

CAPCELL PAK C₁₈ KG

CAPCELL PAK: Our Most Durable Grade



 OSAKA SODA

CAPCELL PAK C₁₈ KG

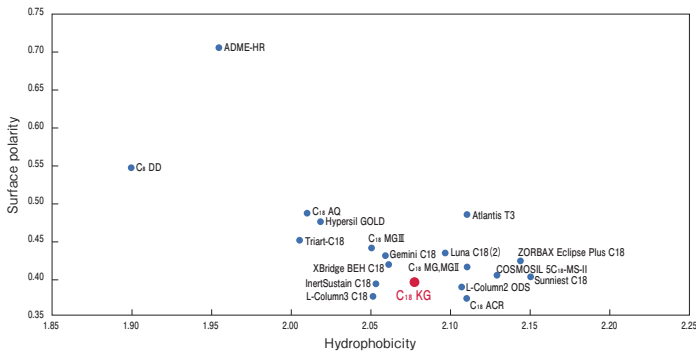
Product Features

- Enhanced durability achieved through improvements in silica and the development of a new polymer coating technology
- Wide pH compatibility (usable pH range of 1 to 12)
- Designed to meet rigorous demands modern analytical condition

Physical properties

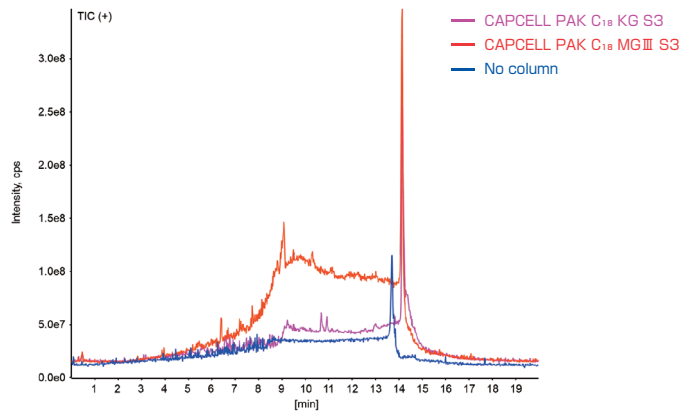
| Functional group | Pore Size (Å) | Particle Size (µm) | Surface Area (m ² /g) | % of Carbon | Density (µmol/m ²) | Pressure resistance (MPa) | pH range | USP class No. |
|------------------|---------------|--------------------|----------------------------------|-------------|--------------------------------|---------------------------|----------|---------------|
| C ₁₈ | 100 | 2 | 320 | 17 | 2.7 | 100 | 1~12 | L1 |
| C ₁₈ | 100 | 3 | 320 | 17 | 2.7 | 20 / 50 | 1~12 | L1 |
| C ₁₈ | 100 | 5 | 320 | 17 | 2.7 | 20 | 1~12 | L1 |

Hydrophobicity and surface polarity



Low bleed column

Compared to the conventional LC-MS/MS C₁₈ column, CAPCELL PAK C₁₈ MGIII, this CAPCELL PAK C₁₈ KG achieves a significant reduction in column bleeding, making it an ideal choice for LC-MS/MS analysis.



HPLC Conditions

Column size : 2.0 or 2.1 mm i.d. × 100 mm
 Mobile phase : A) 0.1 vol% HCOOH B) 0.1 vol% HCOOH, CH₃CN
 B 5 % (0 min) → 95 % (8 min) → 95 % (13 min) → 5 % (13.1 min) Gradient
 Flow rate : 0.4 mL/min
 Temperature : 40 °C
 Detection : TIC (Mass Range : 50 - 1000)
 Ionization : ESI positive

Relationship between flow rate and theoretical plates: Basic compound analysis

The CAPCELL PAK C₁₈ KG S2 demonstrates superior performance compared to the hybrid-type C₁₈ columns from Company A and Company B. It minimizes performance degradation under high flow rate conditions while enabling low-pressure operation.

