GLI Method Summary

Carbon, Hydrogen, and Nitrogen Determination using the PerkinElmer 2400 Series II CHNS/O Analyzer

**Governing SOP:** ME-14  **Analyte:** Carbon, Hydrogen, Nitrogen  **Range:** >0.5% CHN

**Summary**

This instrument burns sample in pure oxygen at 920 – 980°C under static conditions to produce combustion products of CO₂, H₂O, and N₂. The PE-2400 automatically separates and analyzes these products in a self-integrating, steady state thermal conductivity analyzer. An extended combustion time may be employed for difficult to combust samples.

**Instrument**

| PerkinElmer 2400 Series II CHNS/O Analyzer (Instrument #487) |

**Sample Intro**

Weigh 1 – 5 mg into tin capsule; crimp (See GLI Procedure G-6) for liquids.

**De Decomposition**

Combustion at >950°C, reduction at >675°C – CO₂, H₂O, N₂

**Calibration**

Acetanilide (2 – 3 mg)

**Control**

Acetanilide second source

**D Determination**

CO₂; H₂O; N₂ by thermal conductivity analyzer

**Quantitation Limit**

0.5%C, 0.5%H, 0.5%N

**Precision & Accuracy**

<table>
<thead>
<tr>
<th></th>
<th>C</th>
<th>H</th>
<th>N</th>
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<tbody>
<tr>
<td>RSD (%)</td>
<td>0.42%</td>
<td>2.12%</td>
<td>0.91%</td>
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<tr>
<td>Mean Recovery (%)</td>
<td>100.07%</td>
<td>99.43%</td>
<td>98.02%</td>
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**Interferences**

Metals and some halogens cause incomplete combustion. An extended combustion time can be used to alleviate this problem.

**Calculations**

Instrument calculates and prints w/w results for %C, %H, and %N. For samples crimped in an aluminum capsule, the %N is corrected with a factor. 

\[(\mu V/\mu g \text{ sample}/K) \times 100 = \% \text{ Element}; \text{ where } K = \text{ calibration} = \mu V/\mu g \text{ of C, or H, or N}\]

TBD – To Be Determined

**References**


ASTM D5291

AOAC 972.43

**Other GLI Procedures**

G-6  Crimping Volatile Samples

ME-11  Carbon, Hydrogen, and Nitrogen Determination using the LECO 2000

ME-3  Carbon, Hydrogen, and Nitrogen Determination using the CE-440 Elemental Analyzer

E6-5  Determination of Inorganic Carbon

E6-6  Coulometric Determination of Total Carbon

3.2.2.487  Maintenance and Service for the PerkinElmer Model 2400 Series II CHNS/O Analyzer Instrument #487