

AppliChrom®

ABOA StyDiViBe

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 (Patent pending)

- ✓ 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 than 7,8mm columns, 14% more than 7,5mm ID columns)
- ✓ plus extra high pore volume from AppliChrom GPC synthesis technology for an extra increasing of peak capacity and resolution
- ✓ proprietary AppliChrom GPC column packing procedure for accurate peak performance, low back pressures and an extension of column lifetime
- ✓ long column lifetime for reduction of costs even at high throughput screening applications
- ✓ high level of reproducibility
- ✓ high purity of AppliChrom GPC particles and columns for pure GPC mechanisms, low signal noise and reduction of „systempeaks“ after GPC run.
- ✓ GPC-examples (THF): Amylose acetat, amylose autyrat, amylose propionat, butyl rubber, cellulose diacetat, cellulosenitrat, polybutadiene, polycarbonate, polyisoprene, PMMA (polymethylmethacrylate), propylenglycol, polystyrene, polymethylstyrene, natural rubber, PVC (polyvinylchloride), polyvinylacetate, epoxid resins, polyisocyanate, polyols, polyurethans, plant oils/triglycerids/diglycerids,....
- ✓ GPC-examples (toluene): Silicones, polydimethylsiloxan.
- ✓ GPC for epoxid resins, oligomers, isocyanates, PMMA / polymethylmethacrylate, polyethylmethacrylate, PS/polystyrene, vegetable oils /triglycerides/diglycerides,...., polybutadiene, polyisoprene, silicon / siliconoil / polydimethylsiloxane (in toluene), PEG / polyethylenglycol, polypropylenoxide, polyethylenglycol-polypropyleneglycol-copolymer, PVC/polyvinylchloride, PU / polyurethane, celluloseacetate, diallylphthalate, dialkylphthalate, alkyd resin e.g..
- ✓ AppliChrom GPC columns – innovations and quality **Made in Germany**.

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

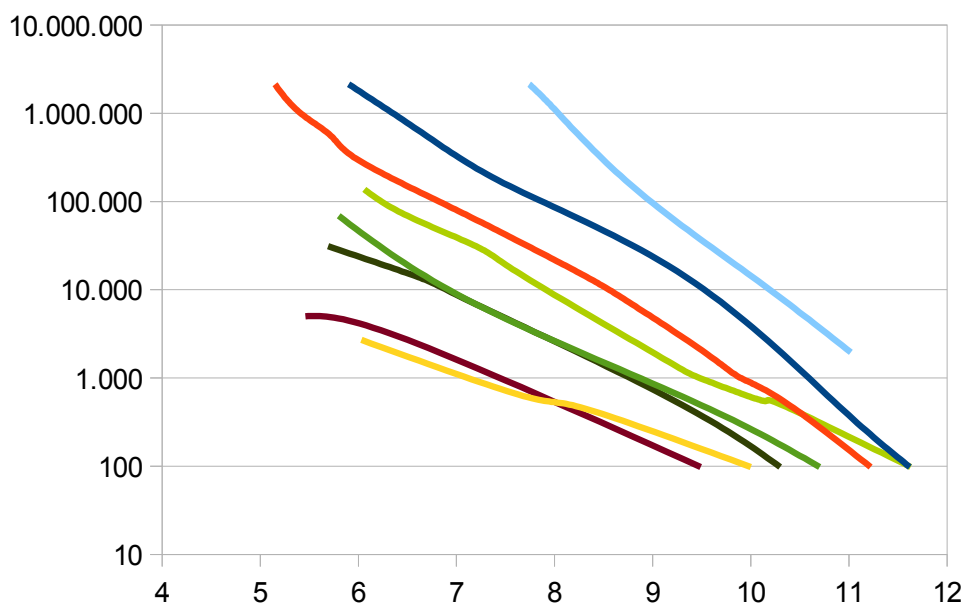
35A	100-2.500Da	<400Da
100A	100-10.000Da	ca. 800Da
500A	100-30.000Da	1.000-3.000Da
10 ³ A	100-70.000Da	3.000-10.000Da
1500A – BPT	100-120.000Da ^{*)}	4.000–15.000Da
10 ⁵ A - BPT	500-1.500.000Da ^{*)}	10.000-150.000Da
10 ⁶ A - BPT	1000-4.000.000Da ^{*)}	20.000-400.000Da
10 ⁷ A - BPT	1000->10.000.000Da ^{*)}	30.000-2.000.000Da

* 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. Do not hesitate asking us in advance – AppliChrom wants you to be successful with your **Application** in **Chromatography**.

