

Continue Learning with FirstHope

Complete Notes on the FirstHope App

Complete subject and semesters are available on FirstHope app only.

- Get complete subject and semester notes in the FirstHope app.
- Available for B.Pharm, D.Pharm, M.Pharm and Pharm.D students.

[Click here to get the FirstHope app](#)

Join the FirstHope Telegram Channel

Join FirstHope Notes and keep up with channel updates.

[Click here to join Telegram](#)

Instagram

@firsthope.official

[Click here to follow Instagram](#)

YouTube Channel

FirstHope-Pharmacy / Live streams

[Click here to watch the YouTube channel](#)

WhatsApp Channel

Follow FirstHope on WhatsApp.

[Click here to join the WhatsApp channel](#)

FirstHope Website

firsthopenotes.com

[Click here to visit the website](#)

Partition Coefficient in n-Octanol and Water

Experiment 11 - Practical Notes

Name: _____ Roll no.: _____ Date: _____

Aim

To calculate the phase concentration ratio for a drug in n-octanol and water.

Principle

For a neutral species at equilibrium, $P = C_{\text{organic}}/C_{\text{water}}$. If ionisation contributes at a stated pH, the ratio of total analytical concentrations is a distribution ratio $D(\text{pH})$. Temperature, pH and phase composition must be controlled.

Requirements

- Assigned neutral teaching solute and staff-approved shake-flask setup, or supplied equilibrium data.
- Matched phase-assay standards, recorded phase volumes, temperature and aqueous pH.

Procedure

1. Condition phases

For the bench method approved by the laboratory, mutually pre-saturate the phases and record actual phase volumes. For a supplied-data exercise, read these conditions from the staff record.

2. Establish equilibrium

Use the staff-approved controlled mixing and settling method with the assigned solute loading. Avoid persistent emulsion and container adsorption.

3. Identify layers

Verify layer identity from the prescribed check; do not rely only on an assumed solvent order.

4. Measure both phases

Determine concentrations using phase-appropriate calibration and dilution factors. Do not substitute raw absorbance ratios from different solvent matrices.

5. Check mass balance

Calculate $C_{\text{organic}} V_{\text{org}} + C_{\text{water}} V_{\text{water}}$ and compare with initial solute mass. Investigate unexplained loss before accepting the ratio.

6. Report

Calculate P or D as applicable and $\log_{10}$ of that ratio. State phase volumes, temperature, pH, ionisation assumption and replicate agreement.

Physical Pharmaceutics**Observations and Record**

Record	Entry
Organic / aqueous phase volumes	_____
Concentrations after dilution correction	_____
Initial / recovered total solute mass	_____
P or D(pH) / $\log_{10}$ value	_____

Worked Example

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

- For $C_o = 4.00$ mg/mL and $C_w = 0.500$ mg/mL, $P = 8.00$ and $\log_{10} P = 0.9031$.
- At 10.0 mL in each phase, recovered mass = $4.00 \times 10.0 + 0.500 \times 10.0 = 45.0$ mg. Compare with an assigned initial 45.0 mg.

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 instructor's assigned material and apparatus; record actual temperature and units with every measured property.
- Check instrument calibration and use repeat readings rather than a single convenient result.
- Compare a marketed teaching formulation only under the same method and conditions; its excipients can change the property.

Viva Questions and Answers**1. Why measure both phases?**

It supports both the ratio and a mass-balance check.

2. When should the result be called D?

When the ratio concerns total species at a stated pH and ionisation affects distribution.

3. Is the ratio obtained in one solvent transferable to another?

No. The solvent system defines the partition behaviour.

Continue Learning with FirstHope

Complete Notes on the FirstHope App

Complete subject and semesters are available on FirstHope app only.

- Get complete subject and semester notes in the FirstHope app.
- Available for B.Pharm, D.Pharm, M.Pharm and Pharm.D students.

[Click here to get the FirstHope app](#)

Join the FirstHope Telegram Channel

Join FirstHope Notes and keep up with channel updates.

[Click here to join Telegram](#)

Instagram

@firsthope.official

[Click here to follow Instagram](#)

YouTube Channel

FirstHope-Pharmacy / Live streams

[Click here to watch the YouTube channel](#)

WhatsApp Channel

Follow FirstHope on WhatsApp.

[Click here to join the WhatsApp channel](#)

FirstHope Website

firsthopenotes.com

[Click here to visit the website](#)