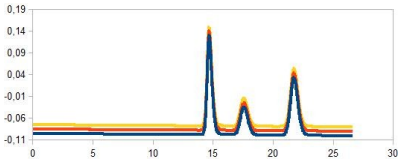
www.applichrom.de

Application & Chromatography

Polymer-based
GPC / SEC / HPLC Columns
Made by AppliChrom



Product Catalog 2020

Polymers

Sugars

Biopolymers

Degradation Products

AppliChrom
Application & Chromatography
Dipl.-Ing. (FH) Susanne Dauwe
Germendorfer Allee 20
D-16515 Oranienburg
Germany

Version 01/2020

www.applichrom.de
info@applichrom.de
Phone: +49 3301 202180
Fax: +49 3301 579293

Table of Contents

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.

AppliChrom’s core competence is the development and production of high quality liquid chromatography media in analytical and semipreparative scale. For this reason AppliChrom is using different reactor lines for producing several unique kinds of chromatography media. Especially for chromatography (HPLC, SEC, GPC) of biopolymers, oligomers, degradation products, fermentation products AppliChrom serves its customers with a unique product line.
AppliChrom branded products are quality products „Made in Germany“, these products are developed and produced in Germany and are submitted to a strict high class quality control.
The headquarter of AppliChrom is located in Oranienburg near Berlin. Oranienburg is the town where Friedlieb Ferdinand Runge invented the early form of paper chromatography in 1850.
Analytical chromatography is a process of separation, quantification and identification of chemical or biological compounds. Chromatography is used e.g. for research and analysis of food, drinks, pharmaceuticals, metabolomic processes, material sciences, environment and chemicals.
With our more than 5.000 products we supply chromatography columns (HPLC, SEC, GPC) for all current applications. Therefore, numerous institutes, universities, manufacturers, as well as our other customers appreciate the high quality, lifetime, reproducibility and reliability of AppliChrom products.
We extend our program steadily with new own chromatographic developments which fulfill the special demands of our customers to secure an economic workflow at the customers’ site.
We are also glad about your inquiry!

Important facts about AppliChrom

Founded: 2006, first market presence in 2009
Company founder: Dipl.-Ing. (FH) Susanne Dauwe (Chemical engeneer)
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

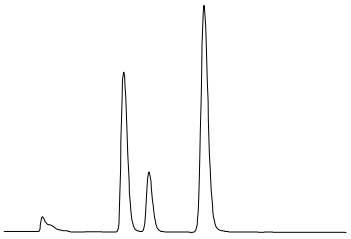
Monument of Dr. Runge in front of the former Laboraity in Oranienburg

AppliChrom ABOA 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: 100-1,000,000Da
- → Examples: PMMA, PAN, cellulose, DMF and DMAc soluble polymers



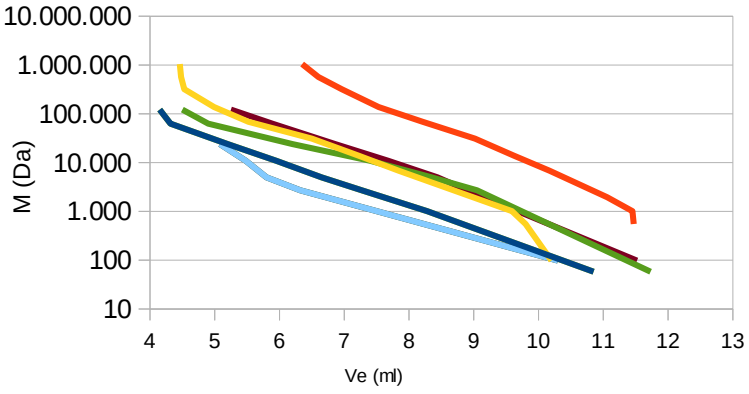
AppliChrom ABOA DMAc-Phil-P molar mass range:

P-100	100-2.500Da
P-200	100-20.000Da
P-250	100-70.000Da
P-250JLD*)	100-100.000Da
P-300	1000-300.000Da
P-350	1.500-1.000.000Da

*) 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 ABOA DMAc-Phil



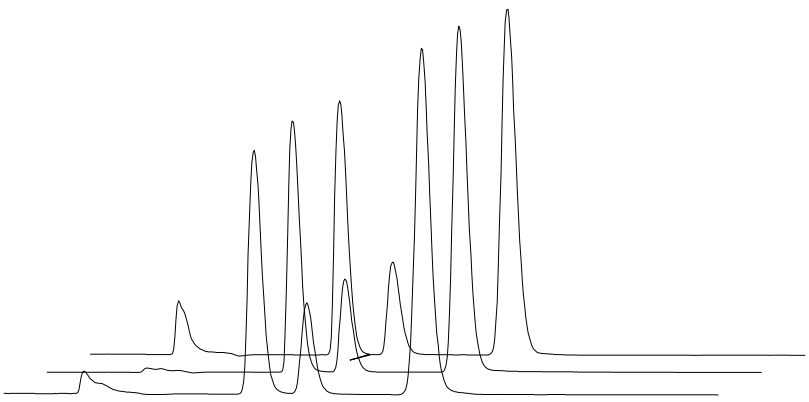
Long linear calbration range

Analyte: **PMMA Standards**

Column:	AppliChrom ABOA DMAcPhil-P-100 AppliChrom ABOA DMAcPhil-P-200 AppliChrom ABOA DMAcPhil-P-250 AppliChrom ABOA DMAcPhil-P-250-JLD AppliChrom ABOA DMAcPhil-P-300 AppliChrom ABOA DMAcPhil-P-350
Dimension:	e.a. 300mm x 8mm
Mobil Phase:	H_2O
Flow:	0,5ml/min
Temperature:	45°C
Detection:	RI
Injection:	20µl sample

AppliChrom ABOA DMAC-Phil-P

Catalog #	Description	Dimension	Separation Range
SADCP1002508 SADCP1003008 SADCP100508 SADCP100308	AppliChrom ABOA DMAC-Phil-P-100	250mm x 8mm 300mm x 8mm 50mm x 8mm 30mm x 8mm	100Da-2.500Da
SADCP2002508 SADCP2003008 SADCP200508 SADCP200308	AppliChrom ABOA DMAC-Phil-P-200	250mm x 8mm 300mm x 8mm 50mm x 8mm 30mm x 8mm	100Da-20.000Da
SADCP2502508 SADCP2503008 SADCP250508 SADCP250308	AppliChrom ABOA DMAC-Phil-P-250	250mm x 8mm 300mm x 8mm 50mm x 8mm 30mm x 8mm	100Da-70.000Da
SADCP2502508J SADCP2503008J SADCP250508J SADCP250308J	AppliChrom ABOA DMAC-Phil-P-250	250mm x 8mm 300mm x 8mm 50mm x 8mm 30mm x 8mm	100Da-100.000Da
SADCP3002508 SADCP3003008 SADCP300508 SADCP300308	AppliChrom ABOA DMAC-Phil-P-300	250mm x 8mm 300mm x 8mm 50mm x 8mm 30mm x 8mm	1.000Da-300kDa
SADCP3502508 SADCP3503008 SADCP350508 SADCP350308	AppliChrom ABOA DMAC-Phil-P-350	250mm x 8mm 300mm x 8mm 50mm x 8mm 30mm x 8mm	1.000Da-1.MioDa
SADCP4002508 SADCP4003008 SADCP400508 SADCP400308	AppliChrom ABOA DMAC-Phil-P-400	250mm x 8mm 300mm x 8mm 50mm x 8mm 30mm x 8mm	10kDa-5 MioDa
SADCP4502508 SADCP4503008 SADCP450508 SADCP450308	AppliChrom ABOA DMAC-Phil-P-450	250mm x 8mm 300mm x 8mm 50mm x 8mm 30mm x 8mm	100 kDa-→10MioDa



Reproducibility

AppliChrom ABOA DMSO-Phil-P

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

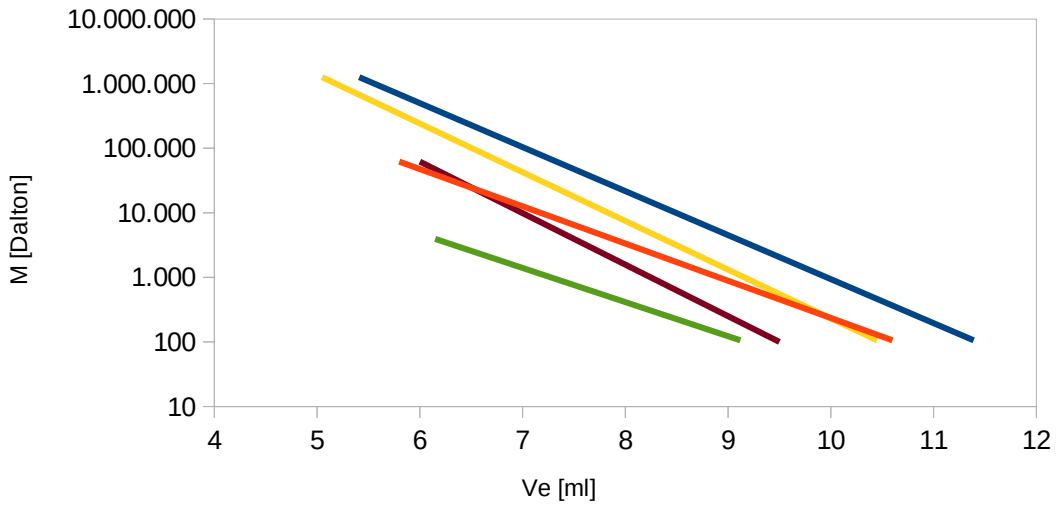
For GPC / SEC analysis in DMSO, examples:

- → 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.

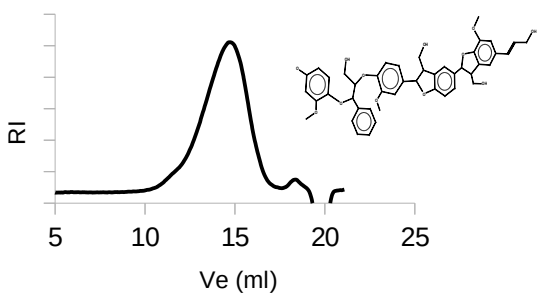
Advantages

- → 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
- → 12µ 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 ABOA DMSO-Phil-P GPC/SEC-columns, 300x8mm, poresizes 100, 200, 250, 350, 400

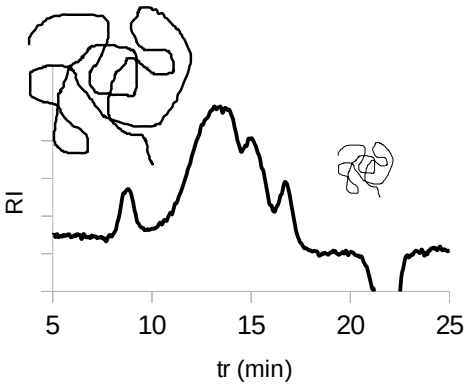


Different pore sizes available



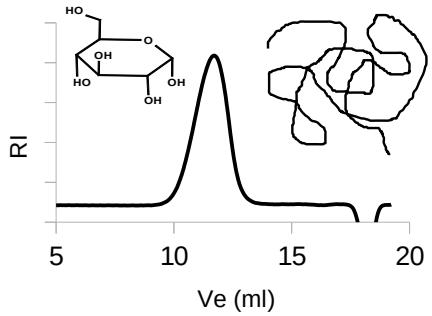
Analyte: **Lignin conifer bark extracts**

Column:	AppliChrom ABOA DMSO-Phil-P-250 AppliChrom ABOA DMSO-Phil-P-350
Dimension:	ea. 300mm x 8mm
Mobil Phase:	DMSO / 0,075M $NaNO_3$
Flow:	0,5ml/min
Temperature:	80°C
Detection:	RI



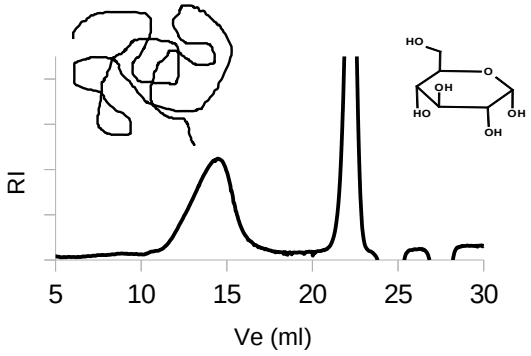
Analyte: **Spruce bark extract**

Column:	AppliChrom ABOA DMSO-Phil-P-250
Dimension:	2 x 300mm x 8mm
Mobil Phase:	DMSO / 0,075M $NaNO_3$
Flow:	0,5ml/min
Temperature:	80°C
Detection:	RI



Analyte: **Polysaccharide**
(M ca. 70kDa)

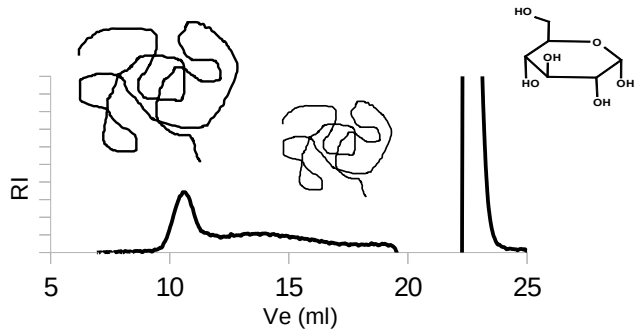
Column:	AppliChrom ABOA DMSO-Phil-P-250 AppliChrom ABOA DMSO-Phil-P-350
Dimension:	ea. 300mm x 8mm
Mobil Phase:	DMSO / 0,075M $NaNO_3$
Flow:	0,5ml/min
Temperature:	80°C
Detection:	RI



Analyte: **Dextran 650**
Dextran from Leuconostoc spp.,
M = 450.000-650.000Da + fructose

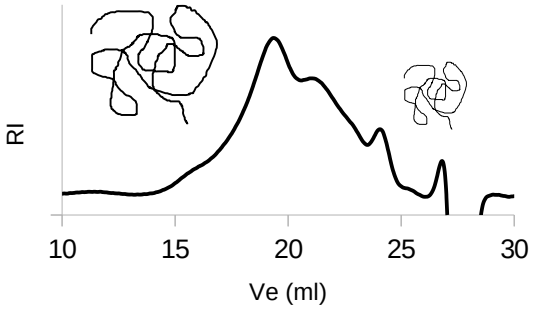
Column:	AppliChrom ABOA DMSO-Phil-P-200 AppliChrom ABOA DMSO-Phil-P-250 AppliChrom ABOA DMSO-Phil-P-350
Dimension:	ea. 300mm x 8mm
Mobil Phase:	DMSO / 0,075M $NaNO_3$
Flow:	0,5ml/min
Temperature:	80°C
Detection:	RI

Many applications for DMSO



Analyte: **Pea starch**

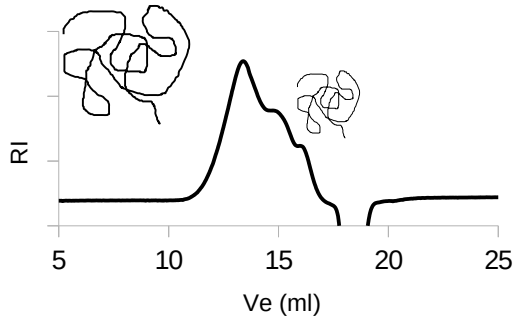
Column:	AppliChrom ABOA DMSO-Phil-P-200 AppliChrom ABOA DMSO-Phil-P-250 AppliChrom ABOA DMSO-Phil-P-350
Dimension:	ea. 300mm x 8mm
Mobil Phase:	DMSO / 0,075M $NaNO_3$
Flow:	0,5ml/min
Temperature:	80°C
Detection:	RI



Analyte: **MUF-resin**

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

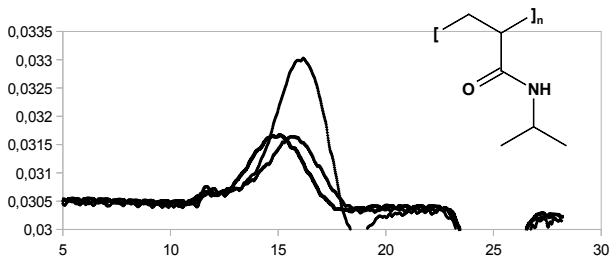
Column:	AppliChrom ABOA DMSO-Phil-P-200 AppliChrom ABOA DMSO-Phil-P-250 AppliChrom ABOA DMSO-Phil-P-350
Dimension:	ea. 300mm x 8mm
Mobil Phase:	DMSO / 0,075M $NaNO_3$
Flow:	0,5ml/min
Temperature:	80°C
Detection:	RI
Injection:	50µl sample



Analyte: **UF-resin**

DMSO-soluble urea formaldehyd resin

Column:	AppliChrom ABOA DMSO-Phil-P-200 AppliChrom ABOA DMSO-Phil-P-350
Dimension:	ea. 300mm x 8mm
Mobil Phase:	DMSO / 0,075M $NaNO_3$
Flow:	0,5ml/min
Temperature:	80°C
Detection:	RI

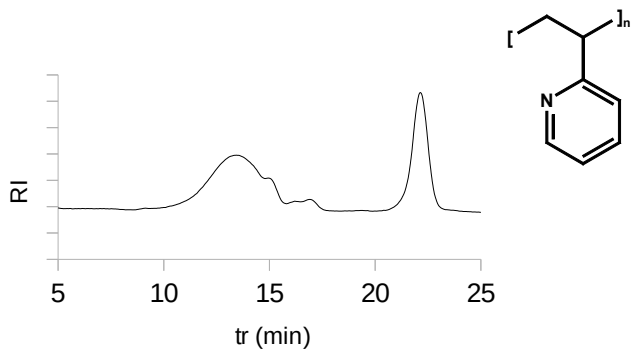


Analyte: **Poly(N-isopropylacrylamide)**

Further denominations: PNIPA, PNIPAAm, NIPA, PNIPAA or PNIPAm.
CAS [25189-55-3], formula: $(C_6H_{11}NO)_n$

