PAHs, chlorinated hydrocarbons, pesticides

Large volume injection of surface water extract

Application Note

Environmental

Authors

Agilent Technologies, Inc.

Introduction

An example of LVI in environmental analytical chemistry is the trace analysis of aromatics, chlorinated hydrocarbons and pesticides in surface water. Sample preparation is kept to a minimum: after addition of salt and internal standards, in-vial extraction is performed with a pentane/ether mixture. No phase separation is required. 200 - 250 µL of the supernatant organic solvent layer is injected automatically in the on-column injector at a rate of 6 µL/s.

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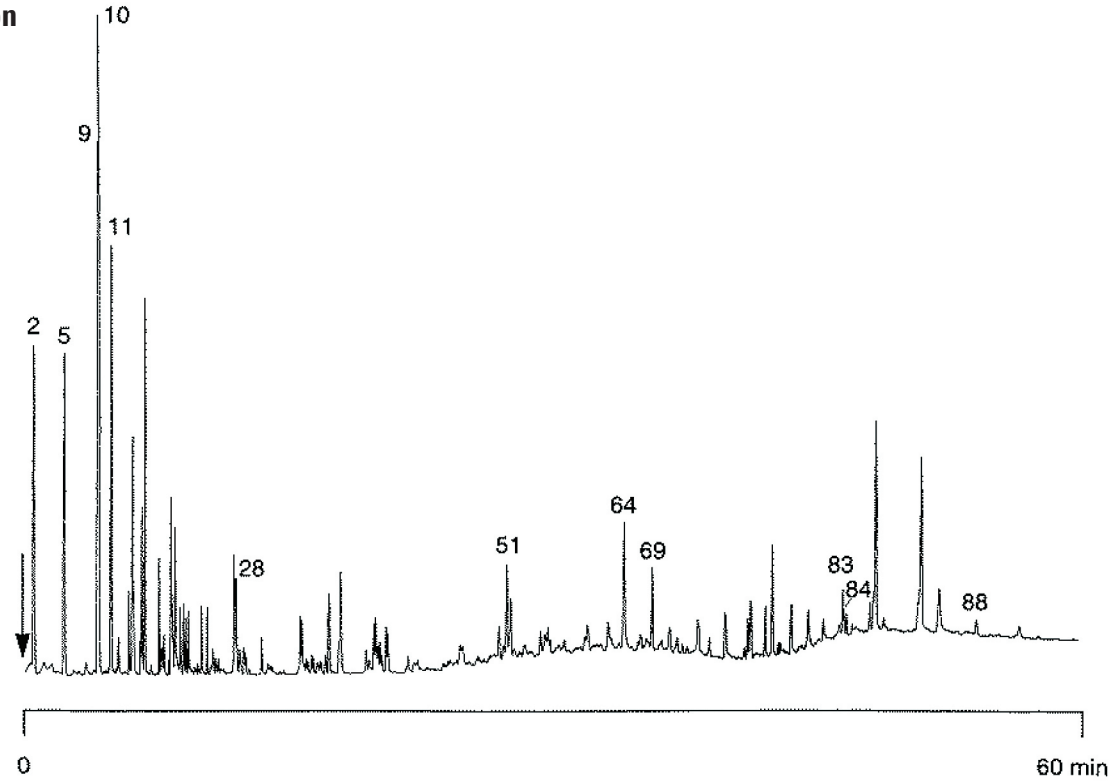
Conditions

Technique	:	GC-capillary
Column	:	Agilent CP-Sil 24 CB-MS, 0.25 mm x 30 m fused silica WCOT (df = 0.25 µm) (Part no. CP5817)
Large Volume Guard	:	0.53 mm x 10 m, Part no. CP8187
Retaining Pre-column	:	0.53 mm x 5 m, df = 0.5 µm
Temperature	:	40 °C (5 min) ⟶ 140 °C, 10 °C/min; 140 °C ⟶ 275 °C, 5 °C/min; 275 °C ⟶ 320 °C, 10 °C/min
Carrier Gas	:	He, 2.5 mL/min
Injector	:	Large Volume On-Column Injection, T = 40 °C
Detector	:	MS-Full Scan, T = 310 °C
Sample Size	:	225 µL
Concentration Range	:	1.0 - 50 µg/L in the water sample
Solvent Sample	:	pentane/ether
Courtesy	:	H. Janssens, I. de Dobbelaar and G. J. Franken, Alcontrol Laboratoria, Hoogvliet, The Netherlands

Peak identification

2. benzene
5. toluene
9. ethylbenzene
10. m,p-xylene
11. o-xylene
28. naphthalene
51. phenanthrene
64. fluoranthene
69. pyrene
84. benzo(k)fluoranthene
88. benzo(g,h,i)perylene



Peak identification

1. 1,2-dichloroethane
2. benzene
3. trichloroethane
4. 1,2 dichloropropane
5. toluene
6. 1,1,2-trichloroethane
7. tetrachloroethene
8. monochlorobenzene
9. ethylbenzene
10. m,p-xylene
11. o-xylene
12. styrene
13. cumene
14. monochlorophenol a
15. dichlorobenzene a
16. phenol
17. dichlorobenzene b
18. dichlorobenzene c
19. cresol a
20. cresol b
21. trichlorobenzene a
22. trichlorobenzene b
23. dichlorophenol a
24. dichlorophenol b
25. hexachlorobutadiene
26. monochlorophenol b
27. monochlorophenol c
28. naphthalene
29. dichlorophenol c
30. trichlorobenzene c
31. tetrachlorobenzene a
32. trichlorophenol a
33. trichlorophenol b
34. tetrachlorobenzene b
35. trichlorophenol c
36. trichlorophenol d
37. trichlorophenol e
38. dichlorophenol d
39. dichlorophenol e
40. acenaphthylene
41. pentachlorobenzene
42. acenaphthene
43. tetrachlorophenol
44. fluorene
45. HCB
46. α-HCH
47. pentachlorophenol
48. quintozene
49. γ-HCH
50. β-HCH
51 . phenanthrene
52. anthracene
53. δ-HCH
54. PCB 28
55. heptachlor
56. PCB 52
57. aldrin
58. telodrin
59. isodrin
60. α-hepo
61. β-hepo
62. trans-chlordane
63, PCB 101
64. fluoranthene
65. cis-chlordane
66. o,p-DDE
67. α-endosulfan
68. p,p-dde
69. pyrene
70. dieldrin
71. o,p-DDD
72. PCB 118
73. endrin
74. PCB 153
75. β-endosulphan
76. p,p-DDD+o,p-DDT
77. p,p-DDT
78. PCB 138
79. endosulphansulphate
80. PCB 180
81. benzo(a)anthracene
82. chrysene
83. benzo(b)fluoranthene
84. benzo(k)fluoranthene
85. benzo(a)pyrene
86. indenopyrene
87. dibenzo(a,h)anthracene
88. benzo(g,h,i)perylene

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