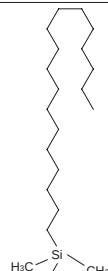
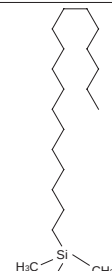


2. Reversed Phase C₁₈ Series

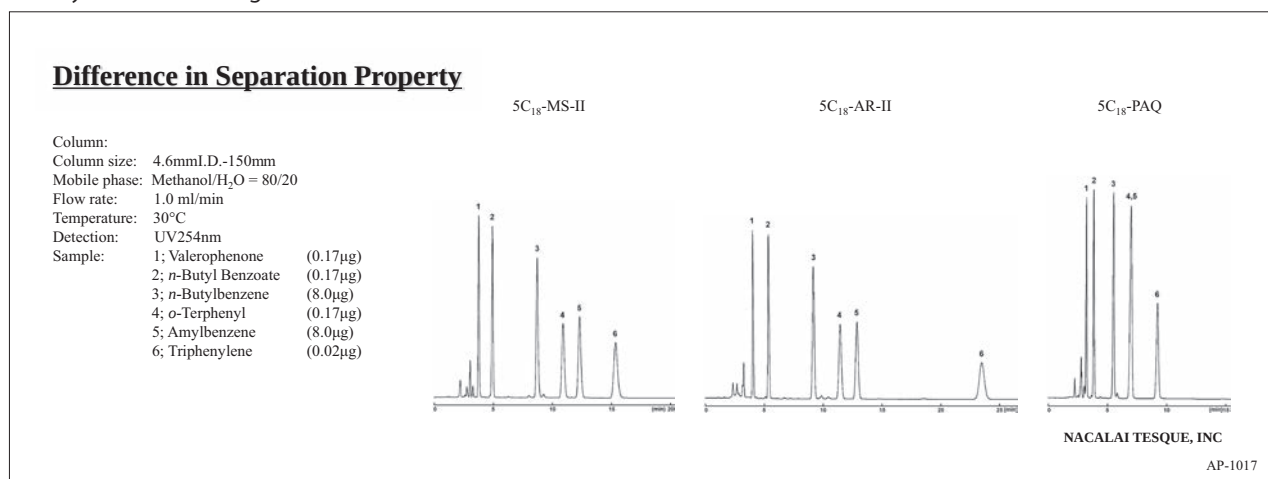
Specifications

Packing Material	C ₁₈ -MS-II				C ₁₈ -AR-II			C ₁₈ -PAQ			C ₁₈ -EB	COSMOCORE C ₁₈
Silica Gel*	High purity porous spherical silica											Core-Shell Silica Gel
Average Particle Size (μm)	2.5	3	5	15	3	5	15	3	5	15	3 μm	2.6 μm
Average Pore Size (Å)	130	120										90
Specific Surface Area (m ² /g)	330	300			300			300			300	150
Bonded Phase Structure												
Bonded Phase	Octadecyl Group											
USP Category	L1											
Bonding Type	Monomeric				Polymeric				Monomeric		Polymeric	
Main Interaction	Hydrophobic interaction											
End-Capping	Near-perfect treatment											
Carbon Content	18%	16%			17%			11%			14.5%	7%
Usable pH Range	2 ~ 10*				1.5 ~ 7.5*			2 ~ 7.5			2 ~ 10*	1.5 ~ 10
Features	• Multi-purpose C ₁₈ Column				• Features strong acid resistance. • Good for acidic compounds and peptides			• Good for hydrophilic compounds • Stable performance under 100% aqueous conditions			• Good for basic compounds	• Same number of theoretical plates as sub-2 μm columns with half the back pressure

*Optimal pH range of silica-based columns is between 2 and 7.5. Extreme pH may significantly decrease column lifetime.

Difference in Separation Properties (5 μm)

COSMOSIL 5C₁₈-AR-II retains planar compounds (such as triphenylene) longer compared to COSMOSIL 5C₁₈-MS-II. COSMOSIL 5C₁₈-PAQ has shorter retention time in general, and retains polar compounds (such as valerophenone and *n*-butyl benzoate) longer.



COSMOSIL C₁₈-MS-II



- First-choice column of our ODS series
- Multi-purpose C₁₈ column
- High reproducibility
- A wide range of applications

Suitable Samples

- Low-MW compounds

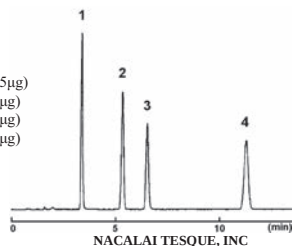
Separation Property

The COSMOSIL 5C₁₈-MS-II is a well-balanced column with better basic performance, such as sharper peaks for basic compounds and chelating compounds, strong hydrophobic interaction, low analytical pressure, and high theoretical plate number. COSMOSIL 5C₁₈-MS-II is the first-choice column for reversed-phase chromatography.

