

SOLVED QUESTIONS

1. State two advantages of chromatography over the other methods of separation.

Ans.

- (a) Chromatography can be carried out with a very small amount of material.
- (b) The substance under investigation does not get wasted in chromatographic separation.

2. (a) What is centrifugation?

(b) What kind of solution / suspension is separated by centrifugation?

(c) What is the principle of centrifugation?

Ans.

(a) The method of separating finely suspended particles in a liquid by whirling the liquid at a very high speed is called centrifugation.

(b) Centrifugation is employed to separate insoluble particles in a colloidal solution.

(c) It is based on the principle that when a very fine suspension of a colloidal solution is whirled rapidly, the heavier particles are forced down the bottom of the liquid and the lighter particles stay at the top.

3. State four applications of centrifugation technique.

Ans.

- (1) It is employed in milk dairies to separate cream from milk.
- (2) It is employed in diagnostic laboratories for testing urine and blood samples.
- (3) It is employed in blood banks to separate the different constituents of blood.
- (4) It is used in drying machines to squeeze out water from wet clothes.

4. State four characteristics of a true solution.

Ans.

- 1. A true solution is always clear and transparent.
- 2. Particles of a solute in a true solution break down to almost molecular size and their diameter is of the order 1 nm (10^{-9} m) or less
- 3. A true solution can completely pass through a filter paper as the particle size of the solute is far smaller than the size of the pores of the filter paper.
- 4. A true solution is homogenous in nature.

5. State four characteristics of a suspension.

Ans.

- 1. Size of the particles in a suspension is more than 10^{-5} cm in diameter
- 2. The particles of a suspension can be separated from the solvent, by the process of filtration.
- 3. When suspension is kept undisturbed the particles of a suspension settle down.
- 4. A suspension is heterogeneous in nature.

6. State four characteristics of a colloidal solution.

Ans.

1. Size of the colloidal particles is between 10^{-9} m to 10^{-7} m
2. The particles of a colloidal solution are visible under a powerful microscope.
3. The particles of a colloidal solution do not settle down with the passage of time
4. The particles of a colloidal solution cannot be recovered by crystallisation or evaporation. However, they can be separated by the process of centrifugation.

7. Classify the following as (i) true solution, colloidal solution and suspension.

- (i) Clear sea water
- (ii) Muddy water
- (iii) Paints
- (iv) Milk
- (v) Copper sulphate solution
- (vi) Starch solution

Ans.

- (i) Clear sea water and copper sulphate solution are true solutions.
- (ii) Milk and starch solution are colloidal solution.
- (iii) Muddy water and paints are suspensions.

8. Give one example each of : (i) aerosol (ii) sol (iii) true solution

Ans.

- (i) Fog is an example of aerosol
- (ii) Milk of magnesia is an example of sol
- (iii) Common salt solution is an example of a true solution.

9. Give four differences between colloidal solution and suspension.

Ans.

Colloidal solution	Suspension
1. The size of the particles of the solute is between 10^{-7} cm to 10^{-5} cm.	1. The size of the particles of the suspension is more than 10^{-5} cm.
2. Particles of the solute do not settle when colloidal solution is allowed to stand.	2. The particles of the suspension settle down when allowed to stand. filtered.
3. Particles of the solute cannot be	3. Particles of the suspension can be easily filtered.
4. The particles of the solute are not visible to an unaided eye.	4. The particles of the solute are visible to an unaided eye.

10. Rain water stored in a tank contains grains of sand, unfilterable clay particles, calcium carbonate, small pieces of paper and air bubbles. Select amongst these one example of (i) Solute, (ii) Solvent, (iii) Colloidal solution and (iv) Suspension.

Ans.

1. Bubbles of dissolved air is the solute.
2. Water is the solvent.
3. Clay particles in water is the colloidal solution.
4. Sand and calcium carbonate are examples of suspensions.