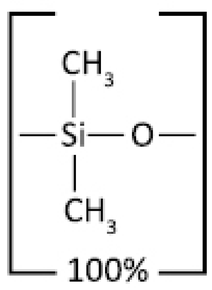
Capillary Columns

High-Performance Columns

SH-I-1MS

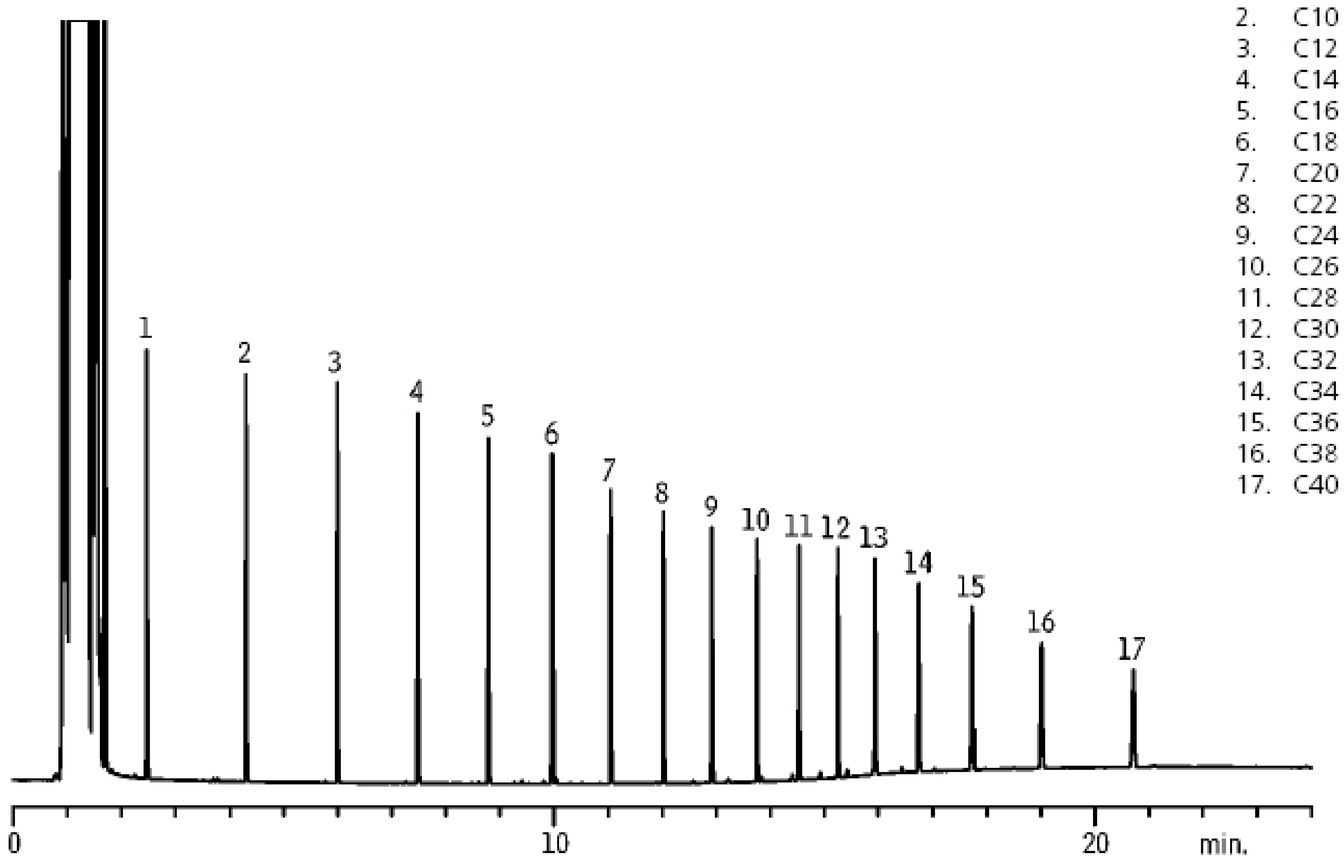
- Non-polar phase: Crossbond™ 100% dimethyl polysiloxane
- Tested and guaranteed for ultra-low bleed; improved signal-to-noise ratio for better sensitivity and mass spectral integrity.
- General-purpose columns for arson accelerants, essential oils, hydrocarbons, pesticides, PCB congeners (e.g., Aroclor mixes), sulfur compounds, amines, solvent impurities, simulated distillation, oxygenates, gasoline range organics (GRO), refinery gases.
- Equivalent to USP G2 phase.
- Similar phases: HP-1ms UI, HP-1ms, DB-1ms UI, DB-1ms, Ultra-1, VF-1ms, SPB-1, Equity-1

SH-I-1MS Structure



ID	df	Temp. Range	20 m	25 m	50 m
0.15 mm	0.15 µm	-60 to 330/350 °C	227-36001-01	–	–
	2.00 µm	-60 to 330/350 °C	227-36002-01	–	–
0.18 mm	0.18 µm	-60 to 330/350 °C	221-75921-20	–	–
	0.36 µm	-60 to 330/350 °C	227-36003-01	–	–
0.20 mm	0.33 µm	-60 to 330/350 °C	–	227-36004-01	227-36004-02
ID	**df**	**Temp. Range**	**15 m**	**30 m**	**60 m**
0.25 mm	0.25 µm	-60 to 330/350 °C	227-36005-01	221-75923-30	227-36005-02
	0.50 µm	-60 to 330/350 °C	227-36006-01	227-36006-02	221-75924-60
	1.00 µm	-60 to 330/350 °C	227-36007-01	227-36007-02	227-36007-03
0.32 mm	0.25 µm	-60 to 330/350 °C	227-36008-01	221-75926-30	227-36008-02
	0.50 µm	-60 to 330/350 °C	227-36009-01	227-36009-02	227-36009-03
	1.00 µm	-60 to 330/350 °C	–	227-36010-01	221-75928-60
	4.00 µm	-60 to 330/350 °C	–	227-36011-01	–
0.53 mm	0.50 µm	-60 to 330/350 °C	227-36012-01	227-36012-02	–
	1.00 µm	-60 to 330/350 °C	227-36013-01	227-36013-02	–
	1.50 µm	-60 to 330/350 °C	227-36014-01	227-36014-02	227-36014-03

Petroleum Hydrocarbons (TPH)



Peaks

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

Conditions

Instrument : GC-2010
Column : SH-I-1Ms, 20 m, 0.18 mm ID, 0.18 µm (P/N: 221-75921-20)
Sample : Florida TRPH Standard, 500 µg/mL each component in hexane
Inj. Vol. : 0.5 µL, split (split ratio 20:1)
Inj. Temp : 275 °C
Carrier Gas : Hydrogen, constant linear velocity mode, 55 cm/sec.
Oven Temp : 40 °C (hold 1 min) to 330 °C at 20 °C/min (hold 10 min)
Detector : FID, 350 °C

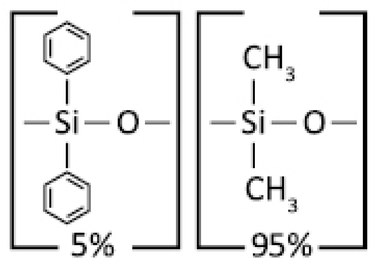
Capillary Columns

High-Performance Columns

SH-I-5MS

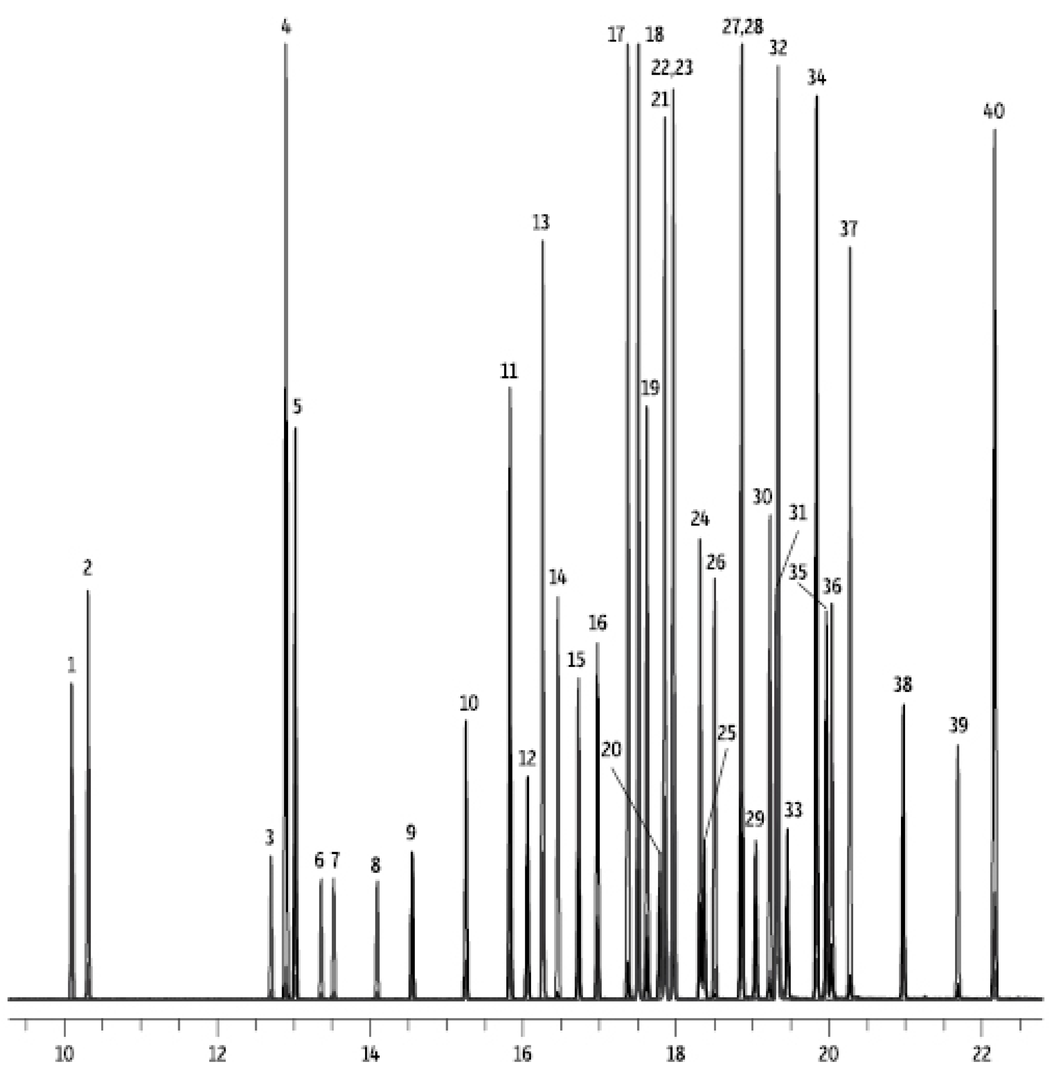
- Low-polarity phase: Crossbond™ 5% diphenyl / 95% dimethyl polysiloxane
- Tested and guaranteed for ultra-low bleed; improved signal-to-noise ratio for better sensitivity and mass spectral integrity.
- General-purpose columns for semi-volatiles, phenols, amines, residual solvents, drugs of abuse, pesticides, PCB congeners (e.g., Aroclor mixes), solvent impurities.
- Equivalent to USP G27 and G36 phases.
- Similar phases: HP-5ms UI, HP-5ms, DB-5, Ultra-2, CP Sil 8 CB, SPB-5, Equity-5

SH-I-5MS Structure



ID	df	Temp. Range	20 m	25 m	50 m
0.18 mm	0.18 µm	-60 to 330/350 °C	227-36015-01	–	–
	0.30 µm	-60 to 330/350 °C	227-36016-01	–	–
	0.36 µm	-60 to 330/350 °C	227-36017-01	–	–
0.20 mm	0.33 µm	-60 to 330/350 °C	–	227-36018-01	227-36018-02
ID	**df**	**Temp. Range**	**15 m**	**30 m**	**60 m**
0.25 mm	0.25 µm	-60 to 330/350 °C	221-75940-15	221-75940-30	227-36019-01
	0.40 µm	-60 to 330/350 °C	–	227-36020-01	–
	0.50 µm	-60 to 330/350 °C	227-36021-01	221-75941-30	221-75942-60
	1.00 µm	-60 to 330/350 °C	227-36022-01	227-36022-02	227-36022-03
0.32 mm	0.25 µm	-60 to 330/350 °C	227-36023-01	221-75943-30	227-36023-02
	0.50 µm	-60 to 330/350 °C	227-36024-01	221-75944-30	227-36024-02
	1.00 µm	-60 to 330/350 °C	227-36025-01	227-36025-02	227-36025-03
0.53 mm	0.25 µm	-60 to 330/350 °C	227-36026-01	227-36026-02	–
	0.50 µm	-60 to 330/350 °C	227-36027-01	227-36027-02	–
	1.00 µm	-60 to 330/350 °C	227-36028-01	227-36028-02	–
	1.50 µm	-60 to 330/350 °C	227-36029-01	227-36029-02	–

GC Multiresidue Pesticide



Peaks

1. Chloroneb
2. Pentachlorobenzene
3. alpha-BHC
4. Hexachlorobenzene
5. Pentachloroanisole
6. beta-BHC
7. gamma-BHC (Lindane)
8. delta-BHC
9. Endosulfan ether
10. Heptachlor
11. Pentachlorothioanisole
12. Aldrin
13. 4,4'-Dichlorobenzophenone
14. Fenson
15. Isodrin
16. Heptachlor epoxide (Isomer B)
17. Chlorbenside
18. *trans*-Chlordane
19. 2,4'-DDE
20. Endosulfan I
21. *cis*-Chlordane
22. *trans*-Nonachlor
23. Chlorfenson (Ovex)
24. 4,4'-DDE
25. Dieldrin
26. 2,4'-DDD
27. Endrin
28. Ethylan (Perthane)
29. Endosulfan II
30. 4,4'-DDD
31. 2,4'-DDT
32. *cis*-Nonachlor
33. Endrin aldehyde
34. 4,4'-Methoxychlor olefin
35. Endosulfan sulfate
36. 4,4'-DDT
37. 2,4'-Methoxychlor
38. Endrin ketone
39. Tetradifon
40. Mirex

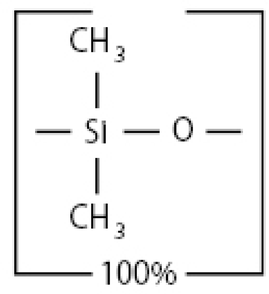
Conditions

Column : SH-I-5MS, 30 m, 0.25 mm ID, 0.25 um (P/N: 221-75940-30)
Inj. Vol. : 1 µL split (split ratio 50:1)
Inj. Temp : 250 °C
Oven Temp : 90 °C (hold 1 min) to 330 °C at 8.5 °C/min (hold 5 min)
Carrier Gas : He, constant flow rate 1.4 mL/min
Detector : MS-QP
Transfer Line Temp: 290 °C
Source Temp: 325 °C
Solvent Delay Time: 5 min
Ionization: EI

SH-I-1HT

- Non-polar phase: Crossbond™ 100% dimethyl polysiloxane
- 40% longer lifetime from specially designed fused silica tubing.
- Columns processed for high-temperature applications, such as high molecular weight hydrocarbons.
- Similar phases: DB-1HT, AT-1ht

SH-I-1HT Structure

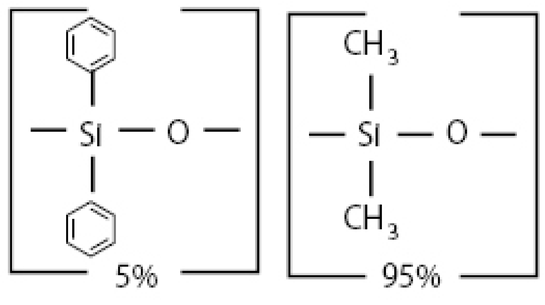


ID	df	Temp. Range	15 m	30 m
0.25 mm	0.10 µm	-60 to 400 °C	227-36087-01	227-36087-02
	0.25 µm	-60 to 400 °C	–	227-36088-01
0.32 mm	0.10 µm	-60 to 400 °C	227-36089-01	227-36089-02
	0.25 µm	-60 to 400 °C	–	227-36090-01

SH-I-5HT

- Low-polarity phase: Crossbond™ 5% diphenyl / 95% dimethyl polysiloxane
- 40% longer lifetime from specially designed fused silica tubing.
- Columns processed for high-temperature applications, such as mineral oil.
- Similar phases: DB-5HT, VF-5HT

SH-I-5HT Structure

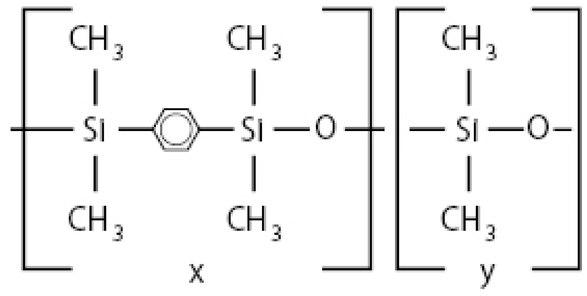


ID	df	Temp. Range	15 m	30 m
0.25 mm	0.10 µm	-60 to 400 °C	221-75933-15	227-36091-01
	0.25 µm	-60 to 400 °C	227-36092-01	221-75934-30
0.32 mm	0.10 µm	-60 to 400 °C	227-36093-01	227-36093-02
	0.25 µm	-60 to 400 °C	–	227-36094-01
0.53 mm	0.15 µm	-60 to 380/400 °C	–	227-36095-01

SH-I-5Sil MS

- Low-polarity phase: Crossbond™ silarylene phase 1,4-bis(dimethylsiloxy)phenylene dimethyl polysiloxane
- Engineered to be a low-bleed GCMS column.
- Excellent inertness for active compounds.
- General-purpose columns—ideal for GCMS analysis of semi-volatiles, polycyclic aromatic compounds, chlorinated hydrocarbons, phthalates, phenols, amines, organochlorine pesticides, organophosphorus pesticides, drugs, solvent impurities, and hydrocarbons.
- Similar phases: DB-5ms UI, DB-5ms, VF-5ms, SLB-5ms

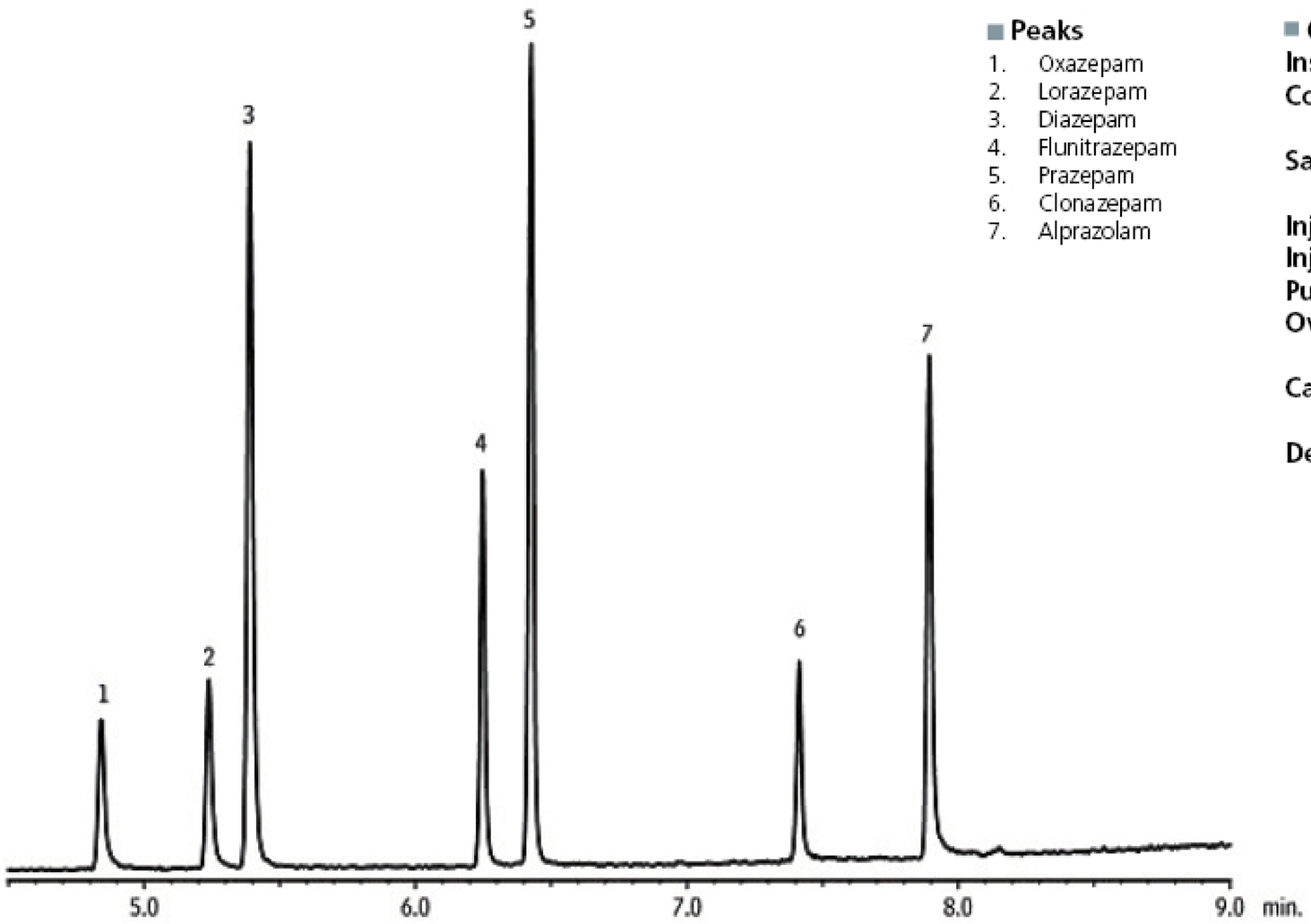
SH-I-5Sil MS Structure



For SH-I-5Sil MS columns with Integra-Guard™ column, please refer to page C-44.