Separation Property

Column: COSMOSIL 5C₁₈-MS-II
 Column size: 4.6mm I.D.-150mm
 Mobile phase: Methanol/ H₂O = 60/40
 Flow rate: 1.0 ml/min
 Temperature: 30°C
 Detection: UV254nm

Sample: 1; Acetophenone (0.05μg)
 2; Methyl Benzoate (0.5μg)
 3; Benzene (2.0μg)
 4; Toluene (2.0μg)



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AP-0421

Table. Comparison of hydrophobic interaction, analytical pressure and theoretical plate number.

Column	Hydrophobic Interaction α (Toluene/Benzene)	Pressure (MPa)	Theoretical Plate Number (Toluene)
COSMOSIL 5C ₁₈ -MS-II	1.96	8.3	14,300
Company A C ₁₈	1.99	13.0	16,800
Company B C ₁₈	1.94	8.0	14,000
Company C C ₁₈	1.69	11.2	5,600
Company D C ₁₈	1.84	10.5	14,200

Analysis of Basic Compounds and Metal Coordination Compounds

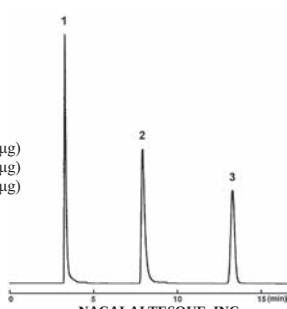
The COSMOSIL 5C₁₈-MS-II column, taking advantage of a new end-capping treatment, can replace the original COSMOSIL C₁₈ (ODS) column. A new end-capping treatment with polar groups for "shield effect" has significantly improved peak shape for basic compounds. Ultra pure silica gel with low trace-metal content is used for COSMOSIL columns; thus the columns provide excellent peak shapes for chelating compounds.

Basic Compounds

Column: 5C₁₈-MS-II
 Column size: 4.6mm I.D.-150mm
 Mobile phase: Methanol/ 20mmol/l Phosphate
 buffer(pH7) = 20/80

Flow rate: 1.0 ml/min
 Temperature: 30°C
 Detection: UV254nm

Sample: 1; Procainamide (0.38μg)
 2; N-Acetylprocainamide (0.25μg)
 3; Benzylalcohol (5.63μg)



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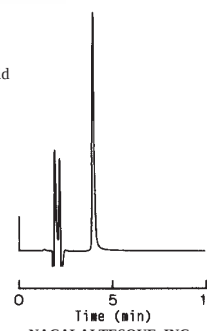
AP-1010

Metal Coordination Compounds

Column: COSMOSIL 5C₁₈-MS-II
 Column size: 4.6mm I.D.-150mm
 Mobile phase: Acetonitrile / 20mmol/l Phosphoric Acid
 = 5/95

Flow rate: 1.0 ml/min
 Temperature: 30°C
 Detection: UV240nm

Sample: Oxine-copper



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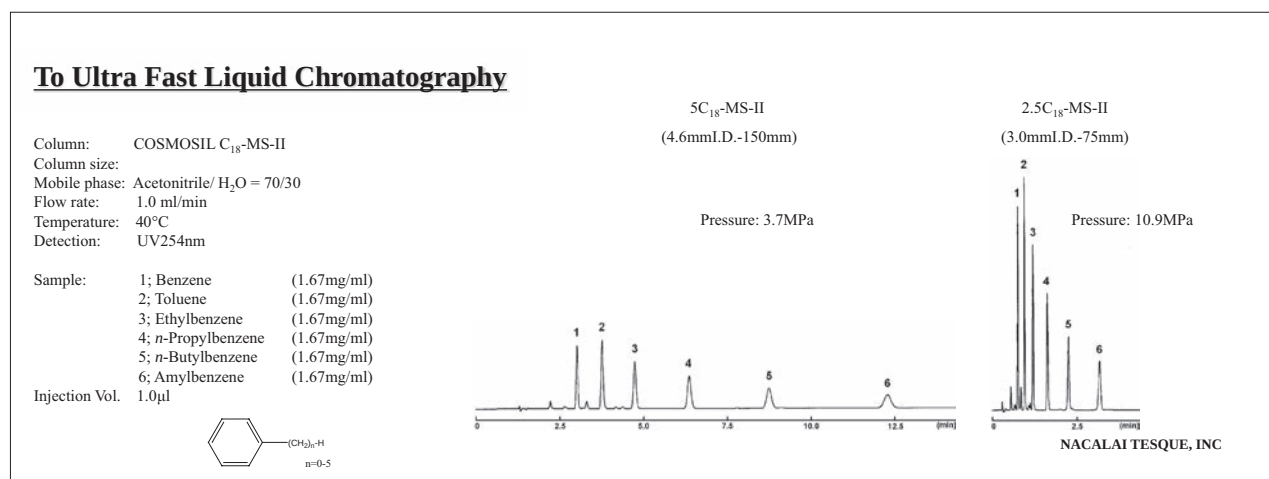
AP-0143

