

the **RESTEK** Advantage

Innovators of High Resolution Chromatography Products

Ultra-Low-Bleed Rtx®-XLB Columns

Maximize Performance from High-Sensitivity GC/MS Systems

By Christopher English, Environmental Innovations Chemist,
and Neil Mosesman, GC Columns Product Marketing Manager

new



We welcome your visit.
www.restekcorp.com

- ✓ Low bleed for GC/MS applications requiring high sensitivity.
- ✓ Ideal for analysis of semivolatiles environmental pollutants - pesticides - PCBs.
- ✓ Thermally stable to 340°C.

Recent improvements to the design of GC/MS systems have produced significant improvements in instrument sensitivity. Because of these improvements, what was formerly considered acceptable column bleed now often is a problem that prevents an analyst from taking full advantage of the sensitivity of the system.



To address the need for lower column bleed, Restek has developed Rtx®-XLB columns. Improvements in polymer synthesis and tubing deactivation have enabled us to develop an inert, stable column that

minimizes bleed interference with high temperature analyses: our bleed specification for these new 30m x 0.25mm, 0.25µm columns is less than 6pA at 340°C.

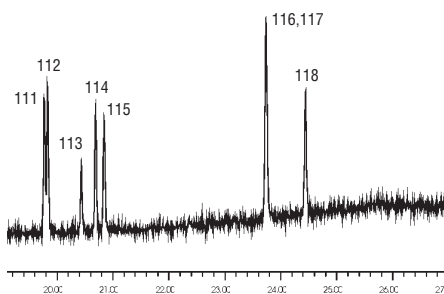
The new Rtx®-XLB stationary phase, in combination with your sensitive GC/MS system, is especially well suited for analyses of high molecular weight active compounds. Figure 1 shows the column bleed from an Rtx®-XLB column at 330°C, the high-temperature end in an analysis of US EPA Method 525 semivolatiles (2.5ng each analyte), as observed with an Agilent 6890/5973 GC/MS. Clearly, there is no column bleed interference in this chromatogram.

Semivolatiles pollutants such as the EPA Method 525 analytes are commonly analyzed by GC/MS. The great sensitivity of newer GC/MS systems, including ion traps, allows analysts to use split injection techniques while still meeting the detection limit requirements of the methods they are following. Split injections make for much lower on-column concentrations, which in turn, call for a column not only with low bleed, but also with excellent inertness. Analysts using Rtx®-XLB columns can achieve exceptional sensitivity and low bleed with on-column concentra-

tions of 5ng (Figure 2), or less. Figure 2 also shows that, in addition to low bleed and inertness, Rtx®-XLB columns offer good resolution of challenging isomer pairs such as benzo(b)fluoranthene and benzo(k)fluoranthene (peaks 111 and 112).

Relative to columns produced through older synthesis technologies, low-bleed Rtx®-XLB columns help ensure lower detection limits and greater instrument stability in semivolatiles analysis. If baseline problems are keeping you from taking full advantage of your high sensitivity system, or if you are having resolution problems with semivolatiles environmental analytes, an Rtx®-XLB column is the best choice for solving your problem.

Figure 1 An Rtx®-XLB column exhibits less than 6pA bleed—even at 330°C.



Rtx®-XLB 30m, 0.25mm ID, 0.25µm (cat.# 12823)
Sample: US EPA Method 525 standards, 1µL, 2.55ng per analyte
See Figure 2.

HOT Tech Tip!

Simple adjustments to the injection conditions help to improve sensitivity for Method 525.2 target compounds. A Drilled Uniliner® inlet liner and pulsed injection help to minimize breakdown in the injection port. (Do not exceed 50psi when using the pulsed splitless mode, to avoid breaking the seal between the column and the liner.) An initial temperature of 35°C helps ensure excellent peak shapes for early eluting compounds.

