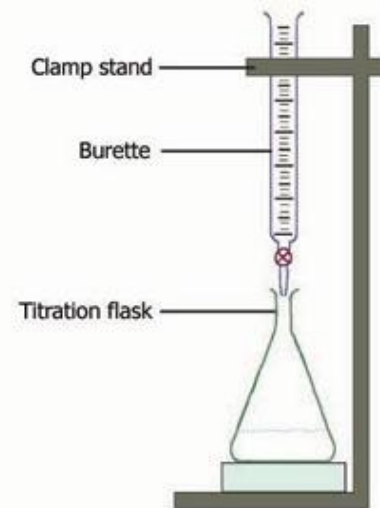


How to carry out a titration

Equipment

Burette
Clamp and stand
Conical flask
Glass pipette and filler
Wash bottle
Indicator (e.g. phenolphthalein)
Your acid solution
Your alkali solution



Method

- 1) Using the wash bottle, **rinse the burette and the pipette**. This is to wash away any chemicals from previous uses so that your solutions do not become contaminated which can affect the validity of your results. After rinsing with water, rinse the pipette with the alkali solution. Fill part of the burette with acid and open the tap over the sink so that the bottom part of the burette fills with acid and that any air bubbles are removed.
- 2) **Fill the burette with the acid** and record the initial volume
- 3) Place the pipette filler onto the top of the pipette and squeeze it to create a vacuum. Lower the **pipette into your alkali solution**. Hold the 'up' button on the filler until the bottom of the meniscus of the solution rests on the 25cm³ line. Then place your pipette into the conical flask and remove the filler which will release the solution.
- 4) **Add a few drops of indicator** to the conical flask.
- 5) Place the conical flask under the pipette and **carry out a rough titration**- this means you run the acid from the burette into the flask quickly and turn the tap off once you have achieved the correct colour change. For example, phenolphthalein changes from pink in an alkali solution to colourless in a neutral solution. Tip- place a white tile under the conical flask to make the colour change even more apparent!
- 6) Once you have recorded the final volume and calculated the titre (final volume-initial volume) take 2cm³ from this value. This leaves you with a number of cm³ that you can run the tap quickly for. For example, if your titre from your rough titration was 20cm³. You would know that you could let 18cm³ out of the burette quickly before slowing the release to drips.
- 7) **Conduct your accurate titration**. Remember to constantly swirl the conical flask. When you have run the amount you predicted quickly, partially close the tap so only drops come out. Then, as soon as you see one drop cause a colour change of the solution, turn the tap off. This gives you a more accurate titre.
- 8) **Repeat the experiment until you get at least 2 results that are concordant with one another**- this means that they are within 0.1 cm³ of each other. Only use concordant values when calculating the mean titre as again this improves accuracy.

Extra tips-

- Always read the volume of the burette at **eye level**, otherwise you get an incorrect value
- If you use a funnel to pour the acid into the burette, remove the funnel before you begin the titration- you don't want an extra drop of acid to fall into the burette part way through your titration without being accounted for in the volume as you really want your titre to be as precise as possible!