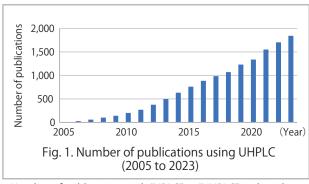


Silica gel columns for UHPLC COSMOSIL 1.8C₁₈-MS-II / COSMOCORE 2.6C₁₈

- Two C₁₈ columns for UHPLC separation
- Well-balanced selectivity for general-purpose separations
- Stable lot-to-lot quality and superior separation

Fast analysis by UHPLC

Ultra-high performance liquid chromatography (UHPLC) is a technology for speeding up analysis by using columns packed with smaller silica gel particles than standard HPLC and flowing mobile phase at a high rate. Analyses by UHPLC are increasing in number every year, and it is sure to continue to be an important technology in years to come.

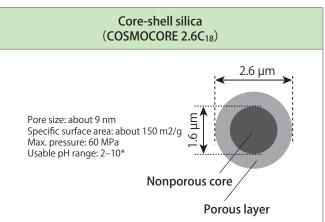


Number of publications with "UPLC" or "UHPLC" in the title, abstract, or keywords, as searched on www.sciencedirect.com

Our UHPLC columns include COSMOSIL $1.8C_{18}$ -MS-II, made with fully porous silica, and COSMOCORE $2.6C_{18}$, made with core-shell silica. Users should choose the appropriate column based on their instrument and analysis requirements. This pamphlet lists some characteristics of each column.

Fully porous silica (COSMOSIL 1.8C₁₈-MS-II) Pore size: about 12 nm Specific surface area: about 340 m2/g Max. pressure: 80 MPa Usable pH range: 2–10* All porous

Because the fully porous silica has pores throughout its structure, it can interact with the sample over a very wide surface area. As the amount of octadecyl phase that can be bonded increases, hydrophobic samples can be retained longer, leading to improved separation.



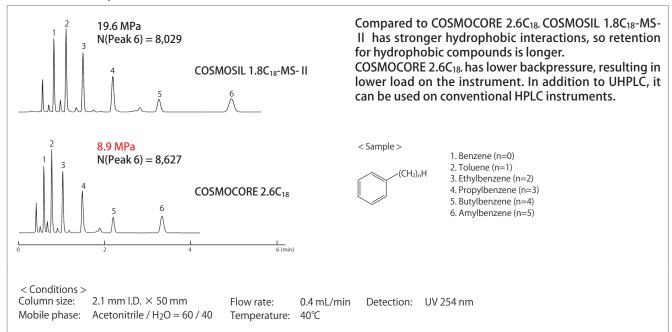
With core-shell silica's nonporous core, sample dispersion is reduced; compared to fully porous columns, high theoretical plate numbers can be achieved even with larger particles. These larger particles result in lower backpressure, enabling use on conventional HPLC instruments.

^{*}Silica gel columns are generally recommended to be used within pH 2–7.5. Outside this range, column degradation may happen more quickly.

Comparison of fully porous and core-shell columns

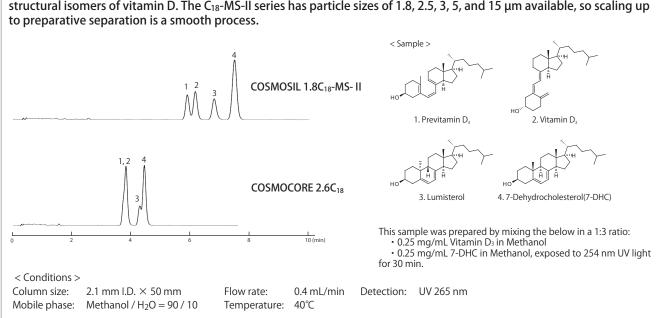
UHPLC columns exhibit very high numbers of theoretical plates, so good separation can be achieved even on short columns.

Retention of alkylbenzenes



Separation of structural isomers of vitamin D

COSMOSIL 1.8C₁₈-MS-II has strong retention and selectivity for hydrophobic compounds, so it can separate these structural isomers of vitamin D. The C₁₈-MS-II series has particle sizes of 1.8, 2.5, 3, 5, and 15 μm available, so scaling up to preparative separation is a smooth process.



- · For analyses that require strong hydrophobic interactions
- For moving methods from HPLC to UHPLC, or scaling up to preparative separation



Fully porous column for UHPLC

COSMOSIL 1.8C₁₈-MS-II

- Keeps backpressure low
- For use with conventional HPLC instruments



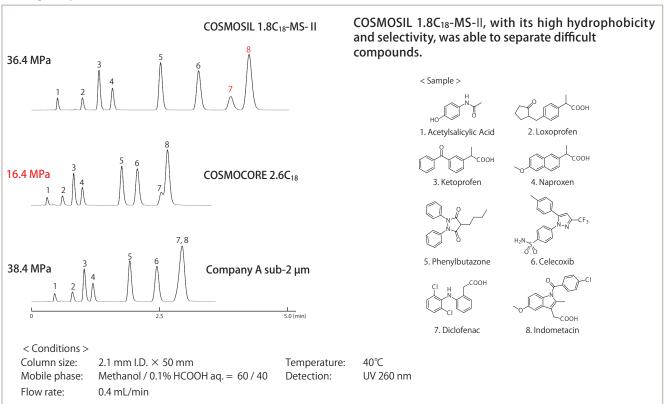
Core-shell column for UHPLC

COSMOCORE 2.6C₁₈

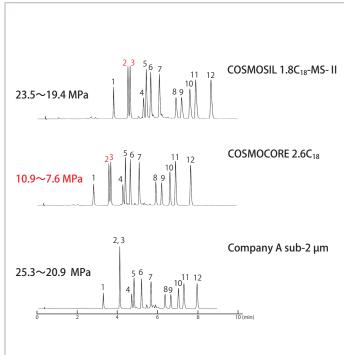
Comparison to competitor columns

COSMOSIL $1.8C_{18}$ -MS-II and COSMOCORE $2.6C_{18}$ were compared to a competitor UHPLC column. COSMOSIL $1.8C_{18}$ -MS-II, with its high retention for hydrophobic compounds, is able to separate compounds that the competitor column was not able to separate. COSMOCORE $2.6C_{18}$ is similar in retention and selectivity to the competitor column, but ran with less than half the backpressure.

