

Lab Report 851: Analysis of Various Oil-Based Mixtures

Objective:The primary objective of this lab report is to analyze the properties of different oil-based mixtures using a variety of instruments. Each mixture is evaluated based on specific characteristics such as viscosity, molecular weight concentrations, and thermal stability.

Materials and Methods:

Viscometer (VS-300)

Test Samples:

Jojoba Oil + Cetyl Alcohol + Glycerin

Procedure Details:

Results and Observations:

Table 1: Sample Measurements and Observations

Instrument	Mixture Composition	Measurement	Observations
Four Ball Tester	Almond Oil, Cetyl Alcohol, Vitamin E	0.850 mm	Consistent wear prevention observed.
HPLC System	Coconut Oil, Glycerin	500.4 mg/L	High purity level with minimal contaminants.
Ion Chromatograph	Almond Oil, Gum, Glycerin	50.2 mM	Precise ion separation achieved.
Thermocycler	Coconut Oil, Cetyl Alcohol, Vitamin E	37 C	Stable temperature control noted.
Centrifuge	Coconut Oil, Cetyl Alcohol	13000 RPM	Successful phase separation in 5 minutes.
Rheometer	Almond Oil, Cetyl Alcohol, Vitamin E	10.5 Pa-s	Non-Newtonian fluid behavior documented.
Viscometer	Jojoba Oil, Cetyl Alcohol	2820.87 cP	Viscosity suitable for cosmetic applications.

Additional Information:

Table 2: Complex Mixing Quantities and Influences

Test ID	Base Oil	Additives	Measured Parameter	Result/Unit	Notes
Report_851a	Almond Oil	Gum, Glycerin	Ion Concentration	50.2 mM	Inconsistent baseline drift.
Report_851b	Coconut Oil	Cetyl Alcohol	RPM Effect	13000 RPM	Optimal centrifugation at high speed.
Report_851c	Joboba Oil	Cetyl Alcohol	Viscosity	2820.87 cP	High lubrication properties.
Report_851d	Joboba Oil	Cetyl Alcohol, Glycerin	Viscosity	2801.48 cP	Slight decrease due to glycerin addition.

Discussion:

The various oil mixtures tested exhibit differential physical characteristics valuable for diverse industrial applications. Notably, mixtures containing cetyl alcohol and Vitamin E demonstrate significant thermal stability and reduced wear, as observed using the Four Ball Tester. The subtle decline in viscosity when comparing joboba oil mixtures with and without glycerin suggests a potential impact of glycerin on the flow properties, enhancing its applicability in dynamic systems.

Irrelevant Observation:It is noteworthy that while preparing samples, the ambient humidity was recorded at 43%, although this parameter was not controlled or considered significant for viscosity-related measurements.

In conclusion, these findings elucidate the robust functionalities and applications of each mixture. Moreover, careful selection of specific additive combinations can enhance desired properties?an insight vital for the formulation of skin-care or lubrication products.

This report sets the foundation for further studies on enhancing oil-based formulations, considering the synergy of ingredients as demonstrated.