

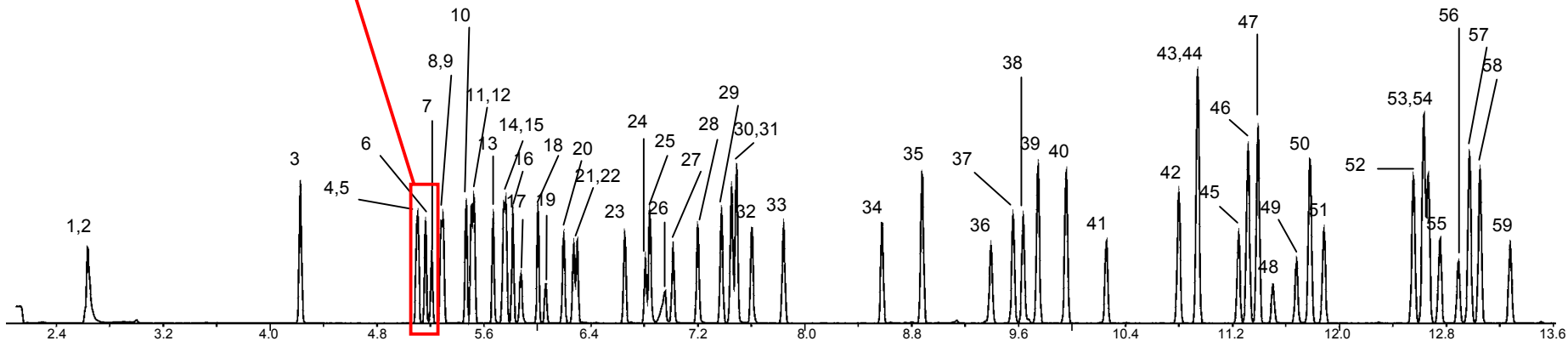
Environmental Applications

eQuity
Capillary GC Columns

USEPA Method 8270 Semivolatile Compounds (GC/MS)

Primary Analyte List

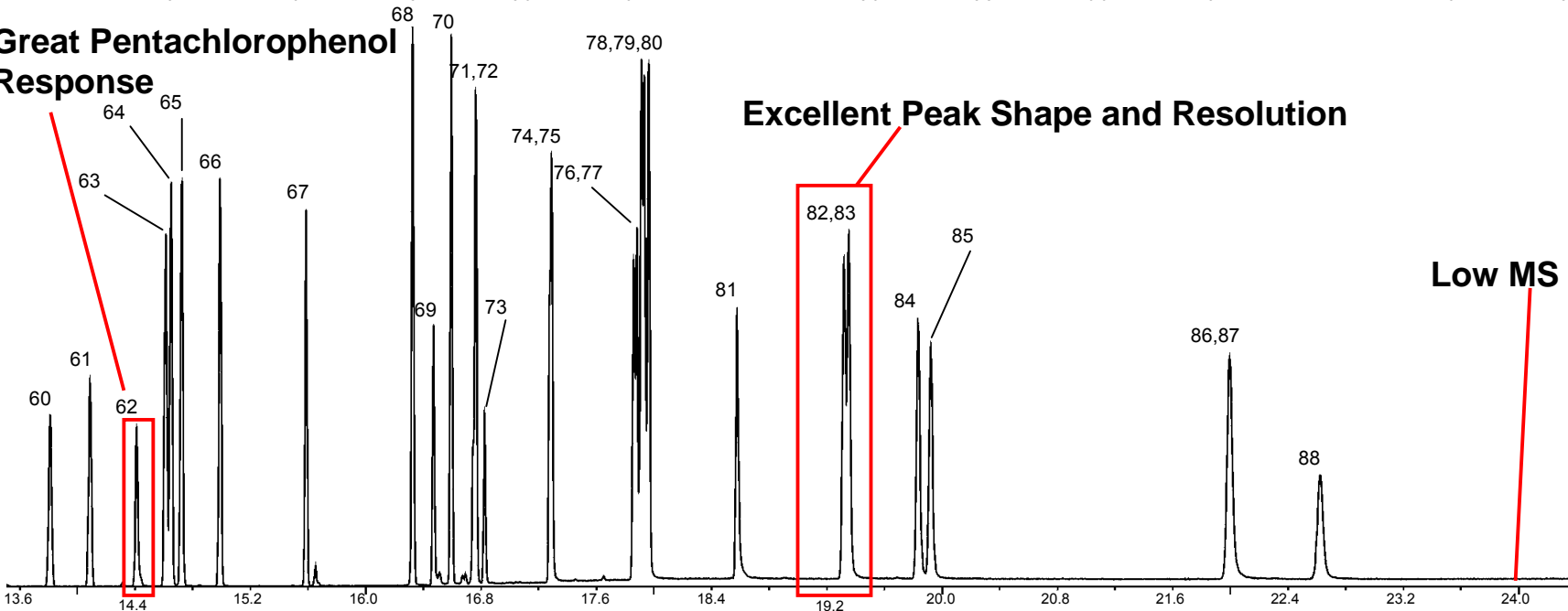
Excellent Peak Shape and Resolution



Great Pentachlorophenol Response

Excellent Peak Shape and Resolution

Low MS Bleed



USEPA Method 8270 Semivolatiles (GC/MS)

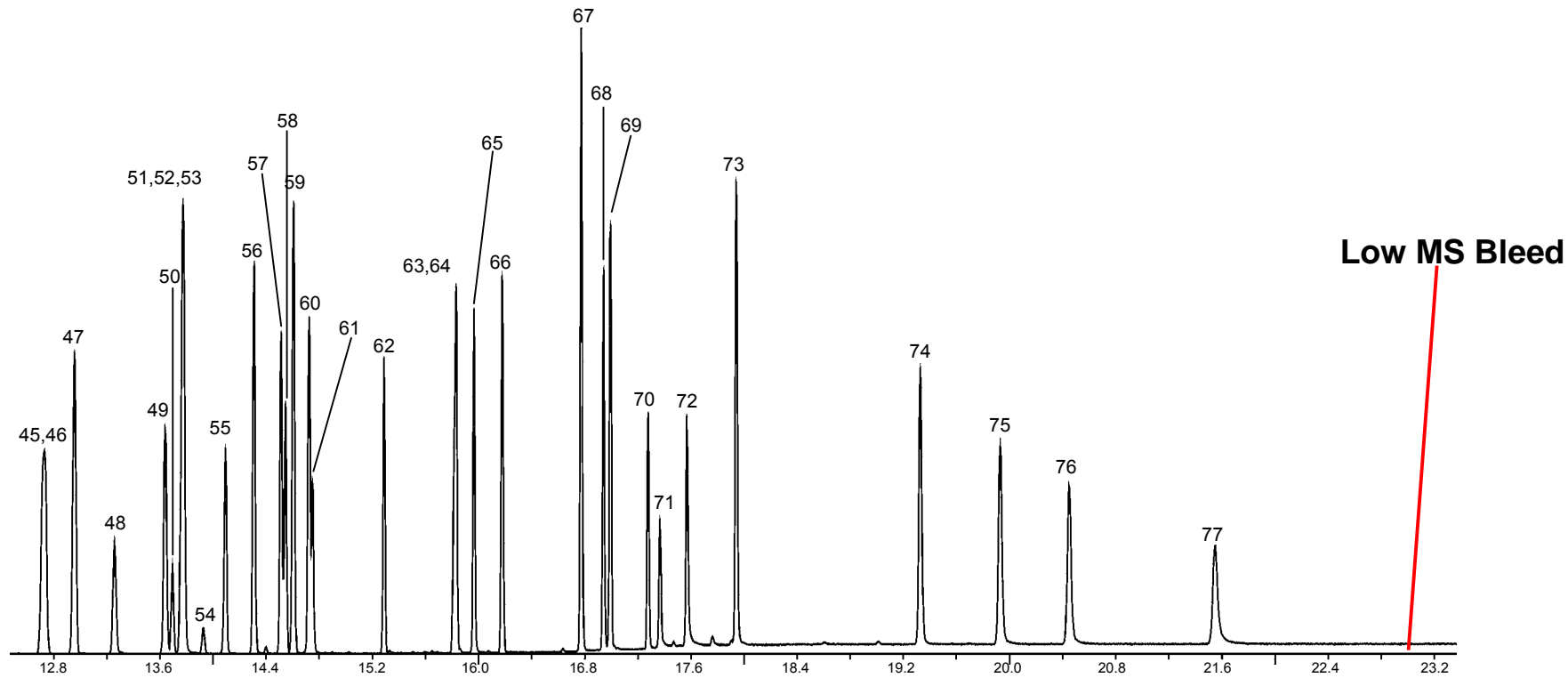
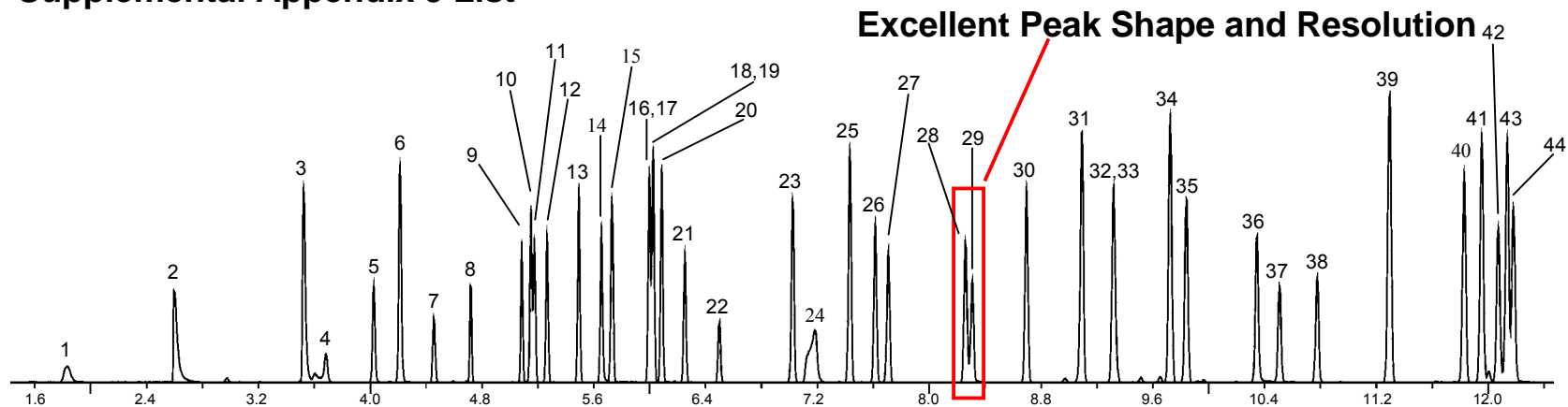
Primary Analyte List

