

COSMOSIL

Normal Phase HPLC Column

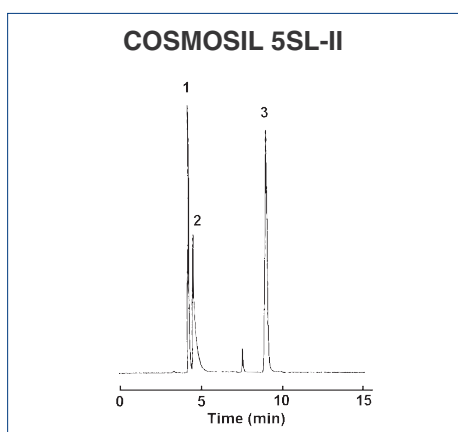
COSMOSIL SL-II

- *High purity silica gel (>99.99%) with special treatment*
- *Suitable for preparative separation*

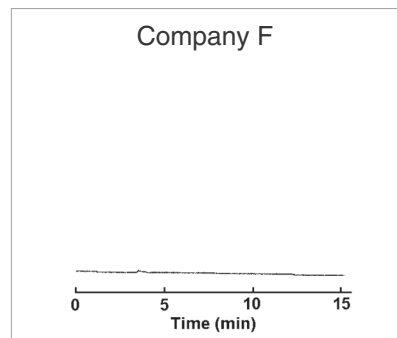
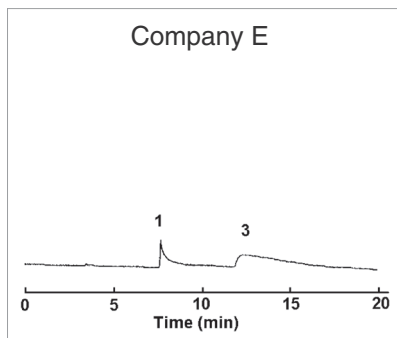
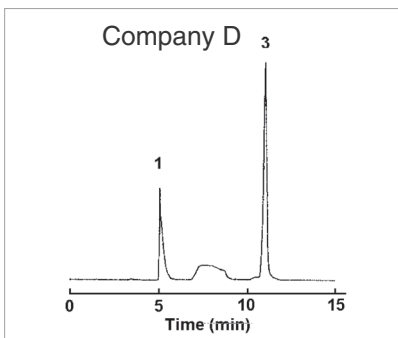
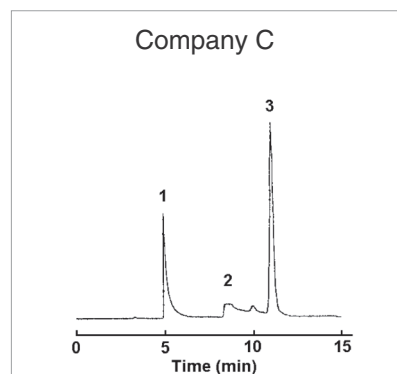
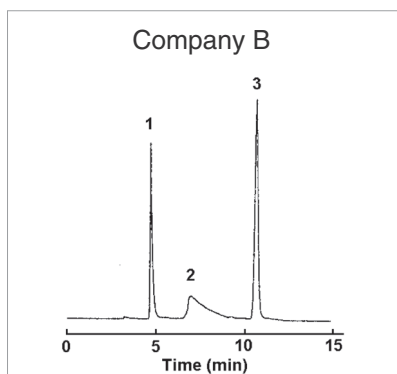
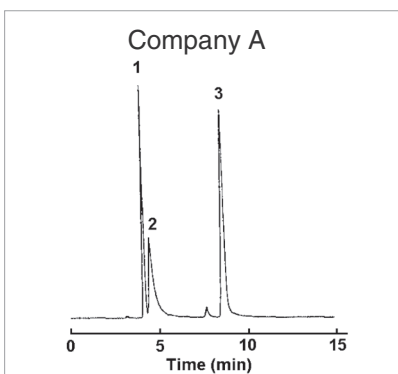
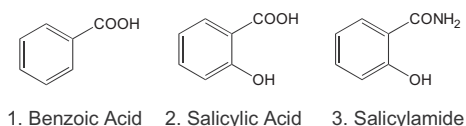


Ultra-pure silica gel of more than 99.99% purity is used for the COSMOSIL SL-II packed column series. This column provides improved separation and reproducibility for compounds with carbonyl or phenol hydroxyl groups, which are often problematic to separate using conventional silica gel columns because of interference of metallic impurities. The followings are applications of COSMOSIL SL-II column on organic acids, acid amides and phenols. COSMOSIL SL-II provides improved separation for these compounds without ionic additives by using mobile phases of hexane and ethanol.

