

# WJEC (Wales) Chemistry A-level

## SP 1.7d - Double Titration

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## SP 1.7d - Double Titration

### Aim

To determine the **concentration** and the **mass** of sodium hydroxide and sodium carbonate in a mixed solution.

### Apparatus and Chemicals

- 50 cm<sup>3</sup> burette and funnel
- Burette clamp and stand
- 25 cm<sup>3</sup> bulb/volumetric pipette with safety filler
- 2 x 250 cm<sup>3</sup> conical flask
- White tile
- 0.1 mol dm<sup>-3</sup> HCl solution
- NaOH/Na<sub>2</sub>CO<sub>3</sub> mixed solution
- Phenolphthalein indicator
- Methyl orange indicator

### Safety Considerations

- ★ Mixed NaOH/Na<sub>2</sub>CO<sub>3</sub> solution - irritant
- ★ 0.1 mol dm<sup>-3</sup> HCl solution - irritant
- ★ Phenolphthalein indicator - flammable
- ★ Methyl orange indicator - flammable



### Method

1. **Titrate** a 25.00 cm<sup>3</sup> sample of the mixed solution against HCl solution using **phenolphthalein** as the indicator. Do not agitate the flask any more than the minimum necessary to mix the acid.
2. Record the volume used at the phenolphthalein **end-point**.
3. Add **methyl orange** and continue titrating until its end-point.
4. Record the total volume of hydrochloric acid added to this end-point.
5. Repeat as necessary until the titration values obtained agree within 0.20 cm<sup>3</sup> and separately average results for the two values.
6. Calculate the **concentration** of NaOH and Na<sub>2</sub>CO<sub>3</sub> in a mixed solution and then the **mass** in grams.

