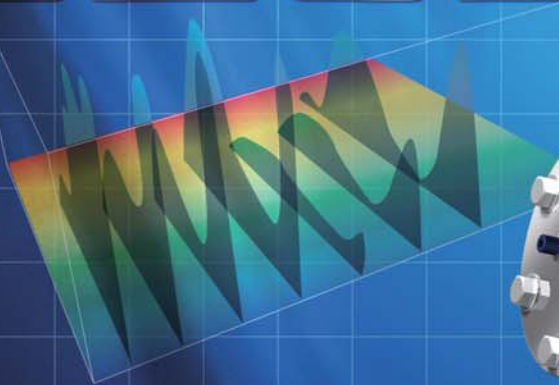
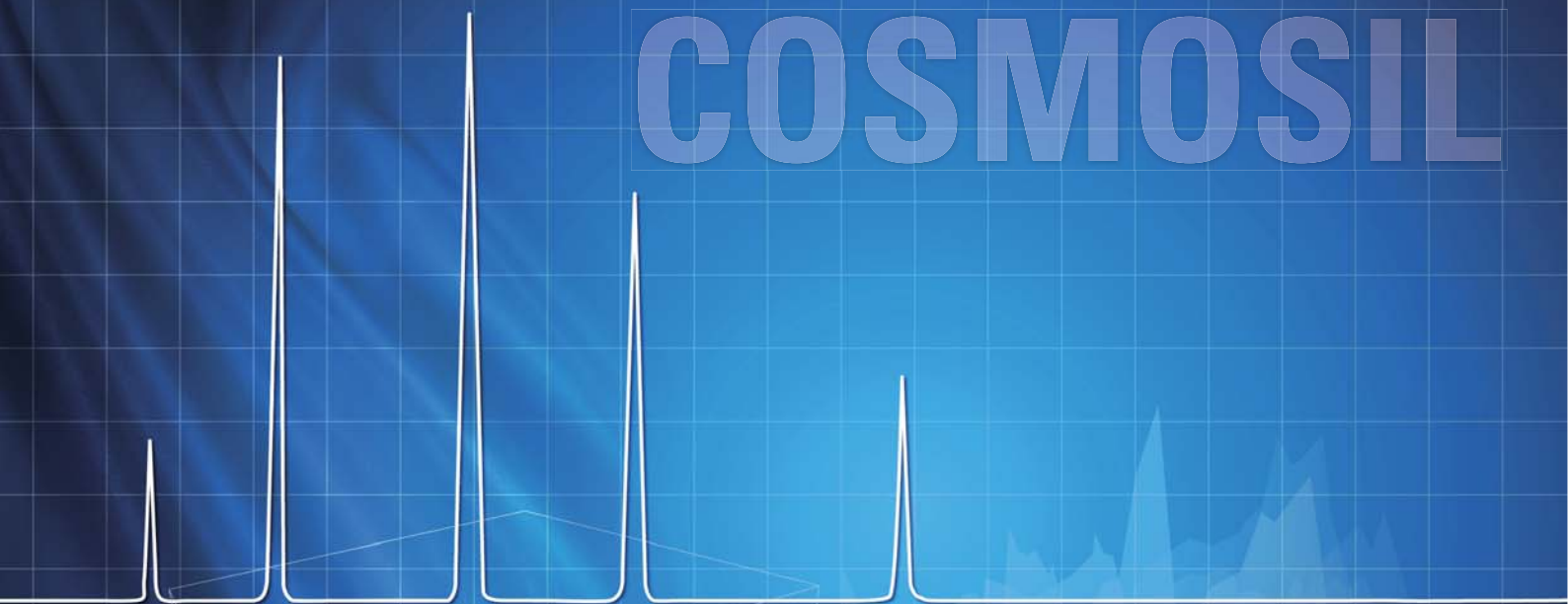


**COSMOSIL**

**COSMOSIL**



**COSMOSIL HILIC**  
**Application Notebook**  
**2013**

COSMOSIL HILIC Application Notebook contains about 200 chromatograms for the separation of polar compounds using COSMOSIL HILIC column. It also describes how the mobile phase conditions, such as buffer pH and salt concentration influence the separation in HILIC mode

## Contents

Hydrophilic Interaction Chromatography	P2
COSMOSIL HILIC	P3
COSMOSIL 2.5HILIC	P5
COSMOSIL Applications	P8
COSMOSIL Applications on Website	P11
COSMOSIL Chromatogram Index	P12
Reference List	P34
INDEX	P36

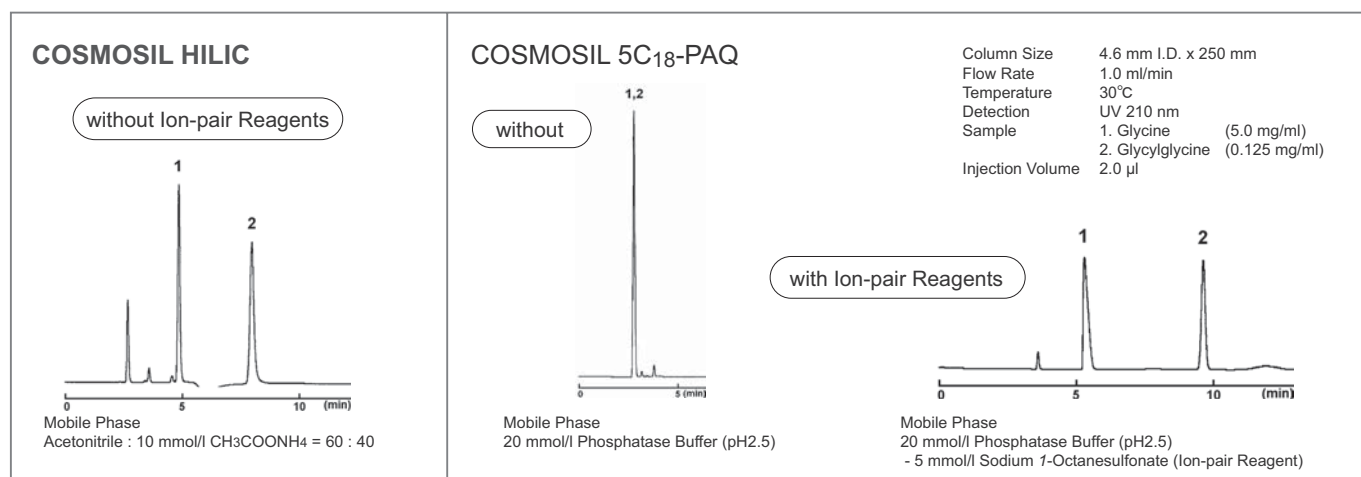
## Hydrophilic Interaction Chromatography

The hydrophilic interaction chromatography is a variation of normal phase chromatography. The elution order is similar to that of normal phase and the sample elution is in the order of increasing hydrophilicity.

Separation Mode	Hydrophilic interaction chromatography	Hydrophobic interaction chromatography
Stationary Phase	Hydrophilic Group (or Silica Gel)	Hydrophobic group (C <sub>18</sub> etc.)
Mobile Phase	Organic Solvent (CH <sub>3</sub> CN etc.) / H <sub>2</sub> O	
Main Interaction	Hydrophilic interaction	Hydrophobic interaction
Target Sample	Hydrophilic compounds	Hydrophilic and hydrophobic compounds
Features	<ul style="list-style-type: none"> <li>for separation of Hydrophilic compounds</li> <li>Suitable for LC/MS</li> </ul>	<ul style="list-style-type: none"> <li>for the widest range of compounds</li> <li>High separation ability</li> <li>A wide range of applications</li> </ul>

## Comparison with C<sub>18</sub>

COSMOSIL HILIC can separate glycine and glycyglycine without ion-pair reagent. Although C<sub>18</sub> column can separate them with ion-pair reagents, there are some disadvantages such as longer column equilibration time, time-consuming preparation of mobile phase and earlier column deterioration.



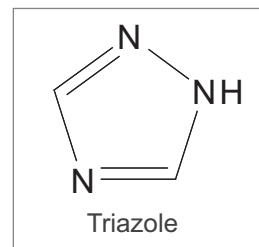


COSMOSIL

HPLC Column for Hydrophilic Interaction

# COSMOSIL HILIC

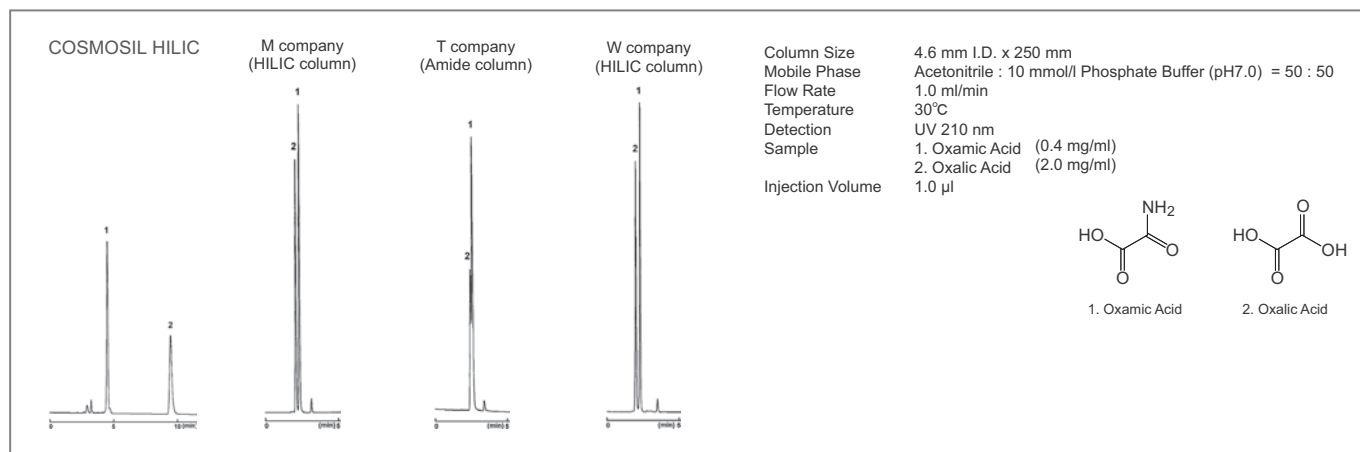
- Triazole bonded stationary phase
- Enhanced hydrophilic interaction
- Alternative selectivity to other HILIC columns



## Different Interactions

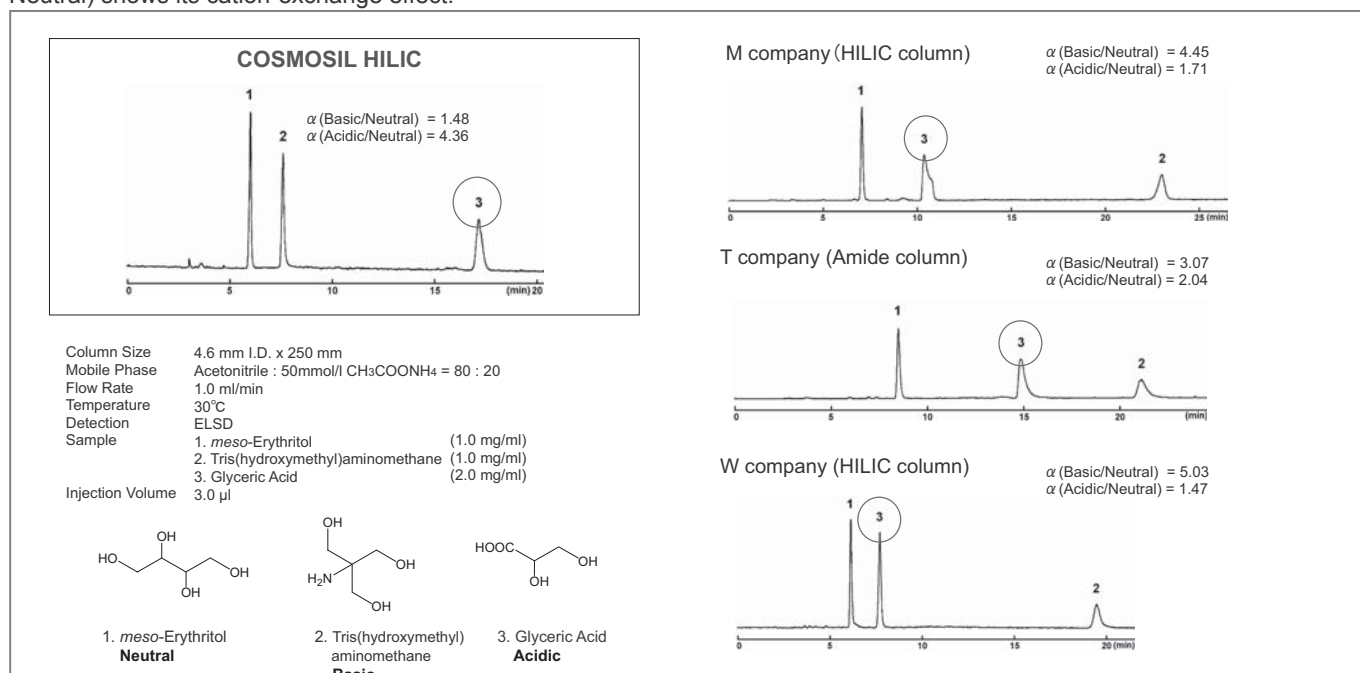
### • Separation of Anionic Compounds

Anionic compounds were used to evaluate the anion-exchange capability. The only COSMOSIL HILIC showed strong selectivity of anionic compounds against competitors' columns



### • Separation of Acidic, Basic and Neutral Compounds

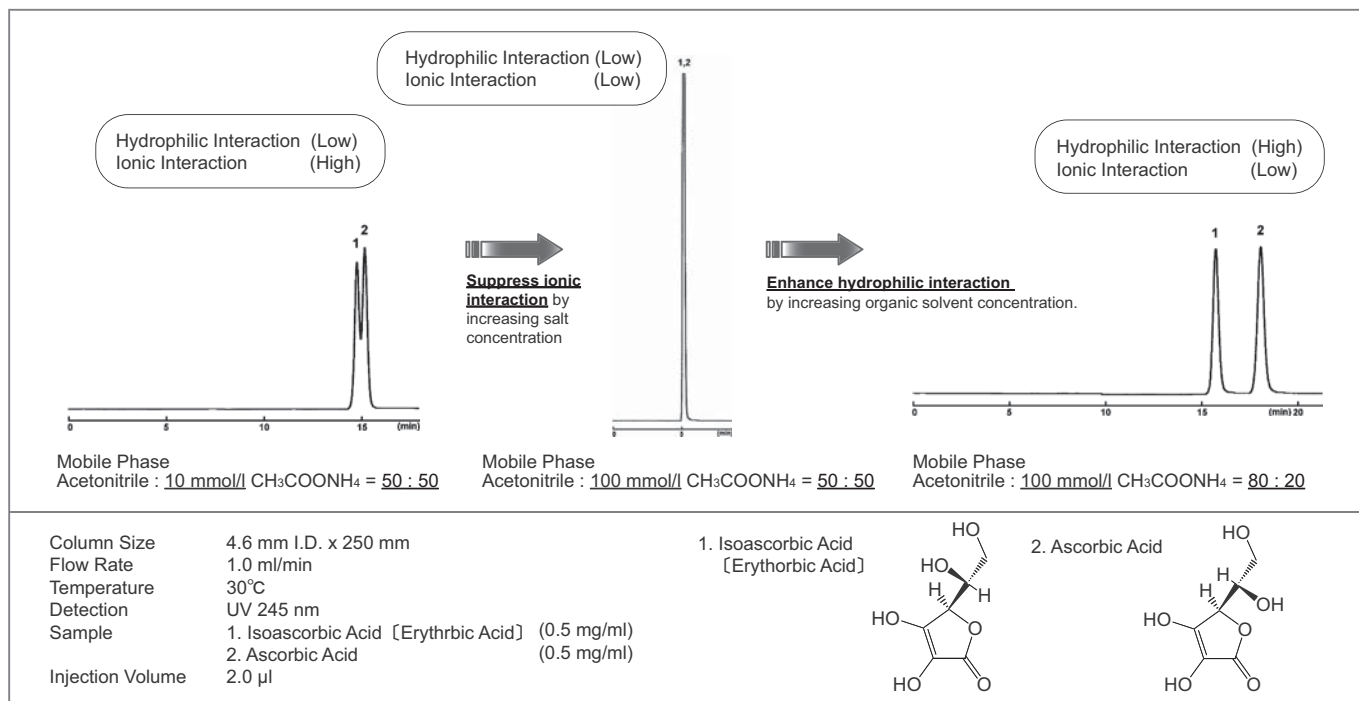
Acidic (Glyceric Acid), basic (Tris) and neutral (*meso*-Erythritol) compounds were used for evaluation of anion and cation-exchange characteristics. The separation factor  $\alpha(\text{Acid/Neutral})$  indicates its anion-exchange capability and the factor  $\alpha(\text{Basic/Neutral})$  shows its cation-exchange effect.



## Different Interactions

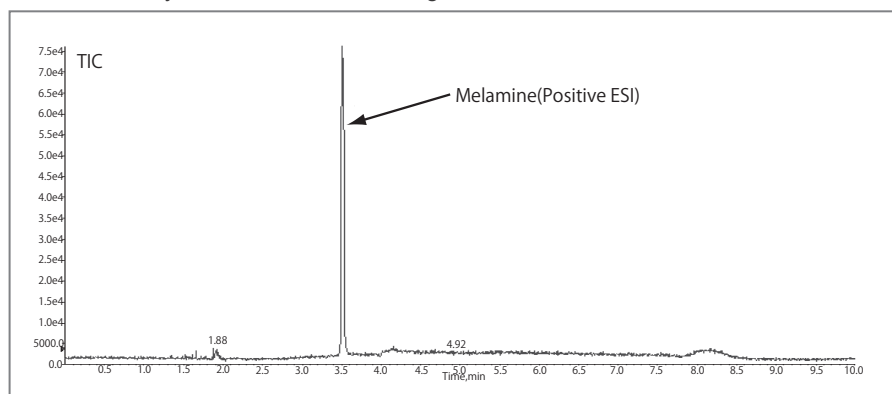
### Separation by Hydrophilic Interaction

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

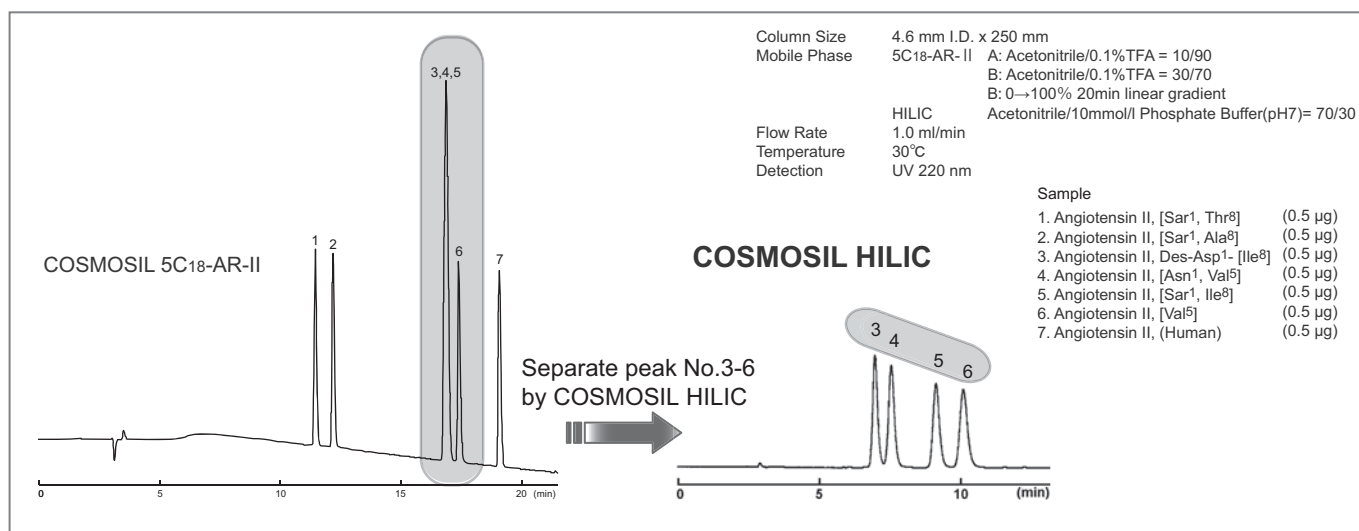


## Melamine Analysis

Melamine analysis and LC/MS/MS using COSMOSIL HILIC.