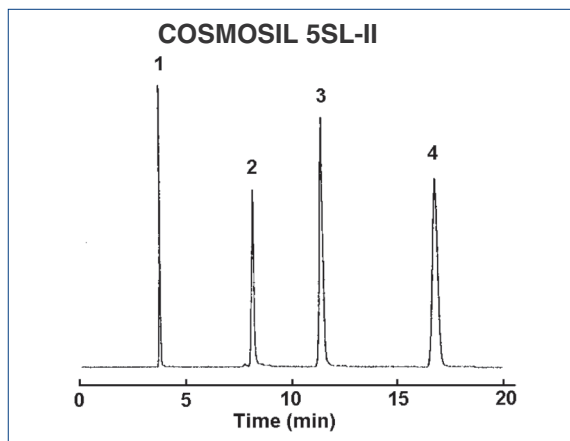
### Comparison with Competitors' Columns in Separation of Organic Acids and Acid Amides



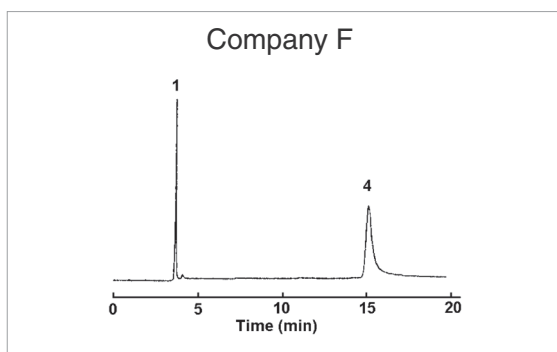
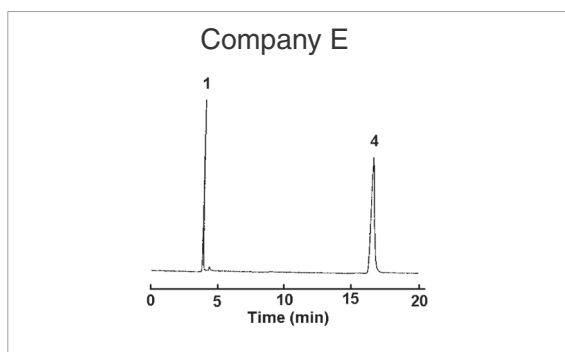
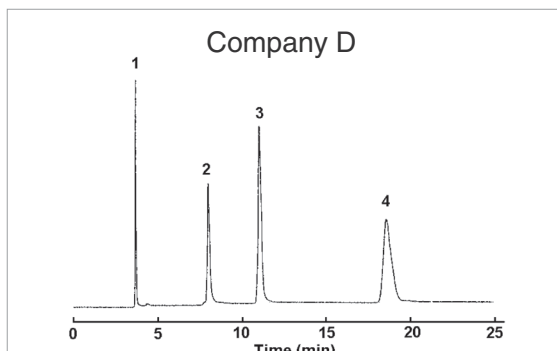
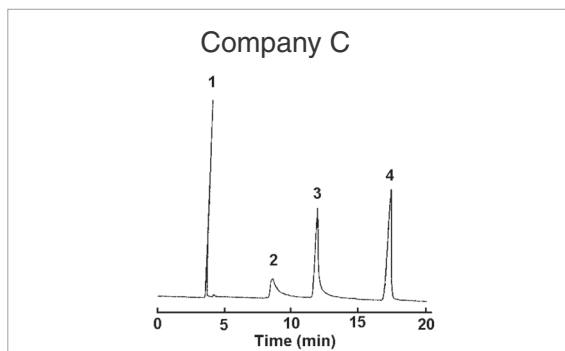
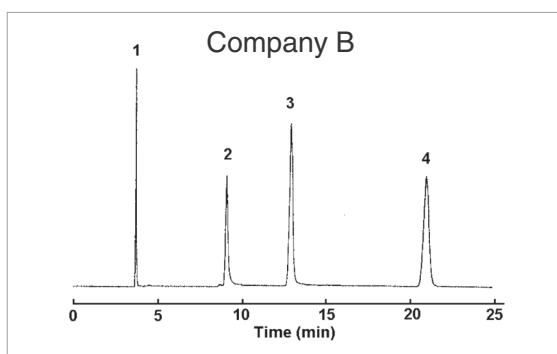
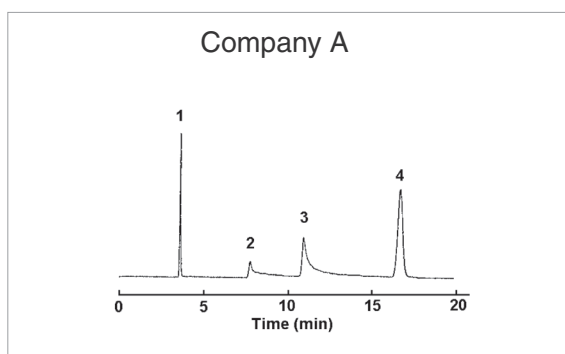
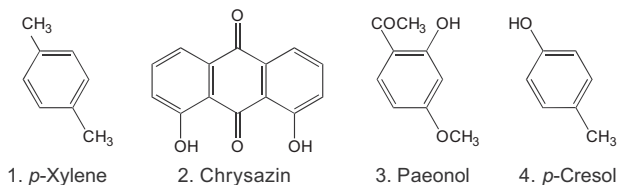
Column Size	4.6 mm I.D. x 250 mm	Sample	1. Benzoic Acid (4.0 µg)
Mobile Phase	Ethanol:Hexane = 10:90		2. Salicylic Acid (6.0 µg)
Flow Rate	1.0 ml/min		3. Salicylamide (4.0 µg)
Temperature	30°C		
Detection	UV 254 nm 0.32 AUFS		



