Lab Report

Experiment ID: Report\_1709

Overview

This document outlines the experimental procedures and results conducted on various mixtures of natural compounds, including coconut oil, jojoba oil, beeswax, and others. Each mixture was subjected to diverse analytical techniques to assess different physical and chemical properties. The experiments utilize advanced instruments such as the Liquid Chromatograph, Four Ball Tester, and others to provide a comprehensive analysis of the sample components.

Section 1: Liquid Chromatography Analysis

The initial assessment was carried out using theLiquid Chromatograph LC-400. The coconut oil-based sample, combined with beeswax and Vitamin E, exhibited notable chromatographic behavior.

Observations & Measurements

Section 2: Mechanical Property Testing

Using theFour Ball FB-1000device, the mechanical properties of the Jojoba Oil mixture were evaluated.

Observations & Measurements

Section 3: Thermal and Spectroscopic Analysis

Thermal properties were assessed using theX-Ray Diffractometer XRD-6000and other spectral analysis devices, revealing unique thermal properties of the studied samples.

Observations & Measurements

Table 1: Instrumental Analysis Data

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Instrument** | **Sample Components** | **Measurement Type** | **Value** | **Unit** |
| Liquid Chromatograph LC-400 | Coconut Oil, Beeswax, Vitamin E | Concentration | 120.5 | µg/mL |
| Four Ball FB-1000 | Jojoba Oil, Beeswax, Glycerin | Wear Scar | 0.356 | mm |
| X-Ray Diffractometer XRD-6000 | Jojoba Oil | Temperature | 75.0 | °C |
| FTIR Spectrometer FTIR-8400 | Jojoba Oil, Beeswax, Glycerin | IR Peak | 1500.0 | 1/cm |

Section 4: Centrifugal and Optical Analysis

The samples underwent force and optical property analysis usingCentrifuge X100andMicroplate Reader MRX.

Observations & Measurements

Table 2: Additional Measurements

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Instrument** | **Sample Components** | **Measurement Type** | **Value** | **Unit** |
| Centrifuge X100 | Coconut Oil, Glycerin | Rotation Speed | 12000.0 | RPM |
| Microplate Reader MRX | Jojoba Oil, Gum | Optical Density | 2.5 | OD |
| Conductivity Meter CM-215 | Coconut Oil, Beeswax | Conductivity | 1850.0 | µS/cm |

Section 5: NMR Spectroscopy and Viscosity Analysis

Using theNMR Spectrometer NMR-500andViscometer VS-300, molecular and viscosity measurements were explored.

Observations & Measurements

Table 3: Spectroscopic and Viscosity Data

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Instrument** | **Sample Components** | **Parameter** | **Value** | **Unit** |
| NMR Spectrometer NMR-500 | Jojoba Oil, Vitamin E | Chemical Shift | 15.0 | ppm |
| Viscometer VS-300 | Jojoba Oil, Gum, Vitamin E | Viscosity | 2135.97 | cP |
| Viscometer VS-300 | Jojoba Oil, Cetyl Alcohol, Glycerin | Viscosity | 2570.06 | cP |

Conclusion

The suite of tests conducted on the natural oils and accompanying ingredients illustrates diverse physical and chemical properties. Each analytical modality provided complementary insights, contributing to a holistic understanding of these complex mixtures. Consequently, any future research or applications relying on these findings can be tailored according to the unique characteristics observed in this comprehensive analysis.