





- General description of the COSMOSIL/COSMOGEL packing materials
- COSMOSIL Silica Packing Material
- Performance Guarantee
- Column Selection Guide
- COSMOSIL Chromatogram Index
- COSMOSIL Application Data
- USP specifications

[Download Cosmosil Catalog](#)

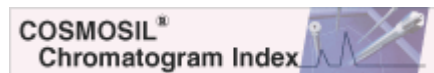
Material characteristics

Packing material	C ₁₈ -MS-II	C ₁₈ -AR-II	C ₁₈ -PAQ
Silica gel	high purity porous spherical silica		
Average particle size	3 • 5 • 15 µm		5 • 15 µm
Average pore size	approx. 120Å		
Specific surface area	approx. 300 m ² /g		
Stationary phase			
	octadecyl group		
Bonding type	monomeric	polymeric	
Main interaction	hydrophobic interaction		
End capping treatment	near-perfect treatment		
Carbon content	approx. 16%	approx. 17%	approx. 11%

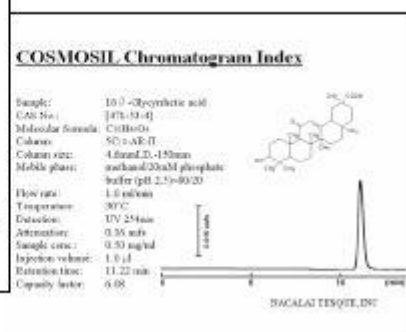
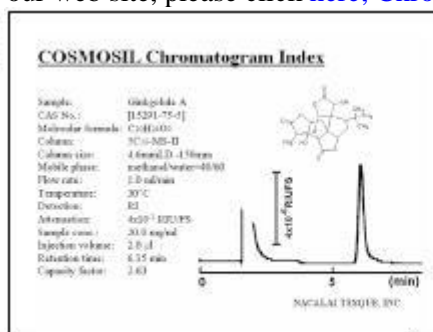
pH range	2-10*	1.5-7.5*	2-7.5
Feature	This phase is recommended for most applications but particularly effective for basic compounds.	This phase is recommended for separations requiring acidic mobile phase conditions. It also shows superior molecular shape selectivity to monomeric type C ₁₈ columns.	This phase is designed to offer superior retention of polar compounds and excellent reproducibility in highly aqueous mobile phases, even in 100% aqueous.

* Optimum pH range of columns based on silica gel is between 2 and 7.5.

COSMOSIL Chromatogram Index



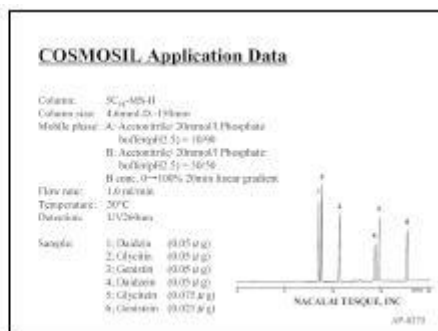
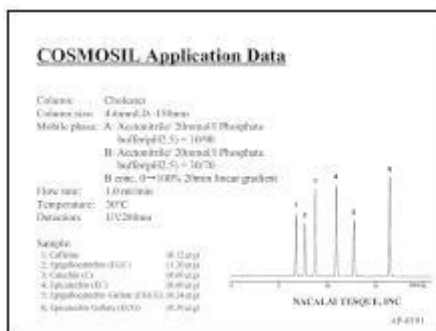
More than 5,700 single compound elution profiles with full chromatographic condition description are available. They are not only an incredible help for chromatographers, but also can be used as references in choosing conditions for similar compounds. These data are available at our web site, please click [here](#); Chromatogram Index.



• COSMOSIL Application Data



COSMOSIL Application Data is now available on our website. The online version includes more than 1,000 application data using COSMOSIL columns. The online data are searchable by name of sample and column. If you have any questions regarding the application data or separations of compounds not listed here, please feel free to e-mail us at info.intl@nacalai.com

