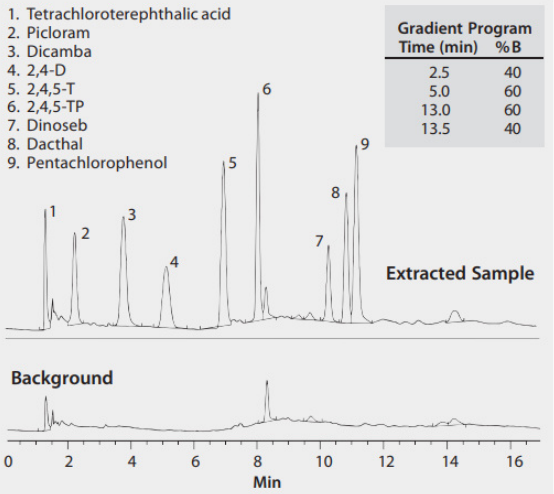
HPLC Analysis of Acidic Herbicides in Water on a Polymeric C18 Column after SPE using Supelclean™ ENVI™-Carb

using Zymark AutoTrace Extraction WorkStation 1.20

sample preparation . . . . . SPE (Solid Phase Extraction)
sample/matrix . . . Fresh 1 L water samples, dechlorinated with sodium thiosulfate when necessary, at ambient temperature and pH.
SPE tube/cartridge . . . . . Supelclean ENVI-Carb, 250 mg/6 mL (57092)
condition . . . . . 10 mL DI water at 20 mL/min
sample addition . . . . . 0.9 L water sample at 20 mL/min
drying . . . . . 10 min using clean nitrogen
washing . . . . . 10 mL DI water at 20 mL/min
elution . . . . . 10 mL 0.1% phosphoric acid in methylene chloride:acetonitrile (80:20) at 5 mL/min
column . . polymeric-coated silica-based PAH specialty column, 20 cm × 3 mm I.D., 5 µm (Supelco equivalent, SUPELCOSIL LC-PAH, available upon request)
mobile phase . . gradient, (A): 0.05% phosphoric acid in DI water; (B): acetonitrile
flow rate . . . . . 0.5 mL/min
column temp. . . . . 50 °C
detector . . . . . photodiode array- peak width: 0.053 min, sampling interval: 0.320 sec, monitor 210 nm & 225 nm
injection . . . . . 10 µL of extract (4-5 ppb each analyte in water)
Application No. 796-0150

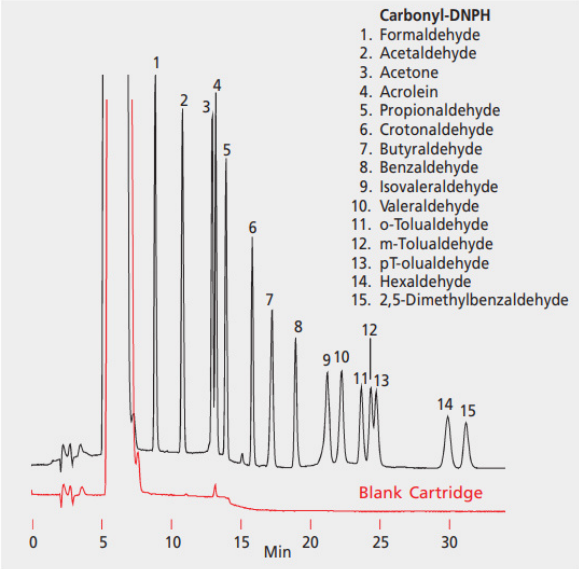


Figures provided by A. Lichtman, Nassau County Dept. of Health, Hempstead, New York, USA. Request Application Note No. T196100.

Air Monitoring and Industrial Hygiene

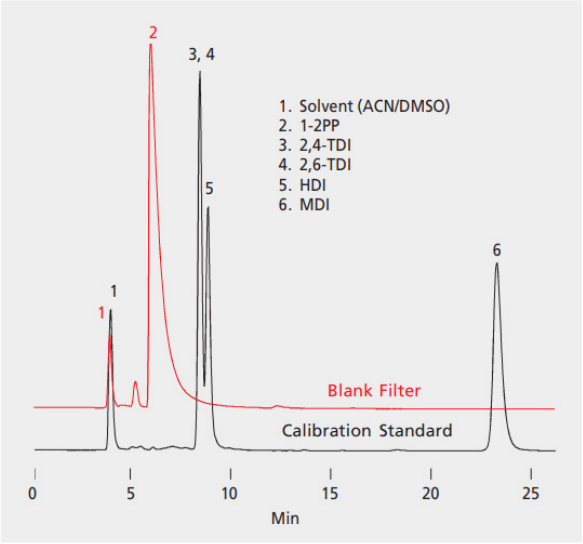
EPA Method TO-11/IP-6A and ASTM® D5197: HPLC Analysis of Aldehydes and Ketones on SUPELCOSIL™ LC-18 after Collection/Desorption using LpDNPH

sample/matrix . . . . . 5 µg each carbonyl-DNPH on LpDNPH cartridge. Cartridge eluted with 5.0 mL acetonitrile
adsorbent tube . . . . . LpDNPH Cartridge (21024-U)
column . . . . . SUPELCOSIL LC-18, 25 cm × 4.6 mm I.D., 5 µm particles (58298)
mobile phase . . . . . (A): acetonitrile:tetrahydrofuran:water, 30:10:60; (B): acetonitrile:water, 60:40 gradient 0% B for 1 min, linear gradient to 100% B over 10 min
flow rate . . . . . 1.5 mL/min
detector . . . . . VIS, 360 nm
injection . . . . . 25 µL of extract
Application No. 795-0298



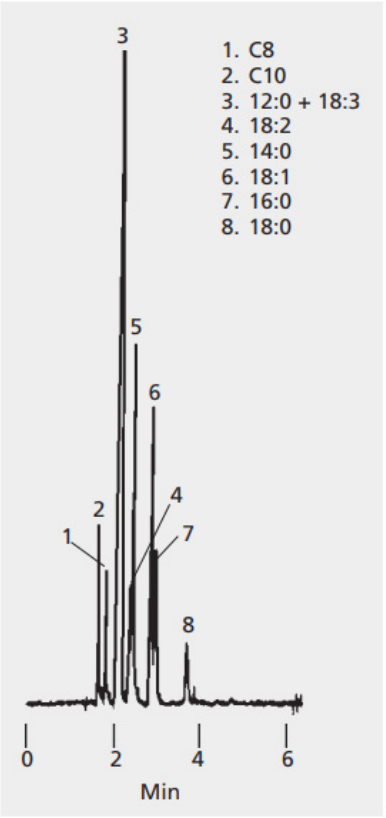
OSHA Method 42/47 and ASTM® D5836: HPLC Analysis of Isocyanates on SUPELCOSIL™ LC-8 after Collection/Desorption using ORBO™-80

sample/matrix . . calibration standard: isocyanate derivatives, 5 µg/mL in acetonitrile
blank: 1-(2-pyridyl)piperazine (1-2PP) coated glass fiber filter desorbed in acetonitrile/DMSO, 9:1
adsorbent tube ORBO-80 (20811)
column . . . . . SUPELCOSIL LC-8, 25 cm × 4.6 mm I.D., 5 µm particles (58297)
mobile phase . . . . . 0.05 M ammonium acetate in water:acetonitrile, 70:30 (pH 6-6.2 with acetic acid)
flow rate . . . . . linear gradient, 0.7 mL/min to 2 mL/min in 15 min
detector . . . . . UV, 254 nm
injection . . . . . 10 µL
Application No. 796-0376



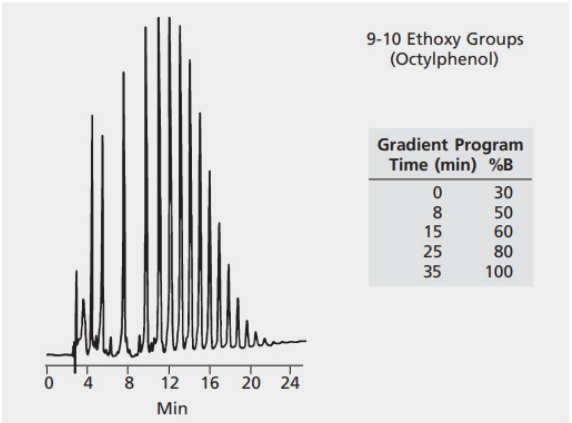
HPLC Analysis of Fatty Acid Methyl Esters (FAMES) on SUPELCOSIL™ LC-18

column . . . . . SUPELCOSIL LC-18, 25 cm × 4.6 mm I.D., 5 µm particles (58298)
mobile phase . . . . . (A) acetonitrile; (B) acetone; (59.0:41.0, v/v, A:B)
flow rate . . . . . 1 mL/min
detector . . . . . RI
injection . . . 10 µL of 9% C8 to C18 saturated and unsaturated FAMEs in mobile phase
Application No. 797-0501



