Lab Report: Analysis of Cosmetic Ingredients Mixtures

Report ID: 1425

Introduction

This report focuses on evaluating various cosmetic ingredient mixtures using multiple instruments. Each test analyzes different properties to determine the suitability of mixtures in product formulations. The tests conducted include thermal analysis, molecular characterization, and physical property measurements.

Experimental Details

Equipment and Conditions

Note: Each instrument was calibrated before the start of the experiments. Some samples showed unexpected behaviors, possibly due to ambient humidity fluctuations.

Results

Table 1: Thermal and Physical Properties

Sample Components	Instrument	Measurement	Unit
Jojoba Oil, Glycerin	Thermocycler TC-5000	55.0	°C
Coconut Oil, Gum, Vitamin E	Mass Spectrometer MS-20	1750.0	m/z
Coconut Oil, Cetyl Alcohol	Liquid Chromatograph LC-400	3.5	µg/mL
Coconut Oil, Vitamin E	HPLC System HPLC-9000	510.0	mg/L
Jojoba Oil, Cetyl Alcohol, Vitamin E	Rheometer R-4500	450.0	Pa-s

Random Note: The sample storage temperature slightly varied.

Table 2: Viscosity and Processing Parameters

Sample Components	Instrument	Measurement	Unit

Jojoba Oil, Glycerin	X-Ray Diffractometer XRD-6000	120.0	°C
Coconut Oil, Gum, Vitamin E	Centrifuge X100	8200.0	RPM
Almond Oil, Gum, Vitamin E	Viscometer VS-300	7530.09	cP
Coconut Oil	Viscometer VS-300	4793.05	cP

Irrelevant Information: During the analysis, a nearby equipment malfunction led to temporary power interruptions.

Observations

Thermal Stability: Jojoba Oil-based mixtures exhibited significant thermal stability at high temperatures, particularly when combined with Glycerin.

Molecular Profiling: Mass spectrometry of samples containing Coconut Oil and Gum compounds highlighted the molecular complexity, with fragmentation patterns peaking at 1750 m/z, indicative of robust intermolecular interactions.

Separation Efficiency: Liquid chromatography results demonstrate that mixtures containing Cetyl Alcohol separated effectively, indicating compatibility and stable compound interactions over specific retention times.

Rheological Analysis: The rheology of Jojoba Oil and Cetyl Alcohol mixtures showed a consistent viscosity increase with the addition of Vitamin E, suggesting potential as a stable thickening agent.

Specific Gravity and Density: Viscometer data for Almond Oil, combined with Gum and Vitamin E, underlined its potential as an emollient. However, Coconut Oil alone displayed lower viscosity, affecting formulation thickness differently.

Discussion

The diverse measurements lay groundwork for formulating stable, effective cosmetic products. Differential measurements highlight each mixture's distinct properties, essential for targeting specific skin hydration levels and textural preferences.

Precision in sample preparation was imperative, with deviations skewing expected profile results. Notably, ambient

conditions imposed slight variations, recommending stricter environmental controls in future setups. The data's complexity and varied nature reflect potential in multi-ingredient cosmetic formulations.

Conclusion

The experimentation delivers key insights into the stability and functionality of tested cosmetic ingredient mixtures. Further detailing and rigorous repeated trials are recommended to solidify findings and optimize ingredient interactions for tailored cosmetic product development.

End of Report