(20 Exam–Style Questions)

1. What is the difference between a colloid and a suspension?

A colloid has smaller particles that do not settle, while a suspension has larger particles that do.

Explanation

In colloids, the dispersed particles remain suspended and do not settle on standing due to their small size and motion. Suspensions have larger, heavier particles that settle when left undisturbed. This makes suspensions appear more clearly heterogeneous than colloids.

2. Can colloids be separated by filtration? If not, why?

No! Colloids cannot be separated by ordinary filtration.

Explanation

The particle size in a colloid is too small to be caught by regular filter paper. Unlike suspensions, the particles do not form layers or settle. Special techniques like ultrafiltration are needed to separate them.

3. Why colloids are considered quite stable mixtures?

Because the particles remain evenly distributed and do not settle.

Explanation

Colloidal particles are constantly in motion (Brownian motion), which prevents them from settling. They also often carry similar charges, leading to repulsion that keeps them dispersed. This results in long-term stability without separation.

4. Why does a colloid show the Tyndall effect?

Because the particles scatter light passing through the mixture.

Explanation

The particle size in colloids is large enough to reflect and scatter light beams. This makes the path of the light visible in a dark room. True solutions do not show this effect due to their tiny particles.

5. What is the Tyndall effect and what does it depend on?

It is the scattering of light by particles in a colloid.

Explanation

The Tyndall effect depends on the size of particles, the wavelength of light used, and the concentration of the colloid. Larger and more concentrated particles scatter light more effectively. It helps distinguish colloids from true solutions.

6. Classify the following as colloids or suspensions: Paints, Milk, Milk of Magnesia, Soap Solution.

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- Paints Colloid
- Milk Colloid
- Milk of Magnesia Suspension
- Soap Solution Colloid

Explanation

Paints and soap solutions are colloids as they have finely dispersed particles that do not settle. Milk is an emulsion (a type of colloid) with fat droplets in water. Milk of magnesia contains visible particles that settle, making it a suspension.

7. How can you justify that milk is a colloid?

Because it has dispersed fat particles that do not settle and show the Tyndall effect.

Explanation

Milk is an emulsion where fat is dispersed in water. The particles are too small to settle and cannot be filtered easily. It also scatters light, showing the Tyndall effect, a key property of colloids.

8. Which of the following shows the Tyndall effect: (a) Sugar solution, (b) Paints, (c) Jelly, (d) Chalk solution?

(b) Paints and (c) Jelly

Explanation

Paints and jelly are colloids, which have the right particle size to scatter light. Sugar and chalk solutions are either true solutions or coarse suspensions, which do not show this effect properly. Thus, only colloids visibly scatter light.

9. Why do not true solutions and suspensions show the Tyndall effect clearly?

Because their particle sizes are either too small or too large to effectively scatter light.

Explanation

In true solutions, particles are molecularly small and cannot scatter light. In suspensions, particles are too large and may settle before scattering light effectively. Colloids have just the right size range (1–1000 nm) for scattering.

10. Why does a suspension not form a homogeneous mixture?

Because its particles settle on standing and are not evenly mixed.

Explanation

Suspensions have large, visible particles that sink due to gravity. Without stirring, the components separate into layers. This results in a clearly non-uniform appearance.

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11. How can you test whether a liquid is a colloid or not?

By passing a beam of light through it and observing the Tyndall effect.

Explanation

If the light path becomes visible inside the mixture, it is a colloid. This is due to light scattering by particles in the 1–1000 nm range. True solutions will not scatter the light and thus appear clear.

12. Classify the following as true solutions or colloids: Blood, Starch Solution, Glucose Solution, Toothpaste, Copper Sulphate Solution, and Silver Nitrate Solution.

- Colloids: Blood, Starch solution, Toothpaste
- **True Solutions:** Glucose solution, Copper sulphate solution, Silver nitrate solution

Explanation

Colloids have dispersed particles that do not settle and may show the Tyndall effect. True solutions are completely clear and homogeneous. The classification is based on particle size and appearance.

13. Why should paints be stirred thoroughly before use?

To mix the settled particles evenly.

Explanation

Paints are colloidal/suspension mixtures, and their pigments may settle at the bottom. Stirring redistributes them throughout the solvent. This ensures even colour and texture during application.

14. Which of the following will scatter light and why? Sugar solution, Soap solution, Milk of magnesia.

Soap solution and milk of magnesia

Explanation

Soap solution is a colloid and scatters light due to its particle size. Milk of magnesia, a suspension, may scatter light if the particles remain suspended. Sugar solution is a true solution and does not scatter light.

15. List five characteristics of colloids.

- 1. Show Tyndall effect
- 2. Particles do not settle
- 3. Cannot be filtered easily
- 4. Exhibit Brownian motion

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5. Heterogeneous but stable

Explanation

These traits help distinguish colloids from true solutions and suspensions. Their particles stay suspended and scatter light. They also require special techniques for separation.

16. List five characteristics of suspensions.

- 1. Heterogeneous and unstable
- 2. Particles settle on standing
- 3. May scatter light faintly
- 4. Particles are visible
- 5. Can be filtered

Explanation

Suspensions clearly separate over time and are not uniform. Their large particles settle and make them easy to filter. They appear cloudy and are not stable.

17. What is the name of the mixture formed when tiny visible particles are dispersed through a medium?

Colloid

Explanation

A colloid has particles that are too small to settle but large enough to scatter light. These mixtures appear uniform but are technically heterogeneous. Examples include milk, fog, and foam.

18. Which of the following is a colloidal liquid: (a) Milk, (b) Slaked lime, (c) Vinegar, (d) AgCl in water?

(a) Milk

Explanation

Milk is an emulsion with fat droplets in water, making it a colloid. Slaked lime is a suspension, vinegar is a true solution, and AgCl is insoluble. Only milk fits the colloid definition.

19. Why is it important to know the difference between solutions, colloids, and suspensions?

To choose appropriate methods for use, separation, or analysis.

Explanation

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Each mixture behaves differently in terms of stability, visibility, and filtration. In food, medicine, and industry, this knowledge helps avoid errors and ensures proper handling. It also aids in choosing correct separation techniques.

20. Why do colloids not settle down even after long periods of standing?

Because colloidal particles are small and constantly in motion.

Explanation

Colloidal particles experience Brownian motion—random movement due to collisions with molecules of the dispersion medium. This motion keeps them suspended and prevents them from settling. Additionally, repulsion between similarly charged particles adds to their stability.