3 different PNIPA fractions

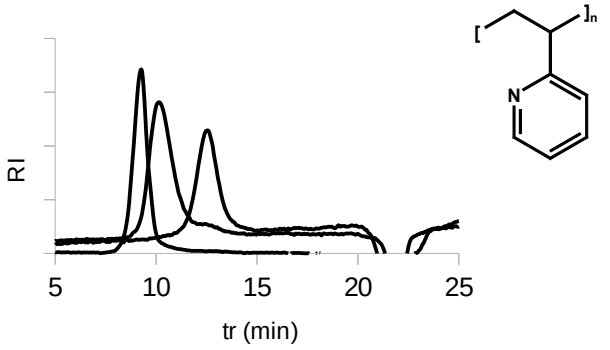
Column:	AppliChrom ABOA DMSO-Phil-P-300
Dimension:	ea. 300mm x 8mm
Mobil Phase:	DMSO / 0,075M $NaNO_3$
Flow:	0,5ml/min
Temperature:	80°C
Detection:	RI



Analyte: **Polyvinylpyridine degradated**

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

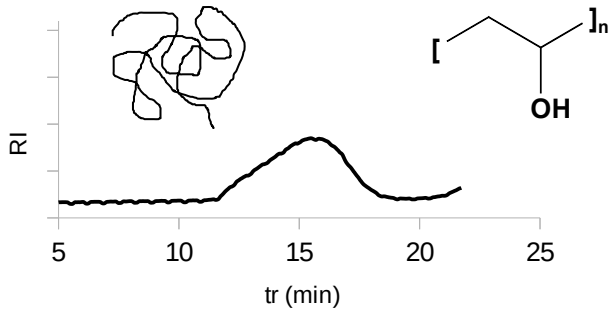
Column:	AppliChrom ABOA DMSO-Phil-P-250
Dimension:	ea. 300mm x 8mm
Mobil Phase:	DMSO / 0,075M $NaNO_3$
Flow:	0,4ml/min
Temperature:	50°C
Detection:	RI



Analyte: **Polyvinylpyridine fractions**

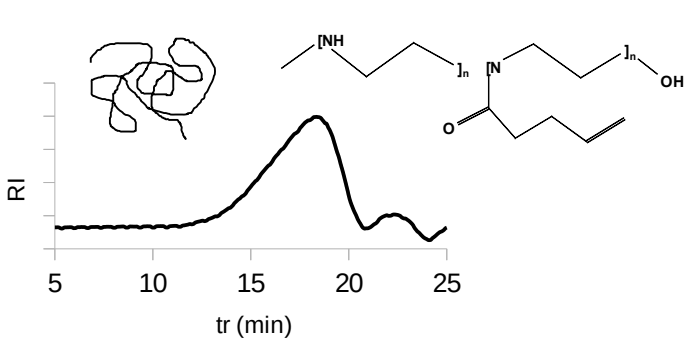
Further denominations: CAS 25014-15-7, $(C_7H_7N)_n$
75.7kDa, 20.9kDa, 3.2kDa
Superposition of 3 different polyvinylpyridin fractions

Column:	AppliChrom ABOA 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



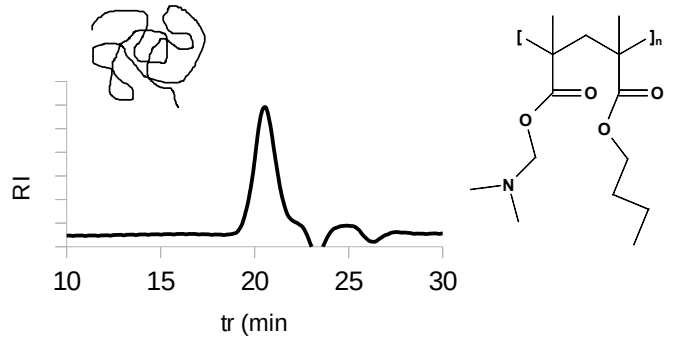
Analyte: **Polyvinylalcohol M=22kDa**

Column:	AppliChrom ABOA 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



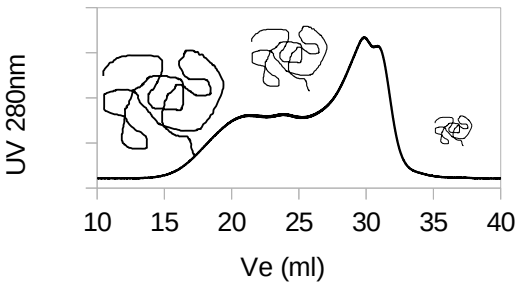
Analyte: **Poly[2-(butenyl)2-oxazoline-co-ethylenimine]**
M = 50.000Da

Column:	AppliChrom ABOA 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**

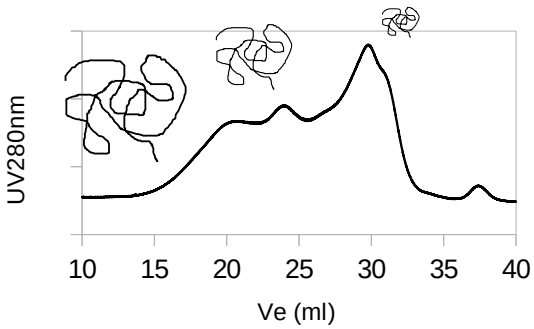
Column:	AppliChrom ABOA DMSO-Phil-P-300
Dimension:	2x. 300mm x 8mm
Mobil Phase:	DMSO / 0,075M $NaNO_3$
Flow:	0,4ml/min
Temperature:	50°C
Detection:	RI



Analyte: **Pea protein GPC**

covering the calibration range of 100-1.000.000Da (based on dextrans)

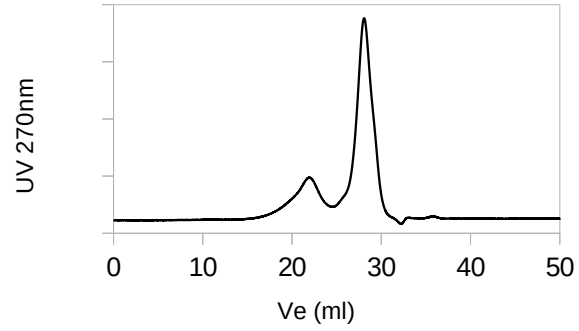
Column:	AppliChrom ABOA DMSO-Phil-P-Multipore
Dimension:	3x. 300mm x 8mm
Mobil Phase:	DMSO
Flow:	0,4ml/min
Temperature:	55°C
Detection:	UV 280nm
Calibration:	vs. Dextran, pullulan or protein



Analyte: **Soy protein GPC**

covering the calibration range of 100-1.000.000Da (based on dextrans)

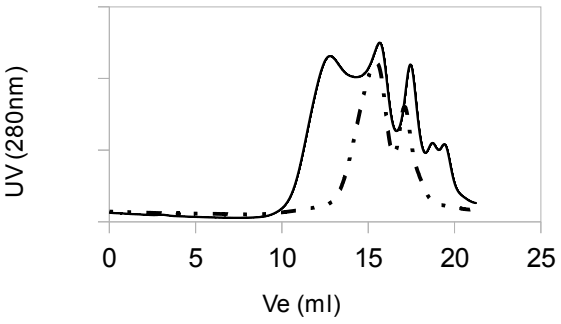
Column:	AppliChrom ABOA DMSO-Phil-P-Multipore
Dimension:	3x. 300mm x 8mm
Mobil Phase:	DMSO
Flow:	0,4ml/min
Temperature:	55°C
Detection:	UV 280nm
Calibration:	vs. Dextran, pullulan or protein



Analyte: **Manuka honey protein GPC**

covering the calibration range of 100-1.000.000Da (based on dextrans)

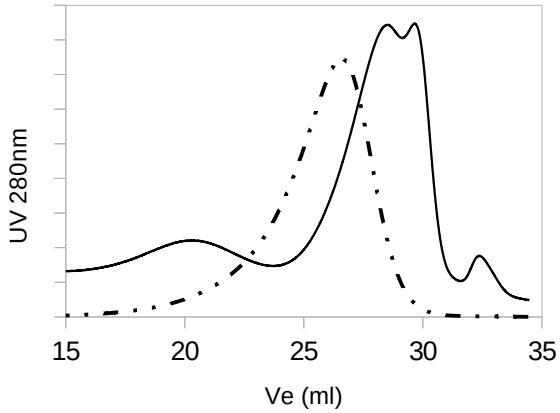
Column:	AppliChrom ABOA DMSO-Phil-P-Multipore
Dimension:	3x. 300mm x 8mm
Mobil Phase:	DMSO
Flow:	0,4ml/min
Temperature:	40°C
Detection:	UV 270nm
Calibration:	vs. Dextran, pullulan or protein



Analyte: **Caramel color GPC**

(range: 100Da-1.500.000Da)
SEC / GPC comparison of 2 Caramel Coulor

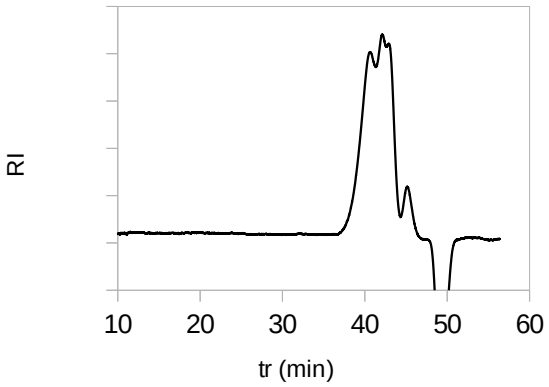
Column:	AppliChrom ABOA DMSO-Phil-P-100 AppliChrom ABOA DMSO-Phil-P-350
Dimension:	ea. 300mm x 8mm
Mobil Phase:	DMSO / 0,075M $NaNO_3$
Flow:	0,3ml/min
Temperature:	60°C
Detection:	UV 280nm



Analyte: **Humic acids / humates GPC**

(range: 100-1.500.000Da)
SEC / GPC comparison GPC / SEC comparison of 2 different humic acids / humates

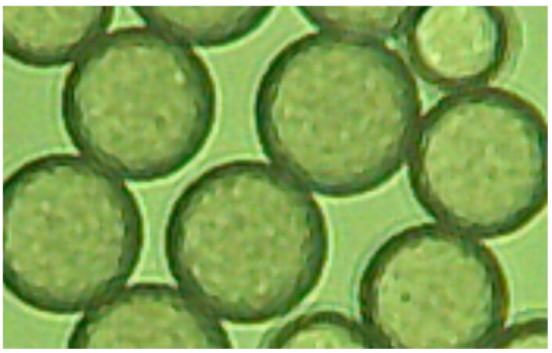
Column:	AppliChrom ABOA DMSO-Phil-P-Multipore
Dimension:	3x 300mm x 8mm
Mobile Phase:	DMSO
Flow:	0,4ml/min
Temperature:	70°C
Detection:	UV 280nm



Analyte: **Melamin GPC**

(range: 100-1.500.000Da)

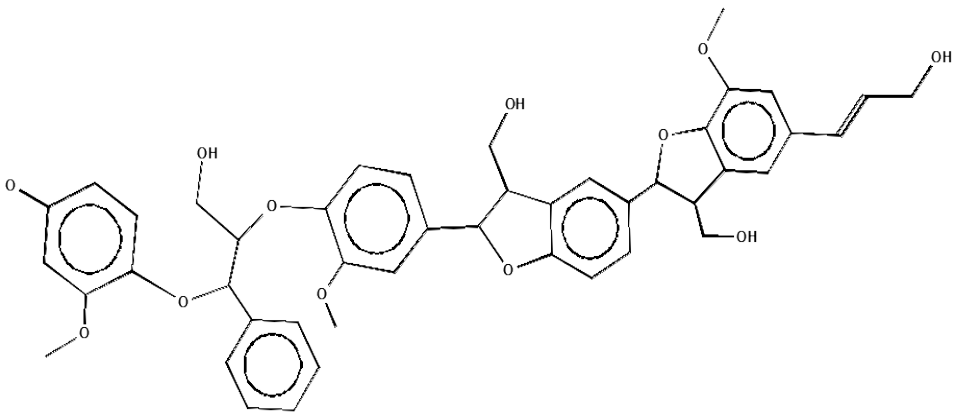
Column:	AppliChrom ABOA DMSO-Phil-P-100 AppliChrom ABOA DMSO-Phil-P-350
Dimension:	ea. 300mm x 8mm
Mobil Phase:	DMSO / 0,075M $NaNO_3$
Flow:	0,4ml/min
Temperature:	60°C
Detection:	RI



GPC-material – particle size uniformity

AppliChrom ABOA DMSO-Phil-P

Catalog #	Description	Dimension	Separation Range
SADP1002508 SADP1003008 SADP100508 SADP100308	AppliChrom ABOA DMSO-Phil-P-100	250mm x 8mm 300mm x 8mm 50mm x 8mm 30mm x 8mm	100Da-2.500Da
SADP2002508 SADP2003008 SADP200508 SADP200308	AppliChrom ABOA DMSO-Phil-P-200	250mm x 8mm 300mm x 8mm 50mm x 8mm 30mm x 8mm	100Da-20.000Da
SADP2502508 SADP2503008 SADP250508 SADP250308	AppliChrom ABOA DMSO-Phil-P-250	250mm x 8mm 300mm x 8mm 50mm x 8mm 30mm x 8mm	100Da-70.000Da
SADP3002508 SADP3003008 SADP300508 SADP300308	AppliChrom ABOA DMSO-Phil-P-300	250mm x 8mm 300mm x 8mm 50mm x 8mm 30mm x 8mm	1.000Da-300kDa
SADP3502508 SADP3503008 SADP350508 SADP350308	AppliChrom ABOA DMSO-Phil-P-350	250mm x 8mm 300mm x 8mm 50mm x 8mm 30mm x 8mm	1.000Da-1.MioDa
SADP4002508 SADP4003008 SADP400508 SADP400308	AppliChrom ABOA DMSO-Phil-P-400	250mm x 8mm 300mm x 8mm 50mm x 8mm 30mm x 8mm	10kDa-5 MioDa
SADP4502508 SADP4503008 SADP450508 SADP450308	AppliChrom ABOA DMSO-Phil-P-450	250mm x 8mm 300mm x 8mm 50mm x 8mm 30mm x 8mm	100 kDa→10MioDa
SADPM2508 SADPM3008 SADPM508 SADPM308	AppliChrom ABOA DMSO-Phil-P-Multipore	250mm x 8mm 300mm x 8mm 50mm x 8mm 30mm x 8mm	100Da - 1MioDa



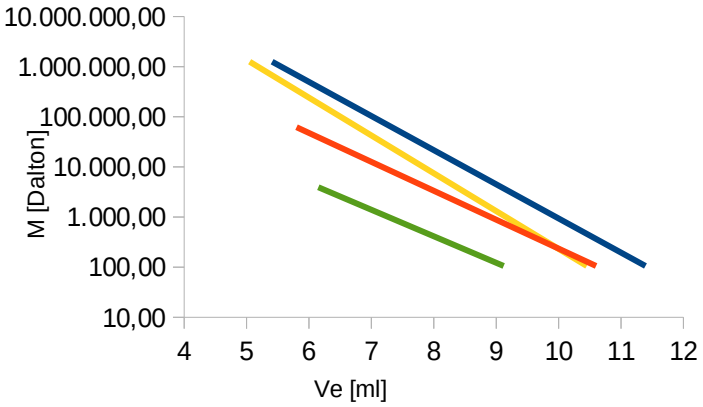
Lignin

AppliChrom ABOA SuperOH-P

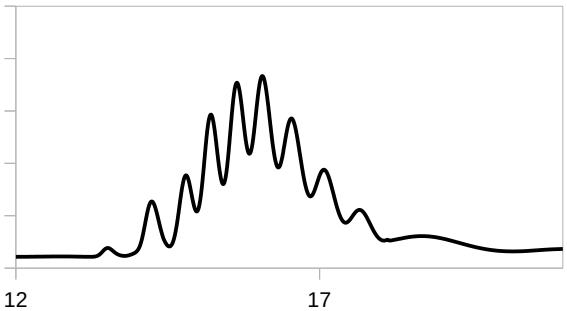
- → optimized for aqueous GPC/SEC-separations
- → aqueous high hydrophilic polymeric base material
- → low column bleeding for low detector noise
- → 7µ particle technology (standard) for high platecounts and high resolution*)
- → large pore volume for high resolution
- → pH stable 2.5-12
- → pressure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

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

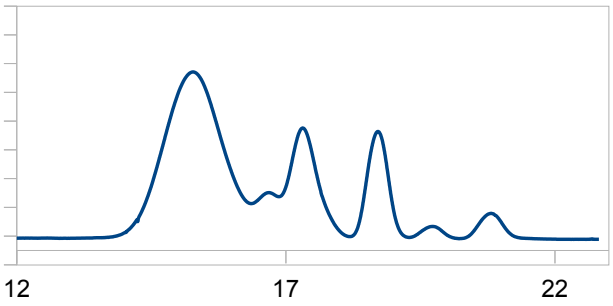
GPC Calibration Curves AppliChrom ABOA SuperOH-P



