is least in case of
 (a) Solid (b) Liquid
 (c) Gas (d) None of these
- IV. Why solids are rigid ?
 (a) Inter-particle distance between the particles are small.
 (b) Because they are made of metals type iron, copper.
 (c) Because they are highly compressible
 (d) Because they are good conductor of electricity.

- V. Out of the following which can as fluid ?
 (a) Gas, Plasma (b) Liquid, Plasma
 (c) Gas, Liquid (d) Solid, Liquid

Read the following and answer any four questions from (I-V)

Case - 3 : What happens inside the matter during change of state? On increasing the temperature of solids, the kinetic energy of the particles increases. Due to the increase in kinetic energy, the Particles start vibrating with greater speed. The energy supplied by heat overcomes the forces of attraction between the particles. The particles leave their fixed positions and start moving more freely. A stage is reached when the solid melts and is converted to a liquid. The minimum temperature at which a solid melts to become a liquid at the atmospheric pressure is called its melting point.

The temperature of the system does not change after the melting point is reached, till all the ice melts. This happens even though we continue to heat the beaker, that is, we continue to supply heat. This heat gets used up in changing the state by overcoming the forces of attraction between the particles. The amount of heat energy that is required to change 1 kg of a solid into liquid at atmospheric pressure at its melting point is known as the latent heat of fusion. So, particles in water at 0°C (273 K) have more energy as compared to particles in ice at the same temperature.

The temperature at which a liquid starts boiling at the atmospheric pressure is known as its boiling point. Boiling is a bulk phenomenon. Particles from the bulk of the liquid gain enough energy to change into the vapour state. A change of state directly from solid to gas without changing into liquid state is called sublimation and the direct change of gas to solid without changing into liquid is called deposition.

- I. A change of state directly from solid to gas without changing into liquid state is called
 (a) Sublimation (b) Deposition
 (c) Boiling point (d) None of these
- II. The direct change of gas to solid without changing into liquid is called
 (a) Sublimation (b) Deposition
 (c) Boiling point (d) None of these
- III. The energy supplied by heat to solid is used to overcome the forces of attraction between the particles. True or false
 (a) True (b) False
 (c) None of these (d) Both (a) and (b)
- IV. Latent heat is
 (a) The amount of heat energy that is required to change 1 kg of a solid into liquid at atmosphere pressure at its melting point.
 (b) The amount of heat energy that is required to change 1 kg of a solid into liquid at atmosphere pressure at its boiling point.
 (c) Heat energy required to complete the chemical reaction.
 (d) Heat energy required to complete the physical reaction.

- V. What does it mean boiling is a bulk phenomenon.
- (a) There is no change in boiling point.
 - (b) The change of state in boiling occurs both from inside and surface of the solution.
 - (c) The change of state in boiling occurs at its surface level.
 - (d) The change in state occurs only from inside the solution.

Read the following and answer any four questions from (I-V)

Case - 4: Do we always need to heat or change pressure for changing the state of matter? Can you quote some examples from everyday life where change of state from liquid to vapour takes place without the liquid reaching the boiling point? In the case of liquids, a small fraction of particles at the surface, having higher kinetic energy, is able to break away from the forces of attraction of other particles and gets converted into vapour. This phenomenon of change of a liquid into vapour at any temperature below its boiling point is called evaporation.

- I. Evaporation of liquid takes place at
 - (a) Boiling point
 - (b) Above boiling point
 - (c) Below boiling point
 - (d) None of these
- II. Evaporation takes place at surface of liquid because
 - (a) They are heavy as compared to other particles
 - (b) They have sufficient kinetic energy to break the force
 - (c) They are light weight as compared to other particles
 - (d) None of these
- III. During evaporation particles of liquid change into vapour
 - (a) From the surface
 - (b) From the bottom
 - (c) From all over the liquid
 - (d) None of these
- IV. Which of the following is the example of evaporation?
 - (a) Boiling Milk
 - (b) Drying clothes in the sun
 - (c) Cooking food in pressure cooker.
 - (d) Refining Sugar.
- V. Evaporation is -
 - (a) Bulk phenomenon, change liquid into vapours.
 - (b) Surface phenomenon, change liquid into solid.
 - (c) Bulk phenomenon, change liquid into solid
 - (d) Surface phenomenon, change liquid into vapours.

Read the following and answer any four questions from (I-V)

Case - 5: You must have observed that the rate of evaporation increases with an increase of surface area: We know that evaporation is a surface phenomenon. If the surface area is increased, the rate of evaporation increases. For example, while putting clothes for drying up we spread them out. An increase of temperature: With the increase of temperature, more number of particles get enough kinetic energy to go into the vapour state. In an open vessel, the liquid keeps on evaporating. The particles of liquid absorb energy from the surroundings to regain the energy lost during evaporation. This absorption of energy from the surroundings makes the surroundings cold.