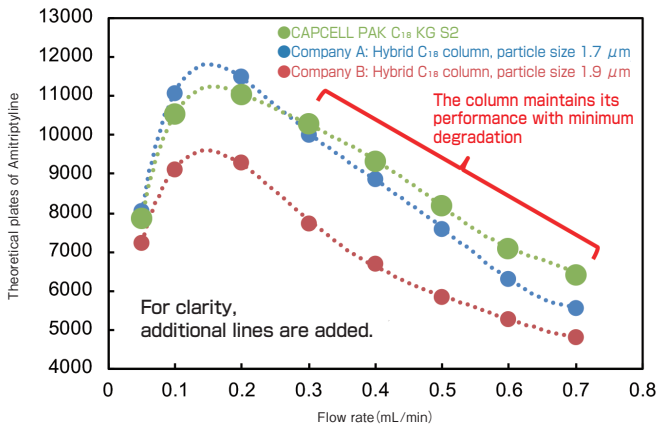


Figure 1: Relationship between flow rate and theoretical plates of amitriptyline

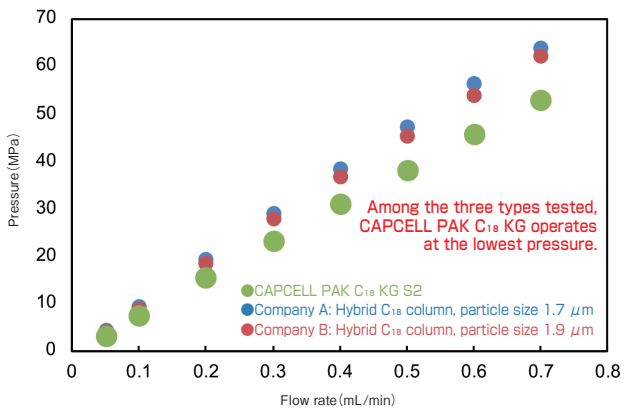


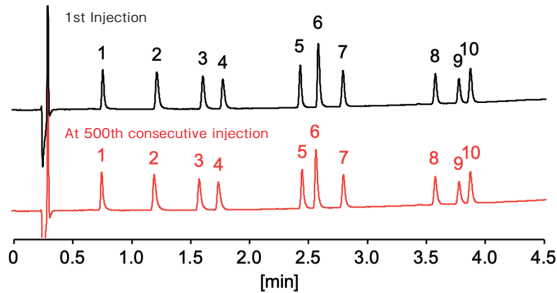
Figure 2: Relationship between flow rate and pressure

HPLC Conditions

Column size : 2.1 mm i.d. × 50 mm
 Mobile phase : 20 mmol/L Phosphate buffer (KH₂PO₄ : K₂HPO₄ = 1 : 1 in molar ratio) / CH₃OH = 20 / 80
 Temperature : 40 °C
 Detection : UV 220 nm
 Inj. vol. : 1 µL
 Sample : Amitriptyline (100 µg/mL)

Durability under acidic (TFA) mobile phase conditions

The CAPCELL PAK C₁₈ KG demonstrates stable performance even under mobile phase conditions using the strong acid trifluoroacetic acid (TFA).

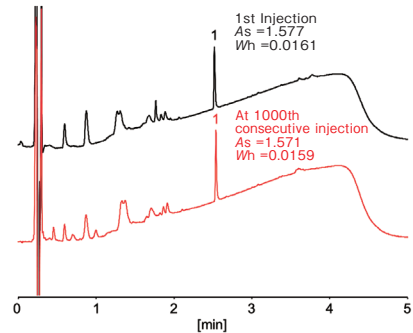


HPLC Conditions

Column : CAPCELL PAK C₁₈ KG S2 ; 2.1 mm i.d. × 50 mm
 Mobile phase : A) 0.1 vol% TFA B) 0.1 vol% TFA, CH₃CN
 B 25 % (0 min) → 70 % (4 min) → 25 % (4.1 min) Gradient
 Flow rate : 600 μL/min
 Temperature : 40 °C
 Detection : UV 220 nm
 Inj. vol. : 2 μL
 Sample : 1. Ambroxol (20 μg/mL) 2. Epinastine (20 μg/mL) 3. Olopatadine (10 μg/mL)
 4. Diphenhydramine (20 μg/mL) 5. Sulindac (15 μg/mL) 6. Fexofenadine (40 μg/mL)
 7. Ketoprofen (20 μg/mL) 8. Flurbiprofen (20 μg/mL)
 9. Diclofenac (10 μg/mL) 10. Ibuprofen (20 μg/mL)

Durability in continuous injections of pharmaceutical additive plasma samples

In bioanalytical sample analysis, a primary cause of column degradation is the adsorption of matrix-derived components onto the packing material surface. The CAPCELL PAK C₁₈ KG maintains excellent performance even under such Demanding conditions, ensuring stable operation during continuous injections.

