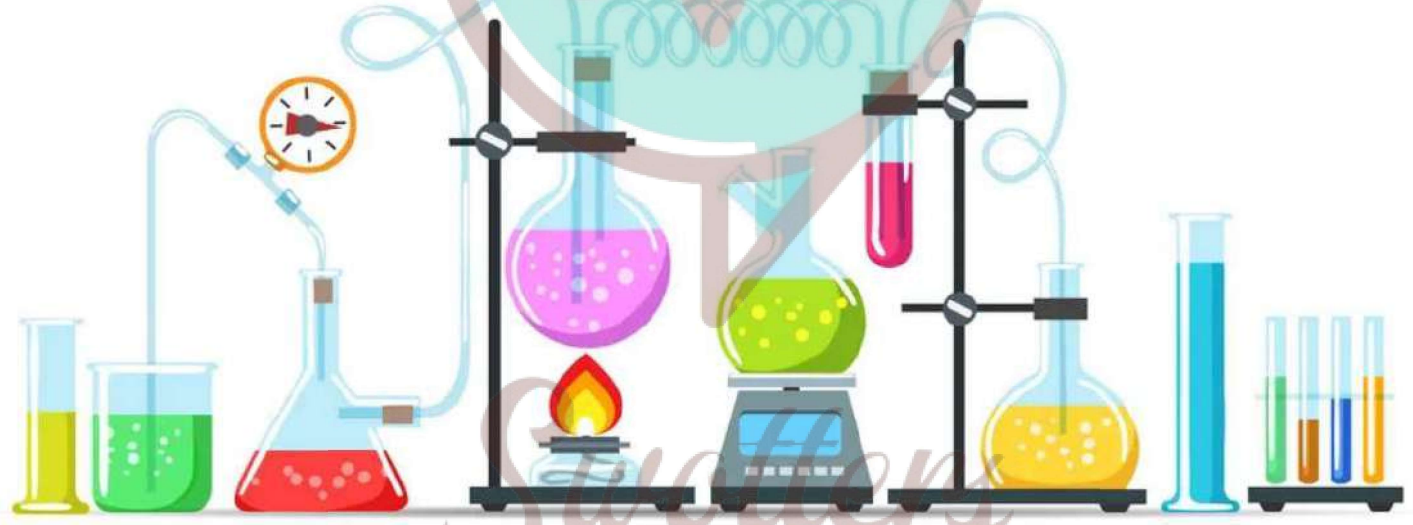
CHEMISTRY

Chapter 2: Is Matter Around Us Pure



Important Questions

➢ Multiple Choice Questions:

1. What is the name of the metal which exists in liquid state at room temperature?

(a) Sodium

(b) Potassium

(c) Mercury

(d) Bromine

2. When the liquid is spun rapidly, the denser particles are forced to the bottom and the lighter particles stay at the top. This principle is used in:

(a) Centrifugation

(b) Fractional distillation

(c) Evaporation

(d) Tunneling

3. What is the name of the metal which exists in liquid state at room temperature?

(a) Mercury

(b) Bromine

(c) Sodium

(d) Potassium

4. Which of the following elements is not a metalloid?

(a) Boron

(b) Silicon

(c) Germanium

(d) Tungsten

5. If we put camphor in an open container, its amount keeps on decreasing due to the phenomenon of

(a) Evaporation

(b) Precipitation

(c) Condensation

(d) Sublimation

6. Heterogeneous mixture in which the solute particles do not dissolve and remain suspended throughout the solvent and the solute particles can be seen with the naked eye is known as:

(a) Colloidal solution

(b) Super saturated solution

(c) Sublimation

(d) Suspensions

7. In tincture of iodine, find the solute and solvent?

(a) alcohol is the solute and iodine is the solvent

(b) iodine is the solute and alcohol is the solvent

(c) any component can be considered as solute or solvent

(d) tincture of iodine is not a solution

8. The continuous zig-zag movement of colloidal particles in a dispersion medium is called

(a) Dispersion

(b) Tyndall effect

(c) Brownian movement

(d) Oscillation

9. A pure substance which is made up of only one kind of atom and cannot be broken into two or more simpler substances by physical or chemical means is referred to as

(a) a compound

(b) an element

(c) a molecule

(d) a mixture

10. Which of the following non-metal is a good conductor of electricity?

(a) Aluminium

(b) Silicon

(c) Graphite

(d) Gold

11. Which of the following property does not describe a compound?

(a) It is composed of two or more elements

(b) It is a pure substance.

