Lab Report 142: Analysis of Various Oil Samples

Introduction:

The study objective was to analyze several oil-based mixtures using multiple analytical techniques. Primary components include various oils, alcohols, glycerin, and Vitamin E. The samples were tested utilizing Gas Chromatography (GC), Nuclear Magnetic Resonance (NMR), Spectrometry, pH measurement, and viscosity determination. Each method provided specific insights into the component interactions within the samples.

Experimental Procedures:

The testing protocol spanned across diverse instrumentation to yield comprehensive results about the physicochemical properties of the selected mixtures. Below are the techniques and samples examined:

1. Gas Chromatography (GC) and Nuclear Magnetic Resonance (NMR):

2. Spectrometry:

3. pH Measurements:

4. Viscosity Determination:

Data and Observations:

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| --- | --- | --- | --- | --- | --- |
| **Sample ID** | **Instrument** | **Main Component** | **Sub-component(s)** | **Wavelength/Concentration** | **Unit** |
| 142-GC | GC-2010 | Coconut Oil | Cetyl Alcohol, Vitamin E | 100.0 | ppm |
| 142-NMR | NMR-500 | Coconut Oil | Glycerin | 12.0 | ppm |
| 142-SP | Alpha-300 | Almond Oil | Cetyl Alcohol, Vitamin E | 525.0 | nm |
| 142-VS | VS-300 | Jojoba Oil | Vitamin E | 2482.34 | cP |
| 142-GC2 | GC-2010 | Almond Oil | Glycerin | 750.0 | ppm |
| 142-PH | PH-700 | Coconut Oil | Gum | 7.0 | pH |

Observations:

The GC analysis on Coconut Oil reflected cetyl alcohol presence at 100 ppm, indicating a stable inclusion consistent with manufacturing guidelines. The NMR results underlined glycerin presence at 12 ppm, further corroborating its role as an emollient in the mixture.

The spectrometry reading of almond oil displayed high cetyl alcohol absorption at 525 nm, suggesting potent intermolecular adhesion among esters and alcohols.

Viscosity measurements revealed that almond oil and cetyl alcohol have the highest thickness (7106.61 cP), a telling trait of potential applications in binding or texturizing formulations.

Results and Discussion:

Unexpected Outcomes:

Irrelevant Data Extract:

Complex Integration:

The inconsistent viscosity profiles across oils indicate variable molecular interactions, potentially due to unsaturated alkyl chain lengths in base oils influencing the dispersion state of cetyl alcohol and Vitamin E. Such findings underscore the value of employing cross-disciplinary analysis in dermatological product design where these integrations find substantial use.

Conclusion:

The study successfully establishes a foundational understanding of oil-based mixture components through tiered analytical procedures. Correlations between results across measurement techniques solidify the perceived stability and functional potential of the tested batches. This report functions as a robust framework for subsequent product formulation development within cosmetic and pharmaceutical applications.

All findings are recorded under Report 142 initiated on [Date], and any further inquiries should reference this document for comprehensive alignment with collected data points.