ID	df	Temp. Range	10 m	20 m	40 m	60 m
0.10 mm	0.10 µm	-60 to 320/350 °C	227-36317-01	–	–	–
0.15 mm	0.15 µm	-60 to 320/350 °C	–	227-36030-01	–	–
	2.00 µm	-60 to 320/350 °C	–	227-36031-01	–	–
0.18 mm	0.10 µm	-60 to 320/350 °C	–	–	–	227-36032-01
	0.18 µm	-60 to 320/350 °C	–	227-36033-01	227-36033-02	–
	0.36 µm	-60 to 320/350 °C	–	227-36034-01	–	–
ID	**df**	**Temp. Range**		**15 m**	**30 m**	**60 m**
0.25 mm	0.10 µm	-60 to 320/350 °C	–	227-36035-01	227-36035-02	–
	0.25 µm	-60 to 320/350 °C	–	227-36036-01	221-75954-30	227-36036-02
	0.50 µm	-60 to 320/350 °C	–	227-36037-01	227-36037-02	–
	1.00 µm	-60 to 320/350 °C	–	227-36038-01	221-75956-30	227-36038-02
0.32 mm	0.25 µm	-60 to 320/350 °C	–	227-36039-01	227-36039-02	–
	0.50 µm	-60 to 320/350 °C	–	–	227-36040-01	–
	1.00 µm	-60 to 320/350 °C	–	–	227-36041-01	–
0.53 mm	1.50 µm	-60 to 320/330 °C	–	–	227-36032-02	–

Benzodiazepines



Peaks

1. Oxazepam
2. Lorazepam
3. Diazepam
4. Flunitrazepam
5. Prazepam
6. Clonazepam
7. Alprazolam

Conditions

Instrument : GCMS-QP2010
Column : SH-I-5Sil MS, 30 m, 0.25 mm ID, 0.25 µm (P/N: 221-75954-30)
Sample : Diluent: Butyl chloride
Conc.: 15 µg/mL
Inj. Vol. : 1 µL splitless (hold 1 min)
Inj. Temp : 280 °C
Purge Flow : 32.2 mL/min (20:1 split)
Oven Temp : 200 °C to 330 °C at 15 °C/min (hold 3 min)
Carrier Gas : He, constant linear velocity mode, 50 cm/sec.
Detector : MS-QP
Transfer Line Temp: 280 °C
Source Temp: 200 °C
Solvent Delay Time: 4 min
Tune: PFTBA
Ionization: EI
Scan Range: 50-350

SH-I-XLB

- Low-polarity proprietary phase
- General-purpose columns exhibiting extremely low bleed. Ideal for many GCMS applications, including pesticides, PCB congeners (e.g., Aroclor mixes), PAHs.
- Unique selectivity.
- Similar phases: DB-XLB, VF-Xms

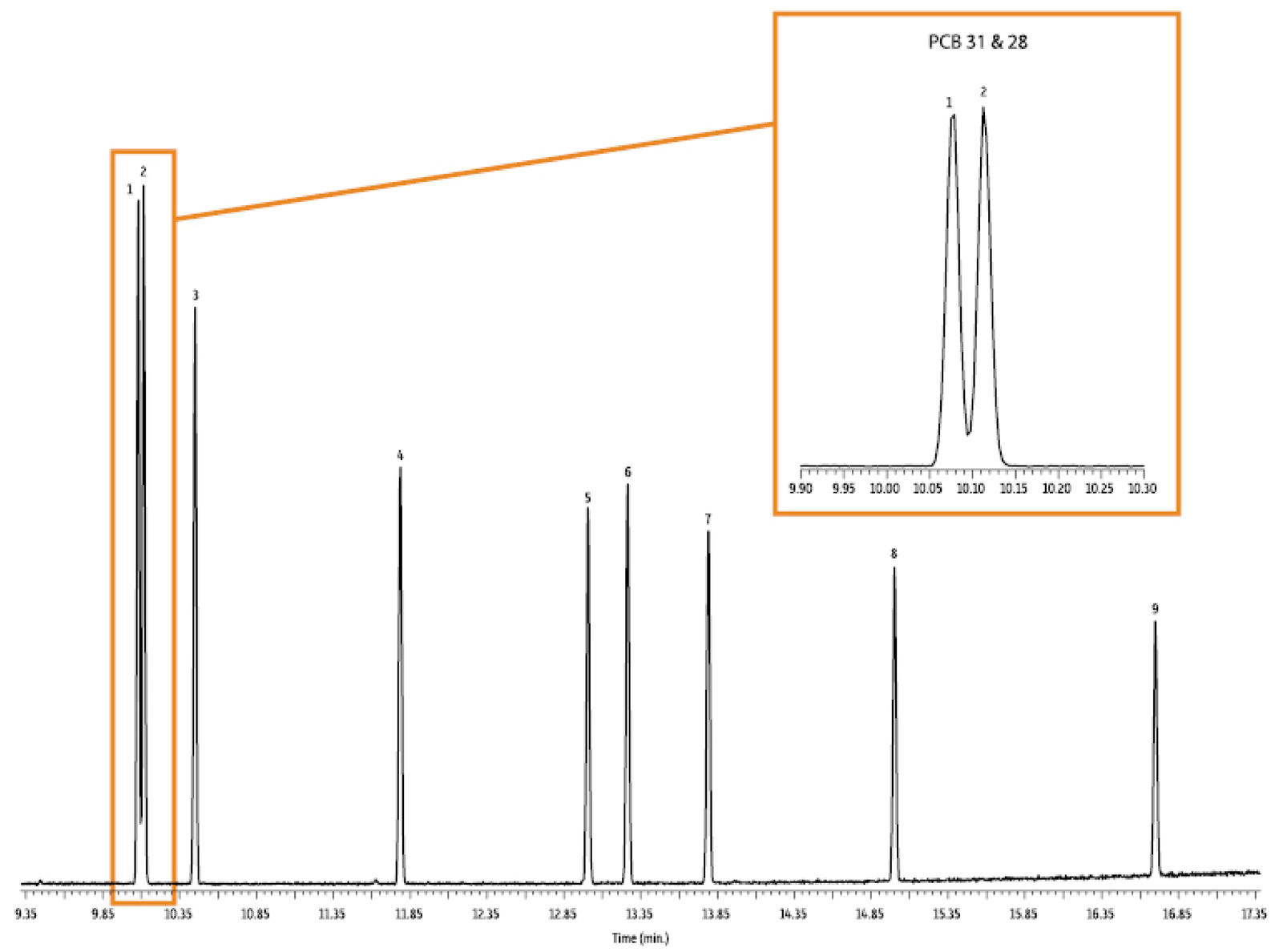
ID	df	Temp. Range	20 m	30 m	60 m
0.18 mm	0.18 µm	30 to 340/360 °C	227-36309-01	–	–
0.25 mm	0.10 µm	30 to 340/360 °C	–	227-36042-01	–
	0.25 µm	30 to 340/360 °C	–	227-36043-01	227-36043-02
	0.50 µm	30 to 340/360 °C	–	227-36044-01	–
	1.00 µm	30 to 340/360 °C	–	227-36045-01	–
0.32 mm	0.25 µm	30 to 340/360 °C	–	227-36046-01	227-36046-02
	0.50 µm	30 to 340/360 °C	–	227-36047-01	–
	1.00 µm	30 to 340/360 °C	–	227-36048-01	–
0.53 mm	0.50 µm	30 to 320/360 °C	–	227-36049-01	–
	1.50 µm	30 to 320/360 °C	–	227-36050-01	–

* Maximum temperatures listed are for shorter length columns. Longer columns may have a different maximum temperature.

EU PCB Congeners

Peaks

1. PCB 31
2. PCB 28
3. PCB 52
4. PCB 101
5. PCB 118
6. PCB 153
7. PCB 138
8. PCB 180
9. PCB 194



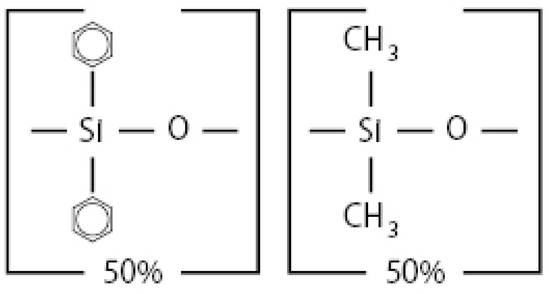
Conditions

Column : SH-I-XLB, 30 m, 0.25 mm ID, 0.25 µm (P/N: 227-36043-01)
Sample : PCB congener standard
Diluent: Dichloromethane
Conc.: 3.5 ppm
Inj. Vol. : 0.5 µL splitless (hold 1.75 min)
Inj. Temp : 300 °C
Purge Flow : 50 mL/min
Oven Temp : 40 °C (hold 2 min) to 240 °C at 30 °C/min (hold 2 min) to 340 °C at 10 °C/min (hold 5 min)
Carrier Gas : He, constant flow rate 1 mL/min
Detector : MS-QP
Transfer Line Temp: 300 °C
Source Temp: 280 °C
Ionization: EI
Scan Range: 45-550

SH-I-17

- Mid-polarity phase: Crossbond™ 50% diphenyl / 50% dimethyl polysiloxane
- General-purpose columns for pesticides, herbicides, rosin acids, phthalate esters, triglycerides, sterols.
- Similar phases: HP-17, DB-17, DB-17HT, DB-608, SPB-17

SH-I-17 Structure

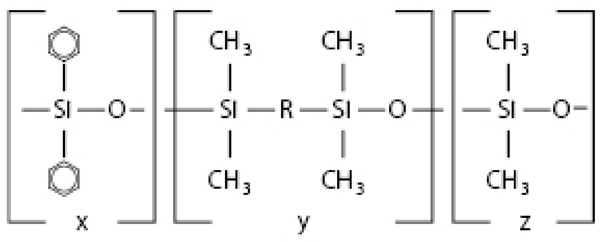


ID	df	Temp. Range	20 m	30 m
0.18 mm	0.18 µm	40 to 280/320 °C	227-36061-01	–
0.25 mm	0.25 µm	40 to 280/320 °C	–	221-75907-30
	0.50 µm	40 to 280/320 °C	–	227-36062-01
	1.00 µm	40 to 280/320 °C	–	227-36063-01
0.32 mm	0.25 µm	40 to 280/320 °C	–	227-36064-01
	0.50 µm	40 to 280/320 °C	–	227-36065-01
	1.00 µm	40 to 280/320 °C	–	227-36066-01
0.53 mm	0.25 µm	40 to 280/320 °C	–	227-36067-01
	0.50 µm	40 to 280/320 °C	–	227-36068-01
	0.83 µm	40 to 280/320 °C	–	227-36069-01
	1.00 µm	40 to 280/320 °C	–	221-76193-30
	1.50 µm	40 to 280/320 °C	–	227-36070-01

SH-I-35Sil MS

- Mid-polarity: Crossbond™ phase (similar to 35% phenyl methyl polysiloxane)
- Very low-bleed phase for GCMS analysis.
- Special selectivity and excellent inertness for substituted polar compounds, such as drugs, pesticides, herbicides, PCBs, phenols, etc.
- Provides superior separation for cannabinoids.
- Similar phases: DB-35ms, DB-35ms UI, VF-35ms

SH-I-35Sil MS Structure

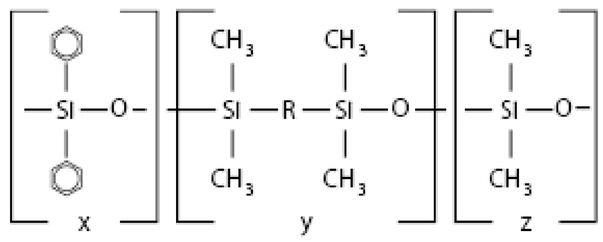


ID	df	Temp. Range	15 m	30 m
0.25 mm	0.25 µm	50 to 340/360 °C	227-36051-01	227-36051-02
	0.50 µm	50 to 340/360 °C	227-36052-01	227-36052-02
	1.00 µm	50 to 320/340 °C	227-36053-01	227-36053-02
0.32 mm	0.25 µm	50 to 340/360 °C	227-36054-01	227-36054-02
	0.50 µm	50 to 340/360 °C	227-36055-01	227-36055-02
	1.00 µm	50 to 320/340 °C	227-36056-01	227-36056-02
0.53 mm	0.50 µm	50 to 340/360 °C	227-36057-01	227-36057-02
	1.00 µm	50 to 325/340 °C	227-36058-01	227-36058-02
	1.50 µm	50 to 310/330 °C	227-36059-01	227-36059-02
	3.00 µm	50 to 280/300 °C	227-36060-01	227-36060-02

SH-I-17Sil MS

- Mid-polarity Crossbond™ phase (similar to 50% phenyl methyl polysiloxane)
- Low bleed for use with sensitive detectors, such as MS.
- Excellent inertness and selectivity for active environmental compounds, such as PAHs.
- Equivalent to USP G3 phase.
- Similar phases: DB-17ms, HP-17, DB-17, VF-17ms, CP-Sil 24 CB

SH-I-17Sil MS Structure



ID	df	Temp. Range	30 m	60 m
0.25 mm	0.25 µm	40 to 340/360 °C	221-75916-30	227-36071-01
0.32 mm	0.25 µm	40 to 340/360 °C	227-36072-01	–

* Maximum temperatures listed are for shorter length columns. Longer columns may have a different maximum temperature.

SH-I-PAH

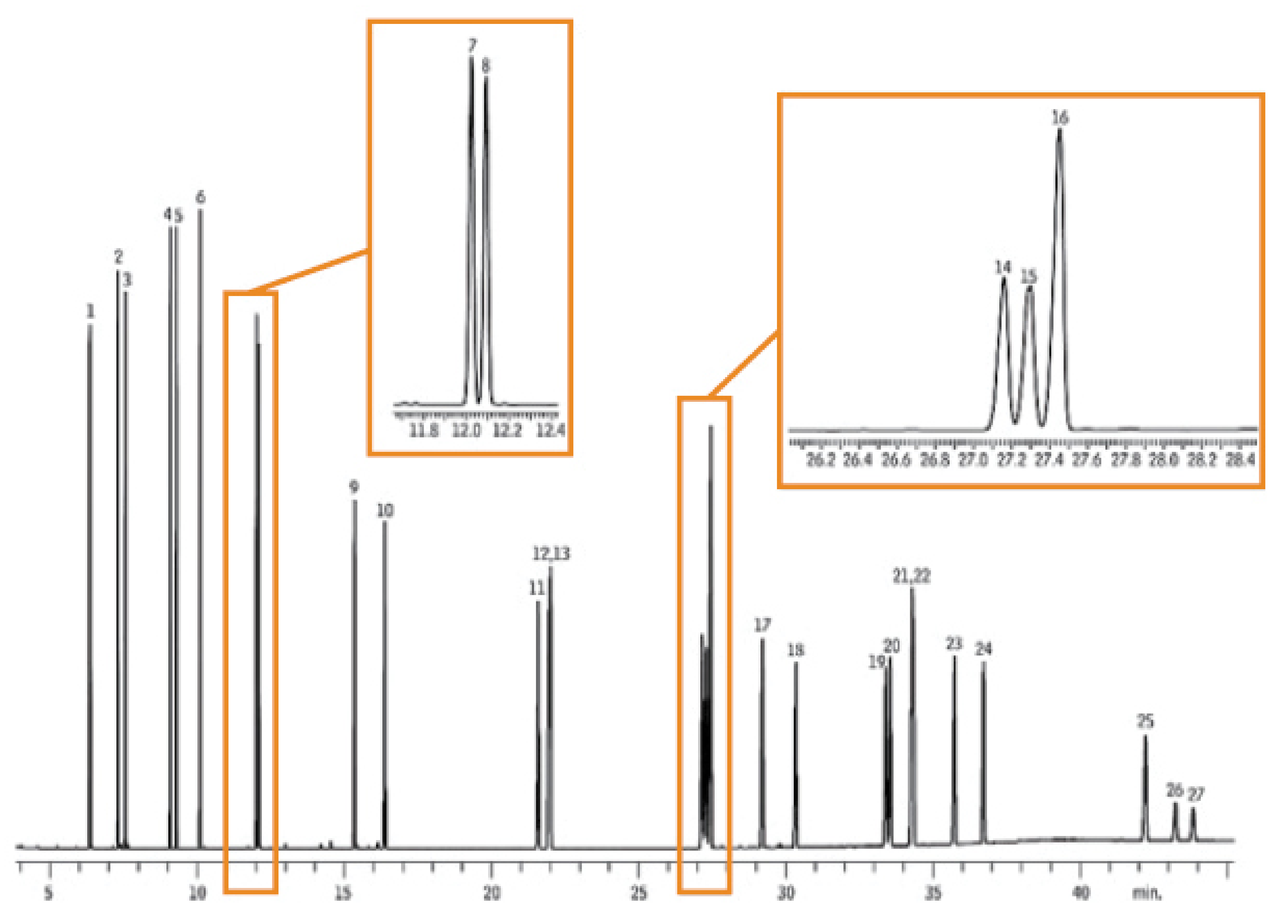
- Mid-polarity proprietary phase
- Ideal for EFSA PAH4 analysis—separates all priority compounds: benz[a]anthracene, chrysene, benzo[b]fluoranthene and benzo[a] pyrene.
- Best resolution of chrysene from interfering PAHs, triphenylene, and cyclopenta[cd]pyrene.
- Complete separation of benzo [b], [k], [j], and [a] fluoranthenes.

