

CAIE Chemistry IGCSE

12.4 Separation and purification

Flashcards

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How can a pure substance be identified using melting or boiling points?



How can a pure substance be identified using melting or boiling points?

Pure substances have a sharp, exact melting and boiling point whereas impure substances will melt/boil over a range of temperatures.



What method can be used to separate
an insoluble salt from a solution?
Describe the process



What method can be used to separate an insoluble salt from a solution? Describe the process

Filtration:

- Put a piece of filter paper into a funnel and place over a conical flask.
- Pour the mixture into the funnel so that the liquid collects in the beaker.
The insoluble salt is left on the filter paper.
- Pour deionised water into the funnel to wash any of the solution from the salt.
- Leave the salt to dry on the filter paper.



How can a soluble salt be separated from a solution? Describe the process



How can a soluble salt be separated from a solution? Describe the process

Crystallisation:

- Place the solution in an evaporating basin.
- Warm the solution gently so that the solvent starts to evaporate and the concentration of the solution increases.
- Remove from the heat and allow the mixture to cool before all the solvent evaporates.
- Leave to evaporate without heating. Dry and collect the crystals.



When is simple distillation used as a separating technique?



When is simple distillation used as a separating technique?

To separate and purify a liquid from a mixture of liquids. It is suitable when the liquids have different boiling points.



Describe how to separate a mixture of water and ethanol using simple distillation



Describe how to separate a mixture of water and ethanol using simple distillation

- Pour the mixture into a round bottomed flask and connected to a condenser (water should flow in at the bottom and out at the top). Place a beaker at the outlet.
- Slowly heat the flask until the ethanol starts to vaporise. Since ethanol has a lower boiling point than water, the ethanol evaporates first then condenses in the condenser before being collected in the beaker.



What mixture is fractional distillation commonly used to separate?



What mixture is fractional distillation commonly used to separate?

Crude oil



Describe how fractional distillation
separates crude oil



Describe how fractional distillation separates crude oil

- The crude oil is heated until it evaporates.
- The vapours enter a fractionating column. The column has a temperature gradient (hottest at the bottom).
- The vapours rise up the column and substances condense at different fractions depending on their boiling points.

