Application Report 406

Analysis of US EPA Method 8270D Semivolatiles Using a 20 m x 0.18 mm I.D., 0.36 µm SLB-5ms

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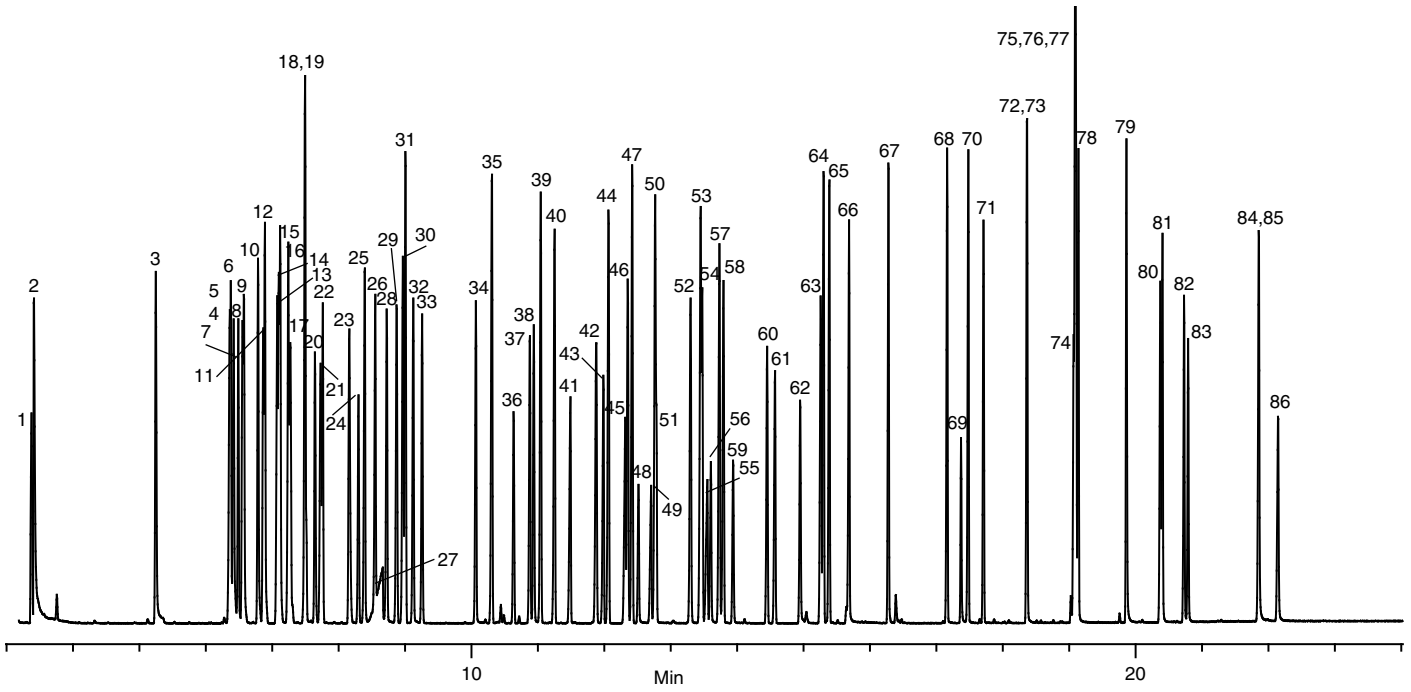
Acquisition System: 6890GC/5973MSD
Notebook Reference: 1569-44

US EPA Method 8270D specifies a procedure for the determination of semivolatiles in solid waste and ground water samples. The long list of analytes includes compounds of a variety of functionalities. A 30 m x 0.25 mm I.D. column is commonly used for the analysis. Sometimes, a thicker phase film, such as a 0.25 mm I.D. x 0.50 µm df, is appropriate to accommodate higher concentrations. In this application, the analysis was done on a column with a similar phase ratio, but of shorter length and a narrower I.D. (20 m x 0.18 mm I.D., 0.36 µm). The higher efficiency in terms of plates/meter of the 0.18 mm I.D. over a 0.25 mm I.D. column allowed for a shorter analysis time on the 20 m length while maintaining critical resolutions.

