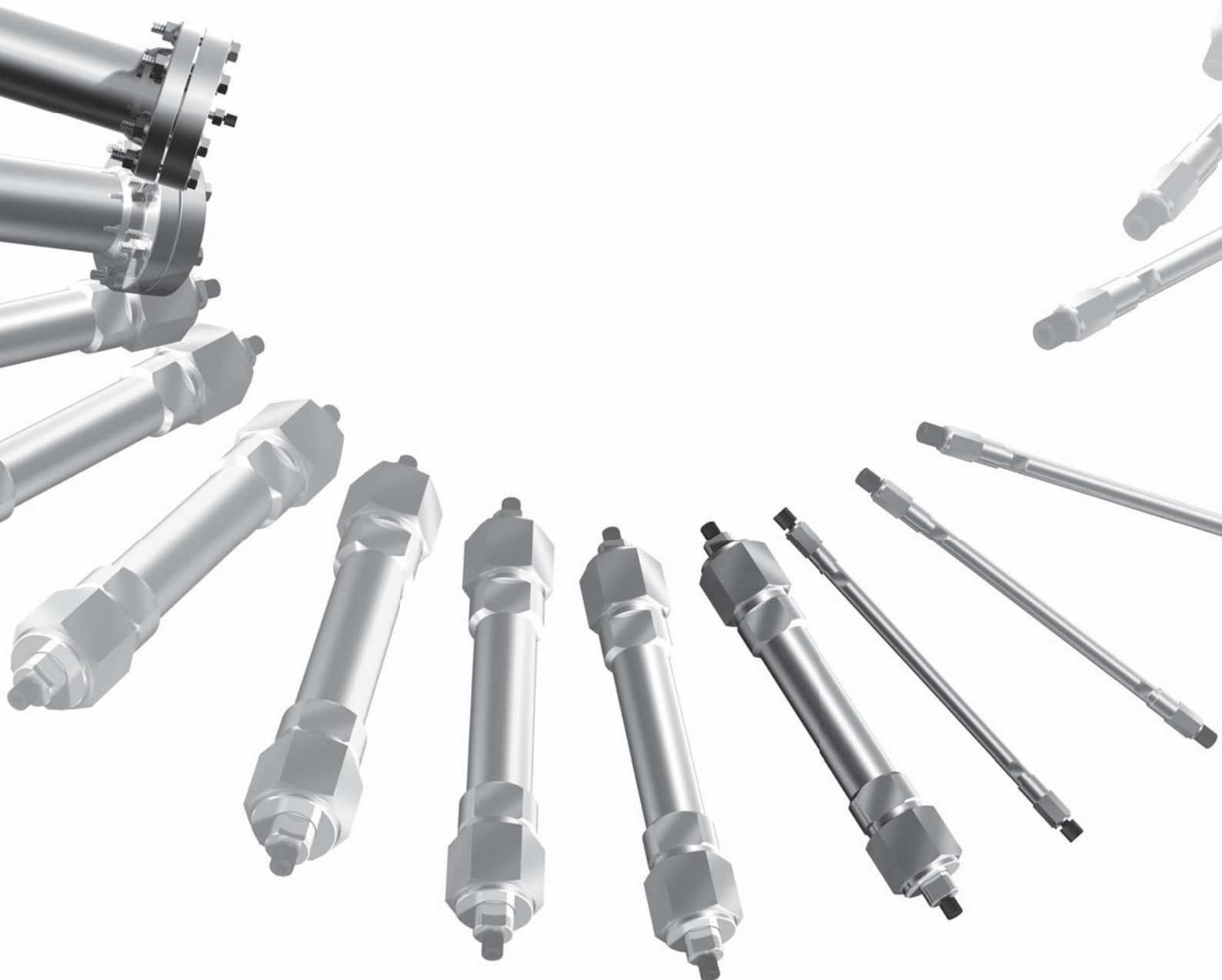




Preparative Packing Materials



1. Normal and Reversed Phase Packing Materials	66
COSMOSIL C ₁₈ -OPN	67
COSMOSIL C ₁₈ -PREP	70
COSMOSIL SL-II-PREP	71
Silica Gel (spherical, neutral)	72
Silica Gel (for column chromatograph)	73



