

Physical vs. Chemical Properties

And using them to separate mixtures

Physical Property

○ – a characteristic that a sample of matter exhibits **without** changing its identity.

○ Examples include:

- Color
- Melting Point
- Boiling Point
- Solubility
- Density
- Magnetism
- Physical State
 - (solid, liquid, gas)
- Hardness
- Taste
- Smell
- Electrical Conductivity

Chemical Property

○ – a property that can be observed only when there is a **change** in the composition of the substance.

○ Examples:

- Ability to burn (flammability)
- Ability to react with oxygen (Iron will form rust, silver will tarnish)
- Ability to react with acids (for all metals)
- Inability to react is also a chemical property

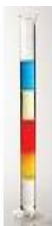
Separating Mixtures

Separating Heterogenous Mixtures

- **Filtration** — Solid particles can be removed from **liquids** this way.



- **Using Density** – Density is the ratio of mass to volume of a substance. If two substances have different densities, the **less** dense material will be on the top, and the **more** dense will be on the bottom.



- **Magnets** - if one component of a mixture is a magnetic solid such as iron.

Separating Homogenous Mixtures/Solutions

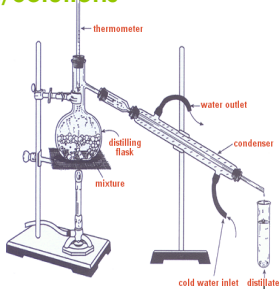
Recrystallization

- Evaporate or boil of the **liquid** to leave the **solid**.

Separating Homogenous Mixtures/Solutions

Distillation

- used to separate a mixture of two **liquids** with different **boiling points**. The one with the **lower** boiling point boils off first leaving the liquid with the **higher** boiling point behind.



Separating Homogenous Mixtures/Solutions

Chromatography

- Allowing a solution to flow through a stationary substance. Different components will have a different **attraction** for the stationary phase and the mobile phase (usually water).
Example - Ink on paper

Let's investigate chromatography

You will need

- Beaker
- Water/Alcohol solution
- Pencil
- Tape
- Chromatography paper
- Colored marker

