

WJEC (Wales) Chemistry A-level

SP 1.7c - Back Titration

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SP 1.7c - Back Titration

Aim

To determine the **percentage** of calcium carbonate in **limestone**.

Apparatus and Chemicals

- Access to a 3 decimal place digital balance (minimum 2 decimal place)
- 25 cm³ bulb/volumetric pipette with safety filler
- Pestle and mortar
- 250 cm³ conical flask
- Hot plate/hot water bath/Bunsen burner
- 50 cm³ burette and funnel
- Burette clamp and stand
- 250 cm³ conical flask
- White tile
- Limestone chips (or antacid tablets)
- 0.1 mol dm⁻³ NaOH solution
- 0.5 mol dm⁻³ HCl solution
- Phenolphthalein indicator

Safety Considerations

- ★ 0.1 mol dm⁻³ NaOH solution - irritant
- ★ 0.1 mol dm⁻³ HCl solution - irritant
- ★ Phenolphthalein indicator - flammable



Method

1. Using a pestle and mortar, grind the limestone chips (or antacid tablet) into a **fine powder**.
2. **Accurately** weigh approximately 0.5 g of limestone powder and transfer to a conical flask.
3. Record the mass of limestone added.
4. Using a 25 cm³ pipette, add 25 cm³ HCl solution.
5. Stir the reaction mixture **vigorously** with a stirring rod and heat gently.
6. When the limestone has **dissolved completely**, cool to room temperature.
7. Add a few drops of **phenolphthalein** indicator and titrate against the standardised NaOH solution.
8. Record the volume of NaOH solution needed to neutralise the excess HCl solution and use this to calculate the percentage CaCO₃ in limestone.

