WJEC (Eduqas) Chemistry A-level

SP C2.1d - Double Titration

Methods and images taken from the WJEC practical handbook

SP C2.1d - 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^3 burette and funnel
- Burette clamp and stand
- 25 cm^3 bulb/volumetric pipette with safety filler
- 2 x 250 cm^3 conical flask
- White tile
- 0.1 mol dm^{-3} HCl solution
- $NaOH/Na_2CO_3$ mixed solution
- Phenolphthalein indicator
- Methyl orange indicator

Safety Considerations

★ mixed $NaOH/Na_2CO_3$ solution - irritant
★ 0.1 mol dm^{-3} HCl solution - irritant
★ phenolphthalein indicator - flammable
★ methyl orange indicator - flammable

Method

1. **Titrate** a 25.00 cm^3 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^3 and separately average results for the two values.
6. Calculate the **concentration** of NaOH and Na_2CO_3 in a mixed solution and then the **mass** in grams.