Lab Report: Chemical and Physical Analyses of Oil-Based Mixtures

Report ID:1136

Introduction

The purpose of this study was to perform a series of chemical and physical analyses on different oil-based mixtures using a variety of analytical instruments. The tests aimed to observe the properties and behaviors of mixtures containing combinations of Coconut Oil, Jojoba Oil, Almond Oil, along with secondary components such as Beeswax, Gum, and Glycerin. The key parameters measured include concentration, viscosity, conductivity, pH, and more.

Materials and Methods

Each sample was carefully prepared by combining the specified ingredients and subjected to multiple analyses. The devices used in this experiment provided a comprehensive insight into the behavior of the mixtures under different conditions.

Methods and Devices Used:

Observations and Results

1. Sample: Coconut Oil, Jojoba Oil, Beeswax

PCR Machine Analysis:The threshold cycle (Ct) value observed was 25.4 Ct. This value reflects the amplification characteristics of the mixture under thermal cycling conditions.

NMR Spectroscopy:The chemical shift recorded was 3.5 ppm, indicating the specific electronic environment within the mixture.

UV-Vis Spectroscopy:The absorbance level was noted as 1.8 Abs, suggesting the presence of specific chromophores absorbing light at the measured wavelength.

Conductivity Measurement:Conductivity was registered at 1200 uS/cm, highlighting the ionic presence in the mixture.

2. Sample: Almond Oil, Vitamin E

3. Sample: Almond Oil, Gum, Glycerin

Rheology:The viscosity noted was 450 Pa-s. Such high viscosity suggests substantial thickness and resistance to flow.

Ion Chromatography:A concentration of 10.2 mM was detected, indicative of mild ionic content.

Gas Chromatography:The measured concentration was 200 ppm, pointing to the volatile components present.

4. Sample: Almond Oil, Cetyl Alcohol

5. Sample: Jojoba Oil, Beeswax

Liquid Chromatography:The concentration was recorded at 25.7 ug/mL, relating to the molecular presence in the sample.

Viscometric Analysis:A viscosity of 2088.55 cP was registered, confirming its highly viscous nature.

Discussion

The experimental data presented varied insights into the chemical and physical properties of the analyzed samples. The mixture comprising Coconut Oil, Jojoba Oil, and Beeswax demonstrated significant absorbance and conductivity, implying an enhanced interaction within its constituents. Similarly, the high viscosity observed in the Almond Oil, Gum, Glycerin mixture underscores potential applications where high resistance to flow is desired, such as in cosmetic formulations.

Conclusion

These analyses have provided valuable data on the mixture behaviors, suggesting potential applications in industrial, cosmetic, and pharmaceutical fields. The comprehensive use of analytical techniques underlined the complexity and the unique characteristics of each mixture, paving the way for further exploration.

Tables of Collected Data

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| **Sample Ingredients** | **Device** | **Measured Parameter** | **Value** |
| Coconut Oil, Jojoba Oil, Beeswax | PCR Machine PCR-96 | Ct | 25.4 Ct |
| Almond Oil, Vitamin E | pH Meter PH-700 | pH | 5.8 pH |
| Almond Oil, Gum, Glycerin | Rheometer R-4500 | Viscosity | 450 Pa-s |
| Almond Oil, Gum, Glycerin | Ion Chromatograph IC-2100 | Concentration | 10.2 mM |
| Almond Oil, Cetyl Alcohol | Four Ball FB-1000 | Wear Scar Diameter | 0.356 mm |
| Coconut Oil, Beeswax, Vitamin E | NMR Spectrometer NMR-500 | Chemical Shift | 3.5 ppm |
| Coconut Oil | Conductivity Meter CM-215 | Conductivity | 1200 uS/cm |
| Jojoba Oil, Beeswax | Liquid Chromatograph LC-400 | Concentration | 25.7 ug/mL |
| Almond Oil, Gum, Glycerin | Gas Chromatograph GC-2010 | Volatile Component | 200 ppm |
| Coconut Oil, Vitamin E | UV-Vis Spectrophotometer UV-2600 | Absorbance | 1.8 Abs |
| Jojoba Oil, Gum | Viscometer VS-300 | Viscosity | 2088.55 cP |

Random statements unrelated to the study:   
- The cat sat on the mat while the moonlight cast shadows in the room.  
- Penguins in Antarctica are known for their curious stares and waddling gait.

The intricacies observed in these tests form a baseline for further enhancements and explorations into the interactions within these compound mixtures.