Column: Equity-5, 30m x 0.25mm ID, 0.5µm (Cat. No. 28092-U)
Oven: 40°C (2 min.) to 100°C @ 50°C/min. to 200°C @ 10°C/min. to 325°C @ 30°C/min. (7.5 min)
Inj.: 280°C
Det.: 5973 MSD, Scan range 45-450 amu, 325°C transfer line
Flow: Pressure programmed, 20psi (0.0 min.), ramp to 80psi (0.0 min.), ramp to 16.5psi (3 min.), ramp to 25psi (hold for remainder of run)
Injection: 1.0µL, splitless (0.61 min.)
Liner: Single taper, unpacked
Sample: 50ng on-column of a 74 component semivolatile standard, 6 internal standards, and 8 surrogates

- | | | | |
|--|----------------------------------|----------------------------------|---------------------------------|
| 1. Pyridine | 26. bis(2-Chloroethoxy)methane | 51. 2,4-Dinitrotoluene | 76. 3,3'-Dichlorobenzidine |
| 2. N-nitrosodimethylamine | 27. Benzoic Acid | 52. Diethyl phthalate | 77. Bis(2-ethylhexyl) phthalate |
| 3. 2-Fluorophenol (Surr.) | 28. 2,4-Dichlorophenol | 53. Fluorene | 78. Benzo(a)anthracene |
| 4. Phenol-d6 (Surr.) | 29. 1,2,4-Trichlorobenzene | 54. 4-Chlorophenyl phenyl ether | 79. Chrysene-d12 (Int. Std.) |
| 5. Phenol | 30. Naphthalene-d8 (Int. Std.) | 55. 4-Nitroaniline | 80. Chrysene |
| 6. Aniline | 31. Naphthalene | 56. 2-Methyl-4,6-dinitrophenol | 81. Di-n-octyl phthalate |
| 7. Bis(2-chloroethyl)ether | 32. 4-Chloroaniline | 57. N-nitrosodiphenylamine | 82. Benzo(b)fluoranthene |
| 8. 2-Chlorophenol-d4 (Surr.) | 33. Hexachlorobutadiene | 58. Azobenzene | 83. Benzo(k)fluoranthene |
| 9. 2-Chlorophenol | 34. 4-Chloro-3-methylphenol | 59. 2,4,6-Tribromophenol (Surr.) | 84. Benzo(a)pyrene |
| 10. 1,3-Dichlorobenzene | 35. 2-Methylnaphthalene | 60. 4-Bromophenyl phenyl ether | 85. Perylene-d12 (Int. Std.) |
| 11. 1,4-Dichlorobenzene-d4 (Int. Std.) | 36. Hexachlorocyclopentadiene | 61. Hexachlorobenzene | 86. Indeno(1,2,3-cd)pyrene |
| 12. 1,4-Dichlorobenzene | 37. 2,4,6-Trichlorophenol | 62. Pentachlorophenol | 87. Dibenz(a,h)anthracene |
| 13. Benzyl alcohol | 38. 2,4,5-Trichlorophenol | 63. Phenanthrene-d10 (Int. Std.) | 88. Benzo(g,h,i)perylene |
| 14. 1,2-Dichlorobenzene-d4 (Surr.) | 39. 2-Fluorobiphenyl (Surr.) | 64. Phenanthrene | |
| 15. 1,2-Dichlorobenzene | 40. 2-Chloronaphthalene | 65. Anthracene | |
| 16. 2-Methylphenol | 41. 2-Nitroaniline | 66. Carbazole | |
| 17. Bis(2-chloroisopropyl)ether | 42. Dimethyl phthalate | 67. Di-n-butyl phthalate | |
| 18. 4-Methylphenol | 43. Acenaphthylene | 68. Fluoranthene | |
| 19. N-Nitroso-di-n-propylamine | 44. 2,6-Dinitrotoluene | 69. Benzidine | |
| 20. Hexachloroethane | 45. 3-Nitroaniline | 70. Pyrene | |
| 21. Nitrobenzene-d5 (Surr.) | 46. Acenaphthene-d10 (Int. Std.) | 71. Aramite#1 | |
| 22. Nitrobenzene | 47. Acenaphthene | 72. Terphenyl-d14 (Surr.) | |
| 23. Isophorone | 48. 2,4-Dinitrophenol | 73. Aramite#2 | |
| 24. 2-Nitrophenol | 49. 4-Nitrophenol | 74. 3,3'-Dimethylbenzidine | |
| 25. 2,4-Dimethylphenol | 50. Dibenzofuran | 75. Butylbenzyl phthalate | |

USEPA Method 8270 Semivolatile Compounds (GC/MS)

Supplemental Appendix 9 List



USEPA Method 8270 Semivolatiles (GC/MS)

