

**TEST YOUR SELF****TEST YOURSELF 6.1 SOLUTION**

i. **Why is a solutions considered mixture?**

**Ans:** Solution is considered as mixture because the components of solution relation their properties. The can be mixed in any ratio and can be separated by physical means.

ii. **Distinguish between the following pairs as compound or solution:**

- (a) Water and salt solution                      (b) vinegar and benzene  
(c) Carbonated drinks and acetone

**Ans:**

- (a) Water is a compound and salt solution is a solution.  
(b) Vinegar is solution and benzene is a compound.  
(c) Carbonated drink is solution and acetone is a compound.

iii. **What is the major difference between a solution and a mixture?**

**Ans:**

Solution	Mixture
<i>It is the homogeneous mixture of two or more substances</i>	<i>It may be homogeneous or heterogeneous.</i>
Every solution is mixture	Every mixture is not solution

iv. **Why are the alloys considered solutions?**

**Ans:** Alloys are considered solutions because they are homogenous mixture of two or more than two metals or non-metals which retain their properties. They have variable composition.

v. **Dead sea is so rich with salts that it forms crystals when temperature lowers in the winter. Can you comment why is it named as "Dead Sea"?**

**Ans:** Its water is so salty that no animal or plant can survive in it because high concentration of salts in water causes dehydration of animals and plants and they die. Hence it is called "Dead Sea" means "without life"

**TEST YOURSELF 6.2 (CONCENTRATION UNITS)**

i. **Do the percentage calculations require the chemical formula of the solute?**

**Ans:** Percentage calculations do not require the chemical formula of the solute because only the mass of solution is considered and molar mass is not required.

ii. **Why is the formula of solute necessary for calculation of formula the molarity of the solution?**

**Ans:** The formula of solute is necessary for calculation of the molarity of the solution because we have to calculate molar mass of solute. Molar mass of solute can be calculated from its chemical formula.

iii. **You are asked to prepare 15 percent (w/w) solution of common salt. How much amount of water will be required to prepare this solution?**

**Ans:** 15% m/m common salt solution means that 15.0g of common salt is dissolved in 85g of water make 100g of solution.

iv. **How much water should be mixed with 18 cm<sup>3</sup> of alcohol so as to obtain 18 % (m/m) alcohol solution?**

**Ans:** 18%V/V alcohol solution in water means that 18cm<sup>3</sup> of alcohol is dissolved in sufficient amount of water so that total volume of the solution becomes 100cm<sup>3</sup>.

v. **Calculate the concentration % (w/w) of a solution which contains 2.5 g of salt dissolved in 50 g of water.**



**Ans:** 
$$\text{Concentration (\%m/m)} = \frac{\text{Mass of solute (g)}}{\text{Mass of solute}_{(g)} + \text{Mass of Solvent}_{(g)}} \times 100$$

$$\% \text{ m/m} = \frac{2.5 \text{ gm}}{2.5 \text{ gm} + 50 \text{ gm}} \times 100$$

$$\% \text{ m/m} = \frac{2.5 \text{ gm}}{52.5 \text{ gm}} \times 100 = 4.76\%$$

$$\% \text{ m/m} = 4.76 \%$$

**vi. Which one of the following solutions is more concentrated?**

**One molar or three molar:**

**Ans.** Concentration depends upon amount of solute. Three molar solutions is more concentrated than one molar solution because it consists of three times the amount of solute.

### TEST YOURSELF 6.3 (SOLUBILITY)

**i. What will happen if the solute-solute forces are stronger than those of solute-solvent forces?**

**Ans:** When solute-solute forces are stronger than those of solute-solvent forces, the solute will not dissolve and does not form solution.

**ii. When solute-solute forces are weaker than those of solute-solvent forces? Will solution form?**

**Ans:** It means when solute-solute forces are weaker than those of solute-solvent forces the solute solvent attractive forces will overcome the solute forces, then solute will dissolve and solution will form.

**iii. Why is iodine soluble in  $\text{CCl}_4$  and not in water?**

**Ans:** The principle of solubility is "like dissolves like."

Iodine is soluble in  $\text{CCl}_4$  because both are non-polar. Water cannot dissolve iodine because water is polar solvent and iodine is non-polar.

**iv. Why test tube becomes cold when  $\text{KNO}_3$  is dissolved in water?**

**Ans.** When  $\text{KNO}_3$  is added in water, the test tube becomes cold. It means during dissolution of these salts heat is absorbed from the surrounding to break the forces between ion of solute.



### TEST YOURSELF 6.4 (COMPARISON OF SOLUTION, SUSPENSION AND COLLOIDS)

**i. What is difference between colloid and suspension?**

**Ans:**

Colloids	Suspension
The particles are large consisting of many atoms, ions or molecules.	The particles are of largest size. They are larger than $10^{-5} \text{ cm}$ in diameter.
A colloid appears to be a homogeneous but actually it is a heterogeneous mixture. Hence, they are not true solution. Particles do not settle down for a long time, therefore, colloids are quite stable.	Particles remain undissolved and form a heterogeneous mixture. Particles settle down after sometime
Particles are large but can't be seen with naked eye.	Particles are big enough to be seen with naked eye.

Although particles are big but they can pass through a filter paper.	Solute particles cannot pass through filter paper.
Particles scatter the path of light rays thus emitting the beam of light i.e. exhibit the Tyndall effect.	Particles are so big that light is blocked and difficult to pass.

**ii. Can colloids be separated by filtration, if not why?**

**Ans:** Colloids cannot be separated by filtration because the particles in colloids are not so big. They can pass through a filter paper.

**iii. Why are the colloids quite stable?**

**Ans:** The colloids are quite stable because particles do not settle down for a long time. Colloids are quite stable.

**iv. Why does the colloid show Tyndall effect?**

**Ans:** Colloids show Tyndall effect because in colloids the particle size is suitable to scatter the path of light rays.

**v. What is Tyndall effect and on what factors it depends?**

**Ans:** The phenomenon of scattering of beam of light by particles of colloids is called Tyndall effect. It depends upon the size of particles.

**vi. Identify as colloids or suspensions from the following:**

**Milk, milk of magnesia, soap solution and Paint.**

**Ans: Identification:**

**Colloids:** Milk, Soap solution

**Suspensions:** Paints, Milk of magnesia

**vii. How can you justify that milk is a colloid:**

**Ans:** Milk (consists of big particles of carbohydrates, fats, proteins etc.) is a colloid because it shows Tyndall effect.

Milk particles are big but they can pass through a filter paper. Milk particles are larger but cannot be seen with naked eye. Milk particles scatter the path of light rays thus emitting the beam of light i.e. exhibit the Tyndall effect.

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