

Identifying substances with chemical tests

Chemistry grades 9-10 (GCSE · IGCSE · O Level · Class 9-10) · Test answers (mark scheme)

Use this guide to mark the paper out of 20. Each mark is for one clear point, a correct formula or a correct equation. Accept any other equivalent wording, and do not penalise British or American spelling.

Level: Chemistry grades 9-10 (GCSE · IGCSE · O Level · Class 9-10) · **Curriculum:** GCSE C8

Question 1 Chromatogram (3 marks)

- a. $4.2 \div 6.0 = \mathbf{0.70}$.
- b. **Yes:** the spot is at the same distance as dye 1.
- c. **No:** X has two spots, so it is a mixture.

Marking: 1 mark each.

Question 2 Flame tests (2 marks)

- a. **Potassium (K^+)**.
- b. **Calcium (Ca^{2+})**.

Marking: 1 mark each.

Question 3 Sodium hydroxide tests (3 marks)

- a. **Fe^{3+}** .
- b. **Al^{3+}** .
- c. **$Fe^{3+}(aq) + 3OH^-(aq) \rightarrow Fe(OH)_3(s)$** .

Marking: 1 mark each.

Question 4 Gas tests (2 marks)

- a. Hold a **lit splint** at the gas: it gives a squeaky pop.
- b. Use a **glowing splint**: it relights.

Marking: 1 mark each.

Question 5 Testing for sulfate (3 marks)

- a. **Dilute hydrochloric acid**, then **barium chloride solution**.
- b. A **white precipitate**.
- c. The acid removes carbonate ions, which would also give a white precipitate with barium.

Marking: 1 mark each.

Question 6 Purity (2 marks)

A pure substance melts at one sharp temperature. A mixture melts over a range and usually begins to melt at a lower temperature.

Marking: 1 mark for sharp fixed melting point, 1 mark for mixture range or lower.

Question 7 Testing for bromide (2 marks)

Add dilute nitric acid, then silver nitrate solution: a cream precipitate forms. $\text{Ag}^+(\text{aq}) + \text{Br}^-(\text{aq}) \rightarrow \text{AgBr}(\text{s})$.

Marking: 1 mark for correct test and cream result, 1 mark for equation.

Question 8 Unknown white solid (3 marks)

The yellow flame shows sodium and the white precipitate shows chloride, so the solid is **sodium chloride**. $\text{Ag}^+(\text{aq}) + \text{Cl}^-(\text{aq}) \rightarrow \text{AgCl}(\text{s})$.

Marking: 1 mark for sodium, 1 mark for chloride, 1 mark for the equation.