Supplemental Appendix 9 List

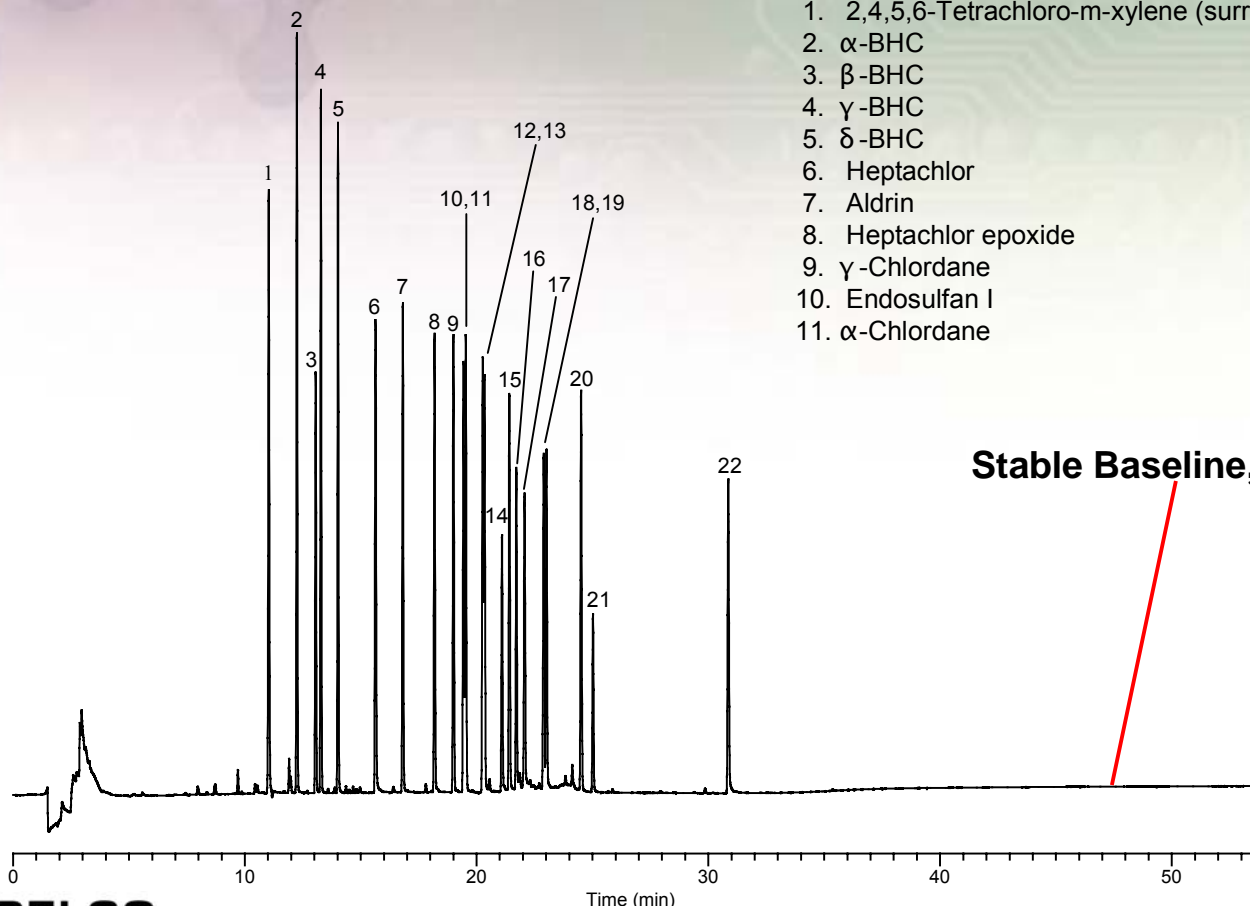
Column: Equity-5, 30m x 0.25mm ID, 0.5µm (Cat. No. 28092-U)
Oven: 40°C (2 min.) to 100°C @ 50°C/min. to 200°C @ 10°C/min. to 325°C @ 30°C/min. (7.5 min)
Inj.: 280°C
Det.: 5973 MSD, Scan range 45-450 amu, 325°C transfer line
Flow: Pressure programmed, 20psi (0.0 min.), ramp to 80psi (0.0 min.), ramp to 16.5psi (3 min.), ramp to 25psi (hold for remainder of run)
Injection: 1.0µL, splitless (0.61 min.)
Liner: Single taper, unpacked
Sample: 50ng on-column of a 62 component semivolatile standard, 6 internal standards, and 8 surrogates

- | | | |
|--|---------------------------------|--------------------------------------|
| 1. 1,4-Dioxane | 26. 2,6-Dichlorophenol | 52. Phorate |
| 2. Pyridine | 27. Hexachloropropene-1 | 53. Phenacetin |
| 3. 2-Picoline | 28. P-Phenylenediamine | 54. Diallylate-2 |
| 4. N-Nitroso-methylethylamine | 29. N-Nitrosodibutylamine | 55. Dimethoate |
| 5. Methyl Methanesulfonate | 30. Safrole | 56. 4-Aminobiphenyl |
| 6. 2-Fluorophenol (surr) | 31. 1-Methylnaphthalene | 57. Pronamide |
| 7. N-Nitrosodiethylamine | 32. 1,2,4,5-Tetrachlorobenzene | 58. Pentachloronitrobenzene |
| 8. Ethyl Methanesulfonate | 33. Isosafrole | 59. Phenanthrene-d10 (internal std.) |
| 9. Phenol-d6 (surr) | 34. 2-Fluorobiphenyl (surr) | 60. Disulfoton |
| 10. Aniline | 35. Isosafrole-2 | 61. Dinoseb |
| 11. Pentachloroethane | 36. 1,4-Naphthoquinone | 62. Methyl Parathion |
| 12. 2-Chlorophenol-d4 (surr) | 37. 1,3-Dinitrobenzene | 63. 4-Nitroquinoline-1-oxide |
| 13. 1,4-Dichlorobenzene-d4 (internal std.) | 38. 1,4-dinitrobenzene | 64. Parathion |
| 14. Benzyl alcohol | 39. Acenaphthene-d10 | 65. Methapyrilene |
| 15. 1,2-Dichlorobenzene-d4 (surr) | 40. Pentachlorobenzene | 66. Isodrin |
| 16. 3-Methylphenol | 41. 1-Naphthylamine | 67. p-Terphenyl-d14 (surr) |
| 17. N-Nitrosopyrrolidine | 42. 2,3,5,6-Tetrachlorophenol | 68. 4-Dimethylaminoazobenzene |
| 18. Acetophenone | 43. 2-Naphthylamine | 69. Chlorobenzilate |
| 19. N-Nitrosomorpholine | 44. 2,3,4,6-Tetrachlorophenol | 70. Famphur |
| 20. o-Toluidine | 45. 5-Nitro-o-toluidine | 71. Kepone |
| 21. Nitrobenzene-d5 (surr) | 46. Thionazin | 72. 2-Acetylaminofluorene |
| 22. N-Nitrosopiperidine | 47. Diphenylamine | 73. Chrysene-d12 (internal std.) |
| 23. o,o,o-Triethylphosphorothioate | 48. 2,4,6-Tribromophenol (surr) | 74. 7,12-Dimethylbenz(a)anthracene |
| 24. α, α-Dimethylphenethylamine | 49. Sulfotep | 75. Perylene-d12 (internal std.) |
| 25. Naphthalene-d8 (internal std.) | 50. 1,3,5-Trinitrobenzene | 76. 3-Methylcholanthrene |
| | 51. Diallylate-1 | 77. Dibenzo(a,j)acridine |

USEPA Method 8081 Chlorinated Pesticides (GC)

Column: Equity-5, 30m x 0.25mm ID, 0.25 μ m (Cat. No. 28089-U)
Oven: 100°C (2 min.) to 160°C @ 15°C/min. to 300°C @ 5°C/min. (10 min)
Inj.: 225°C
Det.: ECD, 310°C
Flow: Helium, 30 cm/sec. @ 100°C
Injection: 2.0 μ L, splitless (0.5 min.)
Liner: Splitless double taper, unpacked
Sample: 50ppb of a 22 component chlorinated pesticide standard (Cat. No. 46845-U)

Excellent Peak Shape and Resolution



- | | |
|---|--------------------------------|
| 1. 2,4,5,6-Tetrachloro-m-xylene (surr.) | 12. 4,4'-DDE |
| 2. α -BHC | 13. Dieldrin |
| 3. β -BHC | 14. Endrin |
| 4. γ -BHC | 15. Endosulfan II |
| 5. δ -BHC | 16. 4,4'-DDD |
| 6. Heptachlor | 17. Endrin aldehyde |
| 7. Aldrin | 18. Endosulfan Sulfate |
| 8. Heptachlor epoxide | 19. 4,4'-DDT |
| 9. γ -Chlordane | 20. Endrin ketone |
| 10. Endosulfan I | 21. Methoxychlor |
| 11. α -Chlordane | 22. Decachlorobiphenyl (surr.) |

