

C8 Chemical analysis

Chemistry Paper 2 | AQA Combined Science Trilogy | Key ideas to remember

Pure substances

1 Purity and formulations

Pure substance: one element or compound, not mixed with other substances. A compound can be pure. "Pure milk" is still a mixture in chemistry.

At fixed pressure: a pure substance has specific melting and boiling points. Impure solids usually melt over a range, often lower. Compare with reference data.

Formulation: a mixture designed to be useful. Components have specific roles and carefully measured quantities.
Examples: paints, medicines, alloys.
Changing proportions changes properties.

Chromatography

2 Separation and interpretation

Mobile phase: moving solvent.

Stationary phase: provided by the paper. Substances distribute between the phases. More time in solvent → farther travel. More strongly held by paper → less travel.

Read each vertical sample lane.

Several spots → a mixture.

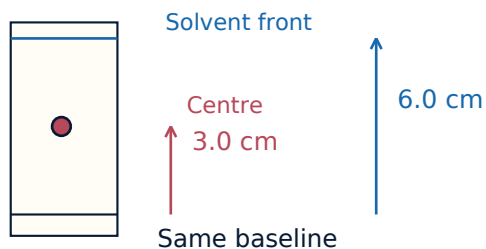
One spot → consistent with purity, but components could overlap. A different suitable solvent may separate them.

Compare references under the same conditions. Matching Rf and colour support identification; they are not absolute proof.

Rf calculations

4 Rf: both distances from baseline

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



$$R_f = 3.0 \div 6.0 = 0.50 \text{ (no unit).}$$

Use the spot **centre** and matching distance units. A spot between baseline and front has Rf between 0 and 1.

5 Hydrogen and oxygen

Gas	Test and positive result
Hydrogen	Burning splint at the open end of the tube → squeaky pop.
Oxygen	Glowing splint inserted into the tube → relights.

Burning



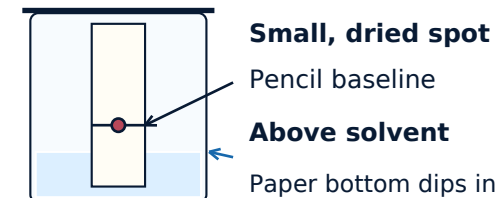
Glowing



Do not swap the splints. State both the method and the observation. Gas colour alone does not identify the gas.

Four gas tests

3 Required practical 12



1. Draw a pencil baseline; add small spots and let them dry.
2. Keep spots above solvent; cover with a lid to reduce evaporation.
3. Stop before the front reaches the top.
4. Mark the front **immediately**, then dry.

Eye protection; follow the teacher's method. Keep flammable solvents away from flames.

6 Carbon dioxide and chlorine

Gas	Test and positive result
Carbon dioxide	Bubble through limewater → milky or cloudy.
Chlorine	Damp litmus paper → bleached white.

Limewater: aqueous calcium hydroxide.

Blue litmus may turn red first. The identifying result is **bleaching white**.

Supervised tests only. Chlorine is toxic: follow the teacher's ventilation precautions. **Never smell gases.**