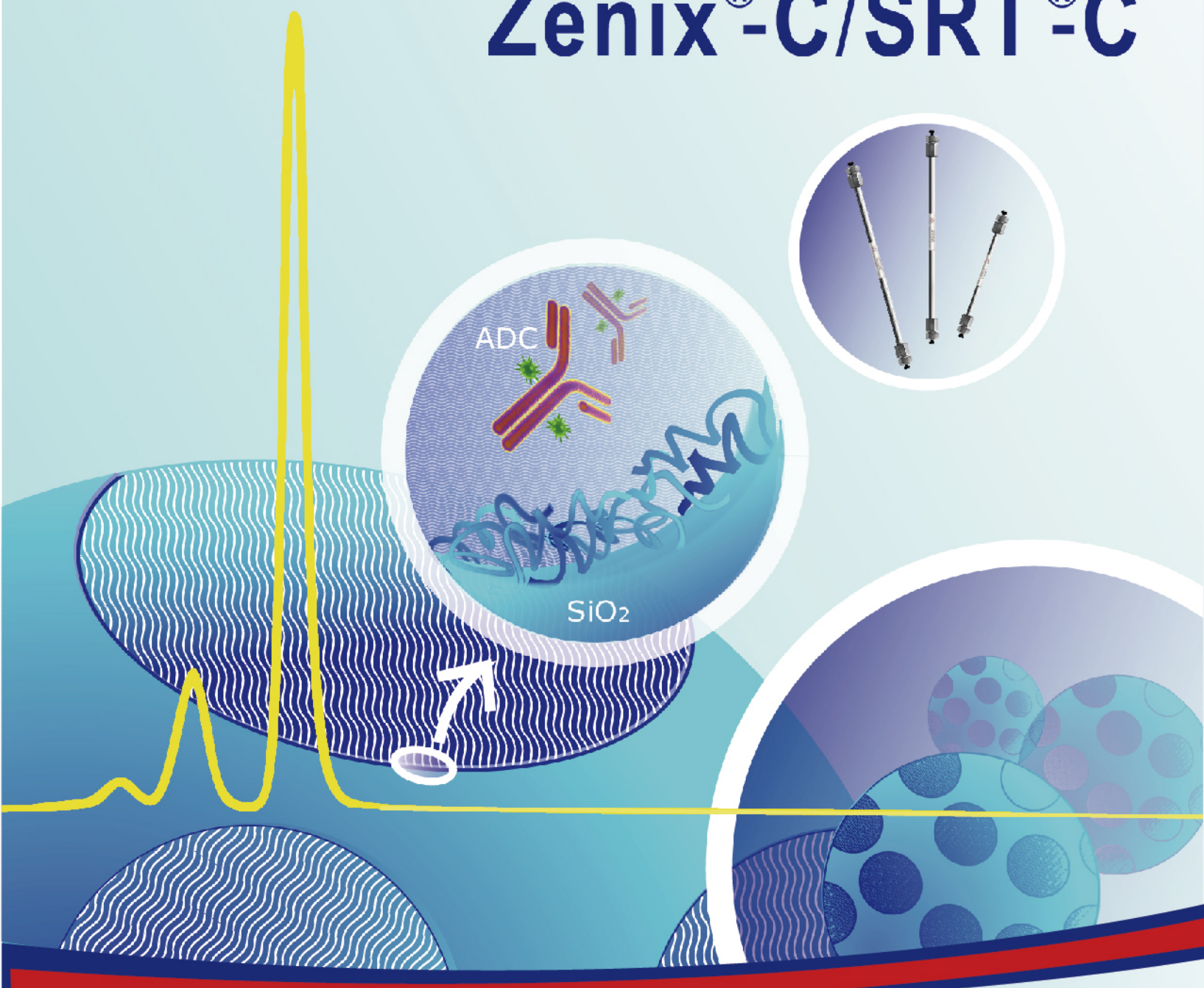
Size Exclusion Chromatography

Sepax Technologies

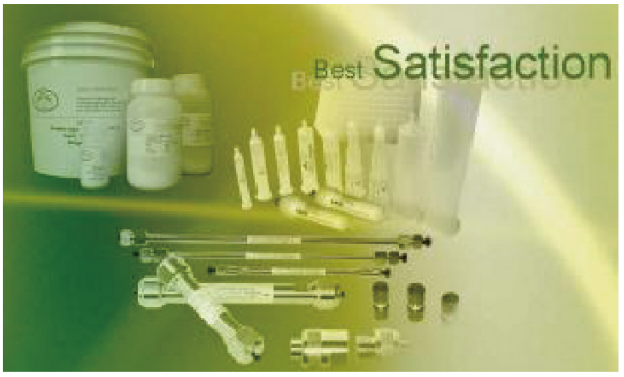
Zenix®-C/SRT®-C



Better Surface Chemistry for Better Separation

Sepax Technologies, Inc.

Better Surface Chemistry for Better Separation



Sepax Technologies, Inc. is a Delaware, USA based leading chromatography product manufacturer and service provider specializing in biological separation areas. We offer unique ranges of HPLC columns for bioanalytical characterization and testing, as well as process media for downstream process and purification of MAb, BsMAb, ADC, Proteins, AAV, VLP, DNA, RNA, and various biologic samples. Sepax has a full portfolio of beads technology platforms, linker and organic synthesis chemistry, as well as protein chemistry in different stages of R&D and production pipelines to support the various needs of the biopharmaceutical industry and our customers. Certified to ISO 9001:2015 standards, Sepax focuses on customer & market needs, and is continuing to expand its presence and supply chain around the globe.

Leader in Biological Separations

Sepax develops and manufactures a wide range of biological separation products using both silica and polymeric resins as the support. The selection of particle size is from 1 µm to 100 µm and pore size is from non–porous to 2000 Å. Unique and proprietary resin synthesis and surface technologies have been developed for solving separation challenges in the area of biologics.

Bioseparation Products

Size Exclusion	Ion Exchange	Hydrophobic Interaction
SRT	Proteomix	Proteomix HIC
SRT-C	Antibodix	Reversed Phase
Nanofilm	Glycomix	Proteomix RP
Zenix	Affinity	Bio-C4
Zenix-C	ProAqa Excel Protein A	Bio-C8
Biomix	Monomix dT20	Bio-C18

Column Dimension Availability

Available Zenix-C SEC column dimensions are 2.1, 4.6, 7.8, 10, 21.2 and 30 mm I.D., and 50, 100, 150, 250, and 300 mm length. Sepax also offers custom-made columns. Both stainless steel and PEEK tubing are available.

Zenix®-C/SRT®-C SEC Phases

Complimentary Phases to Zenix and SRT for Hydrophobic Biomolecules

General Description

Zenix®-C and SRI®-C SEC phases

Developed based on innovative surface coating technology comprised of uniform, hydrophilic, and neutral nanometer thick films chemically bonded on high purity and mechanically stabilized silica. Two different types of coating chemistries, Zenix and SRT, stand-up monolayer bonded on porous silica, and Zenix-C and SRT-C, lay-down monolayer on porous silica offer ideal phase structures for sample type specific separation. The 3 µm based Zenix and Zenix-C, and 5 µm based SRT and SRT-C allow high resolution and performance separation. The combination of these four lines of SEC phases provides a powerful total solution for robust, reproducible and highest resolution size based separation of biological molecules in the market.