## Combination with C<sub>18</sub> Columns



## Ordering Information

Product Name	Column Size	Product Number
COSMOSIL HILIC Packed Column	1.0 mm I.D. x 150 mm	07869-11
	1.0 mm I.D. x 250 mm	07870-71
	2.0 mm I.D. x 30 mm	08568-21
	2.0 mm I.D. x 50 mm	07052-91
	2.0 mm I.D. x 100 mm	08569-11
	2.0 mm I.D. x 150 mm	07054-71
	2.0 mm I.D. x 250 mm	07489-91
	3.0 mm I.D. x 150 mm	07871-61
	3.0 mm I.D. x 250 mm	07872-51
	4.6 mm I.D. x 150 mm	07056-51
4.6 mm I.D. x 150 mm 3 lots set	09385-23	

Product Name	Column Size	Product Number
COSMOSIL HILIC Packed Column	4.6 mm I.D. x 250 mm	07057-41
	10.0 mm I.D. x 150 mm	05564-51
	10.0 mm I.D. x 250 mm	07059-21
	20.0 mm I.D. x 250 mm	07060-81
	28.0 mm I.D. x 250 mm	07875-21
COSMOSIL HILIC Guard Column	4.6 mm I.D. x 10 mm	07055-61
	10.0 mm I.D. x 20 mm	07058-31
	20.0 mm I.D. x 20 mm	07854-91
	20.0 mm I.D. x 50 mm	07873-41
	28.0 mm I.D. x 50 mm	07874-31

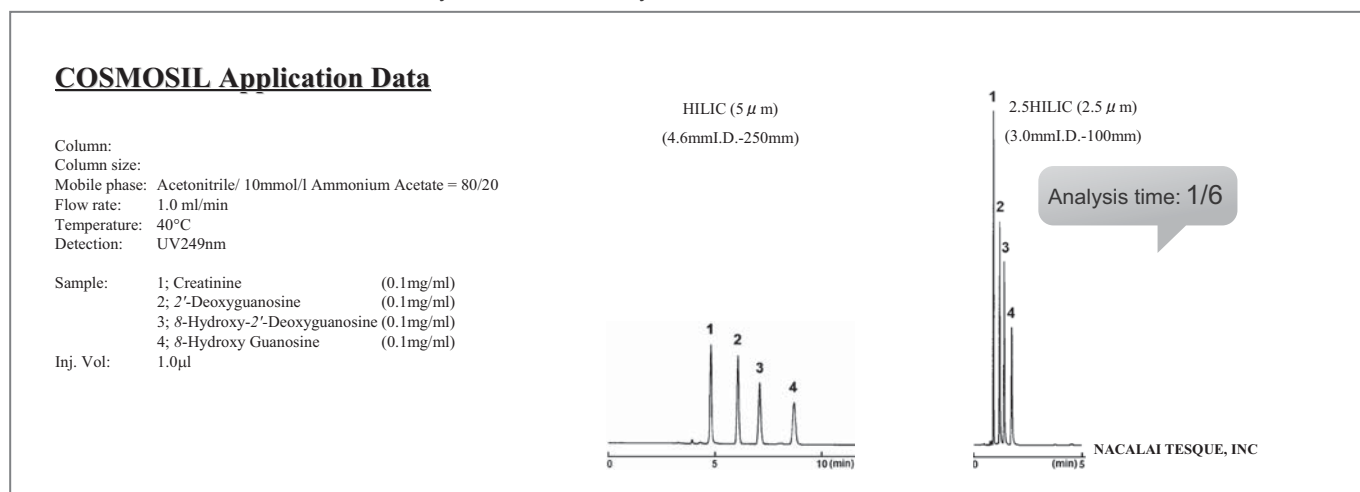
## Ultra-High Performance Column for HILIC Analysis

# COSMOSIL 2.5HILIC

- Ultra-High Performance using 2.5  $\mu\text{m}$  particles

## Ultra-High-Speed Analysis (Oxidation marker analysis)

COSMOSIL 2.5HILIC can be used with any conventional LC systems.



## Ordering Information

Product Name	Column Size	Product Number
COSMOSIL 2.5HILIC Packed Column	2.0 mm I.D. x 50 mm	11766-21
	2.0 mm I.D. x 75 mm	11768-01
	2.0 mm I.D. x 100 mm	11769-91
	2.0 mm I.D. x 150 mm	11770-51

Product Name	Column Size	Product Number
COSMOSIL 2.5HILIC Packed Column	3.0 mm I.D. x 50 mm	11771-41
	3.0 mm I.D. x 75 mm	11772-31
	3.0 mm I.D. x 100 mm	11773-21
	3.0 mm I.D. x 150 mm	11774-11

## Selection guide of mobile phase

COMOSIL HILIC column generates retention and separation by hydrophilic interaction (mainly hydrogen bond) and anion-exchange. Refer to following recommendations to select an appropriate mobile phase condition.

### (1) The effect of organic solvent type and content

- In general, acetonitrile/water is used as mobile phase.
- Retention increases as water content in the mobile phase decreased. (Fig.1)
- Use acetonitrile content in the mobile phase within the range of 0-95% (in general 50-95%).
- Methanol/water generates shorter retention than acetonitrile/water. (Fig.2)
- Use only HPLC grade solvent

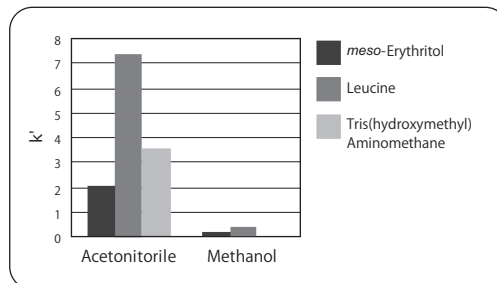
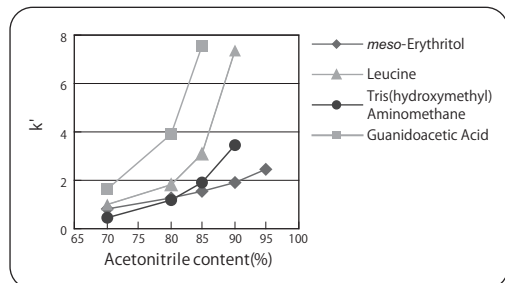


Fig.1 The effect of acetonitrile content on retention

Column; COSMOSIL HILIC  
Mobile phase; Acetonitrile/ 10mmol/l CH<sub>3</sub>COONH<sub>4</sub>

Fig.2 Difference of acetonitrile and methanol on retention

Column; COSMOSIL HILIC  
Mobile phase; Organic solvent/ 10mmol/l CH<sub>3</sub>COONH<sub>4</sub> = 90/10

### (2) The effect of buffer pH

- Keep pH of the mobile phase within the range of 2-7.5.
- The buffer around neutrality generates larger retention. (Fig.3)

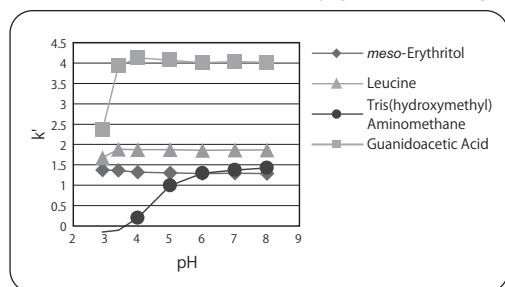


Fig.3 The effect of buffer pH on retention

Column; COSMOSIL HILIC  
Mobile phase; Acetonitrile / 10mmol/l buffer = 90/10

### (3) The effect of salt type and concentration

- When analyze ionic compounds, add salts or buffers in the mobile phase.
- When mobile phase has high acetonitrile content, note dissolubility of the salt. The dissolubility of phosphate buffers used widely in reversed phase chromatography is low in acetonitrile. Therefore use of phosphate buffers is not recommended. Keep the concentration of acetonitrile under 70% if use a phosphate buffer. Check that the salt does not precipitate when mixed with acetonitril before use.
- Ammonium acetate or formic acid ammonium buffers are recommended because they are soluble in high acetonitrile content.
- Use the buffer concentration within the range of 5 - 100mmol/l. Moreover, check that the salt does not precipitate after mixing buffer and acetonitrile.
- High salt concentration inhibits ion exchange capability and decreases retention. (Fig.4)
- Run mobile phase through membrane filter (less than 0.45μm in pore size) before use.

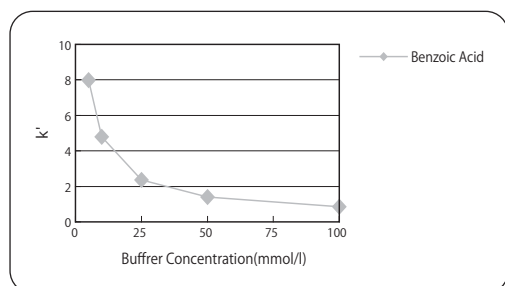


Fig.4 The effect of salt concentration on retention

Column; COSMOSIL HILIC  
Mobile phase; Acetonitrile / 10mmol/l CH<sub>3</sub>COONH<sub>4</sub> = 50/50

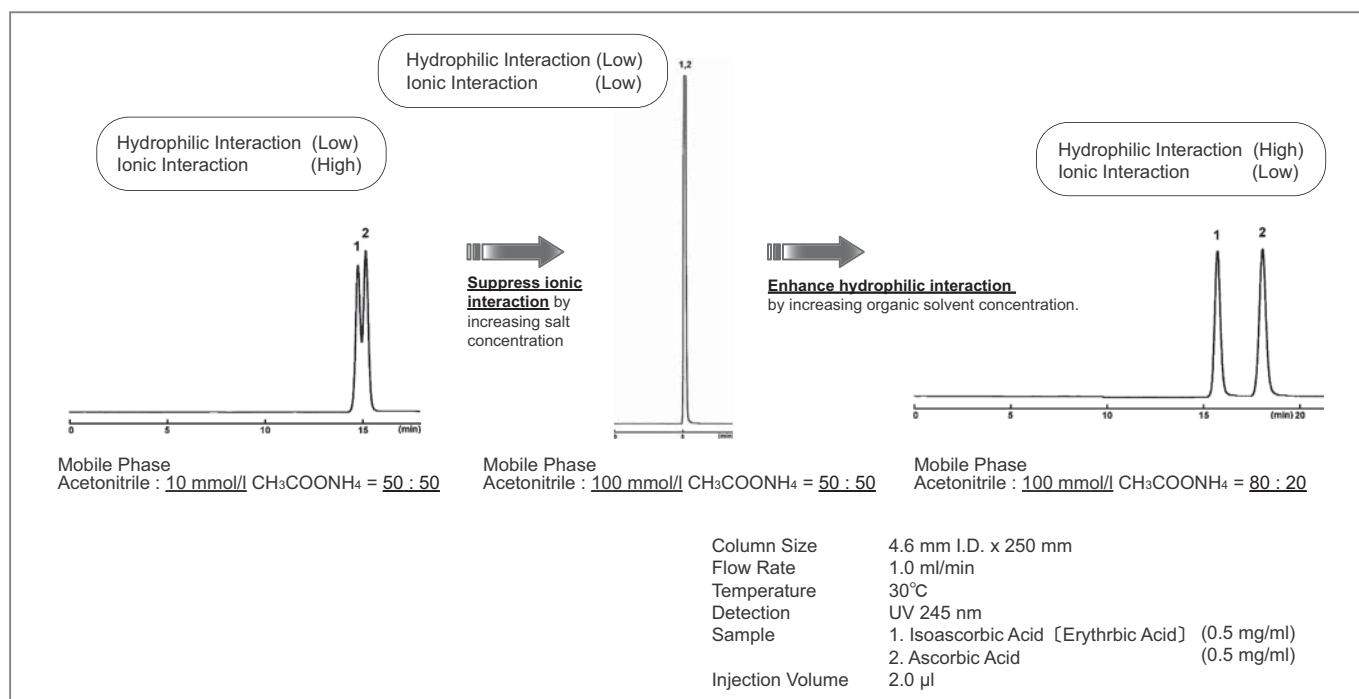
#### (4) Selection of mobile phase

Following are the recommended mobile phases for different compound types.

Neutral compounds	→ Acetonitrile / Water = 90/10
Basic compounds	→ Acetonitrile / 10mmol/l CH <sub>3</sub> COONH <sub>4</sub> = 90/10
Amphoteric compounds	→ Acetonitrile / 10mmol/l CH <sub>3</sub> COONH <sub>4</sub> = 70/30
Acidic compounds	→ Acetonitrile / 10mmol/l CH <sub>3</sub> COONH <sub>4</sub> = 50/50
	↓ not eluted
	Acetonitrile / 10mmol/l Phosphate buffer (pH7.0)= 50/50

#### (5) Two interactions (hydrophilic interaction and anion exchange capability)

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. More specifically, the hydrophilic interaction can be enhanced by increasing the organic solvent concentration while suppressing the ionic interaction with high salt concentration.



#### (6) Improvement of peak shape

Try following if peak shape is tailing. The peak shape might improve.

- Add 5mmol/l EDTA to mobile phase.
- Change to citrate buffer. (i. e. 10 mmol/l citrate buffer pH7.0)

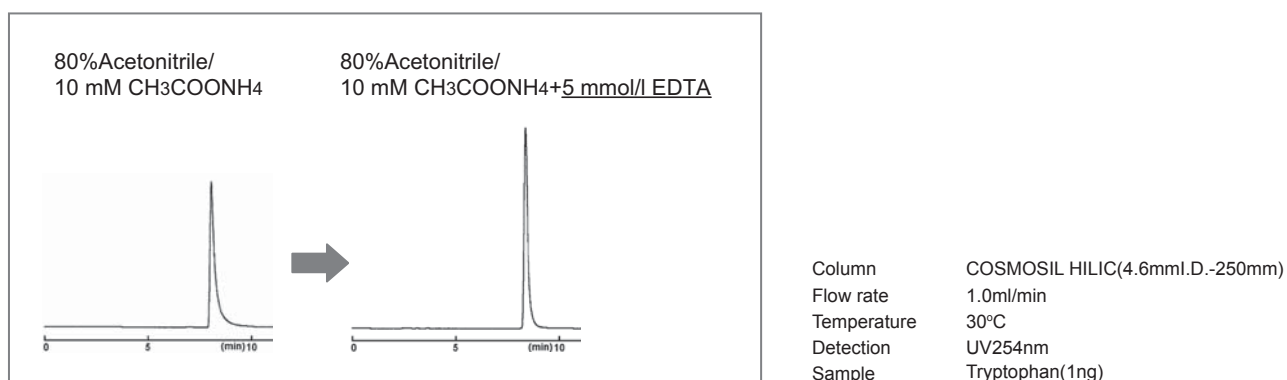


Fig.5 Improvement of peak shape

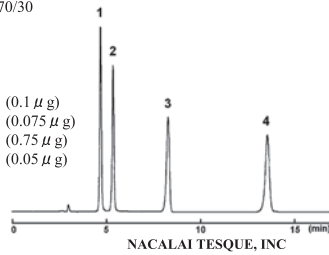
#### (7) Others

- Use scrupulously degassed mobile phase. Air bubbles generate detection noise and accelerate column deterioration.
- We recommend keeping the chromatography conditions constant, since frequent changes of mobile phase shorten column life.

### COSMOSIL Application Data

Column: HILIC  
Column size: 4.6mmI.D.-250mm  
Mobile phase: Acetonitrile/ 10mmol/l  
Ammonium Acetate = 70/30  
Flow rate: 1.0 ml/min  
Temperature: 30°C  
Detection: UV225nm

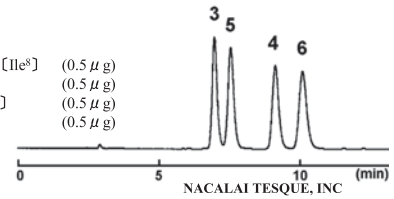
Sample: 1; Melamine (0.1 μg)  
2; Ammeline (0.075 μg)  
3; Cyanuric Acid (0.75 μg)  
4; Ammelide (0.05 μg)



### COSMOSIL Application Data

Column: HILIC  
Column size: 4.6mmI.D.-250mm  
Mobile phase: Acetonitrile/ 10mmol/l Phosphate  
buffer(pH7.0) = 70/30  
Flow rate: 1.0 ml/min  
Temperature: 30°C  
Detection: UV220nm

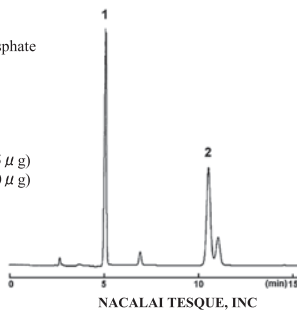
Sample: 3; Angiotensin II, Des-Asp1-[Ile<sup>8</sup>] (0.5 μg)  
4; Angiotensin II, [Sar<sup>1</sup>,Ile<sup>8</sup>] (0.5 μg)  
5; Angiotensin II, [Asn<sup>1</sup>,Val<sup>5</sup>] (0.5 μg)  
6; Angiotensin II, [Val<sup>3</sup>] (0.5 μg)



### COSMOSIL Application Data

Column: HILIC  
Column size: 4.6mmI.D.-250mm  
Mobile phase: Acetonitrile/ 10mmol/l Phosphate  
buffer(pH7.0) = 50/50  
Flow rate: 1.0 ml/min  
Temperature: 30°C  
Detection: UV210nm

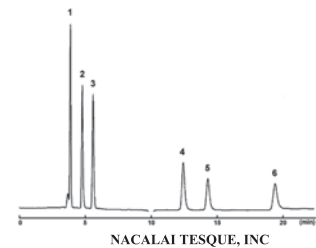
Sample: 1; Ascorbic Acid (1.5 μg)  
2; Malic Acid (3.0 μg)



### COSMOSIL Application Data

Column: HILIC  
Column size: 4.6mmI.D.-250mm  
Mobile phase: Acetonitrile/ 100mmol/l Ammonium  
Acetate = 80/20  
Flow rate: 1.0 ml/min  
Temperature: 30°C  
Detection: UV220nm

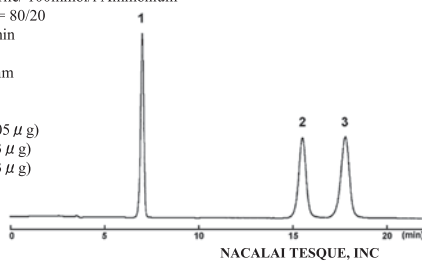
Sample: 1; Nicotinamide (0.125 μg)  
2; Pyridoxine(Vitamin B<sub>6</sub>) (0.25 μg)  
3; Riboflavin (Vitamin B<sub>2</sub>) (0.25 μg)  
4; Nicotinic Acid (0.125 μg)  
5; D-Pantothenic Acid (3.125 μg)  
6; L(+)-Ascorbic Acid (0.875 μg)



### COSMOSIL Application Data

Column: HILIC  
Column size: 4.6mmI.D.-250mm  
Mobile phase: Acetonitrile/ 100mmol/l Ammonium  
Acetate = 80/20  
Flow rate: 1.0 ml/min  
Temperature: 30°C  
Detection: UV254nm

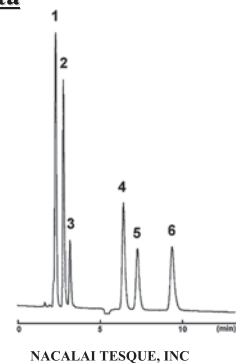
Sample: 1; Sorbic Acid (0.05 μg)  
2; Isoascorbic Acid (0.3 μg)  
3; Ascorbic Acid (0.3 μg)



### COSMOSIL Application Data

Column: HILIC  
Column size: 2.0mmI.D.-150mm  
Mobile phase: Acetonitrile/ 100mmol/l Ammonium  
Acetate = 80/20  
Flow rate: 0.2 ml/min  
Temperature: 30°C  
Detection: UV220nm

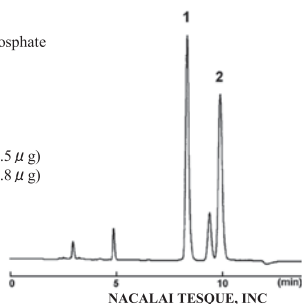
Sample: 1; Nicotinamide (0.125 μg)  
2; Pyridoxine(Vitamin B<sub>6</sub>) (0.25 μg)  
3; Riboflavin (Vitamin B<sub>2</sub>) (0.25 μg)  
4; Nicotinic Acid (0.125 μg)  
5; D-Pantothenic Acid (3.125 μg)  
6; L(+)-Ascorbic Acid (0.875 μg)



### COSMOSIL Application Data

Column: HILIC  
Column size: 4.6mmI.D.-250mm  
Mobile phase: Acetonitrile/ 20mmol/l Phosphate  
buffer(pH7.0) = 70/30  
Flow rate: 1.0 ml/min  
Temperature: 30°C  
Detection: UV210nm

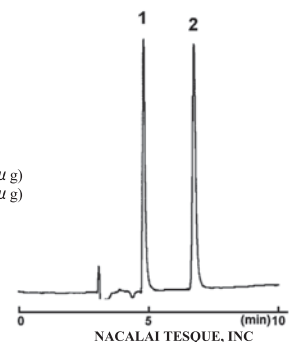
Sample: 1; L-Citrulline (7.5 μg)  
2; Malic Acid (3.8 μg)



### COSMOSIL Application Data

Column: HILIC  
Column size: 4.6mmI.D.-250mm  
Mobile phase: Acetonitrile / H<sub>2</sub>O = 95/5  
Flow rate: 1.0 ml/min  
Temperature: 30°C  
Detection: RI

Sample: 1; Diethylene Glycol (20 μg)  
2; Glycerol (20 μg)

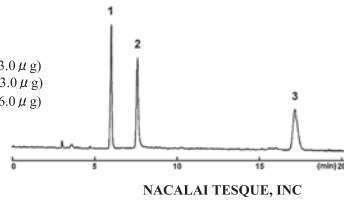




### COSMOSIL Application Data

Column: HILIC  
Column size: 4.6mmI.D.-250mm  
Mobile phase: Acetonitrile/ 50mmol/l Ammonium Acetate = 80/20  
Flow rate: 1.0 ml/min  
Temperature: 30°C  
Detection: ELSD

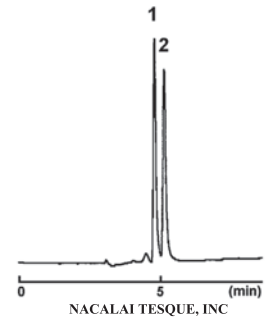
Sample:  
1; *meso*-Erythritol (3.0 µg)  
2; Tris(hydroxymethyl)aminomethane (3.0 µg)  
3; Glyceric Acid (6.0 µg)



### COSMOSIL Application Data

Column: HILIC  
Column size: 4.6mmI.D.-250mm  
Mobile phase: Acetonitrile/ H<sub>2</sub>O = 95/5  
Flow rate: 1.0 ml/min  
Temperature: 30°C  
Detection: RI

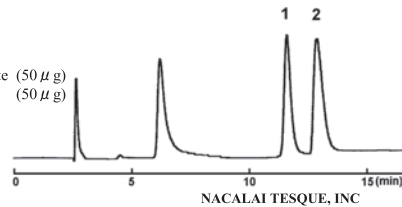
Sample: 1; Trimethylene Glycol (20 µg)  
2; Ethylene Glycol (20 µg)