ID	df	Temp. Range	30 m	40 m	60 m
0.18 mm	0.07 µm	to 360 °C	–	227-36073-01	–
0.25 mm	0.10 µm	to 360 °C	227-36074-01	–	227-36074-02

Polycyclic Aromatic Hydrocarbons (US EPA Method 8100)

Peaks

1. Naphthalene
2. 2-Methylnaphthalene
3. 1-Methylnaphthalene
4. Acenaphthylene
5. Acenaphthene
6. Fluorene
7. Phenanthrene
8. Anthracene
9. Fluoranthene
10. Pyrene
11. Benz[a]anthracene
12. Chrysene
13. Triphenylene
14. Benzo[b]fl uoranthene
15. Benzo[k]fl uoranthene
16. Benzo(j)fl uoranthene
17. Benzo[a]pyrene
18. 3-Methylcholanthrene
19. Dibenz(a,h)acridine
20. Dibenz[a,j]acridine
21. Indeno[1,2,3-cd]pyrene
22. Dibenz[a,h]anthracene
23. Benzo[ghi]perylene
24. 7H-Dibenzo[c,g]carbazole
25. Dibenzo[a,e]pyrene
26. Dibenzo(a,i)pyrene
27. Dibenzo(a,h)pyrene



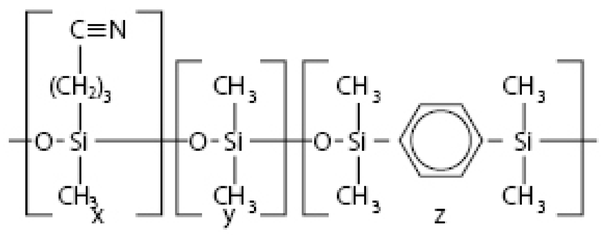
Conditions

Column : SH-I-17Sil MS, 30 m, 0.25 mm ID, 0.25 um (P/N: 221-75916-30)
Inj. Vol. : 0.5 µL splitless (hold 1.75 min)
Inj. Temp : 320 °C
Purge Flow : 75 mL/min
Oven Temp : 65 °C (hold 0.5 min) to 220 °C at 15 °C/min to 330 °C at 4 °C/min (hold 15 min)
Carrier Gas : He, constant flow rate 2.0 mL/min
Detector : FID, 320 °C

SH-I-624Sil MS

- Mid-polarity Crossbond™ silarylene phase (similar to 6% cyanopropylphenyl / 94%dimethyl polysiloxane)
- Low-bleed, high-thermal stability column—maximum temperatures up to 300–320 °C.
- Inert—excellent peak shape for a wide range of compounds.
- Selective—G43 phase highly selective for volatile organics and residual solvents, great choice for USP<467>.
- Manufactured for column-to-column reproducibility—well-suited for validated methods.
- Similar phases: HP-624, DB-624, VF-624ms, CP-Select 624 CB

SH-I-624Sil MS Structure

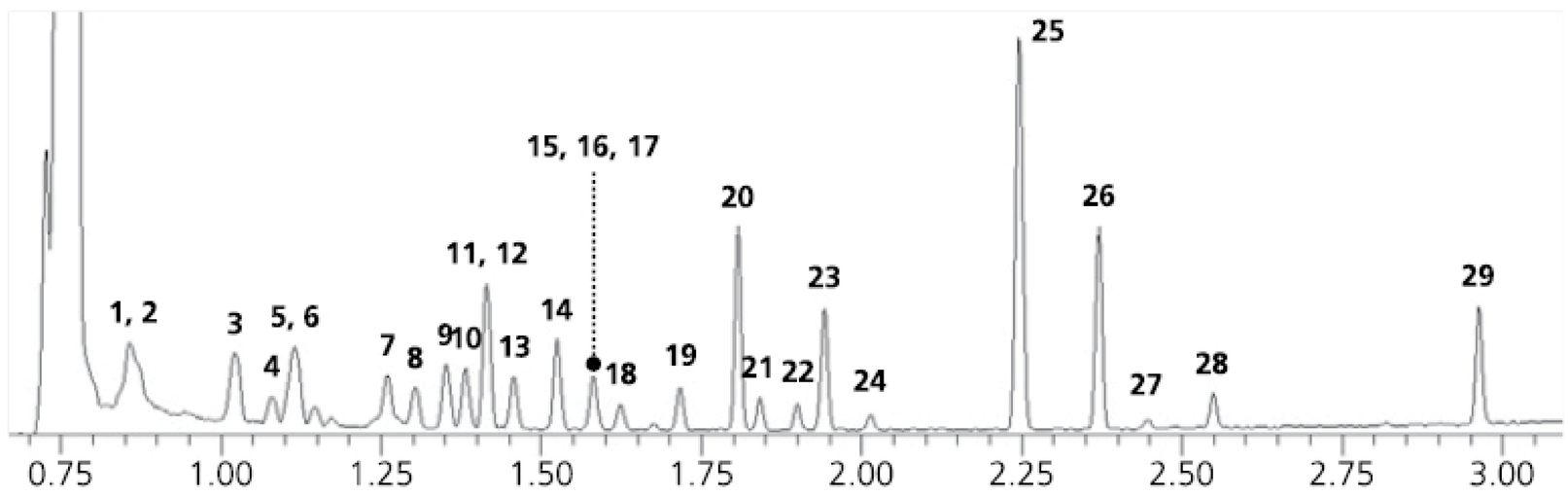


ID	df	Temp. Range	20 m	30 m	60 m	75 m	105 m
0.18 mm	1.00 µm	-20 to 300/320 °C	227-36075-01	–	–	–	–
0.25 mm	1.40 µm	-20 to 300/320 °C	–	221-75962-30	227-36076-01	–	–
0.32 mm	1.80 µm	-20 to 300/320 °C	–	227-36077-01	221-75963-60	–	–
0.53 mm	3.00 µm	-20 to 280/300 °C	–	227-36078-01	227-36078-02	227-36078-03	227-36078-04

Ultra-Fast Analysis of Volatile Organic Compounds in Water

Peaks

1. Vinyl chloride-d3 (ISTD)
2. Vinyl chloride
3. 1,1-dichloroethylene
4. Dichloromethane
5. Methyl-t-butyl ether (MTBE)
6. Trans-1,2-dichloroethylene
7. Cis-1,2-dichloroethylene
8. Trichloromethane
9. 1,1,1-trichloroethane
10. Carbon tetrachloride
11. 1,2-dichloroethane
12. Benzene
13. Fluorobenzene (ISTD)
14. Trichloroethylene
15. 1,4-dioxane-d8 (ISTD)
16. 1,2-dichloropropane
17. 1,4-dioxane
18. Bromodichloromethane
19. Cis-1,3-dichloropropene
20. Toluene
21. Trans-1,3-dichloropropene
22. 1,1,2-trichloroethane
23. Tetrachloroethylene
24. Dibromochloromethane
25. m-,p-xylene
26. o-xylene
27. Bromoform
28. 4-bromofl uorobenzene
29. 1,4-dichlorobenzene



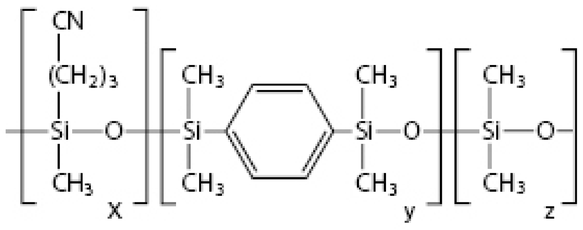
Conditions

Instrument	: GCMS-TQ8030 + HS-20 Loop
Column	: SH-I-624Sil MS, 20 m, 0.18 mm ID, 1.00 µm (P/N: 227-36075-01)
Headspace-Loop	: Loop volume: 1 mL
Sample Equilibration	: 70 °C for 30 min
Vial pressurization	: 0.5 min, 50 kPa, equilibration 0.05 min
Needle Flush	: 2 min
Sample Pathway Temp	: 200 °C
Transfer Line Temp	: 200 °C
Inj.	: Split (split ratio 30:1)
Oven Temp	: 70 °C, 40 °C/min to 220 °C (hold 0.5 min)
Carrier Gas	: He, constant linear velocity mode, 50 cm/sec
Detector	: MS: SIM MS/MS: MRM Event (loop) time: 0.15 sec Source Temp: 200 °C Interface Temp: 230 °C

SH-I-1301Sil MS

- Mid-polarity Crossbond™ silarylene phase (similar to 6% cyanopropylphenyl / 94%dimethyl polysiloxane)
- Highest thermal stability in the industry ensures dependable, accurate MS results and increased uptime.
- Stabilized cyano phase selectivity improves the performance of existing methods. Ideal for solvents, glycols, and other polar compounds.
- Rigorous QC testing ensures inertness and accurate, reliable data for multiple compound classes.
- Similar phase: VF-1301ms

SH-I-1301Sil MS Structure



ID	df	Temp. Range	15 m	30 m	60 m
0.25 mm	0.25 µm	-60 to 320 °C	–	227-36079-01	227-36079-02
	1.00 µm	-60 to 320 °C	–	227-36080-01	227-36080-02
0.32 mm	0.25 µm	-60 to 320 °C	–	227-36081-01	–
	1.00 µm	-60 to 320 °C	–	227-36082-01	227-36082-02
	1.50 µm	-60 to 320 °C	–	227-36083-01	227-36083-02
0.53 mm	1.00 µm	-60 to 320 °C	227-36084-01	227-36084-02	–
	1.50 µm	-60 to 320 °C	–	227-36085-01	–
	3.00 µm	-60 to 320 °C	–	227-36086-01	227-36086-02

Guard columns for SH are also available. Please refer to page C-44.

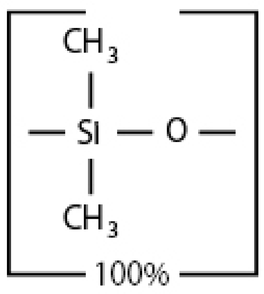
Capillary Columns

General-Purpose Columns

SH-1

- Non-polar phase: Crossbond™ 100% dimethyl polysiloxane
- General-purpose columns for solvent impurities, PCB congeners (e.g., Aroclor mixes), simulated distillation, arson accelerants, gases, natural gas odorants, sulfur compounds, essential oils, hydrocarbons, semi-volatiles, pesticides, oxygenates.
- Equivalent to USP G1, G2, G38 phases.
- Similar phases: HP-1, DB-1, CP-Sil 5 CB, SPB-1

SH-1 Structure



For SH-1 columns with Integra-Guard™ column, please refer to page C-44.

ID	df	Temp. Range	10 m	15 m	25 m	30 m	60 m	105 m
0.25 mm	0.10 µm	-60 to 330/350 °C	–	221-75718-15	–	221-75718-30	227-36096-01	–
	0.25 µm	-60 to 330/350 °C	221-75719-10	–	221-75719-25	221-75719-30	221-75719-60	–
	0.50 µm	-60 to 330/350 °C	–	–	–	227-36097-01	227-36097-02	–
	1.00 µm	-60 to 320/340 °C	–	–	–	227-36098-01	227-36098-02	221-75721-05
0.32 mm	0.10 µm	-60 to 330/350 °C	–	–	–	227-36099-01	227-36099-02	–
	0.25 µm	-60 to 330/350 °C	–	–	–	221-75723-30	221-75723-60	–
	0.50 µm	-60 to 330/350 °C	–	–	–	221-75724-30	227-36100-01	–
	1.00 µm	-60 to 320/340 °C	–	–	–	221-75725-30	221-75725-60	–
	1.50 µm	-60 to 310/330 °C	–	–	–	227-36101-01	227-36101-02	–
	3.00 µm	-60 to 280/300 °C	–	–	–	227-36102-01	227-36102-02	–
	4.00 µm	-60 to 280/300 °C	–	–	–	227-36103-01	–	–
	5.00 µm	-60 to 260/280 °C	–	–	–	221-75728-30	221-75728-60	–
0.53 mm	0.10 µm	-60 to 320/340 °C	–	–	–	227-36104-01	–	–
	0.25 µm	-60 to 320/340 °C	–	–	–	221-75729-30	227-36105-01	–
	0.50 µm	-60 to 310/330 °C	–	221-75730-15	–	221-75730-30	227-36106-01	–
	1.00 µm	-60 to 310/330 °C	–	221-75731-15	–	221-75731-30	221-75731-60	–
	1.50 µm	-60 to 310/330 °C	–	221-75732-15	–	221-75732-30	227-36107-01	–
	3.00 µm	-60 to 270/290 °C	–	–	–	221-75733-30	221-75733-60	–
	5.00 µm	-60 to 270/290 °C	–	–	–	221-75734-30	221-75734-60	–
	7.00 µm	-60 to 240/260 °C	–	–	–	227-36108-01	227-36108-02	–

* Maximum temperatures listed are for shorter length columns. Longer columns may have a different maximum temperature.

SH-PONA

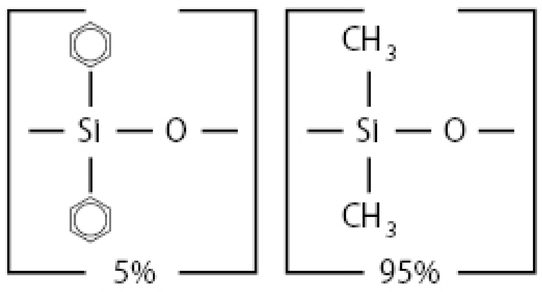
Compatible with ASTM and CGSB for hydrocarbon analysis.

ID	df	Temp. Range	100 m
0.25 mm	0.50 µm	-60 to 300/340 °C	221-76196-00

SH-5

- Low-polarity phase: Crossbond™ 5% diphenyl / 95% dimethyl polysiloxane
- General-purpose columns for drugs, solvent impurities, pesticides, hydrocarbons, PCB congeners (e.g., Aroclor mixes), essential oils, semi-volatiles.
- Equivalent to USP G27 and G36 phases.
- Similar phases: HP-5, DB-5, CP-Sil 8 CB, SPB-5

SH-5 Structure



For SH-5 columns with Integra-Guard™ column, please refer to page C-44.

ID	df	Temp. Range	15 m	25 m	30 m	60 m
0.25 mm	0.10 µm	-60 to 330/350 °C	221-75700-15	–	221-75700-30	227-36109-01
	0.25 µm	-60 to 330/350 °C	227-36313-01	–	221-75701-30	227-36110-01
	0.50 µm	-60 to 330/350 °C	–	221-76178-25	221-76178-30	227-36111-01
	1.00 µm	-60 to 320/340 °C	–	–	221-75702-30	227-36112-01
0.32 mm	0.10 µm	-60 to 330/350 °C	227-36312-01	–	227-36113-01	–
	0.25 µm	-60 to 330/350 °C	221-75703-15	–	221-75703-30	221-75703-60
	0.50 µm	-60 to 330/350 °C	–	–	221-75704-30	227-36114-01
	1.00 µm	-60 to 320/340 °C	–	–	221-75705-30	221-75705-60
	1.50 µm	-60 to 310/330 °C	–	–	221-76181-30	227-36115-01
	3.00 µm	-60 to 280/300 °C	–	–	227-36116-01	227-36116-02
0.53 mm	0.10 µm	-60 to 320/340°C	–	–	227-36117-01	–
	0.25 µm	-60 to 320/340 °C	227-36314-01	–	221-75708-30	227-36118-01
	0.50 µm	-60 to 320-330 °C	–	–	221-75709-30	227-36119-01
	1.00 µm	-60 to 320/330 °C	221-75710-15	–	221-75710-30	221-75710-60
	1.50 µm	-60 to 310/330 °C	221-75711-15	–	221-75711-30	227-36120-01
	3.00 µm	-60 to 270/290 °C	–	–	221-75712-30	227-36121-01
	5.00 µm	-60 to 270/290 °C	–	–	221-75713-30	221-75713-60

* Maximum temperatures listed are for shorter length columns. Longer columns may have a different maximum temperature.

Metal columns are also available. Please refer to page C-43.

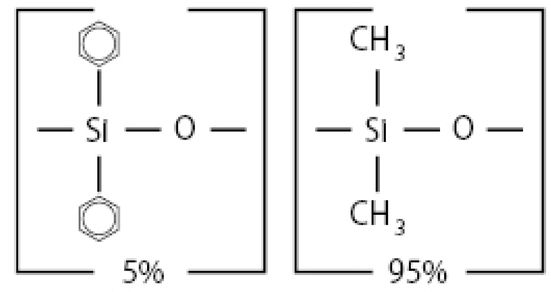
Capillary Columns

General-Purpose Columns

SH-5MS

- Low-polarity phase: Crossbond™ 5% diphenyl / 95% dimethyl polysiloxane
- Column specifically tested for low-bleed performance.
- General-purpose columns for drugs, solvent impurities, pesticides, hydrocarbons, PCB congeners (e.g., Aroclor mixes), essential oils, semi-volatiles.
- Equivalent to USP G27 and G36 phases.
- Similar phases: HP-5, DB-5, CP-Sil 8 CB, SPB-5

SH-5MS Structure

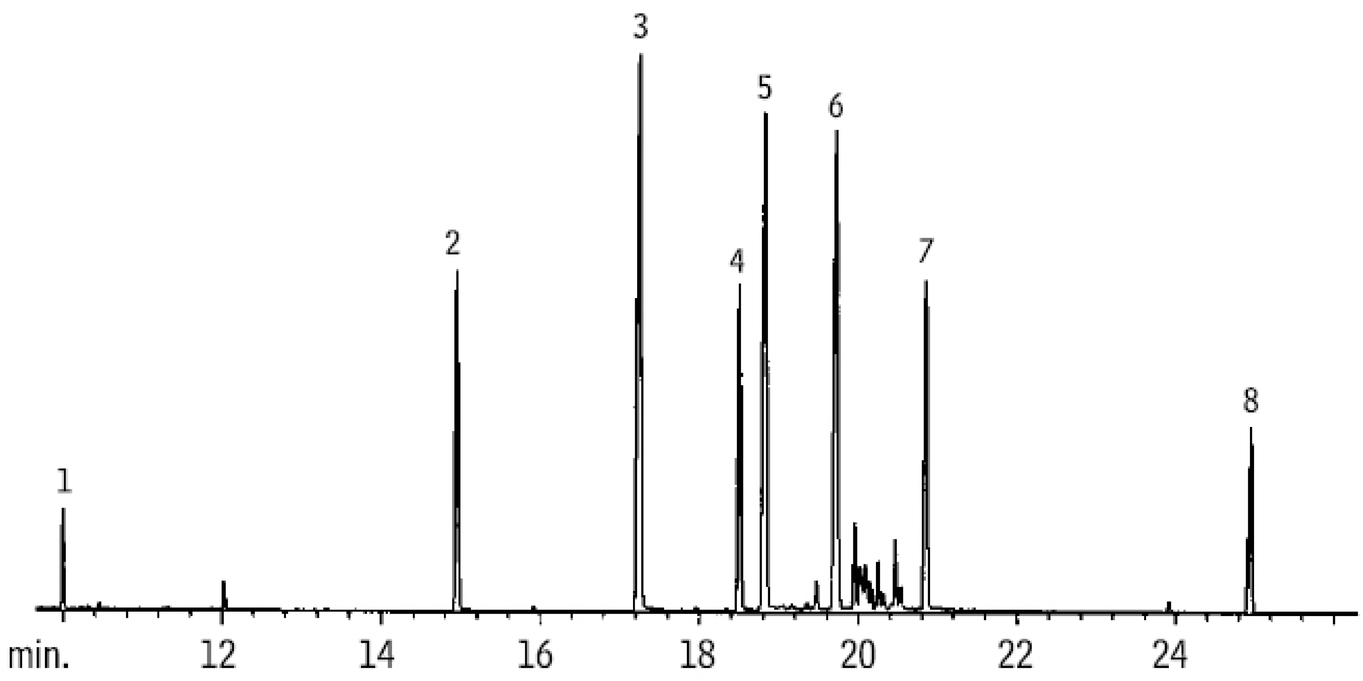


For SH-I-5MS columns with Integra-Guard™ column, please refer to page C-44.

ID	df	Temp. Range	15 m	30 m	60 m
0.25 mm	0.10 µm	-60 to 330/350 °C	221-75854-15	221-75854-30	227-36122-01
	0.25 µm	-60 to 330/350 °C	221-75855-15	221-75855-30	227-36123-01
	0.50 µm	-60 to 330/350 °C	–	227-36124-01	227-36124-02
	1.00 µm	-60 to 325/350 °C	–	221-75857-30	–
0.32 mm	0.10 µm	-60 to 330/350 °C	–	227-36125-01	227-36125-02
	0.25 µm	-60 to 330/350 °C	–	221-75858-30	221-75858-60
	0.50 µm	-60 to 330/350 °C	–	227-36126-01	227-36126-02
	1.00 µm	-60 to 325/350 °C	–	227-36127-01	–
0.53 mm	0.50 µm	-60 to 320/340 °C	–	221-76191-30	–
	1.00 µm	-60 to 320/340 °C	–	227-36128-01	–
	1.50 µm	-60 to 310/330 °C	–	227-36129-01	–

* Maximum temperatures listed are for shorter length columns. Longer columns may have a different maximum temperature.

Endocrine Disruptors: Alkyl Phenols



Peaks

1. *tert*-butyl phenol
2. *n*-pentyl phenol
3. *n*-hexyl phenol
4. *n*-heptyl phenol
5. *tert*-octyl phenol
6. *n*-octyl phenol
7. *n*-nonyl phenol
8. bisphenol A

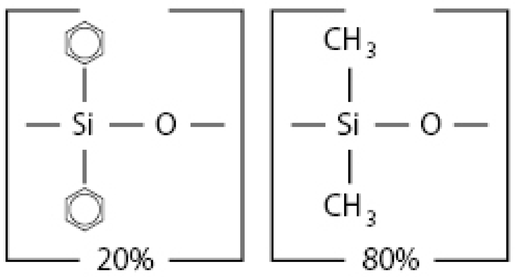
Conditions

Column	: SH-5MS, 30 m, 0.25 mm ID, 0.25 µm (P/N: 221-75855-30).
Conc.	: 5–10 ng on-column
Inj.	: Splitless, purge on at 1 min
Inj. Temp	: 275 °C
Purge Flow	: 32.2 mL/min (20:1 split)
Oven Temp	: 35 °C (hold 1 min) to 300 °C at 10 °C/min (hold 15 min)
Carrier Gas	: He
Det. Temp	: 310 °C

SH-20

- Mid-polarity phase: Crossbond™ 20% diphenyl / 80% dimethyl polysiloxane
- General-purpose columns for volatile compounds, flavor compounds, alcoholic beverages.
- Equivalent to USP G28 and G32 phases.
- Similar phases: SPB-20, 007-20, AT-20, EC-20.