High Reproducibility

The strict quality control system of Nacalai Tesque supports the customers with an individual "Inspection Report" which accompanies each and every COSMOSIL and COSMOGEL Packed Column (except guard columns) and an additional "Certificate of Analysis" for the COSMOSIL 5C₁₈-MS-II (4.6 mm I.D. x 150 mm and 4.6 mm I.D. x 250 mm).

Fast LC Columns (COSMOSIL 2.5C₁₈-MS-II)

* This application was taken using a semi-micro HPLC instrument, setting the detector response time to 0.02 sec.



Ordering Information

● COSMOSIL 5C₁₈-MS-II Analytical / Preparative Columns (Particle Size: 5 μm)

Packed Column

I.D. x Length (mm)	Product Number
1.0× 50	02824-31
1.0× 150	02896-01
2.0× 30	05876-71
2.0× 50	04355-21
2.0× 100	05597-31
2.0× 150	38025-91
2.0× 250	05761-61
3.0× 100	05458-51
3.0× 150	34245-31
3.0× 250	34254-11
4.6× 30	34341-61
4.6× 50	38017-01
4.6× 100	38018-91
4.6× 150*	38019-81

I.D. x Length (mm)	Product Number
4.6× 250*	38020-41
6.0× 150	38021-31
6.0× 250	38022-21
10× 50	05789-21
10× 100	09479-61
10× 150	34355-91
10× 250	38023-11
20× 50	34371-71
20× 100	16580-91
20× 150	05091-41
20× 250	38024-01
28× 100	16582-71
28× 150	16583-61
28× 250	05760-71

Guard Column / Guard Cartridge

I.D. x Length (mm)	Product Number
4.6× 10 Cartridge†	38015-89
10× 20	38016-11
20× 20	05790-81
28× 50	34347-01

* Validated columns

† 3 cartridges included. Guard cartridge holder required; refer to page 78.

● COSMOSIL 15C₁₈-MS-II Preparative Columns (Particle Size: 15 μm)

Packed Column

I.D. x Length (mm)	Product Number
28× 250	34525-61
50× 250	05886-41
50× 500	34531-71

Guard Column

I.D. x Length (mm)	Product Number
28× 50	05885-51
50× 50	34527-41

● COSMOSIL 3C₁₈-MS-II Fast LC Columns (Particle Size: 3 μm)

Packed Column

I.D. x Length (mm)	Product Number
2.0× 50	05514-01
2.0× 75	34470-71
2.0× 100	34367-41
2.0× 150	08723-71
2.0× 250	09995-91

I.D. x Length (mm)	Product Number
3.0× 100	34366-51
3.0× 150	07267-91
4.6× 50	38066-61
4.6× 75	08758-31
4.6× 100	38067-51
4.6× 150	04785-91

Guard Cartridge

I.D. x Length (mm)	Product Number
4.6× 10 Cartridge*	21234-84

* 2 cartridges included. Guard cartridge holder required; refer to page 78.

● COSMOSIL 2.5C₁₈-MS-II Fast LC column (Particle Size: 2.5 μm)

Packed Column

I.D. x Length (mm)	Product Number
2.0× 50	08994-31
2.0× 75	08995-21

I.D. x Length (mm)	Product Number
2.0× 100	08996-11
3.0× 50	08997-01

I.D. x Length (mm)	Product Number
3.0× 75	08998-91
3.0× 100	08999-81

COSMOSIL C₁₈-AR-II



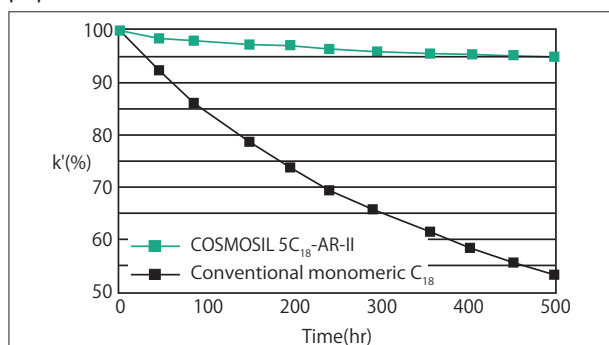
- Features strong acid resistance

Suitable Samples

- Peptides, acidic compounds, etc.

