Organic Application Note

Carbon, Hydrogen, and Nitrogen in Flour and Plant Tissue

Instrument

TruSpec CHN

Sampling and Sample Preparation

It is essential that a representative and uniform sample be analyzed. Samples should be finely ground, and flour reference materials such as those offered by LECO and NIST must be properly prepared. Carbon, Hydrogen and Nitrogen values for reference materials are normally reported on a "dry basis"; take care to follow drying instructions on the certificate of analysis.

Accessories

502-186 Tin Foil Cup

Calibration

LECO flour reference materials or other suitable reference materials.

Analysis Parameters

Sample Weight	0.15 to 0.25 gram
Combustion Furnace Temperature	950°C
Afterburner Temperature	850°C

Element Parameters

	Nitrogen	*Carbon*	*Hydrogen*
Analyze	Yes	Yes	Yes
Minimum Analysis Time	30 seconds	NA	NA
Comparator Level	1.00	NA	NA
Endline Time	1 second	NA	NA
Conversion Factor	1.00	1.00	1.00
Significant Digits	5	5	5

IR Analysis Stabilize Comparator	0.00
IR Baseline Delay Time	5 seconds
IR Baseline Time	2 seconds
IR Pressure Stabilization Comparator	0.00
IR Stop Flow Time	5 seconds
TC Baseline Delay Time	5 seconds
TC Baseline Time	2 seconds

Burn Profile

Burn Steps	*Time*	*Furnace Flow*
1	40 seconds	High
2	30 seconds	Medium
3	30 seconds	High

TruSpec®

Macro Ballast Parameters

Ballast

Equilibrate Time	30 seconds
Not Filled Timeout	300 seconds

Aliquot Loop

Fill Time	20 seconds
Equilibrate Pressure Time	4 seconds

Procedure

1. Prepare instrument for operation as outlined in the operator's instruction manual.
2. Determine and calibrate systems blank as outlined in the operator's instruction manual.
3. Instrument must be calibrated as outlined in the operator's instruction manual.
4. Perform Drift Correction as outlined in the operator's instruction manual.
   Note: Drift should be performed at the start of every day or when the check standard doesn't return the correct result(s).
5. Weigh 0.15 to 0.25 gram sample into a 502-186 Tin Foil Cup, seal, enter mass (weight) into the sample login, place into the appropriate position of the sample carousel, and proceed with analysis.

Typical Results

Sample	Weight (gram)	Carbon (%)	Hydrogen (%)	Nitrogen (%)
LECO	0.2205	44.97	6.48	2.13
Barley Flour	0.2196	44.97	6.48	2.14
502-277	0.2206	44.81	6.49	2.11
44.94% C	0.2227	44.90	6.50	2.12
6.48% H	0.2316	44.84	6.50	2.13
2.14% N	0.2148	44.92	6.50	2.11
	0.2284	44.87	6.52	2.12
	0.2337	44.87	6.52	2.12
	0.2167	44.79	6.50	2.12
	0.2199	44.73	6.51	2.13
	X =	***44.87***	***6.50***	***2.12***
	s =	***0.08***	***0.01***	***0.01***
LECO	0.2022	44.46	5.92	4.01
Alfalfa	0.2019	44.53	5.95	4.01
502-273	0.2015	44.41	5.95	4.02
44.43 % C	0.2018	44.47	5.95	4.02
5.90 % H	0.2026	44.34	5.95	4.01
4.00 % N	0.2042	44.38	5.95	4.02
	0.2040	44.43	5.94	4.01
	0.2040	44.39	5.96	4.00
	0.2030	44.22	5.95	4.02
	0.2031	44.27	5.95	4.02
	X =	***44.39***	***5.95***	***4.01***
	s =	***0.09***	***0.01***	***0.01***

Sample	Weight (gram)	Carbon (%)	Hydrogen (%)	Nitrogen (%)
NIST RM	0.2053	45.48	6.48	2.72
8436	0.2036	45.31	6.49	2.73
Wheat Flour	0.2023	45.35	6.49	2.72
2.709 % N	0.2046	45.30	6.50	2.72
*	0.2040	45.35	6.52	2.72
	0.2016	45.26	6.46	2.71
	0.2042	45.19	6.48	2.73
	X =	***45.32***	***6.49***	***2.72***
	s =	***0.09***	***0.02***	***0.01***

**Carbon and hydrogen values are not certified.*

Delivering the Right Results

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