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

THF GPC-Calibration curves Kalibrationskurven



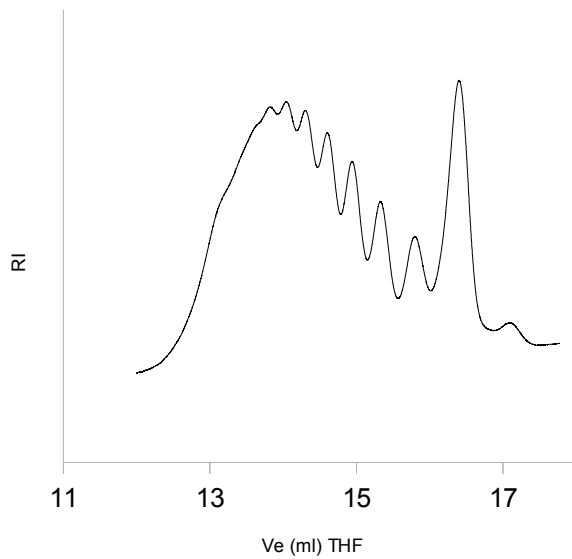
GPC-calibration curves AppliChrom ABOA StyDiViBe 300x8mm, THF, 1ml/min, PMMA standards, M[Da] vs. V_e [ml], porosities: 35A, 100A, 500A, 10³A, 1500A-BPT, 10⁵A-BPT, 10⁶A-BPT, 10⁷A-BPT

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 inhomogeneities 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 inhomogeneities phenomena and to improve the results.

Applications – Examples:

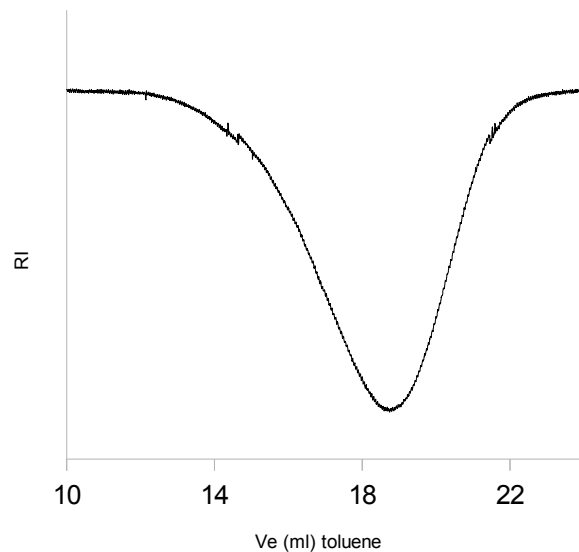
THF GPC polymethylmethacrylate (PMMA) oligomer

AppliChrom ABOA StyDiViBe 100A, 300x8mm (2x)



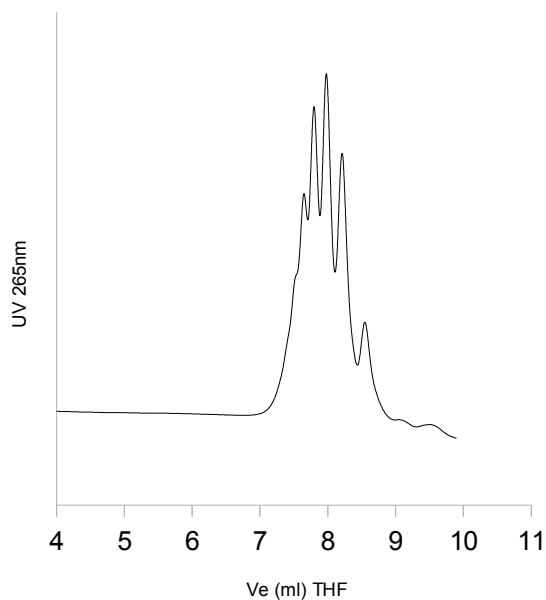
Silicone GPC in toluene

AppliChrom ABOA StyDiViBe 10E5A BPT, 300x8mm (2x)



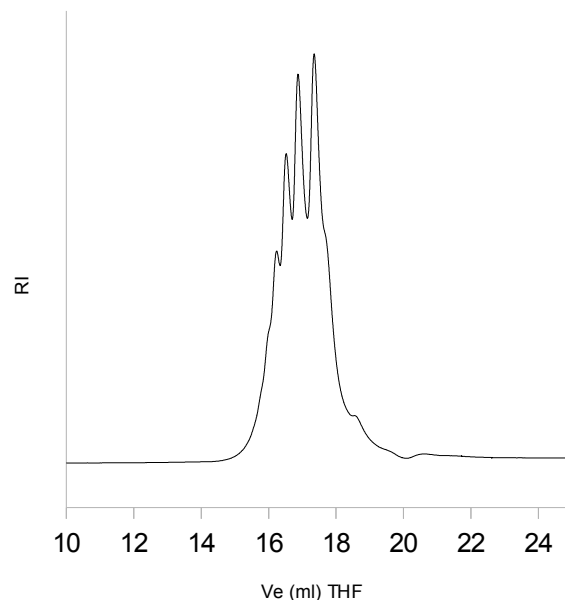
GPC Polystyrene (PS) Mp = 578Da

AppliChrom ABOA StyDiViBe 35A, 300x8mm (1x)



