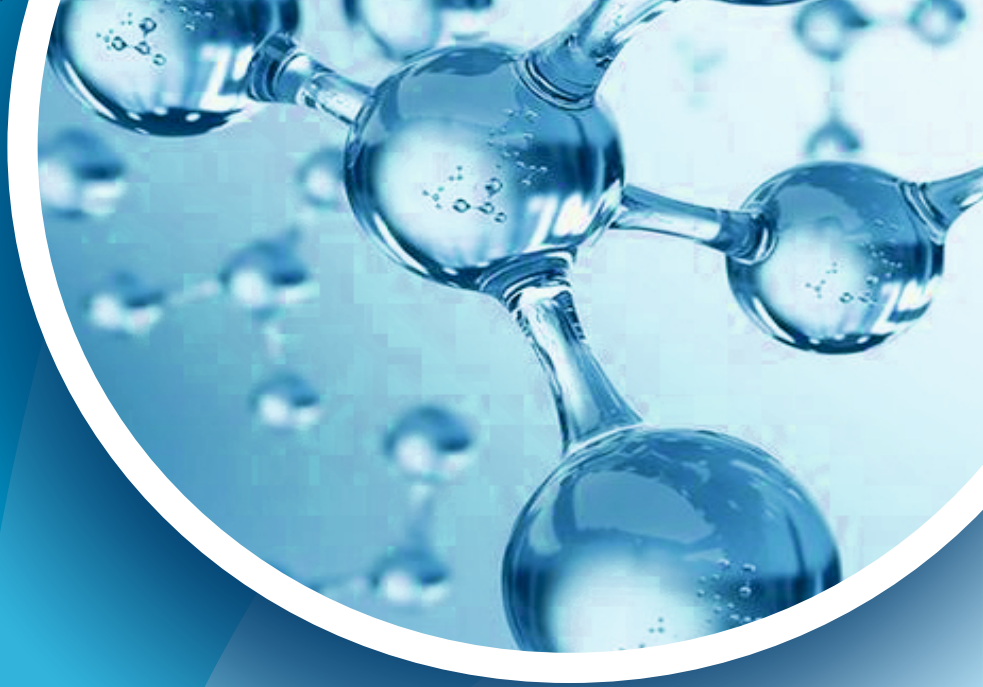


# ProntoGel



Sugar  
Polymers  
Peptides  
Biopolymers  
Protein



 **BISCHOFF**  
CHROMATOGRAPHY

## Selection by USP

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

### ProntoGel-AQ-OH

	Particle size (µm)	Type	USP
ProntoGel-AQ-OH 200 Separation Range 100Da-20 000 Da	10	spherical	L25, L38, L39
ProntoGel-AQ-OH 250 Separation Range 100Da-70 000 Da	10	spherical	L37, L38, L39
ProntoGel-AQ-OH 300 Separation Range 1 000Da-300 000Da	10	spherical	L37, L38, L39
ProntoGel-AQ-OH 350 Separation Range 2 500Da-1 000 000Da	10	spherical	L38, L39
ProntoGel-AQ-OH 400 Separation Range 10 000Da-5 000 000Da	10	spherical	L38, L39
ProntoGel-AQ-OH 450 Separation Range 50 000Da →10 000 000Da	10	spherical	L38, L39

### ProntoGel-P

	Particle size (µm)	Type	USP
ProntoGel-P-50 Separation Range 100Da-2 500Da	5, (10)	spherical	L21
ProntoGel-P-100 Separation Range 100Da-10 000Da	5, (10)	spherical	L21
ProntoGel-P-500 Separation Range 100Da-30 000Da	5, (10)	spherical	L21
ProntoGel-P-1.000 Separation Range 100Da-70 000Da	5, (10)	spherical	L21
ProntoGel-P-1.500 Separation Range 100Da-120 000Da	5, (10)	spherical	L21
ProntoGel-P-10 000 Separation Range 100Da-400 000Da	5, (10)	spherical	L21
ProntoGel-P-100 000 Separation Range 500Da-1 500 000Da	5, (10)	spherical	L21
ProntoGel-P-1000 000 Separation Range 10 000Da-4 000 000Da	5, (10)	spherical	L21
ProntoGel-P-10 000 000 Separation Range 100 000Da-10 000 000Da	5, (10)	spherical	L21

## Selection by Applications

<b>ProntoGel Su</b>			
	Particle size (µm)	Type	For analysis of
ProntoGel Su Ca I	10	spherical	sugars sugar alcohols alcohols
ProntoGel Su Ca II			
ProntoGel Su H I	10	spherical	sugars sugar alcohols alcohols carboxylic acids
ProntoGel Su H II			
ProntoGel Su Pb	10	spherical	sugars especially wood hydrolysates

<b>ProntoGel-Oligo-Su</b>			
	Particle size (µm)	Type	For analysis of
ProntoGel Oligo Su Na	10	spherical	sugars sugar alcohols alcohols
ProntoGel Oligo Su Ag	10	spherical	sugars sugar alcohols alcohols

<b>ProntoGel-DMF</b>			
	Particle size (µm)	Type	For GPC/SEC analysis of
ProntoGel-100-DMF Separation Range 100Da-2 500Da	10	spherical	PMMA PAN cellulose soluble polymers for use in DMF, DMAc and NMP
ProntoGel-200-DMF Separation Range 100Da-20 000Da	10	spherical	
ProntoGel-250-DMF Separation Range 100Da-70 000Da	10	spherical	
ProntoGel-300-DMF Separation Range 1 000Da-300 000Da	10	spherical	
ProntoGel-350-DMF Separation Range 1 000Da-1 000 000Da	10	spherical	
ProntoGel-400-DMF Separation range 10 000Da-5 000 000Da	10	spherical	
ProntoGel-450-DMF Separation range 100 000Da→10 000 000Da	10	spherical	

<b>ProntoGel AC-AQ</b>			
	Particle size (µm)	Type	For GPC/SEC analysis of
ProntoGel-150-AC-AQ	10	spherical	For GPC analysis in 80/20 acetone/water organosolv lignins calibration: molecular weight vs. PEO/PEG
ProntoGel-250-AC-AQ Separation Range 100Da- 70 000Da	10	spherical	
ProntoGel-350-AC-AQ Separation Range 100Da-1 000 000Da	10	spherical	

## Selection by Applications

<b>ProntoGel-NAC</b>			
	Particle size (µm)	Type	For GPC/SEC analysis of
ProntoGel-100-NAC Separation Range 100Da-2 500Da	10	spherical	Special designed for aqueous GPC/SEC: polycations polyamines (chitosanes) polyethylenoxides Polysaccharides polyanions (heparins, pectins)
ProntoGel-150-NAC Separation Range 100Da - 5 000Da	10	spherical	
ProntoGel-350-NAC Separation Range 2 500Da - 1 000 000Da	10	spherical	
ProntoGel-450-NAC Separation Range 300 000Da - 5 000 000Da	10	spherical	
ProntoGel-500-NAC Separation Range 10 000Da - 50 000 000Da	10	spherical	

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

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

## ProntoGel 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 (40-80 °C)
- ▶ Pressure stability 50-150bar, depending on the porosity
- ▶ High resolution due to high pore volume
- ▶ Long service life
- ▶ High reproducibility
- ▶ High purity of the GPC column for good interaction-free GPC
- ▶ Please avoid: drying out
- ▶ Molar mass range: 100Da-10 000 000Da
- ▶ Area of applications: PMMA, PAN, cellulose, DMF and DMAc soluble polymers

### ProntoGel DMF molar mass range:

P-100	100Da-2 500Da
P-200	100Da-20 000Da
P-250	100Da-70 000Da
P-250 ER*)	100Da-100 000Da
P-300	1 000Da-300 000Da
P-350	1 500Da-1 000 000Da
P-400	10 000Da-5 000 000Da
P-450	100 000Da→10 000 000Da

\*) ER Pore: extended linear range

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

Description	Separation Range
ProntoGel-100-DMF	100Da-2 500Da
ProntoGel-200-DMF	100Da-20 000Da
ProntoGel-250-DMF ER	100Da-70 000Da
ProntoGel-250-DMF	100Da-100 000Da
ProntoGel-300-DMF	1 000Da-300 000Da
ProntoGel-350-DMF	1 000Da-1 000 000Da
ProntoGel-400-DMF	10 000Da-5 000 000Da
ProntoGel-450-DMF	100 000Da→10 000 000Da

\* Note:- (All above mentioned phases are available in 300x8, 250x8, 50x8, 30x8 dimension)

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

### For GPC / SEC analysis in DMSO, Area of applications:

- ▶ 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.

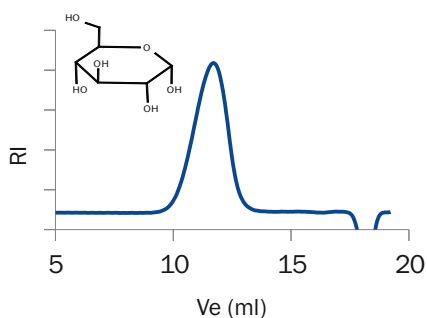
## Benefits

- ▶ Optimized for DMSO-GPC applications
- ▶ Interaction free pure GPC/SEC
- ▶ Easy, reliable and robust GPC/SEC-calibration by dextrans, pullulans et al.
- ▶ Low column bleeding for low detectornoise for improved light scattering or viscosity detection
- ▶ 12 $\mu$  particle technology for low back pressure
- ▶ Large pore volume and optimized mass transfer for polymers giving optimized resolution
- ▶ Low costs caused by long live time of column – result of combination of optimized proprietary particle and packing technology.

Description	Separation Range
ProntoGel-100-DMSO	100Da-2 500Da
ProntoGel-200-DMSO	100Da-20 000Da
ProntoGel-250-DMSO	100Da-70 000Da
ProntoGel-300-DMSO	1.000Da-300 000Da
ProntoGel-350-DMSO	1 000Da-1 000 000Da
ProntoGel-400-DMSO	10 000Da-5 000 000Da
ProntoGel-450-DMSO	100 00Da→10 000 000Da
ProntoGel-600-DMSO	Up to 20 000 000Da
ProntoGel-MP-DMSO	100Da-1 000 000Da

\* Note:- (All above mentioned phases are available in 300x8, 250x8, 50x8, 30x8 dimension)

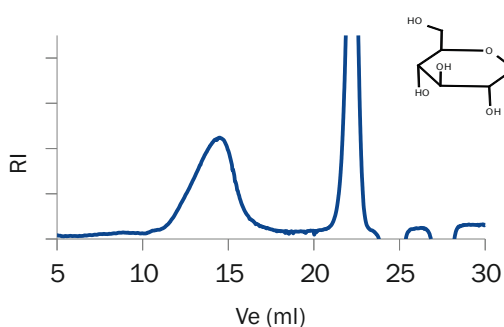
## ProntoGel-DMSO



**Analyte:** **Polysaccharide**  
(M ca. 70 000Da)

**Column:** ProntoGel-250-DMSO  
ProntoGel-350-DMSO

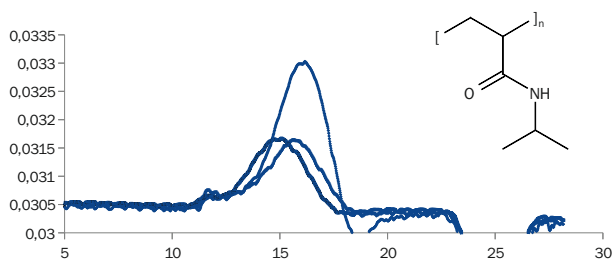
**Dimension:** ea. 300mm x 8mm  
**Mobil Phase:** DMSO / 0.075M NaNO<sub>3</sub>  
**Flow:** 0.5ml/min  
**Temperature:** 80 °C  
**Detection:** RI



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

**Column:** ProntoGel-200-DMSO  
ProntoGel-250-DMSO  
ProntoGel-350-DMSO

**Dimension:** ea. 300mm x 8mm  
**Mobil Phase:** DMSO / 0.075M NaNO<sub>3</sub>  
**Flow:** 0.5ml/min  
**Temperature:** 80 °C  
**Detection:** RI

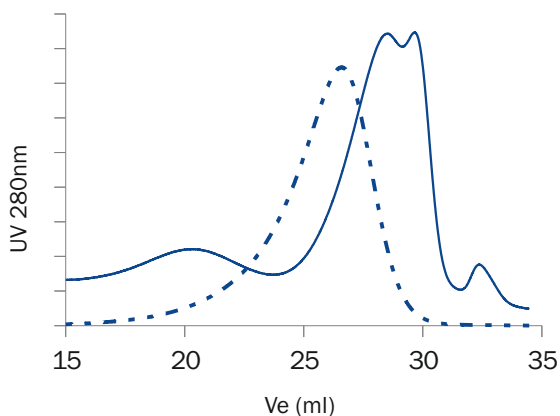


**Analyte:** **Poly(N-isopropylacrylamide)**  
Further denominations: PNIPA,  
PNIPAAm, NIPA, PNIPAA or PNIPAm.  
CAS [25189-55-3], formula: (C<sub>6</sub>H<sub>11</sub>NO)<sub>n</sub>

3 different PNIPA fractions

**Column:** ProntoGel-300-DMSO

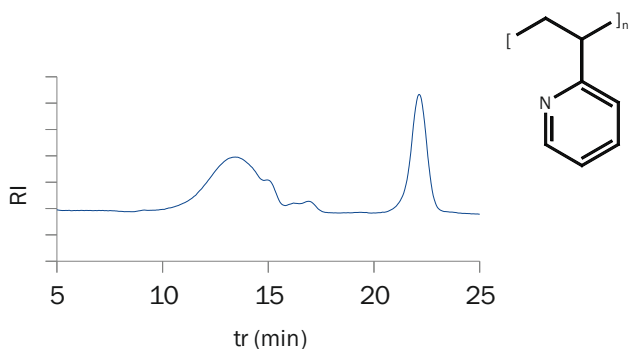
**Dimension:** ea. 300mm x 8mm  
**Mobil Phase:** DMSO / 0.075M NaNO<sub>3</sub>  
**Flow:** 0.5ml/min  
**Temperature:** 80 °C  
**Detection:** RI



