AQA Chemistry GCSE

Required Practical 2

Neutralisation [Higher Tier]

Methods taken from the AQA Required Practical Handbook

Neutralisation

Determination of the reacting volumes of solutions of a strong acid and a strong alkali by titration

Aim

Carry out an investigation to find the **concentration** of a dilute sulfuric acid solution, using a sodium hydroxide solution of known concentration.

$$H_2SO_4 + 2NaOH \quad ----> \quad Na_2SO_4 + 2H_2O$$

Equipment list

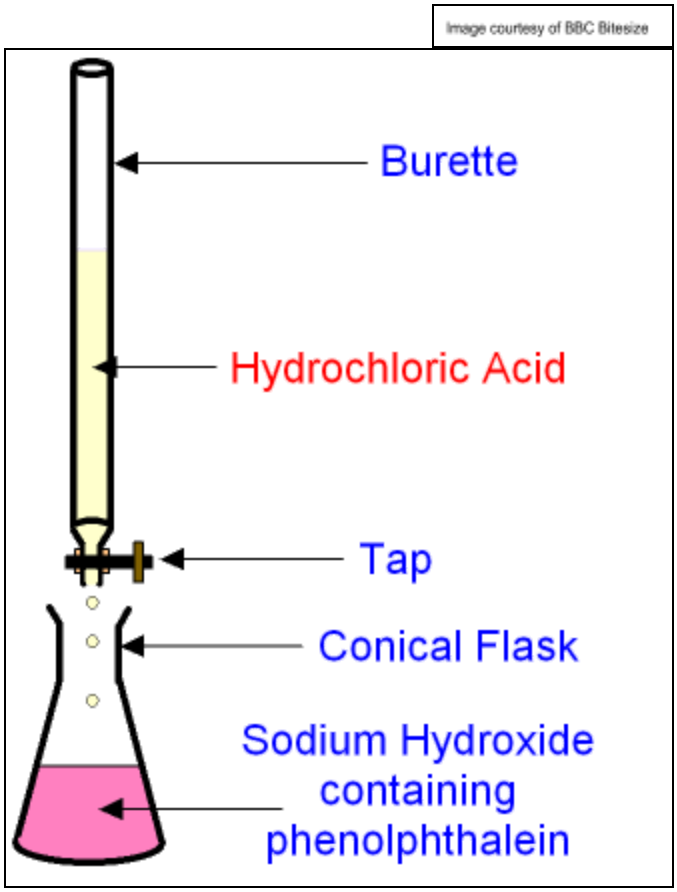
- 25 cm^3 volumetric pipette
- Pipette filler
- 50 cm^3 burette
- 250 cm^3 conical flask
- Small funnel
- Clamp stand and clamp
- White tile
- 0.1 M sodium hydroxide solution
- Sulfuric acid
- Phenolphthalein indicator

Method

1. Use the pipette to measure 25cm^3 of sodium hydroxide into the conical flask.
2. Place the conical flask on a white tile.
3. Fill the burette with sulphuric acid using a funnel.
4. Record the initial reading of acid in the burette.
   - Make sure to always take readings from the bottom of the meniscus.
5. Add a 5 drops of indicator in this case phenolphthalein to the conical flask.
6. Slowly open the burette tap while swirling the conical flask.
7. Add acid drop-by-drop near the endpoint.
   - At this point the colour will start to change slightly.
8. Close the burette when a colour change occurs in phenolphthalein.
   - The solution turns from pink to colourless.
9. Record the final reading of acid in the burette and calculate the titre. This is the volume of acid used to neutralise the alkali.

10. Repeat until you have concordant results.
    - These are within 0.1cm^3 of each other.
11. Present results in a table and calculate the mean titre discarding any anomalies when calculating the mean.
12. Calculate the number of moles of sodium hydroxide used in the titration.
13. In the balanced equation the ratio between sodium hydroxide and sulphuric acid is 2:1. Therefore to find out the moles of sulphuric acid divide the moles of sodium hydroxide by 2.
14. Use the formula [concentration= moles/volume (mean titre volume)] to work out the concentration of sulphuric acid.

Diagram



Safety Precautions

- Wear safety goggles when working with acids.
- Tie hair back.
- Report any broken glassware immediately.