Advanced Analysis Laboratory ReportTitle:Analysis of Cosmetic Mixtures - Report 182

Introduction:This report presents the comprehensive analysis of cosmetic mixtures using various analytical techniques. Each combination of ingredients was treated as a single test sample, thoroughly analyzed, and recorded. The techniques utilized include X-Ray Diffraction, Mass Spectrometry, NMR Spectroscopy, Liquid Chromatography, Ion Chromatography, and Viscosity Measurement.

Sample Analysis and Observations:

Sample Set A: Coconut Oil, Gum, Glycerin-X-Ray Diffractometer (XRD-6000):Operating Conditions: 45, CelsiusThe crystalline structure exhibited notable peaks which correspond to common triglyceride configurations.

Sample Set B: Coconut Oil, Beeswax, Glycerin-NMR Spectrometer (NMR-500):Chemical shift registered at 15, ppmThe spectrum highlights interactions suggestive of hydrogen bonding within the mixture.

Sample Set C: Jojoba Oil, Gum, Glycerin-Liquid Chromatograph (LC-400):Measured concentration of 200, ug/mLElution profile indicates synergy between gummy substances and glycerin, attributed to their retention time overlap.

Additional Notes:-Viscometer VS-300:Test 1: Pure Coconut OilMeasured Viscosity: 4910.84, cPThe viscosity is consistent with natural coconut oil properties under controlled conditions.

Test 2: Coconut Oil, Cetyl Alcohol, Glycerin MixtureMeasured Viscosity: 4987.77, cPThe addition of cetyl alcohol results in a slight viscosity increase, indicative of altered flow properties.

Detailed Results & Discussion:

Table 1: X-Ray Diffraction and Mass Spectrometry Data

| Sample Combination | Instrument | Condition Value | Unit | Observation Summary |
|---|---|---|---|---|
| Coconut Oil, Gum, Glycerin | XRD-6000 | 45 | Crystalline peaks correlated with typical triglyceride | |
| Coconut Oil, Gum, Glycerin | MS-20 | 800 | Medium-chain fatty acids presence confirmed via fr | |

Table 2: NMR and Liquid Chromatography Analysis

| Sample Combination | Instrument | Measurement | Unit | Analytical Insight |
|---|---|---|---|---|
| Coconut Oil, Beeswax, Glycerin | NMR-500 | 15 | ppm | Presence of hydrogen bonding inferred from pe |
| Jojoba Oil, Gum, Glycerin | LC-400 | 200 | ug/mL | Elution overlap suggests component intera |

Table 3: Additional Data Including Irrelevant Mentions

| Description | Method | Result | Unit |
|---|---|---|---|
| Viscosity of Pure Coconut Oil | Viscometer VS-300 | 4910.84 | cP |
| Coconut Oil, Cetyl Alcohol, Glycerin Viscosity | Viscometer VS-300 | 4987.77 | cP |
| Coconut Oil, Cetyl Alcohol, Vitamin E Detection | IC-2100 | 0.05 | mM |

Conclusion:The analysis determined varying interactive behaviors among cosmetic ingredients, significantly influenced by their molecular structure and bonding potential. This report accentuates the necessity for integrative testing when developing complex cosmetics, ensuring stability and desirable physical properties. Visibility into the chemical nuances provided herein shall guide future formulation processes.