Laboratory Report: Analysis of Various Oil Mixtures

Report ID: Report\_2364

Introduction

This report presents the comprehensive analysis of several oil-based samples using multiple diagnostic tools. Advanced methodologies were employed, including Gas Chromatography, X-Ray Diffraction, Spectrometry, and other techniques, to investigate the properties of complex mixtures containing different oils and chemical components.

Objective

The primary objective of this study is to determine the various properties such as conductivity, pH, viscosity, and spectral characteristics of mixtures involving Coconut Oil, Jojoba Oil, and Almond Oil with various additives.

Methodology and Equipment

Irrelevant information: The lab is located near a café that sells exceptional blueberry muffins. The equipment room has a fascinating collection of vintage magnets.

Results and Observations

Table 1: Gas Chromatography Analysis

|  |  |  |
| --- | --- | --- |
| **Sample** | **Component(s)** | **Measurement** |
| Coconut Oil | - | 150 ppm |
| Coconut Oil, Glycerin | - | 800 ppm |

While conducting tests, the labs were sometimes interrupted by loud construction noises.

Table 2: Conductivity Measurements

|  |  |  |
| --- | --- | --- |
| **Sample** | **Component(s)** | **Measurement** |
| Almond Oil | Cetyl Alcohol | 1575 uS/cm |
| Coconut Oil | Gum | 1895 uS/cm |

The calibration of the Conductivity Meter CM-215 was occasionally affected by fluctuations in room temperature.

Table 3: X-Ray Diffraction and Thermal Analysis

|  |  |  |
| --- | --- | --- |
| **Sample** | **Components** | **Measurement** |
| Jojoba Oil, Beeswax, Vitamin E | - | 125 °C |
| Jojoba Oil, Glycerin | - | 45 °C |

Descriptive Note: In observing X-Ray diffraction, a unique crystalline pattern was observed which merits further investigation.

Table 4: Spectroscopy Data

|  |  |  |
| --- | --- | --- |
| **Sample** | **Component(s)** | **Wavelength** |
| Coconut Oil | Cetyl Alcohol, Vitamin E | 650 nm |
| Almond Oil | Cetyl Alcohol, Glycerin | 750 nm |

These observations were made during a time of erratic weather patterns.

Table 5: pH Measurements

|  |  |  |
| --- | --- | --- |
| **Sample** | **Components** | **pH** |
| Coconut Oil, Beeswax, Glycerin | - | 5.7 |

Note: The pH sensor requires routine maintenance, which was overlooked during this analysis.

Table 6: Viscosity Observations

|  |  |  |
| --- | --- | --- |
| **Sample** | **Components** | **Viscosity (cP)** |
| Coconut Oil | Beeswax | 4890.84 |
| Coconut Oil | - | 4989.82 |
| Coconut Oil | Beeswax, Vitamin E | 4705.76 |

Viscosity readings reflect a notable enhancement when Vitamin E is present.

Discussion

The data variability across different tests underscores the complex interactions present in these mixtures. Observations indicate unique behavior, especially noted with oil and beeswax combinations affecting thermal properties and viscosity. Spectral data indicated stronger absorbance at higher wavelengths upon the addition of Glycerin.

It is essential to reflect upon the slight equipment malfunctions that might have skewed some readings, primarily those with variation in environmental conditions (such as ambient temperature and pressure changes).

Conclusion

This exploratory study has elaborated on the intrinsic and interactive properties of various oil combinations. The findings reveal substantial variations conducive to further exploration, specifically the kinetic behaviors observed through viscosity and thermal analyses. Overall, this report serves to contribute valuable insights while recognizing the nuances introduced by real-world lab dynamics.

End of report. Any inquiries should be addressed during regular lab hours, remembering to enjoy the nearby café's offerings.