

Polymer-based Reversed Phase Chromatography Columns (RSpak)

Features

- DS-613**
 - Suitable for reversed phase analysis of highly hydrophilic substances that are not well retained by ODS columns
- DS-413**
 - Fulfill USP-NF L21 requirements

- DE-613**
 - General purpose polymer-based column having similar polarity as ODS columns
- DE-413**
 - Wide working pH range (from pH 2 to 12), usable in 100 % water and buffer solutions
- DE-213**
 - Fulfill USP-NF L71 requirements

- DM-614**
 - Suitable for the analysis of amino acids and water-soluble vitamins
 - Fulfills USP-NF L39 requirements

- NN-814**
 - The packing material modified with sulfo groups supports multimode (reversed phase and cation exchange) analysis
 - Ideal for the analysis of complex samples containing neutral and ionic substances

- JJ-50 2D**
 - The packing material is modified with trace amounts of quaternary ammonium groups, and supports multimode (reversed phase and anion exchange) analysis
 - Ideal for analysis of complex samples containing neutral and ionic substances

DS

• Standard columns

Product Code	Product Name	Plate Number (TP/column)	Functional Group	Particle Size (µm)	Pore Size (Å)	Column Size (mm) I.D. x Length	Shipping Solvent
F7001001	RSpak DS-613	≥ 6,500	—	6	200	6.0 x 150	H ₂ O/CH ₃ CN/THF = 30/40/30
F6700140	RSpak DS-G	(guard column)	—	10	—	4.6 x 10	H ₂ O/CH ₃ CN/THF = 30/40/30
F7001012	RSpak DS-413	≥ 11,000	—	3.5	200	4.6 x 150	H ₂ O/CH ₃ CN/THF = 40/30/30

Base Material: Styrene divinylbenzene copolymer

DE

• Standard columns

Product Code	Product Name	Plate Number (TP/column)	Functional Group	Particle Size (µm)	Pore Size (Å)	Column Size (mm) I.D. x Length	Shipping Solvent
F7001004	RSpak DE-613	≥ 7,000	—	6	25	6.0 x 150	H ₂ O
F7001005	RSpak DE-413	≥ 11,000	—	4	25	4.6 x 150	H ₂ O/CH ₃ CN = 50/50
F6700150	RSpak DE-G 4A	(guard column)	—	10	—	4.6 x 10	H ₂ O

Base Material: Polymethacrylate

• Semi-micro columns

Product Code	Product Name	Plate Number (TP/column)	Functional Group	Particle Size (µm)	Pore Size (Å)	Column Size (mm) I.D. x Length	Shipping Solvent
F7001007	RSpak DE-213	≥ 8,000	—	4	25	2.0 x 150	H ₂ O/CH ₃ CN = 50/50
F6700151	RSpak DE-G 2A	(guard column)	—	6	—	2.0 x 10	H ₂ O/CH ₃ CN = 50/50

Base Material: Polymethacrylate

DM

• Standard columns

Product Code	Product Name	Plate Number (TP/column)	Functional Group	Particle Size (µm)	Pore Size (Å)	Column Size (mm) I.D. x Length	Shipping Solvent
F7001002	RSpak DM-614	≥ 4,500	—	10	200	6.0 x 150	5 mM H ₃ PO ₄ aq.
F6700160	RSpak DM-G 4A	(guard column)	—	12	—	4.6 x 10	5 mM H ₃ PO ₄ aq.

Base Material: Polyhydroxymethacrylate

NN

• Standard columns

Product Code	Product Name	Plate Number (TP/column)	Functional Group	Particle Size (µm)	Pore Size (Å)	Column Size (mm) I.D. x Length	Shipping Solvent
F7008140	RSpak NN-814	≥ 9,000	Sulfo	10	200	8.0 x 250	0.1 M Sodium phosphate buffer (pH3.0)
F6700510	RSpak NN-G	(guard column)	Sulfo	10	—	6.0 x 50	0.1 M Sodium phosphate buffer (pH3.0)

