Lab Report 1909

Introduction

This study investigates the physicochemical properties of various oil-based mixtures using advanced analytical instruments. Different combinations of oils, waxes, and additives were analyzed to understand their optical, thermal, rheological, and chemical properties.

Materials and Methods

Viscometer VS-300

Sample Mixtures:

Results and Discussion

Optical Density and Absorption

The optical properties of the mixtures were measured using the Microplate Reader MRX and UV-Vis Spectrophotometer UV-2600.

Thermal and Spectroscopic Analysis

The thermal behavior and spectroscopic characteristics were recorded with the Thermocycler TC-5000 and FTIR Spectrometer FTIR-8400.

Unrelated Note:During testing, a procedural error led to the accidental heating of a non-sample mixture, resulting in no data collection for that trial.

Chromatography and Rheological Behavior

Liquid and Ion Chromatographs were used to separate components, while rheological properties were assessed using a Rheometer and Viscometer.

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| **Instrument** | **Sample Mixture** | **Measurement** | **Unit** |
| Microplate Reader MRX | Almond Oil, Gum, Glycerin | 2.5 | OD |
| Thermocycler TC-5000 | Jojoba Oil, Gum, Vitamin E | 58.0 | °C |
| Liquid Chromatograph LC-400 | Coconut Oil, Beeswax, Glycerin | 200.4 | μg/mL |
| FTIR Spectrometer FTIR-8400 | Jojoba Oil, Glycerin | 1200.0 | 1/cm |
| Rheometer R-4500 | Almond Oil, Beeswax | 50.2 | Pa-s |
| pH Meter PH-700 | Coconut Oil, Gum, Vitamin E | 7.8 | pH |
| Titrator T-905 | Coconut Oil, Glycerin | 0.025 | M |
| Ion Chromatograph IC-2100 | Almond Oil, Vitamin E | 10.3 | mM |
| UV-Vis Spectrophotometer UV-2600 | Jojoba Oil, Gum, Vitamin E | 1.8 | Abs |

Acid-Base and Miscellaneous Analysis

pH measurements and titrations provided insights into the chemical nature of the mixtures.

Conclusion

The results from various instruments provided a comprehensive analysis of the physico-chemical properties of the tested oil-based mixtures. Each combination demonstrated unique characteristics, offering valuable insights for industrial applications.

References