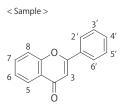
Drug analysis (NSAIDs)



Flavonoid analysis



Compared to isocratic elution, in this gradient elution, the differences in retention time between the columns was small, and elution order was the same. However, COSMOSIL 1.8C₁₈-MS-II and COSMOCORE 2.6C₁₈ were still able to separate compounds that were not separated on the competitor column.



No.	Compounds	3	5	6	7	8	2′	3′	4′	5′	6′
1.	Myricetin	ОН	OH		ОН			ОН	ОН	OH	
2.	7,8-Dihydroxyflavone				ОН	OH					
3.	Quercetin	ОН	OH		ОН			ОН	ОН		
4.	Apigenin		OH		ОН				ОН		
5.	Kaempferol	ОН	OH		ОН				ОН		
6.	7-Hydroxyflavone				ОН						
7.	6-Hydroxyflavone			ОН							
8.	Flavone										
9.	Chrysin		OH		ОН						
10.	6-Methoxyflavone			OCH₃							
11.	3-Hydroxyflavone	ОН									
12.	5-Hydroxyflavone		OH								

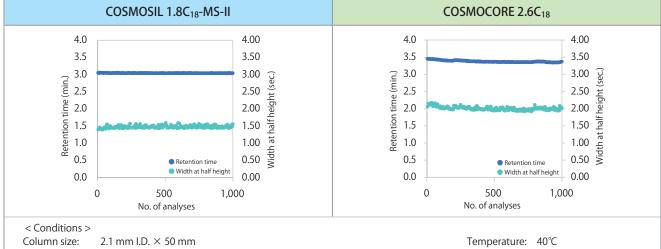
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Column size: 2.1 mm I.D. \times 50 mm Mobile phase: A: 0.1% Formic Acid -in Water B: 0.1% Formic Acid - in Acetonitrile B conc. 10 \rightarrow 70% 10 min Linear gradient

Flow rate: 0.4 mL/minTemperature: 40°C File Detection: UV 280 nm gradient Inj. Vol.: 1.0 µL

Durability of UHPLC columns

UHPLC columns are routinely exposed to high pressures. To evaluate the durability of these columns, amitriptyline was injected 1,000 times into each column. Neither COSMOSIL 1.8C₁₈-MS-II nor COSMOCORE 2.6C₁₈ saw deterioration in retention time or peak shape (width at half height).



Mobile phase: A: 0.1% TFA in Water

B: 0.1% TFA in Acetonitrile

B conc. $5 \rightarrow 90\%$ (0.00 - 3.00 min), $90 \rightarrow 5\%$ (3.00 - 3.01 min), 5%(3.01 - 6.00 min)

Flow rate:

Detection: UV 236 nm

Sample: Amitriptyline (0.2 mg/mL)

Inj. Vol.: 1.0 µL

Please see the below resources for more information:

COSMOSIL C₁₈-MS-II

(https://www.nacalai.co.jp/cosmosil/column/C18-MS.html)

COSMOCORE 2.6C₁₈

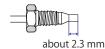
(https://www.nacalai.co.jp/cosmosil/column/COSMOCORE.html)

COSMOSIL Application

(https://www.nacalai.co.jp/cosmosil/data/csmosrchtop.cfm)

[Note on connector type:]

Our UHPLC columns use the same connectors as Waters UPLC® (UHPLC) columns. This is different from our conventional COSMOSIL columns, which use the conventional Waters HPLC-compatible connectors. Attempting to connect an unsuitable fitting may result in it becoming stuck in the column.



Ordering information

● COSMOSIL 1.8C₁₈-MS-II Analytical Columns (Particle Size: 1.8 µm) Packed Column

I.D. x Length (mm)	Product Number			
2.1 × 30	22132-71			
2.1 × 50	22136-31			

I.D. x Length (mm)	Product Number		
2.1 × 75	22137-21		
2.1 × 100	22138-11		

I.D. x Length (mm)	Product Number		
2.1 × 150	22139-01		

COSMOCORE 2.6C₁₈ Analytical Columns (Particle Size: 2.6 µm) **Packed Column**

I.D. x Length (mm)	Product Number			
2.1 × 30	12632-31			
2.1 × 50	12631-41			
2.1 × 75	12630-51			
2.1 × 100	12614-71			
2.1 × 150	12612-91			

I.D. x Length (mm)	Product Number
3.0 × 30	12611-01
3.0 × 50	12609-51
3.0 × 75	12608-61
3.0 × 100	12607-71
3.0 × 150	12602-21

I.D. x Length (mm)	Product Number		
4.6 × 30	12601-31		
4.6 × 50	12600-41		
4.6 × 75	12599-91		
4.6 × 100	12598-01		
4.6 × 150	12597-11		
4.6 × 250	12596-21		

COSMOSIL/COSMOCORE is registered under Nacalai Tesque, Inc.



Nijo Karasuma, Nakagyo-ku, Kyoto 604-0855 JAPAN TEL: +81-(0)75-251-1730

Website: www.nacalai.com E-mail: info.intl@nacalai.com