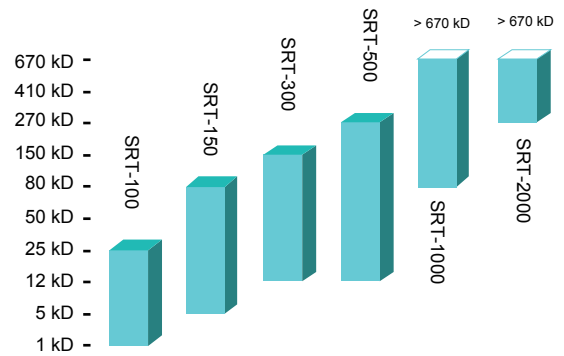
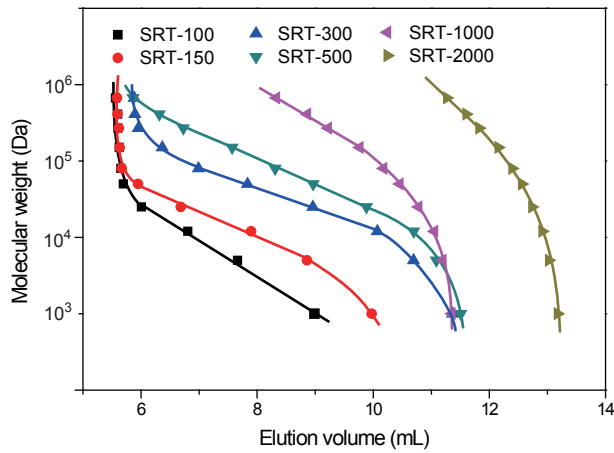


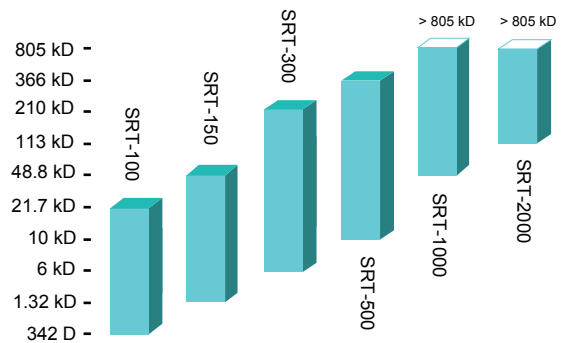
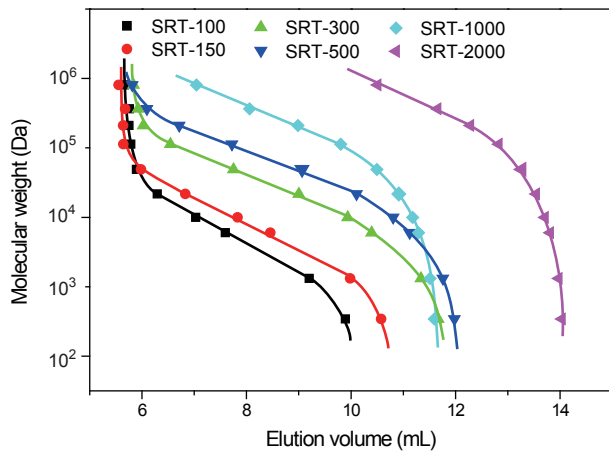
SEC Column Selection Guide for the Separation of Water-soluble Polymers

Dextrans



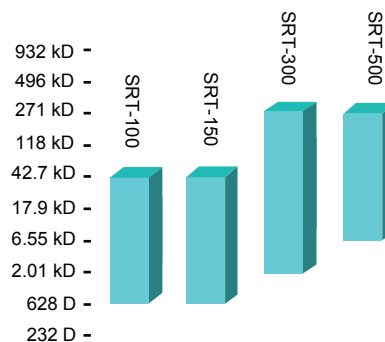
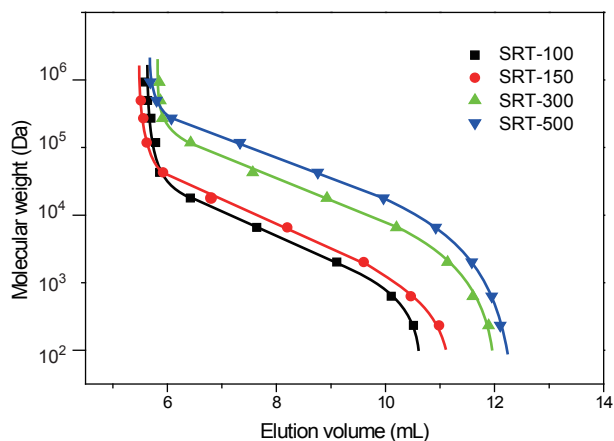
Linear distribution region between Log MW & Elution volume

Pullulans



Linear distribution region between Log MW & Elution volume

Polyethylene Glycols



Linear distribution region between Log MW & Elution volume

Data generated using the following conditions:

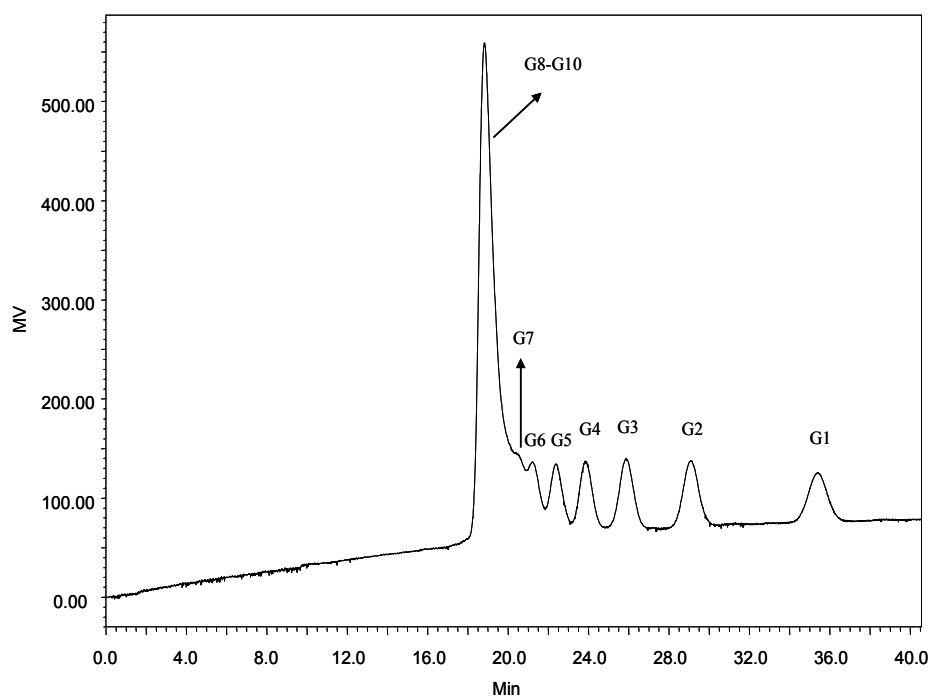
Column: SRT columns, 7.8 x 300 mm; Mobile phase: 150 mM phosphate buffer (pH 7.0); Flow rate: 1.0 mL/min;

Detection: RI; Column temperature: 25 °C; Injection volume: 20 μ L

Note: This column selection guide is applicable for other dimensions and series which including SRT-C, Zenix, and Zenix-C.



Analysis of Glucidex on Carbomix[®]-Ca (5 μ m, 8%, 4.6x300 mm)



Column: Carbomix[®] Ca-NP5 (5 μ m, 8% crosslinkage, 4.6x300 mm)
Mobile Phase: Water, pH 6.0
Flow Rate: 0.2 mL/min
Temperature: 85 °C
Detection: Differential Refractometer
Injection Volume: 20 μ L
Samples: Glucidex (100 mg/mL), 10 components from G1 (monomer) to G10 (10th mer)
(Courtesy of Miyako Kawakatsu, M&S Instruments, Inc.)

