SRT®-C, Zenix™-C SEC Phases

Complimentary Phases to SRT for Derivatized Monoclonal Antibodies

General Description

SRT®, Zenix™, SRT®-C and Zenix™-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. The two different types of coating chemistries, SRT and Zenix, stand-up monolayer bonded on porous silica, and SRT-C and Zenix-C, lay-down monolayer on porous silica offer ideal phase chemistries for sample type specific separation. The 3um based Zenix and Zenix-C, and 5um based SRT and SRT-C allow for 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

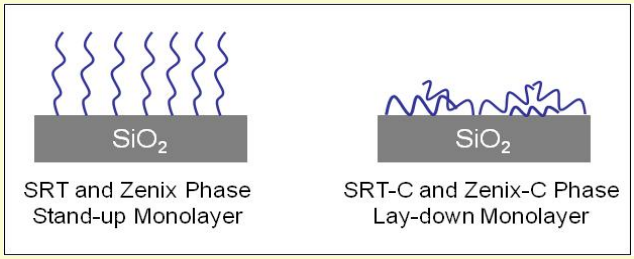


Figure 1. Phase structure difference: a monolayer stands up on the silica surface for SRT and Zenix, and a monolayer lays down on the silica surface for SRT-C and Zenix-C.

Difference in Particle Size

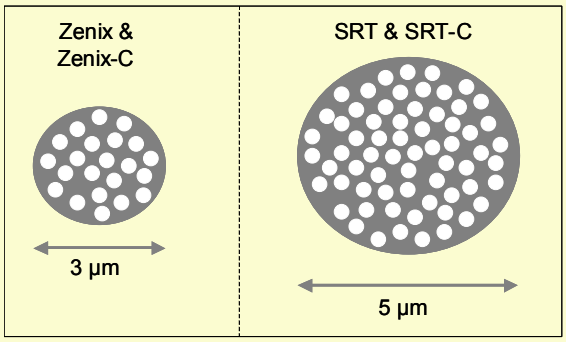


Figure 2. Zenix and Zenix-C are based on 3 µm porous silica. SRT and SRT-C are based on 3 µm porous silica.

Key features of Sepax SEC phases

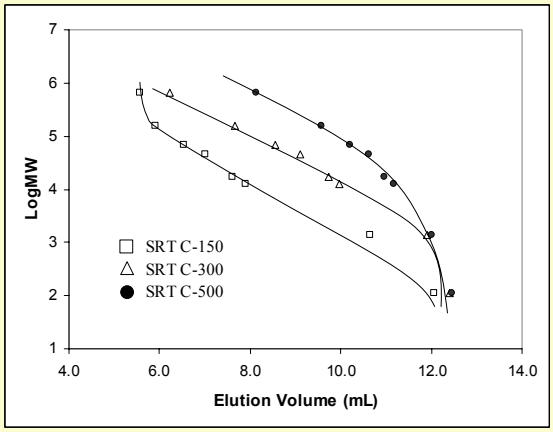
Characteristics	SRT	Zenix	SRT-C	Zenix-C
Particle size	5 µm	3 µm	5 µm	3 µm
Pore size (Å)	100, 150, 300, 500, 1000 & 2000	100, 150, 300	100, 150, 300, 500, 1000 & 2000	100, 150, 300
Resolution	High	Highest, Short column for faster separation	High	Highest, Short column for faster separation
Efficiency	High	Doubled from 5um	High	Doubled from 5um
Selectivity	Same for SRT and Zenix		Same for SRT-C and Zenix-C	
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 proteins* like insulin, membrane protein *monoclonal antibodies derivatized with polymer branches*, e.g. polypeptide, PEG.	

* Ribonuclease A is used as the test molecule for 7.8x300mm column and the plate counts are 22,000 for Zenix vs. 11160 for SRT.

