

8.1 PURITY, FORMULATIONS AND CHROMATOGRAPHY

Pure substances

The closer the recorded value to the exact value, the purer the substance

The melting or boiling point of a sample can be compared with the actual value in a data book

A pure substance will melt/boil at a specific temperature

Boiling or melting point used to determine purity

E.g. pure milk

Everyday definition: A substance with nothing added to it.

Chemistry definition: A substance that contains only one compound or element

Separation depends on the distribution of the substances between the two phases

Separates substances in a mixture

E.g. paper in paper chromatography

Stationary phase - where the molecules can't move

A solvent, e.g. water or ethanol

Mobile phase - where the molecules can move

Allows the constituent substances of the mixture to be identified

Different compounds have different Rf values in different solvents

Rf values

$$Rf = \frac{\text{distance moved by substance}}{\text{distance moved by solvent}}$$

Mixtures designed for a particular use

Formulations

Impurities in the sample will decrease the boiling point and cause the sample to boil over a wider range of temperatures

Impurities in the sample will increase the melting point and cause the sample to melt over a wider range of temperatures

Ensures the formulation has the correct properties

Made by mixing the components in precise quantities

Formulations are found in paints, fuels, cleaning products, cosmetic, fertilisers and foods

The more soluble a chemical, the more time it spends in the solvent, meaning it will move further up the paper

Pure compounds will produce a single spot in all solvents

The compounds in a mixture should separate into different spots (depends on solvent)

The solvent moves up the paper, carrying the substances in the mixture

Paper chromatography

Chromatogram

AQA