Stable Baseline, No Bleed

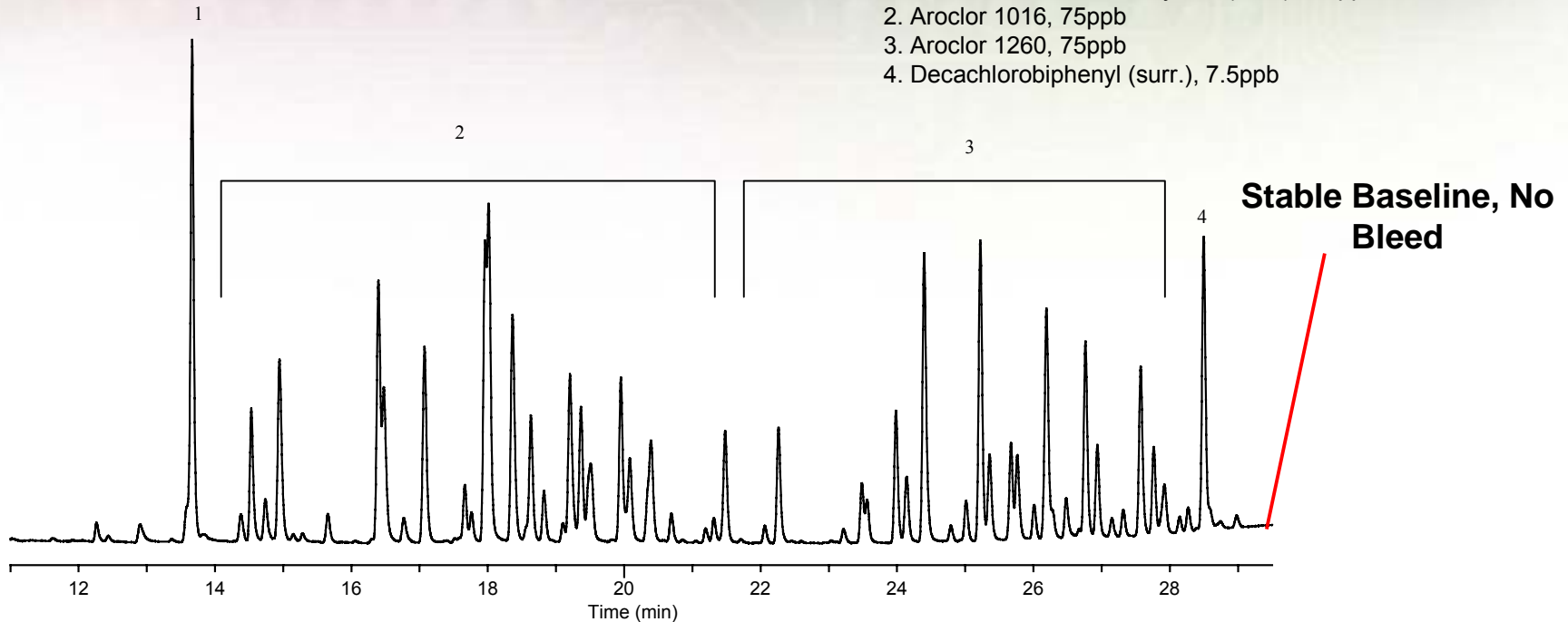
USEPA Method 8082 Polychlorinated Biphenyls (GC)

eQuity
Capillary GC Columns

Column: Equity-5, 30m x 0.25mm ID, 0.25 μ m (Cat. No. 28089-U)
Oven: 100°C (2 min.) to 160°C @ 15°C/min. to 300°C @ 5°C/min. (10 min)
Inj.: 225°C
Det.: ECD, 310°C
Flow: Helium, 30 cm/sec. @ 100°C
Injection: 2.0 μ L, splitless (0.5 min.)
Liner: Splitless double taper, unpacked
Sample: Aroclor Mix 1 standard at 75ppb with surrogates at 7.5ppb. (Cat. No. 46846-U)

Excellent Peak Shape and Resolution

1. 2,4,5,6-Tetrachloro-m-xylene (surr.), 7.5ppb
2. Aroclor 1016, 75ppb
3. Aroclor 1260, 75ppb
4. Decachlorobiphenyl (surr.), 7.5ppb

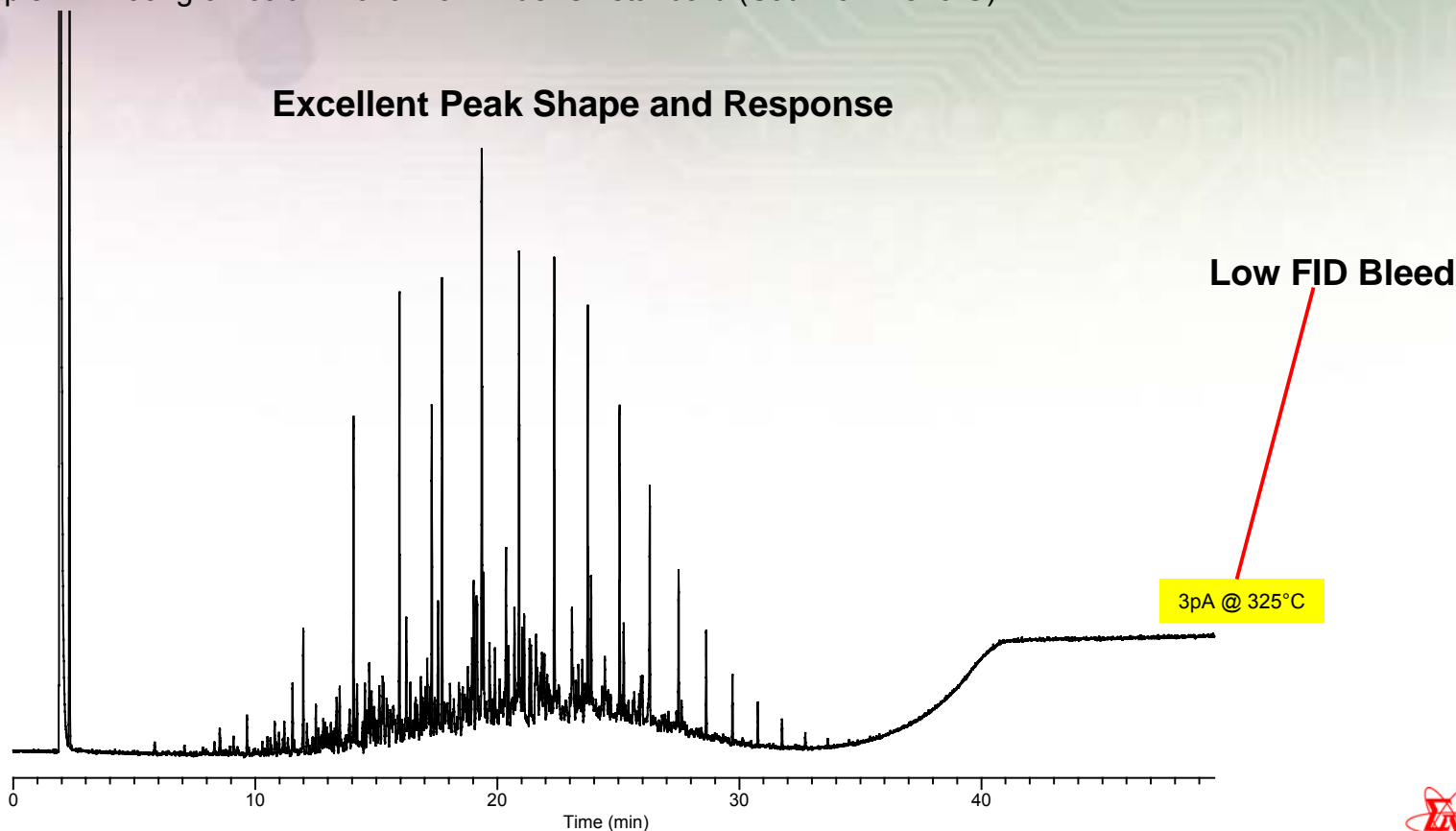


Diesel Fuel (GC)

Column: Equity-1, 30m x 0.25mm ID, 0.25 μ m (Cat. No. 28046-U)
Oven: 40°C (4 min.) to 325°C @ 8°C/min.
Inj.: 275°C
Det.: FID, 325°C
Flow: Helium, constant flow, 1.2mL/sec. @ 40°C
Injection: 1.0 μ L, split 200:1
Liner: 4mm ID single taper
Sample: 100ng on-column of a No. 2 Fuel Oil standard (Cat. No. 47515-U)

