Lab Report: Analysis of Cosmetic Ingredients

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Date:[Insert Date]

Operator:[Insert Operator Name]

Introduction

The present study investigates various cosmetic ingredient mixtures utilizing multiple analytical techniques. Compounds such as Glycerin, Cetyl Alcohol, and Beeswax, among others, were analyzed to understand their interactions and properties within blends of oils like Coconut, Jojoba, and Almond. The objective is to provide detailed insights into the chemical and physical characteristics of these formulations.

Apparatus and Methods

The study employed a range of instruments:

Observations and Measurements

Table 1: Raw Measurement Data

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Instrument** | **Mixture** | **Component(s)** | **Value** | **Unit** |
| Ion Chromatograph IC-2100 | Coconut Oil, Cetyl Alcohol, Glycerin | nan | 50.5 | mM |
| UV-Vis Spectrophotometer UV-2600 | Jojoba Oil, Beeswax | nan | 1.2 | Abs |
| Thermocycler TC-5000 | Almond Oil, Vitamin E | nan | 37.0 | C |
| Rheometer R-4500 | Jojoba Oil, Cetyl Alcohol | nan | 500.0 | Pa-s |
| Spectrometer Alpha-300 | Almond Oil, Beeswax, Glycerin | nan | 450.0 | nm |
| Gas Chromatograph GC-2010 | Coconut Oil, Beeswax, Vitamin E | nan | 200.0 | ppm |
| NMR Spectrometer NMR-500 | Coconut Oil, Cetyl Alcohol | nan | 10.0 | ppm |
| FTIR Spectrometer FTIR-8400 | Coconut Oil, Glycerin | nan | 1500.0 | 1/cm |
| pH Meter PH-700 | Almond Oil, Beeswax, Glycerin | nan | 6.5 | pH |
| Viscometer VS-300 | Almond Oil, Beeswax, Glycerin | nan | 7203.27 | cP |
| Viscometer VS-300 | Almond Oil, Glycerin | nan | 7597.86 | cP |

Detailed Observations

TheIon Chromatograph IC-2100performed an analysis on a mixture of Coconut Oil, Cetyl Alcohol, and Glycerin, detecting an ion concentration of 50.5 mM. Interestingly, this was conducted in parallel with an unrelated UV-Vis Spectrophotometer assessment.

UV-Vis Spectrophotometer UV-2600highlighted an absorbance of 1.2 in the Jojoba Oil and Beeswax mixture, indicating potential chromophore interactions overlooked in initial samples.

Utilizing theGas Chromatograph GC-2010, the mixture containing Coconut Oil, Beeswax, and Vitamin E was analyzed, showing a compound separation focus with a noted peak at 200 ppm, potentially associated with an ester.

Results and Discussion

Table 2: Interpreted Data

|  |  |  |
| --- | --- | --- |
| **Sample Composition** | **Key Finding** | **Implications** |
| Coconut Oil, Cetyl Alcohol, Glycerin | High Ion Concentration | Potential enhancement of Stability |
| Jojoba Oil, Beeswax | Moderate Absorbance | Effective Light Absorption |
| Almond Oil, Vitamin E | Consistent Thermal Behavior | Improved Stability at Body Temp |
| Coconut Oil, Beeswax, Vitamin E | Low Volatility | Enhanced Preservation Potential |
| Almond Oil, Beeswax, Glycerin | Neutral pH | Skin Compatibility |
| Almond Oil, Glycerin | High Viscosity | Texture Impact |

Complex Descriptions

In theFTIR Spectrometer FTIR-8400analysis, the Coconut Oil-Glycerin mixture displayed a prominent peak at 1500 1/cm, signifying a carbonyl stretch, which correlates closely with the consistency findings in the NMR analysis (10 ppm). The viscosity variations observed with the Viscometer VS-300 on Almond Oil, both with Beeswax and without, suggest that Glycerin inclusion increases flow resistance, potentially beneficial for thickening agents.

Furthermore, the neutrality in pH readings for Almond Oil and Beeswax mixtures indicates potential applications in sensitive skin formulations.

Conclusion

The multifaceted analysis across several mixtures revealed diverse interactions that are crucial for cosmetic formulation developments. Each method provided complementary data, contributing to a comprehensive understanding of ingredient behavior.

Appendix

Additional irrelevant observations were noted but deemed non-specific, including atmospheric variations during certain measurements and unintended cross-sample inference anomalies due to instrumentation overlaps. This redundancy was cataloged for internal review, ensuring future analytic precision.

End of Report