
	<b>INDIAN SCHOOL AL WADI AL KABIR</b>	
<b>Class: IX</b>	<b>Department: SCIENCE 2025 – 26</b> <b>SUBJECT: SCIENCE(CHEMISTRY)</b>	<b>Date: 24/04/2025</b>
<b>Worksheet No: 01</b>	<b>CHAPTER / UNIT: MATTER IN OUR SURROUNDINGS</b>	<b>Note:</b> <b>A4 FILE FORMAT</b>
<b>NAME OF THE STUDENT</b>	<b>CLASS &amp; SEC:</b>	<b>ROLL NO.</b>

### **I. OBJECTIVE TYPE QUESTIONS (1 MARK):**

- The property to flow is unique to fluids. Which one of the following statements is correct?
  - Only gases behave like fluids
  - Gases and solids behave like fluids
  - Gases and liquids behave like fluids
  - Only liquids are fluids
- Seema visited a Natural Gas Compressing unit and found that the gas can be liquefied under specific conditions of temperature and pressure. While sharing her experience with friends she got confused. Help her to identify the correct set of conditions
  - Low temperature, low pressure
  - High temperature, low pressure
  - Low temperature, high pressure
  - High temperature, high pressure
- Which one of the following sets of the phenomenon would increase on raising the temperature?
  - Diffusion, evaporation, compression of gases
  - Evaporation, compression of gases, solubility
  - Evaporation, diffusion, expansion of gases
  - Evaporation, solubility, diffusion, compressibility of gases
- On converting 25 °C, 38 °C and 66 °C to kelvin scale, the correct answer will be
  - 298 K, 311 K and 339 K
  - 298 K, 300 K and 338 K
  - 273 K, 278 K and 543 K
  - 298 K, 310 K and 338 K

- 5) The boiling point of water at sea level is
- 0°C
  - 273K
  - 373K
  - 273°C
- 6) Dry ice is
- Water in solid state
  - Water in gaseous state
  - CO<sub>2</sub> in liquid state
  - CO<sub>2</sub> in solid state
- 7) A student takes some water in a beaker and heats it over a flame to determine the boiling point of water. He keeps on taking temperature readings. He observes that the temperature of water:
- Keeps on increasing regularly
  - First increases slowly, then decreases rapidly and eventually becomes constant
  - keeps on increasing irregularly
  - First increases gradually and then becomes constant.
- 8) Materials existing as liquids have:
- Boiling point and melting point above room temperature.
  - Boiling point above room temperature and melting point below room temperature.
  - Boiling point and melting point below room temperature.
  - None of the above.
- 9) Which of the following causes the temperature of a substance to remain constant while it is undergoing a change in its state?
- Latent heat
  - Lattice energy
  - Loss of heat
  - None of these
- 10) Which of the following is incorrect?
- Solids have fixed shape and fixed volume.
  - Liquids have fixed volume but not shape.
  - Gases have neither fixed shape nor volume.
  - The particles have least intermolecular space but maximum kinetic energy in liquids.

## **ASSERTION -REASON TYPE QUESTIONS**

Choose the correct options for the following questions.

- a) Both Assertion and Reason are true and Reason is the correct explanation of Assertion.
- b) Both Assertion and Reason are true but Reason is not the correct explanation of Assertion.
- c) Assertion is true but Reason is false.
- d) Assertion is false but Reason is true

11) **Assertion:** A gas does not have fixed shape.

**Reason:** In gases, the particles are close to each other and less space between the particles.

12) **Assertion:** When a solid melt, its temperature remains the same.

**Reason:** The heat gets used up in changing the state by overcoming the forces of attraction between the particles.

13) **Assertion:** A solid does not fill its container completely

**Reason:** Particles are held together by strong force of attraction.

14) **Assertion:** Rate of evaporation of an aqueous solution increases with increase in humidity.

**Reason:** When there is increase in humidity, atmosphere will not take water vapour easily which decreases the process of evaporation.

15) **Assertion:** Naphthalene does not leave any residue when kept open for some time

**Reason:** The conversion of a solid directly into gas is called Condensation.

## **VERY SHORT ANSWER TYPE QUESTIONS (2M)**

16) Why does our palm feel cold when we put some acetone or petrol or perfume on it?

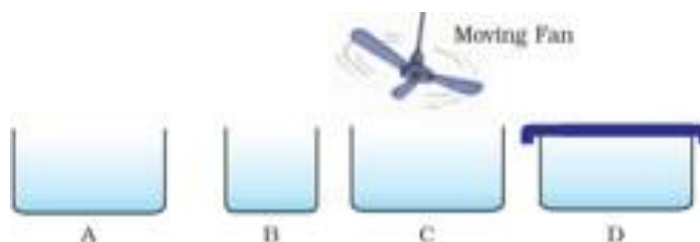
17) Name the process associated with each of the following conversions:

- (i) Solid Ammonium chloride changes to vapour on heating.
- (ii) Solid wax on heating changes to liquid wax.