Protein MW Calibration

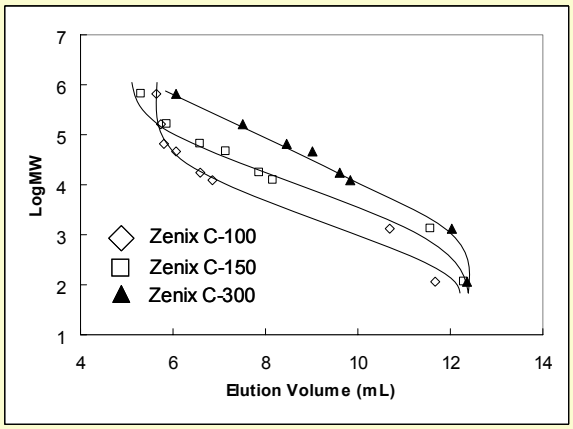
Protein molecular weight vs elution volume is plotted in Figure 3 and Figure 4, indicating that SRT-C 150, 300 and 500, and Zenix-C 100, 150 and 300 have large linear elution region.

Figure 3. Protein MW calibration with elution volume for SRT-C phases.



Columns: SRT-C (7.8x300 mm, 5 µm)
Mobile phase: 150 mM Sodium Phosphate, pH 7.0
Flow rate: 1.0 mL/min
Detection: UV 214 nm
Injection volume: 10 µL
Sample: 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. B12, 1.35 kD; 8. Uracil, 120

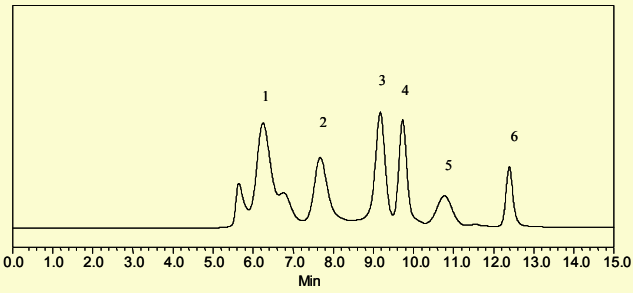
Figure 4. Protein MW calibration with elution volume for Zenix-C phases.



Columns: Zenix-C (7.8x300 mm, 3 µm)
Mobile phase: 150 mM phosphate buffer, pH 7.0
Flow rate: 1.0 mL/min
Detection: UV 214 nm
Injection volume: 10 µL
Sample: 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. B12, 1.35 kD; 8. Uracil, 120

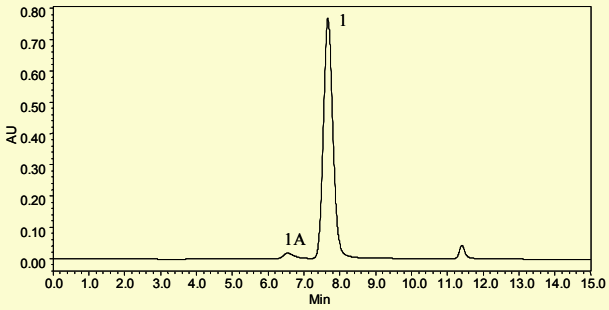
Applications

Figure 5. Separation of a protein mixture by SRT-C 300 column.



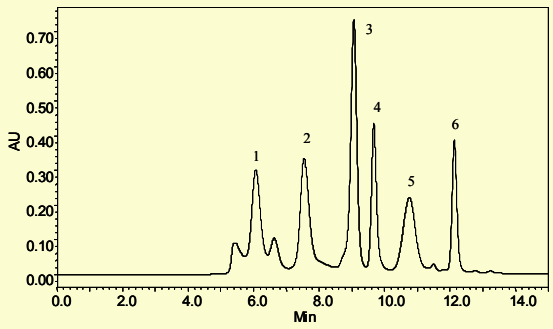
Column: SRT-C 300 (7.8x300 mm, 5 µm)
Mobile phase: 150 mM Sodium Phosphate, pH 7
Flow rate: 1.0 mL/min
Temperature: ambient (~23° C)
Detection: UV 214nm
Injection: 10 µL
Sample: 1) Thyroglobulin, 670kD; 2) γ-Globulin, 158 kD; 3) Ovalbumin, 44kD; 4) Myoglobin, 17.6 kD; 5) Poly-DL-alanine (1-5 kD); 6) Uracil, 120D.

