Chemistry Study Materials for Class 9 (Solved Intext and Exercise Questions)

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Chapter 2: Is Matter Around Us Pure

1. What is meant by a substance?

Solution: It is a pure single form of matter. A substance has definite properties and compositions. Example – Iron

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

Solution:

Homogeneous mixture	Heterogeneous mixture
Particles are uniformly distributed throughout the mixture	All the particles are completely mixed and can be distinguished with the bare eyes or under a microscope.
Has a uniform composition	Irregular composition
No apparent boundaries of division	Noticeable boundaries of division.

3. Differentiate between homogenous and heterogeneous mixtures with examples.

Solution: The following are the differences between heterogeneous and homogenous mixtures.

Heterogeneous mixture	Homogeneous mixture
All the particles are completely mixed and can be distinguished with the bare eyes or under a microscope.	Particles are uniformly distributed throughout the mixture
Irregular composition	Has a uniform composition
Noticeable boundaries of division.	No apparent boundaries of division
Example: seawater, blood, etc.	Example: rainwater, vinegar, etc.

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

Solution:

Attributes	**Sol**	**Solution**	**Suspension**
Type of Mixture	Heterogeneous	Homogeneous	Heterogeneous
Size of particles	10-7 – 10-5cm	Less than 1nm	More than 100nm
Tyndall effect	Exhibited	Not exhibited	May or may not be exhibited
Appearance	Usually glassy and clear	Unclouded and clear	Cloudy and opaque
Visibility	Visible with an ultra microscope	Not visible	Visible with naked eye
Diffusion	Diffuses very slowly	Diffuses rapidly	Do not diffuse
Stability	Pretty stable	Highly stable	unstable
Settling	Get settled in centrifugation	Do not settle	Settle on their own
Example	Milk, blood, smoke	Salt solution, Sugar solution	Sand in water, dusty air

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

Solution:

Mass of solute (NaCl) = 36 g

Mass of solvent (H_2O) = 100 g

Mass of solution (NaCl + H_2O) = 136 g

Concentration = Mass of solute/Mass of solution x 100

Concentration = 36/136 x 100 = 26.47%

Hence, the concentration of the solution is 26.47%

6. 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?

Solution:

A technique known as simple distillation can be used to separate the mixture of miscible liquids, where the difference in boiling point is more than 25°C, to name a few – kerosene and petrol. The whole concept is established on the volatility property of substances. The following are the various steps in the process of simple distillation:

(a) In a distillation flask, take the mixture.

(b) Treat the mixture with heat while a thermometer is affix.

(c) We observe evaporation of petrol as it has a low boiling point.

(d) As the vapours advance towards the condenser, a dip in the temperature causes condensation of the vapours into liquid which can be accumulated in a flask.

(e) We notice that kerosene tends to remain in the flask in a liquid state due to comparatively higher boiling point.

(f) Consequently, the liquids are separated.

7. Name the techniques used to separate the following:

(a) Butter from curd.

(b) Salt from seawater

(c) Camphor from salt

Solution:

a) A process known as centrifugation is used to separate butter from curd. The process is governed on the principle of density.

b) We can use the simple evaporation technique to separate salt from seawater. Distillation causes water to evaporate leaving solid salt behind, hence the production of salt.

c) Sublimation can be used to separate camphor from salt as during the phase change, camphor does not undergo a liquid phase.

8. What type of mixtures are separated by the technique of crystallization?

Solution: The technique of crystallization is used to separate solids from a liquid solution. It is linked to precipitation, but in this technique, the precipitate is achieved in a crystal form which exhibits extremely high levels of purity. The principle of crystallization can be applied to purify impure substances.

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