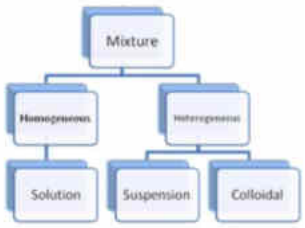
Class: IX	**Topic: Is matter around us pure?**
Subject: Chemistry	**Date -06/10/2021**

1.What is a suspension?

A suspension is formed when two or more substances are mixed in a non-uniform manner. Heterogeneous mixtures are suspensions. The solute does not mix with the solvent and can be viewed through naked eyes.



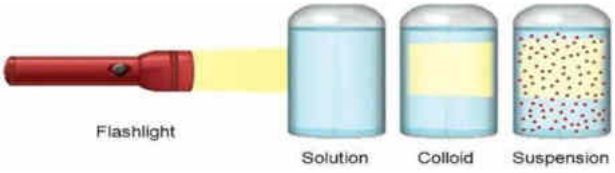
Properties of Suspensions:

- A suspension is a heterogeneous mixture.
- We can see the particles of suspensions through naked eyes.
- We can see the path of light through the particles of a suspension..This is called Tyndall effect.
- The particles of suspension tend to settle down when left undisturbed. Then, they can be separated using filtration.
- The size of the particles of solute is more than 1000nm.
- The suspension is unstable in nature.

2.What are properties of colloids

Properties of colloids:

- Colloids are heterogeneous in nature.
- The particles of a colloid cannot be seen through naked eyes.
- The particles scatter a beam of light passed through a colloid and produce Tyndall effect.
- Colloids are stable in nature. The particles of colloids do not settle down if left uninterrupted.
- We cannot separate the particles of a colloid through filtration. We use a method called **Centrifugation** to separate the particles of a colloid.
- The size of particles of colloid is 1to 1000 nm.



3.What is the Tyndall Effect?

When a beam of light is passed through a colloid the particles of the colloid scatter the beam of light and we can see the path of light in the solution. **For Example**, when a ray of light enters a dark room it is scattered by the dust particles present in the air and we can see the path of light clearly.

4.During an experiment the students were asked to prepare a 10% (Mass/Mass) solution of sugar in water. Ramesh dissolved 10 g of sugar in 100 g of water while Sarika prepared it by dissolving 10 g of sugar in water to make 100 g of the solution.

(a) Are the two solutions of the same concentration?

(b) Compare the mass % of the two solutions.

Solution:

(a) No.

$$\text{Mass per cent} = \frac{\text{Mass of solute}}{\text{Mass of solute} + \text{Mass of solvent}} \times 100$$

(*b*) **Solution made by Ramesh:**

$$\text{Mass per cent} = \left(\frac{10}{10+100}\right)100$$

$$= \frac{10}{110} \times 100$$

$$= \mathbf{9.09\%}$$

Solution made by Sarika:

$$\text{Mass per cent} = \frac{10}{100} \times 100 = \mathbf{10\%}$$

The solution prepared by Sarika has a higher mass per cent than that prepared by Ramesh.

5.Classify Colloids.

Dispersed Phase – The dispersed particles or the solute-like components in a colloid

Dispersing Medium – The substance in which these solute-like particles are added

Based on the state of the dispersing medium colloids are classified as:

Types of Colloids

Example	Dispersing Medium	Dispersed Substance	Colloid Type
Fog, Aerosol sprays	Gas	Liquid	Aerosol
Smoke, Airborne bacteria	Gas	Liquid	Aerosol
Whipped cream, Soap suds	Liquid	Gas	Foam
Milk, Mayonnaise	Liquid	Liquid	Emulsion
Paints, Clays, Gelatin	Liquid	Solid	Sol
Marshmallow, Styrofoam	Solid	Gas	Solid foam
Butter, cheese	Solid	Liquid	Solid emulsion
Ruby glass	Solid	Solid	Solid sol

6 How are colloids, True solution and suspension different from each other?

True Solution	Colloid	Suspension
1) A true solution is a homogeneous mixture of solute and solvent	1) A colloid appears to be homogeneous but actually it is a heterogeneous mixture of solute and solvent	(1) A suspension is a heterogeneous mixture of a solid dispersed in a liquid or a gas.
(2) In a true solution the size of particle is about less than 1nm	(2) In a colloid the size of particles is in between 1-1000 nm	(2) In a suspension the size of particles is greater than 1000nm
(3) In a true solution the solute particles cannot be seen even with a powerful microscope	3) In a colloid the dispersed particles can be seen with a powerful microscope	(3) In a suspension the dispersed particles can be seen with the naked eyes
(4) The entire solution passes through filter paper	(4) The particles can pass through ordinary filter paper	(4) The particles cannot pass through filter paper
(5) The solute particles do not show tyndall effect	(5) The particles show tyndall effect	(5) The particles may or may not show tyndall effect
6) The particles do not settle due to gravity, so stable in nature. eg. salt solution, sugar solution.	(6) The particles do not settle due to gravity, stable in nature. eg starch in water, milk	(6) The particles may settle due to gravity, unstable in nature. Chalk powder in water, soil in water.

