

PROJECT 30 - 8TH NEW

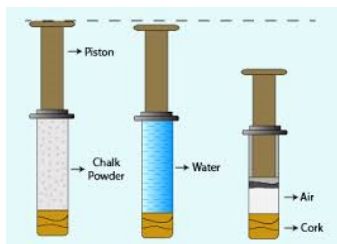
CHEMISTRY

DPP: 1

PARTICULATE NATURE OF MATTER

- Q1** The water in the ocean tastes salty, even though the salt is not visible. Which of the following best explains this phenomenon?
- (A) Ocean water looks blue, so the salt is hidden.
(B) Salt in ocean water dissolves completely to form a uniform mixture.
(C) Salt settles down at the bottom of the ocean and cannot be seen.
(D) The salt particles are too large to be seen with naked eyes.
- Q2** A glass tumbler containing water is taken and a few grains of potassium permanganate are added to it. After some time, the water turns purple throughout the tumbler. Which of the following is the best explanation for this observation?
- (A) Potassium permanganate particles are heavier and sink to the bottom, coloring the water.
(B) The purple color spreads only because of stirring with a spoon.
(C) The particles of potassium permanganate diffuse and spread into the spaces between water molecules, making the solution uniformly purple.
(D) The purple color appears due to a chemical reaction between water and potassium permanganate particles.
- Q3** Which of the following is a correct example of sublimation?
- (A) Water boiling
(B) Naphthalene changing to gas
(C) Melting of wax
(D) Steam condensing
- Q4** Which of the following is NOT a characteristic of matter?
- (A) Matter occupies space
(B) Matter has mass
(C) Matter can be divided infinitely without limit
(D) Matter is made up of particles
- Q5** The Transformation of a substance from the solid state to the liquid state on heating, at a fixed temperature, is called:
- (A) Evaporation – a process in which a liquid changes into vapour at temperatures below its boiling point.
(B) Condensation – a process in which vapours change back into the liquid state on cooling.
(C) Melting (or Fusion) – a process in which a solid absorbs heat and changes into liquid at a fixed temperature known as the melting point.
(D) Sublimation – a process in which a solid changes directly into vapour without becoming a liquid in between.
- Q6** **Assertion:** Solids have a fixed shape.
Reason: Inter-particle forces in solids are strong.
- (A) Assertion and Reason both true, Reason explains Assertion.
(B) Assertion and Reason both true, Reason does not explain Assertion.
(C) Assertion true, Reason false.
(D) Assertion false, Reason true.
- Q7** Three syringes are shown below, each filled with a different substance and their pistons are pressed with equal force:
- Syringe A** – filled with **chalk powder**
Syringe B – filled with **water**
Syringe C – filled with **air**





The pistons move differently in each. Based on this, which of the following is the correct conclusion?

- (A) All substances are equally compressible
- (B) Chalk powder is the most compressible of the three
- (C) Air is the most compressible, water compresses slightly, and chalk powder does not compress
- (D) Water is more compressible than air and chalk powder

Q8 Identify the incorrectly matched pair among the following terms and their other/common names:

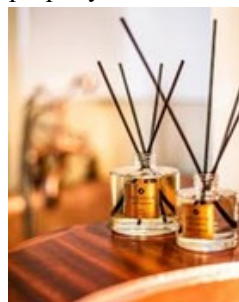
- (A) Vaporization – Boiling or Evaporation
- (B) Solidification – Freezing
- (C) Liquefaction – Condensation
- (D) Sublimation – Melting

Q9 Although sponge is a solid, it can be easily bent or compressed. This is because:

- (A) Sponge is made of liquid particles
- (B) Sponge has high kinetic energy like gases
- (C) Sponge contains small holes filled with air
- (D) Sponge does not have a definite shape

Q10 Check out the given images showing perfume/fragrance spreading in a room. What

property is demonstrated?



- (A) Fluidity
- (B) Transparency
- (C) Diffusion
- (D) Sublimation

Q11 What are the main postulates of the particulate nature of matter?

Q12 Difference between Homogeneous and Heterogeneous Mixtures, with examples.

Q13 Why gases can be compressed easily but not solids?

Q14 Explain how diffusion proves that matter is made up of particles.

Q15 Water, a compound, has different properties compared to those of the elements oxygen and hydrogen from which it is formed. Justify this statement



Answer Key

Q1 (B)

Q2 (C)

Q3 (B)

Q4 (C)

Q5 (C)

Q6 (A)

Q7 (C)

Q8 (D)

Q9 (C)

Q10 (C)

- Q11
- Matter is made up of tiny particles.
 - These particles have spaces between them.
 - They are constantly moving.
 - They attract each other with varying forces depending on the state of matter.