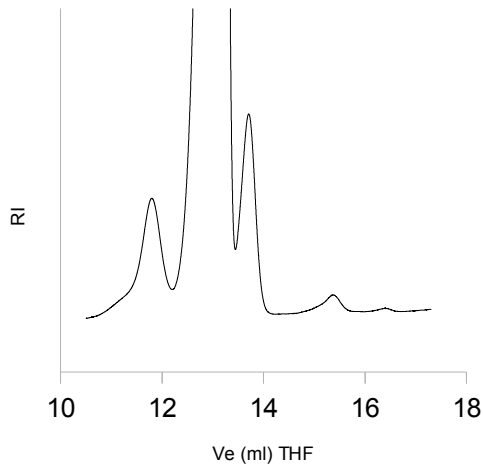
GPC Polyethylenglycol (PEG) 200Da in THF

AppliChrom ABOA StyDiViBe 100A, 300x8mm, 2x



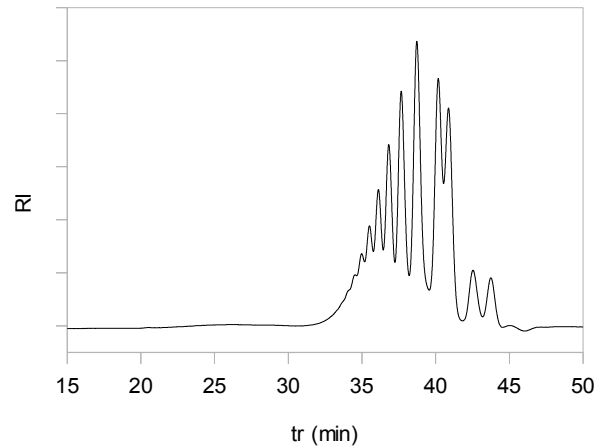
GPC Grapeoil I in THF
(Triglyceride GPC)

AppliChrom ABOA StyDiViBe 100A, 300x8mm, 2x



(aromatic polyester - polyol) GPC in THF

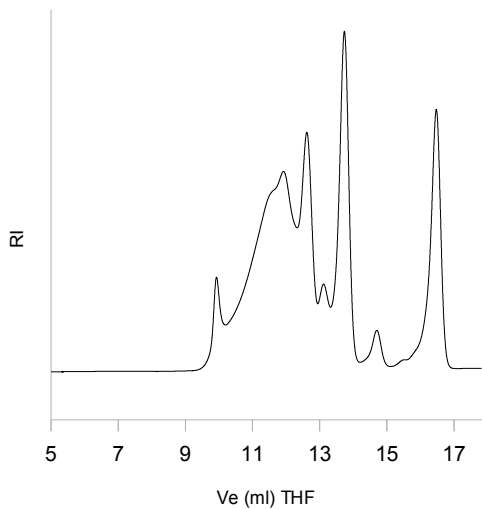
AppliChrom ABOA StyDiViBe 1500A BPT
300x8mm (2x)



GPC of one Bisphenol-A-Epichlorhydrin resin in THF measured under different conditions: Comparison of results obtained from 3 different porous GPC-columns.

Bisphenol-A-Epichlorhydrin resin (I) GPC in THF

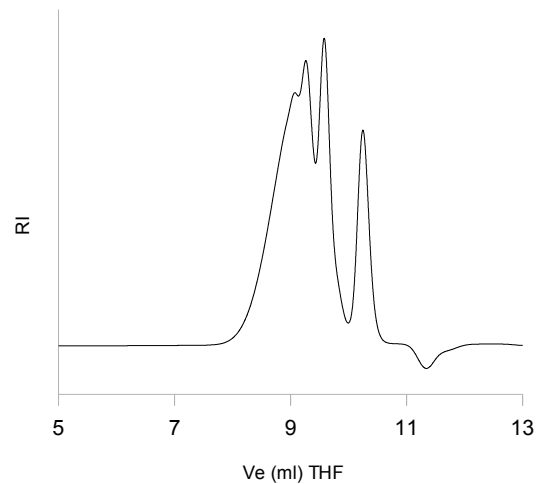
AppliChrom ABOA StyDiViBe 100A, 300x8mm (2x)



High resolving GPC up to 10.000Da.

