

Certificate of Analysis



Agilent Technologies, Inc. acquired Polymer Standards Service GmbH (PSS) on August 01st, 2022.

The Quality Certificate / Certificate of Analysis generated by PSS attached to this Letter is valid for the Product stated in the Certificate sold to You by Agilent Technologies, Inc or its subsidiaries.

Patrick Kunzweiler

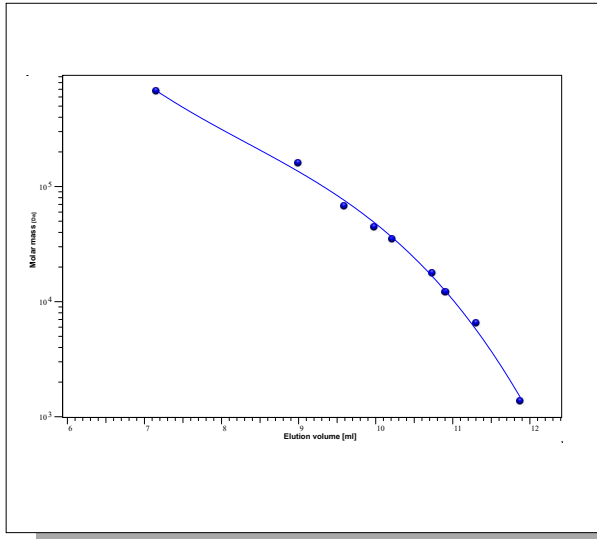
Quality Manager
Liquid Phase Separation Division

Certificate of Analysis

Product: Kit Protein
 Part No: PSS-PROKIT
 Lot No: PROKIT-11

being used with PSS PROTEEMA 3µm 300Å

GPC/SEC - Calibration Curve

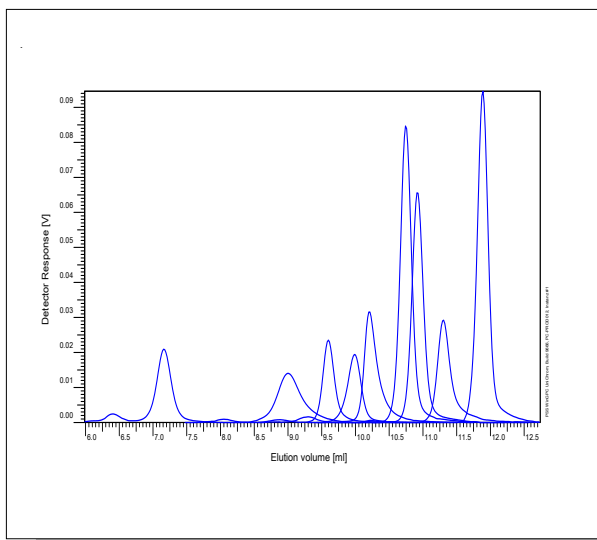


GPC/SEC - Calibration Table

Elution volume [ml]	M [Da]	Protein Lot No:	Protein type:
7,16	670000	PROTG220222	Thyroglobulin
9,00	158000	PROGG121121	γ-globulins
9,60	67000	PROAB221021	Albumin (bovine)
9,98	44000	PROAC211021	Albumin (chicken)
10,21	35000	PROLG241021	β-lactoglobulin
10,74	17600	PROMG231021	Myoglobin
10,91	12000	PROCB030122	Cytochrome c
11,31	6500	PROAP201021	Aprotinin
11,88	1350	PROVI251021	Vitamin B12

Note:
 M = Molar mass

GPC/SEC - Polymer Overlay



GPC/SEC - Calibration Conditions

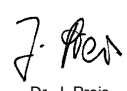
Solvent Phosphate buffer pH6.6 (34mmol/l),
 0.5M sodium chloride
 Flow rate 1,00 ml/min
 Precolumn [8 x 50 mm] PSS PROTEEMA 3µm
 Columns [8 x 300 mm] PSS PROTEEMA 3µm 300Å
 Temperature 23 °C
 Inject volume 20 µl
 Internal standard none
 Data Acquisition Software PSS WinGPC
 Calibration by A.Klein

Fit quality

Fit-type Polynomial 3
 R 0,998467

Storage: Store the tightly recapped polymer standards in a dry, dark, cool area; e.g. (-20 °C).
 Date of expiry: 2028/02/29 (See also product label.)
 Date of approval: 2023/02/13

Manufacture control according to PSS method of analysis

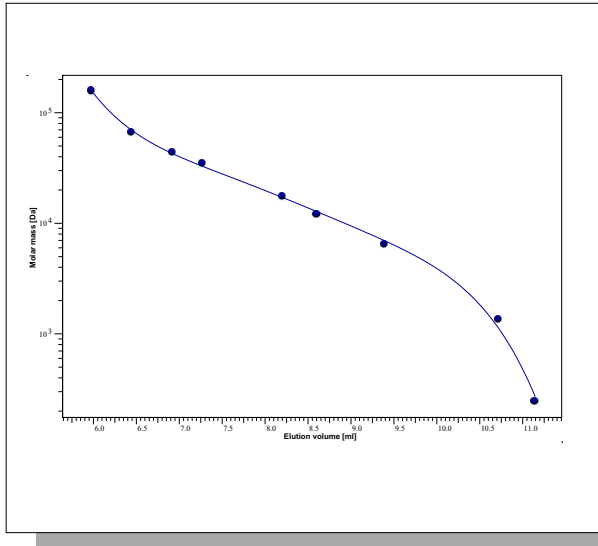

 Dr. J. Preis
 production manager

Certificate of Analysis

Product: Kit Protein
 Part No: PSS-PROKIT
 Lot No: PROKIT-11

being used with PSS PROTEEMA 3µm 100Å

GPC/SEC - Calibration Curve

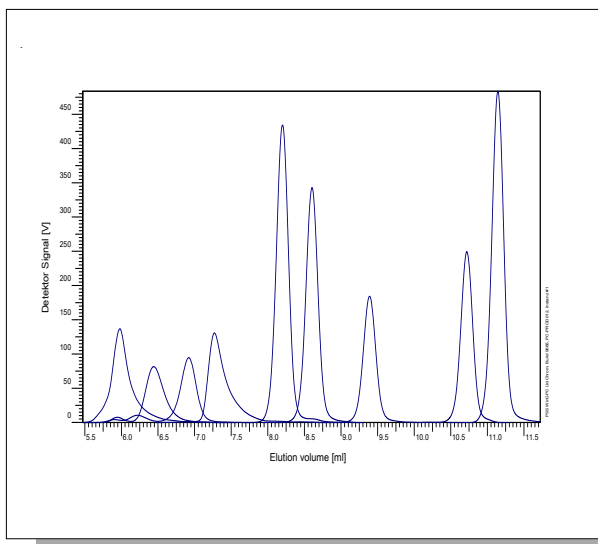


GPC/SEC - Calibration Table

Elution volume [ml]	M [Da]	Protein Lot No:	Protein type:
5,98	158000	PROGG121121	γ-globulins
6,44	67000	PROAB221021	Albumin (bovine)
6,92	44000	PROAC211021	Albumin (chicken)
7,27	35000	PROLG241021	β-lactoglobulin
8,20	17600	PROMG231021	Myoglobin
8,60	12000	PROCB030122	Cytochrome c
9,39	6500	PROAP201021	Aprotinin
10,72	1350	PROVI251021	Vitamin B12
11,14	243	PROCY111121	Cytidine