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

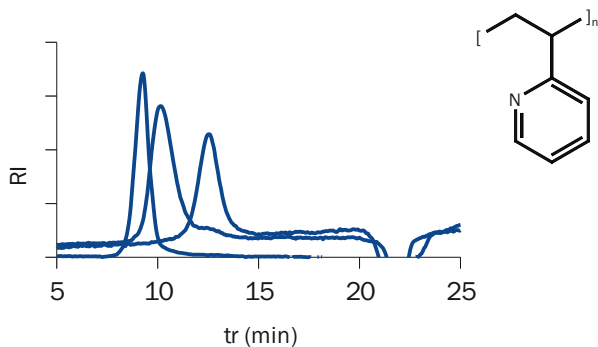
**Column:** ProntoGel DMSO-Multipore

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



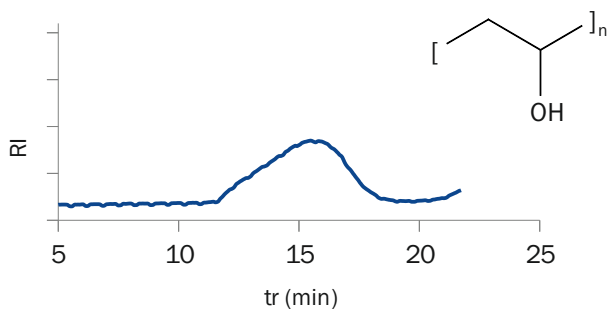
**Analyte:** **Polyvinylpyridine degraded**  
 Further denominations: CAS 25014-15-7,  
 $(C_7H_7N)_n$   
 low molecular weight (oligomeric)  
 polyvinylpyridin fraction

Column: ProntoGel-250-DMSO  
 Dimension: ea. 300mm x 8mm  
 Mobil Phase: DMSO / 0.075M NaNO<sub>3</sub>  
 Flow: 0.4ml/min  
 Temperature: 50°C  
 Detection: RI



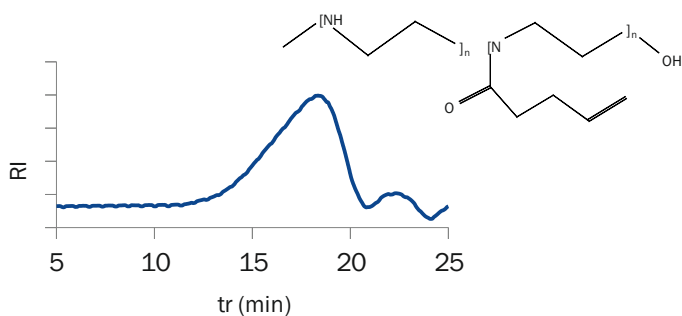
**Analyte:** **Polyvinylpyridine fractions**  
 Further denominations: CAS 25014-15-7,  
 $(C_7H_7N)_n$   
 75.7kDa, 20.9kDa, 3.2kDa  
 Superposition of 3 different polyvinylpyridin  
 fractions

Column: ProntoGel-250-DMSO  
 Dimension: ea. 300mm x 8mm  
 Mobil Phase: DMSO / 0.075M NaNO<sub>3</sub>  
 Flow: 0.4ml/min  
 Temperature: 50°C  
 Detection: RI



**Analyte:** **Polyvinylalcohol M=22kDa**

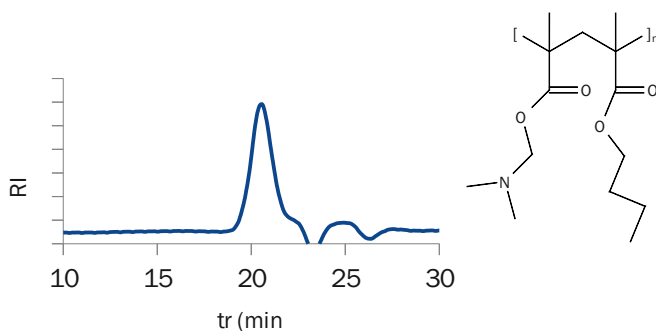
Column: ProntoGel-300-DMSO  
 Dimension: 2 x 300mm x 8mm  
 Mobil Phase: DMSO / 0.075M NaNO<sub>3</sub>  
 Flow: 0.4ml/min  
 Temperature: 50°C  
 Detection: RI



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

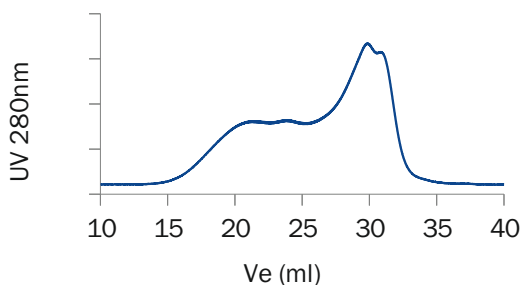
Column: ProntoGel-300-DMSO  
 Dimension: ea. 300mm x 8mm  
 Mobil Phase: DMSO / 0.075M NaNO<sub>3</sub>  
 Flow: 0.4ml/min  
 Temperature: 50°C  
 Detection: RI





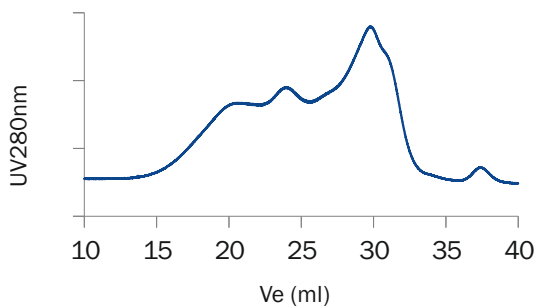
**Analyte:** Polybutyl methacrylate/  
Poly(dimethylamino-  
ethylmethacrylate) M=22kDa

Column: ProntoGel-300-DMSO  
Dimension: 2 x 300mm x 8mm  
Mobil Phase: DMSO / 0.075M NaNO<sub>3</sub>  
Flow: 0.4ml/min  
Temperature: 50° C  
Detection: RI



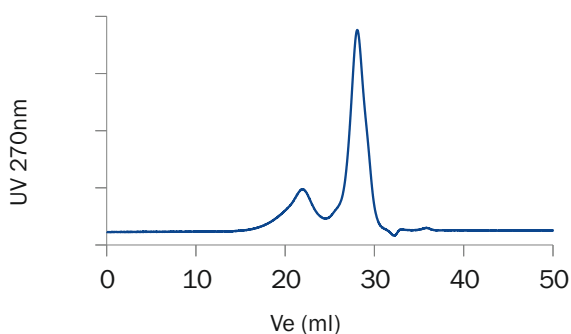
**Analyte:** Pea protein GPC  
covering the calibration range of 100-  
1 000 000Da (based on dextrans)

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

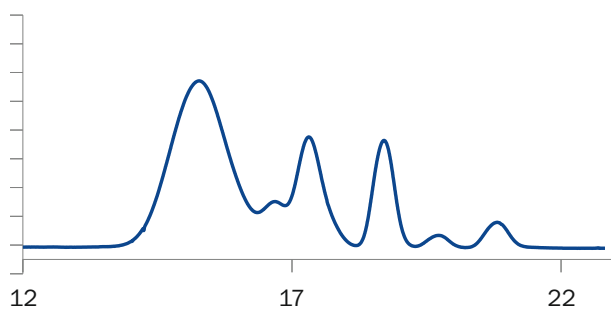
## ProntoGel-AQ-OH

- ▶ Optimized for aqueous GPC/SEC-separations
  - ▶ Aqueous high hydrophilic polymeric base material
  - ▶ Low column bleeding for low detector noise
  - ▶ 7 $\mu$  particle technology (standard) for high platecounts and high resolution\*)
  - ▶ Large pore volume for high resolution
  - ▶ pH stable 2.5-12
  - ▶ Pressure stability 30-80 bar (depending on pore size)
  - ▶ Temperature stability 10-85 °C
  - ▶ Individual pore sizes for individual molecular weight ranges
  - ▶ Multi-pore technology for broad range of molecular size
  - ▶ Increased live of GPC/SEC columns by combination of proprietary particle and packing technology
- service-application center for method screening available in Bischoff centre.

\*) 7 $\mu$  Particle technology is standard for the small porous series – 100 and – 200.

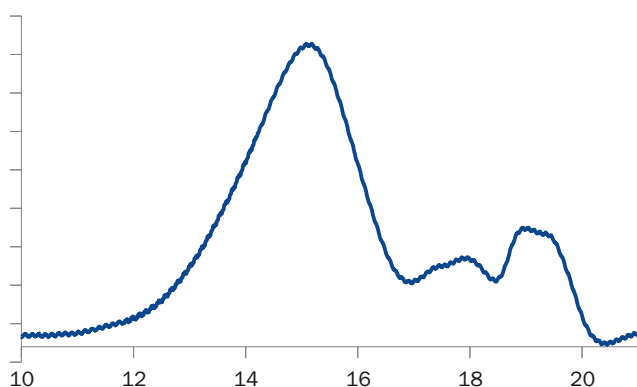
Description	Separation Range
ProntoGel-AQ-OH 100	100Da-2 500Da
ProntoGel-AQ-OH 200	100Da-20 000Da
ProntoGel-AQ-OH 250	100Da-70 000Da
ProntoGel-AQ-OH 300	1 000Da-300 000Da
ProntoGel-AQ-OH 350	2 500Da-1 000 000Da
ProntoGel-AQ-OH 400	10 000Da-5 000 000Da
ProntoGel-AQ-OH 450	50 000Da→10 000 000Da
ProntoGel-AQ-OH MP	100Da-1 000 000Da

\* Note:- (All above mentioned phases are available in 300x8, 250x8, 50x8, 30x8 dimension)



**Analyte: Oligosaccharide**

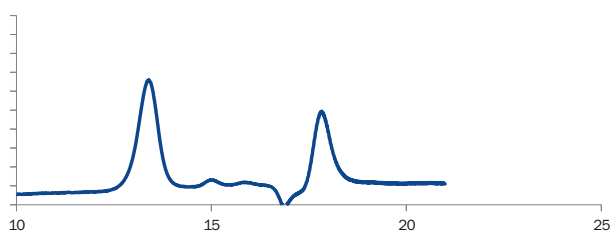
Column: ProntoGel-AQ-OH 100  
 Dimension: 2 x 300mm x 8mm  
 Mobil Phase: H<sub>2</sub>O  
 Flow: 0.5ml/min  
 Temperature: 40 °C  
 Detection: RI  
 Injection: 20µl sample



**Analyte: Pectin**

sample with high content of oligomers

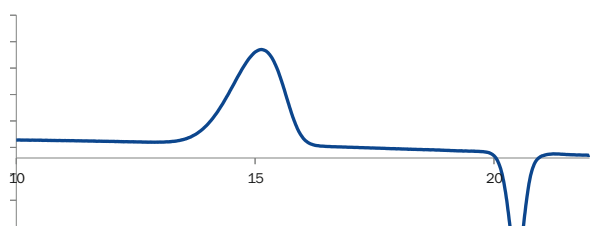
Column: ProntoGel-AQ-OH 100  
 ProntoGel-AQ-OH 350  
 Dimension: e.a. 300mm x 8mm  
 Mobil Phase: H<sub>2</sub>O, NaKHPO<sub>4</sub> (pH 6.8 0.07M) + 50mM NaCl  
 Flow: 1.0ml/min  
 Temperature: 20 °C  
 Detection: RI  
 Injection: 20µl sample



**Analyte: PEGylated protein**

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

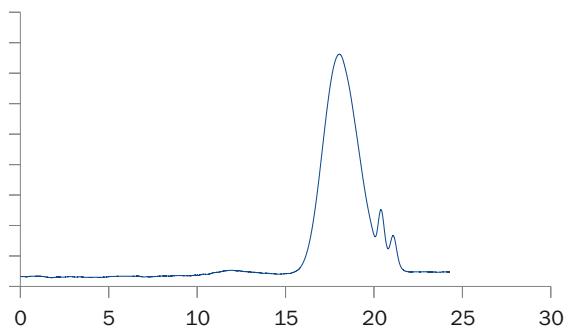
Column: ProntoGel-AQ-OH 100  
 ProntoGel-AQ-OH 350  
 Dimension: e.a. 300mm x 8mm  
 Mobil Phase: 0.05% NaN<sub>3</sub> in H<sub>2</sub>O  
 Flow: 1.0ml/min  
 Temperature: 20 °C  
 Detection: RI  
 Injection: 20µl sample



**Analyte: Starch hydrolysate**

analysis of a 100 000Da fraction

Column: ProntoGel-AQ-OH 100  
 ProntoGel-AQ-OH 350  
 Dimension: e.a. 300mm x 8mm  
 Mobil Phase: 0.2M NaN<sub>3</sub> in H<sub>2</sub>O  
 Flow: 1.0ml/min  
 Temperature: 20 °C  
 Detection: RI  
 Injection: 20µl sample

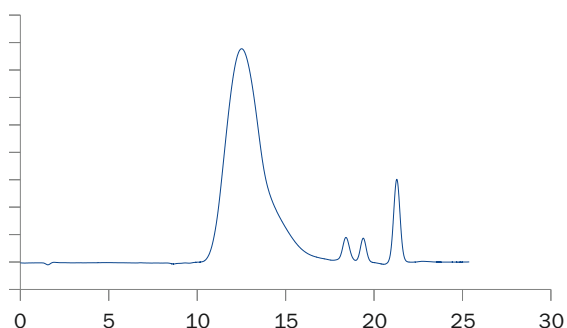


**Analyte: Inulin**

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

Column: ProntoGel-AQ-OH 250  
ProntoGel-AQ-OH 350

Dimension: e.a. 300mm x 8mm  
Mobil Phase: 0.075M NaNO<sub>3</sub>, 5g/l Na<sub>2</sub>HPO<sub>4</sub> x7H<sub>2</sub>O in H<sub>2</sub>O  
Flow: 1.0ml/min  
Temperature: 20°C  
Detection: RI  
Injection: 20µl sample

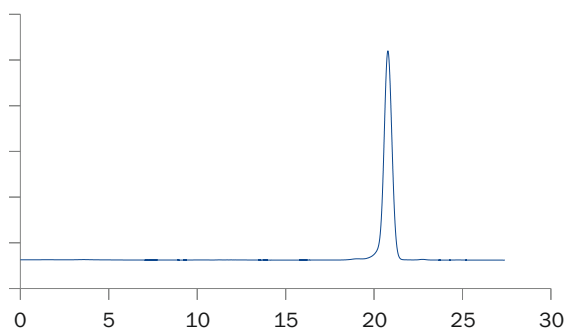


**Analyte: Hyaluronic acid**

including oligomer separation

Column: ProntoGel-AQ-OH 250  
ProntoGel-AQ-OH 350

Dimension: e.a. 300mm x 8mm  
Mobil Phase: 0.075M NaNO<sub>3</sub>, 5g/l Na<sub>2</sub>HPO<sub>4</sub> x7H<sub>2</sub>O in H<sub>2</sub>O  
Flow: 1.0ml/min  
Temperature: 20°C  
Detection: RI  
Injection: 20µl sample

