

Identification of Cations by Pharmacopoeial Tests

Experiment 6 - Practical Notes

Name: _____ Roll no.: _____ Date: _____

Aim

To identify assigned inorganic ions using characteristic and confirmatory reactions.

Principle

A screening reaction suggests an ion; a selective confirmation and appropriate controls strengthen identification. Colour, solubility, pH and interference affect reactions.

Characteristic Reactions

Ion	Expected teaching response
Calcium	Oxalate testing gives a white calcium oxalate precipitate in the prescribed medium; a brick-red flame is supporting evidence.
Sodium	A strong yellow flame is supporting evidence but contamination is common; use the assigned monograph confirmation.
Potassium	A violet flame may be obscured by sodium; use the assigned confirmatory reagent, not flame colour alone.
Ammonium	The supervised alkaline test releases ammonia detected using moist indicator paper; never directly inhale evolved gas.
Copper	Copper(II) solutions commonly appear blue; prescribed ammonia addition produces a deep-blue complex.
Iron	Iron(III) gives the prescribed coloured thiocyanate response; oxidation state and interferences must be considered.

Requirements

- Assigned ion solutions, positive controls and reagent blank
- Prescribed reagents, test tubes, droppers and PPE

Procedure

1. Plan aliquots

Read each prescribed reaction and divide the unknown into separate labelled portions.

2. Screen

Observe initial colour, solubility and the assigned preliminary reaction.

Pharmaceutical Chemistry

3. Confirm

Perform the specified confirmation on a fresh portion; compare with positive and blank controls.

4. Record

Write the reagent, actual observation, inference and supporting reaction.

5. Conclude

Identify the ion only when the observed evidence and controls agree.

Observations and Record

Ion / reaction	Actual observation	Inference
Calcium	_____	_____
Sodium	_____	_____
Potassium	_____	_____
Ammonium	_____	_____
Copper	_____	_____
Iron	_____	_____

Result

The assigned ion was identified as _____ based on _____ and _____. Controls: _____.

Precautions

- Use clean equipment; sodium and chloride contamination are common.
- Use the approved ventilation for gas-evolving tests.
- Do not mix unknown reagents or infer identity from one nonspecific colour.

Viva Questions and Answers**1. Why use a fresh aliquot?**

Reagents from a previous test may interfere with the next reaction.

2. What is a confirmatory test?

A more selective reaction that supports the proposed identity.

3. Why include a blank?

It detects contamination and reagent background.

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