Analyte:	**PEO/PEG**
Column:	AppliChrom ABOA SuperOHl-P-**100** AppliChrom ABOA SuperOH-P-**200** AppliChrom ABOA SuperOH-P-**300** AppliChrom ABOA SuperOH-P-**400**
Dimension:	e.a. 300mm x 8mm
Mobil Phase:	H_2O,
Flow:	0,5ml/min
Temperature:	20°C
Detection:	RI
Injection:	20µl sample

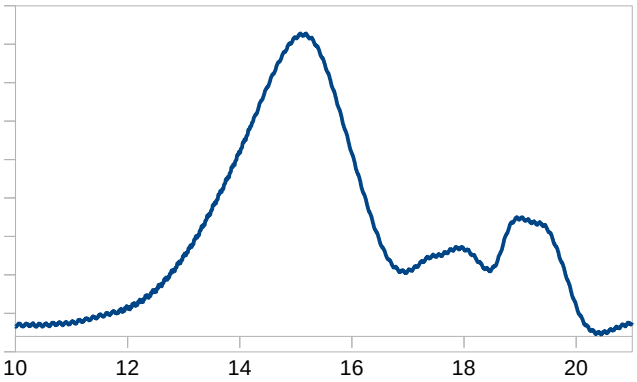


For aqueous applications



Analyte: **Oligosaccharide**

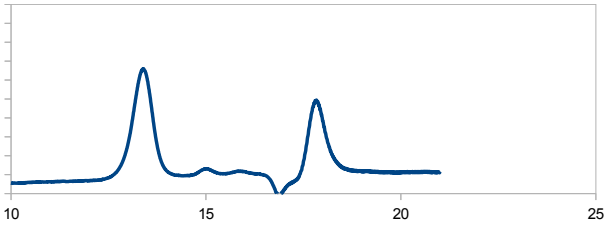
Column:	AppliChrom ABOASuperOH-P-100
Dimension:	2x 300mm x 8mm
Mobil Phase:	H_2O
Flow:	0,5ml/min
Temperature:	40°C
Detection:	RI
Injection:	20µl sample



Analyte: **Pectin**

sample with high content of oligomers

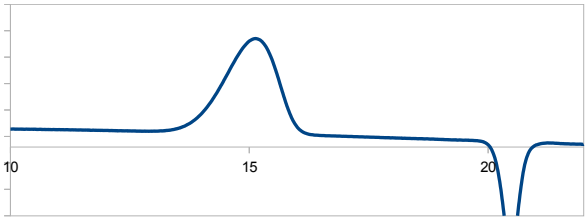
Column:	AppliChrom ABOASuperOH-P-100 AppliChrom ABOASuperOH-P-350
Dimension:	e.a. 300mm x 8mm
Mobil Phase:	H_2O, $NaKHPO_4$ (pH 6.8 0.07M) + 50mM NaCl
Flow:	1,0ml/min
Temperature:	20°C
Detection:	RI
Injection:	20µl sample



Analyte: **PEGylated protein**

Separation of an approx. 5.000Da product of a PEGylated protein of approx. 100.000dalton.

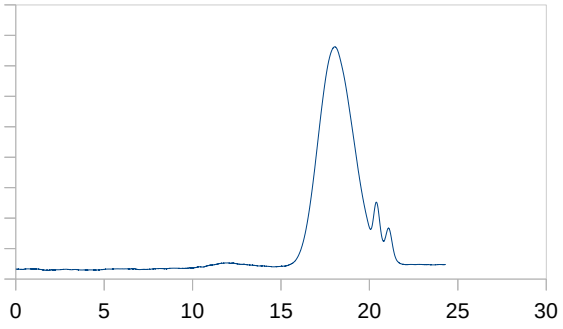
Column:	AppliChrom ABOASuperOH-P-100 AppliChrom ABOASuperOH-P-350
Dimension:	e.a. 300mm x 8mm
Mobil Phase:	0,05% NaN_3 in H_2O
Flow:	1,0ml/min
Temperature:	20°C
Detection:	RI
Injection:	20µl sample



Analyte: **Starch hydrolysate**

analysis of a 100kDa fraction

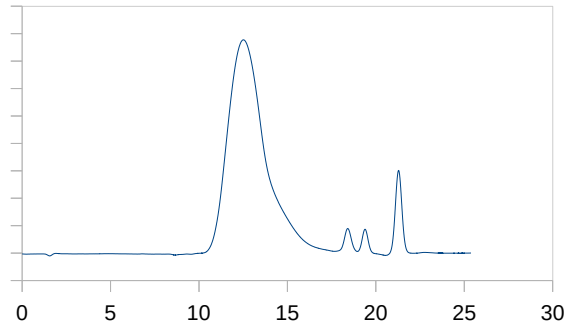
Column:	AppliChrom ABOASuperOH-P-100 AppliChrom ABOASuperOH-P-350
Dimension:	e.a. 300mm x 8mm
Mobil Phase:	0,2M $NaNO_3$ in H_2O
Flow:	1,0ml/min
Temperature:	20°C
Detection:	RI
Injection:	20µl sample



Analyte: **Inulin**

analysis of a 100Da- 1Mio Da,
including oligomer separation

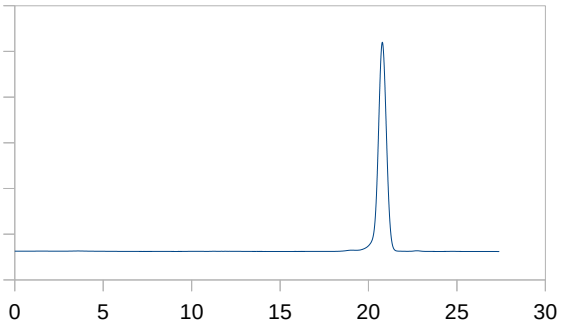
Column:	AppliChrom ABOASuperOH-P-250 AppliChrom ABOASuperOH-P-350
Dimension:	e.a. 300mm x 8mm
Mobil Phase:	0,075M $NaNO_3$, 5g/l $Na_2HPO_4x7H_2O$ in H_2O
Flow:	1,0ml/min
Temperature:	20°C
Detection:	RI
Injection:	20µl sample



Analyte: **Hyaluronic acid**

including oligomer separation

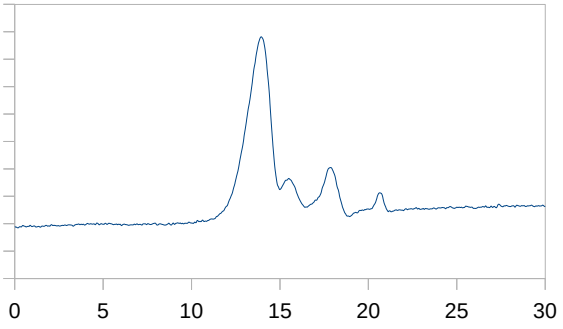
Column:	AppliChrom ABOASuperOH-P-250 AppliChrom ABOASuperOH-P-350
Dimension:	e.a. 300mm x 8mm
Mobil Phase:	0,075M $NaNO_3$, 5g/l $Na_2HPO_4x7H_2O$ in H_2O
Flow:	1,0ml/min
Temperature:	20°C
Detection:	RI
Injection:	20µl sample



Analyte: **Corn syrup**

analysis of a 100Da- 1Mio Da,

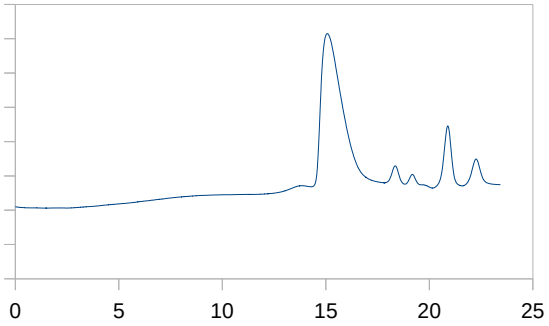
Column:	AppliChrom ABOASuperOH-P-250 AppliChrom ABOASuperOH-P-350
Dimension:	e.a. 300mm x 8mm
Mobil Phase:	H_2O
Flow:	1,0ml/min
Temperature:	20°C
Detection:	RI
Injection:	20µl sample



Analyte: **Water-based acrylate dispersion**

analysis of a 100Da- 1Mio Da area

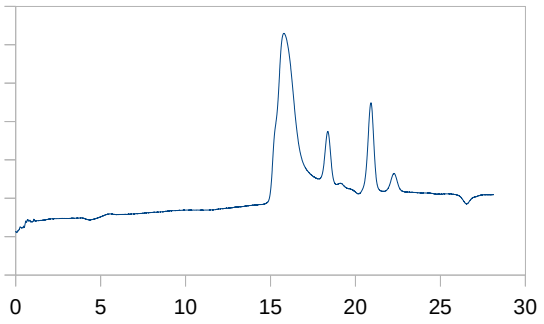
Column:	AppliChrom ABOASuperOH-P-250 AppliChrom ABOASuperOH-P-350
Dimension:	e.a. 300mm x 8mm
Mobil Phase:	1,0M $NaNO_3$ in H_2O
Flow:	1,0ml/min
Temperature:	20°C
Detection:	RI
Injection:	20µl sample



Analyte: **Heparin-Na, 8-25kDa**
including oligomer separation

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

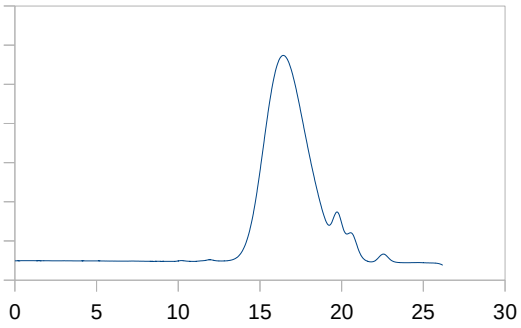
Dimension: e.a. 300mm x 8mm
Mobil Phase: 0,075M $NaNO_3$, 5g/l $Na_2HPO_4x7H_2O$ in H_2O
Flow: 1,0ml/min
Temperature: 20°C
Detection: RI
Injection: 20µl sample



Analyte: **Dextran sulfate-Na**
analysis of a 100Da- 1Mio Da,

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

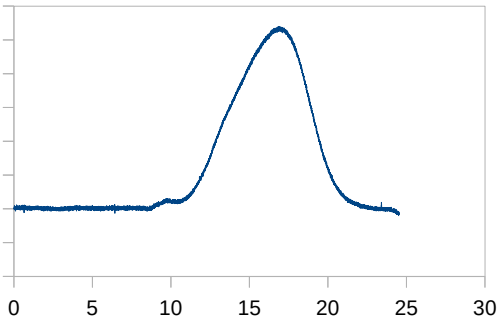
Dimension: e.a. 300mm x 8mm
Mobil Phase: 0,075M $NaNO_3$, 5g/l $Na_2HPO_4x7H_2O$ in H_2O
Flow: 1,0ml/min
Temperature: 20°C
Detection: RI
Injection: 20µl sample



Analyte: **Alginate-Na**
analysis of a 100Da- 1Mio Da,

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

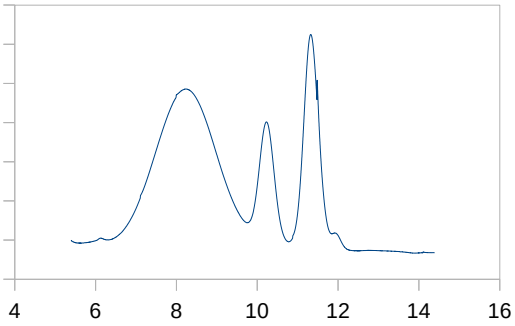
Dimension: e.a. 300mm x 8mm
Mobil Phase: 0,075M $NaNO_3$, 5g/l $Na_2HPO_4x7H_2O$ in H_2O
Flow: 1,0ml/min
Temperature: 20°C
Detection: RI
Injection: 20µl sample



Analyte: **Carrageenan**
analysis of a 1.000Da- 5Mio Da,

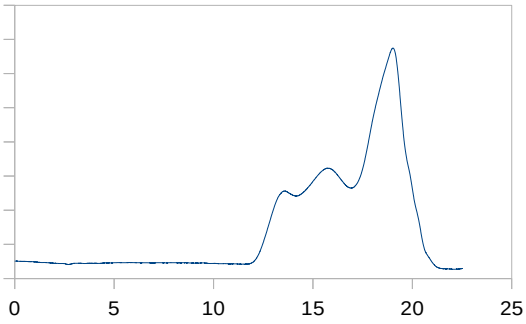
Column: AppliChrom ABOASuperOH-P-350
AppliChrom ABOASuperOH-P-450

Dimension: e.a. 300mm x 8mm
Mobil Phase: 0,075M $LiNO_3$ in H_2O
Flow: 1,0ml/min
Temperature: 20°C
Detection: RI
Injection: 20µl sample



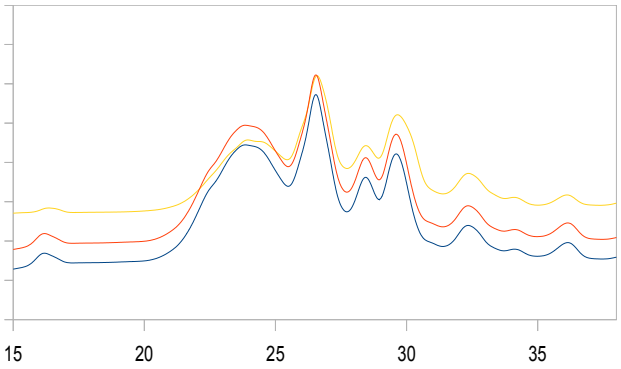
Analyte: **Pullulan**
including oligomer separation

Column:	AppliChrom ABOASuperOH-P-Screening
Dimension:	300mm x 8mm
Mobil Phase:	0,075M $NaNO_3$ in H_2O
Flow:	1,0ml/min
Temperature:	20°C
Detection:	RI
Injection:	20µl sample



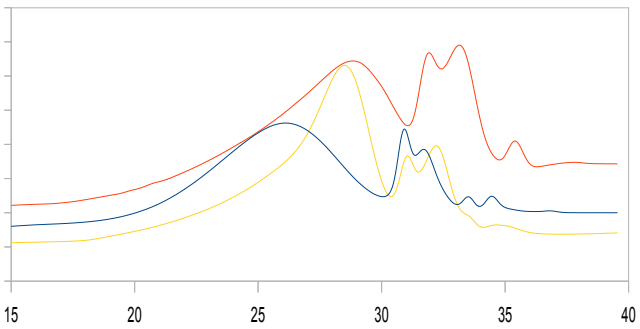
Analyte: **Maltodextrin 12**
analysis of a 100Da-1Mio Da,

Column:	AppliChrom ABOASuperOH-P-250 AppliChrom ABOASuperOH-P-350
Dimension:	e.a. 300mm x 8mm
Mobil Phase:	0,075M $NaNO_3$ in H_2O
Flow:	1,0ml/min
Temperature:	20°C
Detection:	RI
Injection:	20µl sample



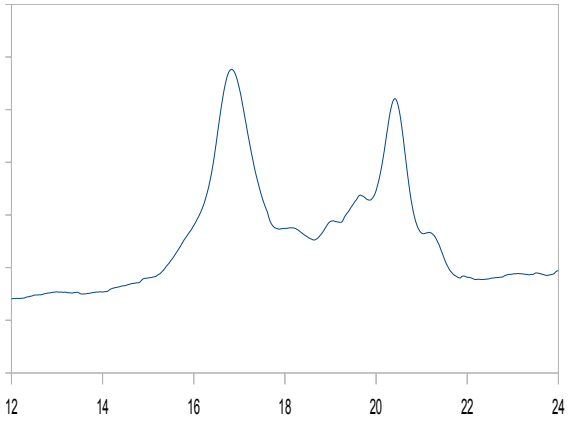
Analyte: **Fish protein hydrolysates**
3 different batches
analysis of a 100Da-70.000 Da,
including oligomer separation

Column:	AppliChrom ABOASuperOH-P-250
Dimension:	3x 300mm x 8mm
Mobil Phase:	0,05M $NaNO_3$ + 0,07M $Na_{1,5}H_{1,5}PO_4$ in H_2O
Flow:	1,0ml/min
Temperature:	30°C
Detection:	RI
Injection:	20µl sample



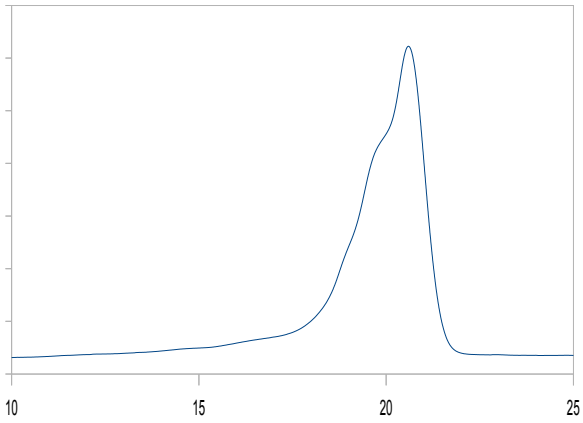
Analyte: **Polycarboxylate ether**
3 different batches

Column:	AppliChrom ABOASuperOH-P-350
Dimension:	3x 300mm x 8mm
Mobil Phase:	0,1M $NaNO_3$+0,05M Na_2HPO_4 in H_2O
Flow:	1,0ml/min
Temperature:	20°C
Detection:	RI
Injection:	20µl sample



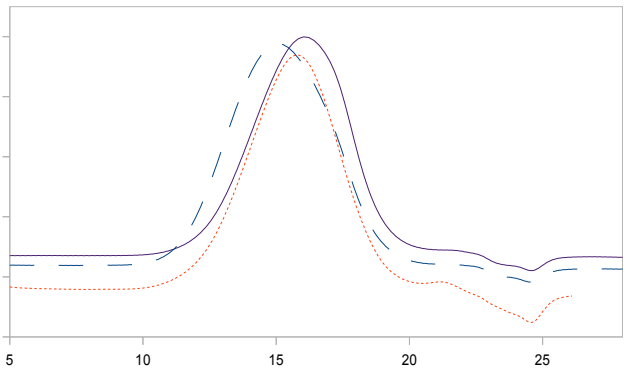
Analyte: **Water-soluble casein fraction**

