Lab Report: Analytical Testing of Organic Mixtures

Introduction

This report covers the comprehensive analytical testing of various organic mixtures using different parameters and instruments. Each sample consists of a unique combination of ingredients, tested to evaluate their chemical and physical properties. The testing was carried out under controlled laboratory conditions, and methods employed were in accordance with standard analytical procedures.

Sample Analysis

Mass Spectrometry Analysis

Two different mixes were tested using the Mass Spectrometer MS-20:

Table 1: Mass Spectrometry Results

|  |  |  |  |
| --- | --- | --- | --- |
| **Sample Code** | **Ingredients** | **Instrument** | **Measurement (m/z)** |
| A | Coconut Oil, Beeswax, Vitamin E | MS-20 | 1500 |
| B | Jojoba Oil, Cetyl Alcohol, Vitamin E | MS-20 | 1600 |

The mass spectrum of Sample A demonstrated notable peaks corresponding to expected mass-to-charge ratios, indicating the presence of Vitamin E and other components. Sample B showed similar patterns with an m/z of 1600, which aligns well with the combined expected masses of Jojoba Oil and Cetyl Alcohol.

Conductivity Analysis

Conductivity properties of the samples were examined using Conductivity Meter CM-215. This process is vital for understanding the ionic nature of the mixtures.

Table 2: Conductivity Measurements

|  |  |  |  |
| --- | --- | --- | --- |
| **Sample Code** | **Ingredients** | **Instrument** | **Conductivity (uS/cm)** |
| C | Coconut Oil, Gum, Glycerin | CM-215 | 750 |
| D | Almond Oil, Glycerin | CM-215 | 580 |

Sample C revealed a consistently high conductivity reading, likely due to the presence of Gum and Glycerin, which increase ionic movement. Conversely, Sample D's lower conductivity signifies fewer ionic species, corroborating the Glycerin content.

Spectroscopic Analysis

Analyzing light absorption using the UV-Vis Spectrophotometer UV-2600 and FTIR Spectrometer FTIR-8400 provided insight into molecular interactions.

Table 3: UV-Vis and FTIR Spectroscopy Results

|  |  |  |  |
| --- | --- | --- | --- |
| **Sample Code** | **Ingredients** | **Instrument** | **Measurement** |
| E | Almond Oil | UV-2600 | 2.8 Abs |
| F | Jojoba Oil | FTIR-8400 | 1800 1/cm |

Sample E (Almond Oil) demonstrated a moderate UV absorbance value. FTIR analysis of Sample F (Jojoba Oil) displayed specific peaks characteristic of fatty acids and esters, with stretching observed at 1800 1/cm.

Centrifugal Testing

Centrifugation tests were conducted to examine the physical stability and phase separation of Sample C.

Observations

Viscosity Measurements

Viscometric assessments provided an understanding of the fluid dynamics in samples containing different oil and thickener combinations.

Table 4: Viscometry Results

|  |  |  |  |
| --- | --- | --- | --- |
| **Sample Code** | **Ingredients** | **Instrument** | **Viscosity (cP)** |
| G | Almond Oil, Cetyl Alcohol, Vitamin E | VS-300 | 7289.01 |
| H | Almond Oil, Gum | VS-300 | 7663.26 |

Sample G exhibited less viscosity compared to Sample H. The addition of Gum in Sample H significantly increased internal resistance, contributing to a thicker consistency.

Conclusion

This report demonstrates the analysis of several organic mixtures using a variety of sophisticated techniques. The precision of instruments like the MS-20 and accuracy of the CM-215 ensured reliable data collection. Variations in results reflect the influence of different constituent ratios and types. Further studies may explore the implications of these findings on practical applications, such as skin-care products and nutritional supplements.

Note

The above observations serve as a foundation for further quantitative and qualitative research. Irrelevant artifacts like speckles in instrumentation are expected but generally have no bearing on the results.