Bisphenol-A-Epichlorhydrin resin (I) GPC in THF

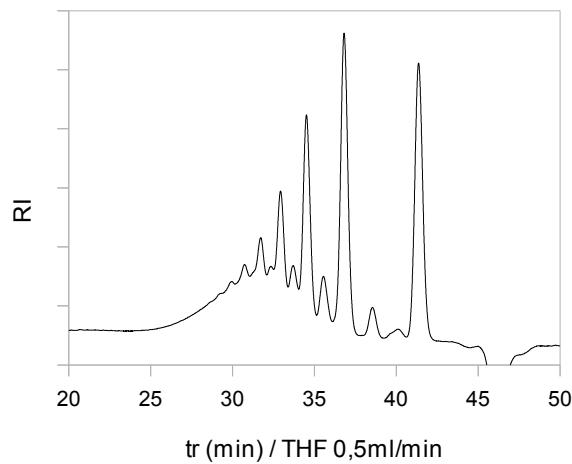
AppliChrom ABOA StyDiViBe 10E5BPT
300x8mm (1x)



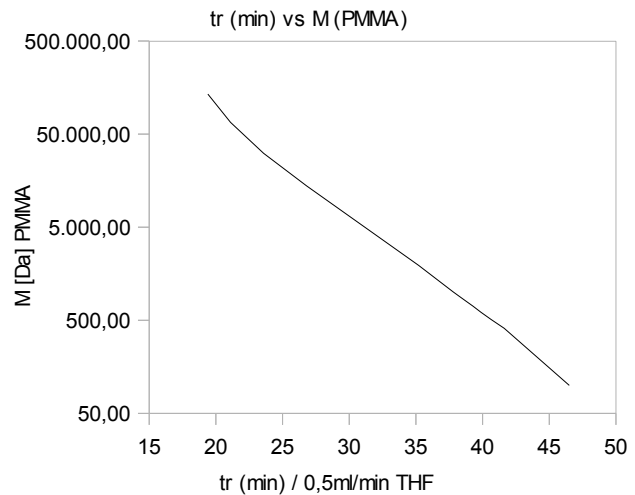
Good linearity from monomer up to 1.5Mio Dalton, ideal for porosity gap artefact reduced GPC screening of large ranges of molecular weights combined with (Erhalt) of oligomer resolution

Bisphenol-A-Epichlorhydrin resin (I) GPC in THF

AppliChrom ABOA StyDiViBe 1500A BPT
300x8mm (2x)



GPC Calibration curve
AppliChrom ABOA StyDiViBe 1500A BPT,
2 x (300x8mm)

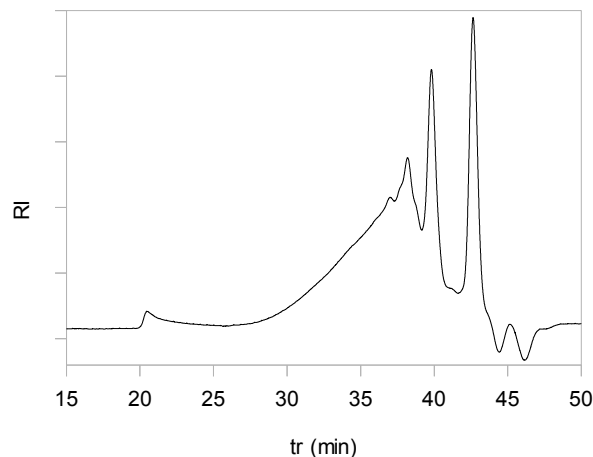


Good resolution, calibration range
respective linearity in the range of 100-
120.000Da, obtained from the special
AppliChrom BPT-technology. No
„surprising“ porosity artefacts from mixing
particles with pores of different size for
covering the full range of molecular sizes.
Great resolution even if 8µl RI measuring
cell is used.

Oligomer and Polymer GPC from 100-120.000Da for optimized resolution in THF GPC performed with AppliChrom ABOA StyDiViBe 1500A BPT columns – no mixing of poresizes resulting in a easy to handle calibration of this system!