Note:
 M = Molar mass

GPC/SEC - Polymer Overlay



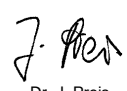
GPC/SEC - Calibration Conditions

Solvent Phosphate buffer pH6.6 (34mmol/l),
 0.5M sodium chloride
 Flow rate 1,00 ml/min
 Precolumn [8 x 50 mm] PSS PROTEEMA 3µm
 Columns [8 x 300 mm] PSS PROTEEMA 3µm 100Å
 Temperature 23 °C
 Inject volume 20 µl
 Internal standard none
 Data Acquisition Software PSS WinGPC
 Calibration by A.Klein

Fit quality
 Fit-type PSS Poly 5
 R 0,999054

Storage: Store the tightly recapped polymer standards in a dry, dark, cool area; e.g. (-20 °C).
 Date of expiry: 2028/02/29 (See also product label.)
 Date of approval: 2023/02/13

Manufacture control according to PSS method of analysis


 Dr. J. Preis
 production manager

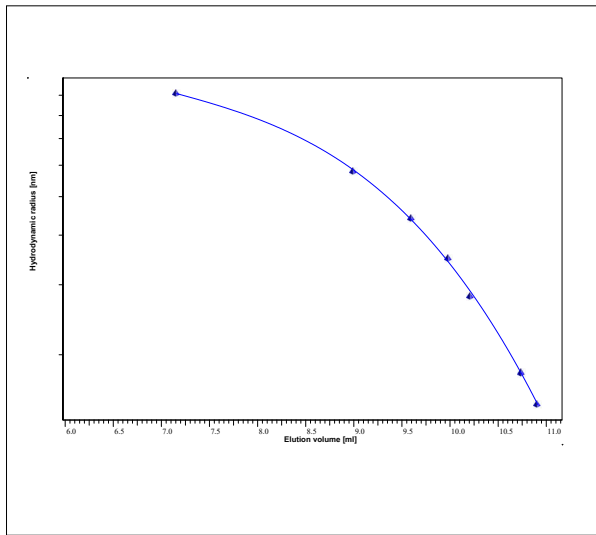


Certificate of Analysis

Product: Kit Protein
 Part No: PSS-PROKIT
 Lot No: PROKIT-11

being used with PSS PROTEEMA 3µm 300Å

GPC/SEC - Calibration Curve - Hydrodynamic Radii [nm]



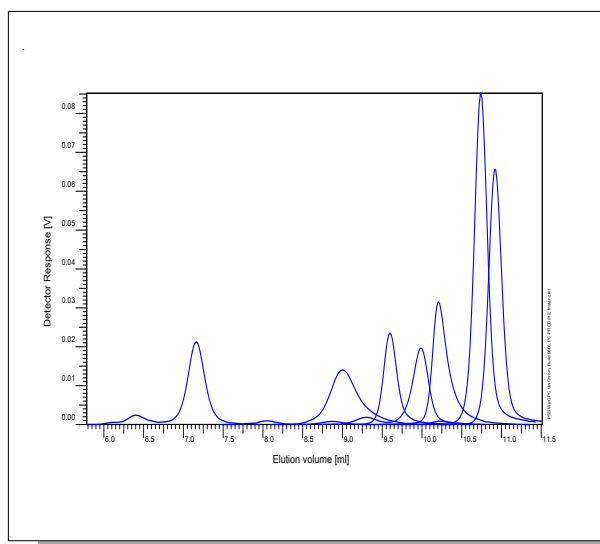
GPC/SEC - Calibration Table - Hydrodynamic Radii [nm]

Elution volume [ml]	Rh [nm]	Protein Lot No:	Protein type:
7,16	9,1	PROTG220222	Thyroglobulin
9,00	5,8	PROGG121121	γ-globulins
9,60	4,4	PROAB221021	Albumin (bovine)
9,98	3,5	PROAC211021	Albumin (chicken)
10,21	2,8	PROLG241021	β-lactoglobulin
10,74	1,8	PROMG231021	Myoglobin
10,91	1,5	PROCB030122	Cytochrome c

Note:

Rh = Hydrodynamic radius (monomer)

GPC/SEC - Polymer Overlay



GPC/SEC - Calibration Conditions

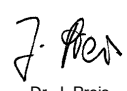
Solvent Phosphate buffer pH6.6 (34mmol/L),
 0.5M sodium chloride
 Flow rate 1,00 ml/min
 Precolumn [8 x 50 mm] PSS PROTEEMA 3µm
 Columns [8 x 300 mm] PSS PROTEEMA 3µm 300Å
 Temperature 23 °C
 Inject volume 20 µl
 Internal standard none
 Data Acquisition Software PSS WinGPC
 Calibration by A.Klein

Fit quality

Fit-type Polynomial 3
 R 0,978965

Storage: Store the tightly recapped polymer standards in a dry, dark, cool area; e.g. (-20 °C).
 Date of expiry: 2028/02/29 (See also product label.)
 Date of approval: 2023/02/13

Manufacture control according to PSS method of analysis


 Dr. J. Preis
 production manager

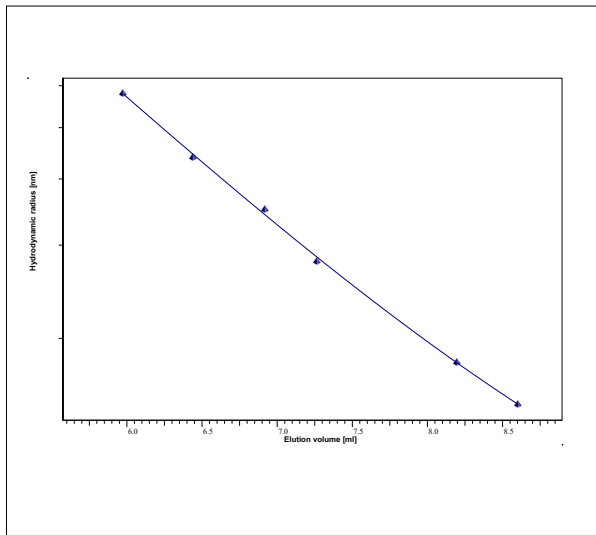


Certificate of Analysis

Product: Kit Protein
 Part No: PSS-PROKIT
 Lot No: PROKIT-11

being used with PSS PROTEEMA 3µm 100Å

GPC/SEC - Calibration Curve - Hydrodynamic Radii [nm]



