

# OCR B GCSE Chemistry

## Topic 5: Chemical analysis

**How do chemists find the composition of unknown samples? (separate science only)**

Notes





1. (separate science only) *Describe the purpose of representative sampling in qualitative analysis*

- To ensure that the samples used for the analysis are representative
- To ensure they will identify any variations in the bulk of the material that is represented in the analysis

2. (separate science only) *Interpret flame tests to identify metal ions, including the ions of lithium, sodium, potassium, calcium and copper*

Lithium	Crimson
Sodium	Yellow
Potassium	Lilac
Copper(II)	Green
Calcium	Orange-red

3. (separate science only) *Describe the technique of using flame tests to identify metal ions*

- Take a sample of the metal and hold on a spatula in a flame from a Bunsen burner and observe the colour that the flame turns dependent on the metal being tested





4. (separate science only) Describe tests to identify aqueous cations and aqueous anions and identify species from test results including: tests and expected results for metal ions in solution by precipitation reactions using dilute sodium hydroxide (calcium, copper, iron(II), iron(III), zinc); tests and expected results for carbonate ions (using dilute acid), chloride, bromide and iodide ions (using acidified dilute silver nitrate) and sulfate ions (using acidified dilute barium chloride or acidified barium nitrate)

ions	few drops NaOH	excess NaOH
calcium	White precipitate forms	No change
copper (II)	blue precipitate forms	no change
iron (II)	green precipitate forms	no change
iron (III)	orange-brown precipitate forms	no change
zinc	White precipitate forms	Precipitate re dissolves

- Carbonates
  - Carbonates react with dilute acids to create carbon dioxide.
  - This gas can be bubbled through limewater, if the limewater goes cloudy, the gas is  $\text{CO}_2$ .
- Halides
  - First add dilute nitric acid, followed by silver nitrate solution
  - Chloride gives a white precipitate
  - Bromide gives a cream precipitate
  - Iodide gives a yellow precipitate
- Sulfates
  - First add dilute hydrochloric acid, followed by barium chloride (or barium nitrate) solution
  - A white precipitate will form when sulfate ions are in this solution



5. (separate science only) *Interpret an instrumental result for emission spectroscopy given appropriate data in chart or tabular form, when accompanied by a reference set in the same form*

- use above information to do so

6. *Describe the advantages of instrumental methods of analysis*

- Elements and compounds can be detected and identified using instrumental methods of analysis
  - o These are accurate, sensitive and rapid

7. *Interpret charts, particularly in spectroscopy*

- use above information to do so

