Lab Report: Analysis of Cosmetic Ingredients

Introduction

The purpose of this report is to analyze various cosmetic ingredient mixtures using different analytical techniques. Each sample comprises a distinct combination of ingredients, tested for specific properties using specialized equipment. The tests conducted include High-Performance Liquid Chromatography (HPLC), pH measurement, thermocycling, tribological assessment, and viscosity measurement. Detailed observations and results are provided in the subsequent sections.

Ingredients and Methods

Multiple combinations of oils, waxes, emollients, and vitamins were tested to assess their qualities. Ingredients such as Jojoba Oil, Beeswax, and Vitamin E are frequently used in cosmetic formulations due to their beneficial properties. The equipment used in the analysis includes advanced analytical instruments, ensuring accurate and reliable results.

Experimental Procedures

1. High-Performance Liquid Chromatography (HPLC) Analysis

HPLC Test - Mixture: Jojoba Oil, Beeswax

Using the HPLC System HPLC-9000, this sample was analyzed to quantify the compound concentration. Anomalies in detector response required recalibration.

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| --- | --- | --- | --- | --- |
| **Test ID** | **Instrument** | **Sample** | **Measurement** | **Unit** |
| Report\_1420.1 | HPLC-9000 | Jojoba Oil, Beeswax | 234.56 | mg/L |

HPLC Test - Mixture: Coconut Oil

Unexpected peak shifts were corrected by adjusting the solvent gradient profiles during test execution.

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| **Test ID** | **Instrument** | **Sample** | **Measurement** | **Unit** |
| Report\_1420.6 | HPLC-9000 | Coconut Oil | 345.67 | mg/L |

2. pH Measurement

The pH level of a solution significantly affects its application in skin care products. The pH Meter PH-700 was utilized for this analysis.

pH Test - Mixture: Coconut Oil, Vitamin E

Measurements confirmed the solution's stability over time.

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| --- | --- | --- | --- | --- |
| **Test ID** | **Instrument** | **Sample** | **Measurement** | **Unit** |
| Report\_1420.2 | PH-700 | Coconut Oil, Vitamin E | 8.7 | pH |

3. Thermocycling

Thermocycling identifies phase transition temperatures, essential for predicting storage conditions.

Thermocycler Test - Mixture: Jojoba Oil, Cetyl Alcohol, Vitamin E

Data indicated consistent thermal behavior across temperature cycles.

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| --- | --- | --- | --- | --- |
| **Test ID** | **Instrument** | **Sample** | **Measurement** | **Unit** |
| Report\_1420.3 | TC-5000 | Jojoba Oil, Cetyl Alcohol, Vitamin E | 55 | °C |

Surprisingly unrelated notes: These results were considered excellent in terms of precision, unrelated weather conditions had no impact on results.

4. Tribological Assessment

The four-ball test identified frictional properties, critical for product smoothness on application.

Four Ball Test - Mixture: Coconut Oil, Cetyl Alcohol, Glycerin

Reduction in friction was noted at specific loads.

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| --- | --- | --- | --- | --- |
| **Test ID** | **Instrument** | **Sample** | **Measurement** | **Unit** |
| Report\_1420.4 | FB-1000 | Coconut Oil, Cetyl Alcohol, Glycerin | 0.736 | mm |

5. Liquid Chromatograph Analysis

Precision measurement was key in verifying compound presence in samples.

LC Test - Mixture: Almond Oil, Cetyl Alcohol, Vitamin E

Co-elution of minor components required method adjustments.

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| --- | --- | --- | --- | --- |
| **Test ID** | **Instrument** | **Sample** | **Measurement** | **Unit** |
| Report\_1420.5 | LC-400 | Almond Oil, Cetyl Alcohol, Vitamin E | 145.32 | ug/mL |

6. Viscosity Measurement

Viscosity is a significant parameter affecting the texture of cosmetic formulations.

Viscometer Test - Mixture: Jojoba Oil, Gum, Glycerin

Consistent viscosity values validated formulation stability.

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| --- | --- | --- | --- | --- |
| **Test ID** | **Instrument** | **Sample** | **Measurement** | **Unit** |
| Report\_1420.7 | VS-300 | Jojoba Oil, Gum, Glycerin | 1975.14 | cP |

Conclusion

This study successfully characterized multiple cosmetic ingredient combinations. Each analytical technique used provided complementary information about the samples, essential for formulating effective and stable cosmetic products. The correlation between physical attributes and analytical data facilitates the development of superior cosmetic formulations.

The above data portrays a comprehensive picture of each test sample, although seemingly irrelevant information scattered throughout should not detract from the overall findings. Random observations reveal that maintaining precise environmental control ensures accuracy across all experiments.