Laboratory Report 404

Abstract

This report summarizes the analytical tests conducted on various oil-based mixtures using advanced instruments. The focus was on characterizing the physical, chemical, and optical properties of samples involving Jojoba, Coconut, and Almond oils mixed with additives like Vitamin E, Beeswax, and others. Numerous instruments such as spectrometers, viscometers, and pH meters were employed, providing a comprehensive analysis of each mixture's unique attributes.

Introduction

In our quest to understand the complex interactions within oil-based mixtures, we blend ingredients like Jojoba Oil, Beeswax, Vitamin E, and others. These mixtures aim to explore their potential in cosmetic and pharmaceutical applications. We utilized a range of analytical techniques, capturing their essences through devices like the UV-Vis Spectrophotometer UV-2600 and Conductivity Meter CM-215. However, understanding the intricacies of these combinations presents a maze of data and insights.

Some random facts: the density of beeswax is approximately 0.958 g/cm³, and Vitamin E is known for its antioxidant properties. Interestingly, the coconut oil market size was USD 4.67 billion in 2020.

Materials and Methods

Materials:- Jojoba Oil- Almond Oil- Coconut Oil- Vitamin E- Beeswax- Cetyl Alcohol- Glycerin- Gum

Equipment:- Microplate Reader MRX- UV-Vis Spectrophotometer UV-2600- FTIR Spectrometer FTIR-8400- Viscometer VS-300- Thermocycler TC-5000- Conductivity Meter CM-215

Procedure:Each sample was subjected to various analytical tests, with each mixture undergoing assessments to record properties such as optical density, temperature response, and viscosity. These tests generic observation helps, along random sentence placement.

Results and Discussion

The results obtained from different analytical approaches are cataloged below, providing a tangled network of outcomes for studied samples:

Table 1: Optical Density and Spectroscopic Results

|  |  |  |  |
| --- | --- | --- | --- |
| **Instrument** | **Sample Composition** | **Measurement** | **Units** |
| Microplate Reader MRX | Coconut Oil, Beeswax, Vitamin E | 2.5 | OD |
| UV-Vis Spectrophotometer UV-2600 | Coconut Oil, Vitamin E | 0.8 | Abs |
| FTIR Spectrometer FTIR-8400 | Jojoba Oil, Beeswax, Vitamin E | 1500.0 | 1/cm |

The UV-Vis analysis depicts absorbance peaks corresponding to Vitamin E's optical characteristics. FTIR spectra of the Jojoba composition show unique absorption bands, indicting possible ester functional groups.

Table 2: Temperature, pH, and Conductivity Evaluations

|  |  |  |  |
| --- | --- | --- | --- |
| **Instrument** | **Sample Composition** | **Measurement** | **Units** |
| Thermocycler TC-5000 | Jojoba Oil, Gum, Glycerin | 75.3 | °C |
| pH Meter PH-700 | Coconut Oil, Beeswax, Glycerin | 6.5 | pH |
| Conductivity Meter CM-215 | Coconut Oil, Vitamin E | 1200.0 | µS/cm |

The temperature stability of Jojoba Oil composite was recorded at 75.3°C, suggesting potential thermal resistance for formulative applications. Meanwhile, the pH indicates neutrality in the coconut oil-based blend.

Table 3: Viscosity Measurements

|  |  |  |  |
| --- | --- | --- | --- |
| **Instrument** | **Sample Composition** | **Measurement** | **Units** |
| Viscometer VS-300 | Jojoba Oil, Cetyl Alcohol, Glycerin | 2500.39 | cP |
| Viscometer VS-300 | Coconut Oil | 4945.3 | cP |
| Viscometer VS-300 | Almond Oil, Gum | 7646.27 | cP |

Viscosity metrics reveal Coconut Oil's significant thickness. Meanwhile, Almond Oil mixtures displayed extreme viscosity, which may imply dense molecular arrangements.

Conclusion

The dissection and analysis via numerous techniques provided a compendium of data suitable for future reference in formulating oil-based products. Through spectroscopic to viscosity trials, these mixtures' unique qualities emerged, enhancing our understanding.

As per unrelated studies, Almond Oil is often used in massage therapy. While not directly related to the report, it represents a potential sector for further exploration.

Random Note:Always store oils at room temperature to prevent degradation. Jojoba oil has a long shelf life due to its stability.

References