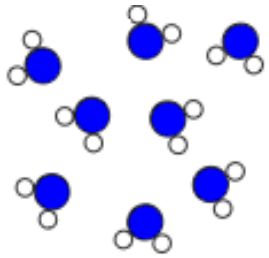
Summary Sheet Year 7 Separating Mixtures

Pure substance

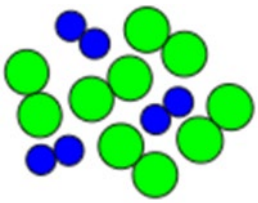
Contains only one type of element or compound



Molecules of a **pure compound**

Mixture

Contains two or more different substances mixed together but not chemically joined



Molecules of **two different elements** mixed together

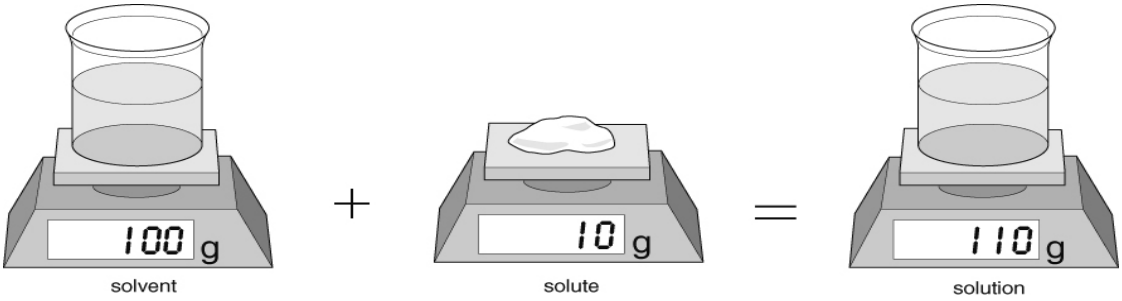
Solutions

Some solids **dissolve** in water to make a solution. These solids are **soluble**.

A solution is made from a **solute** (solid that dissolves) and a **solvent** (liquid which it dissolves in).

Substances that do not dissolve in a solvent are **insoluble**.

When a solid dissolves in water, the **total mass is conserved**. The total mass of a solution equals the mass of solvent added to the mass of solute.



If you keep adding solute to a solvent, you will get to a point where no more will dissolve. The solution is now **saturated** with solute. More solid will only dissolve if you add more solvent (e.g. water) or increase the temperature.

A solid may **dissolve faster** if the temperature is higher, or if it is stirred more.

Interpreting a Chromatogram

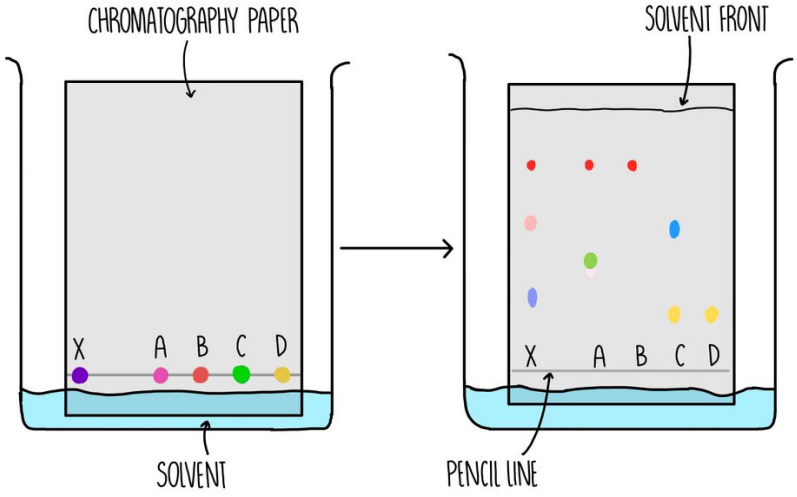
Chromatography can identify different coloured substances in a mixture.

This paper chromatogram shows that **B and D** are all single, **pure substances** (only one dot shown).

Substances **A and C** are **mixtures of 2 substances** (2 spots shown).

Substance **X** is a **mixture of 3 different substances**.

Red is the **most soluble** colour as it **moves furthest** up the filter paper.



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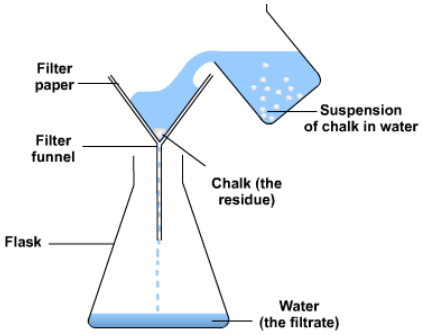
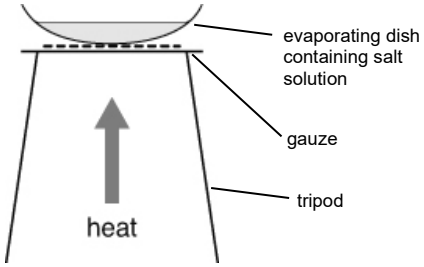
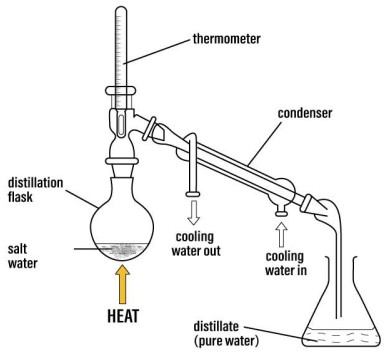
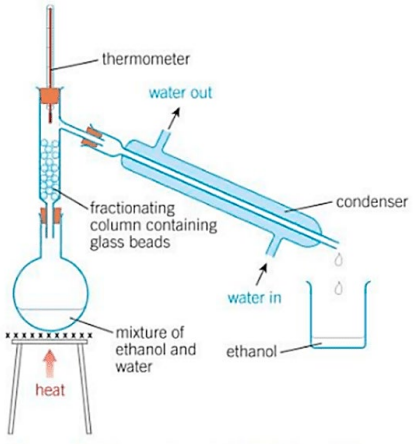
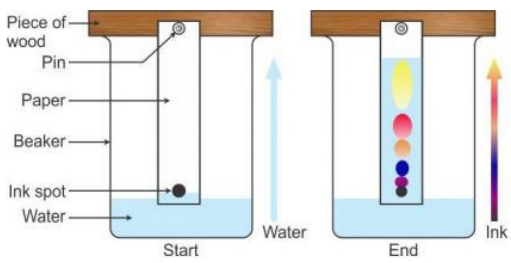
Method	Used to separate	Apparatus used	Examples
Filtering (filtration)	An insoluble solid from a liquid		• separating sand from a mixture of sand and water
Evaporation (or crystallisation)	A soluble solid from a liquid (useful when you only want the solid)		• separating salt from salt solution
Distillation (evaporation followed by condensation)	A solvent from a solution (useful when you want to keep the liquid as well as the solid)		• separating pure water from a salt solution
Fractional distillation	Mixtures with different boiling points into fractions, as they condense at different temperatures (useful when you want to keep both the liquids)		• separating two liquids with different boiling points eg. alcohol (78°C) and water (100°C) • separation of crude oil into useful substances
Chromatography	Different coloured substances in a mixture		• separation of colours found in ink