

Restek Environmental Products

Innovative Solutions, Comprehensive Support



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Products '08
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Chromatography Products

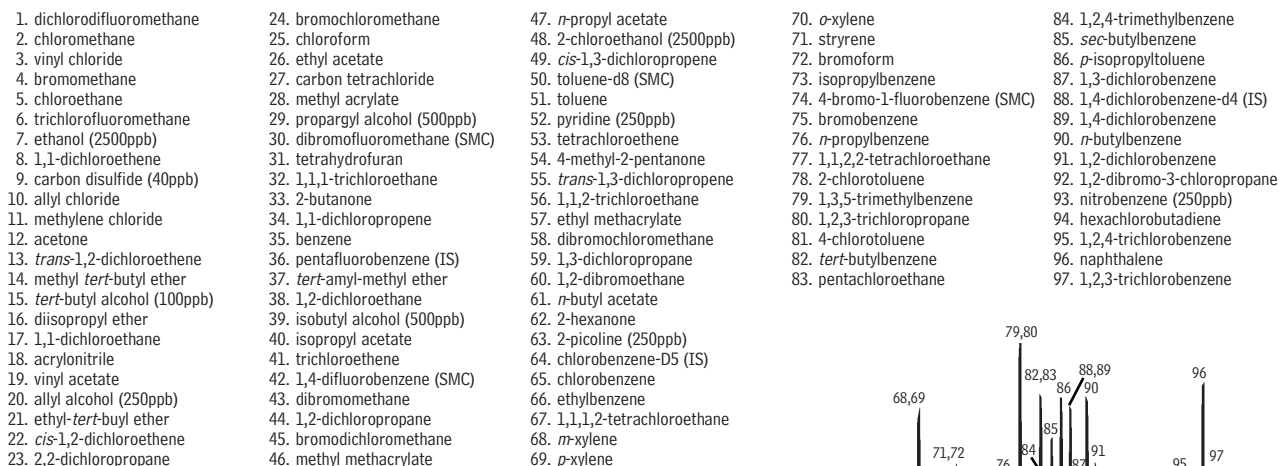
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Volatiles

Volatile organic compounds (VOCs) are usually analyzed using a purge and trap system connected to a GC. The column used must have a selective stationary phase to resolve the volatile pollutants, have a sufficient film thickness to retain and resolve the low boiling volatile compounds (i.e., dichlorodifluoromethane), and must be thermally stable to elute the high boiling volatiles compounds (i.e., hexachlorobutadiene & naphthalene).

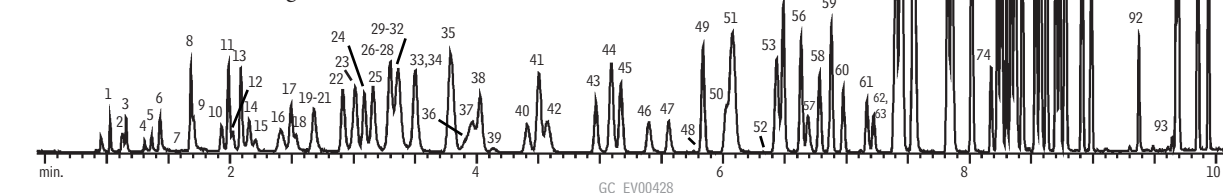
The first fused silica columns used for analyzing volatiles were based on diphenyl/dimethyl polysiloxane stationary phases. However, resolution of gases has always been problematic with these phases. Restek designed the Rtx®-VMS column specifically to optimize separation of volatiles in the most commonly used EPA volatiles methods. A faster oven ramp rate is possible because these compounds elute farther apart on the Rtx®-VMS phase, eliminating partial coelutions that interfere with quantification. Using the EPA suggested surrogates (i.e., chlorobenzene-d5) analysis time can be less than 10 minutes with a narrow bore column, allowing you to connect two purge and trap units to one GC/MS instrument – significantly increasing sample throughput.

Figure 1 Excellent resolution of bromomethane and chloroethane, as well as challenging isomer pairs like 2-/4-chlorotoluene on the Rtx®-VMS column.



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- First choice for use with dual purge & traps¹
- EPA recommended surrogate used.



Column: Rtx®-VMS 20m, 0.18 mm ID, 1.00µm (cat.# 49914)
 Conc.: 10ppb in 5mL of RO water unless otherwise noted; ketones at 2.5X
 Concentrator: Tekmar LSC-3100 Purge and Trap
 Trap: Vocarb 3000 (type K)
 Purge: 11 min. @ 40mL/min. (ambient temperature)
 Dry purge: 1 min. @ 40mL/min.
 Desorb preheat: 245°C
 Desorb: 250°C for 2 min., flow 40mL/min.
 Bake: 260°C for 8 min.

