Acids and Titration Curves Map

Cambridge International AS & A Level Chemistry · 7.2 Acid-base equilibria

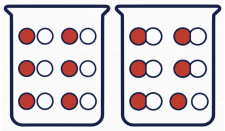
1 Acids and alkalis 7.2.1, 7.2.2

- HCl, H_2SO_4, HNO_3
- CH_3COOH
- NaOH, KOH, NH_3
- Water is pH 7



2 Strong and weak 7.2.3, 7.2.4

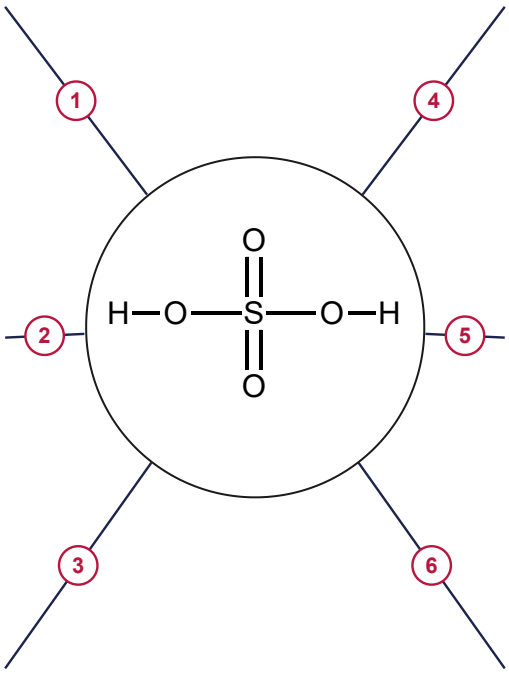
- Acid: proton **donor**
- Base: proton **acceptor**
- Strong: full dissociation
- Weak: partial



3 Neutralisation 7.2.7, 7.2.8

- $H^+ + OH^- \rightarrow H_2O$
- Forms a salt
- Spectator ions
- Ammonia: NH_4^+ salts





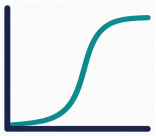
4 Telling them apart 7.2.6

- Reactive metal: rate
- pH meter
- Universal indicator
- Conductivity



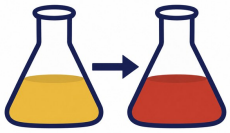
5 Titration curves 7.2.9

- Start pH: the acid
- Finish pH: the alkali
- Vertical section
- Weak pair: none



6 Indicators 7.2.10

- Use the given range
- **Whole** range inside
- the vertical section
- Weak pair: none suits



The four curves start, finish, equivalence

Pair	Start to finish	Equivalence
Strong, strong	pH 1 to 13	pH 7
Weak acid, strong alkali	pH 3 to 13	Above 7
Strong acid, weak alkali	pH 1 to 11	Below 7
Weak, weak	pH 3 to 11	No sharp rise

Worked examples

Equivalence volume

- 20.0 cm^3 0.200 mol dm^{-3} HCl
- 0.00400 mol; NaOH 0.100
- **40.0 cm^3**

Diprotic acid

- 20.0 cm^3 0.050 H_2SO_4
- 0.00100 × 2 mol NaOH
- **0.00200 mol**

Pick an indicator

- Vertical section pH 7–11
- Range 8.2–10.0 fits
- **Phenolphthalein**

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