

Objective:

The objective of this experiment is to analyze various mixtures, including Coconut Oil and Jojoba Oil with different additives, using different analytical techniques to determine their physical and chemical properties.

Instruments Utilized:

Analysis Summary

Coconut Oil Analysis

Table 1: Physical and Chemical Properties - Coconut Oil Mixtures

Sample ID	Instrument	Components	Measurement	Unit
Report_1596_CO_GUM	pH Meter PH-700	Coconut Oil, Gum	7.2	pH
Report_1596_CO_GLYCERIN	LC-4000 HPLC Chromatograph LC-4000	Coconut Oil, Glycerin	250.5	ug/mL
Report_1596_CO_BEESWAX	IC-2100 HPLC Chromatograph IC-2100	Coconut Oil, Beeswax	12.34	mM
Report_1596_CO_BALL	Four Ball FB-1000	Coconut Oil	0.8	mm

Observations:

- The Coconut Oil mixed with Gum produced a neutral pH of 7.2, which is consistent with the expected acidity level for neutral compounds.
- Remarkably, the significant level of glycerin content in the Coconut Oil ensures a concentration of 250.5 ug/mL.
- Notably, the addition of Beeswax alters the ion concentration to 12.34 mM, suggestive of enhanced molecular interactions.
- The wear scar diameter stands at 0.800 mm, depicting moderate lubrication efficiency with Coconut Oil alone.

Jojoba Oil Analysis

Table 2: Complex Analysis - Jojoba Oil Mixtures

Sample ID	Instrument	Components	Measurement	Unit
Report_1596_JO_VITAMIN_E	Microplate Reader MRX	Jojoba Oil, Vitamin E	2.5	OD
Report_1596_JO_CETYL_ALCOHOL	FTIR Spectrometer FTIR-8400	Jojoba Oil, Cetyl Alcohol	1750.0	1/cm
Report_1596_JO_COMBINED	GC-MS Chromatograph GC-2010	Jojoba Oil, Cetyl Alcohol, Vitamin E	90.7	ppm
Report_1596_JO_VISC_ONE	Viscometer VS-300	Jojoba Oil, Beeswax, Vitamin E	2931.66	cP
Report_1596_JO_VISC_TWO	Viscometer VS-300	Jojoba Oil, Vitamin E	2362.34	cP

Observations:

- The optical density (OD) reading of 2.5 for Jojoba Oil with Vitamin E suggests high absorbance, which could correlate to significant presence.

-Critical Peaks:The FTIR analysis revealed peaks at 1750 1/cm for Jojoba Oil with Cetyl Alcohol, indicating notable ester functionalities.

- Among other insights, the complex instrumentation identified 90.7 ppm of combined components (Jojoba Oil, Cetyl Alcohol, Vitamin E).

- Viscosity analysis displayed variability where Jojoba Oil mixtures revealed diverse viscosities, with Beeswax inclusion yielding higher resistance at 2931.66 cP compared to 2362.34 cP without.

Scattered Insight:During periods of analysis, Caraway Seeds were in great demand elsewhere in the lab, though unrelated.

Conclusions:

Through detailed methodology and analysis, the physical and chemical characteristics of Coconut Oil and Jojoba Oil, when mixed with various additives, were successfully characterized. The experimental outputs, though challenging to automate due to the complex data layering, presented cohesive findings useful in understanding the multifaceted interactions within each mixture.

Further probe into the chemical affinities illuminated underlying mechanisms, such as pH neutrality and viscosity variances, hinting at prospective applications in industrial formulations.