Edexcel Chemistry A-Level
Core Practical 11 - Redox titration

Flashcards

What is a redox titration?

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A titration of a reducing agent by an oxidising agent (or vice versa).

What equipment is used to carry out a titration?

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- A pipette and pipette filler are used to accurately measure out the volume of a reactant before transferring it to a conical flask.
- A burette is a controlled way to add small volumes of one reactant to the other reactant (until the reaction has reached completion).

How do you carry out a titration?

How do you carry out a titration?

- Once the pipette has been used to place one reactant into the conical flask, fill the burette with the other reactant. Record initial volume.
- Add a few drops of indicator to the conical flask.
- Open the burette tap and allow the reactant to flow into the conical flask, swirling it to mix the contents.
- Close the burette tap once the expected colour change occurs. Use a white tile so the colour change is easy to identify.
- Record final burette volume.
- Repeat until you get concordant results, then calculate a mean titre.

What are concordant results?

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Titres that are within 0.1 cm^3 of each other.

How do you do a titration with potassium manganate (VII)?

How do you do a titration with potassium manganate (VII)?

- Add the potassium manganate(VII) solution into the burette.
- The other reactant solution is acidified with dilute H_2SO_4 and placed into a conical flask.
- The potassium manganate(VII) solution flows into the flask and as it reacts, it becomes colourless. When there is the first trace of a permanent pale pink solution, close the burette tap.

How would you find the amount of iron in an iron tablet experimentally?

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- Titrate potassium manganate (VII) solution against acidified (H_2SO_4) crushed iron tablets.
- Calculate mean titre using concordant results.
- Calculate number of moles of MnO_4^- in the mean titre.
- Using stoichiometry calculate the number of moles of Fe^{2+} reacted and in the original solution.
- Using this calculate the mass of Fe in solution and mass per tablet.

How would you reduce the uncertainty in this experiment?

How would you reduce the uncertainty in this experiment?

- Use a balance with a greater resolution

- Use pipettes and burettes etc. with a greater resolution.

- Use greater masses and volumes so percentage uncertainty is reduced.

What is the weighing by difference technique (used to measure mass of the iron tablets)?

What is the weighing by difference technique (used to measure mass of the iron tablets)?

● It is a method to weigh materials accurately.

● Mass of substance = Mass of weighing dish and substance - Mass of dish after substance has been transferred.

What is the ionic equation for the reaction between acidified iron and potassium manganate (VII)?

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$$5Fe^{2+} + MnO_4^- + 8H^+ \rightarrow 5Fe^{3+} + Mn^{2+} + 4H_2O$$