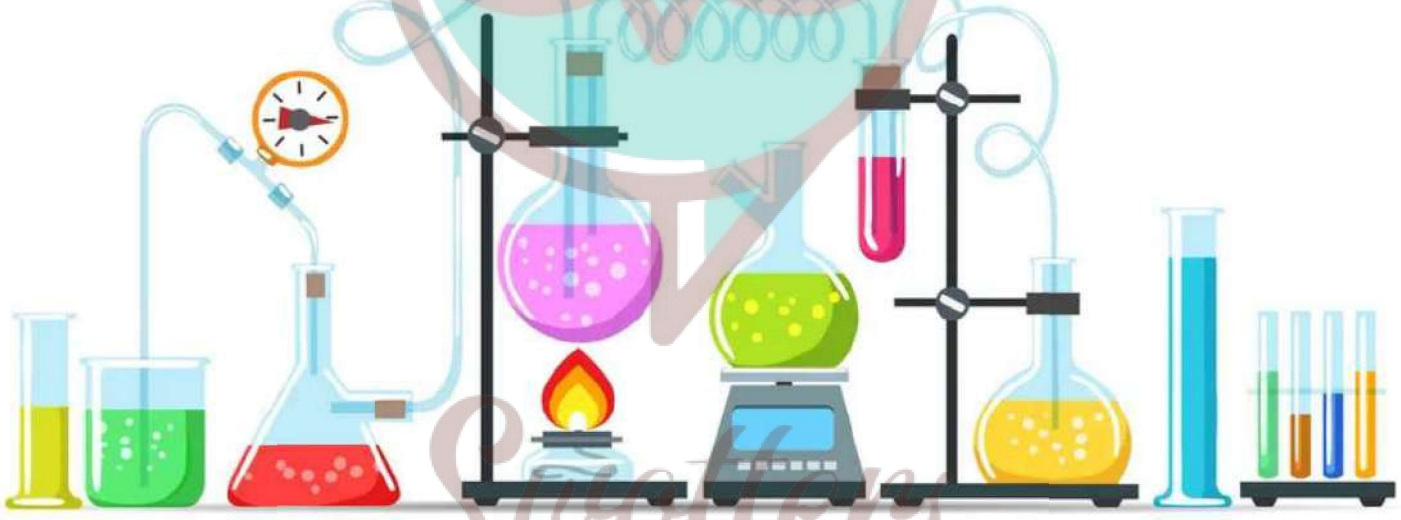
CHEMISTRY

Chapter 1: Matter in Our Surroundings



Importants Questions

➢ Multiple Choice Questions:

1. In which of the following conditions, the distance between the molecules of hydrogen gas would increase?

(i) Increasing pressure on hydrogen contained in a closed container

(ii) Some hydrogen gas leaking out of the container

(iii) Increasing the volume of the container of hydrogen gas

(iv) Adding more hydrogen gas to the container without increasing the volume of the container

(a) (i) and (iii)

(b) (i) and (iv)

(c) (ii) and (iii)

(d) (ii) and (iv)

2. 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:

(a) Air is heavier than bromine

(b) Both air and bromine have the same density

(c) Bromine is heavier than air

(d) Bromine cannot be heavier than air because it is going upwards against gravity

3. A form of matter has no fixed shape but it has a fixed volume. An example of this form of matter is

(a) Krypton

(b) Kerosene

(c) Carbon steel

(d) Carbon dioxide

4. Which one of the following statements is not true?

(a) The molecules in a solid vibrate about a fixed position

(b) The molecules in a liquid are arranged in a regular pattern

(c) The molecules in a gas exert negligibly small forces on each other, except during collisions

(d) The molecules of a gas occupy all the space available

5. The correct procedure of heating iron-sulphur mixture to prepare iron sulphide is:

(a) Heat the powder mixture at the base of the test tube using a blue flame throughout.

(b) Heat the iron filings and sulphur mixture in the middle of the test tube using yellow flame throughout.

(c) Heat the powder mixture at the top of the test tube using an orange flame throughout.

(d) Heat the iron filings-sulphur mixture at 3/4 quarters of the test tube using a red flame throughout.

