COSMOSIL
COSMOGEL

nacalai tesque
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HPLC Column for hydrophilic interaction chromatography

COSMOSIL HILIC Packed Column

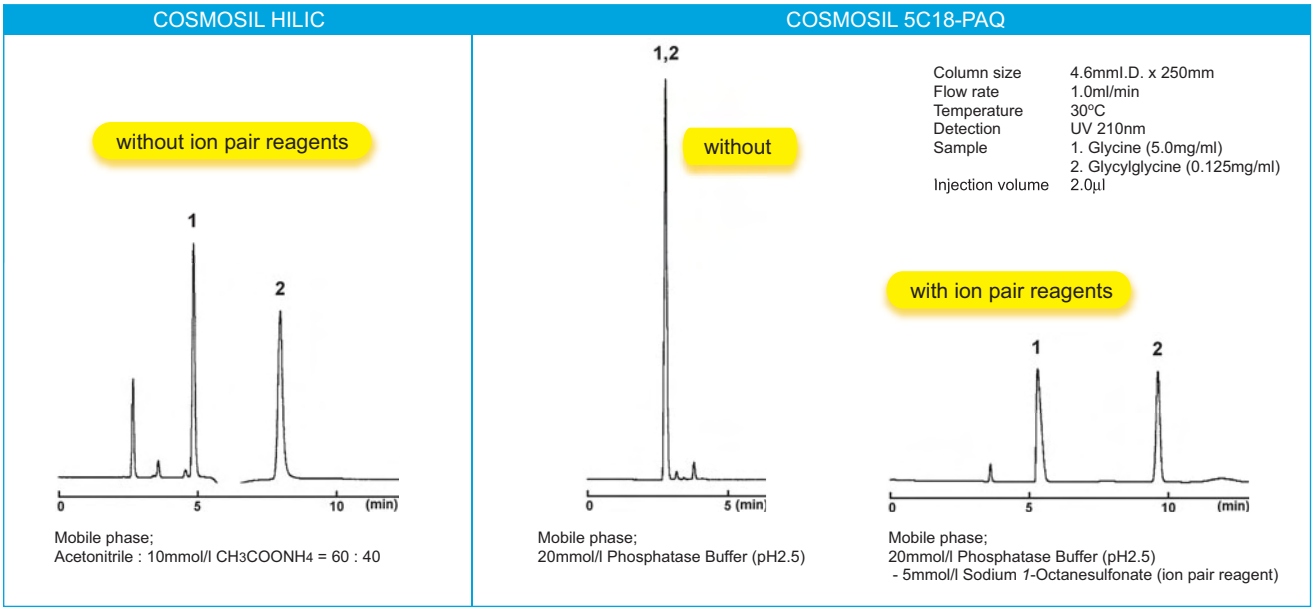
COSMOSIL HILIC is a new column for hydrophilic interaction chromatography with Triazole bonded silica packing material. The hydrophilic interaction chromatography is a variation of normal phase chromatography where a polar stationary phase is used with a mobile phase which contains a high concentration of organic solvent and a low concentration of aqueous eluent. The main retention mechanism is the partitioning of the polar analytes between the polar stationary and the non-polar mobile phase. As it is also called "aqueous normal phase", the elution order is similar to that of normal phase and the sample elution is in the order of increasing hydrophilicity. Without using ion-pair reagent COSMOSIL HILIC retains highly polar analytes that would not be retained in reversed phase chromatography. It also shows a weak anion-exchange mechanism with the positively charged stationary phase, thus acidic compound is strongly retained.

Features of COSMOSIL HILIC

- *Retains highly polar compounds that would not be retained in C18 columns.*
- *Ion-pair reagent is not required*
- *Anion-exchange results in strong retention for acidic compounds.*
- *Enhanced sensitivity in LC/MS*

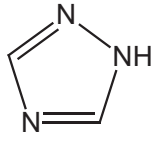
- ***Comparison with C_{18} Columns***

COSMOSIL HILIC can separate Glycine and Glycylglycine without ion-pair reagent. Although C_{18} column can separate them with ion-pair reagents, there are some disadvantages such as column equilibration, preparation of mobile phase and column deterioration.



