

## Chemistry Worksheet Class 9 on Chapter 1 Matter in Our Surroundings with Answers- Set 3

**Q1.** Which of the following has the highest kinetic energy?

- (a) Steam particles at 100 °C
- (b) Steam particles at 0 °C
- (c ) Water particles at 100 °C
- (d) Water particles at 0 °C

**Answer:** (a) Steam particles at 100 °C have the highest kinetic energy.

**Q2.** What is the physical state of water at 25 °C?

- (a) Solid
- (b) Liquid
- (c ) Gas
- (d) None of the above

**Answer:** (b) The physical state of water at 25 °C is liquid.

**Q3.** Arrange the following substances in increasing order of forces of attraction between the particles: Water, Sugar, and Oxygen.

- (a) Water < Sugar < Oxygen
- (b) Oxygen < Water < Sugar
- (c ) Water < Oxygen < Sugar
- (d) Oxygen < Sugar < Water

**Answer:** (b) We can arrange water, sugar and oxygen in increasing order of forces of attraction between the particles as follows.

Oxygen < Water < Sugar.

**Q4.** Which of the following is preferred in the summers?

- (a) Cotton
- (b) Polyester
- (c ) Nylon
- (d) None of the above

**Answer:** (a) Cotton is preferred in the summers.

**Q5.** BEC is the abbreviation for Bose-Einstein Condensate, which has

- (a) Shallow kinetic energy
- (b) Shallow potential energy
- (c ) Both (a) and (b)
- (d) None of the above

**Answer:** (a) BEC is the abbreviation for Bose-Einstein Condensate, which has shallow kinetic energy.

**Q6.** What is the SI unit of pressure? Give its value in the atmospheric unit.

**Answer:** The SI unit of pressure is Pascal (Pa).

Its value in 1 atmospheric pressure is:

1 atmosphere (atm) =  $1.01 \times 10^5$  Pa.

**Q7.** Name the chemical compound present in the nail polish remover.

**Answer:** Acetone is the chemical compound present in nail polish remover.

**Q8.** Which state of matter is responsible for the glow of the sun and the stars?

**Answer:** There is a fourth state of matter- "plasma". The plasma state is mainly responsible for the glow of the sun and the stars.

**Q9.** Fill in the blanks and give a suitable reason for your answer.

(i) Higher the melting point of a substance \_\_\_\_\_ will be the force of attraction between its particles.

(ii) Particles from the bulk of the liquid gain energy to change into the \_\_\_\_\_ state.

**Answer:** (i) Higher the melting point of a substance lesser will be the force of attraction between its particles.

**Explanation:** The temperature at which solid melts to become a liquid at the atmospheric pressure is called its melting point. The higher the melting point of a substance, the more easily it converts into a liquid with less force of attraction between its particles.

(ii) Particles from the bulk of the liquid gain energy to change into the vapour state.

**Explanation:** Boiling is a bulk phenomenon. Particles from the bulk of the liquid gain enough energy to change into the vapour state.

**Q10.** Write the full form of BEC.

**Answer:** The full form of BEC is Bose-Einstein condensate. A Bose-Einstein condensate is the fifth state of matter. This state does not exist under normal conditions.

**Q11.** Name the state of matter that tends to maintain its shape when subjected to outside force.

**Answer:** Solid-state of matter maintains its shape when subjected to outside force.

For example, A rubber band (solid) changes shape under outside force and regains the same shape when the force is removed.

**Q12.** The blue colour spreads when a drop of blue ink is put in water, and the whole solution becomes blue. Name the phenomenon due to which this happens.

**Answer:** Diffusion is the process through which the ink is dissolved into the whole water. Ink has lesser density. Hence, it spreads throughout the water.

**Q13.** Why is dry air heavier than wet air?

**Answer:** The dry air is heavier than the wet air for the following reasons.

- (i) Dry air has nitrogen ( $N_2$ ) and oxygen ( $O_2$ ) molecules.
- (ii) Wet air has a water molecule ( $H_2O$ ).
- (iii) Nitrogen and oxygen molecules in dry air are heavier than the water molecule in wet air.