6. When water at 0°C freezes to form ice at the same temperature of 0°C, then it:

(a) Absorbs some heat

(b) Releases some heat

(c) Neither absorbs nor releases heat

(d) Absorbs exactly 3.34 x 105J/kg of heat

7. When heat is constantly supplied by a burner to boiling water, then the temperature of water during vaporisation :

(a) Rises very slowly

(b) Rises rapidly until steam is produced

(c) First rises and then becomes constant

(d) Does not rise at all

8. Which one of the following set of phenomena would increase on raising the temperature?

(a) Diffusion, evaporation, compression of gases

(b) Evaporation, compression of gases, solubility

(c) Evaporation, diffusion, expansion of gases

(d) Evaporation, solubility, diffusion, compression of gases

9. On converting 308 K, 329 K and 391 K to Celsius scale, the correct sequence of temperatures will be:

(a) 33°C, 56°C and 118°C

(b) 35°C, 56°C and 119°C

(c) 35°C, 56°C and 118°C

(d) 56°, 119°C and 35° C

10. Four students took separately the mixture of sand, common salt and ammonium chloride in beakers, added water, stirred the mixture well and then filtered. They reported their observations as shown below

Student	As residue	In the filtrate

I	Ammonium chloride	Sand, Common salt
II	Common salt, Sand	Ammonium chloride
III	Sand, Ammonium chloride	Common salt
IV	Sand	Ammonium chloride, Common salt

Who reported the observations in the correct order of the components as residue and in the filtrate?

(a) I

(b) IV

(c) III

(d) II

11. Which of the following phenomena always results in the cooling effect?

(a) Condensation

(b) Evaporation

(c) Sublimation

(d) None of these

12. Which of the following cannot be considered a form of matter?

(a) Atom

(b) Water

(c) Humidity

(d) Electron

13. Which of the following causes the temperature of a substance to remain constant while it is undergoing a change in its state?

(a) Latent heat

(b) Lattice energy

(c) Loss of heat

(d) None of these

14. Which of the following statement is correct?

(a) Materials existing as liquids at room temperature have their melting and boiling points lower than that of room temperature.

(b) The phenomenon involving the transition of a substance from solid to liquid state is called sublimation.

(c) To convert a temperature on the Celsius scale to Kelvin scale, subtract 273 from the given

temperature

(d) The density of ice is less than that of water.

15. Which of the following statement is not true regarding the characteristic of matter?

(a) Particles of a matter are randomly moving in all directions.

(b) Kinetic energy of the particles increases with a rise in temperature

(c) Kinetic energy of the particles of all maters remains the same at a particular temperature.

(d) Particles of matter diffuse into each other on their own.

➢ Very Short Question:

1. Define matter.

2. State different states of matter with an example.

3. What is diffusion?

4. What happen to the rate of diffusion if the temperature is increased?

5. Name the state of matter that have the tendency to maintain their shape when subjected to outside force.

6. Define melting point.

7. Define boiling point.

8. Define latent heat of vaporization.

9. Define latent heat of fusion.

10. Define sublimation.

➢ Short Questions:

1. Why do we see water droplets collected on the outer surface of a glass container, containing ice?

2. Explain why solids have fixed shape but liquids and gases do not have fixed shape.

3. Liquids and gases can be compressed but it is difficult to compress solids. Why?

4. A balloon when kept in sun, bursts after some time. Why?

5. Why do people perspire a lot on a hot humid day?

6. Why is it advisable to use pressure cooker at higher altitudes?

7. What are fluids?

8. 1 kg cotton and 1 kg sand, which is more denser? Why?

➢ Long Questions:

1. Pressure and temperature determine the state of a substance. Ex-plane this in detail.

2. Explain giving examples the various factors on which rate of evaporation depends.

➢ Assertion Reason Questions:

1. For two statements are given- one labelled Assertion (A) and the other labelled Reason (R). Select the correct answer to these questions from the codes (a), (b), (c) and (d) as given below:

   a. Both Assertion and Reason are correct, and reason is the correct explanation for assertion.

   b. Both Assertion and Reason are correct, and Reason is not the correct explanation for Assertion.

   c. Assertion is true but Reason is false.

   d. Both Assertion and Reason are false.

   Assertion: Sugar and Salt both are easily dissolved in water.

