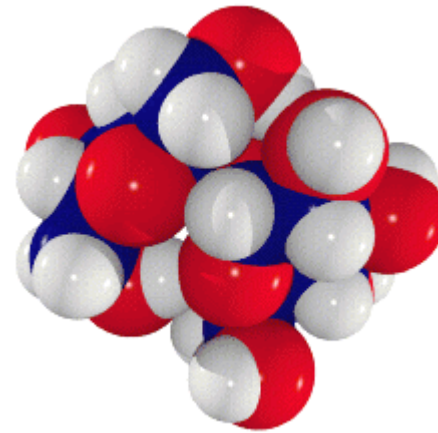


Compounds vs mixtures

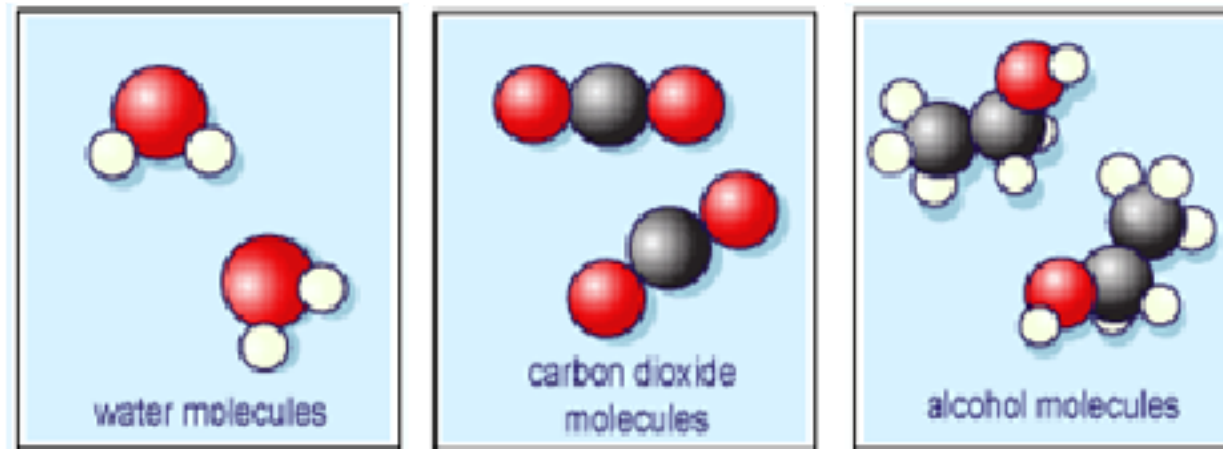


Physics and Chemistry
IES Jaume Salvador i Pedrol
February 2009

Compounds

Remember that a compound is a substance **made up** from two or more elements, chemically joined together.

This means that compounds will **always** exist as molecules, not separate atoms. The diagrams show some molecules of common compounds.

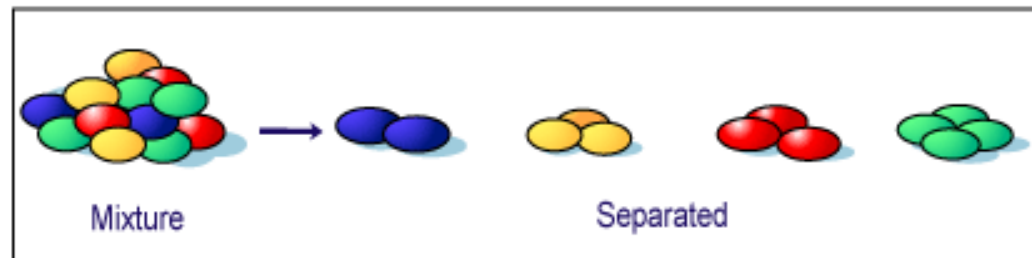


make up = constitute

Mixtures

A mixture is made from different substances that are not chemically joined together - imagine coloured sweets which can be mixed together in a packet, but which are not chemically joined to each other.

The different substances in a mixture can be separated from each other without needing a chemical reaction, in the way that different coloured sweets can be picked out and put into separate piles.