Material characteristics

Packing material	COSMOSIL Cholester
Silica gel	high purity spherical porous silica
Average particle size	5µm
Average pore size	12 nm
Specific surface area	approx. 300^2/g
Stationary phase	Triazole
Main interaction	Hydrophilic interaction

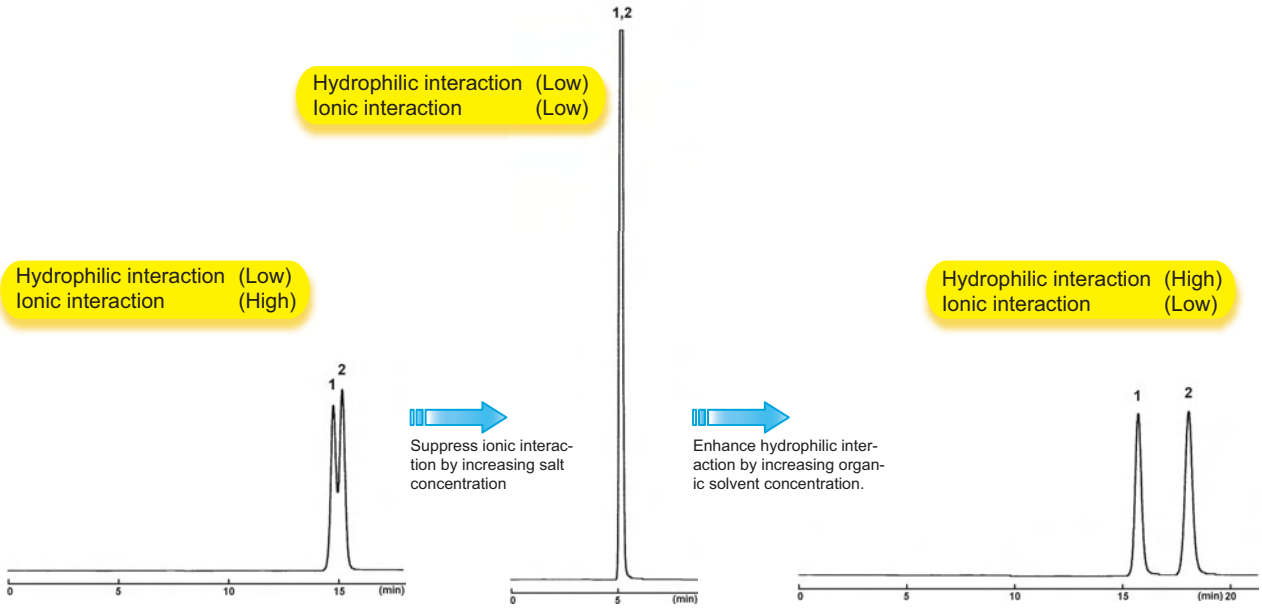


Triazole

Different interactions

The retention Mechanism of COSMOSIL HILIC is the combination of hydrophilic interaction and anion exchange, and the retention can be controlled by changing the mobile phase.

Separation by hydrophilic interaction



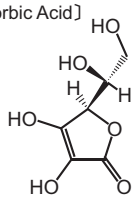
Mobile phase;
Acetonitrile:10mmol/l CH_3COONH_4
=50:50

Mobile phase;
Acetonitrile:100mmol/l CH_3COONH_4
=50:50

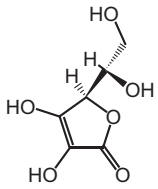
Mobile phase;
Acetonitrile:100mmol/l CH_3COONH_4
=80:20

Column size	4.6mmI.D. x 250mm
Flow rate	1.0ml/min
Temperature	30°C
Detection	UV 245nm
Sample	1. Isoascorbic Acid〔Erythrbic Acid〕(0.5mg/ml) 2. Ascorbic Acid (0.5mg/ml)
Injection volume	2.0µl