   Reason: Sugar and Salt are solid hence it is easily dissolved in water.

2. For two statements are given- one labelled Assertion (A) and the other labelled Reason (R). Select the correct answer to these questions from the codes (a), (b), (c) and (d) as given below:

   a. Both Assertion and Reason are correct, and reason is the correct explanation for assertion.

   b. Both Assertion and Reason are correct, and Reason is not the correct explanation for Assertion.

   c. Assertion is true but Reason is false.

   d. Both Assertion and Reason are false.

   Assertion: When sugar pour in water, then taste of water became a sweet.

   Reason: sugar completely dissolved in water with giving its own character.

➢ Case Study Question:

1. In an experimental activity, crushed ice was taken in a beaker. A thermometer is fitted in such a way that its bulb was thoroughly surrounded by ice. The beaker is now slowly heated and temperature was regularly noted. Temperature rises gradually as the heating is continued and becomes constant when ice starts changing into liquid.

   Select the correct answers for the following questions:

   i) What name is associated with conversion of ice into water?

   a) Evaporation

   b) Sublimation

   c) Freezing

d) Fusion of Solid

ii) What specific name is given to the constant temperature?

a) latent heat of fusion

b) Boiling Point

c) Melting Point

d) Condensation point

iii) The heat added to the system at constant temperature is called

a) specific heat

b) latent heat

c) residual heat

d) none of the above

iv) Where does the heat energy go when the temperature does not rise?

a) It makes the molecular motion of the liquid faster

b) It raises the temperature of the beaker only.

c) It is utilised for bringing out the complete change of state

d) It slows down the molecular motion

2. A hot air balloon has three major parts: the basket, the burner, and the envelope. The basket is where passengers ride. The basket is usually made of wicker. This ensures that it will be comfortable and add little extra weight. The burner is positioned above the passenger's heads. The envelope is the colourful fabric balloon that holds the hot air. The pilot can control the up-and-down movements of the hot air balloon.

1. What keeps a hot air balloon flying?

2. How the balloon's pilot can control the balloon's altitude?

3. Using the passage as a guide, it can be inferred that which of the following statements is not true?

(a) Air goes up and out the top of a chimney when you light a fire.

(b) Cool air collects about the ceiling when you open a refrigerator.

(c) Smoke from a candle rises after you blow out the flame.

(d) Cold air coming from an air conditioning vent settles about the floor

4. According to the author, wicker is

I. Comfortable

II. light weight

III. Durable

a) I only

b) I and II only

c) II and III only

d) I , II and III

✓ Answer Key-

➢ Multiple Choice Answers:

1. (c) (ii) and (iii)
2. (c) Bromine is heavier than air
3. (b) Kerosene
4. (b) The molecules in a liquid are arranged in a regular pattern
5. (a) Heat the powder mixture at the base of the test tube using a blue flame throughout.
6. (b) Releases some heat
7. (d) Does not rise at all
8. (c) Evaporation, diffusion, expansion of gases
9. (c) 35°C, 56°C and 118°C
10. (b) IV
11. (b) Evaporation
12. (c) Humidity
13. (a) Latent heat
14. (d) The density of ice is less than that of water.
15. (c) Kinetic energy of the particles of all maters remains the same at a particular temperature.

➢ Very Short Answers:

1. Answer: Anything that occupies space and has mass is called matter.
2. Answer: Matter has 3 different states
3. Answer. The intermingling of molecules of one substance with that of the other is called diffusion.
4. Answer: With increased temperature, the rate of diffusion also increases as the particles gain energy and vibrate more.
5. Answer: Solid.

6. Answer: The temperature at which a solid melts to become liquid at the atmospheric pressure is called its melting point.
7. Answer: The temperature at which a liquid starts boiling at the atmospheric pressure is known as its boiling point.
8. Answer: Latent heat of vaporization is the heat energy required to change 1 kg of a liquid to gas at atmospheric pressure at its boiling point.
9. Answer: Latent heat of fusion is the amount of heat energy required to change 1 kg of solid into liquid at its melting point.
10. Answer: Sublimation is the change of gaseous state directly to solid state without going through liquid state and vice-versa.

➢ Short Answer:

Answer: The water vapour present in air, comes in contact with the cold outer surface of the container thereby condensing it to form water droplets.

