TSKgel SP-STAT and TSKgel CM-STAT columns

Non-Porous Cation Exchange Columns for High Speed and High Resolution Analysis of Biomolecules

TSKgel
PRODUCT OVERVIEW

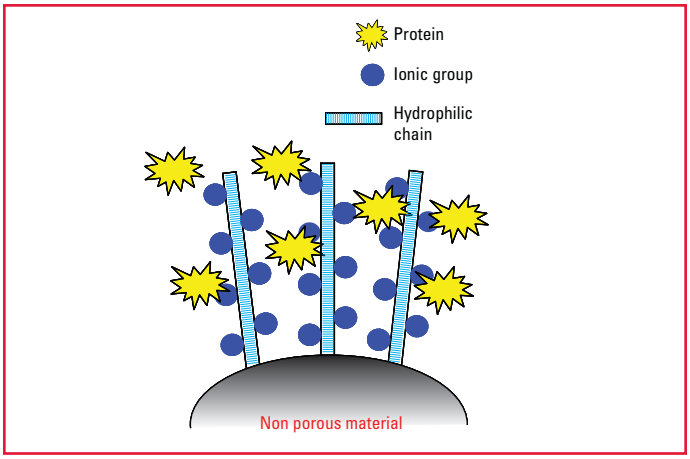
Introduction

TSKgel SP-STAT and TSKgel CM-STAT cation exchange columns allow fast equilibration and analysis, as well as isolation, of complex biomolecules. Both TSKgel columns are packed with 7 or 10µm mono-disperse, non-porous resin particles of which the surface consists of an open access network of multi-layered cation exchange groups *(see Figure 1)*. The innovative bonding chemistry, combined with a relatively large particle size, result in a respectable loading capacity and a low operating pressure, attributes not found in traditional mono-disperse, non-porous resins.

Product Highlights

- **Very efficient chromatography for high as well as low MW solutes made possible by novel bonding chemistry and the absence of micro-pores**
- **High speed and high resolution analysis of biomolecules**
- **Higher adsorption capacities and lower pressures compared with competitive non-porous columns**
- **7 or 10µm particles for SP and CM chemistries**

Figure 1.

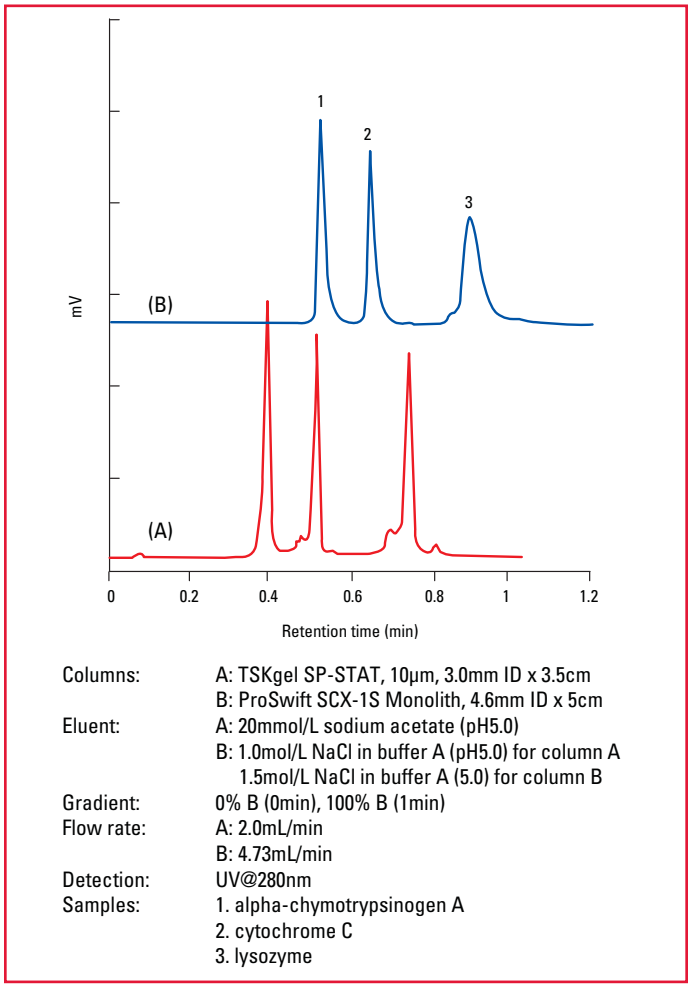


Applications

Fast Separations

The fast separation of protein standards was investigated using short cation exchange columns *(see Figure 2)*. A TSKgel SP-STAT column shows superior resolution, better peak shape, and a shorter analysis time (< 60 seconds) compared to a competitive monolithic SP-type column.

Figure 2.

