01. MATTER IN OUR SURROUNDINGS

Questions and Answers

1. Describe an activity which provides the evidence for
a) the motion of particles
b) attraction between particles
c) inter-particle space

A. **(a)** Activity to show evidence for motion of particles: Take two glass beakers. Fill one beaker with hot water and another with cold water. Add $KMnO_4$ crystals in very small amount in both. Hence we observe the motion of particles that , the particles of $KMnO_4$ move fastly in hot water than in cold water.

(b) Activity to show evidence for attraction between particles: Take a piece of iron and a piece of chalk. Try to break them. We come to know that iron is too hard to break. From this , we say that the particles of matter have forces acting between them. That force kept the particles together. The force of attraction between particles is maximum in solids and minimum in gases.

(c) Activity to show evidence for inter particle space: Take a glass beaker. Fill it with water. Measure the level of water with a scale. Add a tea spoon of salt and stir it well. We observe that there is no change in the water level. We can conclude that there exists inter particle space in the substances like water. Inter particle space is more in gases and less in solids.

2. Name the characteristics of matter that are demonstrated by diffusion.

A. Matter is made up of several particles. There is some space between particles in substances. The particles of solids, liquids and gases diffuse in liquids or in gases. The rate of diffusion of gases is higher than that of liquids and solids. The rate of diffusion of liquids is more than solids and less than gases. The rate of diffusion of solids is very less.

3. "When sugar is dissolved in water there is no increase in volume". Is it true or false? …..Comment on the statement keeping in mind the amount of sugar, amount of water etc.

A. Yes. The statement is true. When sugar is added to water, it dissolves in water. As there exists more inter particle space in water, the particles of sugar occupies the space in water. So the volume of water may not increased.

4. Is there any change in mass when a substance changes its state? Explain with example.

A. For example, coconut oil is usually liquid. But if it is too cold it becomes solid. But its mass not changes. Mass of a substance is the amount of matter contained in it. Matter is made up of several particles. During change in state, the energy of the particles and distance can only changed.

5. Do all substances change from solid to liquid and liquid to gas on heating? Explain.

A. Many substances change from solid to liquid and liquid to gas on heating.
Ex: Ice → Water → Vapour
All substances do not follow this regular trend. Sublimation is a process that a solid directly changes into vapour state.
Ex: Camphor, Moth balls, Iodine, Ammonium chloride,Napthalene balls, Odonil changes into vapour on heating.

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6. Define the following terms: a) melting point b) boiling point c) evaporation

A. **Melting Point:** The temperature at which the solid phase changes to liquid phase at the atmospheric pressure is called melting point of that substance.

Ex: Melting point of ice is 0^oC.

Boiling Point: The temperature at which the liquid phase changes to gaseous phase at the atmospheric pressure is called boiling.

* Boiling is an other type of vaporization.

Ex: Boiling point of water is 100^oC at atm.

Evaporation : The process of escaping of molecules from the surface of a liquid at any temperature is called evaporation. Evaporation is the phase change from liquid to gas at any temperature.

7. Correct the following statements.

a) Water boils at 100^oC under atmospheric pressure.

b) a liquid evaporates above its boiling point

c) solids have the largest inter-particle space.

d) gases have the strongest inter-particle forces.

A. a) Water boils at 100^oC under atmospheric pressure. …. Correct

b) a liquid evaporates above its boiling point …. Incorrect

a liquid can evaporates below its boiling point …. Correct

c) solids have the largest inter-particle space. …. incorrect

solids have the least inter-particle space. …. Correct

d) gases have the strongest inter-particle forces. …. incorrect

gases have the weakest inter-particle forces. …. Correct

8. Why do we prefer to sip hot tea with a saucer rather than a cup?

A. The surface area is quite large for saucer, compared to a cup. So evaporation is fast in saucer. As the evaporation is a cooling process, tea cools down fast in a saucer. So we prefer to sip hot tea with a saucer.