Column:	AppliChrom ABOASuperOH-P-250 AppliChrom ABOASuperOH-P-350
Dimension:	e.a. 300mm x 8mm
Mobil Phase:	0,01M $Na_{1,5}H_{1,5}PO_4$ & 0,3M NaCl in H_2O
Flow:	1,0ml/min
Temperature:	30°C
Detection:	RI
Injection:	50µl sample



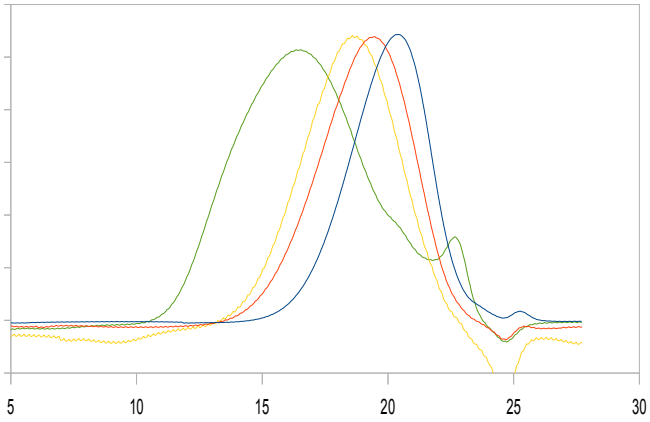
Analyte: **Jelly Bean „Gummibärchen“**

Column:	AppliChrom ABOASuperOH-P-250 AppliChrom ABOASuperOH-P-350
Dimension:	e.a. 300mm x 8mm
Mobil Phase:	0,01M $Na_{1,5}H_{1,5}PO_4$ & 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



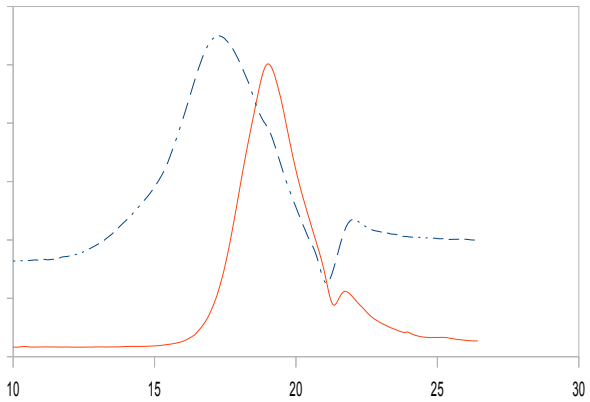
Analyte: **Polyvinyl alcohols,**
88% degree of hydrolysis
3 different batches
including oligomer separation

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



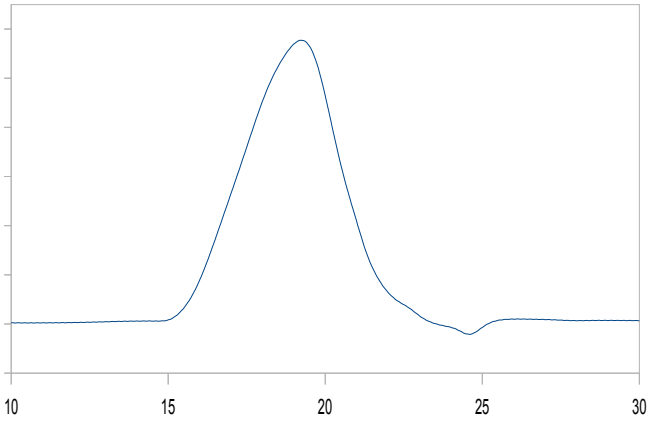
Analyte: **PVP, polyvinyl pyrolidone**
3 different batches
including oligomer separation

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



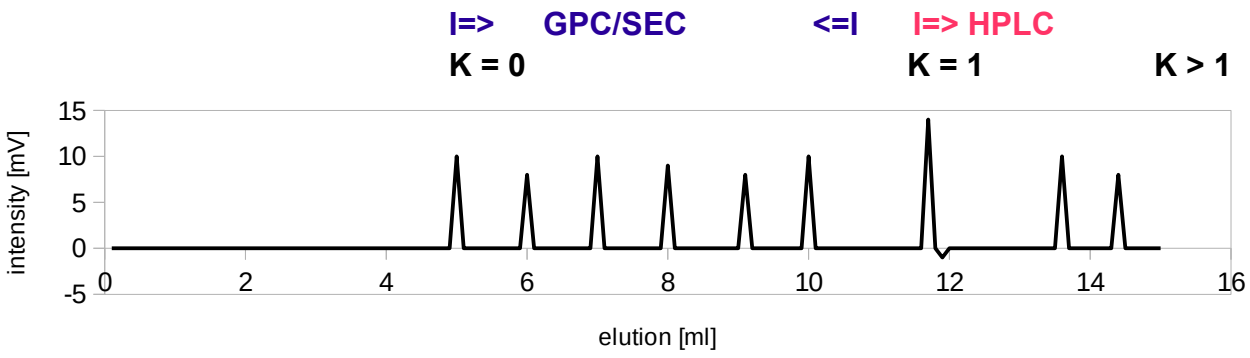
Analyte: **Pork gelatin vs. gelatin from collagen hydrolysate**
including oligomer separation

Column:	AppliChrom ABOASuperOH-P-250 AppliChrom ABOASuperOH-P-350
Dimension:	e.a. 300mm x 8mm
Mobil Phase:	0,01M $Na_{1,5}H_{1,5}PO_4$ & 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- 1Mio Da,

Column:	AppliChrom ABOASuperOH-P-250 AppliChrom ABOASuperOH-P-350
Dimension:	e.a. 300mm x 8mm
Mobil Phase:	0,075M $NaNO_3$, 5g/l $Na_2HPO_4x7H_2O$ in H_2O
Flow:	1,0ml/min
Temperature:	20°C
Detection:	RI
Injection:	20µl sample

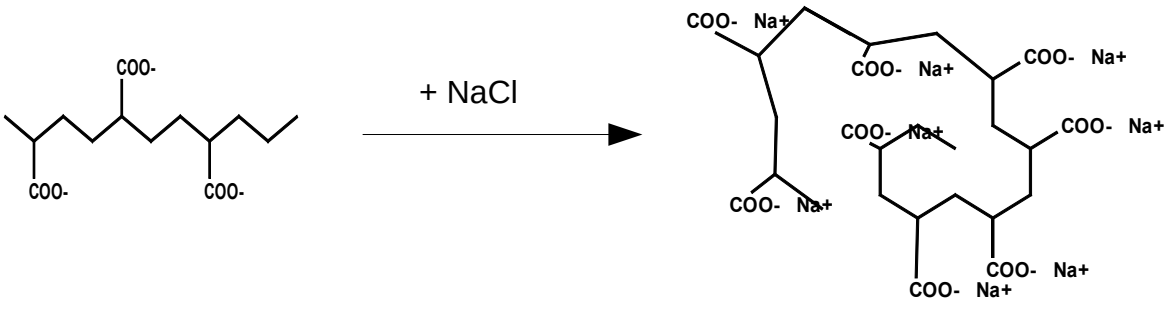


GPC/SEC – Separation by size (ΔS) II **HPLC** – Separation according to bond strength (ΔH)
K = Partition coefficient

GPC/SECfinishes when HPLC begins

AppliChrom ABOA SuperOH-P

Catalog #	Description	Dimension	Separation Range
SASOH1002508 SASOH1003008 SASOH100508 SASOH100308	AppliChrom ABOA SuperOH-P-100	250mm x 8mm 300mm x 8mm 50mm x 8mm 30mm x 8mm	100Da-2.500Da
SASOH2002508 SASOH2003008 SASOH200508 SASOH200308	AppliChrom ABOA SuperOH-P-200	250mm x 8mm 300mm x 8mm 50mm x 8mm 30mm x 8mm	100Da-20.000Da
SASOH2502508 SASOH2503008 SASOH250508 SASOH250308	AppliChrom ABOA SuperOH-P-250	250mm x 8mm 300mm x 8mm 50mm x 8mm 30mm x 8mm	100Da-70.000Da
SASOH3002508 SASOH3003008 SASOH300508 SASOH300308	AppliChrom ABOA SuperOH-P-300	250mm x 8mm 300mm x 8mm 50mm x 8mm 30mm x 8mm	1.000Da-300kDa
SASOH3502508 SASOH3503008 SASOH350508 SASOH350308	AppliChrom ABOA SuperOH-P-350	250mm x 8mm 300mm x 8mm 50mm x 8mm 30mm x 8mm	2.500Da-1.MioDa
SASOH4002508 SASOH4003008 SASOH400508 SASOH400308	AppliChrom ABOA SuperOH-P-400	250mm x 8mm 300mm x 8mm 50mm x 8mm 30mm x 8mm	10kDa-5 MioDa
SASOH4502508 SASOH4503008 SASOH450508 SASOH450308	AppliChrom ABOA SuperOH-P-450	250mm x 8mm 300mm x 8mm 50mm x 8mm 30mm x 8mm	50 kDa→10MioDa
SASOHS2508 SASOHS3008 SASOHS508 SASOHS308	AppliChrom ABOA SuperOH-P-Screening	250mm x 8mm 300mm x 8mm 50mm x 8mm 30mm x 8mm	100Da - 1MioDa



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 analyis from aqueous sample!
→ Low invest: Measurement possible with standard HPLC-system if connected with RI or ELSD (evaporative lighscattering detector).

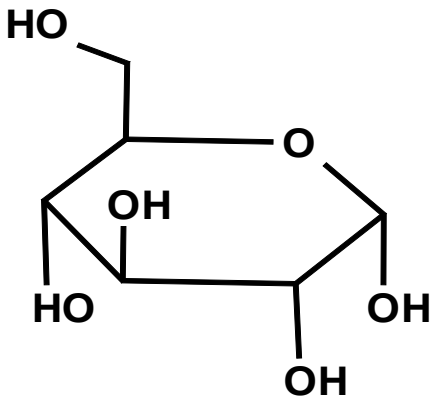
AppliChrom ABOA SugarSep-Ca – Analysis of sugars, sugar alcohols, alcohols.

AppliChrom ABOA SugarSep-Pb – Analysis of sugars

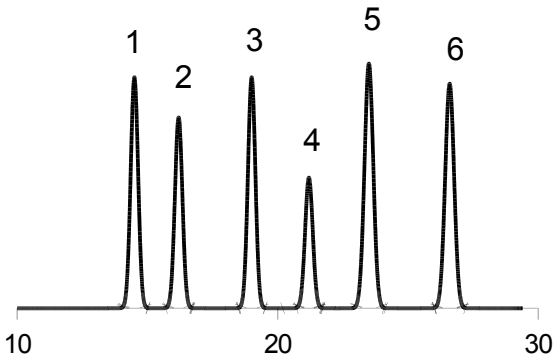
AppliChrom ABOA SugarSep-H – Analysis of sugars, sugaralcohols, alcohols and carobxylic acids.

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

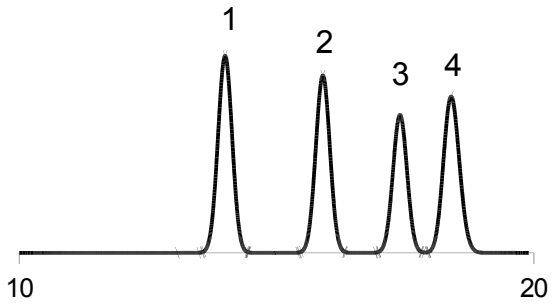
AppliChrom ABOA SugarSep-Oligo – Analysis of sugars, sugaralcohols, alcohols and carobxylic acids.



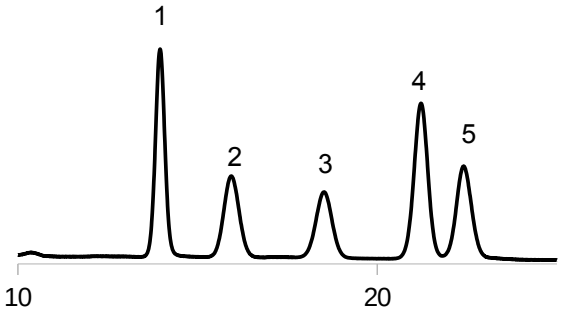
Identification of many sugars



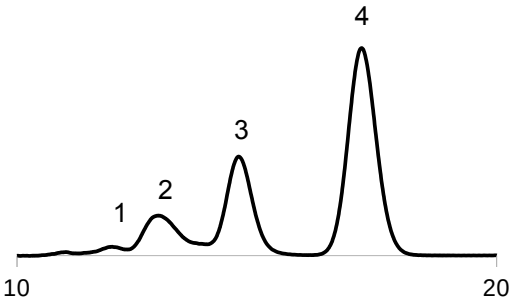
Analyte:	**Mixture of**
	1. Sucrose (Saccarose) 2. Glucose 3. Fructose 4. Glycerin 5. Mannitol 6. Sorbitol
Column:	AppliChrom ABOA SugarSep-Ca
Dimension:	300mm x 8mm
Mobil Phase:	H_2O
Flow:	0,5ml/min
Temperature:	80°C
Detection:	RI
Injection:	20µl sample



Analyte:	**Mixture of**
	1. Sucrose (Saccarose) 2. Glucose 3. Fructose 4. Glycerin
Column:	AppliChrom ABOA SugarSep-Pb
Dimension:	300mm x 8mm
Mobil Phase:	H_2O
Flow:	0,4ml/min
Temperature:	60°C
Detection:	RI
Injection:	20µl sample

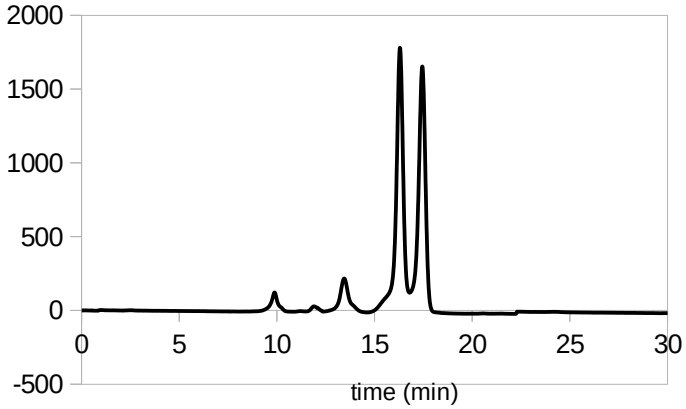


Analyte:	**Mixture of**
	1. Sucrose (Saccarose) 2. Glucose 3. Fructose 4. Glycerin 5. Ethanol
Column:	AppliChrom ABOA SugarSep-Ca
Dimension:	300mm x 8mm
Mobil Phase:	H_2O
Flow:	0,5ml/min
Temperature:	80°C
Detection:	RI
Injection:	20µl sample



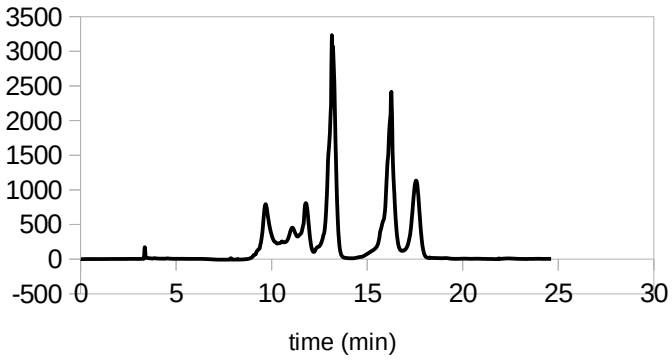
Analyte:	**Honey (solvet in H_2O)**
	1. Dp 3 2. Dp 2 3. Glucose 4. Fructose
Column:	AppliChrom ABOA SugarSep-Ca
Dimension:	300mm x 8mm
Mobil Phase:	H_2O
Flow:	0,5ml/min
Temperature:	80°C
Detection:	RI
Injection:	20µl sample

Sugar HPLC in water



Analyte: Honey

Column:	AppliChrom ABOA SugarSep-Na
Dimension:	300mm x 8mm
Mobil Phase:	H_2O
Flow:	0,5ml/min
Temperature:	80°C
Detection:	RI
Injection:	20µl sample