HPLC Analysis of Nonionic Surfactants, 9-10 Ethoxy Groups (Octylphenol) on SUPELCOSIL™ LC-Diol

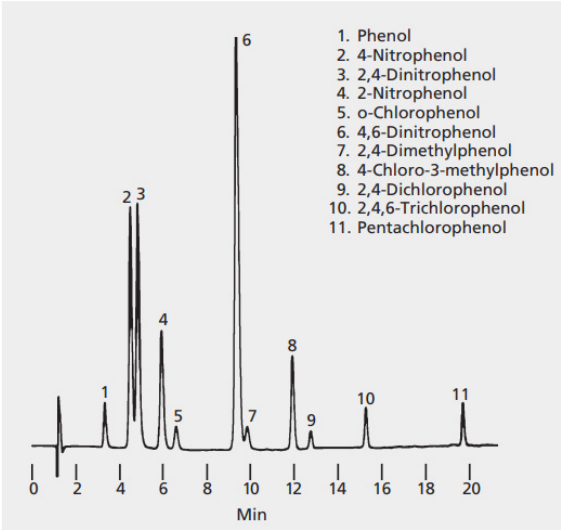
column . . . . . SUPELCOSIL LC-Diol, 25 cm × 4.6 mm I.D., 5 µm particles (58201)
mobile phase . . . . . (A) hexane:methylene chloride (95:5); (B) hexane:methylene chloride:methanol (50:40:10)
flow rate . . . . . 1 mL/min
column temp. . . . . 35 °C
detector . . . . . UV, 280 nm
injection . . . . . 10 µL methylene chloride containing 20 µg surfactant
Application No. 713-0782



Gradient Program Time (min)	%B
0	30
8	50
15	60
25	80
35	100

HPLC Analysis of Phenols on SUPELCOSIL™ LC-8

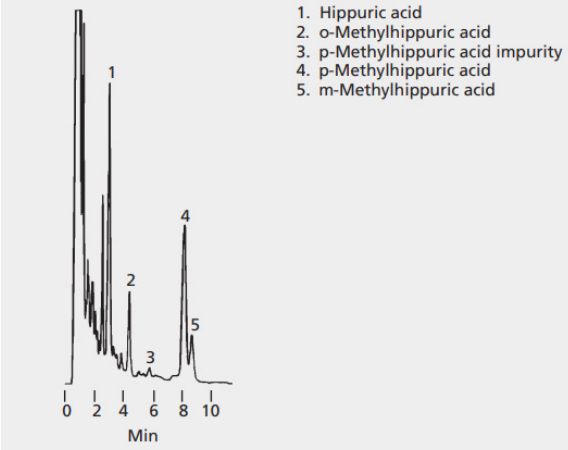
column . . . . . SUPELCOSIL LC-8, 15 cm × 4.6 mm I.D., 5 µm particles (58220-U)
mobile phase . . . . . (A) 1% acetic acid/methanol: (B) 1% acetic acid/water
gradient . . . . . 35:65 to 100:0 (20 min), return to 35:65 (5 min)
flow rate . . . . . 1.5 mL/min
column temp. . . . . 30 °C
detector . . . . . UV, 280 nm
Application No. 713-1031



HPLC Analysis of Hippuric and Methylhippuric Acids in Urine on SUPELCOSIL™ LC-18

Urinary excretion of hippuric acid and m-or p-methylhippuric acid in the urine is a test of exposure to toluene and m-or p-xylene vapors.

column . . . . . SUPELCOSIL LC-18, 7.5 cm × 4.6 mm I.D., 3 µm particles (58984)
mobile phase . . . . . (A) tetrahydrofuran:10 mM potassium phosphate, pH 3.0 (B) with phosphoric acid (3:97, A:B)
flow rate . . . . . 1.5 mL/min
detector . . . . . UV, 260 nm
injection . . 10 µL spiked urine (300 µg/mL HA, o-MHA; 150 µg/mL m-MHA, p-MHA)
Application No. 713-0961A



HPLC Analysis of Metabolites of 7,12-Dimethylbenz[a]anthracene on SUPELCOSIL™ LC-18

column . . . . . SUPELCOSIL LC-18, 25 cm × 4.6 mm I.D., 5 µm particles (58298)
mobile phase . . (A) methanol:(B) water, (50:50, A:B), 10 min to 100:0 at 2.5% /min
flow rate . . . . . 0.8 mL/min
detector . . . . . fluorescence
sample . . . . rat liver, 9000 × g supernatant fraction from Aroclor-treated animals
Application No. 713-1043

1. 2-OH-DMBA(t-diol)
2. 7-OHM-12-MBA-(t-10,11-diol)
3. 7-M-12-OHMBA-(t-8,9-diol)
4. 7-OHM-12-MBA-(t-8,9-diol)
5. 7-OHM-(t-3,4-diol)
6. Mixed diols, incl. DMBA-(t-8,9-diol & t-10, 11-diol)
7. Position of 7,12-bis-OHMBA
8. 7-OHM-12-MBA-2-ol
9. 7-OHM-12-MBA-(3-ol)
10. 7-M-12-OHMNA-4-ol
11. 7-OHM-12-MBA-4-ol
12. 7-M-12-OHMBA-(3-ol)
13. 7-M-12-OHMBA-2-ol
14. 7-OHM-12-MBA
15. 7-M-12-OHMBA
16. DMBA-2-ol
17. DMBA-3-ol
18. DMBA-4-ol
19. DMBA

(parentheses = tentative identifications)

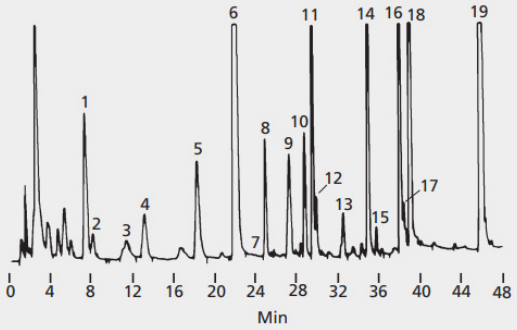


Figure provided by Drs. J. Milner and J. Grunau, University of Illinois, Urbana, Illinois, USA.

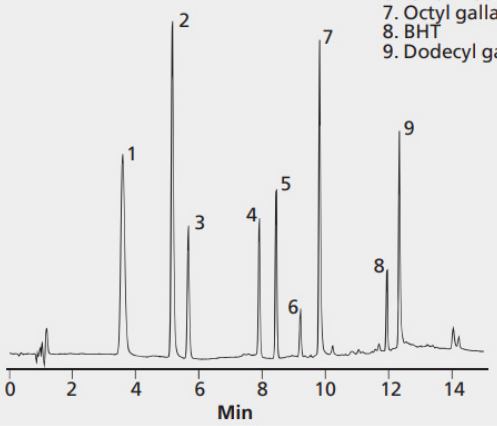
Cosmetics, Personal Care, and Cleaning Products

HPLC Analysis of Antioxidants on SUPELCOSIL™ LC-18

column . . . . SUPELCOSIL LC-18, 15 cm × 4.6 mm I.D., 5 µm particles (58230-U)
mobile phase . . (A) 5% acetic acid in deionized water; (B) acetonitrile:methanol (1:1)
70% A/30% B to 100% B, linear gradient over 10 min, hold 10min
flow rate . . . . . 2 mL/min
detector . . . . . UV, 280 nm
injection . . . . . 10µL, 20 µg/mL each antioxidant
Application No. 795-0438

Gradient Program		
Time (min)	%A	%B
0	70	30
10	0	100
20	70	30

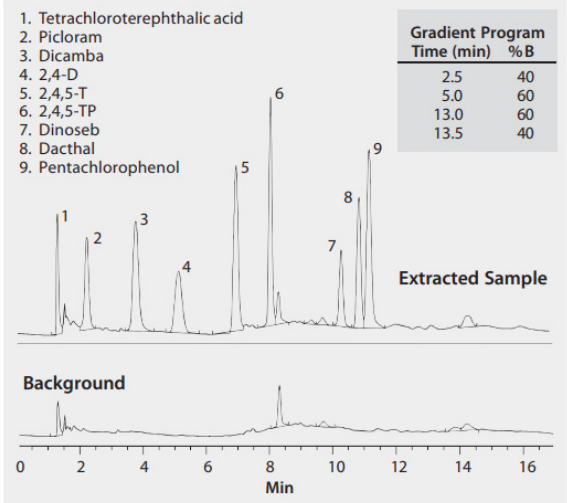
1. Propyl gallate
2. THBP
3. TBHQ
4. NDGA
5. BHA
6. Ionox 100
7. Octyl gallate
8. BHT
9. Dodecyl gallate