Featured Characteristics

- Highest capacity and resolution
- High lot-to-lot reproducibility
- High protein recovery with intact biological activity
- Negligible non-specific interactions
- Ideal for separation and analysis of hydrophobic proteins and monoclonal antibodies derivatized with polymer branches
- Suitable for separation and analysis of general biological samples

Stationary Phase Structure

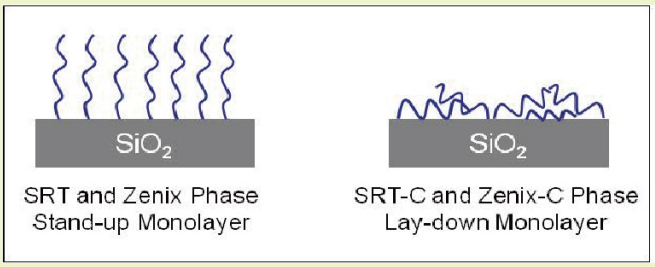


Figure 1. Phase structure difference: a monolayer stands up on the silica surface for Zenix and SRT, and a monolayer lays down on the silica surface for Zenix-C and SRT-C.

Difference in Particle Size

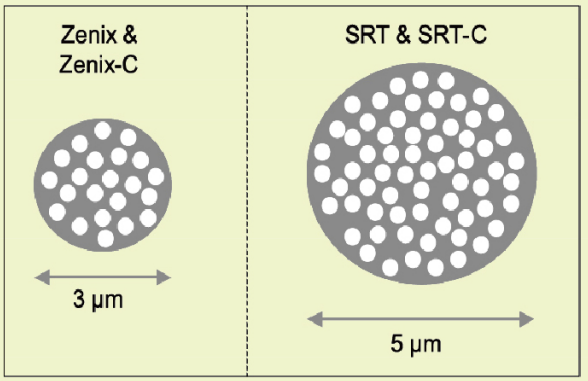


Figure 2. Zenix and Zenix-C are based on 3 µm porous silica. SRT and SRT-C are based on 5 µm porous silica.

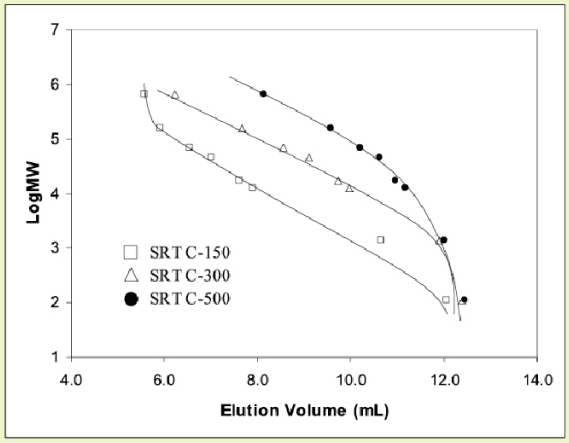
Key features of Sepax SEC phases

Characteristics	SRT	Zenix	SRT-C	Zenix-C
Particle size	5µm	3µm	5µm	3µm
Pore size (A)	100, 150, 300, 500, 1000 & 2000	80,100,150,300 Higher, short column for faster separation	100, 150, 300, 500, 1000 & 2000	80,100,150,300 Higher, short column for faster separation
Resolution	High		High	
Surface structure	Chemically bonded stand-up monolayer		Chemically bonded lay-down monolayer	
Recommended Sample Types	Monoclonal antibodies, proteins, peptides, nucleic acids, oligonucleotides, virus, and water-soluble polymers		"Tough samples" such as hydrophobic samples like insulin, membrane protein, antibody drug conjugates, proteins conjugated with hydrophobic molecules.	

Protein Molecular Weight Calibration

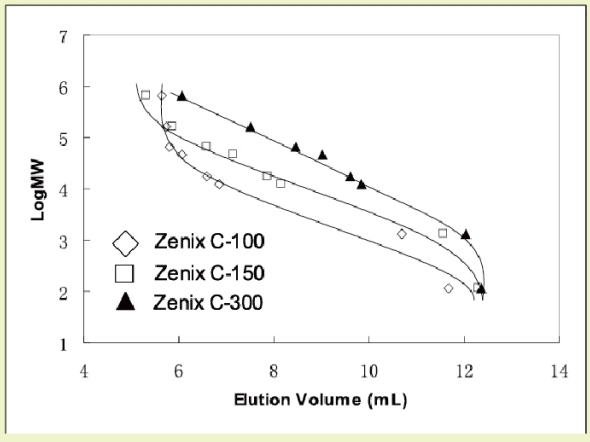
Protein molecular weight vs elution volume is plotted in Figure 3-4, in indicating that SRT-C 150 , 300 , and 500 , and Zenix-C 80 , 100,150 , and 300 have large linear elution region.

Figure 3. Protein MW Calibration with Elution Volume for SRT-C Phases



Columns: SRT-C (5 µm, 7.8 x 300 mm)
Mobile phase: 150 mM sodium phosphate buffer, pH 7.0
Flow rate: 1.0 mL/min
Temperature: Ambient
Detection: UV 214 nm
Injection volume: 10 µL
Samples: 1.Thyroglobulin, 670 kD; 2. γ-Globulin, 158 kD; 3. BSA, 66 kD; 4. Ovalbumin, 44 kD; 5. Myoglobin, 17.6 kD; 6. Ribonuclease A, 13.7 kD; 7. Vitamin B12, 1.35 kD; 8. Uracil, 120 D

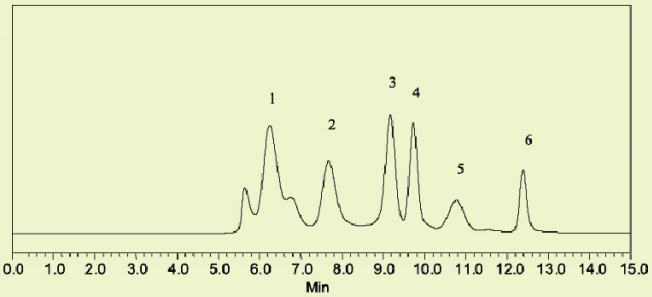
Figure 4. Protein MW Calibration with Elution Volume for ZenixC Phases



Columns: Zenix-C (3 µm, 7.8 x 300 mm)
Mobile phase: 150 mM sodium phosphate buffer, pH 7.0
Flow rate: 1.0 mUmin
Temperature: Ambient
Detection: UV 214 nm
Injection volume: 10 µL
Samples: 1.Thyroglobulin, 670 kD; 2. γ-Globulin, 158k.D; 3. BSA, 66 k.D; 4. Ovalbumin, 44 k.D; 5. Myoglobin, 17.6 kD;

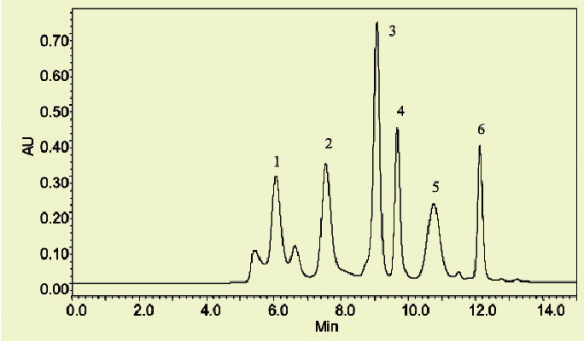
Column Performance with Protein Standards