1. Normal and Reversed Phase Packing Materials

Introduction

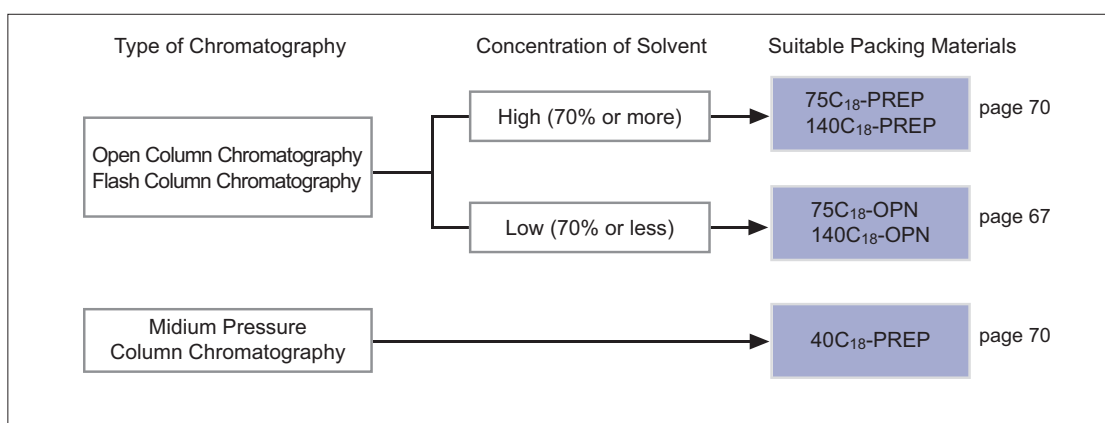
Open column chromatography is an excellent and easy technique for large-scale preparation and purification at low cost. COSMO-SIL offers both normal and reversed phase packing materials based on totally porous spherical silica, which provides higher separation, less pressure and higher reproducibility than irregular silica.

Specifications

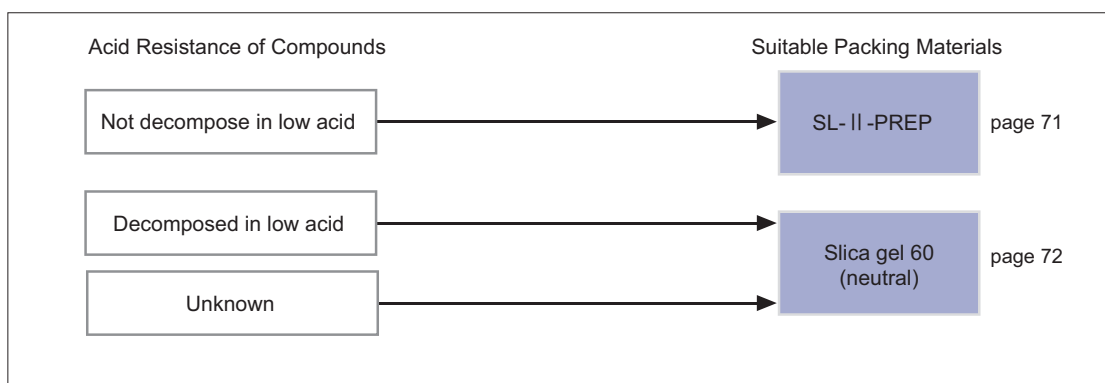
Packing Material	C ₁₈ -OPN	C ₁₈ -PREP	SL-II-PREP	Silica Gel 60 (neutral)
Silica Gel	High Purity Porous Spherical Silica			
Average Particle Size	75, 140 μm	40, 75, 140 μm	75, 140 μm	
Average Pore Size	approx. 120 Å			approx. 60 Å
Specific Surface Area	approx. 300 m ² /g			approx. 500 m ² /g
Bonded Phase	Octadecyl Group		None	
Carbon Load	—	approx. 19%	0%	
Residual Silanol Group	Yes	None	—	
Application	Open Column Chromatography / Flash Column Chromatography			
	Reversed Phase Chromatography		Normal Phase Chromatography	

For more informations on other silica gel, please refer to page 73.

