

Cambridge IGCSE Chemistry

Topic 2: Experimental techniques

Criteria of purity

Notes



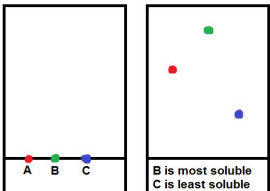


Demonstrate knowledge and understanding of paper chromatography

- Paper chromatography:
 - Used to separate mixtures and give information to help identify substances
 - Involves a stationary phase and a mobile phase
 - Separation depends on the distribution of substances between the phases
 - To carry it out: place substances on line near bottom of paper, place in solvent and observe how far the substances travel up the paper

Interpret simple chromatograms

- if two substances are the same, they will show up the same on the paper after carrying out the chromatogram
- if the substance is a mixture, it will separate on the paper to show all the different components as separate spots
- an impure substance will show up with more than one spot, a pure substance should only show up with one spot

Paper Chromatography 	Analytical technique separating compounds by their relative speeds in a solvent as it spreads through paper. The more soluble a substance is, the further up the paper it travels. Separates different pigments in a coloured substance.
Pigment	Solid, coloured substance

(Extended only) ...Including the use of Rf values

- Rf value = distance moved by substance ÷ distance moved by solvent
- Different compounds have different Rf values in different solvents, which can be used to help identify the compounds
 - Compounds in a mixture may separate into different spots depending on the solvent but a pure compound will produce a single spot in all solvents





(Extended only) Outline how chromatography techniques can be applied to colourless substances by exposing chromatograms to substances called locating agents; knowledge of specific locating agents is not required

- You can analyse colourless mixtures of chemicals if the 'spots' can be coloured by a chemical or light treatment
 - o Examples include...
 - Ninhydrin used with proteins – breaks them down into amino acids and colours them purple
 - UV light – fluoresce many colourless organic molecules
 - (you don't need to remember these specific locating agents)
 - o These are all known as locating agents, allowing Rf values to be taken and (previously colourless) molecules to be identified

Identify substances and assess their purity from melting point and boiling point information

- Pure substances melt and boil at specific temperatures
 - o This melting and boiling points data can be used to distinguish pure substances from mixtures (which melt over a range of temperatures due to them consisting of 2 or more elements or compounds)

Understand the importance of purity in substances in everyday life, e.g. foodstuffs and drugs

- A mixture:
 - o Consists of 2 or more elements or compounds not chemically combined together
 - o Chemical properties of each substance in the mixture are unchanged
- A pure substance = a single element or compound, not mixed with any other substance
- In everyday language, a pure substance = substance that has had nothing added to it, so it is unadulterated and in its natural state, e.g. pure milk
- to have a pure substance for food or drugs is very important as impurities could be dangerous even in small amounts

