Is Matter Around Us Pure: In-text Questions

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Q.1 What is meant by a pure substance?

Sol. A pure substance consists of same type of particles. All constituent particles of the substance have the same chemical nature. Pure substances can be elements or compounds.

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

Sol. Differences between homogeneous and heterogeneous mixtures:

Homogeneous mixtures	heterogeneous mixtures
1. It is a mixture having a uniform composition throughout the mixture.	1. It is a mixture having a non uniform composition throughout the mixture.
2. We cannot see the boundaries of separation in mixture.	2. We cansee the boundaries of separation in mixture.
3. Ex: : salt in water, sugar in water, copper sulphate in water	3. Ex: sodium chloride and iron fillings, salt and sulphur, oil and water

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Q.1 Differentiate between homogeneous and heterogeneous mixtures with examples.

Sol. Differentiate between homogeneous and heterogeneous mixtures:

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2. We cannot see the boundaries of separation in mixture.	2. We cansee the boundaries of separation in mixture.
3. Ex: : salt in water, sugar in water, copper sulphate in water	3. Ex: sodium chloride and iron fillings, salt and sulphur, oil and water

Q.2 How are sol, solution and suspension different from each other?

Sol.

Sol (Colloid)	Solution	Suspension
1. Size of solute particles between 1nm to 100 nm.	Size of solute particles less than 1nm.	Size of solute particles is more than 100.
2. It is stable mixture.	2. It is stable mixture	2. It is unstable mixture
3. It scatters the light.	3. It does not scatter.	3. It scatters the light.
4. Solute particles can pass through filter paper.	4. Solute particles can pass through filter paper.	4. Solute particles cannot pass through filter paper.

Q.3 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.

Sol. Given Mass of solute (NaCl) = 36 g

Mass of solvent (water) = 100 g

So, mass of solution= Mass of solute + Mass of solvent

= (36 + 100) g

=136 g

Concentration of solution: $\frac{\textit{Mass}\ \textbf{of Solute}}{\textit{Mass}\ \textbf{of Solution}} \textbf{x100}$

$\frac{\textbf{36}}{\textbf{136}} \textbf{x100 = 26.47\%}$

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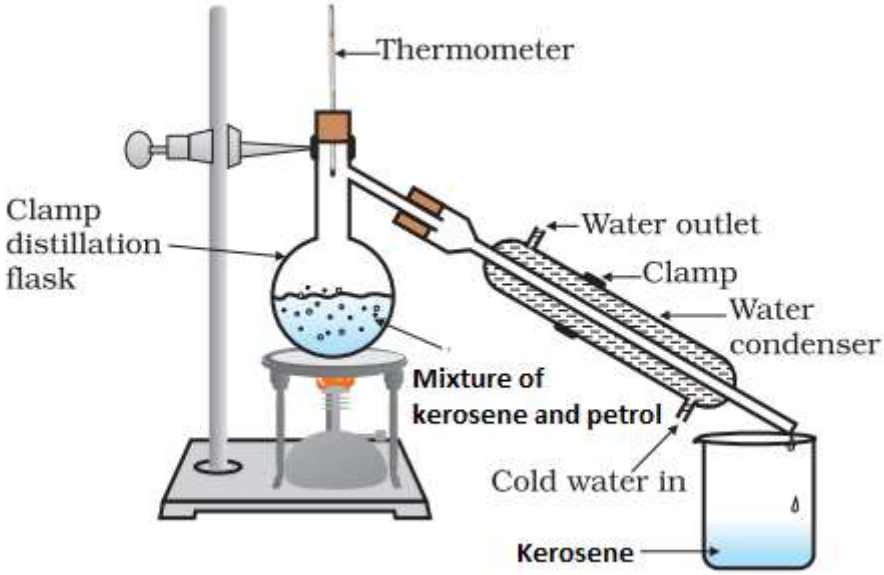
Q.1 How will you separate a mixture containing kerosene and petrol (difference in their boiling points is more than 25°C), which are miscible with each other?

Sol. A mixture of two miscible liquids kerosene and petrol having a difference in their boiling points more than 25°C can be separated by the distillation process.



Apparatus Required: distillation flask, thermometer, beaker, water condenser and burner etc.
Arrange the set up as shown in figure. In this method, the mixture of kerosene and petrol is taken in a distillation flask with a thermometer fitted in it. Then, this mixture is heated slowly. The thermometer should be watched simultaneously. Since boiling point of kerosene is lesser than petrol. So, firstly kerosene will vaporize and condense in the water condenser. This condensed kerosene is collected in beaker from the condenser outlet and petrol is left behind in the distillation flask.

Q.2 Name the technique to separate

(i) butter from curd
(ii) salt from sea-water
(iii) camphor from salt

Sol. (i) Butter can be separated from curd by the centrifugation method.
(ii) Salt can be separated from sea-water by the evaporation method.
(iii) Camphor can be separated from salt by the sublimation method.

Q.3 What type of mixtures is separated by the technique of crystallization?

Sol. By the technique of crystallization, purify the solids from the impurities. For example, salt *is* obtained from sea is separated from impurities.

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Q.1 Classify the following as chemical or physical changes:

- Cutting of trees
- Melting of butter in a pan
- Rusting of almirah
- Boiling of water to form steam
- Passing of electric current through water, and water breaking down into hydrogen and oxygen gas
- Dissolving common salt in water
- Making a fruit salad with raw fruits
- Burning of paper and wood

Sol.

Physical change	Chemical change
Cutting of trees	Rusting of almirah
Melting of butter in a pan	Passing of electric current through water, and water breaking down into hydrogen and oxygen gas
Boiling of water to form steam	Burning of paper and wood
Dissolving common salt in water	
Making a fruit salad with raw fruits	

Q.2 Try segregating the things around you as pure substances or mixtures.

Sol. Pure substance: Water, salt, sugar, gold silver etc.

Mixture: Salt water, soil, air, cold drink, sponge, fog, milk, butter, clothes, food etc.