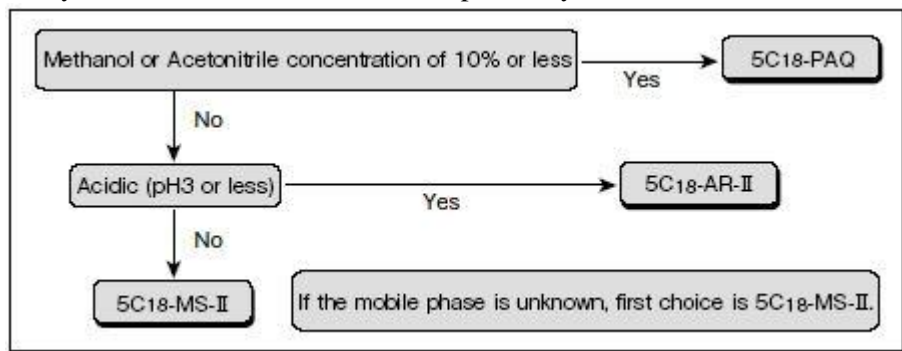


• Application data of substances in Japanese Pharmacopoeia, 15th version (222 data)

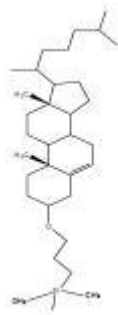
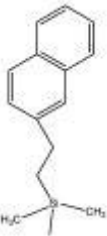
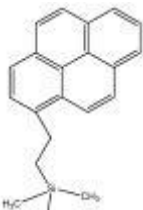


We prepare data of drugs using three kinds of C₁₈ columns that are specified in HPLC analysis in Application Data of Substances in Japanese Pharmacopoeia, 15th version. please click [here](#).

Column selection by mobile phase

- If a mobile phase is determined, use the following chart to select an appropriate COSMOSIL column.
- Refer to application data above for choosing a mobile phase of new analysis.
- Adjustment of pH is required for dissociative compounds.
- Generally acidic mobile phase is suitable for acidic compounds, and neutral mobile phase is suitable for basic compounds.
- If you are not sure about the mobile phase, try C₁₈-MS-II first.

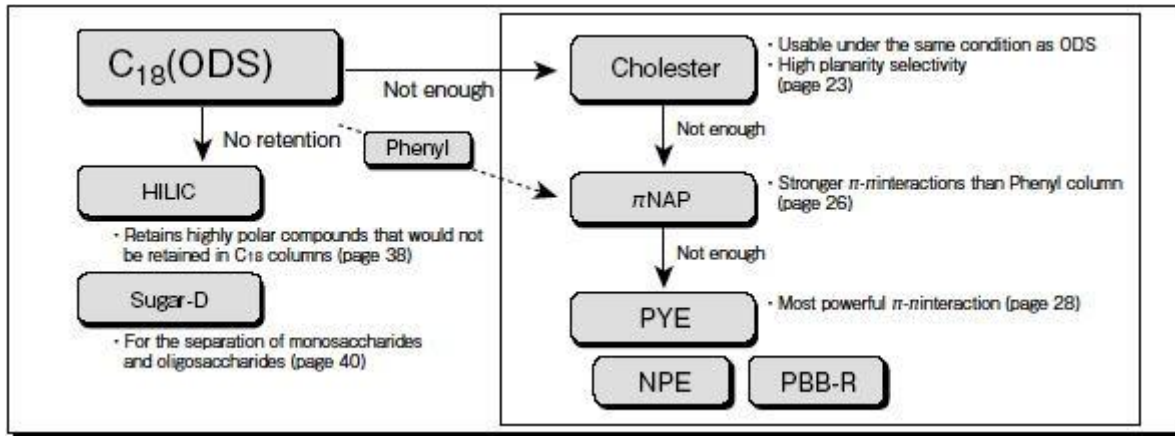


Material characteristics

Packing material	Cholester	π NAP	PYE	NPE	PBB-R
Silica gel	high purity porous spherical silica				
Average particle size	5 μ m				
Average pore size	approx. 120Å				
Specific surface area	approx. 300 m ² /g				
Stationary phase	 Cholesteryl group	 Naphtylethyl group	 Pyrenylethyl group	 Nitophenylethyl group	 Pentabromobenzyl group
Bonding type	monomeric				
Main interaction	- hydrophobic interaction - molecular shape selectivity	-hydrophobic interaction - π - π interaction	-hydrophobic interaction - π - π interaction -dispersion force -charge-transfer interaction	-hydrophobic interaction - π - π interaction -dipole-dipole interaction	-hydrophobic interaction -dispersion force
End capping treatment	near-perfect treatment				

Carbon content	approx. 20%	approx. 11%	approx. 18%	approx. 9%	approx. 8%
Feature	Usable under condition the same as C ₁₈ High molecular sharp selectivity	Stronger π - π interaction than Phenyl column	Strongest π - π interaction	Dipole-Dipole interaction	Dispersion force interaction