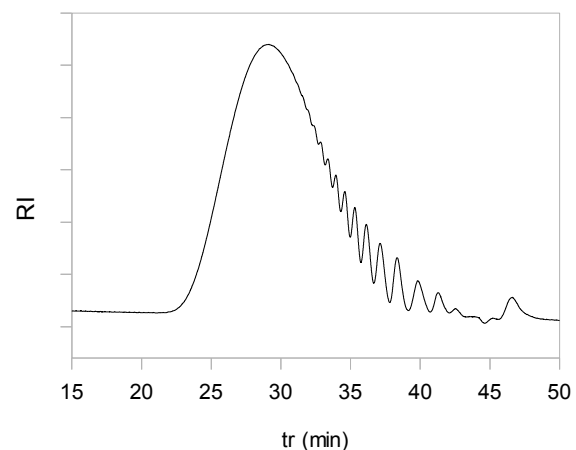
Polyol hard foamCL30082017/120201

2 x AppliChrom ABOA StyDiViBe 1500A BPT, 0,5ml/min THF, 45°C
Delta-P measured (total system) = 25-28bar



aliphatic polyester (adipate polyester) including fingerprint
CL30082017/001659 GPC in THF

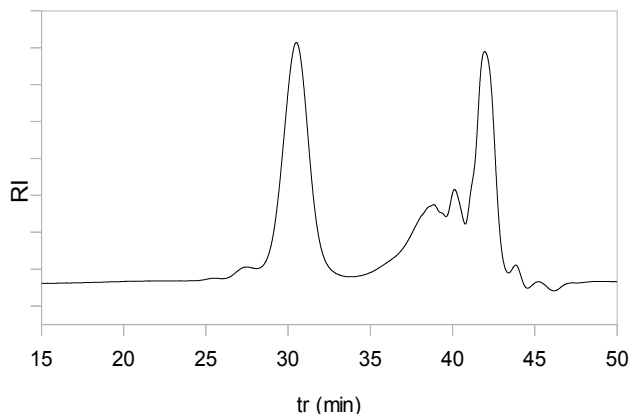
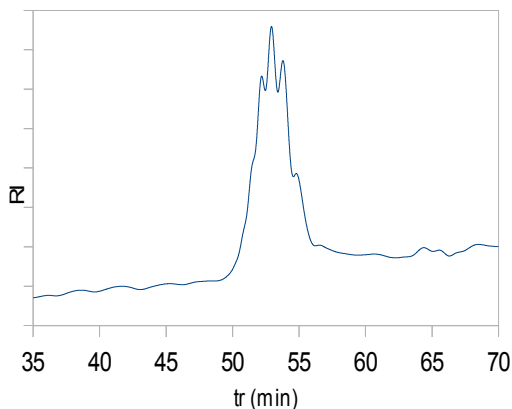
2 x (300x8mm) AppliChrom ABOA StyDiViBe 1500A BPT,
0,5ml/min THF, 45°C,



Polyether polyol CL24092017/170145CP450

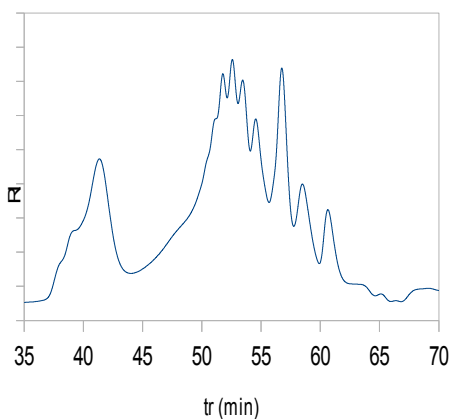
Polyol soft foam CL30082017/125654

3 x AppliChrom ABOA StyDiViBe 1500A BPT (300x8mm) + Vorsäule (50x8mm) x AppliChrom ABOA StyDiViBe 1500A BPT, 0,5ml/min in THF, 45°C, Delta-P measured (total system) = 34bar



Soft foam CL25092017/092622

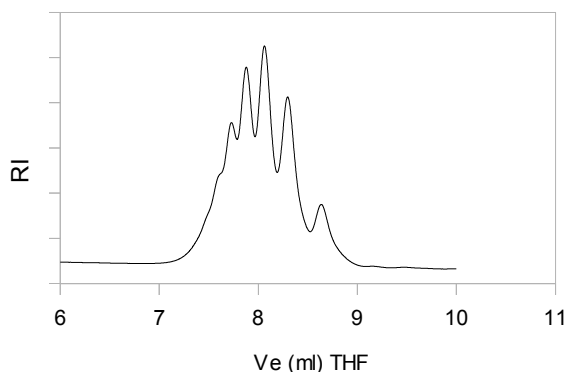
3 x AppliChrom ABOA StyDiViBe 1500A BPT, 0,5ml/min (300x8mm) + Vorsäule (50x8mm), 0,5ml/min, THF, 45°C, Delta-P measured (total system) = 34bar



