

Anion Exchange Chromatography Columns

Features

QA-825

DEAE-825

- Suitable for analyzing relatively high molecular weight compounds: proteins, peptides, DNA, and RNA
- Usable in a wide pH range from pH 2 to 12
- QA-825 fulfills USP-NF L23 requirements

ES-502N 7C

- Compared to IEC series columns, polyvinyl alcohol is used as base material and this offers different separation pattern
- Low hydrophobic interaction of proteins allows analysis under mild conditions

Strong anion exchange resin [Functional Group: Quaternary ammonium]

• Standard column

Product Code	Product Name	Ion Exchange Capacity (meq/g)	Base Material	Particle Size (μm)	Pore Size (Å)	Column Size (mm) I.D. x Length	Shipping Solvent
F6110011	IEC QA-825	0.45	Polyhydroxymethacrylate	12	5,000	8.0 x 75	50 mM Na ₂ SO ₄ aq.

Weak anion exchange resin [Functional Group: Diethylaminoethyl]

• Standard columns

Product Code	Product Name	Ion Exchange Capacity (meq/g)	Base Material	Particle Size (μm)	Pore Size (Å)	Column Size (mm) I.D. x Length	Shipping Solvent
F6118255	IEC DEAE-825	0.6	Polyhydroxymethacrylate	8	5,000	8.0 x 75	50 mM Na ₂ SO ₄ aq.
F7640002	Asahipak ES-502N 7C	0.55	Polyvinyl alcohol	9	2,000	7.5 x 100	50 mM 1,3-Diaminopropane + 50 mM NaCl (pH10.0)

Cation Exchange Chromatography Columns

Features

SP-825

CM-825

- Suitable for analyzing relatively high molecular weight compounds: proteins, peptides, DNA, and RNA
- Usable in a wide pH range from pH 2 to 12

SP-FT 4A

- Non-porous base material
- Provides ultra-rapid analysis using conventional devices

ES-502C 7C

- Compared to IEC series columns, polyvinyl alcohol is used as base material offering different separation pattern
- Low hydrophobic interaction with proteins allows analysis under mild conditions

P-421S

- Column for amino acids analysis by cation exchange mode
- Provides simultaneous analysis of different amino acids
- Fulfills USP-NF L22 and L58 requirements

Strong cation exchange resin [Functional Group: Sulfopropyl]

• Standard columns

Product Code	Product Name	Ion Exchange Capacity (meq/g)	Base Material	Particle Size (μm)	Pore Size (Å)	Column Size (mm) I.D. x Length	Shipping Solvent
F6118250	IEC SP-825	0.4	Polyhydroxymethacrylate	8	5,000	8.0 x 75	50 mM Na ₂ SO ₄ aq.
F6113100	IEC SP-FT 4A	0.2	Polyhydroxymethacrylate	2.7	—	4.6 x 10	20 mM MES buffer (pH5.6)

Housing Material of SP-FT 4A: PEEK
 *MES: 2-(N-Morpholino)ethanesulfonic acid

Weak cation exchange resin [Functional Group: Carboxymethyl]

• Standard columns

Product Code	Product Name	Ion Exchange Capacity (meq/g)	Base Material	Particle Size (μm)	Pore Size (Å)	Column Size (mm) I.D. x Length	Shipping Solvent
F6110002	IEC CM-825	0.4	Polyhydroxymethacrylate	8	5,000	8.0 x 75	50 mM Na ₂ SO ₄ aq.
F7640001	Asahipak ES-502C 7C	0.55	Polyvinyl alcohol	9	2,000	7.5 x 100	0.1 M Sodium phosphate buffer (pH4.4)

Amino acid analysis column [Functional Group: Sulfo (Na⁺)]

