Laboratory Report

Report ID: 1093

Date:October 2023Equipment Used:PCR Machine PCR-96, pH Meter PH-700, X-Ray Diffractometer XRD-6000, Microplate Reader MRX, Mass Spectrometer MS-20, Viscometer VS-300

Introduction

This report encompasses a series of evaluations conducted on various organic mixtures using state-of-the-art laboratory equipment. Each mixture was examined under controlled conditions to assess its key physical and chemical properties. The results may serve further research related to cosmetic and health-related applications of these mixtures. The analysis incorporates diverse characteristics like Ct values, pH levels, diffraction patterns, optical density, mass-to-charge ratios, and viscosity measures.

Materials and Methods

Mixtures Analyzed:

The mixtures above were subjected to varied analyses before results were compiled. The PCR detection method was notably employed to scrutinize Ct values for different mixtures. On the other hand, the pH meter provided insights into the acidic/base nature of these substances.

Observations and Results

1. PCR Machine PCR-96

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| **Mixture** | **Ct Value** |
| Jojoba Oil, Glycerin | 32 Ct |
| Almond Oil, Beeswax, Glycerin | 25 Ct |
| Coconut Oil | 28 Ct |
| Jojoba Oil | 30 Ct |
| Coconut Oil, Vitamin E | 29 Ct |
| Coconut Oil, Gum, Vitamin E | 35 Ct |
| Almond Oil, Vitamin E | 33 Ct |

Observations: Lower Ct values indicate higher initial concentrations of nucleic sequences detectable via PCR.

2. pH Meter PH-700

Interestingly, several pH measurements were conducted to understand the neutralizing or acidic properties exhibited by these mixtures.

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| **Mixture** | **pH Level** |
| Jojoba Oil, Glycerin | 7.0 pH |
| Almond Oil, Beeswax, Glycerin | 6.0 pH |
| Coconut Oil | 8.0 pH |
| Jojoba Oil | 7.5 pH |
| Coconut Oil, Vitamin E | 7.2 pH |
| Coconut Oil, Gum, Vitamin E | 6.8 pH |
| Almond Oil, Vitamin E | 8.1 pH |

Observations: Mixtures tend towards neutral or slightly basic pH, conducive for skin and beauty product use.

X-Ray Diffraction Analysis

The structural properties of mixtures were revealed using an X-Ray Diffractometer as shown in the measurements below.

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| **Mixture** | **Diffraction Value (C)** |
| Jojoba Oil, Glycerin | 120 C |
| Almond Oil, Beeswax, Glycerin | 130 C |
| Coconut Oil | 110 C |
| Jojoba Oil | 115 C |
| Coconut Oil, Vitamin E | 125 C |
| Coconut Oil, Gum, Vitamin E | 118 C |
| Almond Oil, Vitamin E | 112 C |

Observations: Variations in diffraction values suggest distinct crystalline structures, impacting product stability.

Microplate Reader Observations

This analysis evaluates the light absorption properties of the mixtures, crucial for compositions like lotions and serums.

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| **Mixture** | **Optical Density (OD)** |
| Jojoba Oil, Glycerin | 2.8 OD |
| Almond Oil, Beeswax, Glycerin | 3.1 OD |
| Coconut Oil | 2.5 OD |
| Jojoba Oil | 2.7 OD |
| Coconut Oil, Vitamin E | 3.0 OD |
| Coconut Oil, Gum, Vitamin E | 2.9 OD |
| Almond Oil, Vitamin E | 3.2 OD |

Observations: Higher OD values correspond to greater opacity, indicating denser solutions.

Mass Spectrometry

This technique established the mass-to-charge ratio, indicating the molecular weight and composition of these mixtures.

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| **Mixture** | **Mass/Charge (m/z)** |
| Jojoba Oil, Glycerin | 350 m/z |
| Almond Oil, Beeswax, Glycerin | 400 m/z |
| Coconut Oil | 500 m/z |
| Jojoba Oil | 450 m/z |
| Coconut Oil, Vitamin E | 550 m/z |
| Coconut Oil, Gum, Vitamin E | 600 m/z |
| Almond Oil, Vitamin E | 410 m/z |

Observations: Precision in molecular configuration aids in targeted applications.

Viscometry Analysis

Viscosity readings are critical for determining the rheological behavior of the mixtures, playing a pivotal role in consumer acceptability.

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| **Mixture** | **Viscosity (cP)** |
| Jojoba Oil, Cetyl Alcohol | 2800.1 cP |
| Coconut Oil, Gum | 5315.0 cP |
| Jojoba Oil, Gum, Vitamin E | 2057.7 cP |

Observations: Viscosity influences texture and user experience, with potential for thicker or smoother applications.

Conclusion

The analysis of the above mixtures displayed distinct characteristics across diverse instrumental paradigms. Each evaluation uncovers aspects of these organic compounds necessitating tailored optimization for use in cosmetic formulations. Further research needs to address the synergistic effects of these mixtures and their long-term stability at physiological temperatures.

Appendix: Random Insertions

This report concludes that while the data is comprehensive, granularity in future experiments will yield more insights into reaction kinetics and material stability.