SH-20 Structure

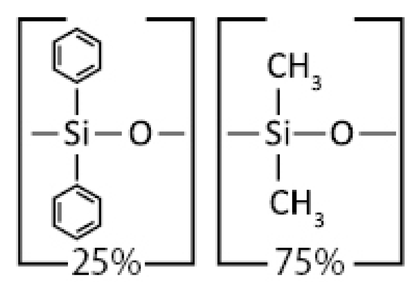


ID	df	Temp. Range	30 m	60 m
0.25 mm	0.10 µm	-20 to 300/320 °C	227-36130-01	227-36130-02
	0.25 µm	-20 to 300/320 °C	227-36131-01	227-36131-02
	0.50 µm	-20 to 290/310 °C	227-36132-01	227-36132-02
	1.00 µm	-20 to 280/300 °C	227-36133-01	227-36133-02
0.32 mm	0.10 µm	-20 to 300/320 °C	227-36134-01	227-36134-02
	0.25 µm	-20 to 300/320 °C	227-36135-01	227-36135-02
	0.50 µm	-20 to 290/310 °C	227-36136-01	227-36136-02
	1.00 µm	-20 to 280/300 °C	227-36137-01	227-36137-02
	1.50 µm	-20 to 270/290 °C	227-36138-01	227-36138-02
	3.00 µm	-20 to 250/270 °C	227-36139-01	227-36139-02
0.53 mm	0.10 µm	-20 to 260/280 °C	227-36140-01	227-36140-02
	0.25 µm	-20 to 260/280 °C	–	227-36141-01
	0.50 µm	-20 to 260/280 °C	227-36142-01	–
	1.00 µm	-20 to 260/280 °C	227-36143-01	227-36143-02
	1.50 µm	-20 to 250/270 °C	227-36144-01	–
	3.00 µm	-20 to 240/260 °C	227-36145-01	227-36145-02

SH-25

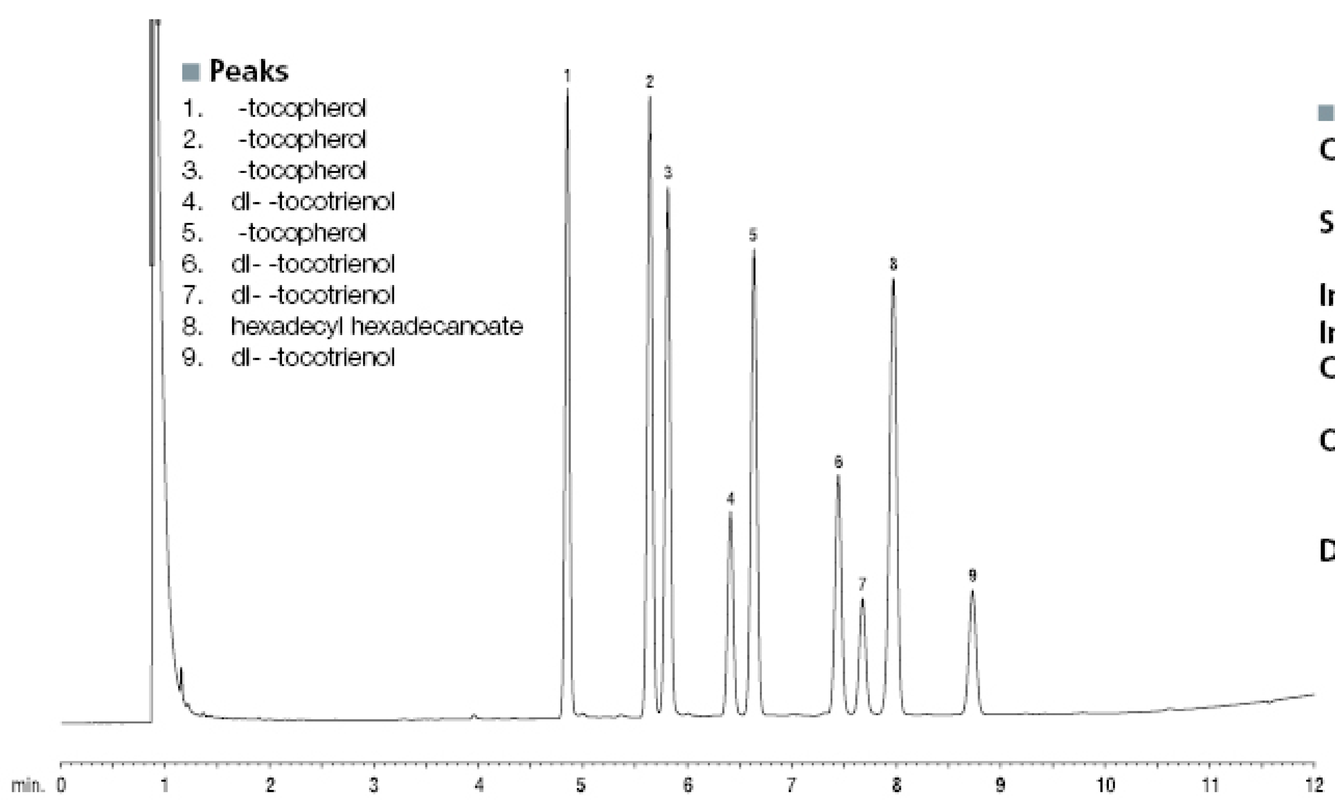
- Mid-polarity phase: Crossbond™ 25% diphenyl / 75% dimethyl polysiloxane
- General-purpose columns for volatile compounds, flavor compounds, alcoholic beverages.

SH-25 Structure



ID	df	Temp. Range	60 m
0.32 mm	1.49 µm	-20 to 250/270 °C	227-36329-01

Tocopherols and Tocotrienols



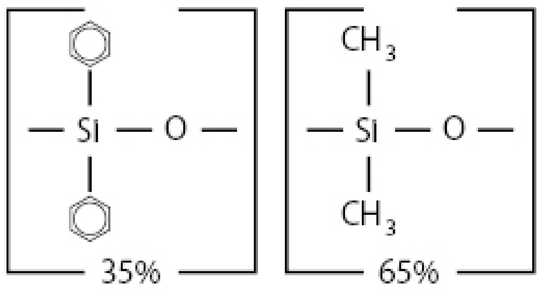
Conditions

Column	: SH-20, 30 m, 0.53 mm ID, 0.50 µm (P/N: 227-36142-01)
Sample	: 1 mg/mL each component in isooctane
Inj. Vol.	: 1 µL split (split ratio 20:1)
Inj. Temp	: 320 °C
Carrier Gas	: Hydrogen, constant flow rate 5.2 mL/min
Oven Temp	: 270 °C to 290 °C at 2 °C/min 290 °C to 320 °C at 10 °C/min (hold 1 min)
Detector	: FID, 320 °C

SH-35/SH-35MS

- Mid-polarity phase: Crossbond™ 35% diphenyl / 65% dimethyl polysiloxane
- General-purpose columns for organochlorine pesticides, PCB congeners (e.g., Aroclor mixes), herbicides, pharmaceuticals, sterols, rosin acids, phthalate esters.
- Equivalent to USP G42 phase.
- Similar phases: HP-35, DB-35, SPB-35, SPB-608

SH-35



SH-35

ID	df	Temp. Range	30 m	60 m
0.25 mm	0.10 µm	40 to 320 °C	227-36146-01	227-36146-02
	0.25 µm	40 to 320 °C	227-36147-01	227-36147-02
	0.50 µm	40 to 310 °C	227-36148-01	227-36148-02
	1.00 µm	40 to 290 °C	227-36149-01	227-36149-02
0.32 mm	0.10 µm	40 to 320 °C	227-36150-01	227-36150-02
	0.25 µm	40 to 320 °C	227-36151-01	227-36151-02
	0.50 µm	40 to 310 °C	227-36152-01	227-36152-02
	1.00 µm	40 to 290 °C	227-36153-01	227-36153-02
	1.50 µm	40 to 270/290 °C	227-36154-01	–
	3.00 µm	40 to 250/270 °C	227-36155-01	227-36155-02
0.53 mm	0.10 µm	40 to 260/280 °C	–	227-36156-01
	0.25 µm	40 to 260/280 °C	–	227-36157-01
	0.50 µm	40 to 300 °C	227-36158-01	227-36158-02
	1.00 µm	40 to 290 °C	227-36159-01	227-36159-02
	1.50 µm	40 to 280 °C	227-36160-01	227-36160-02
	3.00 µm	40 to 240/260 °C	227-36161-01	227-36161-02

SH-35MS (Low-bleed for GCMS analysis)

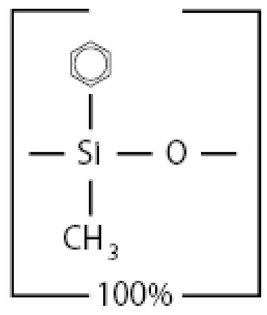
ID	df	Temp. Range	30 m
0.25 mm	0.25 µm	40 to 320 °C	221-75835-30

Download the brochure of GC/GCMS consumables from
http://www.shimadzu.com/an/gc/column_consumable/index.html

SH-50

- Mid-polarity phase: Crossbond™ 100% methyl phenyl polysiloxane
- General-purpose columns for pesticides, herbicides, rosin acids, phthalate esters, sterols.
- Equivalent to USP G3 phase.
- Similar phases: HP-50+, CP-Sil 24 CB, SPB-50

SH-50 Structure

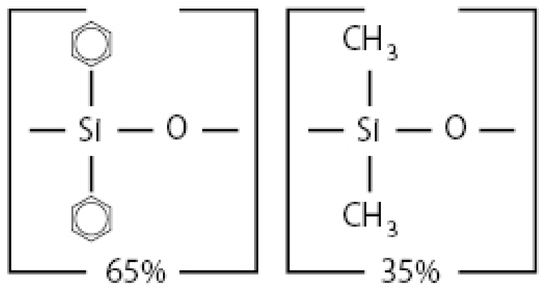


ID	df	Temp. Range	30 m	60 m
0.25 mm	0.25 µm	40 to 300/320 °C	227-36162-01	227-36162-02
	0.50 µm	40 to 290/310 °C	227-36163-01	227-36163-02
	1.00 µm	40 to 280/300 °C	227-36164-01	227-36164-02
0.32 mm	0.25 µm	40 to 300/320 °C	221-76182-30	227-36165-01
	0.50 µm	40 to 290/310 °C	227-36166-01	227-36166-02
	1.00 µm	40 to 280/300 °C	227-36167-01	227-36167-02
0.53 mm	0.50 µm	40 to 270/290 °C	227-36168-01	227-36168-02
	0.83 µm	40 to 270/290 °C	227-36169-01	–
	1.00 µm	40 to 260/280 °C	227-36170-01	227-36170-02
	1.50 µm	40 to 250/270 °C	227-36171-01	227-36171-02

SH-65

- Mid-polarity phase: Crossbond™ 65% diphenyl / 35% dimethyl polysiloxane
- General-purpose columns for phenols, fatty acids, triglycerides.
- Equivalent to USP G17 phase.

SH-65 / SH-65TG Structure



ID	df	Temp. Range	30 m
0.25 mm	0.25 µm	50 to 300 °C	227-36172-01
	0.50 µm	50 to 280/300 °C	227-36173-01
	1.00 µm	50 to 260/280 °C	227-36174-01
0.32 mm	0.25 µm	50 to 300 °C	227-36175-01
	0.50 µm	50 to 280/300 °C	227-36176-01
	1.00 µm	50 to 260/280 °C	227-36177-01
0.53 mm	1.00 µm	50 to 250/270 °C	227-36178-01

SH-65TG

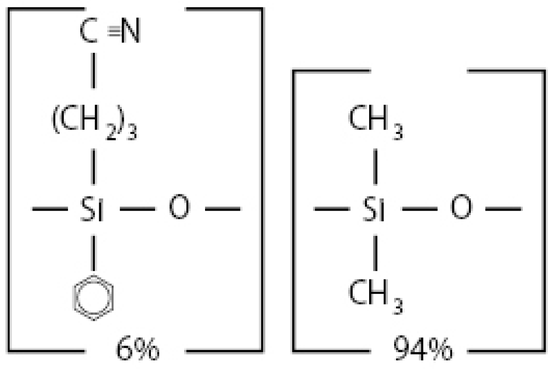
- High-polarity phase; Crossbond diphenyl dimethyl polysiloxane
- Application-specific columns, specially tested for triglycerides.
- Stable to 370 °C.

ID	df	Temp. Range	15 m	30 m
0.25 mm	0.10 µm	40 to 370 °C	227-36325-01	227-36325-02

SH-1301

- Mid-polarity phase: Crossbond™ 6% cyanopropylphenyl / 94% dimethyl polysiloxane
- General-purpose columns for residual solvents, alcohols, oxygenates, and volatile organic compounds.
- Equivalent to USP G43 phase.
- Similar phases: DB-1301, CP-1301, SPB-1301

SH-1301 Structure



For SH-1301 columns with Integra-Guard™ column, please refer to page C-44.

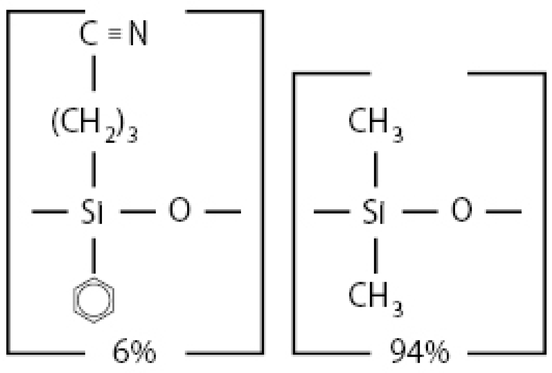
ID	df	Temp. Range	30 m	60 m
0.25 mm	0.25 µm	-20 to 280 °C	221-76194-30	221-76194-60
	0.50 µm	-20 to 270 °C	227-36203-01	–
	1.00 µm	-20 to 260 °C	227-36204-01	227-36204-02
	1.40 µm	-20 to 240 °C	–	227-36205-01
0.32 mm	0.25 µm	-20 to 280 °C	227-36206-01	227-36206-02
	0.50 µm	-20 to 270 °C	227-36207-01	227-36207-02
	1.00 µm	-20 to 260 °C	227-36208-01	227-36208-02
	1.50 µm	-20 to 250 °C	227-36209-01	227-36209-02
	1.80 µm	-20 to 240 °C	227-36210-01	227-36210-02
0.53 mm	0.25 µm	-20 to 280 °C	227-36211-01	–
	0.50 µm	-20 to 270 °C	227-36212-01	227-36212-02
	1.00 µm	-20 to 260 °C	227-36213-01	227-36213-02
	1.50 µm	-20 to 250 °C	227-36214-01	–

* Maximum temperatures listed are for shorter length columns. Longer columns may have a different maximum temperature.

SH-624

- Mid-polarity phase: Crossbond™ 6% cyanopropylphenyl / 94% dimethyl polysiloxane
- Application-specific columns for volatile organic pollutants. Recommended in U.S. EPA methods for volatile organic pollutants.
- Equivalent to USP G43 phase.
- Similar phases: HP-624, DB-624, DB-624 UI, VF-624ms, SPB-624

SH-624 Structure



For SH-624 columns with Integra-Guard™ column, please refer to page C-44.

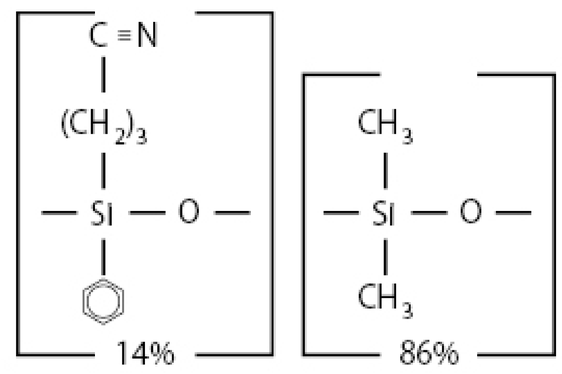
ID	df	Temp. Range	20 m	30 m	60 m	75 m
0.10 mm	0.50 µm	-20 to 240 °C	227-36332-01	–	–	–
0.18 mm	1.00 µm	-20 to 240 °C	227-36259-01	–	–	–
0.25 mm	1.40 µm	-20 to 240 °C	–	221-75863-30	227-36215-01	–
0.32 mm	1.80 µm	-20 to 240 °C	–	221-75864-30	221-75864-60	–
0.53 mm	3.00 µm	-20 to 240 °C	–	221-75865-30	221-75865-60	221-75865-75

* Maximum temperatures listed are for shorter length columns. Longer columns may have a different maximum temperature.

SH-1701

- Mid-polarity phase: Crossbond™ 14% cyanopropylphenyl / 86% dimethyl polysiloxane
- General-purpose columns for alcohols, oxygenates, PCB congeners (e.g., Aroclor mixes), pesticides, and fragrance compounds.
- Equivalent to USP G46 phase.
- Similar phases: DB-1701P, DB-1701, CP-Sil 19 CB, VF-1701ms, VF-1701 Pesticides, Equity-1701

SH-1701 Structure

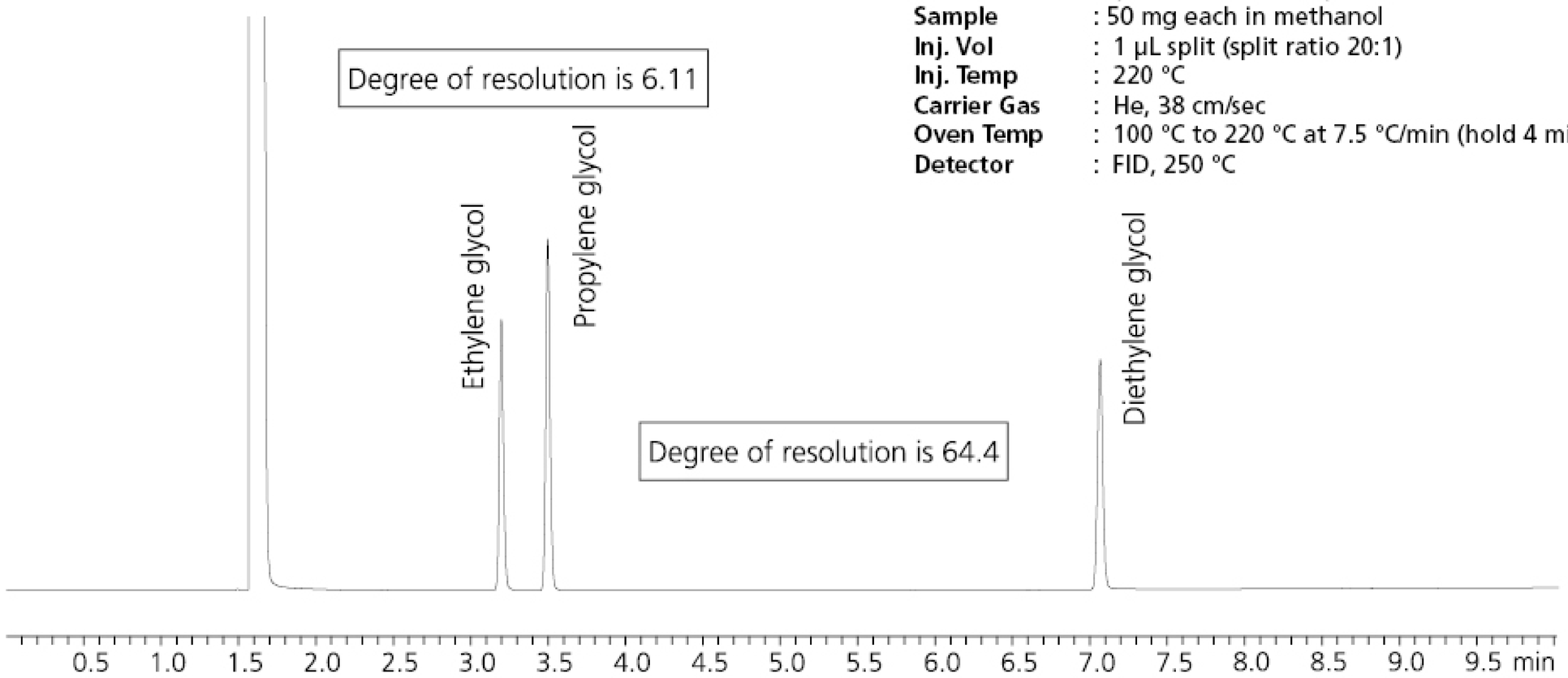


For SH-1701 columns with Intega-Guard™ column, please refer to page C-44.

ID	df	Temp. Range	15 m	30 m	60 m
0.25 mm	0.10 µm	-20 to 280 °C	–	227-36216-01	227-36216-02
	0.25 µm	-20 to 280 °C	–	221-75777-30	227-36217-01
	0.50 µm	-20 to 270/280 °C	–	221-75778-30	227-36218-01
	1.00 µm	-20 to 260/280 °C	–	221-75779-30	227-36219-01
0.32 mm	0.10 µm	-20 to 280 °C	–	221-76184-30	227-36220-01
	0.25 µm	-20 to 280 °C	221-75780-15	221-75780-30	221-75780-60
	0.50 µm	-20 to 270/280 °C	–	221-75781-30	227-36221-01
	1.00 µm	-20 to 260/280 °C	–	221-75782-30	221-75782-60
	1.50 µm	-20 to 240/260 °C	–	227-36222-01	227-36222-02
0.53 mm	0.10 µm	-20 to 270/280 °C	–	227-36223-01	227-36223-02
	0.25 µm	-20 to 270/280 °C	–	227-36224-01	–
	0.50 µm	-20 to 260/270 °C	–	227-36225-01	–
	1.00 µm	-20 to 250/270 °C	–	221-75785-30	227-36226-01
	1.50 µm	-20 to 240/260 °C	–	227-36227-01	227-36227-02
	3.00 µm	-20 to 230/250 °C	–	227-36228-01	227-36228-02

* Maximum temperatures listed are for shorter length columns. Longer columns may have a different maximum temperature.