HPLC Analysis of Acidic Herbicides in Water on a Polymeric C18 Column after SPE using Supelclean™ ENVI™-Carb

using Zymark AutoTrace Extraction WorkStation 1.20

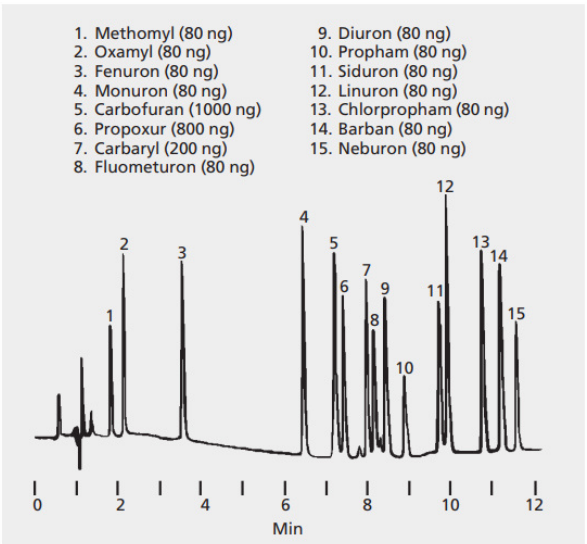
sample preparation . . . . . SPE (Solid Phase Extraction)
sample/matrix . . . Fresh 1 L water samples, dechlorinated with sodium thiosulfate when necessary, at ambient temperature and pH.
SPE tube/cartridge . . . . . Supelclean ENVI-Carb, 250 mg/6 mL (57092)
condition . . . . . 10 mL DI water at 20 mL/min
sample addition . . . . . 0.9 L water sample at 20 mL/min
drying . . . . . 10 min using clean nitrogen
washing . . . . . 10 mL DI water at 20 mL/min
elution . . . . . 10 mL 0.1% phosphoric acid in methylene chloride:acetonitrile (80:20) at 5 mL/min
column . . polymeric-coated silica-based PAH specialty column, 20 cm × 3 mm I.D., 5 µm (Supelco equivalent, SUPELCOSIL LC-PAH, available upon request)
mobile phase . . gradient, (A): 0.05% phosphoric acid in DI water; (B): acetonitrile
flow rate . . . . . 0.5 mL/min
column temp. . . . . 50 °C
detector . . . . . photodiode array- peak width: 0.053 min, sampling interval: 0.320 sec, monitor 210 nm & 225 nm
injection . . . . . 10 µL of extract (4-5 ppb each analyte in water)
Application No. 796-0150



Figures provided by A. Lichtman, Nassau County Dept. of Health, Hempstead, New York, USA. Request Application Note No. T196100.

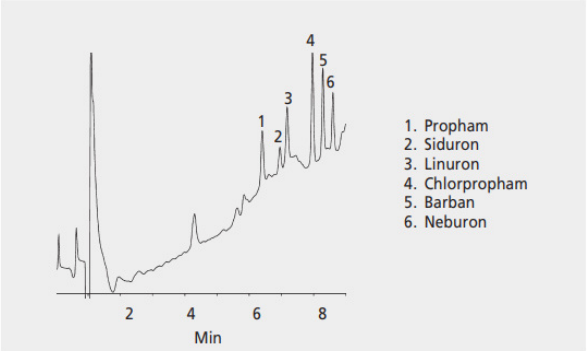
HPLC Analysis of Carbamate and Urea Pesticides on SUPELCOSIL™ LC-8

column . . . . . SUPELCOSIL LC-8, 15 cm × 4.6 mm I.D., 5 µm particles (58220-U)
mobile phase . . . . . (A) acetonitrile; (B) water
gradient . . . . . 18:82 to 65:35 in 9 min, hold 3 min
flow rate . . . . . 2 mL/min
column temp. . . . . 35 °C
detector . . . . . UV, 240 nm
injection . . . . . 10 µL
Application No. 794-0803



HPLC Analysis of Carbamate and Urea Pesticides on SUPELCOSIL™ LC-8 after SPME using 60 µm PDMS/DVB Fiber

sample/matrix . . . . 3 mL water containing 8ng/mL of each analyte in 10% NaCl
SPME fiber . . . . . PDMS/DVB, 60 µm (57317)
extraction . . . . . immersion, 40 min, rapid stirring
desorption process . . . . . static, 5 min in acetonitrile:water (65:35); dynamic, valve open during run
column . . . . . SUPELCOSIL LC-8, 15 cm × 4.6 mm I.D., 5 µm particles (58220-U)
mobile phase . . . . . (A) acetonitrile; (B) water
gradient . . . . . 18:82 to 65:35 in 9 min, hold 3 min
flow rate . . . . . 2.0 mL/min
column temp. . . . . 35 °C
detector . . . . . UV, 240 nm
Application No. 797-0049



HPLC Analysis of Metabolites of 7,12-Dimethylbenz[a]anthracene on SUPELCOSIL™ LC-18

column . . . . . SUPELCOSIL LC-18, 25 cm × 4.6 mm I.D., 5 µm particles (58298)
mobile phase . . (A) methanol:(B) water, (50:50, A:B), 10 min to 100:0 at 2.5% /min
flow rate . . . . . 0.8 mL/min
detector . . . . . fluorescence
sample . . . . rat liver, 9000 × g supernatant fraction from Aroclor-treated animals
Application No. 713-1043

1. 2-OH-DMBA(t-diol)
2. 7-OHM-12-MBA-(t-10,11-diol)
3. 7-M-12-OHMBA-(t-8,9-diol)
4. 7-OHM-12-MBA-(t-8,9-diol)
5. 7-OHM-(t-3,4-diol)
6. Mixed diols, incl. DMBA-(t-8,9-diol & t-10, 11-diol)
7. Position of 7,12-bis-OHMBA
8. 7-OHM-12-MBA-2-ol
9. 7-OHM-12-MBA-(3-ol)
10. 7-M-12-OHMNA-4-ol
11. 7-OHM-12-MBA-4-ol
12. 7-M-12-OHMBA-(3-ol)
13. 7-M-12-OHMBA-2-ol
14. 7-OHM-12-MBA
15. 7-M-12-OHMBA
16. DMBA-2-ol
17. DMBA-3-ol
18. DMBA-4-ol
19. DMBA

(parentheses = tentative identifications)

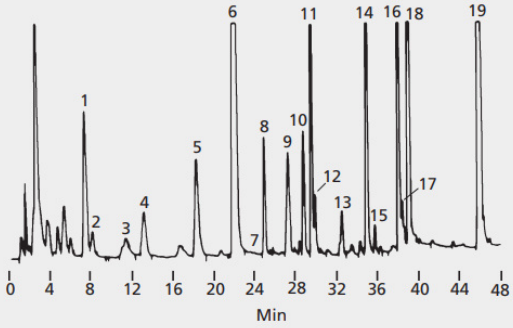
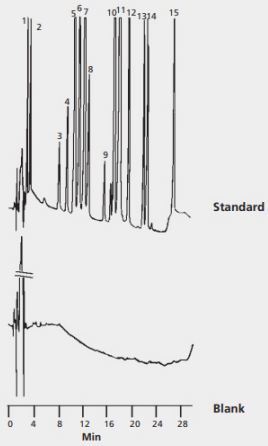


Figure provided by Drs. J. Milner and J. Grunau, University of Illinois, Urbana, Illinois, USA.

HPLC Analysis of Nonvolatile Pesticides in Water on SUPELCOSIL™ LC-18-DB after SPE using Supelclean™ ENVI-Carb™

sample preparation . . . . . SPE (Solid Phase Extraction)
sample/matrix . . . . . water spiked with pesticides at 10-50 µg/L
SPE tube/cartridge . . . . . Supelclean ENVI-Carb, 250 mg/3 mL (57088)
condition . . . . . 5 mL methylene chloride:methanol (80:20); 1 mL methanol; 10 mL 2% acetic acid in water (keep bed moist until sample addition)
sample addition . . . . . 100 mL sample at 5 mL/min
drying . . . . . 1 minute with vacuum
elution . . . . . 0.8 mL methanol; 2 x 35 mL methylene chloride:methanol (80:20)
eluate post-treatment . . . . . dry eluate to 500 µL under gentle nitrogen stream, reconstitute to 1 mL with methanol
column . . SUPELCOSIL LC-18-DB, 25 cm × 4.6 mm I.D., 5 µm particles (58355-U)
mobile phase . . . . . (A) water:acetonitrile (90:10), (B) acetonitrile; gradient 80% A for 5 min then to 30% A over 30 min
flow rate . . . . . 1.5 mL/min
detector . . . . . UV, 220 nm
injection . . . . . 20 µL
Application No. 85-438



Analyte	% Recovery (± RSD, n = 5)
1. Oxamyl	111 ± 9.6
2. Methomyl	105 ± 5.0
3. N-1-Naphthylthiourea	—
4. Aldicarb	92 ± 0.8
5. Simazine	91 ± 6.5
6. Monuron	99 ± 3.2
7. Cyanazine	90 ± 5.4
8. Metribuzin	97 ± 3.9
9. Carbofuran	106 ± 6.2
10. Atrazine	89 ± 5.7
11. Carbaryl	97 ± 3.5
12. Diuron	88 ± 5.7
13. Propham	95 ± 3.2
14. Propachlor	96 ± 3.8
15. Linuron	88 ± 5.4

