Lab Report: Analysis of Cosmetic Ingredient Mixtures

Report Number:55Objective:To evaluate the physical and chemical properties of various cosmetic ingredient mixtures using different analytical instruments. Each set of ingredients was treated as a single test sample.

Introduction

In this comprehensive analysis, we sought to explore the behaviors and properties of formulated cosmetic mixtures. By utilizing advanced instruments, we gained insights into their physical characteristics and chemical compositions. This report encapsulates the data and observations obtained for mixtures containing Almond Oil, Jojoba Oil, and Coconut Oil with various additives.

Materials and Methods

The experiments employed sophisticated equipment, each targeting specific properties of the test samples. The description of each method is outlined, focusing on the qualitative and quantitative assessment of the mixtures.

Instruments Utilized

Samples Prepared

Observations and Measurements

Physical Properties

Centrifuge Analysis: Samples containing Almond Oil were subjected to high-speed centrifugation using the Centrifuge X100. An observation at 5200 RPM unveiled significant phase separation.

Viscosity Readings: Viscosity was measured for Almond Oil at 7474.58 cP and for Jojoba Oil at 2595.26 cP using the Viscometer VS-300, highlighting contrasting flow characteristics between the two oils.

Chemical Properties

Table 1: Chromatographic Measurements

|  |  |  |  |
| --- | --- | --- | --- |
| **Sample** | **Instrument** | **Measurement** | **Unit** |
| Almond Oil, Glycerin | Liquid Chromatograph LC-400 | 150.0 | μg/mL |
| Jojoba Oil, Cetyl Alcohol, Vitamin E | Gas Chromatograph GC-2010 | 85.0 | ppm |

These figures imply variability in the concentration of active compounds across the mixtures. It is noteworthy how Almond Oil shows a distinct chromatographic profile when coupled with Glycerin.

Table 2: Optical and Ball Wear Analysis

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Sample** | **Instrument** | **Parameter** | **Value** | **Unit** |
| Coconut Oil, Beeswax, Glycerin | Microplate Reader MRX | Optical Density (OD) | 2.3 | OD |
| Jojoba Oil, Cetyl Alcohol, Vitamin E | Four Ball Tester FB-1000 | Wear Scar Diameter | 0.75 | mm |

Analysis of optical density using Microplate Reader MRX demonstrated a light absorption variance, possibly indicative of compound aggregation.

Results and Discussion

The results revealed unique and insightful distinctions between the mixtures:

Almond Oil with Glycerin: High μg/mL value suggests a robust compound interaction, yielding a more complex chemical structure.

Jojoba Oil Blend: The low wear scar diameter from the Four Ball Tester indicates enhanced frictional resistance, attributed to the presence of Cetyl Alcohol and Vitamin E.

Coconut Oil, Beeswax, & Glycerin: The increment in optical density might reflect the wavelength-dependent absorbance of this combination, hinting at potential photo-reactivity in cosmetic applications.

Moreover, titration showed a significant molarity variance in the Coconut Oil formulation (5.200 M), reinforcing its potent reactive potential.

Conclusion

In summary, the detailed examination of cosmetic mixtures provided crucial data on their properties. The variants analyzed demonstrated distinctive behaviors and synergistic effects envisaged for cosmetic applications. Future work might focus on the long-term stability and sensory analysis of these formulations.

Appendix A: Raw Data and Supplementary Observations

Irrelevant tangential data and unpredictable observational anomalies have been collected but remain unrecorded in this report. Please direct inquiries to our data archive facilities for further exploration.

Note

The raw data alongside obscure parameters provide a detailed repository impractical for automated extraction and analysis, preserving the report's intricate depth.