### COSMOSIL Application Data

Column: HILIC  
Column size: 4.6mmI.D.-250mm  
Mobile phase: Acetonitrile/ 20mmol/l Phosphate buffer(pH7.0) = 60/40  
Flow rate: 1.0 ml/min  
Temperature: 30°C  
Detection: RI

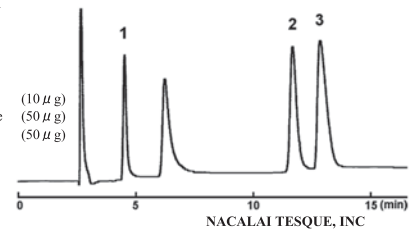
Sample:  
1; *D*-Fructose -6-phosphate (50 µg)  
2; *D*-Glucose-6-phosphate (50 µg)



### COSMOSIL Application Data

Column: HILIC  
Column size: 4.6mmI.D.-250mm  
Mobile phase: Acetonitrile/ 20mmol/l Phosphate buffer(pH7.0) = 60/40  
Flow rate: 1.0 ml/min  
Temperature: 30°C  
Detection: RI

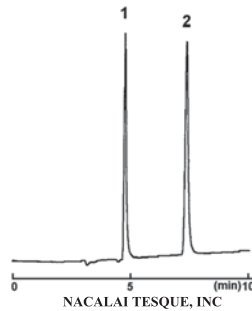
Sample:  
1; Glucose (10 µg)  
2; α-D-Glucose-1-phosphate (50 µg)  
3; D-Glucose-6-phosphate (50 µg)



### COSMOSIL Application Data

Column: HILIC  
Column size: 4.6mmI.D.-250mm  
Mobile phase: Acetonitrile/ H<sub>2</sub>O = 95/5  
Flow rate: 1.0 ml/min  
Temperature: 30°C  
Detection: RI

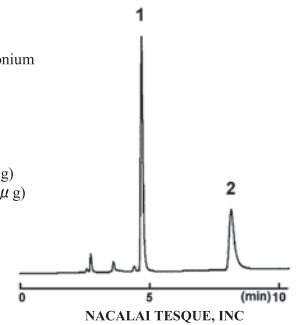
Sample: 1; Trimethylene Glycol (20 µg)  
2; Glycerol (20 µg)



### COSMOSIL Application Data

Column: HILIC  
Column size: 4.6mmI.D.-250mm  
Mobile phase: Acetonitrile/ 10mmol/l Ammonium Acetate = 60/40  
Flow rate: 1.0 ml/min  
Temperature: 30°C  
Detection: UV210nm

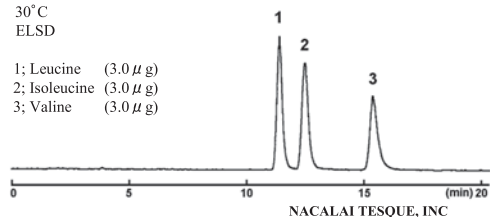
Sample: 1; Glycine (10 µg)  
2; Glycylglycine (0.25 µg)



### COSMOSIL Application Data

Column: HILIC  
Column size: 4.6mmI.D.-250mm  
Mobile phase: Acetonitrile/ 10mmol/l Ammonium Acetate = 85/15  
Flow rate: 1.0 ml/min  
Temperature: 30°C  
Detection: ELSD

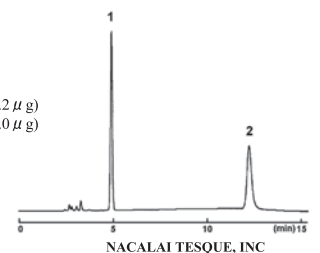
Sample: 1; Leucine (3.0 µg)  
2; Isoleucine (3.0 µg)  
3; Valine (3.0 µg)



### COSMOSIL Application Data

Column: HILIC  
Column size: 4.6mmI.D.-250mm  
Mobile phase: Acetonitrile/ 10mmol/l Phosphate buffer(pH7.0) = 50/50  
Flow rate: 1.0 ml/min  
Temperature: 30°C  
Detection: UV210nm

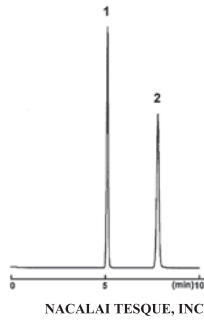
Sample: 1; Oxamic Acid (0.2 µg)  
2; Oxalic Acid (1.0 µg)



### COSMOSIL Application Data

Column: HILIC  
 Column size: 4.6mm I.D.-250mm  
 Mobile phase: Acetonitrile / H<sub>2</sub>O = 90/10  
 Flow rate: 1.0 ml/min  
 Temperature: 30°C  
 Detection: UV254nm

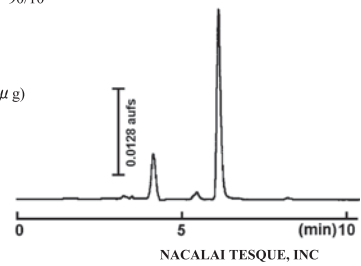
Sample: 1; Uracil (0.1 μg)  
 2; Uridine (0.2 μg)



### COSMOSIL Application Data

Column: HILIC  
 Column size: 4.6mm I.D.-250mm  
 Mobile phase: Acetonitrile/H<sub>2</sub>O = 90/10  
 Flow rate: 1.0 ml/min  
 Temperature: 30°C  
 Detection: UV210nm

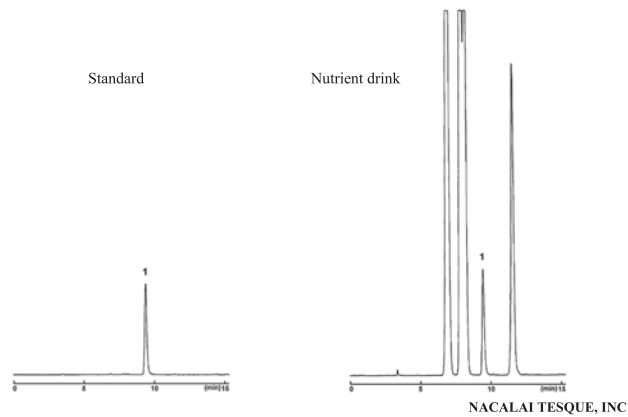
Sample: Urea (20 μg)



### COSMOSIL Application Data

Column: HILIC  
 Column size: 4.6mm I.D.-250mm  
 Mobile phase: Acetonitrile/ 10mmol/l Ammonium Acetate = 80/20  
 Flow rate: 1.0 ml/min  
 Temperature: 30°C  
 Detection: ELSD

Sample: 1; Taurine Standard (10mg/ml)  
 Injection Vol. 0.5 μl



### COSMOSIL Application Data

Column: HILIC  
 Column size: 4.6mm I.D.-250mm  
 Mobile phase: Acetonitrile/ 50mmol/l Ammonium Acetate = 90/10  
 Flow rate: 1.0 ml/min  
 Temperature: 30°C  
 Detection: UV220nm

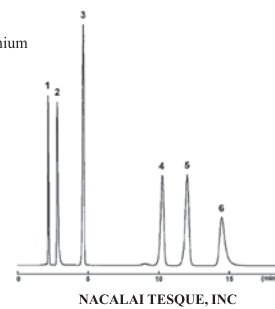
Sample: 1; 4-Methylimidazole (0.25mg/ml)  
 2; 2-Methylimidazole (0.25mg/ml)  
 Inj. Vol.: 1.0 μl



### COSMOSIL Application Data

Column: HILIC  
 Column size: 4.6mm I.D.-150mm  
 Mobile phase: Acetonitrile/ 50mmol/l Ammonium Acetate = 90/10  
 Flow rate: 1.0 ml/min  
 Temperature: 30°C  
 Detection: UV220nm

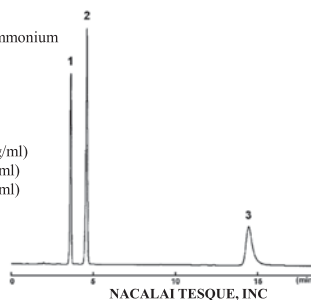
Sample: 1; Caffeine (0.075mg/ml)  
 2; Quinine (0.075mg/ml)  
 3; Saccharin (0.15mg/ml)  
 4; Sorbic Acid (0.15mg/ml)  
 5; Benzoic Acid (0.15mg/ml)  
 6; Aspartame (0.75mg/ml)  
 Inj. Vol.: 1.0 μl



### COSMOSIL Application Data

Column: HILIC  
 Column size: 4.6mm I.D.-150mm  
 Mobile phase: Acetonitrile/ 50mmol/l Ammonium Acetate = 90/10  
 Flow rate: 1.0 ml/min  
 Temperature: 30°C  
 Detection: UV220nm

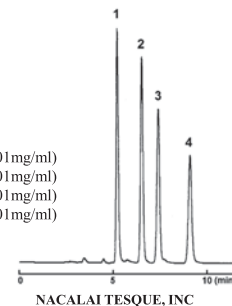
Sample: 1; Acesulfame (0.075mg/ml)  
 2; Saccharin (0.15mg/ml)  
 3; Aspartame (0.75mg/ml)  
 Inj. Vol.: 1.0 μl

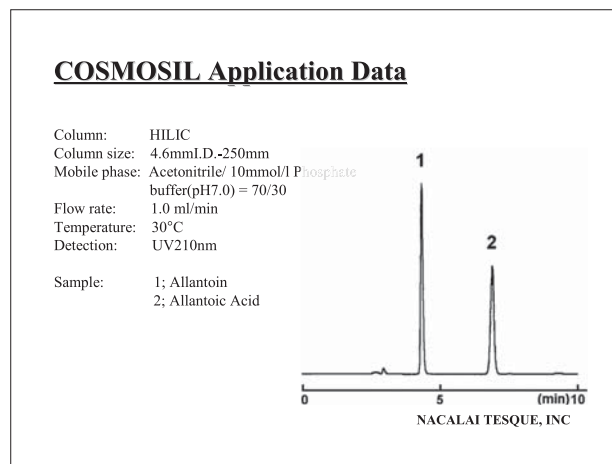
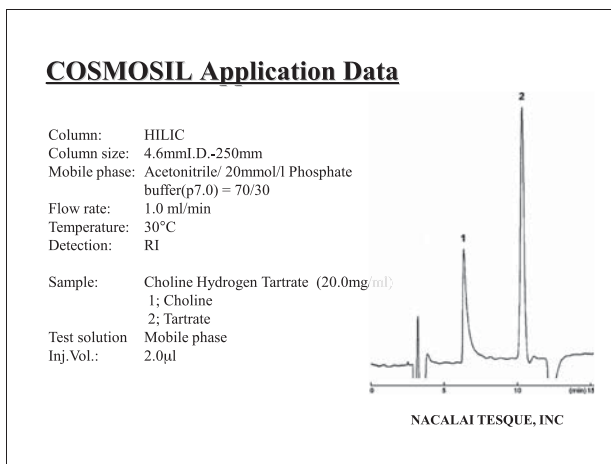
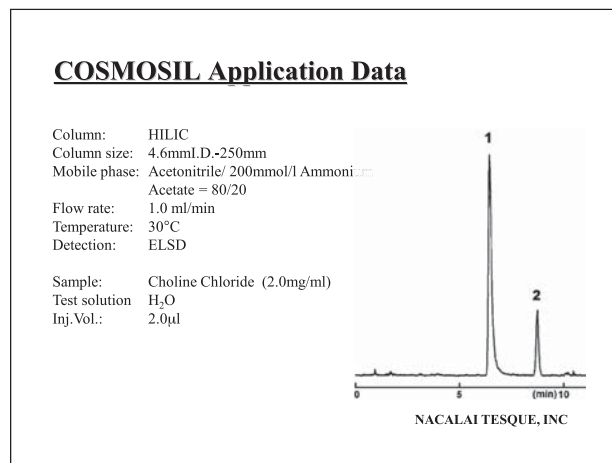
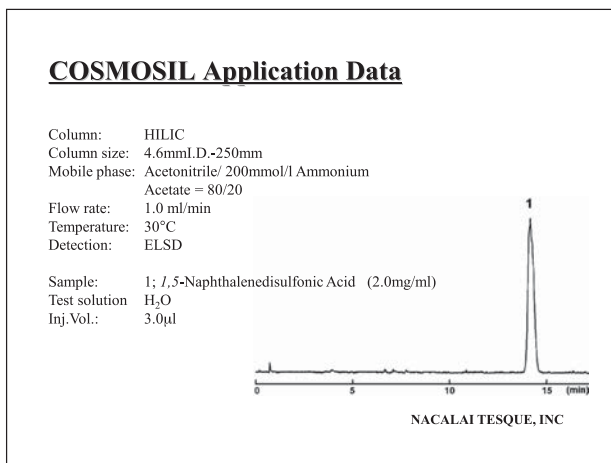


### COSMOSIL Application Data

Column: HILIC  
 Column size: 4.6mm I.D.-250mm  
 Mobile phase: Acetonitrile/ 10mmol/l Ammonium Acetate = 80/20  
 Flow rate: 1.0 ml/min  
 Temperature: 30°C  
 Detection: UV249nm

Sample: 1; Creatinine (0.01mg/ml)  
 2; 2'-Deoxyguanosine (0.01mg/ml)  
 3; 8-Hydroxy-2'-Deoxyguanosine (0.01mg/ml)  
 4; 8-Hydroxy Guanosine (0.01mg/ml)  
 Inj. Vol.: 5.0 μl





## COSMOSIL Applications

COSMOSIL Application has more than 7,000 applications using COSMOSIL columns. Setting optimal HPLC experimental parameters is the one of the most important processes that requires experience and time. COSMOSIL Application provides you with sample analysis conditions with widely used ODS columns and other specialty columns.

Visit COSMOSIL top page at <http://www.nacalai.co.jp/global/cosmosil/>

Click COSMOSIL 中文

Search Result

Date	Date Name	Sample	Particle Size (µm)	Column	CAS No.
AP10381	Dichlorophenol	2,3-Dichlorophenol	5	µHAP	176-24-9
		2,4-Dichlorophenol			100-43-2
		2,5-Dichlorophenol			583-78-8
		2,6-Dichlorophenol			87-65-0

Click

Applications are search by

1. Sample Category
2. Sample Name
3. CAS No.,
4. Column Name
5. Particle Size

Click

COSMOSIL Application

**COSMOSIL Application Data**

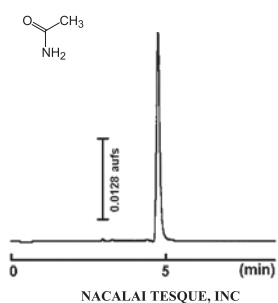
Column: 4.6mm I.D.-250mm  
 Mobile phase: Methanol/ 20mmol/l Phosphate buffer(pH7.0) = 80/20  
 Flow rate: 1.0 ml/min  
 Temperature: 30°C  
 Detection: UV210nm

Sample: 1; Phthalate (0.2 µg)  
 2; Benzoate (0.2 µg)

NACALAI TESQUE, INC

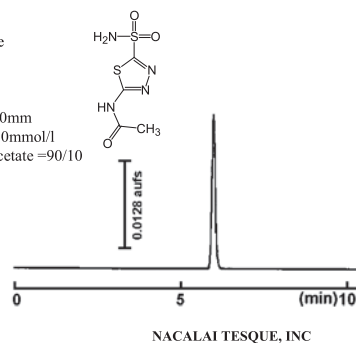
### COSMOSIL Chromatogram Index

Sample: Acetamide  
CAS No.: [60-35-5]  
Molecular formula: C<sub>2</sub>H<sub>5</sub>NO  
Column: HILIC  
Column size: 4.6mm I.D.-250mm  
Mobile phase: Acetonitrile/ H<sub>2</sub>O=95/5  
Flow rate: 1.0 ml/min  
Temperature: 30°C  
Detection: UV220 nm  
Attenuation: 0.128 auFS  
Sample conc.: 10.0mg/ml  
Injection volume: 0.5µl  
Retention time: 4.75min  
Capacity factor: 0.57



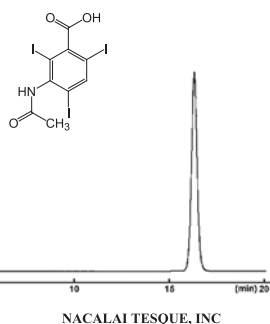
### COSMOSIL Chromatogram Index

Sample: Acetazolamide  
CAS No.: [59-66-5]  
Molecular formula: C<sub>4</sub>H<sub>6</sub>N<sub>4</sub>O<sub>3</sub>S<sub>2</sub>  
Column: HILIC  
Column size: 4.6mm I.D.-250mm  
Mobile phase: Acetonitrile/ 10mmol/l Ammonium acetate =90/10  
Flow rate: 1.0 ml/min  
Temperature: 30°C  
Detection: UV254 nm  
Attenuation: 0.128 auFS  
Sample conc.: 0.2mg/ml  
Injection volume: 0.5µl  
Retention time: 5.99min  
Capacity factor: 1.05



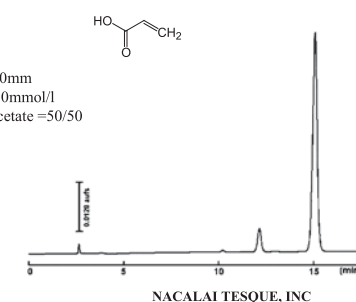
### COSMOSIL Chromatogram Index

Sample: Acetizonic Acid  
CAS No.: [85-36-9]  
Molecular formula: C<sub>9</sub>H<sub>9</sub>N<sub>3</sub>O<sub>3</sub>  
Column: HILIC  
Column size: 4.6mm I.D.-250mm  
Mobile phase: Acetonitrile/ 10mmol/l Ammonium acetate =50/50  
Flow rate: 1.0 ml/min  
Temperature: 30°C  
Detection: UV254 nm  
Attenuation: 0.128 auFS  
Sample conc.: 0.8mg/ml  
Injection volume: 1.0µl  
Retention time: 16.39min  
Capacity factor: 4.76



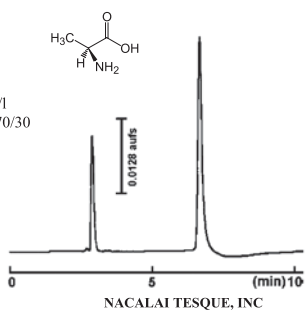
### COSMOSIL Chromatogram Index

Sample: Acrylic Acid  
CAS No.: [79-10-7]  
Molecular formula: C<sub>3</sub>H<sub>4</sub>O<sub>2</sub>  
Column: HILIC  
Column size: 4.6mm I.D.-250mm  
Mobile phase: Acetonitrile/ 10mmol/l Ammonium acetate =50/50  
Flow rate: 1.0 ml/min  
Temperature: 30°C  
Detection: UV220 nm  
Attenuation: 0.128 auFS  
Sample conc.: 1.0mg/ml  
Injection volume: 1.0µl  
Retention time: 15.05min  
Capacity factor: 4.28



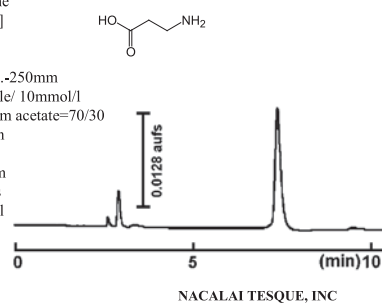
### COSMOSIL Chromatogram Index

Sample: L-α-Alanine  
CAS No.: [56-41-7]  
Molecular formula: C<sub>3</sub>H<sub>7</sub>NO<sub>2</sub>  
Column: HILIC  
Column size: 4.6mm I.D.-250mm  
Mobile phase: Acetonitrile/ 10mmol/l Ammonium acetate=70/30  
Flow rate: 1.0 ml/min  
Temperature: 30°C  
Detection: UV 210nm  
Attenuation: 0.128 auFS  
Sample conc.: 5.0mg/ml  
Injection volume: 2.0µl  
Retention time: 6.67min  
Capacity factor: 1.53



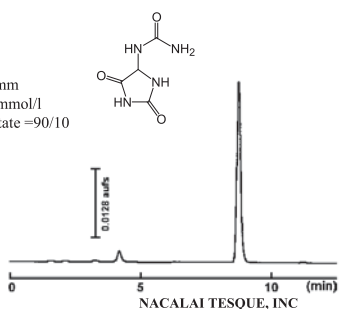
### COSMOSIL Chromatogram Index

Sample: β-Alanine  
CAS No.: [107-95-9]  
Molecular formula: C<sub>3</sub>H<sub>7</sub>NO<sub>2</sub>  
Column: HILIC  
Column size: 4.6mm I.D.-250mm  
Mobile phase: Acetonitrile/ 10mmol/l Ammonium acetate=70/30  
Flow rate: 1.0 ml/min  
Temperature: 30°C  
Detection: UV 210nm  
Attenuation: 0.128 auFS  
Sample conc.: 10.0mg/ml  
Injection volume: 0.5µl  
Retention time: 7.38min  
Capacity factor: 1.81



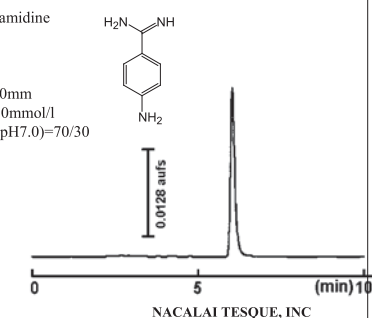
### COSMOSIL Chromatogram Index

Sample: Allantoin  
CAS No.: [97-59-6]  
Molecular formula: C<sub>4</sub>H<sub>6</sub>N<sub>4</sub>O<sub>3</sub>  
Column: HILIC  
Column size: 4.6mm I.D.-250mm  
Mobile phase: Acetonitrile/ 10mmol/l Ammonium acetate =90/10  
Flow rate: 1.0 ml/min  
Temperature: 30°C  
Detection: UV220 nm  
Attenuation: 0.128 auFS  
Sample conc.: 1.0mg/ml  
Injection volume: 1.0µl  
Retention time: 8.75min  
Capacity factor: 2.02