Figure 5. Separation of Protein Standards by SRT-C SEC-300 Column



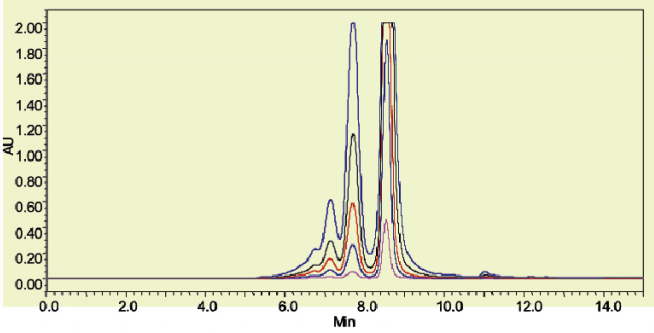
Columns: SRT-C SEC-300 (5 µm, 300 A 7.8 x 300 mm)
Mobile phase: 150 mM sodium phosphate buffer, pH 7.0
Flow rate: 1.0 mL/min
Temperature: Ambient
Detection: UV 214 nm
Injection : 10 µL
Samples: 1.Thyroglobulin, 670 kD; 2. γ-Globulin, 158 kD; 3. Ovalbumin, 44kD; 4. Myoglobin, 17.6 kD; 5.Poly-DL-alanine (1-5 kD); 6. Uracil, 120 D.

Figure 6. Separation of a Protein Standards by Zenix-C SEC-300 column



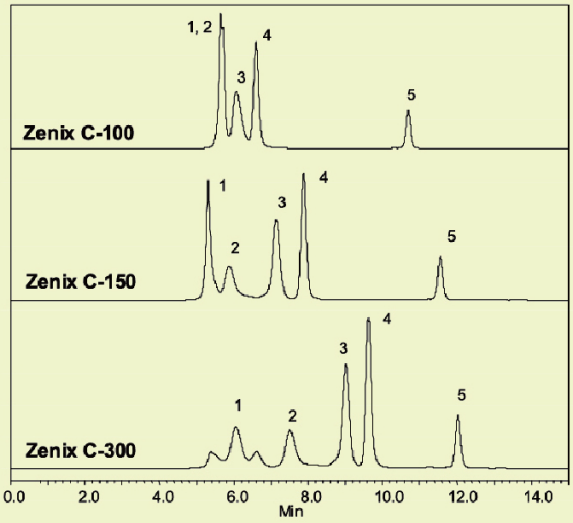
Columns: Zenix-C SEC-300 (3 µm, 300 A, 7.8 x 300 mm)
Mobile phase: 150 mM sodium phosphate buffer, pH 7.0
Flow rate: 1.0 mL/min
Temperature: Ambient
Detection: UV 214 nm
Injection : 10 µL
Samples: 1.Thyroglobulin, 670 kD; 2. γ-Globulin, 158 kD; 3) Ovalbumin, 44 kD; 4) Myoglobin, 17.6 kD; 5) Poly-DL-alanine (1-5 kD); 6) Vitamin B12, 1.35 kD.

Figure 7. BSA Loading Test on a Zenix-C SEC-300 Column



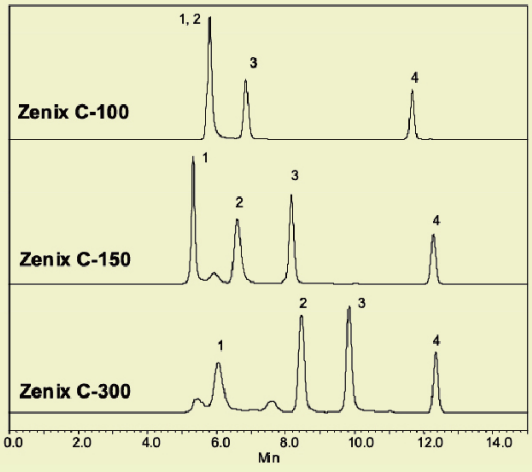
Columns: Zenix-C SEC-300 (3 µm, 300 A, 7.8 x 300 mm)
Mobile phase: 150 mM sodium phosphate buffer, pH 7.0
Flow rate: 1.0 mL/min
Temperature: Ambient
Detection: UV 214 nm
Injection : 10 µL
BSA concentration: I, 5, l 0, 25, and 50 mg/mL (from low to high)

Figure 8. Separation ofBiorad Protein Standards by Zenix-C SEC- 100,150 and 300 Columns



Columns: Zenix-C SEC (3 µm, 7.8 x 300 mm)
Mobile phase: 150 mM sodium phosphate buffer, pH 7.0
Flow rate: 1.0 mL/min
Temperature: Ambient
Detection: UV 214 nm
Injection : 10 µL
Samples: 1.Thyroglobulin, 670 kD; 2. y-Globulin, 158 kD;3. Ovalbumin, 44 kD; 4. Myoglobulin, 16.9 kD; 5. Vitamin B12, 1.35 kD

Figure 9. Separation of Protein Standards A by Zenix-C SEC-100, 150 and 300 Columns



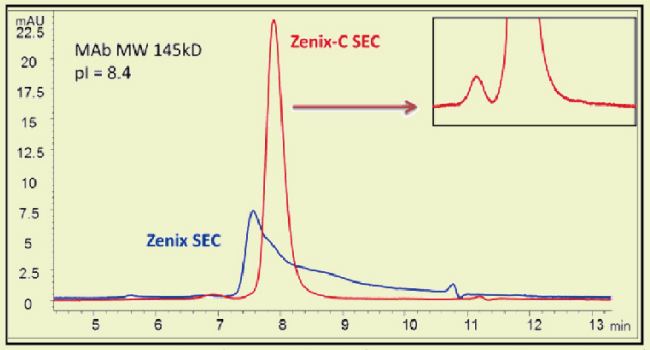
Columns: Zenix-C SEC (3 µm, 7.8 x 300 mm)
Mobile phase: 150 mM sodium phosphate buffer, pH 7.0
Flow rate: 1.0 mL/min
Temperature: Ambient
Detection: UV 214 nm
Injection : 10 µL
Samples: 1. Thyroglobulin, 670 kD; 2. BSA, 66 kD; 3kD;3. Ribonuclease A, 13. 7 kD, and 4. Uracil, 120 D

Applications

Zenix-C and SRT-C SEC phases provide better recovery and separation for hydrophobic biomolecules, which have secondary interaction with traditional resin surfaces due to the hydrophobic property. Different mobile phase additives such as organics, like IP A, arginine sodium perchlorate and acetonitrile, can improve the sample recovery and separation resolution depending on individual hydrophobic biomolecule. Applications on the separation of hydrophobic molecules like Antibody Drug Conjugate (ADC), Fusion Protein, PEGylated Protein, Membrane Protein and Peptide on Zenix-C and SRT-C SEC columns were illustrated in the following Figure 10-31.

