

OCR (A) Chemistry A-level

PAG 12: Research Skills

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12.1 Investigating Iron Tablets

Equipment

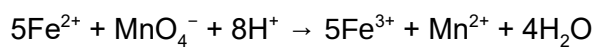
- Weighing boat
- Balance
- Five iron tablets
- Pestle and mortar
- 150 cm³ (1 mol dm⁻³) sulfuric acid
- Distilled water
- 100 cm³ graduated volumetric flask
- Stand and clamp
- Burette
- 25 cm³ volumetric pipette
- Filter funnel and paper
- 150 cm³ (0.02 mol dm⁻³) potassium permanganate solution
- 100 cm³ conical flask
- 250 cm³ conical flask

Method

1. Using the mortar and pestle, grind 5 iron tablets into a fine powder.
2. Place the ground tablets into a weighing boat and accurately measure the mass of the tablets and weighing boat.
3. Add the iron tablets into the 100 cm³ conical flask and reweigh the weighing boat. Record the difference in mass.
4. Add 50 cm³ sulfuric acid to the conical flask, then stopper and shake the flask until the tablets have completely dissolved.
5. Leave the solution for a while until the residue has settled.
6. Without disturbing the residue, carefully filter the solution directly into the volumetric flask.
7. Rinse the residue in the filter paper with a small volume of distilled water, adding the washings to the volumetric flask.
8. Add sulfuric acid to make the solution up to the mark on the volumetric flask.
9. Stopper and invert the volumetric flask several times to mix the contents. This is an acidified solution of iron (II) sulfate.
10. Fill the burette with potassium permanganate solution.
11. Using the pipette, measure 25 cm³ of the acidified iron (II) sulfate solution and add this to a 250 cm³ conical flask.
12. Add 25 cm³ of sulfuric acid to the conical flask.
13. Perform a titration, adding potassium permanganate from the burette until the first permanent pink colour appears.
14. Repeat the experiment until two concordant titres are obtained.
15. Record the results in a suitable format and calculate the mean titre volume.



Equation



Errors

- Ensure that the iron tablets completely dissolve
 - Warming the solution in a water bath may help.
- The colour change may be difficult to observe at the end point
 - Place a white tile under the conical flask to make the colour change easier to see.

Safety

- Sulfuric acid - causes severe skin burns and eye damage.
- Iron (II) sulfate solution - harmful if swallowed; causes skin irritation and serious eye irritation.
- Potassium permanganate solution - harmful if swallowed; environmental hazard.