Base Material: Polyhydroxymethacrylate

JJ

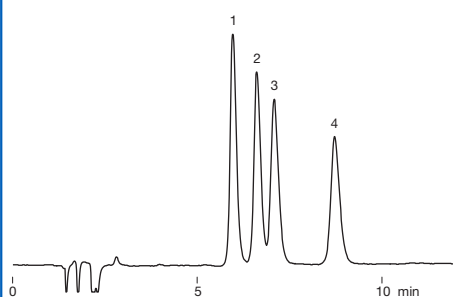
• Semi-micro columns

Product Code	Product Name	Plate Number (TP/column)	Functional Group	Particle Size (µm)	Pore Size (Å)	Column Size (mm) I.D. x Length	Shipping Solvent
F7008220	RSpak JJ-50 2D	≥ 3,500	Quaternary ammonium	5	100	2.0 x 150	H ₂ O/CH ₃ CN = 40/60

Base Material: Polyvinyl alcohol

Fatty acid methyl esters

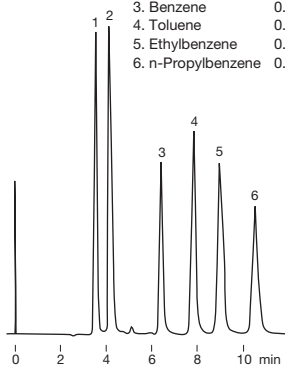
Sample : 0.2 % each, 20 μ L
 1. Methyl linoleate
 2. Methyl palmitate
 3. Methyl oleate
 4. Methyl stearate



Column : Shodex RSpak DS-413
 Eluent : H₂O/CH₃CN/THF = 25/45/30
 Flow rate : 1.0 mL/min
 Detector : RI
 Column temp. : 40 °C

Alkylbenzenes

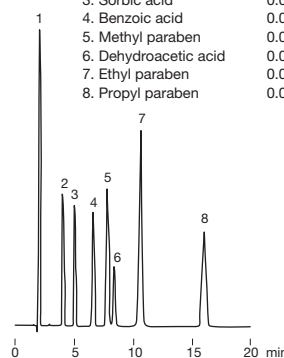
Sample : 5 μ L
 1. m-Cresol 0.1 %
 2. 2,4-Xylenol 0.1 %
 3. Benzene 0.5 %
 4. Toluene 0.5 %
 5. Ethylbenzene 0.5 %
 6. n-Propylbenzene 0.5 %



Column : Shodex RSpak DS-613
 Eluent : H₂O/CH₃CN/THF = 30/40/30
 Flow rate : 1.0 mL/min
 Detector : UV (254 nm)
 Column temp. : 40 °C

Food additives (Preservatives)

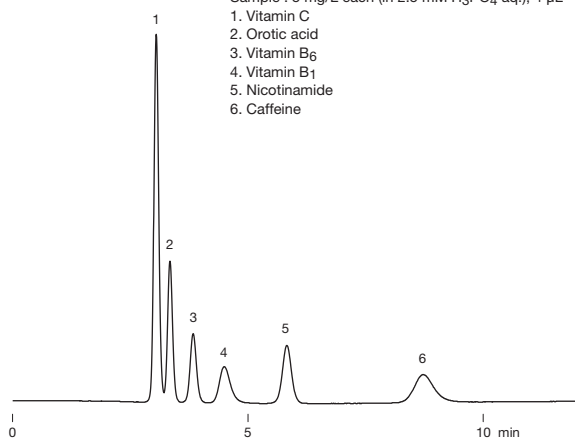
Sample : 10 μ L
 1. Saccharin sodium 0.005 %
 2. p-Hydroxybenzoic acid 0.005 %
 3. Sorbic acid 0.02 %
 4. Benzoic acid 0.02 %
 5. Methyl paraben 0.01 %
 6. Dehydroacetic acid 0.01 %
 7. Ethyl paraben 0.02 %
 8. Propyl paraben 0.02 %



Column : Shodex RSpak DE-413
 Eluent : 50 mM KH₂PO₄ + 0.1 % H₃PO₄ aq./CH₃CN = 65/35
 Flow rate : 1.0 mL/min
 Detector : UV (210 nm)
 Column temp. : 40 °C