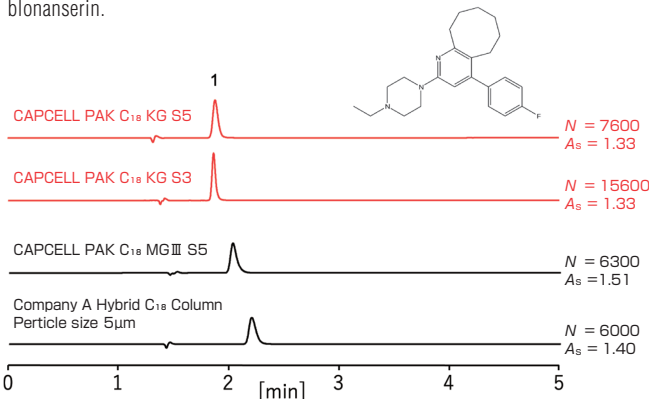


HPLC Conditions

Column : CAPCELL PAK C₁₈ KG S2 ; 2.1 mm i.d. × 50 mm
 Mobile phase : A) 0.1 vol% HCOOH B) 0.1 vol% HCOOH, CH₃CN
 B 30 % (0 min) → 90 % (2 min) → 90 % (3 min) → 30 % (3.1 min) Gradient
 Flow rate : 600 μL/min
 Temperature : 40 °C
 Detection : UV 220 nm
 Inj. vol. : 2 μL
 Sample : 1. Febusostat (10 μg/mL in human plasma supernatant)

Example of blonanserin analysis

Under the acidic conditions commonly used in LC-MS/MS, the CAPCELL PAK C₁₈ KG achieves excellent peak shapes for the analysis of the basic compound blonanserin.

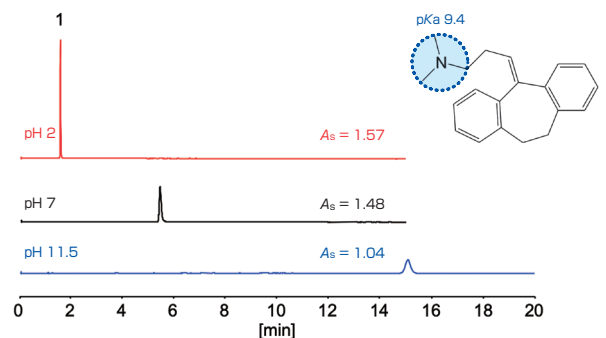


HPLC Conditions

Column size : 4.6 mm i.d. × 150 mm
 Mobile phase : 0.1 vol% HCOOH / CH₃OH = 30 / 70
 Flow rate : 1.0 mL/min
 Temperature : 40 °C
 Detection : UV 254 nm
 Sample : 1. Blonanserin (50 μg/mL)

Analysis of basic compounds under acidic, neutral, and basic conditions

Excellent peak shapes are achieved under acidic, neutral, and basic conditions.

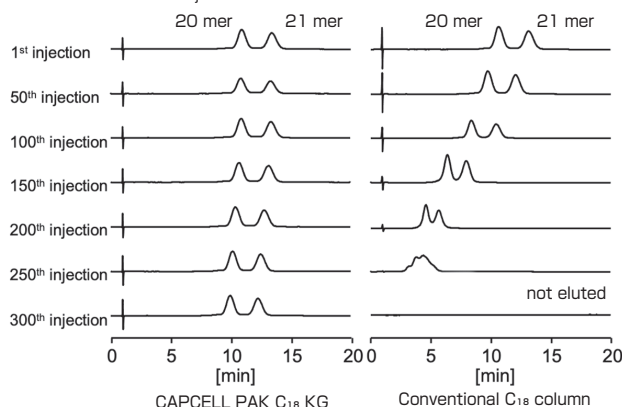


HPLC Conditions

Column : CAPCELL PAK C₁₈ KG S3 ; 4.6 mm i.d. × 150 mm
 Mobile phase : (pH 2) 20 mmol/L Phosphate buffer / CH₃CN = 40 / 60
 (pH 7) 20 mmol/L Phosphate buffer / CH₃CN = 40 / 60
 (pH 11.5) 20 mmol/L Na₂B₄O₇ · 10H₂O / CH₃CN = 40 / 60
 Flow rate : 1.0 mL/min
 Temperature : 30 °C
 Detection : UV 254 nm
 Inj. vol. : 5 μL
 Sample : Amitriptyline (100 μg/mL)

Improved durability under alkaline mobile phase conditions

Compared to conventional C₁₈ columns, C₁₈ KG demonstrates superior durability with high reproducibility in separation performance and retention times even after 300 consecutive injections.