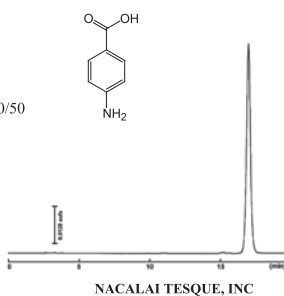
### COSMOSIL Chromatogram Index

Sample: p-Aminobenzamidine  
CAS No.: [3858-83-1]  
Molecular formula: C<sub>8</sub>H<sub>9</sub>N<sub>3</sub>  
Column: HILIC  
Column size: 4.6mm I.D.-250mm  
Mobile phase: Acetonitrile/ 10mmol/l Citrate buffer(pH7.0)=70/30  
Flow rate: 1.0 ml/min  
Temperature: 30°C  
Detection: UV254 nm  
Attenuation: 0.128 auFS  
Sample conc.: 0.5mg/ml  
Injection volume: 1.0µl  
Retention time: 6.07min  
Capacity factor: 1.31



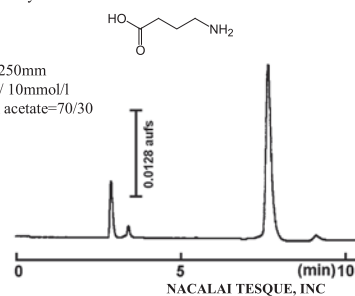
### COSMOSIL Chromatogram Index

Sample: *p*-Aminobenzoic Acid  
CAS No.: [150-13-0]  
Molecular formula: C<sub>7</sub>H<sub>7</sub>NO<sub>2</sub>  
Column: HILIC  
Column size: 4.6mm I.D.-250mm  
Mobile phase: Acetonitrile/ 10mmol/l  
Ammonium acetate =50/50  
Flow rate: 1.0 ml/min  
Temperature: 30°C  
Detection: UV254 nm  
Attenuation: 0.128 aufs  
Sample conc.: 0.4mg/ml  
Injection volume: 1.0µl  
Retention time: 16.97min  
Capacity factor: 4.91



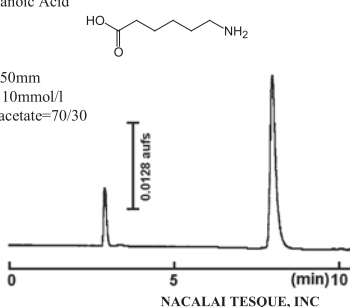
### COSMOSIL Chromatogram Index

Sample: 4-Amino-*n*-butyric Acid  
CAS No.: [56-12-2]  
Molecular formula: C<sub>6</sub>H<sub>9</sub>NO<sub>2</sub>  
Column: HILIC  
Column size: 4.6mm I.D.-250mm  
Mobile phase: Acetonitrile/ 10mmol/l  
Ammonium acetate =70/30  
Flow rate: 1.0 ml/min  
Temperature: 30°C  
Detection: UV210 nm  
Attenuation: 0.128 aufs  
Sample conc.: 10.0mg/ml  
Injection volume: 1.0µl  
Retention time: 7.67min  
Capacity factor: 1.92



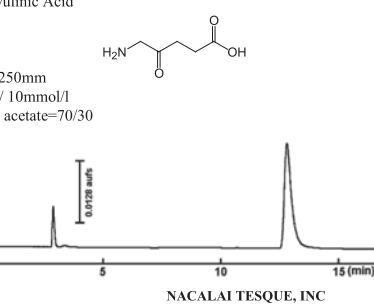
### COSMOSIL Chromatogram Index

Sample: 6-Aminohexanoic Acid  
CAS No.: [60-32-2]  
Molecular formula: C<sub>6</sub>H<sub>13</sub>NO<sub>2</sub>  
Column: HILIC  
Column size: 4.6mm I.D.-250mm  
Mobile phase: Acetonitrile/ 10mmol/l  
Ammonium acetate =70/30  
Flow rate: 1.0 ml/min  
Temperature: 30°C  
Detection: UV 210nm  
Attenuation: 0.128 aufs  
Sample conc.: 10.0mg/ml  
Injection volume: 1.0µl  
Retention time: 7.98min  
Capacity factor: 2.03



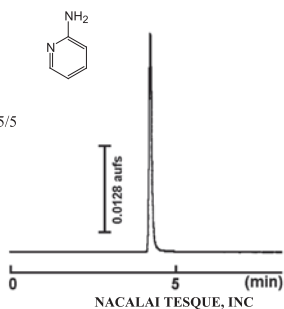
### COSMOSIL Chromatogram Index

Sample: 5-Aminolevulinic Acid  
CAS No.: [5451-09-2]  
Molecular formula: C<sub>5</sub>H<sub>9</sub>NO<sub>3</sub>  
Column: HILIC  
Column size: 4.6mm I.D.-250mm  
Mobile phase: Acetonitrile/ 10mmol/l  
Ammonium acetate =70/30  
Flow rate: 1.0 ml/min  
Temperature: 30°C  
Detection: UV 210nm  
Attenuation: 0.128 aufs  
Sample conc.: 5.0mg/ml  
Injection volume: 1.0µl  
Retention time: 12.80min  
Capacity factor: 3.87



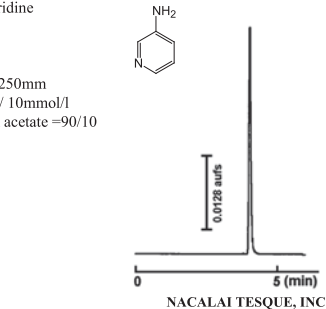
### COSMOSIL Chromatogram Index

Sample: 2-Aminopyridine  
CAS No.: [504-29-0]  
Molecular formula: C<sub>5</sub>H<sub>6</sub>N<sub>2</sub>  
Column: HILIC  
Column size: 4.6mm I.D.-250mm  
Mobile phase: Acetonitrile/ 10mmol/l  
Ammonium acetate =95/5  
Flow rate: 1.0 ml/min  
Temperature: 30°C  
Detection: UV254 nm  
Attenuation: 0.128 aufs  
Sample conc.: 1.0mg/ml  
Injection volume: 0.5µl  
Retention time: 4.25min  
Capacity factor: 0.39



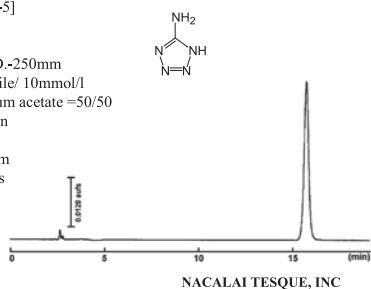
### COSMOSIL Chromatogram Index

Sample: 3-Aminopyridine  
CAS No.: [462-08-8]  
Molecular formula: C<sub>5</sub>H<sub>6</sub>N<sub>2</sub>  
Column: HILIC  
Column size: 4.6mm I.D.-250mm  
Mobile phase: Acetonitrile/ 10mmol/l  
Ammonium acetate =90/10  
Flow rate: 1.0 ml/min  
Temperature: 30°C  
Detection: UV254 nm  
Attenuation: 0.128 aufs  
Sample conc.: 0.1mg/ml  
Injection volume: 1.0µl  
Retention time: 4.05min  
Capacity factor: 0.51



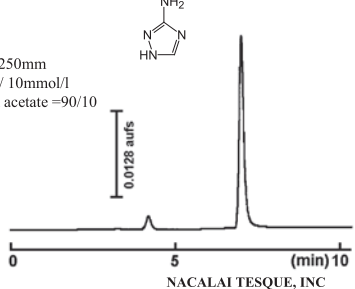
### COSMOSIL Chromatogram Index

Sample: 5-Amino-1*H*-tetrazole  
CAS No.: [4418-61-5]  
Molecular formula: CH<sub>3</sub>N<sub>5</sub>  
Column: HILIC  
Column size: 4.6mm I.D.-250mm  
Mobile phase: Acetonitrile/ 10mmol/l  
Ammonium acetate =50/50  
Flow rate: 1.0 ml/min  
Temperature: 30°C  
Detection: UV220 nm  
Attenuation: 0.128 aufs  
Sample conc.: 0.5mg/ml  
Injection volume: 1.0µl  
Retention time: 15.76min  
Capacity factor: 4.49



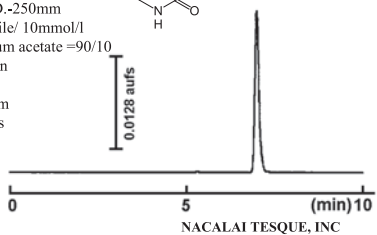
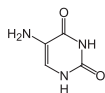
### COSMOSIL Chromatogram Index

Sample: 3-Amino-1*H*-1,2,4-triazole  
CAS No.: [61-82-5]  
Molecular formula: C<sub>2</sub>H<sub>4</sub>N<sub>4</sub>  
Column: HILIC  
Column size: 4.6mm I.D.-250mm  
Mobile phase: Acetonitrile/ 10mmol/l  
Ammonium acetate =90/10  
Flow rate: 1.0 ml/min  
Temperature: 30°C  
Detection: UV220 nm  
Attenuation: 0.128 aufs  
Sample conc.: 0.2mg/ml  
Injection volume: 1.0µl  
Retention time: 7.01min  
Capacity factor: 1.42



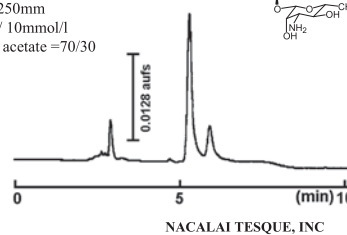
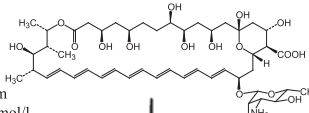
### COSMOSIL Chromatogram Index

Sample: 5-Aminouracil  
 CAS No.: [932-52-5]  
 Molecular formula:  $C_4H_4N_2O_2$   
 Column: HILIC  
 Column size: 4.6mm I.D.-250mm  
 Mobile phase: Acetonitrile/ 10mmol/l Ammonium acetate =90/10  
 Flow rate: 1.0 ml/min  
 Temperature: 30°C  
 Detection: UV260 nm  
 Attenuation: 0.128 auFS  
 Sample conc.: 0.5mg/ml  
 Injection volume: 0.5µl  
 Retention time: 7.01min  
 Capacity factor: 1.42



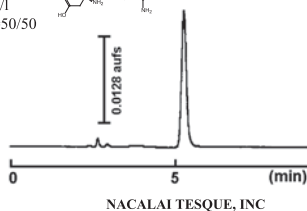
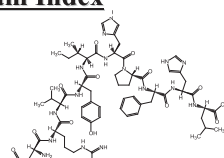
### COSMOSIL Chromatogram Index

Sample: Amphotericin B  
 CAS No.: [1397-89-3]  
 Molecular formula:  $C_{47}H_{73}NO_{17}$   
 Column: HILIC  
 Column size: 4.6mm I.D.-250mm  
 Mobile phase: Acetonitrile/ 10mmol/l Ammonium acetate =70/30  
 Flow rate: 1.0 ml/min  
 Temperature: 30°C  
 Detection: UV210 nm  
 Attenuation: 0.128 auFS  
 Sample conc.: 0.25mg/ml  
 Injection volume: 0.5µl  
 Retention time: 5.34min  
 Capacity factor: 0.99



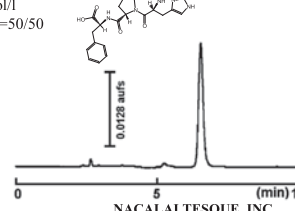
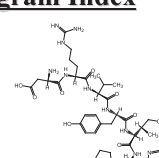
### COSMOSIL Chromatogram Index

Sample: Angiotensin I(Human)  
 CAS No.: [484-42-4]  
 Molecular formula:  $C_{62}H_{89}N_{17}O_{14}$   
 Column: HILIC  
 Column size: 4.6mm I.D.-250mm  
 Mobile phase: Acetonitrile/ 10mmol/l Ammonium acetate =50/50  
 Flow rate: 1.0 ml/min  
 Temperature: 30°C  
 Detection: UV220 nm  
 Attenuation: 0.128 auFS  
 Sample conc.: 0.4mg/ml  
 Injection volume: 0.5µl  
 Retention time: 5.28min  
 Capacity factor: 0.84



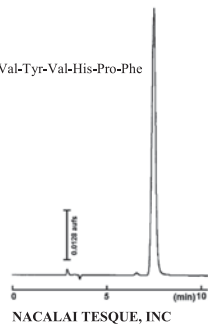
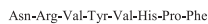
### COSMOSIL Chromatogram Index

Sample: Angiotensin II(Human)  
 CAS No.: [4474-91-3]  
 Molecular formula:  $C_{50}H_{71}N_{13}O_{12}$   
 Column: HILIC  
 Column size: 4.6mm I.D.-250mm  
 Mobile phase: Acetonitrile/ 10mmol/l Ammonium acetate =50/50  
 Flow rate: 1.0 ml/min  
 Temperature: 30°C  
 Detection: UV220 nm  
 Attenuation: 0.128 auFS  
 Sample conc.: 0.4mg/ml  
 Injection volume: 0.5µl  
 Retention time: 6.56min  
 Capacity factor: 1.29



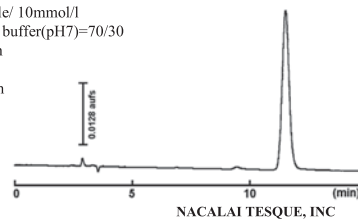
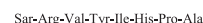
### COSMOSIL Chromatogram Index

Sample: Angiotensin II,[Asn<sup>1</sup>,Val<sup>2</sup>]  
 CAS No.: [53-73-6]  
 Molecular formula:  $C_{46}H_{70}N_{14}O_{11}$   
 Column: HILIC  
 Column size: 4.6mm I.D.-250mm  
 Mobile phase: Acetonitrile/ 10mmol/l Phosphate buffer(pH7)=70/30  
 Flow rate: 1.0 ml/min  
 Temperature: 30°C  
 Detection: UV220 nm  
 Attenuation: 0.128 auFS  
 Sample conc.: 1.0mg/ml  
 Injection volume: 1.0µl  
 Retention time: 7.48min  
 Capacity factor: 1.85



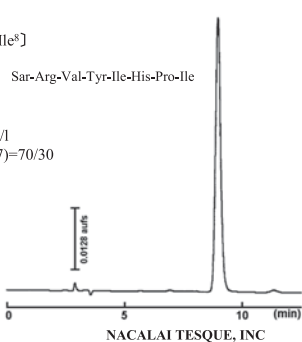
### COSMOSIL Chromatogram Index

Sample: Angiotensin II,[Sar<sup>1</sup>,Ala<sup>8</sup>]  
 CAS No.: [38027-95-1]  
 Molecular formula:  $C_{43}H_{67}N_{13}O_{10}$   
 Column: HILIC  
 Column size: 4.6mm I.D.-250mm  
 Mobile phase: Acetonitrile/ 10mmol/l Phosphate buffer(pH7)=70/30  
 Flow rate: 1.0 ml/min  
 Temperature: 30°C  
 Detection: UV220 nm  
 Attenuation: 0.128 auFS  
 Sample conc.: 1.0mg/ml  
 Injection volume: 1.0µl  
 Retention time: 11.57min  
 Capacity factor: 3.41



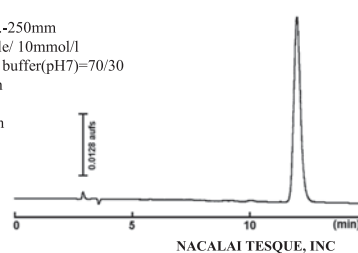
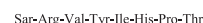
### COSMOSIL Chromatogram Index

Sample: Angiotensin II,[Sar<sup>1</sup>,Ile<sup>8</sup>]  
 CAS No.: [37827-06-8]  
 Molecular formula:  $C_{46}H_{73}N_{13}O_{10}$   
 Column: HILIC  
 Column size: 4.6mm I.D.-250mm  
 Mobile phase: Acetonitrile/ 10mmol/l Phosphate buffer(pH7)=70/30  
 Flow rate: 1.0 ml/min  
 Temperature: 30°C  
 Detection: UV220 nm  
 Attenuation: 0.128 auFS  
 Sample conc.: 1.0mg/ml  
 Injection volume: 1.0µl  
 Retention time: 9.02min  
 Capacity factor: 2.44



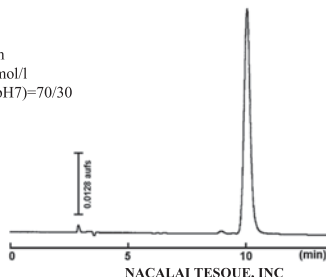
### COSMOSIL Chromatogram Index

Sample: Angiotensin II,[Sar<sup>1</sup>,Thr<sup>8</sup>]  
 CAS No.: [53632-49-8]  
 Molecular formula:  $C_{44}H_{69}N_{13}O_{11}$   
 Column: HILIC  
 Column size: 4.6mm I.D.-250mm  
 Mobile phase: Acetonitrile/ 10mmol/l Phosphate buffer(pH7)=70/30  
 Flow rate: 1.0 ml/min  
 Temperature: 30°C  
 Detection: UV220 nm  
 Attenuation: 0.128 auFS  
 Sample conc.: 1.0mg/ml  
 Injection volume: 1.0µl  
 Retention time: 12.04min  
 Capacity factor: 3.59



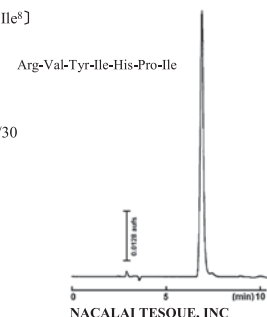
### COSMOSIL Chromatogram Index

Sample: Angiotensin II, [Val<sup>8</sup>] Asp-Arg-Val-Tyr-Val-His-Pro-Phe  
CAS No.: [58-49-1]  
Molecular formula: C<sub>49</sub>H<sub>69</sub>N<sub>13</sub>O<sub>12</sub>  
Column: HILIC  
Column size: 4.6mm I.D.-250mm  
Mobile phase: Acetonitrile/ 10mmol/l Phosphate buffer(pH7)=70/30  
Flow rate: 1.0 ml/min  
Temperature: 30°C  
Detection: UV220 nm  
Attenuation: 0.128 auFS  
Sample conc.: 1.0mg/ml  
Injection volume: 1.0µl  
Retention time: 10.08min  
Capacity factor: 2.85



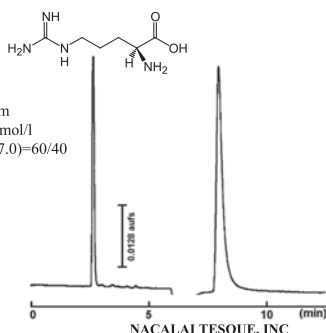
### COSMOSIL Chromatogram Index

Sample: Angiotensin II, Des-Asp<sup>1</sup>-[Ile<sup>8</sup>] Arg-Val-Tyr-Ile-His-Pro-Ile  
CAS No.: [52498-25-6]  
Molecular formula: C<sub>43</sub>H<sub>68</sub>N<sub>12</sub>O<sub>6</sub>  
Column: HILIC  
Column size: 4.6mm I.D.-250mm  
Mobile phase: Acetonitrile/ 10mmol/l Phosphate buffer(pH7)=70/30  
Flow rate: 1.0 ml/min  
Temperature: 30°C  
Detection: UV220 nm  
Attenuation: 0.128 auFS  
Sample conc.: 1.0mg/ml  
Injection volume: 1.0µl  
Retention time: 6.89min  
Capacity factor: 1.63



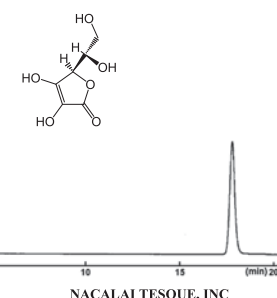
### COSMOSIL Chromatogram Index

Sample: L-Arginine  
CAS No.: [74-79-3]  
Molecular formula: C<sub>6</sub>H<sub>14</sub>N<sub>4</sub>O<sub>2</sub>  
Column: HILIC  
Column size: 4.6mm I.D.-250mm  
Mobile phase: Acetonitrile/ 10mmol/l Citrate buffer(pH7.0)=60/40  
Flow rate: 1.0 ml/min  
Temperature: 30°C  
Detection: UV210 nm  
Attenuation: 0.128 auFS  
Sample conc.: 10.0mg/ml  
Injection volume: 1.0µl  
Retention time: 7.97min  
Capacity factor: 1.95



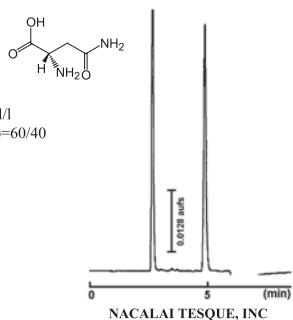
### COSMOSIL Chromatogram Index

Sample: L(+)-Ascorbic Acid  
CAS No.: [50-81-7]  
Molecular formula: C<sub>6</sub>H<sub>8</sub>O<sub>6</sub>  
Column: HILIC  
Column size: 4.6mm I.D.-250mm  
Mobile phase: Acetonitrile/ 10mmol/l Ammonium acetate=50/50  
Flow rate: 1.0 ml/min  
Temperature: 30°C  
Detection: UV245nm  
Attenuation: 0.128 auFS  
Sample conc.: 0.2mg/ml  
Injection volume: 3.0µl  
Retention time: 17.80min  
Capacity factor: 5.31



