# 05

# Core-Shell Columns

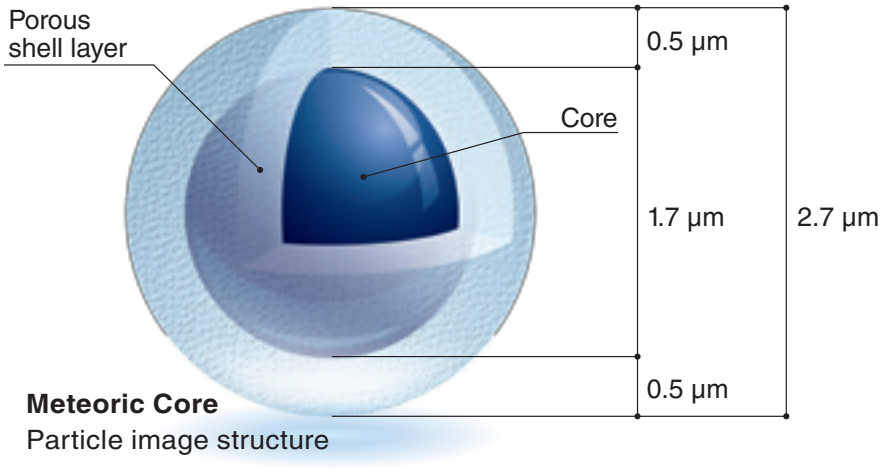
# Meteoric Core

Meteoric Core is Core-Shell columns with outstanding resolution for UHPLC & HPLC. Meteoric Core can be used across a wide pH range and provides excellent peak shape for basic and coordination compounds compared to conventional columns or competitors'. This feature enables smoother method development. Meteoric Core is ideal for ultra fast and high resolution analysis. Meteoric Core can reduce its backpressure by half compared to sub-2 µm columns with the same resolution as this. Meteoric Core can be used with conventional HPLC as well as UHPLC.

## Core-Shell columns with outstanding resolution for UHPLC & HPLC

### Features

- Ultra fast analysis and excellent resolution
- Excellent peak shape on basic and coordination compounds
- Wide usable pH range
- Low column bleeding and ideal for LC/MS



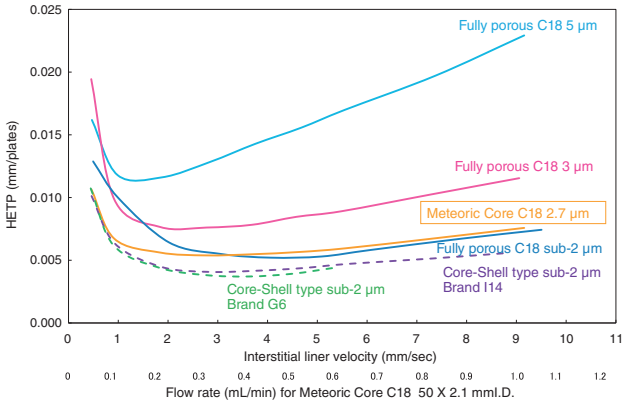

**Meteoric Core**
Particle image structure

### Specifications

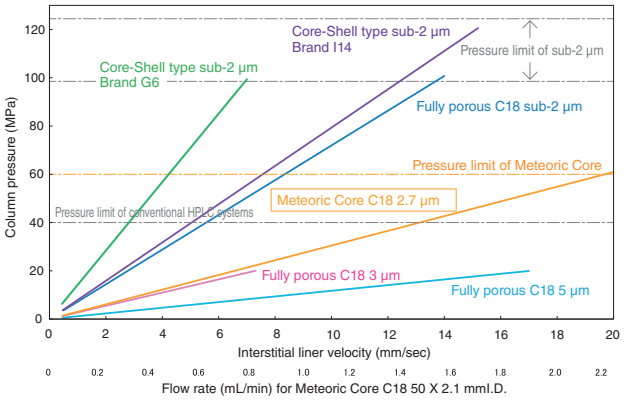
| | Meteoric Core C18 | Meteoric Core C18 BIO | Meteoric Core C8 |
|---|---|---|---|
| Base | Core-Shell type silica gel | | |
| Particle size (µm) | 2.7 | | |
| Pore size (Å) | 80 | 160 | 80 |
| Specific surface area ($m^2$/g) | 150 | 90 | 150 |
| Bonding | Trifunctional | | |
| Carbon content (%) | 7 | 5 | 5 |
| Endcapping | Yes | | |
| Usable pH range | 1.5~10.0 | 1.5~10.0 | 1.5~9.0 |
| USP classification | L1 | L1 | L7 |

