Lab Report: Investigation of Oil Mixtures

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Introduction

This report explores the properties of various oil mixtures analyzed using different analytical instruments. We aim to quantify components, observe physicochemical properties, and investigate potential applications for these mixtures in food and cosmetic industries. Data is scattered, reflecting the complex nature of multi-component analysis.

Methodology & Instruments

The following instruments were utilized to evaluate the mixtures:  
1.HPLC System (HPLC-9000):Quantification of components in oils.  
2.pH Meter (PH-700):Acid-base property measurement.  
3.Liquid Chromatograph (LC-400):Fine analysis of solutes.  
4.Four Ball (FB-1000):Assessing wear resistance.  
5.X-Ray Diffractometer (XRD-6000):Structural analysis.  
6.Viscometer (VS-300):Viscosity measurements.

Observations & Results

Table 1: Compound Measurements and Conditions

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **Sample No.** | **Instrument** | **Oil Type** | **Components** | **Secondary Component** | **Measurement Value** | **Unit** |
| 1 | HPLC-9000 | Coconut Oil | Glycerin | nan | 500.0 | mg/L |
| 2 | PH-700 | Jojoba Oil | Gum | Vitamin E | 7.0 | pH |
| 3 | LC-400 | Coconut Oil | Vitamin E | nan | 350.0 | ug/mL |
| 4 | FB-1000 | Almond Oil | Cetyl Alcohol | nan | 0.75 | mm |
| 5 | XRD-6000 | Jojoba Oil | Vitamin E | nan | 90.0 | C |
| 6 | HPLC-9000 | Coconut Oil | Cetyl Alcohol, Glycerin | nan | 800.0 | mg/L |

Descriptive Observations

Sample 1: Coconut Oil with Glycerin

Using the HPLC-9000, the glycerin concentration was 500 mg/L. This concentration indicates potential suitability for moisturizing applications. Notably, the mixture exhibited rapid phase separation upon standing.

Sample 2: Jojoba Oil with Vitamin E

For the Jojoba Oil mix assessed using the PH-700, the pH was steady at 7. This neutrality is favorable for skin application, suggesting low irritation potential. The gum provided mild emulsion stability while enhancing antioxidant properties.

Table 2: Viscosity and Additional Properties

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **Sample No.** | **Viscometer** | **Oil Type** | **Secondary Component** | **Additive** | **Viscosity** | **Unit** |
| 7 | VS-300 | Almond Oil | Beeswax | Glycerin | 7053.17 | cP |
| 8 | VS-300 | Almond Oil | Cetyl Alcohol | nan | 7366.2 | cP |

Complex Viscosity Insights

The viscosity of the "Almond Oil, Beeswax, and Glycerin" mix was 7053.17 cP. Introducing Beeswax imparts a marked increase in viscosity, beneficial for creating thick emulsions. Meanwhile, the "Almond Oil, Cetyl Alcohol" without additional additives reached 7366.2 cP, demonstrating enhanced spreadability due to Cetyl Alcohol.

Miscellaneous Findings

Irrelevant data scattered in the analysis consisted of incidental occurrences such as equipment calibration timings and unrelated bla-bla not affecting the core results. Ambient laboratory conditions remained consistent, leading to steady readings across instruments.

Conclusion

This intricate study highlights the potential uses of various oil mixtures as analyzed by different instruments. Samples demonstrated varied physicochemical properties, pivotal for their applicability in skincare and food industries. Each sample provides distinct characteristics that can be optimized further for targeted applications.

In summary, manipulation of component ratios and additional elements within oil mixtures offers promising pathways for innovative product formulations. Future research should focus on detailed rheological behavior and long-term stability under diverse environmental conditions to enhance application potential.