Vitamins

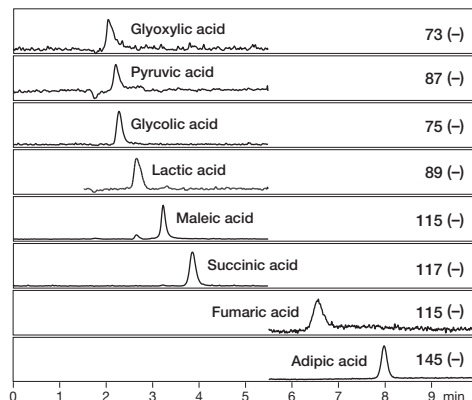
Sample : 5 mg/L each (in 2.5 mM H₃PO₄ aq.), 4 μ L
 1. Vitamin C
 2. Orotic acid
 3. Vitamin B₆
 4. Vitamin B₁
 5. Nicotinamide
 6. Caffeine



Column : Shodex RSpak DM-614
 Eluent : 0.055 M Na₂HPO₄ + 0.045 M KH₂PO₄ aq.
 Flow rate : 1.0 mL/min
 Detector : UV (254 nm)
 Column temp. : 30 °C

LC/MS analysis of organic acids

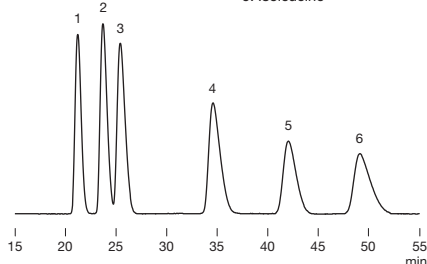
Sample : 50 ng/mL each, 10 μ L



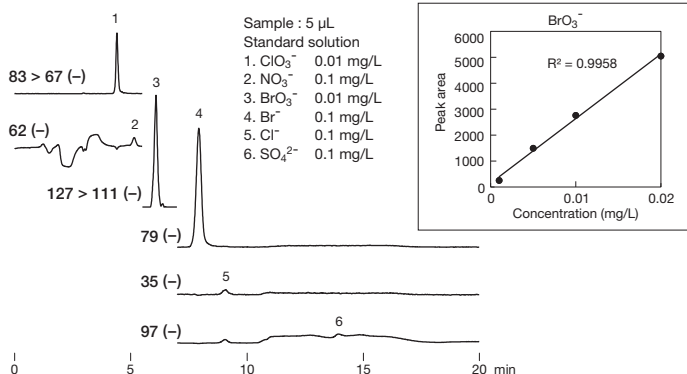
Column : Shodex RSpak DE-213
 Eluent : (A); 0.1 % (v/v) Formic acid aq./ (B); CH₃CN
 Linear gradient; 5 B % (0 to 2 min),
 5 B % to 15 B % (2 to 2.5 min), 15 B % (2.5 to 10 min)
 Flow rate : 0.2 mL/min
 Detector : ESI-MS (SIM)
 Column temp. : 30 °C

Amino acids

Sample : 0.1 % each, 20 μ L
 1. Aspartic acid
 2. Glycine
 3. Alanine
 4. Valine
 5. Methionine
 6. Isoleucine



Column : Shodex RSpak NN-814
 Eluent : 40 mM H₃PO₄ aq.
 Flow rate : 1.0 mL/min
 Detector : RI
 Column temp. : 40 °C

High sensitive analysis of bromate by LC/MS/MS


Sample : 5 μ L
 Standard solution
 1. ClO₃⁻ 0.01 mg/L
 2. NO₃⁻ 0.1 mg/L
 3. BrO₃⁻ 0.01 mg/L
 4. Br⁻ 0.1 mg/L
 5. Cl⁻ 0.1 mg/L
 6. SO₄²⁻ 0.1 mg/L

Column : Shodex RSpak JJ-50 2D
 Eluent : (A); 200 mM HCOONH₄ aq./ (B); CH₃CN
 Linear gradient (High pressure);
 85 B % (0 to 8 min), 85 B % to 50 B % (8 to 9 min), 50 B % (9 to 14 min),
 50 B % to 85 B % (14 to 15 min), 85 B % (15 to 20 min)
 Flow rate : 0.3 mL/min
 Detector : ESI-MS/MS (MRM) for ClO₃⁻, BrO₃⁻
 ESI-MS (SIM) for NO₃⁻, Br⁻, Cl⁻, SO₄²⁻
 Column temp. : 50 °C