(c) It cannot be separated into constituents by physical means

(d) It is mixed in any proportion by mass

12. When two liquids do not mix, they form two separate layers and are known as

(a) Miscible liquids

(b) Immiscible liquids

(c) Saturated liquids

(d) Super saturated liquids

13. How one can separate ammonium chloride from a mixture containing ammonium chloride and sodium chloride?

(a) Precipitation

(b) Sublimation

(c) Chromatography

(d) Cetrifugation

14. The amount of solute present per unit volume or per unit mass of the solution/solvent is known as

(a) Composition of solute

(b) Concentration of a solvent

(c) Concentration of a solute

(d) Concentration of a solution

15. According to the definition of pure substance, which of the following is a pure substance?

(a) Ice

(b) Mercury

(c) Iron

(d) All of these

➢ Very Short Question:

1. Define solvent.
2. Define solute.
3. What is 'tincture of iodine'?
4. What are alloys?
5. Give one example of gas in liquid solution.
6. How can a solution be dilute or concentrated?
7. What is "concentration of a solution"?
8. State the difference between aqueous and, non-aqueous solution.
9. What is "solubility" of a solute?
10. What is saturated solution?

➢ Short Questions:

1. Why is mixture called impure substance?
2. Give the differences between mixture and compound.
3. Distinguish between a physical change and chemical change.
4. State the properties of a solution.
5. State the properties of a suspension.
6. What is a colloidal solution?
7. State the properties of colloidal solution.
8. Give the applications of centrifugation.

➢ Long Questions:

1. Give the difference between true solution, colloidal solution and suspension.
2. State the different types of colloids with examples.
3. (a) Define solution.

(b) Give different types of solutions with one example each.

➢ Assertion Reason Questions:

1. For two statements are given- one labelled Assertion (A) and the other labelled Reason (R). Select the correct answer to these questions from the codes (a), (b), (c) and (d) as given below:
   a. Both Assertion and Reason are correct, and reason is the correct explanation for assertion.
   b. Both Assertion and Reason are correct, and Reason is not the correct explanation for Assertion.
   c. Assertion is true but Reason is false.
   d. Both Assertion and Reason are false.

   Assertion: Oxygen atom is pure substance.

   Reason: Oxygen is never found in any combine state.
2. For two statements are given- one labelled Assertion (A) and the other labelled Reason (R). Select the correct answer to these questions from the codes (a), (b), (c) and (d) as given below:
   a. Both Assertion and Reason are correct, and reason is the correct explanation for assertion.
   b. Both Assertion and Reason are correct, and Reason is not the correct explanation for Assertion.
   c. Assertion is true but Reason is false.

d. Both Assertion and Reason are false.

Assertion: Oxygen atom is pure substance.

Reason: Oxygen is always found in combine state.

➢ Case Study Question:

1. Read the following and answer any four questions from (i) to (v)

A Chemistry teacher explained the different types of separation of mixtures with the help of given adjoined chart. Now, in a practical test, students were provided with give samples and they were asked to separate the samples applying suitable separation methods. Now the students have to select the correct methods of separation.

(i) Fine mud particles suspended in water.

(a) Winnowing

(b) Sedimentation and Decantation.

(c) Using magnet

(d) Chlorination

(ii) Oil from water.

(a) Sedimentation and Decantation

(b) Filtration

(c) Separating funnel

(d) Winnowing

(iii) Sodium chloride from its solution in water.

(a) Filtration

(b) Separating funnel

(c) Sedimentation and Decantation

(d) Evaporation

(iv) Camphor from salt.