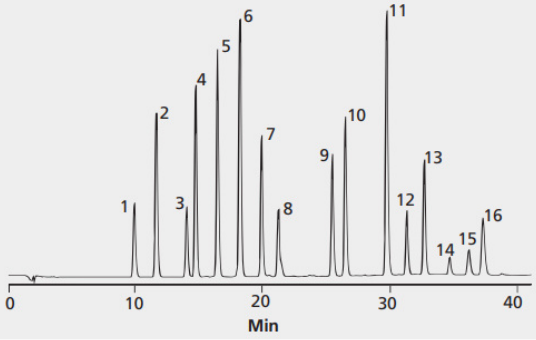
HPLC Analysis of PAHs in Water on SUPELCOSIL™ LC-PAH after SPME using 100 µm PDMS Fiber

sample/matrix . . . . . 5 µL PAH mix (Cat. No. 4-8743) in 5 mL water
SPME fiber . . . . . polydimethylsiloxane, 100 µm (57301)
extraction . . . . . immersion, 30 min (rapid stirring)
desorption process . . . . . static, 200 µL acetonitrile:water, 40:60, 2 min
column . . . . SUPELCOSIL LC-PAH, 15 cm × 4.6 mm I.D., 5 µm particles (58318)
gradient . . 0 min - 50% A; 5 min - 50% A; 30 min - 100% A; 45 min - 100% A
flow rate . . . . . 0-2 min: 0.2 mL/min 2-45 min: 1.0 mL/min
mobile phase . . . . . (A) acetonitrile:(B) water
detector . . . . . UV, 254 nm
Application No. 796-0086

1. Naphthalene 1,000 ng/mL
2. Acenaphthylene 2,000 ng/mL
3. Acenaphthene 1,000 ng/mL
4. Fluorene 200 ng/mL
5. Phenanthrene 100 ng/mL
6. Anthracene 100 ng/mL
7. Fluoranthene 200 ng/mL
8. Pyrene 100 ng/mL
9. Benzo(a)anthracene 100 ng/mL
10. Chrysene 100 ng/mL
11. Benzo(b)fluoranthene 200 ng/mL
12. Benzo(k)fluoranthene 100 ng/mL
13. Benzo(a)pyrene 100 ng/mL
14. Dibenzo(a,h)anthracene 200 ng/mL
15. Benzo(ghi)perylene 200 ng/mL
16. Indeno(1,2,3-cd)pyrene 100 ng/mL

Gradient Program	
Time (min)	% ACN
0	50
5	50
30	100
45	100

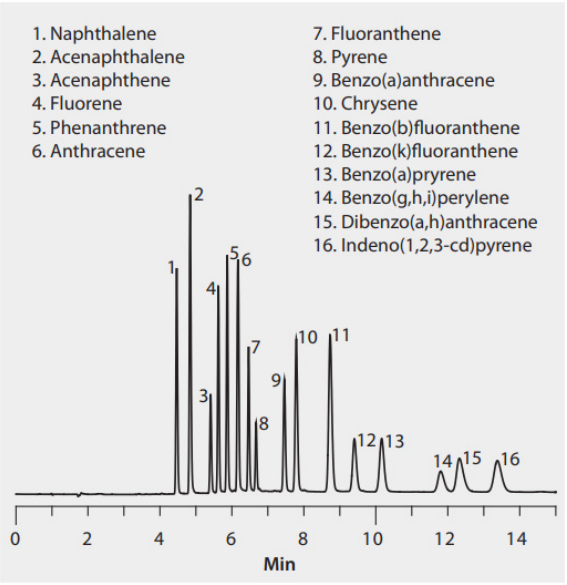
Flow increased at 2.0 min



HPLC Analysis of PAHs on SUPELCOSIL™ LC-PAH

PAHs are traditionally evaluated using an acetonitrile/water gradient. Recently customers are looking for alternatives to this method using a methanol/water gradient due to the risk of an another acetonitrile shortage, solvent costs, and toxicity to the environment. This analysis demostrates the separation using a methanol gradient.

column . . . . . SUPELCOSIL LC-PAH, 15 cm x 4.6 mm I.D., 5 µm particles (58318)
mobile phase . . . . . (A) water, (B) methanol
gradient . . . . . 55 to 100% B in 5 min; held at 100%B for 10 min
flow rate . . . . . 1.5 mL/min
column temp. . . . . 35 °C
detector . . . . . UV, 254 nm
injection . . . . . 5 µL
sample . . . . . EPA 610 mix
Application No. G005559

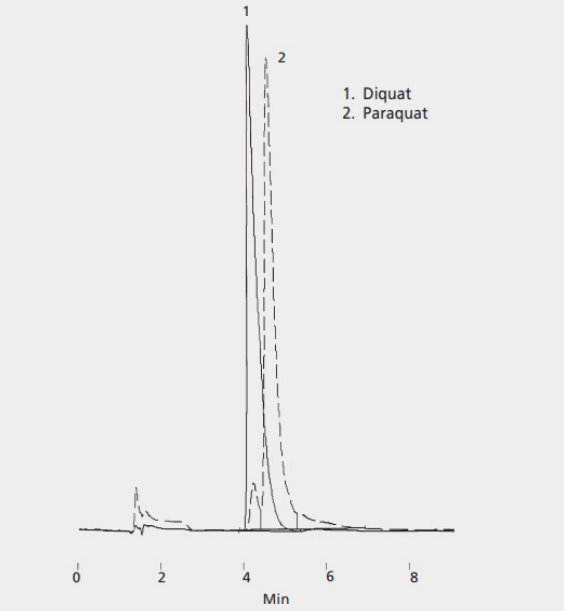


HPLC Analysis of Paraquat and Diquat on SUPELCOSIL™ LC-18 after SPE using ENVI™-8 DSK

Refer to US EPA Method 549.1 for full details

Sample Pre-treatment:
250 mL drinking water. Adjust water sample to pH to 10.5 ± 0.2 with 10% sodium hydroxide or 10% hydrochloric acid

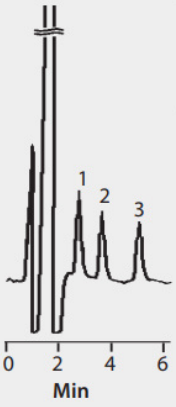
sample preparation . . . . . SPE (Solid Phase Extraction)
sample/matrix . . . . . drinking water adjusted to pH to 10.
sample preparation . . . . . ENVI-8 DSK, 47 mm (57172)
SPE tube/cartridge . . . . . ENVI-8 DSK SPE Disk, 47 mm (57172)
condition . . . . 10 mL acetonitrile; 2 × 10 mL reagent water; 10 mL conditioning solvent A (5 g cetyl trimethyl ammonium bromide and 5 mL conc. ammonium hydroxide in 500 mL DI water, dilute to 1 L); (2 × 10 mL reagent water; 10 mL conditioning solvent B (10 g hexanesulfonic acid, sodium salt and 10 mL conc. ammonium hydroxide in 250 mL DI water, dilute to 500 mL))
sample addition . . . . . 250 mL water 100 mL/min
elution . . 0.5-1.0 mL acetonitrile (to cover/solvate disk); 2 × 4 mL eluting solution (13.5 mL orthophosphoric acid and 10.3 mL diethylamine in 500 mL DI water, dilute to 1 L)
column . . . . SUPELCOSIL LC-18, 15 cm × 4.6 mm I.D., 5 µm particles (58230-U)
mobile phase . . 3.5 mL triethylamine and 1.0 g 1-hexane-sulfonic acid, sodium salt to 800 mL DI H_2O add orthophosphoric acid to pH 2.5, dilute to 1 L
flow rate . . . . . 1.0 mL/min
column temp. . . . . 35 °C
detector . . . . . photodiode array, diquat - 308 nm, paraquat - 257 nm
injection . . . . . 100 µL
Application No. 794-0715



HPLC Analysis of Triazine Herbicides in Grass on SUPELCOSIL™ LC-8-DB after SPE using Supelclean™ LC-SCX

Sample Pre-treatment:
5 g fresh grass clippings spiked with 2 ppm each herbicide. Add 4 g anhydrous sodium sulfate and 20 mL methylene chloride:acetone (80:20). Shake 20 min and allow mixture to stand 1 min.

sample preparation . . . . . SPE (Solid Phase Extraction)
sample/matrix . . . . . fresh grass clippings spiked with herbicides at 2 ppm
SPE tube/cartridge . . . . . Supelclean LC-SCX, 500 mg/3 mL (57018)
condition . . . . . 1 mL methylene chloride
sample addition . . . . . 2 mL grass extract. Wash with 2 x 2 mL acetonitrile.
drying . . . . . Dry packing for 5 min. under nitrogen purge
washing . . Dry packing for 5 min under nitrogen purge; wash with 2 x 2 mL DI water
elution . . . . . 1.5 mL methanol
eluate post-treatment . . . . . dilute to 2 mL with DI water
column . . . . . SUPELCOSIL LC-8-DB, 15 cm × 4.6 mm I.D., 5 µm with guard column (58347)
mobile phase . . . . . (A) acetonitrile; (B) water; (45:55, A:B)
flow rate . . . . . 1.5 mL/min
detector . . . . . UV, 254 nm
injection . . . . . 100 µL
Application No. 84-109



