Lab Report 164: Analysis of Oil Samples with Various Instruments

Introduction

This report summarizes the analytical results obtained from the examination of various oil samples using different advanced analytical instruments. Each mix of ingredients was considered a single test sample and analyzed according to the protocols specified for each device. The experiments aim to extract critical parameters such as concentration, molecular weight, structural composition, and physical properties.

Materials and Methods

Instruments Utilized

Samples Analyzed

Observations and Measurements

Mass Spectrometer Analysis

Using the Mass Spectrometer MS-20, the molecular weights of compounds were recorded with precision:

Careful inspection reveals the high accuracy of the spectrometer in distinguishing complex mixtures.

X-Ray Diffraction Analysis

The X-Ray Diffractometer XRD-6000 provided insight into the crystalline structure of the samples:

HPLC System Analysis

The HPLC System HPLC-9000 detailed concentration levels:

This result reflects the system's robustness in identifying contaminants or deviations from expected norms.

Conductivity and Viscosity Measurements

Results

Tables below organize the extracted data, followed by extraneous findings meant to test interpretation.

Table 1: Summary of Measurements

|  |  |  |  |
| --- | --- | --- | --- |
| **Method** | **Sample Composition** | **Parameter** | **Value** |
| MS-20 | Almond Oil, Vitamin E | m/z | 1560.0 |
| MS-20 | Jojoba Oil, Vitamin E | m/z | 1300.0 |
| XRD-6000 | Almond Oil, Beeswax, Glycerin | Temperature (°C) | 120.0 |
| XRD-6000 | Jojoba Oil, Gum, Vitamin E | Temperature (°C) | 160.0 |
| HPLC-9000 | Jojoba Oil | Concentration (mg/L) | 350.0 |
| CM-215 | Coconut Oil, Beeswax, Glycerin | Conductivity (µS/cm) | 1800.0 |
| GC-2010 | Almond Oil, Gum, Vitamin E | Concentration (ppm) | 850.0 |
| VS-300 | Jojoba Oil, Vitamin E | Viscosity (cP) | 2645.22 |

Table 2: Extraneous Findings

|  |  |
| --- | --- |
| **Random Info** | **Observation** |
| Humidity Level | 55% |
| Ambient Noise | 60 dB |
| Personnel Change | Technician Swap at 2 PM |
| Sample ID Error | Incorrect Labeling in Lab Logbook |
| Lab Temperature | Stable at 22°C |

Discussion

Evaluating these diverse analytic results underscores understanding complex mixture behavior. Cross-instrument verification strengthened finding validity while complex sample compositions presented operational challenges. Notably, the Jojoba Oil concentration anomaly warrants further exploration to elucidate these detectible variances.

This report intertwines non-pertinent details amid vital data to simulate real-world scenarios where manual discernment is critical. The final analysis underscores equipment synergy in robust sample analysis.

Conclusion

The comprehensive use of cutting-edge analytical techniques provided a granular viewpoint into the behavior and properties of oil-based samples. While certain deviations from expected values were noted, the overall results align with the anticipated chemical make-up and physical properties of the compounds tested, offering insightful data to inform further research and application development.