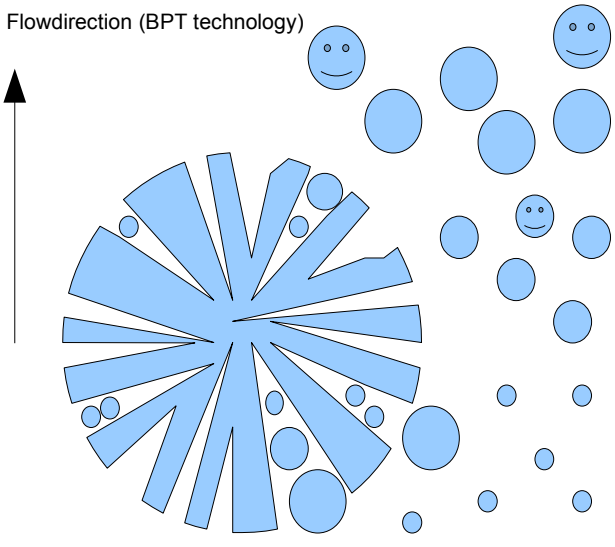


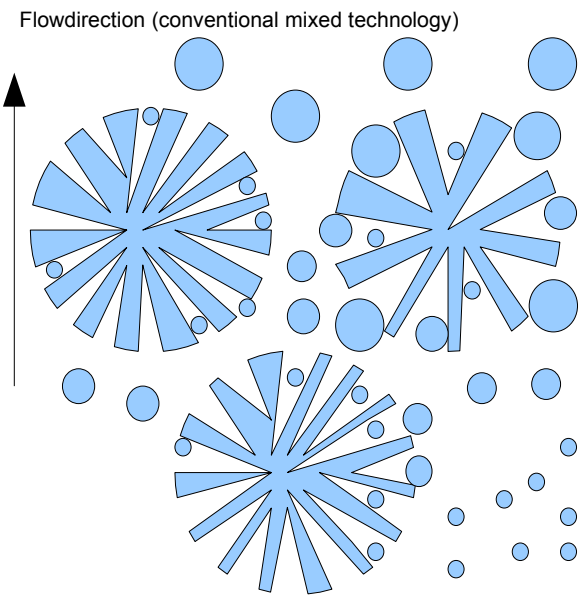
Analyte: Malt Beer

Column:	AppliChrom ABOA SugarSep-Na
Dimension:	300mm x 8mm
Mobil Phase:	H_2O
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 – respecive artifical 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

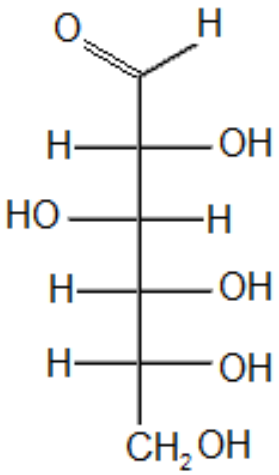




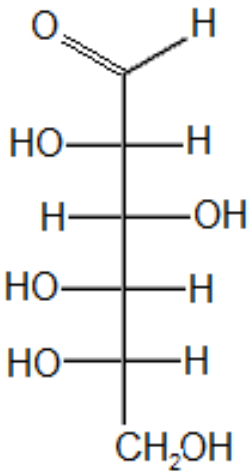
BPT – Broad Pore Technology

AppliChrom ABOA SugarSep

Catalog #	Description	Dimension	
SASCAI102508 SASCAI103008 SASCAI10508 SASCAI10308	AppliChrom ABOA SugarSep-Ca I	250mm x 8mm 300mm x 8mm 50mm x 8mm 30mm x 8mm	
SASPBW102508 SASPBW103008 SASPBW10508 SASPBW10308	AppliChrom ABOA SugarSep-Pb-Wood	250mm x 8mm 300mm x 8mm 50mm x 8mm 30mm x 8mm	
SASHI102508 SASHI103008 SASHI10508 SASHI10308	AppliChrom ABOA SugarSep-H I (SO_3H)	250mm x 8mm 300mm x 8mm 50mm x 8mm 30mm x 8mm	
SASHII102508 SASHII103008 SASHII10508 SASHII10308	AppliChrom ABOA SugarSep-H II (SO_3H)	250mm x 8mm 300mm x 8mm 50mm x 8mm 30mm x 8mm	
SASHIII102508 SASHIII103008 SASHIII10508 SASHIII10308	AppliChrom ABOA SugarSep-H III (SO_3H)	250mm x 8mm 300mm x 8mm 50mm x 8mm 30mm x 8mm	
SASNA102508 SASNA103008 SASNA10508 SASNA10308	AppliChrom ABOA SugarSep-Na	250mm x 8mm 300mm x 8mm 50mm x 8mm 30mm x 8mm	

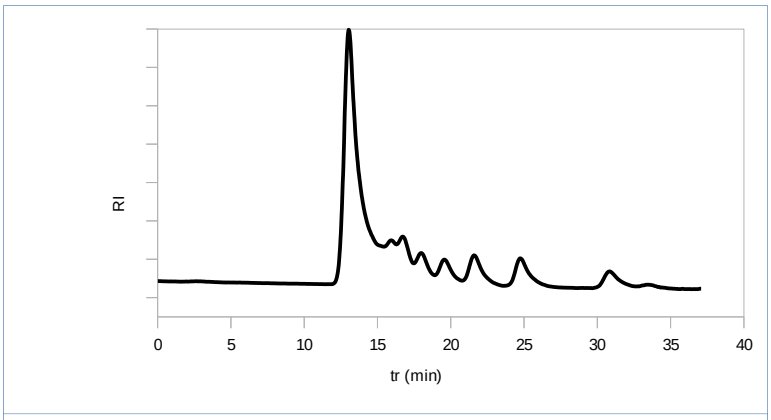


D-Glucose



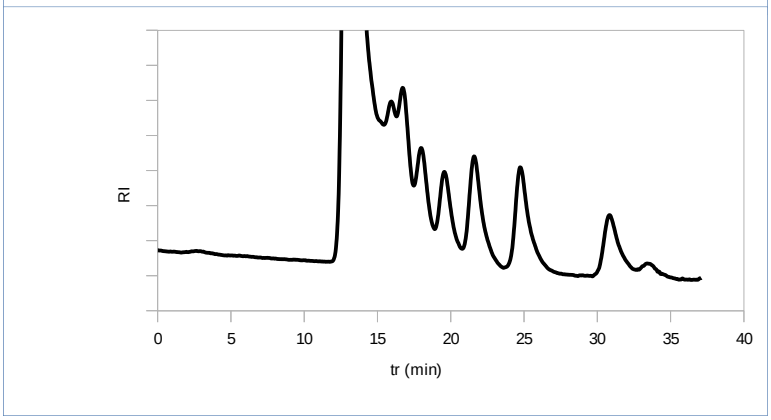
L-Glucose

Oligosaccharide analysis in water



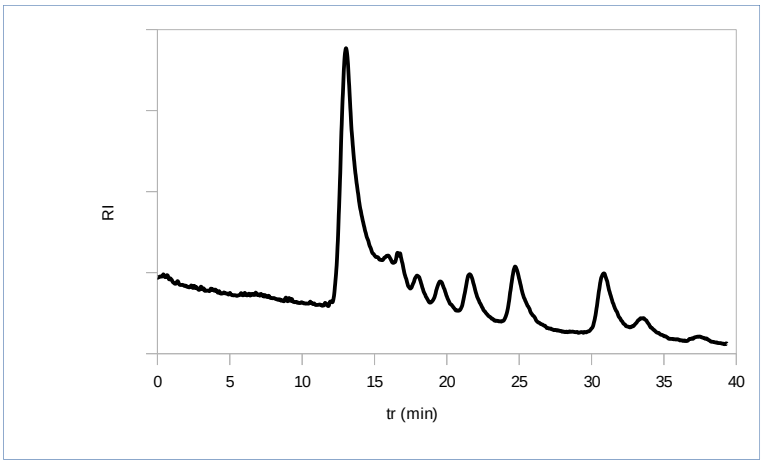
Analyte: **Maltodextrin 19**

Column:	AppliChrom ABOA SugarSep-Oligo
Dimension:	300mm x 8mm
Mobil Phase:	H_2O
Flow:	0,25ml/min
Temperature:	70°C
Detection:	RI
Injection:	20µl sample



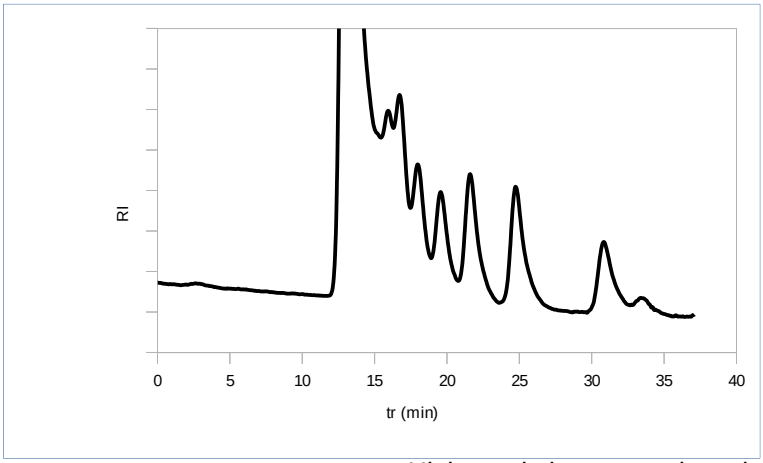
Analyte: **Maltodextrin 19**
Detailed view

Column:	AppliChrom ABOA SugarSep-Oligo
Dimension:	300mm x 8mm
Mobil Phase:	H_2O
Flow:	0,25ml/min
Temperature:	70°C
Detection:	RI
Injection:	20µl sample



Analyte: **Maltodextrin 12**

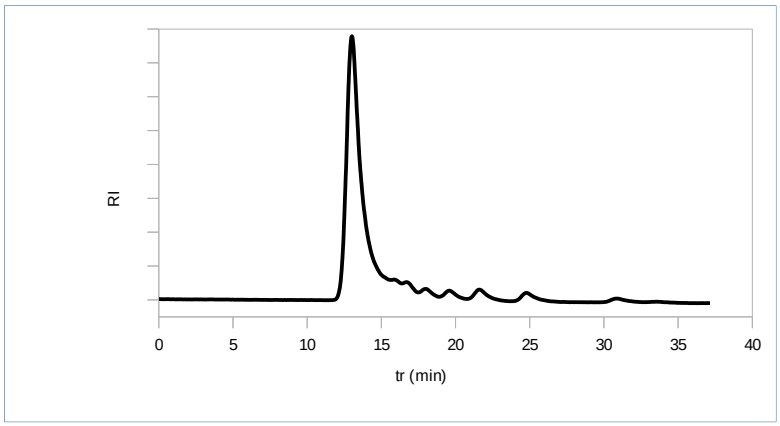
Column:	AppliChrom ABOA SugarSep-Oligo
Dimension:	300mm x 8mm
Mobil Phase:	H_2O
Flow:	0,25ml/min
Temperature:	70°C
Detection:	RI
Injection:	20µl sample



Analyte: **Maltodextrin 12**
Detailed view

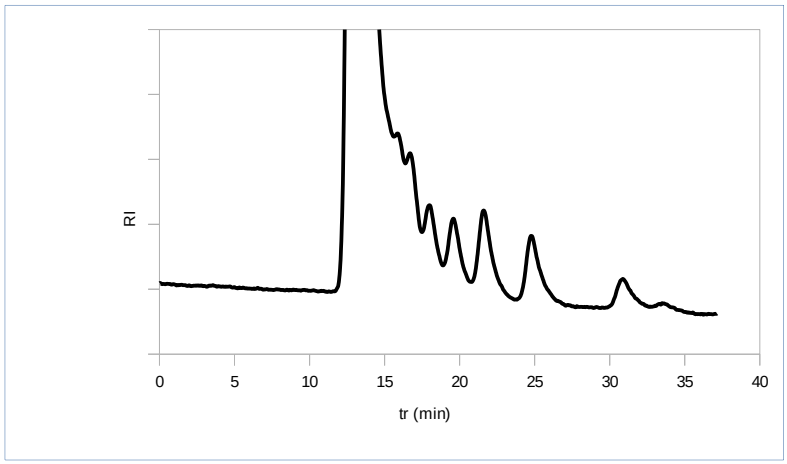
Column:	AppliChrom ABOA SugarSep-Oligo
Dimension:	300mm x 8mm
Mobil Phase:	H_2O
Flow:	0,25ml/min
Temperature:	70°C
Detection:	RI
Injection:	20µl sample

Oligosaccharide analysis in water



Analyte: **Maltodextrin 6**

Column:	AppliChrom ABOA SugarSep-Oligo
Dimension:	300mm x 8mm
Mobil Phase:	H_2O
Flow:	0,25ml/min
Temperature:	70°C
Detection:	RI
Injection:	20µl sample



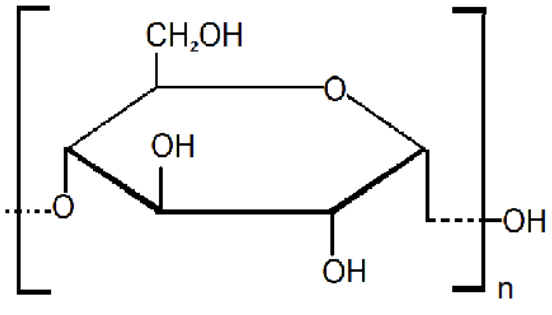
Analyte: **Maltodextrin 6**

Detail view

Column:	AppliChrom ABOA SugarSep-Oligo
Dimension:	300mm x 8mm
Mobil Phase:	H_2O
Flow:	0,25ml/min
Temperature:	70°C
Detection:	RI
Injection:	20µl sample

Oligo SEC/GPC of dextran and inulin

Catalog #	Description	Dimension	
SASOL101508 SASOL102508 SASOL103008 SASOL10508 SASOL10308	AppliChrom ABOA SugarSep-Oligo	150mmx8mm 250mm x 8mm 300mm x 8mm 50mm x 8mm 30mm x 8mm	Oligosaccharide analysis in water



α–1 , 4

Maltodextrin

AppliChrom ABOA 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 livetime
- → long column livetime for reduction of costs even at high througput 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 / polyethylenglyol, polypropylenoxide, polyethylenglycol-polypropylenglycol-copolymer, PVC/polyvinylchloride, PU / polyurethane, celluloseacetate, diallylphthalate, dialkylphthalate, alkyd resin e.g...

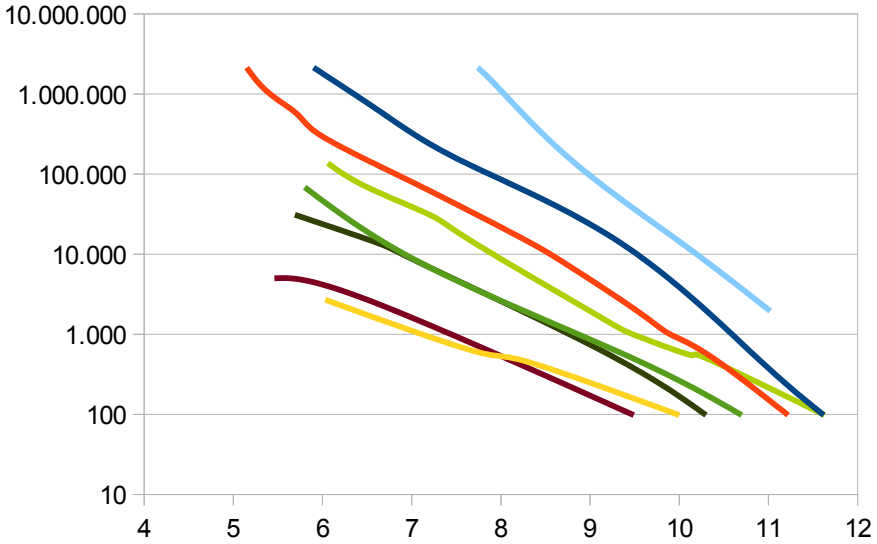
* BPT: Broad Poredistribution Technology – easy calibration curve for large range of molecular sizes; lowered calibration artefacts compared to single pore combination columns.

** 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 ABOA StyDiViBe molecular weight range and optimum range of molecular weights

	Range of molar mass	Optimum resolution
35A	100-2.500Da	<400Da
100A	100-10.000Da	ca. 800Da
500A	100-30.000Da	1.000-3.000Da
1.000A	100-70.000Da	3.000-10.000Da
1.500A – BPT	100-120.000Da*)	4.000–15.000Da
10^5A - BPT	500-1.500.000Da*)	10.000-150.000Da
10^6A - BPT	1000-4.000.000Da*)	20.000-400.000Da
10^7A - BPT	1000->10.000.000Da*)	30.000-2.000.000Da

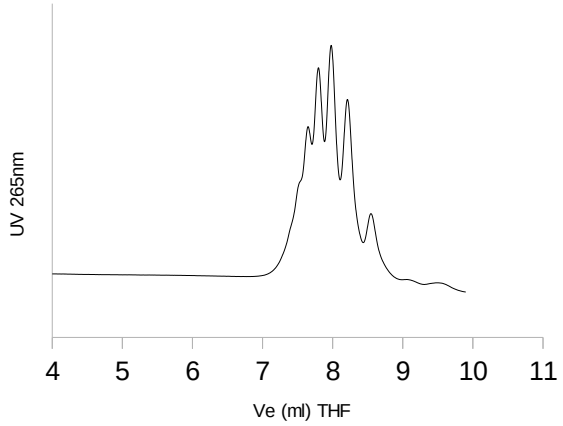
Molecular sizes range of AppliChrom ABOA StyDiViBe GPC-Serie in detail:
THF GPC-Calbration curves



Analyte:	**PMMA Standards**
Column:	AppliChrom ABOA StyDiViBe-P-**35Å** AppliChrom ABOA StyDiViBe-P-**100Å** AppliChrom ABOA StyDiViBe-P-**500Å** AppliChrom ABOA StyDiViBe-P-**1000Å** AppliChrom ABOA StyDiViBe-P-**1500Å** AppliChrom ABOA StyDiViBe-P-**10^5Å** AppliChrom ABOA StyDiViBe-P-**10^6Å** AppliChrom ABOA StyDiViBe-P-**10^7Å**
Dimension:	e.a. 300mm x 8mm
Mobil Phase:	THF
Flow:	1,0ml/min
Temperature:	20°C
Detection:	RI
Injection:	100µl sample

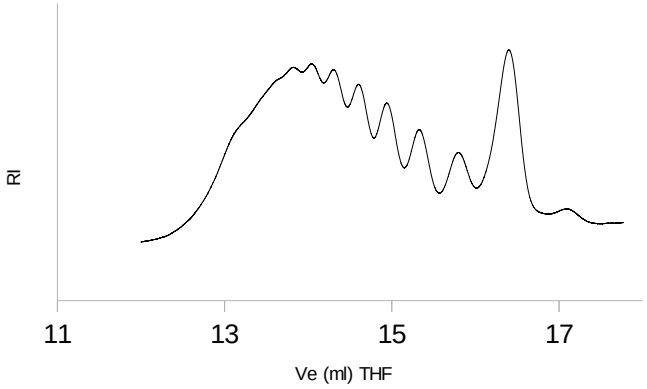
To cover a large range of molecular sizes GPC columns of suited porosities can be combined. This is the typical state of the art in many GPC laboratories. Also now it is useful if a special range of molecular sizes should be zoomed by GPC. But – in some single cases this also results in more or less 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.