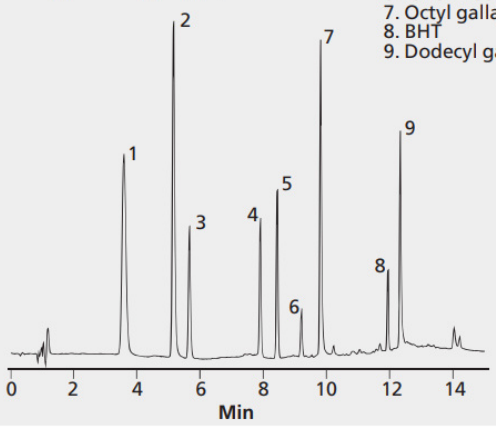
Recovery (± SD, n = 3)		
102.0	±	2.9
102.2	±	1.6
100.5	±	1.8

1. Simazine
2. Atrazine
3. Propazine

HPLC Analysis of Antioxidants on SUPELCOSIL™ LC-18

column . . . . SUPELCOSIL LC-18, 15 cm × 4.6 mm I.D., 5 µm particles (58230-U)
mobile phase . . (A) 5% acetic acid in deionized water; (B) acetonitrile:methanol (1:1)
70% A/30% B to 100% B, linear gradient over 10 min, hold 10min
flow rate . . . . . 2 mL/min
detector . . . . . UV, 280 nm
injection . . . . . 10µL, 20 µg/mL each antioxidant
Application No. 795-0438

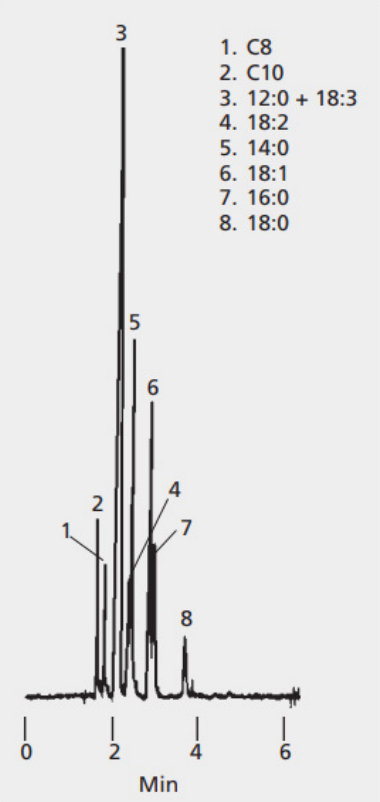
Gradient Program		
Time (min)	%A	%B
0	70	30
10	0	100
20	70	30



1. Propyl gallate
2. THBP
3. TBHQ
4. NDGA
5. BHA
6. Ionox 100
7. Octyl gallate
8. BHT
9. Dodecyl gallate

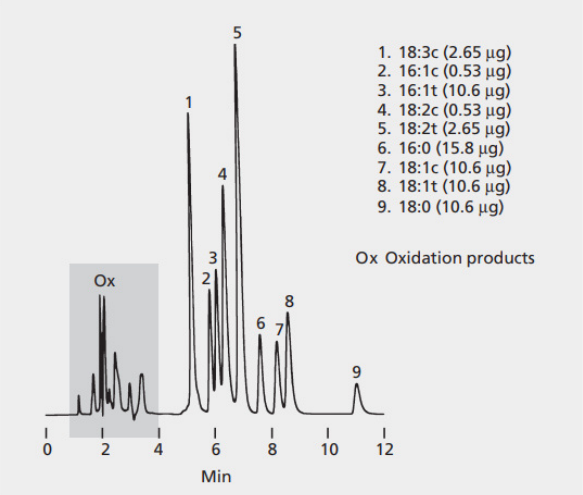
HPLC Analysis of Fatty Acid Methyl Esters (FAMES) on SUPELCOSIL™ LC-18

column . . . . . SUPELCOSIL LC-18, 25 cm × 4.6 mm I.D., 5 µm particles (58298)
mobile phase . . . . . (A) acetonitrile; (B) acetone; (59.0:41.0, v/v, A:B)
flow rate . . . . . 1 mL/min
detector . . . . . RI
injection . . 10 µL of 9% C8 to C18 saturated and unsaturated FAMEs in mobile phase
Application No. 797-0501



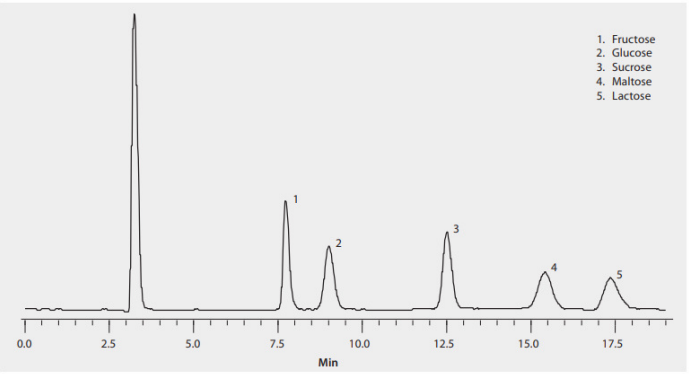
HPLC Analysis of Free Fatty Acids on SUPELCOSIL™ LC-8

column . . . . . SUPELCOSIL LC-8, 15 cm × 4.6 mm I.D., 3 µm particles (58983)
mobile phase . . . acetonitrile:tetrahydrofuran: 0.1% phosphoric acid (50.4:21.6:28)
flow rate . . . . . 1 mL/min
column temp. . . . . 35 °C
detector . . . . . UV, 215 nm
injection . . . . . 10 µL
Application No. 713-0969



HPLC Analysis of Sugars on SUPELCOSIL™ LC-NH2

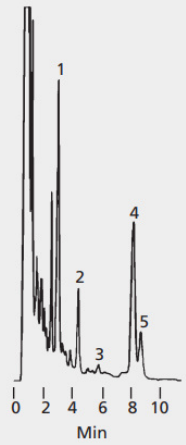
column . . . . . SUPELCOSIL LC-NH2, 25 cm x 4.6 mm I.D., 5 µm particles (58338)
mobile phase . . . . . (A) water; (B) acetonitrile; (25:75, A:B)
flow rate . . . . . 1 mL/min
temp. . . . . ambient
detector . . . . . refractive index (RI)
injection . . . . . 2 µL
sample . . . . . 10 mg/mL in water
Application No. G006195



HPLC Analysis of Hippuric and Methylhippuric Acids in Urine on SUPELCOSIL™ LC-18

Urinary excretion of hippuric acid and m-or p-methylhippuric acid in the urine is a test of exposure to toluene and m-or p-xylene vapors.

column . . . . . SUPELCOSIL LC-18, 7.5 cm × 4.6 mm I.D., 3 µm particles (58984)
mobile phase . . . . . (A) tetrahydrofuran:10 mM potassium phosphate, pH 3.0 (B) with phosphoric acid (3:97, A:B)
flow rate . . . . . 1.5 mL/min
detector . . . . . UV, 260 nm
injection . . 10 µL spiked urine (300 µg/mL HA, o-MHA; 150 µg/mL m-MHA, p-MHA)
Application No. 713-0961A



1. Hippuric acid
2. o-Methylhippuric acid
3. p-Methylhippuric acid impurity
4. p-Methylhippuric acid
5. m-Methylhippuric acid

HPLC Analysis of Metabolites of 7,12-Dimethylbenz[a]anthracene on SUPELCOSIL™ LC-18

column . . . . . SUPELCOSIL LC-18, 25 cm × 4.6 mm I.D., 5 µm particles (58298)
mobile phase . . (A) methanol:(B) water, (50:50, A:B), 10 min to 100:0 at 2.5% /min
flow rate . . . . . 0.8 mL/min
detector . . . . . fluorescence
sample . . . . rat liver, 9000 × g supernatant fraction from Aroclor-treated animals
Application No. 713-1043

1. 2-OH-DMBA(t-diol)
2. 7-OHM-12-MBA-(t-10,11-diol)
3. 7-M-12-OHMBA-(t-8,9-diol)
4. 7-OHM-12-MBA-(t-8,9-diol)
5. 7-OHM-(t-3,4-diol)
6. Mixed diols, incl. DMBA-(t-8,9-diol & t-10, 11-diol)
7. Position of 7,12-bis-OHMBA
8. 7-OHM-12-MBA-2-ol
9. 7-OHM-12-MBA-(3-ol)
10. 7-M-12-OHMNA-4-ol
11. 7-OHM-12-MBA-4-ol
12. 7-M-12-OHMBA-(3-ol)
13. 7-M-12-OHMBA-2-ol
14. 7-OHM-12-MBA
15. 7-M-12-OHMBA
16. DMBA-2-ol
17. DMBA-3-ol
18. DMBA-4-ol
19. DMBA

