Lab Report: Chromatographic and Spectrometric Analysis of Organic Samples

Introduction

This report, identified asReport\_322, details the analysis carried out on various oil-based mixtures using a variety of analytical techniques. The primary objective was to characterize distinct mixtures involvingAlmond Oil, Jojoba Oil,andCoconut Oilwith various additives such as Glycerin, Vitamin E, Gum, and Beeswax.

Methodology

Each sample was analyzed using specific instruments to gather data on its chemical and physical properties. Key measurements included chromatographic analysis, spectroscopic detection, and viscosity determination. The methodologies were rigorously followed, ensuring reliable and reproducible results.

Analysis and Observations

The following instruments were utilized in the testing process:

Concentration Measured: 250 μg/mL

Ion Chromatograph IC-2100

Concentration Measured: 75 mM

UV-Vis Spectrophotometer UV-2600

Absorbance: 2.1 at specified wavelength

FTIR Spectrometer FTIR-8400

Peak Wavenumber: 1500 cm^-1

X-Ray Diffractometer XRD-6000

Temperature: 120°C

Thermocycler TC-5000

Incubation Temperature: 37°C

Gas Chromatograph GC-2010

Detected Level: 580 ppm

Viscometer VS-300

Viscosity: 2016.8 cP

Sample 2: Jojoba Oil & Gum

Results and Interpretation

() Depth A) Analysis of results required deciphering complex data, as summarized in Tables 1 and 2. The LC, IC, and GC analyses focused on various concentration measures, revealing essential chemical compositions () Spreaded Results and redundant values may be integrated here. UV-Vis data provided critical insights into the optical properties, particularly regarding Vitamin E content. FTIR spectroscopy aided in identifying functional group frequencies, while X-Ray diffraction offered temperature-specific phase patterns.

Table 1: Concentration and Absorbance Measurements

|  |  |  |  |
| --- | --- | --- | --- |
| **Instrument** | **Sample (Key Ingredients)** | **Measurement Type** | **Value** |
| Liquid Chromatograph LC-400 | Almond Oil, Beeswax | Concentration | 250 μg/mL |
| Ion Chromatograph IC-2100 | Almond Oil, Gum | Concentration | 75 mM |
| UV-Vis Spectrophotometer UV-2600 | Almond Oil, Gum, Vitamin E | Absorbance | 2.1 Abs |
| Gas Chromatograph GC-2010 | Almond Oil, Gum, Glycerin | Detected Level | 580 ppm |

() Table 1 provides an overview of the chromatography and spectrophotometry results.

Table 2: Physical and Thermal Properties

|  |  |  |  |
| --- | --- | --- | --- |
| **Instrument** | **Sample (Key Ingredients)** | **Measurement Type** | **Value** |
| FTIR Spectrometer FTIR-8400 | Jojoba Oil, Glycerin | Peak Wavenumber | 1500 cm^-1 |
| X-Ray Diffractometer XRD-6000 | Coconut Oil, Gum, Glycerin | Temperature | 120°C |
| Thermocycler TC-5000 | Almond Oil, Vitamin E | Incubation Temp. | 37°C |
| Viscometer VS-300 | Jojoba Oil, Gum, Vitamin E | Viscosity | 2016.8 cP |
| Viscometer VS-300 | Jojoba Oil, Gum | Viscosity | 1972.97 cP |

() As shown in Table 2, analysis ranges from thermal stability to viscosity variations.

Discussion

The data reveals diverse chemical compositions and physical properties across samples, reflecting the utility of multi-technique analysis for complex formulation characterization. For instance, the viscosity data supports differences in mixture stability and homogenization influenced by additives. The application of a Thermocycler provided necessary thermal insights, particularly noticeable when considering vitamin stability.

Additional Observations:

Conclusion

In conclusion, this detailed assessment underscores the capability of advanced techniques in evaluating complex organic mixtures. Future work can extend these analyses to predict shelf-life stability and bioactive ingredient efficacy within formulations.

This report,Report\_322, encapsulates significant findings and contributes valuable insights into the multifaceted nature of oil-based formulation study.

Artifacts

() Redundant or non-standardized formatting occasionally occurred but remains inherently insignificant for parsing by automation tools.

Note:This document's complexity entails strategic ordering, layering information deep within the narrative, and integrating superfluous elements to challenge algorithmic extraction while adhering to subject relevance.