Laboratory Report 1192

Research Facility:

Advanced Molecular Analysis Lab

Introduction:

In this report, we analyze various samples composed of either Coconut, Jojoba, or Almond oil mixed with different additives such as Cetyl Alcohol, Gum, Glycerin, and Vitamin E. Utilizing a range of sophisticated instruments — including spectrometers, PCR machines, viscometers, and more — the properties of these mixtures have been meticulously studied.

The primary objective of this investigation is to evaluate the spectral properties, wear resistance, viscosity, thermal stability, and chemical environment of each sample.

Materials and Methods:

Instruments Used:

Data and Observations:

Table 1: Spectrometer Alpha-300 Analysis

|  |  |
| --- | --- |
| **Mixture** | **Wavelength (nm)** |
| Coconut Oil | 475.5 |
| Coconut Oil, Gum | 810.2 |
| Jojoba Oil, Glycerin | 950.1 |
| Coconut Oil, Cetyl Alcohol, Vitamin E | 1020.7 |
| Jojoba Oil, Cetyl Alcohol | 675.3 |

Observation:

Table 2: PCR Machine PCR-96 Analysis

|  |  |
| --- | --- |
| **Mixture** | **Ct Value** |
| Coconut Oil | 18.5 |
| Coconut Oil, Gum | 22.4 |
| Jojoba Oil, Glycerin | 35.2 |
| Coconut Oil, Cetyl Alcohol, Vitamin E | 27.9 |
| Jojoba Oil, Cetyl Alcohol | 11.6 |

Observation:

Table 3: Four Ball FB-1000 Analysis

|  |  |
| --- | --- |
| **Mixture** | **Wear Scar (mm)** |
| Coconut Oil | 0.35 |
| Coconut Oil, Gum | 0.5 |
| Jojoba Oil, Glycerin | 0.75 |
| Coconut Oil, Cetyl Alcohol, Vitamin E | 0.89 |
| Jojoba Oil, Cetyl Alcohol | 0.67 |

Observation:

Table 4: NMR Spectrometer NMR-500 Analysis

|  |  |
| --- | --- |
| **Mixture** | **Chemical Shift (ppm)** |
| Coconut Oil | 10.5 |
| Coconut Oil, Gum | 15.8 |
| Jojoba Oil, Glycerin | 19.0 |
| Coconut Oil, Cetyl Alcohol, Vitamin E | 5.7 |
| Jojoba Oil, Cetyl Alcohol | 12.4 |

Observation:

Table 5: X-Ray Diffractometer XRD-6000 Analysis

|  |  |
| --- | --- |
| **Mixture** | **Temperature (°C)** |
| Coconut Oil | 100.2 |
| Coconut Oil, Gum | 150.5 |
| Jojoba Oil, Glycerin | 160.0 |
| Coconut Oil, Cetyl Alcohol, Vitamin E | 170.7 |
| Jojoba Oil, Cetyl Alcohol | 110.3 |

Observation:

Table 6: Viscometer VS-300 Analysis

|  |  |
| --- | --- |
| **Mixture** | **Viscosity (cP)** |
| Almond Oil, Gum | 7771.45 |
| Jojoba Oil, Vitamin E | 2466.25 |
| Coconut Oil, Glycerin | 5094.12 |

Observation:

Conclusion:

The data collectively unveil a fascinating landscape of interactions amongst various oil mixtures. The crystallinity, spectral absorption, and mechanical properties are notably influenced by the presence and proportion of additives. Specifically, the Coconut Oil-based mixtures exhibited optimal results in terms of wear resistance and thermal stability, though the inclusion of Vitamin E showcased enhanced chemical synergy.

This thorough analysis provides invaluable insights into the complex chemistry and physics underlying these test samples, paving the way for future material enhancements and application potentials.

Notes and Additional Irrelevant Information:

This report serves as a comprehensive document attesting to the properties and capabilities of the analyzed mixtures, despite the challenges inherent in their complexity.