CBSE Test Paper 03

Chapter 01 Matter in Our Surrounding

1. Identify the incorrect statement about evaporation **(1)**
   (A) It causes cooling
   (B) It increase with increase in humidity
   (C) It decreases with increase in temperature
   (D) It increases with increase in wind speed
   a. (B) and (C) are incorrect
   b. All of these
   c. (A) and (B) are correct
   d. (A), (B) and (C) are correct
2. At 0^{o}C or 273 K, the physical state of water is observed as : **(1)**
   a. solid
   b. vapour
   c. liquid
   d. both solid and liquid
3. Which of the two statements is/are true? **(1)**
   Statement A: A substance is said to be in the liquid state if under normal pressure, its melting point (M.P.) is below the room temperature.
   Statement B: The melting point of a solid and the freezing point of a liquid are different.
   a. Statement B
   b. Neither statement A nor statement B
   c. Both the statements - A and B
   d. Statement A
4. Which of the following is needed by surgeons during surgery? **(1)**
   a. Ethane
   b. Ether
   c. Acid
   d. Propanol
5. In an endothermic process heat is absorbed, in an exothermic process heat is evolved and in an athermic process no thermal change is observed. What is the nature of

evaporation of ether? **(1)**

a. First exothermic then endothermic
b. Athermic
c. Exothermic
d. Endothermic

6. Why do solid substances not diffuse? **(1)**

7. When 50 g of sugar is dissolved in 100 mL of water, there is no increase in volume. What characteristic of matter is illustrated by this observation? **(1)**

8. What is the physical state of water at-

   a. 25°C
   b. 0°C
   c. 100°C ?

9. Which of the following are matter? **(1)**
   Chair, air, love, smell, hate, almonds, thought, cold, cold drink, smell of perfume.

10. Sponge is a solid yet we are able to compress it. Why? (**1)**

11. Give an experiment to show that ammonium chloride undergoes sublimation. **(3)**

12. What is Bose-Einstein Condensate? **(3)**

13. Explain what happens to the molecular motion and energy of 1 kg of water at 273 K when it is changed into ice at same temperature. How is the latent heat of fusion related to the energy exchange that takes place during this change of state? **(3)**

14. Write in brief an activity to show the particulate nature of matter. What are the characteristics of the particles of matter? **(5)**

15. When a crystal of potassium permanganate is placed in a beaker containing water, its purple colour spreads throughout the water. What do you conclude from this observation about the nature of potassium permanganate and water? **(5)**

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Answers

1. a. (B) and (C) are incorrect
   Explanation: The rate of evaporation increases with increase in temperature, surface area & wind speed but decrease by the increase in humidity.

2. d. both solid and liquid
   Explanation: Zero on the Celsius scale (0℃) is now defined as the equivalent to 273K, with a temperature difference of 1 deg C equivalent to a difference of 1K, meaning the unit size in each scale is the same. This means that 100℃, previously defined as the boiling point of water, is now defined as the equivalent to 373K. At 0^{o}C or 273K the water is at its freezing point, hence both solid and liquid phases are present.

3. c. Both the statements - A and B
   Explanation: The temperature at which a solid melts to become a liquid at the atmospheric pressure is called its melting point. The process of melting, that is, change of solid state into liquid state is also known as fusion. A substance is said to be in a liquid state if under normal pressure its melting point is below the room temperature. Melting point of a solid and the freezing point of a liquid are same.

   Melting point and freezing point describe the same transition of matter from liquid to solid (freezing) or equivalently, from solid to liquid (melting). while ice is freezing or melting, its temperature is not changing. It is stuck on 0°C during the entire melting or freezing process. That is, when matter is transitioning from solid to liquid (melting) or liquid to solid (freezing), its temperature is fixed at the melting/freezing point, which is the same temperature.
   So, statement A and B are correct .

4. b. Ether
   Explanation: Ether is used by surgeons during surgery. Ether is highly volatile and antiseptic in nature. It is used to make a wound sterile. It was one of the

first anesthetics used in surgery.

5. d. Endothermic
   Explanation: Evaporation of ether occurs due to absorption of heat by surrounding. So, it is an endothermic process.The chemical reaction in which heat is absorbed in called as an endothermic reaction. The reaction in which heat is evolved is called exothermic reaction and the reaction in which no thermal changes occur is called athermic process.

