Laboratory Report 2477

Experimentation Instrumentation Overview

The primary focus of this laboratory session was to evaluate various mixtures of oils, waxes, and other chemical compounds utilizing diverse measurement techniques. Each combination presented unique data points indispensable for comprehensive analysis. The apparatuses employed included advanced liquid chromatographs, spectrometers, viscometers, and a microplate reader, among others.

Table 1: Instrumentation and Measurement Parameters

Instrument Model	Sample Combination	Primary Measurement	Value
Liquid Chromatograph LC-400	Coconut Oil, Cetyl Alcohol, Vitamin E	Concentration	250 ug/mL
pH Meter PH-700	Almond Oil, Beeswax, Glycerin	pH	7 pH
FTIR Spectrometer FTIR-8400	Coconut Oil, Cetyl Alcohol	Wavenumber	1200 1/cm
Titrator T-905	Jojoba Oil, Beeswax	Molarity	5 M
NMR Spectrometer NMR-500	Almond Oil, Cetyl Alcohol, Vitamin E	Chemical Shift	10 ppm
X-Ray Diffractometer XRD-6000	Coconut Oil	Temperature	90 C
UV-Vis Spectrophotometer UV-2600	Coconut Oil, Cetyl Alcohol, Glycerin	Absorbance	1.5 Abs
Microplate Reader MRX	Jojoba Oil, Gum, Vitamin E	Optical Density	2.5 OD
Four Ball FB-1000	Almond Oil	Wear Scar Diameter	0.750 mm
Viscometer VS-300	Coconut Oil, Cetyl Alcohol, Glycerin	Viscosity	5150.88 cP
Viscometer VS-300	Coconut Oil, Beeswax	Viscosity	4837.36 cP

Detailed Observations and Results

Chromatographic and Spectrometric Analysis

Coconut Oil, Cetyl Alcohol, Vitamin E:Utilizing the Liquid Chromatograph LC-400, the concentration level was determined to be 250 ug/mL. Simultaneously, the spectrometric analysis via FTIR yielded a significant wavenumber of 1200 1/cm, which correlates with the specific vibrational modes of the compounds involved. Separately, a UV-Vis test

confirmed an absorbance of 1.5 Abs for the same mixture, indicating its moderate transparency.

Coconut Oil:The XRD results signified a temperature capability of 90 C, a feature relevant for thermal analysis and indicative of stability at elevated temperatures.

pH Assessments

The Almond Oil, Beeswax, and Glycerin combination, when tested with the pH Meter PH-700, displayed a neutral pH of 7, an ideal reality for many skincare formulations.

Titrimetric Observations

Jojoba Oil, Beeswax:Employing the Titrator T-905, we discovered a molarity of 5 M, pointing to a dense chemical makeup, potentially undulate with a variety of fatty acid moieties.

NMR and Viscosity Measurements

Almond Oil, Cetyl Alcohol, Vitamin E:An NMR assessment with the NMR-500 model revealed a distinct chemical shift at 10 ppm. This suggests the presence of hydrogen in a thick, electronegative environment, hinting at complex molecular interactions.

Rheological Behavior:

These values indicate that the introduction of Cetyl Alcohol elevates the viscosity considerably, perhaps due to increased intermolecular hydrogen bonding networks.

Table 2: Anomalous Findings

Description	Random Notes
FTIR Fluctuations	Intriguing fluctuations detected beyond 1300 1/cm were perceived, although irrelevant noise
Calibration Challenges	Occasional discrepancies owing to viscosity seemed to appear innovative yet hindered con
Phantom Absorbance Readings	Some skewness related to microplate reader pathways revealed unrelated pe

Upon collating the data, ascertainments indicate that external environmental conditions, occasionally irrelevant laboratory variables, or adjoint sample impurities might circumscribe definitive conclusions. However, initial outputs suggest promising viability for therapeutic and cosmetic purposes contingent on a comprehensive exploration of identified physicochemical attributes.