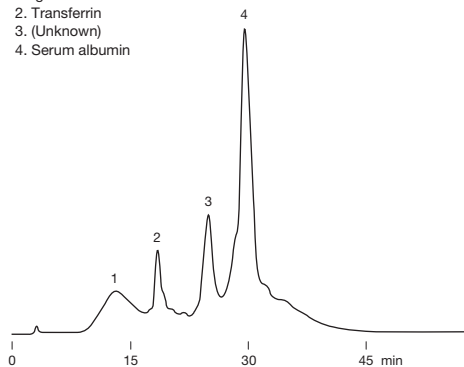
• Standard columns

Product Code	Product Name	Plate Number (TP/column)	Base Material	Particle Size (μm)	Column Size (mm) I.D. x Length	Shipping Solvent
F6354211	CXpak P-421S	≥ 3,500	Styrene divinylbenzene copolymer	6	4.6 x 150	H ₂ O
F6700210	CXpak P-G	(guard column)	Styrene divinylbenzene copolymer	6	4.6 x 10	H ₂ O

Proteins in human serum

Sample : Human serum 0.5 %, 200 μ L

1. IgG
2. Transferrin
3. (Unknown)
4. Serum albumin

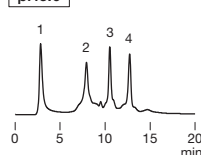


Column : Shodex IEC QA-825

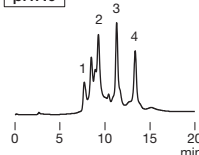
Eluent : (A); 20 mM Tris-HCl buffer (pH8.6)
(B); (A) + 0.5 M NaCl
Linear gradient; 100 % (A) to 50 % (B), 60 min
Flow rate : 1.0 mL/min
Detector : UV (280 nm)
Column temp. : Room temp.

Effects of eluent pH on DEAE-825 analysis

pH6.0

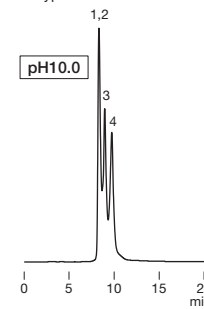


pH7.0

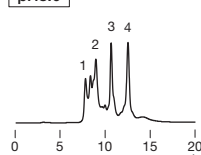


Sample : 100 μ L

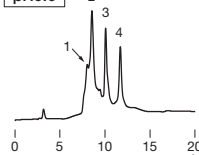
1. Conalbumin 0.1 %
2. Transferrin 0.2 %
3. Ovalbumin 0.2 %
4. Trypsin inhibitor 0.2 %



pH8.0



pH9.0

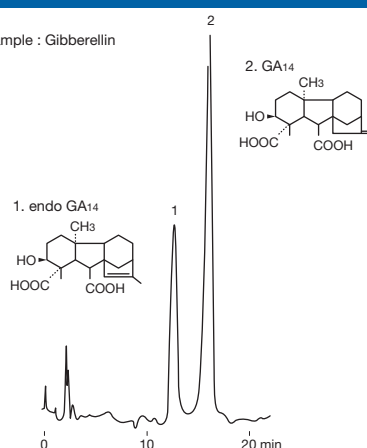


Column : Shodex IEC DEAE-825

Eluent : (A); 20 mM Piperazine-HCl buffer (pH6.0), 20 mM Bis-Tris-HCl buffer (pH7.0)
20 mM Tris-HCl buffer (pH8.0), 20 mM Ethanolamine-HCl buffer (pH9.0)
20 mM 1,3-Diaminopropane-HCl buffer (pH10.0)
(B); (A) + 0.5 M NaCl
Linear gradient; (A) to (B), 20 min
Flow rate : 1.0 mL/min
Detector : UV (280 nm)
Column temp. : 25 $^{\circ}$ C

Gibberellin isomers

Sample : Gibberellin



Column : Shodex Asahipak ES-502N 7C

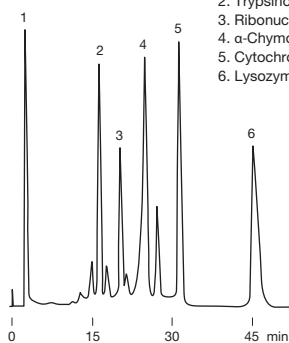
Eluent : CH₃COOH/H₂O/CH₃OH = 0.1/0.4/99.5
Flow rate : 1.5 mL/min
Detector : UV (210 nm)
Column temp. : 50 $^{\circ}$ C

Data provided by Prof. Yamaguchi,
Faculty of Agriculture, University of Tokyo.