18) Give reasons

- (i) A gas fills completely the vessel in which it is kept.
- (ii) Salt and sugar when kept in different jars take the shape of the jars, yet they are classified as solids.

19) Look at Fig. and suggest in which of the vessels A, B, C or D the rate of evaporation will be the highest? Explain.

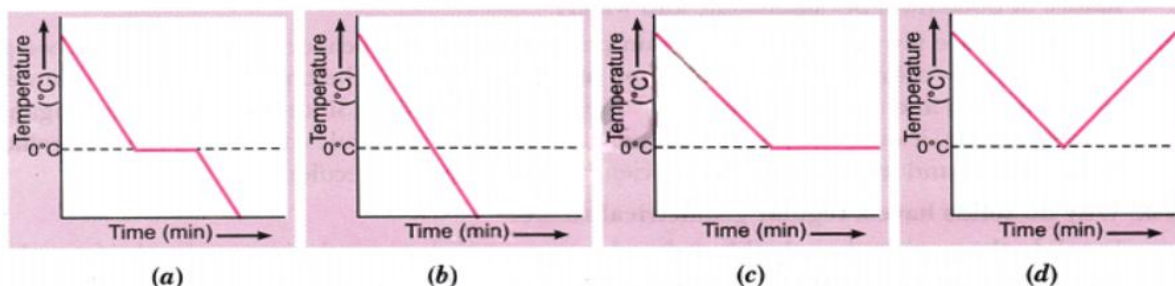


### SHORT ANSWER TYPE QUESTIONS (3M)

- 20) On a hot sunny day, why do people sprinkle water on the roof or open ground?
- 21) Give two reasons to justify —
- Water at room temperature is a liquid.
  - An iron almirah is a solid at room temperature.
- 22) Kinetic energy of particles of water in three vessels A, B and C are  $E_A$ ,  $E_B$  and  $E_C$  respectively and  $E_A > E_B > E_C$ . Arrange the temperatures,  $T_A$ ,  $T_B$  and  $T_C$  of water in the three vessels in increasing order.
- 23) When a crystal of potassium permanganate is placed in a beaker of water, its purple color spreads throughout. What does this observation conclude about potassium permanganate and water?
- 24) Alka felt intense heat from steam while making tea. Is the temperature of steam higher than boiling water?

### LONG ANSWER TYPE QUESTIONS (5 M)

- 25) If a glass tumbler of hot water is kept in a freezer, which graph represents its temperature change over time?



- 26) While heating ice in a beaker with a thermometer suspended in it, a student recorded the following observations:

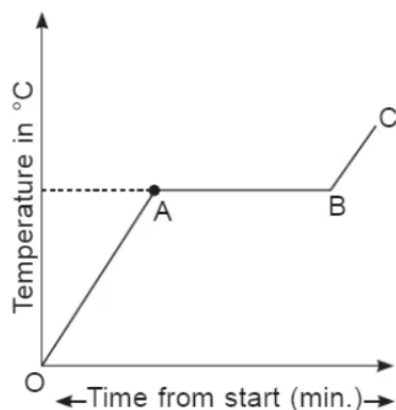
Time (in min.)	0	1	2	3	4	5	6	7	8	10	15	20	25	30	35
Temp. (in °C)	-3	-1	0	0	5	8	12	15	19	22	30	50	73	100	100

Based on these, answer the following:

- State the change observed between 2-3 min and name the process.
  - Between 30-35 min, the temperature remains constant. Explain why and name the heat involved.
- 27) Discuss the factors affecting the rate of evaporation. Given the latent heat of evaporation for two liquids, A and B, is 100 J/kg and 150 J/kg respectively, which one produces more cooling effect and why?
- 28) Explain interconversion of three states of matter with the help of a flow chart. Name the process of each interconversion.

### **CASE STUDY/DATA BASED QUESTIONS (4 M)**

- 29) Boiling occurs when the particle in a liquid state absorb enough energy to overcome the forces holding them together and begin to move apart to form a gas. A liquid is being heated, a graph is plotted between time and temperature in  $^{\circ}\text{C}$ .



- i. Define boiling point. Express the boiling point of water in Kelvin scale.
- ii a) What does OA represent?
- b) What does AB represent?

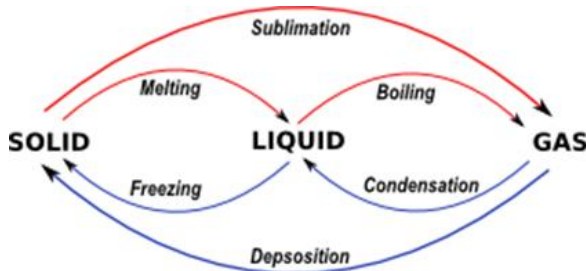
**OR**

- ii. a) Why does temperature remain constant at boiling temperature?
- b) What does BC represent?