Column selection guide



- COSMOSIL Cholester
- COSMOSIL π NAP
- COSMOSIL PYE
- COSMOSIL NPE
- COSMOSIL PBB-R

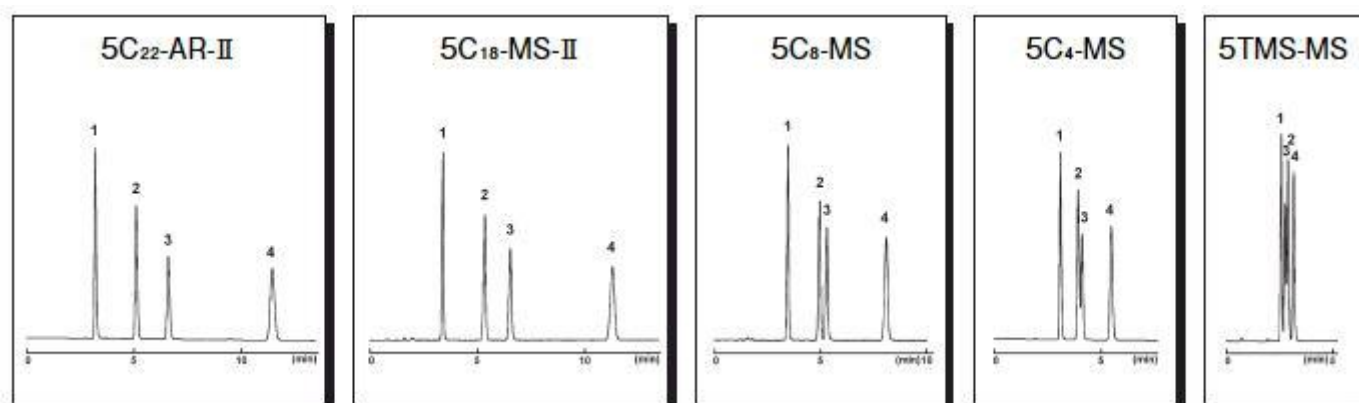
Material characteristics

Packing material	C ₂₂ -AR-II	C ₁₈ -MS-II	C ₈ -MS	C ₄ -MS	TMS-MS
Silica gel	high purity porous spherical silica				
Average particle size	5 μ m				
Average pore size	approx. 120 Å				
Specific surface area	approx. 300 m ² /g				
Stationary phase					
	dococyl group	octadecyl group	octyl group	butyl group	trimethyl group

Bonding type	polymeric	monomeric			
Main interaction	hydrophobic interaction				
End capping treatment	near-perfect treatment				
Carbon content	approx. 19%	approx. 16%	approx. 10%	approx. 7%	approx. 5%

Effect of alkyl chain length on reversed phase

The shorter alkyl chain stationary phase shows shorter retention time for non-polar compounds such as benzene and toluene and longer retention for polar compounds such as acetophenone and benzoate.



Condition

Column size	4.6 mm I.D. x 150 mm	Sample	1. Acetophenone 0.05 µg
Mobile phase	methanol : water = 60 : 40		2. Methyl Benzoate 0.5 µg
Flow rate	1.0 ml/min		3. Benzene 2.0 µg
Temperature	30 °C		4. Toluene 2.0 µg
Detection	UV 254 nm		

Ordering information

· Analytical and preparative column (Particle size : 5 µm)

COSMOSIL 5C₂₂-AR-II

Product name	Size	Product No.
COSMOSIL 5C ₂₂ -AR-II Guard Column	4.6 mm I.D. x 10 mm	04881-21

	10 mm I.D. x 20 mm	05554-81
COSMOSIL 5C ₂₂ -AR-II Packed Column	4.6 mm I.D. x 50 mm	05848-41
	4.6 mm I.D. x 100 mm	05849-31
	4.6 mm I.D. x 150 mm	04598-51
	4.6 mm I.D. x 250 mm	04599-41
	6.0 mm I.D. x 150 mm	05850-91
	6.0 mm I.D. x 250 mm	05851-81
	10 mm I.D. x 250 mm	04969-91
	20 mm I.D. x 250 mm	05183-41

