Chromatography

GC

OPTIMA® 1701 MS

Low bleed and inert mid-polar column

MACHEREY-NAGEL

www.mn-net.com

MZ ANALYSENTECHNIK

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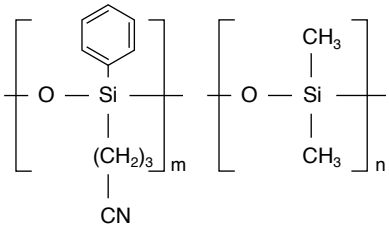
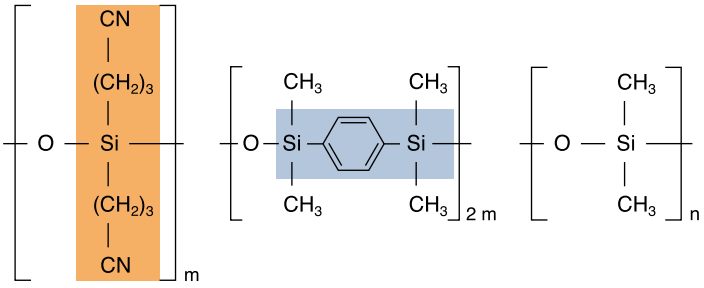
MN Since 1911

Outstanding features and excellent performance

New silarylene synthesis technology - symmetrically substituted siloxanes and integrated phenyl rings



OPTIMA® 1701



OPTIMA® 1701 MS

The even charge distribution and thereby lower polarizability of the silicon atom in symmetrically substituted **cyanopropylsilanes**, along with integrated phenyl rings **(silarylene)** resulted in a considerable increase of the chemical and thermal stability of the polysiloxane. Substantially reduced column bleed and as a consequence longer column life with less detector contamination qualify the OPTIMA® 1701 MS to outperform conventional columns of equal phase polarity.

14 % cyanopropyl-phenyl – 86 % dimethylpolysiloxane · USP G46

Excellent deactivation
- Reliable quantification even for critical samples at ultra trace levels

Mid-polar low bleed silarylene phase
- 100 % ion trap and quadrupol MS compatibility

Area of application
- Suitable for environmental analysis (e.g., PAH, PCB, pesticides)
- Reference column for structure identification, e.g., in combination with OPTIMA® 5 MS

Bleed comparison

Column dimension of all tested columns:
0.25 µm film, 30 m x 0.25 mm ID

Injection temperature:
280 °C

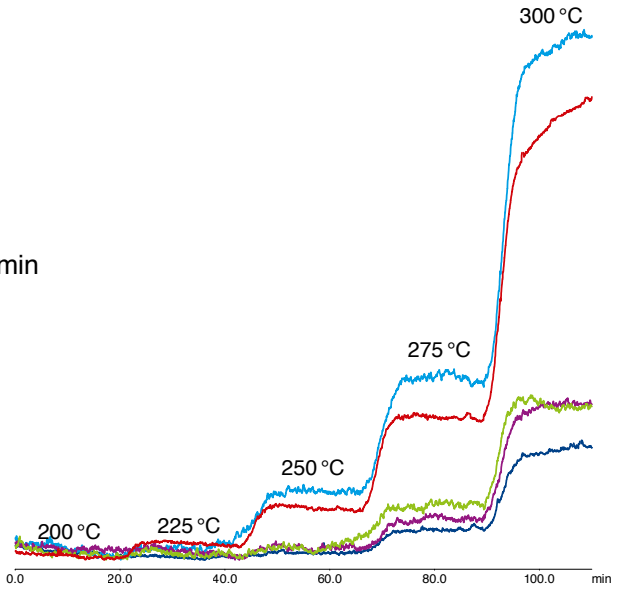
Carrier gas:
Helium, 0.8 bar

Temperature:
200 °C (20 min) → 225 °C (20 min), 8 °C/min → 250 °C (20 min), 8 °C/min → 275 °C (20 min), 8 °C/min → 300 °C (20 min), 8 °C/min

Detector:
FID, 280 °C

- DB-1701
- ZB-1701
- VF-1701ms
- Rtx-1701
- OPTIMA® 1701MS

MN Appl. No. 215050



Columns were tested under equal conditions and not representative of all applications.