Enhanced durability under high-temperature and high-pH conditions

Sequence

5'-U^AC^AA^UC^AA^CA^AC^AA^CU^GA^AA^UA^AC^AC^AA^U-3' RNA 20 mer, All PS
 5'-G^UC^AA^UC^AA^CA^AC^AU^GA^AA^UA^AC^AC^AA^U-3' RNA 21 mer, All PS

^A = Phosphorothioated

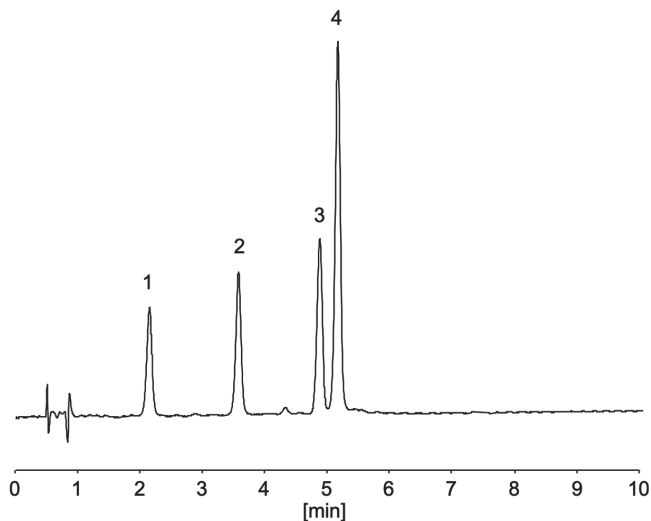
HPLC Conditions

Column : CAPCELL PAK C₁₈ KG S3 ; 2.1 mm i.d. × 100 mm
 Mobile phase : A) 15 mmol/L DBA, 50 mmol/L HFIP
 B) 15 mmol/L DBA, 50 mmol/L HFIP, 50 vol% CH₃OH
 B 73 % (0 min) → 78 % (20 min) → 73 % (20.1 min) Gradient
 Flow rate : 200 μL/min
 Temperature : 60 °C
 Detection : UV 270 nm
 Inj. vol. : 2 μL
 Sample : 100 μg/mL each in 10 mmol/L Tris-HCl buffer (pH 8)

Application

■ Oligonucleotide Resolution Standard

This example demonstrates the analysis of the Oligonucleotide Resolution Standard (manufactured by Agilent), which is commonly used as a benchmark for column separation performance in oligonucleotide analysis, using the metal-free C₁₈ column, CAPCELL PAK INERT C₁₈ KG S3 (2.0 mm i.d. x 100 mm).



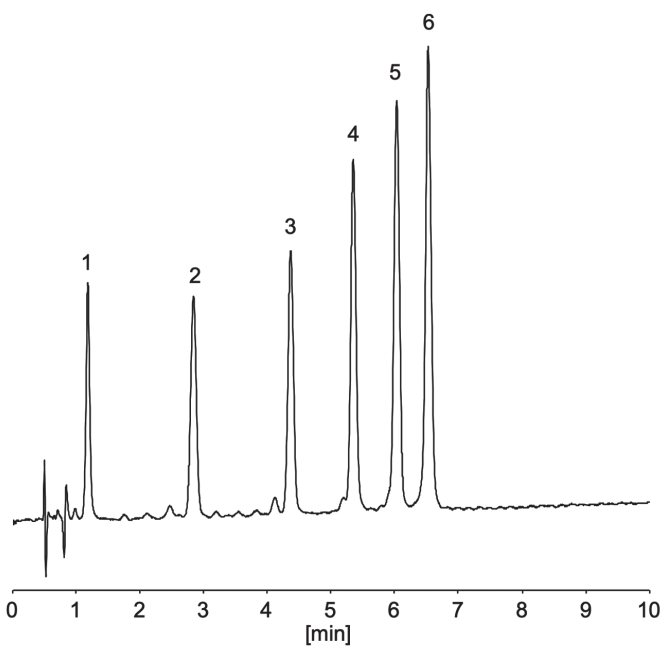
1. RNA 14 mer
2. RNA 17 mer
3. RNA 20 mer
4. RNA 21 mer