## Advantages of Core-Shell column packing material

**Van Deemter Curves : Correlation between linear velocity and column efficiency**




**Column Pressure : Correlation between linear velocity and column backpressure**

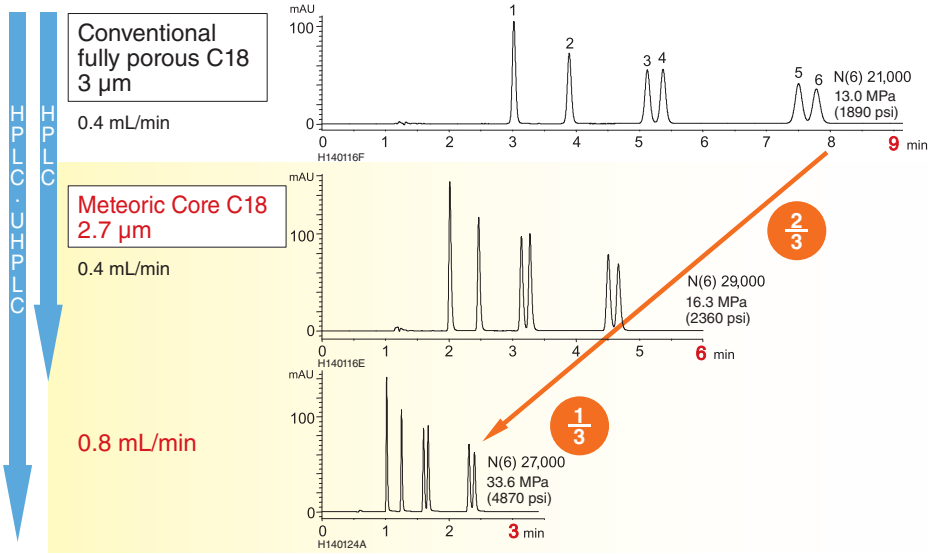



Meteoric Core C18 has high column efficiency which is almost equivalent to sub-2 µm columns over a wide range of flow rate.
The operating pressure of Meteoric Core is one half to one fifths of sub-2 µm Core-Shell type columns.
High throughput analysis using Meteoric Core could be expected even with longer length columns since the usable maximum flow rate of it is higher than competitors' sub-2 µm Core-Shell.

| | |
|---|---|
| Column | : 50 X 2.0 or 2.1 mmI.D. |
| Eluent | : acetonitrile/water (60/40) |
| Temperature | : 25°C |
| Sample | : butyl benzoate |

## Ultrafast analysis and excellent resolution

**Ultrafast separation of Parabens: Typically difficult-to-separate geometric isomers**

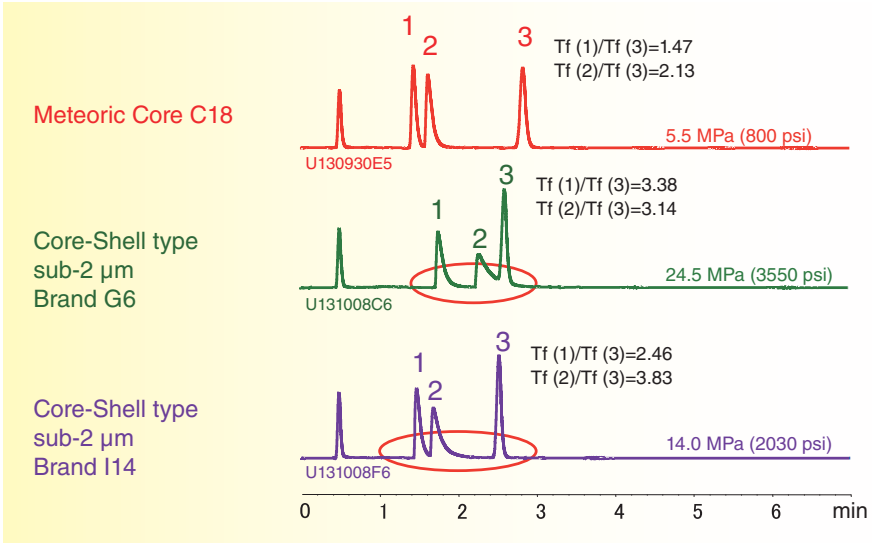



1. Methyl *p*-hydroxybenzoate
2. Ethyl *p*-hydroxybenzoate
3. Isopropyl *p*-hydroxybenzoate
4. Propyl *p*-hydroxybenzoate
5. Isobutyl *p*-hydroxybenzoate
6. Butyl *p*-hydroxybenzoate

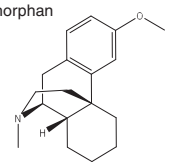
| | |
|---|---|
| Column | : 150 X 3.0 mmI.D. |
| Eluent | : acetonitrile/water (50/50) |
| Temperature | : 30°C |
| Detection | : UV at 270 nm |

Meteoric Core C18 can shorten the analysis time by two thirds compared to the conventional fully porous C18 column with the same column dimension and under the same analysis condition. Moreover, it maintains the theoretical plate number at a two times faster flow rate. It allows us to decrease analysis time by one thirds while maintaining resolution, and at an operating pressure less than 5,000 psi.