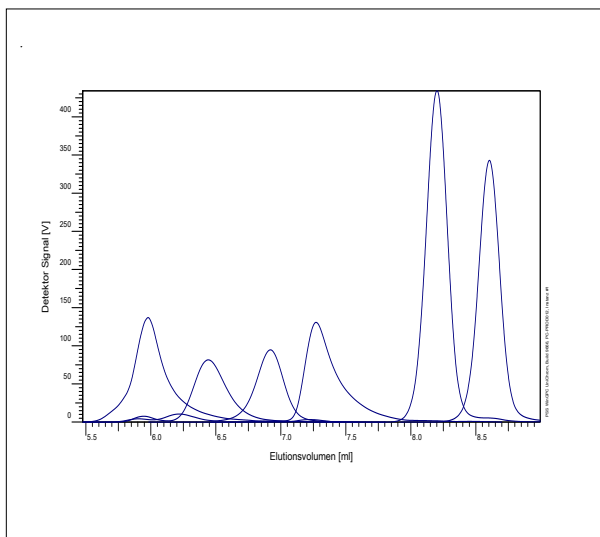
GPC/SEC - Calibration Table - Hydrodynamic Radii [nm]

Elution volume [ml]	Rh [nm]	Protein Lot No:	Protein type:
5,98	5,8	PROGG121121	γ-globulins
6,44	4,4	PROAB221021	Albumin (bovine)
6,92	3,5	PROAC211021	Albumin (chicken)
7,27	2,8	PROLG241021	β-lactoglobulin
8,20	1,8	PROMG231021	Myoglobin
8,60	1,5	PROCB030122	Cytochrome c

Note:

Rh = Hydrodynamic radius (monomer)

GPC/SEC - Polymer Overlay



GPC/SEC - Calibration Conditions

Solvent Phosphate buffer pH6.6 (34mmol/l),
 0.5M sodium chloride
 Flow rate 1,00 ml/min
 Precolumn [8 x 50 mm] PSS PROTEEMA 3µm
 Columns [8 x 300 mm] PSS PROTEEMA 3µm 100Å
 Temperature 23 °C
 Inject volume 20 µl
 Internal standard none
 Data Acquisition Software PSS WinGPC
 Calibration by A.Klein

Fit quality

Fit-type Polynomial 3
 R 0,987473

Storage: Store the tightly recapped polymer standards in a dry, dark, cool area; e.g. (-20 °C).
 Date of expiry: 2028/02/29 (See also product label.)
 Date of approval: 2023/02/13

Manufacture control according to PSS method of analysis

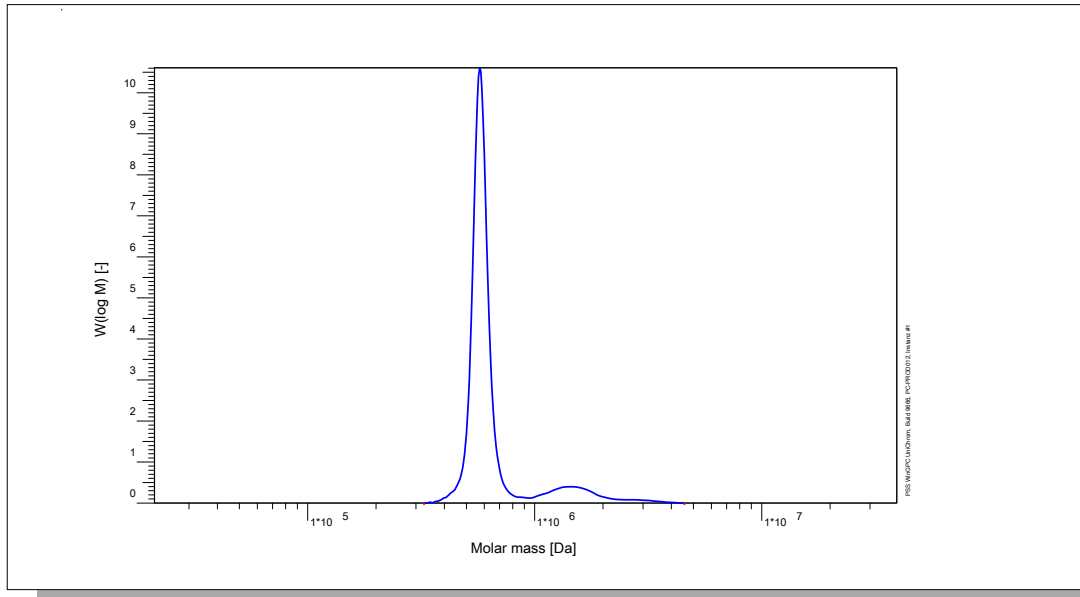
J. Preis
 Dr. J. Preis
 production manager



Certificate of Analysis

Protein: Thyroglobulin from bovine thyroid
 Part No: PSS-PRO670K
 Lot No: PROTG220222

Molar Mass Distribution



GPC/SEC - Conditions

Sample concentration	0,50 g/l	Inject volume	20 µl
Solvent	Phosphate buffer pH6.6 (34mmol/L), 0.5M sodium chloride		
Precolumn [8 x 50 mm]	PSS PROTEEMA 3µm	Flow rate	1,00 ml/min
Columns [analytical, each 8 x 300 mm]	PSS PROTEEMA 3µm 300Å	Temperature	23 °C
Data Acquisition Software	PSS WinGPC	Operator	A.Klein

GPC/SEC - Results

Detector	M [Da]	Rh [nm]
PSS SECcurity UV 280nm	670000	9.1

Note:

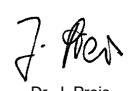
M = Molar mass at the peak maximum
 Rh = Hydrodynamic radius (monomer)

Rh determined with dynamic light scattering measurements

Solvent	Phosphate buffer pH6.6 (34mmol/L), 0.5M sodium chloride
Flow rate	0.50 ml/min
Precolumn [8 x 50 mm]	PSS PROTEEMA 3µm
Columns [analytical, each 8 x 300 mm]	PSS PROTEEMA 3µm 300Å
Temperature	23 °C