eQuity

Capillary GC Columns

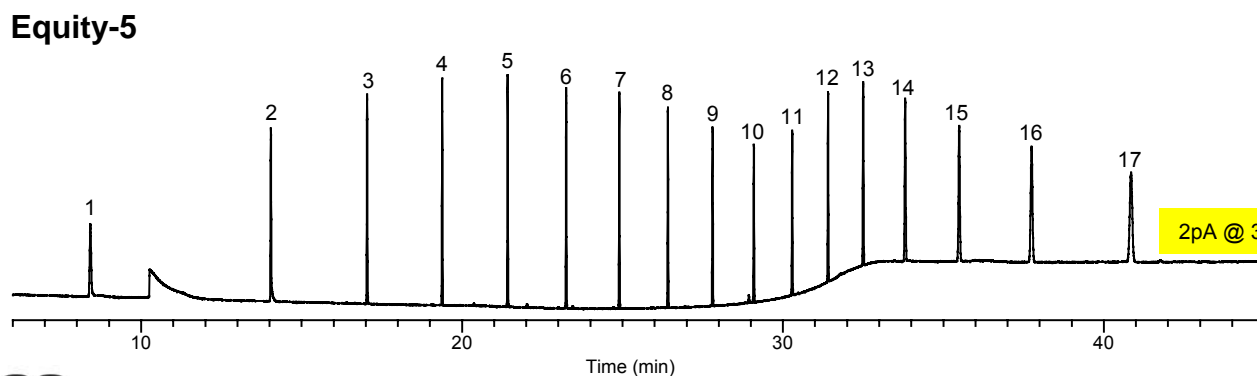
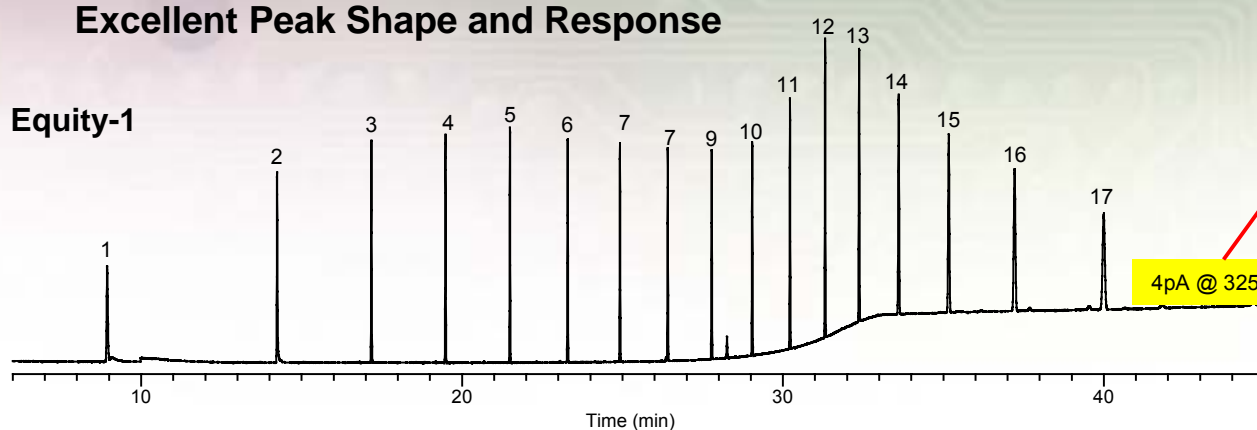


Simple Hydrocarbons (GC)

Column 1: Equity-1, 30m x 0.25mm ID, 0.25 μ m (Cat. No. 28046-U)
Column 2: Equity-5, 30m x 0.25mm ID, 0.25 μ m (Cat. No. 28089-U)
Oven: 40°C (8 min.) to 325°C @ 12°C/min. (16 min.)
Inj.: 275°C
Det.: FID, 325°C
Flow: Helium, constant flow, 1.2mL/sec. @ 40°C
Injection: 1.0 μ L, splitless (2.0 min.)
Liner: 2mm ID splitless
Sample: 100ng on-column of a 17 component n-hydrocarbons standard (Cat. No. 46855-U)

Excellent Peak Shape and Response

1. C8
2. C10
3. C12
4. C14
5. C16
6. C18
7. C20
8. C22
9. C24
10. C26
11. C28
12. C30
13. C32
14. C34
15. C36
16. C38
17. C40



Low FID Bleed

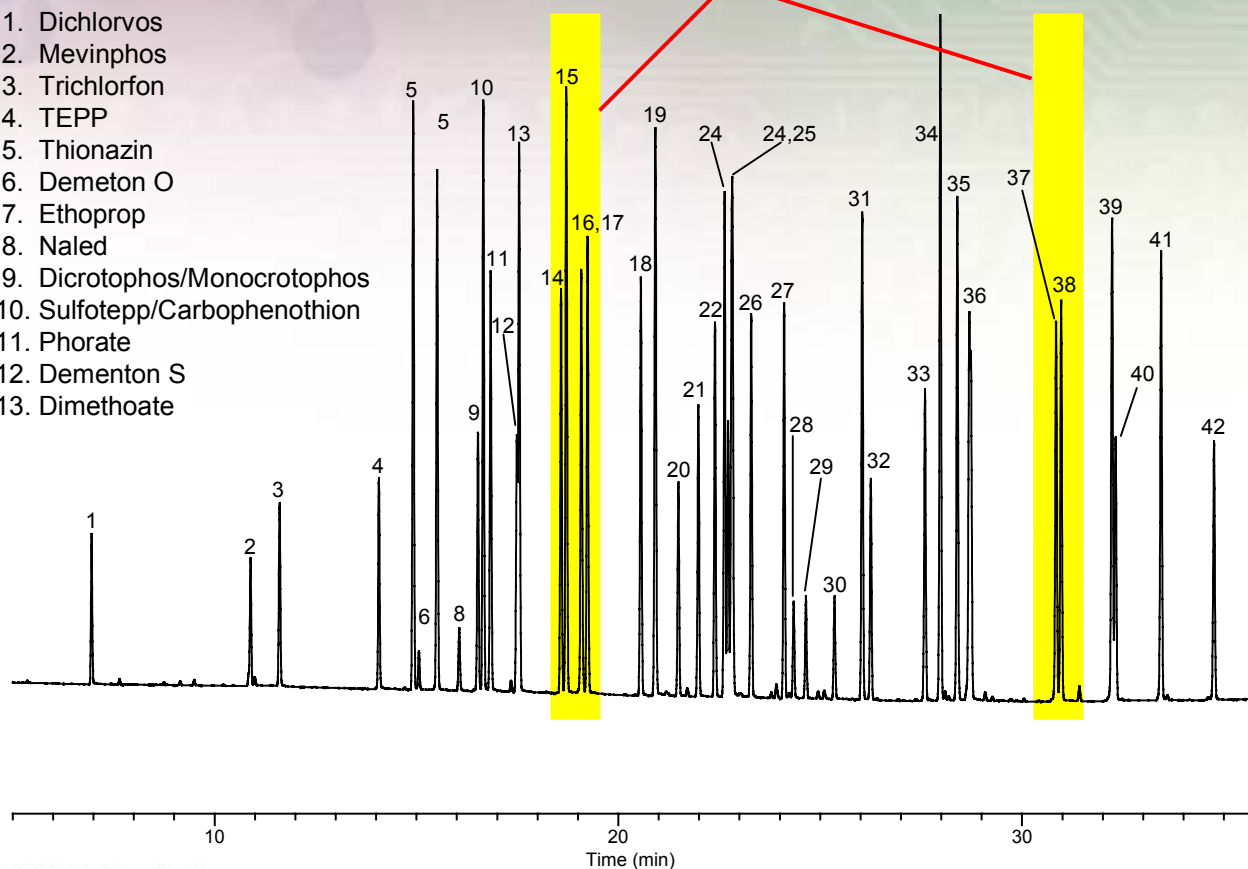
USEPA Method 8141 Organophosphorus Pesticides (GC)

Column: Equity-5, 30m x 0.25mm ID, 0.25 μ m (Cat. No. 28089-U)
 Oven: 120 $^{\circ}$ C (3 min) to 300 $^{\circ}$ C @ 5 $^{\circ}$ C /min.
 Inj.: 250 $^{\circ}$ C
 Det.: NPD, 320 $^{\circ}$ C
 Flow: Helium, 25 cm/sec @ 120 $^{\circ}$ C
 Injection: 1.0 μ l, splitless (0.5 min.)
 Liner: Splitless, double taper
 Sample: 40ng on-column of a custom organophosphorus pesticides mix

Excellent Peak Shape and Resolution

1. Dichlorvos
2. Mevinphos
3. Trichlorfon
4. TEPP
5. Thionazin
6. Demeton O
7. Ethoprop
8. Naled
9. Dicrotophos/Monocrotophos
10. Sulfotepp/Carbophenothion
11. Phorate
12. Dementon S
13. Dimethoate

14. Terbufos
15. Fonophos
16. Diazinon
17. Disulfoton
18. Dichlorofenthion/Phosphamidon
19. Chlorpyrifos methyl/Methyl Parathion
20. Ronnel
21. Fenitrothion
22. Malathion
23. Aspon
24. Chlorpyrifos
25. Fenthion
26. Trichloronate
27. Chlorfenvinphos
28. Crotoxyphos
29. Stirophos
30. Tokuthion
31. Merphos
32. Fensulfothion
33. Ethion
34. Bolstar
35. Famphur
36. Carbophenothion
37. Phosmet
38. EPN
39. Azinphos-methyl
40. Leptophos
41. Azinphos-ethyl
42. Coumaphos

