Preparation and Standardisation of Potassium Permanganate

Experiment 8 - Practical Notes

Name: _____ Roll no.: _____ Date: _____

Aim

To prepare a nominal titrant and determine its actual strength.

Principle

Permanganate is an oxidant and a self-indicator. In acidic oxalate standardisation, two permanganate ions react with five oxalate ions; one mole permanganate accepts five electrons.

Requirements

- Assigned potassium permanganate solution and primary-standard sodium oxalate
- Prescribed sulphuric-acid medium, controlled water bath and burette

Procedure

1. Prepare

Prepare the nominal permanganate solution and complete the assigned conditioning and clarification before standardisation.

2. Prepare standard

Weigh primary-standard oxalate and dissolve in the prescribed sulphuric-acid medium.

3. Control conditions

Use the method-specified warming; the oxalate reaction is slow at the beginning.

4. Titrate

Add titrant at the prescribed rate and determine the persistent pale-pink endpoint.

5. Repeat

Obtain concordant titres, calculate strength and label the protected storage bottle.

Observations and Record

Reading	Trial 1	Trial 2	Trial 3
Standard mass, g	_____	_____	_____
Initial burette, mL	_____	_____	_____
Final burette, mL	_____	_____	_____
Corrected titre, mL	_____	_____	_____

Worked Example

The numbers below are illustrative; enter your own observations in the record.

- N(KMnO4) = mass sodium oxalate (g) / [67.00 g/equivalent × titre (L)].
- Example: 0.16750 g sodium oxalate and 25.00 mL gives 0.1000 N, equivalent to 0.0200 M permanganate in this acidic reaction.

Result

Record the observed outcome and calculated value, with units. State whether the stated laboratory specification was met; do not copy the worked example as your result.

Precautions

- Use the specified acid; hydrochloric acid can introduce side reactions.
- Do not use organic filter paper in an improvised clarification process.
- Match temperature and endpoint conditions across repeats.

Viva Questions and Answers

1. Why is KMnO4 a self-indicator?

A slight excess imparts the endpoint colour.

2. Why is 0.1 N not 0.1 M here?

Each permanganate ion accepts five electrons in the acidic reaction.

3. Why use concordant readings?

Agreement reduces random endpoint and reading error, but does not remove systematic errors.

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