## Comparison with Competitors' Columns in Separation of Phenols



Column Size 4.6 mm I.D. x 250 mm Sample 1. *p*-Xylene (0.004  $\mu$ l)  
 Mobile Phase Ethyl Acetate : Hexane = 5 : 95 2. Chrysazin (0.2  $\mu$ g)  
 Flow Rate 1.0 ml/min 3. Paeonol (0.4  $\mu$ g)  
 Temperature 30°C 4. *p*-Cresol (0.004  $\mu$ l)  
 Detection UV 254 nm 0.16 AUFS

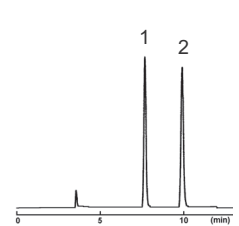
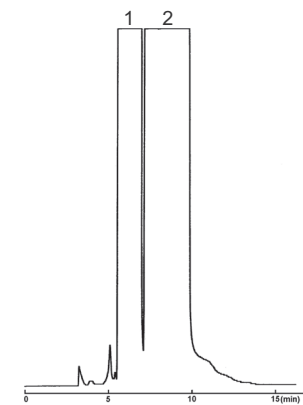
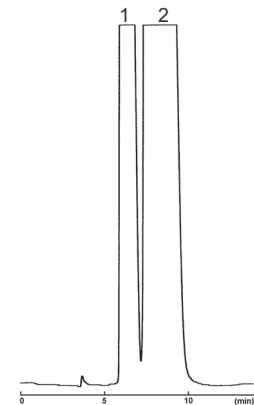
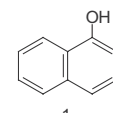


### • Comparison of Purity of Silica Gel with Competitors' columns

Column	Purity of Silica Gel	Particle Size
COSMOSIL SL-II	99.99% and more	5 $\mu$ m
Company A	No guaranteed value (metallic impurities 5 ppm or less)	5 $\mu$ m
Company B	No guaranteed value (high purity)	5 $\mu$ m
Company C	99.999%	5 $\mu$ m
Company D	99.999%	5 $\mu$ m
Company E	No guaranteed value	5 $\mu$ m
Company F	No guaranteed value	5 $\mu$ m

