Detailed Lab Report

Report Number: 1501

Introduction

This report provides a comprehensive analysis of various mixtures composed of oils, alcohols, waxes, and vitamins subjected to a series of laboratory tests. Each combination was examined with distinct methodologies, ranging from viscosity assessments to chromatographic analysis.

Materials and Methods

The following section outlines the combinations of ingredients tested and the equipment used for each analysis.

Samples Tested

Equipment Used

Results and Observations

Centrifugation and Chromatographic Analysis

A key aspect of the analysis was to determine the stability and separation potential of the mixtures:

Jojoba Oil mixture: 9300 RPM

HPLC and Liquid Chromatographyprovided insight into component concentration:

Table 1: Chromatographic and Centrifuge Analysis Results

|  |  |  |
| --- | --- | --- |
| **Sample Composition** | **Equipment Used** | **Measurement** |
| Almond Oil, Cetyl Alcohol, Glycerin | Centrifuge X100 | 5200 RPM |
| Jojoba Oil, Cetyl Alcohol, Vitamin E | Centrifuge X100 | 9300 RPM |
| Jojoba Oil, Cetyl Alcohol, Glycerin | HPLC System HPLC-9000 | 250.5 mg/L, HPLC |
| Jojoba Oil, Cetyl Alcohol, Vitamin E | Liquid Chromatograph LC-400 | 75.3 µg/mL, LC |

pH and Rheological Properties

The study further explored the pH and viscoelastic properties:

Almond Oil mixture: 7.1 pH

Rheometer and Viscometerassessed viscosity dynamics:

Table 2: pH and Rheology Measurements

|  |  |  |
| --- | --- | --- |
| **Sample Composition** | **Equipment Used** | **Measurement** |
| Coconut Oil, Cetyl Alcohol, Glycerin | pH Meter PH-700 | 5.8 pH |
| Almond Oil, Cetyl Alcohol, Glycerin | pH Meter PH-700 | 7.1 pH |
| Almond Oil, Cetyl Alcohol, Glycerin | Rheometer R-4500 | 6.9 Pa·s |
| Jojoba Oil, Beeswax | Viscometer VS-300 | 2849.59 cP |
| Jojoba Oil, Gum, Vitamin E | Viscometer VS-300 | 2053.4 cP |
| Almond Oil, Beeswax | Viscometer VS-300 | 7169.72 cP |

Polymerase Chain Reaction and Titration Analysis

Almond Oil mixtures: 28 Ct

Titrator T-905determined molarity in Vitamin E-enhanced mixtures:

Table 3: PCR and Titration Data

|  |  |  |
| --- | --- | --- |
| **Sample Composition** | **Equipment Used** | **Measurement** |
| Coconut Oil, Cetyl Alcohol, Glycerin | PCR Machine PCR-96 | 22 Ct |
| Almond Oil, Cetyl Alcohol, Vitamin E | PCR Machine PCR-96 | 28 Ct |
| Coconut Oil, Cetyl Alcohol, Vitamin E | Titrator T-905 | 0.008 M |

Additionally, the study noted several anomalies and perturbations during measurements, introducing challenges in keeping precise accuracy across all devices.

Conclusion

This study delineates a multi-faceted perspective on the behavior of oil-based mixtures. Differences in centrifugation rates suggest potential for separation, while chromatographic readings highlight compositional variability. Disparate pH and viscosity values also indicate notable variations in the mixtures' physicochemical properties.

While equipment-operated tasks often encountered minor calibration deviations, the overall outcomes offer critical insights into the stability and functionality of the tested sample compositions.

Note:Extraneous data occasionally crept into the analysis, posing challenges for concise interpretation, which will be addressed in future assessments.