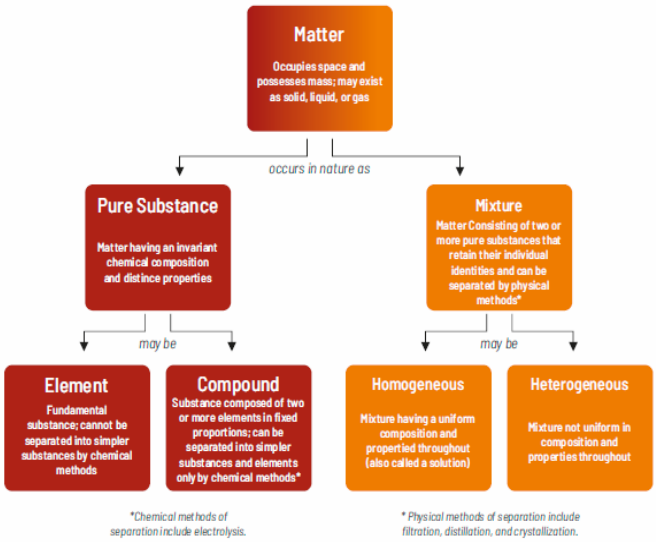
Separation Techniques

Solid-liquid mixtures such as sand in water or tea leaves in tea are readily separated by filtration, which consists of passing the mixture through a barrier, such as a strainer, with holes or pores that are smaller than the solid particles. In principle, mixtures of two or more solids, such as sugar and salt, can be separated by microscopic inspection and sorting.



*Chemical methods of separation include electrolysis.

* Physical methods of separation include filtration, distillation, and crystallization.

Separating Mixtures

Mixtures come in many forms and phases. Most of them can be separated, and the kind of separation method depends on the kind of mixture it is. Below are some common separation methods:

Paper Chromatography

This method is often used in the food industry. It is used to identify chemicals (coloring agents) in foods or inks. For example, if a scientist wants to know how many substances are in a particular blob of ink, paper chromatography can be used

Filtration

This is a more common method of separating an insoluble solid from a liquid. An example of such a mixture is sand and water. Filtration is used in water treatment plants, where water from rivers is filtered to remove solid particles.

Evaporation

Evaporation is great for separating a mixture (solution) of a soluble solid and a solvent. The process involves heating the solution until the solvent evaporates (turns into gas) leaving behind the solid residue.

Simple distillation

This method is best for separating a liquid from a solution. In a way, the concept is similar to evaporation, but in this case, the vapor is collected by condensation. For example, if you want to separate water from a salt solution, simple distillation would be great for this.

Fractional distillation

Similar to simple distillation, fractional distillation is best for separating a solution of two miscible liquids. (Miscible liquids are liquids that dissolve in each other). The Fractional method takes advantage of the different boiling points of the two liquids.

Magnetism

Magnetism is ideal for separating mixtures of two solids with one part having magnetic properties. Some metals like iron, nickel and cobalt have magnetic properties whiles gold, silver and aluminum do not. Magnetic elements are attracted to a magnet.

Separating funnel

In this technique, two liquids that do not dissolve very well in each other (immiscible liquids) can be separated by taking advantage of their unequal density. A mixture of oil and water, for example, can be separated by this technique.