

AQA Chemical Tests

AS Inorganic Tests

Tests for halide ions

Add HNO_3 then $\text{AgNO}_3 \rightarrow$ precipitate. Then add NH_3 if necessary.

Chloride: white precipitate that **dissolves** in **dilute NH_3**

Bromide: cream precipitate that **dissolves** in **concentrated NH_3**

Iodide: yellow precipitate that **does not dissolve** in any NH_3 solution

Carbonate CO_3^{2-}

Add HCl to the carbonate solution $\rightarrow \text{CO}_2$. Turns limewater cloudy. Or vice-versa. Add the carbonate to an acid

Sulphate SO_4^{2-}

Add $\text{BaCl}_2 \rightarrow$ a white precipitate, barium sulphate (BaSO_4).

AS Organic Tests

Alcohols: add $\text{K}_2\text{Cr}_2\text{O}_7/\text{H}^+$ orange \rightarrow green colour change for primary and secondary alcohols

Alkenes: Add bromine water. Orange \rightarrow colourless

Haloalkanes: Dissolve in ethanol (solvent), add water (nucleophile) and then do the halide ion test (as above)

Aldehyde: add Tollen's \rightarrow silver mirror or Fehling's \rightarrow red precipitate (Cu_2O)

Carboxylic Acid: add carbonate as for AS inorganic $\rightarrow \text{CO}_2$ or add $\text{PCl}_5 \rightarrow$ steamy white fumes

A-level Tests

The transition metal complexes are often included in chemical test questions. It's a huge part of that topic and there are a lot of reactions. I have included all of them in the table below. It's debatable if these are chemical tests.

Complex	Few drops NaOH or NH ₃	excess NaOH	excess NH ₃	Na ₂ CO ₃
[Fe(H ₂ O) ₆] ²⁺ pale green	Dirty green ppt Fe(H ₂ O) ₄ (OH) ₂	No reaction	No reaction	Green ppt FeCO ₃
[Al(H ₂ O) ₆] ³⁺ colourless	White ppt Al(H ₂ O) ₃ (OH) ₃	Colourless soln [Al(OH) ₆] ³⁻	No reaction	White ppt Al(H ₂ O) ₃ (OH) ₃
[Fe(H ₂ O) ₆] ³⁺ yellow	brown ppt Fe(H ₂ O) ₃ (OH) ₃	No reaction	No reaction	Brown ppt Fe(H ₂ O) ₃ (OH) ₃
[Cu(H ₂ O) ₆] ²⁺ blue	pale blue ppt Cu(H ₂ O) ₄ (OH) ₂	No reaction	Deep blue soln [Cu(NH ₃) ₄ (H ₂ O) ₂] ²⁺	Green/blue ppt CuCO ₃