CBSE Test Paper 02

Chapter 02 Is matter around us pure

1. The components of compound can be separated by using **(1)**

   a. chemical method
   b. physical method
   c. none of these
   d. cannot be separated by using any method.

2. Which of the following will be a heterogeneous mixture? **(1)**

   a. Common salt and water
   b. Cane sugar and water
   c. Alum and water
   d. Albumin and water

3. Which one of the following will form a translucent solution in water? **(1)**

   a. Soil
   b. Sand
   c. Starch
   d. Sugar

4. 4 g of solute are dissolved in 36 g of water. What is the mass percent of the solution? **(1)**

   a. 10%
   b. 20%
   c. 100%
   d. 5%

5. The system when starch is added to hot water is: **(1)**

   a. colloid
   b. mixture

c. suspension
d. true solution

6. An example of colloid is **(1)**

   a. Salt solution
   b. Milk
   c. Sugar solution
   d. Air

7. What types of mixtures can be separated by technique known as crystallisation? **(1)**

8. Define solubility. **(1)**

9. What is the range of the size of the particles of dispersed phase in a colloidal solution? **(1)**

10. Which separation techniques will you apply for the separation of the butter from curd? (**1)**

11. What is meant by sedimentation? Where this method is used? **(3)**

12. Write the steps you would use for making tea. Use the words solution, solvent, solute, dissolve, soluble, insoluble, filtrate and residue. **(3)**

13. Differentiate between metals and non-metals based upon the various properties that they show. **(3)**

14. Which of the component in a solution will act as solute and which as solvent when both are in the same physical states? **(3)**

15. Pragya tested the solubility of three different substances at different temperatures and collected the data as given below (results are given in the following table, as grams of substance dissolved in 100 grams of water to form a saturated solution).

Substance dissolved	Temperature in K				
	283	293	313	333	353
	Solubility				

Potassium Nitrate	21	32	62	106	167
Sodium Chloride	36	36	36	37	37
Potassium Chloride	35	35	40	46	54
Ammonium Chloride	24	37	71	55	66

a. What mass of potassium nitrate would be needed to produce a saturated solution of potassium nitrate in 50 grams of water at 313 K?
b. Pragya makes a saturated solution of potassium chloride in water at 353 K and leaves the solution to cool at room temperature. What would she observe as the solution cools? Explain.
c. Find the solubility of each salt at 293 K. Which salt has the highest solubility at this temperature?
d. What is the effect of change of temperature on the solubility of a salt?

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Answers

1. a. chemical method

   Explanation: The components of compound can be separated by chemical methods only because they have undergone chemical changes while formation which is physically irreversible.

2. d. Albumin and water

   Explanation: The mixture in which particles are not distributed evenly and forms separate layer if left undisturbed. The mixture of Albumin and water forms a heterogeneous mixture.

3. c. Starch

   Explanation: Starch forms colloidal solution. Colloidal solutions are translucent and their particles can pass through filter paper to give translucent filtrate.

4. a. 10%

   Explanation: Mass of solute = 4 g

   Mass of solution = 36 +4 = 40g

   Mass percent of solution = $\frac{Mass\ of\ solute}{Mass\ of\ solution} = \frac{4}{40} \times 100\% = 10\%$

5. a. colloid

   Explanation: The colloid of starch is prepared by dispersion method. 2-3 g of powdered/crushed starch is dissolved in 3- 4 ml of water to make a thin paste. This paste is added to100 ml of boiling water while stirring. Allow the solution to cool and filter. The filtrate is colloid of starch.

6. b. Milk

   Explanation: Colloidal solution is a heterogeneous mixture. The solute particles cannot be separated by filtration. The solute particles do not settle down and the solution is stable.

   Air is a mixture, salt solution and sugar solution are a true solution and milk is

a colloid having disperse phase of protein and fat in dispersing medium of water and other substance.

7. The solid mixtures in which one component or impurity is less soluble in a particular solvent as compared to the other. For example, impure samples of copper sulphate, potassium nitrate, potash alum etc. can be purified by this method.

8. The maximum quantity of solute, which can dissolve in 100 gram of a solvent is called solubility of solute in that solvent, at a given temperature.

9. It ranges from 1 nm (10^{-9} m) to 100 nm (10^{-7}m).

10. Centrifugation: Butter will get separated upon centrifugation

11. The process of setting of heavy solids at the bottom is called sedimentation. This method is used to seperate the components of a mixture of sand and water. It is seen that the sand and mud settle at the bottom with clear water above it. This is called sedimentation.

12. Steps that would be used for making tea are as follows:-
    i. The **solvent** used for making tea is water. Take some amount of **solvent** in a pan and heat it over a burner.
    ii. After the solvent is sufficiently warm, add a little amount of sugar to the **solvent**. Sugar is used as a **solute** to provide a sweet taste to the **solvent**.
    iii. The **solute** will dissolve completely in the **solvent** and form a true **solution**.
    iv. Add some tea leaves to the true **solution**. The chemical substances present in the tea leaves are soluble and will **dissolve** in the solution.
    v. Pour some milk into the pan. The milk will **dissolve** in the **solution**.
    vi. Bring the **solution** to a boil and switch off the burner. The tea leaves will remain **insoluble** in the **solution**.
    vii. Filter the **solution** with a strainer to separate the **insoluble** tea leaves.
    viii. After filtration, the tea **solution** will be obtained as a **filtrate**. The tea leaves that remain as **residue** can be thrown away.

13.

Metals	Non-metals

Metals have lustre i.e. they have a shinning glow.	Non-metals do not have lustre. They cannot be polished.
They are mostly solids at room temperature. Exceptions - Mercury and Gallium are liquids at 30 ^{o}C	They are either gases or brittle solids at room temperatures.
Most of the metals are good conductors of heat and electricity.	They are mostly bad conductors of heat and electricity. Exception: Graphite
They are malleable i.e. they can be beaten into flat sheets. Exception: Zinc	They are non-malleable.
They are ductile i.e. they can be drawn into wires. Exception: Zinc	They are non-ductile.
They are sonorous (produce a sound on being hit)	They are non-sonorous.
They generally have high melting points and high boiling points.	They generally have low melting points and low boiling points.
E.g. Sodium, Magnesium, and Aluminium	E.g. Chlorine, Oxygen and Carbon

14. The component which is present in larger amount will be the solvent and the other which is present in lesser quantity will be the solute.
15. a. The amount of potassium nitrate required to produce a saturated solution at 313 K in 100 g of water = 62 g
    The amount of potassium nitrate that would be required to produce a saturated solution at 313 K in 50 g of water = (62 x 50) / 100 g
    Therefore, 31 g of potassium nitrate would be required to produce a saturated solution at 313 K in 50 g of water.
    b. At 373 K, preparation of a saturated solution will need 54 g of potassium nitrate. At a room temperature of 293 K, a saturated solution of potassium nitrate requires just 35 g potassium nitrate. As the solution cools, excess potassium nitrate (54 g – 35 g = 19 g) will precipitate out as insoluble salt.
    c. Solubility of potassium nitrate, sodium chloride, potassium chloride and

ammonium chloride in 100 g of water at 293 K are 32 g, 36 g, 35 g and 37 g respectively.

Ammonium chloride has the highest solubility (37 g) at this temperature.

d. Effect of change of temperature on the solubility of a salt: As a general rule, the solubility of the salts is directly proportional to the temperature. If the temperature is increased, the solubility of the salt generally increases.