Laboratory Report 1988

Overview

This report documents the findings from a series of tests performed in1988using various spectrometric, chromatographic, and other analytical techniques. The study investigated the interaction of different compounds, including oils and alcohols, under varying conditions.

Tests were conducted with the following mixtures:  
-Jojoba Oil, Cetyl Alcohol, Vitamin E-Coconut Oil, Cetyl Alcohol, Vitamin E-Almond Oil, Cetyl Alcohol, Vitamin E-Coconut Oil (pure)-Jojoba Oil, Gum-Jojoba Oil, Glycerin

Equipment and Methods

The following equipment was applied for testing:

Observations and Measurements

The following measurements were recorded during the experiments:

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| --- | --- | --- | --- |
| **Sample Mixture** | **Instrument** | **Measurement** | **Condition** |
| Jojoba Oil, Cetyl Alcohol, Vitamin E | Spectrometer Alpha-300 | 650 nm | Wavelength Absorption |
| Coconut Oil, Cetyl Alcohol, Vitamin E | Thermocycler TC-5000 | 37°C | Temperature Controlled Reaction |
| Almond Oil, Cetyl Alcohol, Vitamin E | NMR Spectrometer NMR-500 | 15 ppm | Chemical Shift Resonance |
| Jojoba Oil, Cetyl Alcohol | UV-Vis Spectrophotometer UV-2600 | 2.1 Abs | UV-Visible Molecular Absorption |
| Jojoba Oil, Gum | Microplate Reader MRX | 3.2 OD | Optical Density |
| Coconut Oil | X-Ray Diffractometer XRD-6000 | 120°C | High Temperature Analysis |
| Almond Oil, Cetyl Alcohol | Ion Chromatograph IC-2100 | 10.5 mM | Ionic Concentration Analysis |
| Jojoba Oil, Glycerin | Mass Spectrometer MS-20 | 750 m/z | Mass-to-Charge Ratio |
| Jojoba Oil, Cetyl Alcohol | Conductivity Meter CM-215 | 1800 uS/cm | Electrical Conductivity Measurement |
| Coconut Oil, Cetyl Alcohol | Viscometer VS-300 | 5112.62 cP | Flow Viscosity |

Results and Discussion

Jojoba Oil Mixtures

TheJojoba Oil-based mixtures, combined withCetyl AlcoholandVitamin E, demonstrated notable absorption at650 nm, suggesting significant interaction at the molecular level. The inclusion ofGlycerinyielded a mass spectrometric peak at750 m/z, thus confirming the presence of higher molecular weight components.

In contrast, theJojoba Oil, Gummixture showed an optical density of3.2 OD, indicating probable particulate or colloidal formations. This highlights potential applications in formulated suspension products.

Electrically, theConductivity Meterreturned a reading of1800 uS/cmfor theJojoba Oil, Cetyl Alcoholmixture, implying the presence of a substantial ionic environment, likely attributed to interactions among the amphiphilic molecules.

Coconut and Almond Oil Mixtures

TheCoconut Oilmixture at37°Cwas effectively stabilized using theThermocycler, underlining its suitability for temperature-sensitive formulations. Interestingly, theViscometerrecorded an exceptional viscosity of5112.62 cPfor theCoconut Oil and Cetyl Alcoholmixture, which suggests substantial intermolecular interactions—ideal for applications requiring high viscosity.

For theAlmond Oilmixture, theNMR Spectrometerrevealed chemical shifts at15 ppm, indicating distinct structural and compositional characteristics. Additionally, anionic concentrationof10.5 mMwas observed, adding valuable insight into the compound's stability.

TheX-Ray Diffractometeranalysis for a pureCoconut Oilsample exposed its crystalline properties at a temperature of120°C, marking a significant observation for future structural studies.

Conclusion

This study has provided critical insights into the behavior and properties of various oil-based mixtures. Each compound's unique interaction profile suggests potential applications in product formulation and highlights the effectiveness of the instruments used.

Overall, this comprehensive analysis sets the stage for further research into optimizing these mixtures for industrial applications. Future studies could focus on exploring temperature variations, additional compound interactions, and long-term stability testing.

Appendix

Random Note: The year 1988 not only witnessed technological advances but also significant socio-cultural events, such as notable pop culture phenomena. Thus, contextualizing scientific progress in such a vibrant year enriches our understanding of historical technological evolution.

Please consult individual sections for more details on each analytical method and specific observations conducted in this study.