Keywords: Carbohydrate, Carbomix, calcium form, sugar, maltodextrins, Glucidex



Separation of Dextran on SRT[®]-300

Column: SRT[®] 300 (5 μ m, 300 Å , 7.8 x 300 mm)
Mobile Phase: 150 mM phosphate Buffer, pH 7.0
Flow rate: 1.0 mL/min
Detection: RI (30 $^{\circ}$ C)
Injection volume: 20 μ L

Sample: 10 mg/mL in mobile phase
1 kD, 5 kD, 12 kD, 25 kD, 50 kD, 80 kD,
150 kD, 270 kD, 410 kD and 670 kD
Column temperature: 25 $^{\circ}$ C
Pressures: 600 psi

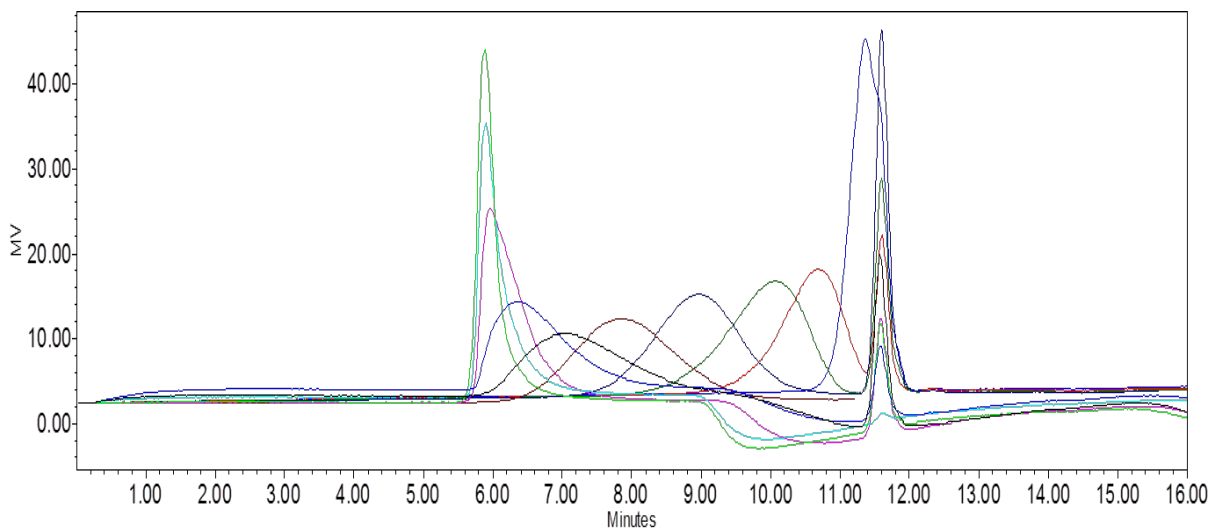


Figure 1. Chromatogram overlays for Dextran standards on SRT[®]-300, 5 μ m, 7.8 x 300 mm.

| Molecular weight (Da) | Log MW | Elution volume (mL) |
|-----------------------|-------------|---------------------|
| 1000 | 3 | 11.366 |
| 5000 | 3.698970004 | 10.692 |
| 12000 | 4.079181246 | 10.071 |
| 25000 | 4.397940009 | 8.962 |
| 50000 | 4.698970004 | 7.834 |
| 80000 | 4.903089987 | 6.991 |
| 150000 | 5.176091259 | 6.368 |
| 270000 | 5.431363764 | 5.955 |
| 410000 | 5.612783857 | 5.895 |
| 670000 | 5.826074803 | 5.883 |

Table 1. Dextran molecular weight and retention time on SRT[®] 300, 5 μ m, 7.8 x 300 mm.

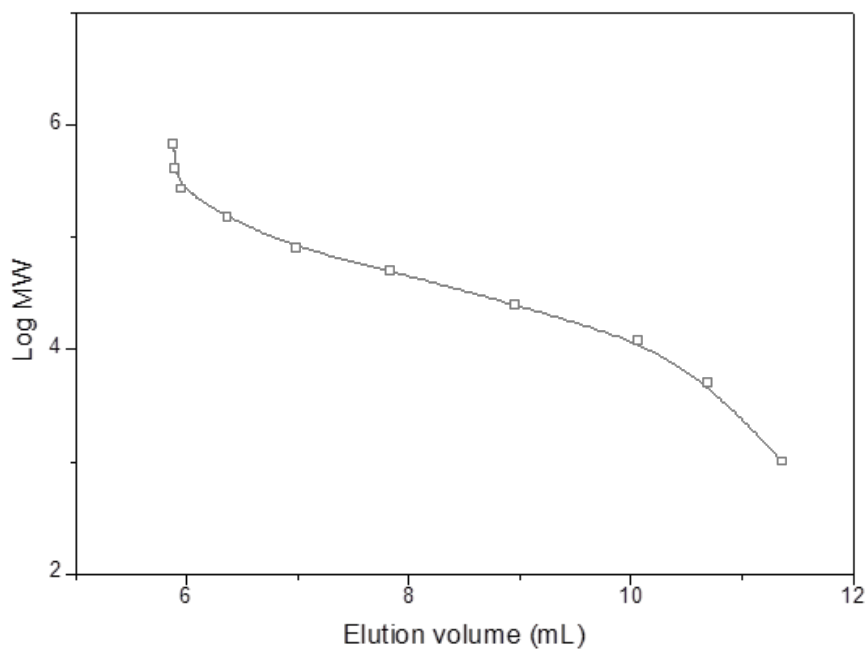


Figure 3. Calibration curve of Dextran molecular weight vs. Elution volume on SRT[®] 300.

Keywords : size exclusion, SRT, Dextran, SRT 300, polysaccharide



Separation of Pullulan on SRT[®]-300

Column: SRT[®] 300 (5 μ m, 300 \AA , 7.8 x 300 mm)
Mobile Phase: 150 mM phosphate Buffer, pH 7.0
Flow rate: 1.0 mL/min
Detection: RI (30 $^{\circ}$ C)
Injection volume: 20 μ L

Sample: 10 mg/mL in mobile phase
0.342 kD, 1.32 kD, 6 kD, 10 kD, 21.7 kD,
48.8 kD 113 kD, 210 kD, 366 kD and 805 kD
Column temperature: 25 $^{\circ}$ C
Pressures: 600 psi

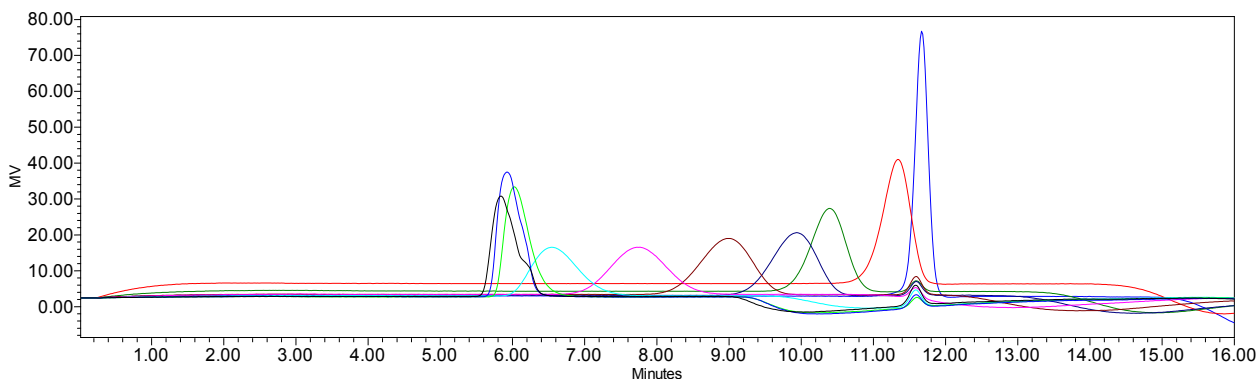


Figure 1. Chromatogram overlays for Pullulan standards on SRT[®]-300, 5 μ m, 7.8 x 300 mm.

| NO | Molecular weight | Log MW | Elution volume(mL) |
|----|------------------|----------|--------------------|
| 1 | 342 | 2.534026 | 11.67 |
| 2 | 1320 | 3.120574 | 11.341 |
| 3 | 6000 | 3.778151 | 10.394 |
| 4 | 10000 | 4 | 9.936 |
| 5 | 21700 | 4.33646 | 9.003 |
| 6 | 48800 | 4.68842 | 7.752 |
| 7 | 113000 | 5.053078 | 6.546 |
| 8 | 210000 | 5.322219 | 6.025 |
| 9 | 366000 | 5.563481 | 5.925 |
| 10 | 805000 | 5.905796 | 5.839 |

Table 1. Pullulan molecular weight and retention time on SRT[®] 300, 5 μ m, 7.8 x 300 mm.