7. Distinguish between physical change and chemical change.
Answer:

Physical change	Chemical change
1. In a physical change, only physical properties such as colour, physical state, density, volume, etc. change; chemical properties remain unchanged.	1. In a chemical change, the chemical composition and chemical properties undergo a change.
2. No new substance is formed in a physical change.	2. A new substance is formed in a chemical change.
3. Very little or no energy in the form of heat, light or sound is usually absorbed or given out in a physical change.	3. A chemical change is always accompanied by absorption or evolution of energy.
4. A physical change is a temporary change.	4. A chemical change is a permanent change.
5. The original form of substance can be regained by simple physical methods.	5. Original substance cannot be obtained by simple physical methods.
6. A physical change is reversible.	6. A chemical change is irreversible.

8. 0.5 g of salt is dissolved in 25 g of water. Calculate the percentage amount of the salt in the solution.
Solution:
Mass of salt present = 0.5 g
Mass of water present in solution = 25 g
∴ Percentage amount of the salt = 0.5/0.5+25×100 = 1.96%

9.Identify colloids and true solutions and suspension from the following:
Fog, aluminium paint, vinegar and glucose dissolved in water, milk, muddy water, milk of magnesia, blue vitrol dissolved in water.
True solutions are vinegar, blue vitrol dissolved in water and glucose in water.
Colloids are fog, aluminium paint and milk. Suspensions are muddy water and milk of magnesia .
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10.Give two examples each for
- **Aerosol,**
- **Emulsion.**

Aerosol: Clouds, smoke
Emulsion: Milk, face cream.
11Smoke and fog both are aerosols. In what way are they different?

Both fog and smoke have gas as the dispersion medium. The only difference is that the dispersed phase in fog is liquid and in smoke it is a solid.

12.Identify the dispersed phase and dispersing medium in the following colloids.
(a) Fog

(b) Cheese
(c) Coloured gemstone

(a) Fog—liquid, gas
(b) Cheese—liquid, solid
(c) Coloured gemstone—solid, solid

13 .A solution of urea in water contains 16 grams of it in 120 grams of solution. Find out the mass percentage of the solution.

Mass of urea present in solution = 16 g
Mass of solution = 120 g

$$\text{Mass per cent of urea} = \frac{\text{Mass of urea}}{\text{Mass of solution}} \times 100$$
$$= \frac{16\,\text{g}}{120\,\text{g}} \times 100$$
$$= \mathbf{13.33\%}$$

14. Calculate the mass of water and glucose required to make 250 g of 40% solution of glucose.
Solution:
Mass of solution = 250g

$$\text{Concentration of solution} = \frac{\text{Mass of glucose}}{\text{Mass of solution}} \times 100$$
$$40 = \frac{\text{Mass of glucose}}{250} \times 100$$

∴ Mass of glucose = 40×250/100 = 100g
Mass of solution = Mass of glucose + Mass of water
So, Mass of water = Mass of solution – Mass of glucose
= 250g – 100g = 150g

15. How much water should be mixed with 12 mL of alcohol so as to obtain 12% alcohol solution?
Solution:
Volume of solute =12 mL
Let the volume of water = x mL
Volume of solution = (12 + x) mL
Concentration of solution = Volume of solute/ Volume of solution ×100
12=12/12+x×100
12 + x = 100
x = 100 – 12 = 88mL
So, 88 mL of water should be mixed.

16.Calculate the mass of sodium sulphate required to prepare its 20% (mass per cent) solution in 100 g of water.

Solution:
Let the mass of sodium sulphate required be x g.
The mass of solution would be = (x + 100)g

$$20 = \frac{x}{x+100} \times 100$$

$$20x + 2000 = 100x$$

$$80x = 2000$$

$$x = \frac{2000}{80} = \mathbf{25\ g}$$

So, the mass of sodium sulphate required is 25 g.

Note-The above content has been absolutely prepared from home.