

Chemical analysis experiment – teacher notes



Education in Chemistry

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rsc.li/EiC517-know-your-poison

This experiment accompanies the above article ‘Know your poison’.

One of Guy’s initial explorations in analysis was reagent testing; simple chemical tests that can identify the drug present with a colour change.

Simple test tube analysis lends itself to practical work, but it can often feel like a series of facts to learn. Questions in this area are becoming increasingly sophisticated, using contexts to ask pupils to plan an analysis that will distinguish between different samples.

The accompanying resources are planned to provide scaffolding and support for lower achieving or younger students and a challenge for those who have significant prior knowledge and need to practice planning skills. As some foodstuffs are included in the mixtures, food tests are included to provide a cross-curricular resource that may be particularly useful for double science classes.

Chemical analysis (1) 14–16 experiment

In this task pupils are challenged to plan and carry out a series of simple chemical tests to determine which sample contains the substances known to be used by a particular drug lab. Analysis can be carried out in test tubes or spotting tiles. A flame test isn’t needed to identify the target mixture so can be omitted if the concept hasn’t yet been introduced or to manage lesson time.

Chemical analysis (2) 11–14 experiment (14–16 for those who need extra support)

In this task pupils are supported to carry out a range of tests to identify the target mixture. They are guided through the results for each test.

Equipment

For both exercises, pupils will need access to the following equipment and reagents.

Four sample vials labelled A–D containing the following mixtures with water (approximately 0.2–0.5 g of each solid in 2–5 cm³ water should be sufficient).

- Sodium chloride, sodium carbonate, flour
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- Potassium iodide, sodium carbonate, glucose
- Sodium chloride, sodium sulfate, flour

Apparatus and reagents for testing.

- 2M hydrochloric acid
- c.0.1M silver nitrate solution (*CLEAPSS recipe 077*)
- Benedict’s qualitative reagent (*CLEAPSS recipe 11*)
- 0.01M iodine solution (*CLEAPSS recipe 050*)
- 0.4M barium chloride solution (*CLEAPSS recipe 010*)
- Apparatus to carry out flame tests (soaked wooden splints are sufficient, see rsc.li/29AphKS)
- Test tubes or spotting tiles

Risk assessment

As with all experimental work you should complete your own risk assessment of the suggested procedures. All the procedures described here are commonly carried out by school pupils. They should be tested with your own reagents to make sure they give the required results in the time you have available.