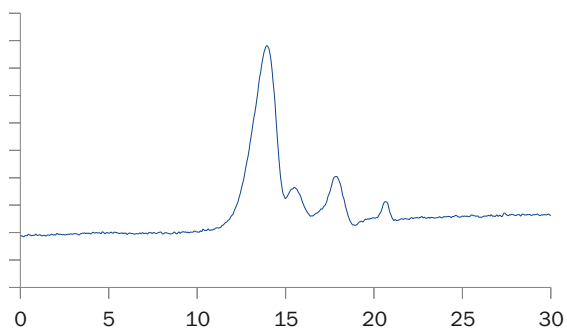


**Analyte: Corn syrup**

analysis of a 100Da- 1 000 000Da area

Column: ProntoGel-AQ-OH 250  
ProntoGel-AQ-OH 350

Dimension: e.a. 300mm x 8mm  
Mobil Phase: H<sub>2</sub>O  
Flow: 1.0ml/min  
Temperature: 20°C  
Detection: RI  
Injection: 20µl sample

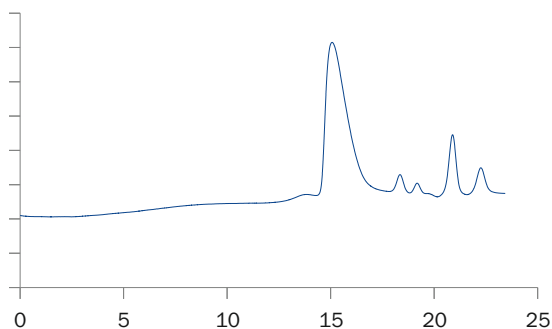


**Analyte: Water-based acrylate dispersion**

analysis of a 100Da- 1 000 000Da area

Column: ProntoGel-AQ-OH 250  
ProntoGel-AQ-OH 350

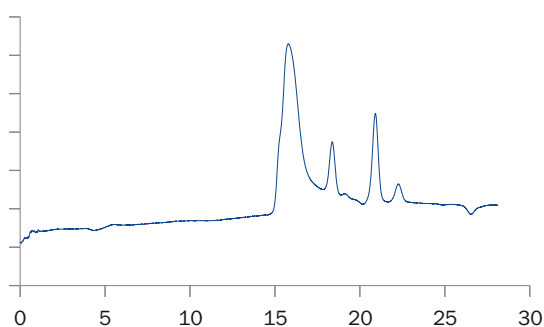
Dimension: e.a. 300mm x 8mm  
Mobil Phase: 1.0M NaNO<sub>3</sub> in H<sub>2</sub>O  
Flow: 1.0ml/min  
Temperature: 20°C  
Detection: RI  
Injection: 20µl sample



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

Column: ProntoGel-AQ-OH 250  
ProntoGel-AQ-OH 350

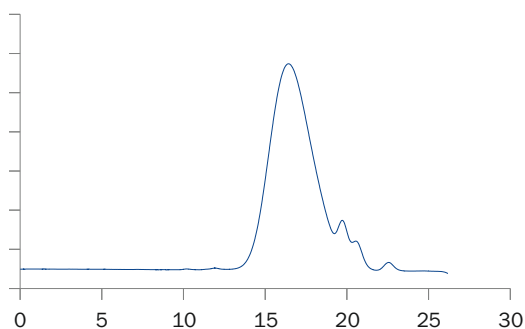
Dimension: e.a. 300mm x 8mm  
Mobil Phase: 0.075M NaNO<sub>3</sub>, 5g/l Na<sub>2</sub>HPO<sub>4</sub>·x7H<sub>2</sub>O in H<sub>2</sub>O  
Flow: 1.0ml/min  
Temperature: 20 °C  
Detection: RI  
Injection: 20µl sample



**Analyte:** **Dextran sulfate-Na**  
analysis of a 100Da- 1 000 000Da area

Column: ProntoGel-AQ-OH 250  
ProntoGel-AQ-OH 350

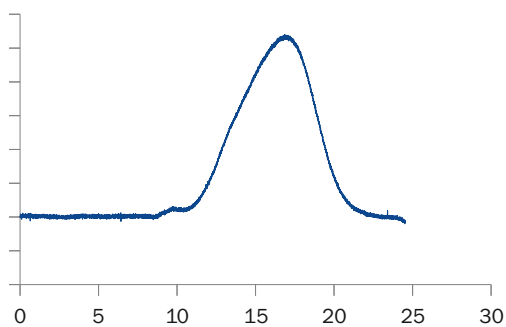
Dimension: e.a. 300mm x 8mm  
Mobil Phase: 0.075M NaNO<sub>3</sub>, 5g/l Na<sub>2</sub>HPO<sub>4</sub>·x7H<sub>2</sub>O in H<sub>2</sub>O  
Flow: 1.0ml/min  
Temperature: 20 °C  
Detection: RI  
Injection: 20µl sample



**Analyte:** **Alginate-Na**  
analysis of a 100Da- 1 000 000 Da area

Column: ProntoGel-AQ-OH 250  
ProntoGel-AQ-OH 350

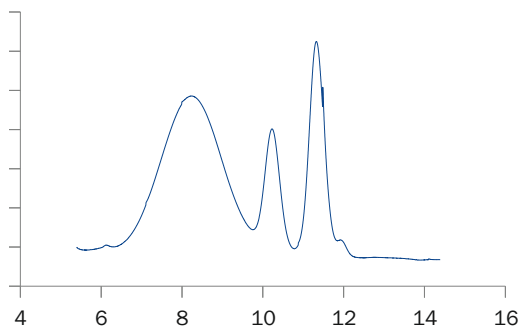
Dimension: e.a. 300mm x 8mm  
Mobil Phase: 0.075M NaNO<sub>3</sub>, 5g/l Na<sub>2</sub>HPO<sub>4</sub>·x7H<sub>2</sub>O in H<sub>2</sub>O  
Flow: 1.0ml/min  
Temperature: 20 °C  
Detection: RI  
Injection: 20µl sample



**Analyte:** **Carrageenan**  
analysis of a 1 000Da- 5 000 000Da area

Column: ProntoGel-AQ-OH 350  
ProntoGel-AQ-OH 450

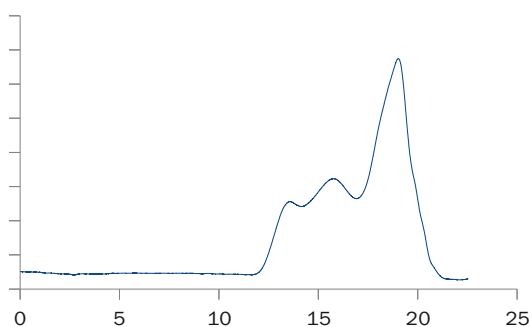
Dimension: e.a. 300mm x 8mm  
Mobil Phase: 0.075M LiNO<sub>3</sub> in H<sub>2</sub>O  
Flow: 1.0ml/min  
Temperature: 20 °C  
Detection: RI  
Injection: 20µl sample



**Analyte:** Pullulan  
including oligomer separation

Column: ProntoGel-AQ-OH Screening

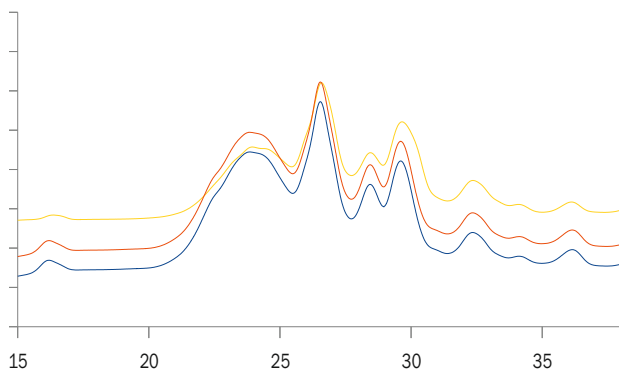
Dimension: 300mm x 8mm  
Mobil Phase: 0.075M NaNO<sub>3</sub> in H<sub>2</sub>O  
Flow: 1.0ml/min  
Temperature: 20°C  
Detection: RI  
Injection: 20µl sample



**Analyte:** Maltodextrin 12  
analysis of a 100Da-1 000 000Da area

Column: ProntoGel-AQ-OH 250  
ProntoGel-AQ-OH 350

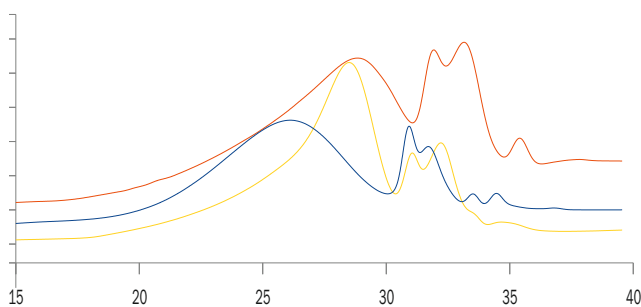
Dimension: e.a. 300mm x 8mm  
Mobil Phase: 0.075M NaNO<sub>3</sub> in H<sub>2</sub>O  
Flow: 1.0ml/min  
Temperature: 20°C  
Detection: RI  
Injection: 20µl sample



**Analyte:** Fish protein hydrolysates  
3 different batches  
analysis of a 100Da-70 000 Da area  
including oligomer separation

Column: ProntoGel-AQ-OH 250

Dimension: 3 x 300mm x 8mm  
Mobil Phase: 0.05M NaNO<sub>3</sub> + 0,07M Na<sub>1,5</sub>H<sub>1,5</sub>PO<sub>4</sub> in H<sub>2</sub>O  
Flow: 1.0ml/min  
Temperature: 30°C  
Detection: RI  
Injection: 20µl sample

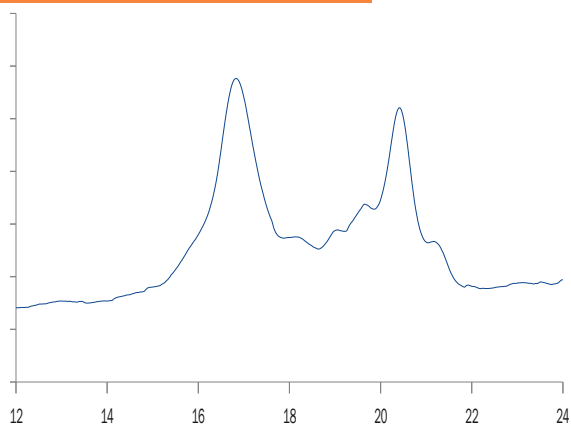


**Analyte:** Polycarboxylate ether  
3 different batches

Column: ProntoGel-AQ-OH 350

Dimension: 3 x 300mm x 8mm  
Mobil Phase: 0.1M NaNO<sub>3</sub>+0.05M Na<sub>2</sub>HPO<sub>4</sub> in H<sub>2</sub>O  
Flow: 1.0ml/min  
Temperature: 20°C  
Detection: RI  
Injection: 20µl sample

## ProntoGel-AQ-OH



### Analyte: Water-soluble casein fraction

Column: ProntoGel-AQ-OH 250  
ProntoGel-AQ-OH 350

Dimension: e.a. 300mm x 8mm

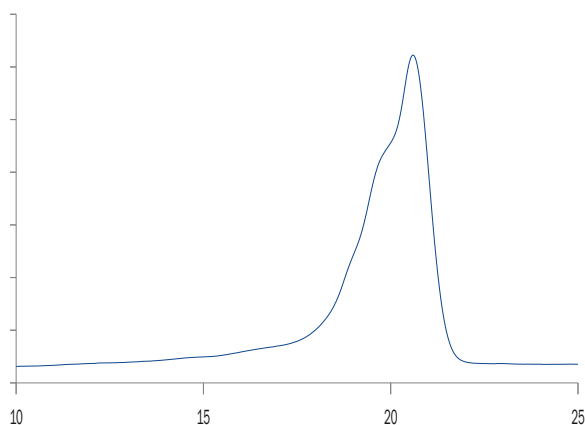
Mobil Phase: 0.01M  $\text{Na}_{1.5}\text{H}_{1.5}\text{PO}_4$  & 0.3M NaCl in  $\text{H}_2\text{O}$

Flow: 1.0ml/min

Temperature: 30 °C

Detection: RI

Injection: 50µl sample



### Analyte: Jelly Bean "Gummibärchen"

Column: ProntoGel-AQ-OH 250  
ProntoGel-AQ-OH 350

Dimension: e.a. 300mm x 8mm

Mobil Phase: 0.01M  $\text{Na}_{1.5}\text{H}_{1.5}\text{PO}_4$  & 0.3M NaCl in  $\text{H}_2\text{O}$

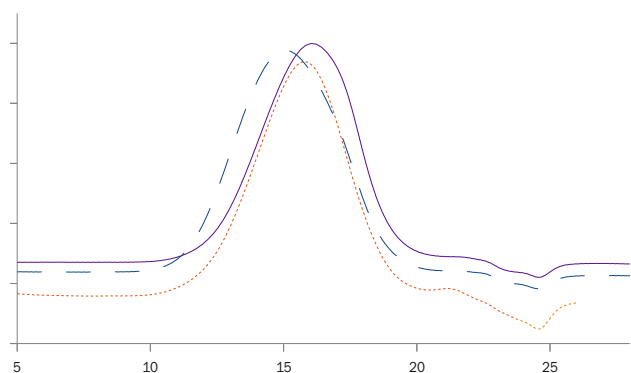
Flow: 1.0ml/min

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: ProntoGel-AQ-OH 350

Dimension: 2 x 300mm x 8mm

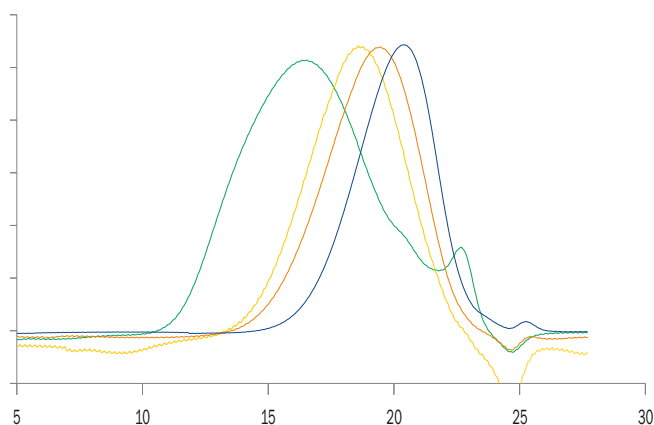
Mobil Phase: 0.05M  $\text{Na}_2\text{HPO}_4$  + 0.1M  $\text{NaNO}_3$  in  $\text{H}_2\text{O}$

