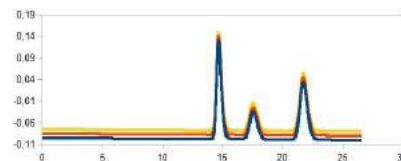


GPC / SEC / HPLC Columns

Made by AppliChrom GmbH



PRODUCT CATALOG 2022

Sugars

Degradation Products

Proteins

Biopolymers

Polymers

Peptides

Peak-Recycling-GPC

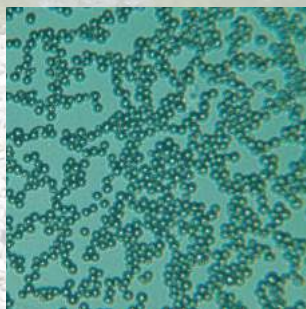


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About Us

AppliChrom team and customers grow together by supporting chromatographers in actual challenging and often difficult separations. You can count on AppliChrom with its own production site for chromatography media, columns and applications and more than 50 years of HPLC/GPC experience at the traditional historical place where 1850 chromatography was first invented by Professor Runge (Dipl.-Ing. (FH) Susanne & Dr. Christian Dauwe).

13 Reasons for AppliChrom

1) We take it personally

Especially the support of our customers. From the analytical question up to the chromatographic process we discuss and accompany you on the way to your chromatographic result.

2) Application and Technical Support from one Source

As your chromatography partner we organize and look at the whole chromatographic process – also under optimal use of the HPLC/GPC/SEC-devices already in use.

3) Increasing Quality

You are looking for the best way to get your optimum chromatographic result in HPLC, GPC or SEC. We do not only offer high quality and highly reproducible products for high resolution and lifetime, but also a suitable consultation to your individual chromatographic task.

4) Saving Time

Chromatographers who start developing a method have to finally produce a reliable method that give complete information about all components of interest from a sample. Maybe the method has to be compatible to different kinds of chromatography systems or environments later – taking these aspects into account from the beginning saves much time and cost for our customers. Our product specialists are glad to assist you from the beginning of a project to make you successful.

5) Experience

AppliChrom's experience of own production of chromatography media, columns and applications (HPLC, GPC and SEC) allows us to support you with the background knowledge of the chromatography media producer with staff having more than 50 years of relevant experience.

6) Individual

From the beginning of your request we integrate your individual wishes, ideas and needs into the support to your optimal chromatographic solution. Resolution, selectivity, compatibility to existing systems, time saving or all of this – please ask us. AppliChrom has own application laboratories, own manufacturing capacities and own development unions to support you with your individual needs.

7) Innovative

AppliChrom chromatography media are typically based on special customers' needs that were covered via the AppliChrom development process unit finishing with the process validation to high end products that are available now for your reliable product solutions. Thus many very unique and powerful solutions are offered now for HPLC, SEC and GPC by AppliChrom.

8) Reproducibility

AppliChrom works at the headquarter Oranienburg has its own quality control laboratories, the production of chromatography columns in small and large series but also units to produce chromatography media in small scale and for larger bulk amounts. The quality of each batch and each column is controlled to ensure the highest level of reproducibility, column for column, batch to batch and year after year.

9) OEM business

AppliChrom supplies well-chosen OEM customers with individual chromatography bulk or column lines. The production also contains customized lines for special needs. You do not find these products necessarily in our public catalogue. If you have a special need – please speak with us.

10) Chromatography – Origin from Oranienburg, innovations from Oranienburg

Maybe it is interesting for you when and where chromatography was invented. It was in 1850 in Oranienburg where professor Runge invented, published and commercialized chromatography products first in the world – it was an early form of paper chromatography – he called it: „Bilder die sich selber malen“ known also as Runge pictures. These are the roots of chromatography and the heritage of Oranienburg that we develop here at Oranienburg to innovative high end products to support you with your specific chromatographic solution.

11) Made in Europe

AppliChrom brand products are quality products made in Germany, coming from Oranienburg located in the Berlin region. Surrounded by several universities and institutes dealing with live and material science we get a continuous input of actual scientific challenges to get inspirations for needed new high end products. Anyway we are glad to hear what AppliChrom can do for you.

12) Carefree

Chromatographic separation should not be an adventure for the customer. We serve you from your request with the needed individual assistance in the beginning up to the after sales service/consultation.

13) Satisfaction

At the end AppliChrom's goal is to only have satisfied customers. This is our endeavour.

Important facts about AppliChrom

Founded: 2006, first market presence in 2009, since 2021 AppliChrom GmbH.

Company founder: Dipl.-Ing. (FH) Susanne Dauwe (Chemical engineer)

Research, development and chromatography applications: Dr. Christian Dauwe (Chemist)

Products:

Silica- and polymeric based liquid chromatography media (HPLC, GPC, SEC)

HPLC-columns –

C8, C18, HILIC & hybrid, ion exchanger and ion exclusion columns and media

Special easy to use HPLC columns for sugars, alcohols, acids

(HILIC, ion exclusion, ion exchangers)

SEC/GPC columns for water soluble biopolymers,

SEC/GPC columns for organic soluble polymers



Monument of Dr. Runge in front of the former Laboratory in Oranienburg

AppliChrom DMAc-Phil-P

AppliChrom GPC columns for GPC analyzes organic (DMAc, DMF and NMP)

Spherical porous polymeric GPC chromatography phases

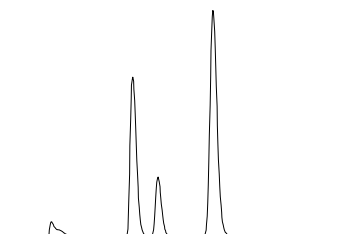
- wide range of pore and particle sizes
- optimal for 0.5ml / min flow rate with 8mm ID columns (40-50°C)
- Pressure stability 50-150bar, depending on the porosity
- high resolution due to high pore volume
- long service life
- high reproducibility
- high purity of the GPC column for good interaction-free GPC
- Please avoid: drying out
- Molar mass range: 100Da-1 000 000Da
- Examples: PMMA, PAN, cellulose, DMF and DMAc soluble polymers

AppliChrom DMAc-Phil-P molar mass range:

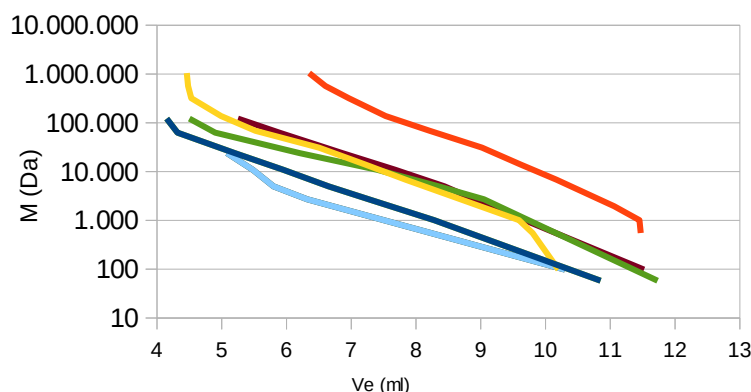
| | |
|------------|---------------------|
| P-100 | 100Da-2 500Da |
| P-200 | 100Da-20 000Da |
| P-250 | 100Da-70 000Da |
| P-250JLD*) | 100Da-100 000Da |
| P-300 | 1 000Da-300 000Da |
| P-350 | 1 500Da-1 000 000Da |

*) JLD Pore: extended linear range

To cover a very wide range of molecular sizes, GPC columns of appropriate porosity can be combined.



GPC Calibration Curves AppliChrom DMAc-Phil



Long linear calibration range

Analyte:

PMMA Standards

Column:

AppliChrom DMAcPhil-P-100
AppliChrom DMAcPhil-P-200
AppliChrom DMAcPhil-P-250
AppliChrom DMAcPhil-P-250-JLD
AppliChrom DMAcPhil-P-300
AppliChrom DMAcPhil-P-350

Dimension:

e.a. 300mm x 8mm

Mobil Phase:

H₂O

Flow:

0.5ml/min

Temperature:

45°C

Detection:

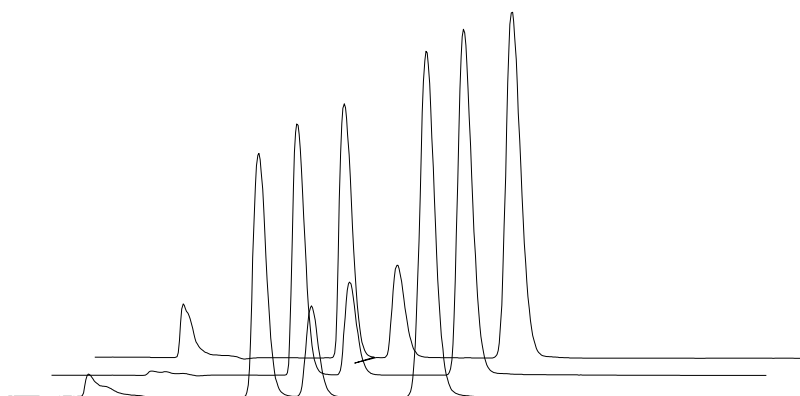
RI

Injection:

20µl sample

AppliChrom DMac-Phil-P

| Catalog # | Description | Dimension | Separation Range |
|----------------------------------------------------------------|----------------------------|--------------------------------------------------------|------------------------|
| SADCP1002508 SADCP1003008 SADCP100508 SADCP100308 | AppliChrom DMac-Phil-P-100 | 250mm x 8mm 300mm x 8mm 50mm x 8mm 30mm x 8mm | 100Da-2 500Da |
| SADCP2002508 SADCP2003008 SADCP200508 SADCP200308 | AppliChrom DMac-Phil-P-200 | 250mm x 8mm 300mm x 8mm 50mm x 8mm 30mm x 8mm | 100Da-20 000Da |
| SADCP2502508 SADCP2503008 SADCP250508 SADCP250308 | AppliChrom DMac-Phil-P-250 | 250mm x 8mm 300mm x 8mm 50mm x 8mm 30mm x 8mm | 100Da-70 000Da |
| SADCP2502508J SADCP2503008J SADCP250508J SADCP250308J | AppliChrom DMac-Phil-P-250 | 250mm x 8mm 300mm x 8mm 50mm x 8mm 30mm x 8mm | 100Da-100 000Da |
| SADCP3002508 SADCP3003008 SADCP300508 SADCP300308 | AppliChrom DMac-Phil-P-300 | 250mm x 8mm 300mm x 8mm 50mm x 8mm 30mm x 8mm | 1 000Da-300 000Da |
| SADCP3502508 SADCP3503008 SADCP350508 SADCP350308 | AppliChrom DMac-Phil-P-350 | 250mm x 8mm 300mm x 8mm 50mm x 8mm 30mm x 8mm | 1 000Da-1 000 000Da |
| SADCP4002508 SADCP4003008 SADCP400508 SADCP400308 | AppliChrom DMac-Phil-P-400 | 250mm x 8mm 300mm x 8mm 50mm x 8mm 30mm x 8mm | 10 000Da-5 000 000Da |
| SADCP4502508 SADCP4503008 SADCP450508 SADCP450308 | AppliChrom DMac-Phil-P-450 | 250mm x 8mm 300mm x 8mm 50mm x 8mm 30mm x 8mm | 100 000Da→10 000 000Da |



Reproducibility

AppliChrom DMSO-Phil-P

Special GPC/SEC media for fast, accurate and robust GPC-analysis in DMSO

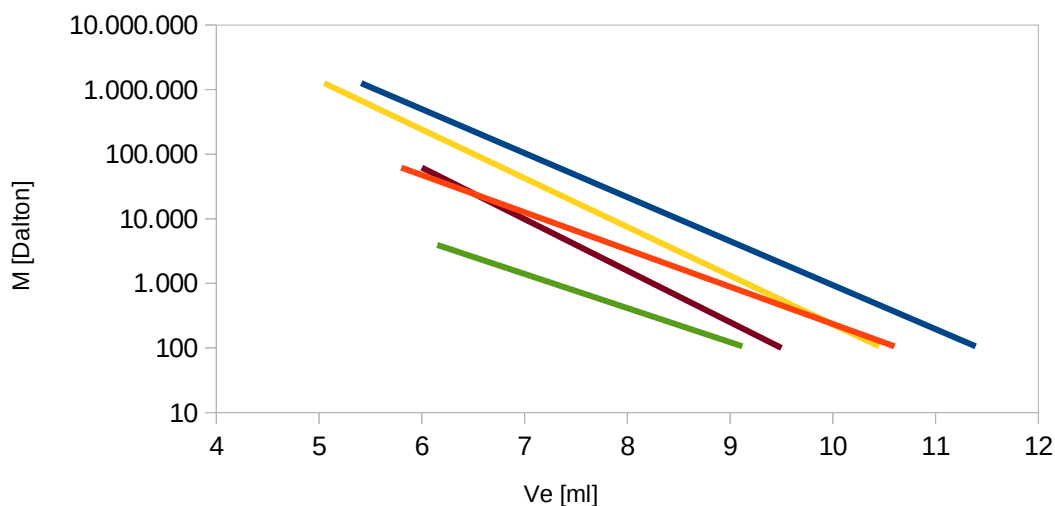
For GPC / SEC analysis in DMSO, examples:

- amylose, amylopectin, starch
- urea-formaldehyd resins (UF-resins)
- melamin-urea-formaldehyd resins (MUF-resins)
- lignins, humic substances, humic acids, coniferous wood bark essences
- polysaccharide, polysaccharid derivatives
- poly(N-isopropylacrylamid) PNIPA
- poly-vinylpyridin
- calibration: pullulan, dextran, polyvinylpyridin et al.

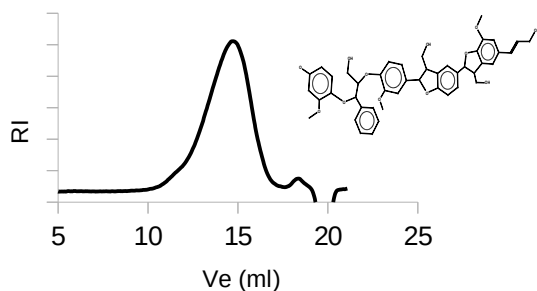
Advantages

- optimized for DMSO-GPC applications
- interactionfree pure GPC/SEC
- easy, reliable and robust GPC/SEC-calibration by dextrans, pullulans et al.
- low column bleeding for low detectornoise for improved lightscattering or viscosity detection
- 12 μ particle technology for low backpressure
- large porevolume and optimized mass transfer for polymers giving optimized resolution
- low costs caused by long livetime of column – result of combination of optimized proprietary particle and packingtechnology.

Measuring range of selected AppliChrom DMSO-Phil-P GPC/SEC-columns, 300x8mm, poresizes
100, 200, 250, 350, 400



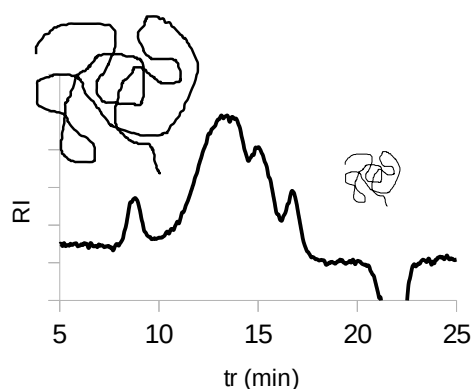
Different pore sizes available



Analyte: Lignin conifer bark extracts

Column: AppliChrom DMSO-Phil-P-250
AppliChrom DMSO-Phil-P-350

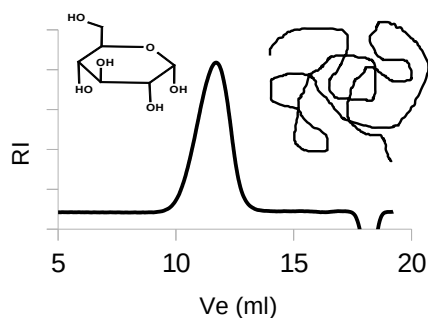
Dimension: ea. 300mm x 8mm
Mobil Phase: DMSO / 0.075M NaNO₃
Flow: 0.5ml/min
Temperature: 80°C
Detection: RI



Analyte: Spruce bark extract

Column: AppliChrom DMSO-Phil-P-250

Dimension: 2x 300mm x 8mm
Mobil Phase: DMSO / 0.075M NaNO₃
Flow: 0.5ml/min
Temperature: 80°C
Detection: RI

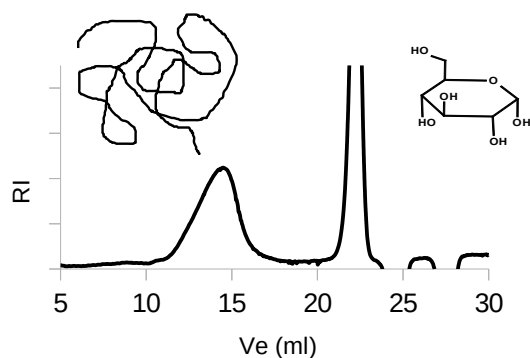


Analyte: Polysaccharide

(M ca. 70 000Da)

Column: AppliChrom DMSO-Phil-P-250
AppliChrom DMSO-Phil-P-350

Dimension: ea. 300mm x 8mm
Mobil Phase: DMSO / 0.075M NaNO₃
Flow: 0.5ml/min
Temperature: 80°C
Detection: RI



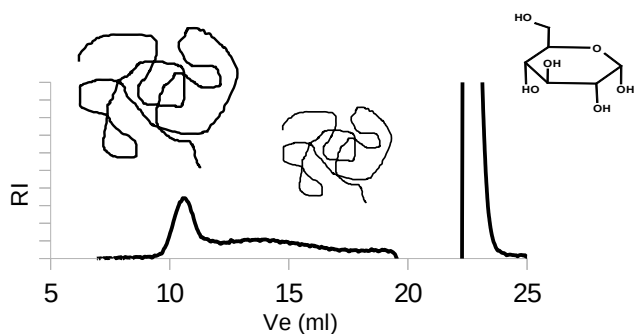
Analyte: Dextran 650

Dextran from Leuconostoc spp.,
M = 450 000-650 000Da + fructose

Column: AppliChrom DMSO-Phil-P-200
AppliChrom DMSO-Phil-P-250
AppliChrom DMSO-Phil-P-350

Dimension: ea. 300mm x 8mm
Mobil Phase: DMSO / 0.075M NaNO₃
Flow: 0.5ml/min
Temperature: 80°C
Detection: RI

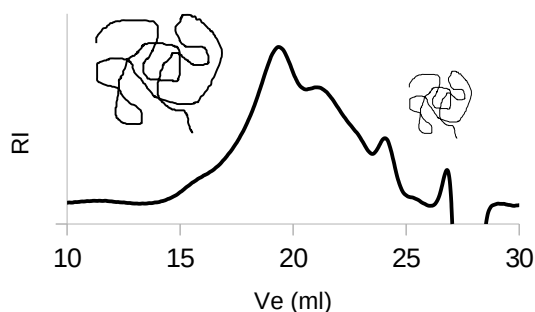
Many applications for DMSO



Analyte: Pea starch

Column: AppliChrom DMSO-Phil-P-200
AppliChrom DMSO-Phil-P-250
AppliChrom DMSO-Phil-P-350

Dimension: ea. 300mm x 8mm
Mobil Phase: DMSO / 0.075M NaNO₃
Flow: 0.5ml/min
Temperature: 80°C
Detection: RI

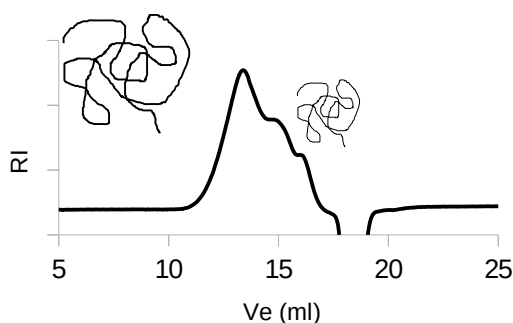


Analyte: MUF-resin

completely DMSO-soluble melamin-urea formaldehyd resin (MUF-resin)

Column: AppliChrom DMSO-Phil-P-200
AppliChrom DMSO-Phil-P-250
AppliChrom DMSO-Phil-P-350

Dimension: ea. 300mm x 8mm
Mobil Phase: DMSO / 0.075M NaNO₃
Flow: 0.5ml/min
Temperature: 80°C
Detection: RI
Injection: 50µl sample

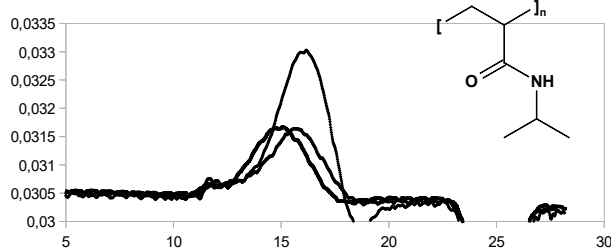


Analyte: UF-resin

DMSO-soluble urea formaldehyd resin

Column: AppliChrom DMSO-Phil-P-200
AppliChrom DMSO-Phil-P-350

Dimension: ea. 300mm x 8mm
Mobil Phase: DMSO / 0.075M NaNO₃
Flow: 0.5ml/min
Temperature: 80°C
Detection: RI



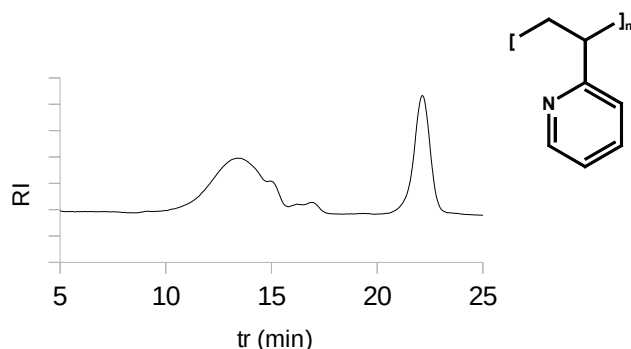
Analyte: Poly(N-isopropylacrylamide)

Further denominations: PNIPA, PNIPAAm, NIPA, PNIPAA or PNIPAm.
CAS [25189-55-3], formula: (C₆H₁₁NO)_n
3 different PNIPA fractions

Column: AppliChrom DMSO-Phil-P-300

Dimension: ea. 300mm x 8mm
Mobil Phase: DMSO / 0.075M NaNO₃
Flow: 0.5ml/min
Temperature: 80°C
Detection: RI

DMSO – easy to handle



Analyte:

Polyvinylpyridine degraded

Further denominations: CAS 25014-15-7, $(C_7H_7N)_n$
low molecular weight (oligomeric)
polyvinylpyridin fraction

Column: AppliChrom DMSO-Phil-P-250

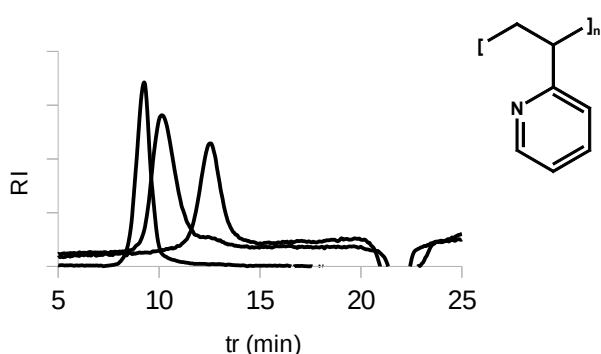
Dimension: ea. 300mm x 8mm

Mobil Phase: DMSO / 0.075M $NaNO_3$

Flow: 0.4ml/min

Temperature: 50°C

Detection: RI



Analyte:

Polyvinylpyridine fractions

Further denominations: CAS 25014-15-7, $(C_7H_7N)_n$
75.7kDa, 20.9kDa, 3.2kDa

Superposition of 3 different polyvinylpyridin fractions

Column: AppliChrom DMSO-Phil-P-250

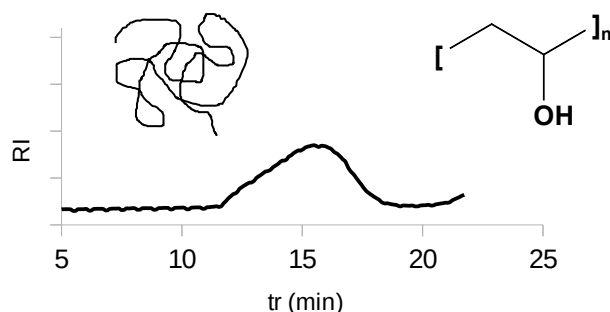
Dimension: ea. 300mm x 8mm

Mobil Phase: DMSO / 0.075M $NaNO_3$

Flow: 0.4ml/min

Temperature: 50°C

Detection: RI



Analyte:

