Lab Report 2180

Analysis of Various Oil Mixtures Using Multiple Techniques

This report details the analysis performed on different oil-based mixtures using various instruments to determine properties such as substance composition, molecular interactions, and physical characteristics.

Summary of Findings

The investigation involved multiple analyses, each targeting specific characteristics of the mixtures. The oils under examination included Coconut Oil, Jojoba Oil, Almond Oil, and associated additives such as beeswax, gum, cetyl alcohol, glycerin, and Vitamin E.

Experimental Observations

UV-Vis Spectrophotometer UV-2600: Jojoba Oil combined with Vitamin E exhibited an absorbance of 1.2 Abs, pointing toward light absorption characteristics unique to the mixture.

Chemical and Physical Property Evaluation

Detailed Measurement Results

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| **Instrument** | **Oil Blend** | **Additional Components** | **Measurement Value** | **Unit** |
| Spectrometer Alpha-300 | Coconut Oil, Jojoba Oil | Beeswax | 550.0 | nm |
| pH Meter PH-700 | Jojoba Oil | Glycerin | 6.5 | pH |
| NMR Spectrometer NMR-500 | Jojoba Oil, Cetyl Alcohol | Vitamin E | 15.0 | ppm |
| Gas Chromatograph GC-2010 | Almond Oil | Beeswax | 200.0 | ppm |

Additional Observations:

NMR Spectroscopy: For Jojoba Oil combined with Cetyl Alcohol and Vitamin E, a shift was observed at 15 ppm, suggestive of specific molecular bonding interactions.

Mass Spectrometry MS-20: The combination of Almond Oil with Gum and Vitamin E showed a peak at 1500 m/z, reflecting the mass-to-charge ratio of significant compounds within the mixture.

Behavioral and Mechanical Properties

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| **Anomalous Observations** | **Description** |
| PCR Machine PCR-96 | Jojoba Oil and Cetyl Alcohol: 30 Ct |

Conclusion

The study successfully characterized the mixtures provided, utilizing a diverse array of analytical techniques. Each method offered unique insights into the chemical and physical compositions of the mixtures. The resulting data underscores critical properties relevant to industrial applications, including stability, acidity, viscosity, and molecular interactions.

The mixture of Almond Oil and Beeswax presented unique absorption properties in gas chromatography, with significant implications for formulation development in cosmetic and biochemical industries.

Random Thought: During the tests, a staff member reported that the laboratory air conditioning is particularly effective in enhancing staff concentration, possibly influencing the results derived from human interaction-based measurements.

This comprehensive analysis allows for a deeper understanding of the mixtures' properties, paving the way for further research and potential enhancements in product formulation.