Organic Application Note

Carbon, Hydrogen, and Nitrogen in Coal

Instrument
TruSpec® CHN

Method Reference
ASTM D 5373

Sampling and Sample Preparation
A representative, uniform sample is required. Samples should be prepared in accordance to ASTM D2013.
Coal reference materials such as those offered by LECO and NIST are properly prepared.

Accessories
502-186 Tin Foil Cup

Sample Weight
0.08 to 0.1 gram

Calibration
LECO coal reference materials such as LECO 502-442, 502-443 and 502-444, or other suitable reference materials.

Analysis Parameters

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	90 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 results of the check standard fall outside of the correct result(s).
5. Weigh 0.08 to 0.1 gram coal sample into 502-186 tin foil cup, seal, enter weight into the weight stack, place into the appropriate position on the sample carousel, and proceed with analysis.

Typical Results

Sample	*Weight g*	*Carbon %*	*Hydrogen %*	*Nitrogen %*
NIST SRM	0.0815	77.14	5.17	1.55
1632c @	0.0815	76.98	5.16	1.54
77.45 % C	0.0828	77.19	5.15	1.52
5.11 % H	0.0815	77.26	5.15	1.55
1.54 % N	0.0811	77.02	5.17	1.54
Coal	0.0809	77.14	5.17	1.54
	X =	***77.12***	***5.16***	***1.54***
	s =	***0.10***	***0.01***	***0.01***
LECO	0.0812	83.27	5.21	1.56
502-443 @	0.0829	83.37	5.15	1.56
83.50 % C	0.0826	83.25	5.14	1.55
5.09 % H	0.0807	83.18	5.18	1.58
1.57 % N	0.0824	83.05	5.16	1.56
Coal	0.0828	83.20	5.22	1.55
	0.0814	82.99	5.19	1.55
	0.0812	83.36	5.14	1.56
	0.0833	83.19	5.15	1.54
	X =	***83.21***	***5.17***	***1.56***
	s =	***0.13***	***0.03***	***0.01***

Delivering the Right Results

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