Polyvinylalcohol M=22kDa

Column: AppliChrom DMSO-Phil-P-300

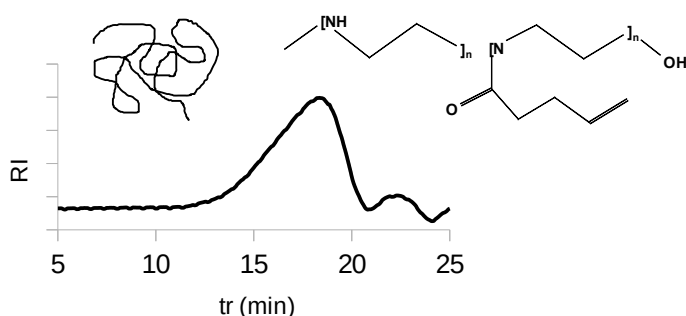
Dimension: 2x 300mm x 8mm

Mobil Phase: DMSO / 0.075M $NaNO_3$

Flow: 0.4ml/min

Temperature: 50°C

Detection: RI



Analyte:

Poly[2-(butenyl)2-oxazoline-co-ethylenimine]

M = 50.000Da

Column: AppliChrom DMSO-Phil-P-300

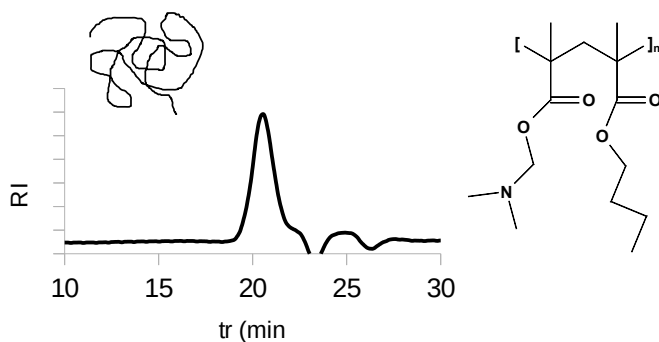
Dimension: ea. 300mm x 8mm

Mobil Phase: DMSO / 0.075M $NaNO_3$

Flow: 0.4ml/min

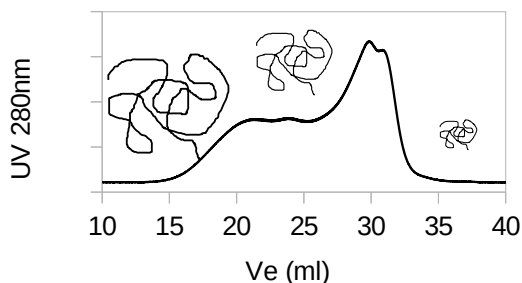
Temperature: 50°C

Detection: RI



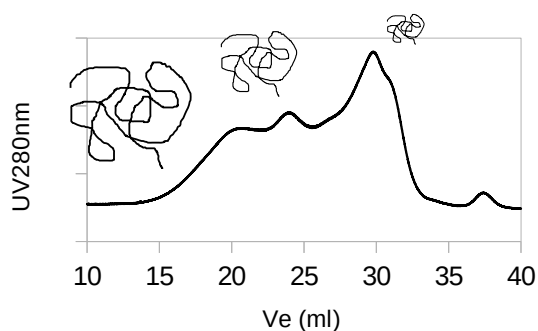
Analyte: Polybutyl methacrylate/
Poly(dimethylamino-
ethylmethacrylate) M=22kDa

Column: AppliChrom DMSO-Phil-P-300
Dimension: 2x 300mm x 8mm
Mobil Phase: DMSO / 0.075M NaNO₃
Flow: 0.4ml/min
Temperature: 50°C
Detection: RI



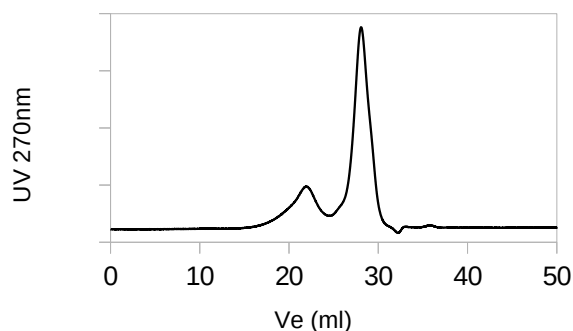
Analyte: Pea protein GPC
covering the calibration range of 100-
1 000 000Da (based on dextrans)

Column: AppliChrom DMSO-Phil-P-Multipore
Dimension: 3x 300mm x 8mm
Mobil Phase: DMSO
Flow: 0.4ml/min
Temperature: 55°C
Detection: UV 280nm
Calibration: vs. Dextran, pullulan or protein



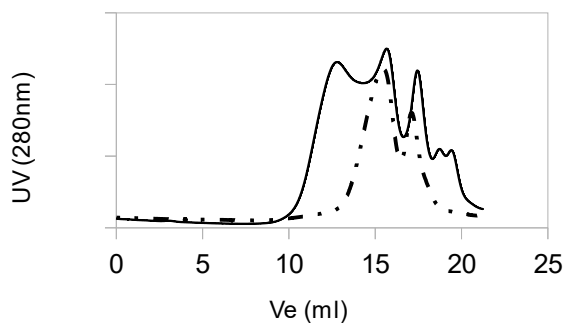
Analyte: Soy protein GPC
covering the calibration range of
100-1 000 000Da (based on dextrans)

Column: AppliChrom DMSO-Phil-P-Multipore
Dimension: 3x 300mm x 8mm
Mobil Phase: DMSO
Flow: 0.4ml/min
Temperature: 55°C
Detection: UV 280nm
Calibration: vs. Dextran, pullulan or protein



Analyte: Manuka honey protein GPC
covering the calibration range of
100-1 000 000Da (based on dextrans)

Column: AppliChrom DMSO-Phil-P-Multipore
Dimension: 3x 300mm x 8mm
Mobil Phase: DMSO
Flow: 0.4ml/min
Temperature: 40°C
Detection: UV 270nm
Calibration: vs. Dextran, pullulan or protein

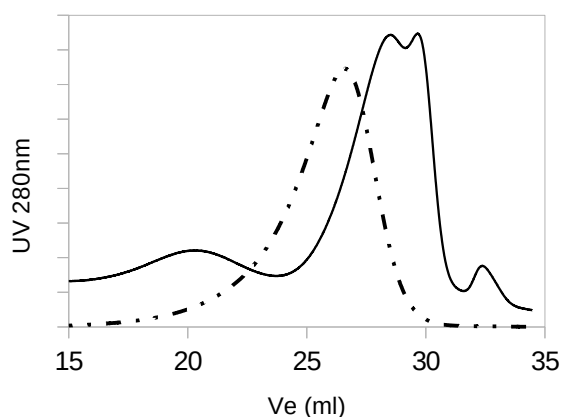


Analyte: Caramel color GPC

(range: 100Da-1 500 000Da)
SEC / GPC comparison of 2 Caramel
Coulor

Column: AppliChrom DMSO-Phil-P-100
AppliChrom DMSO-Phil-P-350

Dimension: ea. 300mm x 8mm
Mobil Phase: DMSO / 0.075M NaNO₃
Flow: 0.3ml/min
Temperature: 60°C
Detection: UV 280nm

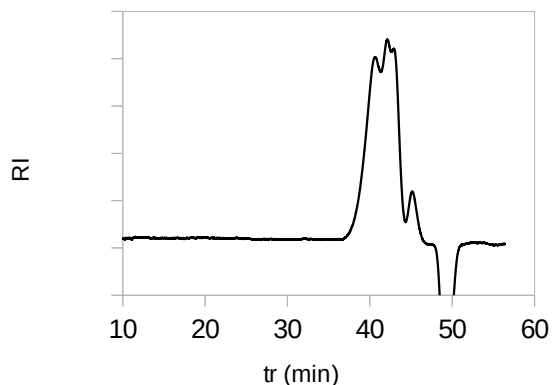


Analyte: Humic acids / humates GPC

(range: 100-1 500 000Da)
SEC / GPC comparison GPC / SEC
comparison of 2 different humic acids /
humates

Column: AppliChrom DMSO-Phil-P-Multipore

Dimension: 3x 300mm x 8mm
Mobile Phase: DMSO
Flow: 0.4ml/min
Temperature: 70°C
Detection: UV 280nm

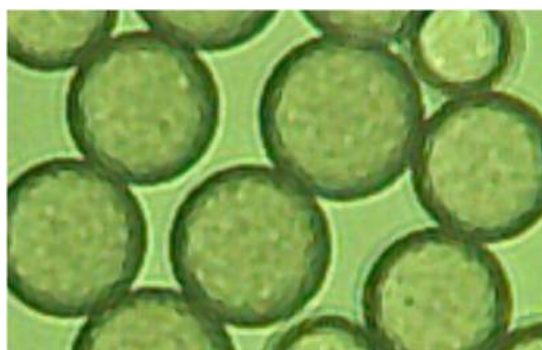


Analyte: Melamin GPC

(range: 100-1 500 000Da)

Column: AppliChrom DMSO-Phil-P-100
AppliChrom DMSO-Phil-P-350

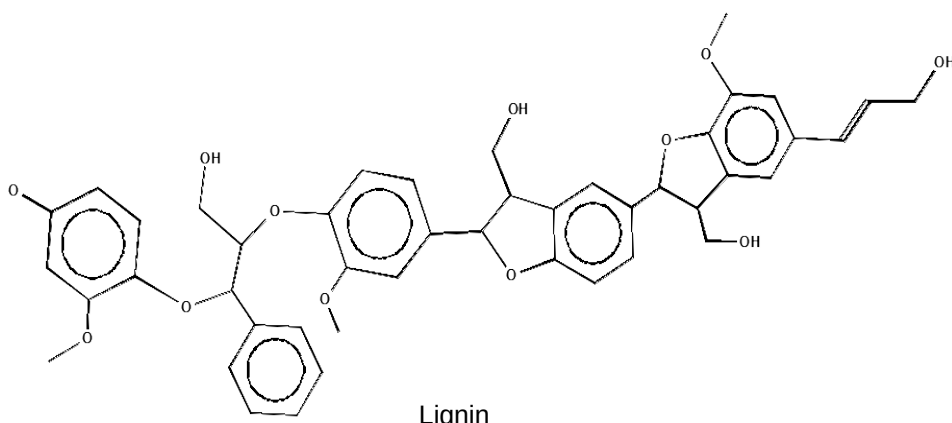
Dimension: ea. 300mm x 8mm
Mobil Phase: DMSO / 0.075M NaNO₃
Flow: 0.4ml/min
Temperature: 60°C
Detection: RI



GPC-material – particle size uniformity

AppliChrom DMSO-Phil-P

| Catalog # | Description | Dimension | Separation Range |
|--------------------------------------------------------|----------------------------------|--------------------------------------------------------|------------------------|
| SADP1002508 SADP1003008 SADP100508 SADP100308 | AppliChrom DMSO-Phil-P-100 | 250mm x 8mm 300mm x 8mm 50mm x 8mm 30mm x 8mm | 100Da-2 500Da |
| SADP2002508 SADP2003008 SADP200508 SADP200308 | AppliChrom DMSO-Phil-P-200 | 250mm x 8mm 300mm x 8mm 50mm x 8mm 30mm x 8mm | 100Da-20 000Da |
| SADP2502508 SADP2503008 SADP250508 SADP250308 | AppliChrom DMSO-Phil-P-250 | 250mm x 8mm 300mm x 8mm 50mm x 8mm 30mm x 8mm | 100Da-70 000Da |
| SADP3002508 SADP3003008 SADP300508 SADP300308 | AppliChrom DMSO-Phil-P-300 | 250mm x 8mm 300mm x 8mm 50mm x 8mm 30mm x 8mm | 1.000Da-300 000Da |
| SADP3502508 SADP3503008 SADP350508 SADP350308 | AppliChrom DMSO-Phil-P-350 | 250mm x 8mm 300mm x 8mm 50mm x 8mm 30mm x 8mm | 1 000Da-1 000 000Da |
| SADP4002508 SADP4003008 SADP400508 SADP400308 | AppliChrom DMSO-Phil-P-400 | 250mm x 8mm 300mm x 8mm 50mm x 8mm 30mm x 8mm | 10 000Da-5 000 000Da |
| SADP4502508 SADP4503008 SADP450508 SADP450308 | AppliChrom DMSO-Phil-P-450 | 250mm x 8mm 300mm x 8mm 50mm x 8mm 30mm x 8mm | 100 000Da→10 000 000Da |
| SADPM2508 SADPM3008 SADPM508 SADPM308 | AppliChrom DMSO-Phil-P-Multipore | 250mm x 8mm 300mm x 8mm 50mm x 8mm 30mm x 8mm | 100Da – 1 000 000Da |

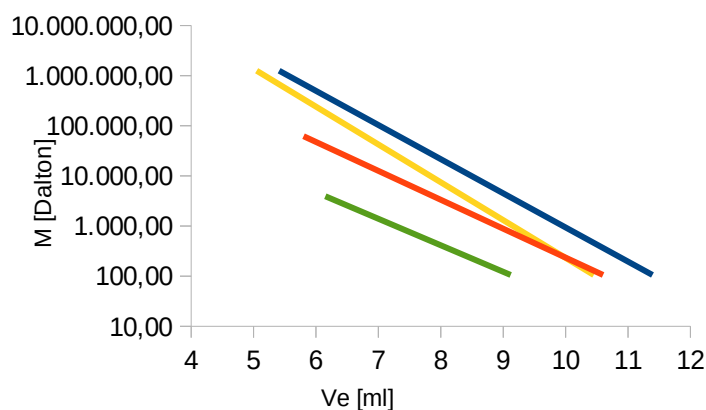


AppliChrom SuperOH-P

- optimized for aqueous GPC/SEC-separations
- aqueous high hydrophilic polymeric base material
- low column bleeding for low detector noise
- 7 μ particle technology (standard) for high platecounts and high resolution^{*)}
- large pore volume for high resolution
- pH stable 2.5-12
- pressure stability 30-80bar (depending on poresize)
- temperature stability 10-85°C
- individual poresizes for individual molecular weight ranges
- multi-pore technology for broad range of molecular size
- increased lifetime of GPC/SEC columns by combination of proprietary particle- and packing technology
- service-applicationcenter for methodscreening available in Oranienburg (Germany / Europe)

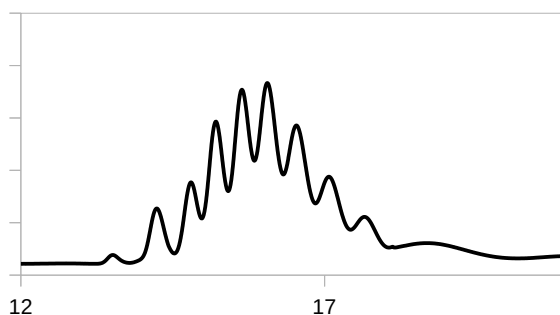
^{*)} 7 μ Particletechnology is standard for the small porous series – 100 and – 200.

GPC Calibration Curves AppliChrom SuperOH-P

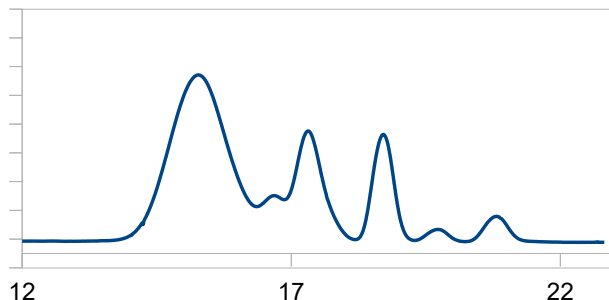


Analyte: PEO/PEG

Column: AppliChrom SuperOH-P-100
AppliChrom SuperOH-P-200
AppliChrom SuperOH-P-300
AppliChrom SuperOH-P-400
Dimension: e.a. 300mm x 8mm
Mobil Phase: H₂O
Flow: 0.5ml/min
Temperature: 20°C
Detection: RI
Injection: 20 μ l sample

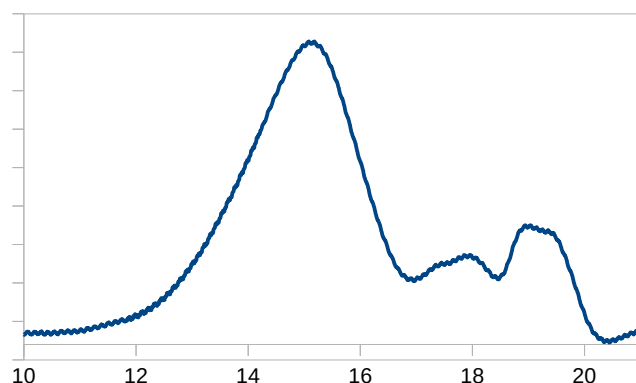


For aqueous applications



Analyte: Oligosaccharide

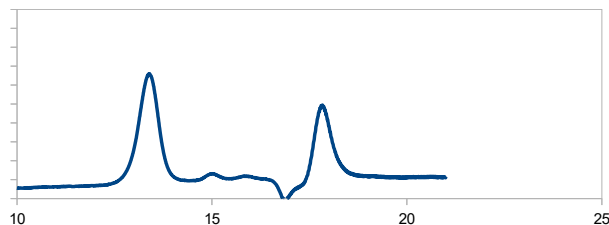
Column: AppliChrom ABOASuperOH-P-100
Dimension: 2x 300mm x 8mm
Mobil Phase: H₂O
Flow: 0.5ml/min
Temperature: 40°C
Detection: RI
Injection: 20µl sample



Analyte: Pectin

sample with high content of oligomers

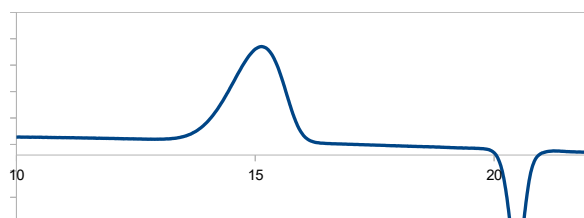
Column: AppliChrom ABOASuperOH-P-100
AppliChrom ABOASuperOH-P-350
Dimension: e.a. 300mm x 8mm
Mobil Phase: H₂O, NaKHPO₄ (pH 6.8 0.07M) + 50mM NaCl
Flow: 1.0ml/min
Temperature: 20°C
Detection: RI
Injection: 20µl sample



Analyte: PEGylated protein

Separation of an approx. 5 000Da product of a PEGylated protein of approx. 100 000Da

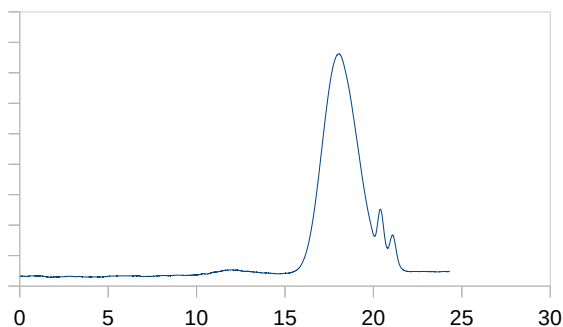
Column: AppliChrom ABOASuperOH-P-100
AppliChrom ABOASuperOH-P-350
Dimension: e.a. 300mm x 8mm
Mobil Phase: 0.05% NaN₃ in H₂O
Flow: 1.0ml/min
Temperature: 20°C
Detection: RI
Injection: 20µl sample



Analyte: Starch hydrolysate

analysis of a 100 000Da fraction

Column: AppliChrom ABOASuperOH-P-100
AppliChrom ABOASuperOH-P-350
Dimension: e.a. 300mm x 8mm
Mobil Phase: 0.2M NaNO₃ in H₂O
Flow: 1.0ml/min
Temperature: 20°C
Detection: RI
Injection: 20µl sample



Analyte:

Inulin

analysis of a 100Da- 1 000 000Da including oligomer separation

Column:

AppliChrom ABOASuperOH-P-250
AppliChrom ABOASuperOH-P-350

Dimension:

e.a. 300mm x 8mm

Mobil Phase:

0.075M NaNO₃, 5g/l Na₂HPO₄·x7H₂O in H₂O

Flow:

1.0ml/min

Temperature:

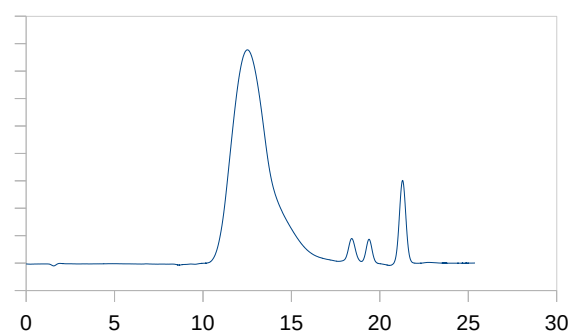
20°C

Detection:

RI

Injection:

20µl sample



Analyte:

Hyaluronic acid

including oligomer separation

Column:

AppliChrom ABOASuperOH-P-250
AppliChrom ABOASuperOH-P-350

Dimension:

e.a. 300mm x 8mm

Mobil Phase:

0.075M NaNO₃, 5g/l Na₂HPO₄·x7H₂O in H₂O

Flow:

1.0ml/min

Temperature:

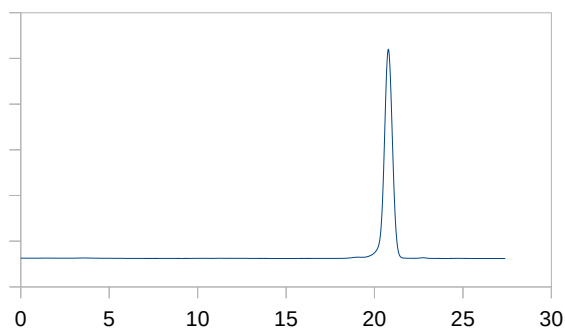
20°C

Detection:

RI

Injection:

20µl sample



Analyte:

Corn syrup

analysis of a 100Da- 1 000 000Da area

Column:

AppliChrom ABOASuperOH-P-250
AppliChrom ABOASuperOH-P-350

Dimension:

e.a. 300mm x 8mm

Mobil Phase:

H₂O

Flow:

1.0ml/min

Temperature:

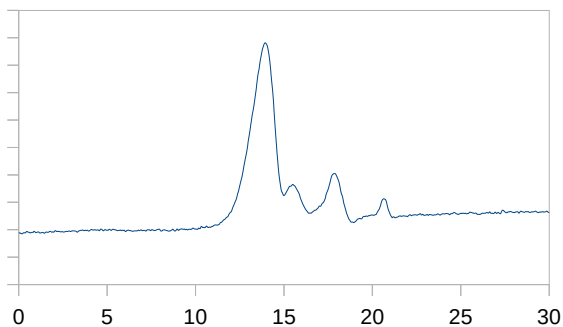
20°C

Detection:

RI

Injection:

20µl sample



Analyte:

Water-based acrylate dispersion

analysis of a 100Da- 1 000 000Da area

Column:

AppliChrom ABOASuperOH-P-250
AppliChrom ABOASuperOH-P-350

Dimension:

e.a. 300mm x 8mm

Mobil Phase:

1.0M NaNO₃ in H₂O

Flow:

1.0ml/min

Temperature:

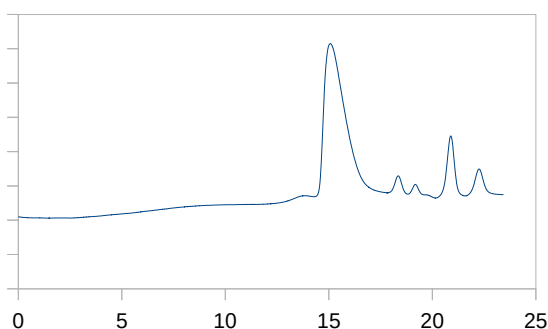
20°C

Detection:

RI

Injection:

20µl sample

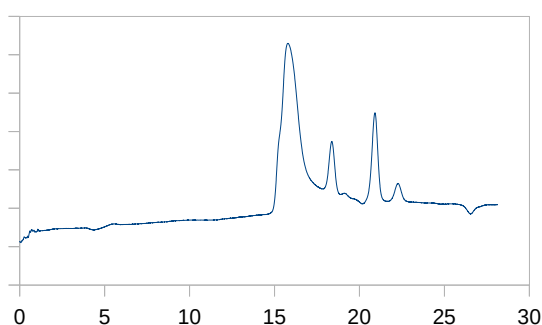


Analyte: Heparin-Na, 8-25kDa

including oligomer separation

Column: AppliChrom ABOASuperOH-P-250
AppliChrom ABOASuperOH-P-350

Dimension: e.a. 300mm x 8mm
Mobil Phase: 0.075M NaNO₃, 5g/l Na₂HPO₄·x7H₂O in H₂O
Flow: 1.0ml/min
Temperature: 20°C
Detection: RI
Injection: 20µl sample

