

# Scheme of Learning: Chemical Analysis

## Topic Sequence:

1	2	3	4	5	6
Forces & Interactions	Organic Chemistry	Inheritance, Variation & Evolution	Forces & Motion	Chemical Analysis	Space (Separate Physics only)

## Topic Overview:

Analysts have developed a range of qualitative tests to detect specific chemicals. The tests are based on reactions that produce a gas with distinctive properties, or a colour change or an insoluble solid that appears as a precipitate. Instrumental methods provide fast, sensitive and accurate means of analysing chemicals, and are particularly useful when the amount of chemical being analysed is small. Forensic scientists and drug control scientists rely on such instrumental methods in their work.

## Lesson Sequence:

This topic builds upon previously learnt knowledge of the difference between elements, mixtures and compounds to make a distinction between chemically pure and impure substances and how to identify them from each other. We then defined formulation as purposefully designed impure substances.

Pupils will have carried out chromatography in KS3 and in the year 9 Atomic Structure topic, but we revisit it now as a required practical and learn how to analyse chromatograms to identify unknown substances. Continuing with identifying substances, we then move onto the chemical tests for hydrogen, oxygen, carbon dioxide and chlorine.

The rest of the topic is for Separate Chemistry pupils only. We use flame tests and chemical tests to identify positive and negative ions as a required practical. We finish the topic learning about how instrumental analysis identifies unknown substances.

## Sequence of Lessons:

1	Pure Substances & Formulations
2	Chromatography – <i>Required Practical</i>
3	Chromatography Theory – <i>mid topic assessment Qs</i>
4	Testing for Gases
5	Tests for Positive ions - <i>Separate Chemistry Only Required practical</i>
6	Tests for Negative ions - <i>Separate Chemistry Only Required practical</i>
7	Testing Unknown ions - <i>Separate Chemistry Only</i>
8	Instrumental Analysis - <i>Separate Chemistry Only</i>
9	Revision
10	Test

## Supportive Reading:

Comprehension activity	TBC
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## Assessment:

Knowledge:	Multiple choice and short answer questions.
Application of Knowledge:	Exam questions

## Resources:

1	Washing up liquid, oil – separate in class set of beakers
2	Chromatography paper, paper clips, food colouring A-D and unknown
3	n/a
4	Mg, HCl, Decibel meter, CaCO <sub>3</sub> chips of different sizes, Limewater, H <sub>2</sub> O <sub>2</sub> , MnO <sub>2</sub> , Delivery tubes (with conical flasks).
5	Compound powders of Li, Na, K, Ca and Cu NaOH, Solutions of Cu, Fe (II), Fe (III), Mg, Ca and Al
6	Silver Nitrate solution, Barium Chloride solution, HCl, limewater, Calcium Carbonate powder, Solutions of NaCl, KBr and KI Nitric acid and Silver nitrate, HCl, limewater Barium Chloride solution
7	NaOH, MgCO <sub>3</sub> powder and solution NaCl powder and solution, KI powder and solution, CuSO <sub>4</sub> powder and solution, Silver Nitrate solution, Barium Chloride solution, HCl, limewater
8	n/a
9	n/a
10	Test in shared folder