Chromatography

# GC

## OPTIMA® 17 MS

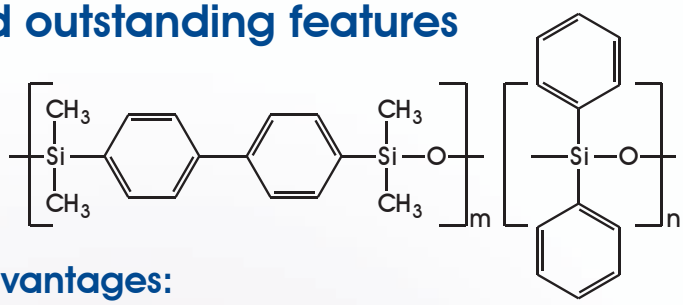

Greyhound
CHROMATOGRAPHY
AND ALLIED CHEMICALS

The ultra low bleed version
of a mid polar classic

MACHEREY-NAGEL
www.mn-net.com

MN
Since 1911

# 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

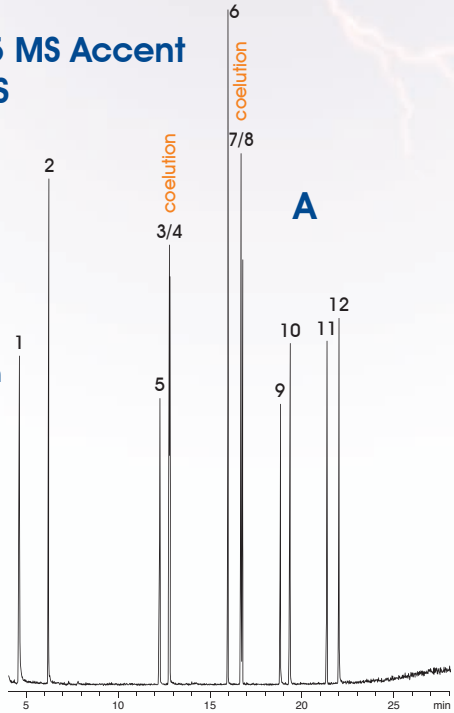
**The new OPTIMA® 17 MS is the optimal and modern reference column to a non-polar "1" or "5" type ultra low bleed phase. The 50% phenyl content leads to a significant increase of polarity, compared to these non-polar columns. Thus results in a considerable increase in selectivity and separation efficiency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

## Top selectivity for mid-polar analytes

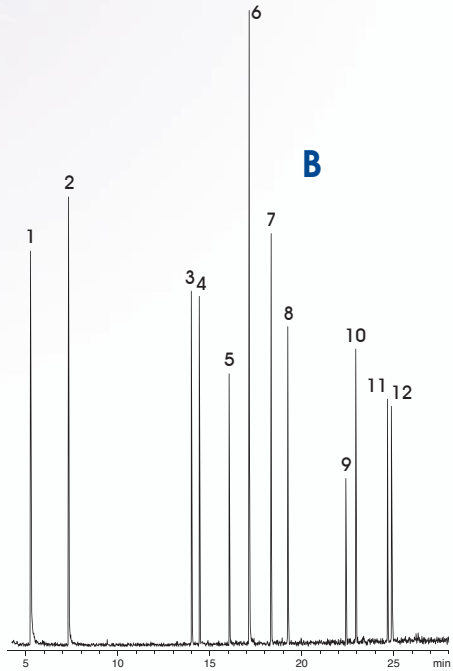
### Drugs of abuse
### Comparison of a OPTIMA® 5 MS Accent with the new OPTIMA® 17 MS

| | |
|---|---|
| **Conditions:** | **A) OPTIMA® 5 MS Accent<br>B) OPTIMA® 17 MS<br>30 m each,<br>0.25 mm ID,<br>0.25 µm film** |
| **Sample:** | **Drugs of abuse** |
| **Carrier gas:** | **Helium** |
| **Flow rate:** | **1 ml/min** |
| **Injection:** | **2 µl, 280 °C,<br>2 min splitless, 25 ml/min** |
| **Temperature:** | **60°C (2 min)<br>-> 150°C (25°C/min)<br>-> 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