**Q14.** What is humidity? What is the effect of humidity on the evaporation rate?

**Answer:** Humidity is the amount of water vapour present in the air. If the amount of water in the air is already high, the evaporation rate decreases. It leads to a reduction in humidity too.

**Q15.** What is the plasma state of matter? Give examples in which matter is present in the plasma state.

**Answer:** The plasma state consists of super energetic and super excited particles. Some examples of the plasma state of matter are mentioned below.

- (i) The sun and the stars glow because of the presence of plasma in them
- (ii) The plasma is created in the stars at a very high temperature.
- (iii) The fluorescent tubes and the neon sign bulbs contain plasma.

**Q16.** Convert 273 K and 373 K into temperatures on the celsius scale. What is the physical state of water at these temperatures?

**Answer:** To convert the temperature on the Kelvin scale to the temperature on the Celsius scale, we will subtract 273.

$$\text{Temperature } (^{\circ}\text{C}) = \text{Temperature (K)} - 273$$

$$\text{Temperature } (^{\circ}\text{C}) = 273 - 273$$

$$\text{Temperature } (^{\circ}\text{C}) = 0^{\circ}\text{C}$$

At  $0^{\circ}\text{C}$ , water can exist in the form of solid and liquid.

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$$\text{Temperature } (^{\circ}\text{C}) = \text{Temperature (K)} - 273$$

$$\text{Temperature } (^{\circ}\text{C}) = 373 - 273$$

$$\text{Temperature } (^{\circ}\text{C}) = 100^{\circ}\text{C}$$

At  $100^{\circ}\text{C}$ , water can exist in the form of gas and liquid.

**Q17.** When ice at  $-10^{\circ}\text{C}$  is slowly heated, ice temperature gradually increases to  $0^{\circ}\text{C}$ . The system's temperature remains constant when the ice changes into water and then rises further. Explain the observation.

**Answer:** When the ice is at 0 Celsius, the system's temperature remains constant because the temperature (heat) is used up already to change the state of matter from solid to liquid. This phenomenon is known as the latent heat of fusion.

**Q18.** What do you mean by the term evaporation? What are the various factors that affect the evaporation rate?

**Answer:** Evaporation is a kind of vaporisation that generally occurs on a liquid surface and involves the transition of the liquid into a vapour state at any temperature below its boiling point. The evaporation of the liquid is affected by the following factors.

1. Temperature
2. Humidity
3. Surface area
4. Wind speed

**Q19.** How will you differentiate between evaporation and boiling?

**Answer:** We can differentiate between evaporation and boiling in the following ways.

S. No.	Evaporation	Boiling
1.	Evaporation is a natural process occurring when the liquid changes into a gaseous state.	Boiling is a synthetic process where the liquid is heated and vaporised due to heating.
2.	The bubbling effect is not visible in evaporation.	The bubbling effect is visual during boiling.
3.	Evaporation takes place only at the surface of the liquid.	Boiling takes place in the entire body of the liquid.
4.	It is a prolonged process.	It is a fast process.

**Q20.** Neha, by mistake, spilt a glass of water on the floor. Her mother suggested switching on the fan, and after a few minutes, she found that all water had disappeared. She asked her mother how this happened and where all water had disappeared. Based on this, answer the following questions:

- (i) What was the phenomenon associated with the disappearance of water?
- (ii) Why does her mother suggest Neha switch on the fan?
- (iii) What are the values associated with her mother?

**Answer:** (i) Evaporation is the phenomenon associated with the disappearance of water.

(ii) Her mother suggested Neha switch on the fan because water will evaporate faster in the presence of a high amount of air from the moving fan. As a result, water evaporates quickly, and the floor will dry quickly.

(iii) Her mother is aware and concerned.