## Excellent peak shape on basic compounds



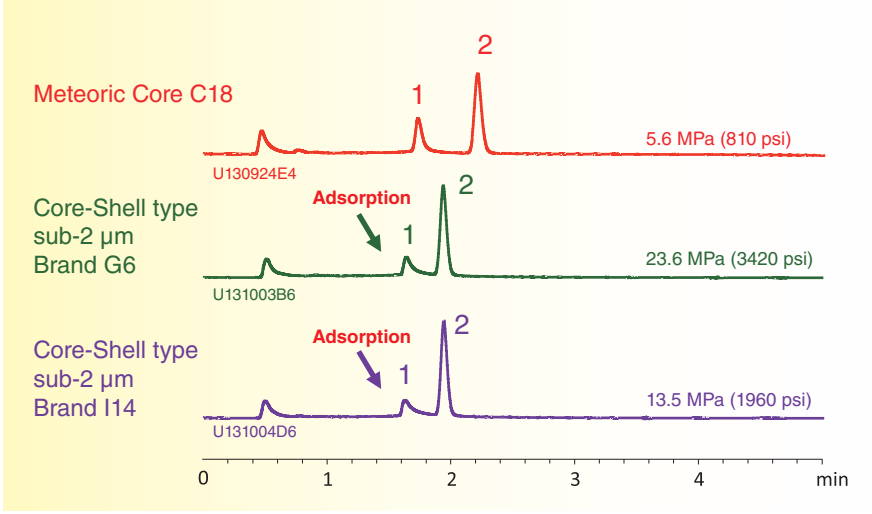

Dextromethorphan
(Peak 2)



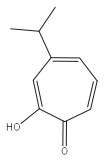
| | |
|---|---|
| Column | : 50 X 2.1 mmI.D. |
| Eluent | : 20 mM $KH_2PO_4$-$K_2HPO_4$ (pH 6.9)/ acetonitrile (65/35) |
| Flow rate | : 0.2 mL/min |
| Temperature | : 40°C |
| Detection | : UV at 235 nm |
| Sample | : 1. Chlorpheniramine<br>2. Dextromethorphan<br>3. Propyl *p*-hydroxybenzoate (I.S.) |

Meteoric Core C18 column is a high resolution column which provides excellent peak shapes for basic compounds (Peak 1 and 2) compared to sub-2 µm Core-Shell columns. Chromatographers can expect ultrafast analysis of basic compounds with highly quantitative and sensitive analysis by using Meteoric Core C18.

## Excellent peak shape on coordination compounds

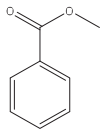



1.



Hinokitiol

2.



Methyl benzoate (I.S.)

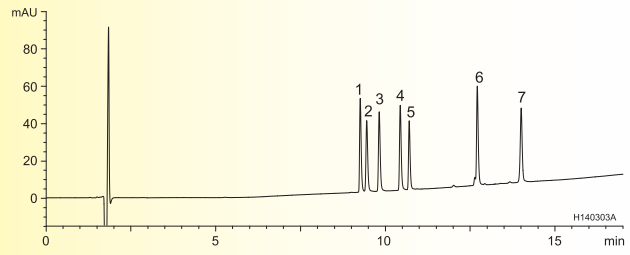
| | |
|---|---|
| Column | : 50 X 2.1 mmI.D. |
| Eluent | : acetonitrile/0.1% phosphoric acid (40/60) |
| Flow rate | : 0.2 mL/min |
| Temperature | : 40°C |
| Detection | : UV at 254 nm |

Meteoric Core C18 is able to provide excellent peak shapes for coordination compounds which are often adsorbed to a column, resulting from a strong interaction with impurities such as trace amount of metal ion. Meteoric Core is suitable for a quantitative analysis of coordination compounds.