Separation of 16 EPA PAHs

MN Appl. No. 215070

Column:
OPTIMA® 1701 MS, 0.25 µm film, 30 m x 0.25 mm ID

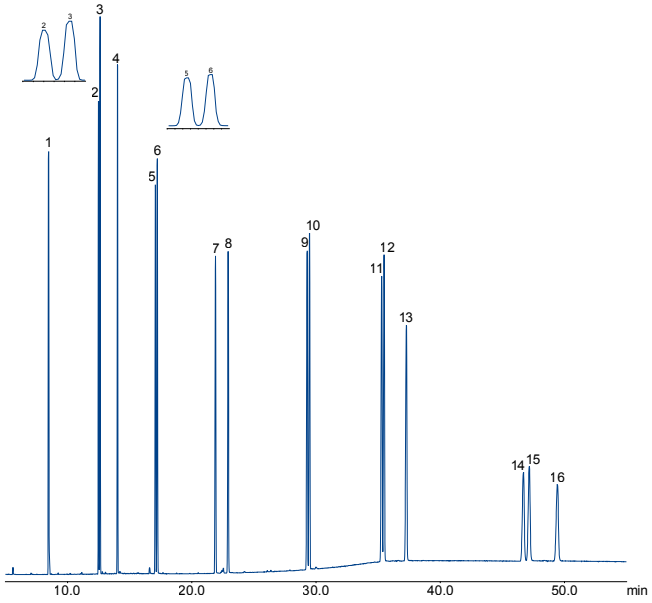
Sample:
PAH test mixture acc. to EPA (REF 722314)
(20 µg/mL each in toluene)

Injection:
1 µL, 300 °C, splitless (for 1 min), split 1:50

Carrier gas:
Helium, lin. velocity 34 cm/s

Temperature:
90 °C for 1 min → 220 °C, 10 °C/min → 300 °C, 4 °C/min

Detector:
MSD



Peaks:
1. Naphthalene · 2. Acenaphthylene · 3. Acenaphthene · 4. Fluorene
5. Phenanthrene · 6. Anthracene · 7. Fluoranthene · 8. Pyrene
9. Benzo(a)anthracene · 10. Chrysene · 11. Benzo(b)fluoranthene
12. Benzo(k)fluoranthene · 13. Benzo(a)pyrene · 14. Indeno(1,2,3-cd)pyrene
15. Dibenzo(a,h)anthracene · 16. Benzo(g,h,i)perylene

Herbicide mix

MN Appl. No. 215100

Column:
OPTIMA® 1701 MS, 0.25 µm film, 30 m x 0.25 mm ID

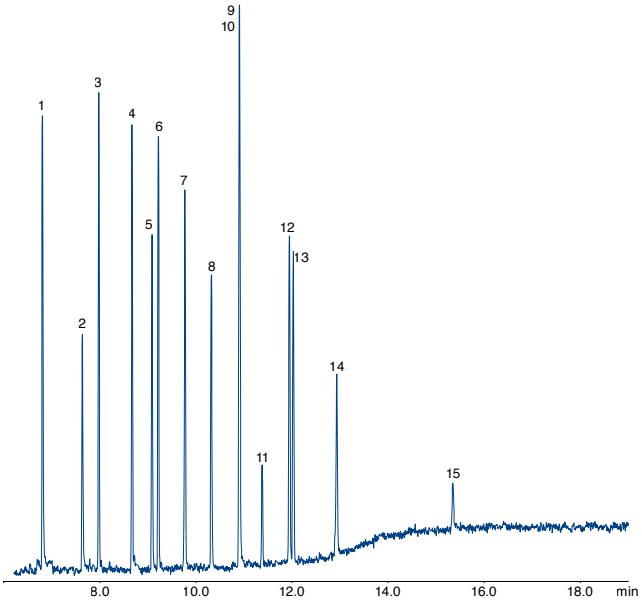
Sample:
Herbicide mix (400 ng/mL in hexane)

Injection:
1 µL, 300 °C, splitless (for 1 min), split 1:50

Carrier gas:
Helium, lin. velocity 42 cm/s

Temperature:
80 °C for 1 min → 200 °C, 20 °C/min → 245 °C, 8 °C/min
→ 260 °C, 20 °C/min

Detector:
MSD



Peaks:
1. 3,5-dichlorobenzoic acid methyl ester · 2. 4-nitroanisole · 3. Dicamba methyl ester
4. Dichlorprop methyl ester · 5. 2,4-D methyl ester · 6. Pentachloro-anisole
7. 2,4,5-TP methyl ester · 8. 2,4,5-T methyl ester · 9. Chloramben methyl ester
10. 2,4-DB methyl ester · 11. Dinoseb methyl ether · 12. Bentazon methyl ester
13. DCPA methyl ester · 14. Picloram methyl ester · 15. Acifluorfen methyl ester

