

Study of Sieve Analysis and Particle-Size Frequency Curves

Practical 08 | Pharmaceutical Engineering

Aim

To study Sieve Analysis and Particle-Size Frequency Curves, and interpret the recorded observations.

Principle

- A sieve stack separates a powder/granulation into size fractions. Distribution plots must state whether size is number-, mass- or another weighted basis.
- 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

- Assigned granulation, sieve stack, balance and sieve shaker.
- 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. Record the granulation mass and each sieve opening.
2. Observe sieving under the assigned conditions.
3. Weigh retained fractions and check the mass recovery.
4. Calculate each retained percentage on a consistent denominator.
5. Construct frequency and cumulative plots using the specified size convention.
6. Explain the principal size range and the meaning of the distribution weighting.

Observation Record

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

Observation / parameter	Record / finding
Sieve opening	_____
Retained mass	_____
Percent retained	_____
Cumulative fraction	_____
Mass recovery	_____

Calculations and Interpretation

- Percent retained = $\text{retained mass} / \text{total recovered mass} \times 100$.
- Cumulative percentages are obtained by adding successive fractions on a stated retained/passing basis.

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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