COSMOSIL 5C₈-MS

Product name	Size	Product No.
COSMOSIL 5C ₈ -MS Guard Column	4.6 mm I.D. x 10 mm	38151-31
	10 mm I.D. x 20 mm	38152-21
COSMOSIL 5C ₈ -MS Packed Column	4.6 mm I.D. x 50 mm	38153-11
	4.6 mm I.D. x 100 mm	38154-01
	4.6 mm I.D. x 150 mm	38155-91
	4.6 mm I.D. x 250 mm	38156-81
	6.0 mm I.D. x 150 mm	38157-71
	6.0 mm I.D. x 250 mm	38158-61
	10 mm I.D. x 250 mm	38159-51
	20 mm I.D. x 250 mm	38160-11

COSMOSIL 5C₄-MS

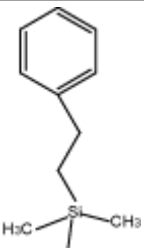
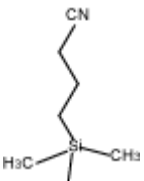
Product name	Size	Product No.
COSMOSIL 5C ₄ -MS Guard Column	4.6 mm I.D. x 10 mm	38161-01
	10 mm I.D. x 20 mm	38162-91
COSMOSIL 5C ₄ -MS Packed Column	4.6 mm I.D. x 50 mm	38163-81
	4.6 mm I.D. x 100 mm	38164-71
	4.6 mm I.D. x 150 mm	38165-61
	4.6 mm I.D. x 250 mm	38166-51

	6.0 mm I.D. x 150 mm	38167-41
	6.0 mm I.D. x 250 mm	38168-31
	10 mm I.D. x 250 mm	38169-21
	20 mm I.D. x 250 mm	38170-81

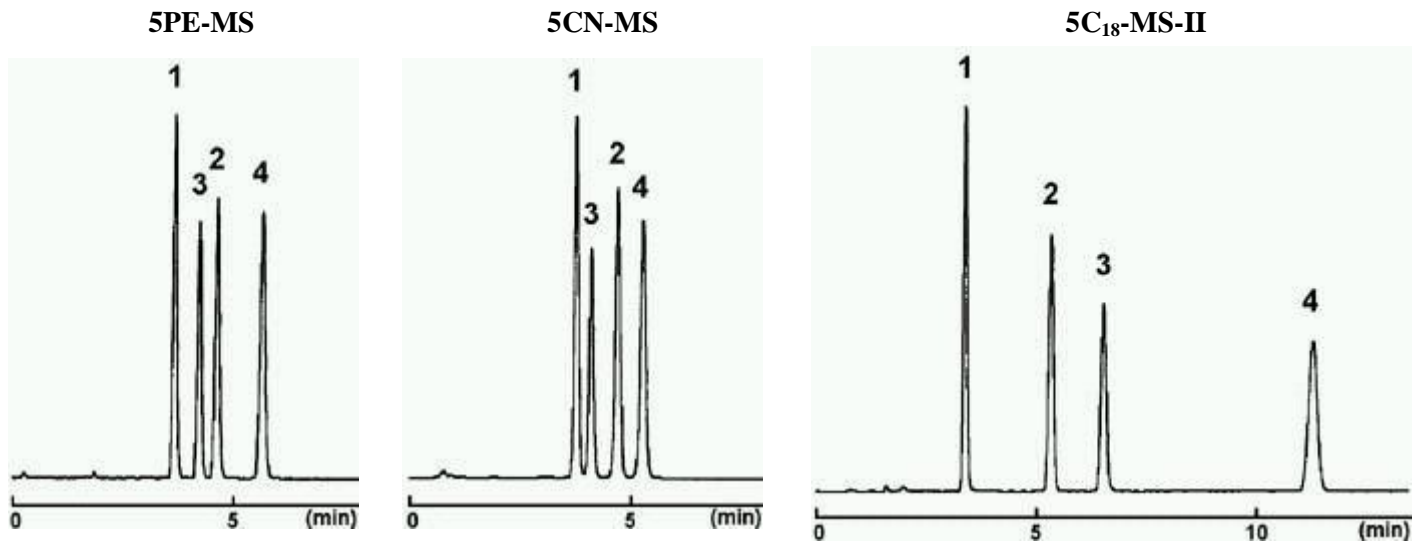
COSMOSIL 5TMS-MS

Product name	Size	Product No.
COSMOSIL 5TMS-MS Guard Column	4.6 mm I.D. x 10 mm	38171-71
	10 mm I.D. x 20 mm	38172-61
COSMOSIL 5TMS-MS Packed Column	4.6 mm I.D. x 50 mm	38173-51
	4.6 mm I.D. x 100 mm	38174-41
	4.6 mm I.D. x 150 mm	38175-31
	4.6 mm I.D. x 250 mm	38176-21
	6.0 mm I.D. x 150 mm	38177-11
	6.0 mm I.D. x 250 mm	38178-01
	10 mm I.D. x 250 mm	38179-91
	20 mm I.D. x 250 mm	38180-51