(a) Filtration

(b) Separating funnel

(c) Sublimation

(d) Sedimentation

(v) Cream from milk

(a) Separating funnel

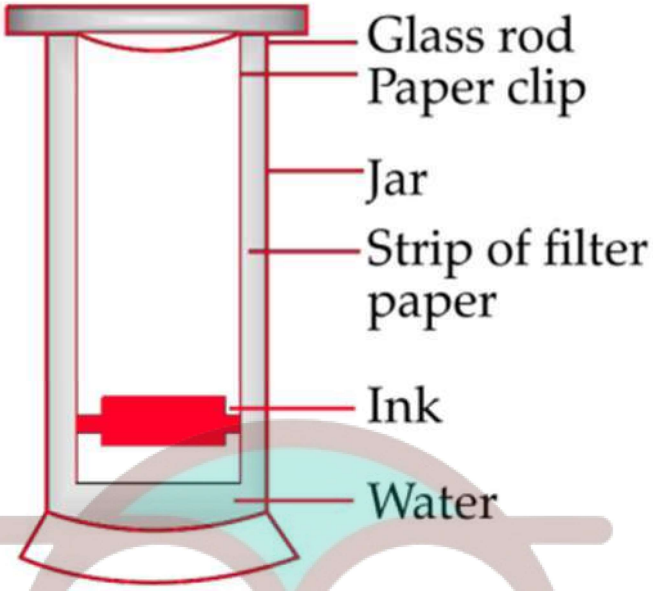
(b) Sedimentation

(c) Filtration

(d) Centrifugation

2. Read the following and answer any four questions from (i) to (v)

A child wanted to separate the mixture of dyes constituting a sample of ink. He marked a line by the ink on the filter paper and placed the filter paper in a glass containing water as shown in figure. The filter paper was removed when the water moved near the top of the filter paper.



(i) Identify the technique used by the child.

(a) Sedimentation

(b) Filtration

(c) Chromatography

(d) Distillation

(ii) What would you expect to see, if the ink contains three different coloured components?

(a) We will not see any band on the filter paper.

(b) We would see three bands on the filter paper at various lengths.

(c) We would see infinite bands on the filter paper.

(d) We would see single band on the filter paper.

(iii) Give one application where you can use this technique.

(a) To separate salt from sand

(b) To separate wheat from husk

(c) To separate oil from water

(d) To separate drugs from blood.

(iv) For the separation of what kind of substances is the above process used?

(a) For the separation of insoluble substances

(b) For the separation of single solute that dissolves in single solvent.

(c) For the separation of those solutes that dissolve in the same solvent.

(d) For the separation of those solutes that dissolve in the different solvents.

(v) What is chromatography?

(a) It is an agricultural method to separate grains

(b) A method to separate magnetic impurities from non-magnetic impurities

(c) The process of separating the suspended particles of an insoluble substance

(d) Method of separating and identifying various components in a mixture, which are present in small trace quantities.

✓ Answer Key-

➢ Multiple Choice Answers:

1. (c) Mercury
2. (a) Centrifugation
3. (b) Bromine
4. (d) Tungsten
5. (d) Sublimation
6. (d) Suspensions
7. (b) iodine is the solute and alcohol is the solvent
8. (c) Brownian movement
9. (b) an element
10. (c) Graphite
11. (d) It is mixed in any proportion by mass
12. (b) Immiscible liquids
13. (b) Sublimation
14. (d) Concentration of a solution
15. (d) All of these

➢ Very Short Answers:

1. Answer: The component of the solution that dissolves the other component in it is called the solvent.
2. Answer: The component of the solution that is dissolved in the solvent is called solute.
3. Answer: A solution of iodine in alcohol is known as tincture of iodine. It has iodine (solid) as the solute and alcohol (liquid) as the solvent.
4. Answer: The homogeneous mixture of two or more metals or a metal and non-metal is called an alloy. E.g., steel is an alloy of iron and carbon.
5. Answer: Cold-drinks, carbon dioxide gas as solute is mixed with water as a solvent.
6. Answer: The amount of solute dissolving in a solvent decides whether the solution is dilute

or concentrated.

7. Answer: The concentration of a solution is the amount of solute present in a given amount of solution or the amount of solute dissolved in a given mass or volume of solvent.
8. Answer: Aqueous solutions have water as solvent and non-aqueous solutions do not haVe water as solvent.
9. Answer: The amount of the solute present in the saturated solution at the given temperature is called its solubility.
10. Answer: The maximum amount of solute dissolved in a solvent at given temperature is called saturated solution, where no more solute can dissolve further.

➢ Short Answer:

1. Answer: Mixture consists of different components which retain their properties and can be easily separated by physical processes, hence it is called as impure substance.
2. Answer:

Mixture	Compound
1. Impure matter	1. Pure matter.
2. Constituents combine in any ratio to form mixture.	2. Constituents combine in fixed ratio to form a compound.
3. Constituents retain their properties.	3. Constituents do not retain their properties as a new substance is formed.
4. Constituents can be separated by physical processes.	4. Constituents cannot be separated by physical processes.