Key Words

semivolatiles, BNA, 506508, 861148, 48467, 46702-U, 46955-U, US EPA Method 8270D, SLB-5ms, 28576-U, faster analysis



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Conditions

column:	SLB-5ms, 20 m x 0.18 mm I.D., 0.36 µm (28576-U)
oven:	40 °C (1 min.), 12 °C/min. to 200 °C, 20 °C/min. to 340 °C (2 min.)
inj.:	250 °C
MSD interface:	340 °C
scan range:	m/z 40-450
carrier gas:	helium, programmed flow; 0.5 mL/min (5 min. hold), 1 mL/min^2 to 1.0 mL/min. (constant for remainder of run)
injection:	0.50 µL, pulsed (25 psi until 0.1 min.), splitless (0.75 min.)
liner:	4 mm I.D., single taper
sample:	50 ng on-column of a 72 component semivolatile standard and 8 surrogate compounds, plus 6 internal standards (at 40 ng on-column) in methylene chloride

Peak IDs

1. N-nitrosodimethylamine
2. Pyridine
3. 2-fluorophenol (surr.)
4. Phenol-d_6 (surr.)
5. Phenol
6. Aniline
7. Bis(2-chloroethyl)ether
8. 2-chlorophenol-d_4 (surr.)
9. 2-chlorophenol
10. 1,3-dichlorobenzene
11. 1,4-dichlorobenzene-d_4 (I.S.)
12. 1,4-dichlorobenzene
13. Benzyl alcohol
14. 1,2-dichlorobenzene-d_4 (surr.)
15. 1,2-dichlorobenzene
16. 2-methylphenol
17. Bis(2-chloroisopropyl)ether
18. 4-methylphenol
19. N-nitroso-di-n-propylamine
20. Hexachloroethane
21. Nitrobenzene-d_5 (surr.)
22. Nitrobenzene
23. Isophorone
24. 2-nitrophenol
25. 2,4-dimethylphenol
26. Bis(2-chloroethoxy)methane
27. Benzoic acid
28. 2,4-dichlorophenol
29. 1,2,4-trichlorobenzene
30. Naphthalene-d_8 (I.S.)
31. Naphthalene
32. 4-chloroaniline
33. Hexachlorobutadiene
34. 4-chloro-3-methylphenol
35. 2-methylnaphthalene
36. Hexachlorocyclopentadiene
37. 2,4,6-trichlorophenol
38. 2,4,5-trichlorophenol
39. 2-fluorobiphenyl (surr.)
40. 2-chloronaphthalene
41. 2-nitroaniline
42. Dimethyl phthalate
43. 2,6-dinitrotoluene
44. Acenaphthylene
45. 3-nitroaniline
46. Acenaphthene-d_{10} (I.S.)
47. Acenaphthene
48. 2,4-dinitrophenol
49. 4-nitrophenol
50. 2,4-dinitrotoluene
51. Dibenzofuran
52. Diethyl phthalate
53. Fluorene
54. 4-chlorophenyl phenyl ether
55. 4-nitroaniline
56. 2-methyl-4,6-dinitrophenol
57. N-nitrosodiphenylamine
58. Azobenzene
59. 2,4,6-tribromophenol (surr.)
60. 4-bromophenyl phenyl ether
61. Hexachlorobenzene
62. Pentachlorophenol
63. Phenanthrene-d_{10} (I.S.)
64. Phenanthrene
65. Anthracene
66. Carbazole
67. Di-n-butyl phthalate
68. Fluoranthene
69. Benzidine
70. Pyrene
71. Terphenyl-d_{14} (surr.)
72. Butylbenzyl phthalate
73. 3,3'-dimethylbenzidine
74. 3,3'-dichlorobenzidine
75. Bis(2-ethylhexyl)phthalate
76. Benzo(a)anthracene
77. Chrysene-d_{12} (I.S.)
78. Chrysene
79. Di-n-octyl phthalate
80. Benzo(b)fluoranthene
81. Benzo(k)fluoranthene
82. Benzo(a)pyrene
83. Perylene-d_{12} (I.S.)
84. Indeno(1,2,3-cd)pyrene
85. Dibenzo(a,h)anthracene
86. Benzo(g,h,i)perylene