Material characteristics

Packing material	PE-MS	CN-MS
Silica gel	high purity porous spherical silica	
Average particle size	5 μm	
Average pore size	approx. 120 \AA	
Specific surface area	approx. 300 m^2/g	
Stationary phase		
	phenylethyl group	cyanopropyl group
Bonding type	monomeric	
Main interaction	hydrophobic interaction / π - π interaction	
End capping treatment	near-perfect treatment	
Carbon content	approx. 10%	approx. 7%

Application data



Condition

Column size	4.6 mm I.D. x 150 mm
Mobile phase	5PE-MS methanol : water = 60 : 40 5CN-MS methanol : water = 40 : 60 5C ₁₈ -MS-II methanol : water = 60 : 40
Flow rate	1.0 ml/min
Temperature	30 °C
Detection	UV 254 nm

Sample	1. Acetophenone 0.05 µg 2. Methyl Benzoate 0.5 µg 3. Benzene 2.0 µg 4. Toluene 2.0 µg
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Ordering information

· Analytical and preparative column (Particle size : 5 µm)

COSMOSIL 5PE-MS

Product name	Size	Product No.
COSMOSIL 5PE-MS Guard Column	4.6 mm I.D. x 10 mm	38181-41
	10 mm I.D. x 20 mm	38182-31
COSMOSIL 5PE-MS Packed Column	4.6 mm I.D. x 50 mm	38183-21
	4.6 mm I.D. x 100 mm	38184-11
	4.6 mm I.D. x 150 mm	38185-01
	4.6 mm I.D. x 250 mm	38186-91
	6.0 mm I.D. x 150 mm	38187-81
	6.0 mm I.D. x 250 mm	38188-71
	10 mm I.D. x 250 mm	38189-61
	20 mm I.D. x 250 mm	38190-21

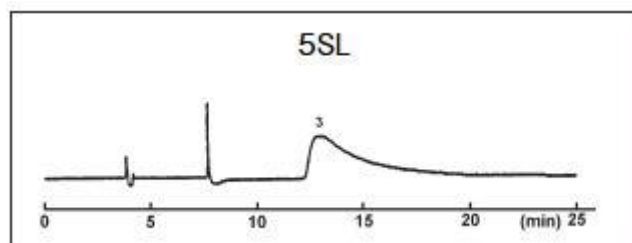
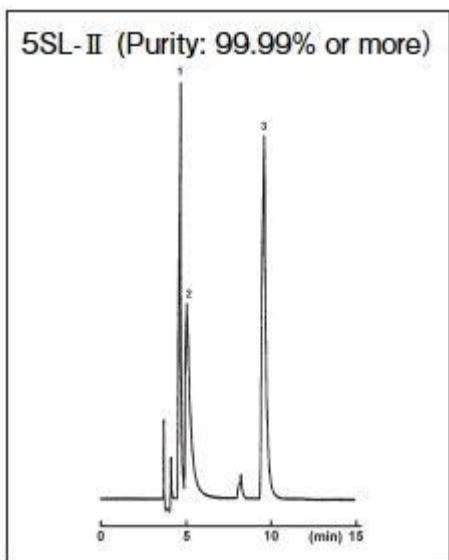
COSMOSIL 5CN-MS

Product name	Size	Product No.
COSMOSIL 5CN-MS Guard Column	4.6 mm I.D. x 10 mm	38231-81
	10 mm I.D. x 20 mm	38232-71
COSMOSIL 5CN-MS Packed Column	4.6 mm I.D. x 50 mm	38233-61
	4.6 mm I.D. x 100 mm	38234-51
	4.6 mm I.D. x 150 mm	38235-41
	4.6 mm I.D. x 250 mm	38236-31
	6.0 mm I.D. x 150 mm	38237-21
	6.0 mm I.D. x 250 mm	38238-11
	10 mm I.D. x 250 mm	38239-01
	20 mm I.D. x 250 mm	38240-31

