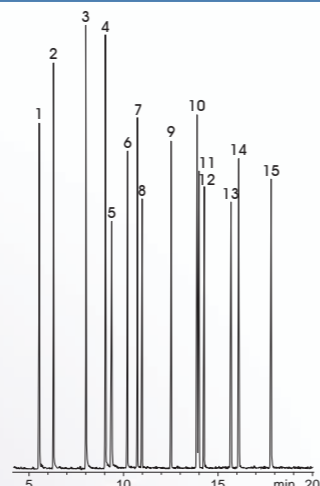




EPA 8060 Phthalates

Conditions: OPTIMA® 17 MS, 30 m, 0.25 mm ID, 0.25 µm film (REF 726162.30)
Sample: EPA 8060 Phthalates
Injection: 1.0 µl, 280°C, 0.5 min splitless, 25 ml/min
Carrier gas: Helium, 0.6 bar
Temperature: 120 °C -> 220 °C (25 °C/min.) -> 330 °C (8 °C/min.) (10 min.)
Detector: MSD

Peaks:
 1. Dimethyl phthalate, 2. Diethyl phthalate, 3. Di-isobutyl phthalate, 4. Di-n-butyl phthalate, 5. Bis (4-methyl-2-pentyl) phthalate, 6. Bis (2-methoxyethyl) phthalate, 7. Di-n-pentyl phthalate, 8. Bis (2-ethoxyethyl) phthalate, 9. Di-n-hexyl phthalate, 10. Bis (2-ethylhexyl) phthalate, 11. Benzyl-butyl phthalate, 12. Bis-(2-butoxyethyl) phthalate, 13. Di-cyclohexyl phthalate, 14. Di-n-octyl phthalate, 15. Di-n-nonyl phthalate

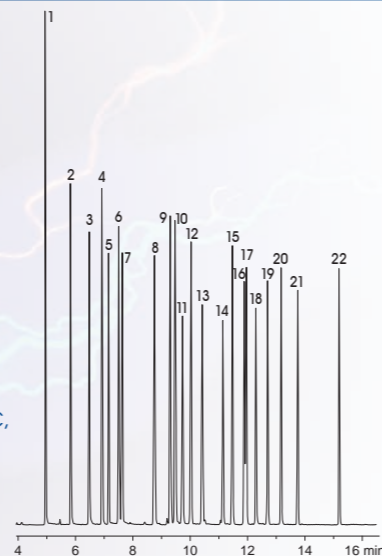


MN Appl. No. 213610

EPA 8081 organochlorine pesticides

Conditions: OPTIMA® 17 MS, 30 m, 0.25 mm ID, 0.25 µm film (REF 726162.30)
Sample: organochlorine pesticide mix EPA 8081
Injection: 1 µl, 280 °C, 0.5 min splitless, 25 ml/min
Flow rate: 1.5 ml/min
Carrier gas: Helium, 0.12 bar, splitless
Temperature: 100°C (0,5 min)-> 210°C (40°C/min)-> 250°C (6,0°C/min)-> 330°C (15°C/min) (5 min)
Detector: MSD

Peaks:
 1. 2,4,5,6-Tetrachloro-m-xylene, 2. alpha-BHC, 3. gamma-BHC (Lindan), 4. Heptachlor, 5. beta-BHC, 6. Aldrin, 7. delta-BHC, 8. Heptachlor epoxide, 9. gamma-chlordane, 10. alpha-chlordane, 11. Endosulfan I, 12. 4,4'-DDE, 13. Dieldrin, 14. Endrin, 15. 4,4'-DDD, 16. Endosulfan II, 17. 4,4'-DDT, 18. Endrin aldehyde, 19. Endosulfan sulfate, 20. Methoxychlor, 21. Endrin ketone, 22. Decachlorobiphenyl