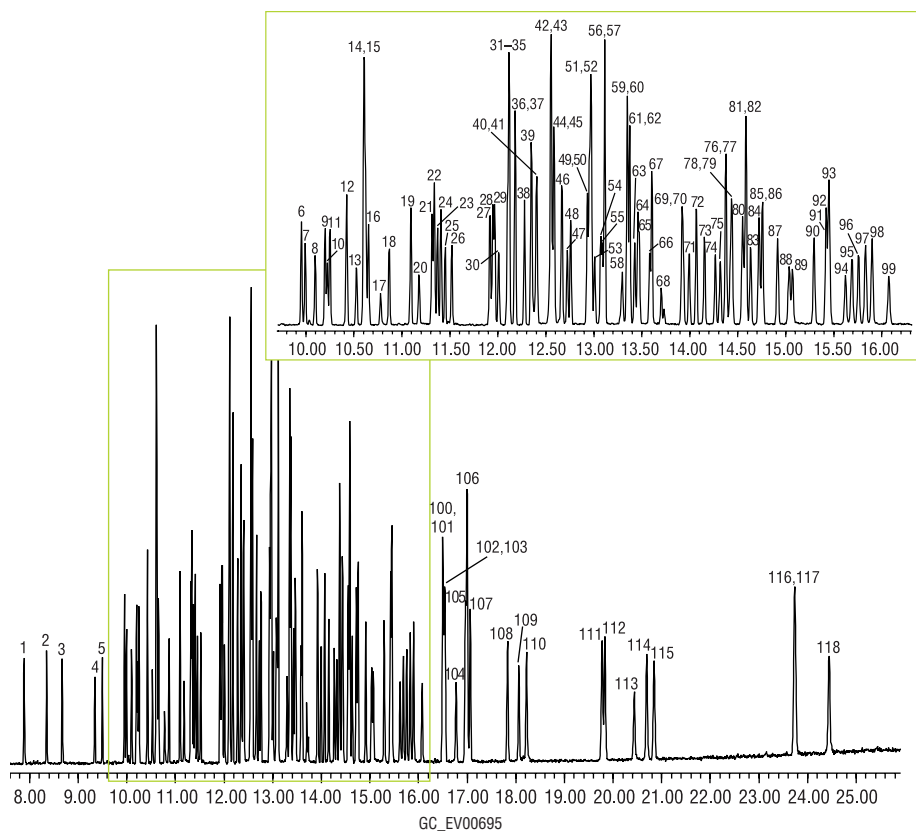
in this issue

- Ultra-Low-Bleed Rtx®-XLB Columns **Pg. 1-2**
- HPLC Analysis of Phenylurea Pesticides **Pg. 3**
- High-Speed/High Resolution GC Analysis: Stop-Flow GC **Pg. 4-5**
- Fast, Efficient HPLC Analysis for Polynuclear Aromatic Hydrocarbons **Pg. 6, 8**
- Simplify Calibration for Volatile Organic Compounds **Pg. 7-8**
- New Reference Mixes **Pg. 9**
- Miniature Air Sampling Canisters **Pg. 10**
- Air Sampling Products **Pg. 11**
- Deactivated Swagelok® Fittings **Pg. 12**
- Vu2 Union™ and SeCure™ “Y” Capillary GC Connectors **Pg. 13**
- New HPLC Mobile Phase Accessories **Pg. 14**
- Parts for Agilent 5890, 6890, and 7673A/B Instruments **Pg. 15**
- New General Catalog **Pg. 16**

RESTEK

2004 vol. 1

Figure 2 An Rtx®-XLB column offers low bleed, inertness, and good resolution of semivolatiles environmental pollutants.



1. isophorone
2. 2-nitro-*m*-xylene
3. dichlorvos
4. hexachlorocyclopentadiene
5. EPTC
6. butylate
7. mevinphos
8. vernolate
9. pebulate
10. etridiazole (Terrazole®)
11. dimethylphthalate
12. acenaphthylene
13. 2,6-dinitrotoluene
14. acenaphthene-d10
15. 2-chlorobiphenyl (BZ#1)
16. chloroneb
17. tebuthiuron
18. molinate
19. diethyl phthalate
20. 2,4-dinitrotoluene
21. propachlor
22. fluorene
23. ethoprop
24. cycloate
25. trifluralin
26. chlorpropham
27. 2,3-dichlorobiphenyl (BZ#5)
28. atraton
29. prometon
30. α -BHC
31. hexachlorobenzene
32. propazine
33. simazine
34. atrazine
35. metribuzin
36. diazinon
37. terbufos
38. pronamide
39. pentachlorophenol
40. β -BHC
41. disulfoton
42. terbacil
43. phenanthrene-d10
44. methyl parathion OA
45. phenanthrene
46. anthracene
47. γ -BHC (lindane)
48. 2,4,5-trichlorobiphenyl (BZ#29)
49. alachlor
50. prometryne
51. ametryn
52. simetryn
53. δ -BHC
54. heptachlor
55. chlorothalonil
56. di-*n*-butylphthalate
57. terbutryn
58. bromacil
59. chlorpyrifos
60. metolachlor
61. DCPA methyl ester (Dacthal®)
62. 2,2',4,4'-tetrachlorobiphenyl (BZ#47)
63. aldrin
64. triadimefon
65. cyanazine (Bladex)
66. MGK-264
67. diphenamid
68. merphos
69. 2,2',3',4,6-pentachlorobiphenyl (BZ#98)
70. heptachlor epoxide (isomer B)
71. heptachlor epoxide (isomer A)
72. butachlor
73. stirofos (tetrachlorvinphos)
74. fenamiphos
75. α -chlorodane
76. napropamide
77. γ -chlorodane
78. endosulfan I
79. *trans*-nonachlor
80. pyrene-d10
81. pyrene
82. 4,4'-DDE
83. 2,2',4,4',5,6'-hexachlorobiphenyl (BZ#154)
84. *p*-terphenyl-d14
85. dieldrin
86. carboxin
87. chlorbenzilate
88. tricyclazole
89. endrin
90. 4,4'-DDD
91. bis(2-ethylhexyl)adipate
92. butyl benzyl phthalate
93. endosulfan II
94. endrin aldehyde
95. norflurazon
96. 4,4'-DDT
97. triphenylphosphate
98. hexazinone
99. endosulfan sulfate
100. bis(2-ethylhexyl)phthalate
101. methoxychlor
102. 2,2',3,3',4,5',6,6'-octachlorobiphenyl (BZ#207)
103. 2,2',3,3',4,4',6-heptachlorobiphenyl (BZ#171)
104. endrin ketone
105. benzo(a)anthracene
106. chrysene-d12
107. chrysene
108. fenarimol
109. *cis*-permethrin
110. *trans*-permethrin
111. benzo(b)fluoranthene
112. benzo(k)fluoranthene
113. fluridone (Sonar®)
114. benzo(a)pyrene
115. perylene-d12
116. dibenzo(a,h)anthracene
117. indeno(1,2,3-cd)pyrene
118. benzo(ghi)perylene