Analysis of Ethylene Glycol and Diethylene Glycol in Propylene Glycol



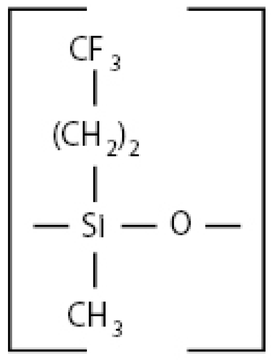
Conditions

Instrument	: GC-2010 Plus AF/AOC-20i
Column	: SH-1701, 30 m, 0.32 mm ID, 1.00 µm (P/N: 221-75782-30)
Sample	: 50 mg each in methanol
Inj. Vol	: 1 µL split (split ratio 20:1)
Inj. Temp	: 220 °C
Carrier Gas	: He, 38 cm/sec
Oven Temp	: 100 °C to 220 °C at 7.5 °C/min (hold 4 min)
Detector	: FID, 250 °C

SH-200/SH-200MS

- Mid-polarity phase: Crossbond™ trifluoropropyl methyl polysiloxane
- General-purpose columns for solvents, Freon® fluorocarbons, alcohols, ketones, silanes, glycols, and drugs of abuse.
- Equivalent to USP G6 phase.
- Similar phases: DB-210, DB-200, VF-200ms

SH-200 / SH-200MS Structure



SH-200

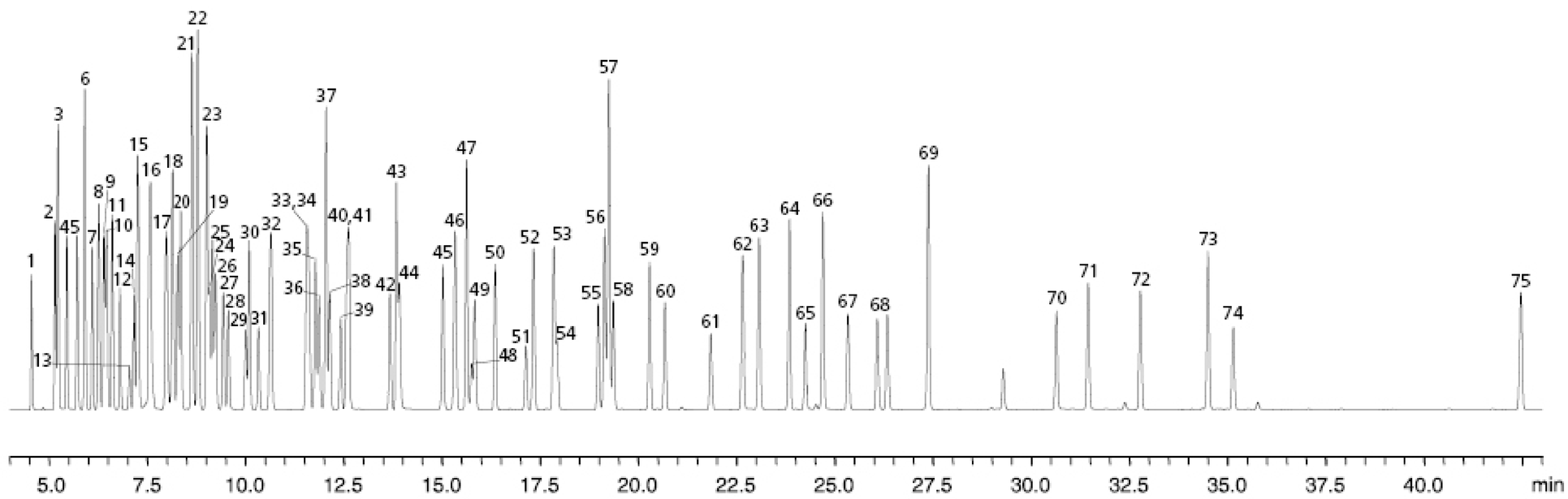
ID	df	Temp. Range	30 m	60 m	105 m
0.25 mm	0.10 µm	-20 to 320/340 °C	227-36179-01	227-36179-02	–
	0.25 µm	-20 to 320/340 °C	227-36180-01	227-36180-02	–
	0.50 µm	-20 to 310/330 °C	227-36181-01	227-36181-02	–
	1.00 µm	-20 to 290/310 °C	221-75800-30	227-36182-01	–
0.32 mm	0.10 µm	-20 to 320/340 °C	227-36183-01	227-36183-02	–
	0.25 µm	-20 to 320/340 °C	227-36184-01	227-36184-02	–
	0.50 µm	-20 to 310/330 °C	227-36185-01	227-36185-02	–
	1.00 µm	-20 to 290/310 °C	227-36186-01	227-36186-02	–
	1.50 µm	-20 to 280/300 °C	227-36187-01	227-36187-02	221-75804-15
0.53 mm	0.10 µm	-20 to 310/330 °C	227-36188-01	227-36188-02	–
	0.25 µm	-20 to 310/330 °C	227-36189-01	227-36189-02	–
	0.50 µm	-20 to 300/320 °C	227-36190-01	227-36190-02	–
	1.00 µm	-20 to 290/310 °C	227-36191-01	227-36191-02	–
	1.50 µm	-20 to 280/300 °C	227-36192-01	227-36192-02	–
	3.00 µm	-20 to 260/380 °C	227-36193-01	227-36193-02	–

* Maximum temperatures listed are for shorter length columns. Longer columns may have a different maximum temperature.

SH-200MS (Low-bleed phase for GCMS analysis)

ID	df	Temp. Range	30 m
0.25 mm	0.10 µm	-20 to 320/340 °C	227-36194-01
	0.25 µm	-20 to 320/340 °C	221-75811-30
	0.50 µm	-20 to 310/330 °C	227-36195-01
	1.00 µm	-20 to 290/310 °C	227-36196-01
0.32 mm	0.10 µm	-20 to 320/340 °C	227-36197-01
	0.25 µm	-20 to 320/340 °C	221-75814-30
	0.50 µm	-20 to 310/330 °C	227-36198-01
	1.00 µm	-20 to 290/310 °C	227-36199-01
0.53 mm	0.50 µm	-20 to 300/320 °C	227-36200-01
	1.00 µm	-20 to 290/310 °C	227-36201-01
	1.50 µm	-20 to 280/300 °C	227-36202-01

Analysis of Organic Solvents



Peaks

1. Methanol
2. Ethanol
3. Acetaldehyde + Ethyl Ether
4. 1,1-Dichloroethylene
5. Isopropanol
6. Dichloromethane + Hexane
7. trans-1,2-Dichloroethylene
8. tert.-Butanol
9. tert.-Butyl Methyl Ether
10. Isopropyl Ether
11. n-Propanol
12. Ethyl Formate
13. Chloroform
14. Methyl Acetate
15. Cyclohexane
16. Tetrachloromethane + sec.-Butanol
17. Isooctane
18. Isobutanol + 1,1,1-Trichloroethane
19. Acetonitrile
20. Acrylonitrile
21. Benzene
22. Tetrahydrofuran + methylcyclohexane
23. Methyl Acrylate + 1,2-Dichloroethane
24. Trichloroethylene
25. n-Butanol
26. Ethyl Acetate
27. 1,2-Dimethoxyethane
28. Ethylene Glycol Monomethyl Ether
29. Ethylenechlorohydrin
30. Methyl Ethyl Ketone
31. Nitromethane
32. Propylene Glycol Monomethyl Ether + Isopropyl Acetate
33. Ethyl Acrylate
34. Isoamyl Alcohol
35. Methyl Methacrylate
36. Ethylene Glycol Monoethyl Ether
37. Toluene
38. 1,4-Dioxane
39. tetrachloroethylene
40. n-Propyl Acetate
41. n-Amyl Alcohol
42. Epichlorohydrin
43. Pyridine
44. Ethylene Glycol Monoisopropyl Ether
45. Isobutyl Acetate
46. Methyl Isobutyl Ketone + Ethylbenzene
47. Chlorobenzene
48. p-Xylene
49. m-Xylene
50. n-Butyl Acetate
51. o-Xylene
52. Methyl Butyl Ketone
53. Cyclohexanol
54. 1,1,2,2-Tetrachloroethane
55. Isoamyl Acetate
56. Butyl Acrylate
57. Ethylene Glycol Monobutyl Ether
58. Anisole + Propylene Glycol Monomethyl Ether Acetate
59. n-Amyl Acetate
60. Ethylene Glycol Monoethyl Ether Acetate
61. N,N-Dimethylformamide
62. Isooctanol
63. Cyclohexanone
64. o-Dichlorobenzene
65. Diethylene Glycol Monoethyl Ether
66. Benzyl Alcohol
67. N,N-Dimethylacetamide
68. Dimethyl Sulfoxide
69. Tetralin
70. Diethylene Glycol Monobutyl Ether
71. 2-Ethylhexyl Acrylate
72. N-Methylpyrrolidone
73. Isophorone
74. 1,3-Dimethyl-2-Imidazolidinone
75. Sulfolane

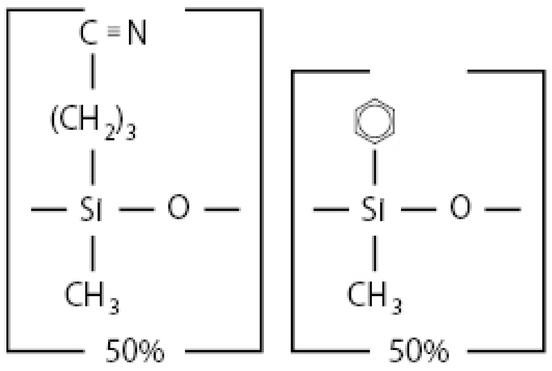
Conditions

Instrument : GC-2010
Column : SH-200, 60 m, 0.32 mm ID, 1.00 µm (P/N: 227-36186-02)
Injection : Split (split ratio: 50:1)
Inj. Temp : 250 °C
Carrier Gas : He, constant linear velocity mode, 25 cm/sec
Oven Temp : 40 °C (0 min) to 310 °C at 4 °C/min
Detector : FID, 330 °C

SH-225

- Polar phase: Crossbond™ 50% cyanopropylmethyl / 50% phenylmethyl polysiloxane
- General-purpose columns for FAMEs, carbohydrates, sterols, flavor compounds.
- Equivalent to USP G7 and G19 phases.
- Similar phases: DB-225, DB-225MS, CP-Sil 43 CB, SPB-225

SH-225 Structure



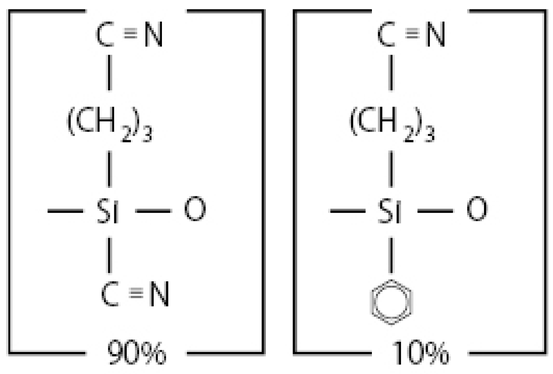
ID	df	Temp. Range	30 m	60 m
0.25 mm	0.25 µm	40 to 220/240 °C	227-36229-01	227-36229-02
	0.50 µm	40 to 220/240 °C	227-36230-01	–
0.32 mm	0.10 µm	40 to 220/240 °C	227-36231-01	–
	0.25 µm	40 to 220/240 °C	227-36232-01	–
	0.50 µm	40 to 220/240 °C	227-36233-01	–
	1.00 µm	40 to 200/220 °C	227-36234-01	227-36234-02
0.53 mm	0.25 µm	40 to 200/220 °C	227-36235-01	–
	0.50 µm	40 to 200/220 °C	227-36236-01	–
	1.00 µm	40 to 200/220 °C	227-36237-01	–

* Maximum temperatures listed are for shorter length columns. Longer columns may have a different maximum temperature.

SH-2330

- Highly polar phase: Crossbond™ 90% biscyanopropyl / 10% cyanopropylphenyl polysiloxane (Non-bonded)
- General-purpose columns for cis/trans FAMEs, dioxin isomers.
- Equivalent to USP G8 and G48 phase.
- Similar phases: DB-23, VF-23ms, SP-2330, SP-2331, SP-2380

SH-2330 Structure



ID	df	Temp. Range	30 m	60 m
0.25 mm	0.10 µm	0 to 260/275 °C	227-36238-01	227-36238-02
	0.20 µm	0 to 260/275 °C	227-36239-01	227-36239-02
0.32 mm	0.10 µm	0 to 260/275 °C	227-36240-01	227-36240-02
	0.20 µm	0 to 260/275 °C	227-36241-01	227-36241-02
0.53 mm	0.10 µm	0 to 260/275 °C	–	227-36242-01
	0.20 µm	0 to 260/275 °C	227-36243-01	227-36243-02

* Maximum temperatures listed are for shorter length columns. Longer columns may have a different maximum temperature.

Capillary Columns

General-Purpose Columns

SH-2560

- Highly polar phase; biscyanopropyl polysiloxane—not bonded
- Stationary phase selectivity optimized for isomer separation to ensure accurate quantification of critical cis/trans FAMEs.
- Application-specific QC test guarantees consistent, reliable performance for AOAC 996.06 and AOCS Ce 1j-07 methods.
- Excellent sample capacity; no peak distortion means easy, accurate peak integration.
- Similar Phase(s): HP-88, CP-Sil 88, SP-2560, BPX-90, MEGA-10

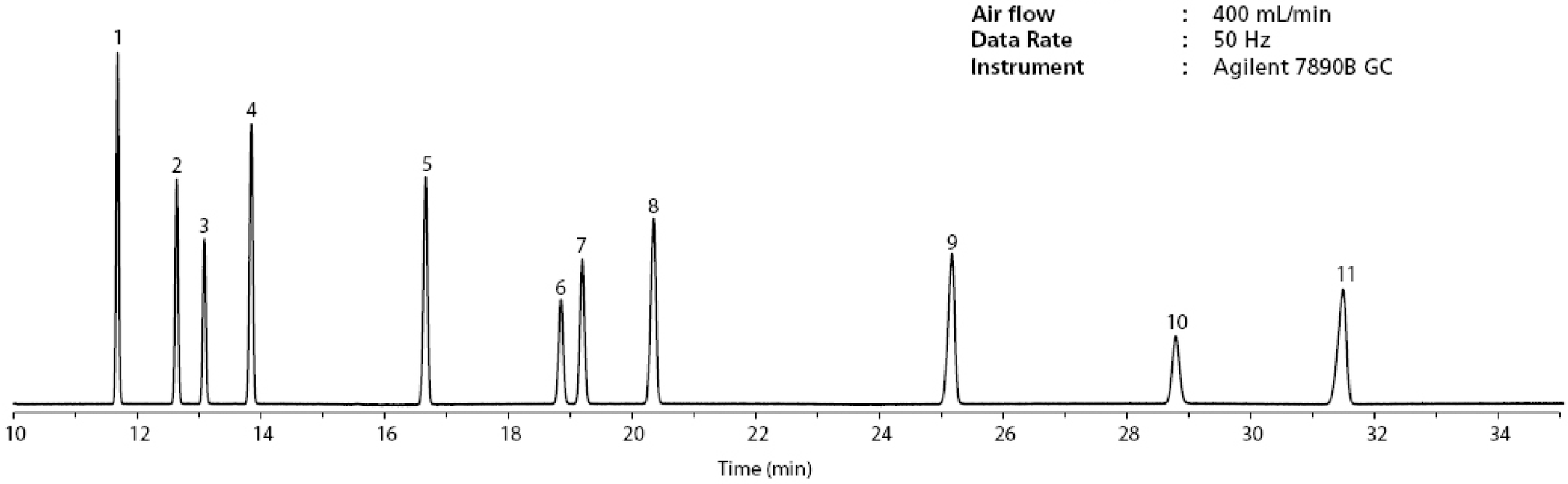
ID	df	Temp. Range	100 m
0.25 mm	0.20 µm	20 to 250 °C	227-36311-01

Unsaturated FAMES QC Test Mix on SH-2560

Peaks	tR (min)	Conc. (µg/mL)	Structural Nomenclature
1. Methyl octadecanoate	11.68	1.1	C18:0
2. Methyl elaidate	12.64	0.8	C18:1 (t9)
3. Methyl oleate	13.09	0.6	C18:1 (c9)
4. Methyl nonadecanoate	13.84	1.1	C19:0
5. Methyl eicosanoate	16.66	1.1	C20:0
6. Methyl eicosenoate	18.85	0.6	C20:1 (c11)
7. Methyl linolenate	19.20	0.8	C18:3 (c9,c12,c15)
8. Methyl heneicosanoate	20.35	1.1	C21:0
9. Methyl docosanoate	25.17	1.1	C22:0
10. Methyl eicosatrienoate	28.79	0.6	C20:3 (c11,c14,c17)
11. Methyl tricosanoate	31.49	1.1	C23:0

Conditions

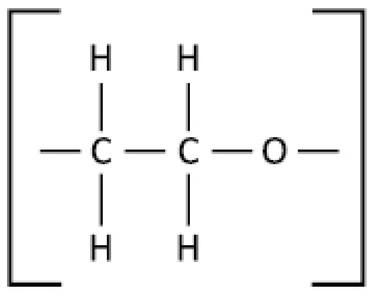
Column	:	SH-2560, 2560, 100 m, 0.25mm ID, 0.20 µm (227-36311-01)
Sample	:	Unsaturated FAMES QC test mix
Diluent	:	Hexane
Injection	:	1 µL split (split ratio 200:1)
Liner	:	Premium 4 mm Precision liner w/wool (cat.# 23305.1)
Inj. Temp	:	250 °C
Oven Temp	:	180 °C (hold 40 min)
Carrier Gas	:	H_2, constant flow
Flow Rate	:	2.5 mL/min
Detector	:	FID, 275 °C
Make-up Gas Type	:	N_2
Hydrogen flow	:	40 mL/min
Air flow	:	400 mL/min
Data Rate	:	50 Hz
Instrument	:	Agilent 7890B GC



SH-Wax

- Polar phase: Crossbond™ polyethylene glycol
- Best polyethylene glycol (PEG) phase for alkenols, glycols, and aldehydes.
- Equivalent to USP G14, G15, G16, G20, G39 phases.
- Similar phases: DB-Wax, CP-Wax 52 CB

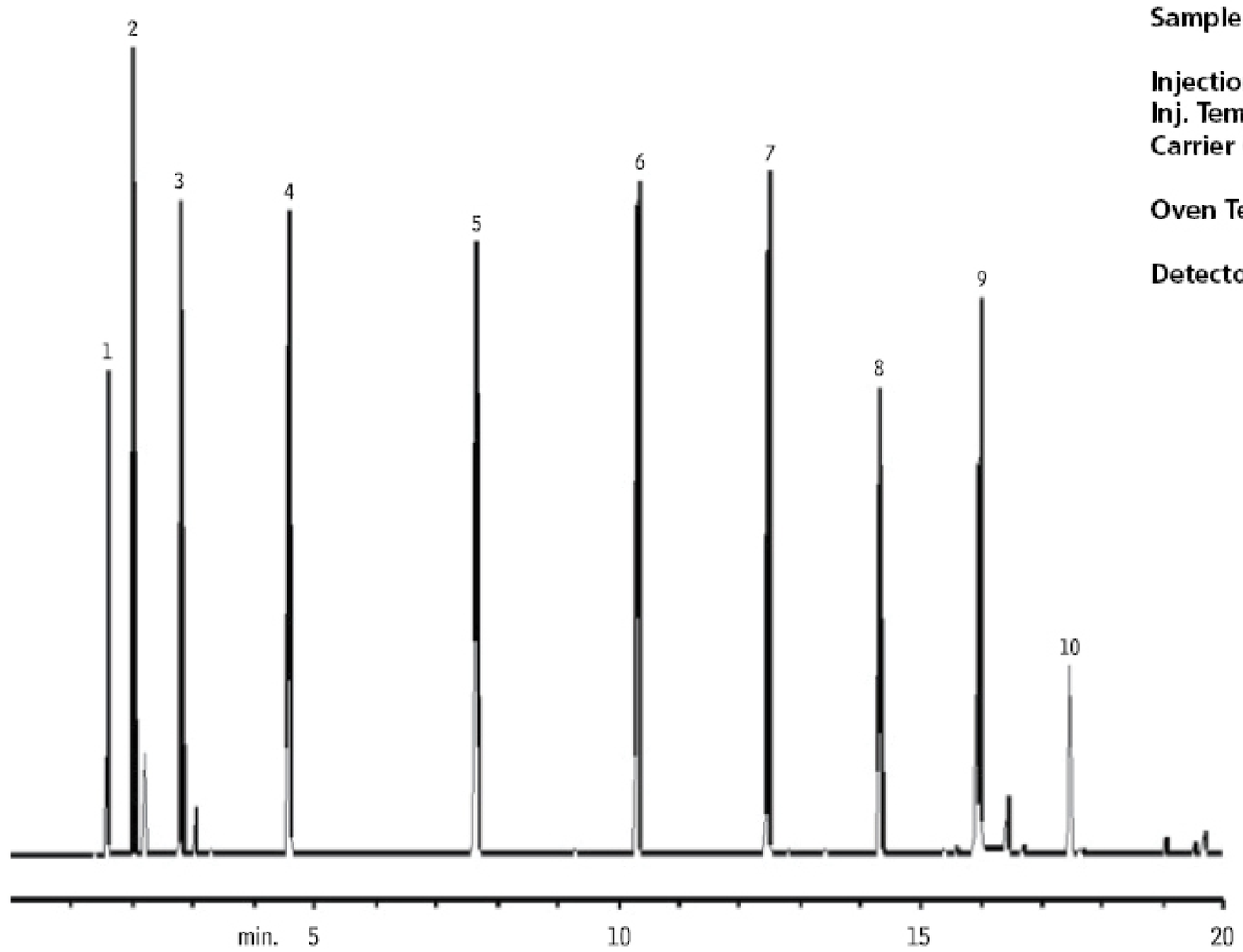
SH-Wax Structure



ID	df	Temp. Range	15 m	20 m	30 m	50 m	60 m
0.25 mm	0.10 µm	20 to 250 °C	–	–	221-76186-30	–	–
	0.25 µm	20 to 250 °C	–	–	221-75893-30	221-75893-50	221-75893-60
	0.50 µm	20 to 250 °C	–	–	221-75894-30	–	221-75894-60
0.32 mm	0.25 µm	20 to 250 °C	–	221-75895-20	221-75895-30	–	221-75895-60
	0.50 µm	20 to 250 °C	–	–	221-75896-30	221-75896-50	221-75896-60
	1.00 µm	20 to 240/250 °C	–	–	221-75897-30	–	221-75897-60
0.53 mm	0.25 µm	20 to 250 °C	–	–	227-36244-01	–	–
	0.50 µm	20 to 250 °C	–	–	221-76188-30	–	227-36245-01
	1.00 µm	20 to 240/250 °C	221-75899-15	–	221-75899-30	–	221-75899-60

* Maximum temperatures listed are for shorter length columns. Longer columns may have a different maximum temperature.

