sns academy
a fingerprint school
Sincerity, Nobility and Service

Book exercise. Ln.5 - Separation of substances

A) Choose the most appropriate answer.

1.Most of the substances we see around us are
(a) pure elements. (b) pure compounds.
(c) impure elements. (d) **mixtures**.

2.A solution of salt in water is a
(a) compound. (b) **homogeneous mixture**.
(c) heterogeneous mixture. (d) element.

3.The property used in separating a mixture of two solids by winnowing is
(a) difference in colour. (b) difference in size.
(c) **difference in weight**. (d) attraction by magnet.

4.The process of settling down of particles of a solid in a liquid is
(a) decantation. (b) sublimation. (c) **sedimentation**. (d) filtration.

5.Which method is used to obtain a pure liquid from a solution?
(a) **distillation**. (b) condensation. (c) filtration. (d) loading

6.The temperature of a saturated solution of sugar in water is raised by 10 °C. Which of these statements is now true?
(a) It will continue to be saturated.
(b) **It will become unsaturated.**
(c) Whether it remains saturated or becomes unsaturated depends on the amount of water taken.
(d) It will continue to be saturated, but if the temperature is increased beyond 10 °C it will become unsaturated.

7.Which of the following can dissolve in water?
(a) only solids. (b) only solids and liquids
(c) **solids, liquids and gases**. (d) only liquids

8.Sedimentation and decantation are useful to separate
(a) immiscible liquids.
(b) soluble solid from liquid.
(c) insoluble solid from liquid.
(d) **insoluble solid from a liquid where the solid is heavier than the liquid.**

9.A commonly used chemical for loading is
(a) hydrogen. (b) **alum**. (c) sulphur. (d) common salt.

10. To get only the pure solid from its solution in water, which method will you use?
(a) **evaporation**. (b) distillation. (c) filteration (d) none of these

B)Very short answer questions.

1.There are very few pure elements or compounds around us. Most substances are mixtures. **True**

2.The constituents of all mixtures are uniformly spread throughout the mixtures. **false**

3.Is a solution of sugar in water homogeneous or heterogeneous?

ANS: In case of a sugar solution, the sugar is distributed uniformly in the water. Thus, sugar solution is a homogeneous solution.

4.Name one property of a compound that remains fixed and can be used to test if the compounds has impurities in it.

ANS: The melting point and boiling point are two properties of a compound that can be used to test its purity as they remain fixed.

5.We have to separate a mixture into its constituents because only pure compounds are useful to us. Mixtures are not of much use. **false**

6.Can a mixture of sawdust and water be separated by sedimentation and decantation?

ANS: Sedimentation and decantation cannot be used to separate sawdust from water because sawdust is not heavier than water. Sedimentation and decantation can only be used to separate an insoluble solid from a liquid if the solid is heavier than the liquid.

7.Which method gives a better separation of an insoluble solid from a liquid−sedimentation and decantation, or filtration?

ANS: An insoluble solid can be separated from a liquid more efficiently by filtration. Filtration can separate out solids that are also lighter than the liquid and it is faster since, liquid need not be left to stand.

8.Name the method which is used to speed up sedimentation.

ANS: The method used to speed up sedimentation is known as loading.

9.Which separation method is used to separate wheat grains from chaff?

ANS: Wheat grains are separated from chaff using the process of winnowing.

10. Name the method used to obtain salt from sea water.

ANS: Salt is obtained from sea water by evaporation of sea water.

11. Which method will you use to get a pure liquid from a solution containing several soluble solids in the liquid?

ANS: Distillation can be used to get a pure liquid from a solution containing several soluble solids in the liquid.

12. Which apparatus is used to cool the liquid vapours during distillation?

ANS:A Liebig's condensor is used to cool liquid vapours during distillation.

13. Which apparatus is used to separate two immiscible liquids?

ANS: Two immiscible liquids can be separated using a separating funnel.

14. Solubility of most solids in water increases with rise in temperature. **True**

15. Solubility of most solids in water increases with the rise in temperature.**True**

16.Can water dissolve liquids and gases also?

ANS: Yes, water can dissolve liquids such as alcohol or milk. It can also dissolve gases such as oxygen, nitrogen etc.

17. The solubility of common salt increases rapidly with rise in temperature. **True**

C.Short answer questions

1.You are given a sample of water. How will you find out whether it is pure or not?

ANS: To find out if water is pure or not, we can measure the boiling point of the sample. If the sample boils at 100 ^{o}C, then the water is pure.

2.What is the principle used in the separation of mixtures?

ANS: The principle used in the separation of a mixture employs a special property of one of the components of the mixture. For example, iron pieces mixed with sand can be separated using a magnet as iron gets attracted towards the magnet.

3.To use a sieve to separate sand and rice seeds, what should be the size of the holes of the sieve in comparison to the size of sand particles and rice seeds?

ANS: To separate sand from rice seeds, the holes in the sieve must be larger than the sand particles and smaller than the rice seeds so that, sand particles can easily pass through the sieves leaving behind the rice seeds.

4.Which property of a filter paper is used to separate an insoluble solid from a liquid?

