

WJEC (Wales) Chemistry A-level

SP 1.6a - Gravimetric Analysis

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SP 1.6a - Gravimetric Analysis

Aim

To identify an **unknown metal chloride**.

Apparatus and Chemicals

- Balance – ideally 3 decimal place (minimum 2 decimal place)
- Access to drying oven
- 2x 250 cm³ beaker
- 2x 100 cm³ beaker
- Spatula
- 10 cm³ measuring cylinder
- 3 x dropping pipette
- Bunsen burner, tripod and gauze or electric hotplate
- Filter funnel
- Filter paper
- Wash bottle
- Sample of unknown chloride
- Deionised water
- 0.5 mol dm⁻³ AgNO₃ solution
- 6.0 mol dm⁻³ HNO₃ solution
- 2.0 mol dm⁻³ HCl solution
- wash solution – 4.0 cm³ of 6.0 mol dm⁻³ HNO₃ per dm³ deionised water

Safety Considerations

- ★ 0.5 mol dm⁻³ AgNO₃ solution - corrosive
- ★ 6.0 mol dm⁻³ HNO₃ solution - corrosive
- ★ 2.0 mol dm⁻³ HCl solution - irritant





Method

1. **Accurately** weigh around 0.3 g of the unknown chloride and transfer to a 250 cm³ beaker.
2. Dissolve this sample in approximately 100 cm³ of **deionised** water and add 3 cm³ of 6.0 mol dm⁻³ HNO₃.
3. Slowly add 20 cm³ of AgNO₃ solution until silver chloride is seen to **coagulate** (form gel-like bubbles), then add a further 5 cm³ of AgNO₃.
4. Heat the beaker carefully for 10 minutes without allowing the solution to boil.
5. Leave the solution to cool for at least 2 hours.
6. **Accurately** weigh a filter paper and place in a filter funnel.
7. Decant the liquid from the beaker into the funnel.
8. **Wash** the precipitate in the beaker with 3 cm³ of wash solution.
9. Transfer all the precipitate to the filter funnel and wash with 20 cm³ of wash solution.
10. Test the used wash solution by adding 3 drops of HCl solution. If a precipitate forms (indicating the presence of Ag⁺ ions), wash with a further 10 cm³ and re-test.
11. Dry the precipitate in the filter paper at 105 °C until **constant mass** is attained.