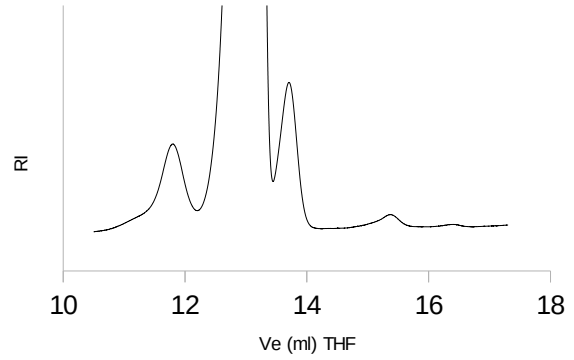
Analyte: **Polystryrene (PS)**
Mp = 578Da

Column:	AppliChrom ABOA StyDiV-Be-P-35Å
Dimension:	300mm x 8mm
Mobil Phase:	THF
Flow:	1,0ml/min
Temperature:	20°C
Detection:	UV 265nm
Injection:	20µl sample



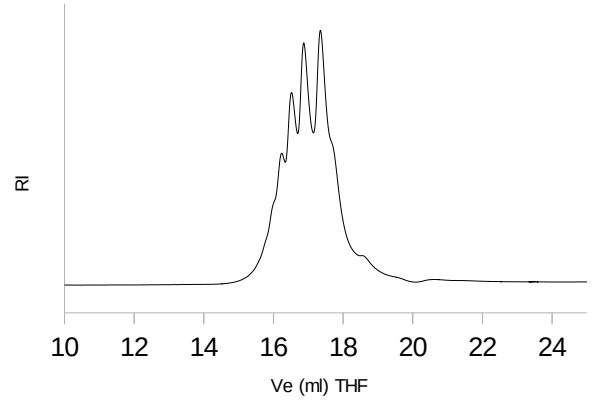
Analyte: **Polymethylmethacrylate (PMMA) oligomer**

Column:	AppliChrom ABOA StyDiV-Be-P-100Å
Dimension:	2x 300mm x 8mm
Mobil Phase:	THF
Flow:	1,0ml/min
Temperature:	20°C
Detection:	RI
Injection:	20µl sample



Analyte: **Grapeoil (Triglyceride GPC)**

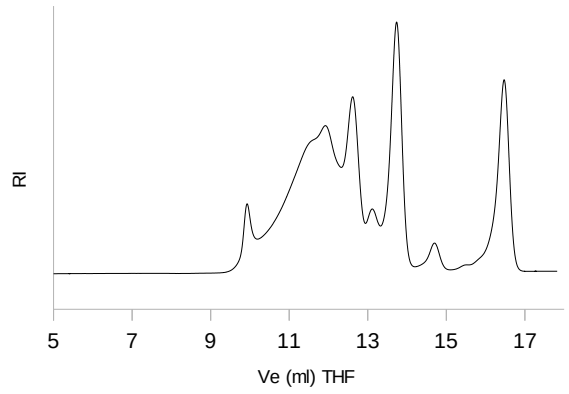
Column:	AppliChrom ABOA StyDiV-Be-P-100Å
Dimension:	2x 300mm x 8mm
Mobil Phase:	THF
Flow:	1,0ml/min
Temperature:	20°C
Detection:	RI
Injection:	20µl sample



Analyte: **Polyethylene glycol (PEG)**
Mp = 200Da

Column:	AppliChrom ABOA StyDiV-Be-P-100Å
Dimension:	2x 300mm x 8mm
Mobil Phase:	THF
Flow:	1,0ml/min
Temperature:	20°C
Detection:	RI
Injection:	20µl sample

Hydrophilic technical polymers

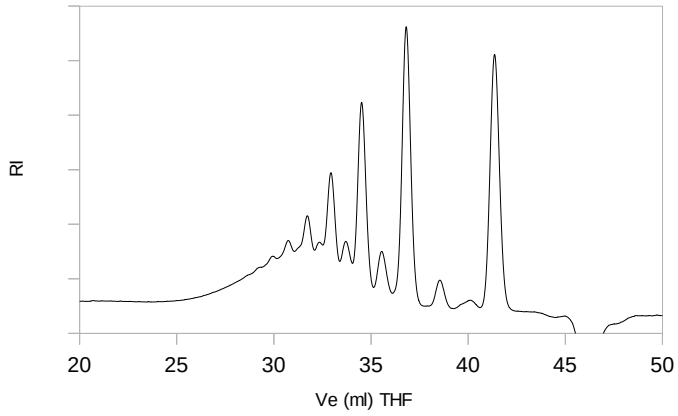


Pore to small

Analyte: **Bisphenol-A-Epichlorhydrin resin (I)**

Column:	AppliChrom ABOA StyDiV-Be-P-100Å
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.

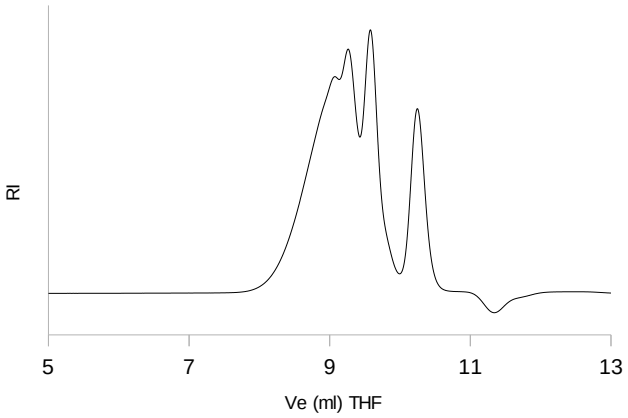


Pore perfect

Analyte: **Bisphenol-A-Epichlorhydrin resin (I)**

Column:	AppliChrom ABOA StyDiV-Be-P-1500Å-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 100-120.000Da, obtained from the special AppliChrom BPT-technology. No „surprising“ porosity artefacts from mixing particles with pores of differnent size for covering the full range of molecular sizes. Great resolution even if 8µl RI measuring cell is used.

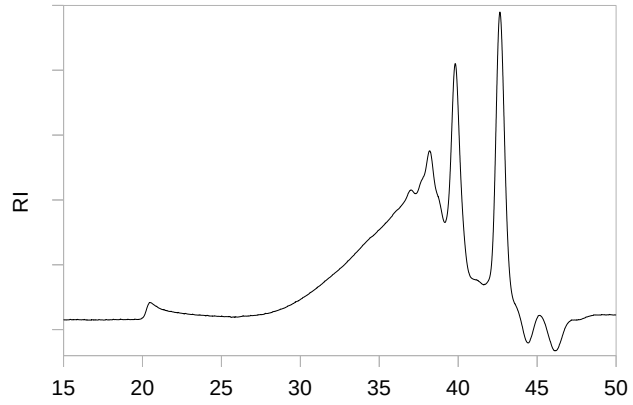


Pore to large

Analyte: **Bisphenol-A-Epichlorhydrin resin (I)**

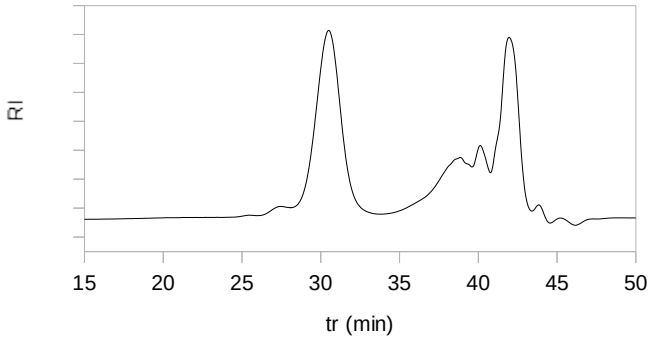
Column:	AppliChrom ABOA StyDiV-Be-P-10E5Å-BPT
Dimension:	300mm x 8mm
Mobil Phase:	THF
Flow:	1,0ml/min
Temperature:	20°C
Detection:	RI
Injection:	20µl sample

Good linearity from monomer up to 1.5Mio Dalton, ideal for porosity gap artefact reduced GPC screening of large ranges of molecular weights combined with maintaining of oligomer resolution



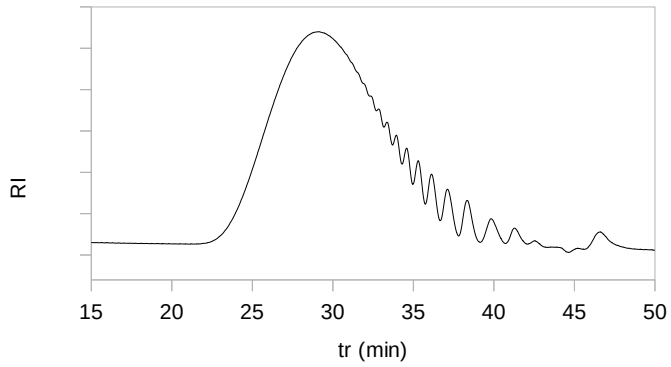
Analyte: **Polyol hard foam**

Column:	AppliChrom ABOA StyDiV-Be-P-1500Å-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**

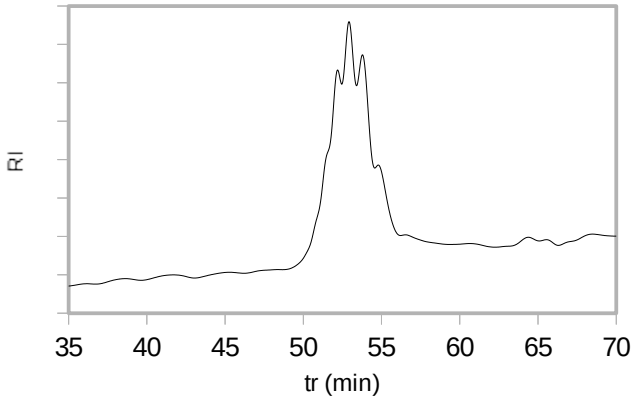
Column:	AppliChrom ABOA StyDiV-Be-P-1500Å-BPT
Dimension:	2x 300mm x 8mm
Mobil Phase:	THF
Flow:	0,5ml/min
Temperature:	45°C
Detection:	RI
Injection:	20µl sample



Analyte: **Aliphatic polyester**

(adipate polyester)
including fingerprint

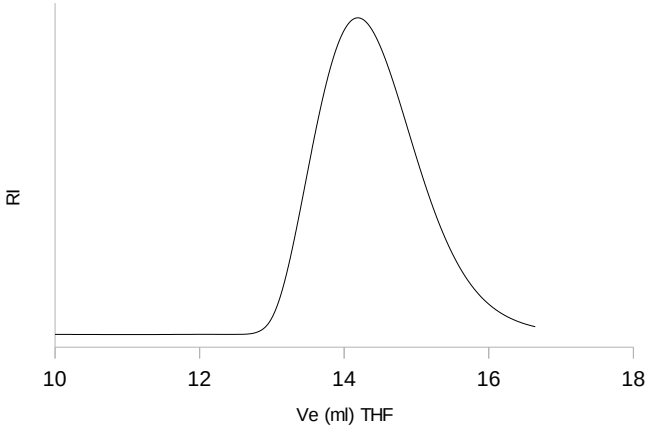
Column:	AppliChrom ABOA StyDiV-Be-P-1500Å-BPT
Dimension:	2x 300mm x 8mm
Mobil Phase:	THF
Flow:	0,5ml/min
Temperature:	45°C
Detection:	RI
Injection:	20µl sample



Analyte: **Polyether polyol**

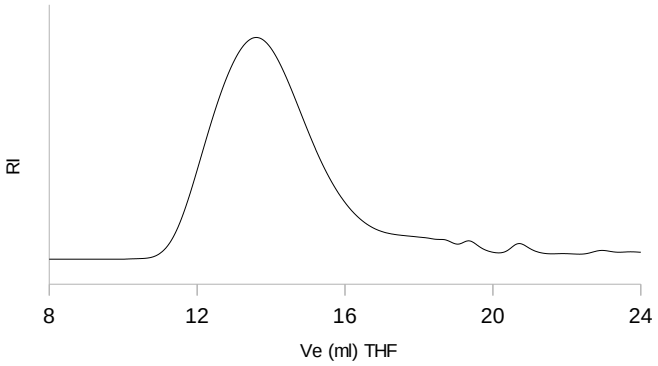
Column:	AppliChrom ABOA StyDiV-Be-P-1500Å-BPT
Dimension:	2x 300mm x 8mm 1x 50mmx 8mm
Mobil Phase:	THF
Flow:	0,5ml/min
Temperature:	45°C
Detection:	RI
Injection:	20µl sample

High resolution



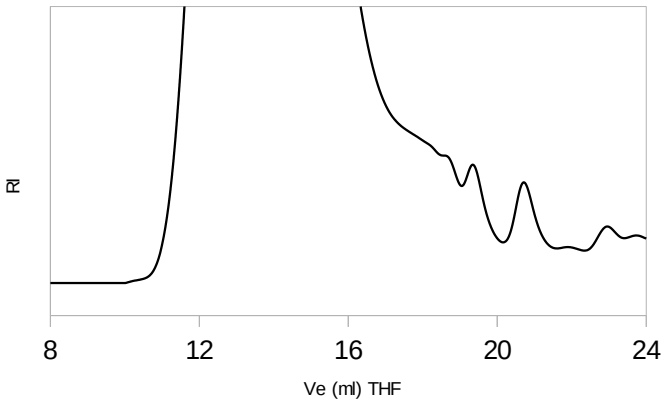
Analyte: **PVC**

Column:	AppliChrom ABOA StyDiV-Be-P-10E5Å-BPT
Dimension:	2x 300mm x 8mm
Mobil Phase:	THF
Flow:	1,0ml/min
Temperature:	45°C
Detection:	RI
Injection:	20µl sample



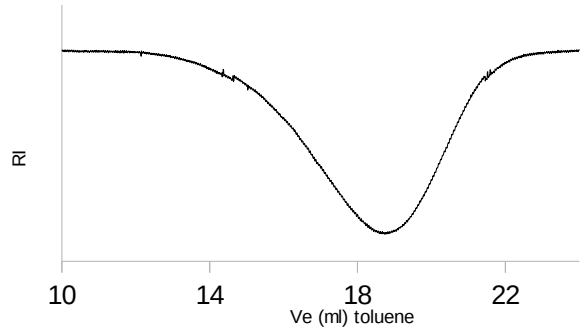
Analyte: **PMMA**

Column:	AppliChrom ABOA StyDiV-Be-P-10E5Å-BPT
Dimension:	2x 300mm x 8mm
Mobil Phase:	THF
Flow:	1,0ml/min
Temperature:	45°C
Detection:	RI
Injection:	20µl sample



Analyte: **PMMA enlarged**

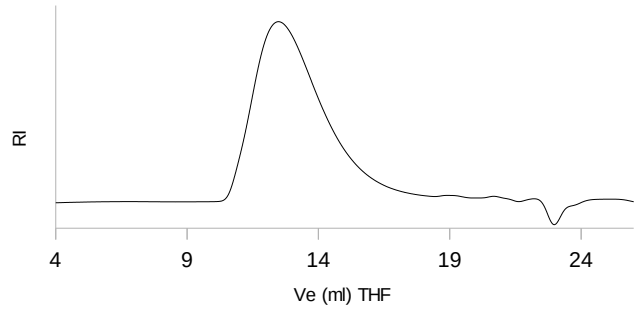
Column:	AppliChrom ABOA StyDiV-Be-P-10E5Å-BPT
Dimension:	2x 300mm x 8mm
Mobil Phase:	THF
Flow:	1,0ml/min
Temperature:	45°C
Detection:	RI
Injection:	20µl sample



Analyte: **Silicone**

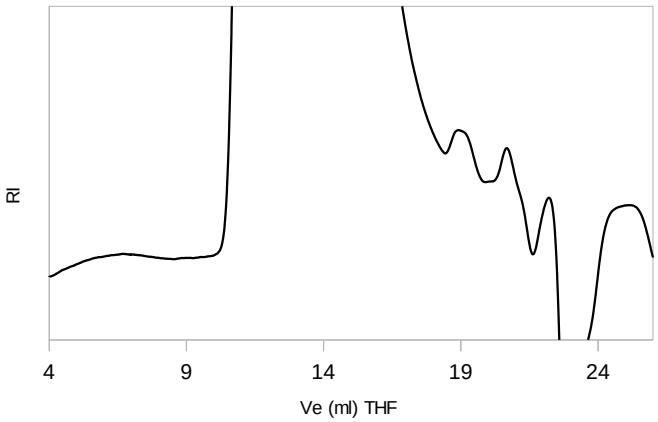
Column:	AppliChrom ABOA StyDiV-Be-P-10E5Å-BPT
Dimension:	2x 300mm x 8mm
Mobil Phase:	Toluene
Flow:	1,0ml/min
Temperature:	20°C
Detection:	RI
Injection:	20µl sample

