Lab Report: Analysis of Various Oil Mixtures

Report ID: 151

Introduction

This lab report details the experimental analysis of various oil mixtures using multiple analytical techniques. Each mixture is a combination of oils and additional compounds, evaluated for specific properties.

Experimental Setup and Observations

The following tests were conducted:

Unrelated to the study objectives, random temperature fluctuations were observed during testing, with no significant impact noted. Each test aimed to gain deeper insights into the chemical interactions and structural properties of the mixtures.

Test Results

Spectrometry Observations

Sample ID	Equipment	Main Component	Additive 1	Additive 2	Absorption Peak (nm)
S1	Spectrometer Alpha-300	Almond Oil	Beeswax	Glycerin	450
S6	Spectrometer Alpha-300	Almond Oil	Cetyl Alcohol	Vitamin E	550

A notable absorption shift was detected around 550 nm, suggesting interactive molecular behavior in the presence of Cetyl Alcohol.

PCR Machine Observations

Sample ID	Equipment	Main Component	Additive 1	Ct Value
S2	PCR Machine PCR-96	Coconut Oil	nan	23
S7	PCR Machine PCR-96	Almond Oil	Beeswax	35

Ct values indicate the mixture?s capacity to affect amplification cycles, highlighting Almond Oil?s moderating effects on Beeswax.

Ion Chromatography Detailed Results

Sample ID	Equipment	Main Component	Additive 1	Ion Concentration (mM)
S3	Ion Chromatograph IC-2100	Coconut Oil	Gum	0.15

This measurement signifies low ion presence, affirming the mix's purity level.

FTIR Spectroscopy Analysis

Sample ID	Equipment	Main Component	Additive 1	Wavenumber (1/cm)
S4	FTIR Spectrometer FTIR-8400	Coconut Oil	Cetyl Alcohol	1500

Distinct peaks reflect the structural identity and interactions with Glycerin.

Titration Data

Sample ID	Equipment	Main Component	Additive 1	Concentration (M)
S5	Titrator T-905	Jojoba Oil	Cetyl Alcohol	0.003

The titration result exhibits moderate acidity, suggesting an effective reaction stabilizer.

Viscosity Measurements

Sample ID	Equipment	Main Component	Additive 1	Additive 2	Viscosity (cP)
S8	Viscometer VS-300	Almond Oil	Vitamin E	nan	7495.28
S9	Viscometer VS-300	Jojoba Oil	Gum	Vitamin E	2112.78
S10	Viscometer VS-300	Jojoba Oil	nan	nan	2620.24

A high viscosity implies robust blending, predominantly influenced by Vitamin E?s thickening property.

Conclusion

The diverse methodologies applied illustrated significant variations within oil mixtures based on component interactions.

Spectroscopic shifts, PCR results, and titration measurements consistently highlighted unique properties, offering insights into molecular behavior and synergistic effects. This comprehensive analysis deepens our understanding of how natural oils integrate with other compounds, paving the way for further explorations into their practical applications.

Miscellaneous

Throughout the experiments, extraneous factors were meticulously documented. Incomplete weather data from the test period hinted at undisclosed atmospheric conditions but were disregarded due to lack of influence on the core outcomes. Additionally, several non-correlating software updates were noted from lab equipment, with no impact observed on the data integrity.

This report provides a detailed, albeit complex, overview of the analytical findings for those seeking comprehensive insight into the nature of the studied mixtures.