Rtx®-XLB 30m, 0.25mm ID, 0.25 μ m (cat.# 12823)
 Sample: US EPA Method 525 standards, 1 μ L 5ng per analyte
 standards used: 31824, 32420, 32421, 32422, 32423, 31825, 31826, 31828, 32291, 32415, 32436.*
 Inj.: pressure pulsed (0.4 min. @ 30psi), splitless (hold 0.4 min.), 4mm Drilled Uniliner® (cat.# 21055)
 Inj. Temp.: 300°C
 Carrier Gas: helium, constant flow
 Flow Rate: 1.0mL/min.
 Oven Temp.: 35°C (hold 2 min.) to 260°C @ 20°C/min. (hold 0 min.) to 330°C @ 6°C/min. (hold 5 min.)
 Det: Agilent 5973 GC/MS
 Transfer Line Temp.: 280°C
 Scan Range: 45–550 amu
 Solvent Delay: 4.7 min.
 Tune: DFTPP

Rtx®-XLB Columns (fused silica) (proprietary low-polarity phase)

ID	df (μ m)	temp. limits*	15-Meter	30-Meter	60-Meter
0.25mm	0.10	30 to 340/360°C		12808	
	0.25	30 to 340/360°C	12820	12823	12826
	0.50	30 to 340/360°C		12838	
	1.00	30 to 340/360°C	12850	12853	
0.32mm	0.10	30 to 340/360°C		12809	
	0.25	30 to 340/360°C	12821	12824	12827
	0.50	30 to 340/360°C		12839	
	1.00	30 to 340/360°C		12854	
ID	df (μ m)	temp. limits	12-Meter	20-Meter	25-Meter
0.18mm	0.18	30 to 340/360°C		42802	
0.20mm	0.33	30 to 340/360°C	42815		42820

*Maximum temperatures listed are for 15- and 30-meter lengths. Longer lengths may have a slightly reduced maximum temperature.



*Additional mixes for Method 525 include individual Aroclor® PCB solutions (cat.# 32075, 32077, 32079, 32081, 32083, 32085, 32087) and TCLP Toxaphene (cat.# 32015). For information about Method 525.2 reference mixes, refer to our 2004 Chromatography Supplies Catalog (available on request) or review Restek Advantage 2003 v.3 on our website.

Method 525.2 Semivolatile Mix

- | | |
|----------------------------|------------------------------|
| acenaphthylene | dimethylphthalate |
| anthracene | di- <i>n</i> -butylphthalate |
| benzo(a)anthracene | 2,4-dinitrotoluene |
| benzo(a)pyrene | 2,6-dinitrotoluene |
| benzo(b)fluoranthene | fluorene |
| benzo(ghi)perylene | hexachlorobenzene |
| benzo(k)fluoranthene | hexachlorocyclopentadiene |
| benzylbutylphthalate | indeno(1,2,3-cd)pyrene |
| bis(2-ethylhexyl)adipate | isophorone |
| bis(2-ethylhexyl)phthalate | pentachlorophenol* |
| chrysene | phenanthrene |
| dibenzo(a,h)anthracene | pyrene |
| diethylphthalate | |

1,000 μ g/mL each in acetone, (*pentachlorophenol at 4,000 μ g/mL, per method requirement), 1mL/ampul

Each	5-pk.	10-pk.
31824	31824-510	—
w/data pack		
31824-500	31824-520	31924