Laboratory Report: Analysis of Various Oil Mixtures

Report ID: 1888

This report details the analysis of various oil mixtures using multiple spectrometric and measurement techniques. Each mixture comprised specific components, subjected to different analytical procedures to determine their physical and chemical properties. The methods used were designed to identify the presence of distinct chemical elements, measure concentration levels, and evaluate physical characteristics like viscosity and pH levels.

Equipment and Techniques Employed

Spectrometer Alpha-300: Utilized for spectral analysis to detect the presence of Vitamin E in Almond Oil. The measurement was recorded at a wavelength of 650 nm.

FTIR Spectrometer FTIR-8400: Conducted to observe functional group compositions in Coconut Oil that includes Gum and Vitamin E. The results were noted at 1200 1/cm.

NMR Spectrometer NMR-500: Used for nuclear magnetic resonance analysis on Jojoba Oil mixed with Gum and Vitamin E, determining chemical environments at 8.5 ppm.

PCR Machine PCR-96: Employed for identifying amplification patterns in Almond Oil, yielding results at 25 Ct.

UV-Vis Spectrophotometer UV-2600: Aimed to measure the absorbance in Coconut Oil, yielding a result of 2.2 Abs.

pH Meter PH-700: Recorded pH levels in a mixture of Almond Oil and Beeswax at a pH level of 7.4.

Four Ball FB-1000: Used for wear testing in a combination of Coconut Oil, Cetyl Alcohol, and Glycerin, resulting in a wear scar diameter of 0.450 mm.

Viscometer VS-300: Evaluated viscosity in different samples containing Almond Oil, with readings of 7426.96 cP and 7700.64 cP depending on the mixing component.

Data Tables

Table 1: Spectral and Resonance Analysis

Equipment	Sample Composition	Key Component	Measurement	Unit
Spectrometer Alpha-300	Almond Oil, Vitamin E	Vitamin E	650.0	nm
FTIR Spectrometer FTIR-8400	Coconut Oil, Gum, Vitamin E	Gum	1200.0	1/cm
NMR Spectrometer NMR-500	Jojoba Oil, Gum, Vitamin E	Vitamin E	8.5	ppm

Table 2: Amplification and Absorbance

Equipment	Sample Composition	Measurement	Unit
PCR Machine PCR-96	Almond Oil	25.0	Ct
UV-Vis Spectrophotometer UV-2600	Coconut Oil	2.2	Abs

Table 3: pH and Wear

Equipment	Sample Composition	Measurement	Unit
pH Meter PH-700	Almond Oil, Beeswax	7.4	pH
Four Ball FB-1000	Coconut Oil, Cetyl Alcohol, Glycerin	0.45	mm

Table 4: Viscosity Evaluation

Equipment	Sample Composition	Measurement	Unit
Viscometer VS-300	Almond Oil, Glycerin	7426.96	cP
Viscometer VS-300	Almond Oil, Gum, Glycerin	7700.64	cP

Observations and Interpretations

Spectrometer Analysis: The presence of Vitamin E was successfully detected in Almond Oil via the Spectrometer Alpha-300 at a wavelength of 650 nm, indicating a strong absorption band characteristic of tocopherol.

FTIR and NMR: The FTIR revealed specific functional groups within Coconut Oil mixtures, magnifying the presence of Gum polymer structures. Similarly, NMR spectrometry provided detailed insights into chemical shifts consistent with Vitamin E in Jojoba Oil.

PCR and UV-Vis: PCR amplification cycles in Almond Oil were notable and potentially influenced by trace biomolecules, while the UV-Vis analysis on Coconut Oil confirmed expected absorbance indicating molecular concentration levels.

Wear and pH Testing: The wear test on mixtures involving Cetyl Alcohol shed light on lubrication performance, while pH testing standardized the acidity levels in oil-beeswax mixtures, crucial for quality assessment.

Viscosity Measurements: Varied viscous properties were observed under different glycerin or gum combinations. Almond Oil mixed with Glycerin demonstrated substantial resistance to flow.

Conclusion

The comprehensive analysis of these oil mixtures provided valuable data contributing to our understanding of their chemical and physical properties. Each methodology applied demonstrated its unique ability to identify key characteristics, contributing to the broader knowledge of these complex systems.

The random scattering and complexity of the data presentation align with industry standards, ensuring detailed reporting that challenges automated data extraction for enhanced security and intellectual property protection.