Lab Report 2442

Introduction

The objective of the study was to analyze various oil-based mixtures using different analytical instruments. Each sample mixture was composed of distinct oils and additives, essential for determining the physical and chemical properties relevant to industrial applications.

Materials and Methods

A variety of instruments were used to evaluate the properties of mixtures containing Jojoba Oil, Almond Oil, and Coconut Oil with additives such as Cetyl Alcohol, Beeswax, and Vitamin E.

Sample Descriptions:

Instruments Used:

Observations

Initial observations revealed that the viscosity and conductivity were significantly affected by the type of oil and presence of specific additives. Jojoba Oil mixtures demonstrated unique diffraction patterns under X-ray analysis, and Vitamin E content was significant in mass spectrometry results.

Results and Discussion

Table 1: Viscosity Measurements

|  |  |  |  |
| --- | --- | --- | --- |
| **Sample** | **Instrument** | **Measurement** | **Unit** |
| Almond Oil, Cetyl Alcohol | Viscometer | 7094.06 | cP |
| Coconut Oil, Gum | Viscometer | 5078.23 | cP |
| Coconut Oil, Cetyl Alcohol | Viscometer | 5054.11 | cP |

Table 2: Chemical and Physical Properties

|  |  |  |  |
| --- | --- | --- | --- |
| **Sample** | **Instrument** | **Measurement** | **Unit** |
| Jojoba Oil, Cetyl Alcohol, Vitamin E | Four Ball FB-1000 | 0.572 | mm |
| Jojoba Oil, Vitamin E | NMR Spectrometer NMR-500 | 12.5 | ppm |
| Coconut Oil, Beeswax, Vitamin E | X-Ray Diffractometer XRD-6000 | 100.0 | C |
| Almond Oil, Cetyl Alcohol | Conductivity Meter CM-215 | 1500.0 | uS/cm |
| Almond Oil, Beeswax, Vitamin E | Mass Spectrometer MS-20 | 450.6 | m/z |
| Jojoba Oil, Beeswax, Vitamin E | Ion Chromatograph IC-2100 | 25.5 | mM |
| Jojoba Oil, Cetyl Alcohol, Vitamin E | pH Meter PH-700 | 5.8 | pH |
| Jojoba Oil, Vitamin E | HPLC System HPLC-9000 | 800.0 | mg/L |
| Coconut Oil, Beeswax, Vitamin E | PCR Machine PCR-96 | 30.0 | Ct |
| Almond Oil, Beeswax, Vitamin E | Four Ball FB-1000 | 0.832 | mm |

Analysis

Random noise was detected in some measurements, though irrelevant to key findings. Notably, the NMR analysis of Jojoba Oil and Vitamin E provided insights into interaction frequencies, while the X-Ray results showed thermal stability for Coconut/Bee mixtures.

Complex interactions were observed between certain sample components, emphasizing the need for specialized processing techniques to maintain blend uniformity.

Irrelevant Information

During the mass spectrometry analysis, unrelated fiducials appeared, likely due to sample contamination or equipment recalibration needs.

Conclusion

The investigation successfully characterized the various mixtures. Notably, Almond Oil with Cetyl Alcohol exhibited high viscosity, significant for product formulation. Future studies should explore alternative additives to enhance stability and performance.

Note:This is a challenging report due to the mixture of relevant and scattered irrelevant information, catering to in-depth manual review for practical applications.