Hydrophobic Monoclonal Antibody(MAb)

Figure 10. SEC Screening for Monoclonal Antibody F

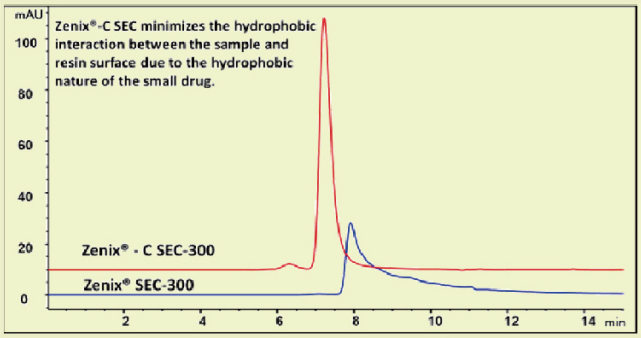


Columns: Zenix-C SEC-300 (3 µm, 300 A, 7.8 x 300 mm)
Mobile phase: 150 mM sodium phosphate, pH 7.0
Flow rate: 1.0 mL/min
Temperature: Ambient
Detection: UV 280 nm
Injection : 10 µL
Samples: 1.23 mg/mL MAb F in IO mM sodium succinate,pH 5.0

Antibody Drug Conjugate (ADC)

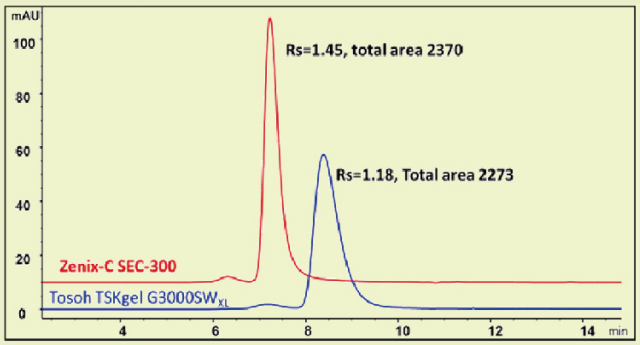
Zenix-C SEC phase offers better recovery and separation for Antibody Drug Conjugate (ADC), which has secondary interaction with traditional resin surfaces due to its hydrophobic property from the conjugated small drugs. Different mobile phase additives such as organics, like IPA, arginine sodium perchlorate and acetonitrile, can improve the sample recovery and separation resolution depending on individual ADCs. Smaller pore size Zenix-C SEC is proven to be beneficial in free drug analysis, which can be in line with mass spectrometry with volatile mobile phases.

Figure 11. Herceptin Lysine ADC Analysis



Column: Zenix-C SEC-300 (3 µm, 300 Å, 7.8 x 300 mm)
Mobile phase: 150 mM sodium phosphate buffer, pH 7.0
Flow rate: 1 mL/min
Detection: UV 280 nm
Temperature: Ambient
Injection: 10 µL
Samples: Herceptin lysine conjugate 2.05 mg/mL

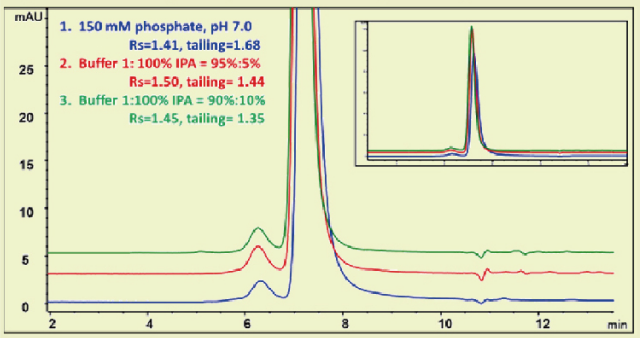
Figure 12. Herceptin Lysine ADC Analysis on Zenix-C SEC-300 vs. Tosoh TSKgel G3000SWXL



Column: Zenix-C SEC-300 (3 µm, 300 Å, 7.8 x 300 mm)
Tosoh TSKgel G3000SWXL(5 µm, 250 Å, 7.8 x 300 mm)
Mobile phase: 150 mM sodium phosphate buffer, pH 7.0
Flow rate: 1 mL/min
Detection: UV 280 nm
Temperature: Ambient
Injection: 10 µL
Samples: Herceptin lysine drug conjugate 2.05 mg/mL

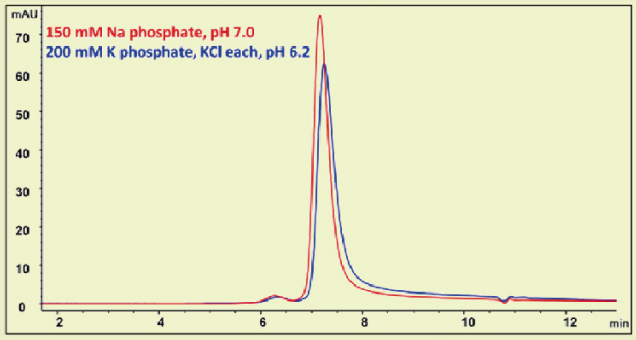
Disclaimer: TSKgel and Tosoh Bioscience are registered trademarks of Tosoh Corporation; Comparative separations may not be representative of all applications.

Figure 13. Herceptin Lysine ADC Analysis - Organic Modifier



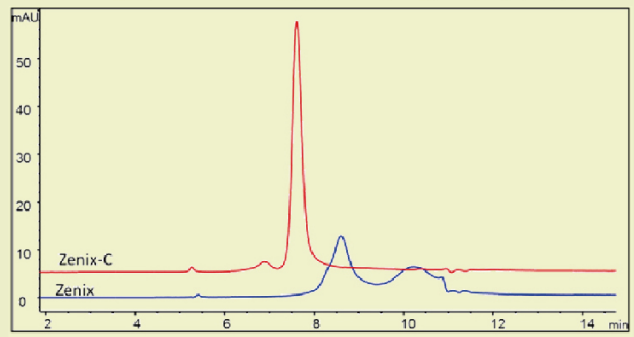
Column: Zenix-C SEC-300 (3 µm, 300 Å, 7.8 x 300 mm)
Mobile phase: As indicated
Flow rate: 1 mL/min
Detection: UV 280 nm
Temperature: Ambient
Injection: 10 µL
Samples: Herceptin lysine conjugate 2.05 mg/mL

Figure 14. Herceptin lysine ADC Analysis - Salt Difference



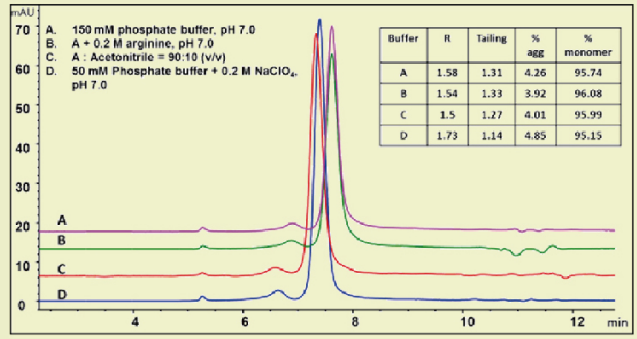
Column: Zenix-C SEC-300 (3 µm, 300 Å, 7.8 x 300 mm)
Mobile phase: As indicated
Flow rate: 1 mL/min
Detection: UV 214 nm
Temperature: Ambient
Injection: 10 µL
Samples: Herceptin lysine ADC 2.05 mg/mL