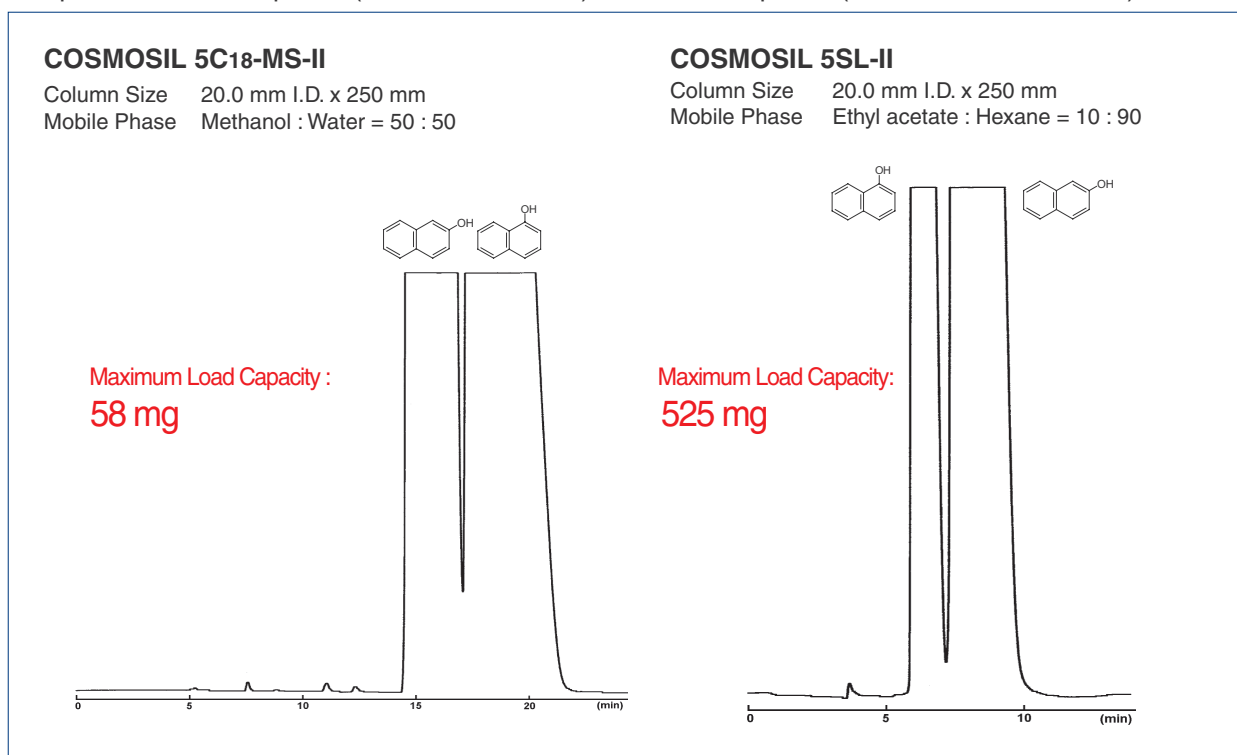
## Scaling up from Analytical to Preparative Separation

Normal phase chromatography, with non-polar mobile phase and low boiling point is used for preparative separation because solvent removal is generally easier for normal phase chromatography than for reversed chromatography. The followings are how to scale up from analytical (4.6 mm I.D.) to preparative (20.0 mm I.D.) separation.

Step 1	Step 2	Step 3
Mobile phase is optimized by using COSMOSIL SL-II (4.6 mm I.D. x 250 mm)	Maximum load capacity is optimized by using COSMOSIL SL-II (4.6 mm I.D. x 250 mm)	Preparative separation by using COSMOSIL SL-II (20.0 mm I.D. x 250 mm)
As mobile phase, highly soluble solvent for sample is suitable.	Maximum injection volume 56 $\mu$ l (28 mg)	Maximum injection volume 1,050 $\mu$ l (525 mg) (19 times higher than 4.6 mm I.D.)
		
Mobile Phase Ethyl Acetate : Hexane = 10 : 90 Flow Rate 4.6 mm I.D. 1.0 ml/min 20.0 mm I.D. 18.9 ml/min Temperature Room Temperature Detection UV 254 nm	Sample 1. 1-Naphthol 2. 2-Naphthol	