- I. Evaporation is surface phenomenon.
 - (a) True
 - (b) False
 - (c) None of these
 - (d) Both (a) and (b)
- II. As temperature increases the rate of evaporation is
 - (a) Increases
 - (b) Decreases
 - (c) Remains constant
 - (d) None of these
- III. The rate of evaporation increases with
 - (a) Increase in wind speed
 - (b) Decrease in wind speed
 - (c) Does not have any effect from wind speed
 - (d) None of these
- IV. When acetone is poured on your palm it gives cooling effect because of
 - (a) Evaporation
 - (b) Boiling
 - (c) Sublimation
 - (d) Freezing
- V. With increase in temperature, evaporation increases because-
 - (a) Kinetic energy of particles decreases, hence more particles keep on evaporating
 - (b) Kinetic energy of particles increases, hence more particles keep on evaporating
 - (c) Kinetic energy of particles remains constant
 - (d) None of the above.



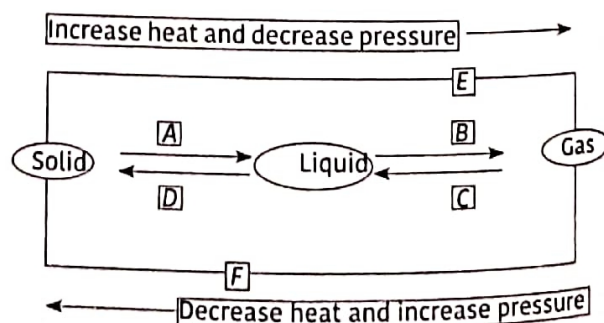


EXAM PRACTICE



NCERT QUESTIONS

1. Which of the following are matter? Chair, air, love, smell, hate, almonds, thought, cold, cold-drink, smell of perfume
2. Give reasons for the following observation. The smell of hot sizzling food reaches you several metres away, but to get the smell of cold food, you have to go close.
3. A diver is able to cut through water in a swimming pool. Which property of matter does this observation show?
4. What are the characteristics of particles of matter?
5. The mass per unit volume of a substance is called density ($\text{Density} = \text{Mass}/\text{Volume}$). Arrange the following in the order of increasing density.
Air, exhaust from chimneys, honey, water, chalk, cotton and iron.
6. (i) Tabulate the differences in the characteristics of states of matter.
(ii) Comment upon the following terms:
Rigidity, compressibility, fluidity, filling a gas container, shape, kinetic energy and density.
7. Give reasons.
 - (i) A gas fills completely the vessel in which it is kept.
 - (ii) A gas exerts pressure on the walls of the container.
 - (iii) A wooden table should be called a solid.
 - (iv) We can easily move our hands in air but to do the same through a solid block of wood, we need a karate expert.
8. For any substance, why does the temperature remain constant during the change of state?
9. Suggest a method to liquefy atmospheric gases.
10. Why does a desert cooler cool better on a hot dry day?
11. How does the water kept in an earthen pot (matka) become cool during summer?
12. Why does our palm feel cold when we put some acetone or petrol or perfume on it?
13. Why are we able to sip hot tea or milk faster from a saucer rather than a cup?
14. What type of clothes should we wear in summer?
15. Convert the following temperatures to the Celsius scale.
 - (i) 293 K
 - (ii) 470 K
16. Convert the following temperatures to the Kelvin scale.
 - (i) 25°C
 - (ii) 373°C
17. Give reason for the following observations:
 - (a) Naphthalene balls disappear with time without leaving any solid.
 - (b) We can get the smell of perfume sitting several metres away.
18. What is the physical state of water at
 - (i) 25°C?
 - (ii) 0°C?
 - (iii) 100°C?
19. Give two reasons to justify.
 - (i) Water at room temperature is a liquid.
 - (ii) An iron almirah is solid at room temperature.
20. Why is ice at 273 K more effective in cooling than water at the same temperature?
21. What produces more severe burns, boiling water or steam?
22. Name A, B, C, D, E and F in the following diagram showing change in its state.





