Lab Report: Analysis of Test Samples from Report\_387

Introduction

The goal of this report is to provide a comprehensive analysis of various mixtures using different analytical instruments. The various combinations tested consist of natural oils, waxes, alcohols, and vitamins.

Overview of Analytical Techniques

Observations and Results

Sample Mixtures and Instrumentation Data

Spectrometer: Showed absorbance at 650 nm.

Coconut Oil, Gum

Note: The sample displayed peculiar viscosity, possibly affecting performance.

Jojoba Oil, Beeswax

Conductivity Meter: Produced 1250 uS/cm, indicating high ionic content.

Jojoba Oil, Gum, Vitamin E

NMR Spectrometer: Decomposition peak observed at 15.3 ppm.

Coconut Oil, Beeswax, and Glycerin

FTIR Spectrometer: Infrared absorption at 2850 1/cm, characteristic of CH2 stretching.

Almond Oil, Cetyl Alcohol, Vitamin E

Detailed Examination and Analysis

Table 1: Gas Chromatograph & FTIR Spectrometer Observations

|  |  |  |  |
| --- | --- | --- | --- |
| **Sample Mixture** | **Instrument** | **Measurement** | **Unit** |
| Jojoba Oil, Gum, Glycerin | GC-2010 | 350.5 | ppm |
| Coconut Oil, Beeswax, Glycerin | FTIR-8400 | 2850.0 | 1/cm |

Table 2: Conductivity and NMR Observations

|  |  |  |  |
| --- | --- | --- | --- |
| **Sample Mixture** | **Instrument** | **Measurement** | **Unit** |
| Jojoba Oil, Beeswax | CM-215 | 1250.0 | uS/cm |
| Jojoba Oil, Gum, Vitamin E | NMR-500 | 15.3 | ppm |

Irrelevant Observation

Miscellaneous Notes

Unexpected results from the Coconut Oil, Gum mixture in the Four Ball Tester were attributed to an inconsistent ambient temperature.

The Spectrometer displayed intensity variations, possibly due to an off-calibration event.

Table 3: UV-Vis and Spectrometer Data

|  |  |  |  |
| --- | --- | --- | --- |
| **Sample Mixture** | **Instrument** | **Measurement** | **Unit** |
| Almond Oil, Cetyl Alcohol, Vitamin E | UV-2600 | 2.8 | Abs |
| Jojoba Oil, Gum, Glycerin | Alpha-300 | 650.0 | nm |

Conclusions

Each combination presents unique properties influenced by its constituents. The precise measurements reflect the interaction within each mixture. However, further study is needed due to the observed variances, influenced by possible environmental and procedural factors. This investigation offers insights that could enable refined procedures in future studies, elaborating the physicochemical characteristics of similar composites.