Q12

Basis of Difference	Homogeneous Mixture	Heterogeneous Mixture
Composition	Composition is uniform throughout the mixture.	Composition is not uniform throughout the mixture.
Visibility of Components	Components cannot be seen separately with the naked eye.	Components can be seen separately with the naked eye.
Examples	Salt solution, air	Oil and water, sand and iron filings

- Q13
- Arrangement of particles
In gases, particles are far apart with large empty spaces between them. In solids, particles are very closely packed with negligible empty space.
 - Effect of applying pressure
When pressure is applied to a gas, the particles can be pushed closer together because of the

large spaces between them. In solids, particles have no significant space to move closer, so compression is not possible.

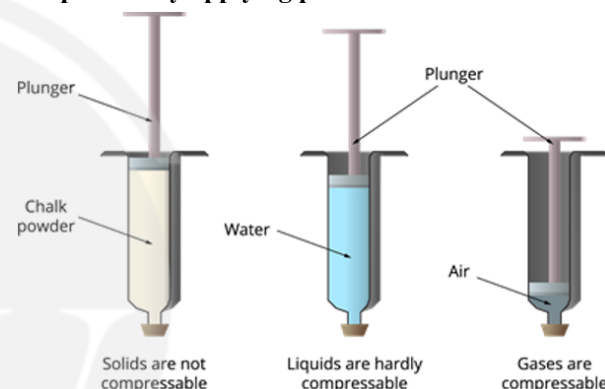
- Strength of intermolecular forces

Gases have very weak intermolecular forces, allowing particles to come closer easily. Solids have strong intermolecular forces that hold particles rigidly in fixed positions.

Examples:

Gas: Air in a syringe can be compressed by pushing the plunger.

Solid: A brick or an iron block cannot be compressed by applying pressure.



Q14 Particles of matter are in constant motion

↓
Particles move from a region of higher concentration to lower concentration

↓
Intermixing of particles occurs without stirring (diffusion)

↓
This shows that matter is made up of tiny, moving particles

If matter were not made up of particles, such spontaneous intermixing would not be possible. The gradual and uniform spreading of one substance into another clearly indicates that particles of matter exist, are extremely small in size, and are constantly moving. Hence, diffusion proves the particulate nature of matter.

Example:

When a few drops of ink are added to a glass of



water, the ink spreads throughout the water on its own. This happens because the particles of ink move continuously and mix with the particles of water. Hence, diffusion proves that matter is made up of particles.



Q15 Hydrogen (H_2) and Oxygen (O_2) are elements



They combine chemically in a fixed ratio (2 : 1)



Atoms rearrange and form new chemical bonds



A new substance, Water (H_2O), is formed



Properties of water are entirely different from hydrogen and oxygen

Explanation with example:

Hydrogen is a highly flammable gas and oxygen supports burning, whereas water is a liquid that puts out fire. This change in properties proves that a compound has properties different from those of its constituent elements.



Hints & Solutions

Note: scan the QR code to watch video solution

Q1 Text Solution:

Salt in ocean water dissolves completely to form a uniform mixture.

Video Solution:**Q2 Text Solution:**

The particles of potassium permanganate diffuse and spread into the spaces between water molecules, making the solution uniformly purple.

Video Solution:**Q3 Text Solution:**

Naphthalene changing to gas

Video Solution:**Q4 Text Solution:**

Matter cannot be divided infinitely; at the atomic level, it is made up of particles. Atoms are the smallest units of matter.

Video Solution:**Q5 Text Solution:**

Melting (or Fusion) – a process in which a solid absorbs heat and changes into liquid at a fixed temperature known as the melting point.

Video Solution:**Q6 Text Solution:**

Assertion and Reason both true, Reason explains Assertion.

Video Solution:**Q7 Text Solution:**

(C) Air is the most compressible, water compresses slightly, and chalk powder does not compress

Video Solution:**Q8 Text Solution:**

Sublimation – Melting

Video Solution:



Q9 Text Solution:

(C) Sponge contains small holes filled with air

Video Solution:



Q10 Text Solution:

Diffusion

Video Solution:



Q11 Video Solution:



Q12 Video Solution:



Q13 Video Solution:



Q14 Video Solution:



Q15 Video Solution:



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