



III. Short Answer Type Questions

Question 1. Why is mixture called impure substance?

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.

Question 2. Give the differences between mixture and compound.

Answer:

| Mixture | Compound |
|---|--|
| <ol style="list-style-type: none">1. Impure matter2. Constituents combine in any ratio to form mixture.3. Constituents retain their properties.4. Constituents can be separated by physical processes. | <ol style="list-style-type: none">1. Pure matter.2. Constituents combine in fixed ratio to form a compound.3. Constituents do not retain their properties as a new substance is formed.4. Constituents cannot be separated by physical processes. |

Question 3. Distinguish between a physical change and chemical change.

Answer:

| Physical Change | Chemical Change |
|---|--|
| <ol style="list-style-type: none">1. No new substance is formed.2. It is a reversible change.3. The properties of constituents are retained.4. No new substance is formed. | <ol style="list-style-type: none">1. New substance is formed.2. It is irreversible change.3. The properties of constituents are not retained.4. Completely new substance is formed. |

Question 4. State the properties of a solution.

Answer: Properties of a solution are:

1. A solution is a homogeneous mixture.
2. Particles of a solution are smaller than 1 nm and cannot be seen by naked eyes.
3. Do not scatter beam of light.
4. Solute particles cannot be separated from the mixture by the process of filtration and thus, solution is stable.

Question 5. State the properties of a suspension.

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.

Question 6. What is a colloidal solution?

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.

Question 7. State the properties of colloidal solution.

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.

Question 8. Give the applications of centrifugation.

Answer: Application of centrifugation are:

1. Used in diagnostic laboratories for blood and urine test.
2. Used in dairies and home to separate butter from cream.
3. Used in a washing machines to squeeze out water from wet clothes.

Question 9. Give the applications of chromatography.

Answer: Applications of chromatography are

1. To separate colours in a dye.
2. To separate pigments from natural colours.
3. To separate drugs from blood.

Question 10. Why is crystallisation better than evaporation?

Answer: Crystallisation is a process that separates a pure solid in the form of its crystals from a solution. Crystallisation is better than evaporation because during Evaporation

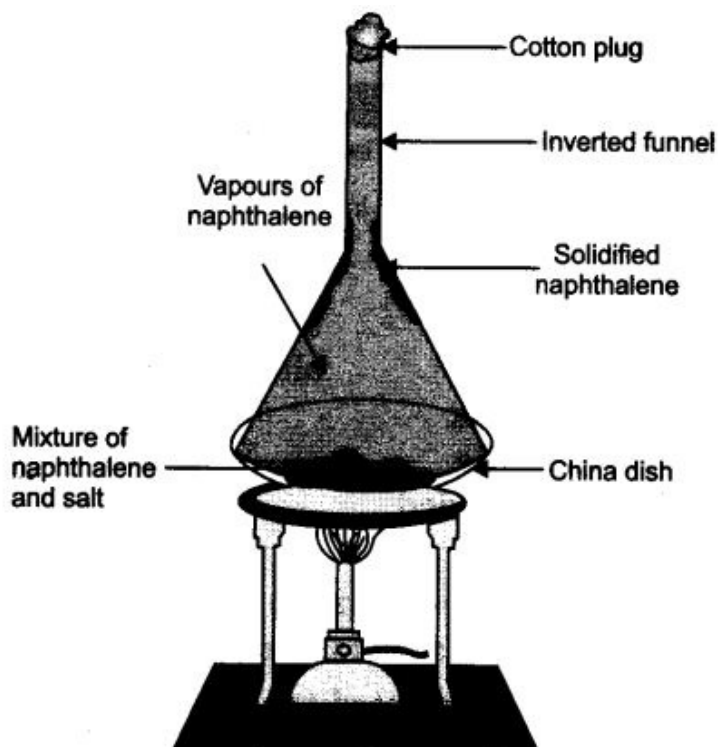
- Some solids decompose or some, like sugar may get charred on heating to dryness.
- Some impurities may remain dissolved in the solution even after filtration which on evaporation contaminates the solid.

Question 11. How will you separate a mixture of oil and water?

Answer: To separate a mixture of oil and water, we need a separating funnel as both are immiscible liquids. Pour the mixture in separating funnel and let the funnel stand undisturbed for sometime. So that separate layer of oil and water are formed. Open the stopcock of the separating funnel and pour out the lower layer of water carefully.

Question 12. A student is given a mixture of naphthalene ball's powder and common salt. He need to separate this mixture. How will he do this?

Answer: The properties of both naphthalene and common salt should be known, before we choose the separation technique. Naphthalene is a sublimate which on heating changes to gaseous state directly. Hence to separate a volatile compound (sublimate) from a non-volatile compound (non-sublimate), the sublimation process is used.