Figure 6. Separation of monoclonal antibody and its high MW species by SRT-C 300 column.



Column: SRT-C 300 (7.8x300 mm, 5 µm)
Mobile phase: 150 mM Sodium Phosphate, pH 7
Flow rate: 1.0 mL/min
Temperature: Ambient (~23° C)
Detection: UV 214nm
Injection: 10 µL
Sample: Monoclonal antibody (1.3 mg/mL)

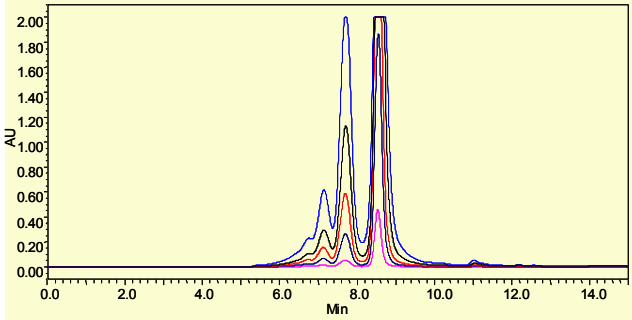
Figure 7. Separation of a protein mixture by Zenix-C 300 column.



Column: Zenix-C 300 (7.8x300 mm, 3 µm)
Mobile phase: 150 mM Sodium phosphate, pH 7

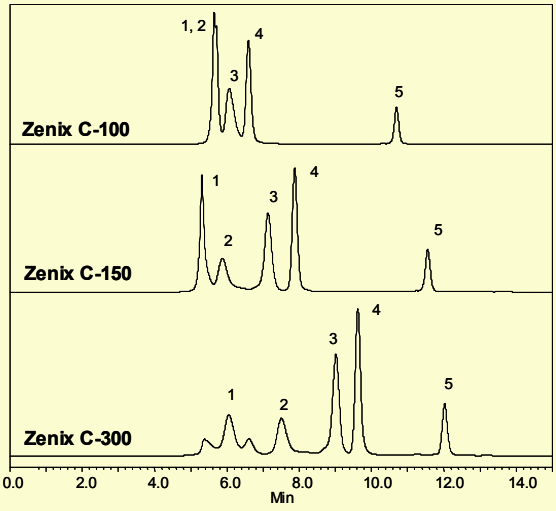
Flow rate: 1.0 mL/min
Temperature: ambient (~23° C)
Detection: UV 214nm
Injection: 10 µL
Sample: 1) Thyroglobulin, 670kD; 2) γ-Globulin, 158 kD; 3) Ovalbumin, 44kD; 4) Myoglobin, 17.6 kD; 5) Poly-DL-alanine (1-5 kD); 6) B12, 1.35KD.

Figure 8. BSA loading test on a Zenix-C 300 column.



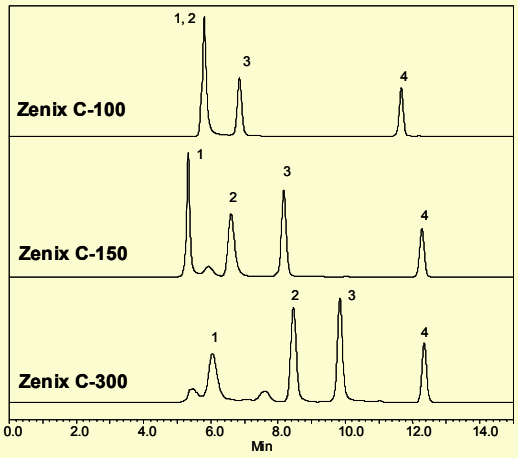
Column: Zenix-C 300 (3 µm, 7.8x300 mm)
Mobile phase: 150 mM Sodium phosphate, pH 7.0
Flow Rate: 1.0 mL/min
Injection volume: 10 µL
BSA concentration: 1, 5, 10, 25 and 50 mg/mL (from low to high)
Detection: UV214 nm

Figure 9. Separation of Biorad protein mixture by Zenix-C 100, 150 and 300 columns.



