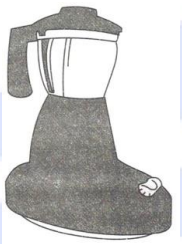
Methods of separation:

1. Centrifugation.
2. By using separating funnel or by decantation.
3. Alum is used to make the sedimentation faster. By adding alum the clay particles settle down rapidly.
4. Filtration, by using special filters.
5. Evaporation.
6. Sieving.
7. Cotton, ceramic, filter, cloth, filter paper.
8. Alum
9. Heavy particles settle down at the bottom and lighter particles float at the top of the liquid.
10. The liquid in the mixture is evaporated off into the air and is not recovered.
11. A mixer – grinder is the very important device by which cream can be separated from milk.

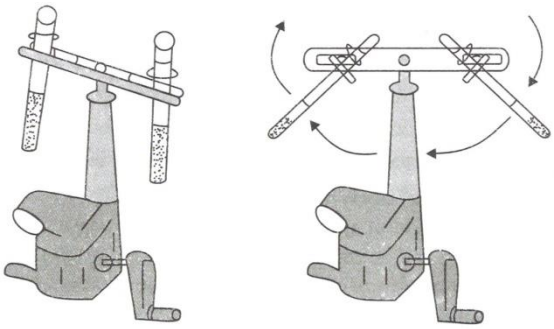


A mixer-grinder

12. Hand- picking is used to separate undesirable component, when present in small amount.
13. First the mixture is crushed and grinded. Water is then added and filtered. Pure salt is collected as filtrate which is heated. Water evaporates off and pure salt is left.
14. Decantation is used to separate insoluble solids from liquids. Two immiscible liquids are also separated by this process.
15. The process that is used to separate 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.
16. Evaporation is used to separate solids dissolved in liquid.
17. Separation of barn (choker) from flour.
18. After rains, the objects at a distance are seen more clearly, because the fine dust particles that are present in air settle down due to loading by rain drops.
19. We can separate pure water from a solution of salt in water, by the process of distillation that is by evaporation followed by condensation.
20. 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.

Separation of tea leaves by using a strainer

21. Centrifugation is the process of separating suspended particles from a liquid by rotating the liquid at a high speed.



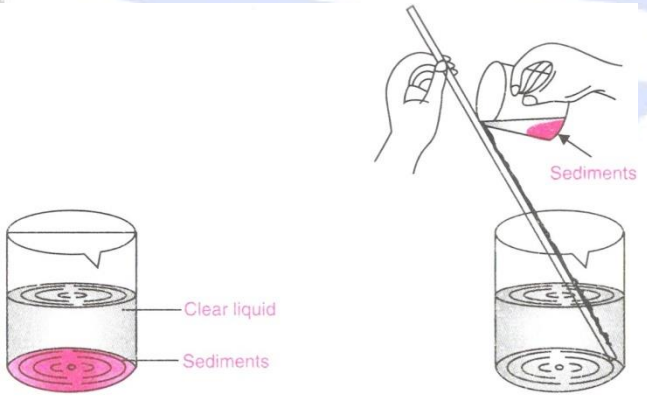
A hand centrifuge machine

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 used to separate cream from milk. Cream collects at the centre and being lighter than milk, it floats at the top of the mixture.

22. (i) Sublimation
    (ii) Winnowing
    (iii) Magnetic separation
    (iv) Separating funnel.

23. We know that common salt 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:
    (i) Firstly, 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.
    (ii) Now filtrate is evaporated and dry common salt is left behind.

24. Decantation is a process of separating insoluble solids from liquids. A suspension of solid particles in liquid is allowed to stand for sometimes. Solid particles settle down at the bottom, due to their weight. This is called sedimentation. The clean water is transferred into another beaker, without disturbing the settled particles. This type separation is called decantation.

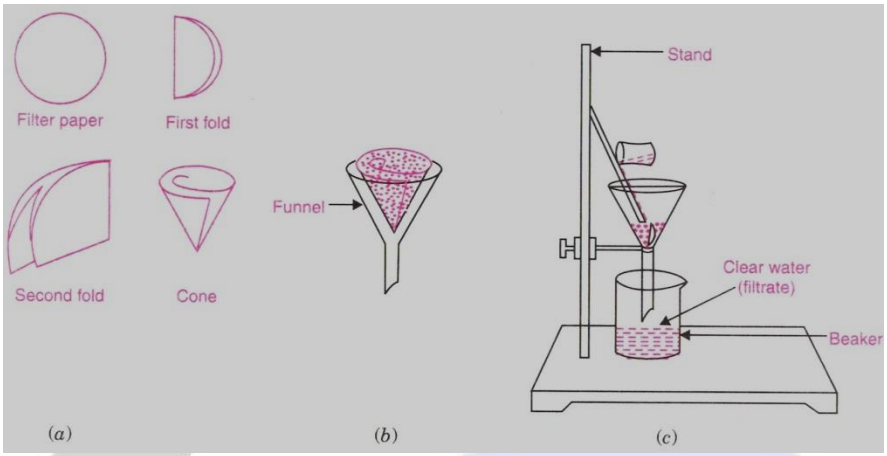


Decantation

25. 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

    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. During filtration, the solid insoluble substance is retained at the filter paper as residue while the liquid free from 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. This filtrate may be warm to dry to obtain soluble component. Fig. (a), (b), (c) shows the folding and use of filter paper in filtration.



In figure: (a) Preparation of a filter paper cone, (b) Fixing of the folder filter paper in a funnel, (c) Filtration through filter paper

26. When sea water is allowed to stand 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.

27. (i) Mixture of wheat, sugar and husk.
    1. For separating husk from the mixture, we should follow the winnowing method husk is lighter than other two components.
    2. Wheat and sugar can be separated by sieving as they have different sizes.

    (ii) Mixture of rice, gram and iron fillings.
    1. For separating iron fillings, we can use a magnet.
    2. Rice and gram can be separated either by sieving or by hand-picking.

    (iii) Sand, black gram (urad) and husk.
    1. Foe separating sand from the mixture, we can sieve the mixture.
    2. Black gram (urad) and husk can be separated by the method of winnowing.