Selection Guide (reversed phase)



Selection Guide (normal phase)



COSMOSIL C₁₈-OPN

- A new “Water-Wet” C₁₈ packing material for reversed phase open column chromatography
- Usable under 100% aqueous eluents

Characteristic

The external surface of the C₁₈-OPN gel is coated with hydrophilic group to increase wettability of the gel, and octadecyl group is bonded in the pore of the gel. Conventional reversed phase C₁₈ packing materials are restricted to about 30–50% water in the mobile phase. The COSMOSIL C₁₈-OPN is a new “Water-Wet” C₁₈ packing material developed for reversed phase open column chromatography. The C₁₈-OPN material can be used in 100% aqueous eluents.

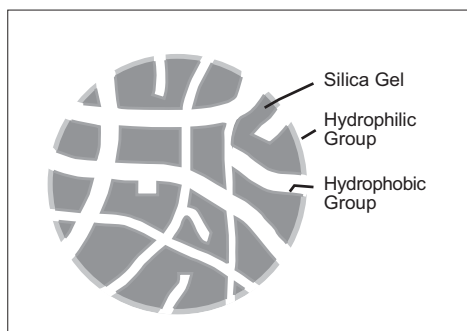


Figure 1. Structure of C₁₈-OPN

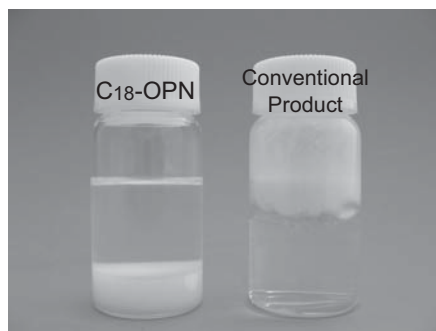
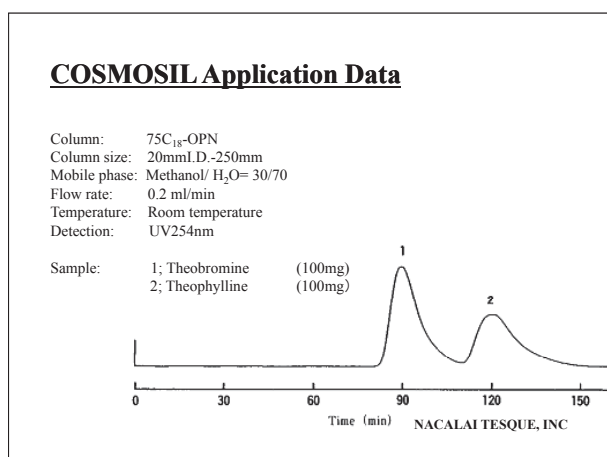


Figure 2. Packing material in water

- Left: C₁₈-OPN provides good resolution
Can be used with low concentration of organic solvent on open, flash column chromatography.
- Right: C₁₈-PREP float up
Use with 70% or more organic solvent on open, flash column chromatography.

Applications

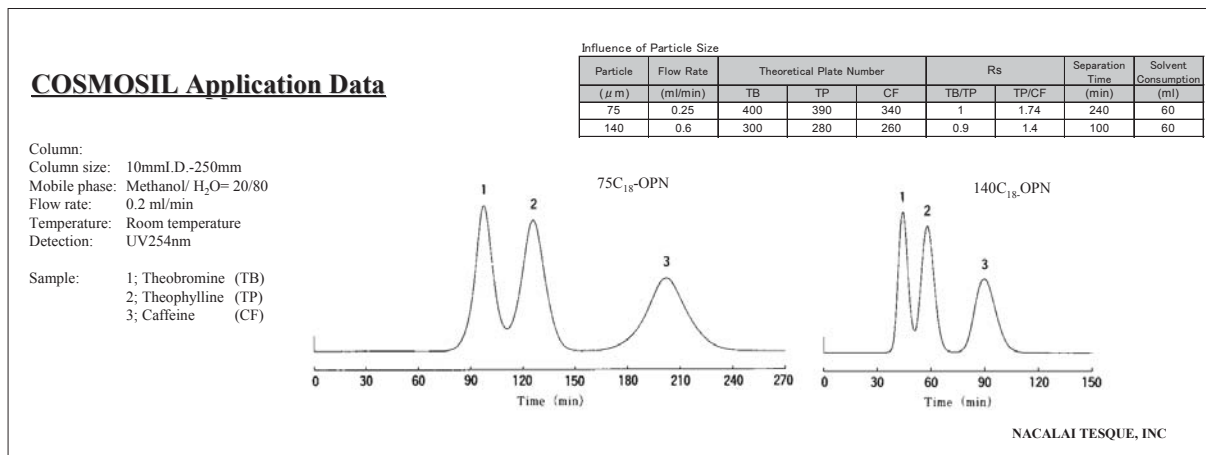
- Separation of hydrophilic compounds in aqueous solution