9. When water solidifies to ice then heat Is a) Liberated b) Absorbed

c) No change

d) Depending on the condition of heat absorbed or liberated.

A. When water solidifies to ice then heat is liberated. The kinetic energy of molecules in a liquid is more than the kinetic energy of molecules in a solid. If liquid converts to a solid then the molecules loses kinetic energy. It should be evolved/liberated.

10. Convert the following temperatures to the Celsius scale.

(a) 283K (b) 570K

A. (a) $t^oC = (t + 273)K$

$T\ K = (T-273)^oC$

$283K = (283 - 273)K = 10^oC$

(b) $t^oC = (t + 273)K$

$T\ K = (T-273)^oC$

$570K = (570 - 273)K = 297^oC$

11. Convert the following temperatures to the Kelvin scale.

(a) 27^0C (b) 367^0C

A. (a) $t^oC = (t + 273)K$

$27^oC = (27 + 273)K = 300K$

(b) $t^oC = (t + 273)K$

$367^oC = (367 + 273)K = 640K$

12. Fill in the blanks.

a) Matter changes from one state to another either raising the .....… or lowering the….....……

b) A change in which a solid on heating directly changes into vapour state is called …….....……

A. a) sublimation

b) temperature, pressure

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13. Match the following.

a) conversion of liquid into gas	(iv)	(i)	gas
b) Non- compressible	(ii)	(ii)	solid
c) maximum expansion	(i)	(iii)	particle
d) constituents of matter	(iii)	(iv)	evaporation

14. How can we smell perfume sitting several meters away from the source?

A. The rate of diffusion of gases is more than other substances. The particles of scent mix with air and they can spread easily. So we can smell perfume sitting several meters away from the source.

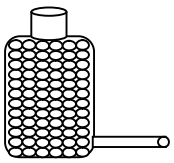
15. Steam produces more severe burns than boiling water. Think why?

A. The temperature of steam is equal to temperature of boiling water. But steam has more energy than boiling water as it gain latent heat of vaporization. So steam produces more severe burns than boiling water.

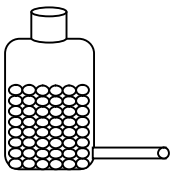
16. Make a model to explain the structure of particles in solids, liquids and gases.

A. Take three small transparent plastic bottles. Make a small hole at the bottom in each of them. Arrange a small piece of pipe (2 inch) or empty barrel of pen.

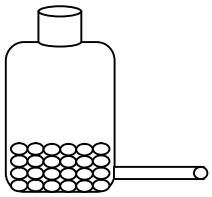
Fill with thermocoal balls fully in first bottle. Place the cap. Blow air through the pipe. Then observe the motion of balls. It is the motion of particles in solids.



Fill with thermocoal balls upto 75% in second bottle. Place the cap. Blow air through the pipe. Then observe the motion of balls. It is the motion of particles in liquids.



Fill with thermocoal balls up to 25% in third bottle. Place the cap. Blow air through the pipe. Then observe the motion of balls. It is the motion of particles in gases.



17. How do you appreciate sweating mechanism of human body to control the temperature of the body?

A. If we get sweat, the sweat evaporates from the surface of our body by absorbing heat from our body. Thus the particles of liquid absorb energy from the body to escape to the surroundings. It makes us feel cold. So I appreciate the sweating mechanism of human body to control the temperature.

*** ADDITIONAL QUESTIONS ***

18. What matter?
19. Write the differences between solids, liquids and gases.
20. Define compressibility.
21. Define diffusion.
22. Write an activity to show that the rate of diffusion is different for different substances.
23. Define latent heat.
24. What are the affecting factors of evaporation?
25. Expand CNG.
26. How can you prove that the rate of evaporation depends upon surface area?
27. Why pigs toil in the mud during hot summer days?
28. Why do dogs pant, during hot summer days?

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