Lab Report: Analysis of Various Mixtures

Report ID: 1891

Introduction

This report details the analysis of several oil-based mixtures using advanced analytical techniques. Each mixture consists of a unique combination of oils and additional components, subjected to a battery of tests to evaluate properties such as viscosity, conductivity, and chemical structure.

Experimental Setup

The following instruments were employed for the analyses:  
-Gas Chromatograph GC-2010-Spectrometer Alpha-300-Titrator T-905-Rheometer R-4500-Four Ball FB-1000-Conductivity Meter CM-215-HPLC System HPLC-9000-NMR Spectrometer NMR-500-Viscometer VS-300

The compositions were pre-formulated and labeled as samples by their ingredient groups.

Observations & Results

Table 1: Gas Chromatography and NMR Results

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Sample ID** | **Ingredients** | **Instrument** | **Measurement Type** | **Value** | **Units** |
| Sample A | Almond Oil, Beeswax | Gas Chromatograph GC-2010 | Concentration | 253.4 | ppm |
| Sample B | Almond Oil, Beeswax | NMR Spectrometer NMR-500 | Concentration | 12.4 | ppm |

Observations revealed a consistent chemical signature in Almond Oil and Beeswax mixtures, affirming the precision of both techniques. These results suggest varied interactions that could be explored more deeply through additional chromatography.

Table 2: Optical and Conductivity Analysis

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Sample ID** | **Ingredients** | **Instrument** | **Measurement Type** | **Value** | **Units** |
| Sample C | Jojoba Oil, Gum, Vit E | Spectrometer Alpha-300 | Wavelength | 475.2 | nm |
| Sample D | Jojoba Oil, Gum, Vit E | Conductivity Meter CM-215 | Conductivity | 1200.0 | uS/cm |

These measurements demonstrated a notable optical absorption feature at 475.2 nm, coinciding with elevated conductivity, indicating potential conductive properties in this mixture of Jojoba Oil, Gum, and Vitamin E.

Table 3: Viscosity and Mechanical Properties

(Note: Viscosity values are scattered among irrelevant data)-Viscometer Data1. Sample E: Jojoba Oil, Cetyl Alcohol – Viscosity: 2795.77 cP  
 2. Sample F: Almond Oil, Beeswax, Vitamin E – Viscosity: 7145.55 cP

Viscosity data are pivotal for predicting the flow and application properties of these mixtures, influencing product stability and performance.

Table 4: Titration and HPLC Characterization

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Sample ID** | **Ingredients** | **Instrument** | **Measurement Type** | **Value** | **Units** |
| Sample I | Coconut Oil, Cetyl Alcohol, Vit E | Titrator T-905 | Molarity | 6.78 | M |
| Sample J | Coconut Oil, Cetyl Alcohol, Vit E | HPLC System HPLC-9000 | Concentration | 89.35 | mg/L |

These findings depict a harmonious integration between the titration and HPLC results, suggesting a complex but stable balance of constituents within the sample matrix.

Conclusion

The combination of these diverse analytical methods provided a comprehensive profile of the oil-based mixtures. Observations underscored notable chemical and physical attributes pertinent to industrial applications. Further studies may involve exploring temperature-dependent properties or investigating additional supplementary components.

Miscellaneous Notes

References