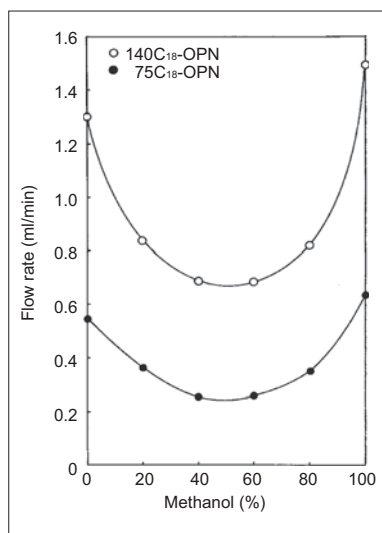
In reversed phase chromatography, hydrophilic compounds such as Theobromine and Theophylline could be separated under low concentration of organic solvent. The figure shows they are clearly separated by reversed open column chromatography with 70% of water.

Influence of Particle Size

The table below shows comparison between 75 μm and 140 μm particle size silica. Although peak shapes and flow rate may differ based on particle size of silica, elution behavior is the same.



Flow Rate



Since reversed phase chromatography generally employs high viscosity solvents such as water and methanol, the flow rate is lower than that of normal phase chromatography. The flow rate of reversed phase depends on the mobile phase composition. The figure left indicates that the flow rate of the COSMOSIL 140 μm -OPN (140 μm in particle size) is about 2.5 times higher than that of the COSMOSIL 75 μm -OPN.

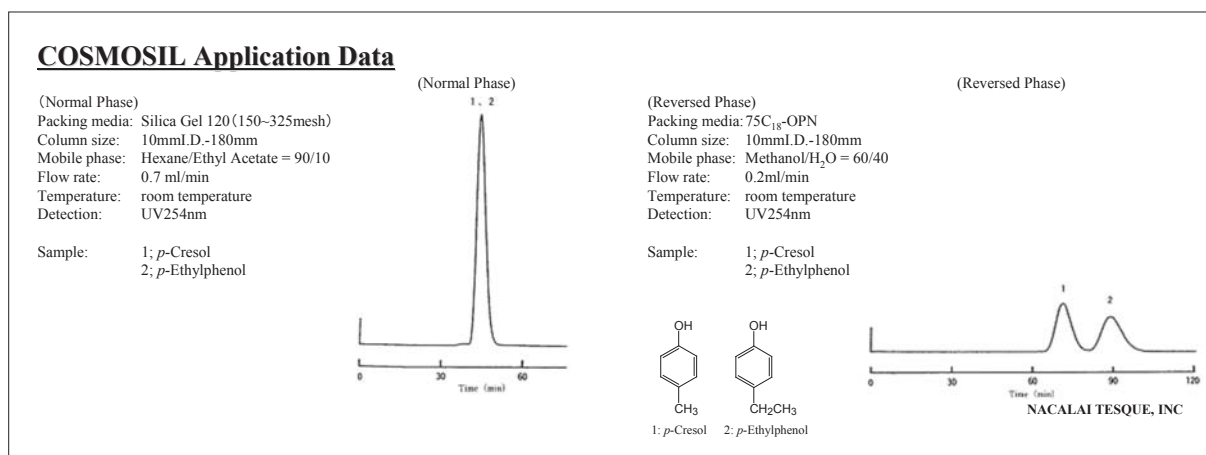
Figure. Concentration of methanol against flow rate

Column size: 10 mm I.D. x 180 mm bed height (gravitational liquid flow)

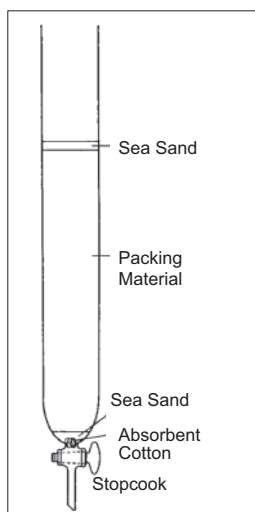
Comparison of Normal Phase

- Separation of *p*-Cresol and *p*-Ethylphenol by normal and reversed phase mode

Since the structural difference between *p*-Cresol and *p*-Ethylphenol is only one methylene group, it is difficult to separate such samples under normal phase condition. On the other hand, the samples are clearly separated under reversed phase condition with COSMOSIL C₁₈-OPN packing material.