Flow: 1.0ml/min

Temperature: 30 °C

Detection: RI

Injection: 20µl sample



### Analyte: PVP, polyvinyl pyrrolidone

3 different batches including oligomer separation

Column: ProntoGel-AQ-OH 350

Dimension: 2 x 300mm x 8mm

Mobil Phase: 0.1M  $\text{NaNO}_3$  in  $\text{H}_2\text{O}$  + 20% ACN

Flow: 1.0ml/min

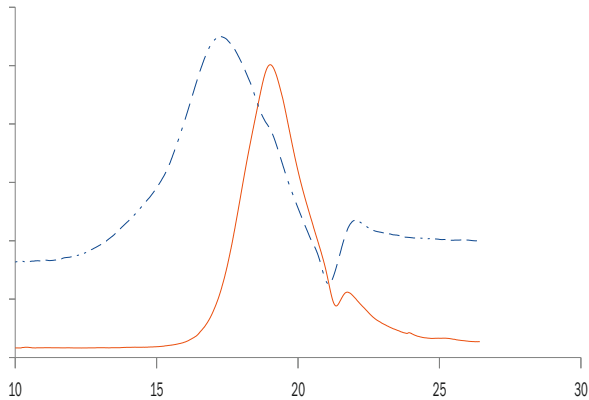
Temperature: 30 °C

Detection: RI

Injection: 50µl sample

PVP (M = 8,3 / 23,4 / 33,7 / 175kDa) dissolved in the eluent

# ProntoGel-AQ-OH



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

Column: ProntoGel-AQ-OH 250  
ProntoGel-AQ-OH 350

Dimension: e.a. 300mm x 8mm

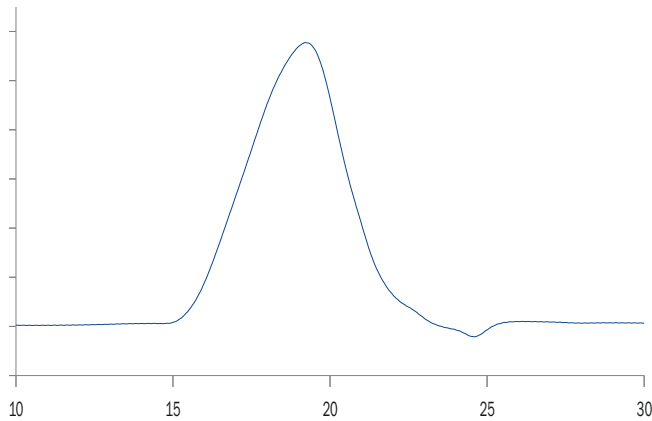
Mobil Phase: 0.01M  $\text{Na}_{1.5}\text{H}_{1.5}\text{PO}_4$  & 0.3M NaCl in  $\text{H}_2\text{O}$

Flow: 1.0ml/min

Temperature: 30°C

Detection: RI

Injection: ea. 50 $\mu\text{l}$  sample  
Pork gelatine (blue - - -),  
Gelatin from collagen hydrolysate (red - - -)



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

Column: ProntoGel-AQ-OH 250  
ProntoGel-AQ-OH 350

Dimension: e.a. 300mm x 8mm

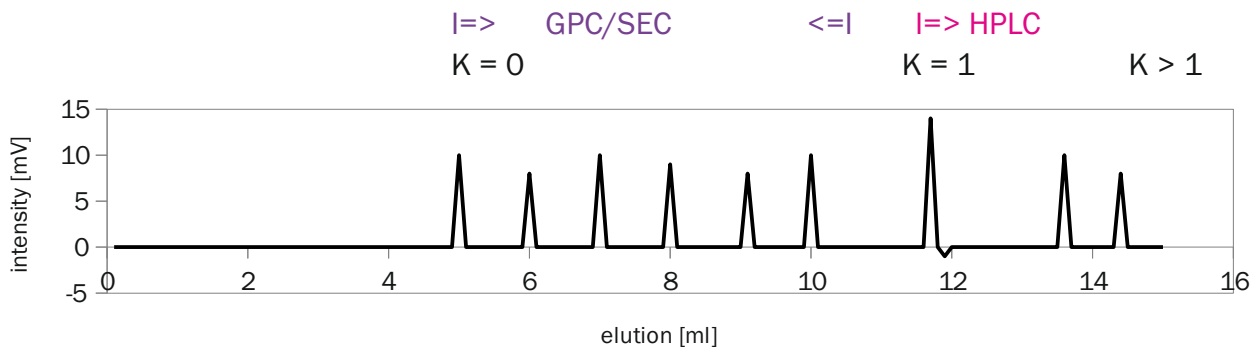
Mobil Phase: 0.075M  $\text{NaNO}_3$ , 5g/l  $\text{Na}_2\text{HPO}_4 \times 7\text{H}_2\text{O}$  in  $\text{H}_2\text{O}$

Flow: 1.0ml/min

Temperature: 20°C

Detection: RI

Injection: 20 $\mu\text{l}$  sample

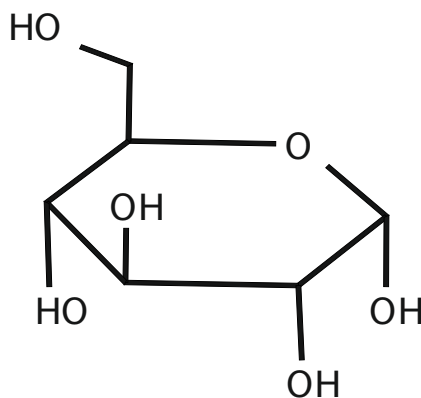


GPC/SEC – Separation by size ( $\Delta S$ ) || HPLC – Separation according to bond strength ( $\Delta H$ )  
K = Partition coefficient



## For HPLC-Analyses of

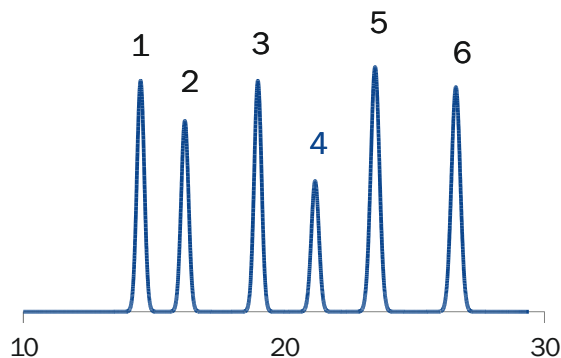
- Sugars/Carbohydrates
  - Sugar Alcohols
  - Alcohols
  - Carboxylic Acids



### Advantages:

- |                       |   |
|-----------------------|---|
| ProntoGel Su Ca I/II  | - Analysis of sugars, sugar alcohols, alcohols.                     |
| ProntoGel Su Pb       | - Analysis of sugars esp. wood extracts                             |
| ProntoGel Su H I/II   | - Analysis of sugars, sugaralcohols, alcohols and carobxylic acids. |
| ProntoGel Su Na       | - Analysis of sugars, sugaralcohols and alcohols.                   |
| ProntoGel Oligo Su Na | - Analysis of sugars, sugaralcohols and alcohols.                   |
| ProntoGel Oligo Su Ag | - Analysis of sugars, sugaralcohols and alcohols.                   |

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



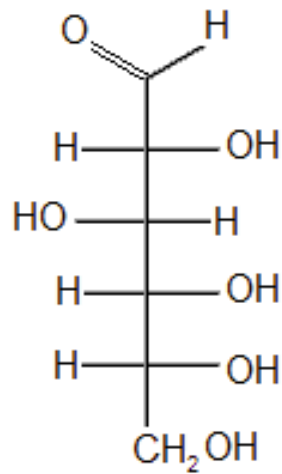
#### Analyte:

#### Mixture of

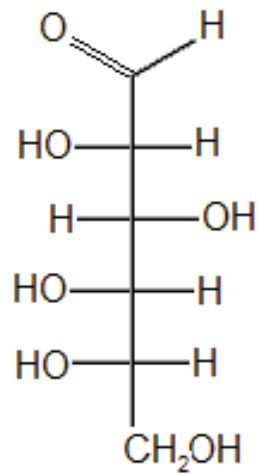
1. Sucrose (Saccarose)
2. Glucose
3. Fructose
4. Glycerin
5. Mannitol
6. Sorbitol

Column:	ProntoGel Su ca
Dimension:	300mm x 8mm
Mobil Phase:	H <sub>2</sub> O
Flow:	0.5ml/min
Temperature:	80 °C
Detection:	RI
Injection:	20µl sample

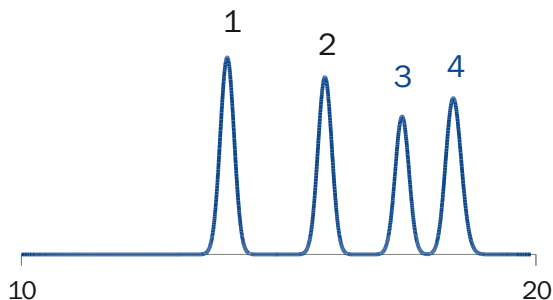
Description	Dimesnsion
ProntoGel Su Ca I	300mm x 8mm 250mm x 8mm 30mm x 8mm
ProntoGel Su Pb	300mm x 8mm 250mm x 8mm 30mm x 8mm
ProntoGel-Su H I (SO <sub>3</sub> H)	300mm x 8mm 250mm x 8mm 30mm x 8mm
ProntoGel Su H II(SO <sub>3</sub> H)	300mm x 8mm 250mm x 8mm 30mm x 8mm
ProntoGel Su Na	300mm x 8mm 250mm x 8mm 30mm x 8mm



D-Glucose



L-Glucose

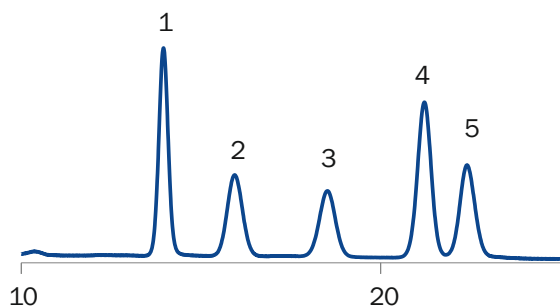


**Analyte:**

**Mixture of**

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

Column: ProntoGel Su Pb  
 Dimension: 300mm x 8mm  
 Mobil Phase: H<sub>2</sub>O  
 Flow: 0.4ml/min  
 Temperature: 60° C  
 Detection: RI  
 Injection: 20µl sample

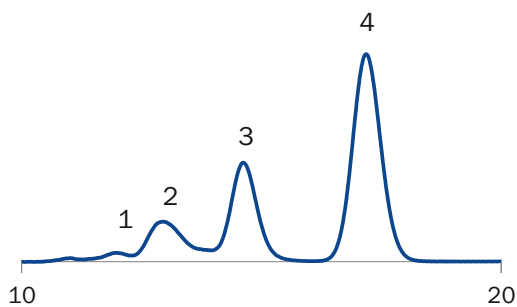


**Analyte:**

**Mixture of**

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

Column: ProntoGel Su Ca  
 Dimension: 300mm x 8mm  
 Mobil Phase: H<sub>2</sub>O  
 Flow: 0.5ml/min  
 Temperature: 80° C  
 Detection: RI  
 Injection: 20µl sample

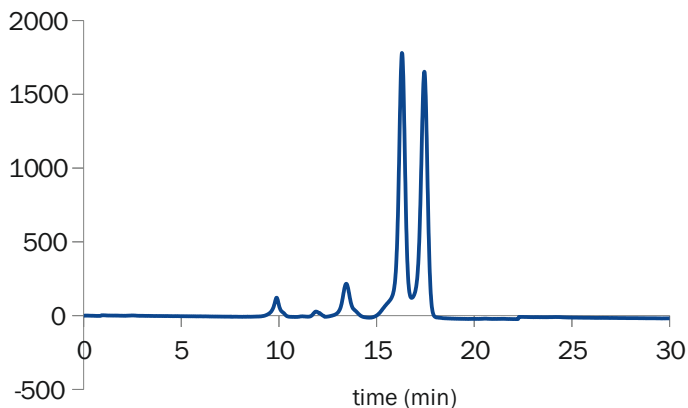


**Analyte:**

**Honey (solvet in H<sub>2</sub>O)**

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

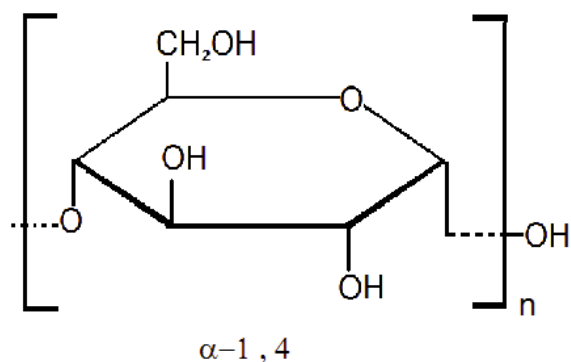
Column: ProntoGel Su Ca  
 Dimension: 300mm x 8mm  
 Mobil Phase: H<sub>2</sub>O  
 Flow: 0.5ml/min  
 Temperature: 80° C  
 Detection: RI  
 Injection: 20µl sample



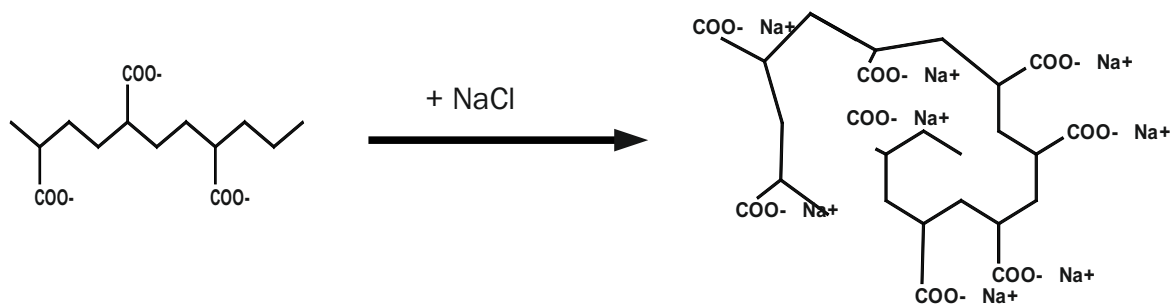
**Analyte:**

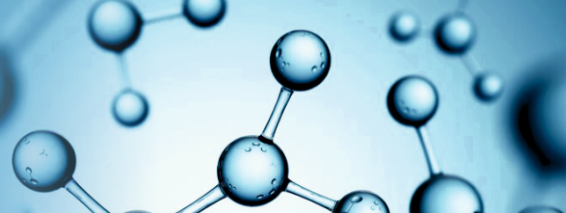
**Honey**

Column: ProntoGel Su Na  
 Dimension: 300mm x 8mm  
 Mobil Phase: H<sub>2</sub>O  
 Flow: 0.5ml/min  
 Temperature: 80° C  
 Detection: RI  
 Injection: 20µl sample