Aldehydes



Peaks

1. ethanal
2. propanal
3. butenal
4. pentanal
5. hexanal
6. heptanal
7. octanal
8. nonanal
9. decanal
10. undecanal

Conditions

Column	: SH-Wax, 30 m, 0.25mm ID, 0.50 µm (P/N: 221-75894-30)
Sample	: C2-C11 aldehydes mixture On-column conc.: 250 ng
Injection	: Split (split ratio: 100:1)
Inj. Temp	: 200 °C
Carrier Gas	: Hydrogen, linear velocity 35 cm/sec. set at 40 °C
Oven Temp	: 40 °C (hold 5 min) to 200 °C at 10 °C/min
Detector	: FID, 200 °C

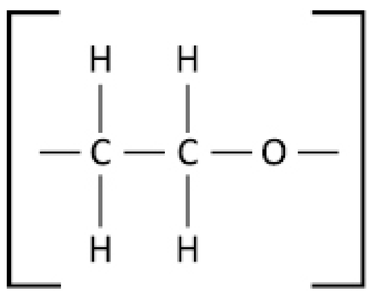
Capillary Columns

General-Purpose Columns

SH-PolarWax / SH-PolarWax MS

- Polar phase: Crossbond™ polyethylene glycol
- Low-bleed PEG column ensures long column lifetimes.
- Rugged enough to withstand repeated water injections.
- Equivalent to USP G14, G15, G16, G20, and G39 phases.
- Similar phases: Innowax, CP-Wax 52 CB, VF-WAX MS, Supelcowax-10

SH-PolarWax / SH-PolarWax MS Structure



SH-PolarWax

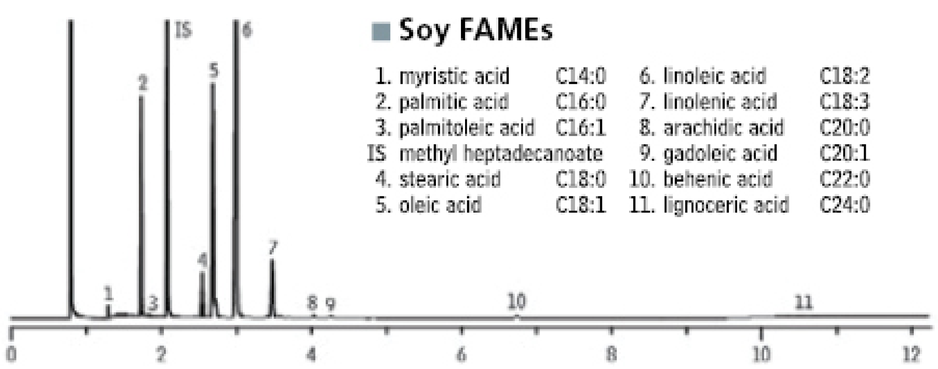
ID	df	Temp. Range	30 m	50 m	60 m
0.25 mm	0.10 µm	40 to 250/260 °C	227-36246-01	–	227-36246-02
	0.25 µm	40 to 250/260 °C	227-36305-02	227-36247-01	227-36247-02
	0.50 µm	40 to 250/260 °C	227-36248-01	–	227-36248-02
0.32 mm	0.10 µm	40 to 250/260 °C	227-36249-01	–	227-36249-02
	0.25 µm	40 to 250/260 °C	221-75972-30	–	227-36250-01
	0.50 µm	40 to 250/260 °C	227-36251-01	–	221-75975-60
	1.00 µm	40 to 240/250 °C	227-36252-01	–	227-36252-02
0.53 mm	0.10 µm	40 to 250/260 °C	227-36253-01	–	–
	0.25 µm	40 to 250/260 °C	227-36254-01	–	227-36254-02
	0.50 µm	40 to 250/260 °C	227-36255-01	–	227-36255-02
	1.00 µm	40 to 240/250 °C	221-75979-30	–	227-36256-01
	1.50 µm	40 to 230/240 °C	227-36257-01	–	227-36257-02
	2.00 µm	40 to 220/230 °C	227-36258-01	–	–

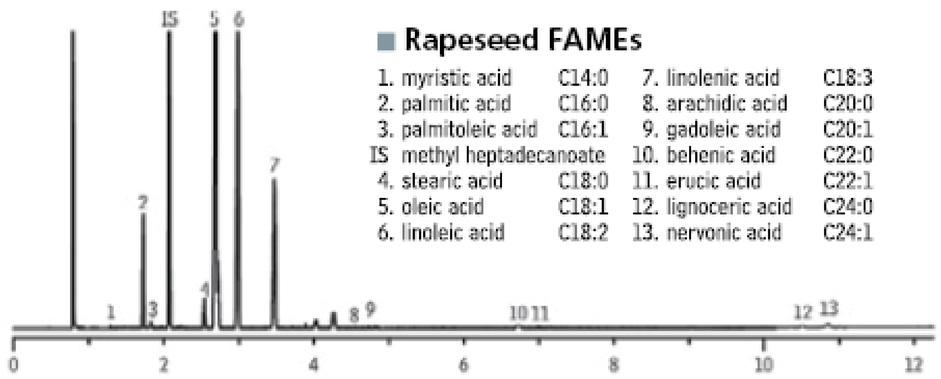
* Maximum temperatures listed are for shorter length columns. Longer columns may have a different maximum temperature.

SH-PolarWax MS

ID	df	Temp. Range	30 m
0.25 mm	0.25 µm	40 to 250/260 °C	227-36322-01
0.32 mm	0.25 µm	40 to 250/260 °C	227-36322-03

FAMEs in Biodiesel Oils





Conditions

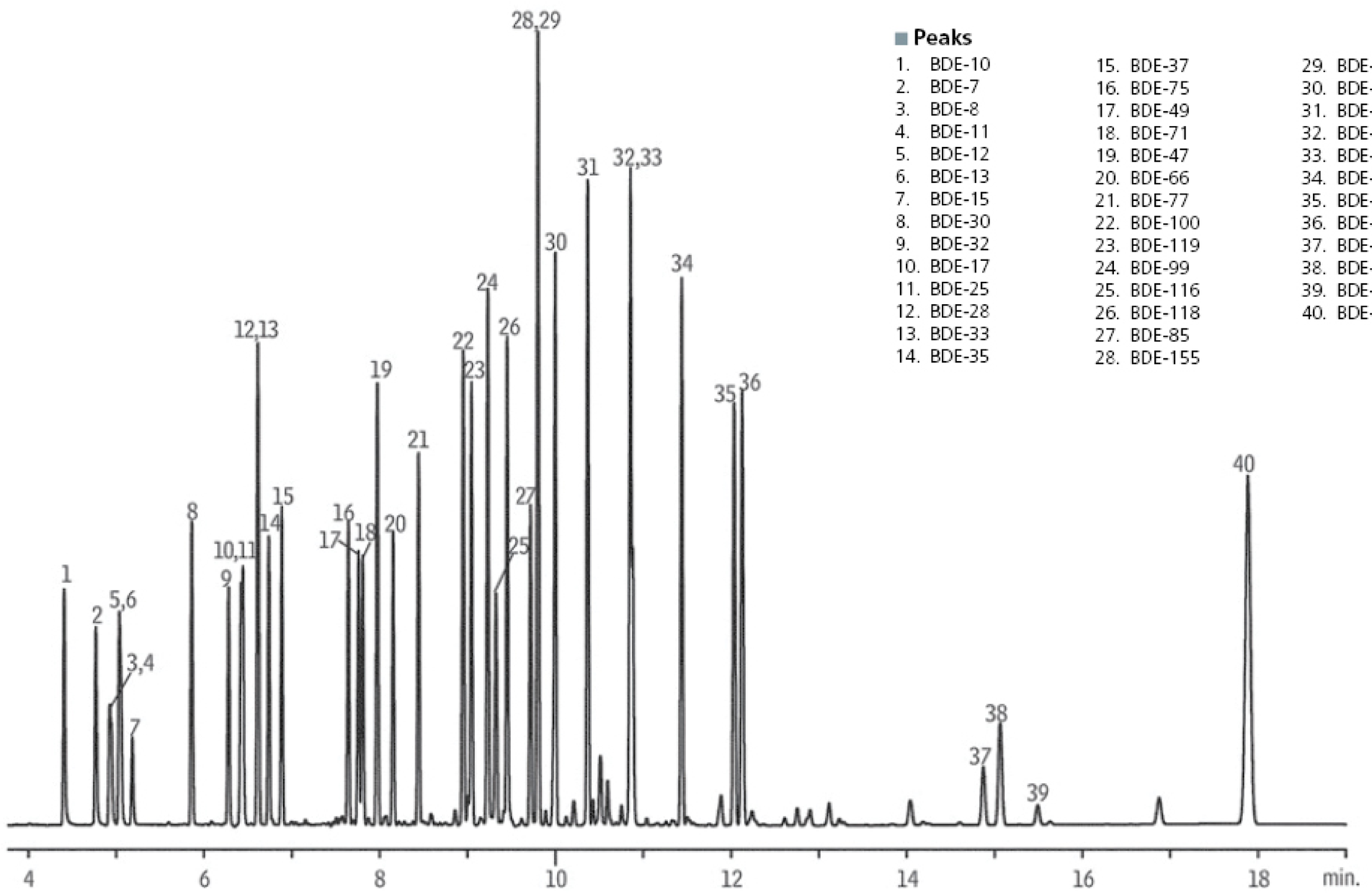
Column : SH-PolarWax, 30 m, 0.32 mm ID, 0.25 µm (P/N: 221-75972-30)
Inj. Vol. : 1 µL split (split ratio 100:1)
Inj. Temp : 250 °C
Carrier Gas : Hydrogen, constant flow rate 3mL/min, linear velocity 60 cm/sec.
Oven Temp : 210 °C (hold 5 min) to 230 °C at 20 °C/min (hold 5 min)
Detector : FID, 250 °C

SH-1614

- 5% diphenyl / 95% dimethyl polysiloxane
- Optimized for PBDE analysis by EPA Method 1614.
- Short column option resolves BDE-209 three times faster, with less thermal breakdown.
- Unique deactivation gives higher BDE-209 response than competitor columns, for greater analytical sensitivity.
- Exceeds EPA Method 1614 resolution criteria for BDE-49 and BDE-71.

ID	df	Temp. Range	15 m	30 m
0.25 mm	0.10 µm	-60 to 330/360 °C	227-36265-01	227-36265-02

Brominated Flame Retardants



Peaks

1. BDE-10
2. BDE-7
3. BDE-8
4. BDE-11
5. BDE-12
6. BDE-13
7. BDE-15
8. BDE-30
9. BDE-32
10. BDE-17
11. BDE-25
12. BDE-28
13. BDE-33
14. BDE-35
15. BDE-37
16. BDE-75
17. BDE-49
18. BDE-71
19. BDE-47
20. BDE-66
21. BDE-77
22. BDE-100
23. BDE-119
24. BDE-99
25. BDE-116
26. BDE-118
27. BDE-85
28. BDE-155
29. BDE-126
30. BDE-154
31. BDE-153
32. BDE-138
33. BDE-166
34. BDE-183
35. BDE-181
36. BDE-190
37. BDE-208
38. BDE-207
39. BDE-206
40. BDE-209

Conditions

Column	: SH-1614, 15 m, 0.25 mm ID, 0.10 µm (P/N: 227-36265-01)
Sample	: 100-300 ppb PBDE PAR Solution 500 ppb decabromodiphenyl ether
Inj. Vol.	: 1 µL splitless (hold 1 min)
Inj. Temp	: 340 °C
Carrier Gas	: He, constant flow, linear velocity 60 cm/sec., 120 °C
Oven Temp	: 120 °C (hold 1 min) to 275 °C at 15 °C/min to 300 °C at 5 °C/min (hold 5 min)
Detector	: µ-ECD, 345 °C

Capillary Columns

Dedicated Columns

SH-OPP2

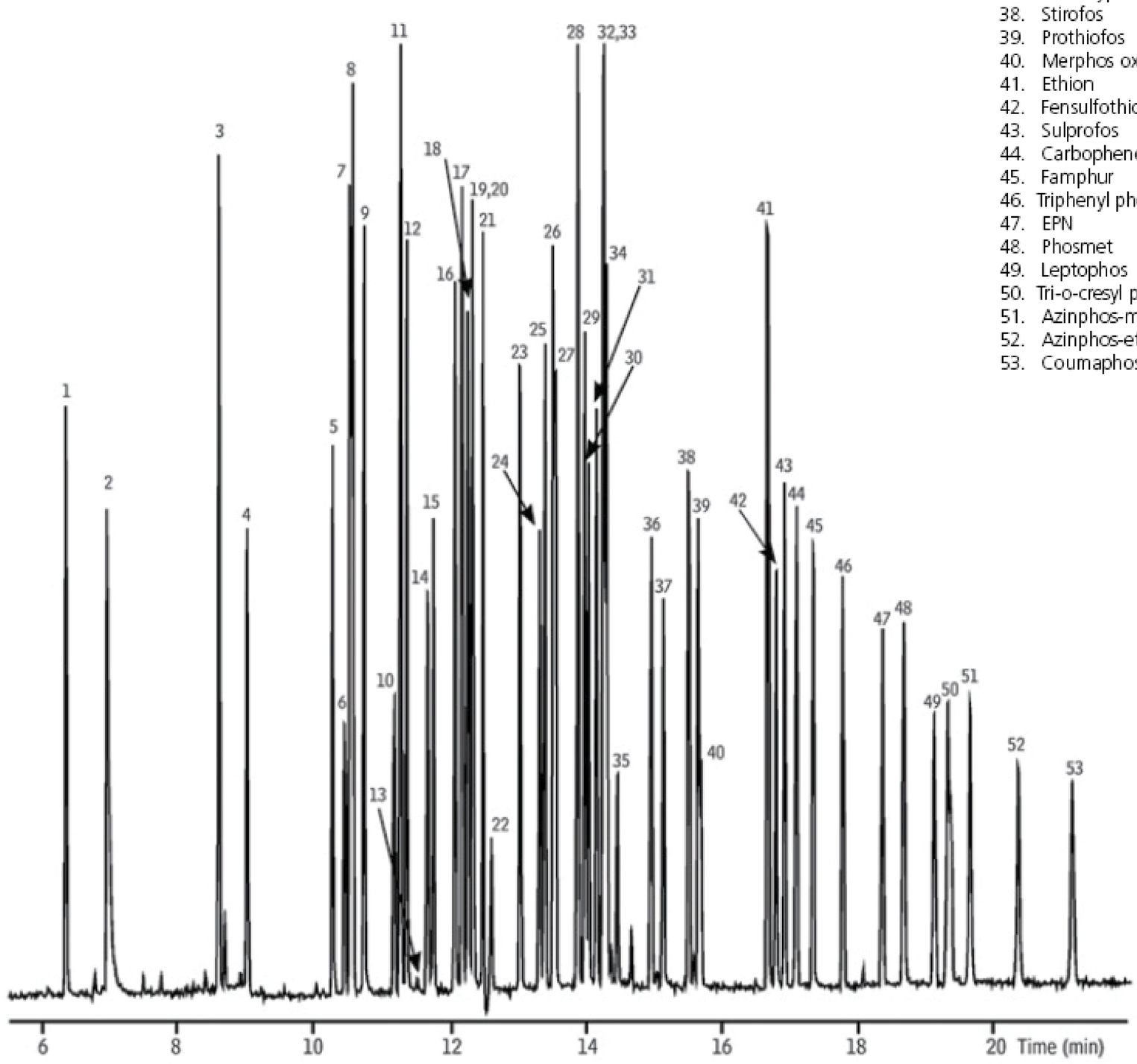
- Dedicated column for organophosphorus pesticides; best column combination for US EPA Method 8141.
- Low bleed - ideal for GC-FPD, GC-NPD, or GCMS analyses.