(parentheses = tentative identifications)

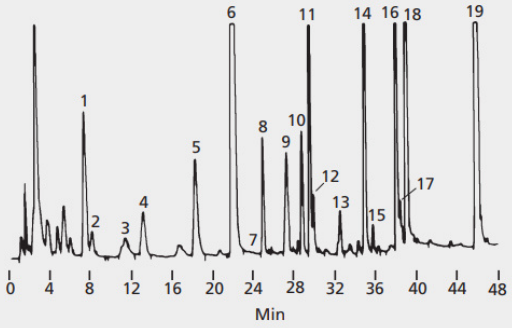
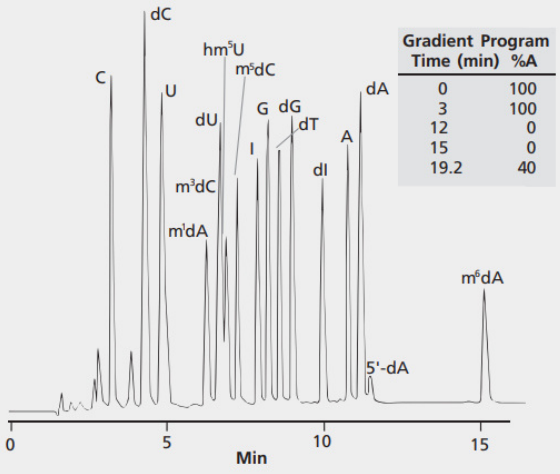


Figure provided by Drs. J. Milner and J. Grunau, University of Illinois, Urbana, Illinois, USA.

HPLC Analysis of Deoxyribonucleosides and Ribonucleosides on SUPELCOSIL™ LC-18-S

column . . . . SUPELCOSIL LC-18-S, 15 cm × 4.6 mm I.D., 5 µm particles (58931)
mobile phase . . 0.05 M K_2HPO_4/KH_2PO_4, pH 4.0:methanol (A) 97.5:2.5; (B) 80:20
flow rate . . . . . 1 mL/min
column temp. . . . . 30 °C
detector . . . . . UV, 254 nm
sample . . . . . nucleoside standards in water
Application No. 713-0955

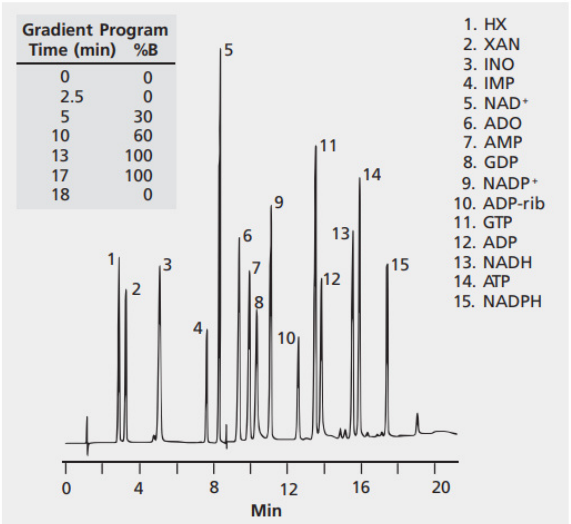


Gradient Program Time (min)	%A
0	100
3	100
12	0
15	0
19.2	40

Figure provided by Dr. C. W. Gehrke and Mr. K. C. Kuo, University of Missouri-Columbia, Experimental Station Chemical Laboratories, Columbia, MO USA.

HPLC Analysis of Nucleotides on SUPELCOSIL™ LC-18-T

column . . . SUPELCOSIL LC-18-T, 15 cm × 4.6 mm I.D., 3 µm particles (58970-U)
mobile phase . . (A) 0.1M potassium phosphate buffer/4mM tertrabutylammonium hydrogen sulfate, pH6.0; (B) A:methanol (70:30), pH 7.2
flow rate . . . . . 1.5 mL/min
detector . . . . . UV, 254 nm
injection . . . . . 20 µL deionized water (25-530 µM each analyte)
Application No. 713-0951



HPLC Analysis of tRNA Hydrolysate on SUPELCOSIL™ LC-18-S

column . . . . SUPELCOSIL LC-18-S, 15 cm × 4.6 mm I.D., 5 µm particles (58931)
mobile phase . . (A) 0.1M potassium phosphate, dibasic (pH 5.3):methanol, 97.5:2.5; (B) 0.01M potassium phosphate, dibasic (pH 5.1):methanol, 80:20; (C) 0.01M potassium phosphate, dibasic (pH 4.9):acetonitrile, 65:35
flow rate . . . . . 1 mL/min
column temp. . . . . 26 °C
detector . . . . . UV, 210 nm, 254 nm, 280 nm
injection . . . . . 50 µL hydrolysate buffer (pH 7.8) containing 5 µg bovine $tRNA^{Leu}$ hydrolysate
Application No. 713-0501

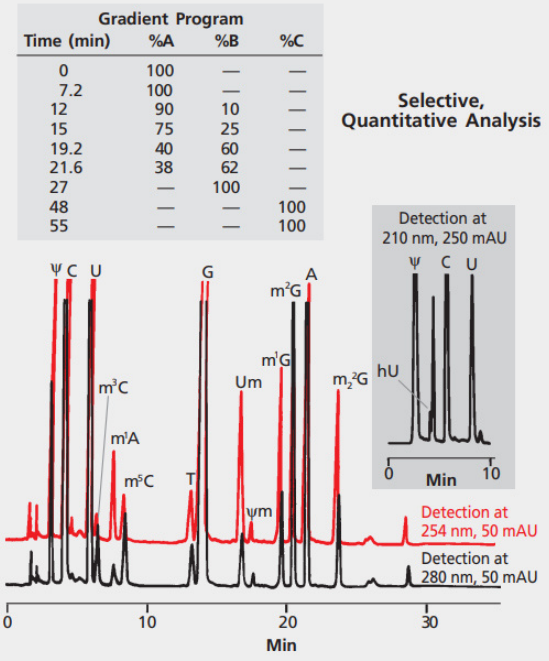
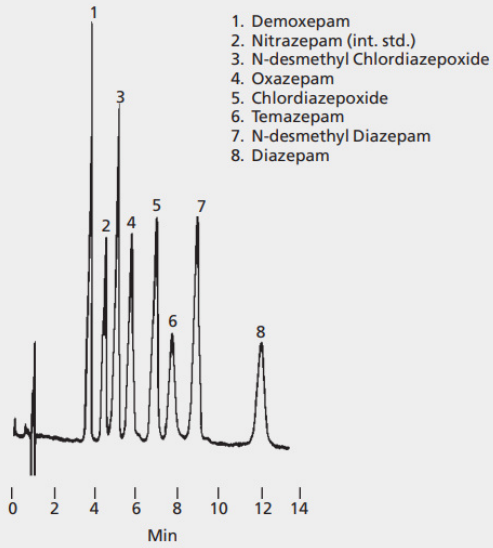


Figure provided by Dr. C.W. Gehrke and Mr. K.C. Kuo of the Interdisciplinary Chromatography-Mass Spectrometry Laboratories, University of Missouri (Columbia, MO, USA).

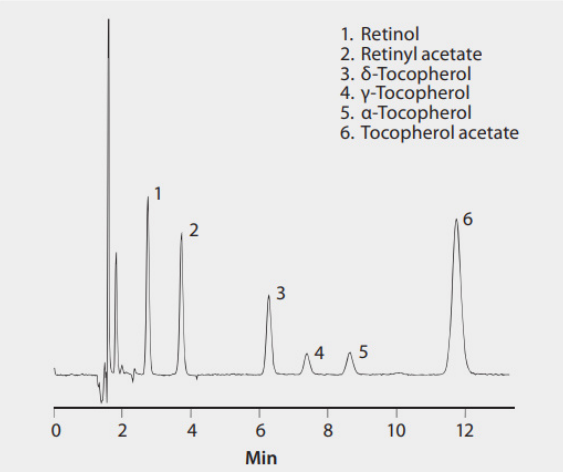
HPLC Analysis of Anxiolytic Drugs on SUPELCOSIL™ LC-8

column . . . . . SUPELCOSIL LC-8, 15 cm × 4.6 mm I.D., 5 µm particles (58220-U)
mobile phase . . methanol:acetonitrile:0.005 M KH_2PO_4 and 0.1 M ammonium acetate buffer (pH 6.0 with glacial acetic acid),26.5:16.5:57 (v/v/v)
flow rate . . . . . 2 mL/min
column temp. . . . . 30 °C
detector . . . . . UV, 245 nm
injection . . . . . 10 µL
Application No. 713-1390