Material characteristics

Packing material	SL-II
Silica gel	high purity porous spherical silica
Average particle size	3, 5, 15 μm
Average pore size	approx. 120 \AA
Specific surface area	approx. 300 m^2/g
Feature	<ul style="list-style-type: none">• High purity Silica Gel (>99.99%) with specially treatment• Suitable for preparative separation

Analysis of acids and amide without ionic additives



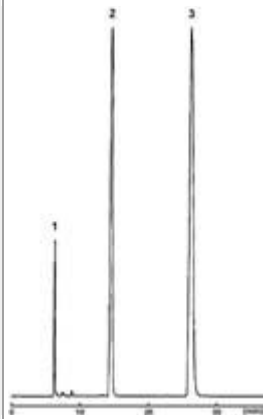
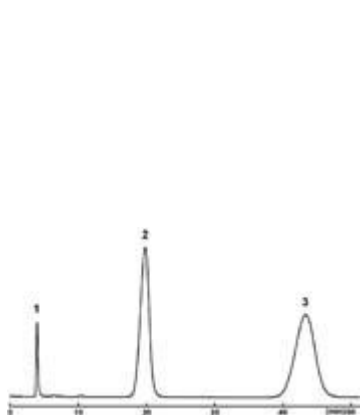
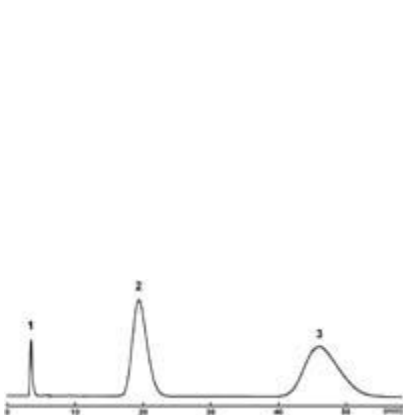
Condition

Column size 4.6 mm I.D. × 250 mm
Mobile phase methanol : hexane = 10 : 90
Flow rate 1 ml/min
Temperature 30 °C
Detection UV 254 nm, 0.5AUFS

Sample 1. Benzoic Acid 4.0 µg
2. Salicylic Acid 6.0 µg
3. Salicylamide 4.0 µg

Comparison with medium-pressure columns

COSMOSIL SL-II offers sharper peak compared with packing materials for medium-pressure liquid chromatography and open chromatography.

Column	5SL-II	A company cartridge (30 µm silica gel)	B company cartridge (60 µm silica gel)
Column size	20 mm I.D. × 250 mm	26 mm I.D. × 104 mm	26 mm I.D. × 104 mm
Pressure	1.3 MPa	0.25 MPa	0.15 MPa
Chromatogram			