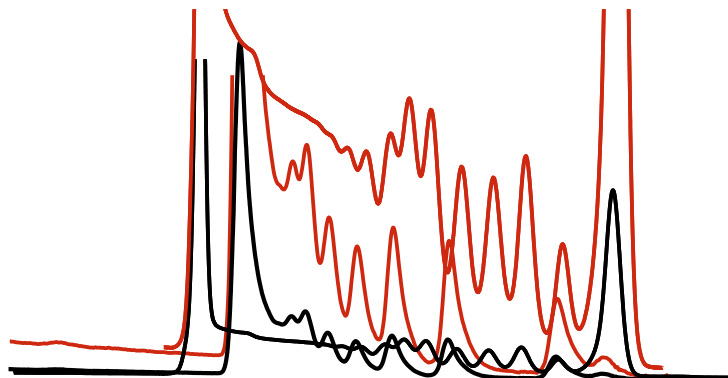


Description	Dimension	
ProntoGel Oligo-Su Na	300mm x 8mm 250mm x 8mm 150mmx8mm 50mm x 8mm 30mm x 8mm	Oligosaccharide analysis in water
ProntoGel Oligo-Su Ag	300mm x 8mm 250mm x 8mm 150mmx8mm 50mm x 8mm 30mm x 8mm	Oligosaccharide analysis in water





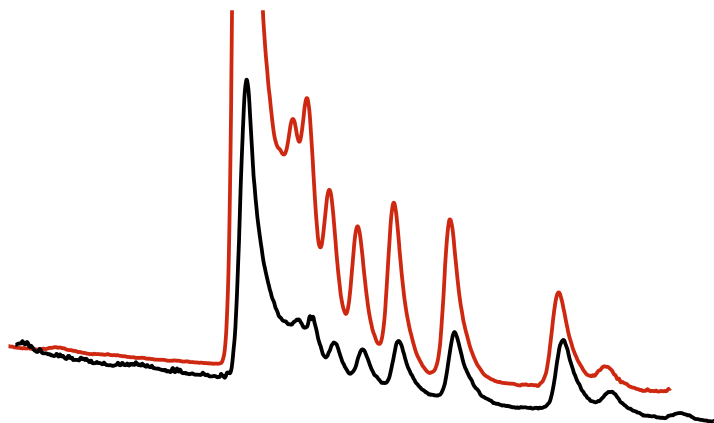
### Oligosaccharide analysis in water



**Analyte:** Maltodextrin 19

[Detailed view](#)

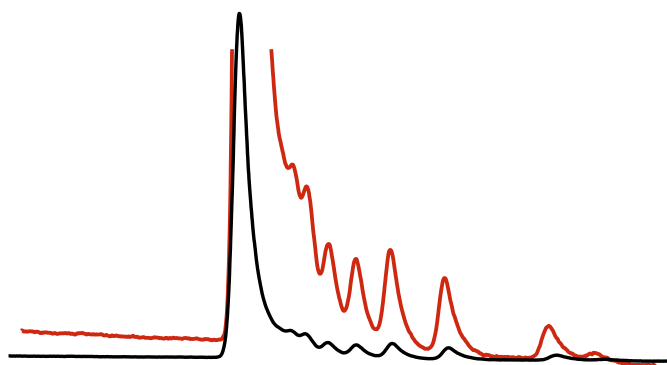
Column: ProntoGel Oligo-Su Na  
Dimension: 300mm x 8mm  
Mobil Phase: H<sub>2</sub>O  
Flow: 0.25ml/min  
Temperature: 70° C  
Detection: RI  
Injection: 20µl sample



**Analyte:** Maltodextrin 12

[Detailed view](#)

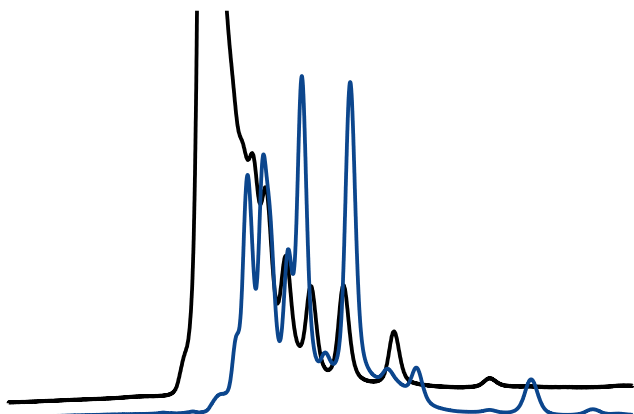
Column: ProntoGel Oligo-Su Na  
Dimension: 300mm x 8mm  
Mobil Phase: H<sub>2</sub>O  
Flow: 0.25ml/min  
Temperature: 70° C  
Detection: RI  
Injection: 20µl sample



**Analyte:** Maltodextrin 6

[Detailed view](#)

Column: ProntoGel Oligo-Su Na  
Dimension: 300mm x 8mm  
Mobil Phase: H<sub>2</sub>O  
Flow: 0.25ml/min  
Temperature: 70° C  
Detection: RI  
Injection: 20µl sample



**Analyte:** Maltodextrin 12 (black)

**Inulin (blue)**

Column: ProntoGel Oligo-Su Na  
Dimension: 300mm x 8mm  
Mobil Phase: H<sub>2</sub>O  
Flow: 0,25ml/min  
Temperature: 70° C  
Detection: RI  
Injection: 20µl sample

ProntoGel P columns for GPC analysis of organic molecules using (THF, toluene, chloroform)\*\*.

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

- ▶ Spherical high porous styrene-divinyl benzene GPC-media
- ▶ Large molecular weight range: 100→10 000 000Da
- ▶ Optimized for 1ml/min flow rate when using 8mm ID-columns
- ▶ High pressure stability of 150-50 bar, depending on porosity
- ▶ High capacity from ProntoGel 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 ProntoGel GPC synthesis technology for an extra increasing of peak capacity and resolution
- ▶ Proprietary ProntoGel GPC column packing procedure for accurate peak performance, low back Pressures and an extension of column lifetime
- ▶ Long column live time for reduction of costs even at high through put screening applications  
High level of reproducibility
- ▶ High purity of ProntoGel GPC particles and columns for pure GPC mechanisms, low signal noise and reduction of “systempeaks” after GPC run

### Area of applications:

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

### 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

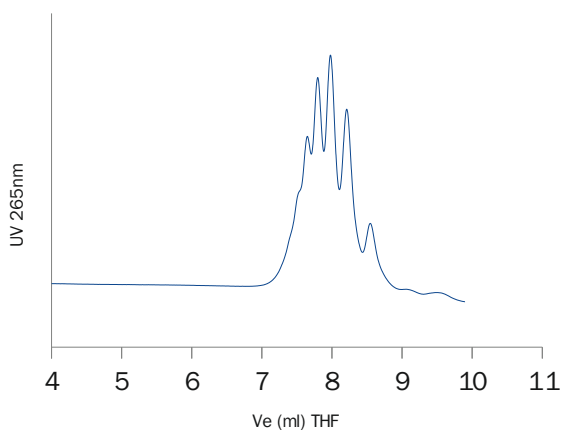


## ProntoGel-P molecular weight range and optimum range of molecular weights

ProntoGel-P-35	100Da-2 500Da
ProntoGel-P-100	100Da-10 000Da
ProntoGel-P-500	100Da-30 000Da
ProntoGel-P-1000	100Da-70 000Da
ProntoGel-P-1500	1.00Da-120 000Da
ProntoGel-P-10 000	100Da-400 000Da
ProntoGel-P-100 000	500Da-1 500 000Da
ProntoGel-P-1 000 000	10 000Da - 4 000 000Da
ProntoGel-P-10 000 000	100 000Da - 10 000 000Da

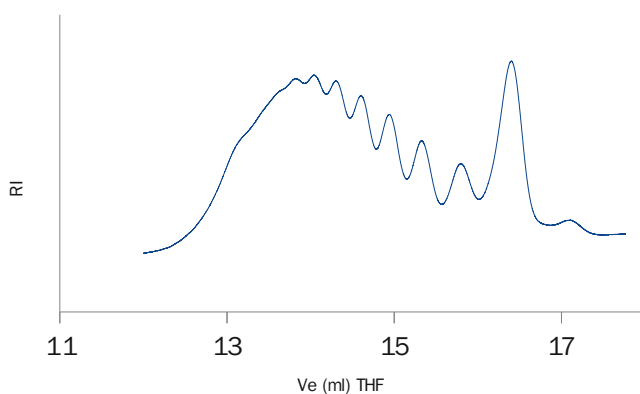
\* Note:- (All above mentioned phases are available in 300x8, 250x8, 50x8, 30x8 dimension)

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 it uses the BPT\* synthesis technology for significant lowering the inhomogenities phenomena and to improve the results.



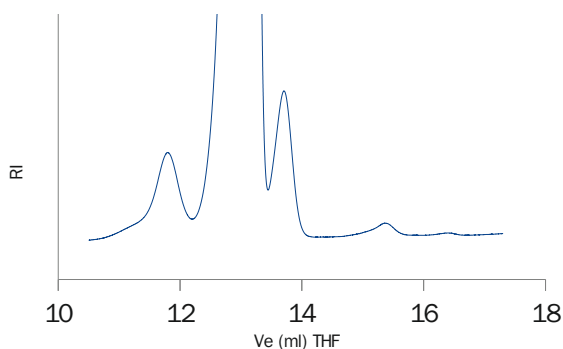
**Analyte:** Polystyrene (PS)  
**Mp = 578Da**

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



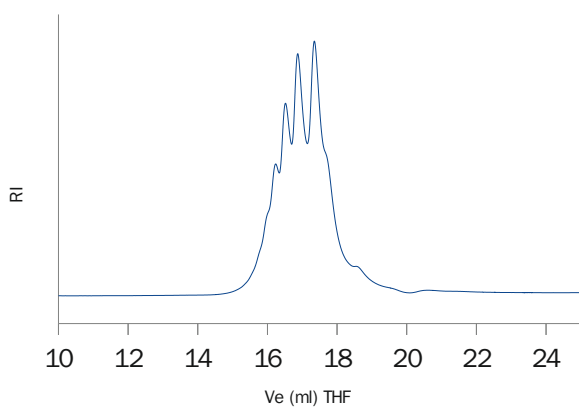
**Analyte:** Polymethylmethacrylate (PMMA) oligomer

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



**Analyte:** Grapeoil (Triglyceride GPC)

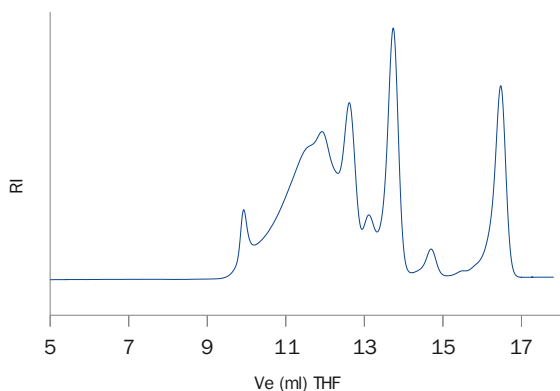
Column: ProntoGel-P-100  
Dimension: 2 x 300mm x 8mm  
Mobil Phase: THF  
Flow: 1.0ml/min  
Temperature: 20°C  
Detection: RI  
Injection: 20µl sample



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

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

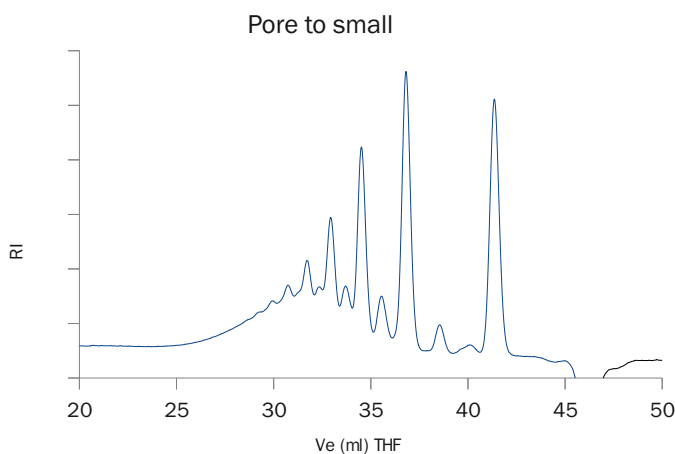




**Analyte:** Bisphenol-A-Epichlorhydrin resin (I)

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

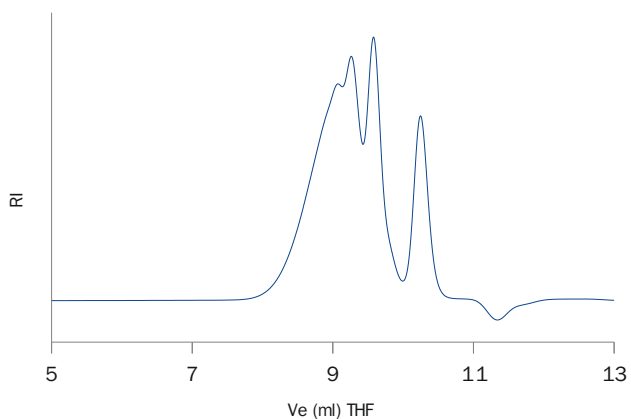
High resolving GPC up to 10 000Da.