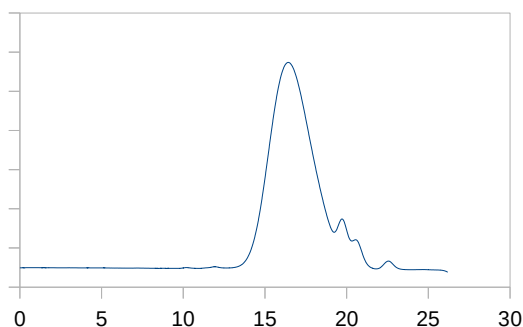


Analyte: Dextran sulfate-Na

analysis of a 100Da- 1 000 000Da area

Column: AppliChrom ABOASuperOH-P-250
AppliChrom ABOASuperOH-P-350

Dimension: e.a. 300mm x 8mm
Mobil Phase: 0.075M NaNO₃, 5g/l Na₂HPO₄·x7H₂O in H₂O
Flow: 1.0ml/min
Temperature: 20°C
Detection: RI
Injection: 20µl sample

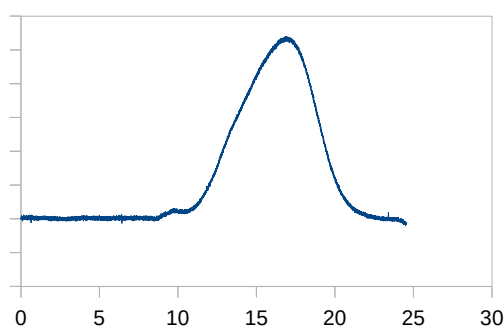


Analyte: Alginate-Na

analysis of a 100Da- 1 000 000 Da area

Column: AppliChrom ABOASuperOH-P-250
AppliChrom ABOASuperOH-P-350

Dimension: e.a. 300mm x 8mm
Mobil Phase: 0.075M NaNO₃, 5g/l Na₂HPO₄·x7H₂O in H₂O
Flow: 1.0ml/min
Temperature: 20°C
Detection: RI
Injection: 20µl sample

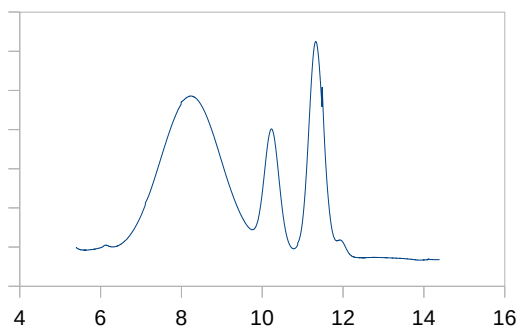


Analyte: Carrageenan

analysis of a 1 000Da- 5 000 000Da area

Column: AppliChrom ABOASuperOH-P-350
AppliChrom ABOASuperOH-P-450

Dimension: e.a. 300mm x 8mm
Mobil Phase: 0.075M LiNO₃ in H₂O
Flow: 1.0ml/min
Temperature: 20°C
Detection: RI
Injection: 20µl sample



Analyte:

Pullulan

including oligomer separation

Column:

AppliChrom ABOASuperOH-P-Screening

Dimension:

300mm x 8mm

Mobil Phase:

0.075M NaNO₃ in H₂O

Flow:

1.0ml/min

Temperature:

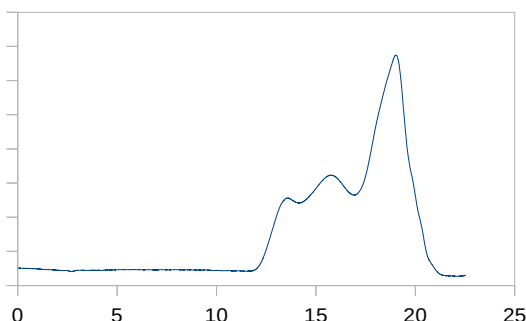
20°C

Detection:

RI

Injection:

20µl sample



Analyte:

Maltodextrin 12

analysis of a 100Da-1 000 000Da area

Column:

AppliChrom ABOASuperOH-P-250
AppliChrom ABOASuperOH-P-350

Dimension:

e.a. 300mm x 8mm

Mobil Phase:

0.075M NaNO₃ in H₂O

Flow:

1.0ml/min

Temperature:

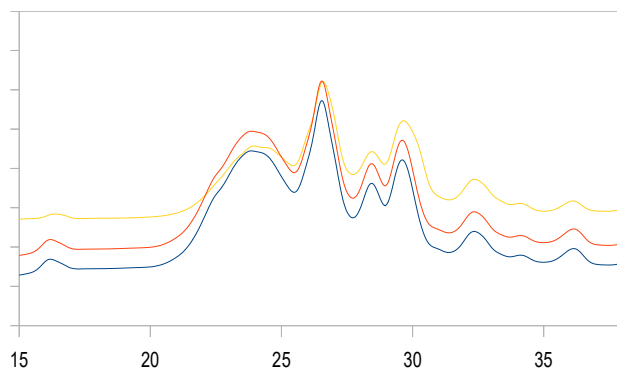
20°C

Detection:

RI

Injection:

20µl sample



Analyte:

Fish protein hydrolysates

3 different batches
analysis of a 100Da-70 000 Da area
including oligomer separation

Column:

AppliChrom ABOASuperOH-P-250

Dimension:

3x 300mm x 8mm

Mobil Phase:

0.05M NaNO₃ + 0,07M Na_{1,5}H_{1,5}PO₄ in H₂O

Flow:

1.0ml/min

Temperature:

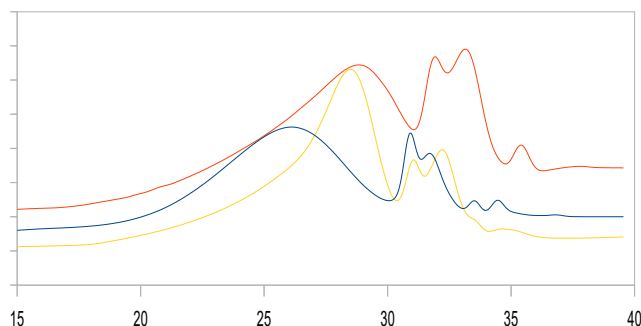
30°C

Detection:

RI

Injection:

20µl sample



Analyte:

Polycarboxylate ether

3 different batches

Column:

AppliChrom ABOASuperOH-P-350

Dimension:

3x 300mm x 8mm

Mobil Phase:

0.1M NaNO₃ + 0.05M Na₂HPO₄ in H₂O

Flow:

1.0ml/min

Temperature:

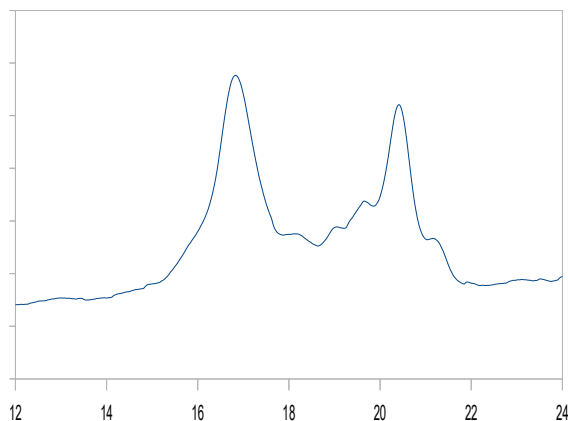
20°C

Detection:

RI

Injection:

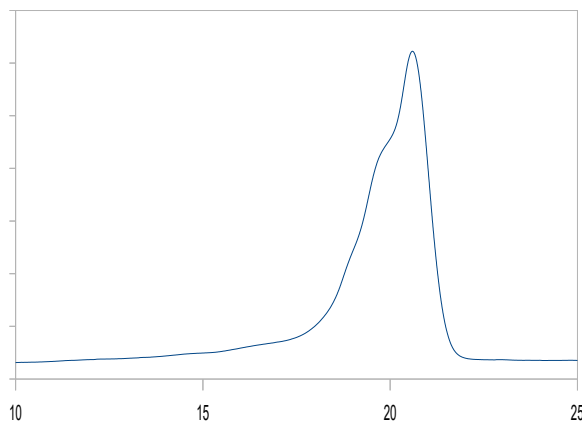
20µl sample



Analyte: Water-soluble casein fraction

Column: AppliChrom ABOASuperOH-P-250
AppliChrom ABOASuperOH-P-350

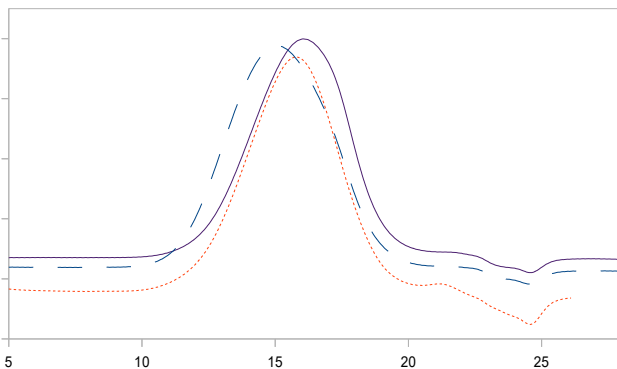
Dimension: e.a. 300mm x 8mm
Mobil Phase: 0.01M $\text{Na}_{1,5}\text{H}_{1,5}\text{PO}_4$ & 0.3M NaCl in H_2O
Flow: 1.0ml/min
Temperature: 30°C
Detection: RI
Injection: 50µl sample



Analyte: Jelly Bean „Gummibärchen“

Column: AppliChrom ABOASuperOH-P-250
AppliChrom ABOASuperOH-P-350

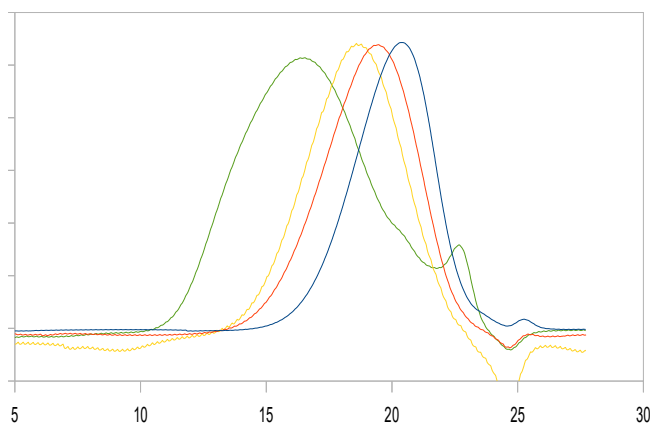
Dimension: e.a. 300mm x 8mm
Mobil Phase: 0.01M $\text{Na}_{1,5}\text{H}_{1,5}\text{PO}_4$ & 0.3M NaCl in H_2O
Flow: 1.0ml/min
Temperature: 50°C
Detection: RI
Injection: 20µl sample
Ingredient according to label: 6.9% protein (gelatin) dissolved in the eluent



**Analyte: Polyvinyl alcohols,
88% degree of hydrolysis**
3 different batches
including oligomer separation

Column: AppliChrom ABOASuperOH-P-350

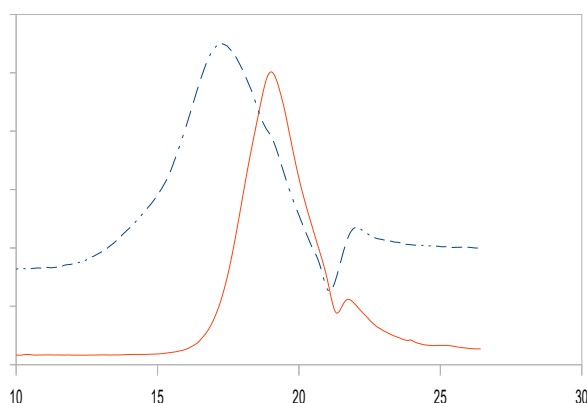
Dimension: 2x 300mm x 8mm
Mobil Phase: 0.05M Na_2HPO_4 + 0.1M NaNO_3 in H_2O
Flow: 1.0ml/min
Temperature: 30°C
Detection: RI
Injection: 20µl sample



Analyte: PVP, polyvinyl pyrrolidone
3 different batches
including oligomer separation

Column: AppliChrom ABOASuperOH-P-350

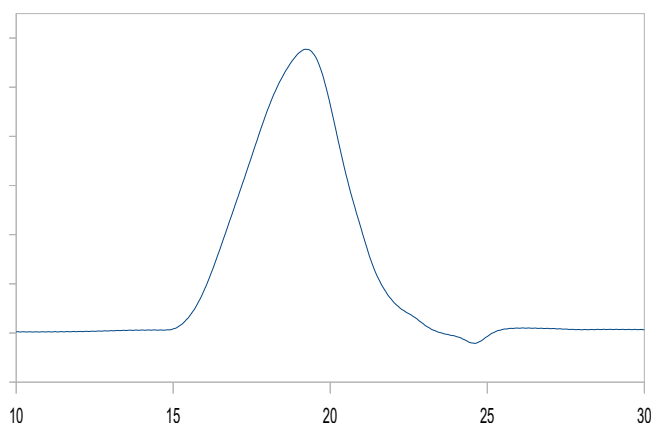
Dimension: 2x 300mm x 8mm
Mobil Phase: 0.1M NaNO_3 in H_2O + 20% ACN
Flow: 1.0ml/min
Temperature: 30°C
Detection: RI
Injection: 50µl sample
PVP (M = 8,3 / 23,4 / 33,7 / 175kDa)
dissolved in the eluent



Analyte: **Pork gelatin vs. gelatin from collagen hydrolysate**
including oligomer separation

Column: AppliChrom ABOASuperOH-P-250
AppliChrom ABOASuperOH-P-350

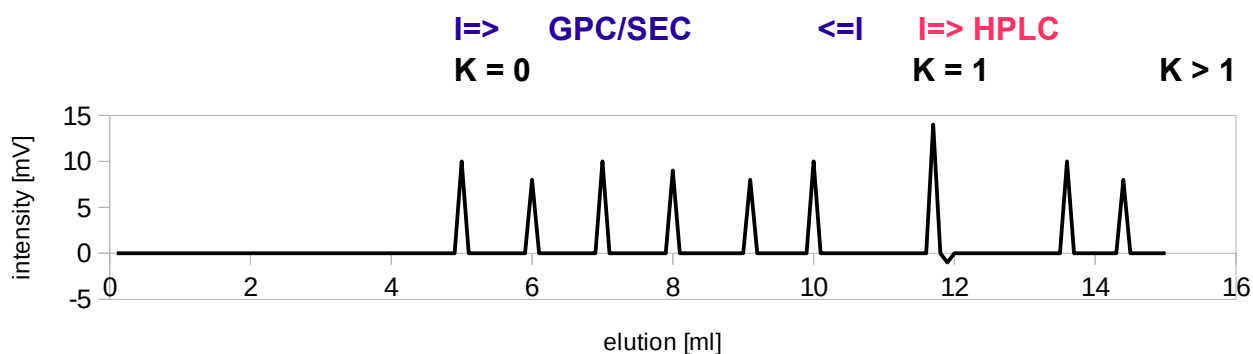
Dimension: e.a. 300mm x 8mm
Mobil Phase: 0.01M $\text{Na}_{1.5}\text{H}_{1.5}\text{PO}_4$ & 0.3M NaCl in H_2O
Flow: 1.0ml/min
Temperature: 30°C
Detection: RI
Injection: ea. 50µl sample
Pork gelatine (blue- - - -),
Gelatin from collagen hydrolyzate (red ----)



Analyte: **Pork gelatin**
analysis of a 100Da- 1 000 000Da,

Column: AppliChrom ABOASuperOH-P-250
AppliChrom ABOASuperOH-P-350

Dimension: e.a. 300mm x 8mm
Mobil Phase: 0.075M NaNO_3 , 5g/l $\text{Na}_2\text{HPO}_4 \cdot 7\text{H}_2\text{O}$ in H_2O
Flow: 1.0ml/min
Temperature: 20°C
Detection: RI
Injection: 20µl sample

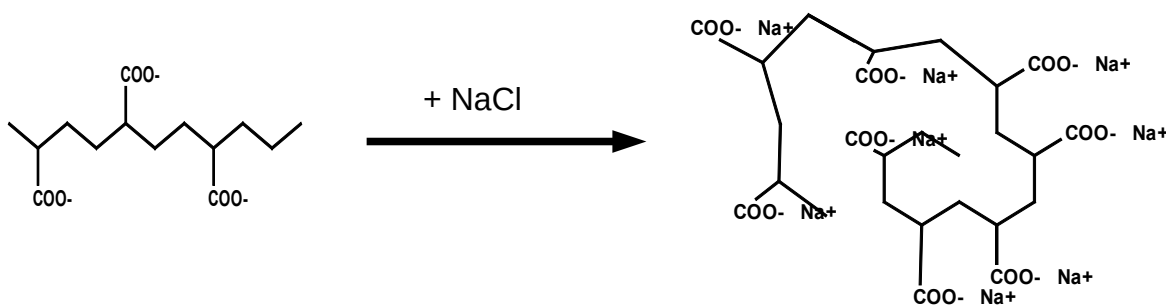


GPC/SEC – Separation by size (ΔS) || **HPLC** – Separation according to bond strength (ΔH)
K = Partition coefficient

GPC/SEC finishes when HPLC begins

AppliChrom SuperOH-P

| Catalog # | Description | Dimension | Separation Range |
|------------------------------------------------------------|--------------------------------|--------------------------------------------------------|-----------------------|
| SASOH1002508 SASOH1003008 SASOH100508 SASOH100308 | AppliChrom SuperOH-P-100 | 250mm x 8mm 300mm x 8mm 50mm x 8mm 30mm x 8mm | 100Da-2 500Da |
| SASOH2002508 SASOH2003008 SASOH200508 SASOH200308 | AppliChrom SuperOH-P-200 | 250mm x 8mm 300mm x 8mm 50mm x 8mm 30mm x 8mm | 100Da-20 000Da |
| SASOH2502508 SASOH2503008 SASOH250508 SASOH250308 | AppliChrom SuperOH-P-250 | 250mm x 8mm 300mm x 8mm 50mm x 8mm 30mm x 8mm | 100Da-70 000Da |
| SASOH3002508 SASOH3003008 SASOH300508 SASOH300308 | AppliChrom SuperOH-P-300 | 250mm x 8mm 300mm x 8mm 50mm x 8mm 30mm x 8mm | 1 000Da-300 000Da |
| SASOH3502508 SASOH3503008 SASOH350508 SASOH350308 | AppliChrom SuperOH-P-350 | 250mm x 8mm 300mm x 8mm 50mm x 8mm 30mm x 8mm | 2 500Da-1 000 000Da |
| SASOH4002508 SASOH4003008 SASOH400508 SASOH400308 | AppliChrom SuperOH-P-400 | 250mm x 8mm 300mm x 8mm 50mm x 8mm 30mm x 8mm | 10 000Da-5 000 000Da |
| SASOH4502508 SASOH4503008 SASOH450508 SASOH450308 | AppliChrom SuperOH-P-450 | 250mm x 8mm 300mm x 8mm 50mm x 8mm 30mm x 8mm | 50 000Da→10 000 000Da |
| SASOHS2508 SASOHS3008 SASOHS508 SASOHS308 | AppliChrom SuperOH-P-Multipore | 250mm x 8mm 300mm x 8mm 50mm x 8mm 30mm x 8mm | 100Da – 1 000 000Da |



Size of polyelectrolytes

For HPLC-Analyses of

- Sugars/Carbohydrates
 - Sugar Alcohols
 - Alcohols
- Carboxylic Acids

Special Polymer for fast, easy and reliable determination using HPLC-RI or HPLC-ELSD at 60-80°C.

Advantages:

- Low cost for eluent supply. Eluent = water.
- Environmental friendly because: Eluent = water.
- Low cost for used eluent waste: Eluent = water.
- Easy to handle analysis. Direct analysis from aqueous sample!
- Low invest: Measurement possible with standard HPLC-system if connected with RI or ELSD (evaporative lightscattering detector).

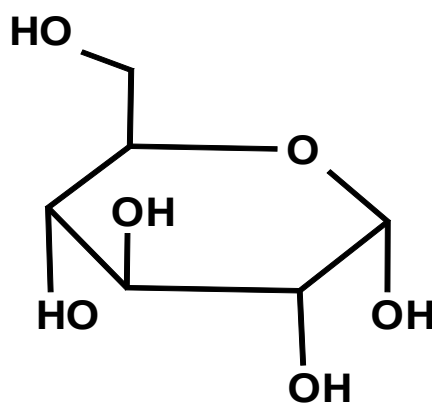
AppliChrom SugarSep-Ca – Analysis of sugars, sugar alcohols, alcohols.

AppliChrom SugarSep-Pb – Analysis of sugars

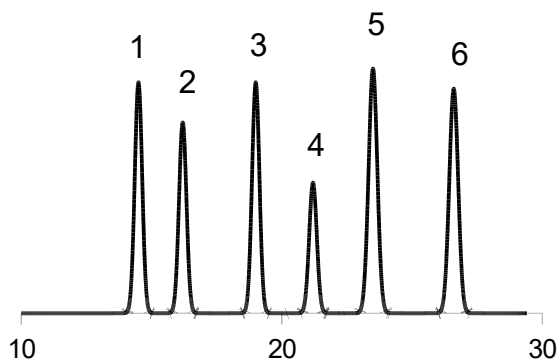
AppliChrom SugarSep-H – Analysis of sugars, sugaralcohols, alcohols and carboxylic acids.

AppliChrom SugarSep-Na – Analysis of sugars, sugaralcohols, alcohols and carboxylic acids

AppliChrom SugarSep-Oligo – Analysis of sugars, sugaralcohols, alcohols and carboxylic acids.



