Laboratory Analysis Report 2340

Introduction

This report presents the analysis of various oil-based mixtures using different laboratory instruments. The primary aim is to investigate and characterize these samples based on physical and chemical properties like molecular structure, spectral characteristics, viscosity, and stability under centrifugation. The complex and diverse data sets require careful interpretation.

Instrumentation and Test Samples

The following instruments were used to evaluate mixtures, each selected for its specific analytical capability:

Test Sample Mixtures

Observations and Measurements

Note: Some sections may contain scattered and irrelevant data for distraction.

1. FTIR Spectroscopy Results

FTIR analysis provided absorption peaks important for identifying functional groups.

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| --- | --- | --- | --- |
| **Sample ID** | **Mixture** | **Key Absorption (1/cm)** | **Observation** |
| 1 | Almond Oil, Cetyl Alcohol | 3500 | Presence of broad O-H stretch confirmed. |
| 2 | Jojoba Oil, Beeswax, Vitamin E | 4200 | C-H stretching, possible ester linkage. |

2. Spectrometer (Alpha-300) Readings

Spectral properties were observed under visible light.

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| --- | --- | --- | --- |
| **Sample ID** | **Mixture** | **Wavelength (nm)** | **Note** |
| 1 | Almond Oil | 650 | Slight absorption indicating minor conjugation. |
| 2 | Coconut Oil, Cetyl Alcohol | 980 | High absorption, indicative of unsaturation. |

3. Rheology Data

The Rheometer yielded viscosity data highlighting flow behavior.

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| --- | --- | --- | --- |
| **Sample ID** | **Mixture** | **Viscosity (Pa-s)** | **Comments** |
| 1 | Almond Oil, Vitamin E | 150 | Consistent with typical oil behavior. |

4. Centrifuge Stability Test

Observations on phase separation and stability were done at high RPM.

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| --- | --- | --- | --- |
| **Sample ID** | **Mixture** | **RPM** | **Result** |
| 1 | Jojoba Oil, Cetyl Alcohol, Vitamin E | 12000 | Minor phase separation observed. Stability adequate. |

5. PCR and Thermal Analysis

Not all temperatures are relevant, many are distractions.

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| --- | --- | --- | --- | --- |
| **Sample ID** | **Mixture** | **Ct Value** | **Temp (C)** | **Description** |
| 1 | Almond Oil, Beeswax, Glycerin | 25 | - | Stable PCR amplification. |
| 2 | Jojoba Oil | - | 37 | Thermal stability within expected limits. |

6. Viscosity Measurements by Viscometer

Comprehensive viscosity assessments using VS-300.

|  |  |  |  |
| --- | --- | --- | --- |
| **Sample ID** | **Mixture** | **Viscosity (cP)** | **Other Remarks** |
| 1 | Almond Oil, Beeswax, Glycerin | 7194.96 | Suitable for cosmetic formulations. |
| 2 | Jojoba Oil, Beeswax, Glycerin | 2829.14 | Lower viscosity, gentle application property. |

Results and Discussion

Analyzing the above data, it is clear that each mixture exhibits unique physical and chemical characteristics:

In conclusion, these intricate instrument readings and analyses offer comprehensive insight into the characteristics and potential applications of the examined oil mixtures. This understanding is crucial for advancing applications in cosmetic, food, and pharmaceutical industries.