Acid Resistance

COSMOSIL 5C₁₈-AR-II packed column features a polymeric type of C₁₈ reversed phase material. The acidic resistance of COSMOSIL 5C₁₈-AR-II is much improved compared with commercially available monomeric type octadecyl stationary phases. It retains high performance even with acidic mobile phases commonly used to separate acidic compounds and peptides.



Acid resistance test

Columns were filled with 0.1% trifluoroacetic acid solution and left at 60°C.

Retention factor (k) for naphthalene

Mobile phase: 70% methanol

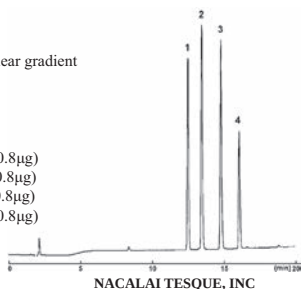
Applications

- Peptides

COSMOSIL Application Data

Column: COSMOSIL 5C₁₈-AR-II
 Column size: 4.6mm I.D.-150mm
 Mobile phase: A; 0.05%TFA-H₂O
 B; 0.05%TFA-Acetonitrile
 B conc. 10→40% 20min Linear gradient
 Flow rate: 1.0 ml/min
 Temperature: 30°C
 Detection: UV220nm

Sample: 1; Oxytocin (0.8μg)
 2; Angiotensin II(Human) (0.8μg)
 3; Angiotensin I(Human) (0.8μg)
 4; Substance P (0.8μg)



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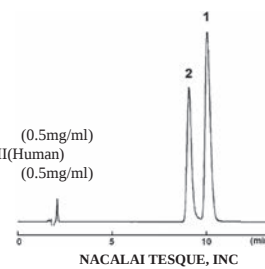
AP-0351

- Phosphopeptide

COSMOSIL Application Data

Column: COSMOSIL 5C₁₈-AR-II
 Column size: 4.6mm I.D.-150mm
 Mobile phase: A; 0.05%TFA-H₂O
 B; 0.05%TFA-Acetonitrile
 B conc. 20%
 Flow rate: 1.0 ml/min
 Temperature: 30°C
 Detection: UV220nm

Sample: 1; Angiotensin II(Human) (0.5mg/ml)
 2; [Tyr(PO₃H₂)₄]-Angiotensin II(Human) (0.5mg/ml)
 Inj. Vol.: 3.0μl



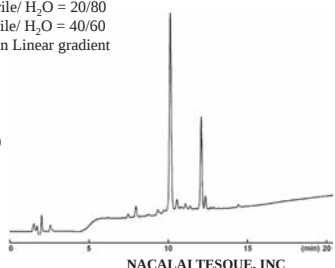
NACALAI TESQUE, INC

- Colistin

COSMOSIL Application Data

Column: COSMOSIL 5C₁₈-AR-II
 Column size: 4.6mm I.D.-150mm
 Mobile phase: A; 0.1% TFA-Acetonitrile/ H₂O = 20/80
 B; 0.1% TFA-Acetonitrile/ H₂O = 40/60
 B conc. 0 → 100% 20min Linear gradient
 Flow rate: 1.0 ml/min
 Temperature: 30°C
 Detection: UV220nm

Sample: Colistin (5mg/ml)
 Inj. Vol.: 1.0μl



NACALAI TESQUE, INC

AP-1502

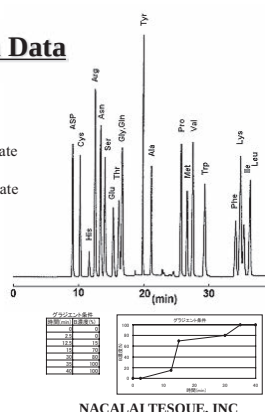
- PTH-Amino Acids

COSMOSIL Application Data

Column: COSMOSIL 5C₁₈-AR-II
 Column size: 4.6mm I.D.-150mm
 Mobile phase: A; Acetonitrile/ 20mmol/l Acetate buffer(pH4.8) = 10/90
 B; Acetonitrile/ 20mmol/l Acetate buffer(pH4.8) = 50/50
 Step wise gradient
 Flow rate: 1.0 ml/min
 Temperature: 60°C
 Detection: UV270nm, 0.16AUFS