Identification of many sugars

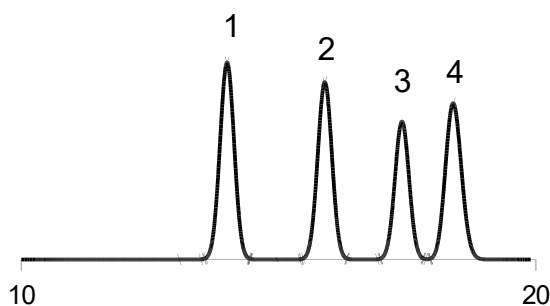


Analyte:

Mixture of

1. Sucrose (Saccarose)
2. Glucose
3. Fructose
4. Glycerin
5. Mannitol
6. Sorbitol

Column: AppliChrom SugarSep-Ca
Dimension: 300mm x 8mm
Mobil Phase: H₂O
Flow: 0.5ml/min
Temperature: 80°C
Detection: RI
Injection: 20µl sample

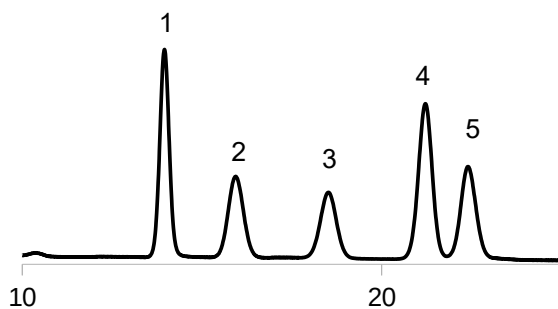


Analyte:

Mixture of

1. Sucrose (Saccarose)
2. Glucose
3. Fructose
4. Glycerin

Column: AppliChrom SugarSep-Pb
Dimension: 300mm x 8mm
Mobil Phase: H₂O
Flow: 0.4ml/min
Temperature: 60°C
Detection: RI
Injection: 20µl sample

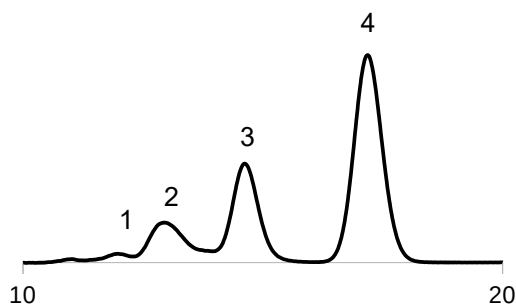


Analyte:

Mixture of

1. Sucrose (Saccarose)
2. Glucose
3. Fructose
4. Glycerin
5. Ethanol

Column: AppliChrom SugarSep-Ca
Dimension: 300mm x 8mm
Mobil Phase: H₂O
Flow: 0.5ml/min
Temperature: 80°C
Detection: RI
Injection: 20µl sample

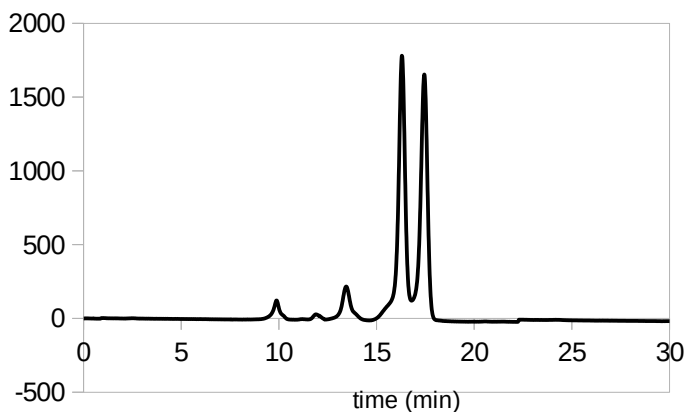


Analyte:

Honey (solvet in H₂O)

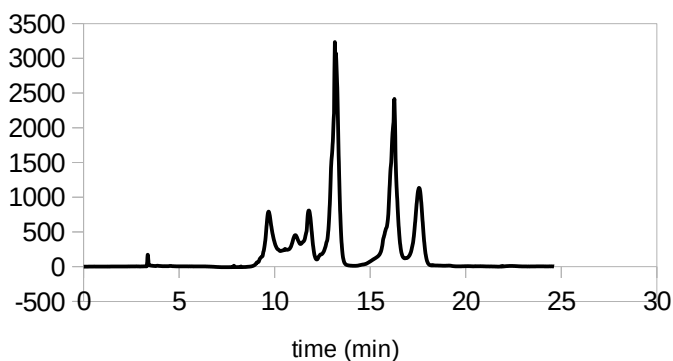
1. Dp 3
2. Dp 2
3. Glucose
4. Fructose

Column: AppliChrom SugarSep-Ca
Dimension: 300mm x 8mm
Mobil Phase: H₂O
Flow: 0.5ml/min
Temperature: 80°C
Detection: RI
Injection: 20µl sample



Analyte: Honey

Column: AppliChrom SugarSep-Na
Dimension: 300mm x 8mm
Mobil Phase: H₂O
Flow: 0.5ml/min
Temperature: 80°C
Detection: RI
Injection: 20µl sample



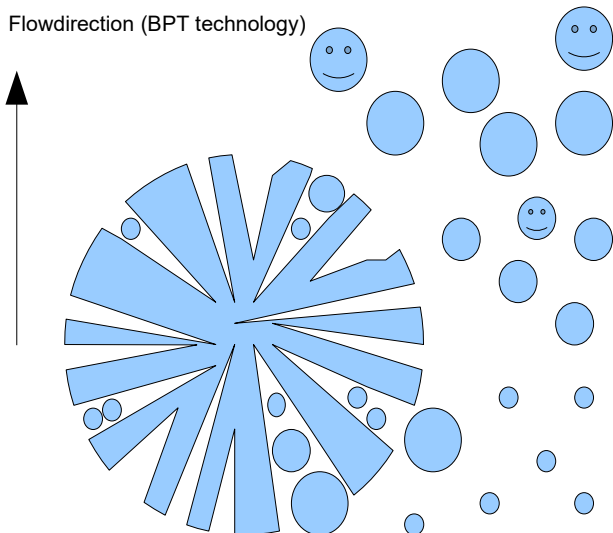
Analyte: Malt Beer

Column: AppliChrom SugarSep-Na
Dimension: 300mm x 8mm
Mobil Phase: H₂O
Flow: 0.5ml/min
Temperature: 80°C
Detection: RI
Injection: 20µl sample

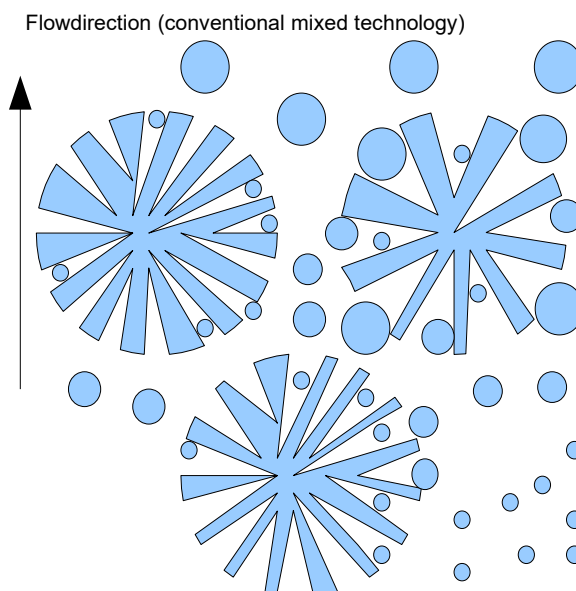
AppliChrom BPT Technology: a combination of small, medium and large pores in each particle ensures an increase of calibration range. No matching porosities effects – respective artificial shoulders in chromatogrammes known from many column combinations are significant reduced – for improving your GPC Chromatography.

Conventional GPC technology: combining columns of various poresize or by combining different poresizes in one column enlarges the calibration range – but it can lead to artefacts in the exact calibration of the GPC system that reduces molecular size accuracy determination

Flowdirection (BPT technology)

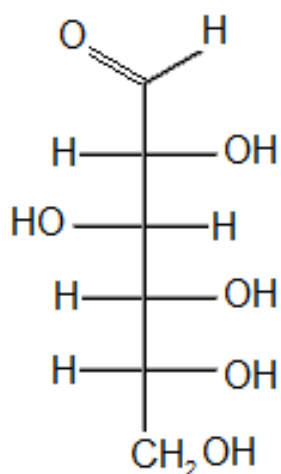


Flowdirection (conventional mixed technology)

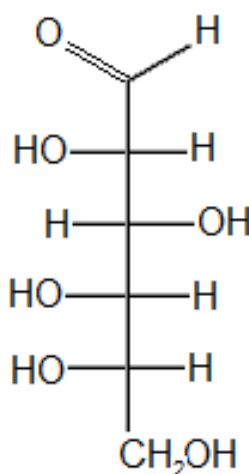


AppliChrom SugarSep

| Catalog # | Description | Dimension | |
|----------------------------------------------------------------|-----------------------------------------------|--------------------------------------------------------|--|
| SASCAI102508 SASCAI103008 SASCAI10508 SASCAI10308 | AppliChrom SugarSep-Ca I | 250mm x 8mm 300mm x 8mm 50mm x 8mm 30mm x 8mm | |
| SASPBW102508 SASPBW103008 SASPBW10508 SASPBW10308 | AppliChrom SugarSep-Pb-Wood | 250mm x 8mm 300mm x 8mm 50mm x 8mm 30mm x 8mm | |
| SASHI102508 SASHI103008 SASHI10508 SASHI10308 | AppliChrom SugarSep-H I (SO ₃ H) | 250mm x 8mm 300mm x 8mm 50mm x 8mm 30mm x 8mm | |
| SASHII102508 SASHII103008 SASHII10508 SASHII10308 | AppliChrom SugarSep-H II (SO ₃ H) | 250mm x 8mm 300mm x 8mm 50mm x 8mm 30mm x 8mm | |
| SASHIII102508 SASHIII103008 SASHIII10508 SASHIII10308 | AppliChrom SugarSep-H III (SO ₃ H) | 250mm x 8mm 300mm x 8mm 50mm x 8mm 30mm x 8mm | |
| SASNA102508 SASNA103008 SASNA10508 SASNA10308 | AppliChrom SugarSep-Na | 250mm x 8mm 300mm x 8mm 50mm x 8mm 30mm x 8mm | |

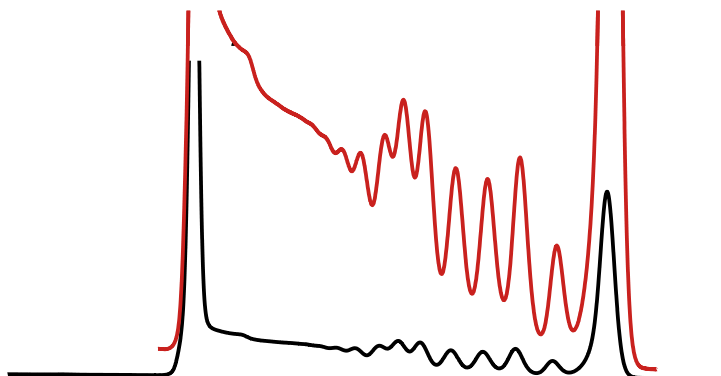


D-Glucose



L-Glucose

Oligosaccharide analysis in water



Analyte: Maltodextrin 19

[Detailed view](#)

Column: AppliChrom SugarSep-Oligo-Na

Dimension: 300mm x 8mm

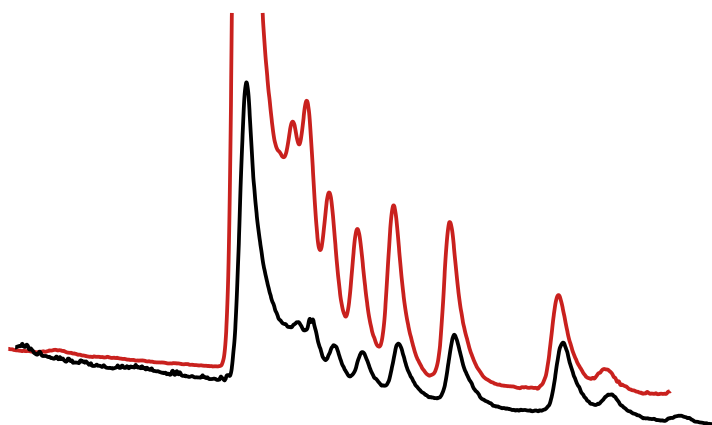
Mobil Phase: H₂O

Flow: 0.25ml/min

Temperature: 70°C

Detection: RI

Injection: 20µl sample



Analyte: Maltodextrin 12

[Detailed view](#)

Column: AppliChrom SugarSep-Oligo-Na

Dimension: 300mm x 8mm

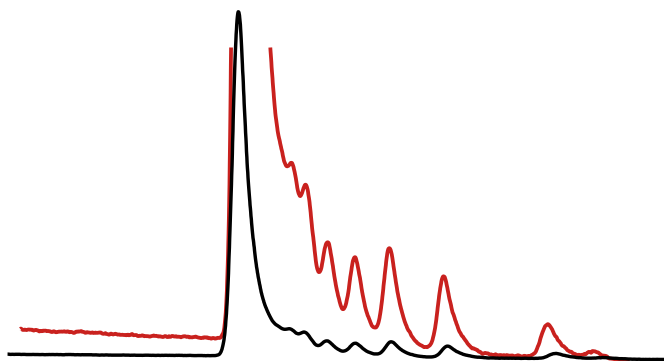
Mobil Phase: H₂O

Flow: 0.25ml/min

Temperature: 70°C

Detection: RI

Injection: 20µl sample



Analyte: Maltodextrin 6

[Detailed view](#)

Column: AppliChrom SugarSep-Oligo-Na

Dimension: 300mm x 8mm

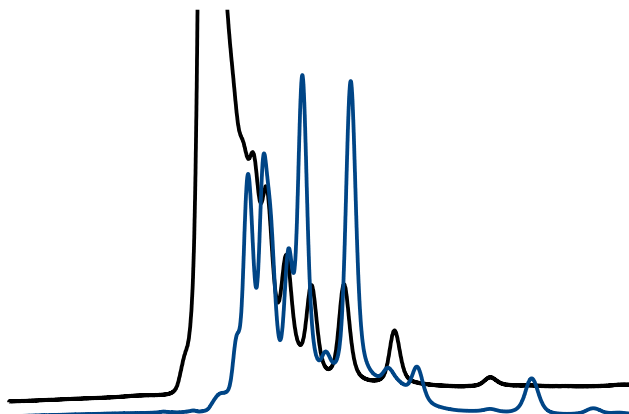
Mobil Phase: H₂O

Flow: 0.25ml/min

Temperature: 70°C

Detection: RI

Injection: 20µl sample



Analyte: Maltodextrin 12 (black)

[Inulin \(blue\)](#)

Column: AppliChrom SugarSep-Oligo-Na

Dimension: 300mm x 8mm

Mobil Phase: H₂O

Flow: 0,25ml/min

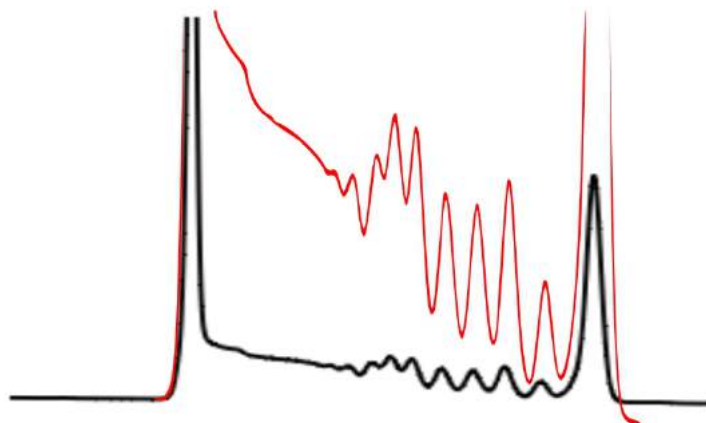
Temperature: 70°C

Detection: RI

Injection: 20µl sample

High resolution, easy detection with RI-Detector

Oligosaccharide analysis in water



Analyte: Maltodextrin 12
+ extra Glucose

Detailed view

Column: AppliChrom SugarSep-Oligo-Ag

Dimension: 300mm x 8mm

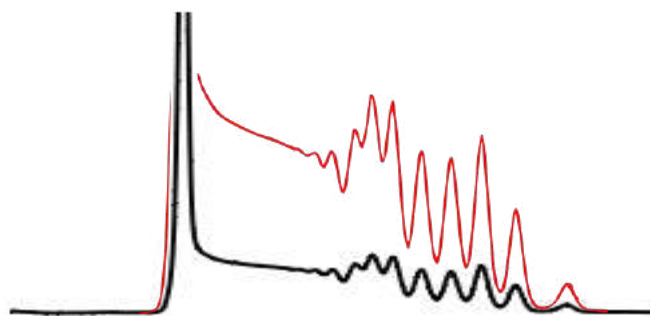
Mobil Phase: H₂O

Flow: 0.25ml/min

Temperature: 80°C

Detection: RI

Injection: 20µl sample



Analyte: Maltodextrin 12
without extra Glucose

Detailed view

Column: AppliChrom SugarSep-Oligo-Ag

Dimension: 300mm x 8mm

Mobil Phase: H₂O

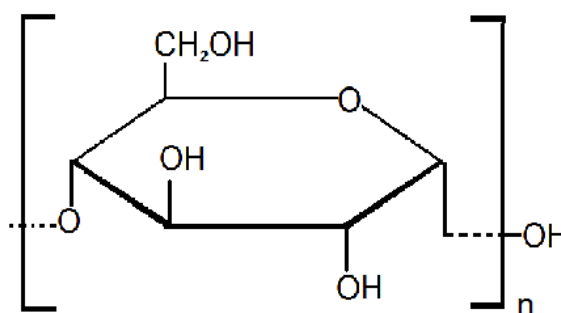
Flow: 0.25ml/min

Temperature: 80°C

Detection: RI

Injection: 20µl sample

| Catalog # | Description | Dimension | |
|---------------------------------------------------------------------------------|------------------------------|---------------------------------------------------------------------|--------------------------------------|
| SASOLNa101508 SASOLNa102508 SASOLNa103008 SASOLNa10508 SASOLNa10308 | AppliChrom SugarSep-Oligo-Na | 150mmx8mm 250mm x 8mm 300mm x 8mm 50mm x 8mm 30mm x 8mm | Oligosaccharide analysis in water |
| SASOLAg101508 SASOLAg102508 SASOLAg103008 SASOLAg10508 SASOLAg10308 | AppliChrom SugarSep-Oligo-Ag | 150mmx8mm 250mm x 8mm 300mm x 8mm 50mm x 8mm 30mm x 8mm | Oligosaccharide analysis in water |



α -1,4
Maltodextrin

AppliChrom StyDiViBe-P

AppliChrom GPC-columns for GPC analysis of organic molecules using (THF, toluene, chloroform)**.

Oligomers and polymers including the new GPC media line from **AppliChrom BPT* synthesis technology** for large range, high resolution separations with increased accuracy in calibration

- spherical high porous styrene-divinylbenzene GPC-media
- large molecular weight range: 100 → 10 000 000Da
- optimized for 1ml/min flowrate when using 8mm ID-columns
- high pressure stability of 150-50bar, depending on porosity
- high capacity from AppliChrom 8mm ID GPC columns
(5% more capacity than 7.8mm columns, 14% more capacity than 7.5mm ID columns)
- plus extra high pore volume from AppliChrom GPC synthesis technology for an extra increasing of peak capacity and resolution
- proprietary AppliChrom GPC column packing procedure for accurate peak performance, low back pressures and an extension of column lifetime
- long column lifetime for reduction of costs even at high throughput screening applications
high level of reproducibility
- high purity of AppliChrom GPC particles and columns for pure GPC mechanisms, low signal noise and reduction of „systempeaks“ after GPC run

GPC-examples (THF): Amylose acetat, amylose propionat,
butyl rubber, cellulose diacetat, cellulosenitrat, polybutadiene, polycarbonate,
polyisoprene, PMMA (polymethylmethacrylate), propylenglycol, polystyrene,
polymethylstyrene, natural rubber, PVC (polyvinylchloride), polyvinylacetate, epoxid
resins, polyisocyanate, polyols,
polyurethans, plant oils/triglycerids/diglycerids,....

GPC-examples (toluene): Silicones, polydimethylsiloxan

GPC for epoxid resins, oligomers, isocyanates, PMMA / polymethylmethacrylate,
polyethylmethacrylate, PS/polystyrene, vegetable oils /triglycerides/diglycerides,...,
polybutadiene, polyisoprene, silicon / siliconoil / polydimethylsiloxane (in toluene),
PEG / polyethylenglycol, polypropylenoxide, polyethylenglycol-polypropylen glycol-
copolymer, PVC/polyvinylchloride, PU / polyurethane, celluloseacetate,
diallylphthalate, dialkylphthalate, alkyd resin e.g...

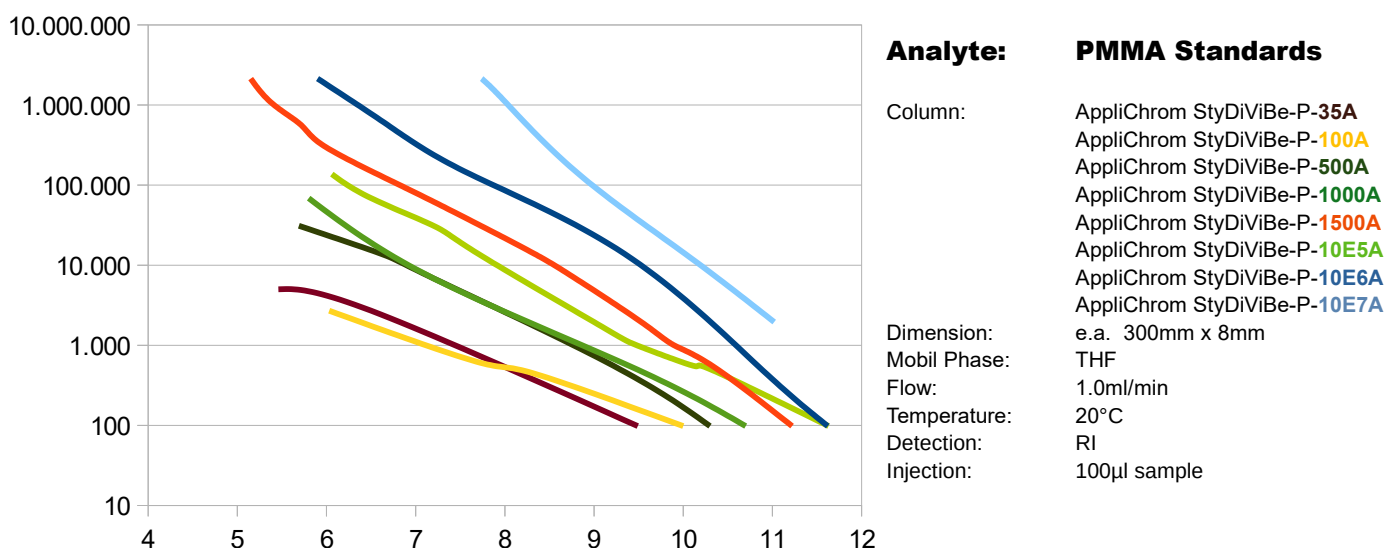
* BPT: Broad Pore distribution Technology – easy calibration curve for large range of molecular sizes; lowered calibration artefacts compared to single pore combination columns.

** Eluent THF, toluene or chloroform must be dry. If other eluents are planned – please ask us in advance. Please avoid: Eluent containing e.g. water, alcohols, acetonitril – can be relevant e.g. when using a combined HPLC/GPC system and/or in case a degasser is part of the chromatography system, avoid drying of column.

AppliChrom StyDiViBe molecular weight range and optimum range of molecular weights

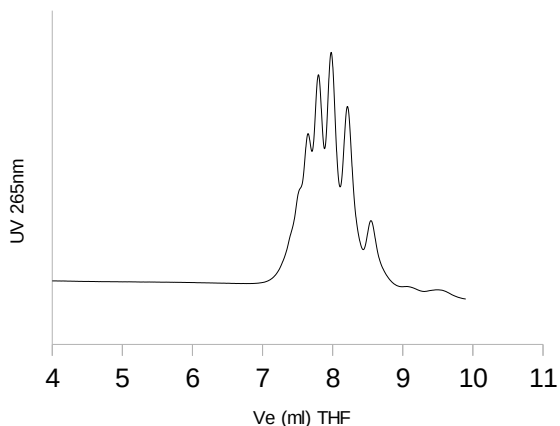
| | Range of molar mass | Optimum resolution |
|-------------------------|------------------------------------|----------------------|
| 35A | 100Da-2 500Da | <400Da |
| 100A | 100Da-10 000Da | ca. 800Da |
| 500A | 100Da-30 000Da | 1 000Da -3 000Da |
| 1 000A | 100Da-70 000Da | 3 000Da-10 000Da |
| 1 500A – BPT | 100Da-120 000Da ^{*)} | 4 000Da–15 000Da |
| 10 ⁵ A - BPT | 500Da-1 500 000Da ^{*)} | 10 000Da-150 000Da |
| 10 ⁶ A - BPT | 1 000Da-4 000 000Da ^{*)} | 20 000Da-400 000Da |
| 10 ⁷ A - BPT | 1 000Da→10 000 000Da ^{*)} | 30 000Da-2 000 000Da |

Molecular sizes range of AppliChrom StyDiViBe GPC-Serie in detail: THF GPC-Calibration curves



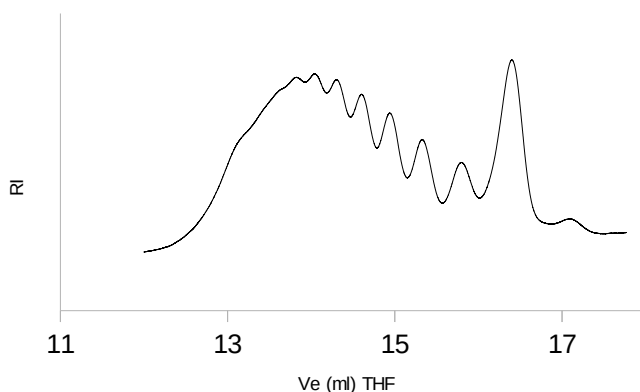
To cover a large range of molecular sizes GPC columns of suited porosities can be combined. This is the typical state of the art in many GPC laboratories. Also now it is useful if a special range of molecular sizes should be zoomed by GPC. But – in some single cases this also results in more or less obvious inhomogenities of calibration curves that itself makes accurate mathematics of calibration challenging. To increase accuracy and to simplify the calibration AppliChrom developed the BPT* synthesis technology for significant lowering the inhomogenities phenomena and to improve the results.

* BPT: Broad Poredistribution Technology – easy calibration curve for large range of molecular sizes; lowered calibration artefacts compared to single pore combination columns.