## Peptide/Protein separation

**Meteoric Core C18 BIO with wider pore size: Appropriate for separation of peptides/proteins whose molecular weight are up to 30,000**

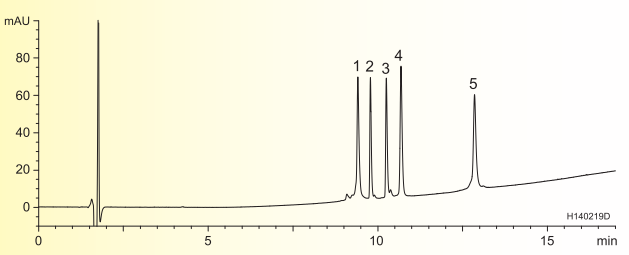
**Peptides (MW 574 - 3,465)**




1. BAM-12P (MW 1,425)
2. [D-Ala$^2$,Met$^5$]-Enkephalinamide (MW 587)
3. Met-Enkephalin (MW 574)
4. [D-Ala$^2$,Met$^5$]-Enkephalin (MW 588)
5. $\alpha$-Endorphin (MW 1,746)
6. $\gamma$-Endorphin (MW 1,859)
7. $\beta$-Endorphin (MW 3,465)

| | |
|---|---|
| Column | : Meteoric Core C18 BIO 2.7 µm<br>150 X 2.1 mmI.D. |
| Eluent | : A) water/TFA (100/0.1)<br>B) acetonitrile/TFA (100/0.1)<br>15-55%B (0-15 min), 55%B (15-17 min) |
| Flow rate | : 0.2 mL/min |
| Temperature | : 40°C |
| Detection | : UV at 220 nm |
| Pressure | : 14.9-16.1 MPa (2160-2330 psi) |

**Peptides/Proteins (MW 4,300 - 25,700)**




1. Cytochrome *c* (MW 12,400)
2. Insulin (bovine) (MW 5,700)
3. Amyloid $\beta$-protein (MW 4,300)
4. Lysozyme (MW 14,000)
5. $\alpha$-Chymotrypsinogen A (MW 25,700)

| | |
|---|---|
| Column | : Meteoric Core C18 BIO 2.7 µm<br>150 X 2.1 mmI.D. |
| Eluent | : A) water/TFA (100/0.1)<br>B) acetonitrile/TFA (100/0.1)<br>20-70%B (0-15 min), 70%B (15-17 min) |
| Flow rate | : 0.2 mL/min |
| Temperature | : 40°C |
| Detection | : UV at 220 nm |
| Pressure | : 12.8-16.1 MPa (1860-2330 psi) |



## Ordering Information -Columns-

### Meteoric Core C18

| Phase dimension | Column I.D. (mm) | Column length (mm) | | | | |
|---|---|---|---|---|---|---|
| | | 30 | 50 | 75 | 100 | 150 |
| 80 Å 2.7 µm | 2.1 | CAS08SQ7-03Q1PT | CAS08SQ7-05Q1PT | CAS08SQ7-L5Q1PT | CAS08SQ7-10Q1PT | CAS08SQ7-15Q1PT |
| | 3.0 | CAS08SQ7-0303PT | CAS08SQ7-0503PT | CAS08SQ7-L503PT | CAS08SQ7-1003PT | CAS08SQ7-1503PT |
| | 4.6 | CAS08SQ7-0346PT | CAS08SQ7-0546PT | CAS08SQ7-L546PT | CAS08SQ7-1046PT | CAS08SQ7-1546PT |

### Meteoric Core C18 BIO

| Phase dimension | Column I.D. (mm) | Column length (mm) | | | | |
|---|---|---|---|---|---|---|
| | | 30 | 50 | 75 | 100 | 150 |
| 160 Å 2.7 µm | 2.1 | CAW16SQ7-03Q1PT | CAW16SQ7-05Q1PT | CAW16SQ7-L5Q1PT | CAW16SQ7-10Q1PT | CAW16SQ7-15Q1PT |
| | 3.0 | CAW16SQ7-0303PT | CAW16SQ7-0503PT | CAW16SQ7-L503PT | CAW16SQ7-1003PT | CAW16SQ7-1503PT |
| | 4.6 | CAW16SQ7-0346PT | CAW16SQ7-0546PT | CAW16SQ7-L546PT | CAW16SQ7-1046PT | CAW16SQ7-1546PT |

### Meteoric Core C8

| Phase dimension | Column I.D. (mm) | Column length (mm) | | | | |
|---|---|---|---|---|---|---|
| | | 30 | 50 | 75 | 100 | 150 |
| 80 Å 2.7 µm | 2.1 | COS08SQ7-03Q1PT | COS08SQ7-05Q1PT | COS08SQ7-L5Q1PT | COS08SQ7-10Q1PT | COS08SQ7-15Q1PT |
| | 3.0 | COS08SQ7-0303PT | COS08SQ7-0503PT | COS08SQ7-L503PT | COS08SQ7-1003PT | COS08SQ7-1503PT |
| | 4.6 | COS08SQ7-0346PT | COS08SQ7-0546PT | COS08SQ7-L546PT | COS08SQ7-1046PT | COS08SQ7-1546PT |