Assay of Ascorbic Acid by Iodine Titration

Experiment 12 - Practical Notes

Name: _____ Roll no.: _____ Date: _____

Aim

To determine ascorbic acid by reaction with standard iodine.

Principle

Ascorbic acid reduces iodine to iodide and is oxidised to dehydroascorbic acid. The mole ratio is 1:1. After the reducing substance is exhausted, excess iodine gives the starch endpoint.

Requirements

- Assigned ascorbic-acid preparation and freshly standardised iodine
- Prescribed acidic vehicle, starch reagent, burette and pipettes

Procedure

1. Weigh and dissolve

Prepare the assigned test amount promptly in the method-specified vehicle.

2. Titrate

Titrate with standard iodine under the stated conditions; use starch at the prescribed stage.

3. Identify endpoint

Record the prescribed persistent blue endpoint rather than a transient local colour.

4. Apply controls

Use the assigned blank and dilution factor; obtain concordant titres.

5. Calculate

Calculate iodine-equivalent ascorbic acid and express percentage on the specified basis.

Observations and Record

Field	Trial 1	Trial 2	Trial 3
Test mass, g	_____	_____	_____
Corrected titre, mL	_____	_____	_____
Iodine molarity	_____	_____	_____
Dilution factor	_____	_____	_____

Worked Example

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

- Mass ascorbic acid (mg) = corrected titre (mL) × iodine M × 176.12 × dilution factor.
- At 0.0500 M iodine (0.1000 N), each mL is equivalent to 8.806 mg ascorbic acid.
- Example: 20.00 mL represents 176.12 mg. If test mass is 180.00 mg without dilution, the assay is 97.84%.

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

- Ascorbic acid oxidises during storage; prepare and assay as directed.
- Protect iodine solutions from unsuitable light exposure and volatilisation.
- Other reducing substances can interfere.

Viva Questions and Answers

1. Why is the reaction 1:1?

One mole ascorbic acid transfers two electrons, matching one mole iodine.

2. What gives the blue endpoint?

Iodine in the presence of starch after the reductant is consumed.

3. Can this identify ascorbic acid alone in any mixture?

No; other reductants may react with iodine.

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