Lab Report

Report ID: Report\_313

Introduction

The objective of this lab report is to analyze various oil mixtures using different scientific instruments. The samples consist of diverse combinations of oils, gums, beeswax, vitamin E, and glycerin. This analysis provides insights into the physicochemical properties of these mixtures.

Methodology

Various high-precision instruments were employed to gauge the properties of the samples, as detailed in the subsequent sections. Each sample contained specific constituents that were mixed uniformly before testing.

Table 1: Instruments and Their Specifications

|  |  |  |
| --- | --- | --- |
| **Instrument Name** | **Model** | **Purpose** |
| FTIR Spectrometer | FTIR-8400 | Infrared spectral analysis |
| Four Ball | FB-1000 | Wear resistance |
| Mass Spectrometer | MS-20 | Molecular weight |
| UV-Vis Spectrophotometer | UV-2600 | Optical absorbance |
| High Performance Liquid Chromatography | HPLC-9000 | Concentration analysis |
| Titrator | T-905 | Molarity determination |
| Liquid Chromatograph | LC-400 | Purity measurement |
| Conductivity Meter | CM-215 | Conductivity measurement |
| Spectrometer | Alpha-300 | Wavelength determination |
| Viscometer | VS-300 | Viscosity measurement |

Observations

Sample Analysis

Sample 1:Almond Oil, Gum, Glycerin

Peak observed at1200 1/cm.

Titrator (T-905):

Calculated molarity:0.005 M.

Viscometer (VS-300):

A surprising viscosity of7640.79 cPwas documented, indicating a significantly thick mixture.

UV-Vis Spectrophotometer (UV-2600):

Absorbance measured at0.8 Abs.

Conductivity Meter (CM-215):

The integration of these observations suggests complex interactions between the gum and glycerin components, affecting both viscosity and conductivity.

Sample 2:Coconut Oil, Gum

Sample 3:Jojoba Oil, Vitamin E

Sample 4:Coconut Oil, Beeswax, Glycerin

Glycerin concentration determined at500 mg/L.

Spectrometer (Alpha-300):

Sample 5:Jojoba Oil, Beeswax

Table 2: Measurement Results

|  |  |  |  |
| --- | --- | --- | --- |
| **Sample** | **Property** | **Value** | **Unit** |
| Almond Oil, Gum, Glycerin | FTIR Peak | 1200.0 | 1/cm |
| Almond Oil, Gum, Glycerin | Molarity | 0.005 | M |
| Almond Oil, Gum, Glycerin | Viscosity | 7640.79 | cP |
| Almond Oil, Gum, Glycerin | Absorbance | 0.8 | Abs |
| Almond Oil, Gum, Glycerin | Conductivity | 950.0 | uS/cm |
| Coconut Oil, Gum | Wear Scar Diameter | 0.3 | mm |
| Jojoba Oil, Vitamin E | Mass Spectrometry Peak | 450.0 | m/z |
| Coconut Oil, Beeswax, Glycerin | Glycerin Concentration | 500.0 | mg/L |
| Jojoba Oil, Beeswax | Concentration via LC | 150.0 | ug/mL |

Conclusion

Each instrument provided crucial insights into the compositions and properties of the oil mixtures. The almond oil-gum-glycerin sample's viscometric data presents potential for targeted applications requiring high viscosity. The diverse findings across the samples underscore the complex interactions and potential applications for each mixture.

Additional research may delve into potential reactions between the sample components, further refining the understanding of these mixtures' properties. The results presented here provide a foundation for such inquiries.