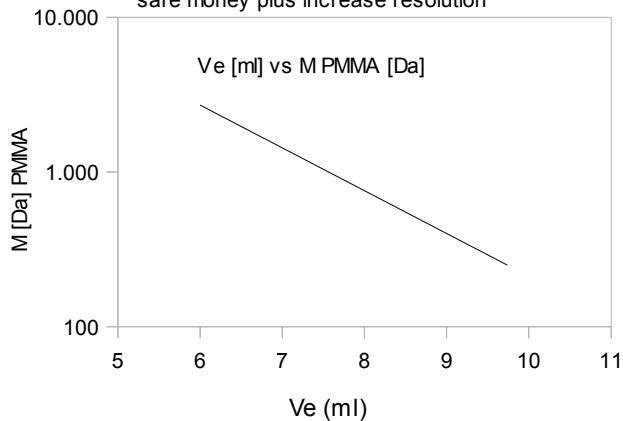
GPC of very low molecular weight oligomers performed with extreme high resolution (100-3.000Da); AppliChrom ABOA StyDiViBe 35A BPT:

Styrene oligomers GPC in THF (Mp = 578g/mol)

GPC-column: 1 x AppliChrom ABOA StyDiViBe 35A BPT, 300x8mm

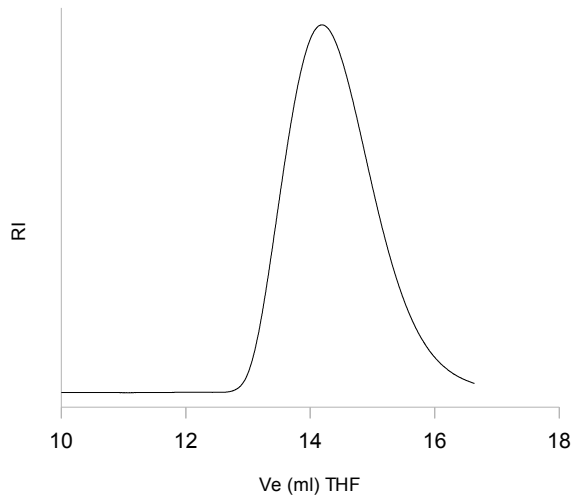


GPC calibration cuve AppliChrom ABOA StyDiViBe 35A BPT 300x8mm (large pore volume plus low exclusion limit for high oligomer resolution even with low backpressure); safe money plus increase resolution

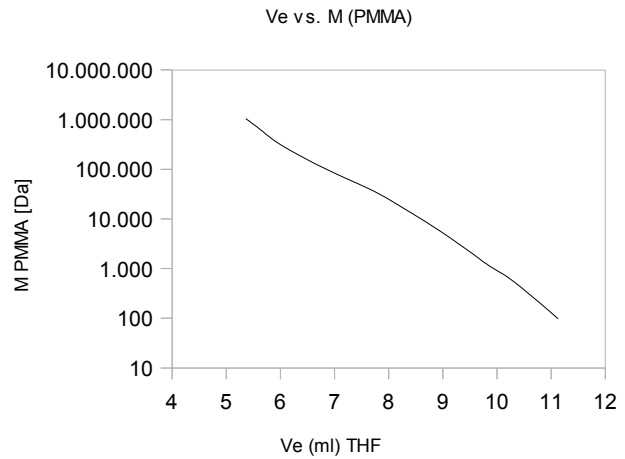


GPC of PVC in THF

AppliChrom ABOA StyDiViBe 10E5 BPT 300x8mm (2x)



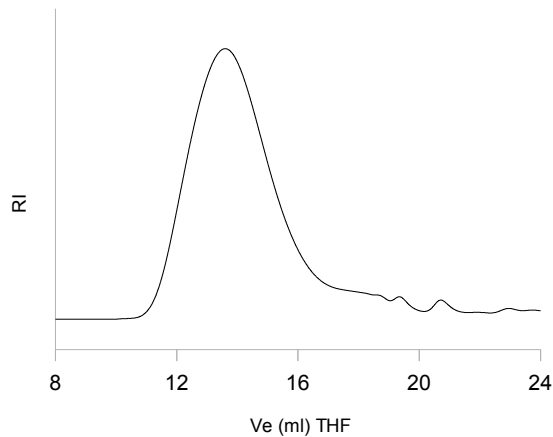
GPC calibration curve AppliChrom ABOA StyDiViBe 10E5BPT (300x8mm)



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.