HPLC Conditions

| | |
|---------------------|--|
| Column | : CAPCELL PAK INERT C ₁₈ KG S3 ; 2.0 mm i.d. x 100 mm |
| Mobile phase | : A) H ₂ O / HFIP* / TEA** = 1000 / 30 / 0.4 B) CH ₃ OH / HFIP* / TEA** = 1000 / 30 / 2 B 15 % (0 min) -> 25 % (10 min) Gradient |
| Flow rate | : 0.4 mL/min |
| Temperature | : 60 °C |
| Detection | : UV 260 nm |
| Inj. vol. | : 2 µL |
| Sample dissolved in | : H ₂ O HFIP* : 1,1,1,3,3,3-Hexafluoroisopropanol TEA** : Triethylamine ※ 1 µg/mL = 1 ppm |

■ Oligonucleotide Ladder Standard

This example demonstrates the analysis of the Oligonucleotide Ladder Standard (manufactured by Agilent), which is commonly used as a benchmark for evaluating column selectivity and reproducibility in oligonucleotide analysis, using the metal-free C₁₈ column, CAPCELL PAK INERT C₁₈ KG S3 (2.0 mm i.d. x 100 mm).



1. Oligodeoxythymidine 15 mer
2. Oligodeoxythymidine 20 mer
3. Oligodeoxythymidine 25 mer
4. Oligodeoxythymidine 30 mer
5. Oligodeoxythymidine 35 mer
6. Oligodeoxythymidine 40 mer

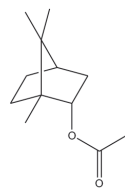
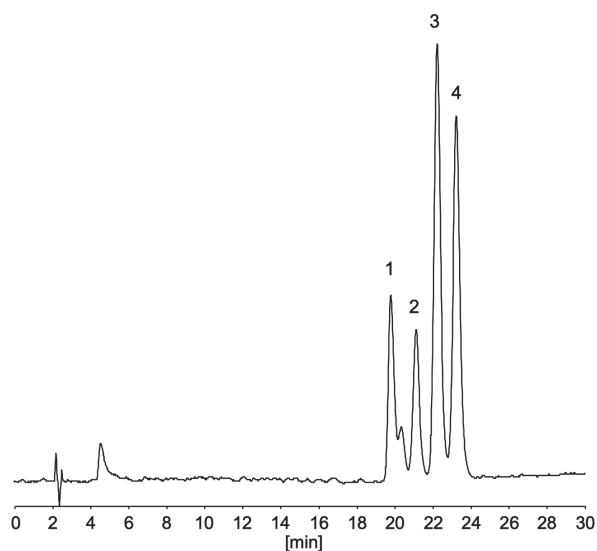
HPLC Conditions

| | |
|---------------------|--|
| Column | : CAPCELL PAK INERT C ₁₈ KG S3 ; 2.0 mm i.d. x 100 mm |
| Mobile phase | : A) H ₂ O / HFIP* / TEA** = 1000 / 30 / 0.4 B) CH ₃ OH / HFIP* / TEA** = 1000 / 30 / 2 B 20 % (0 min) -> 30 % (10 min) Gradient |
| Flow rate | : 0.4 mL/min |
| Temperature | : 60 °C |
| Detection | : UV 260 nm |
| Inj. vol. | : 2 µL |
| Sample dissolved in | : H ₂ O HFIP* : 1,1,1,3,3,3-Hexafluoroisopropanol TEA** : Triethylamine ※ 1 µg/mL = 1 ppm |

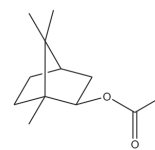
Application

Monoterpene compounds

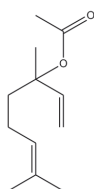
Here is an example of HPLC analysis of four monoterpene acetate esters, which are structural isomers. The peak observed between Peak 1 and Peak 2 is presumed to be isobornyls acetate, which is present at approximately 20% in the commercially available bornyl acetate reagent.