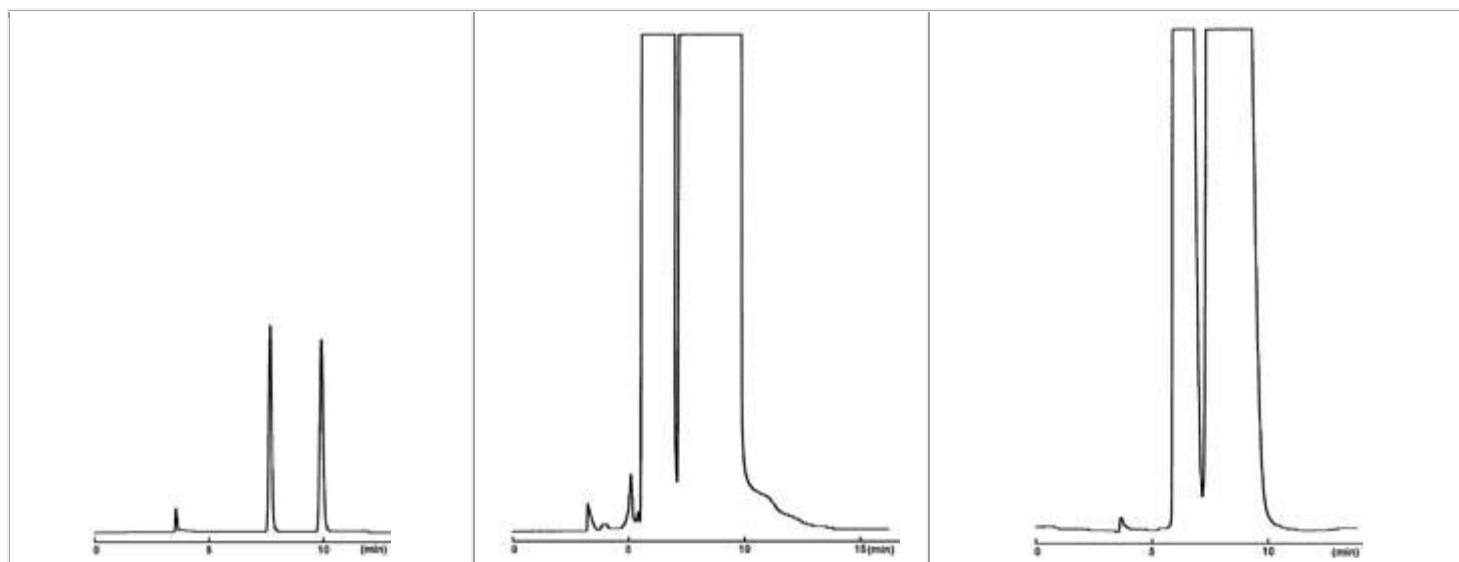
Condition

Mobile phase ethanol : hexane = 5 : 95
Flow rate 10 ml/min
Temperature room temperature
Detection UV 254 nm

Sample 1. *p*-Xylene 8.3 mg
2. Cinnamyl Alcohol 1.7 mg
3. *p*-Nitrobenzyl Alcohol 4.2 mg

Scaling up from analytical to preparative separation

Step 1	Step 2	Step 3
Mobile phase is optimized by using 4.6 mm I.D. × 250 mm column	Maximum load capacity is optimized by using 4.6 mm I.D. × 250 mm column	Preparative separation by using 20 mm I.D. × 250 mm column
As mobile phase, highly soluble solvent for sample is suitable.	Maximum injection volume 56 µl (28 mg)	Maximum injection volume 1,050 µl (525 mg) (19 times higher than 4.6 mm I.D.)

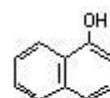


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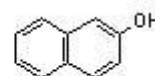
Mobile phase
Flow rate
Temperature
Detection

ethyl acetate : hexane = 10 : 90
4.6 mm I.D. : 1 ml/min
20 mm I.D. : 18.9 ml/min
room temperature
UV 254 nm

Sample 1. 1-Naphthol
2. 2-Naphthol



1-Naphthol



2-Naphthol

Ordering information

· Analytical and preparative column (Particle size : 5 μm)

COSMOSIL 5SL-II

Product name	Size	Product No.
COSMOSIL 5SL-II Guard Column	4.6 mm I.D.×10 mm	37997-01
	10 mm I.D.×20 mm	37998-91
	20 mm I.D.×20 mm	05874-91
	20 mm I.D.×50 mm	05875-81
	28 mm I.D.×50 mm	34359-51
COSMOSIL 5SL-II Packed Column	4.6 mm I.D.×50 mm	37999-81
	4.6 mm I.D.×100 mm	38000-01
	4.6 mm I.D.×150 mm	38001-91
	4.6 mm I.D.×250 mm	38002-81
	6.0 mm I.D.×150 mm	38003-71
	6.0 mm I.D.×250 mm	38004-61
	10 mm I.D.×250 mm	38005-51
	20 mm I.D.×250 mm	38006-41
	28 mm I.D.×250 mm	34358-61

· Preparative column (Particle size : 15 µm)

COSMOSIL 15SL-II

Product name	Size	Product No.
COSMOSIL 15SL-II Guard Column	28 mm I.D.×50 mm	05892-51
	50 mm I.D.×50 mm	05894-31
COSMOSIL 15SL-II Packed Column	28 mm I.D.×250 mm	05893-41
	50 mm I.D.×250 mm	05895-21
	50 mm I.D.×500 mm	05896-11

· Fast LC column (Particle size : 3 µm)

COSMOSIL 3SL-II

Product name	Size	Product No.
COSMOSIL 3SL-II Packed Column	4.6 mm I.D.×10 mm	38059-61
	4.6 mm I.D.×50 mm	38060-21
	4.6 mm I.D.×100 mm	38061-11

International Co. for Lab. Instruments

45 Shalhoub st. Ain Shams, Cairo, Egypt Post Code 11311



+202 24916139 or +202 24916139



+202 24953441