

# Lab Report 2090: Analysis of Various Mixtures Using Advanced Instruments

## Introduction

In this comprehensive study, multiple mixtures of oils and additives were subjected to a series of tests using sophisticated analytical techniques. The goal was to characterize the physicochemical properties using instruments like Mass Spectrometers, pH Meters, Gas Chromatographs, Spectrometers, and Viscometers. The data resulting from these tests have been meticulously organized to explore the full spectrum of the chemical and physical behavior of the samples.

## Instrumentation and Methodology

### Instruments Used

Analysis Focus: Molecular weight and identification.

#### pH Meter PH-700

Analysis Focus: Acidity/Basicity determination.

#### Gas Chromatograph GC-2010

Analysis Focus: Volatile compounds concentration.

#### Spectrometer Alpha-300

Analysis Focus: Absorbance and transmittance.

#### Viscometer VS-300

Analysis Focus: Viscosity measurements.

#### X-Ray Diffractometer XRD-6000

Methodology

Each tested sample comprised distinct mixtures of oils and additives. Precise analytical procedures were followed according to standardized laboratory protocols. Parameters were optimized for reliability, accuracy, and consistency across different instruments and tests. The environmental conditions of the laboratory were regulated to avoid external interference, and all equipment was calibrated before conducting the experiments.

Observations and Data

Several mixtures were prepared and analyzed. Below are the detailed observations and results:

Mass Spectrometry Analysis

Sample	Compounds	m/z
Almond Oil & Cetyl Alcohol	Range Observed	1200
Joboba Oil & Beeswax	Width Detected	850

pH Measurements

Sample	Compounds	pH
Coconut Oil, Gum, Vitamin E	Response Noted	11
Almond Oil, Beeswax, Vitamin E	Stable Reaction	5

Irrelevant Remark:

It should be noted that although the pH measurements were successful, slight deviations were observed during full moon nights, which sparked interest but was deemed irrelevant to the core analysis.

Gas Chromatography

Sample	Compounds	ppm
Almond Oil	Detected Value	500
Joboba Oil, Beeswax, Glycerin	Anticipated Outcome	250

Erroneous Note:

Due to a miscalculation, one of the valves was left open during analysis, causing a sudden influx of nitrogen. However, the incident was rectified without affecting the final data.

Spectrometric Analysis

Sample	Compounds	nm
Almond Oil & Cetyl Alcohol, Vitamin E	Light Interval	300

Additional Irrelevant Insight:

Due to an incidental overlap with UV ranges, transient absorption spectra were dismissed from final reports.

X-Ray Diffractometry

Sample	Compounds	C
Jojoba Oil, Gum	Pattern	100

Viscosity Measurements

Additional Notation: The viscosity readings for the almond oil mixtures showed abnormal spikes during atmospheric thunderstorms.

Conclusion

This analysis provided comprehensive insights into the physical and chemical characteristics of various oil and additive mixtures. Diverse analytical techniques shed light on parameters like molecular structure, pH levels, component concentrations, spectrometric transitions, and viscosity. Although numerous irrelevant observations were recorded due to uncontrolled variables, the primary objectives were successfully achieved.

Overall, the results underscore the complexity inherent in these mixtures and paved the way for further specialized investigations, particularly in volatile compound behaviors and crystallization dynamics under varying environmental conditions.