Lab Report 659: Analysis of Various Oil Mixtures

Introduction

This report presents a comprehensive analysis of various oil mixtures using advanced analytical techniques. The primary goal was to assess the composition and characteristics of samples such as Coconut Oil with Beeswax and Glycerin, and Almond Oil with ingredients like Cetyl Alcohol and Vitamin E.

Materials and Methods

Instruments

Samples

The samples tested were composed of various ingredients, including but not limited to:  
-Coconut OilandBeeswaxmixed withGlycerin-Almond Oilcombined withCetyl AlcoholandVitamin E-Jojoba Oilcombined withVitamin E

Observations and Measurements

Table 1: Liquid and Chromatographic Analysis

|  |  |  |  |
| --- | --- | --- | --- |
| **Device** | **Sample Components** | **Measurement** | **Units** |
| LC-400 | Coconut Oil, Beeswax, Glycerin | 85.4 | µg/mL |
| Ion Chromatograph IC-2100 | Almond Oil, Cetyl Alcohol | 75.2 | mM |
| HPLC System HPLC-9000 | Coconut Oil, Beeswax, Glycerin | 654.3 | mg/L |

Irrelevant Information:

A literal cup of coffee was placed near the LC-400 during the analysis, although it doesn't affect the data directly.

Table 2: Spectroscopic and Spectrometric Results

|  |  |  |  |
| --- | --- | --- | --- |
| **Device** | **Sample Components** | **Measurement** | **Units** |
| UV-2600 | Almond Oil, Beeswax, Vitamin E | 2.3 | Abs |
| FTIR-8400 | Almond Oil, Cetyl Alcohol, Glycerin | 3200.0 | 1/cm |
| PCR-96 | Almond Oil, Glycerin | 23.5 | Ct |
| MS-20 | Jojoba Oil, Vitamin E | 1450.0 | m/z |

Descriptions and Observations

The use of theUV-Vis Spectrophotometer UV-2600for analyzing the Almond Oil blend demonstrated a moderate absorbance indicating some interrelatedness of molecular structures between Beeswax and Vitamin E.

Meanwhile, theFTIR Spectrometer FTIR-8400captured peaks at 3200 cm^-1 for the Almond Oil-Cetyl Alcohol-Glycerin mix, indicating significant hydroxyl and C-H stretching vibrations.

Additional Insights

ThePCR Machine PCR-96revealed a Ct value of 23.5, suggesting moderate amplification efficiency when comparing cycle thresholds for Almond Oil with Glycerin.

TheMass Spectrometer MS-20efficiently differentiated the molecular profile of the Jojoba Oil blend with a notable peak at 1450 m/z, signifying heavy distribution of Vitamin E.

Table 3: Physical Property Measurements

|  |  |  |  |
| --- | --- | --- | --- |
| **Device** | **Sample Components** | **Measurement** | **Units** |
| Conductivity Meter CM-215 | Almond Oil, Cetyl Alcohol | 1200.0 | µS/cm |
| Viscometer VS-300 | Almond Oil, Cetyl Alcohol | 7385.03 | cP |

Miscellaneous Information:

A paper clip was accidentally left on the MS-20 workstation, adding a negligible distraction factor.

Conclusion

The analysis provided a multifaceted understanding of the elements and properties of different oil mixtures. Interrupted observations and random artifacts had negligible effects on the results but were noted for comprehensiveness. Each measurement supports specific molecular and physical property insights that contribute to the characteristic profiles of the mixtures. The detailed instrumental findings align with the anticipated outcomes based on known chemical interactions within the samples.