MN Appl. No. 213630

OPTIMA® 17 MS

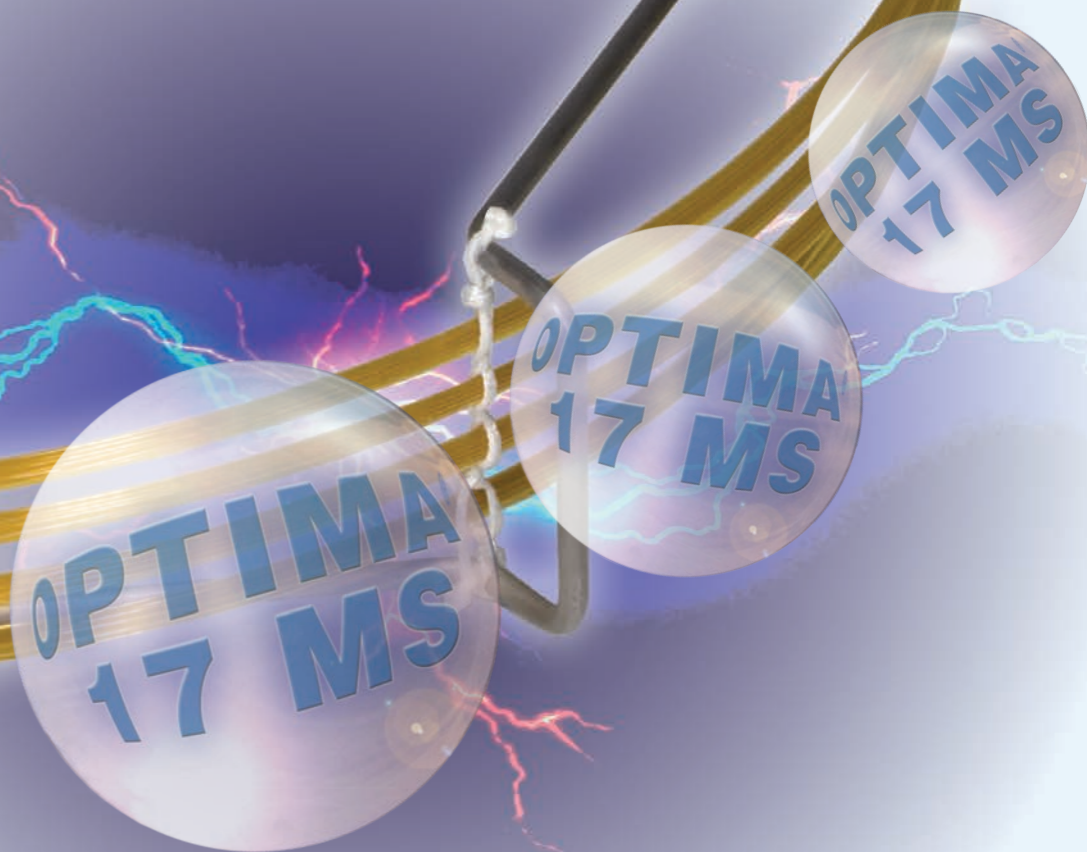
- max. temperature for isothermal runs: 340 °C, for short isotherms in a temperature program 360 °C
- very low bleed characteristics, mid-polar phase, suitable for ion-trap detection systems, can be rinsed with solvents
- application area: "all round" phases for environmental analysis, trace analysis, EPA methods, pesticides, PAHs, food and drug analysis
- chemically bonded, cross-linked silarylene phase, polarity index according to 50 % Phenyl / 50 % Methyl-Polysiloxane
- similar phases: OV-17, AT™-50, BPX™-50, DB-17, DB-17ms, HP-50+, HP-17, SPB™-50, SPB™-17, SP™-2250, Rtx®-50, CP-Sil 24 CB, 007-17, VF-17ms, ZB-50
- USP G3

REF	Length	ID [mm]	df [µm]
726162.30	30	0.25	0.25
726162.60	60	0.25	0.25
726165.30	30	0.32	0.25
726165.60	60	0.32	0.25

