Featured Application: *Fluorotelomer Alcohols (FTOHs) on LPGC Rtx-200*

Fast Analysis of Fluorotelomer Alcohols

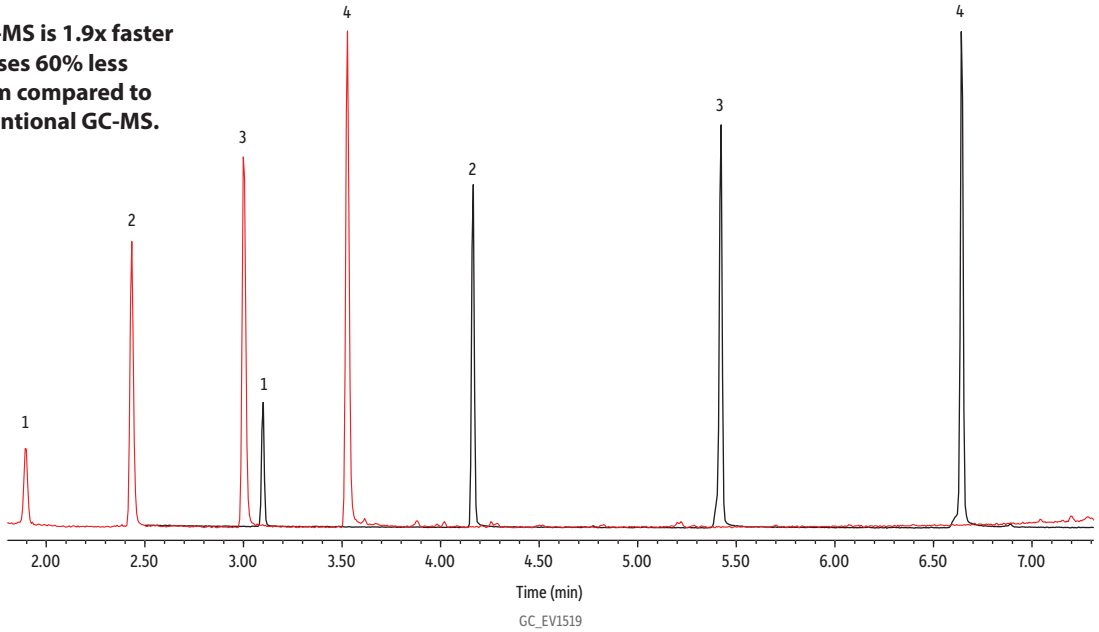
- 1.9x faster than conventional GC-MS analysis.
- Reduces helium usage by 60% compared to conventional GC-MS methods.
- LPGC kits are factory connected with a proven leak-free connector making LPGC as simple as a column change.

Fluorotelomer alcohols (FTOHs) have recently emerged as an important class of PFAS compounds in environmental testing laboratories. These compounds are commonly used in manufacturing materials for their oil and water-repellant capabilities but have recently been found to degrade into toxic compounds that pose health and environmental concerns. The degradation products of these volatile FTOHs are frequently detected in indoor and outdoor air samples and thus are important to monitor. Since FTOHs are an emerging class of compounds, testing methodologies are limited. In this application, we developed a rapid analysis of four common fluorotelomer alcohols on the LPGC Rtx-200, achieving excellent separations with a run time of under four minutes. As show in Figure 1, the optimized LPGC method is 1.9x faster and uses 60% less helium than conventional methods. Despite significant speeds gains, excellent separations were still achieved for all isobars.

Utilizing LPGC for analysis of FTOHs significantly reduces analysis time, improving lab productivity while also conserving helium. Each of our factory-coupled LPGC kits are individually tested, so you can have the assurance of a leak-free connection. To learn more about this powerful technique, visit **www.restek.com/lpgc**

Figure 1: Comparison of Conventional and LPGC-MS Analysis of Fluorotelomer Alcohols

LPGC-MS is 1.9x faster and uses 60% less helium compared to conventional GC-MS.



Peaks	Conc. (µg/mL)	t_R (30 m)	t_R (LPGC)
1. 4:2 FTOH (2-perfluorobutyl alcohol)	2	3.10	1.90
2. 6:2 FTOH (2-perfluorohexyl alcohol)	2	4.17	2.43
3. 8:2 FTOH (2-perfluorooctyl alcohol)	2	5.44	3.01
4. 10:2 FTOH (2-perfluorodecyl alcohol)	2	6.65	3.53