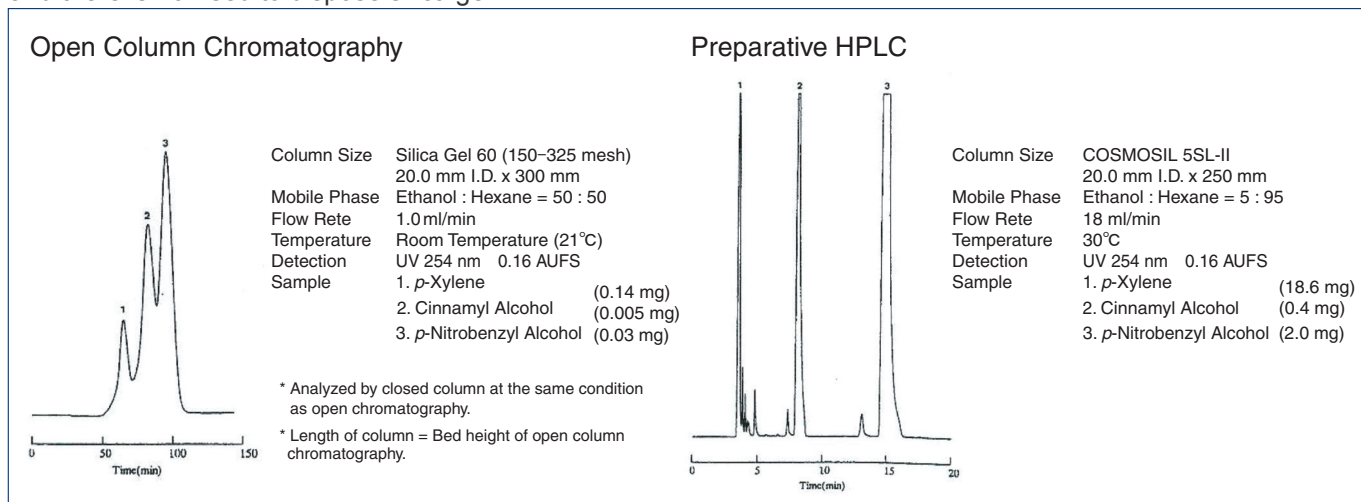
## Preparative Scale Comparison of Normal Phase and Reversed Phase

Normal phase chromatography is more suitable for preparative separation than reversed phase chromatography as larger amount of sample can be loaded in normal phase chromatography. The following are preparative scale comparison of normal phase (COSMOSIL 5SL-II) and reversed phase (COSMOSIL 5C18-MS-II).



## Preparative HPLC as an Alternative Approach to Open Column Chromatography

Open column chromatography has limitations, such as low separations and long separation time. To overcome these disadvantages, preparative HPLC chromatography can be an alternative approach. Preparative HPLC offers high separations and shorter analysis time. Furthermore it is environmentally friendly as it can be used repeatedly and there is no need to dispose silica gel.



	Open Column Chromatography	Preparative HPLC
Separation Capacity (Theoretical Plate Number) <sup>1)</sup>	approx. 200 → <b>100-fold</b> →	approx. 20,000
Preparative Time	approx. 120 min. → <b>1/8</b> →	16 min
The number of use	1 → <b>1/8</b> →	approx. 1,000
Loading Capacity <sup>1)</sup>	0.03 mg → <b>70-fold</b> →	2.0 mg
Repeatability	△	◎
Quantitative Performance	△	◎
Detection	Difficult	Easy
Adjustment of Column	Necessary	Unnecessary
Disposal of Silica Gel	Necessary	Unnecessary
Pretreatment of Sample	Unnecessary	Necessary
Equipment	Unnecessary	Necessary

Note: <sup>1)</sup> Compared by peak of *p*-Nitrobenzyl Alcohol.

## Ordering Information

### • Particle Size: 5 µm (Analytical/Preparative Columns)

Product Name	Column Size	Product Number
COSMOSIL 5SL-II Packed Column	4.6 mm I.D. x 50 mm	37999-81
	4.6 mm I.D. x 100 mm	38000-01
	4.6 mm I.D. x 150 mm	38001-91
	4.6 mm I.D. x 250 mm	38002-81
	6.0 mm I.D. x 150 mm	38003-71
	6.0 mm I.D. x 250 mm	38004-61
	10.0 mm I.D. x 250 mm	38005-51
	20.0 mm I.D. x 250 mm	38006-41
COSMOSIL 5SL-II Gurad Column	4.6 mm I.D. x 10 mm	37997-01
	10.0 mm I.D. x 20 mm	37998-91
	20.0 mm I.D. x 20 mm	05874-91
	20.0 mm I.D. x 50 mm	05875-81
	28.0 mm I.D. x 50 mm	34359-51

### • Particle Size: 15 µm (Preparative Columns)

Product Name	Column Size	Product Number
COSMOSIL 15SL-II Packed Column	28.0 mm I.D. x 250 mm	05893-41
	50.0 mm I.D. x 250 mm	05895-21
	50.0 mm I.D. x 500 mm	05896-11
COSMOSIL 15SL-II Gurad Column	28.0 mm I.D. x 50 mm	05892-51
	50.0 mm I.D. x 50 mm	05894-31

### • Particle Size: 3 µm (Fast LC Columns)

Product Name	Column Size	Product Number
COSMOSIL 3SL-II Packed Column	4.6 mm I.D. x 10 mm	38059-61
	4.6 mm I.D. x 50 mm	38060-21
	4.6 mm I.D. x 100 mm	38061-11

Other size may be available. Please enquire.

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