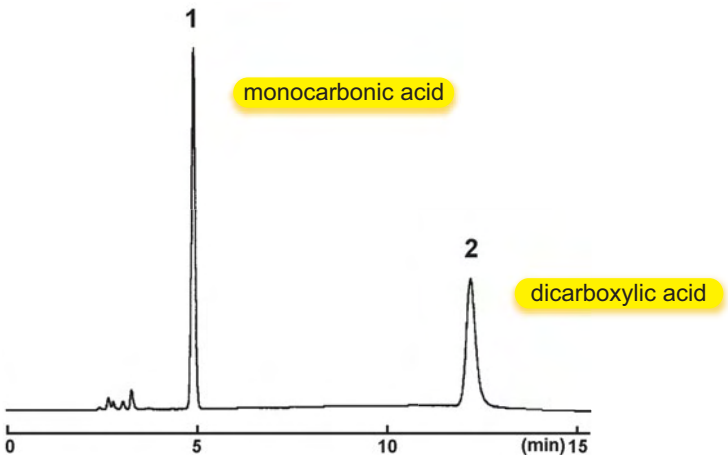
1. Isoascorbic Acid
〔Erythorbic Acid〕



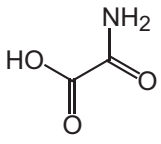
2. Ascorbic Acid



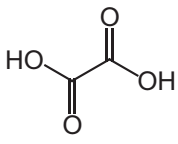
Separation by anion exchange ability



Column size	4.6mmI.D. x 250mm
Mobile phase	Acetonitrile:10mmol/l Phosphate Buffer (pH7.0)=50:50
Flow rate	1.0ml/min
Temperature	30°C
Detection	UV 210nm
Sample	1. Oxamic Acid (0.4mg/ml) 2. Oxalic Acid (2.0mg/ml)
Injection volume	2.0µl



1. Oxamic Acid

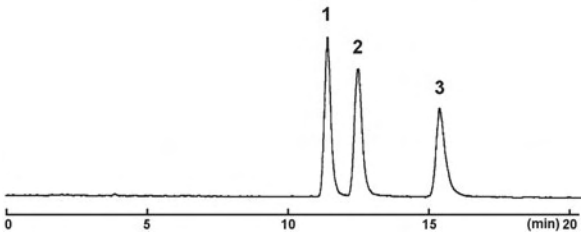


2. Oxalic Acid

Analysis data

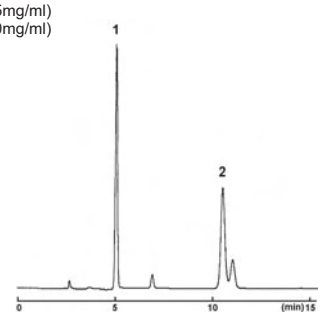
BCAA (amino acid branched-chain)

Column size	4.6mmI.D. x 250mm
Mobile phase	Acetonitrile:10mmol/l CH_3COONH_4=85:15
Flow rate	1.0ml/min
Temperature	30°C
Detection	ELSD (Atten=8, Gain=6)
Sample	1. Leucine (1.0mg/ml)
	2. Isoleucine (1.0mg/ml)
	3. Valine (1.0mg/ml)
Injection volume	3.0µl



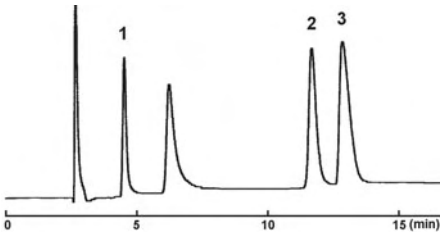
Juice components

Column size	4.6mmI.D. x 250mm
Mobile phase	Acetonitrile:10mmol/l Phosphate Buffer (pH7.0)=50:50
Flow rate	1.0ml/min
Temperature	30°C
Detection	UV 210nm
Sample	1. Ascorbic Acid (0.5mg/ml)
	2. Malic Acid (1.0mg/ml)
Injection volume	3.0µl



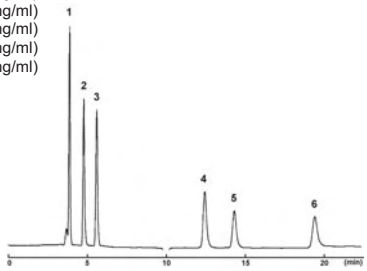
Phosphorylated saccharide

Column size	4.6mmI.D. x 250mm
Mobile phase	Acetonitrile:20mmol/l Phosphate Buffer (pH7.0)=60:40
Flow rate	30°C
Temperature	RI
Detection	1. Glucose (2mg/ml)
Sample	2. α-*D*-Glucose-*1*-Phosphate (10mg/ml)
	3. *D*-Glucose-*6*-Phosphate (10mg/ml)
Injection volume	5.0µl