Column Packing Instructions



1. Use a standard open glass column, close the stopcock, pack a small amount of absorbent cotton in the bottom of the column and add solvent to approximately 1/3 of the column length.
2. Add a thin layer (5 mm) of sea sand to the surface of the absorbent cotton.
3. Prepare a slurry solution of the packing material (30% w/v) with solvent right before packing. (Make sure to prepare enough slurry solution to form a column bed sufficient to separate the compounds of interest.)
4. Simultaneously open the stopcock and add the slurry solution to the column to form the column bed.
5. After packing the column, wash the newly packed column bed with 5–10 column volumes of solvent. Allow the bed to stabilize overnight in solvent.
6. Add a thin layer (5 mm) of sea sand to the top of the bed in order to prevent disturbance of the top of the column bed during sample or solvent addition.

Column Size and Required Amount of Packing Material

Table. Column size and required amount of C₁₈-OPN packing material

Column I.D. (mm)	Bed Height (mm)	Amount of C ₁₈ -OPN (g)
10	150	4
	250	7
20	150	17
	250	28
30	150	38
	250	63

Reproducibility and Washing Methods

Wash the COSMOSIL C₁₈-OPN packing material with tetrahydrofuran, chloroform or other solvents to remove the impurities. This packing material has excellent reproducibility and can be used repeatedly.

“Attention”

1. Do not wash with basic solvents of pH 7 or more which will dissolve the silica gel or pH 2 or less which will cleave the C₁₈ stationary phase.
2. Dry the packing material at 50°C or less.

Ordering Information

● COSMOSIL C₁₈-OPN

Product Name	Average Particle Size	Product Number	PKG Size
COSMOSIL 75C ₁₈ -OPN	75µm	37842-66	100 g
		37842-95	500 g
		37842-11	1 kg
COSMOSIL 140C ₁₈ -OPN	140µm	37878-16	100 g
		37878-45	500 g
		37878-61	1 kg

COSMOSIL C₁₈-PREP

- Standard reversed phase packing material for open chromatography
- End-capping treated
- 3 types of particle size (40, 75, 140 μm)

Particle Size, Flow Rate and Theoretical Plate Number

Because reversed phase chromatography employs mobile phase of high viscosity such as methanol and water, the flow rate is lower than that of normal phase chromatography, which uses mobile phase of low viscosity such as hexane and ethyl acetate.

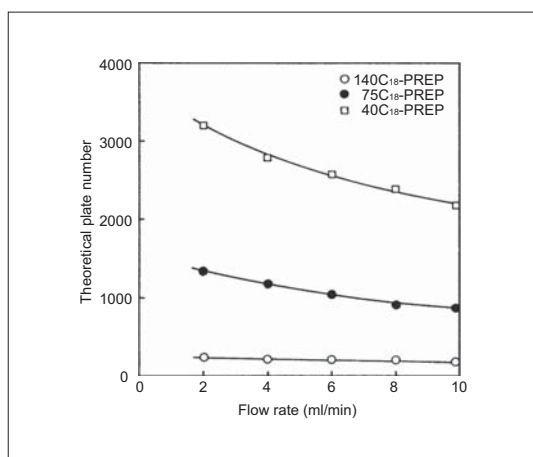


Figure 1. Flow rate against theoretical plate number
Column size: 20 mm I.D. x 300 mm