Answer: Solids have fixed shape due to strong intermolecular force of attraction between them. The liquids and gases have molecules with less intermolecular force of attraction and hence they can flow and take shape of the container.

Answer: Liquids and gases have intermolecular space, on applying pressure externally on them the molecules can come closer thereby minimizing the space between them. But in case of solids there is no intermolecular space to do so.

Answer: The balloon has air filled in it. The balloon when kept in sun gets heated and the air inside it also gets heated. The molecules of air get energy, and vibrate faster thereby exerting large force on the walls of the balloon. Due to this expansion of gases the balloon bursts.

Answer: On a hot, humid day, due to the heat our body starts sweating for the cooling mechanism i.e., by evaporation and gets cooling effect. But the air cannot hold any more water on a humid day and therefore the sweat or perspiration is seen.

Answer: At higher altitudes, the atmospheric pressure is low and the water boils very fast and evaporates at faster rate therefore the pressure is required to increase the cooking process and this is done by using pressure cooker which increases the pressure inside the container and cooks food faster.

Answer: The states of matter that can flow due to less intermolecular force of attraction, are liquids and gases and are called as fluids.

Answer: One kg sand is more denser than 1 kg cotton because density = mass/volume.

The volume required by cotton is more than the sand and density and volume are inversely proportional.

➢ Long Answer:

1. Answer:

- Any matter i.e., solid, liquid or gas when experiences an increase in temperature then they change their state.

Example: Solid (Ice) $\xrightarrow{\text{heat}}$ Liquid (Water) $\xrightarrow{\text{heat}}$ Gas (Steam)

Take ice cubes in a beaker or heat them slowly, the temperature increases and the ice melts to form liquid. Heat this liquid further it will become steam.

- On lowering down the temperature of any matter, show change in their state.

Example: Gas (Steam) $\xrightarrow{\text{cool}}$ Liquid (Water) $\xrightarrow{\text{cool}}$ Solid (Ice)

Take the steam that is coming out of a boiling water and allow it to cool down, it condenses to form water and on further cooling of this water we get ice.

- On applying pressure and reducing temperature we can liquefy gases or change them into solid.

Example: Take carbon-dioxide gas, reduce its temperature and apply lot of pressure on it so that it changes into solid carbon dioxide, called diy ice, which is used as refrigerant for cooling.

If the pressure on it is decreased, it directly changes into gas.

In LPG cylinders, the petroleum gas is cooled and with lot of pressure changes it into liquid state.

While using this LPG, we release the pressure exerted on it and hence it comes out in the form of gas.

2. Answer: The rate of evaporation depends on the following factors:

- Surface area: If the surface area is increased the rate of evaporation also increases.

(a) To dry the clothes we spread them to dry faster.

(b) Tea in saucer cools faster than in a cup.

- Temperature: If the temperature is increased the rate of evaporation also increases. Due to increase in temperature the particles gain more kinetic energy and change their phase from liquid to gaseous. Water will evaporate faster in sun than in shade.
- Humidity: It is the amount of water vapour present in air. The air can hold definite amount of water vapour, at a given temperature. If the amount of water vapour is high in the air then the rate of evaporation decreases. On hot and humid day, desert coolers are not effective as the air cannot hold any more moisture to get the cooling effect.

- Wind speed: With the increase in wind speed, the rate of evaporation increases. The particles of water vapour move away with the wind, decreasing the amount of water vapour in the surrounding.

➢ Assertion Reason Answer:

1. (c) Assertion is true but Reason is false.
2. (a) Both Assertion and Reason are correct, and reason is the correct explanation for assertion.

➢ Case Study Answer:

1. **Answer:**

   i) d) Fusion of Solid

   ii) c) Melting Point

   iii) b) latent heat

   iv) d) It slows down the molecular motion

2. **Answer:**

   i) The Envelope colourful fabric keeps the hot air balloon flying.

   ii) Through the envelope that holds hot air the pilot can control the balloon aptitude.

   iii) (b) Cool air collects about the ceiling when you open a refrigerator.

   "Hot air rises and cold air falls." Therefore, the cool air inside a refrigerator would fall to the floor when you open the door, not collect about the ceiling. This means (B) is not true

   iv) a) I only