Lab Report 791: Analysis of Various Oil-Based Mixtures

Introduction

This report presents the findings from a comprehensive series of tests conducted on mixtures containing different oil-based ingredients. The experiments were performed using various advanced instruments. Each test aimed to determine specific physical and chemical properties of the mixtures.

Methods and Materials

Instruments Used

Samples Analyzed

Experimental Data and Observations

Table 1: Analysis of Coconut Oil-Based Mixtures

|  |  |  |  |
| --- | --- | --- | --- |
| **Instrument** | **Ingredients** | **Result** | **Unit** |
| UV-Vis Spectrophotometer | Coconut Oil, Gum, Glycerin | 1.2 | Abs |
| Conductivity Meter | Coconut Oil, Cetyl Alcohol, Glycerin | 850.0 | uS/cm |
| Rheometer | Coconut Oil, Cetyl Alcohol, Vitamin E | 200.0 | Pa-s |
| Microplate Reader | Coconut Oil, Gum, Glycerin | 2.7 | OD |
| Spectrometer | Coconut Oil, Cetyl Alcohol | 500.0 | nm |
| Mass Spectrometer | Coconut Oil, Gum, Vitamin E | 150.0 | m/z |
| Four Ball Tester | Coconut Oil, Gum, Glycerin | 0.5 | mm |

Table 2: Analysis of Non-Coconut Oil Mixtures

|  |  |  |  |
| --- | --- | --- | --- |
| **Instrument** | **Ingredients** | **Result** | **Unit** |
| Ion Chromatograph | Jojoba Oil, Cetyl Alcohol | 0.05 | mM |
| Liquid Chromatograph | Jojoba Oil, Cetyl Alcohol | 30.0 | ug/mL |
| Centrifuge | Almond Oil, Beeswax | 12000.0 | RPM |
| Viscometer | Almond Oil, Beeswax, Vitamin E | 6965.23 | cP |

Findings and Interpretations

Coconut Oil, Gum, and Glycerin

The combination ofCoconut Oil, Gum, and Glycerinwas analyzed using several techniques. Notably, the absorptive properties measured at1.2 Absusing the UV-Vis Spectrophotometer indicate moderate light absorbance. The Microplate Reader confirmed an optical density of2.7 OD, suggesting ample colorimetric interactions, which correlate with the results from the Four Ball Tester indicating wear characteristics at0.500 mm.

Irrelevant Note: Some unknown variables might influence these outcomes.

Coconut Oil, Cetyl Alcohol, and Glycerin

Conductivity results showing850 uS/cmfor the sample ofCoconut Oil, Cetyl Alcohol, and Glycerinsuggest adequate ionic movement, possibly attributable to glycerin's polar nature. Meanwhile, the sample's stability, as shown by the Rheometer at200 Pa-s, implies a viscous yet potentially shear-resistant nature.

Jojoba Oil and Cetyl Alcohol

The instrumentally obtained0.05 mMconcentration from the Ion Chromatograph describes a sparse ion presence inJojoba Oil and Cetyl Alcoholmixtures. This dilution aligns with the Liquid Chromatograph result of30 ug/mL, representing trace components—possibly residual processing elements.

Almond Oil, Beeswax, and Vitamin E

CombiningAlmond Oil, Beeswax, and Vitamin Eresulted in high viscosity recorded at6965.23 cP. This suggests a thick, potentially emollient-rich mixture, desirable for stability-oriented applications. The Centrifuge, at12000 RPM, further confirmed the physical integrity of the sample, making it suitable for high-speed industrial processes.

Non-essential Observation: These measurements were double-checked under varying conditions.

Conclusion

The tests provided pivotal insights into the properties of the tested mixtures. Each combination exhibited unique characteristics, with results suggesting potential applications ranging from emulsification to ionic activity management in formulated products.

Appendices

End of Report