NCERT Solutions Class 8 Science (Curiosity)

Chapter 7 Particulate Nature of Matter

Question Answer (InText)

Question 1. Is every speck of this fine chalk powder still composed of the same substance, or has it changed into something else on breaking or grinding? (Page 99)
Answer: Yes, even after breaking or grinding, each speck of chalk powder (fine-grinded) is the same as the previous state because this change is a physical change in which only the size of chalk changes, not any chemical change occurred.

Question 2. Are the units of chalk obtained in this manner considered the smallest units of chalk? (Page 100)
Answer: No, the obtained units of chalk in the process of grinding are not the smallest unit. Every unit of chalk is even consists of constituent particles, which are the basic units of chalk.

Question 3. Do gases also have a fixed volume? (Page 105)
Answer: No, gases don't have a fixed shape or volume. The volume of gas changes with the amount of closeness of particles or the interparticle attraction between particles.

Question 4. Sugar and sand are both solids. Why does sugar dissolve in water, but sand does not? (Page 108)
Answer: Sugar particles are solid, but they dissolve in water and occupy some space between the water molecules. Because water can break down sugar particles, which reduces the total volume of the mixture. Whereas sand particles have a rigid crystal structure, which cannot be broken down by water molecules, and hence settle down in water and increasing the total volume.

Question Answer (Exercise) (Pages 113-114)

Question 1. Choose the correct option.
The primary difference between solids and liquids is that the constituent particles are:
(i) closely packed in solids, while they are stationary in liquids.
(ii) far apart in solids and have fixed positions in liquids.
(iii) always moving in solids and have a fixed position in liquids.
(iv) closely packed in solids and move past each other in liquids.
Answer: (iv) Closely packed in solids and move past each other in liquids.

Question 2. Which of the following statements are true? Correct the false statements.
(i) Melting ice into water is an example of the transformation of a solid into a liquid.
(ii) The melting process involves a decrease in interparticle attractions during the

transformation.
(iii) Solids have a fixed shape and a fixed volume.
(iv) The interparticle interactions in solids are very strong, and the interparticle spaces are very small.
(v) When we heat camphor in one corner of a room, the fragrance reaches all corners of the room.
(vi) On heating, we are adding energy to the camphor, and the energy is released as a smell.

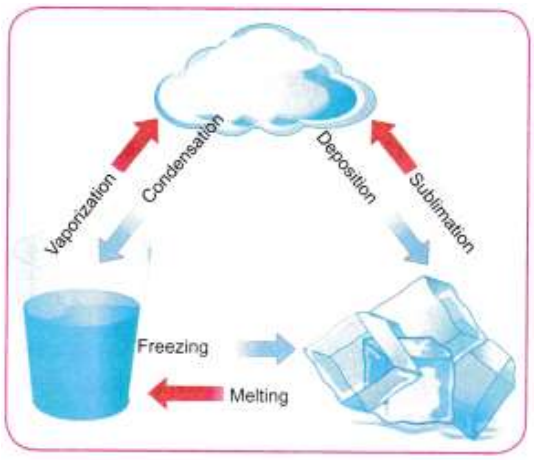
Answer: (i) True: Melting ice into water is an example of the transformation of a solid into a liquid.
(ii) True: The Melting process involves a decrease in interparticle attraction during the transformation.
(iii) True: Solids have a fixed shape and a fixed volume.
(iv) True: The interparticle interactions in solids are very strong, and the interparticle spaces are very small.
(v) True: When we heat camphor in one corner of a room, the fragrance reaches all corners of the room.
(vi) False: The correct statement is: On heating, energy is added to camphor, causing it to undergo sublimation. The camphor directly converts into gas, and the vapour carries its characteristic smell.

Question 3. Choose the correct answer with justification. If we could remove all the constituent particles from a chair, what would happen?
(i) Nothing will change.
(ii) The chair will weigh less due to lost particles.
(iii) Nothing of the chair will remain.
Answer: Correct option is (iii) Nothing of the chair will remain.
Justification: A chair is made up of constituent particles (atoms and molecules). If you remove all the particles from the chair, there is nothing left to form the structure, shape, weight, or existence of the chair.

Question 4. Why do gases mix easily, while solids do not?
Answer: Gas particles are far apart from each other, and that's why they move very fast in all directions. Gases have weak intermolecular forces, so they don't attach. Due to this reason, gas particles spread easily around other particles.

Question 5. When spilled on the table, milk in a glass tumbler flows and spreads out, but the glass tumbler stays in the same shape. Justify this statement.
Answer: In this case, milk is spilled on the table, and it spreads around the table because its state is liquid. Liquids can take the shape of their surrounding because their molecules are free to move. This is the reason the milk flows around the table. Whereas the glass tumbler's shape does not change because it is a solid. In solids, the molecules are closely packed.

Question 6. Represent diagrammatically the changes in the arrangement of particles as ice melts and transforms into water vapour.
Answer: As ice melts into water and then vaporizes into steam, the arrangement of water particles changes significantly. Initially, in ice (a solid), water molecules are tightly packed in a fixed, crystalline structure with limited movement (vibrations). As ice melts, the particles gain kinetic energy, breaking free from their fixed positions and becoming able to slide past each other, forming liquid water. Further heating increases the kinetic energy, causing the particles to move more rapidly and spread out, eventually breaking free from the liquid and becoming water vapour, a gas with particles moving randomly and freely.



Ice (Solid)

- Arrangement: Water molecules are tightly packed in a regular, crystalline structure.
- Movement: Molecules vibrate in fixed positions.

