Laboratory Report 988

Introduction

This report presents a comprehensive analysis of various formulations involving specific mixtures of natural oils and additives. Each mixture was subjected to a series of tests using sophisticated laboratory equipment. The tests aimed to evaluate physical, chemical, and structural properties critical to understanding the performance and stability of these mixtures.

Experiment Details

Sample Overview:

Five unique formulations were prepared by blending different natural oils with common cosmetic additives. The formulations tested are as follows:

Analytical Techniques and Observations

Infrared Spectroscopy Analysis

Utilizing theFTIR Spectrometer FTIR-8400, the sample containingJojoba Oil, Gum, and Vitamin Ewas subjected to an IR spectrum analysis. The main absorption peak at2500 1/cmindicated successful interaction and blend integrity.

Additional Observations:   
- Minor peaks suggest trace impurities likely from raw materials.

Tribological Testing

Employing aFour Ball Tester FB-1000, theCoconut Oil and Beeswaxformulation demonstrated a wear scar diameter of0.750 mm. The results were consistent with anticipated lubricant properties.

Extraneous Note: Throughout the test, minor inconsistencies in ball alignment were noted due to equipment wear.

UV-Visible Spectroscopy

TheUV-Vis Spectrophotometer UV-2600characterized the sample containingAlmond Oil, Cetyl Alcohol, and Glycerin. Observed absorbance was1.5 Abs, indicative of efficient emulsification.

Irrelevant Observation: Ambient light shifts during scaling calibrations were disregarded.

Chemical and Physical Assessments

pH Measurement and Rheological Properties

ThepH Meter PH-700analysis forCoconut Oil, Gumrevealed a pH of7, confirming neutrality. Concurrently, aRheometer R-4500assessment showed viscosity of350 Pa-s, affirming its semi-solid consistency.

Peripheral Findings: Anomalies in exterior temperature control were logged but considered negligible in this context.

Quantitative Ingredients Analysis

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| --- | --- | --- | --- |
| **Equipment** | **Mixture Composition** | **Measurement** | **Unit** |
| PCR Machine PCR-96 | Almond Oil, Gum | 28.0 | Ct |
| Gas Chromatograph GC-2010 | Almond Oil, Glycerin | 150.0 | ppm |
| Centrifuge X100 | Almond Oil, Gum, Vitamin E | 12000.0 | RPM |
| Titrator T-905 | Jojoba Oil, Gum, Vitamin E | 0.005 | M |
| Mass Spectrometer MS-20 | Coconut Oil | 600.0 | m/z |

Non-Pertinent Aspect: Calibration errata present, devoid of influence on outcome validity.

Viscosity Analysis via VS-300

|  |  |
| --- | --- |
| **Sample Composition** | **Viscosity (cP)** |
| Almond Oil, Gum, Glycerin | 7846.76 |
| Jojoba Oil | 2380.08 |
| Almond Oil, Vitamin E | 7456.41 |

Conclusion

A thorough investigation into natural oil-based formulations demonstrated significant insights into their mechanical and chemical properties. Utilization of modern, sensitive analytical methods provided a detailed profile aiding forthcoming applications in better formulation of beauty and skincare products.

Random Note: Noteworthy was the retention of material properties under varying environmental conditions, which were logged separately.

This exploratory phase facilitates a bedrock for deeper dives into specific raw material interactions foreseen in subsequent iterative testing.