3. Answer:

Physical Change	Chemical Change
1. No new substance is formed.	1. New substance is formed.
2. It is a reversible change.	2. It is irreversible change.
3. The properties of constituents are retained.	3. The properties of constituents are not retained.
4. No new substance is formed.	4. Completely new substance is formed.

4. Answer: Properties of a solution are:
   - A solution is a homogeneous mixture.
   - Particles of a solution are smaller than 1 nm and cannot be seen by naked eyes.
   - Do not scatter beam of light.
   - Solute particles cannot be separated from the mixture by the process of filtration and thus, solution is stable.
5. Answer: Properties of a suspension
   - Suspension is a heterogeneous mixture having particle size greater than 100 nm.

- The particles of a suspension can be seen by naked eyes.
- Particles can scatter a beam of light.
- It is unstable.

6. Answer: It is a heterogeneous solution which appears to be homogeneous, particles size is very small and so cannot be seen with naked eyes but it is stable. E.g., milk and blood.
7. Answer: Properties of colloidal solution.
   - It is a heterogeneous mixture having particle size between 1 nm to 100 nm.
   - Size of particles is very small, cannot be seen with naked eyes.
   - It scatters a beam of light.
   - They are stable as the particles do not settle when left undisturbed.
8. Answer: Application of centrifugation are:
   - Used in diagnostic laboratories for blood and urine test.
   - Used in dairies and home to separate butter from cream.
   - Used in a washing machines to squeeze out water from wet clothes.

➢ Long Answer:

1. Answer: The difference between true solution, colloidal solution and suspension

Property	True Solution	Colloidal Solution	Suspension
1. Particle size	less than 1nm.	between 1nm and 100 nm.	more than 100 nm.
2. State	Stable	Stable	Unstable
3. Tyndall effect (Scattering of light)	No	Yes	Yes
4. Separation by filtration	Not possible	Not possible	Is possible
5. Nature	Transparent	Translucent	Translucent/opaque

2. Answer: Different colloids are formed due to different dispersed phase and dispersing

Dispersed Phase	Dispersing Medium	Type	Examples
Liquid	Gas	Aerosol	Fog, clouds, mist
Solid	Gas	Aerosol	Smoke, automobile exhaust
Gas	Liquid	Foam	Shaving cream
Liquid	Liquid	Emulsion	Milk, face cream
Solid	Liquid	Sol	Milk of magnesia, mud
Gas	Solid	Foam	Sponge, pumice
Liquid	Solid	Gel	Jelly, cheese, butter
Solid	Solid	Solid sol	Coloured gemstone, milky glass

3. Answer:

(a) Solution: It is a homogeneous mixture of two or more substances. It consists of solute and solvent.

(b) Different types of solution:

(i) Based on solvent—Aqueous and non-aqueous Aqueous solution has water as solvent (sugar + water) Non-aqueous solution has some other solvent but not water. Example, (sulphur + carbon disulphide)

(ii) Depending on the amount of solute dissolved in solvent—Dilute solution and concentrated solution

Dilute solution: Less amount of solute particles are present in a solvent.

Concentrated solution: Amount of solute present in its maximum capacity in a solvent.

(iii) Amount of solute present in its maximum capacity at a given temperature—Saturated and unsaturated solution.

Saturated solution: It is a solution in which no more solute can further dissolve in a given solvent at a given temperature.

Unsaturated solution: It is a solution in which some more solute can dissolve in a solvent at a given temperature.

(iv) Depending on the size of solute particles

True solution	Suspension	Colloid
Size is very small and particles cannot be seen through naked eyes	Size is very big and can be seen through naked eyes	Size is intermediate between true solution and suspension

➢ Assertion Reason Answer:

1. (c) Assertion is true but Reason is false.
2. (b) Both Assertion and Reason are correct, and Reason is not the correct explanation for Assertion.

➢ Case Study Answer:

1. **Answer:**

   (i) (b) Sedimentation and Decantation.

   (ii) (c) Separating funnel

   (iii) (d) Evaporation

   (iv) (c) Sublimation

   (v) (d) Centrifugation

2. **Answer:**

(i) (c) Chromatography

(ii) (b) We would see three bands on the filter paper at various lengths.

(iii) (d) To separate drugs from blood.

(iv) (c) For the separation of those solutes that dissolve in the same solvent.

(v) (d) Method of separating and identifying various components in a mixture, which are present in small trace quantities.