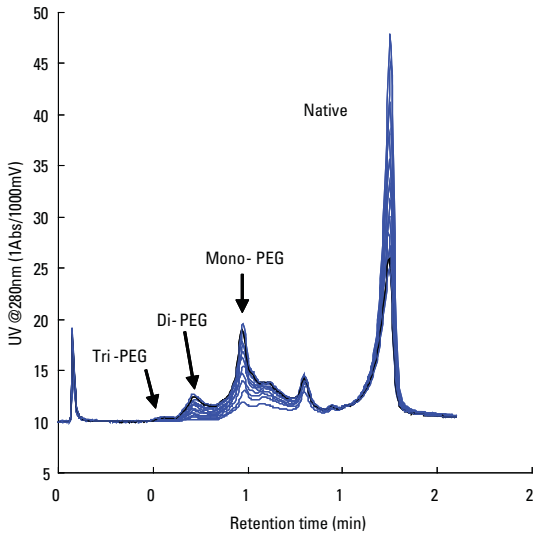


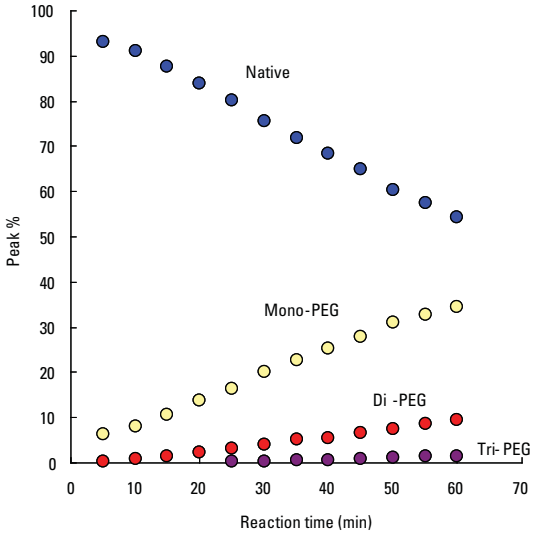
Columns:	A: TSKgel SP-STAT, 10µm, 3.0mm ID x 3.5cm B: ProSwift SCX-1S Monolith, 4.6mm ID x 5cm
Eluent:	A: 20mmol/L sodium acetate (pH5.0) B: 1.0mol/L NaCl in buffer A (pH5.0) for column A 1.5mol/L NaCl in buffer A (5.0) for column B
Gradient:	0% B (0min), 100% B (1min)
Flow rate:	A: 2.0mL/min B: 4.73mL/min
Detection:	UV@280nm
Samples:	1. alpha-chymotrypsinogen A 2. cytochrome C 3. lysozyme

Reaction Monitoring

A sample of β-lactoglobulin (5mg/mL) was reacted with polyethylene glycol (5kDa) in a pH 6.5 phosphate buffer. The formation of pegylated protein reaction products was monitored in 5 minute intervals on a 3.5cm TSKgel SP-STAT column. As demonstrated in *Figure 3*, peak areas of mono-, di-, and tri-pegylated β-lactoglobulin increased with reaction time, while the area of unreacted β-lactoglobulin declined.

Figure 3.



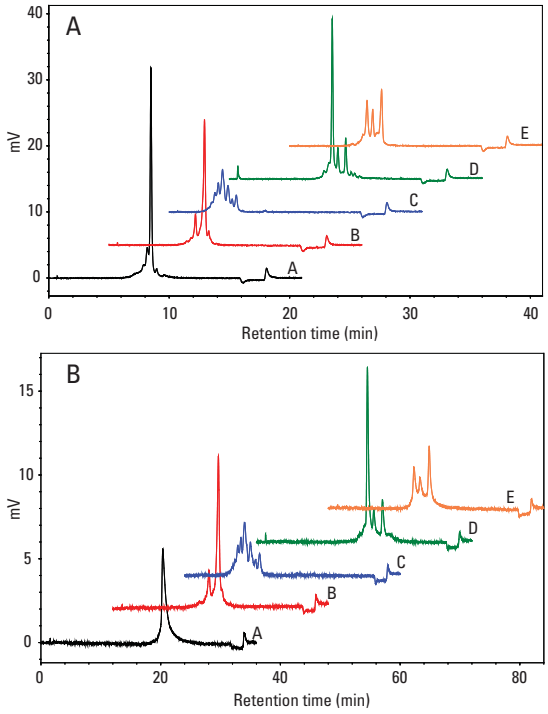


Column:	A: TSKgel SP-STAT, 10µm, 3mm ID x 3.5cm
Eluent:	A: 20mmol/L sodium acetate buffer (pH5.0) B: 1.0mol/L NaCl in buffer A (pH5.0)
Gradient:	0% B (0min), 100% B (2min)
Flow rate:	2.0mL/min
Detection:	UV@280nm
Sample:	pegylated β-lactoglobulin

Antibody Analysis

The analysis profiles for five antibodies separated on a TSKgel CM-STAT column were compared with the profiles obtained on a competitive WCX-10 column *(Figure 4)*. Similar or higher resolution profiles were obtained on TSKgel CM-STAT in approximately half the time.

Figure 4.



Columns:	A: TSKgel CM-STAT, 7µm, 4.6mm ID x 10cm B: ProPac WCX-10, 10µm, 4mm ID x 25cm
Eluent:	A: 20mmol/L MES (pH6.0) B: 20mmol/L MES + 0.5mol/L NaCl (pH6.0)
Gradient:	A: 10% B (0min), 30% B (15min), 100% B (15min), 100% B (17min), 10% B (17min), 10% B (21min) B: 10% B (0min), 30% B (30min), 100% B (30min), 100% B (32min), 10% B (32min), 10% B (36min)
Flow rate:	1.0mL/min
Temp.:	Ambient
Detection:	UV@280nm
Inj. Vol.:	20µL
Sample:	monoclonal antibodies (mAb A through E)

Ordering Information

Part #	Description	Matrix	Housing	ID (mm)	Length (cm)
21963	TSKgel SP-STAT, 10µm	Polymer	Stainless Steel	3	3.5
21964	TSKgel SP-STAT, 7µm	Polymer	Stainless Steel	4.6	10
21965	TSKgel CM-STAT, 10µm	Polymer	Stainless Steel	3	3.5
21966	TSKgel CM-STAT, 7µm	Polymer	Stainless Steel	4.6	10

TOSOH

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