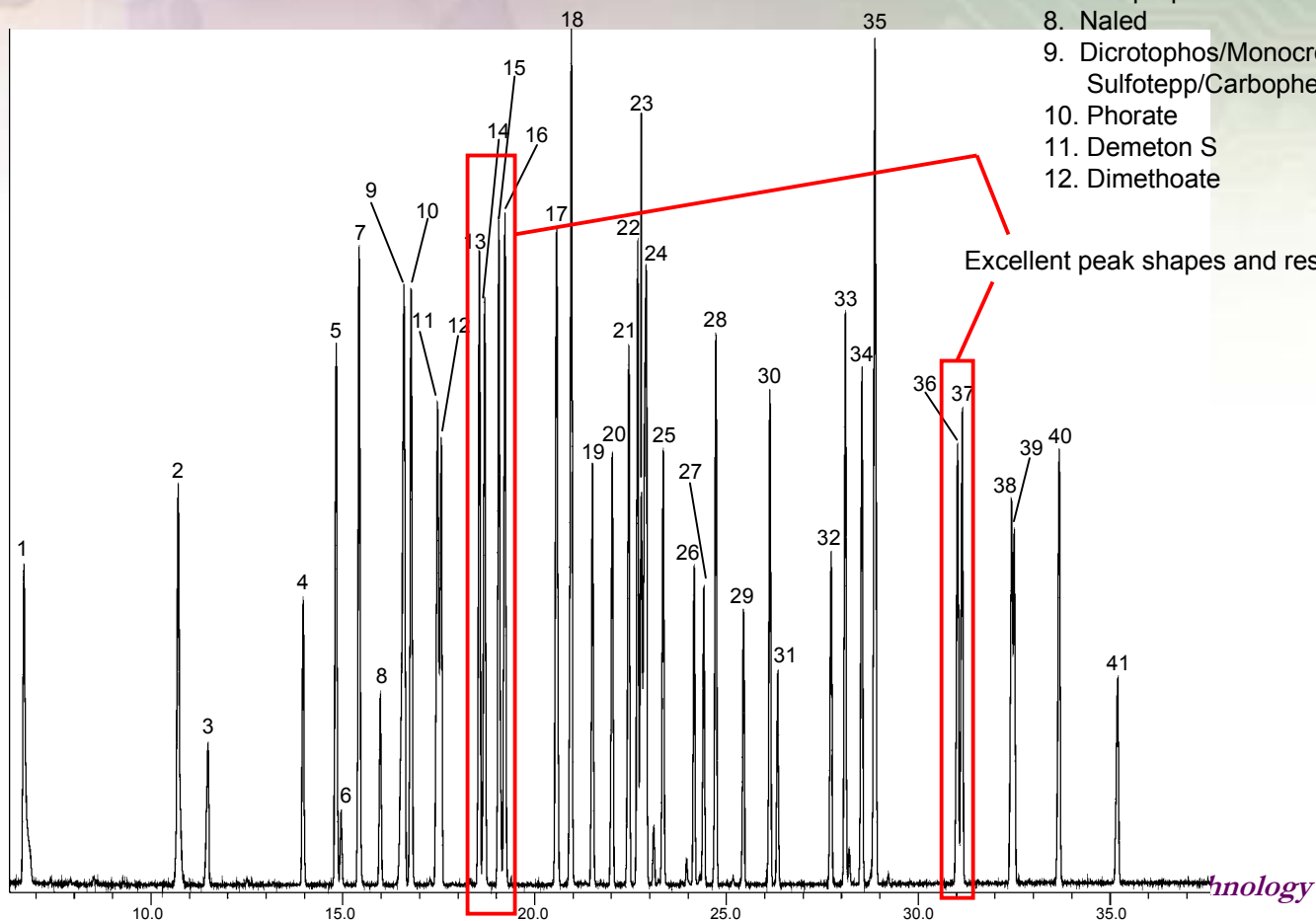


USEPA Method 8141 Organophosphorus Pesticides (GC/MS)



Column: Equity-5, 30m x 0.25mm ID, 0.25µm (Cat. No. 28089-U)
Oven: 120° C (3 min) to 270°C @ 5°C /min.
Inj.: 250°C
Det.: MSD, Scan range 45-450 amu, 325°C transfer line
Flow: Helium, 30cm/sec @ 120°C
Injection: 1.0 ul, splitless (0.3 min.)
Liner: Splitless, double taper
Sample: 40ng on-column of a custom organophosphorus pesticides mix

- | | |
|------------------------------|--|
| 1. Dichlorvos | 13. Terbufos |
| 2. Mevinphos | 14. Fonophos |
| 3. Trichlorfon | 15. Diazinon |
| 4. TEPP | 16. Disulfoton |
| 5. Thionazin | 17. Dichlorofenthion/Phosphamidon |
| 6. Demeton O | 18. Chlorpyrifos methyl/Methyl Parathion |
| 7. Ethoprop | 19. Ronnel |
| 8. Naled | 20. Fenitrothion |
| 9. Dicrotophos/Monocrotophos | 21. Malathion |
| 10. Phorate | 22. Aspon |
| 11. Demeton S | 23. Chlorpyrifos |
| 12. Dimethoate | 24. Fenthion |
| | 25. Trichloronate |
| | 26. Chlorfenvinphos |
| | 27. Crotoxyphos |
| | 28. Stirophos |
| | 29. Tokuthion |
| | 30. Merphos |
| | 31. Fensulfothion |
| | 32. Ethion |
| | 33. Bolstar |
| | 34. Famphur |
| | 35. Carbophenothion |
| | 36. Phosmet |
| | 37. EPN |
| | 38. Azinphos-methyl |
| | 39. Leptophos |
| | 40. Azinphos-ethyl |
| | 41. Coumaphos |

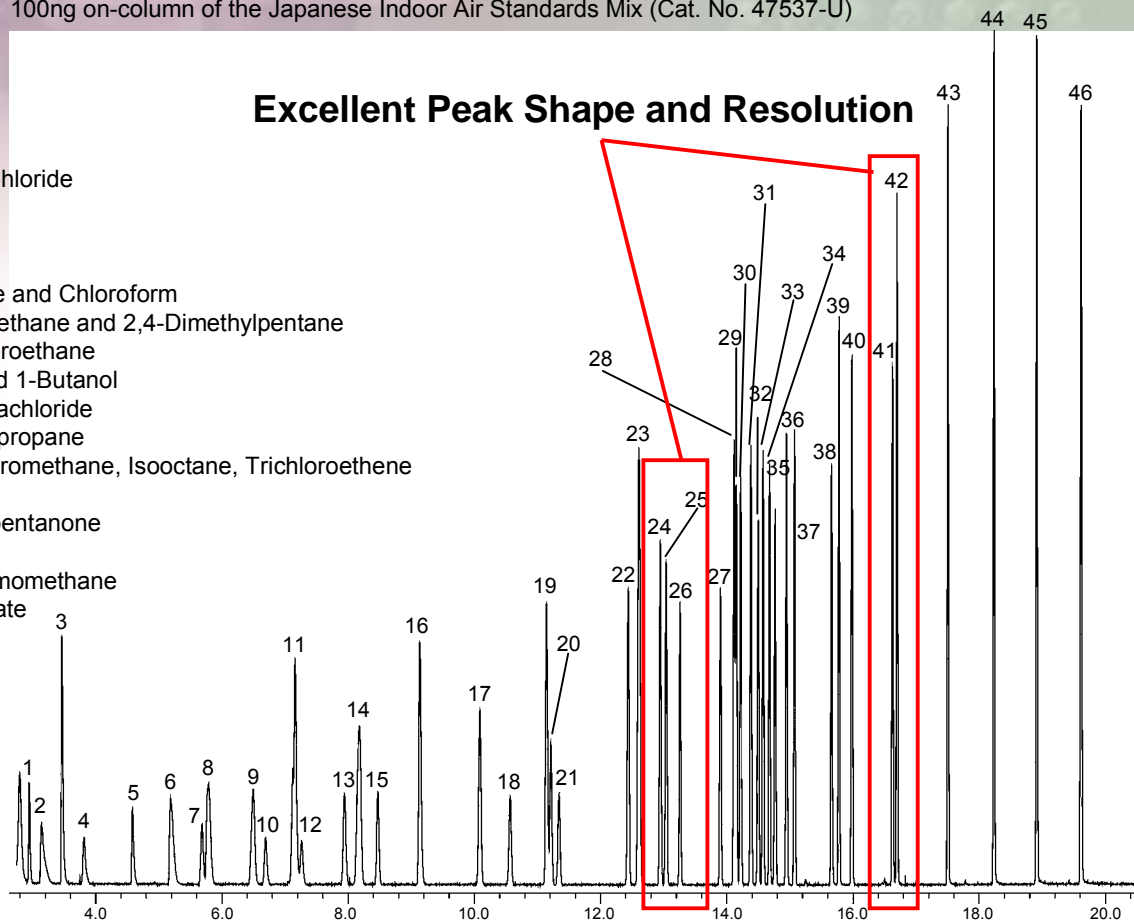


Indoor Air (GC/MS)