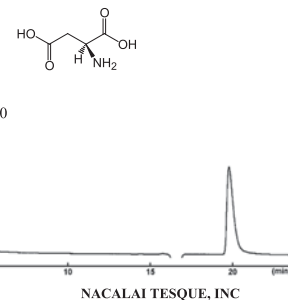
### COSMOSIL Chromatogram Index

Sample: L-Asparagine  
CAS No.: [70-47-3]  
Molecular formula: C<sub>4</sub>H<sub>8</sub>N<sub>2</sub>O<sub>3</sub>  
Column: HILIC  
Column size: 4.6mm I.D.-250mm  
Mobile phase: Acetonitrile/ 10mmol/l Citrate buffer(pH7.0)=60/40  
Flow rate: 1.0 ml/min  
Temperature: 30°C  
Detection: UV210 nm  
Attenuation: 0.128 auFS  
Sample conc.: 5.0mg/ml  
Injection volume: 1.0µl  
Retention time: 4.88min  
Capacity factor: 0.80



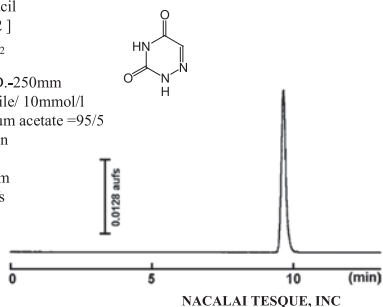
### COSMOSIL Chromatogram Index

Sample: L-Aspartic Acid  
CAS No.: [56-84-8]  
Molecular formula: C<sub>4</sub>H<sub>7</sub>NO<sub>4</sub>  
Column: HILIC  
Column size: 4.6mm I.D.-250mm  
Mobile phase: Acetonitrile/ 10mmol/l Ammonium acetate=50/50  
Flow rate: 1.0 ml/min  
Temperature: 30°C  
Detection: UV 210nm  
Attenuation: 0.128 auFS  
Sample conc.: 10.0mg/ml  
Injection volume: 2.0µl  
Retention time: 19.79min  
Capacity factor: 6.01



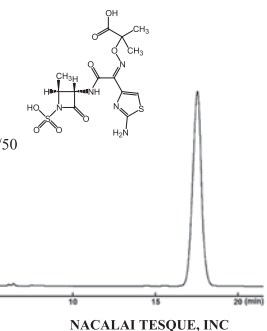
### COSMOSIL Chromatogram Index

Sample: 6-Azauracil  
CAS No.: [461-89-2]  
Molecular formula: C<sub>3</sub>H<sub>3</sub>N<sub>3</sub>O<sub>2</sub>  
Column: HILIC  
Column size: 4.6mm I.D.-250mm  
Mobile phase: Acetonitrile/ 10mmol/l Ammonium acetate=95/5  
Flow rate: 1.0 ml/min  
Temperature: 30°C  
Detection: UV260 nm  
Attenuation: 0.128 auFS  
Sample conc.: 0.3mg/ml  
Injection volume: 0.5µl  
Retention time: 9.65min  
Capacity factor: 2.19



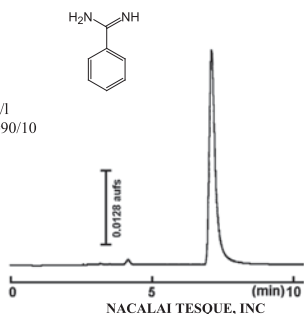
### COSMOSIL Chromatogram Index

Sample: Aztreonam  
CAS No.: [78110-38-0]  
Molecular formula: C<sub>13</sub>H<sub>17</sub>N<sub>5</sub>O<sub>8</sub>S<sub>2</sub>  
Column: HILIC  
Column size: 4.6mm I.D.-250mm  
Mobile phase: Acetonitrile/ 20mmol/l Phosphate buffer(pH7)=50/50  
Flow rate: 1.0 ml/min  
Temperature: 30°C  
Detection: UV280 nm  
Attenuation: 0.128 auFS  
Sample conc.: 2.5mg/ml  
Injection volume: 1.0µl  
Retention time: 17.57min  
Capacity factor: 5.18



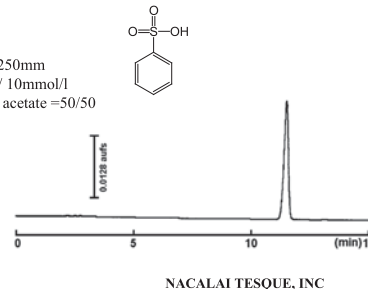
### COSMOSIL Chromatogram Index

Sample: Benzamidine  
CAS No.: [618-39-3]  
Molecular formula:  $C_8H_{10}N_2$   
Column: HILIC  
Column size: 4.6mm I.D.-250mm  
Mobile phase: Acetonitrile/ 10mmol/l  
Ammonium acetate =90/10  
Flow rate: 1.0 ml/min  
Temperature: 30°C  
Detection: UV254 nm  
Attenuation: 0.128 au/s  
Sample conc.: 1.5mg/ml  
Injection volume: 0.5µl  
Retention time: 7.16min  
Capacity factor: 1.46



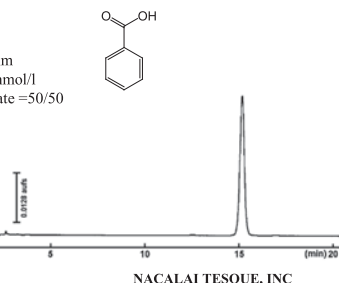
### COSMOSIL Chromatogram Index

Sample: Benzenesulfonic Acid  
CAS No.: [98-11-3]  
Molecular formula:  $C_6H_5O_3S$   
Column: HILIC  
Column size: 4.6mm I.D.-250mm  
Mobile phase: Acetonitrile/ 10mmol/l  
Ammonium acetate =50/50  
Flow rate: 1.0 ml/min  
Temperature: 30°C  
Detection: UV254 nm  
Attenuation: 0.128 au/s  
Sample conc.: 5.0mg/ml  
Injection volume: 1.0µl  
Retention time: 11.54min  
Capacity factor: 3.05



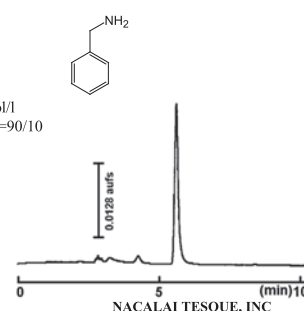
### COSMOSIL Chromatogram Index

Sample: Benzoic Acid  
CAS No.: [65-85-0]  
Molecular formula:  $C_7H_6O_2$   
Column: HILIC  
Column size: 4.6mm I.D.-250mm  
Mobile phase: Acetonitrile/ 10mmol/l  
Ammonium acetate =50/50  
Flow rate: 1.0 ml/min  
Temperature: 30°C  
Detection: UV254 nm  
Attenuation: 0.128 au/s  
Sample conc.: 5.0mg/ml  
Injection volume: 0.5µl  
Retention time: 15.19min  
Capacity factor: 4.29



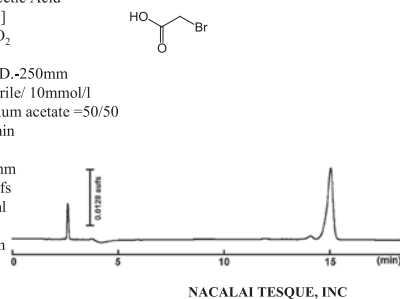
### COSMOSIL Chromatogram Index

Sample: Benzylamine  
CAS No.: [100-46-9]  
Molecular formula:  $C_7H_9N$   
Column: HILIC  
Column size: 4.6mm I.D.-250mm  
Mobile phase: Acetonitrile/ 50mmol/l  
Ammonium acetate =90/10  
Flow rate: 1.0 ml/min  
Temperature: 30°C  
Detection: UV220 nm  
Attenuation: 0.128 au/s  
Sample conc.: 1.0mg/ml  
Injection volume: 0.5µl  
Retention time: 5.58min  
Capacity factor: 0.95



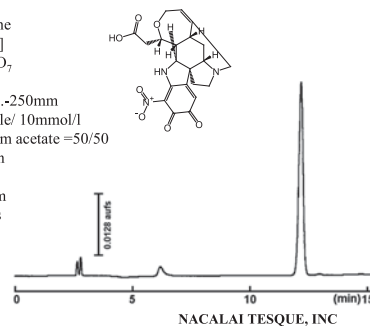
### COSMOSIL Chromatogram Index

Sample: Bromoacetic Acid  
CAS No.: [79-08-3]  
Molecular formula:  $C_2H_3BrO_2$   
Column: HILIC  
Column size: 4.6mm I.D.-250mm  
Mobile phase: Acetonitrile/ 10mmol/l  
Ammonium acetate =50/50  
Flow rate: 1.0 ml/min  
Temperature: 30°C  
Detection: UV210 nm  
Attenuation: 0.128 au/s  
Sample conc.: 1.0mg/ml  
Injection volume: 1.0µl  
Retention time: 15.04min  
Capacity factor: 4.31



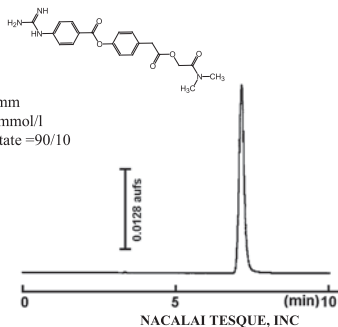
### COSMOSIL Chromatogram Index

Sample: Cacotheine  
CAS No.: [561-20-6]  
Molecular formula:  $C_{21}H_{21}N_3O_7$   
Column: HILIC  
Column size: 4.6mm I.D.-250mm  
Mobile phase: Acetonitrile/ 10mmol/l  
Ammonium acetate =50/50  
Flow rate: 1.0 ml/min  
Temperature: 30°C  
Detection: UV220 nm  
Attenuation: 0.128 au/s  
Sample conc.: 1.0mg/ml  
Injection volume: 1.0µl  
Retention time: 12.19min  
Capacity factor: 3.23



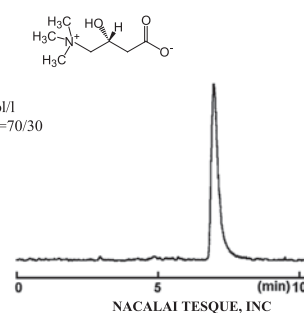
### COSMOSIL Chromatogram Index

Sample: Camostat  
CAS No.: [59721-28-7]  
Molecular formula:  $C_{20}H_{22}N_4O_5$   
Column: HILIC  
Column size: 4.6mm I.D.-250mm  
Mobile phase: Acetonitrile/ 10mmol/l  
Ammonium acetate =90/10  
Flow rate: 1.0 ml/min  
Temperature: 30°C  
Detection: UV265 nm  
Attenuation: 0.128 au/s  
Sample conc.: 0.5mg/ml  
Injection volume: 0.5µl  
Retention time: 7.16min  
Capacity factor: 1.47



### COSMOSIL Chromatogram Index

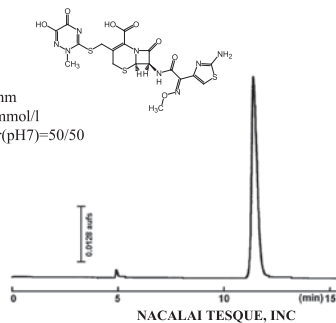
Sample: L-Carnitine  
CAS No.: [541-15-1]  
Molecular formula:  $C_7H_{15}NO_3$   
Column: HILIC  
Column size: 4.6mm I.D.-250mm  
Mobile phase: Acetonitrile/ 10mmol/l  
Ammonium acetate =70/30  
Flow rate: 1.0 ml/min  
Temperature: 30°C  
Detection: ELSD  
Attenuation: Gain=6, Atten=8  
Sample conc.: 2.0mg/ml  
Injection volume: 1.5µl  
Retention time: 6.96min  
Capacity factor: 1.78





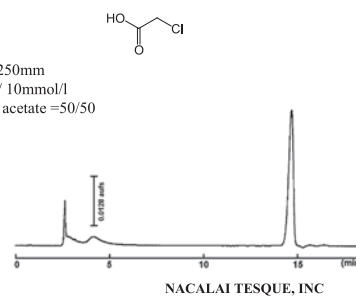
### COSMOSIL Chromatogram Index

Sample: Ceftriaxone  
CAS No.: [73384-59-5]  
Molecular formula:  $C_{15}H_{18}N_6O_7S_3$   
Column: HILIC  
Column size: 4.6mm I.D.-250mm  
Mobile phase: Acetonitrile/ 10mmol/l  
Phosphate buffer(pH7)=50/50  
Flow rate: 1.0 ml/min  
Temperature: 30°C  
Detection: UV254 nm  
Attenuation: 0.128 aufs  
Sample conc.: 0.5mg/ml  
Injection volume: 1.0µl  
Retention time: 11.36min  
Capacity factor: 3.05



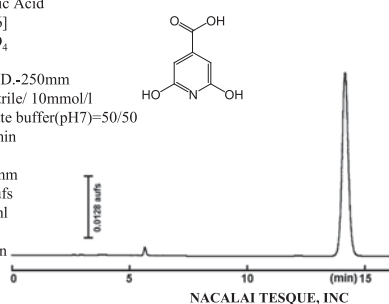
### COSMOSIL Chromatogram Index

Sample: Chloroacetic Acid  
CAS No.: [79-11-8]  
Molecular formula:  $C_2H_3ClO_2$   
Column: HILIC  
Column size: 4.6mm I.D.-250mm  
Mobile phase: Acetonitrile/ 10mmol/l  
Ammonium acetate =50/50  
Flow rate: 1.0 ml/min  
Temperature: 30°C  
Detection: UV210 nm  
Attenuation: 0.128 aufs  
Sample conc.: 10.0mg/ml  
Injection volume: 1.0µl  
Retention time: 14.69min  
Capacity factor: 4.15



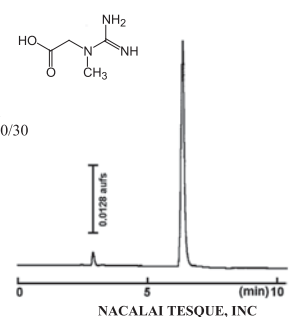
### COSMOSIL Chromatogram Index

Sample: Citrazinic Acid  
CAS No.: [99-11-6]  
Molecular formula:  $C_6H_5NO_4$   
Column: HILIC  
Column size: 4.6mm I.D.-250mm  
Mobile phase: Acetonitrile/ 10mmol/l  
Phosphate buffer(pH7)=50/50  
Flow rate: 1.0 ml/min  
Temperature: 30°C  
Detection: UV220 nm  
Attenuation: 0.128 aufs  
Sample conc.: 0.5mg/ml  
Injection volume: 0.5µl  
Retention time: 14.16min  
Capacity factor: 3.98



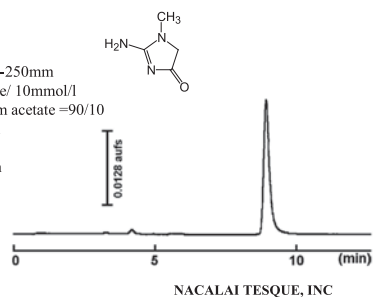
### COSMOSIL Chromatogram Index

Sample: Creatine  
CAS No.: [57-00-1]  
Molecular formula:  $C_4H_9N_3O_2$   
Column: HILIC  
Column size: 4.6mm I.D.-250mm  
Mobile phase: Acetonitrile/ 10mmol/l  
Ammonium acetate =70/30  
Flow rate: 1.0 ml/min  
Temperature: 30°C  
Detection: UV220 nm  
Attenuation: 0.128 aufs  
Sample conc.: 1.0mg/ml  
Injection volume: 1.0µl  
Retention time: 6.35min  
Capacity factor: 1.40



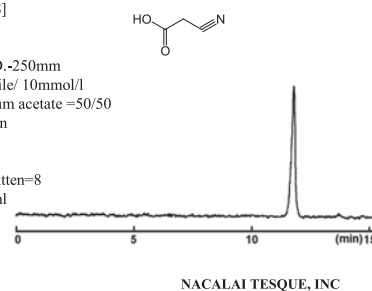
### COSMOSIL Chromatogram Index

Sample: Creatinine  
CAS No.: [60-27-5]  
Molecular formula:  $C_4H_7N_3O$   
Column: HILIC  
Column size: 4.6mm I.D.-250mm  
Mobile phase: Acetonitrile/ 10mmol/l  
Ammonium acetate =90/10  
Flow rate: 1.0 ml/min  
Temperature: 30°C  
Detection: UV220 nm  
Attenuation: 0.128 aufs  
Sample conc.: 0.5mg/ml  
Injection volume: 0.5µl  
Retention time: 8.93min  
Capacity factor: 2.08



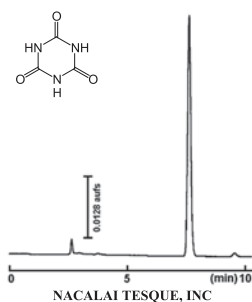
### COSMOSIL Chromatogram Index

Sample: Cyanoacetic Acid  
CAS No.: [372-09-8]  
Molecular formula:  $C_3H_3NO_2$   
Column: HILIC  
Column size: 4.6mm I.D.-250mm  
Mobile phase: Acetonitrile/ 10mmol/l  
Ammonium acetate =50/50  
Flow rate: 1.0 ml/min  
Temperature: 30°C  
Detection: ELSD  
Attenuation: Gain=6, Atten=8  
Sample conc.: 10.0mg/ml  
Injection volume: 0.5µl  
Retention time: 11.78min  
Capacity factor: 3.56



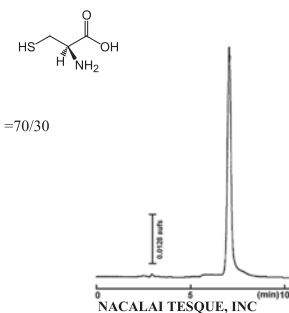
### COSMOSIL Chromatogram Index

Sample: Cyanuric Acid  
CAS No.: [108-80-5]  
Molecular formula:  $C_3H_3N_3O_3$   
Column: HILIC  
Column size: 4.6mm I.D.-250mm  
Mobile phase: Acetonitrile/ 10mmol/l  
Ammonium acetate =50/50  
Flow rate: 1.0 ml/min  
Temperature: 30°C  
Detection: UV220 nm  
Attenuation: 0.128 aufs  
Sample conc.: 0.5mg/ml  
Injection volume: 1.0µl  
Retention time: 7.61min  
Capacity factor: 1.68



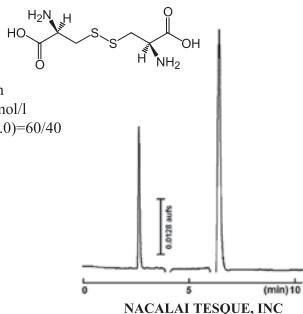
### COSMOSIL Chromatogram Index

Sample: L-Cysteine  
CAS No.: [52-90-4]  
Molecular formula:  $C_3H_7NO_2S$   
Column: HILIC  
Column size: 4.6mm I.D.-250mm  
Mobile phase: Acetonitrile/ 20mmol/l  
Phosphate buffer(pH7) =70/30  
Flow rate: 1.0 ml/min  
Temperature: 30°C  
Detection: UV220 nm  
Attenuation: 0.128 aufs  
Sample conc.: 5.0mg/ml  
Injection volume: 2.0µl  
Retention time: 7.05min  
Capacity factor: 1.69



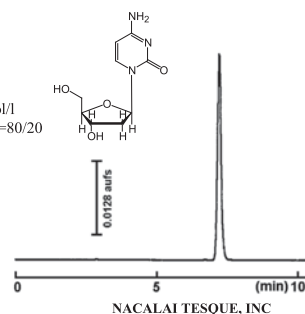
### COSMOSIL Chromatogram Index

Sample: L-(-)-Cystine  
 CAS No.: [56-89-3]  
 Molecular formula: C<sub>6</sub>H<sub>12</sub>N<sub>2</sub>O<sub>4</sub>S<sub>2</sub>  
 Column: HILIC  
 Column size: 4.6mm I.D.-250mm  
 Mobile phase: Acetonitrile/ 10mmol/l Citrate buffer(pH7.0)=60/40  
 Flow rate: 1.0 ml/min  
 Temperature: 30°C  
 Detection: UV210 nm  
 Attenuation: 0.128 auFS  
 Sample conc.: 5.0mg/ml  
 Injection volume: 0.5µl  
 Retention time: 6.42min  
 Capacity factor: 1.38



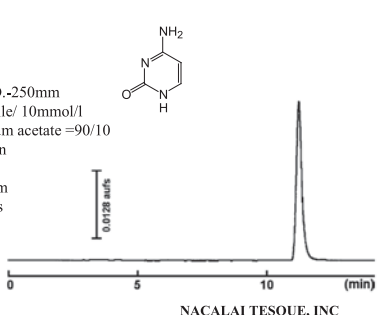
### COSMOSIL Chromatogram Index

Sample: Cytidine  
 CAS No.: [65-46-3]  
 Molecular formula: C<sub>9</sub>H<sub>13</sub>N<sub>3</sub>O<sub>5</sub>  
 Column: HILIC  
 Column size: 4.6mm I.D.-250mm  
 Mobile phase: Acetonitrile/ 10mmol/l Ammonium acetate =80/20  
 Flow rate: 1.0 ml/min  
 Temperature: 30°C  
 Detection: UV260 nm  
 Attenuation: 0.128 auFS  
 Sample conc.: 0.5mg/ml  
 Injection volume: 0.5µl  
 Retention time: 7.22min  
 Capacity factor: 1.58



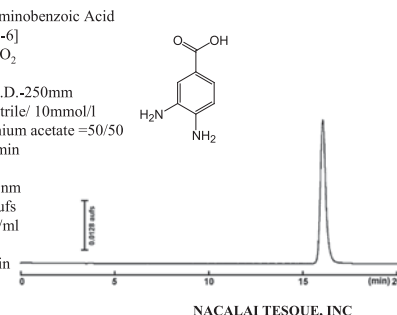
### COSMOSIL Chromatogram Index

Sample: Cytosine  
 CAS No.: [71-30-7]  
 Molecular formula: C<sub>4</sub>H<sub>5</sub>N<sub>3</sub>O  
 Column: HILIC  
 Column size: 4.6mm I.D.-250mm  
 Mobile phase: Acetonitrile/ 10mmol/l Ammonium acetate =90/10  
 Flow rate: 1.0 ml/min  
 Temperature: 30°C  
 Detection: UV260 nm  
 Attenuation: 0.128 auFS  
 Sample conc.: 0.5mg/ml  
 Injection volume: 0.5µl  
 Retention time: 11.22min  
 Capacity factor: 2.87