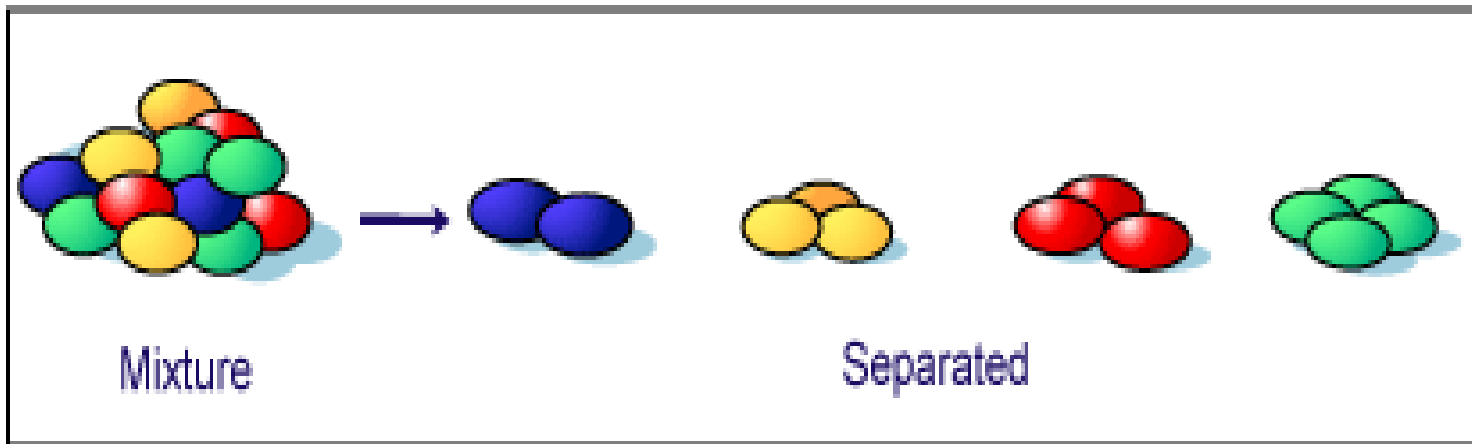
A packet of sweets contains a mixture of different colours

Mixture and compounds

Mixtures have different properties from compounds

	Mixture	Compound
Composition	Variable composition – you can vary the amount of each substance in a mixture.	Definite composition – you cannot vary the amount of each element in a compound.
Joined or not	The different substances are not chemically joined together.	The different elements are chemically joined together.
Properties	Each substance in the mixture keeps its own properties.	The compound has properties different from the elements it contains.
Separation	Each substance is easily separated from the mixture.	It can only be separated into its elements using chemical reactions.
Examples	Air, sea water, most rocks.	Water, carbon dioxide, magnesium oxide, sodium chloride.

Separating mixtures



The different substances in mixtures are usually easily separated from one another.

The method you use depends upon the type of mixture you have.

Try to guess what is the suitable method in each case.

Filtration

This is good for separating an insoluble solid from a liquid (an insoluble substance does not dissolve in water).

For example, sand can be separated from a mixture of sand and water using **Filtration**.....



http://www.bbc.co.uk/schools/ks3bitesize/science/chemistry/elements_com_mix_8.shtml

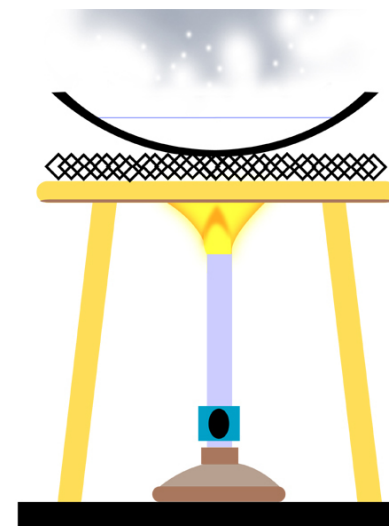
Evaporation

This is good for separating a soluble solid from a liquid (a soluble substance dissolves in water to form a solution).

For example, copper sulphate crystals can be separated from copper sulphate solution using

Evaporation.....

Remember that it is the water that evaporates away, not the solution.