Storage: Store the tightly recapped polymer standard in a dry, dark, cool area; e.g. (-20 °C).
Date of expiry: 2028/02/29 (See also product label.)
Date of approval: 2023/02/13

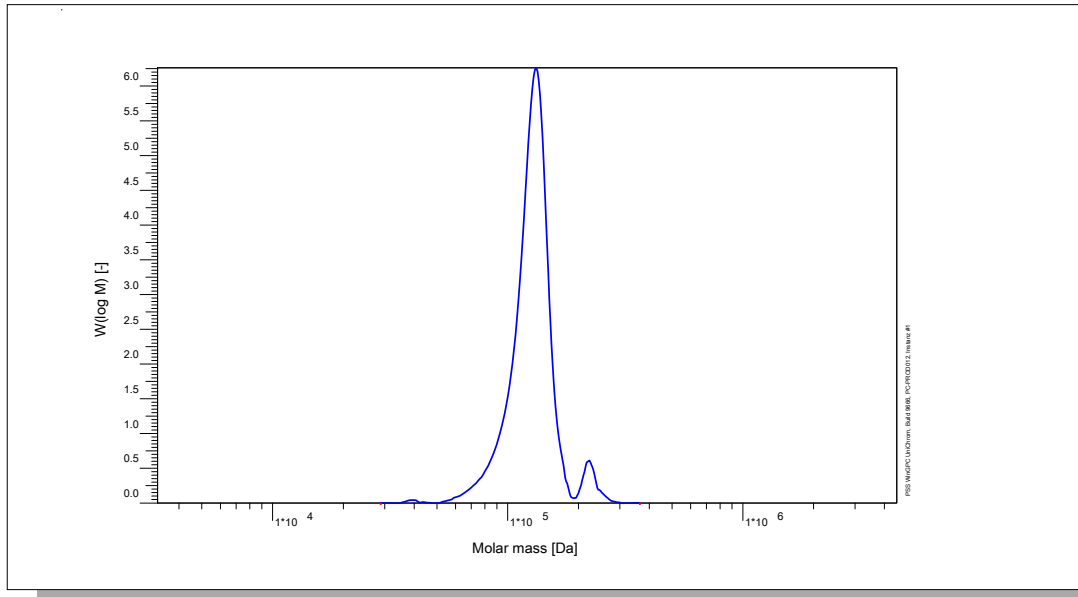
Manufacture control according to PSS method of analysis


 Dr. J. Preis
 production manager

Certificate of Analysis

Protein: Gamma-globulins from bovine blood
 Part No: PSS-PRO158K
 Lot No: PROGG121121

Molar Mass Distribution



GPC/SEC - Conditions

Sample concentration	0,50 g/l	Inject volume	20 µl
Solvent	Phosphate buffer pH6.6 (34mmol/L), 0.5M sodium chloride		
Precolumn [8 x 50 mm]	PSS PROTEEMA 3µm	Flow rate	1,00 ml/min
Columns [analytical, each 8 x 300 mm]	PSS PROTEEMA 3µm 300Å	Temperature	23 °C
Data Acquisition Software	PSS WinGPC	Operator	A.Klein

GPC/SEC - Results

Detector	M [Da]	Rh [nm]
PSS SECcurity UV 280nm	158000	5.8

Note:

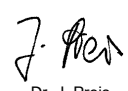
M = Molar mass at the peak maximum
 Rh = Hydrodynamic radius (monomer)

Rh determined with dynamic light scattering measurements

Solvent	Phosphate buffer pH6.6 (34mmol/L), 0.5M sodium chloride
Flow rate	0.50 ml/min
Precolumn [8 x 50 mm]	PSS PROTEEMA 3µm
Columns [analytical, each 8 x 300 mm]	PSS PROTEEMA 3µm 300Å
Temperature	23 °C

Storage: Store the tightly recapped polymer standard in a dry, dark, cool area; e.g. (-20 °C).
Date of expiry: 2028/02/29 (See also product label.)
Date of approval: 2023/02/13

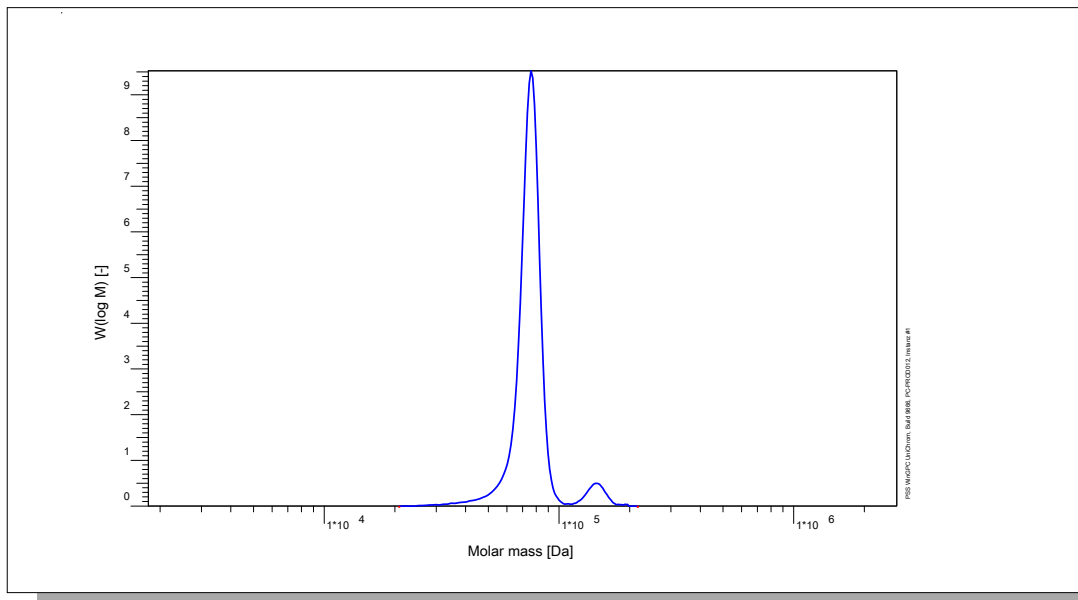
Manufacture control according to PSS method of analysis


