

Questions and Answers (Is Matter Around Us Pure?)

1. What is meant by a pure substance?

A substance is a pure single form of matter. It cannot be separated into other kinds of matter by any physical process. For example: sugar, sodium chloride.

2. List the points of differences between homogeneous and heterogeneous mixtures.

Homogeneous Mixture	Heterogeneous Mixture
1. They have uniform compositions. 2. The components of homogeneous mixtures are not physically distinct. 3. They have no visible boundaries of separation between the constituents.	1. They have non-uniform compositions. 2. They contain physically distinct parts. 3. They have visible boundaries of separation between the constituents.

3. How are sol, solution and suspension different from each other?

Solution	Sol	Suspension
A solution is a homogeneous mixture of two or more substances.	A sol is a heterogeneous mixture.	Suspension is a heterogeneous mixture.
The particles of a solution are smaller than 1 nm (10^{-9} metre) in diameter. So, they cannot be seen by naked eyes.	The size of particles of a sol is too small to be individually seen by naked eyes. It is between 1 nm and 100 nm in diameter.	The particles of a suspension can be seen by the naked eye. Their size is larger than 100 nm in diameter.
Due to small particle size, they do not scatter a beam of light passing through them. Thus, the path of light is not visible in a solution.	Sols are big enough to scatter a beam of light passing through them and make its path visible.	The particles of a suspension scatter a beam of light passing through it and make its path visible.
The solute particles do not settle down when left undisturbed, i.e., a solution is stable.	They do not settle down when left undisturbed, i.e., a sol is quite stable.	The solute particles settle down when a suspension is left undisturbed, i.e., a suspension is unstable.
The solute particles cannot be separated from the mixture by the process of filtration.	The solute particles cannot be separated from the mixture by the process of filtration.	They can be separated from the mixture by the process of filtration.

4. To make a saturated solution, 36 g of sodium chloride is dissolved in 100 g of water at 293 K. Find its concentration at this temperature.

$$\begin{aligned}\text{Mass of the solution} &= \text{Mass of solute} + \text{Mass of solvent} \\ &= 36 + 100 \\ &= 136 \text{ g}\end{aligned}$$

$$\begin{aligned}\text{Concentration} &= \frac{\text{Mass of the solute}}{\text{Mass of the solution}} \times 100 \\ &= \frac{36}{136} \times 100 \\ &= 26.47\%\end{aligned}$$

5. Name the technique to separate (i) Butter from curd, (ii) Salt from sea-water, (iii) Camphor from salt

Technique used to separate :

- (i) Butter from curd – Centrifugation
 - (ii) Salt from sea water – Evaporation
 - (iii) Camphor from salt – Sublimation
6. Classify the following into solutions, suspensions and colloids:
Soda - water, milk, Brine, Blood Ink, Smoke in air, Chalk water mixture, Milk of Magnesia, shaving cream, Muddy river water.

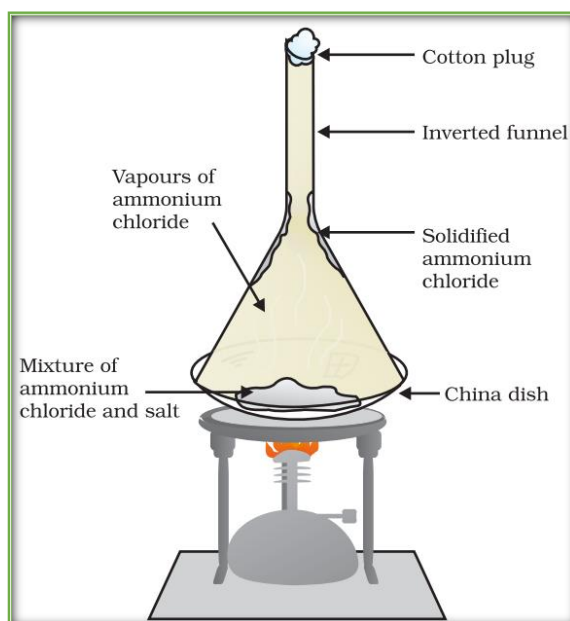
Solutions - Brine

Suspensions - Chalk water mixture, milk of magnesia, Muddy river water

Colloids - Milk, blood, ink, shaving cream, smoke in air, soda water

7. With the help of a labelled diagram, describe the method of separating ammonium chloride from a mixture of ammonium chloride and common salt. Mention the difference in the properties of ammonium chloride and sodium chloride which has made this separation possible.

The mixture of common salt and ammonium chloride is taken in a china dish and placed on a tripod stand. The china dish is covered with an inverted glass funnel. A loose cotton plug is put in the upper, open end of the funnel to prevent the ammonium chloride vapours from escaping into the atmosphere. The china dish is heated by using a burner. On heating the mixture, ammonium chloride changes into white vapours. These vapours rise up and get converted into solid ammonium chloride on coming in contact with the cold, inner walls of the funnel. In this way, pure ammonium chloride collects on the inner sides of the funnel in the form of a sublimate and can be removed. Common salt does not change into vapours on heating, so it remains behind in the china dish and can be separated out.



Ammonium chloride sublimes on heating whereas common salt does not sublime on heating. So, we can separate ammonium chloride from a mixture of common salt and ammonium chloride by the process of sublimation.