Simple distillation

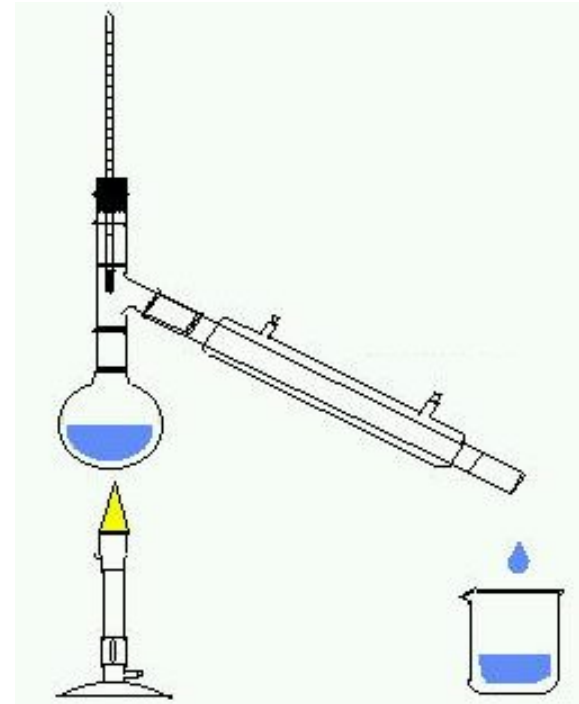
This is good for separating a liquid from a solution.

For example, water can be separated from salty water by

..**Simple distillation**.....

This method works because the liquid evaporates from the solution, but is then cooled and condensed into a separate container.

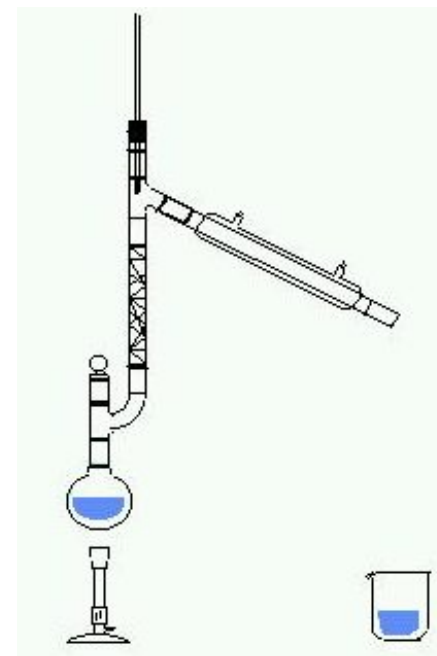
The salt does not evaporate and so it stays behind.



Fractional distillation

This is good for separating two or more liquids from each other.
For example, ethanol (alcohol) can be separated from a mixture of ethanol and water by

Fractional distillation.....