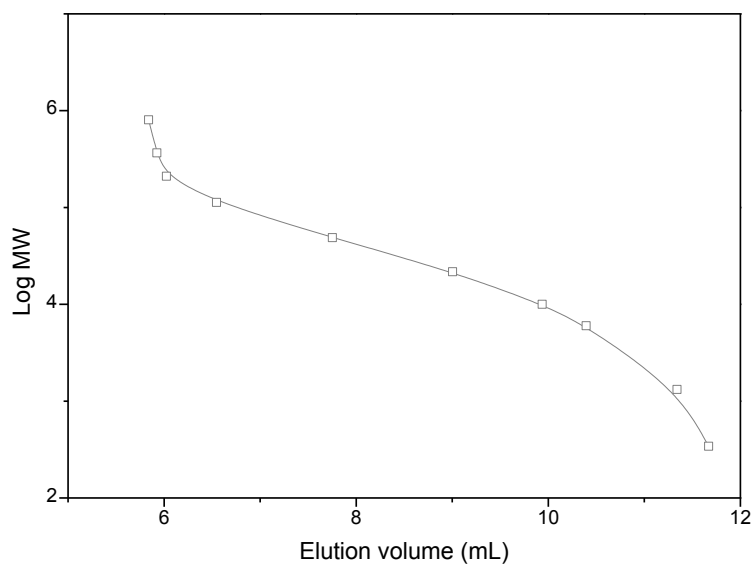
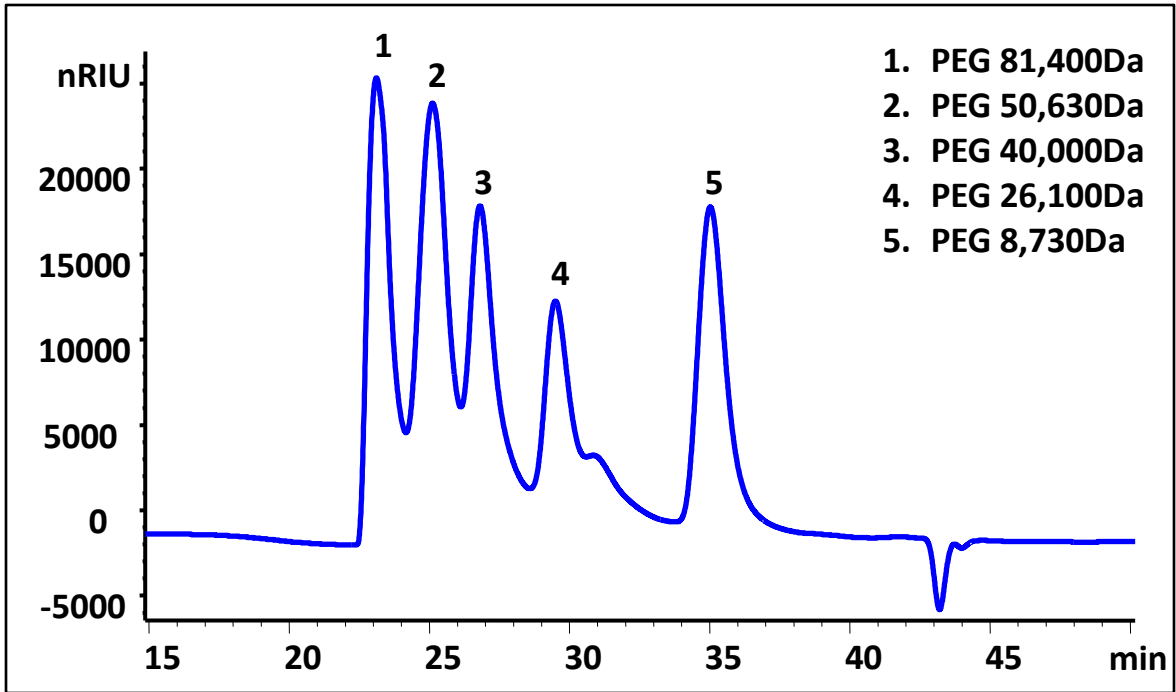


Figure 3. Calibration curve of Pullulan molecular weight vs. Elution volume on SRT[®] 300.

Keywords : size exclusion, SRT, Pullulan, SRT 300, polysaccharide

PEG separation on two Zenix SEC-300 7.8x300mm columns in Tandem

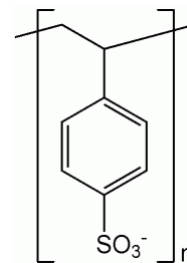


Columns: 2 Zenix SEC-300 3 μ m, 300 \AA , 7.8x300mm connected in tandem
 Mobile Phase: 150 mM Sodium Phosphate Buffer pH=7.0
 Flow Rate: 0.5 mL/min
 Temperature: 25 $^{\circ}$ C
 Detection: Refractive Index at 30 $^{\circ}$ C
 Injection Volume: 10 μ L
 Samples:

1. PEG 81,400Da (2mg/mL)
2. PEG 50,630Da (2mg/mL)
3. PEG 40,000Da (2mg/mL)
4. PEG 26,100Da (2mg/mL)
5. PEG 8,730Da (2mg/mL)

Polystyrene sulfonate polymer SEC separations

- Columns:
 - Zenix[®] SEC-150 (3 μm , 1.50 \AA)
 - Zenix[®] SEC-300 (3 μm , 300 \AA)
 - SRT[®] SEC-500 (5 μm , 500 \AA)
 - SRT[®] SEC-1000 (5 μm , 1000 \AA)
- Samples:
 - 1640, 7950, 16600, 34700, 57500, 127000, 505100 Da
 - 15, 80, 150, 300, 670, 1,000 and 2,350 kDa
- With shorter column 7.8 x 150 mm and higher flow rate at 1.5 mL/min, the separation can be achieved under 5 minutes.
- Different pore size columns in tandem will expand the MW separation range .