Figure 15. Cysteine ADC Analysis - SEC Phase Comparison



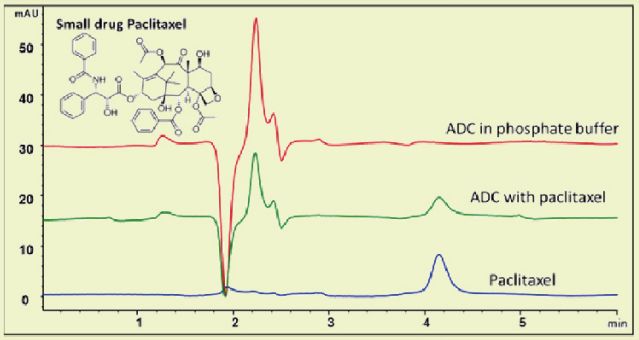
Column: Zenix-C SEC-300 (3 µm, 300 Å, 7.8 x 300 mm)
Mobile phase: 150 mM sodium phosphate buffer, pH 7.0
Flow rate: 1 mL/min
Detection: UV 280 nm
Temperature: Ambient
Injection: 20 µL
Samples: 1.68 mg/mL ADC

Figure 16. Cysteine ADC Analysis - Mobile Phase Difference



Column: Zenix-C SEC-300 (3 µm, 300 Å, 7.8 x 300 mm)
Mobile phase: As indicated
Flow rate: 1 mL/min
Detection: UV 280 nm
Temperature: Ambient
Injection: 20 µL
Samples: 1.68 mg/mL ADC

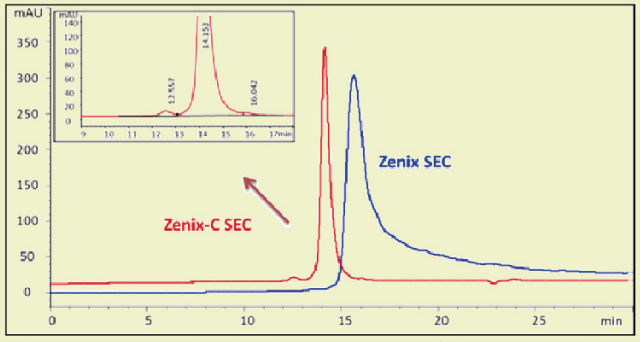
Figure 17. ADC and Free Drug Paclitaxel Analysis



Column: Zenix-C SEC-80 (3 µm, 80 Å, 4.6 x 50 mm)
Mobile phase: 50 mM NH4Ac: ACN = 80:20 (v/v)
Flow rate: 0.3 mL/min
Detection: UV 228 nm
Temperature: 25 °C
Injection: 2µL
Samples: As indicated

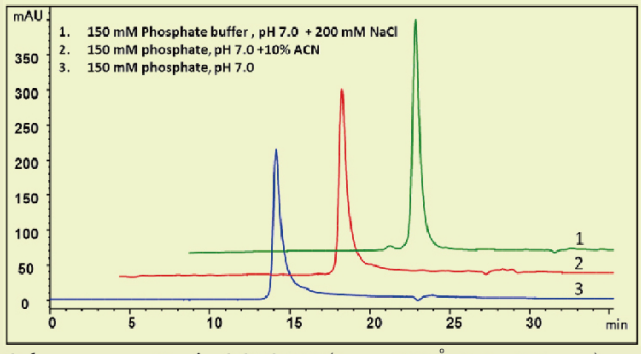
Fusion Protein and Peptide

Figure 18. Fusion Protein Analysis



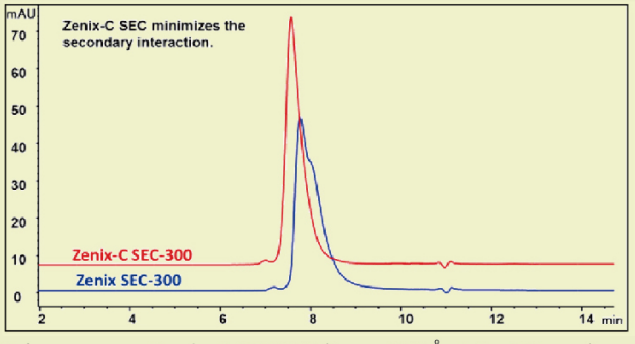
Column: Zenix-C SEC-300 (3 µm, 300 Å, 7.8 x 300 mm)
Mobile phase: 150 mM sodium phosphate buffer (pH 7.0) + 200 mM NaCI
Flow rate: 0.5 mL/min
Detection: UV 214 nm
Temperature: Ambient
Injection: 10 µL
Samples: 1 mg/mL IBI302, MW 170 kD, pl 6.8-7.0

Figure 19. Fusion Protein 3 - Mobile Phase Effect



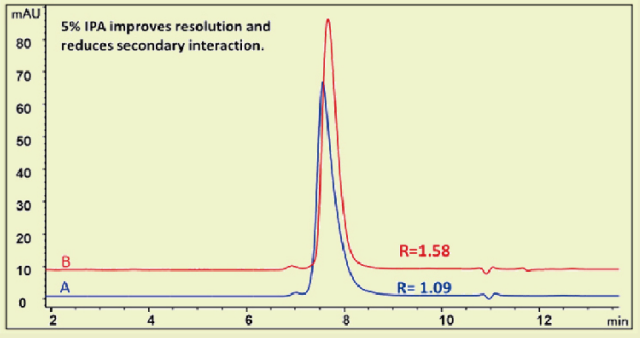
Column: Zenix-C SEC-300 (3 µm, 300 Å, 7.8 x 300 mm)
Mobile phase: As indicated
Flow rate: 0.5 mL/min
Detection: UV 214 nm
Temperature: Ambient
Volume: 10 µL
Samples: 1 mg/mL fusion protein, MW 170 kD, pl 6.8-7.0
10% retention time offset for presentation purpose

Figure 20. HSA Conjugated Peptide - SEC Phase Comparison



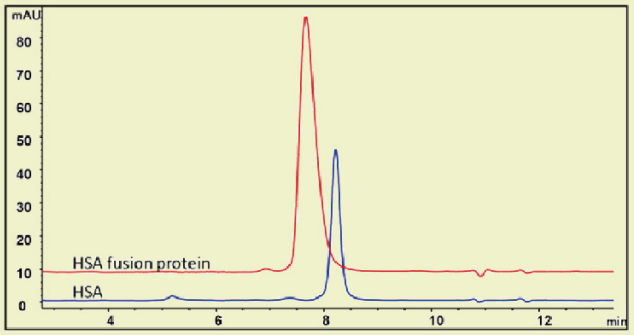
Column: Zenix-C SEC-300 (3 µm, 300 Å, 7.8 x 300 mm)
Mobile phase: 150 mM sodium phosphate buffer, pH 7.0
Flow rate: 1.0 mL/min
Detection: UV 280 nm
Temperature: Ambient
Injection: 10 µL
Samples: HSA fusion peptide 5 mg/mL (MW 75 kD, pI 5.0, HSA conjugated peptide in diabetes treatment)

Figure 21. HSA Conjugated Peptide - Mobile Phase Effect



Column: Zenix-C SEC-300 (3 µm, 300 Å, 7.8 x 300 mm)
Mobile phase: A. 150 mM sodium phosphate buffer, pH 7.0, B: 150 mM Phosphate buffer (pH 7.0): IPA = 95:5 (v/v)
Flow rate: 1.0 mL/min
Detection: UV 280 nm
Temperature: Ambient
Injection: 10 µL
Samples: HSA fusion peptide 5 mg/mL (MW 75 kD, pI 5.0, HSA conjugated peptide in diabetes treatment)

