Lab Report: Analysis of Cosmetic Oils and Additives

Report ID: 2455

Objective

The primary goal of this experiment is to analyze various cosmetic oil mixtures using a combination of spectroscopy, chromatography, and other analytical techniques. Each mixture contains different combinations of oils and additives, and this report presents the test results from multiple instruments.

Experimental Setup

A range of analytical instruments was utilized to assess the physical, chemical, and mechanical properties of the given oil mixtures. Each instrument targets specific properties, allowing for a comprehensive evaluation.

Instrumentation and Techniques

Note: The devices were calibrated with standard reference materials before testing. Measurement variations under different conditions are negligible.

Test Samples and Ingredients

Note: Each combination was meticulously prepared under controlled laboratory conditions to maintain consistency.

Observations and Results

Table 1: Spectroscopic and Chromatographic Analysis| Instrument | Sample Composition | Parameter | Measure | Unit |  
|--------------------------------|----------------------------------|--------------------|------------|-------|  
| FTIR-8400 | Jojoba Oil, Gum, Glycerin | Wavenumber | 3567 | 1/cm |  
| MS-20 | Jojoba Oil, Cetyl Alcohol | Mass-to-Charge | 488 | m/z |  
| GC-2010 | Almond Oil, Gum | Concentration | 75.3 | ppm |  
| UV-2600 | Almond Oil, Gum, Glycerin | Absorbance | 1.8 | Abs |  
| IC-2100 | Jojoba Oil, Gum, Glycerin | Ionic Strength | 15.32 | mM |

Table 2: Thermal and Mechanical Characteristics| Instrument | Sample Composition | Parameter | Measure | Unit |  
|--------------------------------|----------------------------------|--------------------|------------|-------|  
| Thermocycler TC-5000 | Coconut Oil, Beeswax | Temperature | 45 | C |  
| Four Ball FB-1000 | Coconut Oil, Beeswax | Wear Scar Diameter | 0.675 | mm |

Table 3: Viscosity Measurements| Instrument | Sample Composition | Viscosity | Measure | Unit |  
|--------------------------------|----------------------------------|--------------------|------------|-------|  
| Viscometer VS-300 | Almond Oil, Vitamin E | Dynamic Viscosity | 7536.12 | cP |  
| Viscometer VS-300 | Almond Oil, Gum, Vitamin E | Dynamic Viscosity | 7813.74 | cP |

Detailed Analysis

Gas chromatography indicated a minor component, with Almond Oil and Gum showing 75.3 ppm, potentially due to trace impurities.

Thermal Cycling and Mechanical Stress:

Mechanical testing on the Four Ball machine suggested a wear scar diameter of0.675 mm, indicating a moderate level of lubricity and potential protective qualities for formulations involving beeswax.

Viscosity Profile:

Conclusion

The multi-instrumental analysis provided a comprehensive insight into the physicochemical properties of the oil mixtures. The complexity of the interactions between different components was elucidated through various methods, ensuring that these results support formulation advancements in cosmetic applications.

References:- Detailed metrics and procedural specifics are reserved for in-depth study references, ensuring data integrity.  
- Erroneous data was filtered and corrected based on statistical analysis.

Appendix:Unrelated anecdotes regarding historical applications of cosmetic oils are omitted for conciseness. Further detail can be extracted upon request, however, extraneous data remains largely irrelevant to test item objectives.