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

**Column:** ProntoGel-P-1500  
**Dimension:** 2 x 300mm x 8mm  
**Mobil Phase:** THF  
**Flow:** 0.5ml/min  
**Temperature:** 20 °C  
**Detection:** RI  
**Injection:** 20µl sample

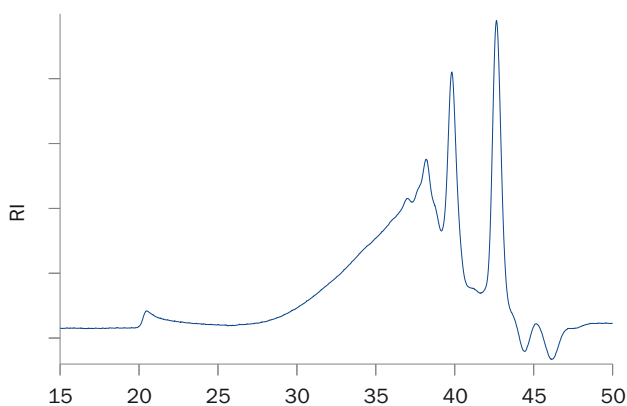
Good resolution, calibration range respective linearity in the range of 100Da-120 000Da, obtained from the special ProntoGel BPT-technology. No “surprising” porosity artefacts from mixing particles with pores of different size for covering the full range of molecular sizes. Great resolution even if 8µl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



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

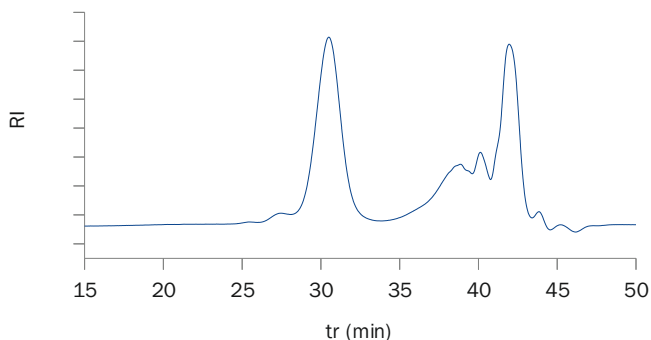
**Column:** ProntoGel-P-100 000  
**Dimension:** 300mm x 8mm  
**Mobil Phase:** THF  
**Flow:** 1.0ml/min  
**Temperature:** 20 °C  
**Detection:** RI  
**Injection:** 20µl sample

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



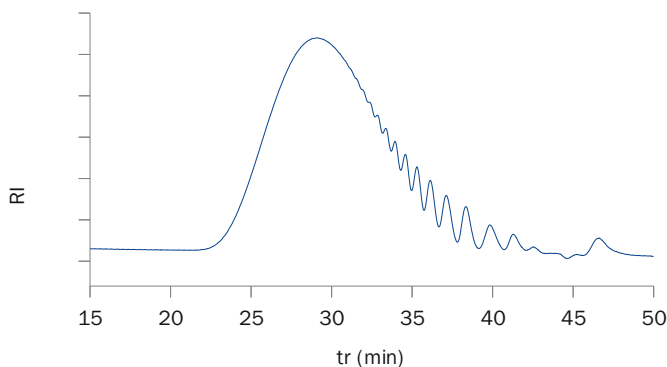
**Analyte: Polyol hard foam**

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



**Analyte: Polyol soft foam**

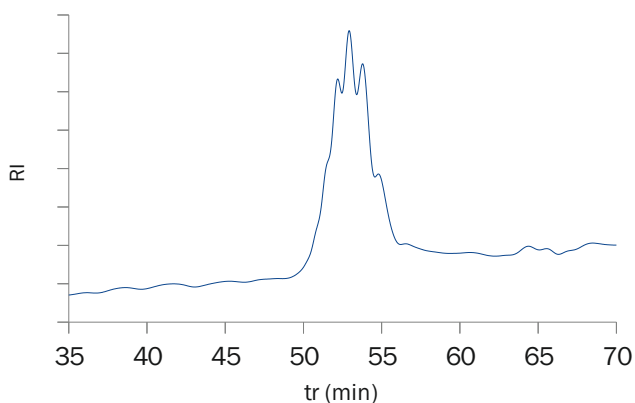
Column: ProntoGel-P-1500  
 Dimension: 2 x 300mm x 8mm  
 Mobil Phase: THF  
 Flow: 0.5ml/min  
 Temperature: 45°C  
 Detection: RI  
 Injection: 20µl sample



**Analyte: Aliphatic polyester**

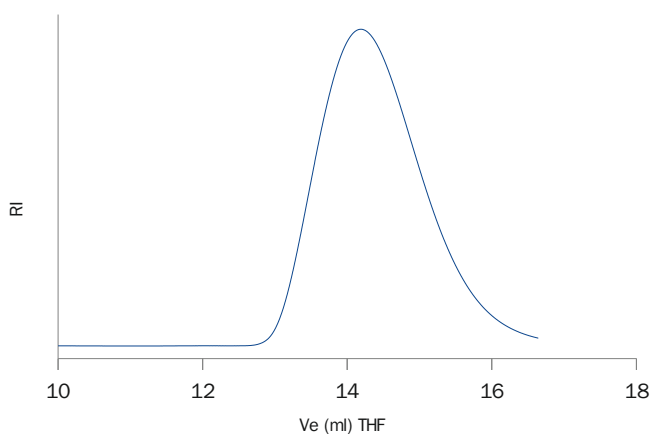
(adipate polyester)  
 including fingerprint

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



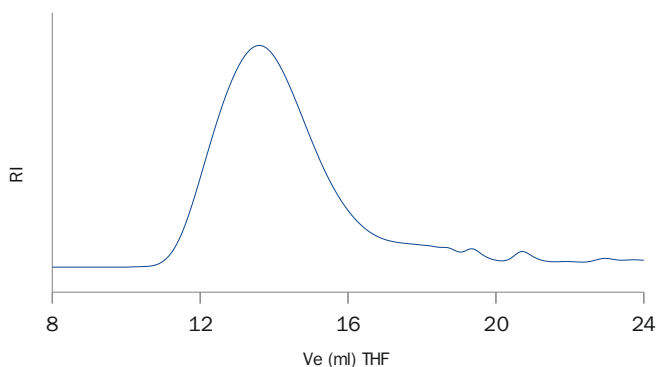
**Analyte: Polyether polyol**

Column: ProntoGel-P-1500  
 Dimension: 2 x 300mm x 8mm  
 1x 50mmx 8mm  
 Mobil Phase: THF  
 Flow: 0.5ml/min  
 Temperature: 45°C  
 Detection: RI  
 Injection: 20µl sample



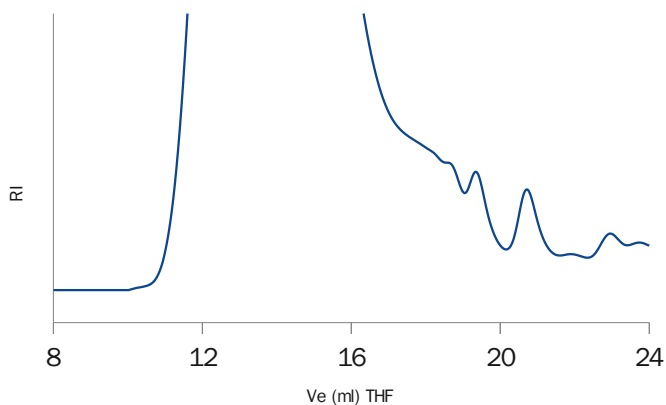
**Analyte: PVC**

Column: ProntoGe-P-100 000  
 Dimension: 2 x 300mm x 8mm  
 Mobil Phase: THF  
 Flow: 1.0ml/min  
 Temperature: 45°C  
 Detection: RI  
 Injection: 20µl sample



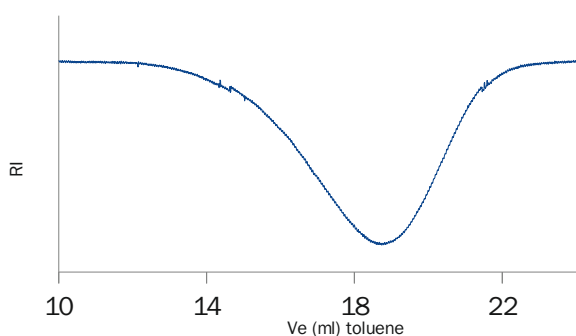
**Analyte: PMMA**

Column: ProntoGel-P-100 000  
 Dimension: 2 x 300mm x 8mm  
 Mobil Phase: THF  
 Flow: 1.0ml/min  
 Temperature: 45°C  
 Detection: RI  
 Injection: 20µl sample



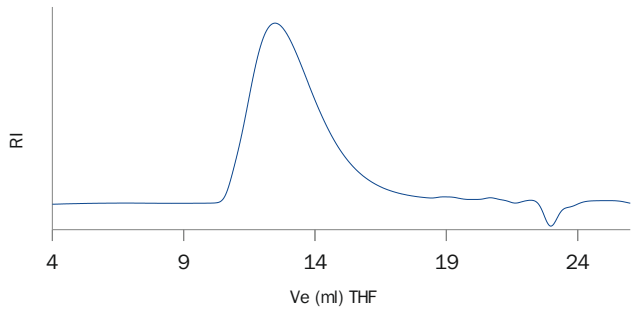
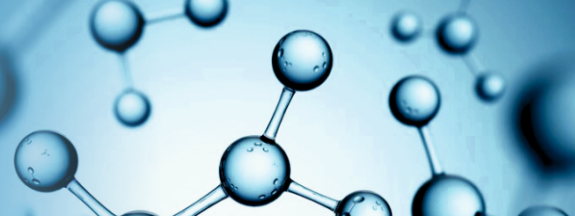
**Analyte: PMMA enlarged**

Column: ProntoGel-P-100 000  
 Dimension: 2 x 300mm x 8mm  
 Mobil Phase: THF  
 Flow: 1.0ml/min  
 Temperature: 45°C  
 Detection: RI  
 Injection: 20µl sample



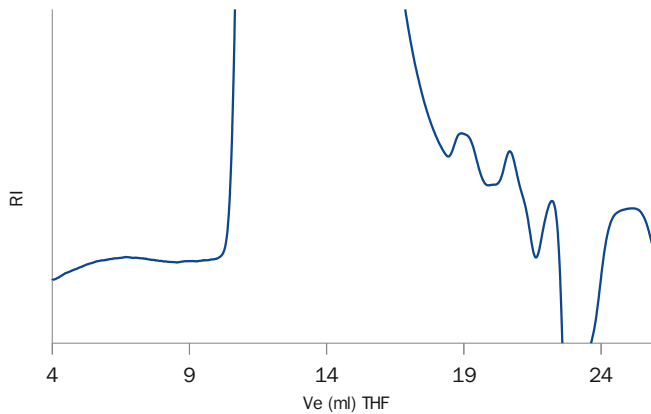
**Analyte: Silicone**

Column: ProntoGel-P-100 000  
 Dimension: 2 x 300mm x 8mm  
 Mobil Phase: Toluene  
 Flow: 1.0ml/min  
 Temperature: 20°C  
 Detection: RI  
 Injection: 20µl sample



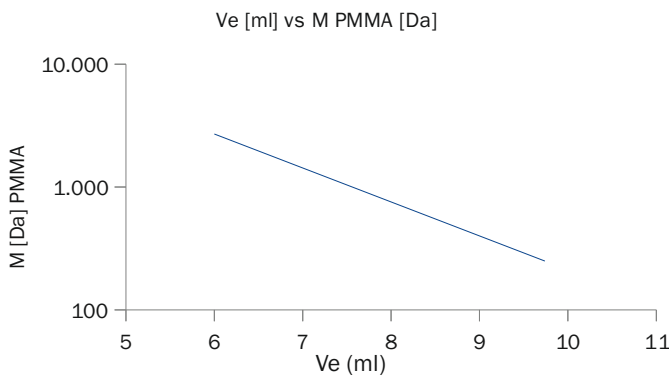
**Analyte: Polystyrene**

Column: ProntoGel-P-100 000  
 Dimension: 2 x 300mm x 8mm  
 Mobil Phase: THF  
 Flow: 1.0ml/min  
 Temperature: 45° C  
 Detection: RI  
 Injection: 20µl sample



**Analyte: Polystyrene enlarged**

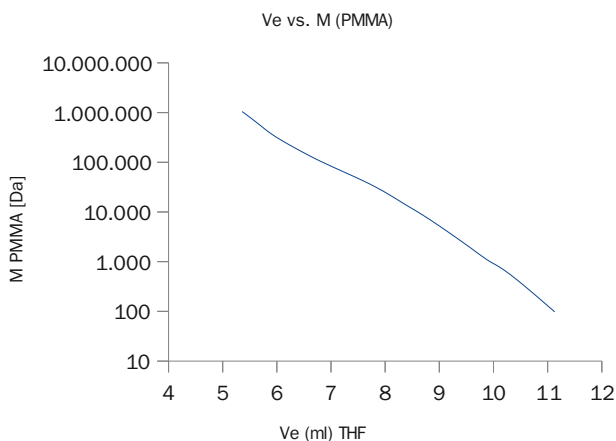
Column: ProntoGel-P-100 000  
 Dimension: 2 x 300mm x 8mm  
 Mobil Phase: THF  
 Flow: 1.0ml/min  
 Temperature: 45° C  
 Detection: RI  
 Injection: 20µl sample



**GPC calibration curve**

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

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



**GPC calibration curve**

Column: ProntoGel-P-100 000  
 Dimension: 2 x 300mm x 8mm  
 Mobil Phase: THF  
 Flow: 1.0ml/min  
 Temperature: 20° C  
 Detection: RI  
 Injection: 20µl sample

ProntoGel-P-100 000-BPT-Technology: Large calibration range respective good to calculate calibration curve from 100 000Da to 1 500 000Da, ideal technological step ahead if a combination of porosities results in "artificial shoulders" of calibration curves and/or in artificial shoulders of broad distributed molecular weight polymers. An easy to use tool to improve quality of results for your analytes.

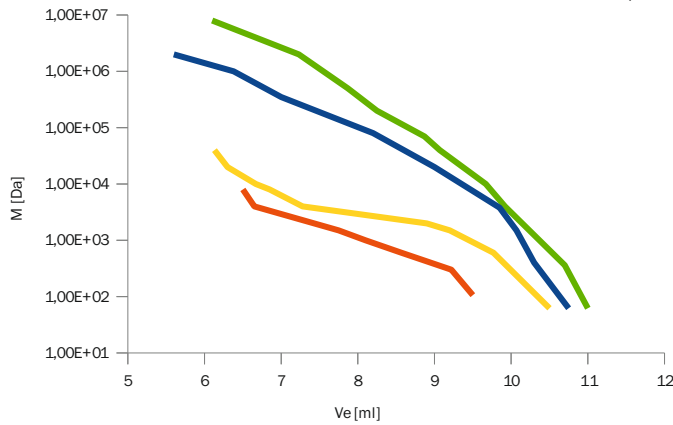
Special GPC / SEC columns for the aqueous analysis of neutral, anionic and additionally cationic polymers.

For GPC / SEC analysis of

- ▶ Polycations, polyammonium compounds
- ▶ polyamines (chitosans), polyethylenimines,
- ▶ PEGylated polyethyleneimines
- ▶ Polysaccharides
- ▶ Polyanions (heparins, pectins, ...)

