



# 8.3 IDENTIFICATION OF IONS BY CHEMICAL AND SPECTROSCOPIC MEANS (Chemistry only)

Aluminium hydroxide will redissolve in excess sodium hydroxide

Calcium, aluminium and magnesium ions all produce white precipitates

Copper(II) ions form a blue precipitate, iron(II) ions form a green precipitate and iron(III) ions form a brown precipitate

Add sodium hydroxide solution to identify metal ions

Metal hydroxides

Limewater will turn cloudy

Carbon dioxide identified by bubbling through limewater

Carbonates react with dilute acids to produce carbon dioxide

Carbonates

1. Clean a wire loop using hydrochloric acid
2. Hold it in the blue flame until it burns without colour
3. Dip the loop into the sample
4. Place the loop in the flame and record the colour

Flame tests

Lithium ions – crimson flame

Sodium ions – yellow flame

Potassium ions – lilac flame

Copper ions – green flame

Calcium ions – orange-red flame

Some flame colours may be masked if the sample contains a mixture of ions

First add dilute nitric acid

Add silver nitrate solution

Halides

Coloured precipitates produced: silver chloride is white, silver bromide is cream and silver iodide is yellow

Used to detect and identify elements and compounds

Sensitive, accurate and rapid

Analyse metal ions in solution

Instrumental methods

Flame emission spectroscopy

A line spectrum is produced that can be analysed to identify the ions and their concentrations

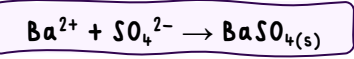
The sample is placed in a flame and the light given out is passed through a spectroscope

Sulfates

First add dilute hydrochloric acid

Add barium chloride solution

If sulfate ions are present, a white precipitate will form



AQA