Liquid Water

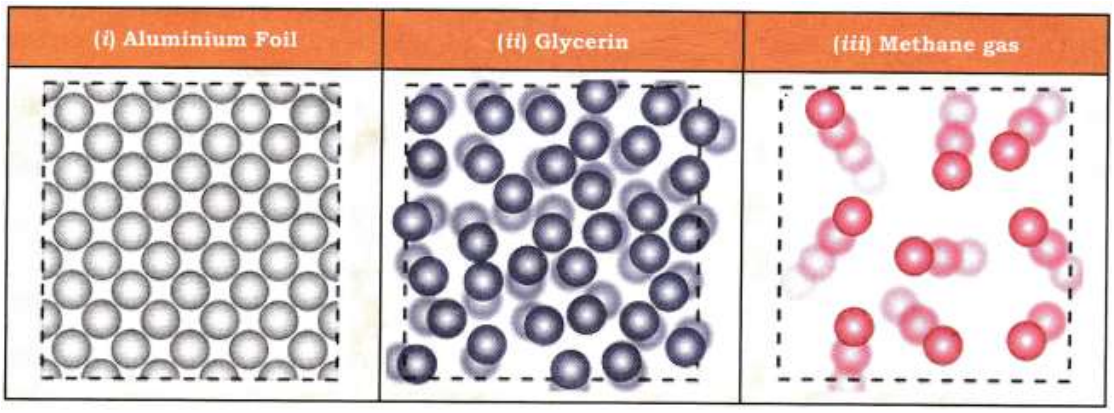
- Arrangement: Molecules are closer together than in a gas, but not in a regular structure. They can move around and slide past each other.
- Movement: Molecules can move around and slide past each other.

Water Vapor (Gas)

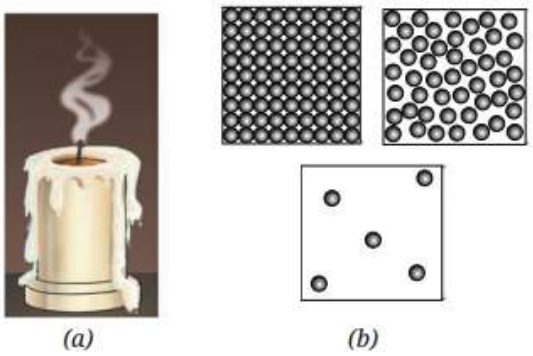
- Arrangement: Molecules are far apart and move randomly and freely in all directions.
- Movement: Molecules move rapidly and randomly, colliding with each other and the container walls.

Question 7. Draw a picture representing particles present in the following:
(i) Aluminium foil
(ii) Glycerin
(iii) Methane gas
Answer: Pictorial representation of particles of Aluminium foil, Glycerin, and Methane

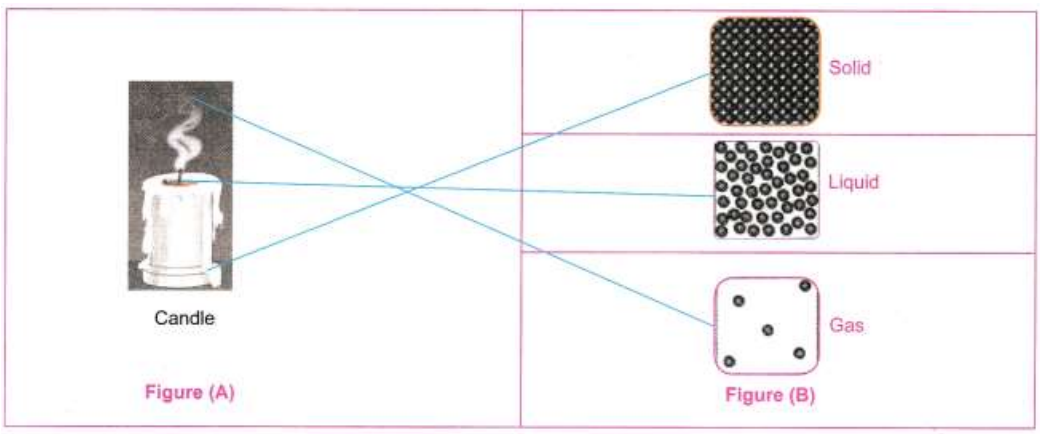
gas.



Question 8. Observe figure (A), which shows the image of a candle that was just extinguished after burning for some time. Identify the different states of wax in the figure and match them with figure B, showing the arrangement of particles.



Answer: Different states of wax



Question 9. Why does the water in the ocean taste salty, even though the salt is not visible? Explain.

Answer: Ocean water tastes salty because it contains a high concentration of dissolved salts, primarily sodium chloride (common table salt). These salts are not visible because they are dissolved at a molecular level, meaning the individual salt molecules are dispersed throughout the water, making it appear clear.

Question 10. Grains of rice and rice flour take the shape of the container when placed in different jars. Are they solids or liquids? Explain.

Answer: Grains of rice and rice flour are considered solids, despite appearing to take the

shape of their container. This is because each grain retains its shape and volume, even when mixed. The “flowing” behavior is due to the ability of these small, irregularly shaped particles to move past each other with minimal friction.

Question Answer (Activities)
Activity 7.9: Let us find out (Page 110)

1. Light an incense stick in one corner of the room.

Burning of an incense stick

2. Wait for a few minutes and observe.
3. Do you notice the fragrance from a distance?

Answer: Observations:

- We can smell the fragrance of an incense stick from one corner.
- Slowly, the fragrance of this incense stick can be smelled all around the room.

Conclusions:

- The smell of an incense stick can be observed throughout the room because the particles of air are moving randomly.
- As the interparticle forces are weak, they can move freely around the room.