 Dr. J. Preis
 production manager

Certificate of Analysis

Protein: Albumin from bovine
 Part No: PSS-PRO67K
 Lot No: PROAB221021

Molar Mass Distribution



GPC/SEC - Conditions

Sample concentration	0,50 g/l	Inject volume	20 µl
Solvent	Phosphate buffer pH6.6 (34mmol/L), 0.5M sodium chloride		
Precolumn [8 x 50 mm]	PSS PROTEEMA 3µm	Flow rate	1,00 ml/min
Columns [analytical, each 8 x 300 mm]	PSS PROTEEMA 3µm 300Å	Temperature	23 °C
Data Acquisition Software	PSS WinGPC	Operator	A.Klein

GPC/SEC - Results

Detector	M [Da]	Rh [nm]
PSS SECcurity UV 280nm	67000	4.4

Note:

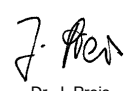
M = Molar mass at the peak maximum
 Rh = Hydrodynamic radius (monomer)

Rh determined with dynamic light scattering measurements

Solvent	Phosphate buffer pH6.6 (34mmol/L), 0.5M sodium chloride
Flow rate	0.50 ml/min
Precolumn [8 x 50 mm]	PSS PROTEEMA 3µm
Columns [analytical, each 8 x 300 mm]	PSS PROTEEMA 3µm 300Å
Temperature	23 °C

Storage: Store the tightly recapped polymer standard in a dry, dark, cool area; e.g. (-20 °C).
Date of expiry: 2028/02/29 (See also product label.)
Date of approval: 2023/02/13

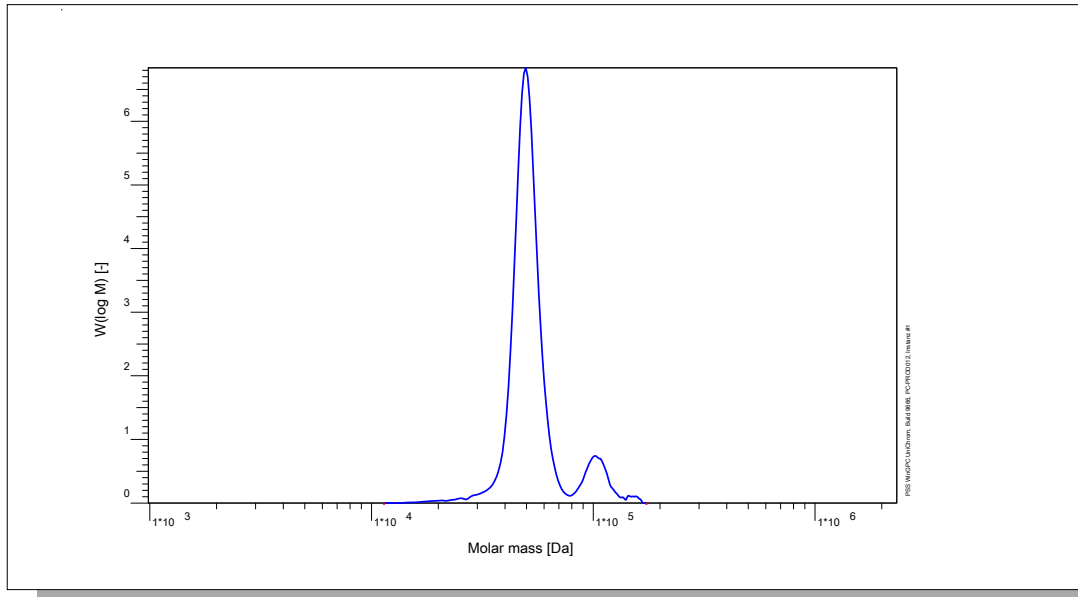
Manufacture control according to PSS method of analysis


 Dr. J. Preis
 production manager

Certificate of Analysis

Protein: Albumin from chicken egg white
 Part No: PSS-PRO44K
 Lot No: PROAC211021

Molar Mass Distribution



GPC/SEC - Conditions

Sample concentration	0,50 g/l	Inject volume	20 µl
Solvent	Phosphate buffer pH6.6 (34mmol/L), 0.5M sodium chloride		
Precolumn [8 x 50 mm]	PSS PROTEEMA 3µm	Flow rate	1,00 ml/min
Columns [analytical, each 8 x 300 mm]	PSS PROTEEMA 3µm 300Å	Temperature	23 °C
Data Acquisition Software	PSS WinGPC	Operator	A.Klein

GPC/SEC - Results

Detector	M [Da]	Rh [nm]
PSS SECcurity UV 280nm	44000	3.5

Note:

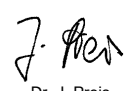
M = Molar mass at the peak maximum
 Rh = Hydrodynamic radius (monomer)

Rh determined with dynamic light scattering measurements

Solvent	Phosphate buffer pH6.6 (34mmol/L), 0.5M sodium chloride
Flow rate	0.50 ml/min
Precolumn [8 x 50 mm]	PSS PROTEEMA 3µm
Columns [analytical, each 8 x 300 mm]	PSS PROTEEMA 3µm 300Å
Temperature	23 °C

Storage: Store the tightly recapped polymer standard in a dry, dark, cool area; e.g. (-20 °C).
Date of expiry: 2028/02/29 (See also product label.)
Date of approval: 2023/02/13

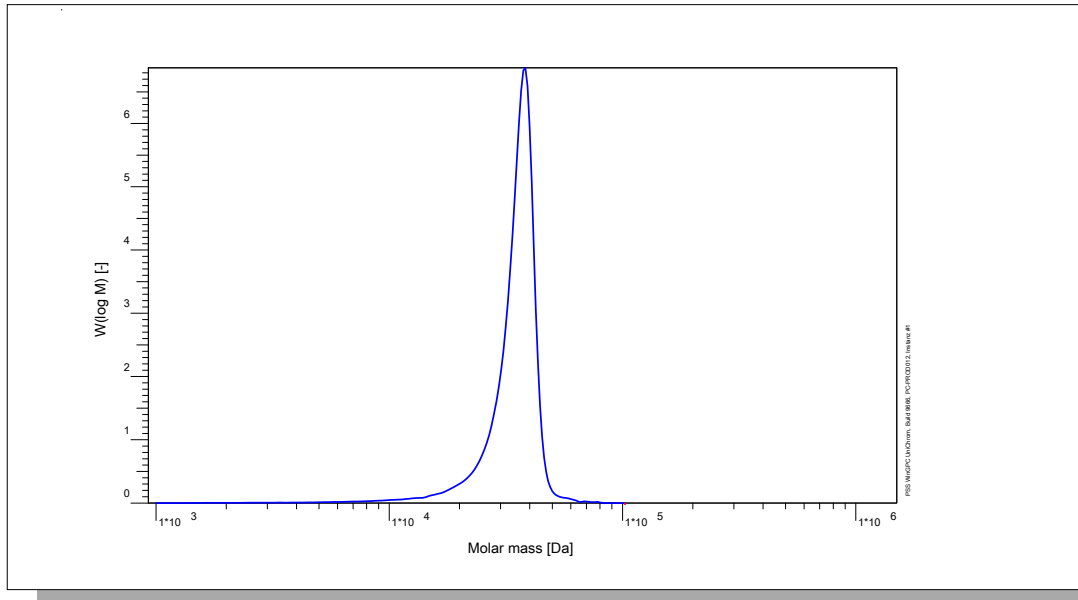
Manufacture control according to PSS method of analysis