COMPETENCY QUESTIONS

(FOR FOUNDATION, NTSE, OLYMPIAD QUESTIONS)

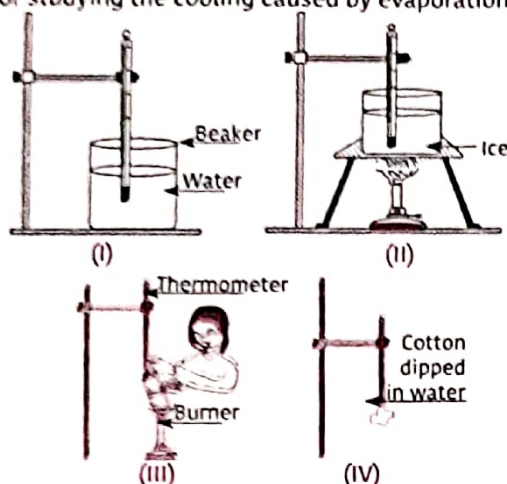
SECTION A MULTIPLE CHOICE QUESTIONS

DIRECTIONS: This section contains multiple choice questions. Each question has 4 choices (a), (b), (c) and (d) out of which only one is correct.

- Select the one that is not a matter.
(a) feeling of hot (b) smoke
(c) humidity (d) water
- Which is incorrect statement?
(a) Matter is continuous in nature.
(b) Of the three state of matter, the one that is most compact is solid state.
(c) In solid state inter-particles space (i.e., empty space) is minimum.
(d) The density of solid is generally more than that of a liquid.
- Select the one that when used would be considered as best condition for liquefaction of a gas.
(a) Increasing the temperature.
(b) Decreasing the pressure.
(c) Increasing the pressure and decreasing the temperature.
(d) Decreasing the pressure and increasing the temperature.
- Select the correct order of evaporation for water, alcohol, petrol and kerosene oil:
(a) water > alcohol > kerosene oil > petrol
(b) alcohol > petrol > water > kerosene oil
(c) petrol > alcohol > water > kerosene oil
(d) petrol > alcohol > kerosene oil > water.
- Which one is a sublime substance?
(a) Table salt (b) Sugar
(c) Iodine (d) Potassium Iodide
- The process of change of liquid state into gaseous state at constant temperature is known as
(a) boiling (b) melting
(c) fusion (d) evaporation
- Which one is a surface phenomenon?
(a) Evaporation (b) Boiling
(c) Both (a) and (b) (d) None of these
- Which of the following processes is known as fusion?
(a) Change of liquid to solid
(b) Change of solid to liquid
(c) Change of liquid to vapour
(d) Change of gaseous state to solid state
- The evaporation of a liquid can best be carried out in a
(a) flask (b) china dish
(c) test-tube (d) beaker
- The one, in which inter-particle forces are strongest, is
(a) sodium chloride (b) hydrogen
(c) ether (d) carbon dioxide
- The melting point temperature of the solid state of a substance is 40°C . The freezing point temperature of the liquid state of the same substance will be
(a) 35°C (b) 40°C
(c) 45°C (d) can't predict
- Which one will help to accelerate the process of evaporation of a liquid kept in an open china dish?
(a) Keeping dish in open
(b) Blowing air into the liquid
(c) Keeping the dish under a running fan
(d) All of the above
- When a gas is compressed keeping temperature constant, it results in
(a) increase in speed of gaseous molecules
(b) increase in collision among gaseous molecules
(c) decrease in speed of gaseous molecules
(d) decrease in collision among gaseous molecules
- The cause of Brownian movement is
(a) convection current
(b) heat changes in liquid state
(c) impact of molecules of dispersion medium on colloidal particles.
(d) attractive forces between particles of dispersed phase and dispersion medium.
- During summer, water kept in an earthen pot becomes cool because of the phenomenon of
(a) diffusion (b) transpiration
(c) osmosis (d) evaporation
- A few substances are arranged in the increasing order of 'forces of attraction' between their particles. Which one of the following represents a correct arrangement?
(a) Water, air, wind
(b) Air, sugar, oil
(c) Oxygen, water, sugar
(d) Salt, juice, air
- The boiling points of diethyl ether, acetone and n-butyl alcohol are 35°C , 56°C and 118°C respectively. Which one of the following correctly represents their boiling points in Kelvin scale?
(a) 306 K, 329 K, 391 K
(b) 308 K, 329 K, 392 K
(c) 308 K, 329 K, 391 K
(d) 329 K, 392 K, 308 K



18. Which one of the following experimental set up is correct for studying the cooling caused by evaporation of water?



- (a) I (b) II
(c) III (d) IV

19. Non-reacting gases have a tendency to mix with each other. This phenomenon is known as
(a) chemical reaction (b) diffusion
(c) effusion (d) explosion
20. A gas can be compressed to a fraction of its volume. The same volume of a gas can be spread all over a room. The reason for this is that
(a) the volume occupied by molecules of a gas is negligible as compared to the total volume of the gas.
(b) gases consists of molecules which are in a state of random motion
(c) gases consist of molecules having very large intermolecular space which can be reduced or increased under ordinary conditions
(d) None of these
21. Which has the least energetic molecules?
(a) Solids (b) Liquids
(c) Gases (d) Plasmas

SECTION B MATCHING BASED MCQ

DIRECTIONS (Qs.22 to 23): Match Column-I with Column-II and select the correct answer using the codes given below the columns.