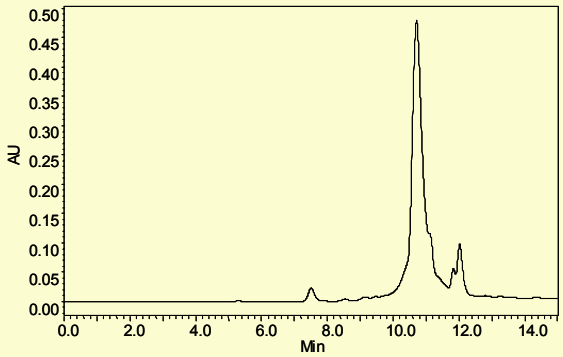
Columns: Zenix-C (3 µm, 7.8x300 mm)
Mobile phase: 150 mM Sodium phosphate, pH 7.0
Flow rate: 1.0 mL/min
Detection: UV214 nm
Injection: 10 µL
Sample: 1) Thyroglobulin, 670 kD; 2) γ-Globulin, 158 kD; 3) Ovalbumin, 44 kD; 4) Myoglobulin, 16.9 kD; 5) Vitamin B12, 1355 D.

Figure 10. Separation of protein mixture A by Zenix-C 100, 150 and 300 columns.

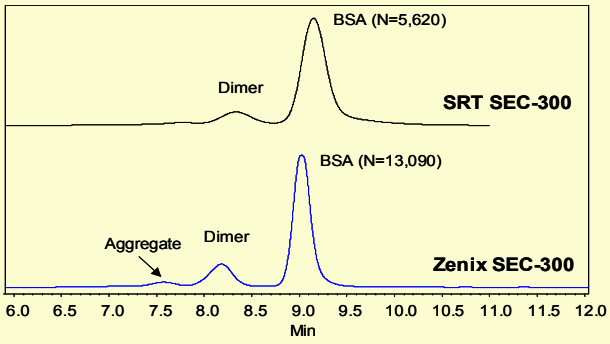


Column: Zenix-C (3 µm, 7.8x300 mm)
Mobile phase: 150 mM Sodium phosphate, pH 7.0
Flow rate: 1.0 mL/min
Temperature: Ambient (~23° C)
Detection: UV 214nm
Injection: 10 µL (3 µL for 4.6x300 mm)
Sample: 1) Thyroglobulin (1.0 mg/mL), 670 kD; 2) BSA (1.0 mg/mL), 66 kD; 3) Ribonuclease A (1.0 mg/mL), 13.7 kD, and 4) Uracil (2.5 µg/mL), 120D.

Figure 11. Elution of *insulin* from Zenix-C 300 column.



Columns: Zenix-C 300 (3 µm, 7.8x300 mm)
Mobile phase: 150 mM Sodium phosphate, pH 7.0
Flow rate: 1.0 mL/min
Detection: UV 214 nm
Injection: 10 µL
Sample: Insulin (from a commercial source containing impurity)



Unique benefits of Zenix and Zenix-C Phases

Zenix and Zenix-C columns offer highest efficiency and resolution for biomolecules

Figure 12. Column: 7.8x300mm; 150 mM sodium phosphate, pH 7.0; Flow rate: 1.0 mL/min; UV 214nm; Injection: 10 µL (5.0 mg/mL).

SRT-C Technical Specifications

Phase	SRT-C 150	SRT-C 300	SRT-C 500
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)	~ 150	~ 300	~ 500
Protein MW range (native)	*500 - 150,000*	*5,000 – 1,250,000*	*15,000 – 5,000,000*
pH stability	2 – 8.5 (pH 8.5-9.5 can be tolerated temporarily.)	2 – 8.5 (pH 8.5-9.5 can be tolerated temporarily.)	2 – 8.5 (pH 8.5-9.5 can be tolerated temporarily.)
Backpressure (psi for a 7.8x300 mm)	~ 700	~ 700	~ 700
Maximum backpressure (psi)	~ 4,500	~ 3,500	~ 3,000
Salt concentration range	20 mM - 2.0 M	20 mM - 2.0 M	20 mM - 2.0 M
Maximum temperature (°C)	~ 80	~ 80	~ 80
Mobile phase compatibility	Aqueous and organic	Aqueous and organic	Aqueous and organic