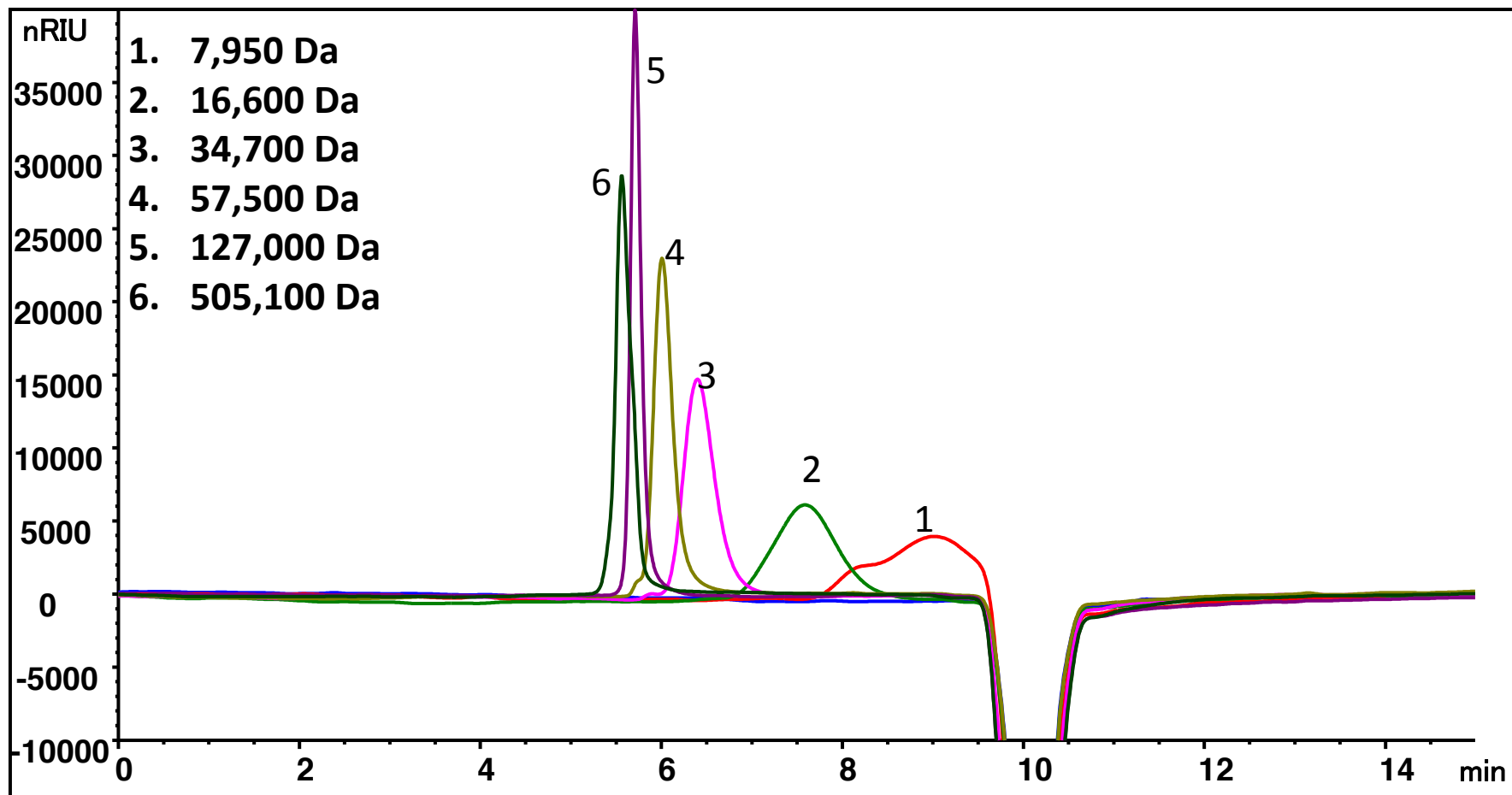
Sodium polystyrene sulfonate separation on Zenix[®] SEC-150, 7830

Column: **Zenix[®] SEC-150** (3 μm , 150 \AA , 7.8 x 300 mm)

Mobile phase: 150mM Phosphate Buffer, pH 7

Flow rate: 1.0 mL/min; Detector: RI; Column temperature: RT

Injection volume: 50 μg , Sample: See chromatogram, total run time 15 min



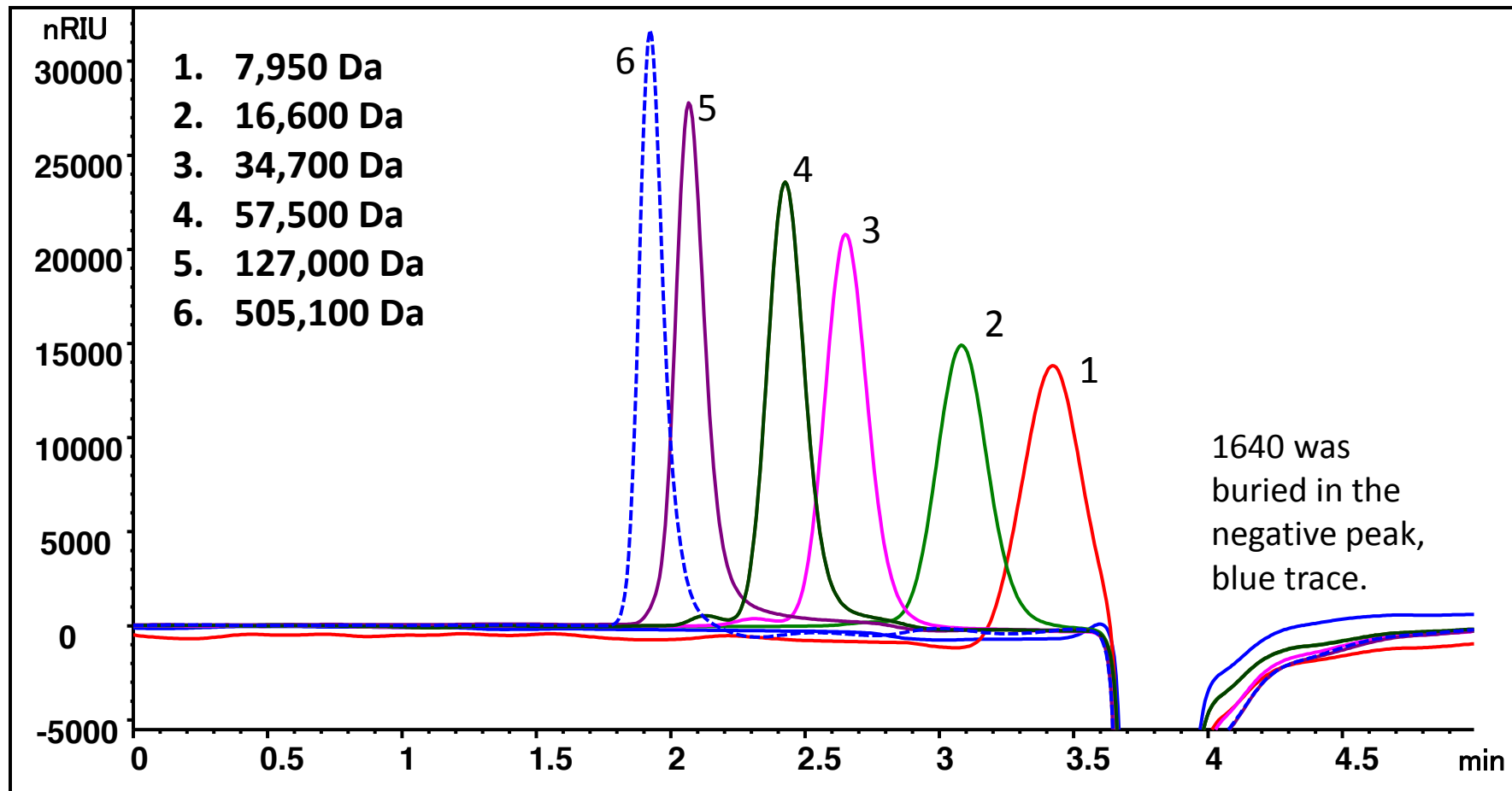
Sodium polystyrene sulfonate separation on Zenix® SEC-300, 7815, RI

Column: **Zenix® SEC-300** (3 μm , 300 \AA , 7.8 x 150 mm)

