

Exercise walk-through

Acid–base titrations ■ 12.2

eXercise

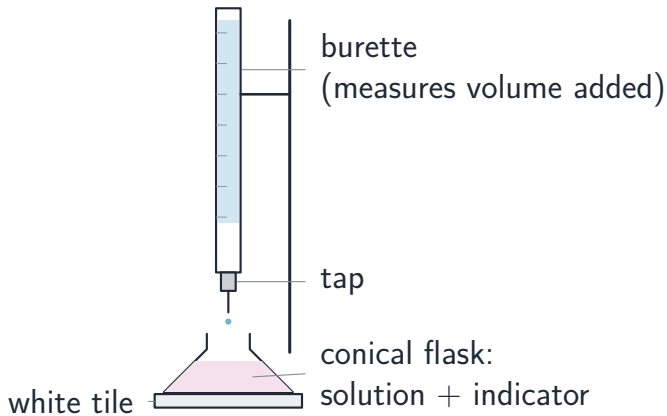
You must be able to

- describe the titration method (pipette, indicator, burette)
- explain the end-point
- relate the procedure to an accurate result

Method — The titration method

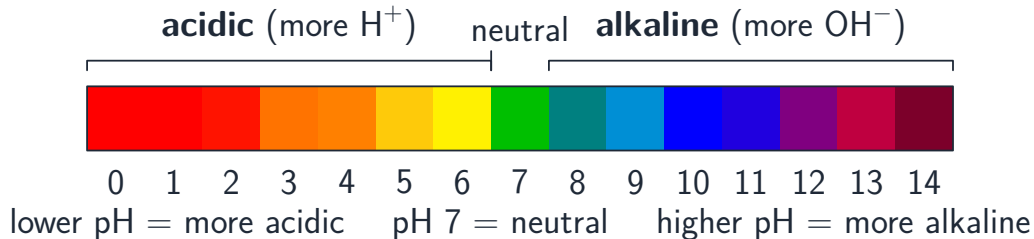
- pipette a fixed volume of one solution into a flask; add indicator.
- add the other solution from the burette slowly until the colour just changes (end-point).
- read the burette to find the volume added.

Method — The titration method



A burette above a conical flask of solution and indicator

Method — The titration method



A titration tracks the change in pH

Practice 2.1 ■ 1 mark

Name the apparatus used to measure the fixed volume into the flask.

Solution 2.1

Method: The titration method

Worked steps

a (volumetric) pipette **B1**.

Practice 2.2 ■ 1 mark

State what the end-point of a titration shows.

Solution 2.2

Method: The titration method

Worked steps

the reaction is exactly complete (the acid and alkali have reacted) **B1**.

Exam-style 3.1 ■ 1 mark

The solution added from the burette is run in:

- A** all at once
- B** slowly, until the indicator just changes colour
- C** until the flask overflows
- D** without an indicator

Solution 3.1

Method: The titration method

- A all at once
- B slowly, until the indicator just changes colour 
- C until the flask overflows
- D without an indicator

Worked steps

B. The solution is added slowly until the indicator just changes colour.

Exam-style 3.2 ■ 3 marks

A student titrates sodium hydroxide against hydrochloric acid.

- (a) Describe how they would carry out the titration.
- (b) Explain why a few drops of indicator are added.

Solution 3.2

Method: The titration method

Worked steps

- (a) pipette a fixed volume of sodium hydroxide into the flask and add indicator **M1**; add acid from the burette slowly, swirling **M1**; stop when the indicator just changes colour and read the burette **A1**.
- (b) to show the end-point by changing colour **B1**.