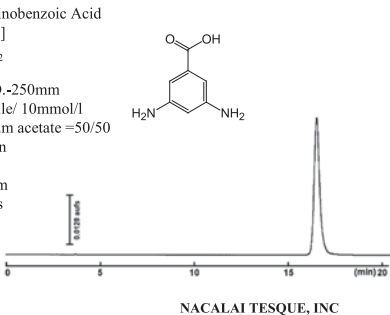
### COSMOSIL Chromatogram Index

Sample: 3,4-Diaminobenzoic Acid  
 CAS No.: [619-05-6]  
 Molecular formula: C<sub>7</sub>H<sub>7</sub>N<sub>2</sub>O<sub>2</sub>  
 Column: HILIC  
 Column size: 4.6mm I.D.-250mm  
 Mobile phase: Acetonitrile/ 10mmol/l Ammonium acetate =50/50  
 Flow rate: 1.0 ml/min  
 Temperature: 30°C  
 Detection: UV254 nm  
 Attenuation: 0.128 auFS  
 Sample conc.: 0.10mg/ml  
 Injection volume: 4.0µl  
 Retention time: 16.13min  
 Capacity factor: 4.62



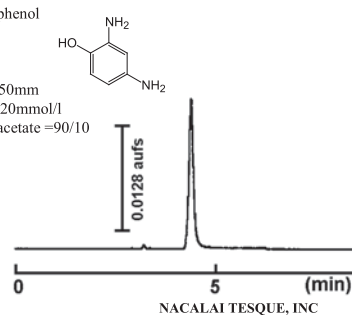
### COSMOSIL Chromatogram Index

Sample: 3,5-Diaminobenzoic Acid  
 CAS No.: [535-87-5]  
 Molecular formula: C<sub>7</sub>H<sub>7</sub>N<sub>2</sub>O<sub>2</sub>  
 Column: HILIC  
 Column size: 4.6mm I.D.-250mm  
 Mobile phase: Acetonitrile/ 10mmol/l Ammonium acetate =50/50  
 Flow rate: 1.0 ml/min  
 Temperature: 30°C  
 Detection: UV254 nm  
 Attenuation: 0.128 auFS  
 Sample conc.: 0.1mg/ml  
 Injection volume: 4.0µl  
 Retention time: 16.54min  
 Capacity factor: 4.76



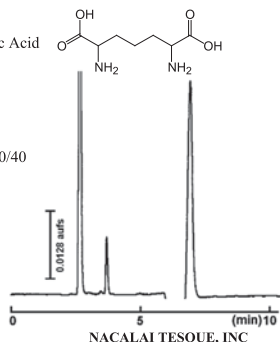
### COSMOSIL Chromatogram Index

Sample: 2,4-Diaminophenol  
 CAS No.: [95-86-3]  
 Molecular formula: C<sub>6</sub>H<sub>7</sub>N<sub>2</sub>O  
 Column: HILIC  
 Column size: 4.6mm I.D.-250mm  
 Mobile phase: Acetonitrile/ 20mmol/l Ammonium acetate =90/10  
 Flow rate: 1.0 ml/min  
 Temperature: 30°C  
 Detection: UV254 nm  
 Attenuation: 0.128 auFS  
 Sample conc.: 0.5mg/ml  
 Injection volume: 0.5µl  
 Retention time: 4.40min  
 Capacity factor: 0.51



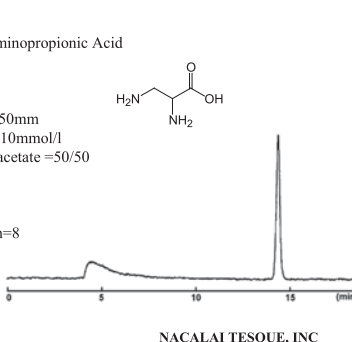
### COSMOSIL Chromatogram Index

Sample: DL-2,6-Diaminopimelic Acid  
 CAS No.: [583-93-7]  
 Molecular formula: C<sub>7</sub>H<sub>14</sub>N<sub>2</sub>O<sub>4</sub>  
 Column: HILIC  
 Column size: 4.6mm I.D.-250mm  
 Mobile phase: Acetonitrile/ 10mmol/l Citrate buffer(pH7.0)=60/40  
 Flow rate: 1.0 ml/min  
 Temperature: 30°C  
 Detection: UV210 nm  
 Attenuation: 0.128 auFS  
 Sample conc.: 10.0mg/ml  
 Injection volume: 1.5µl  
 Retention time: 6.93min  
 Capacity factor: 1.56



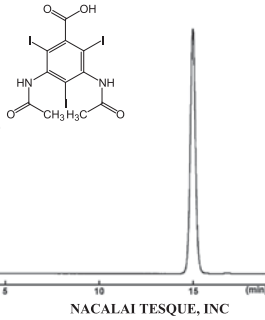
### COSMOSIL Chromatogram Index

Sample: DL-2,3-Diaminopropionic Acid  
 CAS No.: [54897-59-5]  
 Molecular formula: C<sub>3</sub>H<sub>6</sub>N<sub>2</sub>O<sub>2</sub>  
 Column: HILIC  
 Column size: 4.6mm I.D.-250mm  
 Mobile phase: Acetonitrile/ 10mmol/l Ammonium acetate =50/50  
 Flow rate: 1.0 ml/min  
 Temperature: 30°C  
 Detection: ELSD  
 Attenuation: Gain=6, Atten=8  
 Sample conc.: 5.0mg/ml  
 Injection volume: 2.0µl  
 Retention time: 14.38min  
 Capacity factor: 4.52



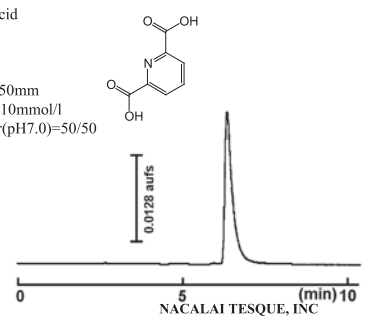
### COSMOSIL Chromatogram Index

Sample: Diatrizoic Acid  
CAS No.: [117-96-4]  
Molecular formula:  $C_7H_5I_3N_2O_4$   
Column: HILIC  
Column size: 4.6mm I.D.-250mm  
Mobile phase: Acetonitrile/ 10mmol/l Ammonium acetate =50/50  
Flow rate: 1.0 ml/min  
Temperature: 30°C  
Detection: UV254 nm  
Attenuation: 0.128 au/s  
Sample conc.: 0.8mg/ml  
Injection volume: 1.0µl  
Retention time: 14.98min  
Capacity factor: 4.26



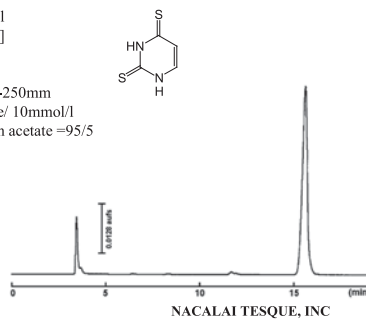
### COSMOSIL Chromatogram Index

Sample: Dipicolinic acid  
CAS No.: [499-83-2]  
Molecular formula:  $C_6H_6NO_4$   
Column: HILIC  
Column size: 4.6mm I.D.-250mm  
Mobile phase: Acetonitrile/ 10mmol/l Citrate buffer(pH7.0)=50/50  
Flow rate: 1.0 ml/min  
Temperature: 30°C  
Detection: UV254 nm  
Attenuation: 0.128 au/s  
Sample conc.: 0.5mg/ml  
Injection volume: 1.0µl  
Retention time: 6.37min  
Capacity factor: 1.23



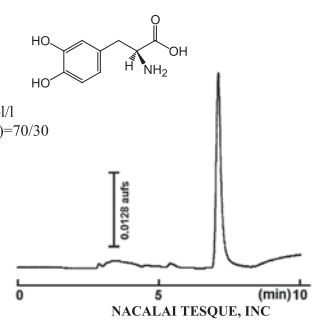
### COSMOSIL Chromatogram Index

Sample: Dithiouracil  
CAS No.: [2001-93-6]  
Molecular formula:  $C_4H_3N_2S_2$   
Column: HILIC  
Column size: 4.6mm I.D.-250mm  
Mobile phase: Acetonitrile/ 10mmol/l Ammonium acetate =95/5  
Flow rate: 1.0 ml/min  
Temperature: 30°C  
Detection: UV260 nm  
Attenuation: 0.128 au/s  
Sample conc.: 0.2mg/ml  
Injection volume: 1.5µl  
Retention time: 15.60min  
Capacity factor: 4.15



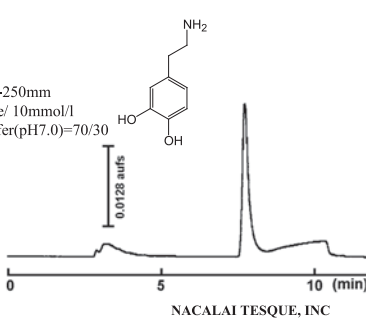
### COSMOSIL Chromatogram Index

Sample: L-DOPA  
CAS No.: [59-92-7]  
Molecular formula:  $C_9H_9NO_4$   
Column: HILIC  
Column size: 4.6mm I.D.-250mm  
Mobile phase: Acetonitrile/ 10mmol/l Citrate buffer(pH7.0)=70/30  
Flow rate: 1.0 ml/min  
Temperature: 30°C  
Detection: UV254 nm  
Attenuation: 0.128 au/s  
Sample conc.: 3.0mg/ml  
Injection volume: 3.0µl  
Retention time: 7.12min  
Capacity factor: 1.72



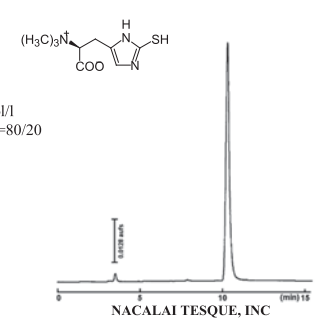
### COSMOSIL Chromatogram Index

Sample: Dopamine  
CAS No.: [51-61-6]  
Molecular formula:  $C_8H_{11}NO_2$   
Column: HILIC  
Column size: 4.6mm I.D.-250mm  
Mobile phase: Acetonitrile/ 10mmol/l Citrate buffer(pH7.0)=70/30  
Flow rate: 1.0 ml/min  
Temperature: 30°C  
Detection: UV254 nm  
Attenuation: 0.128 au/s  
Sample conc.: 1.0mg/ml  
Injection volume: 4.0µl  
Retention time: 7.73min  
Capacity factor: 1.96



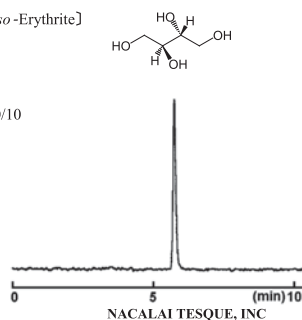
### COSMOSIL Chromatogram Index

Sample: L-(+)-Ergothioneine  
CAS No.: [497-30-3]  
Molecular formula:  $C_8H_{13}N_3O_2S$   
Column: HILIC  
Column size: 4.6mm I.D.-250mm  
Mobile phase: Acetonitrile/ 10mmol/l Ammonium acetate =80/20  
Flow rate: 1.0 ml/min  
Temperature: 30°C  
Detection: UV220 nm  
Attenuation: 0.128 au/s  
Sample conc.: 1.0mg/ml  
Injection volume: 1.0µl  
Retention time: 10.29min  
Capacity factor: 2.79



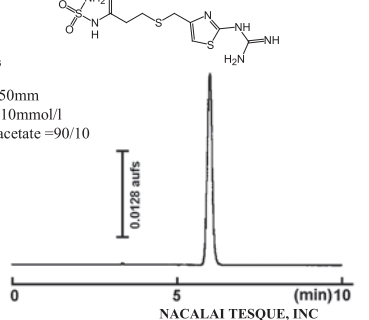
### COSMOSIL Chromatogram Index

Sample: meso-Erythritol [meso-Erythrite]  
CAS No.: [149-32-6]  
Molecular formula:  $C_4H_{10}O_4$   
Column: HILIC  
Column size: 4.6mm I.D.-250mm  
Mobile phase: Acetonitrile/ H<sub>2</sub>O=90/10  
Flow rate: 1.0 ml/min  
Temperature: 30°C  
Detection: ELSD  
Attenuation: Gain=6, Atten=8  
Sample conc.: 1.0mg/ml  
Injection volume: 1.0µl  
Retention time: 5.78min  
Capacity factor: 1.18



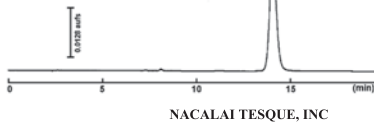
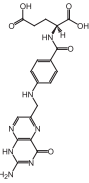
### COSMOSIL Chromatogram Index

Sample: Famotidin  
CAS No.: [76824-35-6]  
Molecular formula:  $C_8H_{13}N_5O_2S$   
Column: HILIC  
Column size: 4.6mm I.D.-250mm  
Mobile phase: Acetonitrile/ 10mmol/l Ammonium acetate =90/10  
Flow rate: 1.0 ml/min  
Temperature: 30°C  
Detection: UV254 nm  
Attenuation: 0.128 au/s  
Sample conc.: 0.25mg/ml  
Injection volume: 2.0µl  
Retention time: 5.99min  
Capacity factor: 1.06



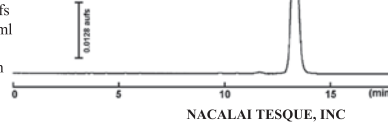
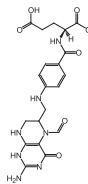
### COSMOSIL Chromatogram Index

Sample: Folic Acid  
CAS No.: [59-30-3]  
Molecular formula:  $C_{19}H_{19}N_7O_6$   
Column: HILIC  
Column size: 4.6mm I.D.-250mm  
Mobile phase: Acetonitrile/ 20mmol/l Phosphate buffer(pH7)=50/50  
Flow rate: 1.0 ml/min  
Temperature: 30°C  
Detection: UV254 nm  
Attenuation: 0.128 au/s  
Sample conc.: 0.25mg/ml  
Injection volume: 2.0µl  
Retention time: 14.09min  
Capacity factor: 3.95



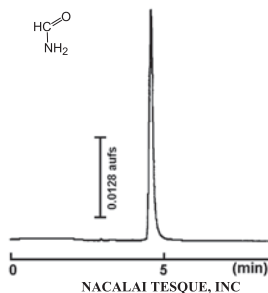
### COSMOSIL Chromatogram Index

Sample: Folic Acid  
CAS No.: [58-05-9]  
Molecular formula:  $C_{20}H_{23}N_7O_7$   
Column: HILIC  
Column size: 4.6mm I.D.-250mm  
Mobile phase: Acetonitrile/ 10mmol/l Phosphate buffer(pH7)=50/50  
Flow rate: 1.0 ml/min  
Temperature: 30°C  
Detection: UV254 nm  
Attenuation: 0.128 au/s  
Sample conc.: 0.25mg/ml  
Injection volume: 2.0µl  
Retention time: 13.36min  
Capacity factor: 3.68



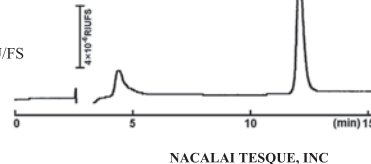
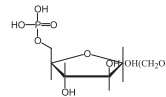
### COSMOSIL Chromatogram Index

Sample: Formamide  
CAS No.: [75-12-7]  
Molecular formula:  $CH_3NO$   
Column: HILIC  
Column size: 4.6mm I.D.-250mm  
Mobile phase: Acetonitrile/  $H_2O=95/5$   
Flow rate: 1.0 ml/min  
Temperature: 30°C  
Detection: UV220 nm  
Attenuation: 0.128 au/s  
Sample conc.: 10.0mg/ml  
Injection volume: 0.5µl  
Retention time: 4.58min  
Capacity factor: 0.52



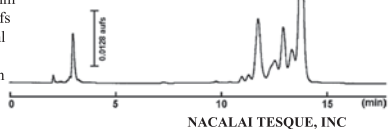
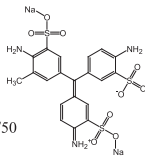
### COSMOSIL Chromatogram Index

Sample: D-Fructose-6-phosphate  
CAS No.: [643-13-0]  
Molecular formula:  $C_6H_{13}O_5P$   
Column: HILIC  
Column size: 4.6mm I.D.-250mm  
Mobile phase: Acetonitrile/ 10mmol/l Phosphate buffer(pH7)=50/50  
Flow rate: 1.0 ml/min  
Temperature: 30°C  
Detection: RI  
Attenuation:  $4 \times 10^{-5}$  RIU/FS  
Sample conc.: 10.0mg/ml  
Injection volume: 5.0µl  
Retention time: 12.16min  
Capacity factor: 3.64



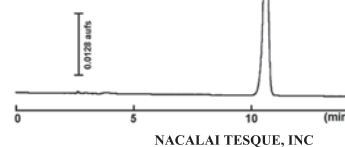
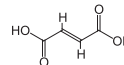
### COSMOSIL Chromatogram Index

Sample: Fuchsine, Acid  
CAS No.: [3244-88-0]  
Molecular formula:  $C_{20}H_{17}N_3Na_2O_9S_3$   
Column: HILIC  
Column size: 4.6mm I.D.-250mm  
Mobile phase: Acetonitrile/ 10mmol/l Ammonium acetate =50/50  
Flow rate: 1.0 ml/min  
Temperature: 30°C  
Detection: UV254 nm  
Attenuation: 0.128 au/s  
Sample conc.: 5.0mg/ml  
Injection volume: 1.5µl  
Retention time: 13.82min  
Capacity factor: 3.85



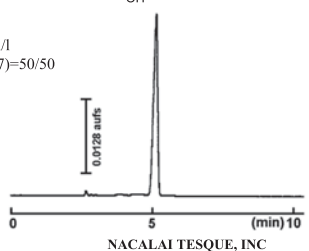
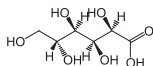
### COSMOSIL Chromatogram Index

Sample: Fumaric Acid  
CAS No.: [110-17-8]  
Molecular formula:  $C_4H_4O_4$   
Column: HILIC  
Column size: 4.6mm I.D.-250mm  
Mobile phase: Acetonitrile/ 10mmol/l Phosphate buffer(pH7)=50/50  
Flow rate: 1.0 ml/min  
Temperature: 30°C  
Detection: UV210 nm  
Attenuation: 0.128 au/s  
Sample conc.: 0.2mg/ml  
Injection volume: 0.5µl  
Retention time: 10.63min  
Capacity factor: 2.75



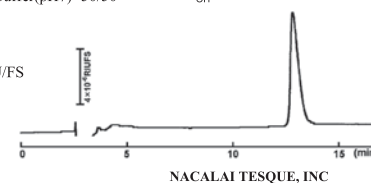
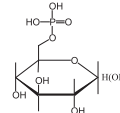
### COSMOSIL Chromatogram Index

Sample: Gluconic Acid  
CAS No.: [526-95-4]  
Molecular formula:  $C_6H_{12}O_7$   
Column: HILIC  
Column size: 4.6mm I.D.-250mm  
Mobile phase: Acetonitrile/ 10mmol/l Phosphate buffer(pH7)=50/50  
Flow rate: 1.0 ml/min  
Temperature: 30°C  
Detection: UV210 nm  
Attenuation: 0.128 au/s  
Sample conc.: 10.0mg/ml  
Injection volume: 1.0µl  
Retention time: 5.15min  
Capacity factor: 0.81



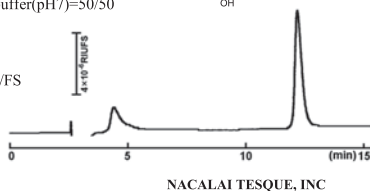
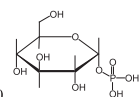
### COSMOSIL Chromatogram Index

Sample: D-Glucose-6-phosphate  
CAS No.: [56-73-5]  
Molecular formula:  $C_6H_{13}O_9P$   
Column: HILIC  
Column size: 4.6mm I.D.-250mm  
Mobile phase: Acetonitrile/ 10mmol/l Phosphate buffer(pH7)=50/50  
Flow rate: 1.0 ml/min  
Temperature: 30°C  
Detection: RI  
Attenuation:  $4 \times 10^{-5}$  RIU/FS  
Sample conc.: 10.0mg/ml  
Injection volume: 5.0µl  
Retention time: 12.95min  
Capacity factor: 3.94



### COSMOSIL Chromatogram Index

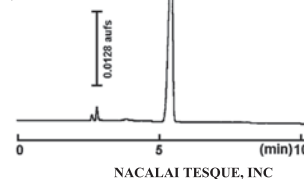
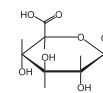
Sample:  $\alpha$ -D-Glucose-1-phosphate  
CAS No.: [59-56-3]  
Molecular formula:  $C_6H_{13}O_9P$   
Column: HILIC  
Column size: 4.6mm I.D.-250mm  
Mobile phase: Acetonitrile/ 10mmol/l  
Phosphate buffer(pH7)=50/50  
Flow rate: 1.0 ml/min  
Temperature: 30°C  
Detection: RI  
Attenuation:  $4 \times 10^{-5}$  RIU/FS  
Sample conc.: 10.0mg/ml  
Injection volume: 5.0 $\mu$ l  
Retention time: 12.26min  
Capacity factor: 3.68



