



UNIQUE STUDY POINT

Separation of Substances

Question 1: Why do we need to separate different components of a mixture? Give two examples.

Answer: Before using a substance, we need to separate harmful or non-useful substances that may be mixed with it. Sometimes, we separate even useful components if we need to use them separately.

For example:

- (a) After preparing tea, we strain it to remove the used tea leaves from tea.
- (b) Pebbles are separated from rice and pulse before cooking.

Question 2: What is winnowing? Where is it used?

Answer: Winnowing is the method of separating components of a mixture containing heavier and lighter components by wind or by blowing air.

It is used to separate husk particles from seeds of grain.

Question 3: How will you separate husk or dirt particles from a given sample of pulses before cooking?

Answer: Husk or dirt particles can be separated by winnowing method.

Question 4: What is sieving? Where is it used?

Answer: Sieving is the process of filtering components of a mixture of different sizes. Sieving allows fine particles to pass through the holes of the sieve, while the bigger impurities remain on the sieve.

Sieving is used in flour mills to separate broken particles of grains from flour. It is also used at construction sites to separate lumps, smaller stones from the mixture of sand and cement.

Question 5: How will you separate sand and water from their mixture?

Answer: Sand and water can be separated by any of the following two methods:

(a) Sedimentation and decantation: Mixture is kept undisturbed for some time. After some time, sand being heavier and insoluble in water, settles down at the bottom of container. Now, water is poured into another container to separate it from sand.

(b) Filtration: Mixture of sand and water is passed through a filter paper (a filter with very fine pores). Sand particles being larger in size are retained by the filter paper and get separated from water.

Question 6: Is it possible to separate sugar mixed with wheat flour? If yes, how will you do it.

Answer: Yes. Through sieving we can separate sugar mixed with wheat flour. Sugar particles being larger in size are retained by the sieve whereas wheat flour will pass through it.

Question 7: How would you obtain clear water from a sample of muddy water?

Answer: Clear water can be obtained from a sample of muddy water by the method of filtration. In this method, the sample of muddy water is poured through a cloth having fine pores or through a filter paper. Water will pass through the filtering medium, leaving behind the mud.

Question 8: Fill up the blanks

(a) The method of separating seeds of paddy from its stalks is called _____.

(b) 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 _____.

(c) Salt is obtained from sea water by the process of _____ .

(d) 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 _____.

Answer:

(a) Threshing

(b) Filtration

(b) Evaporation

(d) Decantation

Question 9: True or false?

(a) A mixture of milk and water can be separated by filtration.

(b) A mixture of powdered salt and sugar can be separated by the process of winnowing.

(c) Separation of sugar from tea can be done with filtration.

(d) Grain and husk can be separated with the process of decantation.

Answer: (a) False: Filtration is used for the separation of solid components of the mixture from the liquid. But here both the components are liquids.

(b) False: Winnowing is used to separate heavier particles from the lighter particles which can be blown away by wind. But here both sand and sugar are heavy particles.

(c) False: Dissolved particles cannot be separated by filtration.

(d) False: Decantation is used to separate insoluble solid components from the liquid component.

Question 10: 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?

Answer: We should add sugar before adding ice. Sugar dissolves in warm water more quickly than in cold water. We can dissolve more sugar before mixing ice in water.

Short Type Questions and Answers

Question 1. When is handpicking used?

Answer: Handpicking is used to separate undesirable component when present in small amount.

Question 2. What is threshing? How is it done?

Answer: The process that is used to separate the grain from stalks is threshing. In this process, the stalks are beaten to free the grain seeds. Sometimes, threshing is done with the help of bullocks. Machines are also used to thresh large quantities of grain.

Question 3. Which type of separation is used in cashew nut factories?

Answer: Sieving.

Question 4. Give one example of sieving used in everyday life.

Answer: Separation of barn (choker) from flour.

Question 5. Name some materials that are used as filters.

Answer: Cotton, ceramic, filter cloth, filter paper.

Question 6. Name the process of separating two immiscible liquids.

Answer: By using separating funnel or by decantation.

Question 7. Which substance is used for loading?

Answer: Alum (phitkari).

Question 8. What is the use of alum in loading?

Answer: Alum is used to make the sedimentation faster. By adding alum the clay particles settle down rapidly.

Question 9. Which process is used to separate bacteria from water?

Answer: Filtration, by using special filters, i.e., bacteria proof filter.

Question 10. What is decantation?

Answer: Decantation is a process of separating insoluble solids from liquids. A suspension of solid particles in liquid is allowed to stand for some time. Solid particles settle down at the bottom, due to their weight.

Question 11. What is the use of decantation?

Answer: Decantation is used to separate insoluble solids from liquids. Two immiscible liquids are also separated by this process.

Question 12. What is the drawback of evaporation?

Answer: The liquid in the mixture is evaporated off into the air and is not recovered.

Question 13. Name the process to obtain salt from seawater.

Answer: Evaporation.

Question 14. Which types of mixtures are separated by evaporation?

Answer: Evaporation is used to separate solids dissolved in liquid.

Question 15. Describe the method to obtain pure salt from rock salt.

Answer: First, the mixture is crushed and grinded. Water is then added and filtered. Pure salt is collected as filtrate which is heated for evaporation. Water evaporates off and pure salt is left.

Question 16. How will you separate pure water from a solution of salt in water?

Answer: We can separate pure water from a solution of salt in water, by the process of distillation that is by evaporation and followed by condensation.

Question 17. Write opposite process of condensation.

Answer: Evaporation.

Question 18. What do you mean by solubility?