Mobile phase: 150mM Phosphate Buffer, pH 7

Flow rate: 1.5 mL/min; Detector: RI; Column temperature: RT

Injection volume: 50 μg , Sample: See chromatogram, total run time 5 min



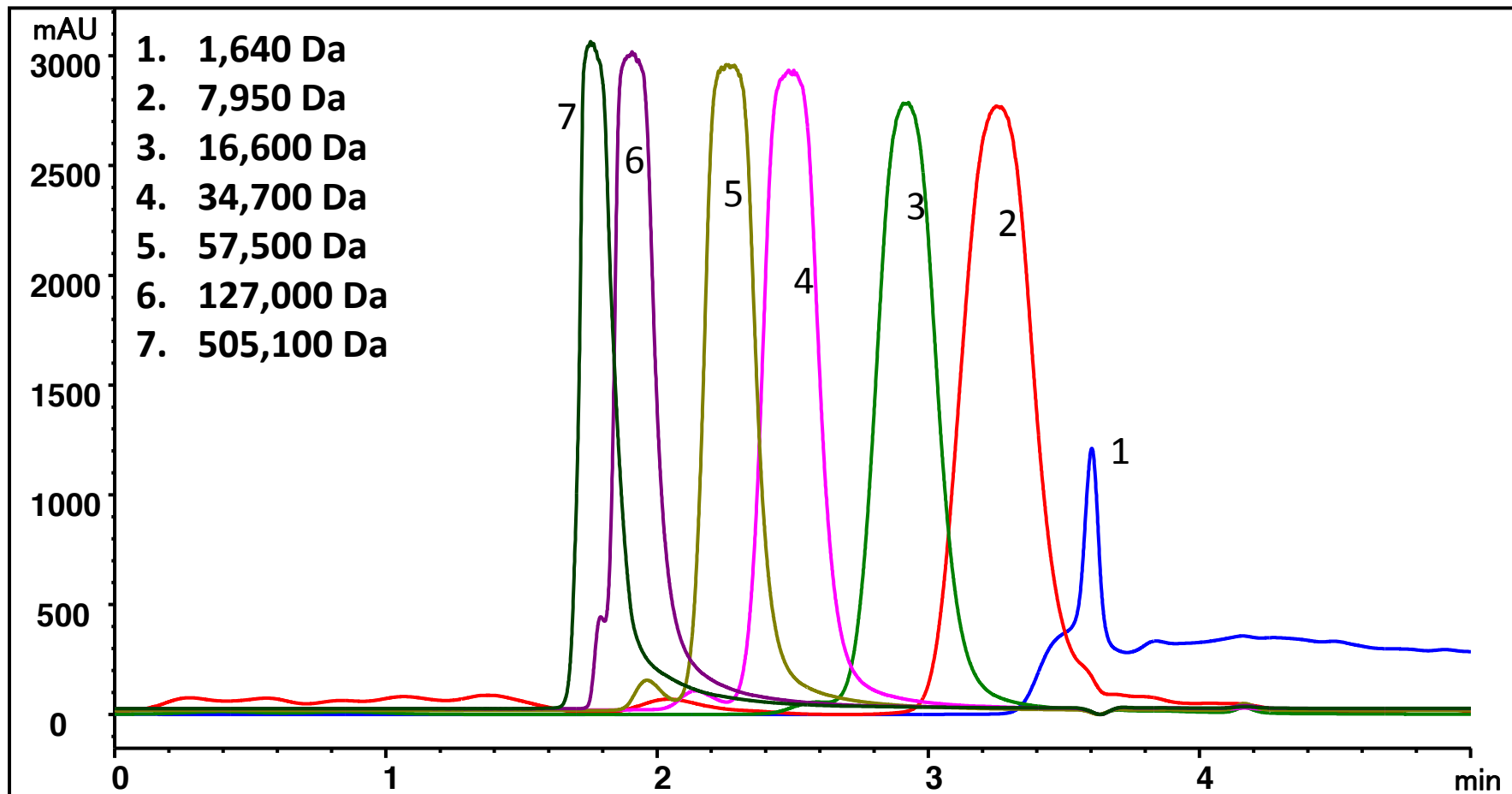
Sodium polystyrene sulfonate separation on Zenix® SEC-300, 7815

Column: **Zenix® SEC-300** (3 μm , 300 \AA , 7.8 x 150 mm)

Mobile phase: 150mM Phosphate Buffer, pH 7

Flow rate: 1.5 mL/min; Detector: UV 214 nm; Column temperature: RT

Injection volume: 50 μg , Sample: See chromatogram, total run time 5 min



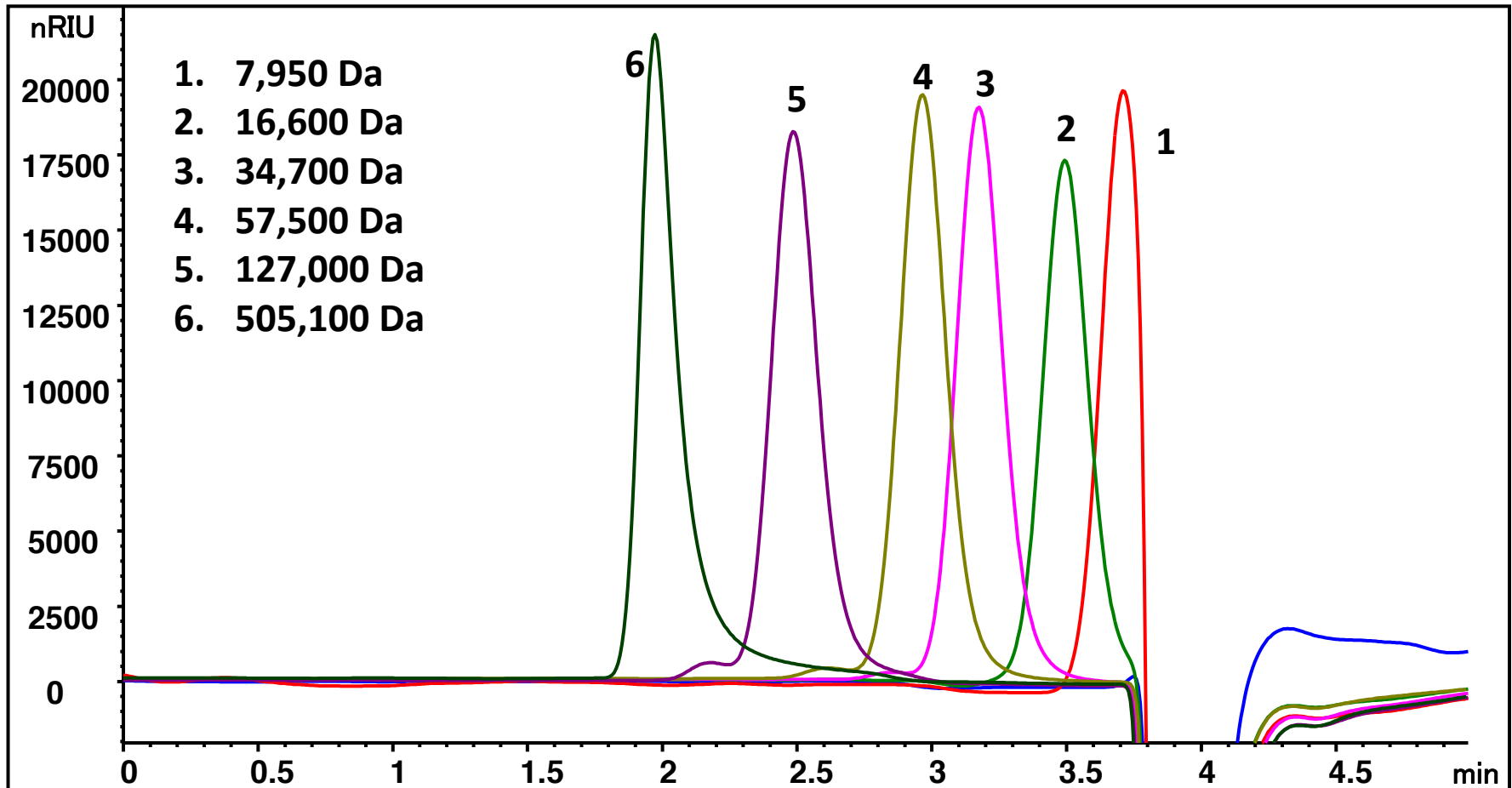
Sodium polystyrene sulfonate separation on SRT[®] SEC-500, 7815

Column: **SRT[®] SEC-500** (5 μm , 500 \AA , 7.8 x 150 mm)