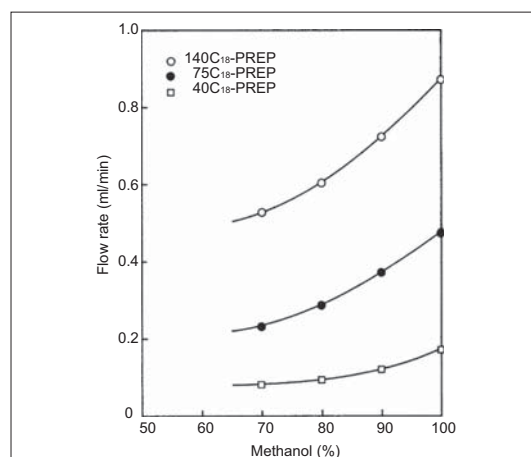
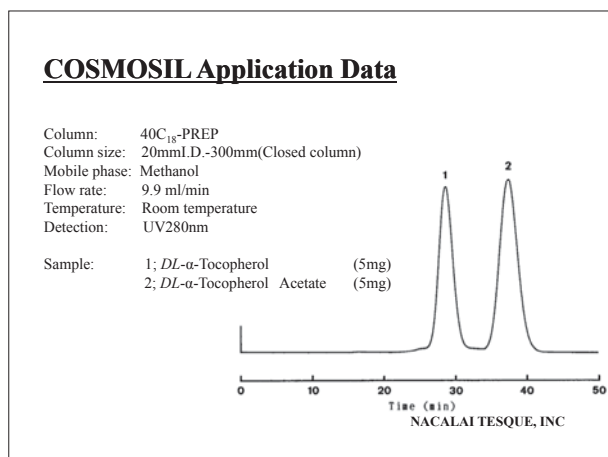


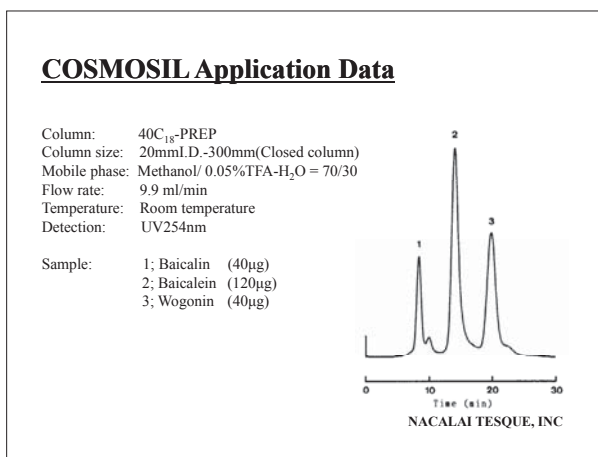
Figure 2. Concentration of methanol against flow rate
Column size: 10 mm I.D. x 180 mm bed height
(gravitational liquid flow)

Applications

- Vitamin E



- Natural Compounds



Ordering Information

- COSMOSIL C₁₈-PREP

Product Name	Average Particle Size	Product Number	PKG Size
COSMOSIL 40C ₁₈ -PREP	40 μm	37932-86	100 g
		37932-15	500 g
		37932-31	1 kg
COSMOSIL 75C ₁₈ -PREP	75 μm	37933-76	100 g
		37933-05	500 g
		37933-21	1 kg
COSMOSIL 140C ₁₈ -PREP	140 μm	37934-66	100 g
		37934-95	500 g
		37934-11	1 kg

