Sadiq Public School

Do the right, fear no man

Subject: G. Science **Class: P6** **Day: Saturday (16-11-2024)**

Lesson

This lesson is about techniques for separating mixtures.

A: Inquiry

We studied about differences between homogenous and heterogenous mixtures. How we can separate mixtures from each other?

This lesson will enable the students to:

- Understand what different techniques for separating mixtures are.
- Describe each type with examples.

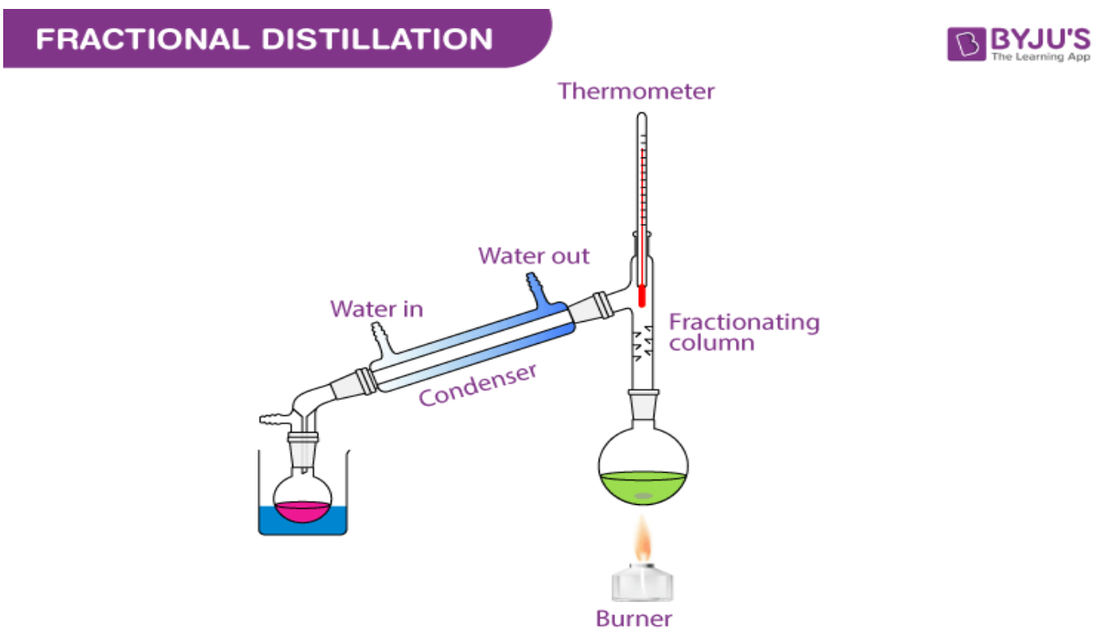
B: Information

Separation of Mixtures

Not everyone is out searching for gold (and not many of those searchers is going to get much gold, either). In a chemical reaction, it is important to isolate the component(s) of interest from all the other materials so they can be further characterized. Studies of biochemical systems, environmental analysis, pharmaceutical research – these and many other areas of research require reliable separation methods. Here are a number of common separation techniques:

Distillation

Distillation is an effective method to separate mixtures that are comprised of two or more pure liquids. Distillation is a purification process where the components of a liquid mixture are vaporized and then condensed and isolated. In simple distillation, a mixture is heated, and the most volatile component vaporizes at the lowest temperature. The vapor passes through a cooled tube (a condenser), where it condenses back into its liquid state. The condensate that is collected is called distillate.



In the figure above, we see several important pieces of equipment. There is a heat source, a test tube with a one-hole stopper attached to a glass elbow, and rubber tubing. The rubber tubing is placed into a collection tube, which is submerged in cold water. There are other more complicated assemblies for distillation that can also be used, especially to separate mixtures which are comprised of pure liquids, with boiling points that are close to one another.

Evaporation

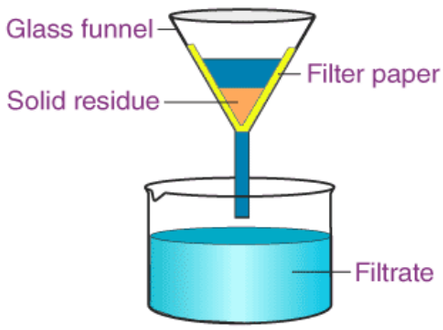
Evaporation is a technique used to separate out homogeneous mixtures that contain one or more dissolved salts. The method drives off the liquid components from the solid components. The process typically involves heating the mixture until no more liquid remains. Prior to using this method, the mixture should only contain one liquid component, unless it is not important to isolate the liquid components. This is because all liquid components will evaporate over time. The evaporation method is suitable to separate a soluble solid from a liquid.

Evaporation process

In many parts of the world, table salt is obtained from the evaporation of sea water. The heat for the process comes from the sun.

Filtration

Filtration is a separation method used to separate out pure substances in mixtures comprised of particles—some of which are large enough in size to be captured with a porous material. Particle size can vary considerably, given the type of mixture. For instance, stream water is a mixture that contains naturally occurring biological organisms like bacteria, viruses, and protozoa.

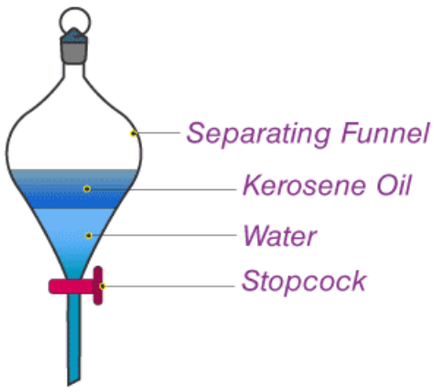


Filtration process

Some water filters can filter out bacteria, the length of which are on the order of 1 micron. Other mixtures, like soil, have relatively large particle sizes, which can be filtered through something like a coffee filter.

Separating Funnel

Separating funnel is used mainly to segregate two immiscible liquids. The mechanism involves taking advantage of the unequal density of the particles in the mixture. Oil and water can be easily separated using this technique.



Separating Funnel

C: Synthesis/absorbing the information

Write your own notes in your notebooks related to separation of mixture.

Watch this video related to topic discussed above.

https://youtu.be/6K3Roqp41N0

D: Practicing:

- What is evaporation?
- How filtration is done?
- Give four examples of filtration from daily life.
- What is fractional distillation?
- How fractional distillation works to separate mixtures?