Application Report 474

Fast GC-MS Analysis of US EPA Method 8270D Semivolatiles Using Supelco SLB-5ms

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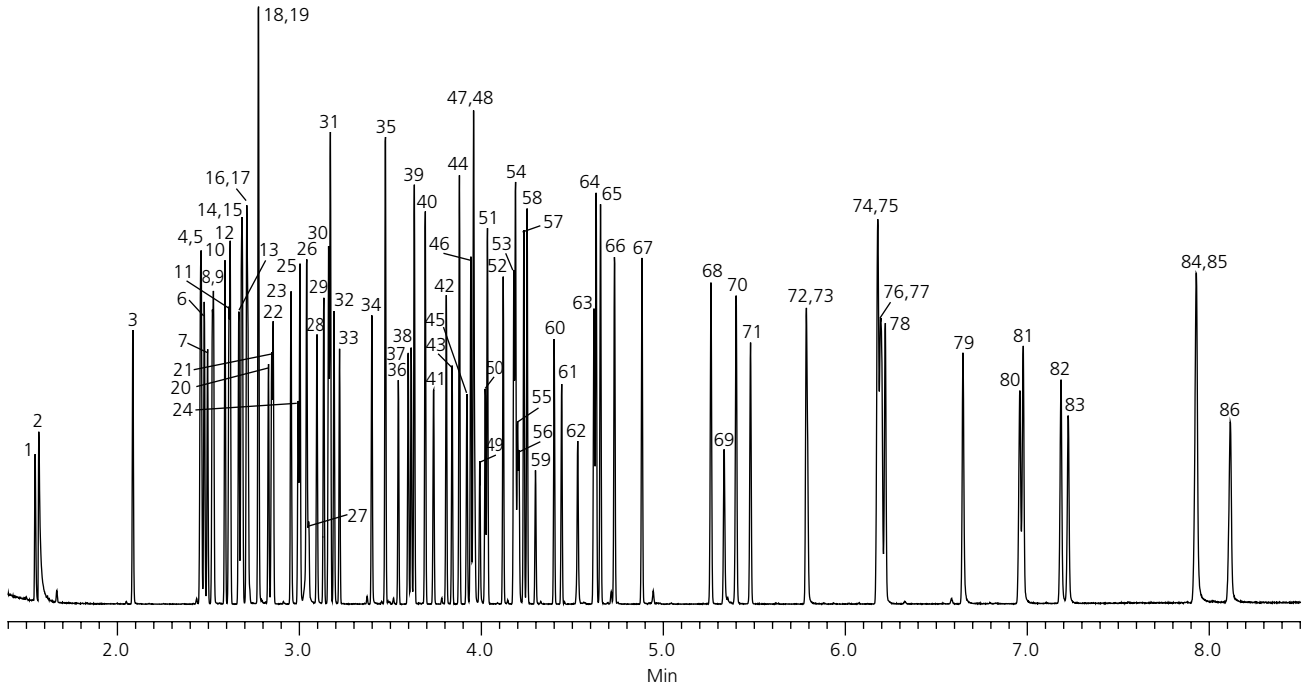
Acquisition System: 6890GC/5973MSD
Notebook Reference: 1569-86

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. In addition to the challenge posed by the activity of some of these compounds, the method specifies that all analyses must be completed within 12 hours of meeting specific MS tune criteria. In this application, the principles of fast GC were applied to analyze a typical 8270 analyte list in under 8.5 minutes. This was achieved by using a 20 m x 0.18 mm I.D. x 0.18 µm column in combination with a rapid oven ramp rate and high carrier gas linear velocity.

Key Words

semivolatiles, BNA, 28564-U, 506508, 861148, 48467, 46702-U, 46955-U, US EPA Method 8270D, RCRA, SLB-5ms, fast GC, 2879501-U, GC-MS



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Conditions

column: SLB-5ms, 20 m x 0.18 mm I.D., 0.18 µm (28564-U)
oven: 40 °C (0.7 min.), 55 °C/min. to 240 °C, 28 °C/min. to 330 °C (2 min.)
inj.: 250 °C
MSD interface: 330 °C
scan range: m/z 40-450
carrier gas: helium, 40 cm/sec., constant
injection: 0.5 µL, 10:1 split
liner: 2 mm I.D., FAST FocusLiner™ with taper (2879501-U)
sample: 80 component semivolatile standard at 50 ppm plus 6 internal standards (at 40 ppm) 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. N-Nitroso-di-n-propylamine
19. 4-Methylphenol
20. Hexachloroethane
21. Nitrobenzene-d_5 (surr.)
22. Nitrobenzene
23. Isophorone
24. 2-Nitrophenol
25. 2,4-Dimethylphenol
26. Bis(2-chloroethoxymethane)
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. 4-Chlorophenyl phenyl ether
54. Fluorene
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. 3,3′-Dimethylbenzidine
73. Butylbenzyl phthalate
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