Interface: 0.53mm ID Silcosteel® tubing transfer line
 1:40 split at injection port. 1mm ID liner.
 Oven temp.: 50°C (hold 4 min.) to 100°C @ 18°C/min. (hold 0 min.)
 to 230°C @ 40°C/min. (hold 3 min.)
 Carrier gas: helium @ ~1.0mL/min. constant flow
 Adjust dichlorodifluoromethane to a retention time of 1.03 min. @ 50°C.
 Detector: Agilent 5973 MSD
 Scan range: 35-300amu

¹A.L. Hilling and G. Smith, Environmental Testing & Analysis, 10(3), 15-19, 2001.

Recommended Column

Rtx®-VMS Columns (fused silica)

(proprietary Crossbond® phase)

ID	df (µm)	temp. limits	length	cat. #
0.18mm	1.00	-40 to 240/260°C	20-Meter	49914

Analytical Reference Materials

8260A Internal Standard Mix

chlorobenzene-d5 fluorobenzene
1,4-dichlorobenzene-d4
2,500µg/mL each in P&T methanol, 1mL/ampul
cat. # 30241 (ea.)

8260 Internal Standard Mix

chlorobenzene-d5 1,4-difluorobenzene
1,4-dichlorobenzene-d4 pentafluorobenzene
2,500µg/mL each in P&T methanol, 1mL/ampul
cat. # 30074 (ea.)

8260A Surrogate Mix

4-bromofluorobenzene 1,2-dichloroethane-d4
dibromofluoromethane toluene-d8
2,500µg/mL each in P&T methanol, 1mL/ampul
cat. # 30240 (ea.)

8260 Surrogate Mix

4-bromofluorobenzene toluene-d8
dibromofluoromethane
2,500µg/mL each in P&T methanol, 1mL/ampul
cat. # 30073 (ea.)

8260B MegaMix® Calibration Mix (76 components)

Please visit us online for compound list
2,000µg/mL each in P&T methanol, 1mL/ampul
cat. # 30633 (ea.)

8260B MegaMix® Calibration Mix Kit

30633: 8260B MegaMix®
30265: 2-chloroethyl vinyl ether
Contains 1mL each of these mixtures.
cat. # 30475 (kit)

502.2 Calibration Mix #1 (gases)

bromomethane dichlorodifluoromethane (CFC-12)
chloroethane trichlorofluoromethane (CFC-11)
chloromethane vinyl chloride
200µg/mL each in P&T methanol, 1mL/ampul
cat. # 30439 (ea.)
2,000µg/mL each in P&T methanol, 1mL/ampul
cat. # 30042 (ea.)

VOA Calibration Mix #1 (ketones)

acetone 2-hexanone
2-butanone 4-methyl-2-pentanone
5,000µg/mL each in P&T methanol:water (90:10), 1mL/ampul
cat. # 30006 (ea.)

California Oxygenates Mix

diisopropyl ether 2,000µg/mL *tert*-butyl alcohol 10,000
ethyl-*tert*-butyl ether 2,000 methyl *tert*-butyl ether 2,000
tert-amyl methyl ether 2,000
In P&T methanol, 1mL/ampul
cat. # 30465 (ea.)

Reduce Dead Volume, Contamination, & Cold Spots

The injection port can be a source for dead volume, which is especially critical when dealing with a sample in the gas phase. The severity of the problem is a combination of the inside diameter of the injection port liner and the total desorb flow through the port. To reduce dead volume in the injection port, use a 1mm ID inert split liner. Always be sure to use insulation where the transfer line attaches to the inlet line since this is a cold spot that will condense high molecular weight analytes.

Transfer lines often are the first place contamination occurs. When the response factor for bromoform fails the method criteria, changing the transfer line is the first step to getting the system working again. Replace your transfer line with our Siltek® deactivated tubing, for optimum performance.

1mm Split Inlet Liner for Agilent GCs

ID*/OD & Length (mm)	cat.#	ea.	cat.#	5-pk.
1.0 ID 6.3 OD x78.5	20972		20973	

*Nominal ID at syringe needle expulsion point.

Also available with Siltek® deactivation, upon request.

Siltek®/Sulfinert® Treated Coiled 304 Grade Stainless Steel Tubing

Our most popular grade of tubing.

- chromatography applications.
- gas delivery systems.
- lower pressures.
- inert applications.



ID	OD	cat.#	5-24 ft.	25-199 ft.	200-399 ft.	> 400 ft.
0.040" (1.02mm)	1/16" (1.59mm)	22505				

*0.020" wall thickness

An extra charge is applied for cutting Siltek®/Sulfinert®, Silcosteel®, or Silcosteel®-CR tubing, calculated from the total number of pieces produced for each line item.

free literature

Optimizing the Analysis of Volatile Organic Compounds
lit. cat.# 59887A

Contact your Restek representative, to request your free copy!