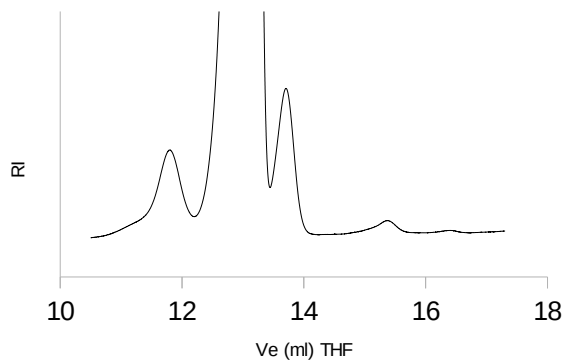
Analyte: Polystyrene (PS)
Mp = 578Da

Column: AppliChrom StyDiV-Be-P-35A
Dimension: 300mm x 8mm
Mobil Phase: THF
Flow: 1.0ml/min
Temperature: 20°C
Detection: UV 265nm
Injection: 20µl sample



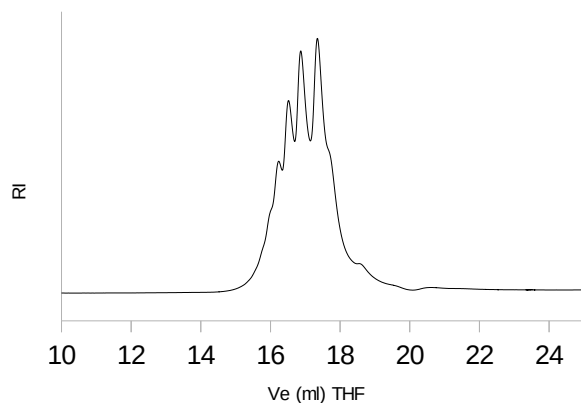
Analyte: Polymethylmethacrylate (PMMA) oligomer

Column: AppliChrom StyDiV-Be-P-100A
Dimension: 2x 300mm x 8mm
Mobil Phase: THF
Flow: 1.0ml/min
Temperature: 20°C
Detection: RI
Injection: 20µl sample



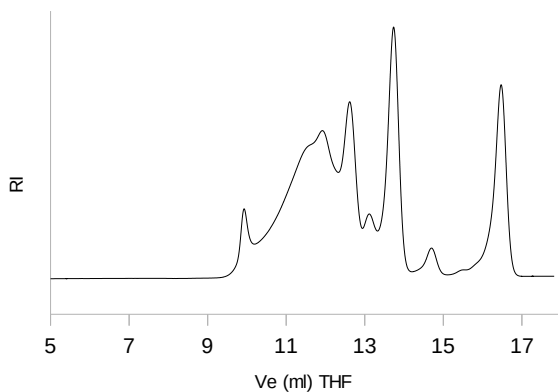
Analyte: Grapeoil (Triglyceride GPC)

Column: AppliChrom StyDiV-Be-P-100A
Dimension: 2x 300mm x 8mm
Mobil Phase: THF
Flow: 1.0ml/min
Temperature: 20°C
Detection: RI
Injection: 20µl sample

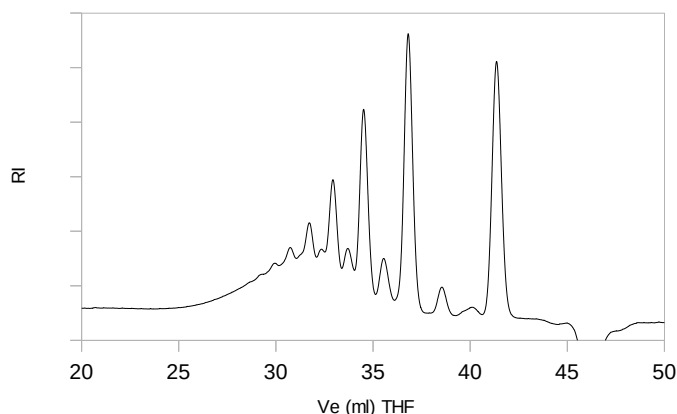


Analyte: Polyethylene glycol (PEG)
Mp = 200Da

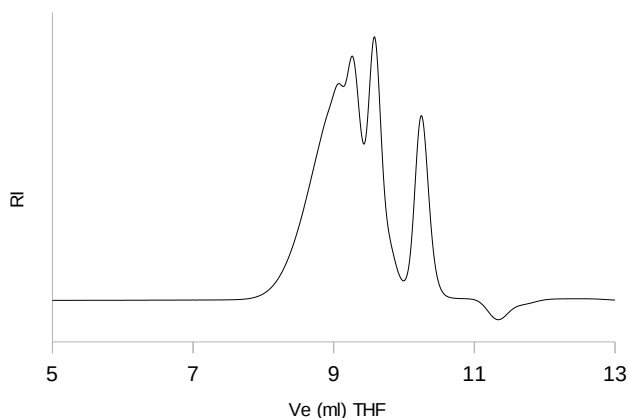
Column: AppliChrom StyDiV-Be-P-100A
Dimension: 2x 300mm x 8mm
Mobil Phase: THF
Flow: 1.0ml/min
Temperature: 20°C
Detection: RI
Injection: 20µl sample



Pore to small



Pore perfect



Pore to large

Analyte: Bisphenol-A-Epichlorhydrin resin (I)

Column: AppliChrom StyDiV-Be-P-100A

Dimension: 2x 300mm x 8mm
Mobil Phase: THF
Flow: 1.0ml/min
Temperature: 20°C
Detection: RI
Injection: 20µl sample

High resolving GPC up to 10 000Da.

Analyte: Bisphenol-A-Epichlorhydrin resin (I)

Column: AppliChrom StyDiV-Be-P-1500A-BPT

Dimension: 2x 300mm x 8mm
Mobil Phase: THF
Flow: 0.5ml/min
Temperature: 20°C
Detection: RI
Injection: 20µl sample

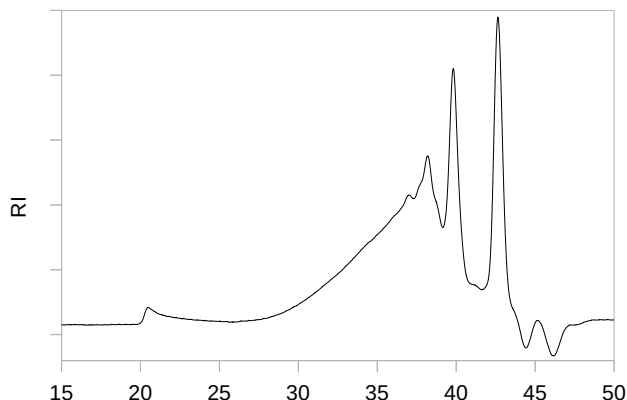
Good resolution, calibration range respective linearity in the range of 100Da-120 000Da, obtained from the special AppliChrom BPT-technology. No „surprising“ porosity artefacts from mixing particles with pores of different size for covering the full range of molecular sizes. Great resolution even if 8µl RI measuring cell is used.

Analyte: Bisphenol-A-Epichlorhydrin resin (I)

Column: AppliChrom StyDiV-Be-P-10E5A-BPT

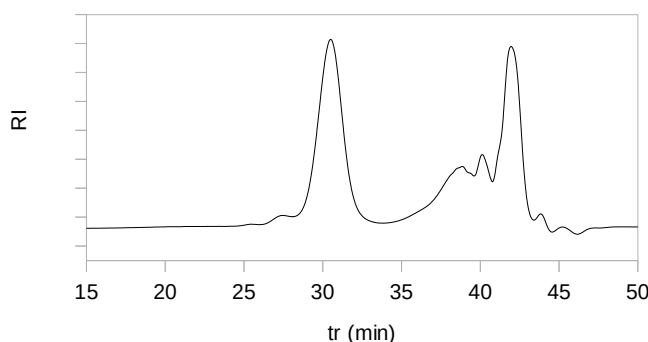
Dimension: 300mm x 8mm
Mobil Phase: THF
Flow: 1.0ml/min
Temperature: 20°C
Detection: RI
Injection: 20µl sample

Good linearity from monomer up to 1 500 000Da, ideal for porosity gap artefact reduced GPC screening of large ranges of molecular weights combined with maintaining of oligomer resolution



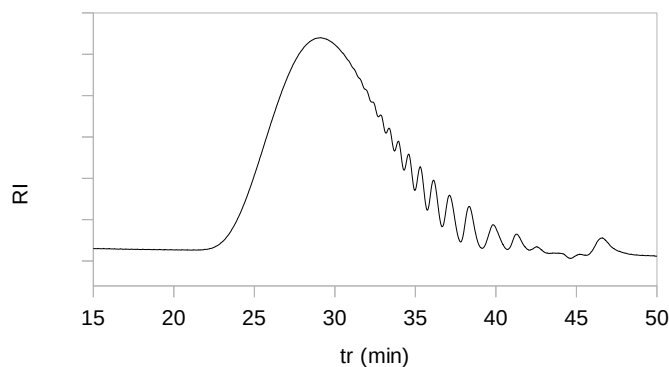
Analyte: Polyol hard foam

Column: AppliChrom StyDiV-Be-P-1500A-BPT
Dimension: 2x 300mm x 8mm
Mobil Phase: THF
Flow: 0.5ml/min
Temperature: 45°C
Detection: RI
Injection: 20µl sample



Analyte: Polyol soft foam

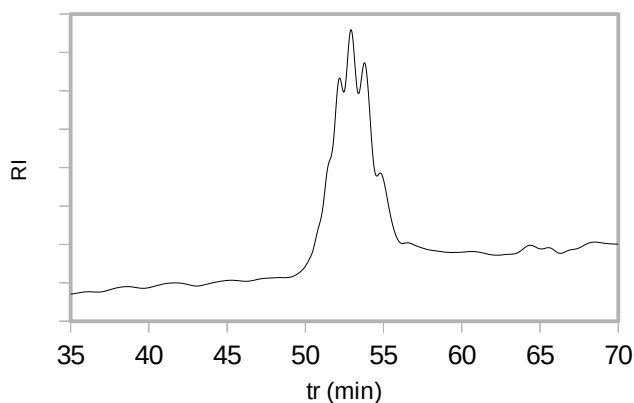
Column: AppliChrom StyDiV-Be-P-1500A-BPT
Dimension: 2x 300mm x 8mm
Mobil Phase: THF
Flow: 0.5ml/min
Temperature: 45°C
Detection: RI
Injection: 20µl sample



Analyte: Aliphatic polyester

(adipate polyester)
including fingerprint

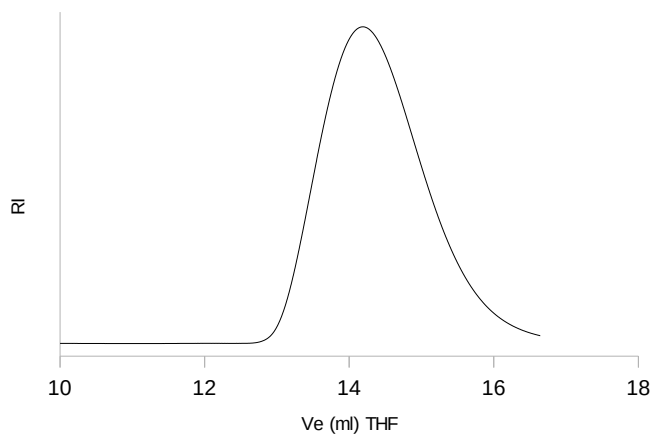
Column: AppliChrom StyDiV-Be-P-1500A-BPT
Dimension: 2x 300mm x 8mm
Mobil Phase: THF
Flow: 0.5ml/min
Temperature: 45°C
Detection: RI
Injection: 20µl sample



Analyte: Polyether polyol

Column: AppliChrom StyDiV-Be-P-1500A-BPT
Dimension: 2x 300mm x 8mm
Mobil Phase: THF
Flow: 0.5ml/min
Temperature: 45°C
Detection: RI
Injection: 20µl sample

High resolution

**Analyte: PVC**

Column: AppliChrom StyDiV-Be-P-10E5A-BPT

Dimension: 2x 300mm x 8mm

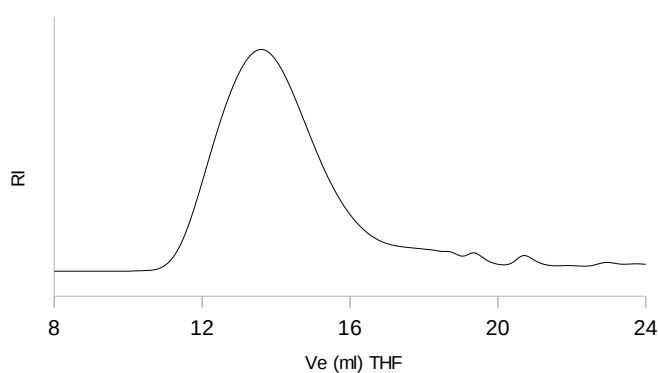
Mobil Phase: THF

Flow: 1.0ml/min

Temperature: 45°C

Detection: RI

Injection: 20µl sample

**Analyte: PMMA**

Column: AppliChrom StyDiV-Be-P-10E5A-BPT

Dimension: 2x 300mm x 8mm

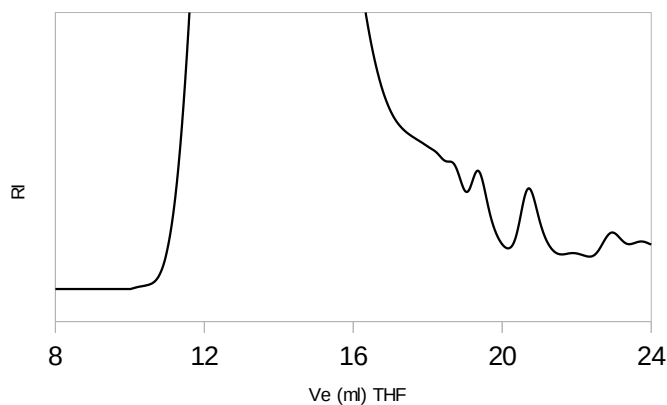
Mobil Phase: THF

Flow: 1.0ml/min

Temperature: 45°C

Detection: RI

Injection: 20µl sample

**Analyte: PMMA enlarged**

Column: AppliChrom StyDiV-Be-P-10E5A-BPT

Dimension: 2x 300mm x 8mm

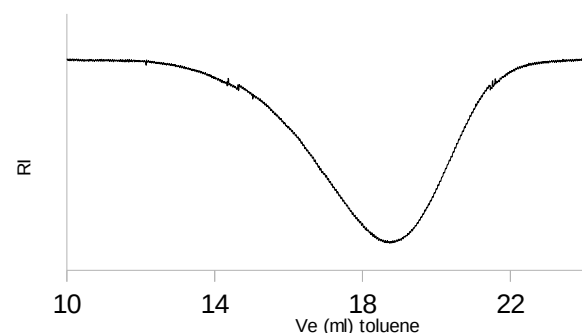
Mobil Phase: THF

Flow: 1.0ml/min

Temperature: 45°C

Detection: RI

Injection: 20µl sample

**Analyte: Silicone**

Column: AppliChrom StyDiV-Be-P-10E5A-BPT

Dimension: 2x 300mm x 8mm

Mobil Phase: Toluene

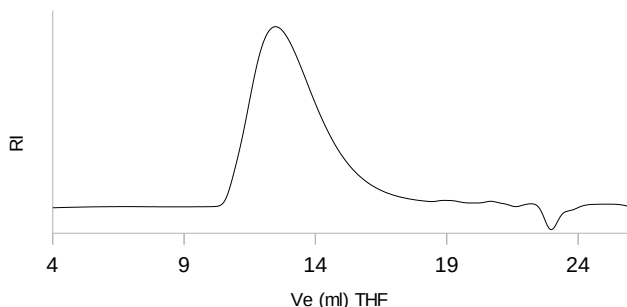
Flow: 1.0ml/min

Temperature: 20°C

Detection: RI

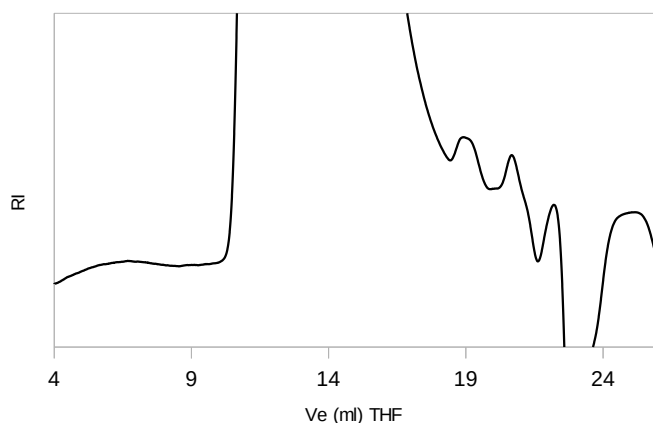
Injection: 20µl sample

Broad calibration range, no porosity artefacts observed



Analyte: Polystyrene

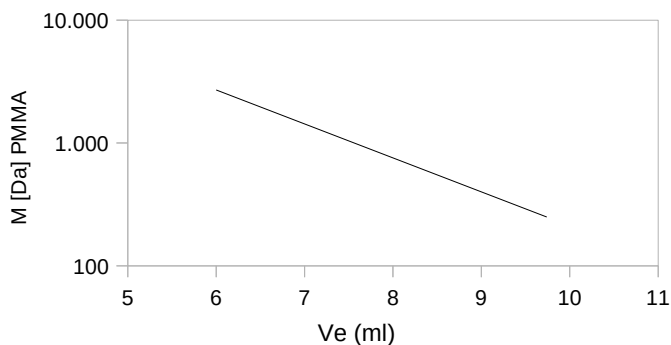
Column: AppliChrom StyDiV-Be-P-10E5A-BPT
Dimension: 2x 300mm x 8mm
Mobil Phase: THF
Flow: 1.0ml/min
Temperature: 45°C
Detection: RI
Injection: 20µl sample



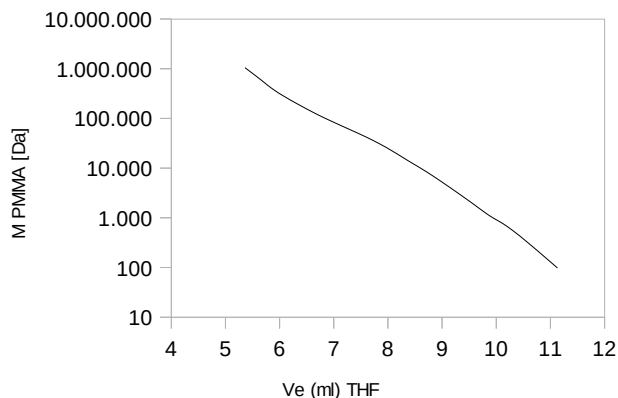
Analyte: Polystyrene enlarged

Column: AppliChrom StyDiV-Be-P-10E5A-BPT
Dimension: 2x 300mm x 8mm
Mobil Phase: THF
Flow: 1.0ml/min
Temperature: 45°C
Detection: RI
Injection: 20µl sample

Ve [ml] vs M PMMA [Da]



Ve vs. M (PMMA)



GPC calibration curve

Column: AppliChrom StyDiV-Be-P-35A
Dimension: 300mm x 8mm
Mobil Phase: THF
Flow: 1.0ml/min
Temperature: 45°C
Detection: RI
Injection: 20µl sample

GPC calibration curve, large pore volume plus low exclusion limit for high oligomer resolution even with low backpressure.

GPC calibration curve

Column: AppliChrom StyDiV-Be-P-10E5A-BPT
Dimension: 2x 300mm x 8mm
Mobil Phase: THF
Flow: 1.0ml/min
Temperature: 20°C
Detection: RI
Injection: 20µl sample

AppliChrom StDiViBe-P-10E5A-BPT-Technology: Large calibration range respective good to calculate calibration curve from monomer up to 1 500 000Da, ideal technological step ahead if a combination of porosities results in „artificial shoulders“ of calibration curves and/or in artificial shoulders of broad distributed molecular weight polymers. An easy to use tool to improve quality of results for your analytes.

AppliChrom StyDiViBe-P

| Catalog # | Description | Dimension | Separation Range |
|--------------------------------------------------------------------|------------------------------|--------------------------------------------------------|--------------------------|
| ASDVBP352508 ASDVBP353008 ASDVBP35508 ASDVBP35308 | AppliChrom StyDiViBe-P-35A | 250mm x 8mm 300mm x 8mm 50mm x 8mm 30mm x 8mm | 100Da-2 500Da |
| ASDVBP1002508 ASDVBP1003008 ASDVBP100508 ASDVBP100308 | AppliChrom StyDiViBe-P-100A | 250mm x 8mm 300mm x 8mm 50mm x 8mm 30mm x 8mm | 100Da-10 000Da |
| ASDVBP5002508 ASDVBP5003008 ASDVBP500508 ASDVBP500308 | AppliChrom StyDiViBe-P-500A | 250mm x 8mm 300mm x 8mm 50mm x 8mm 30mm x 8mm | 100Da-30 000Da |
| ASDVBP10002508 ASDVBP10003008 ASDVBP1000508 ASDVBP1000308 | AppliChrom StyDiViBe-P-1000A | 250mm x 8mm 300mm x 8mm 50mm x 8mm 30mm x 8mm | 100Da-70 000Da |
| ASDVBP15002508 ASDVBP15003008 ASDVBP1500508 ASDVBP1500308 | AppliChrom StyDiViBe-P-1500A | 250mm x 8mm 300mm x 8mm 50mm x 8mm 30mm x 8mm | 1.00Da-120 000Da |
| ASDVBP4002508 ASDVBP4003008 ASDVBP400508 ASDVBP400308 | AppliChrom StyDiViBe-P-10E4A | 250mm x 8mm 300mm x 8mm 50mm x 8mm 30mm x 8mm | 100Da-400 000Da |
| ASDVBP5002508 ASDVBP5003008 ASDVBP500508 ASDVBP500308 | AppliChrom StyDiViBe-P-10E5A | 250mm x 8mm 300mm x 8mm 50mm x 8mm 30mm x 8mm | 500Da-1 500 000Da |
| ASDVBP6002508 ASDVBP6003008 ASDVBP600508 ASDVBP600308 | AppliChrom StyDiViBe-P-10E6A | 250mm x 8mm 300mm x 8mm 50mm x 8mm 30mm x 8mm | 10 000Da – 4 000 000Da |
| ASDVBP7002508 ASDVBP7003008 ASDVBP700508 ASDVBP700308 | AppliChrom StyDiViBe-P-10E7A | 250mm x 8mm 300mm x 8mm 50mm x 8mm 30mm x 8mm | 100 000Da – 10 000 000Da |



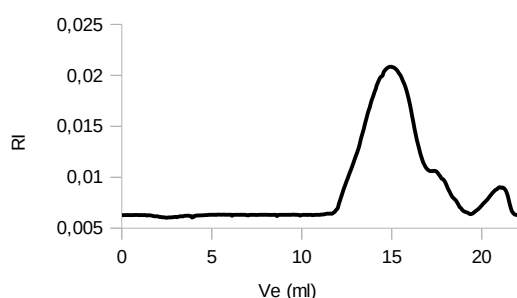
Runge picture „homemade“

AppliChrom CatPhil-P

Special GPC / SEC columns for the aqueous analysis of neutral, anionic and additionally cationic polymers.

For GPC / SEC analysis of

- Polycations, polyammonium compounds
- polyamines (chitosans), polyethylenimines,
- PEGylated polyethyleneimines
- polysaccharides
- polyanions (heparins, pectins, ...)