Broad calibration range, no porosity artefacts observed



Analyte: **Polystyrene**

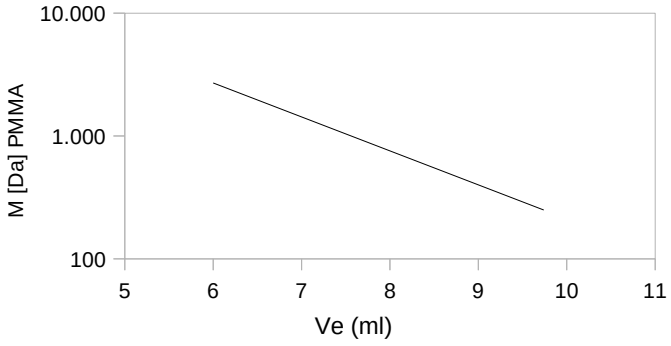
Column:	AppliChrom ABOA StyDiV-Be-P-10E5Å-BPT
Dimension:	2x 300mm x 8mm
Mobil Phase:	THF
Flow:	1,0ml/min
Temperature:	45°C
Detection:	RI
Injection:	20µl sample



Analyte: **Polystyrene enlarged**

Column:	AppliChrom ABOA StyDiV-Be-P-10E5Å-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]

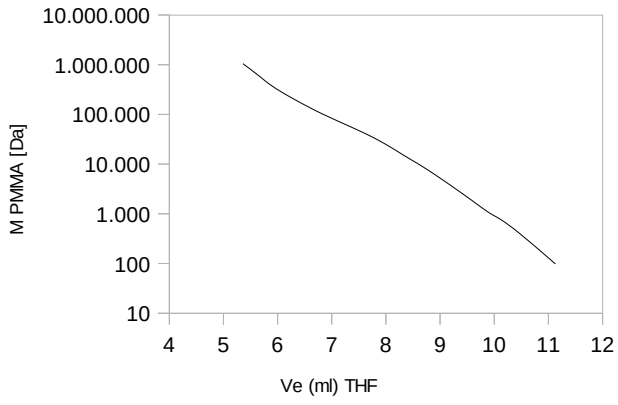


Ve vs. M (PMMA)

GPC calibration curve

Column:	AppliChrom ABOA StyDiV-Be-P-35Å
Dimension:	300mm x 8mm
Mobil Phase:	THF
Flow:	1,0ml/min
Temperature:	45°C
Detection:	RI
Injection:	20µl sample

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



GPC calibration curve

Column:	AppliChrom ABOA StyDiV-Be-P-10E5Å-BPT
Dimension:	2x 300mm x 8mm
Mobil Phase:	THF
Flow:	1,0ml/min
Temperature:	20°C
Detection:	RI
Injection:	20µl sample

AppliChrom ABOA StDiViBe 10E5A BPT-Technology: Large calibration range respective good to calculate calibration curve from monomer up to 1.5Mio Dalton, 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 ABOA StyDiViBe-P

Catalog #	Description	Dimension	Separation Range
ASDVBP352508 ASDVBP353008 ASDVBP35508 ASDVBP35308	AppliChrom ABOA StyDiViBe-P-35Å	250mm x 8mm 300mm x 8mm 50mm x 8mm 30mm x 8mm	100Da-2.500Da
ASDVBP1002508 ASDVBP1003008 ASDVBP100508 ASDVBP100308	AppliChrom ABOA StyDiViBe-P-100Å	250mm x 8mm 300mm x 8mm 50mm x 8mm 30mm x 8mm	100Da-10.000Da
ASDVBP5002508 ASDVBP5003008 ASDVBP500508 ASDVBP500308	AppliChrom ABOA StyDiViBe-P-500Å	250mm x 8mm 300mm x 8mm 50mm x 8mm 30mm x 8mm	100Da-30.000Da
ASDVBPE3X2508 ASDVBPE3X3008 ASDVBPE3X508 ASDVBPE3X308	AppliChrom ABOA StyDiViBe-P-1000Å	250mm x 8mm 300mm x 8mm 50mm x 8mm 30mm x 8mm	100Da-70.000Da
ASDVBP15002508 ASDVBP15003008 ASDVBP1500508 ASDVBP1500308	AppliChrom ABOA StyDiViBe-P-1500Å	250mm x 8mm 300mm x 8mm 50mm x 8mm 30mm x 8mm	1.00Da-120.000Da
ASDVBPE4X2508 ASDVBPE4X3008 ASDVBPE4X508 ASDVBPE4X308	AppliChrom ABOA StyDiViBe-P-10^4Å	250mm x 8mm 300mm x 8mm 50mm x 8mm 30mm x 8mm	100Da-400.000Da
ASDVBPE5X2508 ASDVBPE5X3008 ASDVBPE5X508 ASDVBPE5X308	AppliChrom ABOA StyDiViBe-P-10^5Å	250mm x 8mm 300mm x 8mm 50mm x 8mm 30mm x 8mm	500Da-1.5MioDa
ASDVBPE6X2508 ASDVBPE6X3008 ASDVBPE6X508 ASDVBPE6X308	AppliChrom ABOA StyDiViBe-P-10^6Å	250mm x 8mm 300mm x 8mm 50mm x 8mm 30mm x 8mm	10.000Da - 4MioDa
ASDVBPE7X2508 ASDVBPE7X3008 ASDVBPE7X508 ASDVBPE7X308	AppliChrom ABOA StyDiViBe-P-10^7Å	250mm x 8mm 300mm x 8mm 50mm x 8mm 30mm x 8mm	100.000Da - 10MioDa

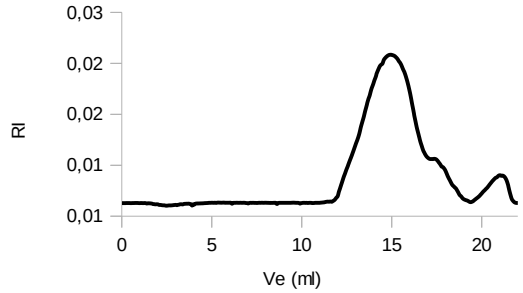
Runge picture „homemade“

AppliChrom ABOA CatPhil-P

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

For GPC / SEC analysis of

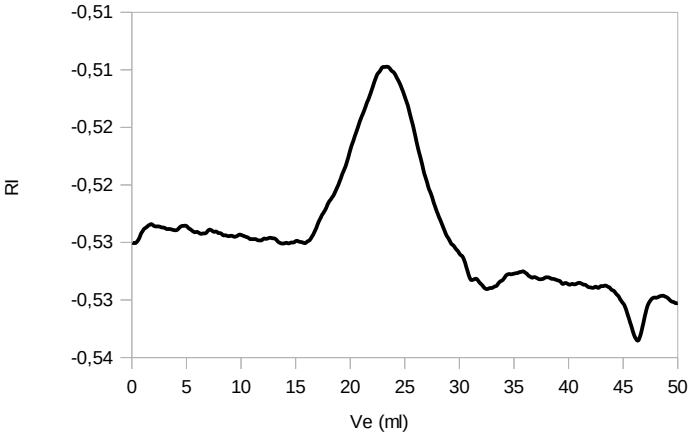
- Polycations, polyammonium compounds
- polyamines (chitosans), polyethylenimines,
- PEGylated polyethyleneimines
- polysaccharides
- polyanions (heparins, pectins, ...)



Analyte: **Poly DADMAC**

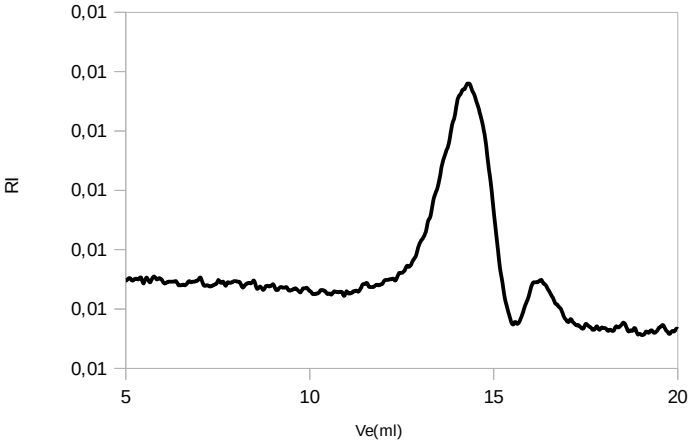
Polydiallyldimethylammonium chloride, polyquaternium-6, Mw = 100-200kDa, CAS [26062-79-3]

Column:	AppliChrom ABOA CatPhil-P-100 AppliChrom ABOA 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]

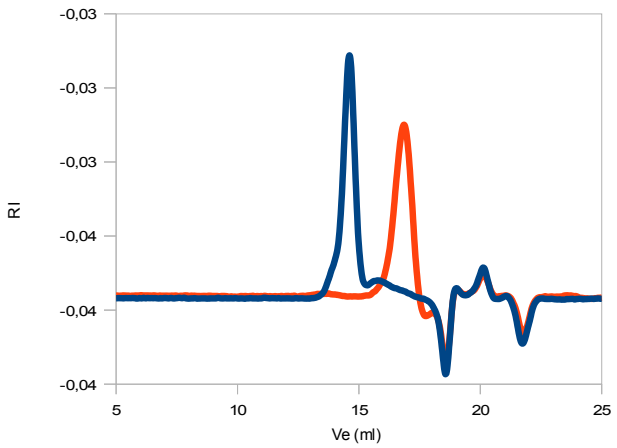
Column:	AppliChrom ABOA CatPhil-P-400
Dimension:	3x 300mm x 8mm
Mobil Phase:	$NaNO_3$ + 0,2% formic acid in H_2O
Flow:	1,0ml/min
Temperature:	20°C
Detection:	RI
Injection:	100µl sample



Analyte: **Chitosan sulfate**

Column:	AppliChrom ABOA CatPhil-P-100 AppliChrom ABOA CatPhil-P-350
Dimension:	e.a. 300mm x 8mm
Mobil Phase:	0,05MNa_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)**

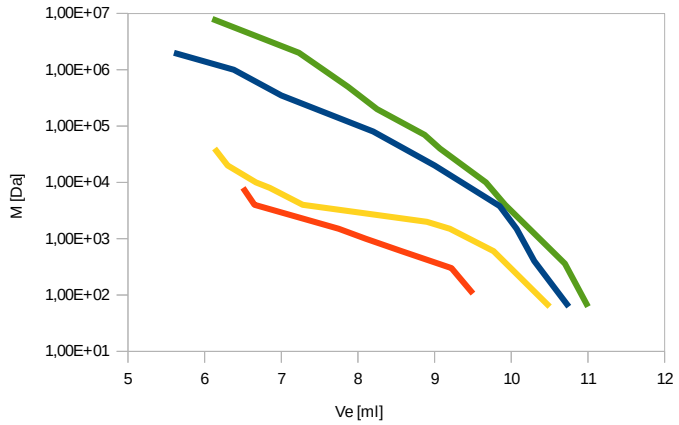
linear, PEI 150, CAS [9002-98-6]
Mn = 4x104, Mw = 4.2x104,
Mp = 3.9x104Da;

PEI (polyethyleneimine)

linear, PEI 25, CAS [9002-98-6]
Mn = 2.1x103, Mw = 2.9x103,
Mp = 2.15x103 Da

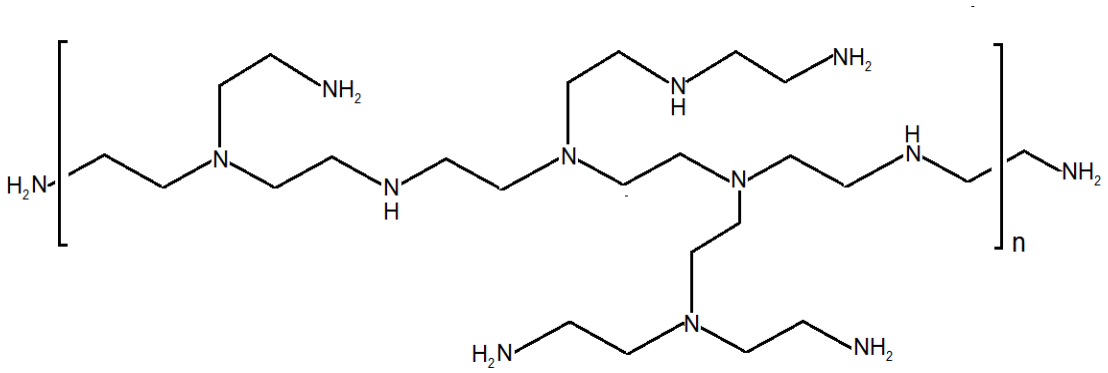
Column:	AppliChrom ABOA CatPhil-P-100 AppliChrom ABOA CatPhil-P-350
Dimension:	e.a. 300mm x 8mm
Mobil Phase:	0.1M NaCl + 0,2% TFA in H_2O
Flow:	1,0ml/min
Temperature:	20°C
Detection:	RI
Injection:	100µl sample

AppliChrom ABOA CatPhil-P Calibration curve Porosity P-100, P-200, P-350 and P400, based on dextrans



Analyte: **Dextrans**

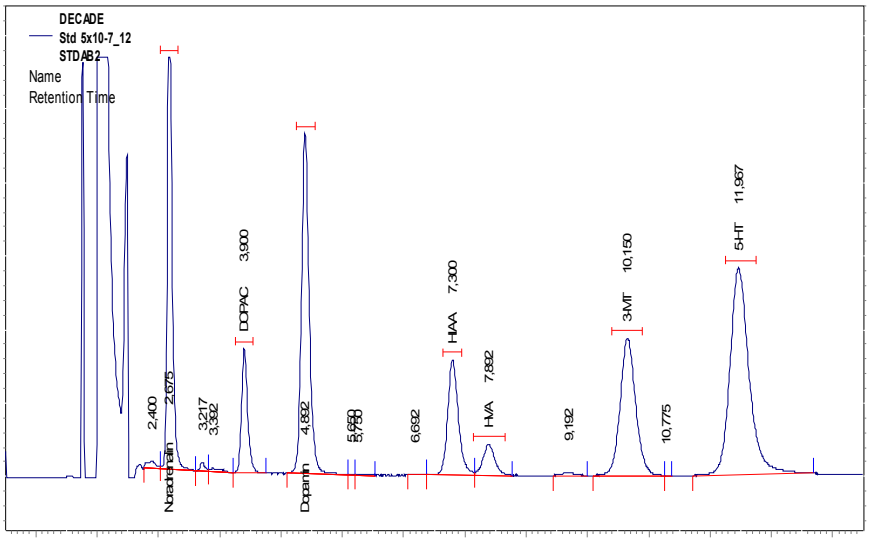
Column:	AppliChrom ABOA CatPhil-P-**100** AppliChrom ABOA CatPhil-P-**200** AppliChrom ABOA CatPhil-P-**350** AppliChrom ABOA CatPhil-P-**400**
Dimension:	e.a. 300mm x 8mm
Mobil Phase:	H_2O,
Flow:	1,0ml/min
Temperature:	20°C
Detection:	RI
Injection:	100µl sample



Polyethylenimine (PEI)

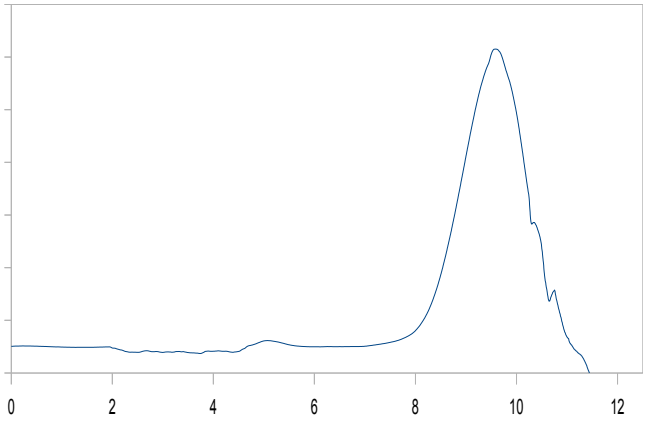
AppliChrom ABOA CatPhil-P

Catalog #	Description	Dimension	Separation Range
SACP1002508 SACP1003008 SACP100508 SACP100308	AppliChrom ABOA CatPhil-P-100	250mm x 8mm 300mm x 8mm 50mm x 8mm 30mm x 8mm	100Da-2.500Da
SACP2002508 SACP2003008 SACP200508 SACP200308	AppliChrom ABOA CatPhil-P-200	250mm x 8mm 300mm x 8mm 50mm x 8mm 30mm x 8mm	100Da-20.000Da
SACP3502508 SACP3503008 SACP350508 SACP350308	AppliChrom ABOA 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 ABOA CatPhil-P-400	250mm x 8mm 300mm x 8mm 50mm x 8mm 30mm x 8mm	10.000Da-5.000.000Da



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

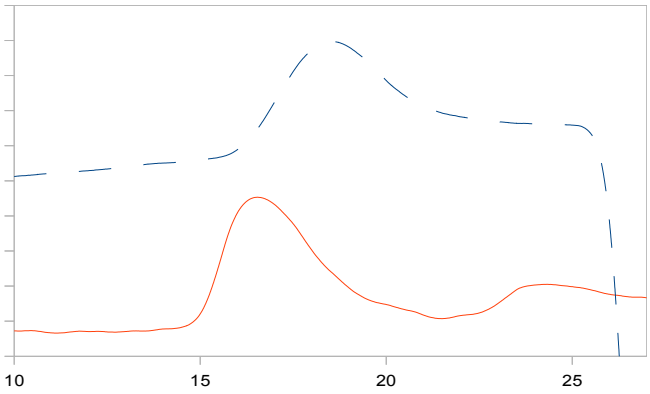
Special GPC / SEC columns for the aqueous analysis of neutral, anionic and additionally cationic polymers - JLJ series with further increased hydrophilicity for extended application range - also in pure aqueous eluents (calibration with dextran / pullulan and new: additionally with PEO / PEG or p-2-vinylpyridine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



