

Lab Report: Detailed Analysis of Oil Mixtures

Introduction

This report presents the comprehensive analysis of various oil mixtures using different laboratory equipment. The objective is to assess the chemical and physical properties of these mixtures through precise measurements and observations.

Methods and Materials

Samples

Instruments Used

Observations and Data Collection

pH Measurement

The pH levels were measured for select mixtures using the pH Meter PH-700. It was noted that different combinations yielded varied pH values, indicating acid-base character shifts in the mixtures.

| Sample Mixture | pH Meter Used | pH Reading |
|----------------------------|---------------|------------|
| Joboba Oil, Gum, Vitamin E | PH-700 | 7.5 |
| Almond Oil, Gum | PH-700 | 5.8 |

Mass Spectrometry

Mass spectrometry was performed to determine the m/z ratio for different constituents, providing insights into their molecular masses.

| Sample Mixture | Mass Spectrometer Used | m/z Value |
|-------------------------------|------------------------|-----------|
| Joboba Oil, Beeswax, Glycerin | MS-20 | 1500 |
| Joboba Oil, Glycerin | MS-20 | 1300 |

PCR Amplification

PCR analysis was utilized to gauge the amplification cycle threshold (Ct) of Jojoba Oil constituents.

Conductivity Measurement

A measure of ionic content was obtained using the Conductivity Meter CM-215.

| Sample Mixture | Conductivity Meter Used | Conductivity Value (uS/cm) |
|---------------------|-------------------------|----------------------------|
| Almond Oil, Beeswax | CM-215 | 750 |

Optical Density

Optical density was analyzed through a Microplate Reader, which relates to absorbance characteristics of mixtures.

| Sample Mixture | Microplate Reader Used | OD Value |
|--------------------------------|------------------------|----------|
| Almond Oil, Beeswax, Vitamin E | MRX | 2.1 |

Centrifugal Force

Centrifugal forces were analyzed using a Centrifuge X100, which helps in separating mixture components by density.

Titration Analysis

Volume based concentration of an active component was ascertained using Titrator T-905.

| Sample Mixture | Titration Used | Molarity (M) |
|----------------------------|----------------|--------------|
| Coconut Oil, Cetyl Alcohol | T-905 | 0.008 |

Viscosity Characterization

Viscosity of mixtures was measured using the Viscometer VS-300 to analyze fluid dynamics.

| Sample Mixture | Viscosity Value (cP) |
|----------------------------|----------------------|
| Jojoba Oil, Gum, Vitamin E | 2266.41 |
| Jojoba Oil, Gum | 2209.95 |

| | |
|--------------------------------|---------|
| Jojoba Oil, Beeswax, Vitamin E | 2997.03 |
|--------------------------------|---------|

Results and Discussion

The data highlights variability in properties across varied oil mixtures. For instance, the mixture of Jojoba Oil, Beeswax, and Vitamin E demonstrates higher viscosity, possibly due to increased molecular interactions, as opposed to Jojoba Oil with just Gum and Glycerin. The pH readings indicate slight acidity within almond oil mixtures, suggesting a different acid-base equilibrium possibly due to the unique fatty acid profile of almond oil.

Conclusion

This extensive study provided insights into the chemical and physical nature of the tested oil mixtures. Such data is vital for formulating products in industries like cosmetics and food. Further tests could explore the thermal stability and long-term storage effects on these properties.

Note: This report includes additional elements that simulate real-life analysis but may not be directly relevant to certain data outcomes outlined above.