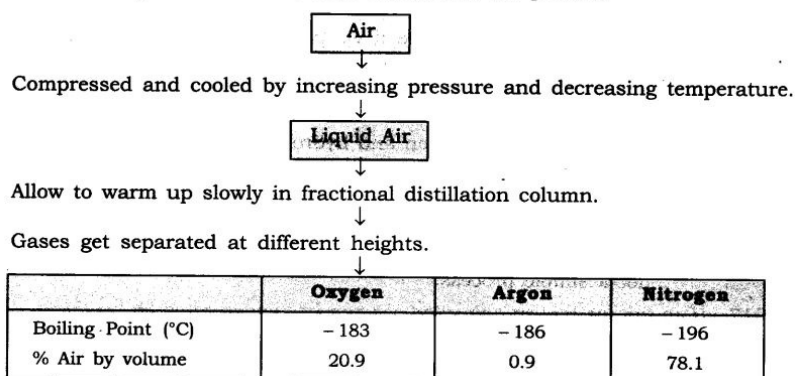
Sublimation of naphthalene

In a China dish the mixture is kept, and is placed on a stand. An inverted funnel is kept over the mixture in China dish with plugged stem. The sublimate on heating gets collected on the funnel and common salt remains in the China dish.

Question 13. How can we obtain different gases from air?

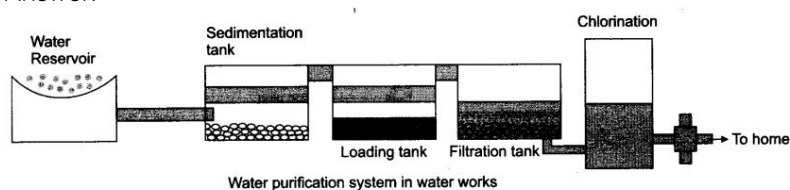
Answer: Air is a homogeneous mixture and its components can be separated by fractional distillation.

The flow diagram shows the steps involved in the process.



Question 14. Draw a flow diagram to show the water purification system in water works.

Answer:



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graph LR
    A[Water is collected in the reservoir] --> B[The water is sent to sedimentation tank to allow solids to settle]
    B --> C[It is then passed to 2nd tank i.e., loading tank, so that the suspended impurities are loaded to settle down as sediment.]
    C --> D[Then water reaches the filtration tank]
    D --> E[Chlorination]
    E --> F[To home]
  
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In filtration tank water passes through different layers of sand and gravel as shown in the above figure this is for adsorption of impurities.

The clear water reaches a chlorinated tank where water is mixed with bleaching powder/chlorine to kill bacteria and then supplied to houses.

Question 15. Why is air considered as a mixture and not compound?

Answer: Air is considered as a mixture because it exhibits following properties:

1. Each component present in air retains its properties.
2. Each component can be separated by simple physical processes.
3. The components do not have any fixed proportion. All gases are present in different amount. Example, in greener area—more oxygen and water vapour is present; near industrial area—air consists of lot of impurities and smoke suspended in it.

Question 16. How can you prove that water is a compound?

Answer: Water is a compound because if we pass electricity through it then at two different electrodes, we get two different gases i.e., oxygen and hydrogen during electrolysis of water. The ratio of oxygen: hydrogen is 1 : 2 by number of molecules.

- The properties of oxygen and hydrogen gases are entirely different from that of liquid water.
- The ratio of oxygen: hydrogen combination is always constant i.e., 1: 2 by volume.
- To separate the components of water, we need electrolytic cell, and it is not a simple process.

Question 17. How can we convert saturated solution into unsaturated by heating?

Answer: Saturated solution is said to be saturated at a given temperature when there is no more scope of solute particles to dissolve /dissociate into water. It is because the solute particle has taken all the inter molecular space present in the solvent. On heating, the molecules of solvent gain kinetic energy, start vibrating and try to move away from each other thereby accommodating some more solute particle in this space and hence it becomes an unsaturated solution.

Question 18. What is the difference in fog and smoke?

Answer: Fog is a colloidal solution with liquid dispersed in gas. Smoke is a colloidal solution with solid dispersed in gas.

Question 19. If 20g of salt is present in 220 g of solution, calculate the concentration of solution:

$$\begin{aligned}\text{Concentration of solution} &= \frac{\text{Mass of solute}}{(\text{Mass of solute} + \text{Mass of solvent})} \times 100 \\ \text{Mass solute} &= 20 \text{ g} \\ \text{Mass of solute} + \text{solvent} &= 220 \text{ g} \\ \therefore \text{Concentration of solution} &= \frac{20}{220} \times 100 = 9.09\%\end{aligned}$$

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