Mobile phase: 150mM Phosphate Buffer, pH 7

Flow rate: 1.5 mL/min; Detector: RI; Column temperature: RT

Injection volume: 50 μg , Sample: See chromatogram, total run time 5 min



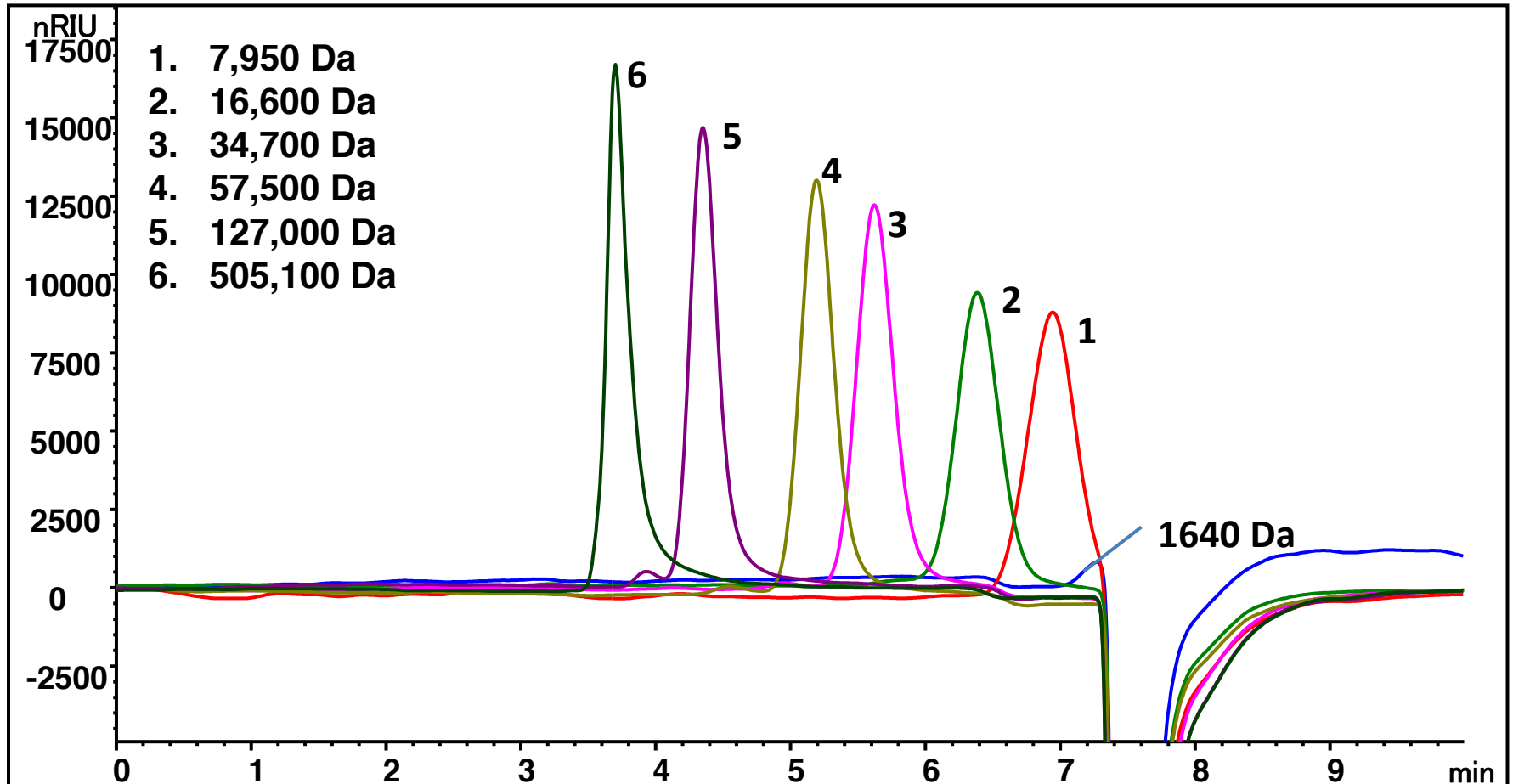
Zenix® SEC-300 and SRT® SEC-500 in tandem

Column: **Zenix® SEC-300** (3 μm , 300 \AA , 7.8 x 150 mm), **SRT® SEC-500** (5 μm , 500 \AA , 7.8 x 150 mm)

Mobile phase: 150mM Phosphate Buffer, pH 7

Flow rate: 1.5 mL/min; Detector: RI; Column temperature: RT

Injection volume: 50 μg , Sample: See chromatogram, total run time 10 min



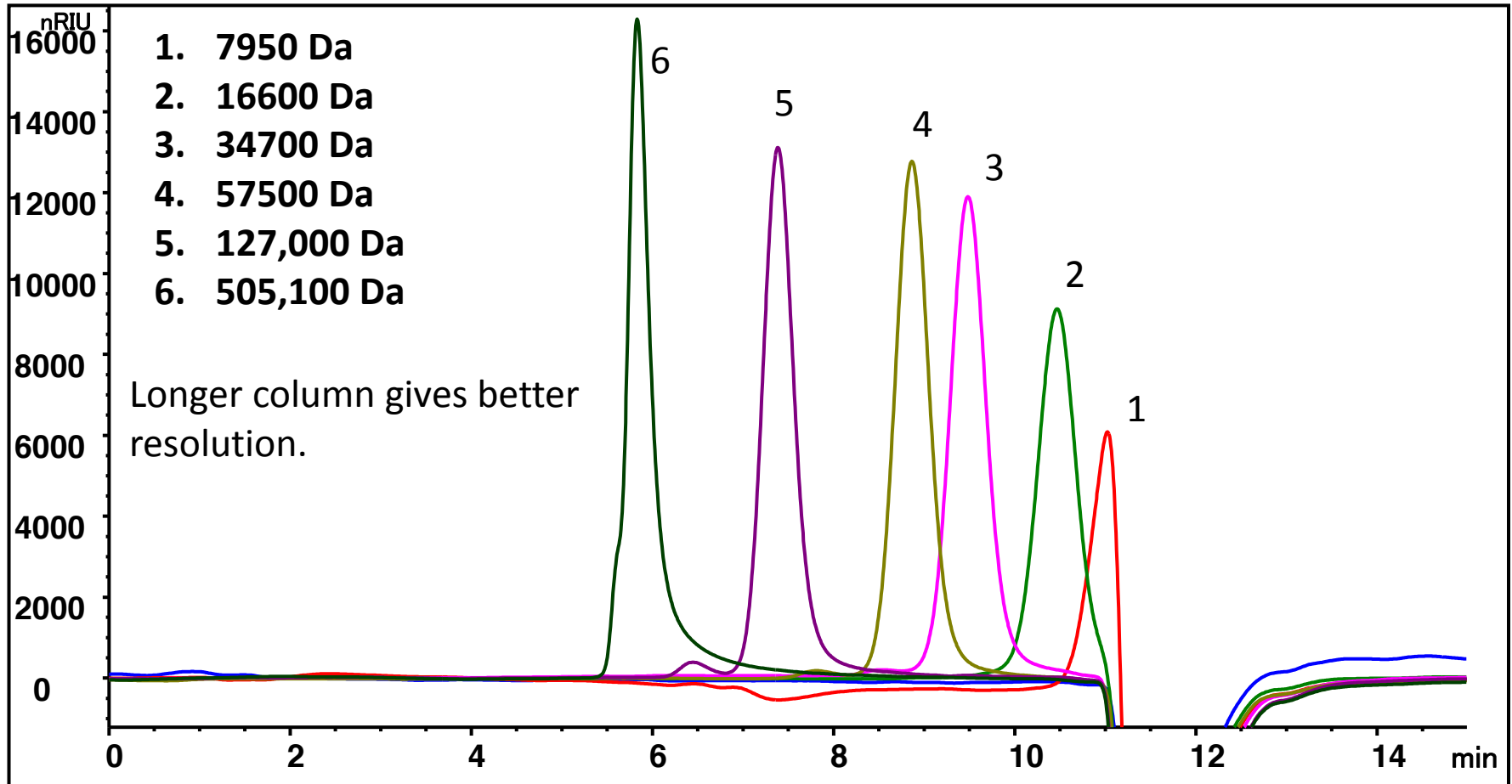
Sodium polystyrene sulfonate separation on SRT[®] SEC-500 7830

Column: **SRT[®] SEC-500** (5 μm , 500 \AA , 7.8 x 300 mm)