Column-I	Column-II
(A) Liquid metal	(p) Camphor
(B) Sublime substance	(q) Hg
(C) Metallic crystal	(r) Five
(D) No. of states of matter	(s) Kelvin
(E) SI unit of temperature	(t) Good conductor of heat & electricity

- (a) A - (q); B - (p); C - (t); D - (r); E - (q)
(b) A - (p); B - (q); C - (t); D - (r); E - (q)
(c) A - (q); B - (p); C - (t); D - (s); E - (r)
(d) A - (q); B - (t); C - (p); D - (r); E - (s)

23.

Column-I	Column-II
(A) Evaporation	(p) Solid
(B) Sponge	(q) Diffusion
(C) Spreading of virus on sneezing	(r) Liquid into vapours above room temperature
(D) Fusion	(s) Liquid into vapours
(E) Boiling	(t) Melting

- (a) A - (s); B - (q); C - (p); D - (t); E - (r)
(b) A - (s); B - (p); C - (q); D - (t); E - (r)
(c) A - (p); B - (s); C - (q); D - (t); E - (r)
(d) A - (s); B - (p); C - (q); D - (r); E - (t)

SECTION C STATEMENT BASED MCQ

24. Consider the following statements:
(i) Water at room temperature is a liquid.
(ii) When a liquid is cooled very quickly, it always forms a crystal.
(iii) Atoms in a liquid are farther apart than the atoms in a gas.
Which of these statement (s) is/are correct?
(a) (i) and (ii)
(b) (ii) and (iii)
(c) Only (i)
(d) Only (iii)
25. Consider the following statements:
(i) The rate of evaporation depends only on the surface area exposed to the atmosphere.
(ii) Latent heat of vaporisation is the heat energy required to change 1 kg of a liquid to gas at atmospheric pressure at its melting point.
Which of these statement(s) is/are correct?
(a) (i) only
(b) (ii) only
(c) Both (i) and (ii)
(d) Neither (i) nor (ii)
26. Consider the following statements:
(i) The molecules in a gas are in constant random motion.
(ii) Gases have the same pressure throughout the entire atmosphere.
(iii) Gas molecules are always evenly distributed in the atmosphere.
Which of these statement (s) is/are correct?
(a) (i) and (ii)
(b) (ii) and (iii)
(c) Only (i)
(d) Only (ii)

SECTION D ASSERTION REASON BASED MCQ

DIRECTIONS (Qs. 27 to 29): Following questions consist of two statements, one labelled as the 'Assertion' and the other as 'Reason'. You are to examine these two statements carefully and select the answer to these items using the code given below.

Codes:

- (a) Both A and R are individually true and R is the correct explanation of A:
- (b) Both A and R are individually true but R is not the correct explanation of A.
- (c) A is true but R is false
- (d) A is false but R is true.

27. **Assertion:** Naphthalene balls disappear completely after few days.

Reason: They are highly volatile (sublimate) and change into vapours completely.

28. **Assertion:** At room temperature, the evaporation of a liquid takes place at variable rate.

Reason: During evaporation of a liquid, the temperature of the liquid remains unaffected.

29. **Assertion:** Refining of petroleum involves fractional distillation.

Reason: Fractional distillation involves repeated evaporation and distillation.

SECTION E CORRECT DEFINITION BASED MCQ

30. Latent heat of vaporization is

- (a) amount of heat energy required to change 1g of a liquid into gaseous state at atmosphere pressure without change of temperature at its boiling point.
- (b) amount of heat energy required to change 1 kg of a liquid in to gaseous state at atmosphere pressure without any change of temperature at its boiling point.
- (c) amount of heat energy required to change 1 kg of solid into gaseous state at atmospheric pressure without any change of temperature at its melting point.
- (d) amount of heat energy required to change 1g of a liquid into gaseous state at STP without any change of temperature at its boiling point.

SECTION F FEATURE BASED MCQ

31. On the basis of following features identify correct option

- (i) It is a surface phenomena
 - (ii) It occurs below boiling point of liquid
 - (iii) This results in cooling
- | | |
|------------------|-----------------|
| (a) Condensation | (b) Evaporation |
| (c) Boiling | (d) Melting |