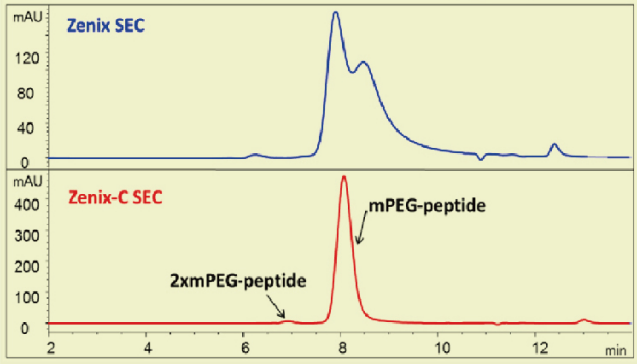
Figure 22. HSA Conjugated Peptide vs HSA



Column: Zenix-C SEC-300 (3 µm, 300 Å, 7.8 x 300 mm)
Mobile phase: 150 mM sodium phosphate buffer (pH 7.0) : IPA = 95 : 5 (v/v)
Flow rate: 1.0 mL/min
Detection: UV 280 nm
Temperature: Ambient
Injection: 10 µL
Samples: HSA fusion peptide 5 mg/mL (MW 75 kD, pI 5.0, HSA conjugated peptide in diabetes treatment), HSA 2 mg/mL

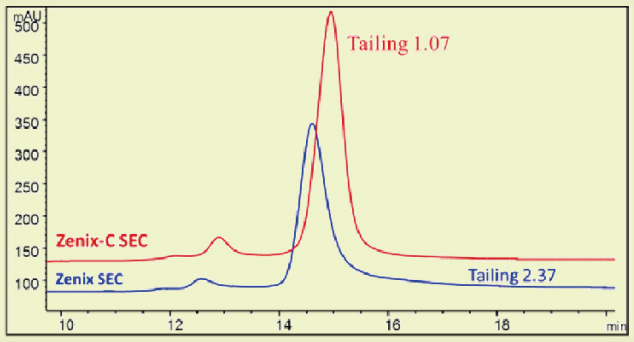
PEGylated Protein and Peptide

Figure 23. mPEG-peptide (20 kD PEG + 4 kD peptide)



Column: Zenix-C SEC-300 (3 µm, 300 Å, 7.8 x 300 mm)
Mobile phase: 150 mM sodium phosphate buffer, pH 7.0
Flow rate: 1.0 mL/min
Temperature: Ambient
Detection: UV 214 nm
Injection: 10 µL
Sample: mPEG-peptide concentration is 6 mg/Ml

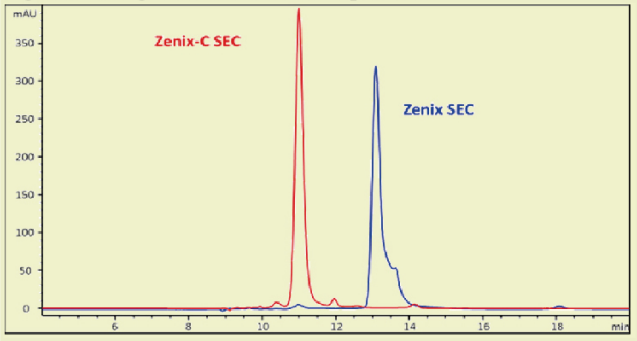
Figure 24. PEGylated Exenatide Separation



Column: Zenix-C SEC-300 (3 µm, 300 Å, 7.8 x 300 mm)
Mobile phase: 50 mM CH_3COONH_4 : ACN=90 : 10 (v/v)
Flow rate: 0.5 mL/min
Temperature: Ambient
Detection: UV 214 nm
Injection: 15 µL
Pressure: 42 bar
Sample: 3.3 mg/mL PEG-Exanatide in water (PEG 23 kD)

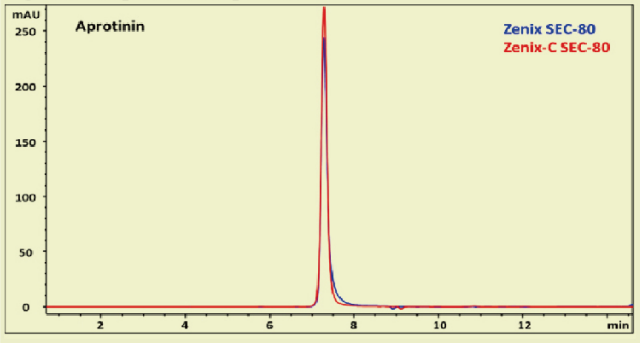
Peptide Separation

Figure 25. Angiotensin I Acetate Separation



Column: Zenix-C SEC-80 (3 µm, 80 Å, 7.8 x 300 mm)
Flow rate: 1 mL/min
Temperature: Ambient
Detection: UV 214
Mobile phase: 150 mM sodium phosphate buffer pH 7.0
Injection: 5 µL

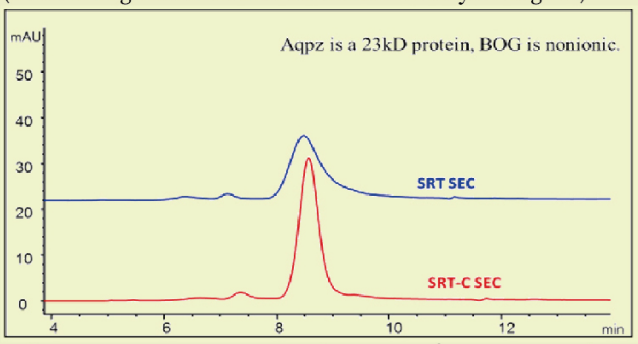
Figure 26. Aprotinin Separation



Column: Zenix-C SEC-80 (3 µm, 80 Å, 7.8 x 300 mm)
Flow rate: 1 mL/min
Temperature: Ambient
Detection: UV 214
Mobile phase: 150 mM sodium phosphate buffer pH 7.0
Injection: 5 µL

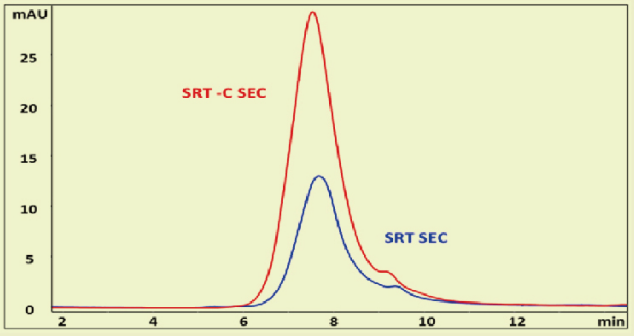
Membrane Protein

Figure 27. Membrane Protein Aqpz Separation
(Acknowledgement: Brad Bennett at University of Virginia)