MN Appl. No. 213590

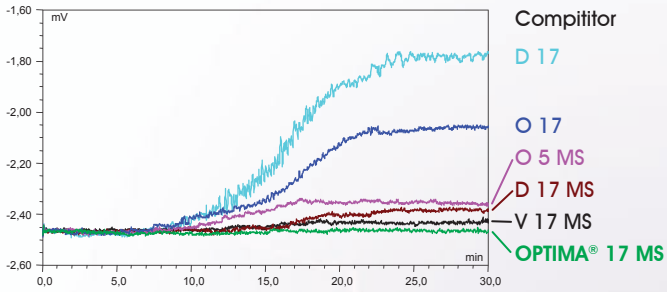



MN Appl. No. 213580

## 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* |

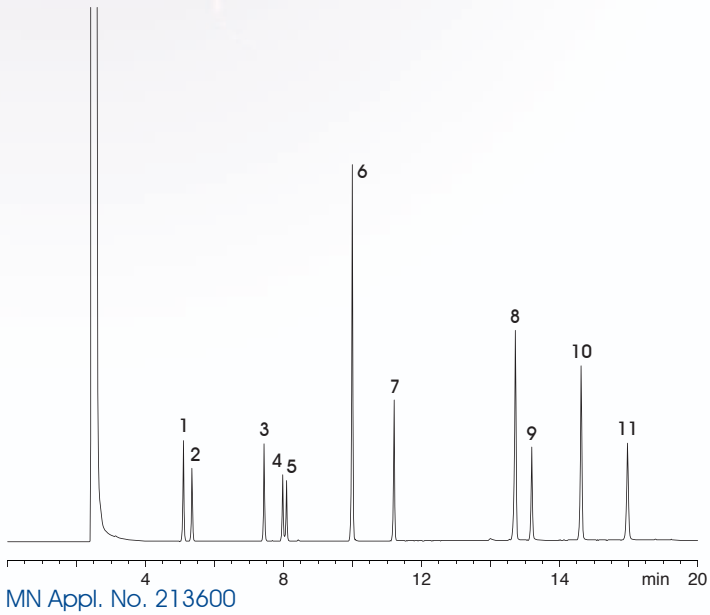
* as indicated from manufacturers product catalogues 2009

## ✔ 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

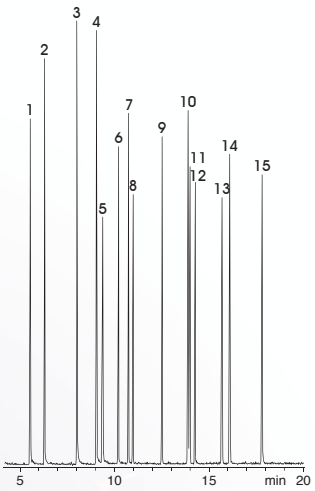



MN Appl. No. 213600

## 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

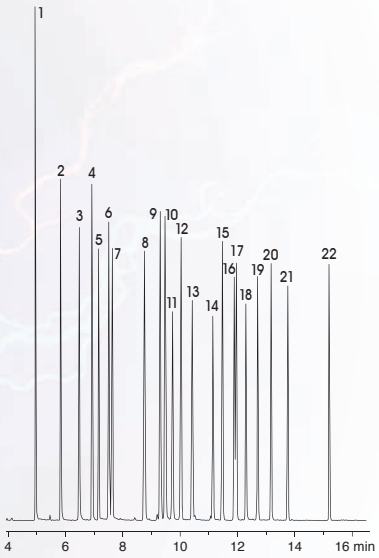



MN Appl. No. 213610

## 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. Decachlorbiphenyl




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 |

GC17MS EN1/2/0/3.10 PD
KATEN200077
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