

Ion Exclusion Chromatography Columns

Features

SH1011 SH1821

- Columns for simultaneous analysis of saccharides and organic acids
- Separates neutral sugars by size exclusion mode and organic acids by ion exclusion mode
- Suitable for the analysis of uronic and aldonic acids
- Fulfill USP-NF L17 and L22 requirements

KC-811

- Columns suitable for the analysis of organic acids
- Separates compounds by ion exclusion mode and reversed phase mode
- Highly selective when used with post column method
- KC-811 6E is suitable for the analysis of cyanide ions and cyanogen chloride in accordance with the Japanese Water Supply Act
- Fulfills USP-NF L17 and L22 requirements

For simultaneous analysis of saccharides and organic acids

• Standard columns

Product Code	Product Name	Plate Number (TP/column)	Functional Group	Exclusion Limit (Pullulan)	Particle Size (µm)	Column Size (mm) I.D. x Length	Shipping Solvent
F6378100	SUGAR SH1011	≥ 17,000	Sulfo	1,000	6	8.0 x 300	H ₂ O
F6378101	SUGAR SH1821	≥ 17,000	Sulfo	10,000	6	8.0 x 300	H ₂ O
F6700080	SUGAR SH-G	(guard column)	Sulfo	—	10	6.0 x 50	H ₂ O
F6378104	SUGAR SH1011 8C	≥ 5,000	Sulfo	1,000	6	8.0 x 100	H ₂ O

Base Material: Styrene divinylbenzene copolymer

For organic acids, cyanide ions and cyanogen chloride

• Standard columns

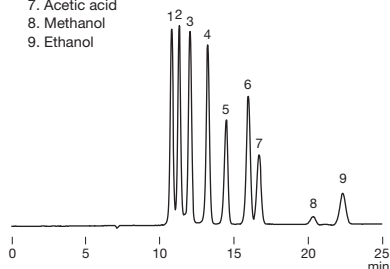
Product Code	Product Name	Plate Number (TP/column)	Functional Group	Particle Size (µm)	Column Size (mm) I.D. x Length	Shipping Solvent
F6378030	RSpak KC-811	≥ 17,000	Sulfo	6	8.0 x 300	0.1 % H ₃ PO ₄ aq.
F6378033	RSpak KC-811 6E	≥ 13,000	Sulfo	6	6.0 x 250	0.1 % H ₃ PO ₄ aq.
F6700030	RSpak KC-G 6B	(guard column)	Sulfo	10	6.0 x 50	0.1 % H ₃ PO ₄ aq.
F6700010	RSpak KC-G 8B	(guard column)	Sulfo	13	8.0 x 50	0.1 % H ₃ PO ₄ aq.

Use KC-G 8B for samples with relatively high impurities and KC-G 6B for samples with relatively low impurities. Base Material: Styrene divinylbenzene copolymer

Maltooligosaccharides, organic acids and ethanol

 Sample : 0.05 % each, 20 μ L

1. Maltotetraose
2. Maltotriose
3. Maltose
4. Glucose
5. Lactic acid
6. Glycerin
7. Acetic acid
8. Methanol
9. Ethanol

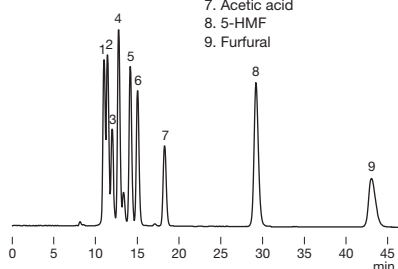


Column : Shodex SUGAR SH1821
Eluent : 0.5 mM H₂SO₄ aq.
Flow rate : 0.6 mL/min
Detector : RI
Column temp. : 75 °C

Cello-oligosaccharides and furfurals

 Sample : 0.1 % each, 10 μ L

1. Cellopentaose
2. Cellotetraose
3. Cellotriose
4. Cellobiose
5. Glucose
6. Glyceric acid
7. Acetic acid
8. 5-HMF
9. Furfural

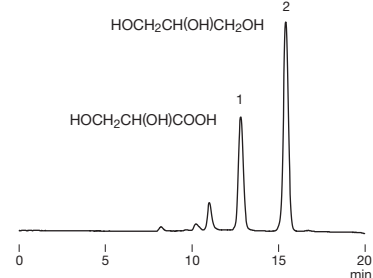


Column : Shodex SUGAR SH1821
Eluent : 2 mM H₂SO₄ aq.
Flow rate : 0.6 mL/min
Detector : RI
Column temp. : 60 °C

Glycerin and glyceric acid

 Sample : 0.1 % each, 10 μ L

1. Glyceric acid
2. Glycerin

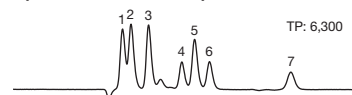
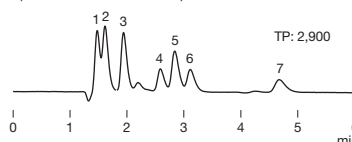


Column : Shodex SUGAR SH1011
Eluent : 2 mM H₂SO₄ aq.
Flow rate : 0.6 mL/min
Detector : RI
Column temp. : 60 °C