NACALAI TESQUE, INC

### COSMOSIL Chromatogram Index

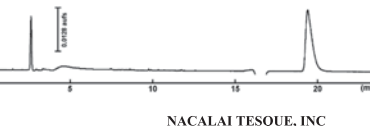
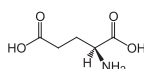
Sample: D-Glucuronic Acid  
CAS No.: [6556-12-3]  
Molecular formula:  $C_6H_{10}O_7$   
Column: HILIC  
Column size: 4.6mm I.D.-250mm  
Mobile phase: Acetonitrile/ 10mmol/l  
Phosphate buffer(pH7)=50/50  
Flow rate: 1.0 ml/min  
Temperature: 30°C  
Detection: UV210 nm  
Attenuation: 0.128 auFS  
Sample conc.: 10.0mg/ml  
Injection volume: 1.0 $\mu$ l  
Retention time: 5.45min  
Capacity factor: 0.92



NACALAI TESQUE, INC

### COSMOSIL Chromatogram Index

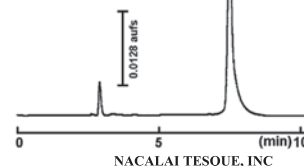
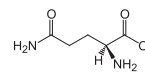
Sample: L-Glutamic Acid  
CAS No.: [56-86-0]  
Molecular formula:  $C_5H_9NO_4$   
Column: HILIC  
Column size: 4.6mm I.D.-250mm  
Mobile phase: Acetonitrile/ 10mmol/l  
Ammonium acetate=50/50  
Flow rate: 1.0 ml/min  
Temperature: 30°C  
Detection: UV 210nm  
Attenuation: 0.128 auFS  
Sample conc.: 10.0mg/ml  
Injection volume: 2.0 $\mu$ l  
Retention time: 19.38min  
Capacity factor: 5.87



NACALAI TESQUE, INC

### COSMOSIL Chromatogram Index

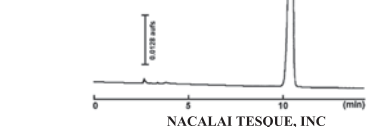
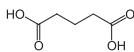
Sample: L-Glutamine  
CAS No.: [56-85-9]  
Molecular formula:  $C_5H_{11}N_2O_3$   
Column: HILIC  
Column size: 4.6mm I.D.-250mm  
Mobile phase: Acetonitrile/ 10mmol/l  
Ammonium acetate=70/30  
Flow rate: 1.0 ml/min  
Temperature: 30°C  
Detection: UV210 nm  
Attenuation: 0.128 auFS  
Sample conc.: 10.0mg/ml  
Injection volume: 0.5 $\mu$ l  
Retention time: 7.50min  
Capacity factor: 1.85



NACALAI TESQUE, INC

### COSMOSIL Chromatogram Index

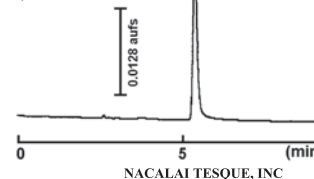
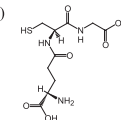
Sample: Glutaric Acid  
CAS No.: [110-94-1]  
Molecular formula:  $C_5H_8O_4$   
Column: HILIC  
Column size: 4.6mm I.D.-250mm  
Mobile phase: Acetonitrile/ 10mmol/l  
Phosphate buffer(pH7)=50/50  
Flow rate: 1.0 ml/min  
Temperature: 30°C  
Detection: UV210 nm  
Attenuation: 0.128 auFS  
Sample conc.: 10.0mg/ml  
Injection volume: 1.0 $\mu$ l  
Retention time: 10.45min  
Capacity factor: 2.68



NACALAI TESQUE, INC

### COSMOSIL Chromatogram Index

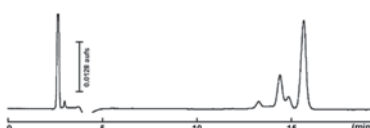
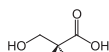
Sample: Glutathione(Reduced Form)  
CAS No.: [70-18-8]  
Molecular formula:  $C_{10}H_{17}N_3O_6S$   
Column: HILIC  
Column size: 4.6mm I.D.-250mm  
Mobile phase: Acetonitrile/ 10mmol/l  
Phosphate buffer(pH7)=50/50  
Flow rate: 1.0 ml/min  
Temperature: 30°C  
Detection: UV220 nm  
Attenuation: 0.128 auFS  
Sample conc.: 1.0mg/ml  
Injection volume: 2.0 $\mu$ l  
Retention time: 5.43min  
Capacity factor: 0.89



NACALAI TESQUE, INC

### COSMOSIL Chromatogram Index

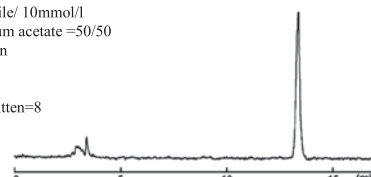
Sample: DL-Glyceric Acid  
CAS No.: [600-19-1]  
Molecular formula:  $C_3H_6O_4$   
Column: HILIC  
Column size: 4.6mm I.D.-250mm  
Mobile phase: Acetonitrile/ 10mmol/l  
Ammonium acetate =50/50  
Flow rate: 1.0 ml/min  
Temperature: 30°C  
Detection: UV210 nm  
Attenuation: 0.128 auFS  
Sample conc.: 6.0mg/ml  
Injection volume: 5.0 $\mu$ l  
Retention time: 15.68min  
Capacity factor: 4.50



NACALAI TESQUE, INC

### COSMOSIL Chromatogram Index

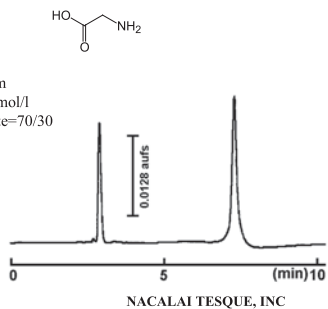
Sample: Glycinamide  
CAS No.: [598-41-4]  
Molecular formula:  $C_2H_5N_2O$   
Column: HILIC  
Column size: 4.6mm I.D.-250mm  
Mobile phase: Acetonitrile/ 10mmol/l  
Ammonium acetate =50/50  
Flow rate: 1.0 ml/min  
Temperature: 30°C  
Detection: ELSD  
Attenuation: Gain=6, Atten=8  
Sample conc.: 1.0mg/ml  
Injection volume: 3.0 $\mu$ l  
Retention time: 13.35min  
Capacity factor: 3.64



NACALAI TESQUE, INC

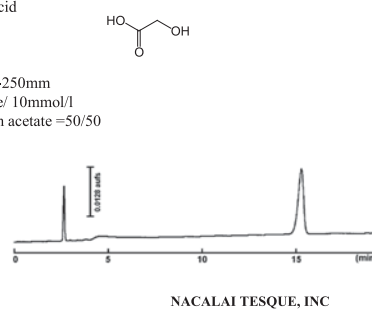
### COSMOSIL Chromatogram Index

Sample: Glycine  
CAS No.: [56-40-6]  
Molecular formula:  $C_2H_5NO_2$   
Column: HILIC  
Column size: 4.6mm I.D.-250mm  
Mobile phase: Acetonitrile/ 10mmol/l  
Ammonium acetate=70/30  
Flow rate: 1.0 ml/min  
Temperature: 30°C  
Detection: UV210 nm  
Attenuation: 0.128 auFS  
Sample conc.: 5.0mg/ml  
Injection volume: 2.0µl  
Retention time: 7.29min  
Capacity factor: 1.77



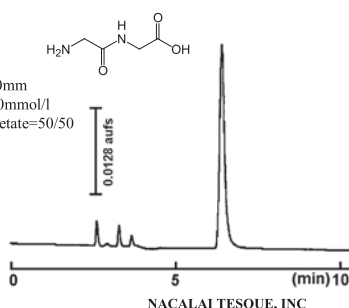
### COSMOSIL Chromatogram Index

Sample: Glycolic Acid  
CAS No.: [79-14-1]  
Molecular formula:  $C_2H_4O_3$   
Column: HILIC  
Column size: 4.6mm I.D.-250mm  
Mobile phase: Acetonitrile/ 10mmol/l  
Ammonium acetate=50/50  
Flow rate: 1.0 ml/min  
Temperature: 30°C  
Detection: UV210 nm  
Attenuation: 0.128 auFS  
Sample conc.: 10.0mg/ml  
Injection volume: 2.0µl  
Retention time: 15.28min  
Capacity factor: 4.39



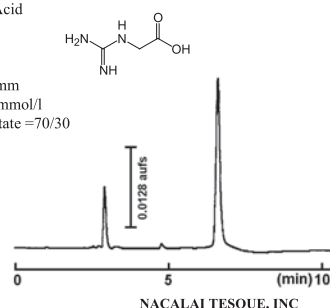
### COSMOSIL Chromatogram Index

Sample: Glycylglycine  
CAS No.: [556-50-3]  
Molecular formula:  $C_4H_8N_2O_3$   
Column: HILIC  
Column size: 4.6mm I.D.-250mm  
Mobile phase: Acetonitrile/ 10mmol/l  
Ammonium acetate=50/50  
Flow rate: 1.0 ml/min  
Temperature: 30°C  
Detection: UV210 nm  
Attenuation: 0.128 auFS  
Sample conc.: 1.0mg/ml  
Injection volume: 0.5µl  
Retention time: 6.40min  
Capacity factor: 1.27



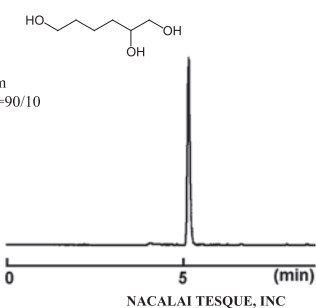
### COSMOSIL Chromatogram Index

Sample: Guanidoacetic Acid  
CAS No.: [352-97-6]  
Molecular formula:  $C_3H_6N_2O_2$   
Column: HILIC  
Column size: 4.6mm I.D.-250mm  
Mobile phase: Acetonitrile/ 10mmol/l  
Ammonium acetate =70/30  
Flow rate: 1.0 ml/min  
Temperature: 30°C  
Detection: UV210 nm  
Attenuation: 0.128 auFS  
Sample conc.: 0.5mg/ml  
Injection volume: 1.0µl  
Retention time: 6.61min  
Capacity factor: 1.51



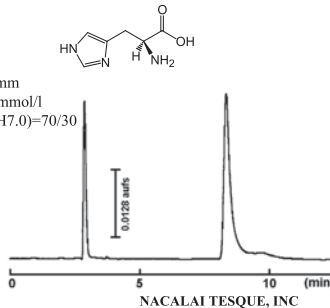
### COSMOSIL Chromatogram Index

Sample: 1,2,6-Hexanetriol  
CAS No.: [106-69-4]  
Molecular formula:  $C_6H_{14}O_3$   
Column: HILIC  
Column size: 4.6mm I.D.-250mm  
Mobile phase: Acetonitrile/  $H_2O$ =90/10  
Flow rate: 1.0 ml/min  
Temperature: 30°C  
Detection: ELSD  
Attenuation: Gain=6, Atten=8  
Sample conc.: 1.0mg/ml  
Injection volume: 2.0µl  
Retention time: 5.19min  
Capacity factor: 0.80



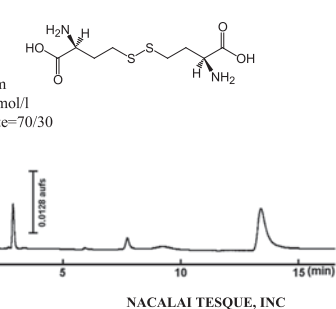
### COSMOSIL Chromatogram Index

Sample: L-Histidine  
CAS No.: [71-00-1]  
Molecular formula:  $C_6H_9N_3O_2$   
Column: HILIC  
Column size: 4.6mm I.D.-250mm  
Mobile phase: Acetonitrile/ 10mmol/l  
Citrate buffer(pH7.0)=70/30  
Flow rate: 1.0 ml/min  
Temperature: 30°C  
Detection: UV220 nm  
Attenuation: 0.128 auFS  
Sample conc.: 0.50mg/ml  
Injection volume: 1.0µl  
Retention time: 8.38min  
Capacity factor: 2.19



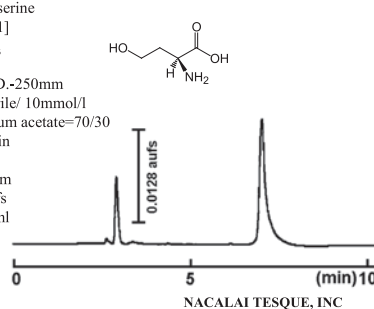
### COSMOSIL Chromatogram Index

Sample: L-Homocysteine  
CAS No.: [626-72-2]  
Molecular formula:  $C_8H_{16}N_2O_4S_2$   
Column: HILIC  
Column size: 4.6mm I.D.-250mm  
Mobile phase: Acetonitrile/ 10mmol/l  
Ammonium acetate=70/30  
Flow rate: 1.0 ml/min  
Temperature: 30°C  
Detection: UV 210nm  
Attenuation: 0.128 auFS  
Sample conc.: 2.0mg/ml  
Injection volume: 1.0µl  
Retention time: 13.41min  
Capacity factor: 4.10



### COSMOSIL Chromatogram Index

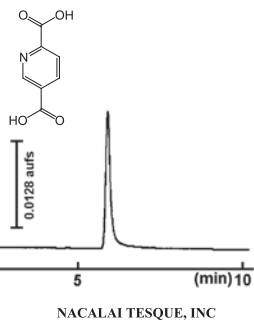
Sample: L-Homoserine  
CAS No.: [672-15-1]  
Molecular formula:  $C_4H_9NO_3$   
Column: HILIC  
Column size: 4.6mm I.D.-250mm  
Mobile phase: Acetonitrile/ 10mmol/l  
Ammonium acetate=70/30  
Flow rate: 1.0 ml/min  
Temperature: 30°C  
Detection: UV 210nm  
Attenuation: 0.128 auFS  
Sample conc.: 10.0mg/ml  
Injection volume: 1.0µl  
Retention time: 7.03min  
Capacity factor: 1.67





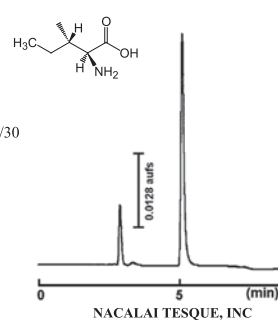
### COSMOSIL Chromatogram Index

Sample: Isocinchomeronic Acid  
CAS No.: [100-26-5]  
Molecular formula:  $C_7H_7NO_4$   
Column: HILIC  
Column size: 4.6mm I.D.-250mm  
Mobile phase: Acetonitrile/ 10mmol/l Citrate buffer(pH7.0)=50/50  
Flow rate: 1.0 ml/min  
Temperature: 30°C  
Detection: UV254 nm  
Attenuation: 0.128 auFS  
Sample conc.: 0.5mg/ml  
Injection volume: 0.5µl  
Retention time: 5.91min  
Capacity factor: 1.07



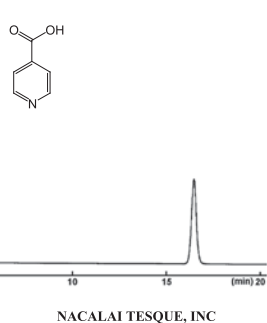
### COSMOSIL Chromatogram Index

Sample: L-Isoleucine  
CAS No.: [73-32-5]  
Molecular formula:  $C_6H_{13}NO_2$   
Column: HILIC  
Column size: 4.6mm I.D.-250mm  
Mobile phase: Acetonitrile/ 10mmol/l Ammonium acetate=70/30  
Flow rate: 1.0 ml/min  
Temperature: 30°C  
Detection: UV210 nm  
Attenuation: 0.128 auFS  
Sample conc.: 10.0mg/ml  
Injection volume: 1.0µl  
Retention time: 5.12min  
Capacity factor: 0.95



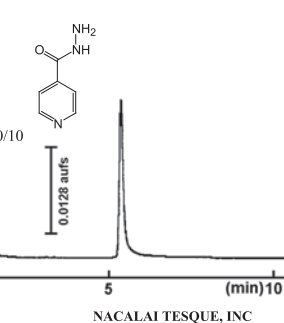
### COSMOSIL Chromatogram Index

Sample: Isonicotinic Acid  
CAS No.: [55-22-1]  
Molecular formula:  $C_6H_5NO_2$   
Column: HILIC  
Column size: 4.6mm I.D.-250mm  
Mobile phase: Acetonitrile/ 10mmol/l Ammonium acetate =50/50  
Flow rate: 1.0 ml/min  
Temperature: 30°C  
Detection: UV254 nm  
Attenuation: 0.128 auFS  
Sample conc.: 1.0mg/ml  
Injection volume: 0.5µl  
Retention time: 16.45min  
Capacity factor: 4.78



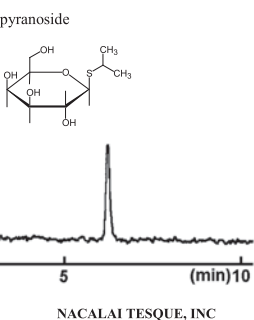
### COSMOSIL Chromatogram Index

Sample: Isonicotinohydrazide  
CAS No.: [54-85-3]  
Molecular formula:  $C_6H_7N_3O$   
Column: HILIC  
Column size: 4.6mm I.D.-250mm  
Mobile phase: Acetonitrile/ 10mmol/l Ammonium acetate =90/10  
Flow rate: 1.0 ml/min  
Temperature: 30°C  
Detection: UV265 nm  
Attenuation: 0.128 auFS  
Sample conc.: 0.50mg/ml  
Injection volume: 0.5µl  
Retention time: 5.37min  
Capacity factor: 0.85



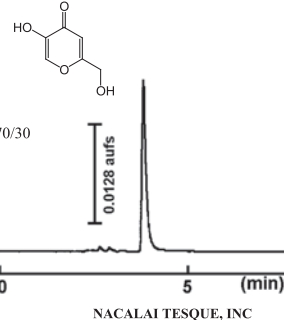
### COSMOSIL Chromatogram Index

Sample: Isopropyl β-D-1-thiogalactopyranoside  
CAS No.: [367-93-1]  
Molecular formula:  $C_9H_{18}O_5S$   
Column: HILIC  
Column size: 4.6mm I.D.-250mm  
Mobile phase: Acetonitrile/ H<sub>2</sub>O=90/10  
Flow rate: 1.0 ml/min  
Temperature: 30°C  
Detection: ELSD  
Attenuation: Gain=6, Atten=8  
Sample conc.: 0.1mg/ml  
Injection volume: 0.5µl  
Retention time: 6.23min  
Capacity factor: 1.15



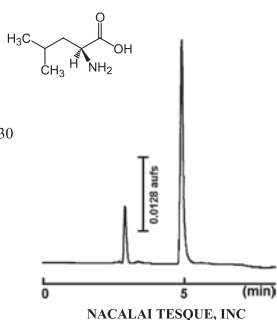
### COSMOSIL Chromatogram Index

Sample: Kojic Acid  
CAS No.: [501-30-4]  
Molecular formula:  $C_6H_6O_4$   
Column: HILIC  
Column size: 4.6mm I.D.-250mm  
Mobile phase: Acetonitrile/ 10mmol/l Citrate buffer(pH7.0)=70/30  
Flow rate: 1.0 ml/min  
Temperature: 30°C  
Detection: UV245 nm  
Attenuation: 0.128 auFS  
Sample conc.: 0.1mg/ml  
Injection volume: 1.0µl  
Retention time: 3.83min  
Capacity factor: 0.46



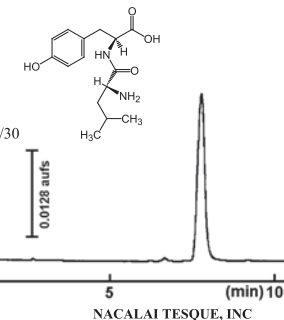
### COSMOSIL Chromatogram Index

Sample: L-Leucine  
CAS No.: [61-90-5]  
Molecular formula:  $C_6H_{13}NO_2$   
Column: HILIC  
Column size: 4.6mm I.D.-250mm  
Mobile phase: Acetonitrile/ 10mmol/l Ammonium acetate=70/30  
Flow rate: 1.0 ml/min  
Temperature: 30°C  
Detection: UV210 nm  
Attenuation: 0.128 auFS  
Sample conc.: 10.0mg/ml  
Injection volume: 1.0µl  
Retention time: 4.91min  
Capacity factor: 0.87



### COSMOSIL Chromatogram Index

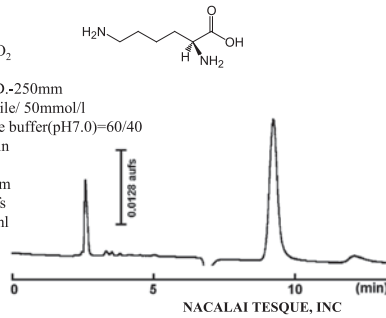
Sample: D-Leucyl-L-tyrosine  
CAS No.: [3303-29-5]  
Molecular formula:  $C_{12}H_{22}N_2O_4$   
Column: HILIC  
Column size: 4.6mm I.D.-250mm  
Mobile phase: Acetonitrile/ 10mmol/l Ammonium acetate=70/30  
Flow rate: 1.0 ml/min  
Temperature: 30°C  
Detection: UV 254nm  
Attenuation: 0.128 auFS  
Sample conc.: 10.0mg/ml  
Injection volume: 1.0µl  
Retention time: 7.79min  
Capacity factor: 1.96





