The Sciences (Double Award)

5.2.2 Neutralisation reactions (b)

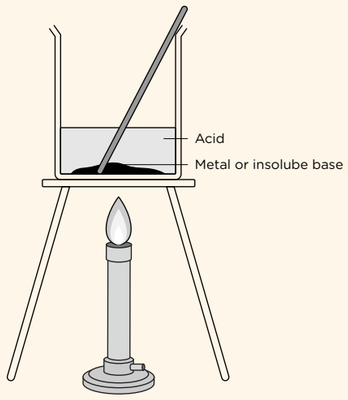
There are two methods used to prepare soluble salts from the reactions of acids with alkalis, bases and carbonates.

Experiment 1

Preparing crystals of a soluble salt from an insoluble base or carbonate.

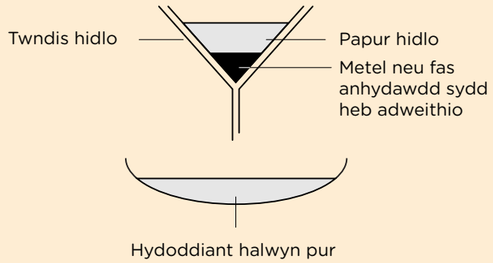
Stage 1 – neutralisation reaction

- Excess base is added to the acid. This is to ensure all of the acid has fully reacted.
- There will be some base remaining once the reaction has completed and it is in excess.



Stage 2 – filtration

- The salt solution passes through the filter paper into the beaker
- The excess (unreacted) base remains in the filter paper.

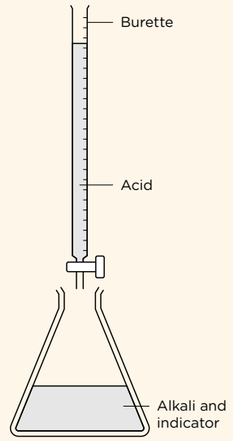


Experiment 2

Using titration to find the neutralisation point and subsequently producing pure crystals of the salt.

Stage 1 – titration with indicator

- Measure out a fixed volume of the alkali into a conical flask using a pipette.
- Add a few drops of the indicator to the alkali in the conical flask.
- Fill the burette with the acid and record the starting volume.
- Slowly add the acid from the burette to the alkali in the conical flask, whilst swirling the flask to mix.
- Continue adding the acid to the flask until the end-point of the reaction is reached. This is when the indicator changes colour to show the solution is neutral.
- Record the end volume of acid in the burette.
- Calculate the volume of acid added to the alkali. This is the difference between the starting and end volumes of acid in the burette.



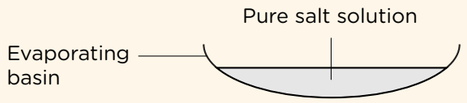
Stage 2 – titration with NO indicator

Repeat the titration without adding the indicator, using the same fixed volume of alkali in stage 1 and the volume of acid calculated from the titration.

Note: Repeating the titration without the indicator means the salt solution produced is pure and not contaminated with the indicator.

Stage 3 – evaporation (this is the same for both experiments)

The salt solution is heated until the water evaporates and salt crystals have formed.



Note: The size of the crystals produced depends upon how quickly the water is evaporated.

- Large crystals form when the water is evaporated slowly, for example, when left on window ledge over a few days.
- Small crystals form when the water is evaporated quickly, for example, when heated using a Bunsen burner.