Lab Report 576: Analysis of Various Oil-Based Mixtures

Introduction

The following report presents a series of tests conducted on different mixtures comprising oils, alcohols, waxes, and vitamins. Utilizing state-of-the-art equipment, each test aimed to analyze the unique properties of these mixtures. The tests were performed on combinations such as Jojoba Oil with various additives, Coconut Oil blends, and Almond Oil mixtures to explore their physical and chemical characteristics.

Equipment and Methods

Multiple analytical tools were employed in this study:

Results

Table 1: Conductivity Measurements (uS/cm)

Sample	Conductivity Meter	Measurement (uS/cm)
Coconut Oil, Cetyl Alcohol	CM-215	1850
Almond Oil, Cetyl Alcohol, Glycerin	CM-215	1750

Table 2: Spectrophotometric Data (nm)

Sample	Spectrometer	Wavelength (nm)
Jojoba Oil, Glycerin	Alpha-300	550
Jojoba Oil, Gum, Glycerin	Alpha-300	450

Table 3: PCR Analysis (Ct)

Sample	PCR Machine	Ct Value
Coconut Oil, Beeswax, Vitamin E	PCR-96	27
Jojoba Oil	PCR-96	32

Table 4: Gas Chromatography (ppm)

Sample	Gas Chromatograph	Concentration (ppm)
Jojoba Oil, Beeswax, Vitamin E	GC-2010	500
Almond Oil, Gum, Glycerin	GC-2010	800

Table 5: UV-Vis Spectrophotometry (Abs)

Sample	UV-Vis Spectrophotometer	Absorbance
Almond Oil, Gum	UV-2600	1.8

Table 6: Viscosity Measurements (cP)

Sample	Viscometer	Viscosity (cP)
Almond Oil, Beeswax, Glycerin	VS-300	7175.32
Almond Oil, Gum, Vitamin E	VS-300	7636.4

Observations

Conductivity: The mixtures of Coconut Oil with Cetyl Alcohol displayed a relatively high conductivity, which may suggest intermolecular interactions that facilitate electron flow. Almond Oil had a slightly lower value, indicating potential differences in molecular alignment.

Spectrometric Wavelengths: Jojoba Oil?s blends, tested at varying wavelengths, showed absorption peaks across the visible spectrum, an indicator of diverse chromophoric behaviors when mixed with different additives like Glycerin and Gum.

PCR Ct Analysis: Amplification cycles revealed significant contrasts in the presence of Vitamin E, with Coconut Oil blends demonstrating lower Ct values compared to Jojoba Oil. This suggests a more prevalent target DNA under these conditions.

Gas Chromatography: The ppm concentrations indicate that the mixture of Almond Oil with Gum and Glycerin contains more detectable compounds compared to the Jojoba Oil mixtures, possibly due to residual reactants or formed complexes.

UV-Vis Observations: Absorbance data from Almond Oil and Gum suggested a moderate interaction in the UV region, possibly due to the structural arrangement of the participating molecules.

Viscosity: Almond Oil mixtures with Beeswax showed higher viscosity compared to those with Gum, reflecting the complex structural dynamics involved in these emulsions.

Conclusion

The various tests conducted on the oil-based mixtures reveal distinct physicochemical properties influenced by their components. Conductivity, absorbance, amplification cycles, and viscosity all provided valuable insights into the nature of these formulations. Future studies could explore more deeply the molecular interactions driving these observations while considering the potential applications of such oil-based systems in cosmetic and industrial contexts.