GCT7MS EN1/20/03.10 PD
 KATEN200077
 Printed in Germany

Chromatography

GC OPTIMA® 17 MS



The ultra low bleed version of a mid polar classic

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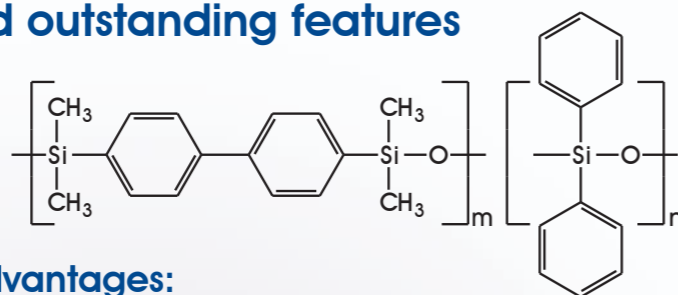
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Excellent performance and outstanding features due to a new innovative silarylene phase



This unique phase composition provides a lot of advantages:

- ✓ **Mid-polar ultra low bleed silarylene phase (without CN-groups in the polymer)**
 - > 100% Ion-Trap and Quadrupol-MS-compatibility
 - > unlimited use of ECD and NPD-detectors
 - > it is possible to inject aqueous samples, water stable phase
- ✓ **50 % phenyl content in the phase**
 - > easy result transfer from standard "17" phases, i.e. for EPA and ASTM procedures
 - > increased selectivity spectrum and separation efficiency for mid-polar analytes
- ✓ **Temperature stability up to 360°C**
 - > shorter retention times due to higher possible end temperatures
 - > longer column lifetime during "normal" use
- ✓ **Excellent deactivation**
 - > reliable quantification even for critical samples at ultra trace levels

The new OPTIMA® 17 MS is the optimal and modern reference column to a non-polar "1" or "5" type ultra low bleed phase. The 50% phenyl content leads to a significant increase of polarity, compared to these non-polar columns. Thus results in a considerable increase in selectivity and separation efficiency for mid-polar analytes.

Top selectivity for mid-polar analytes

Drugs of abuse Comparison of a OPTIMA® 5 MS Accent with the new OPTIMA® 17 MS

Conditions: A) OPTIMA® 5 MS Accent
B) OPTIMA® 17 MS
30 m each,
0.25 mm ID,
0.25 µm film

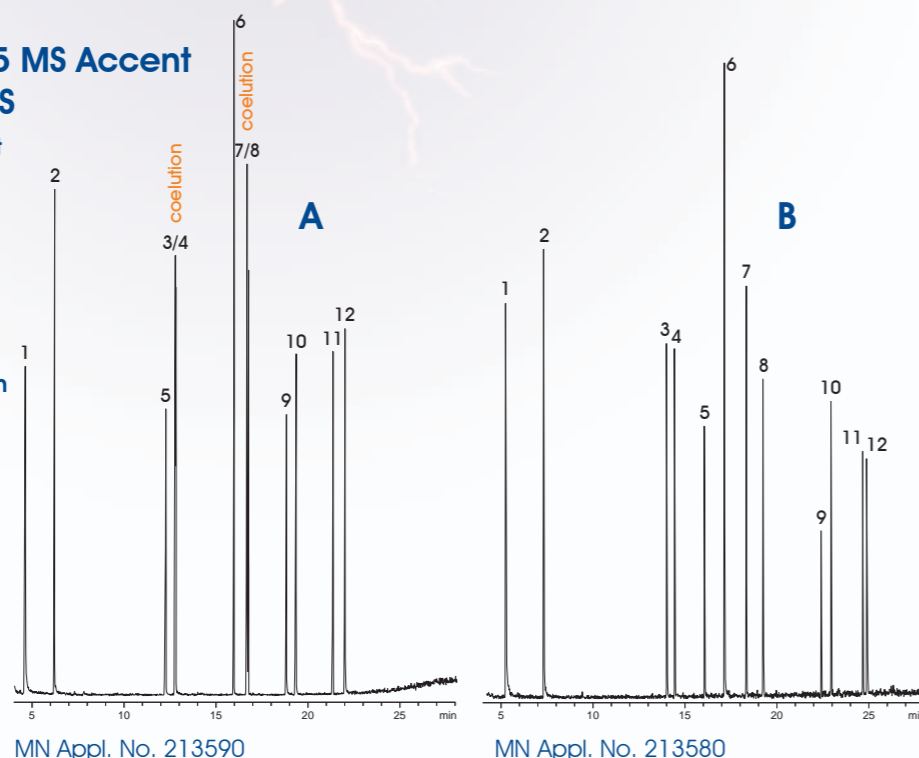
Sample: Drugs of abuse
Carrier gas: Helium
Flow rate: 1 ml/min
Injection: 2 µl, 280 °C,
2 min splitless, 25 ml/min