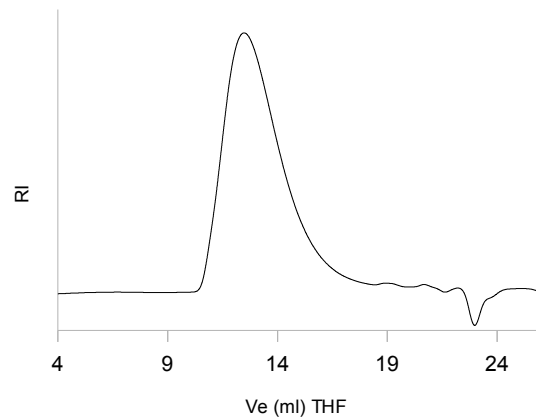
PMMA GPC in THF

AppliChrom ABOA StyDiViBe 10E5A BPT, 300x8mm (2x)



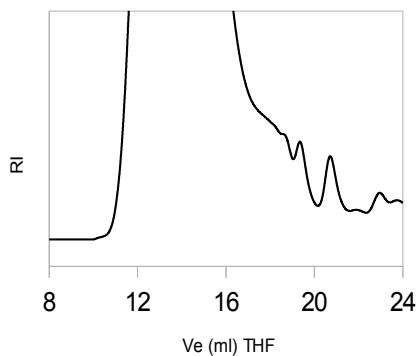
Polystyrene GPC in THF

AppliChrom ABOA StyDiViBe 10E5A, 300x8mm (2x)



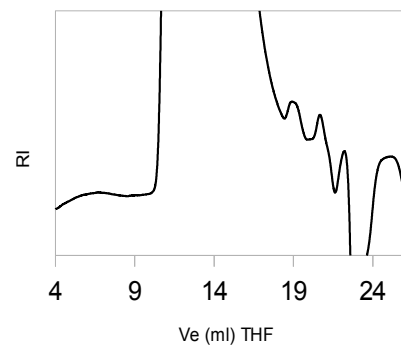
PMMA GPC in THF enlarged

AppliChrom ABOA StyDiViBe 10E5A BPT, 300x8mm (2x)



Polystyrol GPC in THF enlarged

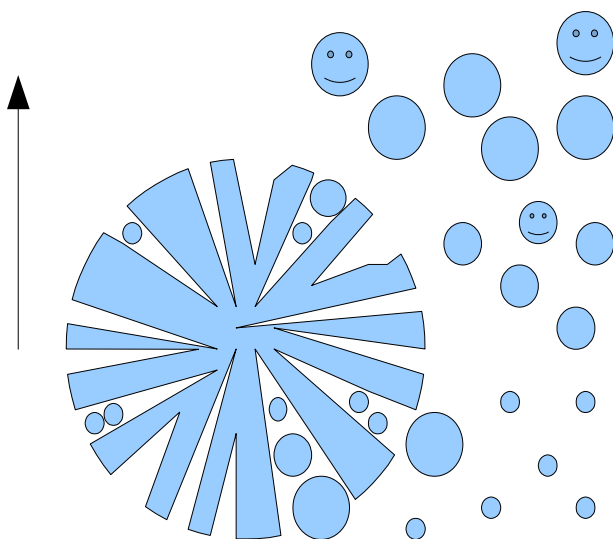
AppliChrom ABOA StyDiViBe 10E5A, 300x8mm (2x)



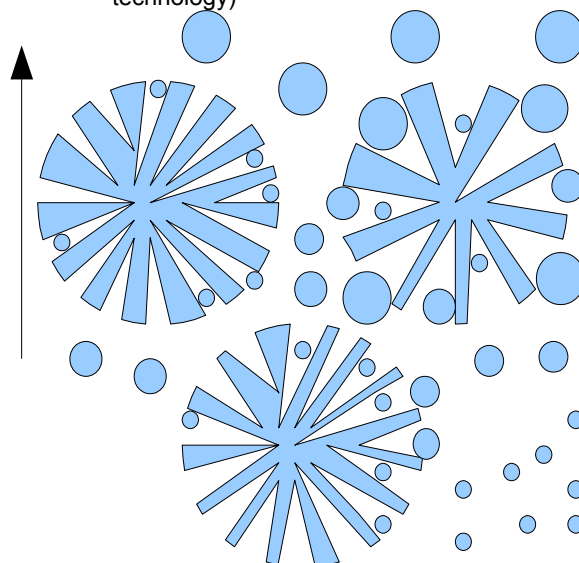
AppliChrom BPT Technology: a combination of small, medium and large pores in each particle ensures an increase of calibration range. No matching porosities effects – respective artificial shoulders in chromatogrammes known from many column combinations are significant reduced – for improving your GPC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

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

Flowdirection (BPT technology)



Flowdirection (conventional mixed technology)



Ordering Informations:

