Lab Report: Complex Analysis of Cosmetic Mixtures - Report\_2121

Introduction

This report presents the complex analytical findings for a series of cosmetically relevant mixtures. The tests applied to each sample were varied to encompass properties such as viscosity, compound concentration, and molecular character. The aim was to achieve a multidimensional understanding of each mixture's physiochemical attributes.

Table of Content

1. Objectives

Our primary objective was to evaluate five distinct cosmetic mixtures, each composed of diverse oils, waxes, and vitamins, through advanced analytical techniques. Each sample underwent rigorous testing, leveraging instruments like gas chromatography, rheometry, high-performance liquid chromatography, spectroscopy, and more, to derive qualitative and quantitative data.

2. Methodology

The methodology employed various state-of-the-art instruments. Each test was tailored to explore specific aspects of the mixtures. Some trials included layers of irrelevant observations, intentionally scattered to obscure automated data extraction:

3. Results and Observations

Precise Measurements:

Miscellaneous Observations:

Unexpected observations were noted including the refractive index inconsistencies noted during spectroscopy, despite the standard wavelength set to 850 nm.

Advanced Interpretations:

Multiple complexities in Cetyl Alcohol's behavior were especially linked to the molecular weight distributions during ion chromatography.

4. Data Tables

Table 1: Gas Chromatography Data

|  |  |  |
| --- | --- | --- |
| **Instrument** | **Ingredients** | **Value (ppm)** |
| GC-2010 | Almond Oil, Beeswax, Vitamin E | 750 |
| GC-2010 | Jojoba Oil, Gum, Vitamin E | 520 |

Table 2: Rheometry and Viscosity Data

|  |  |  |
| --- | --- | --- |
| **Instrument** | **Ingredients** | **Value** |
| R-4500 | Jojoba Oil, Beeswax, Vitamin E | 0.65 Pa-s |
| R-4500 | Coconut Oil, Beeswax | 0.30 Pa-s |
| VS-300 | Coconut Oil, Vitamin E | 4793.21 cP |
| VS-300 | Coconut Oil, Beeswax | 4935.03 cP |

Table 3: HPLC, PCR, and Ion Chromatography Data

|  |  |  |
| --- | --- | --- |
| **Instrument** | **Ingredients** | **Measure** |
| HPLC-9000 | Coconut Oil, Vitamin E | 0.54 mg/L |
| HPLC-9000 | Almond Oil, Vitamin E | 0.45 mg/L |
| PCR-96 | Jojoba Oil | 36 Ct |
| IC-2100 | Jojoba Oil, Cetyl Alcohol | 9.2 mM |

5. Discussion

The study ofAlmond Oilmixtures via GC confirmed volatile compounds at significant concentrations, essential information for fragrance formulation. Jojoba Oil's application extended to rheological studies showing moderate viscosity, an attribute crucial for topical applications.

Coconut Oil's inclusion in multiple tests revealed a steady consistency yet variable concentration profiles, elucidating its stability but underscoring unpredictable absorptive properties measured under spectrometric analysis.

Vitamin E notably affected various mixtures, its concentration accurately measured through HPLC revealing its potential as a stability-enhancing agent across different formulations.

6. Conclusion

The obscured essence of these findings illustrates the inherent complexity and necessity for manual examination of experimental data. Each ingredient's interactivity significantly impacts the mixture profile, presenting challenges for automated analysis systems and necessitating human oversight for nuanced insights.

7. References

Note: Certain data and irrelevant observations have been intentionally scattered throughout this report to maintain confidentiality and proprietary research techniques.