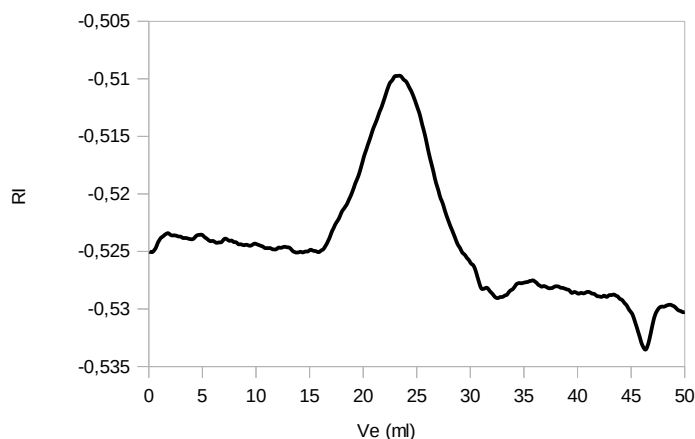


Analyte: Poly DADMAC

Polydiallyldimethylammonium chloride, polyquaternium-6
Mw = 100-200 000Da, CAS [26062-79-3]

Column: AppliChrom CatPhil-P-100
AppliChrom CatPhil-P-350

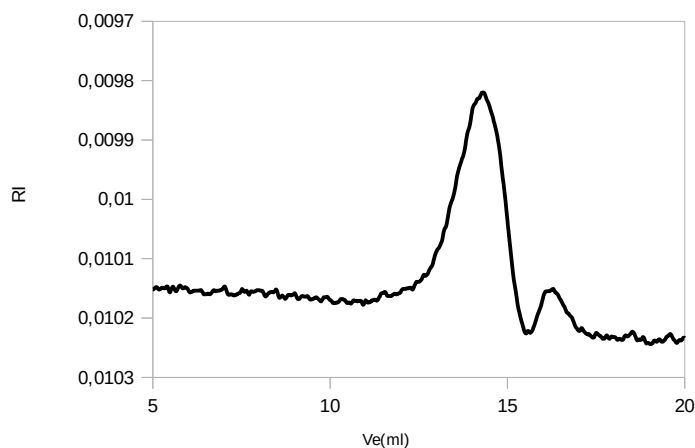
Dimension: e.a. 300mm x 8mm
Mobil Phase: NaNO_3 + 0.2% formic acid in H_2O
Flow: 1.0ml/min
Temperature: 20°C
Detection: RI
Injection: 100µl sample



Analyte: High molecular weight chitosan, poliglusam, polyglucosamine, CAS [9012-76-4]

Column: AppliChrom CatPhil-P-400

Dimension: 3x 300mm x 8mm
Mobil Phase: NaNO_3 + 0.2% formic acid in H_2O
Flow: 1.0ml/min
Temperature: 20°C
Detection: RI
Injection: 100µl sample

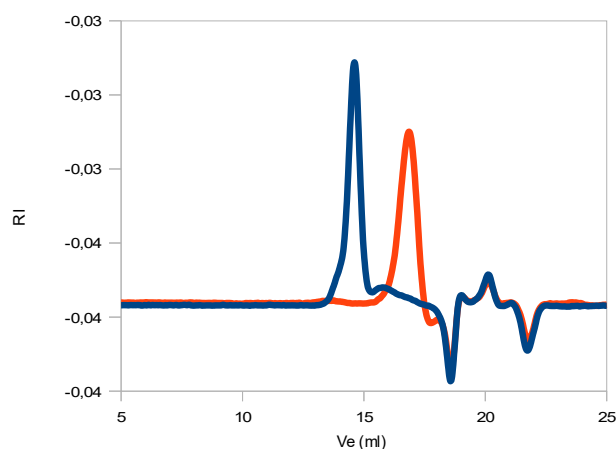


Analyte: Chitosan sulfate

Column: AppliChrom CatPhil-P-100
AppliChrom CatPhil-P-350

Dimension: e.a. 300mm x 8mm
Mobil Phase: 0.05M Na_2HPO_4 + 0.1M NaNO_3 in H_2O
Flow: 1.0ml/min
Temperature: 20°C
Detection: RI
Injection: 100µl sample

For aqueous polycations including



Analyte: PEI (polyethyleneimine)

linear, PEI 150, CAS [9002-98-6]

$M_n = 4 \times 10^4$, $M_w = 4.2 \times 10^4$,

$M_p = 3.9 \times 10^4 \text{ Da}$;

PEI (polyethyleneimine)

linear, PEI 25, CAS [9002-98-6]

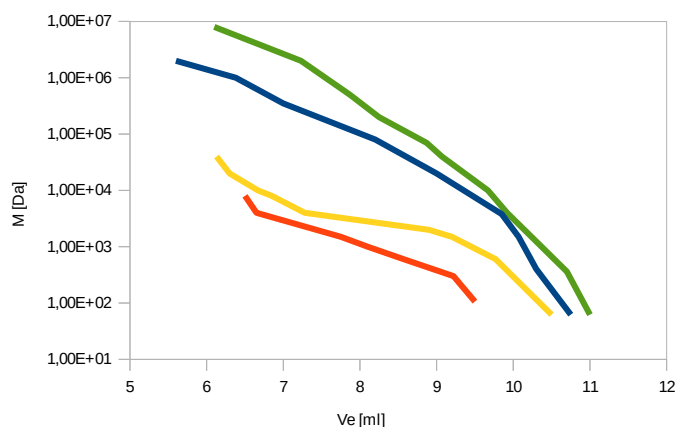
$$M_n = 2.1 \times 10^3, M_w = 2.9 \times 10^3,$$

$M_p = 2.15 \times 10^3 \text{ Da}$

Column: AppliChrom CatPhil-P-100
 AppliChrom CatPhil-P-350

Dimension: e.a. 300mm x 8mm
 Mobil Phase: 0.1M NaCl + 0.2% TFA in H₂O
 Flow: 1.0ml/min
 Temperature: 20°C
 Detection: RI
 Injection: 100µl sample

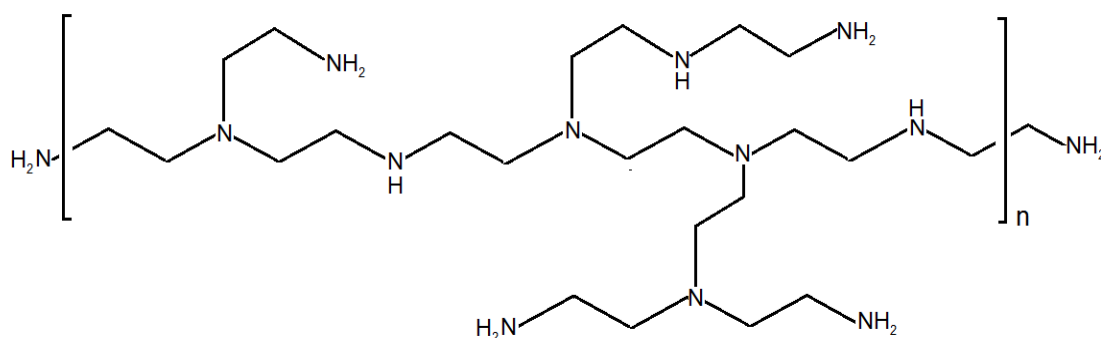
AppliChrom CatPhil-P Calibration curve
Porosity P-100, P-200, P-350 and P-400,
based on dextrans



Analyte: Dextrans

Column: AppliChrom CatPhil-P-**100**
 AppliChrom CatPhil-P-**200**
 AppliChrom CatPhil-P-**350**
 AppliChrom CatPhil-P-**400**

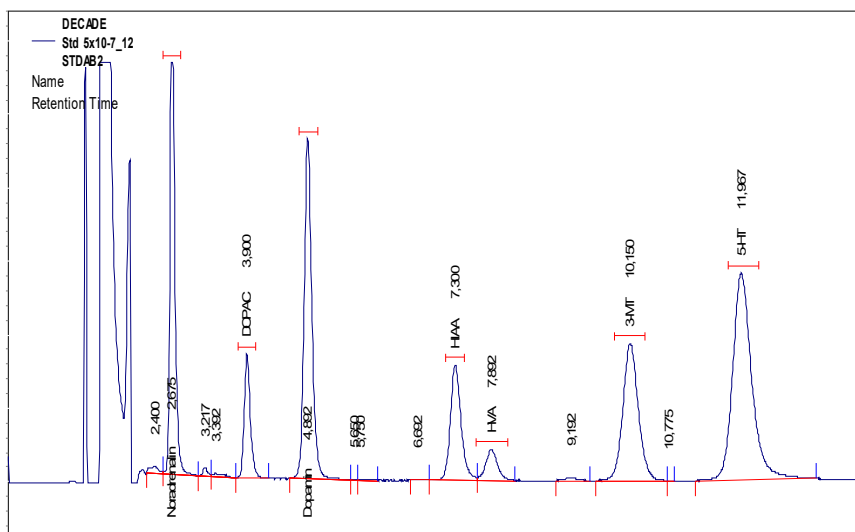
Dimension: e.a. 300mm x 8mm
Mobil Phase: H₂O,
Flow: 1.0ml/min
Temperature: 20°C
Detection: RI
Injection: 100µl sample



Polyethylenimine (PEI)

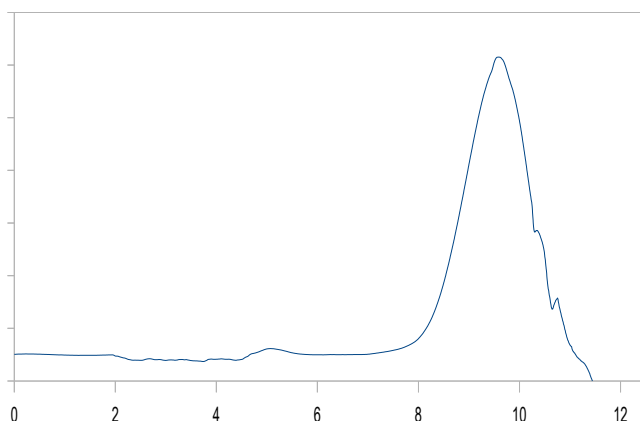
AppliChrom CatPhil-P

| Catalog # | Description | Dimension | Separation Range |
|--------------------------------------------------------|--------------------------|--------------------------------------------------------|----------------------|
| SACP1002508 SACP1003008 SACP100508 SACP100308 | AppliChrom CatPhil-P-100 | 250mm x 8mm 300mm x 8mm 50mm x 8mm 30mm x 8mm | 100Da-2 500Da |
| SACP2002508 SACP2003008 SACP200508 SACP200308 | AppliChrom CatPhil-P-200 | 250mm x 8mm 300mm x 8mm 50mm x 8mm 30mm x 8mm | 100Da-20 000Da |
| SACP3502508 SACP3503008 SACP350508 SACP350308 | AppliChrom CatPhil-P-350 | 250mm x 8mm 300mm x 8mm 50mm x 8mm 30mm x 8mm | 2 500Da-1 000 000Da |
| SACP4002508 SACP4003008 SACP400508 SACP400308 | AppliChrom CatPhil-P-400 | 250mm x 8mm 300mm x 8mm 50mm x 8mm 30mm x 8mm | 10 000Da-5 000 000Da |



AppliChrom® CatPhil-P-JLJ series - additionally enhanced hydrophilicity

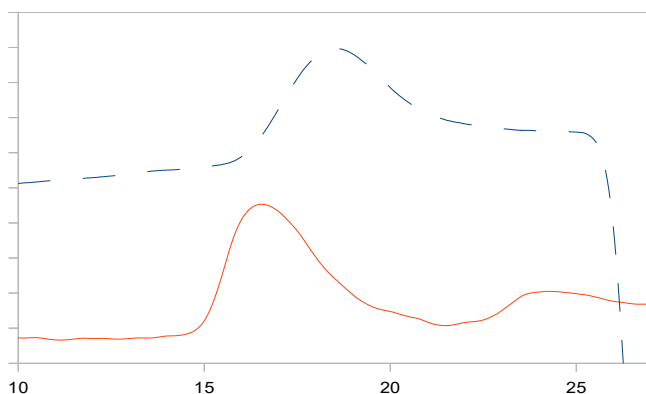
Special GPC / SEC columns for the aqueous analysis of neutral, anionic and additionally cationic polymers - JLJ series with further increased hydrophilicity for extended application range - also in pure aqueous eluents (calibration with dextran / pullulan and new: additionally with PEO / PEG or p-2-vinylpyridine possible).



Analyte: Poly(2-vinylpyridine)
CAS [25014-15-7], Mw = 40 000Da

Column: AppliChrom CatPhil-P-350-JLJ

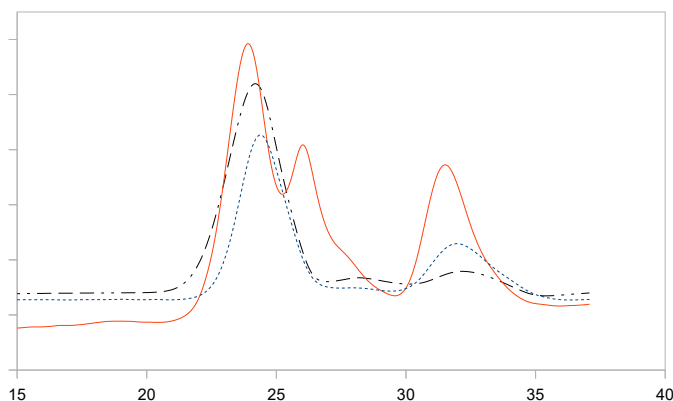
Dimension: 300mm x 8mm
Mobil Phase: 0.1M NaCl + 0.2% TFA in H₂O,
Flow: 1.0ml/min
Temperature: 20°C
Detection: RI
Injection: 20µl sample



Analyte: Polyquaternium-33
very high molecular weight, copolymer of trimethylaminoethyl acrylate salt and acrylamide, CAS [69418-26-4] (red) vs. high molecular weight polyacrylamide, CAS [9003-05-8] 15Mio Da (blue, dashed)

Column: AppliChrom CatPhil-P-100-JLJ
AppliChrom CatPhil-P-350-JLJ
AppliChrom CatPhil-P-500-JLJ

Dimension: e.a. 300mm x 8mm
Mobil Phase: 0.1M NaCl + 0.2% TFA in H₂O,
Flow: 1.0ml/min
Temperature: 40°C
Detection: RI
Injection: 100µl sample

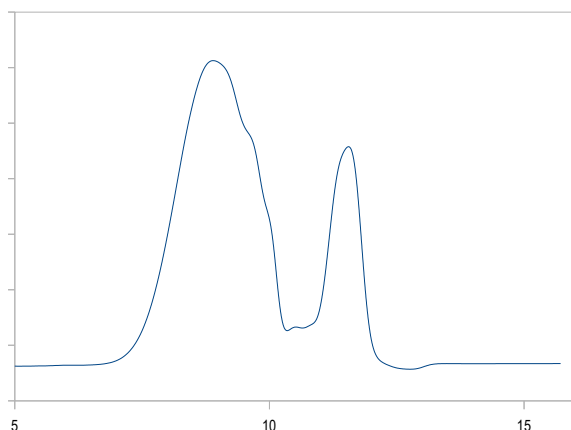


GPC comparison 3 samples

Analyte: Poly DADMAC
Polydiallyldimethylammonium chloride, polyquaternium-6
Mw = 100Da-200 000Da, CAS [26062-79-3]

Column: AppliChrom CatPhil-P-100-JLJ
AppliChrom CatPhil-P-350-JLJ
AppliChrom CatPhil-P-500-JLJ

Dimension: e.a. 300mm x 8mm
Mobil Phase: 0.1M NaCl + 0.2% TFA in H₂O,
Flow: 1.0ml/min
Temperature: 40°C
Detection: RI
Injection: 100µl sample

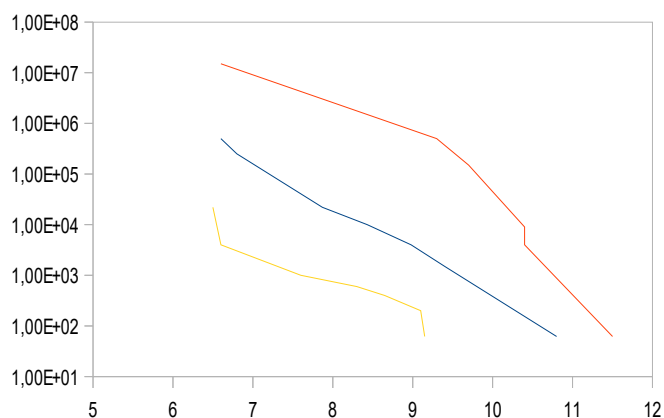


Analyte: Poly(vinylimidazole),
CAS [25232-42-2]

Column: AppliChrom CatPhil-P-350-JLJ

Dimension: 300mm x 8mm
Mobil Phase: 0.1M NaCl + 0.2% TFA in H₂O,
Flow: 1.0ml/min
Temperature: 20°C
Detection: RI
Injection: 20µl sample

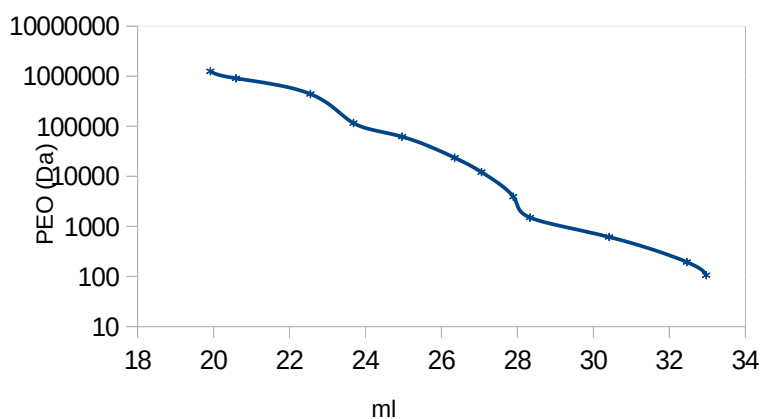
AppliChrom CatPhil-P-JLJ Calibration curve
Porosity P-100-JLJ, P-350-JLJ and P-500-JLJ,
based on dextrans



Analyte: PEO
Dextran
Polyacrylamide

Column: AppliChrom CatPhil-P-100-JLJ
AppliChrom CatPhil-P-350-JLJ
AppliChrom CatPhil-P-500-JLJ

Dimension: e.a. 300mm x 8mm
Mobil Phase: H₂O,
Flow: 1.0ml/min
Temperature: 20°C
Detection: RI
Injection: 100µl sample



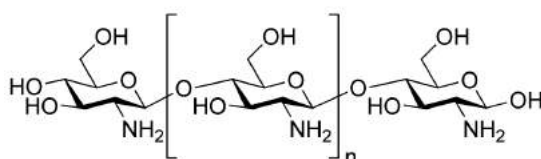
PEO/PEG Calibration

Column: AppliChrom CatPhil-P-100-JLJ
AppliChrom CatPhil-P-100-JLJ
AppliChrom CatPhil-P-350-JLJ
AppliChrom CatPhil-P-450-JLJ

Dimension: 1x 50mm x 8mm
3x 300mm x 8mm
Mobil Phase: H₂O
Flow: 1.0ml/min
Temperature: 20°C
Detection: RI

AppliChrom CatPhil-P-JLJ

| Catalog # | Description | Dimension | Separation Range |
|--------------------------------------------------------------------|------------------------------|--------------------------------------------------------|-------------------------|
| SACP100JLJ2508 SACP100JLJ3008 SACP100JLJ508 SACP100JLJ308 | AppliChrom CatPhil-P-100-JLJ | 250mm x 8mm 300mm x 8mm 50mm x 8mm 30mm x 8mm | 100Da-2 500Da |
| SACP150JLJ2508 SACP150JLJ3008 SACP150JLJ508 SACP150JLJ308 | AppliChrom CatPhil-P-150-JLJ | 250mm x 8mm 300mm x 8mm 50mm x 8mm 30mm x 8mm | 100Da-5 000Da |
| SACP350JLJ2508 SACP350JLJ3008 SACP350JLJ508 SACP350JLJ308 | AppliChrom CatPhil-P-350-JLJ | 250mm x 8mm 300mm x 8mm 50mm x 8mm 30mm x 8mm | 2 500Da-1 000 000Da |
| SACP450JLJ2508 SACP450JLJ3008 SACP450JLJ508 SACP450JLJ308 | AppliChrom CatPhil-P-450-JLJ | 250mm x 8mm 300mm x 8mm 50mm x 8mm 30mm x 8mm | 300 000Da-50 000 000Da |
| SACP500JLJ2508 SACP500JLJ3008 SACP500JLJ508 SACP500JLJ308 | AppliChrom CatPhil-P-500-JLJ | 250mm x 8mm 300mm x 8mm 50mm x 8mm 30mm x 8mm | 10 000Da- ~50 000 000Da |



AppliChrom® HFIP-Phil-P

Special GPC / SEC columns for the GPC analysis of HFIP-soluble polymers.

For GPC / SEC analyzes from *)

Polyesters (polybutylene terephthalate / PBT / CAS 24968-12-5,
polyethylene terephthalate / PET / CAS 25038-59-9, polylactide
PLA / CAS 26100-51-6)

Polyamide 6 / PA6 / polycaprolactam / CAS 25038-54-4, polyamide 6-6 /
PA6-6 / polyhexamethylene adipamide / CAS131-17-2, polyamide 6-10 /
PA6-10 / poly(hexamethylene sebacamide) / PA 6-10, CAS 9011-52-3

Other (paraformaldehyde / polyoxymethylene / POM / polyacetal / CAS
30525-89-4 polyethylenimine / PEI / poly (iminoethylene / polyaziridine /
CAS 9002-98-6)

HFIP GPC / SEC calibration versus

- PMMA / polymethylmethacrylate / CAS 901-14-7

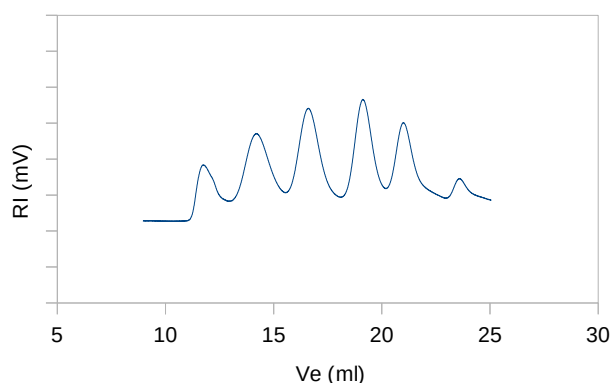
HFIP Accessories:

5mM CF₃COOK or 0.075M CF₃COONa are added to the eluent HFIP
for the suppression of electrostatic interactions and for artefact-free GPC.

Benefits AppliChrom HFIP-Phil-P GPC columns series over standard columns

- very large pore volume for high GPC resolution
- high GPC resolution for oligomers / condensates of 100Da 70 000Da
- high resolution GPC separation for the range 100Da-800 000Da
- large areas with high linearity calibratable areas without porosity artifacts
- low bleed
- standard columns also used for GPC-LS and GPC viscosity

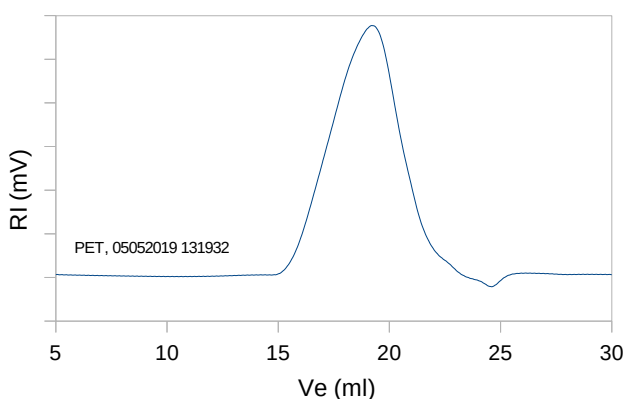
*) GPC / SEC of polylactide (PLA) - see also AppliChrom StyDiViBe in CHCl₃, for polyethylenimine (PEI)
- see also: AppliChrom CatPhil-P in H₂O



Analyte: **Polymethylmethacrylat**
(PMMA), CAS 9011-14-7, CAS131-17-2
M = 901.000, 96.760, 32.500, 3196, 540Da

Column: AppliChrom HFIP-Phil-P-350

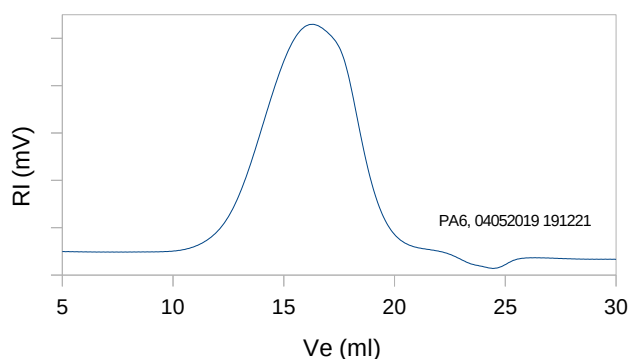
Dimension: 2x 300mm x 8mm
Mobil Phase: HFIP, 5mM CF₃COONa
Flow: 0.5ml/min
Temperature: 40°C
Detection: RI
Injection: 100µl sample



Analyte: **Polyethylenterephthalat**
(PET), CAS 25038-59-9

Column: AppliChrom HFIP-Phil-P-350

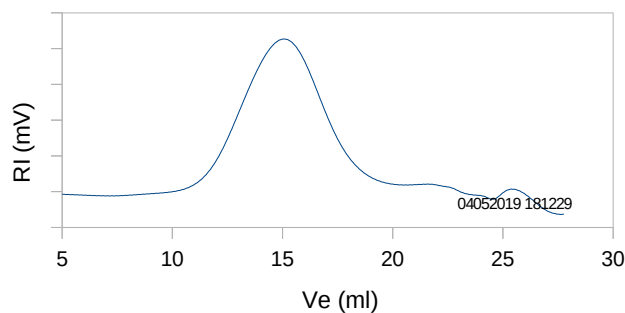
Dimension: 2x 300mm x 8mm
Mobil Phase: HFIP, 5mM CF₃COONa
Flow: 0.5ml/min
Temperature: 40°C
Detection: RI
Injection: 100µl sample



Analyte: **Polyethylenterephthalat**
(PET), CAS 25038-59-9

Column: AppliChrom HFIP-Phil-P-350

Dimension: 2x 300mm x 8mm
Mobil Phase: HFIP, 5mM CF₃COONa
Flow: 0.5ml/min
Temperature: 40°C
Detection: RI
Injection: 100µl sample



Analyte: **Polyamide 6,6 (PA6-6),**
CAS131-17-2

Column: AppliChrom HFIP-Phil-P-350

Dimension: 2x 300mm x 8mm
Mobil Phase: HFIP, 5mM CF₃COOK
Flow: 0.5ml/min
Temperature: 40°C
Detection: RI
Injection: 100µl sample; 1g/l