Description	Separation Range
ProntoGel-100-NAC	100Da-2 500Da
ProntoGel-200-NAC	100Da-20 000Da
ProntoGel-350 NAC	2 500Da-1 000 000Da
ProntoGel-400-NAC	10 000Da-5 000 000Da

\* Note:- (All above mentioned phases are available in 300x8, 250x8, 50x8, 30x8 dimension)

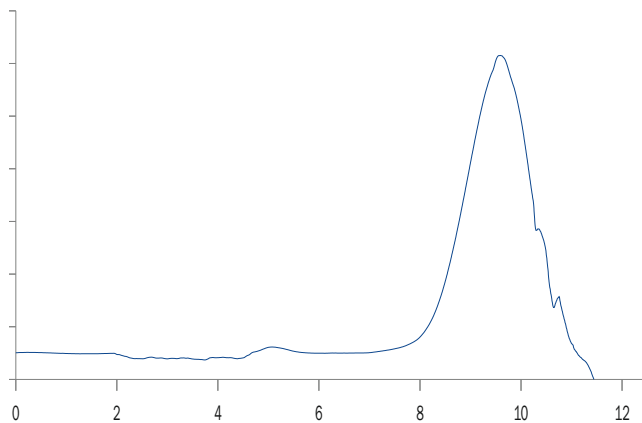
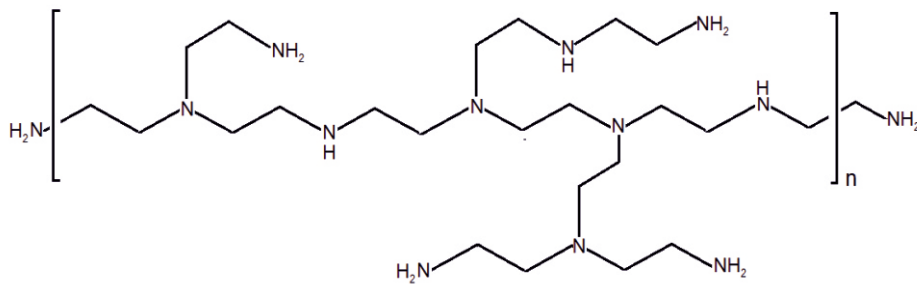


**Analyte: Dextrans**

Column: ProntoGel-100-NAC  
 ProntoGel-200-NAC  
 ProntoGel-350-NAC  
 ProntoGel-400-NAC

Dimension: e.a. 300mm x 8mm  
 Mobil Phase: H<sub>2</sub>O,  
 Flow: 1.0ml/min  
 Temperature: 20°C  
 Detection: RI  
 Injection: 100µl sample

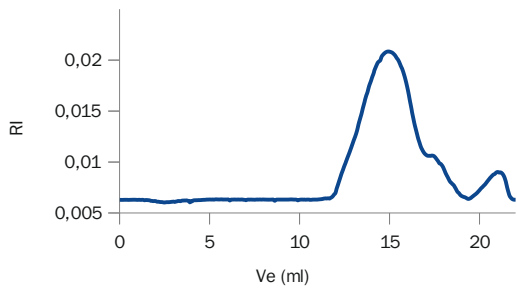
ProntoGel NAC Calibration curve  
 Porosity P-100, P-200, P-350 and P-400,  
 based on dextrans



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

Column: ProntoGel-350-NAC

Dimension: 300mm x 8mm  
 Mobil Phase: 0.1M NaCl + 0.2% TFA in H<sub>2</sub>O,  
 Flow: 1.0ml/min  
 Temperature: 20°C  
 Detection: RI  
 Injection: 20µl sample



## Analyte:

### Poly DADMF

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

Column:

ProntoGel-100-NAC  
ProntoGel-350-NAC

Dimension:

e.a. 300mm x 8mm

Mobil Phase:

NaNO<sub>3</sub> + 0.2% formic acid in H<sub>2</sub>O

Flow:

1.0ml/min

Temperature:

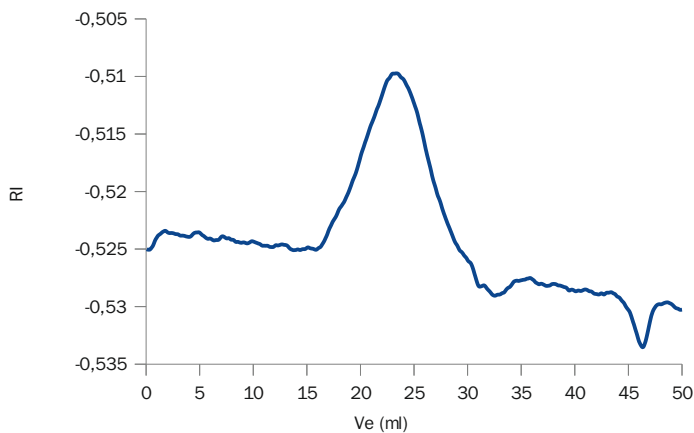
20°C

Detection:

RI

Injection:

100µl sample



## Analyte:

### High molecular weight chitosan, poliglusam, polyglucosamine

CAS [9012-76-4]

Column:

ProntoGel-400-NAC

Dimension:

3 x 300mm x 8mm

Mobil Phase:

NaNO<sub>3</sub> + 0.2% formic acid in H<sub>2</sub>O

Flow:

1.0ml/min

Temperature:

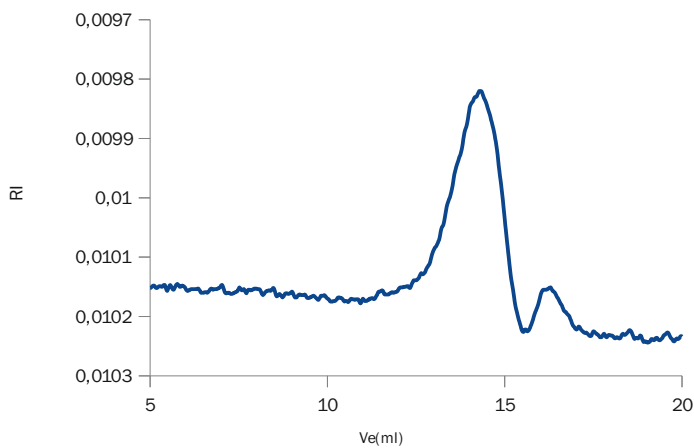
20°C

Detection:

RI

Injection:

100µl sample



## Analyte:

### Chitosan sulfate

Column:

ProntoGel-100-NAC  
ProntoGel-350-NAC

Dimension:

e.a. 300mm x 8mm

Mobil Phase:

0.05MNa<sub>2</sub>HPO<sub>4</sub> + 0.1M NaNO<sub>3</sub> in H<sub>2</sub>O

Flow:

1.0ml/min

Temperature:

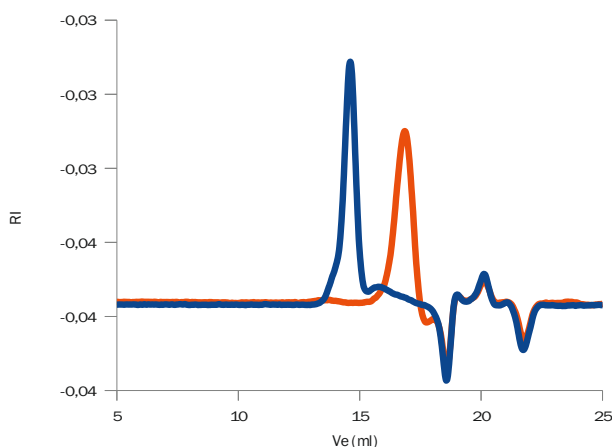
20°C

Detection:

RI

Injection:

100µl sample



## Analyte:

### PEI (polyethyleneimine)

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

Mn = 4 x 104, Mw = 4.2 x 104,

Mp = 3.9 x 104Da;

### PEI (polyethyleneimine)

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

Mn = 2.1 x 103, Mw = 2.9 x 103,

Mp = 2.15 x 103 Da

Column:

ProntoGel-100-NAC  
ProntoGel-350-NAC

Dimension:

e.a. 300mm x 8mm

Mobil Phase:

0.1M NaCl + 0.2% TFA in H<sub>2</sub>O

Flow:

1.0ml/min

Temperature:

20°C

Detection:

RI

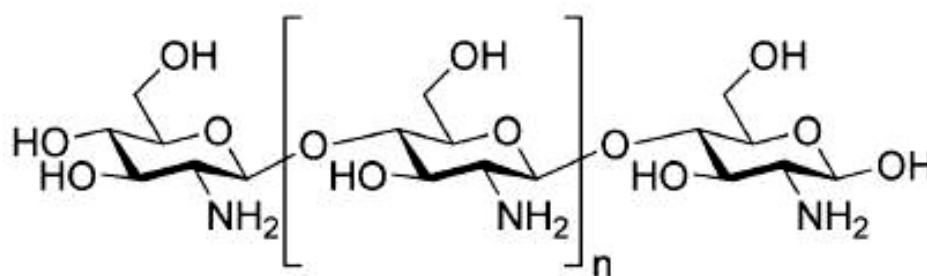
Injection:

100µl sample

## ProntoGel-NAC Plus

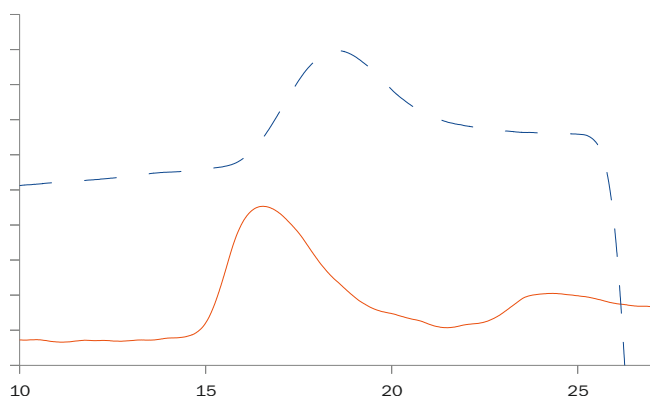
Description	Separation Range
ProntoGel-100-NAC Plus	100Da-2 500Da
ProntoGel-150-NAC Plus	100Da-5 000Da
ProntoGel-350-NAC Plus	2 500Da-1 000 000Da
ProntoGel-450-NAC Plus	300 000Da-50 000 000Da
ProntoGel-500-NAC Plus	10 000Da~50 000 000Da

\* Note:- (All above mentioned phases are available in 300x8, 250x8, 50x8, 30x8 dimension)





Special GPC / SEC columns for the aqueous analysis of neutral, anionic and additionally cationic polymers - PLJ 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: 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: ProntoGel-100-NAC Plus  
ProntoGel-350-NAC Plus  
ProntoGel-500-NAC Plus

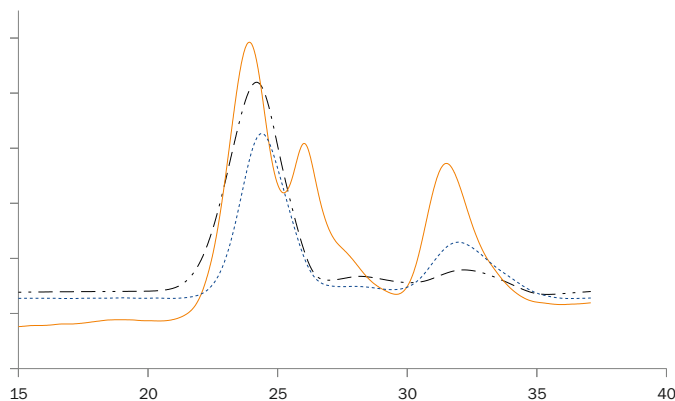
Dimension: e.a. 300mm x 8mm  
Mobil Phase: 0.1M NaCl + 0.2% TFA in H<sub>2</sub>O,  
Flow: 1.0ml/min  
Temperature: 40°C  
Detection: RI  
Injection: 100µl sample

**Analyte: Poly DADMF**

GPC comparison 3 samples

**Polydiallyldimethylammonium chloride, polyquaternium-6**

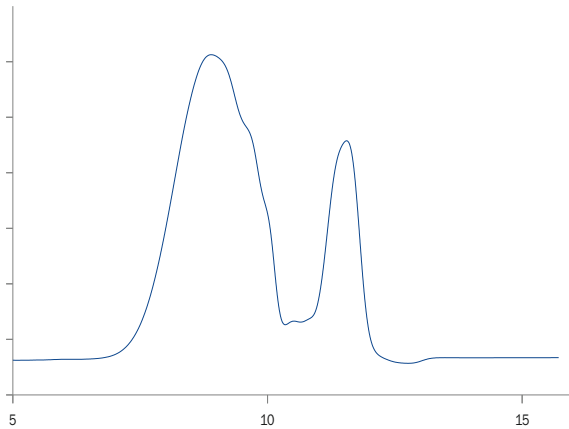
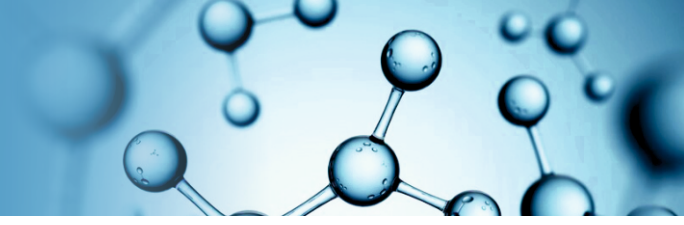
Mw = 100Da-200 000Da,  
CAS [26062-79-3]



Column: ProntoGel-100-NAC Plus  
ProntoGel-350-NAC Plus  
ProntoGel-500-NAC Plus

Dimension: e.a. 300mm x 8mm  
Mobil Phase: 0.1M NaCl + 0.2% TFA in H<sub>2</sub>O,  
Flow: 1.0ml/min  
Temperature: 40°C  
Detection: RI  
Injection: 100µl sample





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

**Column:** ProntoGel NAC Plus-350

**Dimension:** 300mm x 8mm

**Mobil Phase:** 0.1M NaCl + 0.2% TFA in H<sub>2</sub>O,

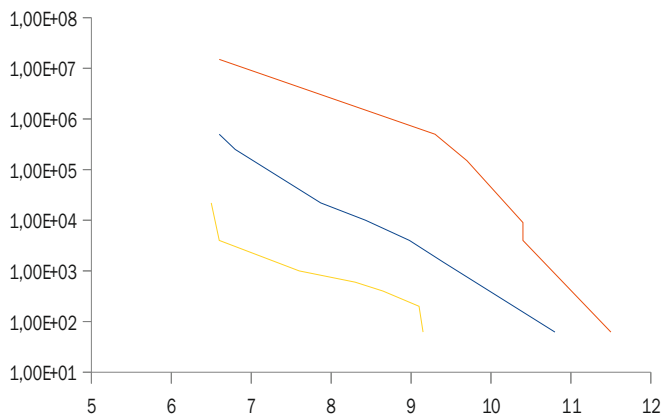
**Flow:** 1.0ml/min

**Temperature:** 20° C

**Detection:** RI

**Injection:** 20µl sample

ProntoGel NAC-PLJ Calibration curve  
Porosity P-100-PLJ, P-350-PLJ and P-500-PLJ,  
based on dextrans



