Lab Report 2038

Overview

This report presents a series of detailed analyses conducted on different mixtures of oils and additives using various advanced analytical instruments. Each test performed on a sample highlights its specific chemical and physical properties.

Objectives

Analytical Methods and Data

Instruments Employed

Experimental Observations

Coconut Oil-Based Mixtures-Thermal Observation: At a controlled thermal setting of28°C, the Coconut Oil and accompanying additives (Gum and Glycerin) were assessed using Thermocycler TC-5000, yielding a stable thermal profile.  
-Chromatographic Measurements: Liquid Chromatograph LC-400 determined a concentration of358 µg/mLin the mixture containing Beeswax and Vitamin E.  
-Titrimetric Analysis: Utilizing Titrator T-905, a molarity of0.006 Mwas detected when mixed with Cetyl Alcohol.  
-Gas Chromatographic Findings: A pivotal measure of590 ppmwas recorded with a Gas Chromatograph GC-2010 for the sample with Gum and Vitamin E.  
-Additional Findings: Another titration indicated a more potent solution of2.5 Mfor a mixture of Beeswax and Glycerin.

Almond Oil-Based Mixtures-Thermal Parameters: An elevated thermal exposure at67°Cshowcased the thermal stability of Almond Oil using the Thermocycler TC-5000.  
-Chromatographic Evaluation: The mixture, composed of Beeswax and Glycerin, demonstrated a concentration of456 ppmvia Gas Chromatograph GC-2010.

Jojoba Oil-Based Mixtures-Ion Chromatographic Result: When combined with Beeswax, the Ion Chromatograph IC-2100 measured a concentration of0.75 mM.  
-Viscometric Challenges: Diverse viscosities were recorded with the Viscometer VS-300 for various combinations:  
 - With Gum and Glycerin:1760.27 cP- With Gum and Vitamin E:2079.58 cP- Pure Jojoba Oil:2645.89 cP

Tables of Results

Table 1: Thermal and Chromatographic Data

|  |  |  |
| --- | --- | --- |
| **Sample** | **Instrument** | **Measurement** |
| Coconut Oil, Gum, Glycerin | Thermocycler TC-5000 | 28°C |
| Coconut Oil, Beeswax, Vit E | Liquid Chromatograph | 358 µg/mL |
| Coconut Oil, Cetyl Alcohol | Titrator T-905 | 0.006 M |
| Almond Oil, Beeswax, Glycerin | Gas Chromatograph | 456 ppm |
| Jojoba Oil, Beeswax | Ion Chromatograph | 0.75 mM |
| Almond Oil (pure) | Thermocycler TC-5000 | 67°C |

Table 2: Viscosity Measurements

|  |  |  |
| --- | --- | --- |
| **Mixture** | **Instrument** | **Viscosity (cP)** |
| Jojoba Oil, Gum, Glycerin | Viscometer VS-300 | 1760.27 |
| Jojoba Oil, Gum, Vit E | Viscometer VS-300 | 2079.58 |
| Jojoba Oil (pure) | Viscometer VS-300 | 2645.89 |

Additional Remarks

Discrepancies in Data: Observed discrepancies between various mixtures, potentially due to the unique interaction of components.

Complexity in Viscosity: Differences in viscosity readings suggest significant interaction effects between the internal components.

Inaccurate Data Points: The scattering of certain data points that appear irrelevant may indicate procedural anomalies or documentation errors.

Conclusion

The conducted analyses provide an in-depth understanding of the thermal stability, component concentration, and viscosity characteristics of oil-based mixtures. Future exploration should focus on pinpointing the inter-component reactions that result in varied physical and chemical behaviors. This report entails strategic integration of scientific methodology sculpted to promote innovative understanding within complex multi-ingredient systems.