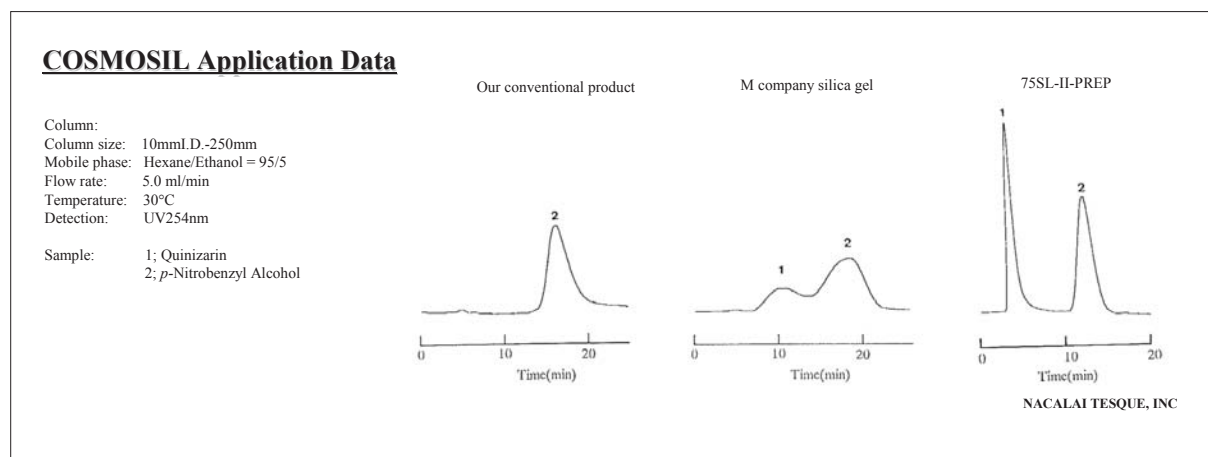
COSMOSIL SL-II-PREP

- Standard packing materials for normal phase chromatography
- Ultra pure silica gel packing material more than 99.99% purity

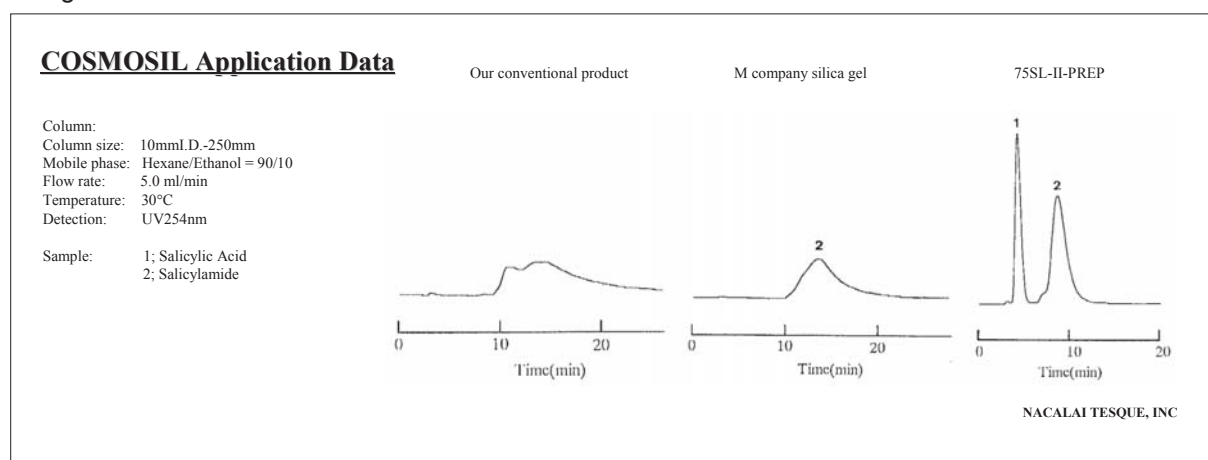
Performance for Chelating Compounds

Highly purified silica gel of COSMOSIL SL-II-PREP enables separation of metal coordination compounds without adsorption.

• Metal Coordination Compounds



• Organic Acid and Amide



Ordering Information

• COSMOSIL SL-II-PREP

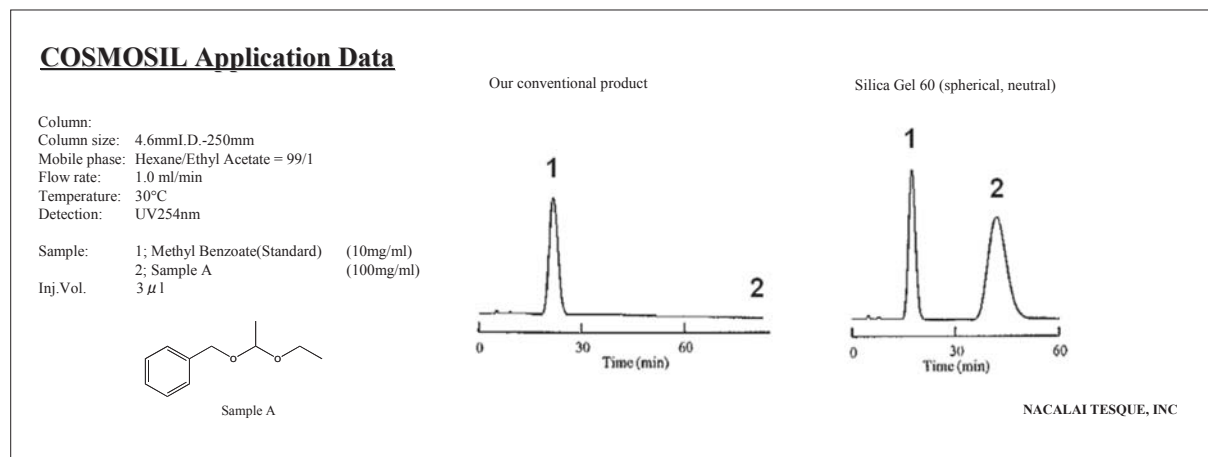
Product Name	Average Particle Size	Product Number	PKG Size
COSMOSIL 75SL-II-PREP	75 μm	38012-64	100 g
		38012-35	500 g
		38012-51	1 kg
COSMOSIL 140SL-II-PREP	140 μm	38013-54	100 g
		38013-41	1 kg