 Dr. J. Preis
 production manager

Certificate of Analysis

Protein: Beta-lactoglobulin from bovine milk
 Part No: PSS-PRO35K
 Lot No: PROLG241021

Molar Mass Distribution



GPC/SEC - Conditions

Sample concentration	0,50 g/l	Inject volume	20 µl
Solvent	Phosphate buffer pH6.6 (34mmol/L), 0.5M sodium chloride		
Precolumn [8 x 50 mm]	PSS PROTEEMA 3µm	Flow rate	1,00 ml/min
Columns [analytical, each 8 x 300 mm]	PSS PROTEEMA 3µm 300Å	Temperature	23 °C
Data Acquisition Software	PSS WinGPC	Operator	A.Klein

GPC/SEC - Results

Detector	M [Da]	Rh [nm]
PSS SECcurity UV 280nm	35000	2.8

Note:


M = Molar mass at the peak maximum
 Rh = Hydrodynamic radius (monomer)

Rh determined with dynamic light scattering measurements

Solvent	Phosphate buffer pH6.6 (34mmol/L), 0.5M sodium chloride
Flow rate	0.50 ml/min
Precolumn [8 x 50 mm]	PSS PROTEEMA 3µm
Columns [analytical, each 8 x 300 mm]	PSS PROTEEMA 3µm 300Å
Temperature	23 °C

Storage: Store the tightly recapped polymer standard in a dry, dark, cool area; e.g. (-20 °C).
Date of expiry: 2028/02/29 (See also product label.)
Date of approval: 2023/02/13

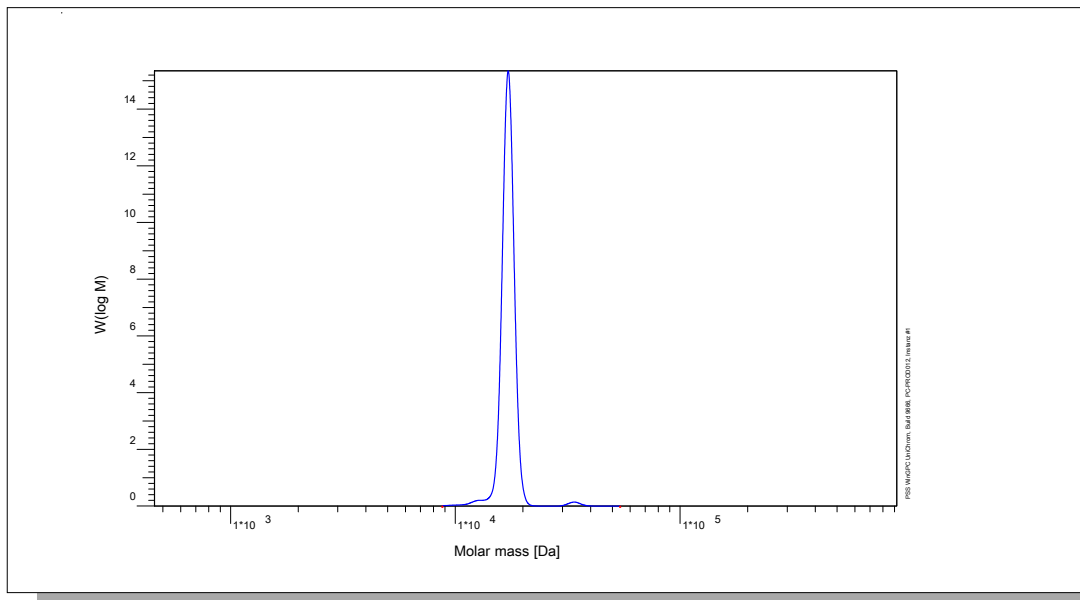
Manufacture control according to PSS method of analysis


 Dr. J. Preis
 production manager

Certificate of Analysis

Protein: Myoglobin from equine skeletal muscle
 Part No: PSS-PRO17.5K
 Lot No: PROMG231021

Molar Mass Distribution



GPC/SEC - Conditions

Sample concentration	0,50 g/l	Inject volume	20 µl
Solvent	Phosphate buffer pH6.6 (34mmol/l), 0.5M sodium chloride		
Precolumn [8 x 50 mm]	PSS PROTEEMA 3µm	Flow rate	1,00 ml/min
Columns [analytical, each 8 x 300 mm]	PSS PROTEEMA 3µm 100Å	Temperature	23 °C
Data Acquisition Software	PSS WinGPC	Operator	A.Klein

GPC/SEC - Results

Detector	M [Da]	Rh [nm]
PSS SECcurity ² UV 280nm	17600	1.8

Note:

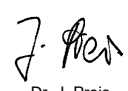
M = Molar mass at the peak maximum
 Rh = Hydrodynamic radius (monomer)

Rh determined with dynamic light scattering measurements

Solvent	Phosphate buffer pH6.6 (34mmol/l), 0.5M sodium chloride
Flow rate	0.50 ml/min
Precolumn [8 x 50 mm]	PSS PROTEEMA 3µm
Columns [analytical, each 8 x 300 mm]	PSS PROTEEMA 3µm 100Å
Temperature	23 °C

Storage: Store the tightly recapped polymer standard in a dry, dark, cool area; e.g. (-20 °C).
Date of expiry: 2028/02/29 (See also product label.)
Date of approval: 2023/02/13