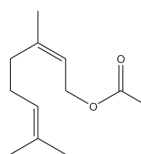
1. Bornyl acetate
(2500 µg/mL) (M.W. 196.3)



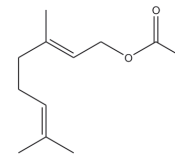
Isobornyl acetate (M.W. 196.3)



2. Linalyl acetate
(50 µg/mL) (M.W. 196.3)



3. Neryl acetate
(50 µg/mL) (M.W. 196.3)



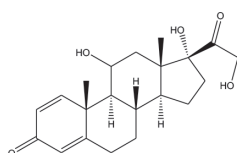
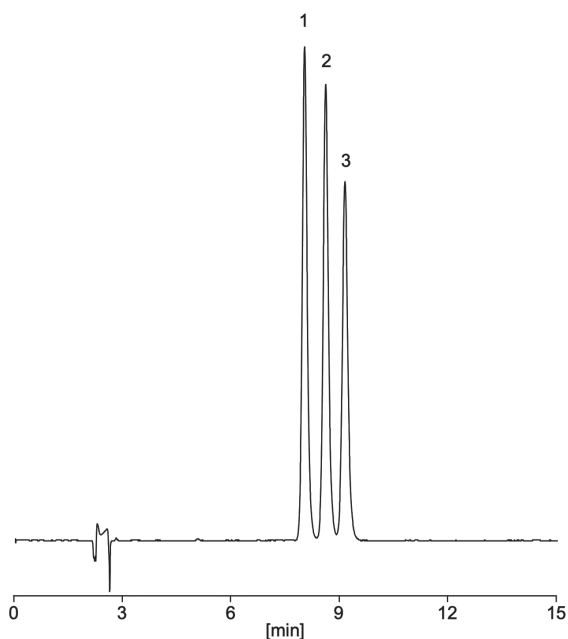
4. Geranyl acetate
(50 µg/mL) (M.W. 196.3)

HPLC Conditions

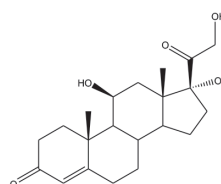
Column : CAPCELL PAK C₁₈ KG S5 ; 4.6 mm i.d. × 250 mm
 Mobile phase : H₂O / CH₃CN = 30 / 70
 Flow rate : 1.0 mL/min
 Temperature : 40 °C
 Detection : UV 210 nm
 Inj. vol. : 10 µL
 Sample dissolved in : 80 vol% CH₃CN
 ※ 1 µg/mL = 1 ppm

Steroids

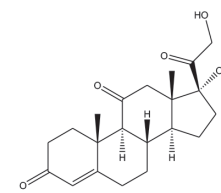
Additionally, this example demonstrates the analysis of three steroids: prednisolone, hydrocortisone, and cortisone.



1. Prednisolone
(100 µg/mL) (M.W. 360.4)



2. Hydrocortisone
(100 µg/mL) (M.W. 362.5)



3. Cortisone
(100 µg/mL) (M.W. 360.4)

HPLC Conditions

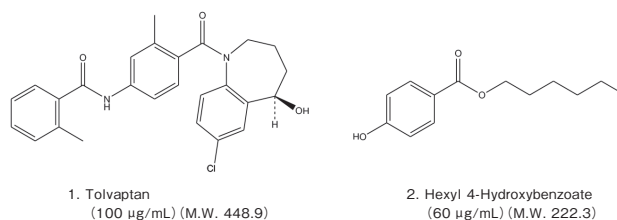
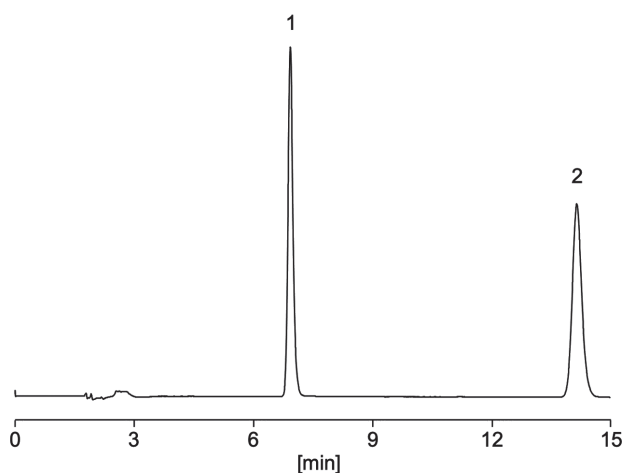
Column : CAPCELL PAK C₁₈ KG S5 ; 4.6 mm i.d. × 250 mm
 Mobile phase : H₂O / CH₃CN = 70 / 30
 Flow rate : 1.0 mL/min
 Temperature : 40 °C
 Detection : UV 254 nm
 Inj. vol. : 5 µL
 Sample dissolved in : Prednisolone was dissolved in methanol at 2 mg/mL.
 Hydrocortisone and cortisone were separately dissolved in methanol at 1 mg/mL.
 50 µL of prednisolone solution and 100 µL of other solutions were mixed together and water was added to the mixture to make 1 mL.
 ※ 1 µg/mL = 1 ppm