ID	df	Temp. Range	30 m
0.32 mm	0.32 µm	-20 to 310/330 °C	221-75887-30

Organophosphorus Pesticides (U.S. EPA Method 8141A)

Peaks

1. Dichlorvos
2. Hexamethylphosphoramide
3. Mevinphos
4. Trichlorfon
5. TEPP
6. Demeton-O
7. Tributyl phosphate (SS)
8. Thionazin
9. Ethoprop
10. Naled
11. Sulfotepp
12. Phorate
13. Dicrotophos
14. Monocrotophos
15. Demeton-S
16. Terbufos
17. Dimethoate
18. Diazinon
19. Dioxathion
20. Fonophos
21. Disulfoton
22. Phosphamidon isomer (breakdown product)
23. Dichlorofenthion
24. Phosphamidon
25. Chlorpyrifos methyl
26. Methyl parathion
27. Ronnel
28. Aspon
29. Fenitrothion
30. Malathion
31. Chlorpyrifos
32. Trichloronate
33. Parathion-ethyl
34. Fenthion
35. Merphos
36. Chlorfenvinphos
37. Crotoxyphos
38. Stirofos
39. Prothiofos
40. Merphos oxone (breakdown product)
41. Ethion
42. Fensulfothion
43. Sulprofos
44. Carbophenothion
45. Famphur
46. Triphenyl phosphate (SS)
47. EPN
48. Phosmet
49. Leptophos
50. Tri-o-cresyl phosphate
51. Azinphos-methyl
52. Azinphos-ethyl
53. Coumaphos



Conditions

Column	: SH-OPP2, 30 m, 0.32 mm ID, 0.32 µm (P/N: 221-75887-30)	**Carrier Gas**	: He
Inj. Vol.	: 1 µL splitless (hold 1 min)	**Dead Time**	: 1.03 min at 80 °C
Inj. Temp	: 200 °C	**Detector**	: FPD, 250 °C
Oven Temp	: 80 °C (hold 0.5 min) to 280 °C at 12 °C/min (hold 10 min)	**Notes**	: Constant pressure

SH-CLP / SH-CLP II

- Dedicated columns for organochlorine pesticides and herbicides.
- Low bleed - ideal for high-sensitivity GC-ECD or GCMS analyses.
- Baseline separations in less than 10 minutes.
- Analyze EPA Method 8081B, 8082A, 8151A, 504.1, 515, 508.1, and 552.2 compounds without time-consuming column changes.
- Similar phases: DB-CLP1 / DB-CLP2

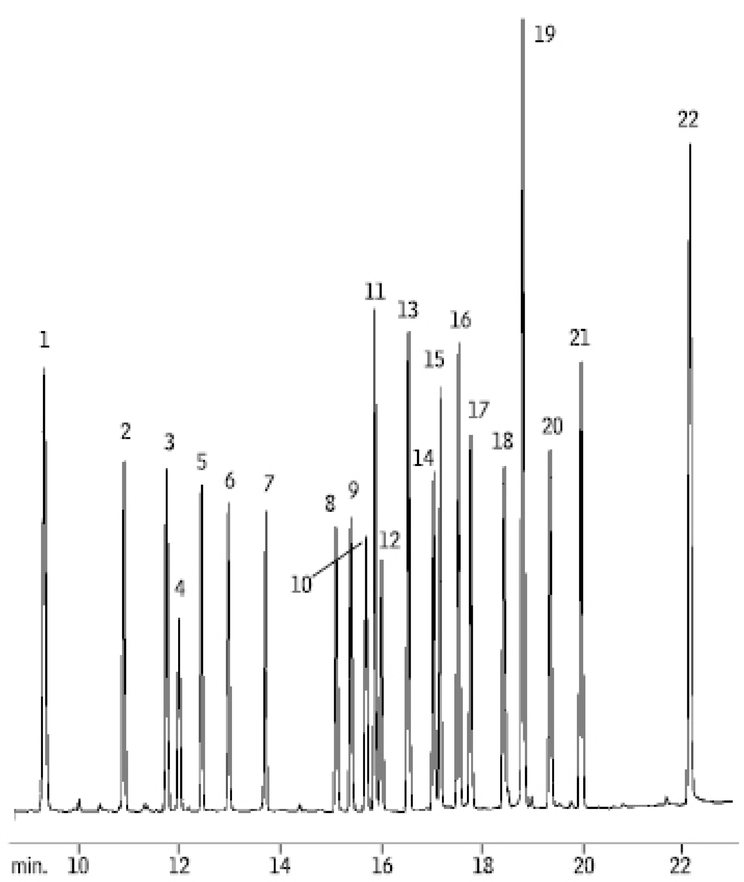
SH-CLP

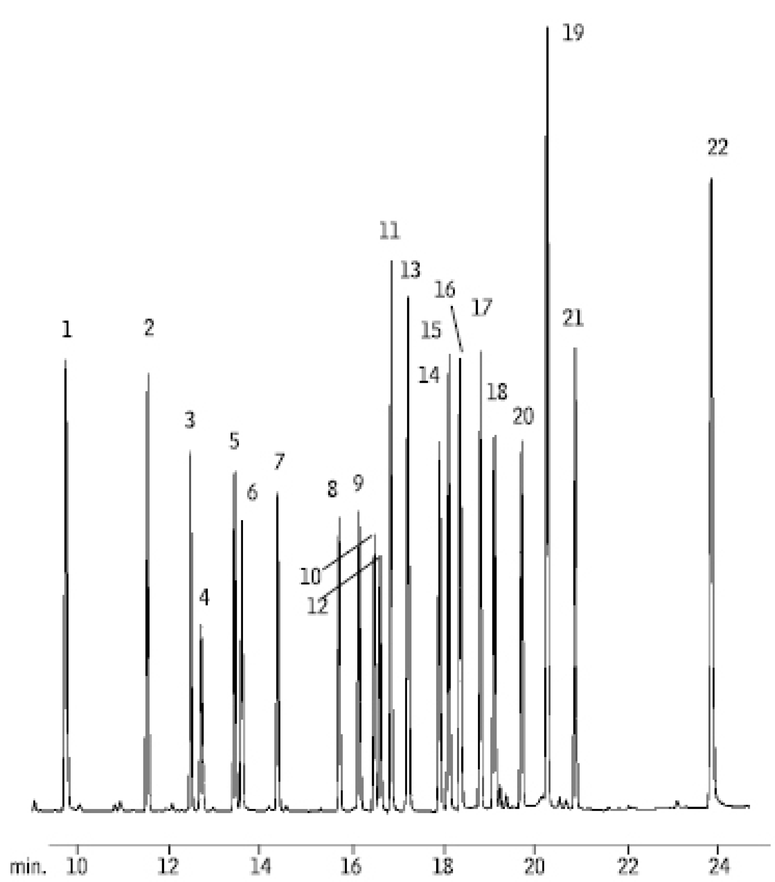
ID	df	Temp. Range	30 m
0.32 mm	0.32 µm	-20 to 320/340 °C	227-36266-01
	0.50 µm	-20 to 320/340 °C	221-75879-30

SH-CLP II

ID	df	Temp. Range	30 m
0.32 mm	0.25 µm	-20 to 320/340 °C	227-36267-01

Organochlorine Pesticides (US EPA Method 8081)





Peaks

1. 2,4,5,6-tetrachloro-m-xylene
2. α-BHC (α-HCH)
3. γ-BHC (lindane)
4. β-BHC (β-HCH)
5. δ-BHC (δ-HCH)
6. heptachlor
7. aldrin
8. heptachlor epoxide
9. γ-chlordane
10. α-chlordane
11. 4,4'-DDE
12. endosulfan I
13. dieldrin
14. endrin
15. 4,4'-DDD
16. endosulfan II
17. 4,4'-DDT
18. endrin aldehyde
19. methoxychlor
20. endosulfan sulfate
21. endrin ketone
22. decachlorobiphenyl

Conditions

Column	: SH-CLP, 30 m, 0.32 mm ID, 0.50 µm (P/N: 221-75879-30)	SH-CLP2, 30 m, 0.32 mm ID, 0.25 µm (P/N: 227-36267-01)
Oven Temp	: 120 °C (hold 1 min) to 300 °C (hold 10 min) at 9 °C/min	
Inj.	: Direct	
Inj. Temp	: 200 °C	
Detector	: ECD, 300 °C with anode purge	
Dead time	: 1.9 min	
Head pressure	: 8.7 psi (constant)	
Flow rate	: 1.3 mL/min at 120 °C, He	

Capillary Columns

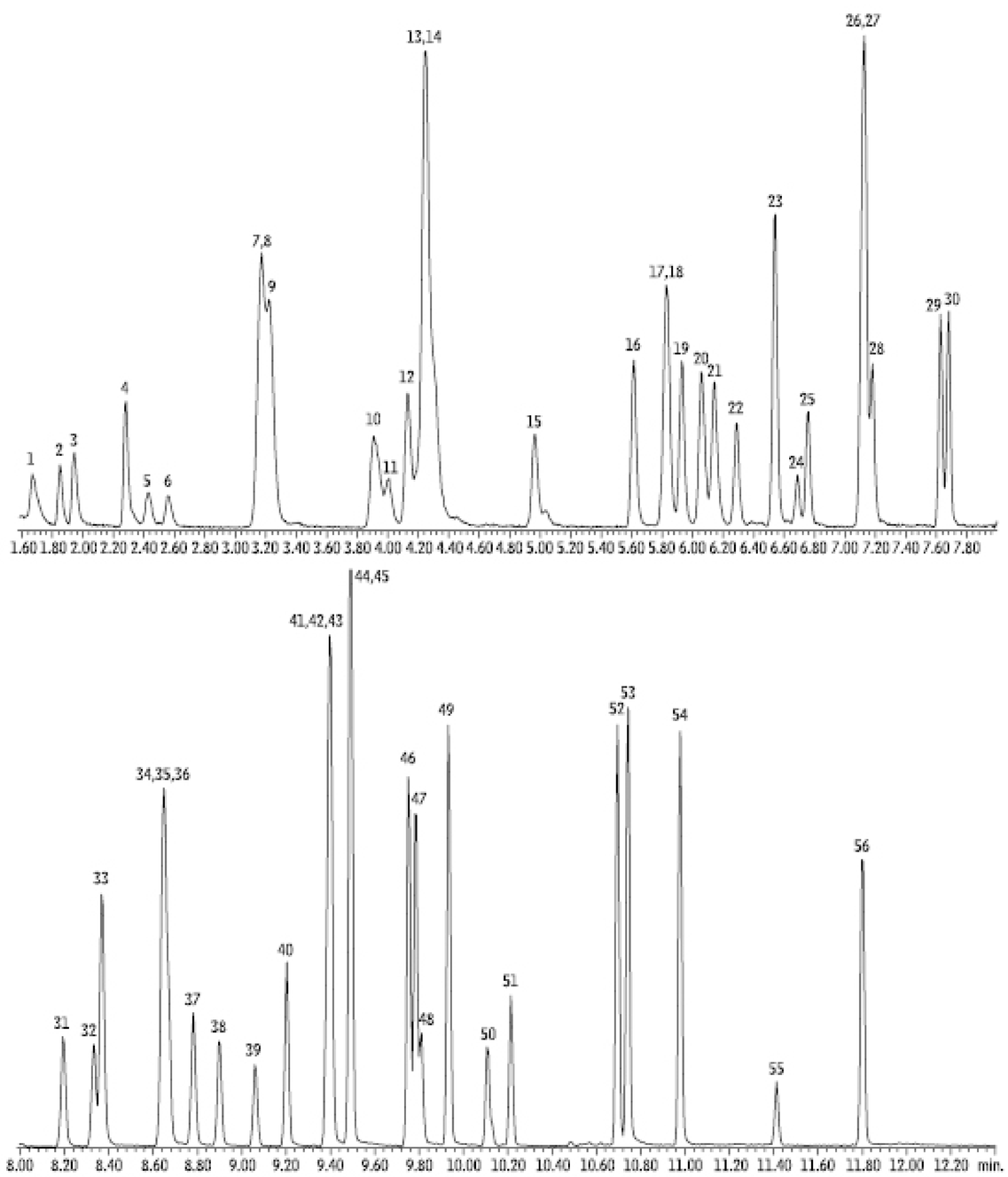
Dedicated Columns

SH-VMS

- Dedicated columns for analyzing volatile organic pollutants by GCMS including methods TO-15, TMS, and EPA 8260.
- Complete separation of U.S. EPA Method 8260 compounds in less than 10 minutes.

ID	df	Temp. Range	20 m	30 m	60 m
0.18 mm	1.00 µm	-40 to 240/260 °C	227-36412-01	–	–
0.25 mm	1.40 µm	-40 to 240/260 °C	–	227-36268-01	227-36268-02
0.32 mm	1.80 µm	-40 to 240/260 °C	–	227-36269-01	227-36269-02

Volatile Organics (US EPA CLP 04.1)



Peaks

1. dichlorodifluoromethane
2. chloromethane
3. vinyl chloride
4. bromomethane
5. chloroethane
6. trichlorofl uoromethane
7. 1,1-dichloroethene
8. carbon disulfi de
9. 1,1,2-trichloro-1,2,2-trifl uoroethane
10. methylene chloride
11. acetone
12. trans -1,2-dichloroethene
13. methyl acetate
14. methyl tert-butyl ether
15. 1,1-dichloroethane
16. cis-1,2-dichoroethane
17. cyclohexane
18. bromochloromethane (IS)
19. chloroform
20. carbon tetrachloride
21. 1,1,1-trichloroethane
22. 2-butanone
23. benzene
24. 1,2-dichloroethane-d4 (SS)
25. 1,2-dichloroethane
26. methylcyclohexane
27. trichloroethene
28. 1,4-difl uorobenzene (IS)
29. 1,2-dichloropropane
30. bromodichloromethane
31. cis -1,3-dichloropropene
32. toluene d8 (SS)
33. toluene
34. tetrachloroethane
35. 4-methyl-2-pentanone
36. trans -1,3-dichloropropane
37. 1,1,2-trichloroethane
38. dibromochloromethane
39. 1,2-dibromoethane
40. 2-hexanone
41. chlorobenzene d5 (IS)
42. chlorobenzene
43. ethylbenzene
44. m -xylene
45. p -xylene
46. o -xylene
47. styrene
48. bromoform
49. isopropylbenzene
50. 4-bromofl uorobenzene (SS)
51. 1,1,2,2-tetrachloroethane
52. 1,3-dichlorobenzene
53. 1,4-dichlorobenzene
54. 1,2-dichlorobenzene
55. 1,2-dibromo-3-chloropropane
56. 1,2,4-trichlorobenzene

Conditions

Column : SH-VMS, 30 m, 0.25 mmID, 1.40 µm (P/N: 227-36268-01)

Purge and Trap : Trap: #10 (Tenax$_R$/silica gel/carbon molecular sieve)
Sample Temp: ambient
Purge: 11 min at 40 mL/min
Desorb preheat: 185 °C
Desorb: 0.5 min at 190 °C
Desorb flow rate: 35.0 mL/min
Bake: 8 min at 210 °C
Interface: split injector
Transfer Line Temp: 150 °C

Inj. : Split (split ratio: 35:1)

Inj. Temp : 200 °C

Carrier Gas : He, linear velocity 34 cm/sec., 40 °C, constant flow

Oven Temp : 40 °C (hold 4 min) to 90 °C at 16 °C/min to 220 °C at 32 °C/min (hold 5 min)

Detector : MS
Transfer Line Temp: 150 °C
Scan Range: 35-300 amu.
Ionization: EI

Capillary Columns

Dedicated Columns

SH-VRX

- Proprietary Crossbond phase
- Application-specific columns for volatile organic pollutants.
- Excellent for U.S. EPA Method 8021 compounds.
- Stable to 260 °C.
- Similar Phase(s): DB-VRX

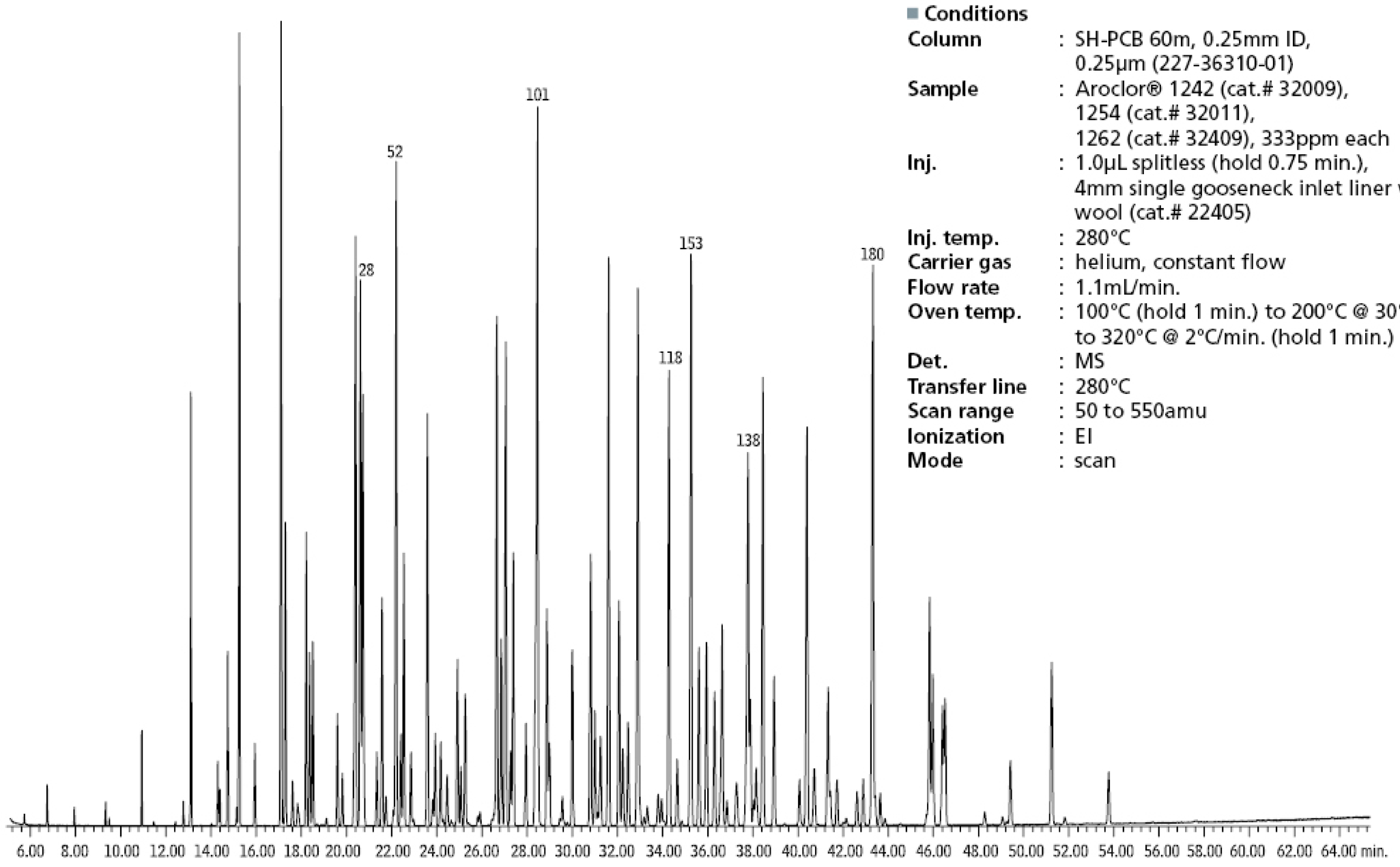
ID	df	Temp. Range	25 m
0.10 mm	0.50 µm	-40 to 240/260 °C	227-36331-01

SH-PCB

- Proprietary Crossbond phase
- Unique polymer for PCBs analysis by GC-ECD or GC-MS.
- Good results for other semi-volatiles.
- Low polarity; inert to active compounds.
- Stable to 340 °C.

ID	df	Temp. Range	60 m
0.25 mm	0.25 µm	30 to 320/340 °C	227-36310-01

Aroclor PCBs



Conditions

Column	: SH-PCB 60m, 0.25mm ID, 0.25µm (227-36310-01)
Sample	: Aroclor® 1242 (cat.# 32009), 1254 (cat.# 32011), 1262 (cat.# 32409), 333ppm each
Inj.	: 1.0µL splitless (hold 0.75 min.), 4mm single gooseneck inlet liner w/ wool (cat.# 22405)
Inj. temp.	: 280°C
Carrier gas	: helium, constant flow
Flow rate	: 1.1mL/min.
Oven temp.	: 100°C (hold 1 min.) to 200°C @ 30°C/min., to 320°C @ 2°C/min. (hold 1 min.)
Det.	: MS
Transfer line	: 280°C
Scan range	: 50 to 550amu
Ionization	: EI
Mode	: scan

Capillary Columns

Dedicated Columns

SH-BAC Plus 1 / SH-BAC Plus 2

- Optimized column selectivities guarantee resolution of ethanol, internal standards, and frequently encountered interferences.
- Robust and reproducible column chemistry ensures longer column lifetime and consistent results.

