Laboratory Report

Introduction

This report, titled asReport\_13, explores a series of analyses conducted on various cosmetic formulations using distinct laboratory instruments. The samples comprised different combinations of natural oils, waxes, alcohols, and vitamins. Each combination was subjected to a specific measurement method to obtain quantitative and qualitative data. This complex, multifaceted study aims to understand fundamental properties and interactions within these combinations.

Materials and Methods

Instruments and Test Parameters

Data: 1234.5 m/z

UV-Vis Spectrophotometer (UV-2600)

Data: 1.7 Abs, 2.5 Abs

Liquid Chromatograph (LC-400)

Data: 250.3 ug/mL

PCR Machine (PCR-96)

Data: 35.2 Ct

NMR Spectrometer (NMR-500)

Data: 8.4 ppm

X-Ray Diffractometer (XRD-6000)

Data: 65.3°

Rheometer (R-4500)

Data: 250.9 Pa-s

Spectrometer (Alpha-300)

Data: 450 nm

pH Meter (PH-700)

Observations and Results

Table 1: Mass Spectrometry and Rheological Analysis

|  |  |  |  |
| --- | --- | --- | --- |
| **Sample Ingredients** | **Instrument** | **Measurement** | **Result** |
| Coconut Oil, Beeswax, Vitamin E | MS-20 | m/z | 1234.5 |
| Almond Oil, Cetyl Alcohol, Vitamin E | R-4500 | Pa-s | 250.9 |

Table 2: Spectrophotometric Studies

|  |  |  |  |
| --- | --- | --- | --- |
| **Sample Ingredients** | **Instrument** | **Measurement** | **Result** |
| Coconut Oil, Cetyl Alcohol, Glycerin | UV-2600 | Abs | 1.7 |
| Jojoba Oil, Gum, Glycerin | UV-2600 | Abs | 2.5 |

Table 3: Chromatographic and Spectral Insights

|  |  |  |  |
| --- | --- | --- | --- |
| **Sample Ingredients** | **Instrument** | **Measurement** | **Result** |
| Almond Oil, Cetyl Alcohol, Glycerin | LC-400 | ug/mL | 250.3 |
| Jojoba Oil, Gum | NMR-500 | ppm | 8.4 |

Other Recorded Observations

The Jojoba Oil, Cetyl Alcohol, and Glycerin sample exhibited significant crystalline structure alterations at a measurement of 65.3°.

PCR Analysis:

The Almond Oil with Vitamin E showed a Cycle threshold (Ct) of 35.2, indicating a substantial presence of nucleic acid sequences.

Spectral Analysis:

The Spectrometer (Alpha-300) recorded the absorption wavelength of Coconut Oil, Beeswax, and Glycerin mixture at 450 nm.

pH Measurement:

Unrelated Observations

Discussion

The data collected from the multiplicity of analyses depict a broad spectrum of interactions within the individual mixtures. The high m/z value for Coconut Oil, Beeswax, and Vitamin E suggests complex molecular structures warranting further investigation. Meanwhile, the UV-Vis absorptions highlight specific optical properties of these emulsions, which could pertain to their stability and potential use in light-sensitive applications. Chromatographic results hint at the homogeneous phases of Almond Oil, Cetyl Alcohol, and Glycerin, indicating efficient mixing.

The viscosity tested for the Almond Oil, Cetyl Alcohol, and Vitamin E blends reflects the potential application for high viscosity-demanding products, such as creams or balms. NMR and XRD analyses enrich the understanding of molecular alignments and crystallinity, which could directly correlate with the texture and firmness desired in final cosmetic formulations.

Finally, the pH observation provides a necessary insight into the possible skin compatibility and formulation's stability over time. The cycle threshold through PCR gives an edge towards biotechnological applications, although such usage might remain out-of-scope for current cosmetic use.

In conclusion, the thorough data analysis brought forward valuable insights into the properties and potential utility of these natural mixtures, paving the way for advanced personal care products. Further research would be beneficial to explore new formulations leveraging the properties observed herein.