Column selection criteria for the 18th Edition of the Japanese Pharmacopoeia, Second Supplement

■ Column selection criteria for the quantitative determination of tolvaptan

Tolvaptan, a diuretic listed in the 18th Edition of the Japanese Pharmacopoeia, Second Supplement, has specific column selection criteria defined in the pharmacopoeia. The criteria state that a column must elute tolvaptan and hexyl para-hydroxybenzoate in that order, with a resolution of at least 15 between the two compounds.

With the introduction of the General Chapter on Chromatography in the 18th Edition of the Japanese Pharmacopoeia, First Supplement, parameters such as column dimensions and flow rates can now be adjusted, providing greater flexibility in column selection for quantitative analysis. Although the pharmacopoeia specifies a C₁₈ column with dimensions of 6.0 mm i.d. x 150 mm and a particle size of 5 μm for the quantitative determination of tolvaptan, the CAPCELL PAK C₁₈ KG S5 (4.6 mm i.d. x 150 mm) is also suitable. Using this column for the quantitative method achieved a resolution of 22.1, demonstrating excellent separation.

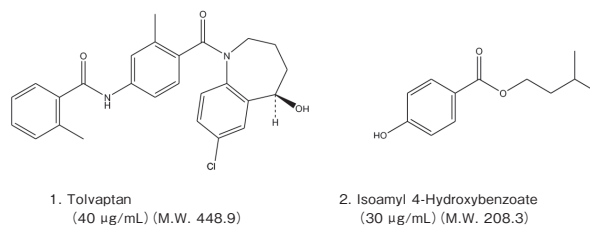
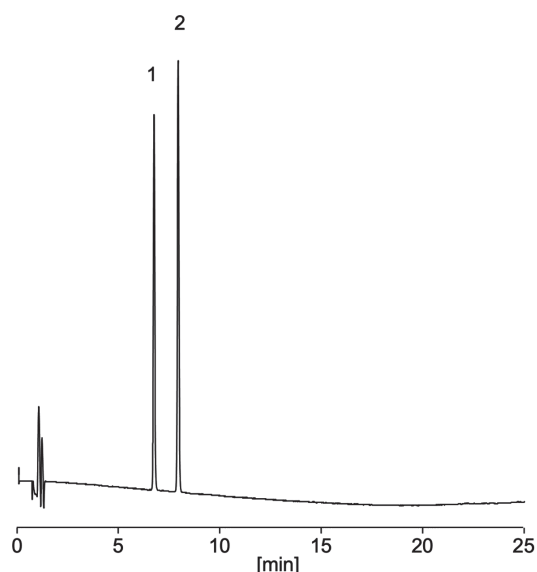


HPLC Conditions

Column : CAPCELL PAK C₁₈ S5 ; 4.6 mm i.d. x 150 mm
 Mobile phase : H₃PO₄ / H₂O / CH₃CN = 1 / 400 / 600
 Flow rate : 0.51 mL/min
 Temperature : 25 °C
 Detection : UV 254 nm
 Inj. vol. : 6 μL
 Sample dissolved in : CH₃OH
 ※ 1 μg/mL = 1 ppm

■ Column selection criteria for the purity test of tolvaptan

Tolvaptan, a diuretic listed in the 18th Edition of the Japanese Pharmacopoeia, Second Supplement, has specific column selection criteria defined in the pharmacopoeia. The criteria state that a column must elute tolvaptan and hexyl para-hydroxybenzoate in that order, with a resolution of at least 3 between the two compounds. Under these conditions, the CAPCELL PAK C₁₈ KG S3 (4.6 mm i.d. x 100 mm) achieved a resolution of 9.2, demonstrating excellent separation performance.