Triazine pesticide mix (EPA 619)

MN Appl. No. 215080

Column:
OPTIMA® 1701 MS, 0.25 µm film, 30 m x 0.25 mm ID

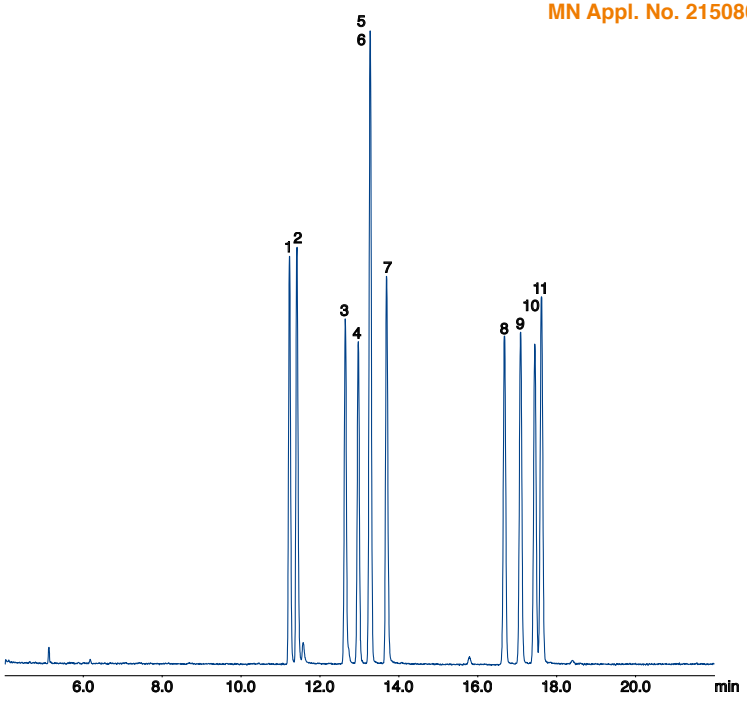
Sample:
Triazine pesticide mix

Injection:
1 µL, 250 °C, split 1:100

Carrier gas:
Helium, lin. velocity 42 cm/s

Temperature:
160 °C for 1 min → 180 °C, 15 °C/min → 220 °C, 2 °C/min

Detector:
MSD



Peaks:
1. Prometon · 2. Atraton · 3. Propazine · 4. Atrazine ·
5. Simazine · 6. Tertbuthylazine · 7. Secbumeton ·
8. Prometryn · 9. Ametryn · 10. Simetryn · 11. Terbutryn

OPTIMA® 1701 MS

Max. temperature for isothermal operation 280 °C, max. temperature for short isotherms in a temperature program 300 °C

Similar phases:
VF-1701ms, TG-1701MS, OV-1701, DB-1701, HP-1701, Rtx-1701, SPB-1701, CP Sil 19 CB, 007-1701, BP10, ZB-1701

Ordering information

ID	Length	Film thickness	Agilent J&W VF-1701ms	Restek Rtx-1701	Phenomenex ZB-1701	MACHEREY-NAGEL OPTIMA® 1701 MS
0.25 mm	**30 m**	**0.25 µm**	CP9151	12023	7HG-G006-11	**726630.30**
0.25 mm	**60 m**	**0.25 µm**	CP9154	12026	7KG-G006-11	**726630.60**
0.25 mm	**30 m**	**0.50 µm**	–	12038	–	**726631.30**
0.25 mm	**60 m**	**0.50 µm**	–	12041	–	**726631.60**
0.25 mm	**30 m**	**1.00 µm**	CP9152	12053	7HG-G006-22	**726632.30**
0.25 mm	**60 m**	**1.00 µm**	CP9156	12056	–	**726632.60**
0.32 mm	**30 m**	**0.25 µm**	CP9162	12024	7HM-G006-11	**726633.30**
0.32 mm	**60 m**	**0.25 µm**	CP9165	12027	7KM-G006-11	**726633.60**
0.32 mm	**30 m**	**0.50 µm**	–	12039	–	**726634.30**
0.32 mm	**60 m**	**0.50 µm**	–	12042	–	**726634.60**
0.32 mm	**30 m**	**1.00 µm**	CP9163	12054	7HM-G006-22	**726635.30**
0.32 mm	**60 m**	**1.00 µm**	CP9166	12057	–	**726635.60**

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Since 1911