Rapid analysis of maltooligosaccharides, organic acids and ethanol

 Sample : 0.1 % each, 5 μ L

1. Maltotriose
2. Maltose
3. Glucose
4. Lactic acid
5. Acetic acid
6. Glycerin
7. Ethanol

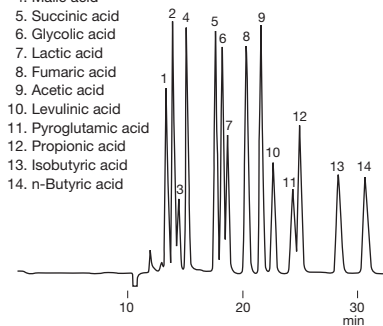
(1) Shodex SUGAR SH1011 8C (8.0 mm I.D. x 100 mm)

(2) Ion exclusion column from other manufacturer (7.8 mm I.D. x 100 mm)


Column : (1) Shodex SUGAR SH1011 8C
 (2) Ion exclusion column from other manufacturer
Eluent : 1 mM H₂SO₄ aq.
Flow rate : (1) 1.0 mL/min
 (2) 0.95 mL/min
Detector : RI
Column temp. : 65 °C

Common organic acids

Sample :

1. Citric acid
2. Tartaric acid
3. Pyruvic acid
4. Malic acid
5. Succinic acid
6. Glycolic acid
7. Lactic acid
8. Fumaric acid
9. Acetic acid
10. Levulinic acid
11. Pyroglutamic acid
12. Propionic acid
13. Isobutyric acid
14. n-Butyric acid

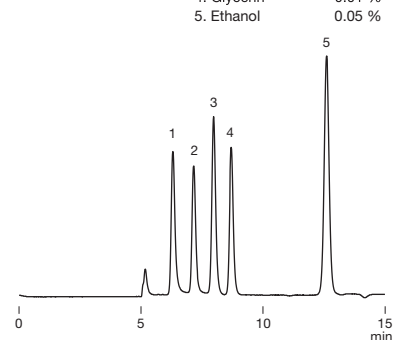


Column : Shodex RSpak KC-811 x 2
Eluent : 6 mM HClO₄ aq.
Flow rate : 1.0 mL/min
Detector : VIS (430 nm)
 post column method
Column temp. : 50 °C

Glucronolactone and organic acids

 Sample : 20 μ L

- | | |
|--------------------|--------|
| 1. Citric acid | 0.01 % |
| 2. Malic acid | 0.01 % |
| 3. Glucronolactone | 0.01 % |
| 4. Glycerin | 0.01 % |
| 5. Ethanol | 0.05 % |

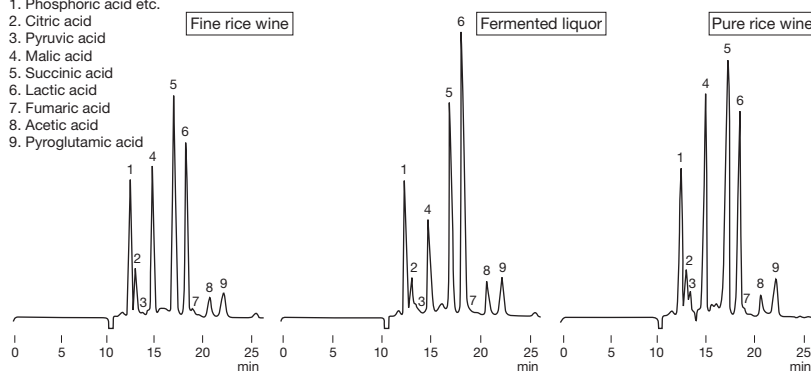


Column : Shodex RSpak KC-811
Eluent : 3 mM HClO₄ aq.
Flow rate : 1.0 mL/min
Detector : RI
Column temp. : 40 °C

Organic acids in sake

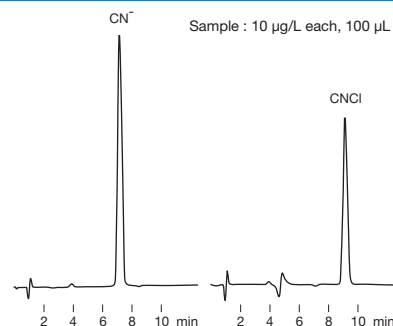
 Sample : 100 μ L

1. Phosphoric acid etc.
2. Citric acid
3. Pyruvic acid
4. Malic acid
5. Succinic acid
6. Lactic acid
7. Fumaric acid
8. Acetic acid
9. Pyroglutamic acid



Column : Shodex RSpak KC-G 8B + KC-811 x 2
Eluent : 4.8 mM HClO₄ aq.
Flow rate : 1.0 mL/min
Detector : VIS (430 nm)
 post column method
Column temp. : 63 °C

Analysis of cyanide ion and cyanogen chloride with post column method

 Sample : 10 μ g/L each, 100 μ L


Column : Shodex RSpak KC-811 6E
Eluent : 1 mM H₂SO₄ aq.
Reagent A : Chloramine T solution
Reagent B : 4-Pyridinecarboxylic acid-Pyrazolone solution
Flow rate : (Eluent) 1.0 mL/min
 (Reagent) 0.5 mL/min each
Detector : VIS (638 nm)
Column temp. : 40 °C
Reaction temp. : (Reagent A) 40 °C
 (Reagent B) 80 °C