

Partition Coefficient of Two Assigned Drugs

Practical 16 | Medicinal Chemistry I

Aim

To study Partition Coefficient of Two Assigned Drugs, and interpret the recorded observations.

Principle

- Compare distribution in two immiscible phases at a stated pH and temperature. Intrinsic neutral-species partitioning differs from total-species distribution when a drug ionizes.
- The property is obtained from a defined observable under controlled conditions.
- Replicate measurements, instrument checks and consistent units are needed before comparison.

Materials and Apparatus

- Two instructor-selected drugs, prepared equilibrium phase solutions and assigned concentration assays.
- Assigned test material and calibration or comparison material.
- The apparatus specified for this property, a balance or volumetric equipment where relevant, and a record sheet.

Method

1. Identify the measured property, units and controlled variables before setting up the apparatus.
2. Check the instrument, zero or calibration and record the relevant operating conditions.
3. Prepare a representative measured portion without changing its intended composition.
4. Obtain the readings specified for the property and repeat under the same conditions.
5. Calculate the required property, including corrections stated for the apparatus or method.
6. Summarize the replicate results and explain the effect of the variable studied.

Observation Record

Complete this record using actual laboratory findings or the provided teaching data.

Observation / parameter	Record / finding
Drug	_____
Organic/aqueous concentrations	_____
pH	_____
Temperature	_____
Replicate ratios	_____

Calculations and Interpretation

- $D = \text{total organic-phase concentration} / \text{total aqueous-phase concentration}$.
- For neutral-species partitioning, P uses the same molecular species in both phases; $\log P = \log_{10}(P)$.
- Compare the two drugs only under equivalent phase and measurement conditions.

Result

Record the actual finding, calculated value with units where relevant, and a conclusion supported by the observations.

Finding: _____

Conclusion: _____

Precautions

- Keep temperature and test conditions consistent across comparative readings.
- Record raw readings before rounding calculated values.
- Do not compare results obtained with different methods as if they were interchangeable.

Viva Questions

1. Why control the test conditions?

A change in conditions may alter the measured property independently of the intended variable.

2. Why retain replicate readings?

They show repeatability and help identify an anomalous measurement.

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