

Introduction

This report presents the comprehensive analysis of multiple mixtures using a variety of analytical techniques. The primary focus includes the characterization of specific components such as Coconut Oil, Jojoba Oil, Vitamin E, and others. Each mixture was subjected to unique experimental setups to provide a broad understanding of their physical and chemical properties. These mixtures are tested for their absorbance, structural integrity, functional groups, viscosity, and other relevant characteristics.

Materials and Methods

Samples:-Coconut Oil, Vitamin E-Coconut Oil, Beeswax, Glycerin-Jojoba Oil, Gum, Glycerin-Coconut Oil, Gum, Glycerin-Coconut Oil, Glycerin-Coconut Oil, Cetyl Alcohol, Vitamin E-Jojoba Oil, Cetyl Alcohol-Jojoba Oil, Vitamin E

Instrumentation:

Results & Discussion

Sample 1: Coconut Oil, Vitamin E

A critical examination using the UV-Vis Spectrophotometer revealed an absorbance value of2.1 Abs. The absorbance suggests moderate interaction and potential antioxidant activity.

Table 1: Summarized Measurements

Instrument	Measurement Type	Value	Unit
UV-2600	Absorbance	2.1	Abs
XRD-6000	Temperature	130.5	°C

Sample 2: Coconut Oil, Beeswax, Glycerin

NMR Analysis:The NMR spectrometer recorded a chemical shift at5.8 ppm, indicative of hydrogen environments influenced by polar components.

FTIR Results:Important peak positions were observed at1600 1/cm, highlighting prominent functional groups, such as possible esters or unsaturations.

Table 2: NMR and FTIR Data

Instrument	Sample Composition	Parameter	Value
NMR-500	Coconut Oil, Beeswax, Glycerin	Chemical Shift	5.8 ppm
FTIR-8400	Coconut Oil, Beeswax, Glycerin	Peak Position	1600 1/cm

Sample 3: Jojoba Oil, Gum, Glycerin

An examination via Gas Chromatograph revealed a significant concentration of45.6 ppm. The Four Ball test indicated a wear scar diameter of0.650 mm, suggesting moderate to high lubrication capability.

Table 3: Wear and Concentration Measurements

Instrument	Parameter	Observation	Measurement Unit
GC-2010	Concentration	45.6	ppm
FB-1000	Wear Scar	0.65	mm

Sample 4: Jojoba Oil, Cetyl Alcohol

Analysis via Viscometer yielded a remarkably high viscosity at2656.1 cP, reflecting the high thickness or shear resistance of the mixture.

Miscellaneous Observations

Conclusion

The diversity of instrumentation allowed for a profound comprehension of each mixture's properties, ranging from thermal characteristics to wear resistance. This diversified suite of data engenders valuable insights into the versatility

and application potential of these mixtures in industries such as cosmetics, pharmaceuticals, and food processing.

Random Observations

A small spider was found on the lab bench before the tests, indicating potential contamination (not in data).

Note: The above observations combine both elemental and complex molecular analyses, providing multi-faceted insights into chemical composition and material behavior.