### **ANSWER KEY**

Q.NO	ANSWERS
1	c) Gases and liquids behave like fluids
2	c) Low temperature, high pressure
3	c) Evaporation, diffusion, expansion of gases
4	a) 298 K, 311 K and 339 K
5	c) 373K
6	d) $\text{CO}_2$ in solid state
7	d) First increases gradually and then becomes constant
8	b) Boiling point above room temperature and melting point below room temperature.
9	a) Latent heat
10	d) the particles have least intermolecular space and maximum kinetic energy in liquids.
11	c) Assertion is true but Reason is false.

12	a) Both Assertion and Reason are true and Reason is the correct explanation of Assertion.
13	a) Both Assertion and Reason are true and Reason is the correct explanation of Assertion.
14	d) Assertion is false but Reason is true
15	c) Assertion is true but Reason is false
16	Acetone, perfume and petrol are volatile liquids. These liquids absorb heat from our hand and changes to vapours. (evaporation). Evaporation causes cooling
17	(i) Sublimation (ii) Fusion/melting
18	(i) The molecules of a gas are very loosely packed due to intermolecular force of attraction between them. (ii) The individual crystals of each are small and many of these small sugar or salt crystals can fill up the empty spaces of a container
19	(c) The rate of evaporation increases with an increase of surface area because evaporation is a surface phenomenon. Also, with the increase in air speed, the particles of water vapour will move away with the air, which will increase the rate of evaporation
20	During hot sunny day, the surface of roof or ground absorbs large amount of heat and remains hot, on sprinkling water on these surfaces, the water absorbs large amount of heat from the surface due to its large latent heat of vaporisation thereby allowing the hot surface to cool.
21	a) For a temperature of $0\text{ }^{\circ}\text{C}$ to $100\text{ }^{\circ}\text{C}$ water is in gaseous state. Since room temperature always lie between $0\text{ }^{\circ}\text{C}$ and $100\text{ }^{\circ}\text{C}$ and within this range the physical state of water is liquid so water is liquid at room temperature. b) Since the room temperature is very less than the melting point of iron hence an almirah made up of iron will be a solid at room temperature.
22	$T_C < T_B < T_A$ , the kinetic energy of particles is greater at higher temperature.
23	The purple color spreading throughout the water indicates diffusion. Potassium permanganate, being a solid, initially settles at the bottom, but water molecules collide with it and the particles intermingle due to sufficient space between the molecules in the liquid state.
24	No, the temperature of both steam and boiling water is $100^{\circ}\text{C}$ . However, steam has more energy due to the latent heat of vaporisation.
25	(a) Initially, the water cools until it reaches $0^{\circ}\text{C}$ , the freezing point. At this stage, the temperature remains constant as the water freezes. Once all the water has turned into ice, the temperature will drop further.
26	(a) Between 2-3 min, ice changes into water, a process called fusion. (b) Between 30-35 min, the temperature remains constant as the heat supplied is used to

	overcome the intermolecular forces to change the liquid into vapor. This heat is known as latent heat of vaporisation.
27	<p>Factors affecting evaporation:</p> <ul style="list-style-type: none"> <li>• Surface area: Larger surface area increases the rate of evaporation.</li> <li>• Temperature: Higher temperature increases the rate of evaporation.</li> <li>• Humidity: Higher humidity decreases the rate of evaporation.</li> <li>• Wind speed: Higher wind speed increases the rate of evaporation.</li> </ul> <p>Liquid B produces more cooling because it absorbs more heat from the surroundings for evaporation due to its higher latent heat.</p>
28	<p>The interconversion of the three states of matter can be illustrated as follows:</p> <ul style="list-style-type: none"> <li>• Solid to Liquid: Melting / fusion</li> <li>• Liquid to Gas: Vaporisation / boiling</li> <li>• Gas to Liquid: Condensation</li> <li>• Liquid to Solid: Freezing / solidification</li> <li>• Solid to Gas: Sublimation</li> <li>• Gas to Solid: Deposition</li> </ul>  <pre> graph LR     SOLID -- Melting --&gt; LIQUID     LIQUID -- Boiling --&gt; GAS     GAS -- Condensation --&gt; LIQUID     LIQUID -- Freezing --&gt; SOLID     SOLID -- Sublimation --&gt; GAS     GAS -- Deposition --&gt; SOLID   </pre>
29	<p>i. The temperature at which a liquid boils and turns to vapour.</p> <p>ii.</p> <ol style="list-style-type: none"> <li>Liquid being heated and absorbing energy, therefore particles move more energetically.</li> <li>It represents mixture of liquid and vapours at the boiling point of the liquid.</li> </ol> <p style="text-align: center;">OR</p> <p>ii.</p> <ol style="list-style-type: none"> <li>The temperature remains constant at the boiling point because the heat of vaporisation is used to overcome the force of attraction between liquid particles.</li> <li>It represents a vapour state, and particle absorb heat and become more energetic. The temperature of the gas will rise.</li> </ol>

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