First Hope

COMPLETE NOTES

Click here to visit our website

PHARMACY PRACTICAL NOTES

Complete subject and semesters are available on FirstHope app only.

Scan or click here

Click here to get the app >

Available on Google Play

JOIN THE FIRSTHOPE COMMUNITY

Join our Telegram channel

Click here to join Telegram >

Scan or click here

@FirstHopeNotes

Instagram

@firsthope.official

Click here to follow >

YouTube channel

FirstHope-Pharmacy / Live streams

Click here to watch >

WhatsApp channel

Follow FirstHope on WhatsApp

Click here to join >

FirstHope website

firsthope.co.in

Click here to visit >

B.Pharm / D.Pharm / M.Pharm / Pharm.D

Complete subjects and semesters are available in the FirstHope app.

Isolation of Caffeine from Tea

Experiment 12 - Practical Notes

Name: _____ Roll no.: _____ Date: _____

Aim

To obtain a caffeine-enriched fraction from tea and assess recovery and identity.

Principle

Caffeine can be extracted from an aqueous tea preparation into a suitable organic solvent. Mild alkalinity can reduce transfer of acidic polyphenols. Isolation mass is crude recovery until identity and purity have been assessed.

Requirements

- Tea, water, instructor-assigned carbonate and ethyl acetate extraction system.
- Controlled heater, filter, separatory funnel, drying agent, evaporation setup and identity-check materials.

Procedure

1. Extract tea

An illustrative microscale teaching setup uses 10 g tea and 100 mL hot water with the assigned carbonate quantity. Use the college's specified extraction time and filter away the leaves.

2. Cool

Cool the filtrate before liquid-liquid extraction. Transfer to a correctly supported separatory funnel with free headspace.

3. Partition

Extract with three small fresh ethyl-acetate portions, such as 10 mL each under the approved method. Mix gently and vent safely in the hood. Confirm phase identity; ethyl acetate is normally the upper layer.

4. Dry

Combine the appropriate organic fractions. Use the prescribed anhydrous drying agent, then separate it without transferring solids.

5. Recover

Evaporate through the authorised controlled setup. Weigh the dry recovered material; no open flame is used.

6. Confirm

Compare the TLC/other assigned identity test with authentic caffeine. If the class performs further purification, record its mass loss and separate purity assessment.

Observations and Record

Record	Entry
Tea mass / water / carbonate / extraction time	_____
Organic solvent and extraction portions	_____
Dry recovered mass / identity result	_____

Worked Example

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

- Crude recovery (% of tea mass) = recovered dry mass / tea mass × 100.
- From 10.0 g tea, 0.080 g dry isolate gives 0.80% recovery. This is not a measured purity or a percentage of the true caffeine content recovered.

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 authenticated, labelled teaching material and instructor-prepared reagents. Wear the protection specified for the chemical method.
- Compare with a known control and record actual observations. A single colour, precipitate or odour description cannot authenticate a crude drug.
- Do not taste botanical material or directly inhale vapours; dispose of solvents and staining reagents in their assigned waste containers.
- Cool before funnel extraction, vent away from people and verify the layer before discarding any fraction.

Viva Questions and Answers

1. Why use several fresh solvent portions?

Repeated partitioning usually improves transfer compared with one equal total-volume portion.

2. Why dry the organic fraction?

Dissolved water can remain in the extract and distort mass or crystallisation.

3. Why call the first product caffeine-enriched?

Other soluble compounds may still be present.

First Hope

COMPLETE NOTES

Click here to visit our website

PHARMACY PRACTICAL NOTES

Complete subject and semesters are available on FirstHope app only.

Scan or click here

Click here to get the app >

Available on Google Play

JOIN THE FIRSTHOPE COMMUNITY

Join our Telegram channel

Click here to join Telegram >

Scan or click here

@FirstHopeNotes

Instagram

@firsthope.official

Click here to follow >

YouTube channel

FirstHope-Pharmacy / Live streams

Click here to watch >

WhatsApp channel

Follow FirstHope on WhatsApp

Click here to join >

FirstHope website

firsthope.co.in

Click here to visit >

B.Pharm / D.Pharm / M.Pharm / Pharm.D

Complete subjects and semesters are available in the FirstHope app.