Analyte: **Poly(2-vinylpyridine)**

CAS [25014-15-7], Mw = 40.000Da

Column:	AppliChrom ABOA CatPhil-P-350-JLJ
Dimension:	300mm x 8mm
Mobil Phase:	0.1M NaCl + 0,2% TFA in H_2O,
Flow:	1,0ml/min
Temperature:	20°C
Detection:	RI
Injection:	20µl sample

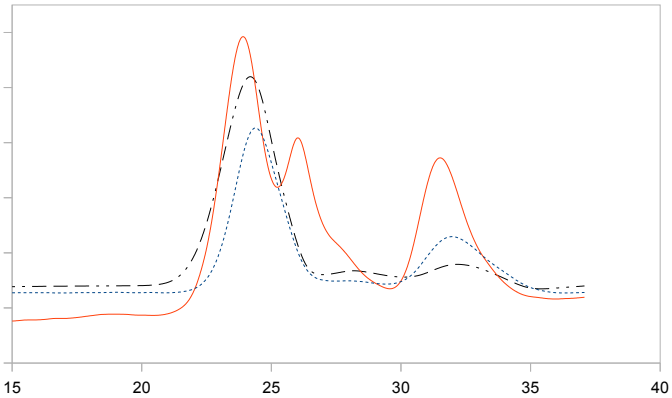


Analyte: **Polyquaternium-33**

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 ABOA CatPhil-P-100-JLJ AppliChrom ABOA CatPhil-P-350-JLJ AppliChrom ABOA CatPhil-P-500-JLJ
Dimension:	e.a. 300mm x 8mm
Mobil Phase:	0.1M NaCl + 0,2% TFA in H_2O,
Flow:	1,0ml/min
Temperature:	40°C
Detection:	RI
Injection:	100µl sample

GPC comparison 3 samples

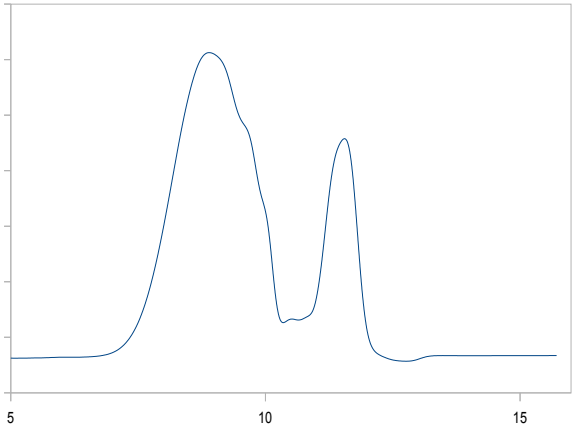


Analyte: **Poly DADMAC**

Polydiallyldimethylammonium chloride, polyquaternium-6

Mw = 100-200kDa, CAS [26062-79-3]

Column:	AppliChrom ABOA CatPhil-P-100-JLJ AppliChrom ABOA CatPhil-P-350-JLJ AppliChrom ABOA CatPhil-P-500-JLJ
Dimension:	e.a. 300mm x 8mm
Mobil Phase:	0.1M NaCl + 0,2% TFA in H_2O,
Flow:	1,0ml/min
Temperature:	40°C
Detection:	RI
Injection:	100µl sample

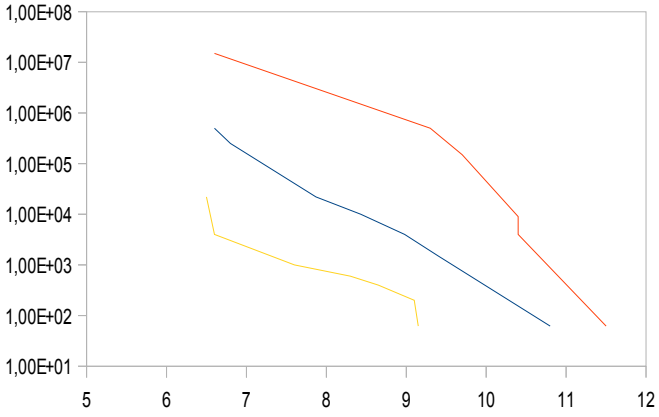


Analyte: **Poly(vinylimidazole),**
CAS [25232-42-2]

Column: AppliChrom ABOA CatPhil-P-350-JLJ

Dimension: 300mm x 8mm
Mobil Phase: 0.1M NaCl + 0,2% TFA in H_2O,
Flow: 1,0ml/min
Temperature: 20°C
Detection: RI
Injection: 20µl sample

AppliChrom ABOA CatPhil-P-JLJ Calibration curve
Porosity P-100, P-200, P-350 and P400,
based on dextrans



Analyte: **PEO**
Dextran
Polyacrylamide

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

Dimension: e.a. 300mm x 8mm
Mobil Phase: H_2O,
Flow: 1,0ml/min
Temperature: 20°C
Detection: RI
Injection: 100µl sample

AppliChrom ABOA CatPhil-P-JLJ

Catalog #	Description	Dimension	Separation Range
SACP100JLJ2508 SACP100JLJ3008 SACP100JLJ508 SACP100JLJ308	AppliChrom ABOA CatPhil-P-100-JLJ	250mm x 8mm 300mm x 8mm 50mm x 8mm 30mm x 8mm	100Da-2.500Da
SACP350JLJ2508 SACP350JLJ3008 SACP350JLJ508 SACP350JLJ308	AppliChrom ABOA CatPhil-P-350-JLJ	250mm x 8mm 300mm x 8mm 50mm x 8mm 30mm x 8mm	2.500Da-1.000.000Da
SACP500JLJ2508 SACP500JLJ3008 SACP500JLJ508 SACP500JLJ308	AppliChrom ABOA CatPhil-P-500-JLJ	250mm x 8mm 300mm x 8mm 50mm x 8mm 30mm x 8mm	10.000Da- ~50.000.000Da

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.

Errors and changes excepted. Products for research and development. Not tested for clinical, diagnostic or food applications.

AppliChrom® ABOA 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

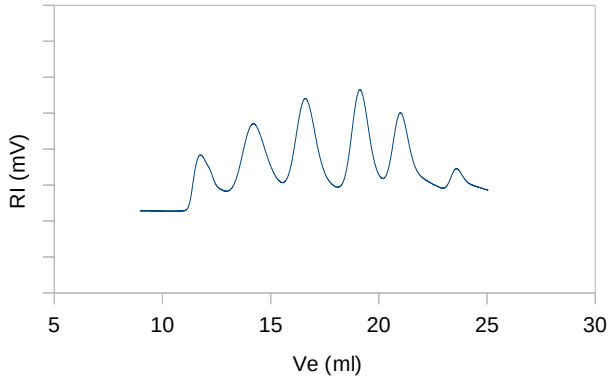
HFIP Accessories:

5mM CF_3COOK or 0.075M CF_3COONa are added to the eluent HFIP for the suppression of electrostatic interactions and for artefact-free GPC.

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

- → very large pore volume for high GPC resolution
- → high GPC resolution for oligomers / condensates of 100-70,000Da
- → high resolution GPC separation for the range 100-800.000Da
- → 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 ABOA StyDiViBe in CHCl3, for polyethylenimine (PEI) - see also: AppliChrom ABOA CatPhil-P in H_2O

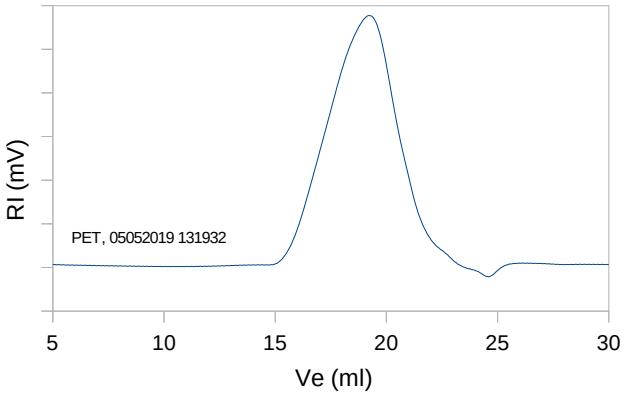


Analyte: **Polymethylmethacrylat**

(PMMA), CAS 9011-14-7, CAS131-17-2

M = 901.000, 96.760, 32.500, 3196, 540Da

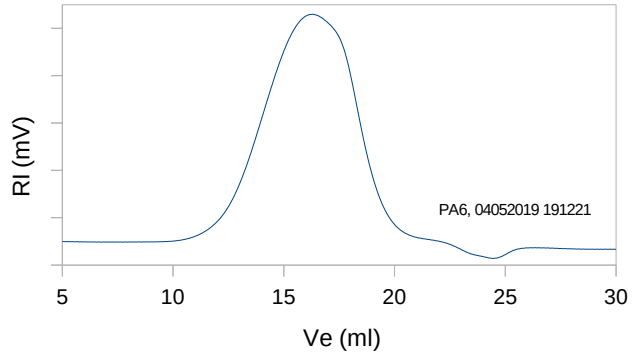
Column:	AppliChrom ABOA HFIP-Phil-P-350
Dimension:	2x 300mm x 8mm
Mobil Phase:	HFIP, 5mM CF_3COONa
Flow:	0,5ml/min
Temperature:	40°C
Detection:	RI
Injection:	100µl sample



Analyte: **Polyethylenterephthalat**

(PET), CAS 25038-59-9

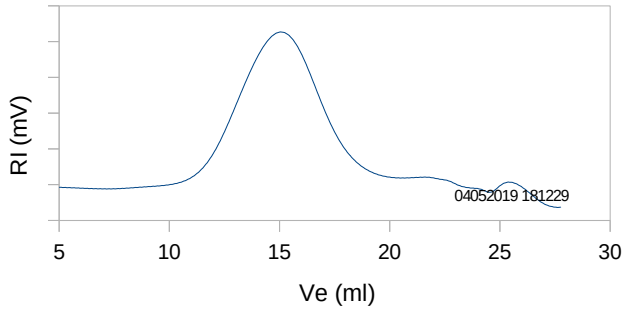
Column:	AppliChrom ABOA HFIP-Phil-P-350
Dimension:	2x 300mm x 8mm
Mobil Phase:	HFIP, 5mM CF_3COONa
Flow:	0,5ml/min
Temperature:	40°C
Detection:	RI
Injection:	100µl sample



Analyte: **Polyethylenterephthalat**

(PET), CAS 25038-59-9

Column:	AppliChrom ABOA HFIP-Phil-P-350
Dimension:	2x 300mm x 8mm
Mobil Phase:	HFIP, 5mM CF_3COONa
Flow:	0,5ml/min
Temperature:	40°C
Detection:	RI
Injection:	100µl sample



Analyte: **Polyamide 6,6 (PA6-6),**

CAS131-17-2

Column:	AppliChrom ABOA HFIP-Phil-P-350
Dimension:	2x 300mm x 8mm
Mobil Phase:	HFIP, 5mM CF_3COOK
Flow:	0,5ml/min
Temperature:	40°C
Detection:	RI
Injection:	100µl sample; 1g/l

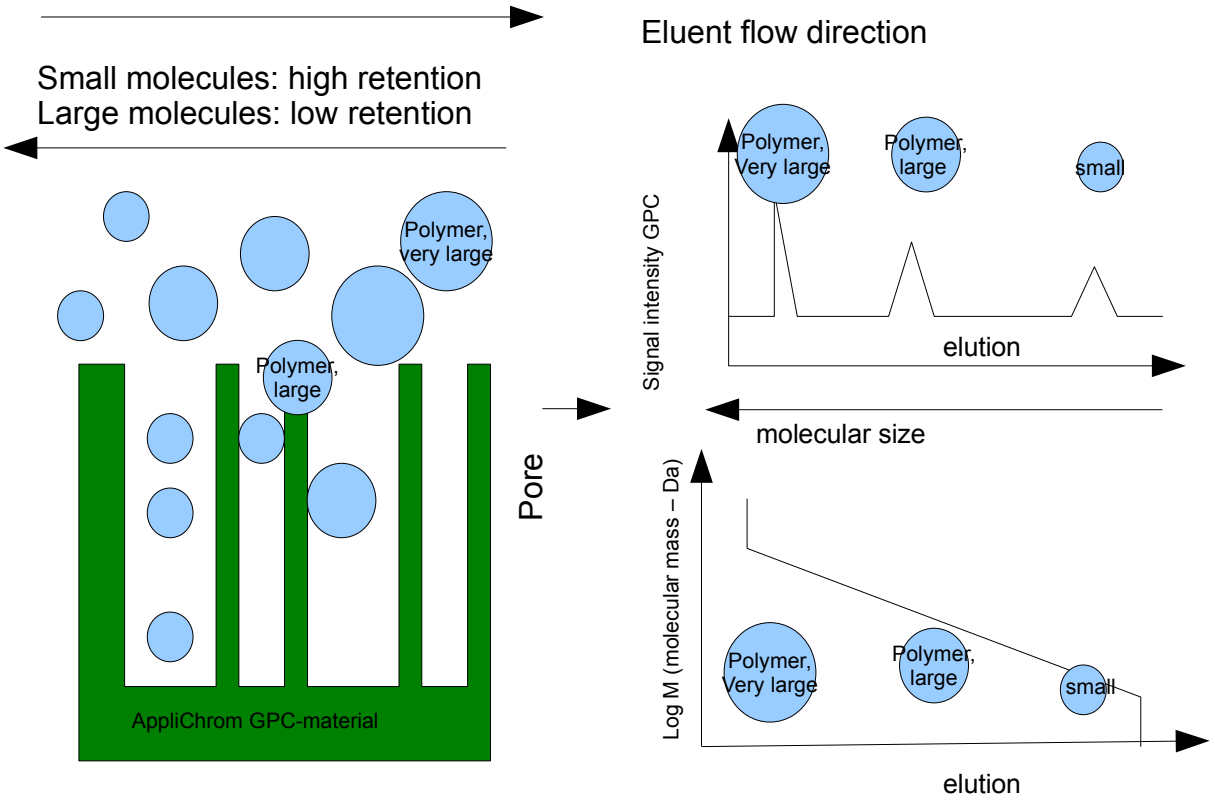
Good for many HFIP soluble polymers

AppliChrom ABOA HFIP-Phil-P

Catalog #	Description	Dimension	Separation Range
SAHFIP1002508 SAHFIP1003008 SAHFIP100508 SAHFIP100308	AppliChrom ABOA HFIP-Phil-P-100	250mm x 8mm 300mm x 8mm 50mm x 8mm 30mm x 8mm	100Da-2.500Da
SAHFIP3502508 SAHFIP3503008 SAHFIP350508 SAHFIP350308	AppliChrom ABOA 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 ABOA 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 ABOA GPC/SEC Series:

AppliChrom ABOA 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 ABOA GPC column is tested and supplied with its individual test chromatogram and specifications. For long live time of AppliChrom ABOA 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 ABOA 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 ABOA 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 to low you get extra void volumes and loss of peak performance, if distance between capillary and ferrule is to 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 to high pressure! Maybe laboratory must be continous good temperated (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 documentat 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 occure
- 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) sould 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 stepvise 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 volumns 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 livetime 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 servcie, e.g. at sales@applichrom.de

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

Installation:

a) 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 1ml / min, note the originating counterpressure.

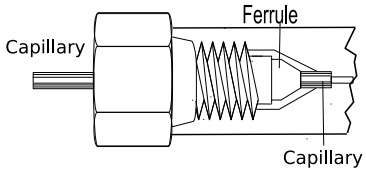
b) Connect the capillary to the column entrance with the HPLC / GPC column. Provide for the fact that the capillary is optimally connected with the column entrance. Between the capillary end and the column should be

- no dead volume originate (by to short capillary piece) – leads to line widening

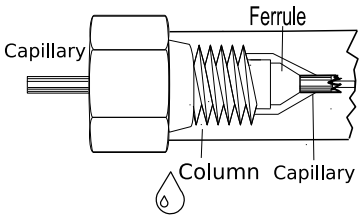
- the capillary end also not longer as the admission within the HPLC / GPC-Column– can lead to leakage in the column head.

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.

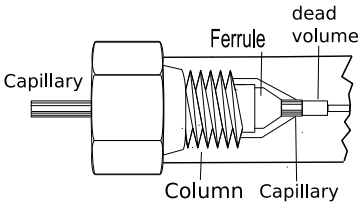
Charting of the influence of the capillary length



Capillary suitably



Capillary to long
(Column damage possibly)



Capillary to short

c) **Pump** the eluent by the HPLC / GPC system consisting of pump, injector, capillary between column and injector, column, e.g., with 1ml / min with 4.6 mm of columns ID. Let go the first eluent 2-4ml them 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 50-250mm), with 8 mm of columns ID and lengths from 250-300mm please 15-20ml 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.

d) **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 solvens, 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!

e) **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.

f) **Document** at regular intervals the system pressure.

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

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.
Only place of performance and jurisdiction is Oranienburg/Germany.
We reserve the right to make technical changes.
Our company does not participate in a consignment procedure.

*

Mixture 1	Mixture 2	Mixture 3	Mixture 4
1. Sucrose	1. Sucrose	1. Sucrose	1. Dp 3
2. Glucose	2. Glucose	2. Glucose	2. Dp 2
3. Fructose	3. Fructose	3. Fructose	3. Glucose
4. Glycerin	4. Glycerin	4. Glycerin	4. Fructose
5. Mannitol		5.Ethanol	
6. Sorbitol			

AppliChrom
Application & Chromatography
Dipl.-Ing. (FH) Susanne Dauwe
Germendorfer Allee 20
D-16515 Oranienburg
Germany

www.applichrom.de
info@applichrom.de
Phone: +49 3301 202180
Fax: +49 3301 579293