HPLC Analysis of Vitamins, Fat Soluble (A and E), on SUPELCOSIL™ LC-18

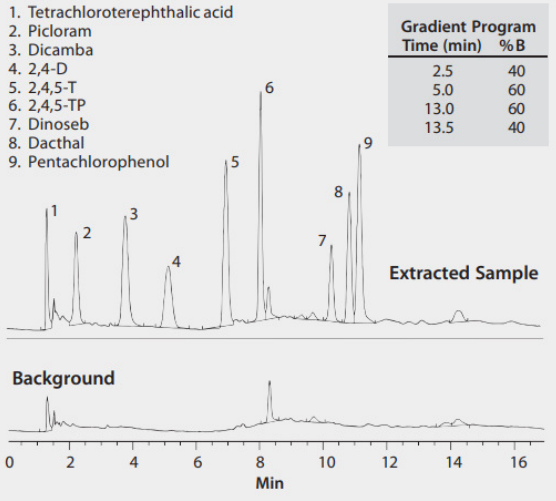
column . . . . . SUPELCOSIL LC-18, 25 cm × 4.6 mm I.D., 5 µm particles (58298)
mobile phase . . . . . (A) methanol: (B) deionized water (98:2, A:B)
flow rate . . . . . 2 mL/min
detector . . . . . UV, 325 nm (retinol, retinyl acetate) or 290 nm (tocopherols, tocopherol acetate)
injection . . . . . 20 µL
sample . . . . . 0.2-1 mg/mL each analyte in methanol
Application No. 712-0679



HPLC Analysis of Acidic Herbicides in Water on a Polymeric C18 Column after SPE using Supelclean™ ENVI™-Carb

using Zymark AutoTrace Extraction WorkStation 1.20

sample preparation . . . . . SPE (Solid Phase Extraction)
sample/matrix . . . Fresh 1 L water samples, dechlorinated with sodium thiosulfate when necessary, at ambient temperature and pH.
SPE tube/cartridge . . . . . Supelclean ENVI-Carb, 250 mg/6 mL (57092)
condition . . . . . 10 mL DI water at 20 mL/min
sample addition . . . . . 0.9 L water sample at 20 mL/min
drying . . . . . 10 min using clean nitrogen
washing . . . . . 10 mL DI water at 20 mL/min
elution . . . . . 10 mL 0.1% phosphoric acid in methylene chloride:acetonitrile (80:20) at 5 mL/min
column . . polymeric-coated silica-based PAH specialty column, 20 cm × 3 mm I.D., 5 µm (Supelco equivalent, SUPELCOSIL LC-PAH, available upon request)
mobile phase . . gradient, (A): 0.05% phosphoric acid in DI water; (B): acetonitrile
flow rate . . . . . 0.5 mL/min
column temp. . . . . 50 °C
detector . . . . . photodiode array- peak width: 0.053 min, sampling interval: 0.320 sec, monitor 210 nm & 225 nm
injection . . . . . 10 µL of extract (4-5 ppb each analyte in water)
Application No. 796-0150



Figures provided by A. Lichtman, Nassau County Dept. of Health, Hempstead, New York, USA. Request Application Note No. T196100.

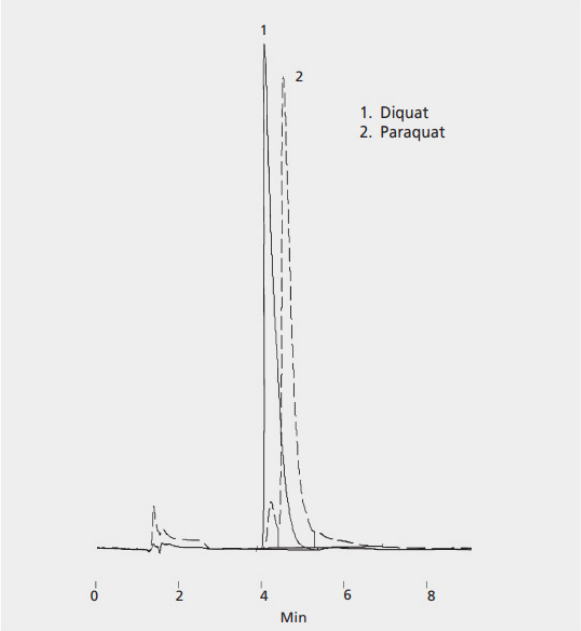
HPLC Analysis of Paraquat and Diquat on SUPELCOSIL™ LC-18 after SPE using ENVI™-8 DSK

Refer to US EPA Method 549.1 for full details

Sample Pre-treatment:

250 mL drinking water. Adjust water sample to pH to 10.5 ± 0.2 with 10% sodium hydroxide or 10% hydrochloric acid

sample preparation . . . . . SPE (Solid Phase Extraction)
sample/matrix . . . . . drinking water adjusted to pH to 10.
SPE tube/cartridge . . . . . ENVI-8 DSK SPE Disk, 47 mm (57172)
sample preparation . . . . . ENVI-8 DSK, 47 mm (57172)
condition . . 10 mL acetonitrile; 2 × 10 mL reagent water; 10 mL conditioning solvent A (5 g cetyl trimethyl ammonium bromide and 5 mL conc. ammonium hydroxide in 500 mL DI water, dilute to 1 L); (2 × 10 mL reagent water; 10 mL conditioning solvent B (10 g hexanesulfonic acid, sodium salt and 10 mL conc. ammonium hydroxide in 250 mL DI water, dilute to 500 mL))
sample addition . . . . . 250 mL water 100 mL/min
elution . . 0.5-1.0 mL acetonitrile (to cover/solvate disk); 2 × 4 mL eluting solution (13.5 mL orthophosphoric acid and 10.3 mL diethylamine in 500 mL DI water, dilute to 1 L)
column . . . . SUPELCOSIL LC-18, 15 cm × 4.6 mm I.D., 5 µm particles (58230-U)
mobile phase . . 3.5 mL triethylamine and 1.0 g 1-hexane-sulfonic acid, sodium salt to 800 mL DI H_2O add orthophosphoric acid to pH 2.5, dilute to 1 L
flow rate . . . . . 1.0 mL/min
column temp. . . . . 35 °C
detector . . . . . photodiode array, diquat - 308 nm, paraquat - 257 nm
injection . . . . . 100 µL
Application No. 794-0715

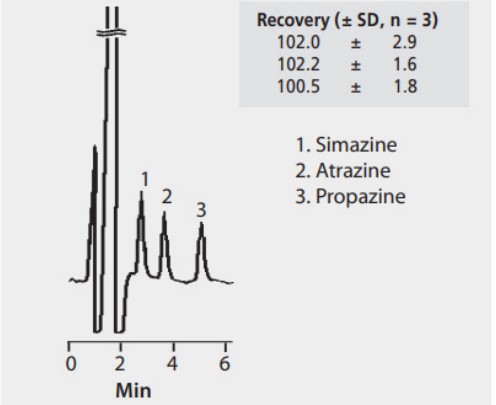


HPLC Analysis of Triazine Herbicides in Grass on SUPELCOSIL™ LC-8-DB after SPE using Supelclean™ LC-SCX

Sample Pre-treatment:

5 g fresh grass clippings spiked with 2 ppm each herbicide. Add 4 g anhydrous sodium sulfate and 20 mL methylene chloride:acetone (80:20). Shake 20 min and allow mixture to stand 1 min.

sample preparation . . . . . SPE (Solid Phase Extraction)
sample/matrix . . . . . fresh grass clippings spiked with herbicides at 2 ppm
SPE tube/cartridge . . . . . Supelclean LC-SCX, 500 mg/3 mL (57018)
condition . . . . . 1 mL methylene chloride
sample addition . . . . . 2 mL grass extract. Wash with 2 x 2 mL acetonitrile.
drying . . . . . Dry packing for 5 min. under nitrogen purge
washing . . Dry packing for 5 min under nitrogen purge; wash with 2 x 2 mL DI water
elution . . . . . 1.5 mL methanol
eluate post-treatment . . . . . dilute to 2 mL with DI water
column . . . . . SUPELCOSIL LC-8-DB, 15 cm × 4.6 mm I.D., 5 µm with guard column (58347)
mobile phase . . . . . (A) acetonitrile; (B) water; (45:55, A:B)
flow rate . . . . . 1.5 mL/min
detector . . . . . UV, 254 nm
injection . . . . . 100 µL
Application No. 84-109