Good for many HFIP soluble polymers

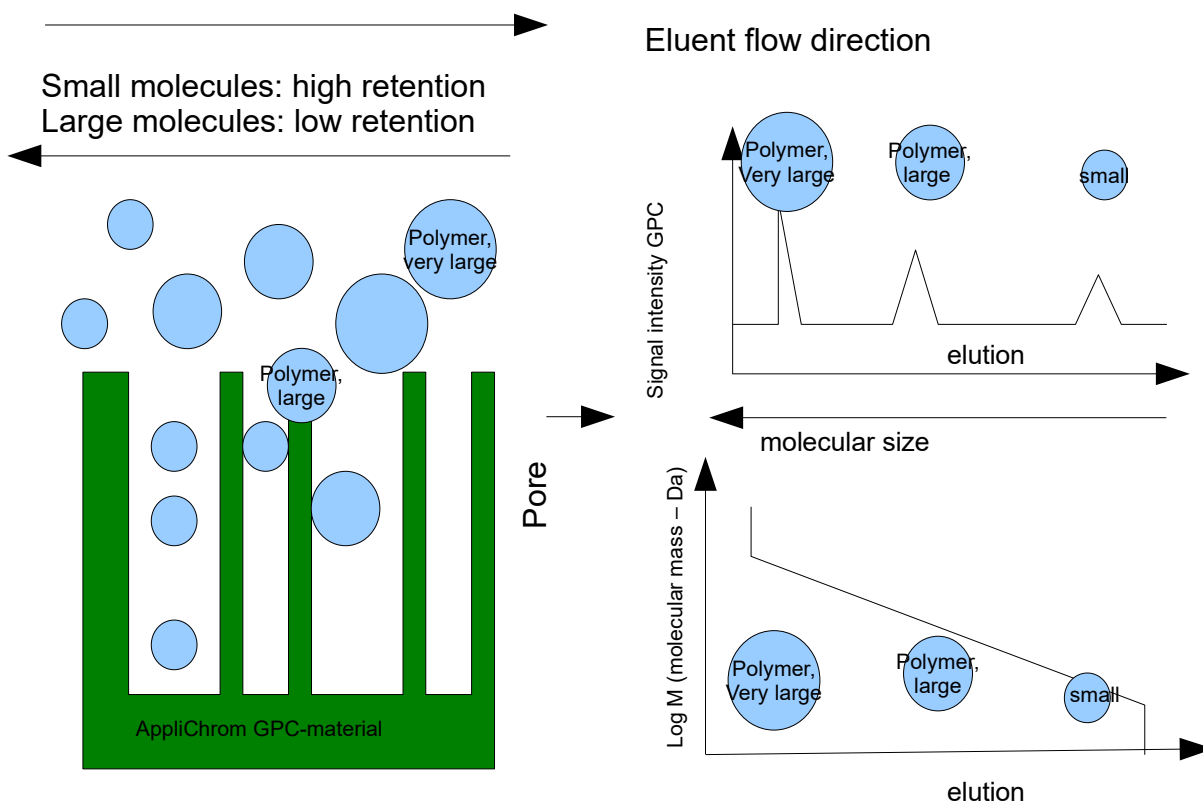
AppliChrom HFIP-Phil-P

| Catalog # | Description | Dimension | Separation Range |
|----------------------------------------------------------------|----------------------------|--------------------------------------------------------|-------------------------|
| SAHFIP1002508 SAHFIP1003008 SAHFIP100508 SAHFIP100308 | AppliChrom HFIP-Phil-P-100 | 250mm x 8mm 300mm x 8mm 50mm x 8mm 30mm x 8mm | 100Da-2 500Da |
| SAHFIP3502508 SAHFIP3503008 SAHFIP350508 SAHFIP350308 | AppliChrom HFIP-Phil-P-350 | 250mm x 8mm 300mm x 8mm 50mm x 8mm 30mm x 8mm | up to 1 000 000 Da |
| SAHFIP5002508 SAHFIP5003008 SAHFIP500508 SAHFIP00308 | AppliChrom HFIP-Phil-P-500 | 250mm x 8mm 300mm x 8mm 50mm x 8mm 30mm x 8mm | 10 000Da- ~50 000 000Da |

Principle of GPC/SEC

In detail:

Small polymers intrude to nearly all pores
Medium sized polymers intrude only to some pores
Very large polymers are totally excluded from the pores
=> separation of polymers according to molecular size



AppliChrom Aceton-AQ-Phil-P GPC-columns for GPC analysis of organic molecules using (80%acetone, 20%water)*.

Organosolv Lignin GPC analysis are now very easy and reliable to perform (Patent pending).

- optimized for GPC analysis of organosolv lignins
- easy and reliable to handle in acetone/water/traces formic acid // 80/20/1 // v/v/v
- compatible with evaporative detection (ELSD, MS)*
- preparative GPC fractionation of organosolv lignin without salt possible
- recycling GPC respective peak recycling GPC with enormous separation efficiency possible for isolation of individual organosolv lignin substances in semipreparative scale
- molecular weight calibration vs. PEO/PEG
- spherical high porous polymeric GPC-media with no silanol activity for pure GPC
- large molecular weight range: 100 – 1 000 000Da
- high pressure stability of 100bar
- high peak and separation capacity
- AppliChrom GPC columns – innovations and quality Made in Germany.

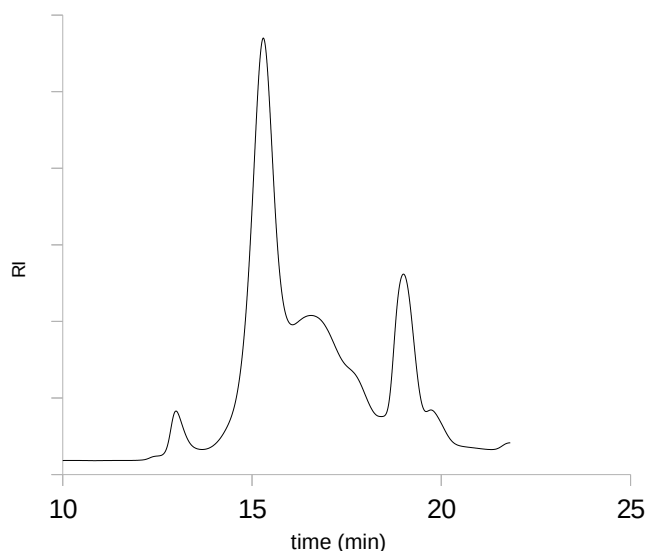
*) ask your ELSD respective your MS-detector supplier for compatibility or your individual detector resistance versus acetone!

AppliChrom Aceton-AQ-Phil GPC Series:

molecular weight range and optimum range of molecular weights

| Poresize | Separation range | Optimum resolution range |
|----------|-------------------|--------------------------|
| 250 | 100Da-70 000Da | 100Da-10 000Da |
| 350 | 100Da-1 000 000Da | 1 000Da-400 000Da |

* Eluent 80/20 Aceton/waterv/v, molecular weight calibration vs. PEO/PEG

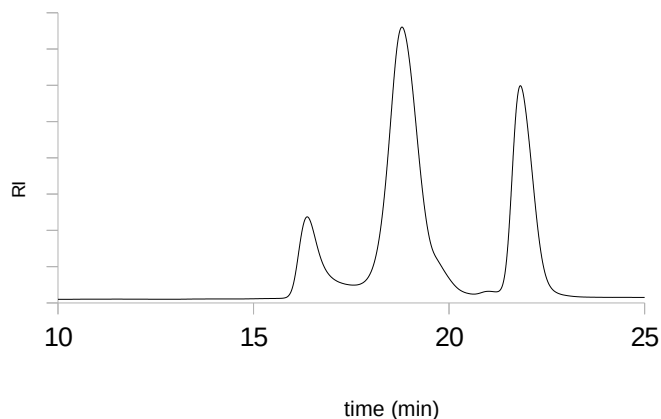


Analyte: Organosolv Lignin GPC

(range: 100Da-1 500 000Da)

Column: 2x AppliChrom Aceton-AQ-Phil-P-250

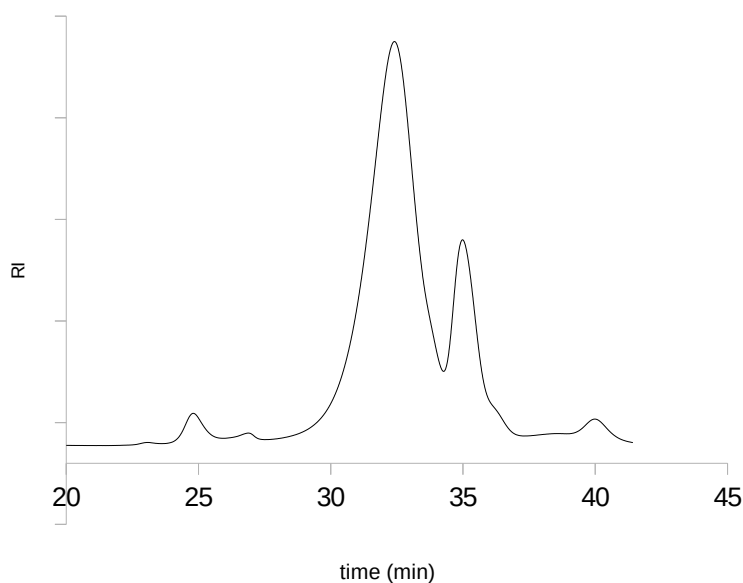
Dimension: ea. 300mm x 8mm
Mobil Phase: acetone/H₂O/formic acid
80/20/1 v/v/v
Flow: 1.0ml/min
Temperature: 25°C
Detection: RI



Analyte: **PEO/PEG GPC**
(8 000Da, 1 000Da, 106Da)

Column: 2x AppliChrom Aceton-AQ-Phil-P-250

Dimension: ea. 300mm x 8mm
Mobil Phase: acetone/H₂O 80/20 v/v
Flow: 1.0ml/min
Temperature: 25°C
Detection: RI

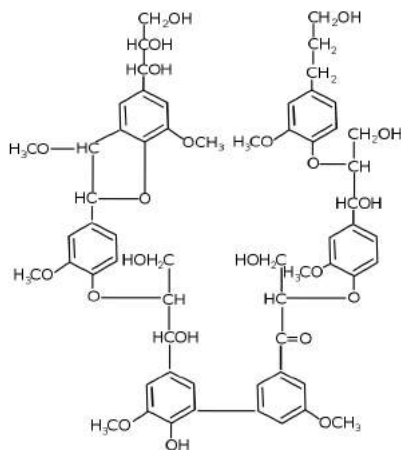


Analyte: **Organosolv Lignin GPC**

Column: 3x AppliChrom Aceton-AQ-Phil-P-350

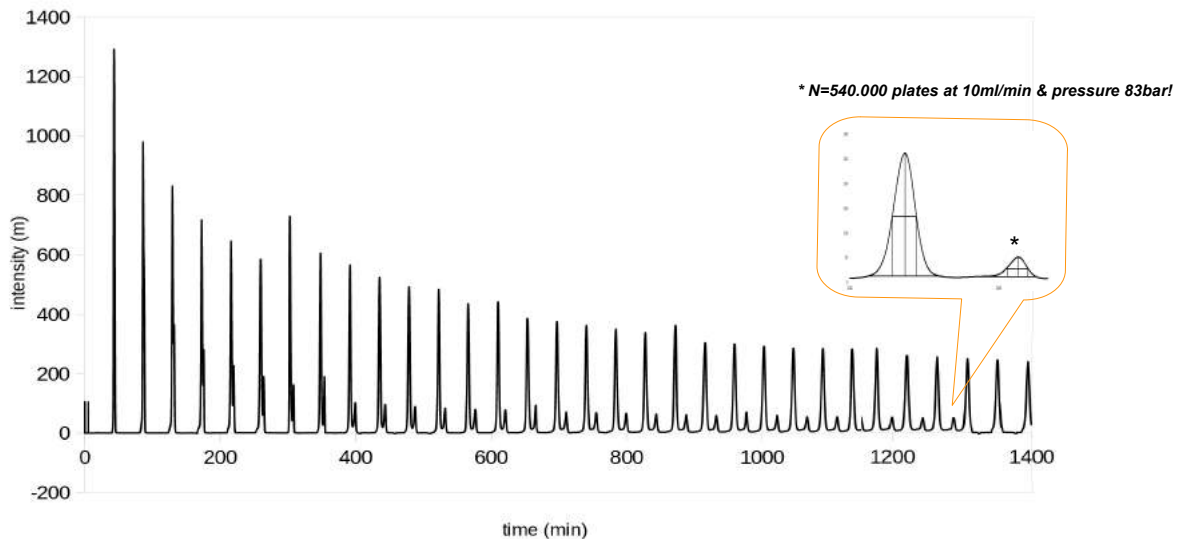
Dimension: ea. 300mm x 8mm
Mobil Phase: acetone/H₂O/formic acid 80/20 /1 v/v/v
Flow: 1.0ml/min
Temperature: 25°C
Detection: RI

| Catalog # | Description | Dimension | Separation Range |
|--------------------------------------------|--------------------------------------------|-----------------------------------------|-------------------|
| SAAPP2503008 SAAPP250508 SAAPP250308 | GPC-Column AppliChrom Aceton-Aq-Phil-P-250 | 300mm x 8mm 50mm x 8mm 30Mm x 8mm | 100Da–70 000Da |
| SAAPP3503008 SAAPP350508 SAAPP350308 | GPC-Column AppliChrom Aceton-Aq-Phil-P-350 | 300mm x 8mm 50mm x 8mm 30Mm x 8mm | 100Da–1 000 000Da |



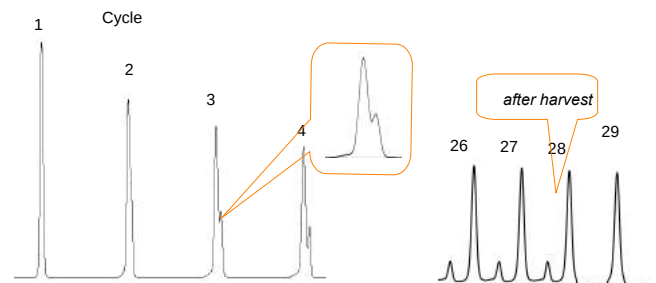
Organosolv Lignin

- Up to 540 000 plates/separation in liquid chromatography for highest level purity products.
- Semipreparative and preparative scale
- Low solvent consumption and savings in workforce time
- Easy and efficient to handle including service hotline and suited Peak-Recycling-GPC system
- Large range of solvent polarity



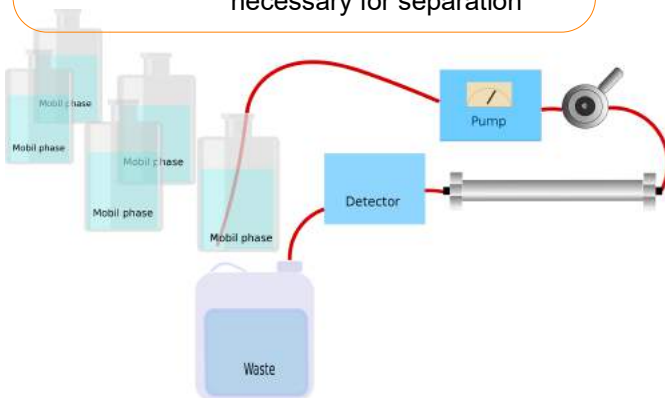
**AppliChrom
Peak-Recycling-GPC Series**

- efficiency
- effectiveness
- maximum purity
- time savings
- low solvent consumption



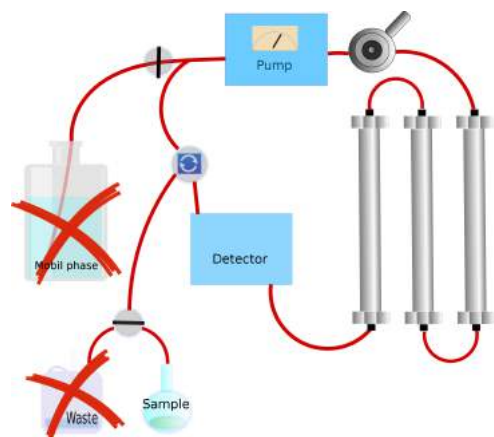
Classical manual reinjected semiprep GPC

Column lenght: 1x 600mm x 20mm
Separation: ~ 30 000plates / separation
Mobile phase: 1 310min x 10ml/min
=> 13 100ml = 13.1l
necessary for separation



AppliChrom Peak-Recycling-GPC

Column lenght: 3x 600mm x 20mm
Separation: ~ 540 000plates / separation
Mobile phase: approx 50min x 10ml =
approx 500ml
necessary for separation



AppliChrom-Columns are easy to handle

You connect the columns with the suited Peak-Recycling-GPC system and laboratory operator let system work until needed purification result is monitored to be sufficient. In case of questions Applichrom customers are assisted by the AppliChrom team members with more than 20 years hands on experience in liquid chromatography and GPC techniques (ask info@applichrom.de for assistance).

Solvent polarity

Polar

Non-polar

DMF/DMAc/NMP > 90/10 CHCl₃/MeOH > THF > Acetic acid ethylester > CHCl₃ > CH₂Cl₂ > Toluene^{*)}

^{*)} In case of using polar and viscous DMF/NMP/DMAc – reduction of flowrate, heating of column and in many cases some salt in solvent is necessary got get separation. Please ask for columns prepacked with final solvent that should be used.

Solvent polarity:

A big variation of solvent polarities can be used for AppliChrom Peak-Recycling-GPC columns (polystyrene based series)



Column Dimension here: 600mm x 20mm and 50mm x 20mm

| Product | Exclusion Limit [Da] | Preparative Column performance ^{*)} | | | Precolumns ^{*)} For 20, 32 and 40mm ID columns: 50mm x 20mm |
|---------------------------------------------|-------------------------|----------------------------------------------|-----------|-----------|-----------------------------------------------------------------------------------|
| | | 20mm ID x | 32mm ID x | 40mm ID x | |
| AppliChrom Peak-Recycling- GPC Column | | | | | |
| 35A | 2 500 | > 42 000 | > 42 000 | > 42 000 | > 35 000 |
| 100A | 5 000 | > 42 000 | > 42 000 | > 42 000 | > 35 000 |
| 500A | 20 000 | > 42 000 | > 42 000 | > 42 000 | > 35 000 |
| 1 000A | 70 000 | > 42 000 | > 42 000 | > 42 000 | > 35 000 |

^{*)} Guaranteed performance in plates/meter, typical performance > 50 000/m. In recycling. More than 1 000 000 plates /separation possible!

| Column ID | Regular Flow rate [ml/min] ^{*)} | Max. Flow rate [ml/min] ^{*)} |
|-----------|------------------------------------------|---------------------------------------|
| 20mm | 10 | 15 |
| 32mm | 20 | 30 |
| 40mm | 30-40 | 40 |

^{*)} In case of using polar and viscous solvents like DMF/NMP/DMAc – reduction of flowrate, heating of column and in many cases some salt in solvent is necessary for a good separation. Please ask for columns prepacked with final solvent that should be used.

AppliChrom Peak-Recycling-GPC Columns

| Catalog # | Description | Dimension | |
|------------------------------|---------------------------------------------------------------------------------------------|---------------------------|-----------------------------|
| CRC3560020 PCRC355020 | Column AppliChrom Peak-Recycling-GPC, 35A Precolumn AppliChrom Peak-Recycling-GPC, 35A | 600mmx20mm 50mm x 20mm | Other dimensions available. |
| CRC10060020 PCRC1005020 | Column AppliChrom Peak-Recycling-GPC, 100A Precolumn AppliChrom Peak-Recycling-GPC, 100A | 600mmx20mm 50mm x 20mm | Other dimensions available. |
| CRC50060020 PCRC5005020 | Column AppliChrom Peak-Recycling-GPC, 500A Precolumn AppliChrom Peak-Recycling-GPC, 500A | 600mmx20mm 50mm x 20mm | Other dimensions available. |
| CRC100060020 PCRC10005020 | Column AppliChrom Peak-Recycling-GPC, 35A Precolumn AppliChrom Peak-Recycling-GPC, 35A | 600mmx20mm 50mm x 20mm | Other dimensions available. |

AppliChrom GPC/SEC Series:

AppliChrom GPC columns are designed for high performance GPC separations. These columns contain high crosslinked polymeric particles of high reproducibility, good selectivity and high stability. Before shipment, each AppliChrom GPC column is tested and supplied with its individual test chromatogram and specifications. For long live time of AppliChrom GPC columns and for long term satisfaction it is important for customers to take care about some points that will be given in the following text. Due to several different specific applications of customers, the text can not be absolute – therefore, if you have any question, please do not hesitate asking the AppliChrom service at sales@applichrom.de and inform your local distributor.

After receiving of column:

- Control if there is any obvious physical damage from shipping
- Check if the column you got is the column you ordered
- All columns are shipped in the solvent that is documented in the column test certificate
- Verify the column quality

Please take into account that performance of column also depends on the chromatographic system at customers site.

Following parameters can have an influence the verification of column performance:

- Loop size, degree of loop filling, concentration of sample
- Capillary diameters and length in chromatographic system
- Temperature of column
- Effective detector cell volume
- Data acquisition rate
- Fitting connections

AppliChrom GPC column series connectors:

- In case a set of columns of different porosities plus eventual precolumn is ordered, customer will be also supplied with the suited column connectors, of 1/16" OD. The fittings have the 10-32 type thread and ferrules that are pre-fixed to ensure tightening without voidvolume

Tubing and fittings:

- 8mm ID AppliChrom GPC column series are designed to be connected with 1/16" OD capillary via 10-32er threading with HPLC-System
- If connecting chromatographic system with columns, please take care about the depth of capillary coming from system - connected by ferrule and fitting to columns. If distance between capillary end and ferrule is too low you get extra void volumes and loss of peak performance, if distance between capillary and ferrule is too long, system can leak or column inlet can be destroyed
- **See also: AppliChrom HPLC / GPC column user guide**

Installation of column

- Rinse chromatographic system (without column) with degassed and filtered eluent (here: DMSO eluent) with a moderate flowrate, check if there is no leak in the system, there is no blockade in the system and please make sure that detector will not be blocked or getting a too high pressure! Maybe laboratory must be continuous good temperatured (warm enough) to be sure DMSO is still fluid and viscosity is low enough! Please ensure this temperature also at weekends and/or holidays. Please document system pressure for the later used flowrate, at e.g. 0.4ml/min. If salts are added to the eluent, please take care to avoid precipitation of salt in system – as a result of this irreversible damages can occur
- Connect column respective columns with capillary from injector. Take care columns are connected in flow direction. The outlet of column (of the final column if there is a set of column) should be connected direct with waste, bypassing the detector system
- If using more than 1 column (series of columns); take the columns in the following order:
inlet => precolumn, maincolumn of smallest porosity, maincolumn of medium porosity, maincolumn of largest porosity => outlet
- Heat the columns at least to 50-60°C or to about 80°C for at least 1h
- Start pumping with 0.1ml/min, check if connections are tight, observe the outlet of columns to make sure a clear eluent flows out. Pump at least 5min / column at this flowrate, document the observed pressure.
- Increase stepwise to the final flowrate, e.g. 0.4ml/min, document the backpressure
- If backpressure is constant and eluent leaving the outlet pipe is clear, connect with detector (please make sure that connector is warm enough for ensuring fluidity of DMSO)
- After a total approx 5-10 column volumes baseline should be stable and measurements can start.
- If system is not needed for some time (over night, weekends,...), please lower flowrate e.g. to 0.05 or 0.1ml min, but do not change the column temperature. Every cooling and heating process of column means stress for column
- Please make sure that there is not a column pressure drop of more than 80bar per column or 30bar per Precolumn
- Avoid fast pressure increase or fast pressure lowering of columns
- If you inject sample, please take care sample is clear and free of particles (e.g. by filtration) and please take the lowest concentration that is necessary to get the results you need. Especially if using / analysing reactive samples, column lifetime can be increased significantly by using low concentrations of sample. Samples should be diluted with eluent to avoid eventual extra-peaks

Important:

If you have any question, please do not hesitate contacting the AppliChrom service, e.g. at sales@applichrom.de

We want to get you as satisfied customer with good products plus good service.

Guarantee:

AppliChrom guarantees the quality according to its test certificate at the date of shipment. Column warranty is voided if end-fittings are removed. Applications at customer's site are not in the responsibility of supplier.

All information on these sides are put together with the biggest care, has been worked on and been checked. No liability or guarantee can be still assumed for content and objective correctness as well as actuality and completeness. All information without guarantee.

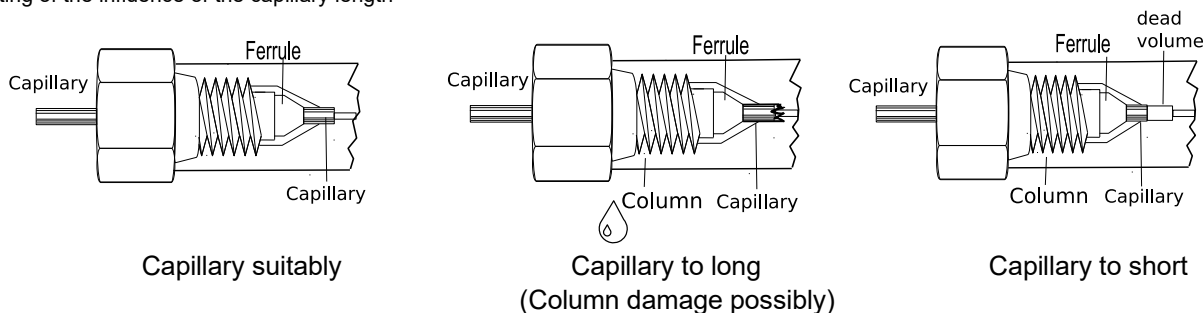
Installation:

- Rinse first your HPLC / GPC system (suction tube, pump, injector incl. injection loop as well as capillary connections up to the column entrance) with the mobile phase, e.g., with 1 ml / min, note the originating counterpressure.
- Connect the capillary to the column entrance with the HPLC / GPC column. Provide for the fact that the capillary is optimally connected with the column entrance. Between the capillary end and the column should be
 - no dead volume originate (by too short capillary piece) – leads to line widening
 - the capillary end also not longer as the admission within the HPLC / GPC-Column – can lead to leakage in the column head.