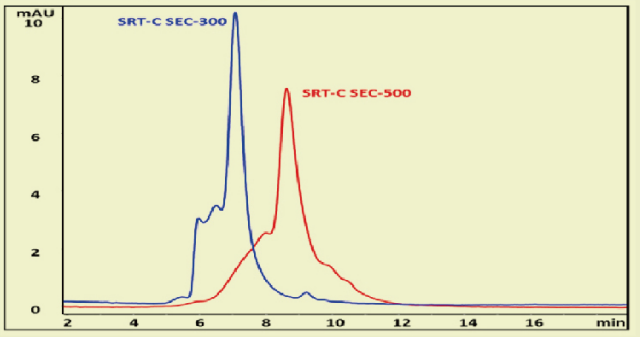
Column: SRT-C SEC-300 (5 µm, 300 Å, 7.8 x 300 mm)
Mobile phase: 20 mM TrisHCl, pH 7.0, 190 mM NaCl, 10 mM KC1, 40 mM Octyl glucoside
Flow rate: 1 mL/min
Temperature: Ambient
Detection: UV280 nm
Injection: 2 mL of 6 mg/mL

Figure 28. Bacterial K Channel (16 kD homotetramer) in 0.261% DDM (n-dodecyl-b-D-Maltoside)



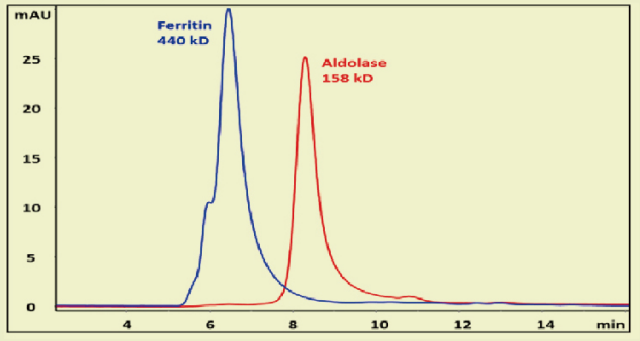
Column: SRT-C SEC-300 (5 µm, 300 Å, 4.6 x 300 mm)
Mobile phase: 20 mM Tris pH 7.5, 20 mM NaCl, 0.261% DDM
Flow rate: 0.35 mL /min
Temperature: Ambient
Detection: UV280 nm

Figure 29. Bacterial ABC Transporter (65 kD homodimer) in 0.1% UDM(β-undecylmaltoside)



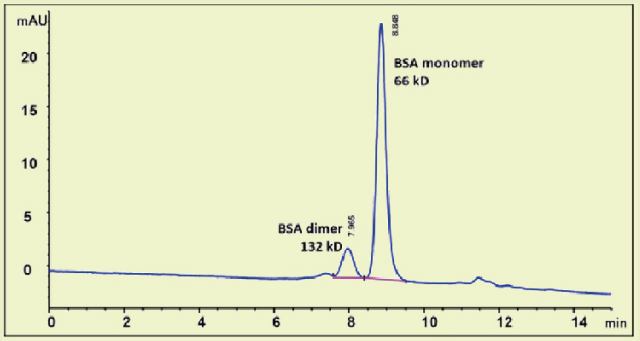
Column: SRT-C SEC-300 (5 µm, 300 Å, 4.6 x 300 mm)
SRT-C SEC-500 (5 µm, 300 Å, 4.6 x 300 mm)
Mobile phase: 20 mM Tris pH 7.5, 20 mM NaCl, 0.1% UDM
Flow rate: 0.35 mL/min
Temperature: Ambient
Detection: UV280 nm, AKTA FPLC system

Figure 30. Ferritin and Aldolase in 0.261% DDM (n-dodecyl-b-D-Maltoside)



Column: SRT-C SEC-300(5 µm, 300 Å, 4.6x 300 mm)
Mobile phase: 20 mM Tris pH 7.5, 20 mM NaCl, 0.261% DDM
Flow rate: 0.35 mL/min
Temperature: Ambient
Detection: UV280 nm; AKTA FPLC system

Figure 31. BSA in 0.02% TDM (Tridecyl-β-maltoside)



Column: SRT-C SEC-300 (5 µm, 300 Å, 7.8 x 300 mm)
Mobile phase: 50 mM HEPES, pH 7.5, 500 mM NaCl, 0.02% TDM, 2% Glycerol
Flow rate: 1 mL/min
Temperature: Ambient
Detection: UV 280 nm
Temperature: 25 ℃
Sampies: 20 µL BSA 1mg/mL in mobile phase

SRT-C Technical Specifications

Phase	SRT–C SEC–100	SRT–C SEC–150	SRT–C SEC–300
Material	Neutral, hydrophilic film bonded silica	Neutral, hydrophilic film bonded silica	Neutral, hydrophilic film bonded silica
Particle size	5 µm	5 µm	5 µm
Pore size (Å)	~ 100	~ 150	~ 300
Protein MW range (native)	100–100,000	500–150,000	5,000–1,250,000
pH stability①	2–8.5	2–8.5	2–8.5
Backpressure (psi for a 7.8x300 mm)②	~ 700 psi	~ 700 psi	~ 700 psi
Salt concentration range	20 mM–2.0 M	20 mM–2.0 M	20 mM–2.0 M
Mobile phase compatibility	Aqueous and organic	Aqueous and organic	Aqueous and organic

Phase	SRT–C SEC–500	SRT–C SEC–1000	SRT–C SEC–2000
Material	Neutral, hydrophilic film bonded silica	Neutral, hydrophilic film bonded silica	Neutral, hydrophilic film bonded silica
Particle size	5 µm	5 µm	5 µm
Pore size (Å)	~ 500	~ 1000	~ 2000
Protein MW range (native)	15,000–5,000,000	50,000–7,500,000	>10,000,000
pH stability①	2–8.5	2–8.5	2–8.5
Backpressure (psi for a 7.8x300 mm)②	~ 700 psi	~ 700 psi	~ 700 psi
Salt concentration range	20 mM–2.0 M	20 mM–2.0 M	20 mM–2.0 M
Mobile phase compatibility	Aqueous and organic	Aqueous and organic	Aqueous and organic

Zenix-C Technical Specifications

Phase	Zenix–C SEC–80	Zenix–C SEC–100	Zenix–C SEC–150	Zenix–C SEC–300
Material	Neutral, hydrophilic film bonded silica	Neutral, hydrophilic film bonded silica	Neutral, hydrophilic film bonded silica	Neutral, hydrophilic film bonded silica
Particle size	3 µm	3 µm	3 µm	3 µm
Pore size (Å)	~ 80	~ 100	~ 150	~ 300
Protein MW range (native)	100–50,000	100–100,000	500–150,000	5,000–1,250,000
pH stability①	2–8.5	2–8.5	2–8.5	2–8.5
Backpressure for 7.8x300 mm (1.0 mL/min)②	~1885 psi	~ 1,500 psi	~ 1,375 psi	~ 1,100 psi
Backpressure for 4.6x300 mm (0.35 mL/min)	~1450 psi	~ 1,400 psi	~ 1,250 psi	~ 1,000 psi
Salt concentration range	20 mM–2.0 M	20 mM–2.0 M	20 mM–2.0 M	20 mM–2.0 M
Mobile phase compatibility	Aqueous and organic	Aqueous and organic	Aqueous and organic	Aqueous and organic

① Store the column in neutral pH, or 20% ethanol in water
② Recommended maximum flow rate for 7.8 x 300 mm 1.5 ml/min

SRT/SRT-C SEC, 5 µm

Sample Loading Recommendation (SRT, 5 µm, 300 Å)