HPLC Conditions

Column : CAPCELL PAK C₁₈ KG S3 ; 4.6 mm i.d. x 100 mm
 Mobile phase : A) 0.1 vol% H₃PO₄ B) 0.1 vol% H₃PO₄, CH₃CN
 B 40 % (0 min) -> 80 % (20 min) -> 80 % (25 min) -> 40 % (25.1 min) Gradient
 Flow rate : 1.0 mL/min
 Temperature : 25 °C
 Detection : UV 254 nm
 Inj. vol. : 5 μL
 Sample dissolved in : CH₃OH
 ※ 1 μg/mL = 1 ppm

Product Lineup

CAPCELL PAK C₁₈ KG 2μm

| Product number | Particle Size(μm) | Inner diameter(mm) | Length(mm) |
|----------------|-------------------|--------------------|------------|
| 85101 | 2 | 2.1 | 35 |
| 85102 | 2 | 2.1 | 50 |
| 85103 | 2 | 2.1 | 100 |
| 85104 | 2 | 2.1 | 150 |

CAPCELL PAK C₁₈ KG 3μm

| Product number | Particle Size(μm) | Inner diameter(mm) | Length(mm) |
|----------------|-------------------|--------------------|------------|
| 85201 | 3 | 2.1 | 35 |
| 85202 | 3 | 2.1 | 50 |
| 85203 | 3 | 2.1 | 75 |
| 85204 | 3 | 2.1 | 100 |
| 85205 | 3 | 2.1 | 150 |
| 85206 | 3 | 2.1 | 250 |
| 85207 | 3 | 3.0 | 35 |
| 85208 | 3 | 3.0 | 50 |
| 85209 | 3 | 3.0 | 75 |
| 85210 | 3 | 3.0 | 100 |
| 85211 | 3 | 3.0 | 150 |
| 85212 | 3 | 3.0 | 250 |
| 85213 | 3 | 4.6 | 35 |
| 85214 | 3 | 4.6 | 50 |
| 85215 | 3 | 4.6 | 75 |
| 85216 | 3 | 4.6 | 100 |
| 85217 | 3 | 4.6 | 150 |
| 85218 | 3 | 4.6 | 250 |

CAPCELL PAK INERT C₁₈ KG

| Product number | Particle Size(μm) | Inner diameter(mm) | Length(mm) |
|----------------|-------------------|--------------------|------------|
| 95093 | 2 | 2.0 | 50 |
| 95094 | 2 | 2.0 | 100 |
| 95095 | 2 | 2.0 | 150 |
| 95083 | 3 | 2.0 | 50 |
| 95084 | 3 | 2.0 | 100 |
| 95085 | 3 | 2.0 | 150 |

CAPCELL PAK C₁₈ KG 5μm

| Product number | Particle Size(μm) | Inner diameter(mm) | Length(mm) |
|----------------|-------------------|--------------------|------------|
| 85301 | 5 | 2.1 | 35 |
| 85302 | 5 | 2.1 | 50 |
| 85303 | 5 | 2.1 | 75 |
| 85304 | 5 | 2.1 | 100 |
| 85305 | 5 | 2.1 | 150 |
| 85306 | 5 | 2.1 | 250 |
| 85307 | 5 | 3.0 | 35 |
| 85308 | 5 | 3.0 | 50 |
| 85309 | 5 | 3.0 | 75 |
| 85310 | 5 | 3.0 | 100 |
| 85311 | 5 | 3.0 | 150 |
| 85312 | 5 | 3.0 | 250 |
| 85313 | 5 | 4.6 | 35 |
| 85314 | 5 | 4.6 | 50 |
| 85315 | 5 | 4.6 | 75 |
| 85316 | 5 | 4.6 | 100 |
| 85317 | 5 | 4.6 | 150 |
| 85318 | 5 | 4.6 | 250 |

CAPCELL PAK C₁₈ KG Semi-Preparative Columns

| Product number | Particle Size(μm) | Inner diameter(mm) | Length(mm) |
|----------------|-------------------|--------------------|------------|
| 85320 | 5 | 10 | 100 |
| 85321 | 5 | 10 | 150 |
| 85322 | 5 | 10 | 250 |
| 85324 | 5 | 20 | 100 |
| 85325 | 5 | 20 | 150 |
| 85326 | 5 | 20 | 250 |
| 85330 | 5 | 30 | 250 |

Inert Column Structure

Metal-Free Columns



Internal Surface : PEEK
Filter : PEEK

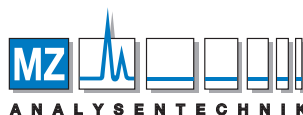


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🌐 <https://sub.osaka-soda.co.jp/HPLC/e/>



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