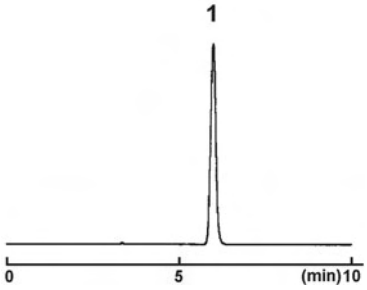
Water-soluble vitamin

Column size	4.6mmI.D. x 250mm
Mobile phase	Acetonitrile:100mmol/l CH_3COONH_4=80:20
Flow rate	1.0ml/min
Temperature	30°C
Detection	UV 220nm
Sample	
1. Nicotinamide	(0.25mg/ml)
2. Pyridoxine (Vitamin B_6)	(0.50mg/ml)
3. Vitamin B_2 (Riboflavin)	(0.50mg/ml)
4. Nicotinic Acid	(0.25mg/ml)
5. *D*-Pantothenic Acid	(6.25mg/ml)
6. *L*(+)-Ascorbic Acid	(1.75mg/ml)
Injection volume	0.5µl



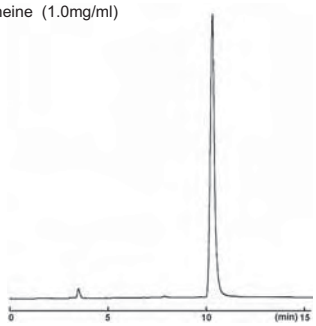
Hydrophilic drug

Column size	4.6mmI.D. x 250mm
Mobile phase	Acetonitrile:10mmol/l CH_3COONH_4=90:10
Flow rate	1.0ml/min
Temperature	30°C
Detection	UV 254nm
Sample	Famotidine (0.25mg/ml)
Injection volume	2.0µl



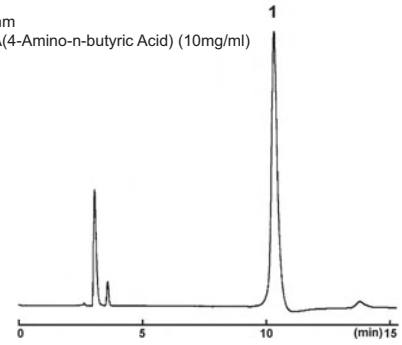
Natural product

Column size	4.6mmI.D. x 250mm
Mobile phase	Acetonitrile:10mmol/l CH_3COONH_4=80:20
Flow rate	1.0ml/min
Temperature	30°C
Detection	UV 220nm
Sample	*L*-(+)-Ergothioneine (1.0mg/ml)
Injection volume	3.0µl



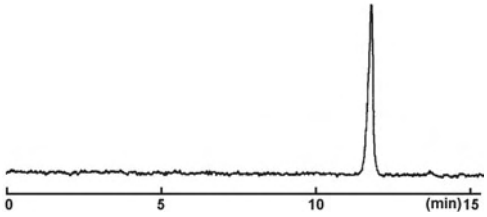
GABA(4-Amino-n-butyric Acid)

Column size	4.6mmI.D. x 250mm
Mobile phase	Acetonitrile:10mmol/l CH_3COONH_4=75:25
Flow rate	1.0ml/min
Temperature	30°C
Detection	UV 210nm
Sample	1. GABA(4-Amino-n-butyric Acid) (10mg/ml)
Injection volume	3.0µl