ID	2.1x300 mm	4.6x300 mm	7.8x300 mm	10x300 mm	21.2x300 mm	30x300 mm
Column Volume	1.04 mL	4.99 mL	14.34 mL	23.56 mL	105.90 mL	212.06 mL
Standard Loading : (4% of CV)	42 µL	200 µL	573 µL	942 µL	4.24 mL	8.48 mL
Type	Nano	Narrow-bore	Regular	Semi Prep	Prep	Process
V-Injection	0.1-2 µL	0.5-10 µL	1-100 µL	1-250 µL	0.01-1.5 mL	0.1-5 mL
Maximum Mass (BSA)	85 µg	400 µg	1.2 mg	2 mg	9 mg	20 mg
Standard Flow Rate (Maximum)	0.067 mL/min	0.35 mL/min	1.0 mL/min	1.5 mL/min (2.0 mL/min)	7 mL/min (10 mL/min)	15 mL/min (25 mL/min)
Sensitivity	Highest	Higher	High	N/A	N/A	N/A
Back Pressure	~300 psi	~400 psi	~700 psi	700-900 psi	700-900 psi	700-900 psi
Instrument Type	Capillary	Regular	Regular	Prep	Prep	Process

Zenix/Zenix-C SEC, 3 µm

Sample Loading Recommendation (Zenix-300 with HPLC)

ID	2.1x300 mm	4.6x300 mm	7.8x300 mm	10x300 mm	21.2x300 mm	30x300 mm
Column Volume	1.04 mL	4.99 mL	14.34 mL	23.56 mL	105.90 mL	212.06 mL
Standard Loading : (4% of CV)	42 µL	200 µL	573 µL	942 µL	4.24 mL	8.48 mL
Type	Nano	Narrow-bore	Regular	Semi Prep	Prep	Process
V-Injection	0.1-18 µL	0.5-85 µL	10-250 µL	10-420 µL	0.01-2 mL	0.1-4 mL
Maximum Mass (BSA)	200 µg	1 µg-1 mg	20 µg-3 mg	5 mg	22 mg	45 mg
Standard Flow Rate (Maximum)	0.067 mL/min	0.35 mL/min	1.0 mL/min	1.5 mL/min (2.0 mL/min)	7 mL/min (10 mL/min)	15 mL/min (25 mL/min)
Sensitivity	Highest	Higher	High	N/A	N/A	N/A
Back Pressure	~1,200 psi	~1,200 psi	~1,200 psi	700-900 psi	700-900 psi	700-900 psi
Instrument Type	Capillary	Regular	Regular	Prep	Prep	Process

Ordering Information

Other dimension and pore size available upon request

SRT-C SEC Column

SRT-C SEC-100 (5 µm, 100 Å)

ID x Length (mm)	P/N
7.8 x 300	235100-7830
7.8 x 50 (Guard)	235100-7805
4.6 x 300	235100-4630
4.6 x 50 (Guard)	235100-4605
10 x 300	235100-10030
21.2 x 300	235100-21230

SRT-C SEC-150 (5 µm, 150 Å)

ID x Length (mm)	P/N
7.8 x 300	235150-7830
7.8 x 50 (Guard)	235150-7805
4.6 x 300	235150-4630
4.6 x 50 (Guard)	235150-4605
10 x 300	235150-10030
21.2 x 300	235150-21230

SRT-C SEC-300 (5 µm, 300 Å)

ID x Length (mm)	P/N
7.8 x 300	235300-7830
7.8 x 50 (Guard)	235300-7805
4.6 x 300	235300-4630
4.6 x 50 (Guard)	235300-4605
10 x 300	235300-10030
21.2 x 300	235300-21230
10 x 300	233300-10030
21.2 x 300	233300-21230

SRT-C SEC-500 (5 µm, 500 Å)

ID x Length (mm)	P/N
7.8 x 300	235500-7830
7.8 x 50 (Guard)	235500-7805
4.6 x 300	235500-4630
4.6 x 50 (Guard)	235500-4605
10 x 300	235500-10030
21.2 x 300	235500-21230

SRT-C SEC-1000 (5 µm, 1000 Å)

ID x Length (mm)	P/N
7.8 x 300	235950-7830
7.8 x 50 (Guard)	235950-7805
4.6 x 300	235950-4630
4.6 x 50 (Guard)	235950-4605
10 x 300	235950-10030
21.2 x 300	235950-21230

SRT-C SEC-2000 (5 µm, 2000 Å)

ID x Length (mm)	P/N
7.8 x 300	235980-7830
7.8 x 50 (Guard)	235980-7805
4.6 x 300	235980-4630
4.6 x 50 (Guard)	235980-4605
10 x 300	235980-10030
21.2 x 300	235980-21230

Zenix-C SEC Column

Zenix-C SEC-80 (3 µm, 80 Å)

ID x Length (mm)	P/N
7.8 x 300	233080-7830
7.8 x 50 (Guard)	233080-7805
4.6 x 300	233080-4630
4.6 x 50 (Guard)	233080-4605
10 x 300	233080-10030
21.2 x 300	233080-21230

Zenix-C SEC-100 (3 µm, 100 Å)

ID x Length (mm)	P/N
7.8 x 300	233100-7830
7.8 x 50 (Guard)	233100-7805
4.6 x 300	233100-4630
4.6 x 50 (Guard)	233100-4605

Zenix-C SEC-150 (3 µm, 150 Å)

ID x Length (mm)	P/N
7.8 x 300	233150-7830
7.8 x 50 (Guard)	233150-7805
4.6 x 300	233150-4630
4.6 x 50 (Guard)	233150-4605
10 x 300	233150-10030
21.2 x 300	233150-21230

Zenix-C SEC-300 (3 µm, 300 Å)

ID x Length (mm)	P/N
7.8 x 300	233300-7830
7.8 x 50 (Guard)	233300-7805
4.6 x 300	233300-4630
4.6 x 50 (Guard)	233300-4605
10 x 300	233300-10030
21.2 x 300	233300-21230

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For Analytical Columns
with Particle Size 5 µm and 10 µm

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PN: 102001-P355 PEEK Refill Frits (2 µm), 5 units/pk

with Particle Size below 3 µm

PN: 102000-P356 PEEK Precolumn Filter & Frit (0.5 µm)
PN: 102001-P356 PEEK Refill Frits (0.5 µm), 5 units/pk

PN: 102000-P346 PEEK Precolumn Filter SS Frit (0.5 µm)
PN: 102001-P346 SS Refill Frits (0.5 µm), 5 units/pk

PREP Filter

For Prep Column (≥ 21.2mm ID)
Particle Size 5 µm or Above

PN: 102020-21200
Stainless Steel Precolumn Filter & Frits (2 µm)

PN: 102020-00001
Stainless Steel Refill Frits, (2 µm), 5 units/pk)

Guard ANALYTICAL

Cartridge & Holder

Packed with Resin,
Part Number is dependent to Phase
Contact sales for assistance.

Replacement Cartridge Holder

PN: 102000-2001
Holder for 2.1mm ID column

PN: 102000-4001
Holder for 4.6 mm ID column

PEEK Column Coupler

102002-COUPLER

Analytical PEEK Coupler with Flexible Tubing

102006-COUPLER

PREP Guard

Cartridge & Holder

Packed with Resin,
Part Number is dependent to Phase
Contact sales for assistance.

PEEK/SS Coupler

102003-COUPLER

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