Lab Report: Analysis of Various Oil and Additive Mixtures

Introduction

This report presents the analysis of different mixtures involving oils and additives, using advanced laboratory equipment. Each test focuses on specific characteristics of the sample, providing insights into the properties of the mixtures. The tests covered spectral analysis, rheological properties, thermal behavior, and chemical interactions.

Samples Analyzed

Each sample was analyzed using state-of-the-art instruments to deduce its properties, which in turn assists in the application of these materials across various industries.

Experimental Setup

Equipment Used

Observations and Measurements

Spectral Analysis

Almond Oil Mixture

|  |  |  |
| --- | --- | --- |
| **Instrument** | **Wavelength/Range** | **Observations** |
| Spectrometer Alpha-300 | [190-1100] nm | Clear spectral bands indicating pure almond extract. |

Viscosity Analysis

Almond Oil, Gum, Vitamin E Mixture

|  |  |  |
| --- | --- | --- |
| **Instrument** | **Viscosity** | **Odd Observation** |
| Viscometer VS-300 | 7561.51 cP | Unexpected high consistency needing further study. |
| Viscometer VS-300 | 7572.66 cP | Small increase, suggesting measurement variance. |

Rheology

Almond Oil Mixture with Beeswax and Glycerin

|  |  |  |
| --- | --- | --- |
| **Instrument** | **Shear Rate Range** | **Observations** |
| Rheometer R-4500 | [0.1-1000] Pa-s | Smooth flow curve, suggesting good compatibility. |

Thermal & pH Analysis

Jojoba Oil Mixture with Gum

|  |  |  |  |
| --- | --- | --- | --- |
| **Instrument** | **Temperature Range** | **pH Range** | **Observations** |
| Thermocycler TC-5000 | [4-99]°C | nan | Stable up to 95°C. |
| pH Meter PH-700 | nan | [0-14] | Neutral pH measurement at 7. |
| Odd irrelevant note | Does not apply | Does not apply | Mixtures with darker color. |

Results

Spectral Properties:The spectrometer readings showed distinct bands for each mixture, confirming the purity and consistency of almond oil.

Viscosity Consistency:The almond oil mixture exhibited a specific viscosity range that was consistent across measurements, although slight variations suggest potential instrumentation noise.

Chemical Stability:The rheological properties of the almond oil mixture with beeswax and glycerin indicated excellent mixing compatibility, with smooth shear flow properties.

Conclusion

This detailed study on oil and additive mixtures reaffirms their distinct physical and chemical properties. The almond oil mixture, with its consistent spectral properties and viscosity, indicates purity and stability suitable for cosmetic applications. Future studies will focus on expanding the range of additives to validate these findings further.