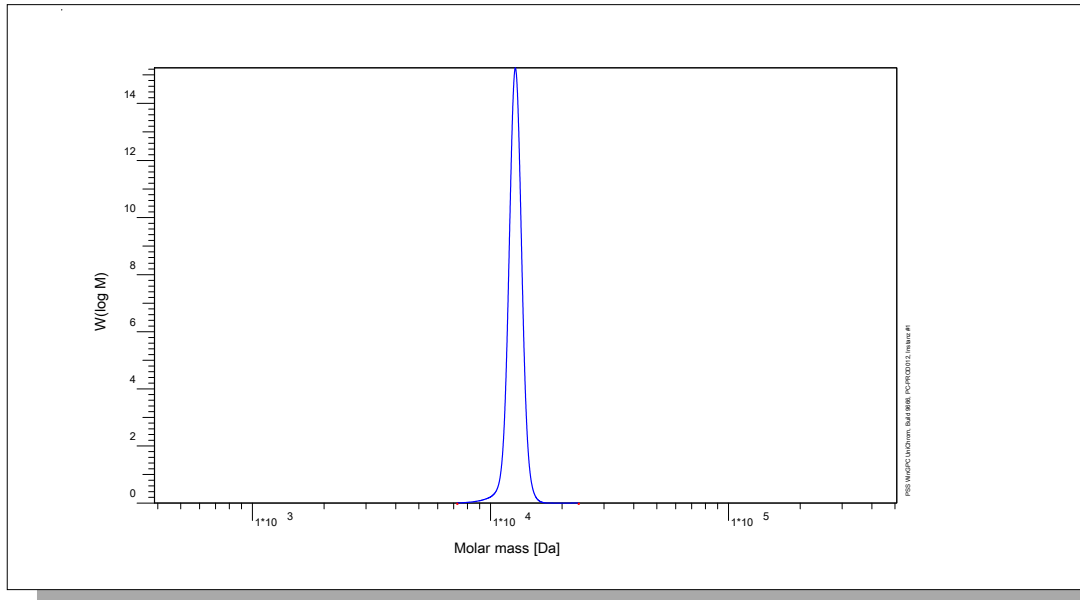
Manufacture control according to PSS method of analysis


 Dr. J. Preis
 production manager

Certificate of Analysis

Protein: Cytochrome c from bovine heart
 Part No: PSS-PRO12K
 Lot No: PROCB030122

Molar Mass Distribution



GPC/SEC - Conditions

Sample concentration	0,50 g/l	Inject volume	20 µl
Solvent	Phosphate buffer pH6.6 (34mmol/l), 0.5M sodium chloride		
Precolumn [8 x 50 mm]	PSS PROTEEMA 3µm	Flow rate	1,00 ml/min
Columns [analytical, each 8 x 300 mm]	PSS PROTEEMA 3µm 100Å	Temperature	23 °C
Data Acquisition Software	PSS WinGPC	Operator	A.Klein

GPC/SEC - Results

Detector	M [Da]	Rh [nm]
PSS SECcurity ² UV 280nm	12000	1.5

Note:

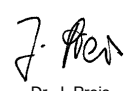
M = Molar mass at the peak maximum
 Rh = Hydrodynamic radius (monomer)

Rh determined with dynamic light scattering measurements

Solvent	Phosphate buffer pH6.6 (34mmol/l), 0.5M sodium chloride
Flow rate	0.50 ml/min
Precolumn [8 x 50 mm]	PSS PROTEEMA 3µm
Columns [analytical, each 8 x 300 mm]	PSS PROTEEMA 3µm 100Å
Temperature	23 °C

Storage: Store the tightly recapped polymer standard in a dry, dark, cool area; e.g. (-20 °C).
Date of expiry: 2028/02/29 (See also product label.)
Date of approval: 2023/02/13

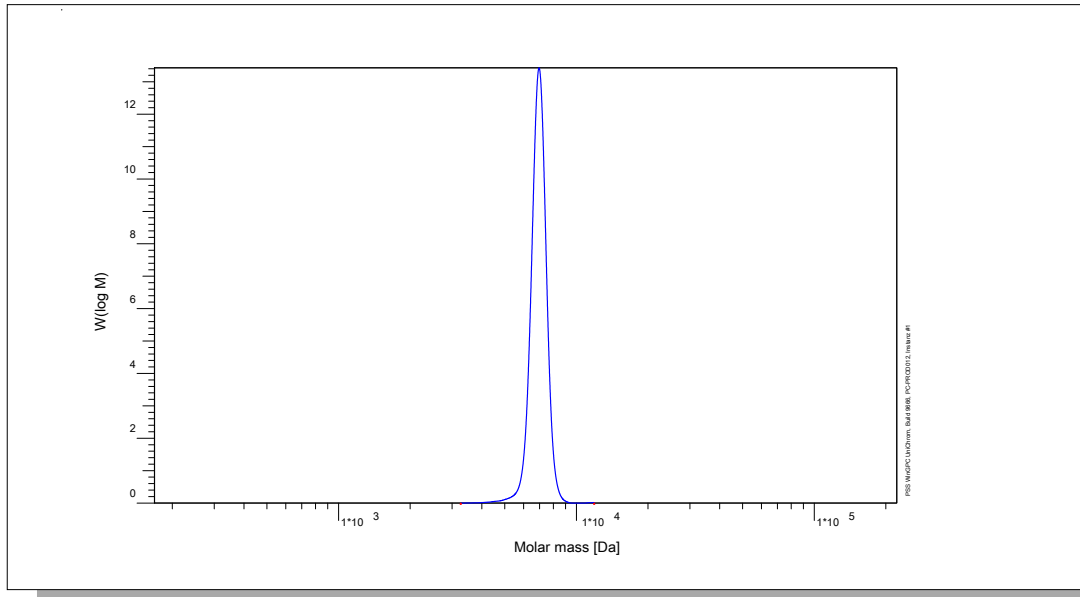
Manufacture control according to PSS method of analysis


 Dr. J. Preis
 production manager

Certificate of Analysis

Protein: Aprotinin
 Part No: PSS-PRO6.5K
 Lot No: PROAP201021

Molar Mass Distribution



GPC/SEC - Conditions

Sample concentration	0,50 g/l	Inject volume	20 µl
Solvent	Phosphate buffer pH6.6 (34mmol/l), 0.5M sodium chloride		
Precolumn [8 x 50 mm]	PSS PROTEEMA 3µm	Flow rate	1,00 ml/min
Columns [analytical, each 8 x 300 mm]	PSS PROTEEMA 3µm 100Å	Temperature	23 °C
Data Acquisition Software	PSS WinGPC	Operator	A.Klein

GPC/SEC - Results

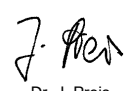
Detector	M [Da]	Rh [nm]
PSS SECcurity ² UV 280nm	6500	-

Note:

M = Molar mass at the peak maximum
 Rh = Hydrodynamic radius (monomer)

Storage: Store the tightly recapped polymer standard in a dry, dark, cool area; e.g. (-20 °C).
Date of expiry: 2028/02/29 (See also product label.)
Date of approval: 2023/02/13

