### Chapter 3 - Separation of Substances – 1

##### **Q1. State True/False**

i.             The property used in separating a mixture of two solid by winnowing is difference in weight. True

ii.            The chemical used for loading is baking soda. False

iii.          A mixture of milk and water can be separated by filtration. False

iv.          A mixture of powdered salt and sugar can be separated by the process of winnowing. False

v.           Separation of sugar from tea can be done with filtration. False

vi.          Grain and husk can be separated with the process of decantation. False

vii.        The method in which stalks are beaten to free the grain seeds is called threshing. True

viii.       Sieving is used when the component of mixture are of different sizes. True

ix.          The method of filtration is also used in the process of preparing cottage cheese in homes. True

x.           When no more salt can be dissolved in the given amount of water at particular temperature, the solution is said to be unsaturated. False

xi.          Centrifugation is used to separate cream from curd. True

xii.        Hand picking can be used to separate cashew nuts from mixture of almonds and cashew nuts. True

##### **Q2. Fill in the blanks.**

i.             We can remove small stones from pulses before cooking by handpicking.

ii.            The process of separating a liquid from solid sediment is called decantation.

iii.          The method of separating seeds of paddy from its stalks is called threshing.

iv.          When milk, cooled after boiling, is poured onto a piece of cloth the cream (malai) is left behind on it. This process of separating cream from milk is an example of filtration.

v.           Salt is obtained from seawater by the process of evaporation.

vi.          Impurities settled at the bottom when muddy water was kept overnight in a bucket. The clear water was then poured off from the top. The process of separation used in this example is called sedimentation and decantation.

vii.        Hand picking method is used to separate stones from grains.

viii.       Husk from wheat can be separated by \_winnowing\_\_\_\_\_\_\_\_\_

ix.          Sieving is used to remove impurities from the bran and flour.

x.           The two liquids that do not mix with each other can be separated by decantation.

xi.          Salt is obtained from sea water.

xii.        We see water drops under the plate that has been used to cover a container containing milk that has just been boiled. This is due to process of condensation.

##### **Q3. Write any two methods used for separation of substances.**

Ans. Hand picking and Threshing

##### **Q4. How can we separate sand from water?**

Ans. Sedimentation and Decantation

##### **Q5. Which method can be used to separate soil from mixture of soil and grains?**

Ans. Sieving

##### **Q6. Which method would you prefer to separate solid dissolved in liquid?**

Ans. Evaporation

##### **Q7. Which method farmers use to separate grains from bundles of stalk?**

Ans. Threshing

##### **Q8. Which method do you prefer for tea leaves from prepared tea?**

Ans. Filtration

##### **Q9 Filtration method is used to separate tea leaves from prepared tea. Which other method can be used?**

Ans. Decantation

##### **Q10. List various methods of separation of components from their mixtures.**

Ans. Some of the methods are: handpicking, winnowing, threshing, sedimentation, decantation, filtration, evaporation and condensation.

##### **Q11. The process of adding alum to water to fasten sedimentation is called loading. Why has this name been given to the process?**

Ans. It is because the suspended light particles become heavy on adding alum.

##### **Q12. How can we separate oil and water from their mixture?**

Ans. Oil floats on water and form separate layer. Separating funnel can be used to separate the two.

##### **Q13. Why are we able to dissolve more solute in a solvent at high temperature?**

Ans. We are able to dissolve more solute in a solvent at high temperature because high temperature facilitates dissolving reaction by providing energy to break bonds in the solid.

##### **Q14. Why sieving is not used to separate very small stones from rice grains?**

Ans. Sieving is not used to separate very small stones from rice grains because both are of almost same size and both will pass through the holes of the sieve.

##### **Q15. There are 3 beakers half filled with water. Now add 3 spoon of sugar in first beaker, 5 spoon of sugar in second beaker and 7 spoon of sugar in third beaker. Stir the solution of all three beakers. Which solution is more saturated?**

Ans. Third beaker

##### **Q16. Define the following terms:** **a.   Hand picking**

Handpicking is a method used to separate larger impurities like pieces of dirt, stones etc. just by picking them out with the help of hand from the mixture.

##### **b.   Threshing**

Threshing is a method of separating grains or seeds from the stalks by some mechanical means such as by beating with a flail or by the action of a threshing machine.

##### **c.   Evaporation**

The process of conversion of water into water vapor is called evaporation.

##### **d.   Condensation**

The process of conversion of water vapor into its liquid form is called condensation.

##### **e.   Saturated Solution**

A solution in which no more solute (such as sugar or salt) can be dissolved in the given amount of solvent (such as water) at a particular temperature is known as saturated solution.

##### **f.    Unsaturated Solution**

A solution in which more solute (such as sugar or salt) can be dissolved in the given amount of solvent (such as water) at a particular temperature is known as unsaturated solution.

##### **g.   Decantation**

Decantation is the process of removing liquid from mixture when heavier component settles down at the bottom of container.

##### **h.   Solution**

A mixture of soluble solid in liquid is called solution.

##### **i.     Solute**

Substance that is dissolved is called solute.

##### **j.    Solvent**

The liquid in which the solute dissolves is called solvent.

##### **k.   Strainer**

Strainer is a device with holes punched in it or made of crossed wires for separating solid matter from a liquid.

##### **Q17. What is winnowing? Where is it used?**

Ans.  Winnowing is the method in which heavier components of the mixture are separated from the lighter components such as chaff, dirt, etc. by dropping mixture from height into the air. This method is used by farmers to separate husk and other lighter impurities from grains.