6. Hard solids do not diffuse due to strong inter-molecular forces between its particles.

7. This observation indicates that particles of water have spaces between them into which sugar particles got fit.

8. a. At 25°C
   water is liquid,
   b. at 0°C
   water is solid(ice),
   c. at 100°C|
   water is gas(water vapour).

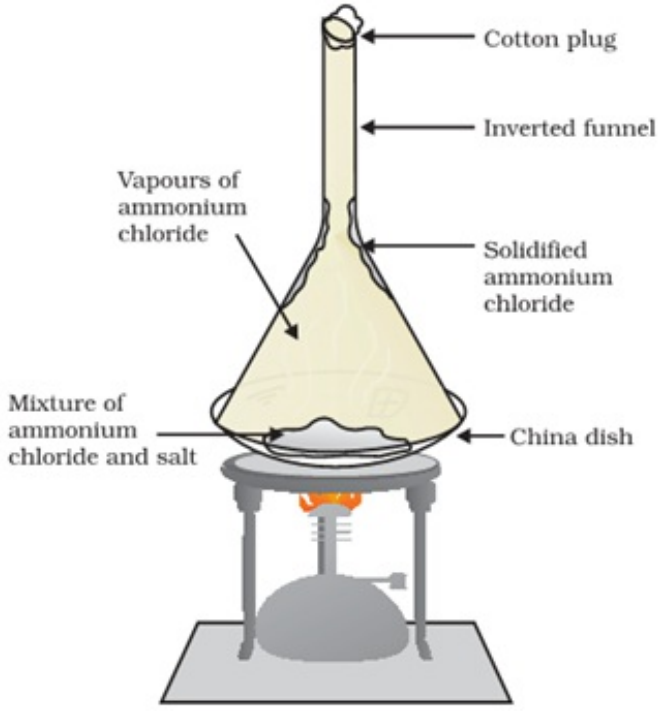
9. Chair, air, smell, almonds, cold drink and smell of perfume are matter.

10. There are minute holes in sponge in which air ir trapped which is expelled out when compresses. Thus, sponge is compressible.

11. Experiment to show that ammonium chloride (NH_4Cl) undergoes sublimation:-

    a. Take a china dish with crystals of ammonium chloride (NH_4Cl) and cover it with an inverted glass funnel with a cotton fitted at the top.
    b. Put the china dish on a burner and heat the crystals.
    c. As soon as the crystals are heated, we observe the vapours of ammonium chloride (NH_4Cl) rising in the funnel. These vapours get solidified along the walls at the upper end of the funnel which is a colder part.
    d. This shows that solid ammonium chloride does not undergo liquid state but directly changes to vapour state which then solidifies i.e. it undergoes sublimation

(solid changes directly to gases without undergoing liquid state).



12. It is a phenomenon which occurs at very low temperature. In 1995, Carle Wieman (a physicist from USA) chilled atoms of a gas of extremely low density, to the lowest temperature ever achieved, and created a new state of matter called the Bose-Einstein condensate. This effect is based on the works of the Indian physicist, Prof. Satyendra Nath Bose and Albert Einstein. They predicted the existence of the Bose Einstein condensate in 1925 and therefore, this effect is named after them. Scientists consider this as the fifth state of matter. At very low temperatures
(around 2×10^{-7} K) a Bose-Einstein condensate can be formed in which several thousand atoms become a single entity (a superatom). This effect has been observed with atoms of rubidium (Rb) and lithium (Li).

13. a. Molecular motion decreases as water gets converted into ice.
    b. Latent heat of solidification is given off.
    c. Latent heat of solidification is equal to latent heat of fusion.
14. Activity:
    i. Take a beaker and add 50 mL of water in it. Mark the level of water in the beaker.
    ii. Add 15-20 g of sugar with the help of a spatula.
    iii. Take a glass rod and stir the crystals of sugar completely.
    iv. The particles of sugar will disappear as they enter the spaces between particles of

water.

Characteristics:

i. Matter is composed of very small particles like atoms or molecules.
ii. The particles of matter have space between them.
iii. The particles of matter attract each other.
iv. The particles of matter are in constant motion.

15. When we place few crystals of potassium permanganate in a beaker containing water, we get two distinct layers—colourless water at the top and pink colour at the bottom. After few minutes, pink colour spreads and whole solution turns pink due to diffusion. Since potassium permanganate is a solid substance, it does not possess so much space. Water molecules due to a liquid state, collide with solid particles and intermix due to sufficient space between molecules.