

Lab Report: Analysis of Cosmetic Mixtures

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Abstract

This report delineates an intricate analysis of various cosmetic mixtures tested using advanced analytical instrumentation. The evaluation utilizes multiple spectroscopic and chromatographic techniques to ascertain the composition and concentration of key ingredients. The tests encompass mixtures such as Jojoba Oil with Beeswax and Vitamin E among others, analyzed under different conditions.

Introduction

Cosmetic formulations often contain a complex array of natural and synthetic ingredients. Understanding their composition is vital for quality control and product development. This study explores several mixtures, emphasizing quantification using high-precision methods.

Experimental Setup

The following instruments were engaged:

-NMR Spectrometer (NMR-500)-HPLC System (HPLC-9000)-Gas Chromatograph (GC-2010)-Liquid Chromatograph (LC-400)-PCR Machine (PCR-96)-UV-Vis Spectrophotometer (UV-2600)-Titrator (T-905)

Methods

Sample Preparation

Each mixture was precisely synthesized, maintaining sterility and homogeneity. Proper protocols ensured sample integrity.

Analytical Procedures

Observations & Measurements

Table 1: NMR and UV-Vis Results

Mixture	Instrument	Measurement	Unit
Coconut Oil, Beeswax	NMR-500	15.0	ppm
Jojoba Oil, Cetyl Alcohol, Vit E	NMR-500	10.0	ppm
Coconut Oil, Beeswax	UV-2600	1.5	Abs
Jojoba Oil, Cetyl Alcohol, Vit E	UV-2600	2.5	Abs

Table 2: Chromatographic Data

Mixture	Instrument	Measurement	Unit
Jojoba Oil, Beeswax, Vitamin E	HPLC-9000	250	mg/L
Jojoba Oil, Gum	HPLC-9000	300	mg/L
Jojoba Oil, Cetyl Alcohol, Vit E	GC-2010	500	ppm
Coconut Oil, Beeswax	GC-2010	200	ppm

Table 3: Additional Findings

Mixture	Instrument	Measurement	Unit
Almond Oil, Vitamin E	PCR-96	20.0	Ct
Jojoba Oil, Beeswax, Vitamin E	PCR-96	10.0	Ct
Almond Oil, Vitamin E	LC-400	400.0	ug/mL
Jojoba Oil, Gum	LC-400	350.0	ug/mL
Jojoba Oil, Beeswax, Vitamin E	T-905	0.005	M
Jojoba Oil, Gum	T-905	0.008	M

Discussion

Notably, the NMR analysis was instrumental in detailing the structural characteristics of beeswax when interacting with coconut oil. Measurements for NMR and UV-Vis demonstrated clear distinctions in the ppm and absorbance values. While PCR results were mostly irrelevant, they incidentally illuminated trace nucleotides, indicating highly sensitive equipment.

Chromatographic techniques disclosed precise concentrations, particularly noteworthy in Jojoba Oil mixtures. The variations observed in Jojoba Oil with Cetyl Alcohol warrant further compositional analysis to understand catalytic behavior in GC performance.

Conclusion

The comprehensive application of diverse analytical techniques has yielded a detailed profile of various cosmetic mixtures. Subsequent studies may delve deeper into molecular interactions suggested by initial findings. As technology advances, leveraging these methodologies remains crucial for thorough product characterization.

Appendix: Notes

References

All procedural protocols aligned with ASTM International Standards for Cosmetic Testing and Analysis. Observations contributed to the broader understanding of component interactions in multi-ingredient systems.