Protein separation using cation exchange columns

Sample : 90 μ L

1. Myoglobin
2. Trypsinogen
3. Ribonuclease A
4. α -Chymotrypsinogen A
5. Cytochrome c
6. Lysozyme



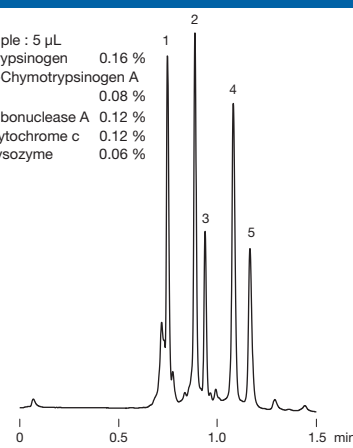
Column : Shodex IEC CM-825

Eluent : (A); 20 mM Sodium phosphate buffer (pH7.0)
(B); (A) + 0.5 M NaCl
Linear gradient; (A) to (B), 60 min
Flow rate : 1.0 mL/min
Detector : UV (280 nm)
Column temp. : Room temp.

Ultra-rapid analysis of hemoglobins

Sample : 5 μ L

1. Trypsinogen 0.16 %
2. α -Chymotrypsinogen A 0.08 %
3. Ribonuclease A 0.12 %
4. Cytochrome c 0.12 %
5. Lysozyme 0.06 %

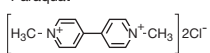


Column : Shodex IEC SP-FT 4A

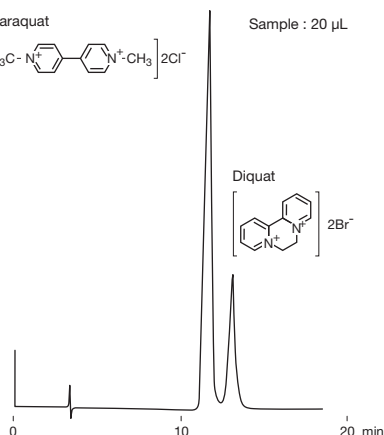
Eluent : (A); 20 mM MES buffer (pH5.6)
(B); (A) + 0.5 M Na₂SO₄
Linear gradient; (A) to (B), 2 min
Flow rate : 1.7 mL/min
Detector : UV (280 nm)
Column temp. : 30 $^{\circ}$ C

Paraquat and diquat

Paraquat



Sample : 20 μ L



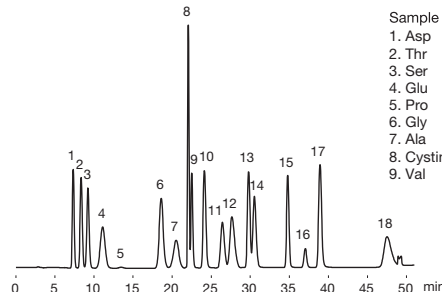
Column : Shodex Asahipak ES-502C 7C

Eluent : 50 mM Sodium phosphate buffer (pH7.0) + 150 mM NaCl
Flow rate : 1.0 mL/min
Detector : UV (288 nm)
Column temp. : 30 $^{\circ}$ C

Standard amino acids

Sample : 0.1 μ M each, 100 μ L

1. Asp
2. Thr
3. Ser
4. Glu
5. Pro
6. Gly
7. Ala
8. Cystine
9. Val
10. Met
11. Ile
12. Leu
13. Tyr
14. Phe
15. Lys
16. NH₃
17. His
18. Arg



Column : Shodex CXpak P-421S

Eluent : MCI BUFFER™ PH Kit (Mitsubishi Chemical Corporation)
Low pressure step gradient;
PH-1 (0 min), PH-2 (0.2 min), PH-3 (13.5 min), PH-4 (23.2 min), PH-RG (47.0 min)
Reagent : Ninhydrin Coloring Solution Kit for HITACHI
(FUJIFILM Wako Pure Chemical Corporation)
R1:R2 = 50:50
Flow rate : (Eluent) 0.5 mL/min
(Reagent) 0.35 mL/min
Detector : VIS (570 nm)
Column Temp. : 63 $^{\circ}$ C
Reaction Temp. : 120 $^{\circ}$ C