Answer: The maximum mass of a solute that can be dissolved in 100 g of the solvent at any specific temperature is called solubility.

Question 19. Why is water a universal solvent?

Answer: Water can dissolve different kinds of substances. That is why water is commonly called as a universal solvent.

Question 20. What is the effect of temperature on solubility?

Answer: Solubility increases when the increase in temperature takes place.

Question 21. Differentiate between saturated and unsaturated solutions.

Answer: Saturated solution: A solution in which no more solute can be dissolved at a given temperature.

Unsaturated solution: A solution in which more solute can be dissolved at any temperature.

Question 22. During centrifugation, which particles settle down at the bottom?

Answer: Heavy particles settle down at the bottom and lighter particles float at the top of the liquid.

Question 23. Name the method by which you can separate butter from milk.

Answer: Centrifugation.

Question 24. Name the device by which cream can be separated from milk at home.

Answer: A mixer-grinder is the very important device by which cream can be separated from milk.

Question 25. Why does visibility increase after rains?

Answer: After rains, the objects at a distance are seen more clearly, because the fine dust particles that were present in air settle down due to loading by rain drops.

Question 26. What is strainer?

Answer: Wire mesh is commonly known as strainer. For example, while preparing tea, we separate tea leaves from water by using a filter such as wire mesh. Tea leaves are bigger in size than the holes of the mesh.

Long Type Questions and Answers

Question 1. Name the property of the components used for separating the following mixtures:

1. salt and camphor
2. wheat and husk
3. iron fillings and saw-dust
4. coconut oil and water.

Answer:

1. sublimation
2. winnowing
3. magnetic separation
4. separating funnel.

Question 2. Mention the methods that can be used for the separation of the following mixtures:

1. wheat, sugar and husk
2. rice, gram and iron fillings

3. sand, Mack gram (urad) and husk.

Answer:

1. Mixture of wheat, sugar and husk.

- For separating husk from the mixture, we should follow the winnowing method as husk is lighter than other two components.

- Wheat and sugar can be separated by sieving as they have different sizes.

2. Mixture of rice, gram and iron fillings.

- For separating iron fillings, we can use a magnet.

- Rice and gram can be separated either by sieving or by handpicking.

3. Sand, black gram (urad) and husk.

- For separating sand from the mixture, we can sieve the mixture.

- Black gram (urad) and husk can be separated by the method of winnowing.

Question 3. Write various methods of separation of compounds from their mixture.

Answer:

1. Handpicking

2. Threshing

3. Winnowing

4. Sedimentation

5. Decantation

6. Filtration

7. Evaporation

8. Condensation.

Question 4. How will you Separate a mixture of common salt and chalk powder?

Answer: We know that common salt is soluble in water while chalk is sparingly, soluble. So, on the basis of different solubility, we can separate the common salt and chalk powder as follows:

- First, some water is mixed with the mixture of common salt and chalk powder, stir the solution well. Filter the solution by using filter paper. On filtering, chalk powder is obtained as a residue on the filter paper and salt solution is obtained.

- Now filtrate is evaporated and dry common salt is left behind.

Question 5. Match the following items given in Column A with that in Column B:

Column A	Column B
(a) Handpicking	(i) Conversion of water vapours into liquids
(b) Threshing	(ii) Separating bran from flour

(c) Winnowing	(iii) Separating larger size impurities
(d) Sieving	(iv) Separating butter from milk
(e) Sedimentation	(v) Conversion of water into its vapours
(f) Evaporation	(vi) Separating grains from its stalks
(g) Condensation	(vii) Settling of heavier components at bottom
(h) Churning	(viii) Separation by wind or by blowing air

Answer:

Column A	Column B
(a) Handpicking	(iii) Separating larger size impurities
(b) Threshing	(iv) Separating grains from its stalks
(c) Winnowing	(viii) Separation by wind or by blowing air
(d) Sieving	(ii) Separating bran from flour
(e) Sedimentation	(vii) Settling of heavier components at bottom
(f) Evaporation	(v) Conversion of water into its vapours
(g) Condensation	(i) Conversion of water vapours into liquids
(h) Churning	(iv) Separating butter from milk

Question 6. What is filtration?

Answer: The process by which insoluble substance can be separated from a solution, by passing that solution through a porous paper (filter paper) is called filtration.

When one component of a mixture is soluble in water and other component is insoluble in water, the soluble component gets dissolved and insoluble one is separated by filtering the solution.

During filtration, the solid insoluble substance is retained at the filter paper as residue while the liquid free from any suspended matter passes through the filter paper and is collected as filtrate.

Question 7. How is common salt obtained from seawater?

Answer: When seawater is allowed to evaporate in shallow pits, water gets heated by sunlight and changes into water vapour by the process of evaporation leaving behind impure solid salts. Now, the lumps of impure common salt are crushed to get powdered salt. The powdered common salt is dissolved in water to prepare a solution. Now the solution of common salt is filtered to remove

insoluble impurities. The clear solution is evaporated by heating to remove the water content to obtain a concentrated solution of common salt. The hot and concentrated solution is allowed to cool. On cooling, crystallization takes place and crystals of pure common salt are obtained.

Question 8. What is the importance of centrifugation? How is it done?

Answer: Centrifugation is the process of separating suspended particles from a liquid by rotating the liquid at a high speed. The mixture is taken in a closed bottle and rotated at a high speed. The heavy particles settle at the bottom while light particles remain behind. This method is also used to separate cream from milk. Cream collects at the centre and being lighter than milk, it floats at the top of the mixture.

FOR MORE STUDY MATERIALS VISIT: WWW.UNIQUESTUDYONLINE.COM

JOIN US ON:

