Featured Application: *MCPDs on LPGC Rxi-17Sil MS*

Fast Analysis of MCPDs by LPGC-MS

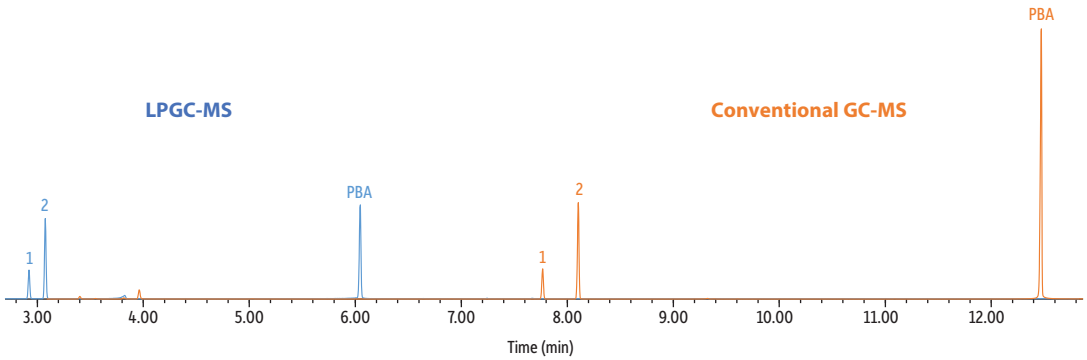
- 2x faster than conventional GC-MS analysis.
- Reduces helium usage by 69% compared to conventional GC-MS methods.
- Rxi-17Sil MS kits are factory connected with a proven leak-free connector making LPGC as simple as a column change.

MCPDs are impurities found in food products that result from heat processes in manufacturing. They have been largely detected in refined oils, including vegetable oil and palm oil, along with processed foods that use these oils in their formulations, including baby formula. MCPDs are typically analyzed by GC-MS using a 30 m x 0.25 mm ID x 0.25 µm capillary column with a 5% diphenyl, 95% dimethyl polysiloxane or a 50% diphenyl, 50% dimethyl polysiloxane stationary phase. Run times using conventional GC-MS are typically over 12 minutes. With the large volumes of samples laboratories need to process, there is a motivation to cut down on run times, both to increase sample throughput and save on helium costs. However, techniques to shorten analysis times often compromise critical isomer separations.

Low-pressure gas chromatography (LPGC) offers a unique solution: by lowering the pressure inside the GC column, analysis times and helium usage are significantly reduced, allowing laboratories to analyze more samples at a lower production cost. Utilizing our LPGC Rxi-17Sil MS kit (cat.# 11805), analysis time was cut in half, and helium consumption was reduced by 69% compared to conventional GC-MS methods. Additionally, good resolution was achieved for the critical separation of 2-MCPD and 3-MCPD, and these analytes were both resolved well before the derivatization agent. LPGC is as easy as a column change and offers a significant benefit by reducing analysis time, allowing for increased sample throughput while also conserving helium. Each factory-coupled LPGC kit is individually tested to ensure a leak-free connection. To learn more about the LPGC technique, visit **www.restek.com/lpgc**

Figure 1: MCPDs on LPGC Rxi-17Sil MS Compared to Conventional GC-MS Analysis

- **LPGC-MS is 2x faster and uses 69% less helium compared to conventional GC-MS.**



Peaks	t_R (30 m)	t_R (LPGC)	Conc. (µg/mL)
1. 3-MCPD	7.767	2.921	30
2. 2-MCPD	8.103	3.075	50

Column	See notes
Standard/Sample	3-MCPD 2-MCPD
Diluent:	Isooctane
Conc.:	30-50 ppm (See the peak table.)
Injection	
Inj. Vol.:	1 µL split (split ratio 10:1)
Liner:	Topaz 4.0 mm ID single taper inlet liner w/ wool (cat.# 23303)
Inj. Temp.:	280 °C
Carrier Gas	He
Detector	MS
Mode:	Scan
Transfer Line Temp.:	280 °C
Analyzer Type:	Quadrupole
Source Temp.:	330 °C
Quad Temp.:	180 °C
Electron Energy:	70 eV
Tune Type:	PFTBA
Ionization Mode:	EI
Instrument	Agilent 7890B GC & 5977A MSD
Sample Preparation	Standards were derivatized with 20 µL phenylboronic acid (PBA), saturated solution in diethyl ether, dried, and then reconstituted in 1 mL isooctane in a 2 mL, short-cap, screw-thread vial (cat.# 21143) and capped with a short-cap, screw-vial closure (cat.# 24495). Final concentrations are given in the peak table.
Notes	**Conventional (30 m) Analysis:** Column: Rxi-17Sil MS, 30 m, 0.25 mm ID, 0.25 µm (cat.# 14123) Temp. program: 100 °C (hold 0.5 min) to 180 °C at 12 °C/min to 320 °C at 25 °C/min (hold 4 min) Flow: 1.4 mL/min Scan start time: 3 min Scan range: 50-350 amu Scan rate: 8.5 scans/sec **LPGC-MS Analysis:** Column: LPGC Rxi-17Sil MS column kit, includes 10 m x 0.32 mm ID x 0.25 µm Rxi-17Sil MS analytical column and 5 m x 0.15 mm ID Rxi restrictor factory connected via SilTite connector (cat.# 11805) Temp. program: 100 °C (hold 0.5 min) to 320 °C at 30 °C/min (hold 5 min) Flow: 0.9 mL/min Scan start time: 1.5 min Scan range: 50-350 amu Scan rate: 8.5 scans/sec

Looking for MCPD standards? To view our inventory of the most common MCPDs, visit our website at www.restek.com; then search for "MCPD" in the search bar with "Products" selected in the dropdown menu.

Featured Products

Analytical Column	Maintenance & Accessories
	
LPGC Rxi-17Sil MS Column Kit (cat.# 11805)	**Topaz, Single Taper Inlet Liner,** 4.0 mm x 6.5 x 78.5, for Agilent GCs, w/Quartz Wool, Premium Deactivation, 5-pk. (cat.# 23303) **GC Accelerator Oven Insert Kit,** for Agilent 5890, 6890, 7890, and 8890 GCs (cat.# 23849)

LPGC Rxi-17Sil MS Column Kit

- 2x faster analysis of phthalates with 69% less helium consumption.
- Factory-coupled, leak-free kit makes setup as simple as a column change.
- Ideal for speeding up GC-MS and GC-MS/MS methods.

Cat.#	Includes	Units
11805	10 m x 0.32 mm ID x 0.25 µm Rxi-17Sil MS analytical column and 5 m x 0.15 mm ID Rxi restrictor factory connected via SilTite connector	kit

Topaz Single Taper 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

Cat.#	Product Name	Units
23303	Topaz, single taper, inlet liner, 4.0 mm x 6.5 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 instruments

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

Description	Instrument	qty.	cat.#
GC Accelerator Oven Insert Kit	for Agilent 5890, 6890, 7890, and 8890 instruments	kit	23849

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

Related Products

Vials and Caps

Cat.#	Product Name	Units
21143	Short-Cap Vial with Grad Marking Spot, 9-425 Screw-Thread, 2.0 mL, 9 mm, 12 x 32 (vial only), Amber	1000-pk.
24495	Short Screw Caps, Polypropylene, Screw-Thread, PTFE/Silicone/PTFE Septa, Black, Preassembled, 2.0 mL, 9 mm	100-pk.

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

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