##### **Q18. Why do we separate substances?**

Ans. We need to separate the components of a mixture for the following reasons:

                        i.        To separate two different but useful components from the mixture.

                       ii.        To remove non – useful components from the mixture.

                      iii.        To remove impurities or harmful substance from the mixture.

                      iv.        To remove the unwanted impurities from the mixture.

                       v.        To obtain pure substances by removing the other substances.

##### **Q19. How will you separate husk or dirt particles from a given sample of pulses before cooking?**

Ans. Husk or dirt particles from a given sample of pulses can be removed by washing the pulses with water. Being heavier, pulses will settle down in the bottom of the container whereas lighter particles will keep floating in the water. This is called sedimentation. Dirty water can be removed by the process of decantation by leaving behind pulses in the bottom of the container.

##### **Q20. What is sieving? Where is it used?**

Ans. Sieving is a simple and convenient technique of separating particles of different sizes by allowing the smaller particles to pass through the holes of a sieve leaving the bigger particle in the sieve.

Uses of sieving

                      i.        Used in homes to separate flour from impurities such as husk, stalks and small pieces of stones.

                     ii.        Used in flour mill to separate broken particles of grain from flour.

                    iii.        Used at the construction sites to separate small pieces of stones from sand.

##### **Q21. How will you separate sand and water from their mixture?**

Ans. Sand is insoluble in water. So we can use two methods to separate sand and water from the mixture.

     1.   Sedimentation & Decantation – Allow the mixture to stand undisturbed for some time. Being heavier sand settles down at the bottom of the container. This process is called sedimentation. Now slowly pour the water into another container. This process is called decantation.

     2.   Filtration – Pour water on strainer or a piece of cloth or a filter paper so that water passes through the strainer and sand remains on the strainer.

##### **Q22. Is it possible to separate sugar mixed with wheat flour? If yes, how will you do it?**

Ans. Yes, it is possible to separate sugar mixed with wheat flour by the process of sieving. Allow the mixture to pass through the sieve. Fine particles of wheat flour passes through the holes of the sieve whereas the bigger particles of sugar would remain on the sieve.

##### **Q23. Lemonade is prepared by mixing lemon juice and sugar in water. You wish to add ice to cool it. Should you add ice to the lemonade before or after dissolving sugar? In which case would it be possible to dissolve more sugar?**

Ans. We should add sugar before adding ice as sugar dissolves faster in warm water than in cold water. We can dissolve more sugar in case of warm water.

##### **Q24. How would you obtain clear water from a sample of muddy water?**

Ans. We can obtain clear water from a sample of muddy water in the following ways:

    1.   Sedimentation and Decantation: Allow mixture to stand still for sometimes so, that mud settles down at the bottom. This process is called sedimentation. Now gently pour the water in another container. This process is called decantation.

    2.   Filtration: Allow the mixture to pass through the filter paper. Water will pass through the filter paper and mud will get collected on the filter paper. This process is called filtration.

##### **Q25. How will you separate the components of the following?**

##### **a.   Green Chillies from pulao**

Handpicking

##### **b.   Green gram from Chick pea**

Handpicking

##### **c.   Pebbles from rice**

Hand picking or sieving

##### **d.   Tea leaves from tea**

Sieving or straining

##### **e.   Wheat bran from wheat flour**

Sieving

##### **f.    Sand and husk**

Winnowing

##### **g.   Wheat, sugar and stalks**

Stalks being lighter can be separated by winnowing. Wheat and sugar can be separated by sieving.

##### **h.   Water and kerosene**

Separating funnel

##### **i.     Rice and sugar**

Sieving

##### **Q26. How can we convert a saturated solution into an unsaturated solution?**

Ans. We can convert a saturated solution into an unsaturated solution in the following ways:-

             i.        by heating the solution

            ii.        by adding more solvent to the solution

##### **Q27. How do we get salt from sea water?**

Ans. The salt can be obtained from sea by the process of evaporation.

Sea water is collected in shallow pits and heat of the sun slowly turns water into water vapor and in few days through evaporation, the water evaporates completely leaving behind solid common salt.

##### **Q28. You must have often noticed that sky becomes clear after the first rain. Explain why?**

Ans. Rain drops attach themselves to dust particles suspended in air, make them heavy and bring them down to the earth that is why sky becomes clear.

##### **Q29. Differentiate between homogeneous and heterogeneous mixtures? Give an example of each.**

Ans. Difference between homogeneous and heterogeneous mixture

|  |  |
| --- | --- |
| **Homogeneous mixture** | **Heterogeneous mixture** |
| 1. ‘homo’ means same | 1. ‘hetero’ means different |
| 2. It has uniform composition | 2. It has non uniform composition |
| 3. It can’t be separated physically | 3. It can be separated physically |
| 4. Examples of homogeneous mixtures are: salt in water, sugar in water. | 4. Examples of heterogeneous mixtures are: water and sand, oil and water. |

##### **Q30. What should the size of the pores in a sieve depend upon?**

Ans. The size of the pores in a sieve depends upon the size of the substance to be separated and the impurities of the mixture.

##### **Q31. What are colloids? Give few examples of colloids that you see in your daily life.**

Ans. A colloid is mixture where at least two types of substances that are not as small as a solution and not as large as a suspension are mixed together.  Each substance retains its own properties. Examples: whipped cream, milk, butter, gelatin, jelly, muddy water, plaster, colored glass, and paper.

##### **Q32. What is the importance of threshing to the farmers?**

Ans. The essence of threshing is separation of a cereal grain from the shaft. Threshing is done after harvesting of the crops. This may be carried out in the field or on the farm, by hand or with the help of animals or machines.

##### **Q33. What is the function of candles in home water filters?**

Ans. Ceramic candle filters are simple devices made out of clay and used to filter drinking water in order to removes cloudiness, suspended materials and pathogens.

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