Column See notes
Standard/Sample 2-(Perfluorobutyl)ethanol
2-(Perfluorohexyl)ethanol
2-(Perfluorooctyl)ethanol
2-(Perfluorodecyl)ethanol
Diluent: Methanol
Conc.: 2 µg/mL
Injection
Inj. Vol.: 1 µL split (split ratio 5:1)
Liner: Topaz, precision inlet liner, 4.0 mm x 6.3 x 78.5 (cat.# 23305)
Inj. Temp.: 280 °C
Carrier Gas He
Detector MS
Mode: SIM
SIM Program: 131 m/z, 300 ms dwell
Transfer Line Temp.: 280 °C
Analyzer Type: Quadrupole
Source Temp.: 250 °C
Quad Temp.: 180 °C
Tune Type: PFTBA
Ionization Mode: EI
Instrument Agilent 7890B GC & 5977A MSD
Sample Preparation All standards (original concentration of 100 µg/mL) were combined into one solution at a concentration 1 ppm in polypropylene vial (cat. #23242) with a polypropylene cap (cat. #23244). A 50 µL aliquot was analyzed by GC-MS using a 100 µL insert (cat. #24512).
Notes **Conventional (30 m) Analysis:**
Column: Rtx-200ms, 30 m, 0.25 mm ID, 0.25 µm (cat.# 15623)
Temp. program: 35 °C (hold 1 min) to 280 °C at 15 °C/min (hold 5 min)
Flow: 1.2 mL/min
SIM start: 2.5 min
SIM: 131 m/z, 300 ms

LPGC-MS Analysis:
Column: LPGC Rtx-200 column kit, includes 10 m x 0.32 mm ID x 1.00 µm Rtx-200 analytical column and 5 m x 0.15 mm ID Rxi restrictor factory connected via SilTite connector (cat.# 11807)
Temp. program: 35 °C (hold 0.5 min) to 280 °C at 35 °C/min (hold 5 min)
Flow: 0.9 mL/min
SIM start: 1.5 min
SIM: 131 m/z, 300 ms

Pulsed split injection was used; 30 psi until 0.15 min.

The injections were performed on different instruments under different head pressures, resulting in different analyte responses.

Featured Products

Analytical Column	Maintenance & Accessories	
		
LPGC Rtx-200 Column Kit cat.# 11807	**Topaz Precision Inlet Liner** cat.# 23305	**GC Accelerator Oven Insert Kit** cat.# 23849

Related Products

Sample Handling		
		
Limited-Volume Vials cat.# 23242	**Screw-Thread Caps** cat.# 23244	**Vial Inserts** cat.# 24512

LPGC Rtx-200 Column Kit

- 1.9x faster fluorotelomer alcohols (FTOHs) analysis with 60% less helium consumption.
- Factory-coupled, leak-free kit makes set up as simple as a column change.
- Ideal for speeding up GC-MS and GC-MS/MS methods.

Catalog No.	Includes	Units
11807	10 m x 0.32 mm ID x 1 µm Rtx-200 analytical column and 5 m x 0.15 mm ID Rxi restrictor factory connected via SilTite connector	kit

Topaz, Precision Inlet Liner

Topaz GC inlet liners feature revolutionary technology and inertness to deliver you the next level of True Blue Performance:

- **Deactivation**—unbelievably low breakdown for accurate and precise low-level GC analyses.
- **Reproducibility**—unbeatable manufacturing controls and QC testing for superior reliability across compound classes.
- **Productivity**—unparalleled cleanliness for maximized GC uptime and lab throughput.
- **100% Satisfaction**—if a liner doesn't perform to your expectations, we will replace it or credit your account.

Patented

Catalog No.	Product Name	Units
23305	Topaz, Precision Inlet Liner, 4.0 mm x 6.3 x 78.5, for Agilent GCs, w/Quartz Wool, Premium Deactivation	5-pk.

GC Accelerator Oven Insert Kit for Agilent 5890, 6890, 7890, and 8890 GCs

- GC Accelerator kit installs easily without damaging the GC column or interfering with the MS interface.

Catalog No.	Product Name	Instrument	Units
23849	GC Accelerator oven insert kit	for Agilent 5890, 6890, 7890, and 8890 GCs	kit

If using a 120 V GC oven, a GC Accelerator oven insert kit (cat.# 23849) may be needed to meet aggressive ramp rates.

Vials and Caps

Catalog No.	Product Name	Units
23242	Limited-Volume Screw-Thread Polypropylene Vials, 9 mm, 1.5 mL, 12 x 32 mm	100-pk.
23244	2.0 mL, 9 mm Solid-Top Polyethylene Caps, Screw-Thread, 10 mil thick membrane, Clear	100-pk.

Vial Inserts

Catalog No.	Product Name	Units
24512	Vial Inserts, Polypropylene w/Bottom Spring, 100 µL	100-pk.

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Questions? Contact us or your local Restek representative (www.restek.com/contact-us).

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Lit. Cat.# EVFA4311-UNV