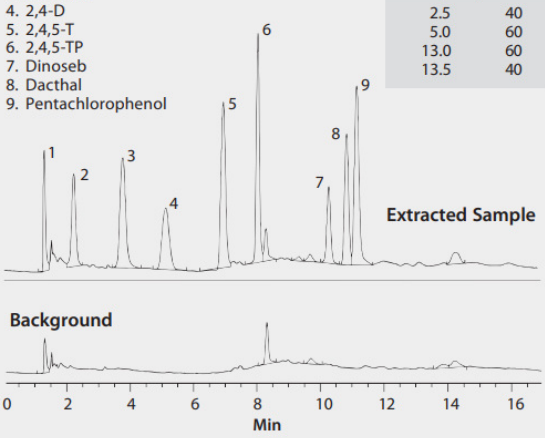
HPLC Analysis of Acidic Herbicides in Water on a Polymeric C18 Column after SPE using Supelclean™ ENVI™-Carb

using Zymark AutoTrace Extraction WorkStation 1.20

sample preparation . . . . . SPE (Solid Phase Extraction)
sample/matrix . . . Fresh 1 L water samples, dechlorinated with sodium thiosulfate when necessary, at ambient temperature and pH.
SPE tube/cartridge . . . . . Supelclean ENVI-Carb, 250 mg/6 mL (57092)
condition . . . . . 10 mL DI water at 20 mL/min
sample addition . . . . . 0.9 L water sample at 20 mL/min
drying . . . . . 10 min using clean nitrogen
washing . . . . . 10 mL DI water at 20 mL/min
elution . . . . . 10 mL 0.1% phosphoric acid in methylene chloride:acetonitrile (80:20) at 5 mL/min
column . . polymeric-coated silica-based PAH specialty column, 20 cm × 3 mm I.D., 5 µm (Supelco equivalent, SUPELCOSIL LC-PAH, available upon request)
mobile phase . . gradient, (A): 0.05% phosphoric acid in DI water; (B): acetonitrile
flow rate . . . . . 0.5 mL/min
column temp. . . . . 50 °C
detector . . . . . photodiode array- peak width: 0.053 min, sampling interval: 0.320 sec, monitor 210 nm & 225 nm
injection . . . . . 10 µL of extract (4-5 ppb each analyte in water)
Application No. 796-0150

1. Tetrachloroterephthalic acid
2. Picloram
3. Dicamba
4. 2,4-D
5. 2,4,5-T
6. 2,4,5-TP
7. Dinoseb
8. Dacthal
9. Pentachlorophenol

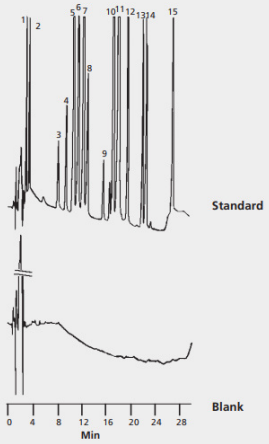
Gradient Program	
Time (min)	%B
2.5	40
5.0	60
13.0	60
13.5	40



Figures provided by A. Lichtman, Nassau County Dept. of Health, Hempstead, New York, USA. Request Application Note No. T196100.

HPLC Analysis of Nonvolatile Pesticides in Water on SUPELCOSIL™ LC-18-DB after SPE using Supelclean™ ENVI-Carb™

sample preparation . . . . . SPE (Solid Phase Extraction)
sample/matrix . . . . . water spiked with pesticides at 10-50 µg/L
SPE tube/cartridge . . . . . Supelclean ENVI-Carb, 250 mg/3 mL (57088)
condition . . . . . 5 mL methylene chloride:methanol (80:20); 1 mL methanol; 10 mL 2% acetic acid in water (keep bed moist until sample addition)
sample addition . . . . . 100 mL sample at 5 mL/min
drying . . . . . 1 minute with vacuum
elution . . . . . 0.8 mL methanol; 2 x 35 mL methylene chloride:methanol (80:20)
eluate post-treatment . . . . . dry eluate to 500 µL under gentle nitrogen stream, reconstitute to 1 mL with methanol
column . . SUPELCOSIL LC-18-DB, 25 cm × 4.6 mm I.D., 5 µm particles (58355-U)
mobile phase . . . . . (A) water:acetonitrile (90:10), (B) acetonitrile; gradient 80% A for 5 min then to 30% A over 30 min
flow rate . . . . . 1.5 mL/min
detector . . . . . UV, 220 nm
injection . . . . . 20 µL
Application No. 85-438



Analyte	% Recovery (± RSD, n = 5)
1. Oxamyl	111 ± 9.6
2. Methomyl	105 ± 5.0
3. N-1-Naphthylthiourea	—
4. Aldicarb	92 ± 0.8
5. Simazine	91 ± 6.5
6. Monuron	99 ± 3.2
7. Cyanazine	90 ± 5.4
8. Metribuzin	97 ± 3.9
9. Carbofuran	106 ± 6.2
10. Atrazine	89 ± 5.7
11. Carbaryl	97 ± 3.5
12. Diuron	88 ± 5.7
13. Propham	95 ± 3.2
14. Propachlor	96 ± 3.8
15. Linuron	88 ± 5.4

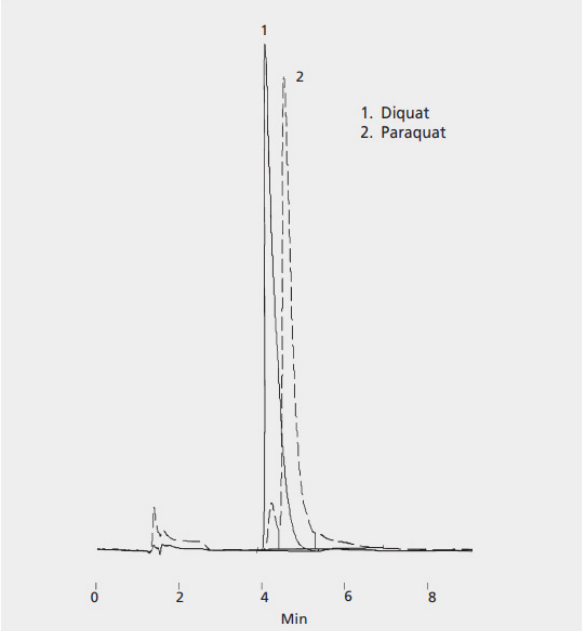
HPLC Analysis of Paraquat and Diquat on SUPELCOSIL™ LC-18 after SPE using ENVI™-8 DSK

Refer to US EPA Method 549.1 for full details

Sample Pre-treatment:

250 mL drinking water. Adjust water sample to pH to 10.5 ± 0.2 with 10% sodium hydroxide or 10% hydrochloric acid

sample preparation . . . . . SPE (Solid Phase Extraction)
sample/matrix . . . . . drinking water adjusted to pH to 10.
SPE tube/cartridge . . . . . ENVI-8 DSK SPE Disk, 47 mm (57172)
sample preparation . . . . . ENVI-8 DSK, 47 mm (57172)
condition . . 10 mL acetonitrile; 2 × 10 mL reagent water; 10 mL conditioning solvent A (5 g cetyl trimethyl ammonium bromide and 5 mL conc. ammonium hydroxide in 500 mL DI water, dilute to 1 L); (2 × 10 mL reagent water; 10 mL conditioning solvent B (10 g hexanesulfonic acid, sodium salt and 10 mL conc. ammonium hydroxide in 250 mL DI water, dilute to 500 mL))
sample addition . . . . . 250 mL water 100 mL/min
elution . . . . . 0.5-1.0 mL acetonitrile (to cover/solvate disk); 2 × 4 mL eluting solution (13.5 mL orthophosphoric acid and 10.3 mL diethylamine in 500 mL DI water, dilute to 1 L)
column . . . . SUPELCOSIL LC-18, 15 cm × 4.6 mm I.D., 5 µm particles (58230-U)
mobile phase . . 3.5 mL triethylamine and 1.0 g 1-hexane-sulfonic acid, sodium salt to 800 mL DI H_2O add orthophosphoric acid to pH 2.5, dilute to 1 L
flow rate . . . . . 1.0 mL/min
column temp. . . . . 35 °C
detector . . . . . photodiode array, diquat - 308 nm, paraquat - 257 nm
injection . . . . . 100 µL
Application No. 794-0715



HPLC Analysis of Triazine Herbicides in Grass on SUPELCOSIL™ LC-8-DB after SPE using Supelclean™ LC-SCX

Sample Pre-treatment:

5 g fresh grass clippings spiked with 2 ppm each herbicide. Add 4 g anhydrous sodium sulfate and 20 mL methylene chloride:acetone (80:20). Shake 20 min and allow mixture to stand 1 min.

sample preparation . . . . . SPE (Solid Phase Extraction)
sample/matrix . . . . . fresh grass clippings spiked with herbicides at 2 ppm
SPE tube/cartridge . . . . . Supelclean LC-SCX, 500 mg/3 mL (57018)
condition . . . . . 1 mL methylene chloride
sample addition . . . . . 2 mL grass extract. Wash with 2 x 2 mL acetonitrile.
drying . . . . . Dry packing for 5 min. under nitrogen purge
washing . . Dry packing for 5 min under nitrogen purge; wash with 2 x 2 mL DI water
elution . . . . . 1.5 mL methanol
eluate post-treatment . . . . . dilute to 2 mL with DI water
column . . . . . SUPELCOSIL LC-8-DB, 15 cm × 4.6 mm I.D., 5 µm with guard column (58347)
mobile phase . . . . . (A) acetonitrile; (B) water; (45:55, A:B)
flow rate . . . . . 1.5 mL/min
detector . . . . . UV, 254 nm
injection . . . . . 100 µL
Application No. 84-109