**Analyte:** **PEO**  
**Dextran**  
**Polyacrylamide**

**Column:** ProntoGel-100-NAC Plus  
ProntoGel-350-NAC Plus  
ProntoGel-500-NAC Plus

**Dimension:** e.a.300mm x 8mm

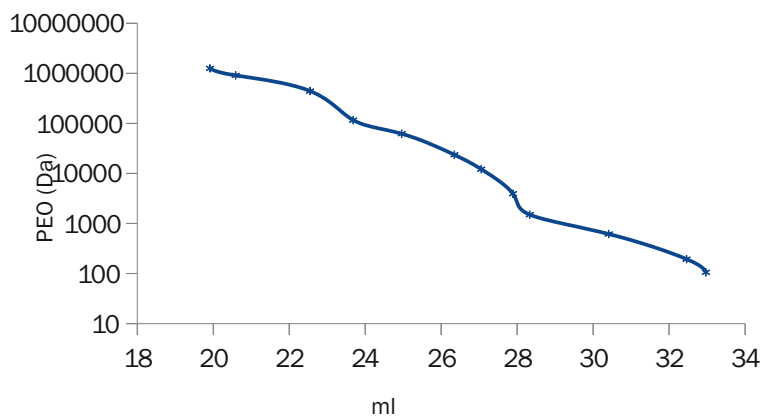
**Mobil Phase:** H<sub>2</sub>O,

**Flow:** 1.0ml/min

**Temperature:** 20° C

**Detection:** RI

**Injection:** 100µl sample



**PEO/PEG Calibration**

**Column:** ProntoGel-100-NAC Plus  
ProntoGel-100-NAC Plus  
ProntoGel-350-NAC Plus  
ProntoGel-450-NAC Plus

**Dimension:** 1 x 50mm x 8mm  
3 x 300mm x 8mm

**Mobil Phase:** H<sub>2</sub>O

**Flow:** 1.0ml/min

**Temperature:** 20° C

**Detection:** RI



## Benefits ProntoGel HFIP GPC columns series over standard columns

- ▶ Very large pore volume for high GPC resolution
- ▶ High GPC resolution for oligomers / condensates of 100Da-70 000Da
- ▶ High resolution GPC separation for the range 100Da-800 000Da
- ▶ Large areas with high linearity calibratable areas without porosity artifacts
- ▶ Low bleed
- ▶ Standard columns also used for GPC-LS and GPC viscosity

Description	Separation Range
ProntoGel-100-HFIP	100Da-2 500Da
ProntoGel-350-HFIP	up to 1 000 000 Da
ProntoGel-500-HFIP	10 000Da--50 000 000Da

\* Note:- (All above mentioned phases are available in 300x8, 250x8, 50x8, 30x8 dimension)

## 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

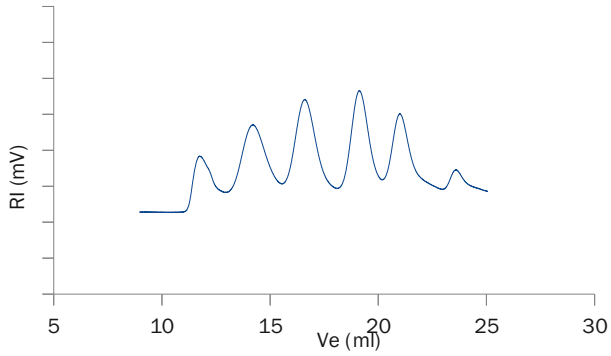
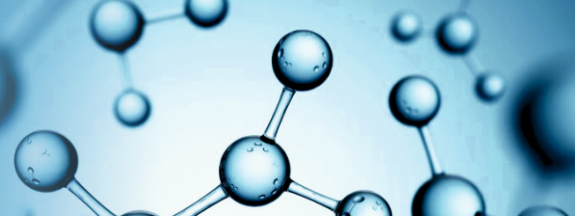
Other (paraformaldehyde / polyoxymethylene / POM / polyacetal / CAS 30525-89-4 polyethylenimine / PEI / poly (iminoethylene / polyaziridine / CAS 9002-98-6)

## HFIP GPC / SEC calibration versus

- PMMA / polymethylmethacrylate / CAS 901-14-7

## HFIP Accessories:

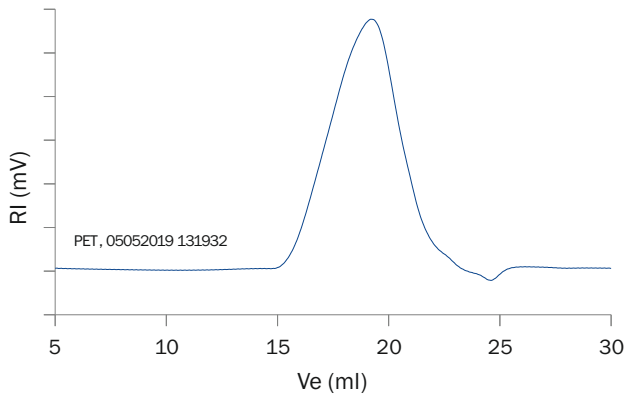
5mM CF<sub>3</sub>COOK or 0.075M CF<sub>3</sub>COONa are added to the eluent HFIP for the suppression of electrostatic interactions and for artefact-free GPC.



**Analyte: Polymethylmethacrylat**

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

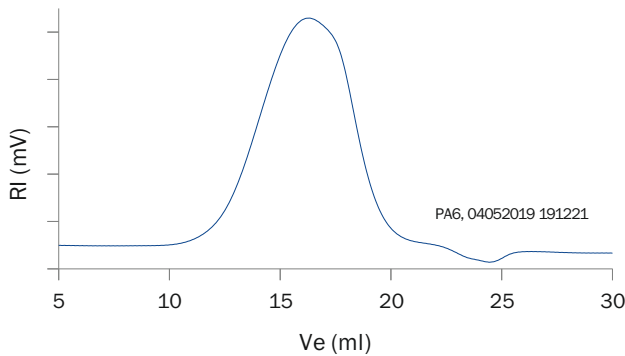
Column: ProntoGel-350-HFIP  
Dimension: 2 x 300mm x 8mm  
Mobil Phase: HFIP, 5mM CF<sub>3</sub> COONa  
Flow: 0.5ml/min  
Temperature: 40°C  
Detection: RI  
Injection: 100µl sample



**Analyte: Polyethylenterephthalat**

(PET), CAS 25038-59-9

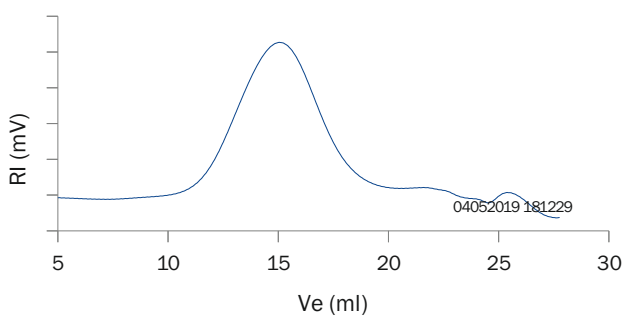
Column: ProntoGel-350-HFIP  
Dimension: 2 x 300mm x 8mm  
Mobil Phase: HFIP, 5mM CF<sub>3</sub> COONa  
Flow: 0.5ml/min  
Temperature: 40°C  
Detection: RI  
Injection: 100µl sample



**Analyte: Polyethylenterephthalat**

(PET), CAS 25038-59-9

Column: ProntoGel-350-HFIP  
Dimension: 2 x 300mm x 8mm  
Mobil Phase: HFIP, 5mM Cf<sub>3</sub> COONa  
Flow: 0.5ml/min  
Temperature: 40°C  
Detection: RI  
Injection: 100µl sample



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

CAS131-17-2

Column: ProntoGel-350-HFIP  
Dimension: 2 x 300mm x 8mm  
Mobil Phase: HFIP, 5mM Cf<sub>3</sub> COONa  
Flow: 0.5ml/min  
Temperature: 40°C  
Detection: RI  
Injection: 100µl sample; 1g/l

**ProntoGel AC-AQ-250, 300, 400 GPC-columns for GPC analysis of organic molecules using (80%acetone, 20%water)\*.**

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

- ▶ Optimized for GPC analysis of organosolv lignins
- ▶ Easy and reliable to handle in acetone/water/traces formic acid // 80/20/1 // v/v/v
- ▶ Compatible with evaporative detection (ELSD, MS)\*
- ▶ Preparative GPC fractionation of organosolv lignin without salt possible
- ▶ Recycling GPC respective peak recycling GPC with enormous separation efficiency possible for isolation of individual organosolv lignin substances in semipreparative scale
- ▶ Molecular weight calibration vs. PEO/PEG
- ▶ Spherical high porous polymeric GPC-media with no silanol activity for pure GPC
- ▶ Large molecular weight range: 100 – 1 000 000Da
- ▶ High pressure stability of 100bar
- ▶ High peak and separation capacity
- ▶ ProntoGel GPC columns – innovations and quality

Made in Germany

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

ProntoGel Ac-AQ GPC Series:

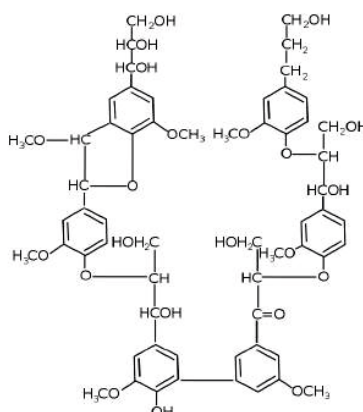
molecular weight range and optimum range of molecular weights

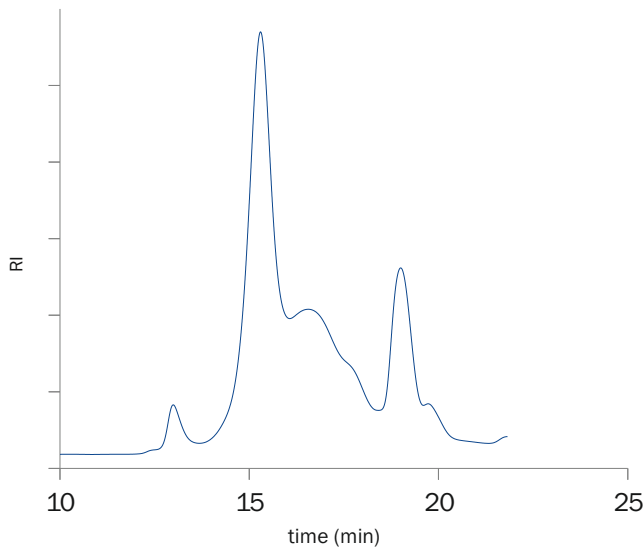
Pore size	Separation range	Optimum resolution range
250	100Da-70 000Da	100Da-10 000Da
350	100Da-1 000 000Da	1 000Da-400 000Da

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

Description	Separation Range
GPC-Column ProntoGel-250-AC-AQ	100Da-70 000Da
GPC-Column ProntoGel-350-AC-AQ	100Da-1 000 000Da

\* Note:- (All above mentioned phases are available in 300x8, 250x8, 50x8, 30x8 dimension)





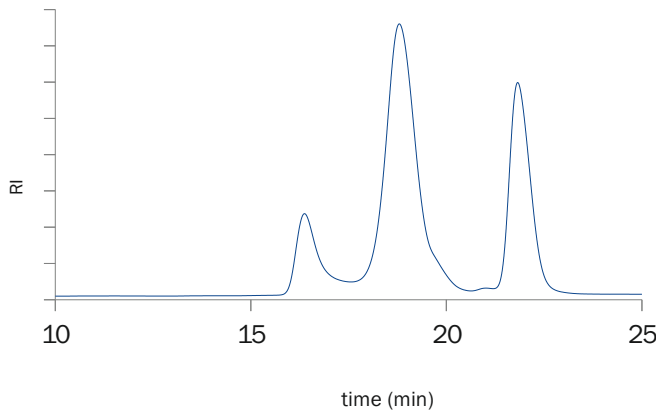
**Analyte: Organosolv Lignin GPC**

(range: 100Da-1 500 000Da)

Column: 2 x ProntoGel-250-AC-AQ

Dimension: ea. 300mm x 8mm  
Mobil Phase: acetone/H<sub>2</sub>O/formic acid  
80/20/1 v/v/v

Flow: 1.0ml/min  
Temperature: 25°C  
Detection: RI

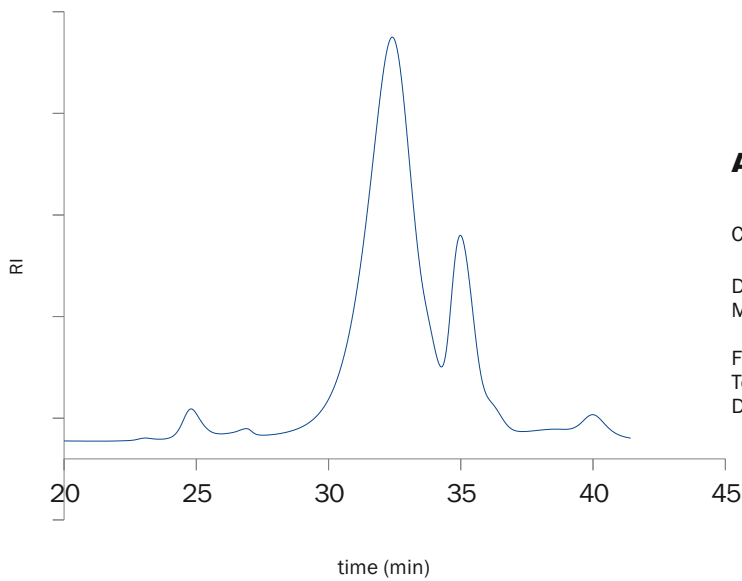


**Analyte: PEO/PEG GPC**

(8 000Da, 1 000Da, 106Da)

Column: 2 x ProntoGel-250-AC-AQ

Dimension: ea. 300mm x 8mm  
Mobil Phase: acetone/H<sub>2</sub>O 80/20 v/v  
Flow: 1.0ml/min  
Temperature: 25°C  
Detection: RI



**Analyte: Organosolv Lignin GPC**

Column: 3 x ProntoGel-350-AC-AQ

Dimension: ea. 300mm x 8mm  
Mobil Phase: acetone/H<sub>2</sub>O/formic acid  
80/20 /1 v/v/v

Flow: 1.0ml/min  
Temperature: 25°C  
Detection: RI

# ProntoGel

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Böblinger Str. 23, 71229 Leonberg  
Phone: +49-7152-6064-0  
Web: [www.bischoff365.com](http://www.bischoff365.com)

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