Cyanoacetic Acid

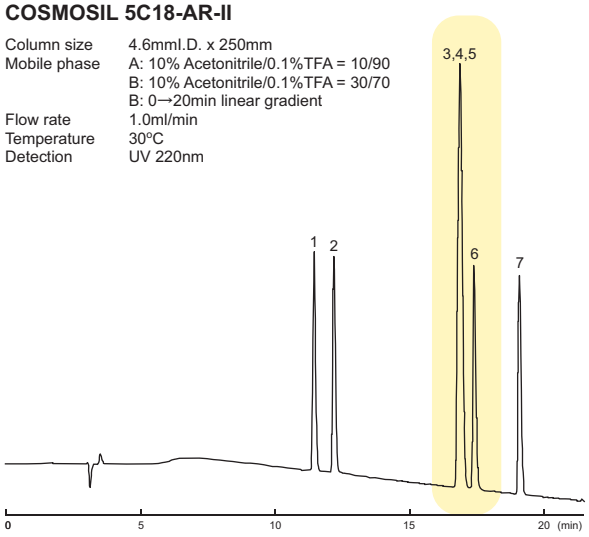
Column size	4.6mmI.D. x 250mm
Mobile phase	Acetonitrile:10mmol/l CH_3COONH_4=50:50
Flow rate	1.0ml/min
Temperature	30°C
Detection	ELSD
Sample	1. Cyanoacetic Acid (10mg/ml)
Injection volume	0.5µl



Combination with C18 columns

COSMOSIL 5C18-AR-II

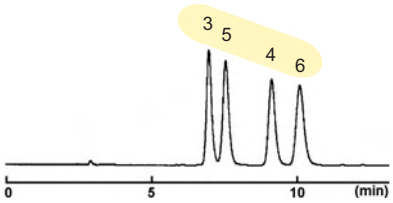
Column size	4.6mmI.D. x 250mm
Mobile phase	A: 10% Acetonitrile/0.1%TFA = 10/90 B: 10% Acetonitrile/0.1%TFA = 30/70 B: 0→20min linear gradient
Flow rate	1.0ml/min
Temperature	30°C
Detection	UV 220nm



COSMOSIL HILIC

Column size	4.6mmI.D. x 250mm
Mobile phase	Acetonitrile / 10mmol/l Phosphate Buffer (pH7) = 70 / 30
Flow rate	1.0ml/min
Temperature	30°C
Detection	UV 220nm

Sample	1. Angiotensin II, [Sar1, Thr8] 2. Angiotensin II, [Sar1, Ala8] 3. Angiotensin II, Des-Asp1- [Ile8] 4. Angiotensin II, [Sar1, Ile8] 5. Angiotensin II, [Asn1, Val5] 6. Angiotensin II, [Val5] 7. Angiotensin II, (Human)



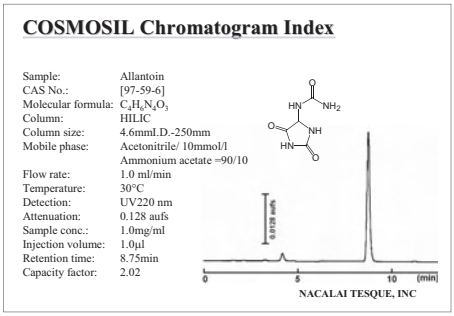
Selection of mobile phase

Following are the recommended mobile phases for different samples.

- Neutral compounds — Acetonitrile / Water = 90 / 10
- Basic compounds — Acetonitrile / 10mmol/l CH_3COONH_4 = 90 / 10
- Amphoteric compounds — Acetonitrile / 10mmol/l CH_3COONH_4 = 70 / 30
- Acidic compounds — Acetonitrile / 10mmol/l CH_3COONH_4 = 50 / 50
  (not eluted) → Acetonitrile / 10mmol/l Phosphatase buffer (pH7.0) = 50 / 50

COSMOSIL Chromatogram Index

COMSOSIL HILIC Chromatogram Index, which includes 154 chromatograms using COSMOSIL HILIC, is now available. This index is useful for optimizing analytical conditions for hydrophilic interaction chromatography.



Ordering information

Product name	Size	Code No.
COSMOSIL HILIC Packed Column	2.0mmI.D. x 50mm	07052-91
	2.0mmI.D. x 150mm	07054-71
	4.6mmI.D. x 150mm	07056-51
	4.6mmI.D. x 250mm	07057-41
	10.0mmI.D. x 250mm	07059-21
	20.0mmI.D. x 250mm	07060-81

Product name	Size	Code No.
COSMOSIL HILIC Guard Column	4.6mmI.D. x 10mm	07055-61
	10.0mmI.D. x 20mm	07058-31

Other size may be available. Please enquire!!

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