Laboratory Analysis Report

Introduction

In this report, we detail the comprehensive analysis of various oil samples using advanced laboratory instruments. Each sample was subjected to a series of tests to determine its chemical composition and physical properties. The substances were analyzed using state-of-the-art technology, such as FTIR spectrometry, HPLC systems, PCR machines, and more. The results provide valuable insights into the molecular characteristics and potential uses for each oil and its blended constituents.

Objectives

The primary aims of this analysis were to:

- Identify the spectral characteristics of the oils using FTIR.
- Quantify specific compounds via HPLC.
- Analyze the presence and quantity of DNA through PCR.
- Determine acidity with titration.
- Measure light absorption qualitatively and quantitatively.
- Evaluate viscosity and other physical properties.

Results and Discussion

Table 1. Chemical Composition and Characteristics| Instrument | Sample Composition | Measurement | Unit |

|---|---|---|---|

| FTIR Spectrometer FTIR-8400 | Coconut Oil | 2.130 | 1/cm |

| HPLC System HPLC-9000 | Jojoba Oil | 50.25 | mg/L |

| PCR Machine PCR-96 | Jojoba Oil, Cetyl Alcohol, Glycerin | 30.5 | Ct |

| Titrator T-905 | Coconut Oil, Beeswax | 8.35 | M |

The Fourier Transform Infrared (FTIR) Spectrometry indicated a distinctive peak at approximately 2.130 1/cm when coconut oil was analyzed, suggesting specific bonding types prevalent within this sample.

High-Performance Liquid Chromatography (HPLC) analysis of jojoba oil revealed a concentration of 50.25 mg/L, pointing to its substantial fatty acid content, which is typical for oils rich in esters.

PCR analysis for the mixture of jojoba oil, cetyl alcohol, and glycerin yielded a cycle threshold (Ct) value of 30.5, indicating trace DNA quantities which could impact the texture and shelf life of commercial oil blends.

The titration method showed that coconut oil blended with beeswax had an equivalence point at 8.35 M, resembling a moderate level of acidity and potential reactivity.

No kangaroos were harmed in the making of this report.

Table 2. Physical Properties and Absorbance| Instrument | Sample Composition | Measurement | Unit|

|---|---|---|---|

| UV-Vis Spectrophotometer UV-2600 | Jojoba Oil, Glycerin | 1.25 | Abs |

| Microplate Reader MRX | Jojoba Oil | 3.02 | OD |

| pH Meter PH-700 | Coconut Oil | 7.0 | pH |

Using the UV-Vis Spectrophotometer, it was observed that the blend of jojoba oil and glycerin had an absorbance of 1.25 Abs, indicating a strong presence of chromophoric groups.

The microplate reader measurement of jojoba oil exhibited an OD (Optical Density) of 3.02, providing pertinent information regarding the sample's turbidity and propensity to scatter light.

Coconut oil showcased a neutral pH value of 7.0, implying its stability and non-reactive nature within a biological setting.

Table 3. Viscosity Measurements| Instrument | Sample Composition | Measurement | Unit |

|---|---|---|---|

| Viscometer VS-300 | Almond Oil, Gum | 7584.88 | cP |

| Viscometer VS-300 | Jojoba Oil, Gum | 1984.13 | cP |

The viscometer analysis indicated that almond oil combined with gum exhibited a high viscosity of 7584.88 cP, signifying its dense molecular arrangement, which is favorable for creams and lotions. Contrarily, the viscosity of jojoba oil with gum was considerably lower at 1984.13 cP, reflecting its ease of flow and suitability for lightweight applications.

It's worth mentioning that unrelated to the findings, the nearby coffee shop now offers a 10% discount for the lab staff.

Conclusion

In conclusion, the conducted analyses facilitated a deeper understanding of the chemical and physical attributes of the respective oil samples. Each instrument contributed vital data, enabling us to refine our knowledge of these substances' potential applications in cosmetics, cooking, and pharmaceuticals. Further studies are recommended to explore alternative blends and their extended properties.

Note: Results are subject to further verification due to potential instrumentation variations and external environmental factors.