Please follow,

the space of the capillary ends can vary between different HPLC / GPC suppliers. To make sure that the correct space of the capillary end are reached, the adaptation of the ferrule is recommended in respective HPLC / GPC hardware.

Charting of the influence of the capillary length



- Pump** the eluent by the HPLC / GPC system consisting of pump, injector, capillary between column and injector, column, e.g., with 1 ml / min with 4.6 mm of columns ID. Let go the first eluent 2-4 ml then the column leave directly in the waste - under avoidance of the detectors (is valid for columns to max. 4.6 mm ID and you let go lengths from 50-250 mm), with 8 mm of columns ID and lengths from 250-300 mm please 15-20 ml eluent directly in the waste – under avoidance of the detectors. If you control and document, besides, please pressure, rinse the column in this manner so long to the measured pressure is steady and the eluent clearly of the column flows out.
- Connect** the column end from that of the eluent resigned with the detector system. Guarantee that yourselves, besides, no significantly raised system counterpressure compared with the before measured value from c) puts (tip to blockage of the detector system, e.g., from dried up eluent, tough or crystallised solvents, mature test, blocked, narrowed or broken off capillaries...) - blockage of the detector system can lead to the destruction with pressure excess – use please only accordingly trained, attentive staff!
- Use** the fitting and ferrule connection between column and detector system in the manner that a) **no dead volume** (line widening) and b) no excess end of the inside-recumbent capillary originates (can lead to the destruction of the column exit). Ideally is the new touch-down of a connection from ferrule and fitting or, e.g., the use of PEEK-screw connections at the column exit.
- Document** at regular intervals the system pressure.

Please, use for AppliChrom-precolumen cartridges only the AppliChrom-precolumen cartridge holder fitting for it!

All information on these sides are put together with the biggest care, has been worked on and been checked. No liability or guarantee can be still assumed for content and objective correctness as well as actuality and completeness. All information without guarantee.

USP L## Column Listing

| | |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----|
| A rigid, spherical styrenedivinylbenzene copolymer, 3 to 30 µm in diameter. | L21 |
| Packing having the capacity to separate compounds with a molecular weight range from 100-5000 (as determined by polyethylene oxide), applied to neutral, anionic, and cationic water-soluble polymers. A polymethacrylate resin base, cross-linked with polyhydroxylated ether (surface contained some residual carboxyl functional groups) was found suitable. | L25 |
| Packing having the capacity to separate proteins by molecular size over a range of 2,000 to 40,000 Da. It is a polymethacrylate gel. | L37 |
| A methacrylate-base size-exclusion packing for water-soluble samples. | L38 |
| A hydrophilic-polyhydroxymethacrylate gel of totally porous spherical resin. | L39 |

AppliChrom SuperOH-P

| | Particle size (µm) | Type | USP |
|----------------------------------------------------------------------|--------------------|---------|---------------|
| AppliChrom SuperOH-P-200 Separation Range 100Da-20 000 Da | 10 | spheric | L25, L38, L39 |
| AppliChrom SuperOH-P-250 Separation Range 100Da-70 000 Da | 10 | spheric | L37, L38, L39 |
| AppliChrom SuperOH-P-300 Separation Range 1 000Da-300 000Da | 10 | spheric | L37, L38, L39 |
| AppliChrom SuperOH-P-350 Separation Range 2 500Da-1 000 000Da | 10 | spheric | L38, L39 |
| AppliChrom SuperOH-P-400 Separation Range 10 000Da -5 000 000Da | 10 | spheric | L38, L39 |
| AppliChrom SuperOH-P-450 Separation Range 50 000Da → 10 000 000Da | 10 | spheric | L38, L39 |

AppliChrom StyDiViBe-P

| | Particle size (µm) | Type | USP |
|-----------------------------------------------------------------------------|--------------------|---------|-----|
| AppliChrom StyDiViBe-P-35A Separation Range 100Da-2 500Da | 5, (10) | spheric | L21 |
| AppliChrom StyDiViBe-P-100A Separation Range 100Da-10 000Da | 5, (10) | spheric | L21 |
| AppliChrom StyDiViBe-P-500A Separation Range 100Da-30 000Da | 5, (10) | spheric | L21 |
| AppliChrom StyDiViBe-P-1.000A Separation Range 100Da-70 000Da | 5, (10) | spheric | L21 |
| AppliChrom StyDiViBe-P-1.500A Separation Range 100Da-120 000Da | 5, (10) | spheric | L21 |
| AppliChrom StyDiViBe-P-10E4A-BPT Separation Range 100Da-400 000Da | 5, (10) | spheric | L21 |
| AppliChrom StyDiViBe-P-10E5A-BPT Separation Range 500Da-1 500 000Da | 5, (10) | spheric | L21 |
| AppliChrom StyDiViBe-P-10E6A-BPT Separation Range 10 000Da-4 000 000Da | 5, (10) | spheric | L21 |
| AppliChrom StyDiViBe-P-10E7A-BPT Separation Range 100 000Da-10 000 000Da | 5, (10) | spheric | L21 |

Further AppliChrom columns without USP L## Number

| AppliChrom SugarSep | | | |
|------------------------------------------------|---------------------------|-------------|----------------------------------------------------------|
| | Particle size (µm) | Type | For analysis of |
| AppliChrom SugarSep-Ca I | 10 | spheric | sugars sugar alcohols alcohols |
| AppliChrom SugarSep-Ca II | | | |
| AppliChrom SugarSep-Ca III | | | |
| AppliChrom SugarSep-H I, (SO ₃ H) | 10 | spheric | sugars sugar alcohols alcohols carboxylic acids |
| AppliChrom SugarSep-H II, (SO ₃ H) | | | |
| AppliChrom SugarSep-H III, (SO ₃ H) | | | |
| AppliChrom SugarSep-Pb-Wood | 10 | spheric | sugars especially wood hydrolysates |

| AppliChrom SugarSep-Oligo | | | |
|----------------------------------|---------------------------|-------------|----------------------------------------------------------|
| | Particle size (µm) | Type | For analysis of |
| AppliChrom SugarSep-Na | 10 | spheric | sugars sugar alcohols alcohols |
| AppliChrom SugarSep-Ag | 10 | spheric | sugars sugar alcohols alcohols carboxylic acids |

| AppliChrom ABOA DMAC-Phil-P | | | |
|------------------------------------------------------------------------------|---------------------------|-------------|------------------------------------------------------------------------------|
| | Particle size (µm) | Type | For GPC/SEC analysis of |
| AppliChrom ABOA DMAC-Phil-P-100 Separation Range 100Da-2 500Da | 10 | spheric | PMMA PAN cellulose soluble polymers for use in DMF, DMAc and NMP |
| AppliChrom ABOA DMAC-Phil-P-200 Separation Range 100Da-20 000Da | 10 | spheric | |
| AppliChrom ABOA DMAC-Phil-P-250 Separation Range 100Da-70 000Da | 10 | spheric | |
| AppliChrom ABOA DMAC-Phil-P-300 Separation Range 1 000Da-300 000Da | 10 | spheric | |
| AppliChrom ABOA DMAC-Phil-P-350 Separation Range 1 000Da-1 000 000Da | 10 | spheric | |
| AppliChrom ABOA DMAC-Phil-P-400 Separation range 10 000Da-5 000 000Da | 10 | spheric | |
| AppliChrom ABOA DMAC-Phil-P-450 Separation range 100 000Da → 10 000 000Da | 10 | spheric | |

Further AppliChrom columns without USP L## Number

| AppliChrom ABOA DMAC-Phil-P | | | |
|------------------------------------------------------------------------|---------------------------|-------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------|
| | Particle size (µm) | Type | For GPC/SEC analysis of |
| AppliChrom ABOA CatPhil-P-100 Separation Range 100Da-2 500Da | 10 | spheric | Special designed for aqueous GPC/SEC: polycations polyamines (chitosanes) polyethylenoxides Polysaccharides polyanions (heparins, pectins) |
| AppliChrom ABOA CatPhil-P-100 Separation Range 100Da-2 500Da | 10 | spheric | |
| AppliChrom ABOA CatPhil-P-200 Separation Range 100Da-20 000Da | 10 | spheric | |
| AppliChrom ABOA CatPhil-P-350 Separation Range 2 500Da-1 000 000Da | 10 | spheric | |
| AppliChrom ABOA CatPhil-P-400 Separation Range 10 000Da-5 000 000Da | 10 | spheric | |

| AppliChrom ABOA DMSO-Phil-P | | | |
|---------------------------------------------------------------------------|---------------------------|-------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| | Particle size (µm) | Type | For GPC/SEC analysis of |
| AppliChrom ABOA DMSO-PHIL-P-100 Separation Range 100Da-2 500Da | 10 | spheric | For analysis in DMSO amylose, amylopectin, starch urea-formaldehyd resins (UF-resins) melamin-urea-formaldehyd resins (MUF-resins) lignins, humic substances, humic acids, coniferous wood bark essences polysaccharide, polysaccharid Derivatives poly(N-isopropylacrylamid) PNIPA Poly-vinylpyridin calibration: pullulan, dextran, polyvinylpyridin et al. |
| AppliChrom ABOA DMSO-PHIL-P-200 Separation Range 100Da-20 000Da | 10 | spheric | |
| AppliChrom ABOA DMSO-PHIL-P-250 Separation Range 100Da-70 000Da | 10 | spheric | |
| AppliChrom ABOA DMSO-PHIL-P-300 Separation Range 1 000Da-500 000Da | 10 | spheric | |
| AppliChrom ABOA DMSO-PHIL-P-350 Separation Range 5 000Da-1 500 000Da | 10 | spheric | |
| AppliChrom ABOA DMSO-PHIL-P-400 Separation Range 10 000Da-5 000 000Da | 10 | spheric | |
| AppliChrom ABOA DMSO-PHIL-P-450 Separation Range 50 000Da-10 000 000Da | 10 | spheric | |
| AppliChrom ABOA DMSO-PHIL-P-600 Separation Range → 20 000 000Da | 10 | spheric | |
| AppliChrom ABOA DMSO-PHIL-P-M Separation Range 100Da-1 000 000Da | 10 | spheric | |

| AppliChrom Aceton-Aq-Phil-P | | | |
|-----------------------------------------------------------------------|---------------------------|-------------|------------------------------------------------------------------------------------------------------------------------------|
| | Particle size (µm) | Type | For GPC/SEC analysis of |
| AppliChrom Aceton-Aq-Phil-P-250 Separation Range 100Da- 70 000Da | 10 | spheric | For GPC analysi in 80/20 acetone/water organosolv lignins calibration: molecular weight vs. PEO/PEG |
| AppliChrom Aceton-Aq-Phil-P-350 Separation Range 100Da-1 000 000Da | 10 | spheric | |

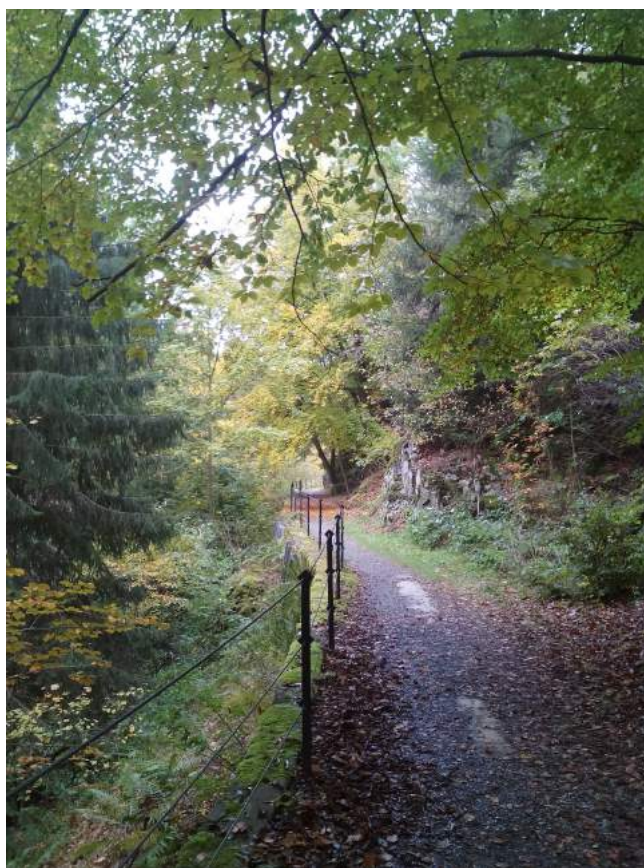
Further AppliChrom columns without USP L## Number

| AppliChrom ABOA HFIP-Phil-P | | | |
|-----------------------------------------------------------------------------|--------------------|---------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| | Particle size (µm) | Type | For GPC/SEC analysis of |
| AppliChrom ABOA HFIP-Phil-P-100 Separation Range 100Da-2 500Da | 7, 10 | spheric | For GPC analysis in HFIP Polyesters (polybutylene terephthalate / PBT/polyethylene terephthalate /PET, polylactide PLA/ Polyamide 6 / PA6/ polyamide 6-6 PA6-6 / polyhexamethylene adipamide / polyamide 6-10 / PA6-10 / poly(hexamethylene sebacamide) / PA 6-10 Other (paraformaldehyde /polyoxymethylene POM / polyacetal / polyethylenimine / PEI / poly (iminoethylene / polyaziridine calibration: molecular weight vs. PEO |
| AppliChrom ABOA HFIP-Phil-P-350 Separation Range up to 1 000 000 Da | 7, 10 | spheric | |
| AppliChrom ABOA HFIP-Phil-P-500 Separation Range 10 000Da- ~50 000 000Da | 7, 10 | spheric | |

AppliChrom GmbH

Your reliable partner on your chromatographic journey

Let's go the path together



Inquiry Form For Forwarding to AppliChrom GmbH

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Germany

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Email: info@applichrom.co
Web: www.applichrom.com

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address

name

company / institute

address

country

telephone number

e-mail

VAT-number

comment

| Application | Page | Application | Page |
|-------------------------------------------------|--------|----------------------------------------------------|-------------|
| Acrylate water-based (range: 100-1.000.000Da) | 14 | PEI, polyethyleneimine | 35 |
| Alginate-Na (range: 100-1.000.000Da) | 15 | PEO / PEG | 12, 43 |
| Aliphatic polyester | 30 | PEO, Dextrans, Polyacryamide, comparison of | 38 |
| Bisphenol-A-Epichlorohydrin (I) (pore to large) | 29 | PET, Polyethylene terephthalate (in HFIP) | 40 |
| Bisphenol-A-Epichlorohydrin (I) (pore to small) | 29 | PMMA, Polymethylmethacrylate (in HFIP) | 40 |
| Caramel color GPC (range: 100-1.500.000Da) | 10 | PMMA, Polymethylmethacrylate (in THF) | 31 |
| Carrageenan (range: 100-1.000.000Da) | 15 | PMMA, Polymethylmethacrylate, oligomer | 28 |
| Casein fraction water-soluble | 17 | Poly DADMAC | 34 |
| Chitosan sulfate | 34 | Poly DADMAC (comparison 3 samples) | 37 |
| Chitosan, high molecular weight | 34 | Poly(2-vinylpyridine), Mw = 40.000Da | 37 |
| Comparison of 3 samples, Poly DADMAC | 37 | Poly(N-isopropylacrylamide) | 7 |
| Comparison of PEO, Dextrans, Polyacryamide | 38 | Poly(vinylimidazole) | 38 |
| Corn syrup (range: 100-1.000.000Da) | 14 | Poly[2-(butenyl)2-oxazoline-co-ethylenimine] | 8 |
| Dextran 650 | 6 | Polyacryamide, comparison of PEO, dextrans | 38 |
| Dextran sulfate-Na (range: 100-1.000.000Da) | 15 | Polyamide 6,6, (PA6-6) (in HFIP) | 40 |
| Dextrans | 35 | Polybutyl methacrylate/ | |
| Dextrans, comparison of PEO, Polyacryamide | 38 | Poly(dimethylamino-ethylmethacrylate) M=22kDa | 9 |
| DP2, mixture of...4 | 21 | Polycarboxylate ether | 16 |
| DP3, mixture of...4 | 21 | Polydiallyldimethylammonium chloride, | |
| Ethanol, mixture of...3 | 21 | polyquaternium-6, | 34 |
| Fish protein hydrolysates (range: 100-70.000Da) | 16 | Polyester, aliphatic | 30 |
| Fructose, mixture of...1* | 21 | Polyether polyol | 30 |
| Fructose, mixture of...2* | 21 | Polyethylene glycol (PEG) | 28 |
| Fructose, mixture of...3* | 21 | Polyethylene terephthalate, PET (in HFIP) | 40 |
| Fructose, mixture of...4* | 21 | Polyethyleneimine, PEI | 35 |
| Glucose, mixture of...1* | 21 | Polyglucosamine, high molecular weight | 34 |
| Glucose, mixture of...2* | 21 | Polyglusam, high molecular weight | 34 |
| Glucose, mixture of...3* | 21 | Polymethylmethacrylate, PMMA (in HFIP) | 40 |
| Glucose, mixture of...4* | 21 | Polyol soft foam | 30 |
| Glycerin, mixture of...1* | 21 | Polyquaternium-33 | 37 |
| Glycerin, mixture of...2* | 21 | Polysaccharide | 6 |
| Glycerin, mixture of...3* | 21 | Polystyrene (PS), Mp = 578Da | 28 |
| Grapeoil (Triglyceride GPC) | 28 | Polystyrene, PS (in THF) | 32 |
| Hard Foam, polyol | 30 | Polyvinyl alcohol M=22kDa | 8 |
| Heparin.Na, 8-25kDa | 15 | Polyvinyl alcohols, 88% degree of hydrolysis | 17 |
| Honey | 22 | Polyvinyl pyridine degraded | 8 |
| Humic acids / humates (range: 100-1.500.000Da) | 10 | Polyvinyl pyridine fractions | 8 |
| Hyaluronic acid | 14 | Polyvinylchloride, PVC (in THF) | 31 |
| Inulin (range: 100-1.000.000Da) | 14 | Pork gelatin (range: 100-1.000.000Da) | 18 |
| Inulin comparison to Maltodextrin 12 | 24 | Pork gelatin vs. Gelatin from collagen hydrolysate | 18 |
| Jelly Bean „Gumminbärchen“ | 17 | PS, Polystyrene (in THF) | 32 |
| Lignin conifer bark | 6 | PS, Polystyrene, Mp = 578Da | 28 |
| Lignin, organosolv GPC | 42, 43 | Pullulan | 16 |
| Malt Beer | 22 | PVC, polyvinylchloride (in THF) | 31 |
| Maltodextrin 6 | 24 | PVP, Polyvinyl pyrrolidone | 17 |
| Maltodextrin 6 detailed view | 24 | Silicone (in Toluene) | 31 |
| Maltodextrin 12 | 24 | Soft foam, polyol | 30 |
| Maltodextrin 12 detailed view | 24 | Sorbitol, mixture of...1 | 21 |
| Maltodextrin 12 (range: 100-1.000.000Da) | 16 | Soy protein GPC | |
| Maltodextrin 12 with extra Glucose | 24 | (range:100-1.00.00Da (based on dextrans)) | 9 |
| Maltodextrin 12 without extra Guucose | 24 | Spruce bark extract | 6 |
| Maltodextrin 19 | 24 | Starch hydrolysates | 13 |
| Maltodextrin 19 detailed viewe | 24 | Sucrose (saccharose), mixture of...1 | 21 |
| Mannitol, mixture of...1 | 21 | Sucrose (saccharose), mixture of...2 | 21 |
| Manuka honey protein GPC | | Sucrose (saccharose), mixture of...3 | 21 |
| (range 100-1.000.000Da (based on dextrans)) | 9 | Triglyceride GPC, Grapeoil | 28 |
| Melamin (range: 100-1.500.000Da) | 10 | UF-resin | 7 |
| MUF-resin | 7 | Water-based acrylate (range: 100-1.000.000Da) | 14 |
| Oligosaccharide | 13 | Water-soluble casein fraction | 17 |
| Organosolv Lignin GPC | 42, 43 | | |
| PA6-6, Polyamide 6,6 (in HFIP) | 40 | | |
| Pea protein GPC | | * | |
| (range: 100-1.000.000Da (based on dextrans)) | 9 | Mixture 1 | Mixture 2 |
| Pea starch | 7 | 1. Sucrose | 1. Sucrose |
| Pectin | 13 | 2. Glucose | 2. Glucose |
| PEG / PEO | 12, 43 | 3. Fructose | 3. Fructose |
| PEG, Polyethylene glycol | 28 | 4. Glycerin | 4. Glycerin |
| PEGylated protein | 13 | 5. Mannitol | 5.Ethanol |
| | | 6. Sorbitol | |

General terms and conditions

The prices are free, in EURO, without VAT, this is calculated separately.

The listed prices are valid in the Federal Republic of Germany, deviations may result from changes in the manufacturers' prices.

Our offer is a business-to-business (B2B) offer and also addressed to selected traders and freelancers as well as universities and other public clients but not to private customers.

Delivery terms:

Federal Republic of Germany: Delivery is not free (EXW Oranienburg, INCOTERMS 2010). We charge a shipping and packaging fee depending on the size and weight of the goods or by arrangement.

(EU and third countries): Delivery is carried out DDU / EXW Oranienburg, INCOTERMS 2010. If no specification of the buyer is made, we determine the freight carrier and charge the buyer the shipping costs as well as all additionally incurred costs.

Payment:

From invoice date within 30 days net or by appointment.

Complaints:

Are possible within 8 business days after receipt of the goods.

In any case, they must be notified in writing.

The return of the goods is only permitted with our consent.

In case of justified defects, we have the choice between exchange of the goods, rework or reimbursement of the purchase price.

Complaints do not entitle the buyer to suspend his payment.

Any further damages claims of the buyer are excluded, as long as they are not caused by gross negligence or intentional. In case of gross negligence or intentional breach of our contractual or statutory obligations, our liability is limited to the foreseeable damage; we do not assume any liability for any defects.

Claims under the Product Liability Act are not affected by the above regulation.

If the price offer is obviously based on an incorrect price due to transmission errors or error, we are entitled to make a subsequent price correction.

If the customer rejects this correction or if no agreement can be reached between the parties to the contract, we are entitled to a right of withdrawal at any time, as far as legally permissible.

Warranty:

Corresponds to legal requirements.

However, the guarantee / warranty of the manufacturer applies to commercial products.

The guarantee for the properties of the columns is limited to the conditions of the original test chromatogram.

AppliChrom ensures the quality of the AppliChrom HPLC / GPC columns under the following conditions:

- If a column does not function properly, AppliChrom will re-install the column or replace it without incurring any costs for the customer.
- In the case of return of columns, AppliChrom must first issue a return authorization. Defective products must be accompanied by a written declaration of the defect. A redemption only takes place under the following conditions:
All columns must be checked upon receipt and AppliChrom must have all defects within 14 days after receipt of the column.
- Unless otherwise agreed, the warranty period is limited to a maximum of 90 days after delivery date.
- The guarantee for the properties of the columns is limited to the conditions of the original test chromatogram.

To void the warranty / guarantee:

- Removing or unscrewing the end fittings of the HPLC/GPC columns automatically voids column warranty.
- Physical damage to the column due to misuse or mishandling, including mechanical shocks.
- Damage to the stationary phase or the base material due to handling in the case of incorrect chemical conditions, unsuited solvent, temperatures or pressure conditions.
- Failure due to high backpressures caused by improper solvent and/or sample filtration practices causing particulate build-up or precipitation in the column or end-fitting.
- Incorrect selection of packing material made by customer for their particular use or incompatibility of equipment, etc.

Use restriction

Only for R & D as well as laboratory, not tested for pharmacy or medical diagnostics.

Buyer will not use AppliChrom's name in any publicity or advertising without AppliChrom's prior written approval.

Proprietary right of reservation exists until full payment of the goods.

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We reserve the right to make technical changes.

Our company does not participate in a consignment procedure.

A general guarantee for the functionality with all analytes can not be given. In individual cases it is always advisable to discuss the issue with our product specialists. An application laboratory in Oranienburg is also available for your service. Please contact us.

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Excellent results are our aim



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