Silica Gel (spherical, neutral)

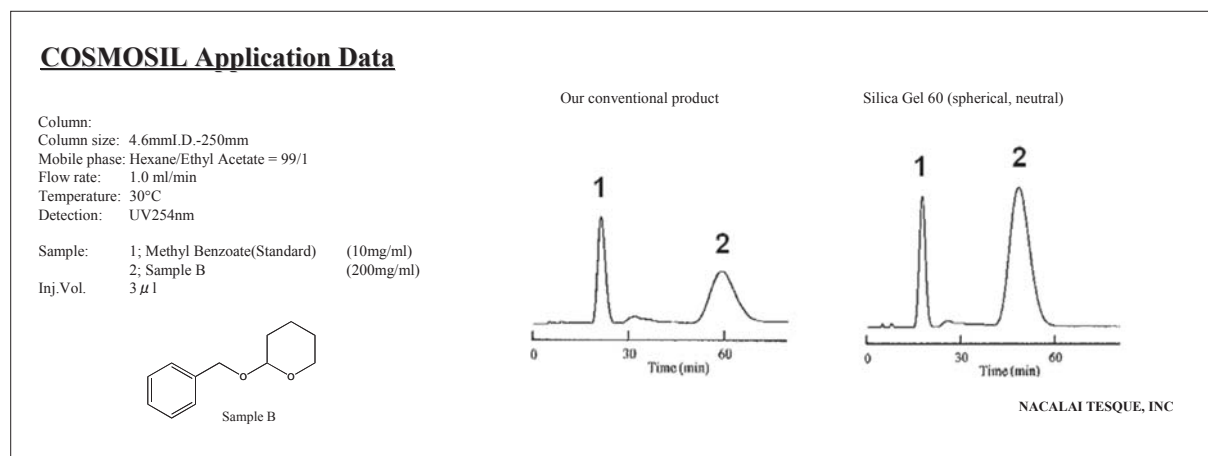
- The pH of Silica Gel is adjusted to neutral
- Suitable for the separation of pH sensitive compounds

Comparison with Conventional Silica Gel

- Purification of Acetal -1



- Purification of Acetal -2



Ordering Information

- Silica gel 60 (spherical, neutral)

Product Name	Average Particle Size	Product Number	PKG Size
Silica Gel 60 (spherical, neutral) for Column Chromatograph	75 µm	30511-64	100 g
		30511-35	500 g
		30511-51	1 kg
		30511-06	5 kg
		30511-22	25 kg
	140 µm	30518-94	100 g
		30518-65	500 g
		30518-81	1 kg
		30518-52	25 kg

Silica Gel (for column chromatograph)

Ordering Information

• Silica Gel (spherical)

Product Name	Particle Size	Pore Size	Grade	Product Number	PKG Size
Silica Gel 60, Spherical	approx. 70 ~ 230 mesh	60 Å	SP	30731-71	1 kg
				30731-42	25 kg
	approx. 150 ~ 325 mesh		SP	30733-51	1 kg
				30733-22	25 kg
Silica Gel 120, Spherical	approx. 70 ~ 230 mesh	120 Å	SP	30734-41	1 kg

• Silica Gel (irregular)

Product Name	Particle Size	Pore Size	Grade	Product Number	PKG Size
Silica Gel 60	approx. 70 ~ 230 mesh	60 Å	SP	30724-55	500 g
				30724-71	1 kg
				30724-84	5 kg
				30724-42	25 kg
	approx. 230 ~ 400 mesh		SP	30721-85	500 g
				30721-01	1 kg
			30721-14	5 kg	