Column: Equity-1, 30m x 0.25mm ID, 1.0µm (Cat. No. 28049-U)
 Oven: 35°C (3 min.) to 100°C @ 8°C/min. to 250°C @ 20°C/min. (10 min.)
 Inj.: 250°C
 Det.: MSD, Scan range 33-350 amu, 280°C transfer line
 Flow: Helium, 30 cm/sec @ 35°C
 Injection: 1.0µL, split 10:1
 Liner: Split, cup design
 Sample: 100ng on-column of the Japanese Indoor Air Standards Mix (Cat. No. 47537-U)

1. Ethanol
2. Acetone
3. 2-Propanol
4. Methylene Chloride
5. 1-Propanol
6. 2-Butanone
7. Hexane
8. Ethyl acetate and Chloroform
9. 1,2-Dichloroethane and 2,4-Dimethylpentane
10. 1,1,1-Trichloroethane
11. Benzene and 1-Butanol
12. Carbon Tetrachloride
13. 1,2-Dichloropropane
14. Bromodichloromethane, Isooctane, Trichloroethene
15. Heptane
16. 4-Methyl-2-pentanone
17. Toluene
18. Chlorodibromomethane
19. n-Butyl acetate

Excellent Peak Shape and Resolution



20. Octane
21. Tetrachloroethylene
22. Ethylbenzene
23. m-Xylene and p-Xylene
24. Styrene
25. o-Xylene
26. Nonane
27. α-Pinene
28. 3-Ethylbenzene
29. 4-Ethylbenzene
30. 1,3,5-Trimethylbenzene
31. 2-Ethyltoluene
32. β-Pinene
33. 1,2,4-Trimethylbenzene
34. Decane
35. 1,4-Dichlorobenzene
36. 1,2,3-Trimethylbenzene
37. Limonene
38. Nonanal
39. Undecane
40. 1,2,4,5-Tetramethylbenzene
41. Decanal
42. Dodecane
43. Tridecane
44. Tetradecane
45. Pentadecane
46. Hexadecane

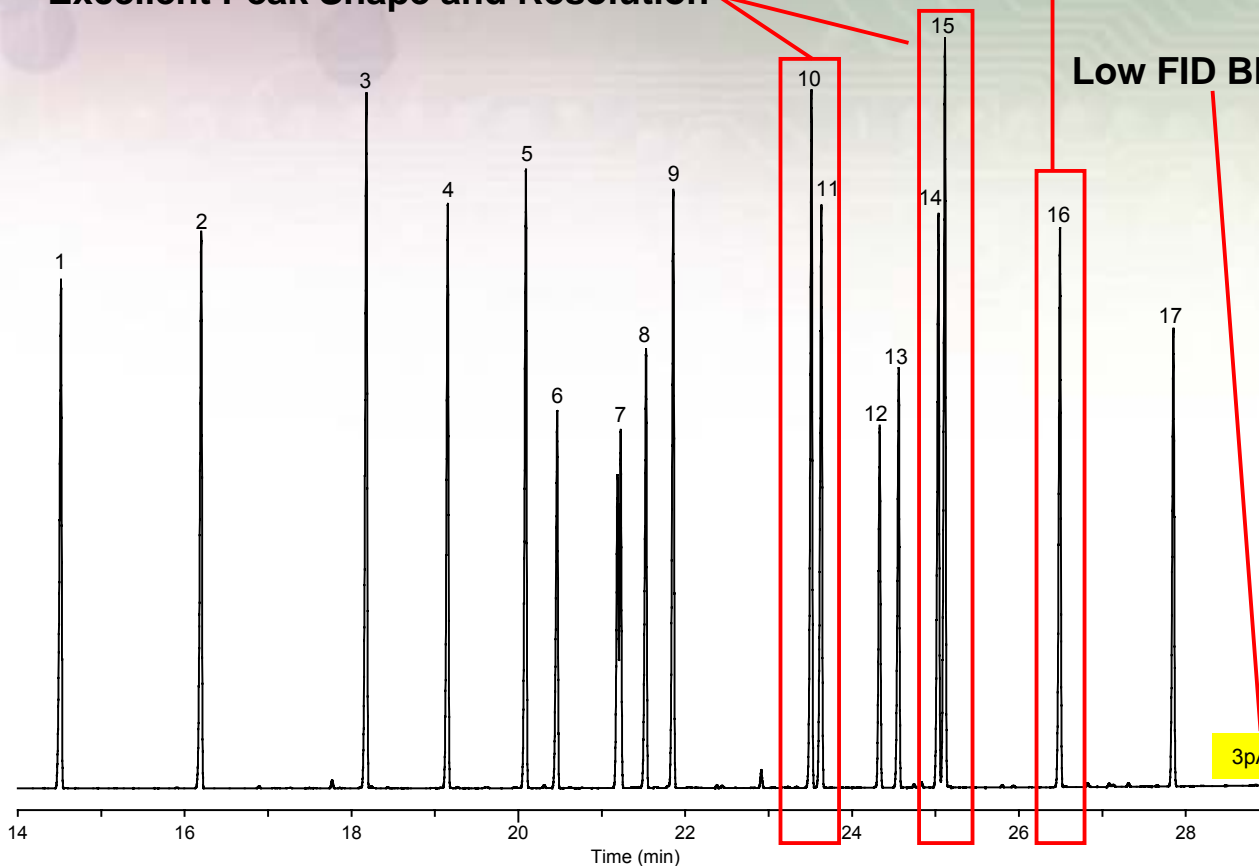
Phthalate Esters (GC)

Column: Equity-5, 30m x 0.25mm ID, 0.25 μ m (Cat. No. 28089-U)
Oven: 40 $^{\circ}$ C (1 min.) to 325 $^{\circ}$ C @ 10 $^{\circ}$ C /min.
Inj.: 250 $^{\circ}$ C
Det.: FID, 325 $^{\circ}$ C
Flow: Helium, Constant flow, 1.3 ml/sec @ 40 $^{\circ}$ C
Injection: 1.0 μ l, splitless (0.75 min.)
Liner: Splitless, 4mm ID single taper
Sample: 50ng on-column of a custom phthalate ester mix

