

Saponification Value and Unsaponifiable Matter

Experiment 19 - Practical Notes

Name: _____ Roll no.: _____ Date: _____

Aim

To calculate saponification value and unsaponifiable content from an assigned oil analysis.

Principle

Saponification consumes alkali in hydrolysis and neutralisation. The unsaponifiable fraction is material recovered by the prescribed separation that does not undergo the defined saponification reaction.

Requirements

- Assigned oil, prescribed supervised saponification method, standardised titrant and supplied extraction/constant-mass records.

Procedure

1. Record the oil

Enter test mass, method and blank basis.

2. Saponification measurement

Follow the assigned supervised method and record the blank and residual-alkali back-titration.

3. Unsaponifiable record

Read the specified separation and residue data, including blank correction and dry/constant-mass basis.

4. Calculate separately

Express alkali consumption as mg KOH per g and unsaponifiable matter as a mass percentage.

5. Conclude

Compare replicate findings with the assigned oil specification.

Observations and Record

Measurement	Value
Oil mass	_____
Blank / test titre	_____
Corrected residue mass	_____
Saponification value / unsaponifiable %	_____

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Worked Example

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

- Saponification value = $(B - S) \times N \times 56.1 / m$, in mg KOH/g, with mL titres and mass m in g.
- Example: $8.0 \text{ mL} \times 0.5 \times 56.1 / 1.0 \text{ g} = 224.4 \text{ mg KOH/g}$.
- Unsaponifiable matter (%) = corrected dry residue mass / oil mass $\times 100$. Example: $0.012 \text{ g} / 2.0 \text{ g} \times 100 = 0.60\%$.

Result

Record the completed observations, calculations and conclusion with units. State any limitation of the observation.

Precautions

- Use the prescribed blank and account for residual solvent in weighed material.
- Apply supervised solvent and hot-alkali handling; no unapproved extraction is performed.

Viva Questions and Answers

1. What does saponification value include?

The alkali equivalent consumed by the defined method, including ester hydrolysis and free-acid neutralisation.

2. Why weigh a dry residue?

Residual solvent would overestimate the unsaponifiable fraction.

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