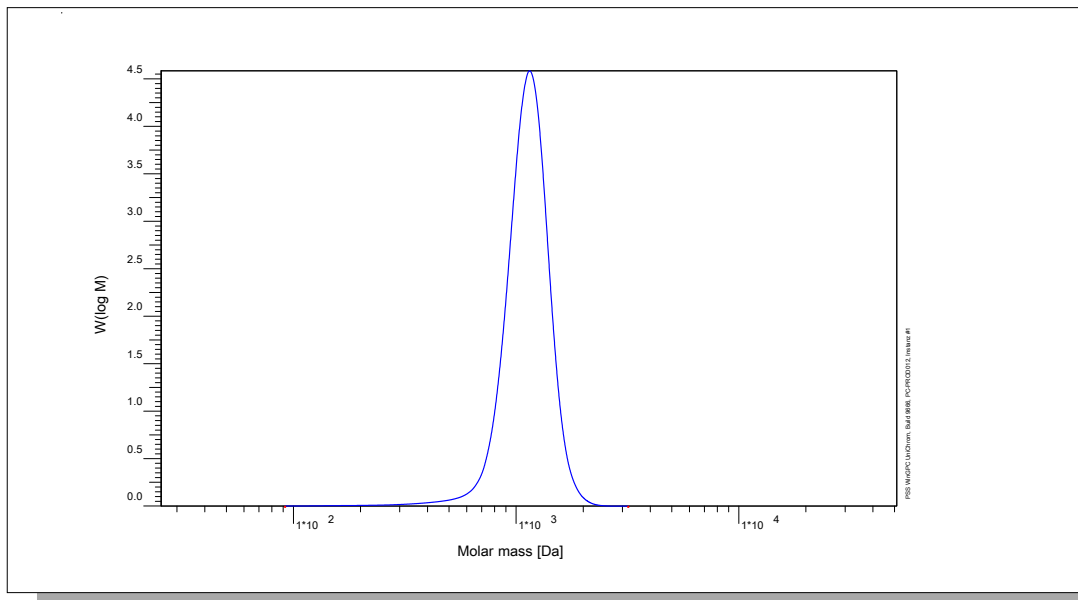
Manufacture control according to PSS method of analysis


 Dr. J. Preis
 production manager

Certificate of Analysis

Protein: Vitamin B12
 Part No: PSS-PRO1.4K
 Lot No: PROVI251021

Molar Mass Distribution



GPC/SEC - Conditions

Sample concentration	0,50 g/l	Inject volume	20 µl
Solvent	Phosphate buffer pH6.6 (34mmol/l), 0.5M sodium chloride		
Precolumn [8 x 50 mm]	PSS PROTEEMA 3µm	Flow rate	1,00 ml/min
Columns [analytical, each 8 x 300 mm]	PSS PROTEEMA 3µm 100Å	Temperature	23 °C
Data Acquisition Software	PSS WinGPC	Operator	A.Klein

GPC/SEC - Results

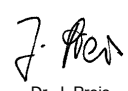
Detector	M [Da]	Rh [nm]
PSS SECcurity ² UV 280nm	1350	-

Note:

M = Molar mass at the peak maximum
 Rh = Hydrodynamic radius (monomer)

Storage: Store the tightly recapped polymer standard in a dry, dark, cool area; e.g. (-20 °C).
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Date of approval: 2023/02/13

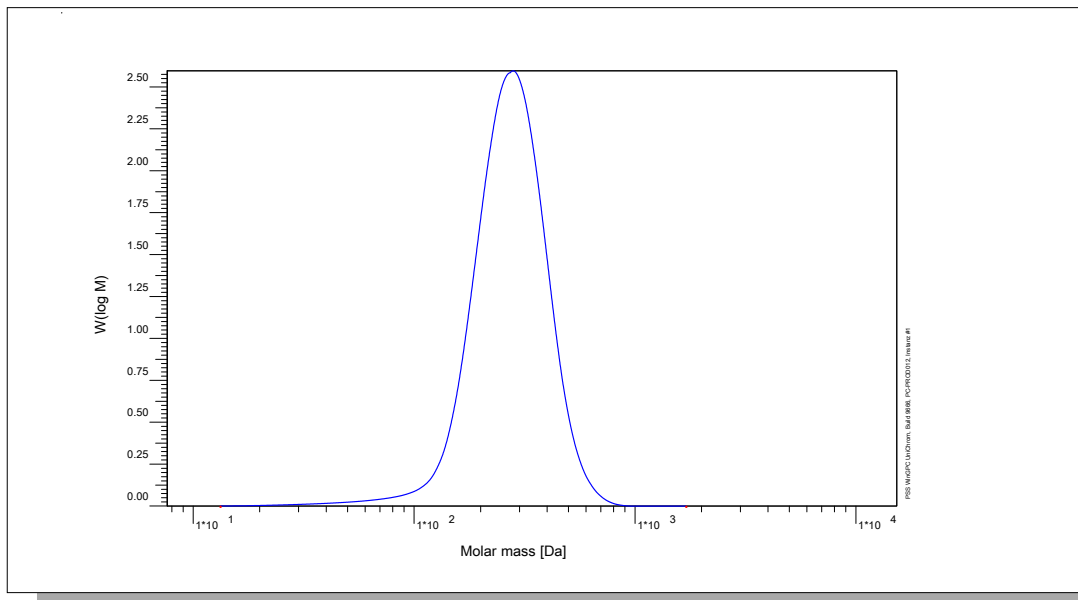
Manufacture control according to PSS method of analysis


 Dr. J. Preis
 production manager

Certificate of Analysis

Protein: Cytidin
 Part No: PSS-PRO243
 Lot No: PROCY111121

Molar Mass Distribution



GPC/SEC - Conditions

Sample concentration	0,50 g/l	Inject volume	20 µl
Solvent	Phosphate buffer pH6.6 (34mmol/l), 0.5M sodium chloride		
Precolumn [8 x 50 mm]	PSS PROTEEMA 3µm	Flow rate	1,00 ml/min
Columns [analytical, each 8 x 300 mm]	PSS PROTEEMA 3µm 100Å	Temperature	23 °C
Data Acquisition Software	PSS WinGPC	Operator	A.Klein

GPC/SEC - Results

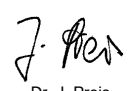
Detector	M [Da]	Rh [nm]
PSS SECcurity ² UV 280nm	243	-

Note:

M = Molar mass at the peak maximum
 Rh = Hydrodynamic radius (monomer)

Storage: Store the tightly recapped polymer standard in a dry, dark, cool area; e.g. (-20 °C).
Date of expiry: 2028/02/29 (See also product label.)
Date of approval: 2023/02/13

Manufacture control according to PSS method of analysis


 Dr. J. Preis
 production manager