Mobile phase: 150mM Phosphate Buffer, pH 7

Flow rate: 1.0 mL/min; Detector: RI; Column temperature: RT

Injection volume: 50 μg , Sample: See chromatogram, total run time 15 min



Polystyrene sulfonate separation on SRT[®] SEC-1000

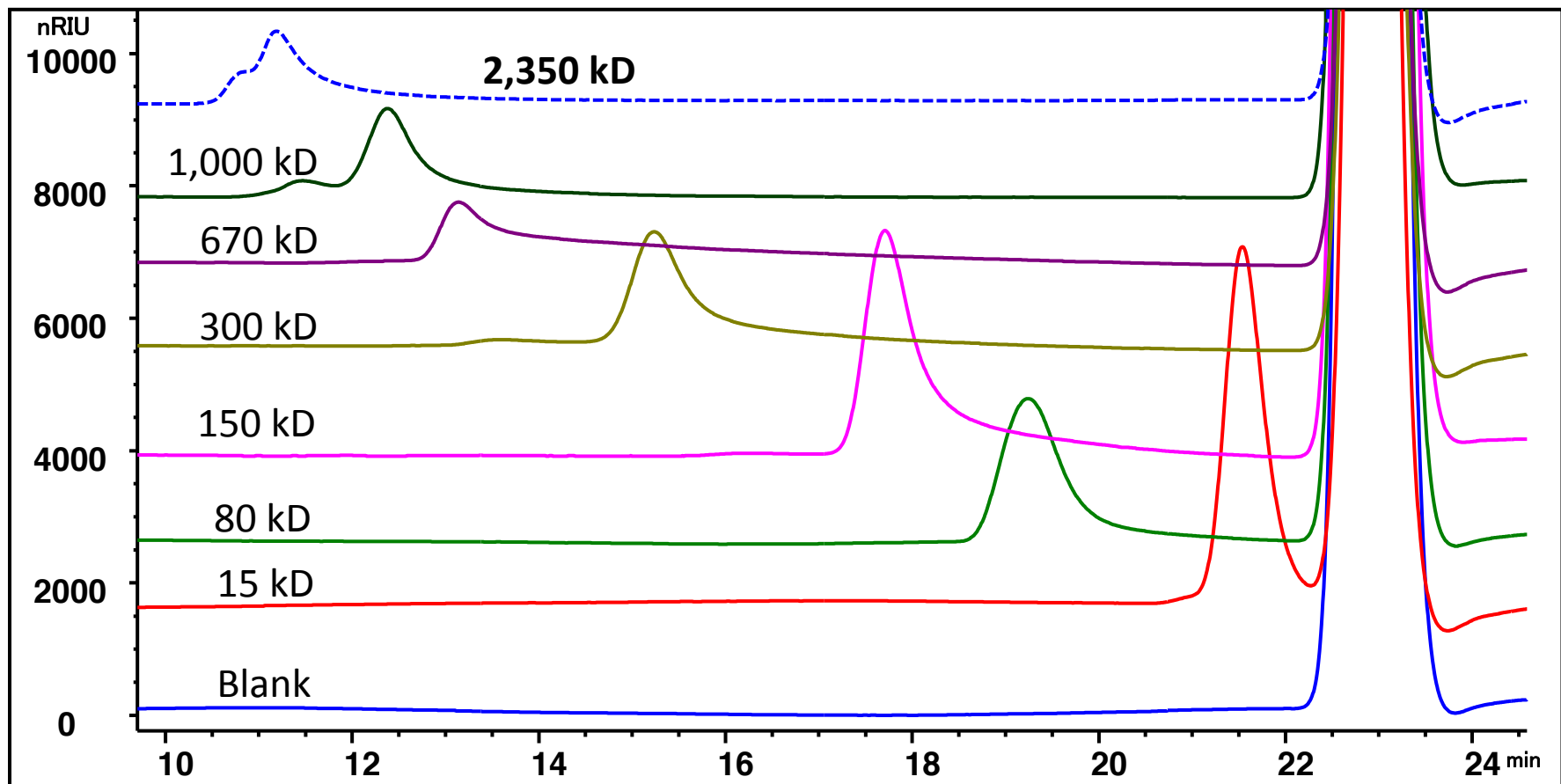
Column: SRT[®] SEC-1000 (5 μm , 1000 \AA , 7.8 x 300 mm)

Mobile phase: 0.2 M NaCl + 0.01% NaN₃

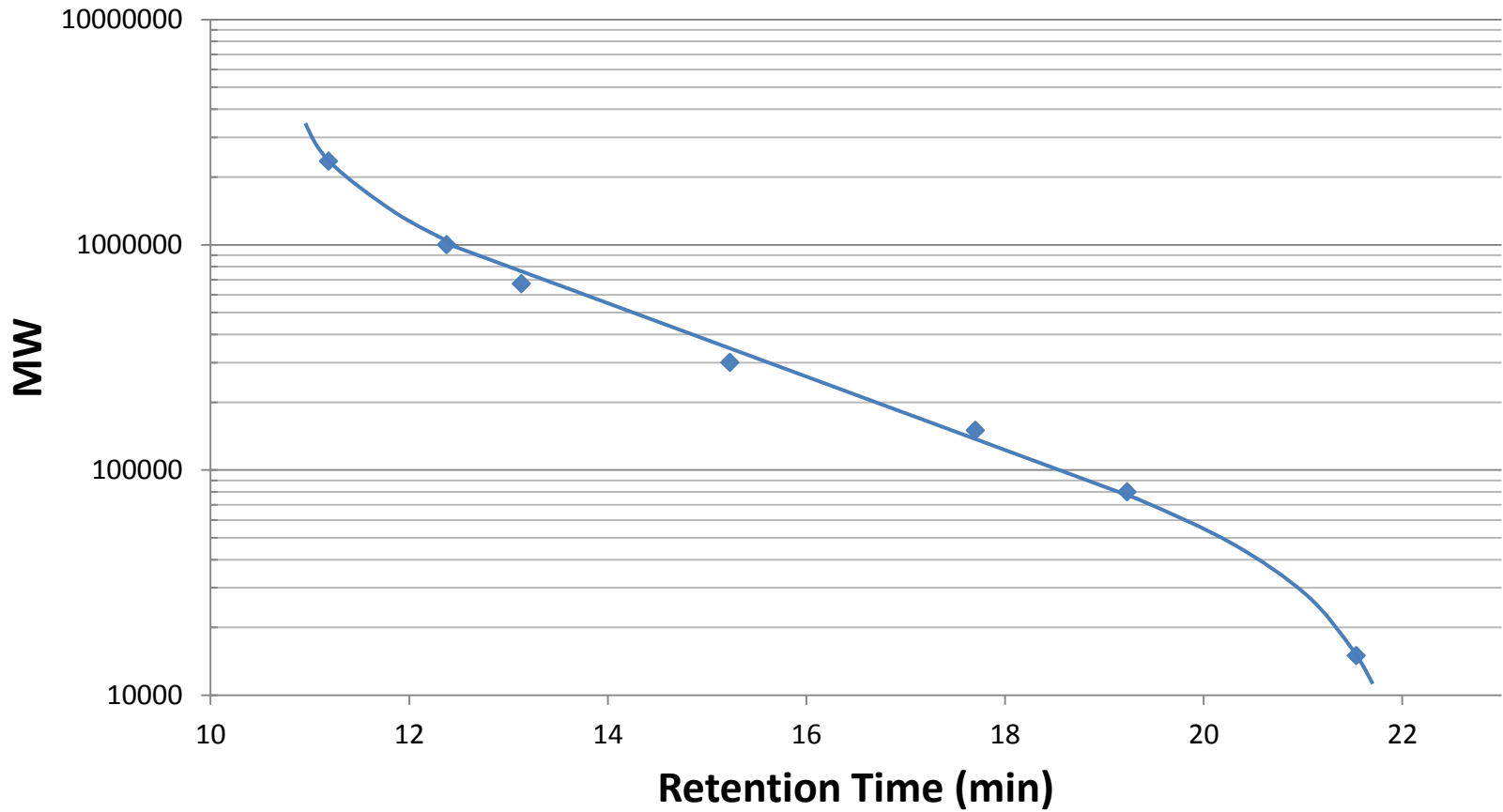
Flow rate: 0.5 mL/min, Detector: RI (35°C), Column temperature: 35°C

Injection volume: 100 μL 0.1 mg/mL, Pressure: 23 bar

Sample: Blank, 15, 80, 150, 300, 670, 1,000 and 2,350 kD Sodium polystyrene sulfonate

