Carbon Determination in Fluoropolymers

LECO Corporation; Saint Joseph, Michigan USA

Instrument: C-144

Introduction

Fluoropolymers are used in many different applications for modern equipment. Some uses for fluoropolymers are tubing, thread tape, wire insulation, cooking pans and other applications that require a non-stick surface. Fluoropolymers also have desirable qualities in corrosion resistance and high temperature stability compared to other plastics. One of the most commonly used fluoropolymers is polytetrafluroethylene.

Accessories

Combustion Boat (529-204), F-CL Absorbent (769-610-HAZ), Halogen Scrubber (502-351), Glass Wool (501-081), Anhydrone (501-171-HAZ)

Calibration Standard

LECO 502-211 (Glycine), LECO 501-034 (Calcium Carbonate)

Method Parameters

Furnace Temperature:	1350°C
Minimum Integration Time:	70 seconds
Maximum Integration Time:	180 seconds
Comparator Terminate Level:	1%

Procedure

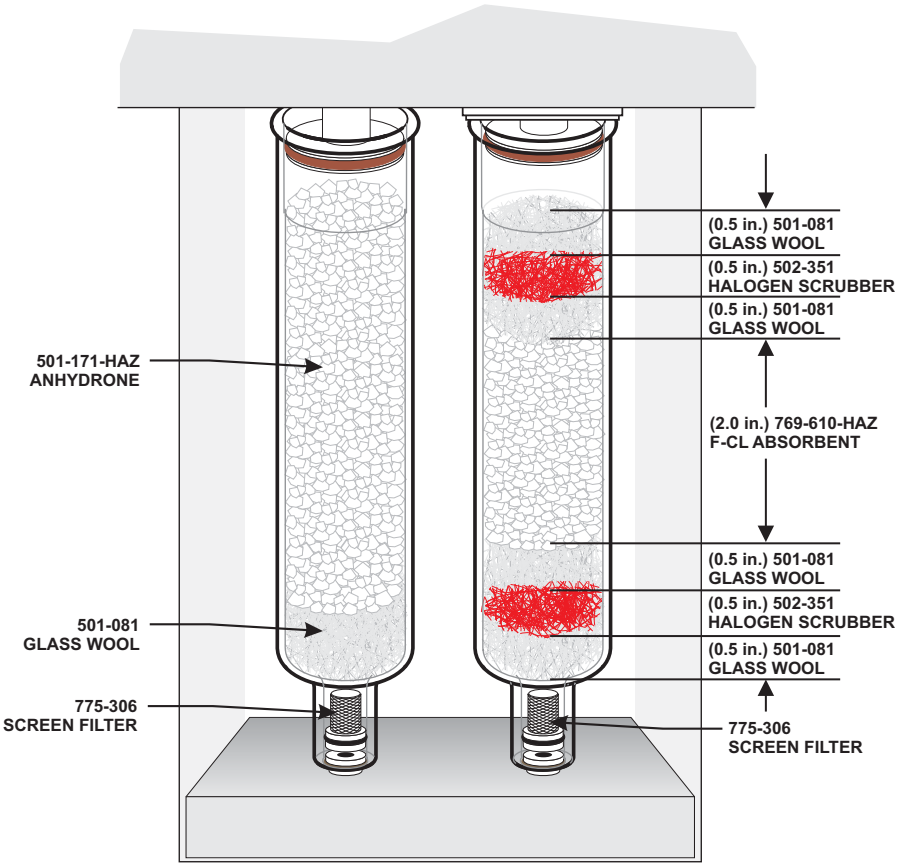
1. Prepare instrument for operation as outlined in the operator's instruction manual.
2. Pack the Halogen Scrubber Tube as shown in Figure 1. Place the tube in the space shown in Figure 1.
3. Condition the instrument by analyzing a few coal samples, until the readings are stable.
4. Determine a blank.
   a. Enter a 1.000 g mass into the Add Sample Login (F3) using Blank as the sample name.
   b. Initiate Analysis Sequence (F4). When "Push boat into furnace" message appears on the display, click the "OK" button, then slide an empty (clean) 529-204 Combustion Boat into the combustion tube until it reaches the boat stop.
   c. Repeat steps 4a and 4b a minimum of three times.
   d. Set the blank following the procedure outlined in the operator's instruction manual.

5. Calibration.
   a. Weigh ~0.05 g of LECO 502-211 (Glycine) calibration standard or ~0.1 g of LECO 501-034 (Calcium Carbonate) calibration standard into the 529-204 Combustion Boat and enter the mass and identification information into the Add Sample Login (F3).
   b. Initiate Analysis Sequence (F4). When "Push boat into furnace" message appears on the display, click the "OK" button, then slide the 529-204 Combustion Boat into the combustion tube until it reaches the boat stop.
   c. Repeat steps 5a and 5b a minimum of three times.
   d. Calibrate the instrument following the procedure outlined in the operator's instruction manual.
6. Analyze Samples.
   a. Weigh ~0.05 g of a fluoropolymer sample into the 529-204 Combustion boat and enter the mass and identification information into the Add Sample Login (F3).
   b. Initiate the Analysis Sequence (F4). When "Push boat into furnace" message appears on the display, click the "OK" button, then slide the 529-204 Combustion Boat into the combustion tube until it reaches the boat stop.
   c. Repeat from step 6a for each desired sample analysis.

Organic Application Note

Delivering the Right Results

Figure 1.



Typical Results

Sample	*Mass (g)*	*% Carbon*
Fluoropolymer Tubing	0.0554	19.9
	0.0590	20.3
	0.0565	20.1
	0.0541	20.2
	0.0526	20.6
	***X*=**	***20.2***
	***s*=**	***0.3***
Fluoropolymer Tape	0.0509	18.3
	0.0524	18.5
	0.0541	18.3
	0.0571	18.3
	0.0526	18.1
	***X*=**	***18.3***
	***s*=**	***0.1***

NOTE: Not applicable for Sulfur determination in the SC-144DR or SC632 Series due to Sulfur interference.

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