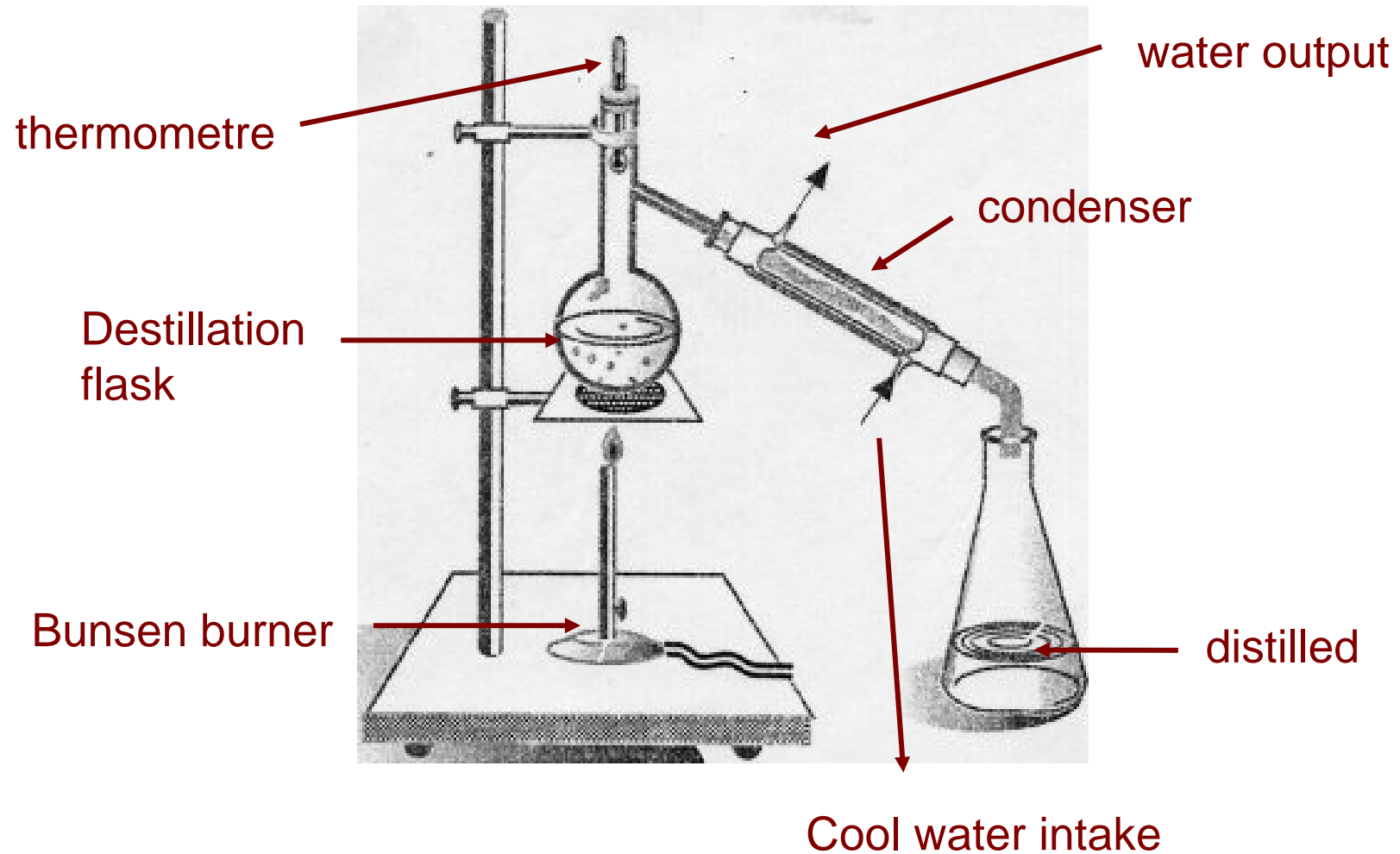


This method works because the two liquids have different boiling points.

http://www.bbc.co.uk/schools/ks3bitesize/science/chemistry/elements_com_mix_8.shtml

Distillation apparatus

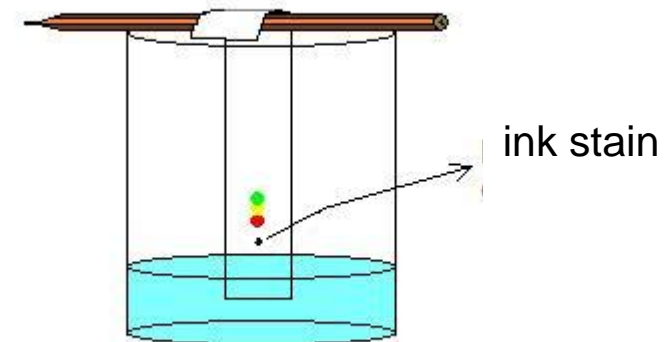
Can you remember the names of their parts?



Chromatography

This is good for separating dissolved substances that have different colours, such as inks and plant dyes.

It works because some of the coloured substances dissolve in the liquid better than others, so they travel further up the paper.



Separation of the compounds of the ink

<http://www.ucm.es/info/diciex/programas/quimica/pelis/barramezclas.html>

http://www.bbc.co.uk/schools/ks3bitesize/science/chemistry/elements_com_mix_8.shtml

Now, you have to write 5 questions about this topic in order to ask some classmate...

- **Is the carbon dioxide a mixture?**
- **Is the carbon dioxide a substance made of molecules?**
- **Does a mixture need a chemical reaction to be separate?**
- **What happen when a solution is heated?**
- **Which part of a salt and water evaporates when it's heated?**
- **What is a molecule?**
- **Which of this methods you have to use to?**
- **How many methods of separation you know?**

Diagram of separation