P.O. Number	Product name, separation range, column dimension	Price
ASDVBP353008	GPC-Column AppliChrom ABOA StyDiViBe-P-35A, separation range 100-2500 Da, 300mm x 8mm	On request
ASDVBP1003008	GPC-Column AppliChrom ABOA StyDiViBe-P-100A, separation range 100-10.000 Da, 300mmx8mm	On request
ASDVBP5003008	GPC-Column AppliChrom ABOA StyDiViBe-P-500A, separation range 100-30.000 Da, 300mmx8mm	On request
ASDVBP10003008	GPC-Column AppliChrom ABOA StyDiViBe-P-10 ³ A, separation range 100-70.000 Da, 300mmx8mm	On request
ASDVBP15003008	GPC Column AppliChrom ABOA StyDiViBe-P-1500A, separation range 100-120.000Da, 300x8mm	On request
ASDVBE5XB3008	GPC-Column AppliChrom ABOA StyDiViBe-P-10 ⁵ A-BPT, separation range 500Da-1.5 Mio Da, 300mmx8mm	On request
ASDVBE6XB3008	GPC-Column AppliChrom ABOA StyDiViBe-P-10 ⁶ A-BPT, separation range 10000Da-4Mio Da, 300mmx8mm	On request
ASDVBE7XB3008	GPC-Column AppliChrom ABOA StyDiViBe-P-10 ⁷ A-BPT, separation range 100Da-10Mio Da, 300mmx8mm	On request
VASDVBP508	To increase column livetime: Precolumn: AppliChrom ABOA StyDiViBe (50x8mm)	On request

Many further column dimensions are available on request, please do not hesitate contacting us – info@applichrom.de

Ask for your personal application, ask for columns packed in your preferred eluent (THF/Toluene/CH₂CL₂/CHCl₃ or DMF/DMAc/NMP or aqueous or DMSO,...)

AppliChrom wants to support young and interested scientists, ask for our support programme for young scientists.

Ask per phone +49/03301/579293 per mail info@applichrom.de, your local distributor.

AppliChrom-Application & Chromatography

Products for polymer, biopolymer and degradation product

AppliChrom ABOA SuperOH-P

Series for aqueous GPC/SEC-analysis of mainly neutral and anionic polymers like heparins, polysaccharides, PEO, PEG,....

AppliChrom ABOA Cat-Phil-P

Series for aqueous GPC/SEC-analysis of of special aminic and polycationic polymers like p-DADMAC, PEI/polyethylenimin, chitosan, copolymers with polyaminofunctions, but also useful for polyanions or neutral polymers like heparin or PEO/PEG, dextran or pullulan.

AppliChrom ABOA DMSO-Phil-P

Series for DMSO GPC/SEC analysis (humic substances, UF/MUF-glue, p-NIPA, many polycondensates, protein from pea or leguminosae,...)

AppliChrom ABOA DMAc-Phil-P

Series for GPC/SEC analysis in DMAc, DMF, NMP. Good for many medium polar substances, polyoxazolines, lignin,...

AppliChrom ABOA ProteSep-S

Series for SEC analysis of proteins (BSA, many Immunoglobulins, Insulin, milkprotein,...)

AppliChrom ABOA SugarSep-H/Na/Ca

Series for ion exchange, ion exclusion and SEC separations of low molecular weight sugars, alcohols, acids. HPLC identification of many highly water soluble substances.

AppliChrom OTU

Series (C8, C18, Phenyl, HILIC), for silica based high resolution HPLC separations of hydrophilic, polar or hydrophobic substances with using isocratic or gradient systems.

AppliChrom SPE-columns (C8, C18)

For sample enrichment or pretreatment

AppliChrom SaloEx P, und SaloEx DNA

For separation of buffers and low molecular weight substances in bioprocess technology – e.g. desalting (a DNA, Protein purification step)

Oranienburg – origin, development and progress in chromatography:

AppliChrom produces and researches in Oranienburg, which also happens to be the site of the discovery of chromatography. An early form of paper chromatography was invented and described by Prof. Dr. F.F. Runge in 1850 in Oranienburg, Germany. He was most famous for his works "To colour chemistry, pattern pictures for friends of the beauty and for the use for draftsmen, painters, decorators and printers." (1850. Original title: *Zur Farbenchemie. Musterbilder für Freunde des Schönen und zum Gebrauch für Zeichner, Maler, Verzierer und Zeugdrucker, 1.Lieferung. Dargestellt durch chemische Wechselwirkung von Dr. F.F. Runge*) and "The creative impulse of the substances illustrated in self-grown pictures" (1855. Original title: *Der Bildungstrieb der Stoffe, veranschaulicht in selbständig gewachsenen Bildern*) Encouraged by the history of chromatography in Oranienburg, AppliChrom develops and produces high quality innovative chromatography products and applications for the present and future needs of our customers. Our continuous growth in demand allows for increased investments into new capacities for further technological developments. What are your needs – please feel free to contact us - info@aplichrom.de.

Version Jan.2017, Version June 2016. As for R & D and laboratory, not tested for pharmaceuticals or medical diagnostics. The terms and conditions of AppliChrom are valid.