Temperature: 60°C (2 min)
-> 150°C (25°C/min)
-> 320°C (8°C/min)

Detector: MSD

Peaks:

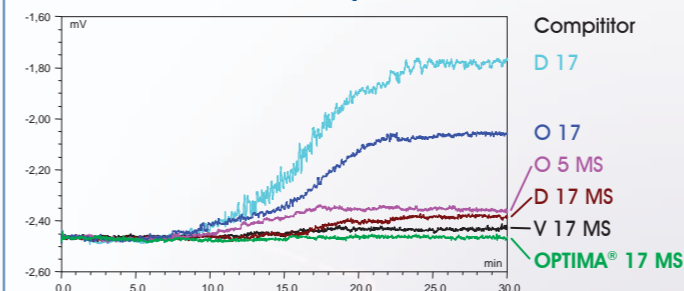
1. methamphetamine hydrochloride,
2. nicotine, 3. diphenyl hydramine,
4. lidocaine, 5. caffeine, 6. methadone,
7. amitriptyline, 8. cocaine, 9. codeine,
10. diazepam, 11. prazepam,
12. fentanyl



Lowest column bleed

- ✓ **reduced contamination of the detection system, improved detectability of solutes in trace analysis**

In a bleed comparison test between OPTIMA® 17 MS with a 5 MS, two conventional 17 and two 17 MS phases (all competitor phases), the enormous progress in phase technology and the outmatched performance of this new developed silarylene phase is proved.



Column dimensions (30 m, 0.25 mm, 0.25 µm)
In the picture the baseline increase between 200°C and 320°C is shown
200°C (5 min)-> 320°C (10°C/min) (12 min)

High temperature stability

- ✓ **extended column lifetime, shorter retention times due to increased heating rates are possible**

Column	Isotherm Max. temp.	Max. temp. in programm
OPTIMA® 17 MS	340°C	360°C
Agilent HP-50+	280°C*	300°C*
Agilent DB 17ms	320°C*	340°C*
Grace AT™-50	300°C	325°C
Phenomenex ZB-50	320°C*	340°C*
Restek Rtx®-50	300°C*	320°C*
Supelco SPB™-17	280°C	300°C
Varian FactorFour VF-17ms	330°C*	360°C*

* as indicated from manufacturers product catalogues 2009

✓ Excellent deactivation EPA 604 free phenols

Conditions: OPTIMA® 17 MS
30 m,
0.25 mm ID,
0.25 µm film
(REF 726162.30)

Sample: Phenol-Mix 604
Injection: 1 µl, 230 °C
Carrier gas: Helium, 0.8 bar, split 1:30
Temperature: 100°C-> 250°C (10°C/min)
Detector: FID, 280°C

Peaks:

1. Phenol , 2. 2-Chlorophenol, 3. 2,4-Dimethylphenol,
4. 2-Nitrophenol, 5. 2,4-Dichlorophenol,
6. 4-Chloro-3-methylphenol, 7. 2,4,6-Trichlorophenol,
8. 4-Nitrophenol, 9. 2,4-Dinitrophenol,
10. 2-Methyl-4,6-dinitrophenol, 11. Pentachlorophenol