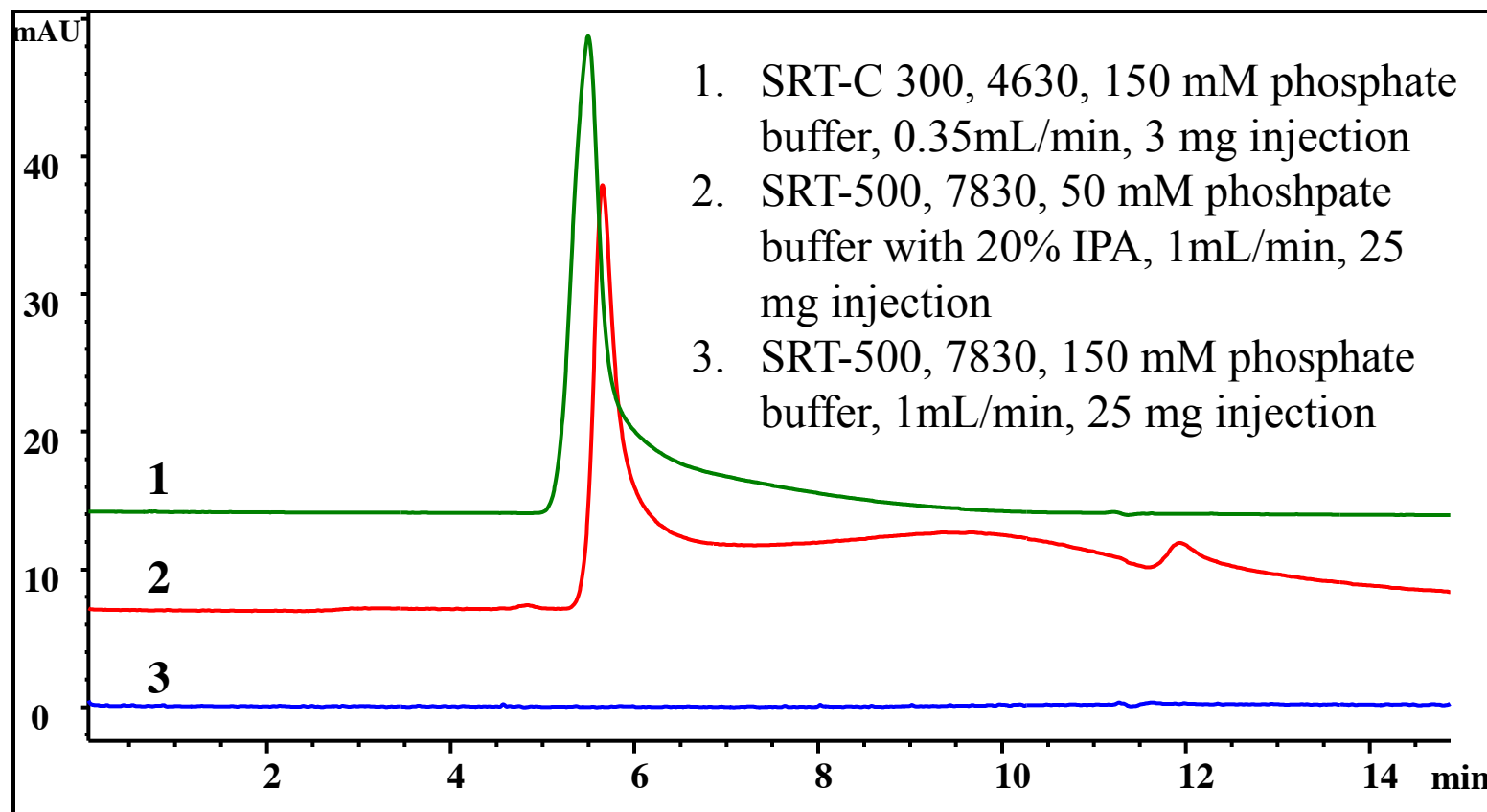


Polystyrene sulfonate MW Calibration Curve on SRT[®] SEC-1000

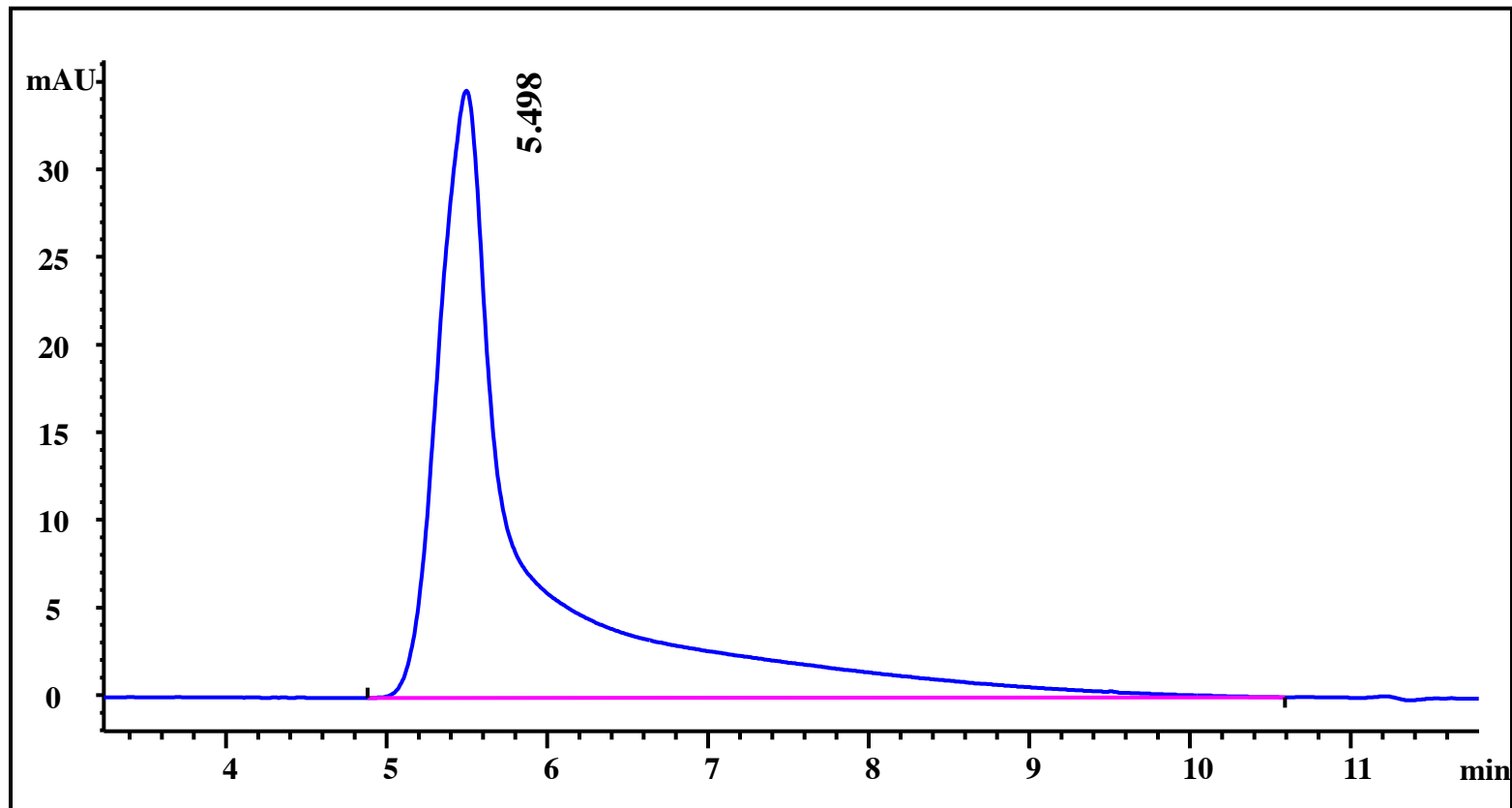


Blue Dextran on SEC

UV280nm



Blue dextran on SRT-C 300 4630



Blue Dextran on SRT SEC-1000