Sample: PTH-Asp (0.4mg/ml)
 PTH-His (0.3mg/ml)
 PTH-Arg (0.5mg/ml)
 PTH-Ser (0.3mg/ml)
 PTH-Trp (0.25mg/ml)
 PTH-Lys (0.35mg/ml)
 Others (0.2mg/ml)

Injection 2.0μl



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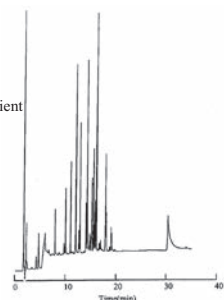
AP-0004

Applications

● Peptide Mappings

COSMOSIL Application Data

Column: COSMOSIL 5C₁₈-AR-II
 Column size: 4.6mm I.D. × 150mm
 Mobile phase: A; 5mmol/l TFA-H₂O
 B; 5mmol/l TFA-60% Acetonitrile
 B conc. 0 → 100% 30min Linear gradient
 Flow rate: 1.0 ml/min
 Temperature: 30°C
 Detection: UV210nm, 0.32AUFS
 Sample: Cytochrome C
 Lysyl Endopeptidase digested
 (2.5μl)



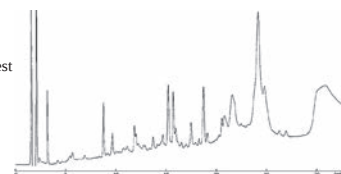
NACALAI TESQUE, INC

AP-0002

● β-Casein Trypsin Digest

COSMOSIL Application Data

Column: COSMOSIL 5C₁₈-AR-II
 Column size: 4.6mm I.D. × 150mm
 Mobile phase: A; 0.05% TFA-H₂O
 B; 0.05% TFA-Acetonitrile
 B conc. 20 → 50% 30min Linear gradient
 Flow rate: 1.0 ml/min
 Temperature: 30°C
 Detection: UV220nm
 Sample: β-Casein Trypsin digest
 Inj. Vol.: 20μl



NACALAI TESQUE, INC

Ordering Information

● COSMOSIL 5C₁₈-AR-II Analytical / Preparative Columns (Particle Size: 5 μm)

Packed Column

I.D. x Length (mm)	Product Number
1.0 × 50	02955-21
1.0 × 150	02951-61
2.0 × 30	05098-71
2.0 × 50	34400-81
2.0 × 100	34469-11
2.0 × 150	37992-51
2.0 × 250	05272-71
3.0 × 100	05791-71
3.0 × 150	38028-61
3.0 × 250	38029-51
4.6 × 30	05877-61
4.6 × 50	38142-51
4.6 × 100	38143-41
4.6 × 150*	38144-31
4.6 × 150 3 Lots Set*	09396-83

I.D. x Length (mm)	Product Number
4.6 × 250*	38145-21
6.0 × 150	38146-11
6.0 × 250	38147-01
10 × 50	05369-21
10 × 100	07800-81
10 × 150	34350-41
10 × 250	38149-81
20 × 50	34479-81
20 × 100	08059-91
20 × 150	34316-01
20 × 250	38150-41
28 × 100	16584-51
28 × 150	16585-41
28 × 250	34362-91

Guard Column / Guard Cartridge

I.D. x Length (mm)	Product Number
4.6 × 10 Cartridge†	38008-89
10 × 20	38148-91
20 × 20	34458-51
28 × 50	34363-81

* Columns for validation

† 3 cartridges included. Guard cartridge holder required; refer to page 78.

● COSMOSIL 15C₁₈-AR-II Preparative Columns (Particle Size: 15 μm)

Packed Column

I.D. x Length (mm)	Product Number
28 × 250	37978-51

I.D. x Length (mm)	Product Number
50 × 250	38058-71
50 × 500	05884-61

Guard Column

I.D. x Length (mm)	Product Number
28 × 50	38030-11
50 × 50	38057-81

● COSMOSIL 3C₁₈-AR-II Fast LC Columns (Particle Size: 3 μm)

Packed Column

I.D. x Length (mm)	Product Number
2.0 × 50	05478-91
2.0 × 75	34471-61
2.0 × 100	06941-71
2.0 × 150	07583-41
3.0 × 250	16864-81

I.D. x Length (mm)	Product Number
4.6 × 50	38069-31
4.6 × 75	13362-41
4.6 × 100	38070-91
4.6 × 150	06887-01
4.6 × 250	19391-81

Guard Cartridge

I.D. x Length (mm)	Product Number
4.6 × 10 Cartridge*	21231-14

* 2 cartridges included. Guard cartridge holder required; refer to page 78.