

Determination of Benzoic Acid Partition Between Benzene and Water

Practical 03 | Physical Pharmaceutics I

Aim

To determine Benzoic Acid Partition Between Benzene and Water, and interpret the recorded observations.

Principle

- The measured total-concentration distribution ratio depends on pH and possible association in the organic phase. It is not automatically the intrinsic partition constant of one molecular species.
- 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

- Instructor-provided equilibrium phase solutions, assigned phase assay and closed partition apparatus.
- 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
Phase volumes	_____
Temperature	_____
Aqueous pH	_____
Organic concentration	_____
Aqueous concentration	_____

Calculations and Interpretation

- Observed distribution ratio $D = \text{total concentration in organic phase} / \text{total concentration in aqueous phase}$.
- Keep units equal. Explain ionization or dimerization before treating D as an intrinsic constant.

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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