Excellent Peak Shape

Excellent Peak Shape and Resolution

Low FID Bleed

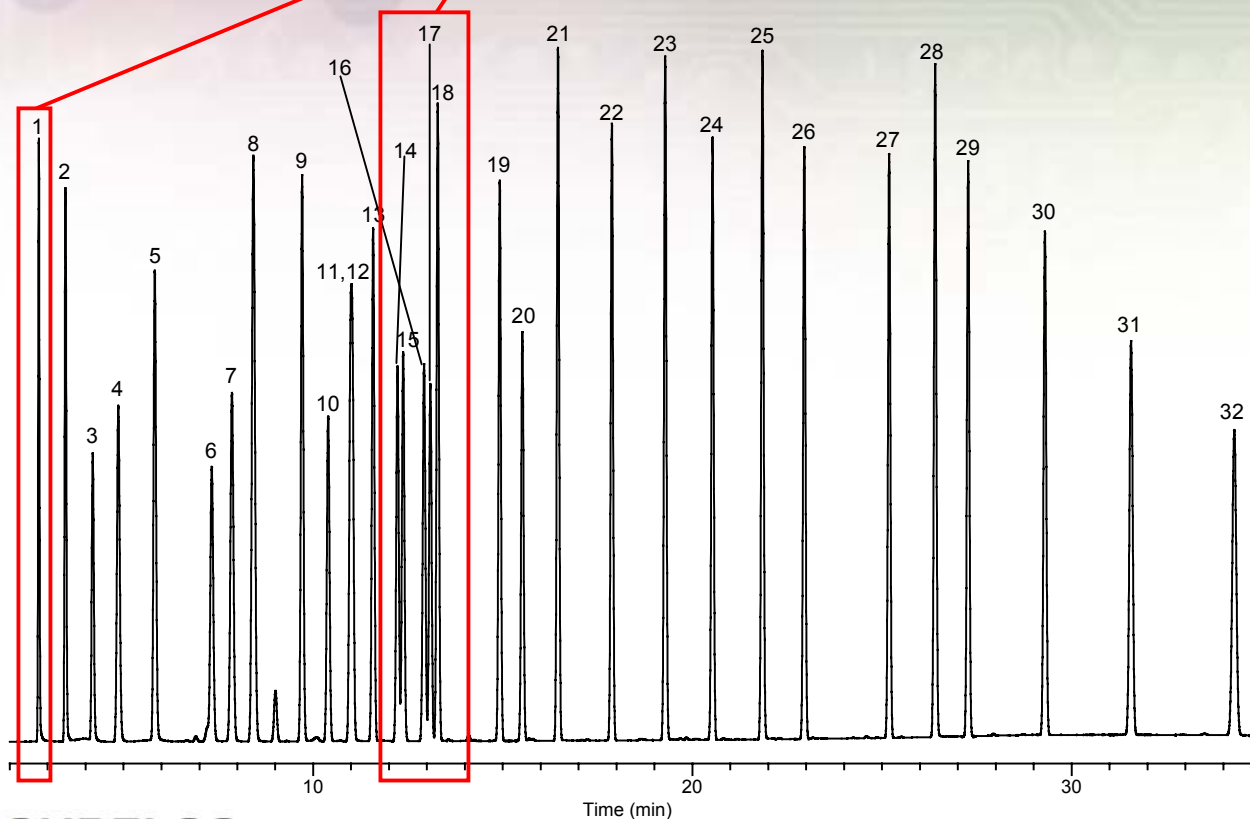


1. Dimethyl phthalate
2. Diethyl phthalate
3. Benzyl benzoate
4. Diisobutyl phthalate
5. Dibutyl phthalate
6. Bis(2-methylethyl)phthalate
7. Bis(4-methyl-2-pentyl)phthalate
8. Bis(2-ethoxyethyl)phthalate
9. Diamyl phthalate
10. Di-n-hexyl phthalate
11. Butyl benzyl phthalate
12. Hexyl-2-ethylhexyl phthalate
13. Bis(2-butoxyethyl)phthalate
14. Dicyclohexyl phthalate
15. Bis(2-ethylhexyl)phthalate
16. Di-n-octyl phthalate
17. Di-n-nonyl phthalate

Hydrocarbons and Alcohols (GC)

Column: Equity-1, 30m x 0.53mm ID, 3.0 μ m (Cat. No. 28076-U)
Oven: 40 $^{\circ}$ C (5 min.) to 225 $^{\circ}$ C @ 8 $^{\circ}$ C /min.
Inj.: 250 $^{\circ}$ C
Det.: FID, 275 $^{\circ}$ C
Flow: Helium, 30 cm/sec @ 40 $^{\circ}$ C
Injection: 0.10 μ l, split 100:1
Liner: Split, cup design
Sample: 32 component mixed solvent sample, equal by weight

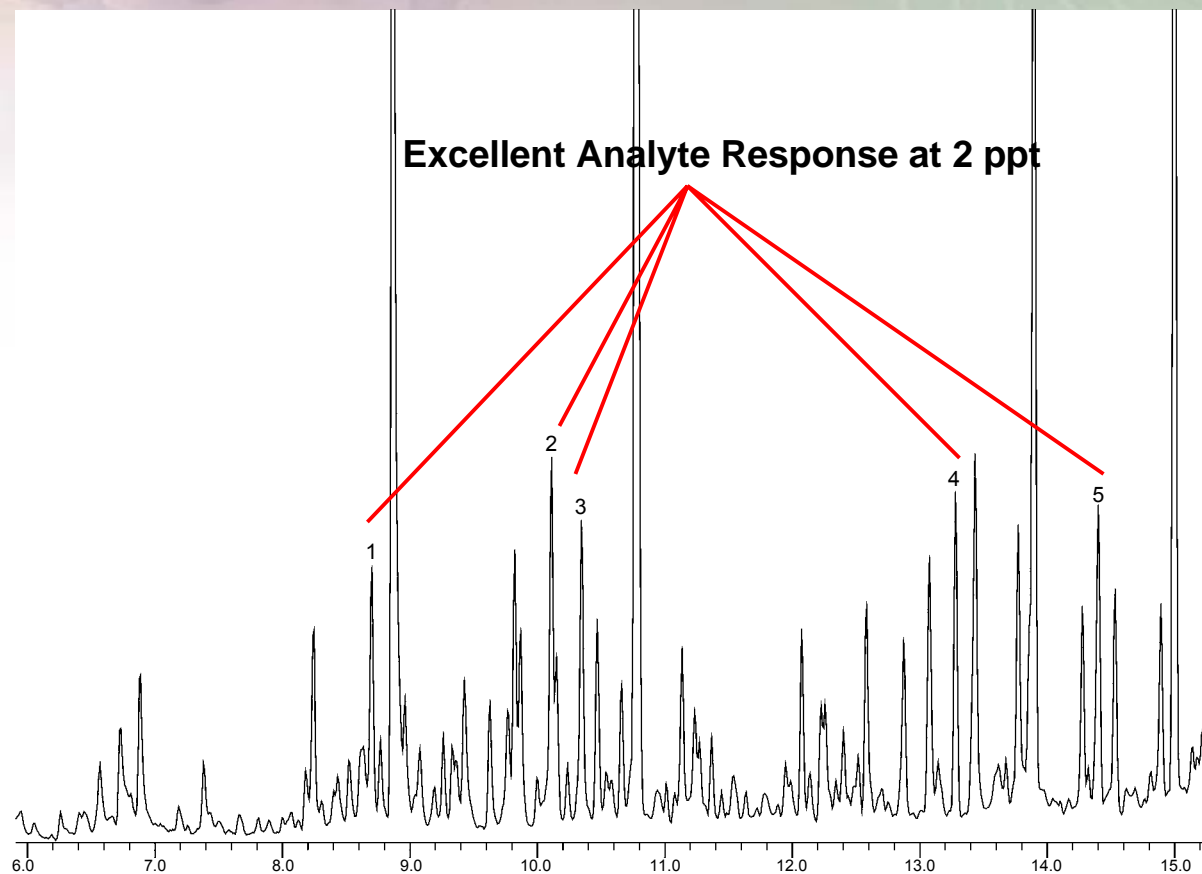
Excellent Peak Shape and Resolution



1. Methanol
2. Ethanol
3. Isopropanol
4. t-Butanol
5. Propanol
6. 2-Butanol
7. Hexane
8. Isobutanol
9. Butanol
10. 3-Methyl-2-butanol
11. 2-Pentanol
12. 3-Pentanol
13. Heptane
14. 3-Methyl-1-butanol
15. 2-Methyl-1-butanol
16. 3-Methyl-3-pentanol
17. 4-Methyl-2-pentanol
18. Pentanol
19. Octane
20. 4-Methyl-1-pentanol
21. Hexanol
22. Nonane
23. Heptanol
24. Decane
25. Octanol
26. Undecane
27. Dodecane
28. Decanol
29. Tridecane
30. Tetradecane
31. Pentadecane
32. Hexadecane

Trace Odors in Drinking Water (SPME-GC/MS)

Column: Equity-5, 30m x 0.25mm, 0.25µm film, Cat. No.: 28089-U
SPME Fiber: 2cm StableFlex coated with 50/30µm DVB/Carboxen/PDMS, Cat. No. 57348-U
Extraction: headspace, 65°C (30 min.)
Desorption: 3 min. at 260°C
Oven: 60°C (2min) to 200°C at 8°C/min
GC Liner: 0.75mm SPME liner
Detector: 5973 MSD, selected ions (SIM) 95, 112, 124, 137, 197; interface at 280°C
Flow: Helium, 37cm/sec@ 60°C (1mL/min constant flow)
Injection: SPME fiber, splitless opened at after 1 min at 50mL/min.
Sample: 25mL of water containing 25% NaCl and drinking water odors kit, Cat. No. 47529-U



1. 2-Isopropyl-3-methoxypyrazine, 2ppt
2. 2-Isobutyl-3-methoxypyrazine, 2ppt
3. 2- Methylisoborneol, 2ppt
4. 2,4,6 -Trichloroanisole (Internal Standard), 8ppt
5. (±)Geosmin, 2ppt