Zenix-C Technical Specifications

Phase	Zenix-C 100	Zenix-C 150	Zenix-C 300
Material	Neutral, hydrophilic film bonded silica	Neutral, hydrophilic film bonded silica	Neutral, hydrophilic film bonded silica
Particle size	3 µm	3 µm	3 µm
Pore size (Å)	~ 100	~ 150	~ 300
Protein MW range (native)	*100 - 100,000*	*500 - 150,000*	*5,000 – 1,250,000*
pH stability	2 – 8.5 (pH 8.5-9.5 can be tolerated temporarily.)	2 – 8.5 (pH 8.5-9.5 can be tolerated temporarily.)	2 – 8.5 (pH 8.5-9.5 can be tolerated temporarily.)
Backpressure for 7.8x300 mm (1.0 mL/min)	~ 1,500 psi	~ 1,375 psi	~ 1,100 psi
Backpressure for 4.6x300 mm (0.35 mL/min)	~ 1,400 psi	~ 1,250 psi	~ 1,000 psi
Maximum backpressure (psi)	~ 4,500	~ 4,500	~ 3,500
Salt concentration range	20 mM - 2.0 M	20 mM - 2.0 M	20 mM - 2.0 M
Maximum temperature (oC)	~ 80	~ 80	~ 80
Mobile phase compatibility	Aqueous and organic	Aqueous and organic	Aqueous and organic

Ordering Information

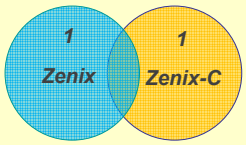
Other dimension and pore size available upon request

SRT-C 150 (5µm, 150Å)

ID x Length (mm)	P/N
7.8x300	SEP235150-7830
7.8x50 (Guard)	SEP235150-7805
4.6x300	SEP235150-4630
4.6x50 (Guard)	SEP235150-4605
10x300	SEP235150-10030
21.2x300	SEP235150-21230

SRT-C 300 (5µm, 300Å)

ID x Length (mm)	P/N
7.8x300	SEP235300-7830
7.8x50(Guard)	SEP235300-7805
4.6x300	SEP235300-4630
4.6x50 (Guard)	SEP235300-4605
10x300	SEP235300-10030
21.2x300	SEP235300-21230



Zenix & Zenix-C SEC Solution Pack

P/N ***SEPZ233300-7830***

Includes

1 Zenix (300Å, 7.8x300mm)

+

1 Zenix-C (300Å, 7.8x300mm)

P/N ***SEPZ233150-7830***

Includes

1 Zenix (150Å, 7.8x300mm)

+

1 Zenix-C (150Å, 7.8x300mm)

Limited Time
Introductory Offer
Please Ask For A Quote

SRT-C 500 (5µm, 500Å)

ID x Length (mm)	P/N
7.8x300	SEP235500-7830
7.8x50(Guard)	SEP235500-7805
4.6x300	SEP235500-4630
4.6x50 (Guard)	SEP235500-4605
10x300	SEP235500-10030
21.2x300	SEP235500-21230

Zenix-C 150 (3µm, 150Å)

ID x Length (mm)	P/N
7.8x300	SEP233150-7830
7.8x50(Guard)	SEP233150-7805
4.6x300	SEP233150-4630
4.6x50 (Guard)	SEP233150-4605
10x300	SEP233150-10030
21.2x300	SEP233150-21230

Zenix-C 100 (3µm, 100Å)

ID x Length (mm)	P/N
7.8x300	SEP233100-7830
7.8x50 (Guard)	SEP233100-7805
4.6x300	SEP233100-4630
4.6x50 (Guard)	SEP233100-4605
10x300	SEP233100-10030
21.2x300	SEP233100-21230

Zenix-C 300 (3µm, 300Å)

ID x Length (mm)	P/N
7.8x300	SEP233300-7830
7.8x50(Guard)	SEP233300-7805
4.6x300	SEP233300-4630
4.6x50 (Guard)	SEP233300-4605
10x300	SEP233300-10030
21.2x300	SEP233300-21230