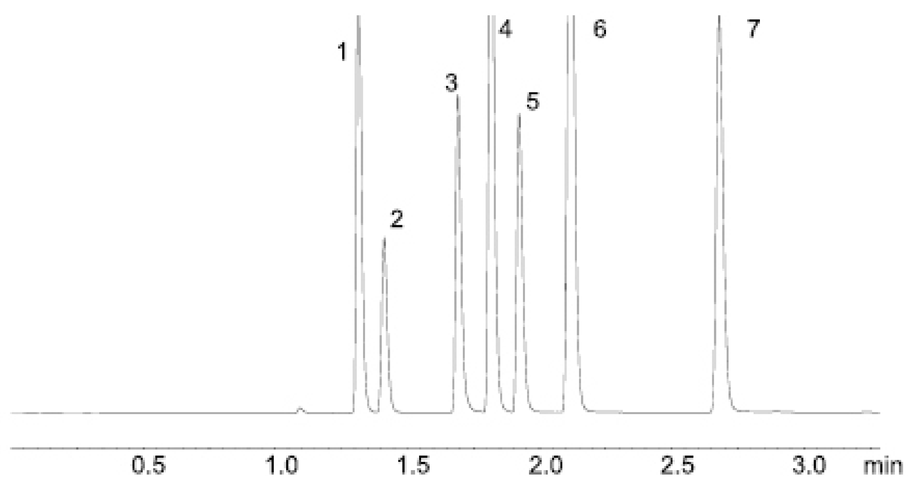
SH-BAC Plus 1

ID	df	Temp. Range	30 m
0.32 mm	1.80 µm	-20 to 240/260 °C	227-36260-01
0.53 mm	3.00 µm	-20 to 240/260 °C	227-36261-01

SH-BAC Plus 2

ID	df	Temp. Range	30 m
0.32 mm	0.60 µm	-20 to 240/260 °C	227-36263-01
0.53 mm	1.00 µm	-20 to 240/260 °C	227-36264-01

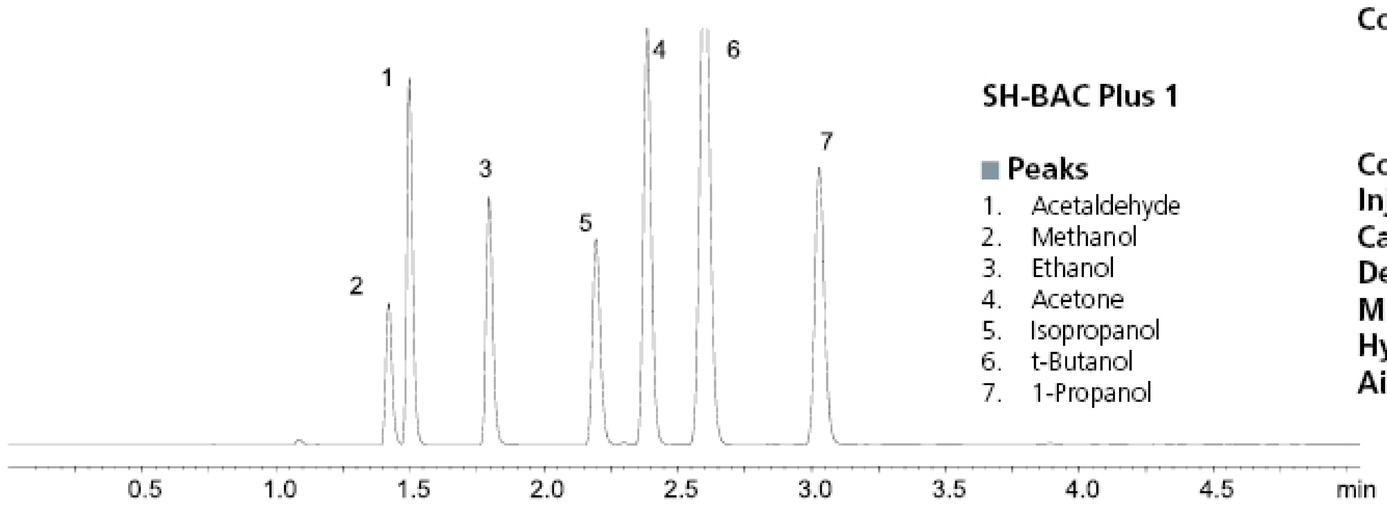
Analysis of Alcohol Compounds in Blood



SH-BAC Plus 2

Peaks

1. Acetaldehyde
2. Methanol
3. Ethanol
4. Acetone
5. Isopropanol
6. t-Butanol
7. 1-Propanol



SH-BAC Plus 1

Peaks

1. Acetaldehyde
2. Methanol
3. Ethanol
4. Acetone
5. Isopropanol
6. t-Butanol
7. 1-Propanol

Conditions

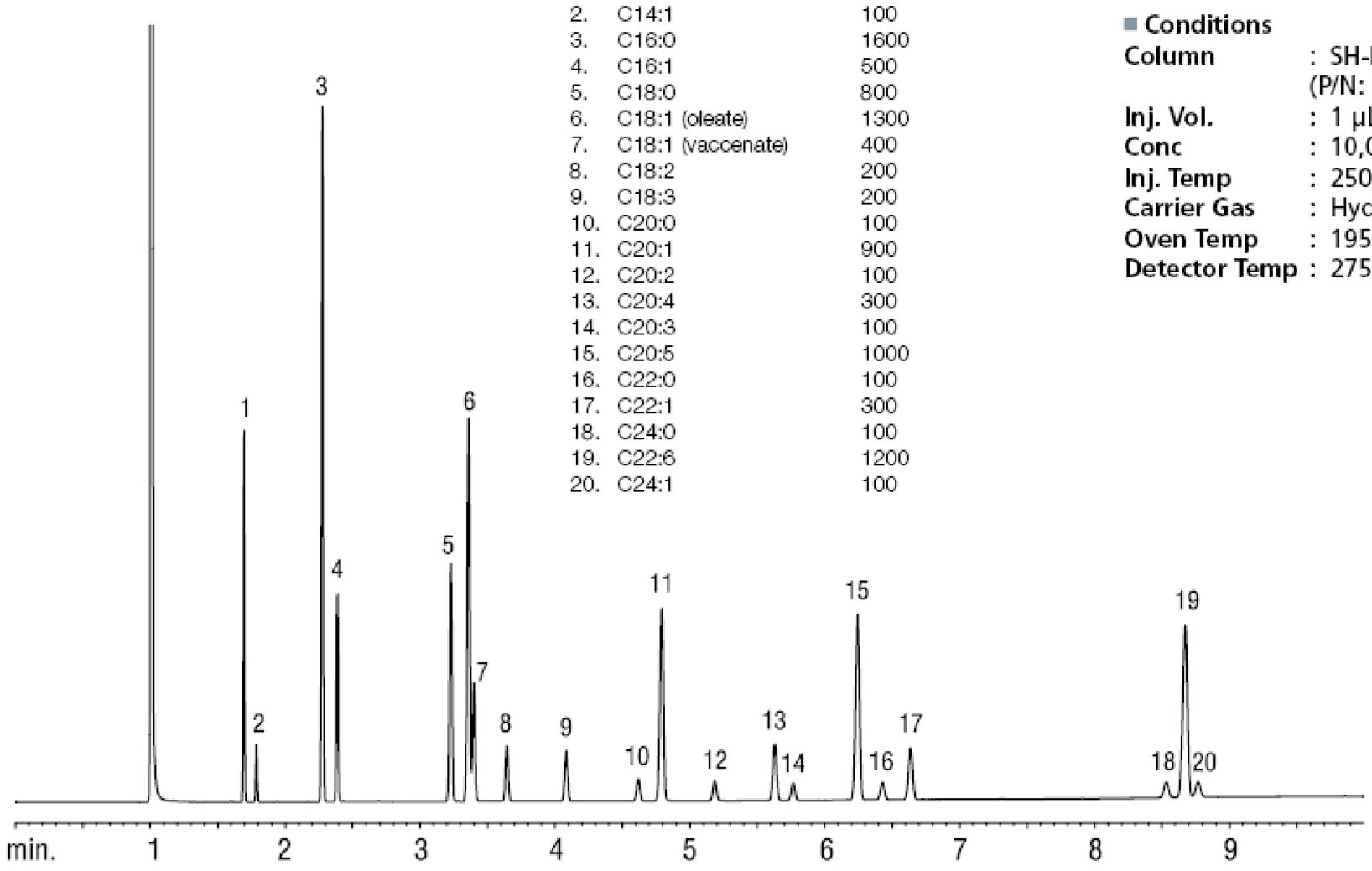
Instrument	: GC-2010 Plus AF + HS-20
Headspace	: Oven Temp.: 85 °C Vial Warming Time: 15 min Vial Pressurization Time: 1 min Injection Time: 0.5 min Sample Line Temp: 150 °C Vial Volume: 20 mL Vial Agitation: Off Vial Pressurization: 100 kPa Load Time: 0.5 min Needle Flash Time: 0.5 min Transfer Line Temp: 150 °C
Column	: SH-BAC Plus 2, 30 m, 0.32 mm ID, 0.60 µm (P/N: 227-36263-01) SH-BAC Plus 1, 30 m, 0.32 mm ID, 1.80 µm (P/N: 227-36260-01)
Column Temp	: 40 °C
Inj.	: Split (split ratio: 20:1)
Carrier Gas	: He, 100 kPa
Detector	: FID, 250 °C
Makeup Gas	: He, 30 mL/min
Hydrogen	: 40 mL/min
Air	: 400 mL/min

SH-FAME

- Dedicated column for FAMEs, specially tested with a FAME mixture.
- Equivalent to USP G16 phase.
- Similar phases: Select FAME, Omegawax

ID	df	Temp. Range	30 m
0.25 mm	0.25 µm	20 to 320/340 °C	227-36324-01
0.32 mm	0.25 µm	20 to 320/340 °C	227-36270-01

FAMEs (Marine Oil Standard)



Peaks	Conc. (µg/mL)
1. C14:0	600
2. C14:1	100
3. C16:0	1600
4. C16:1	500
5. C18:0	800
6. C18:1 (oleate)	1300
7. C18:1 (vaccenate)	400
8. C18:2	200
9. C18:3	200
10. C20:0	100
11. C20:1	900
12. C20:2	100
13. C20:4	300
14. C20:3	100
15. C20:5	1000
16. C22:0	100
17. C22:1	300
18. C24:0	100
19. C22:6	1200
20. C24:1	100

Conditions

Column : SH-FAME, 30 m, 0.32 mm ID, 0.25 µm (P/N: 227-36270-01)
Inj. Vol. : 1 µL split (split ratio: 100:1)
Conc : 10,000 µg/mL in isooctane (total FAMEOs)
Inj. Temp : 250 °C
Carrier Gas : Hydrogen, constant flow rate 3 mL/min
Oven Temp : 195 - 240 °C at 5 °C/min (hold 1 min)
Detector Temp : 275 °C

SH-Volatil Amin

- Unique selectivity for baseline resolution of all volatile amines.
- Excellent inertness assures accuracy and sensitivity for volatile amines, including free ammonia.
- Highly robust phase withstands repeated water injections, resulting in longer column lifetime.
- High temperature stability (290 °C) ensures elution of amines up to C16 and allows contaminants to be removed by "baking out" the column.
- Similar Phase(s): CP-Volamine

ID	Temp. Range	30 m	60 m
0.32 mm	40 to 370 °C	227-36326-01	227-36326-02

SH-5 Amine / SH-35 Amine

- Dedicated columns for amines and other basic compounds, including alkylamines, diamines, triamines, ethanolamines, and nitrogen-containing heterocyclics.

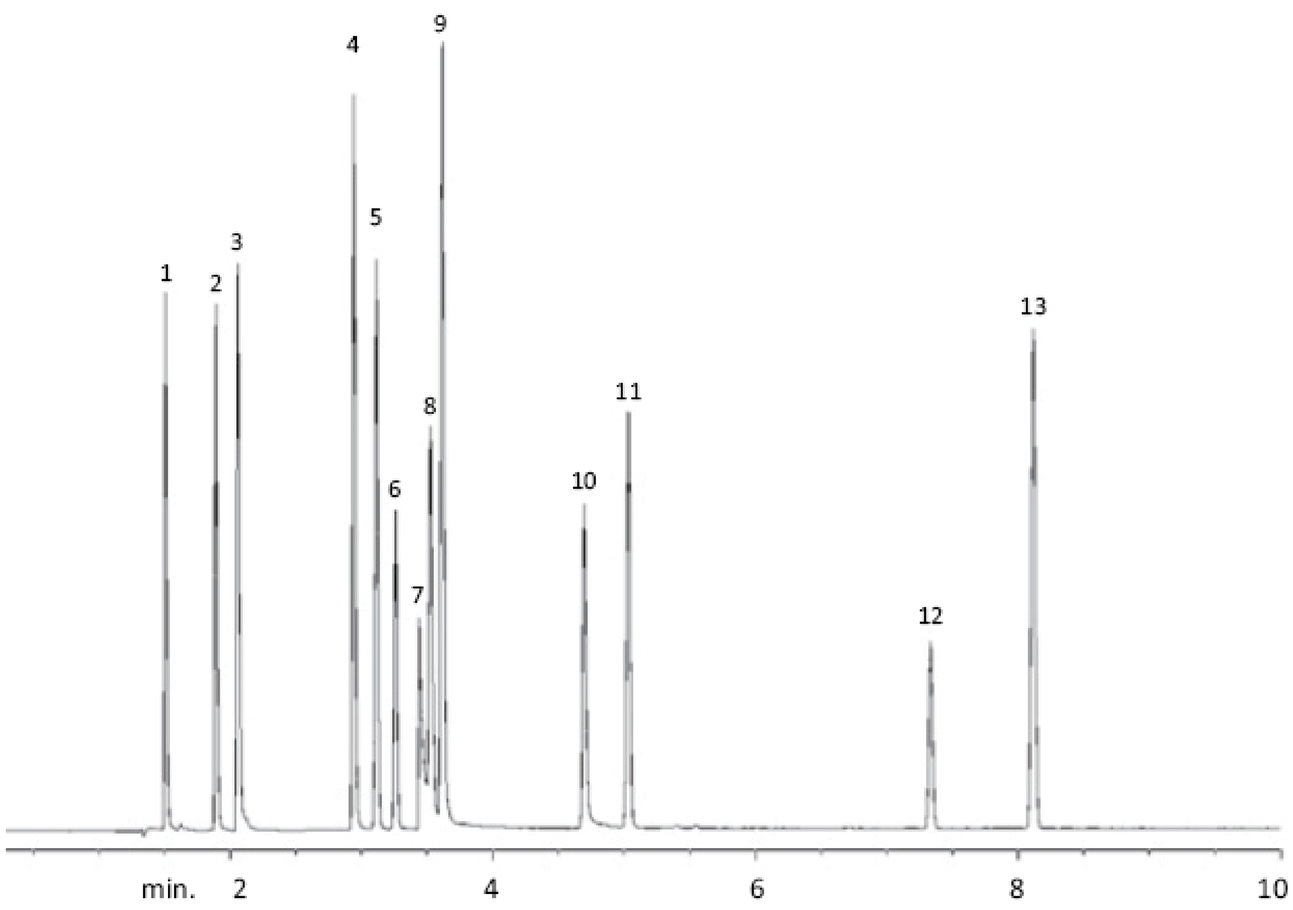
SH-5 Amine (Low-polarity phase: Crossbond™ 5% diphenyl / 95% dimethyl polysiloxane)

ID	df	Temp. Range	15 m	30 m
0.25 mm	0.25 µm	-60 to 300/315 °C	-	227-36282-01
	0.50 µm	-60 to 300/315 °C	227-36323-01	227-36283-01
	1.00 µm	-60 to 300/315 °C	227-36323-02	227-36284-01
0.32 mm	1.00 µm	-60 to 300/315 °C	-	227-36332-02
	1.50 µm	-60 to 290/305 °C	-	227-36285-01
0.53 mm	1.00 µm	-60 to 290/305 °C	-	227-36286-01
	3.00 µm	-60 to 280/295 °C	-	227-36287-01

SH-35 Amine (Mid-polarity phase: Crossbond™ 35% diphenyl / 65% dimethyl polysiloxane)

ID	df	Temp. Range	30 m
0.25 mm	0.50 µm	0 to 220 °C	227-36288-01
	1.00 µm	0 to 220 °C	227-36289-01
0.32 mm	1.00 µm	0 to 220 °C	227-36290-01
	1.50 µm	0 to 220 °C	227-36291-01
0.53 mm	1.00 µm	0 to 220 °C	227-36292-01
	3.00 µm	0 to 220 °C	227-36293-01

Amines & Phenols



Peaks

1. diethylamine
2. pyridine
3. morpholine
4. phenol
5. aniline
6. 2-chlorophenol
7. diethylenetriamine
8. octylamine
9. 1-methyl-2-pyrrolidinone
10. 2-nitrophenol
11. 2,6-dimethylaniline
12. nicotine
13. 2-nitroaniline

Conditions

Column	:	SH-5 Amine, 30 m, 0.32 mm ID, 1.00 µm (P/N: 227-36290-01)
Inj. Vol.	:	1 µL split injection of miscellaneous amines and phenols in water (split ratio: 25:1)
On-column conc.	:	22 ng
Inj. Temp	:	305 °C
Oven Temp	:	120 °C to 220 °C at 10 °C/min
Carrier Gas	:	Hydrogen, linear velocity 38cm/sec. set at 120 °C
Detector Temp	:	305 °C
FID sensitivity	:	6.4×10^{-11} AFS

Capillary Columns

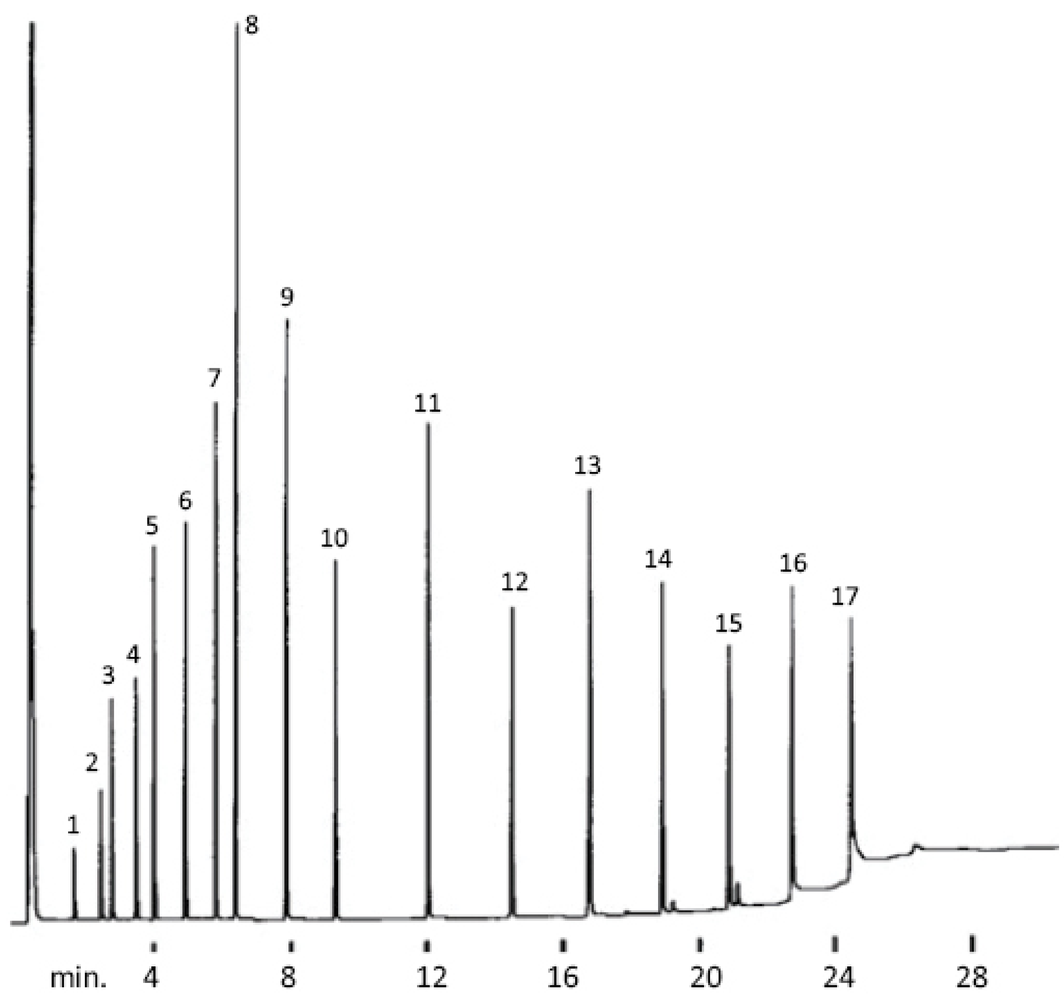
Dedicated Columns

SH-PolarD

- Polar phase: Crossbond™ acid-deactivated Carbowax™ polyethylene glycol
- Dedicated columns for free (underivatized) acids, some inorganic acids.
- Resistant to oxidative damage.
- Equivalent to USP G25 and G35 phases.
- Similar phases: HP-FFAP, DB-FFAP, VF-DA, CP-Wax 58 CB, CP-FFAP CB, Nukol

ID	df	Temp. Range	30 m	60 m
0.25 mm	0.10 µm	40 to 250/260 °C	227-36271-01	–
	0.25 µm	40 to 250/260 °C	221-75981-30	227-36272-01
	0.50 µm	40 to 250/260 °C	227-36273-01	227-36273-02
0.32 mm	0.10 µm	40 to 250/260 °C	227-36274-01	–
	0.25 µm	40 to 250/260 °C	227-36321-02	227-36275-01
	0.50 µm	40 to 250/260 °C	227-36322-02	227-36276-01
	1.00 µm	40 to 240/250 °C	227-36277-01	227-36277-02
0.53 mm	0.25 µm	40 to 250/260 °C	227-36278-01	227-36278-02
	0.50 µm	40 to 250/260 °C	227-36279-01	227-36279-02
	1.00 µm	40 to 240/250 °C	227-36280-01	227-36280-02
	1.50 µm	40 to 230/240 °C	227-36281-01	227-36281-02

Organic Acids (Free Fatty Acids)



Peaks

1. acetic acid
2. propionic acid
3. isobutyric acid
4. n-butyric acid
5. isovaleric acid
6. n-valeric acid
7. isocaproic acid
8. caproic acid
9. heptanoic acid
10. caprylic acid
11. capric acid
12. lauric acid
13. myristic acid
14. palmitic acid
15. stearic acid
16. arachidic acid
17. behenic acid

Conditions

Column	: SH-PolarD, 30 m, 0.53 mm ID, 0.25 µm (P/N: 227-36278-01)
Sample	: free acid standard Conc.: 25 ng/µL.
Inj. Vol.	: 0.3 µL direct
Inj. Temp	: 280 °C
Oven Temp	: 100 °C (hold 2 min) to 280 °C at 8 °C/min, (hold 10 min)
Carrier Gas	: Hydrogen, flow rate 10 cc/min, linear velocity 80 cm/sec.
Detector	: FID, 280 °C