ANS: An insoluble solid can be separated from a liquid using a filter paper as the filter paper allows the liquid to pass through it while the solid will not pass through the filter paper.

5.We always talk about a saturated solution at a certain temperature? Why is the temperature specified?

ANS: The solubility of a solid in a solution increases with increasing temperature. If the temperature of a saturated solution is increased, the solution will become unsaturated. Thus, the temperature plays an important role in specifying whether a solution is saturated or not.

6.Under which condition can handpicking be used to separate the constituents of mixture?

ANS: Handpicking can be used to separate the constituents of a mixture only when the constituents of the mixture are easily visible and can be separated. For example, stones can be separated from rice by handpicking.

7.Why are objects at a distance seen more clearly after rain?

ANS: When it rains, the dust particles in the air get wet and settle down on the ground. As a result, the air is clearer after it rains and objects at a distance are seen more clearly.

8.The process of adding alum to water to hasten sedimentation is called 'loading'. Why has this name been given to the process?

ANS: When alum is added to water, it dissolves in water and makes the suspended impurities heavier making them settle down quickly. Therefore, the addition of alum is known as loading.

D.Long answer questions.

1.What is the difference between homogeneous and heterogeneous mixtures? Give an example of each mixture.

ANS:

Homogeneous mixture	Heterogeneous mixture
The components of the mixture are uniformly distributed in the mixture.	The components of a mixture are not uniformly distributed in the mixture.
Example: Salt dissolved in water is a homogeneous mixture.	Example: Iron filings mixed in sand is a heterogeneous mixture.

2.List three properties of mixtures.

ANS: Following are the properties of mixtures:

1)The constituents of a mixture may be present in any ratio.

2)The constituents of a mixture retain their individual properties The molecules of the constituents do not change. For example, when iron and sulphur are mixed together, their properties do not change.

3)Constituents of a mixture can be separated easily. For example, stones in rice can be separated easily by visual observation.

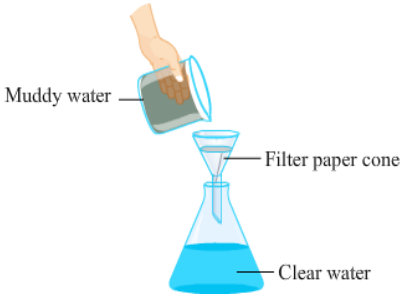
3.Give two situations where it is necessary to separate a mixture into its constituents.

ANS: It is necessary to separate a mixture into its constituents for the following situations:

Removing undesirable constituents: For example, it is desirable to remove small stones in rice, or separating tea leaves from tea.To obtain useful substances: Butter is obtained by churning curds. In the same way, crude oil can be separated into various oils such as petrol, kerosene, diesel etc.

4.Draw a labelled diagram to show the arrangement used to filter a mixture of a liquid and an insoluble solid.

ANS: The arrangement used to filter a mixture of a liquid from an insoluble solid is shown below:



5.Draw a labelled diagram of the apparatus used to distil out pure water from a solution.

ANS:

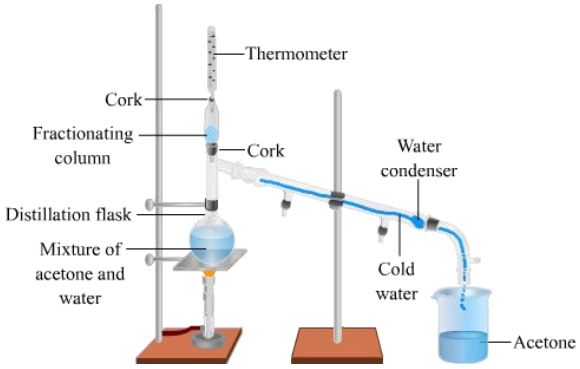


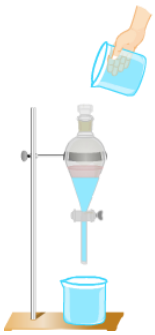
Diagram of apparatus used to distil out pure water from a solution

6.How will you separate a mixture of grass, pebbles and sand?

ANS: To separate a mixture of grass, pebbles and sand, the first step is to pass the mixture through a fine filter. Sand will pass through the filter leaving grass and the pebbles on the filter.
Then, we can winnow the grass and the pebbles since, they have different weights to separate them from each other.

7.Explain with the help of a diagram how can a mixture of oil and water be separated.

ANS: Oil and water can be separated using a separation funnel. The experimental set up is shown in the figure:



The mixture of oil and water is poured into the separating funnel and allowed to stand for some time. The oil accumulates at the top of the funnel and water near the bottom as shown in the figure. If the stop cock at the bottom is opened, water flows out of the funnel and can be collected in a beaker. If the stop cock is closed when the oil reaches the level of the stop cock, we will have oil in the funnel and water in the beaker.

8.Why is water considered as an important solvent?

ANS: Water is considered an important solvent because:

1)Water can dissolve a large number of substances that are important for life.

2)Waste products are also dissolved in water before they can be excreted from the body.

3)Most of the chemical reactions occurring in the body take place in the presence of water.

4)Gases such as oxygen and carbon dioxide are soluble in water. This makes aquatic life possible

Complete the hots questions and submit