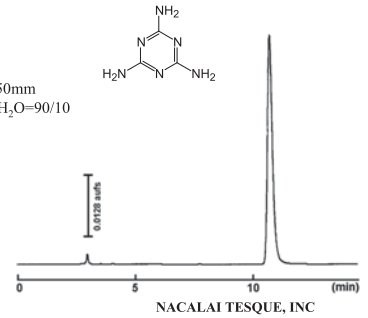
### COSMOSIL Chromatogram Index

Sample: L-Lysine  
CAS No.: [56-87-1]  
Molecular formula:  $C_6H_{11}N_2O_2$   
Column: HILIC  
Column size: 4.6mm I.D.-250mm  
Mobile phase: Acetonitrile/ 50mmol/l  
Phosphate buffer(pH7.0)=60/40  
Flow rate: 1.0 ml/min  
Temperature: 30°C  
Detection: UV210 nm  
Attenuation: 0.128 auFS  
Sample conc.: 10.0mg/ml  
Injection volume: 2.0µl  
Retention time: 9.26min  
Capacity factor: 2.55



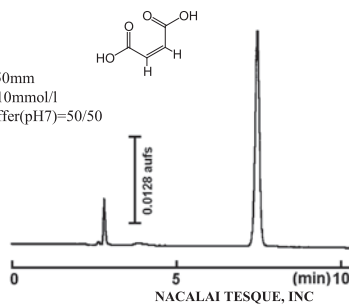
### COSMOSIL Chromatogram Index

Sample: Melamine  
CAS No.: [108-78-1]  
Molecular formula:  $C_3H_4N_6$   
Column: HILIC  
Column size: 4.6mm I.D.-250mm  
Mobile phase: Acetonitrile/ H<sub>2</sub>O=90/10  
Flow rate: 1.0 ml/min  
Temperature: 30°C  
Detection: UV240 nm  
Attenuation: 0.128 auFS  
Sample conc.: 1.0mg/ml  
Injection volume: 1.0µl  
Retention time: 10.79min  
Capacity factor: 2.79



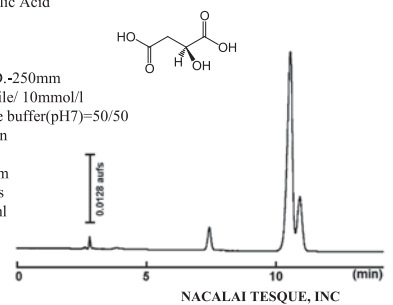
### COSMOSIL Chromatogram Index

Sample: Maleic Acid  
CAS No.: [110-16-7]  
Molecular formula:  $C_4H_4O_4$   
Column: HILIC  
Column size: 4.6mm I.D.-250mm  
Mobile phase: Acetonitrile/ 10mmol/l  
Phosphate buffer(pH7)=50/50  
Flow rate: 1.0 ml/min  
Temperature: 30°C  
Detection: UV210 nm  
Attenuation: 0.128 auFS  
Sample conc.: 0.1mg/ml  
Injection volume: 0.5µl  
Retention time: 7.45min  
Capacity factor: 1.62



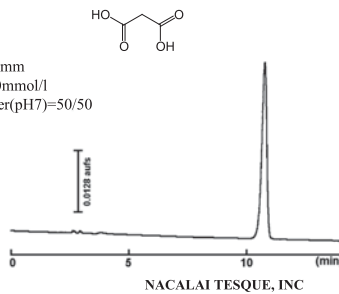
### COSMOSIL Chromatogram Index

Sample: L-(-)-Malic Acid  
CAS No.: [97-67-6]  
Molecular formula:  $C_4H_6O_5$   
Column: HILIC  
Column size: 4.6mm I.D.-250mm  
Mobile phase: Acetonitrile/ 10mmol/l  
Phosphate buffer(pH7)=50/50  
Flow rate: 1.0 ml/min  
Temperature: 30°C  
Detection: UV210 nm  
Attenuation: 0.128 auFS  
Sample conc.: 10.0mg/ml  
Injection volume: 0.5µl  
Retention time: 10.55min  
Capacity factor: 2.71



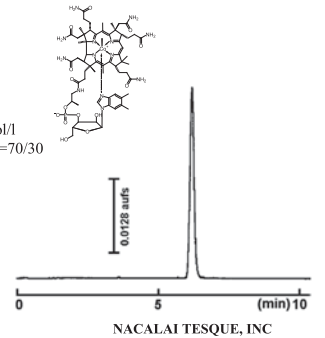
### COSMOSIL Chromatogram Index

Sample: Malonic Acid  
CAS No.: [141-82-2]  
Molecular formula:  $C_3H_4O_4$   
Column: HILIC  
Column size: 4.6mm I.D.-250mm  
Mobile phase: Acetonitrile/ 10mmol/l  
Phosphate buffer(pH7)=50/50  
Flow rate: 1.0 ml/min  
Temperature: 30°C  
Detection: UV210 nm  
Attenuation: 0.128 auFS  
Sample conc.: 10.0mg/ml  
Injection volume: 0.5µl  
Retention time: 10.78min  
Capacity factor: 2.81



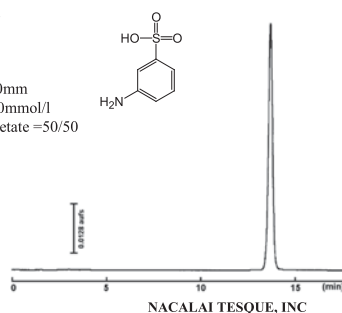
### COSMOSIL Chromatogram Index

Sample: Mecobalamin  
CAS No.: [13422-55-4]  
Molecular formula:  $C_{63}H_{91}CoN_{13}O_{14}P$   
Column: HILIC  
Column size: 4.6mm I.D.-250mm  
Mobile phase: Acetonitrile/ 10mmol/l  
Ammonium acetate =70/30  
Flow rate: 1.0 ml/min  
Temperature: 30°C  
Detection: UV266 nm  
Attenuation: 0.128 auFS  
Sample conc.: 0.5mg/ml  
Injection volume: 1.0µl  
Retention time: 6.22min  
Capacity factor: 1.35



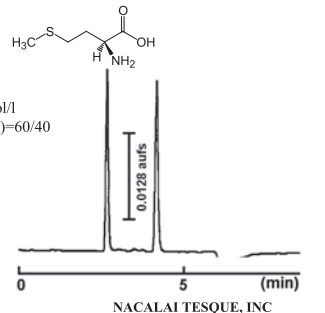
### COSMOSIL Chromatogram Index

Sample: Metanilic Acid  
CAS No.: [121-47-1]  
Molecular formula:  $C_6H_7NO_3S$   
Column: HILIC  
Column size: 4.6mm I.D.-250mm  
Mobile phase: Acetonitrile/ 10mmol/l  
Ammonium acetate =50/50  
Flow rate: 1.0 ml/min  
Temperature: 30°C  
Detection: UV254 nm  
Attenuation: 0.128 auFS  
Sample conc.: 1.0mg/ml  
Injection volume: 1.0µl  
Retention time: 13.68min  
Capacity factor: 3.80



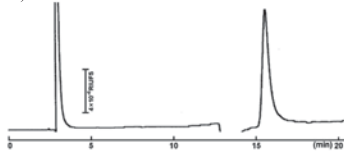
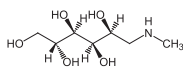
### COSMOSIL Chromatogram Index

Sample: L- Methionine  
CAS No.: [63-68-3]  
Molecular formula:  $C_5H_{11}NO_2S$   
Column: HILIC  
Column size: 4.6mm I.D.-250mm  
Mobile phase: Acetonitrile/ 10mmol/l  
Citrate buffer(pH7.0)=60/40  
Flow rate: 1.0 ml/min  
Temperature: 30°C  
Detection: UV210 nm  
Attenuation: 0.128 auFS  
Sample conc.: 1.0mg/ml  
Injection volume: 0.5µl  
Retention time: 4.15min  
Capacity factor: 0.54



### COSMOSIL Chromatogram Index

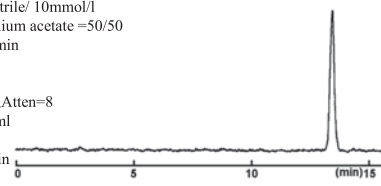
Sample: *N*-Methylglucamine  
 CAS No.: [6284-40-8]  
 Molecular formula: C<sub>8</sub>H<sub>17</sub>NO<sub>5</sub>  
 Column: HILIC  
 Column size: 4.6mm I.D.-250mm  
 Mobile phase: Acetonitrile/ 10mmol/l Citrate buffer(pH7.0)=70/30  
 Flow rate: 1.0 ml/min  
 Temperature: 30°C  
 Detection: RI  
 Attenuation: 4 × 10<sup>-5</sup>RIU/FS  
 Sample conc.: 10.0mg/ml  
 Injection volume: 2.0μl  
 Retention time: 15.52min  
 Capacity factor: 4.22



NACALAI TESQUE, INC

### COSMOSIL Chromatogram Index

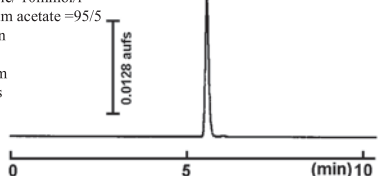
Sample: *N*-Methylhydroxylamine  
 CAS No.: [593-77-1]  
 Molecular formula: CH<sub>3</sub>NO<sub>2</sub>  
 Column: HILIC  
 Column size: 4.6mm I.D.-250mm  
 Mobile phase: Acetonitrile/ 10mmol/l Ammonium acetate =50/50  
 Flow rate: 1.0 ml/min  
 Temperature: 30°C  
 Detection: ELSD  
 Attenuation: Gain=6, Atten=8  
 Sample conc.: 1.0mg/ml  
 Injection volume: 2.0μl  
 Retention time: 13.45min  
 Capacity factor: 4.21



NACALAI TESQUE, INC

### COSMOSIL Chromatogram Index

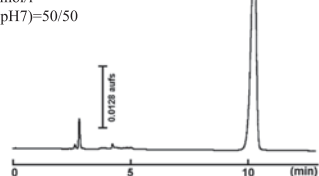
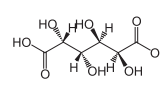
Sample: 6-Methyl-2-thiouracil  
 CAS No.: [56-04-2]  
 Molecular formula: C<sub>5</sub>H<sub>6</sub>N<sub>2</sub>OS  
 Column: HILIC  
 Column size: 4.6mm I.D.-250mm  
 Mobile phase: Acetonitrile/ 10mmol/l Ammonium acetate =95/5  
 Flow rate: 1.0 ml/min  
 Temperature: 30°C  
 Detection: UV260 nm  
 Attenuation: 0.128 auFs  
 Sample conc.: 0.1mg/ml  
 Injection volume: 0.5μl  
 Retention time: 5.58min  
 Capacity factor: 0.84



NACALAI TESQUE, INC

### COSMOSIL Chromatogram Index

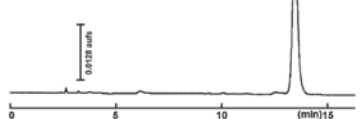
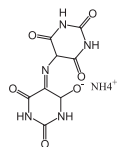
Sample: Mucic Acid  
 CAS No.: [526-99-8]  
 Molecular formula: C<sub>6</sub>H<sub>10</sub>O<sub>8</sub>  
 Column: HILIC  
 Column size: 4.6mm I.D.-250mm  
 Mobile phase: Acetonitrile/ 10mmol/l Phosphate buffer(pH7)=50/50  
 Flow rate: 1.0 ml/min  
 Temperature: 30°C  
 Detection: UV210 nm  
 Attenuation: 0.128 auFs  
 Sample conc.: 10.0mg/ml  
 Injection volume: 1.0μl  
 Retention time: 10.27min  
 Capacity factor: 2.62



NACALAI TESQUE, INC

### COSMOSIL Chromatogram Index

Sample: Murexide  
 CAS No.: [3051-09-0]  
 Molecular formula: C<sub>8</sub>H<sub>6</sub>N<sub>2</sub>O<sub>6</sub>  
 Column: HILIC  
 Column size: 4.6mm I.D.-250mm  
 Mobile phase: Acetonitrile/ 10mmol/l Ammonium acetate =50/50  
 Flow rate: 1.0 ml/min  
 Temperature: 30°C  
 Detection: UV220 nm  
 Attenuation: 0.128 auFs  
 Sample conc.: 1.0mg/ml  
 Injection volume: 0.5μl  
 Retention time: 13.47min  
 Capacity factor: 3.69



NACALAI TESQUE, INC

### COSMOSIL Chromatogram Index

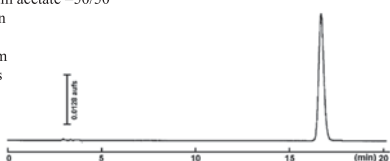
Sample: Nicotinamide  
 CAS No.: [98-92-0]  
 Molecular formula: C<sub>6</sub>H<sub>6</sub>N<sub>2</sub>O  
 Column: HILIC  
 Column size: 4.6mm I.D.-250mm  
 Mobile phase: Acetonitrile/ 10mmol/l Ammonium acetate =95/5  
 Flow rate: 1.0 ml/min  
 Temperature: 30°C  
 Detection: UV254 nm  
 Attenuation: 0.128 auFs  
 Sample conc.: 0.2mg/ml  
 Injection volume: 1.0μl  
 Retention time: 5.40min  
 Capacity factor: 0.77



NACALAI TESQUE, INC

### COSMOSIL Chromatogram Index

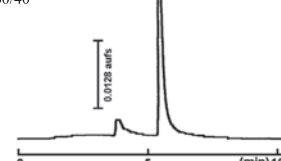
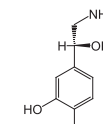
Sample: Nicotinic Acid  
 CAS No.: [59-67-6]  
 Molecular formula: C<sub>6</sub>H<sub>5</sub>NO<sub>2</sub>  
 Column: HILIC  
 Column size: 4.6mm I.D.-250mm  
 Mobile phase: Acetonitrile/ 10mmol/l Ammonium acetate =50/50  
 Flow rate: 1.0 ml/min  
 Temperature: 30°C  
 Detection: UV254 nm  
 Attenuation: 0.128 auFs  
 Sample conc.: 1.0mg/ml  
 Injection volume: 0.5μl  
 Retention time: 16.67min  
 Capacity factor: 4.87



NACALAI TESQUE, INC

### COSMOSIL Chromatogram Index

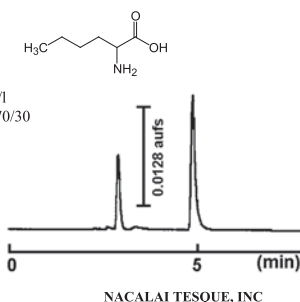
Sample: *L*-Noradrenaline  
 CAS No.: [51-41-2]  
 Molecular formula: C<sub>8</sub>H<sub>11</sub>NO<sub>3</sub>  
 Column: HILIC  
 Column size: 4.6mm I.D.-250mm  
 Mobile phase: Acetonitrile/ 10mmol/l Citrate buffer(pH7.0)=60/40  
 Flow rate: 1.0 ml/min  
 Temperature: 30°C  
 Detection: UV254 nm  
 Attenuation: 0.128 auFs  
 Sample conc.: 5.0mg/ml  
 Injection volume: 1.0μl  
 Retention time: 5.47min  
 Capacity factor: 1.07



NACALAI TESQUE, INC

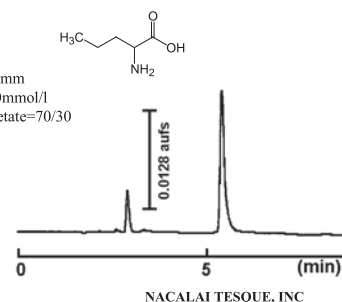
### COSMOSIL Chromatogram Index

Sample: DL-Norleucine  
CAS No.: [616-06-8]  
Molecular formula:  $C_7H_{13}NO_2$   
Column: HILIC  
Column size: 4.6mm I.D.-250mm  
Mobile phase: Acetonitrile/ 10mmol/l  
Ammonium acetate=70/30  
Flow rate: 1.0 ml/min  
Temperature: 30°C  
Detection: UV210 nm  
Attenuation: 0.128 auFS  
Sample conc.: 5.0mg/ml  
Injection volume: 1.0µl  
Retention time: 4.89min  
Capacity factor: 0.86



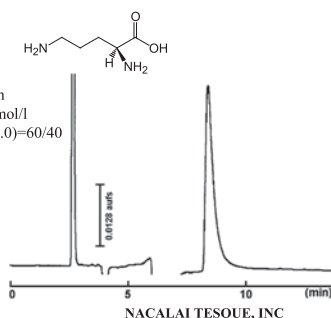
### COSMOSIL Chromatogram Index

Sample: DL-Norvaline  
CAS No.: [760-78-1]  
Molecular formula:  $C_7H_{13}NO_2$   
Column: HILIC  
Column size: 4.6mm I.D.-250mm  
Mobile phase: Acetonitrile/ 10mmol/l  
Ammonium acetate=70/30  
Flow rate: 1.0 ml/min  
Temperature: 30°C  
Detection: UV 210nm  
Attenuation: 0.128 auFS  
Sample conc.: 10.0mg/ml  
Injection volume: 0.5µl  
Retention time: 5.43min  
Capacity factor: 1.07



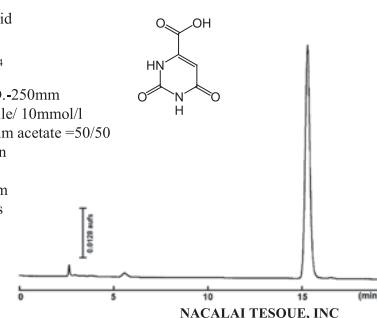
### COSMOSIL Chromatogram Index

Sample: L-Ornithine  
CAS No.: [70-26-8]  
Molecular formula:  $C_5H_{12}N_2O_2$   
Column: HILIC  
Column size: 4.6mm I.D.-250mm  
Mobile phase: Acetonitrile/ 10mmol/l  
Citrate buffer(pH7.0)=60/40  
Flow rate: 1.0 ml/min  
Temperature: 30°C  
Detection: UV210 nm  
Attenuation: 0.128 auFS  
Sample conc.: 10.0mg/ml  
Injection volume: 2.0µl  
Retention time: 8.39min  
Capacity factor: 2.10



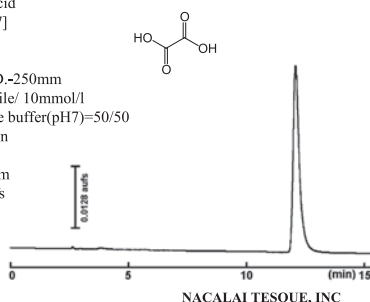
### COSMOSIL Chromatogram Index

Sample: Orotic Acid  
CAS No.: [65-86-1]  
Molecular formula:  $C_5H_6N_2O_4$   
Column: HILIC  
Column size: 4.6mm I.D.-250mm  
Mobile phase: Acetonitrile/ 10mmol/l  
Ammonium acetate =50/50  
Flow rate: 1.0 ml/min  
Temperature: 30°C  
Detection: UV220 nm  
Attenuation: 0.128 auFS  
Sample conc.: 0.5mg/ml  
Injection volume: 1.0µl  
Retention time: 15.24min  
Capacity factor: 4.36



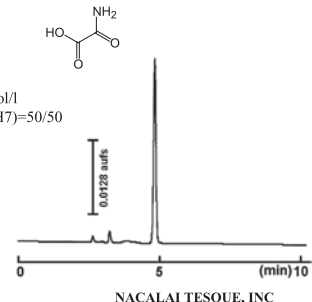
### COSMOSIL Chromatogram Index

Sample: Oxalic Acid  
CAS No.: [144-62-7]  
Molecular formula:  $C_2H_2O_4$   
Column: HILIC  
Column size: 4.6mm I.D.-250mm  
Mobile phase: Acetonitrile/ 10mmol/l  
Phosphate buffer(pH7)=50/50  
Flow rate: 1.0 ml/min  
Temperature: 30°C  
Detection: UV210 nm  
Attenuation: 0.128 auFS  
Sample conc.: 5.0mg/ml  
Injection volume: 0.5µl  
Retention time: 12.08min  
Capacity factor: 3.27



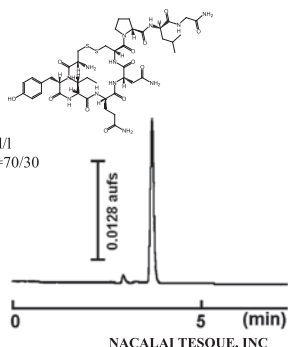
### COSMOSIL Chromatogram Index

Sample: Oxamic Acid  
CAS No.: [471-47-6]  
Molecular formula:  $C_2H_3NO_3$   
Column: HILIC  
Column size: 4.6mm I.D.-250mm  
Mobile phase: Acetonitrile/ 10mmol/l  
Phosphate buffer(pH7)=50/50  
Flow rate: 1.0 ml/min  
Temperature: 30°C  
Detection: UV210 nm  
Attenuation: 0.128 auFS  
Sample conc.: 0.1mg/ml  
Injection volume: 1.0µl  
Retention time: 4.83min  
Capacity factor: 0.71



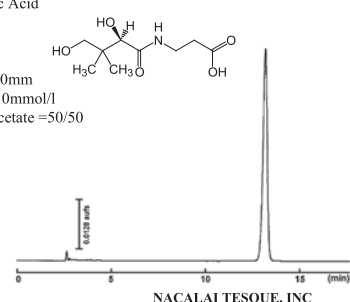
### COSMOSIL Chromatogram Index

Sample: Oxytocin  
CAS No.: [50-56-6]  
Molecular formula:  $C_{43}H_{66}N_{12}O_{12}S_2$   
Column: HILIC  
Column size: 4.6mm I.D.-250mm  
Mobile phase: Acetonitrile/ 10mmol/l  
Ammonium acetate =70/30  
Flow rate: 1.0 ml/min  
Temperature: 30°C  
Detection: UV220 nm  
Attenuation: 0.128 auFS  
Sample conc.: 0.4mg/ml  
Injection volume: 0.5µl  
Retention time: 3.71min  
Capacity factor: 0.39



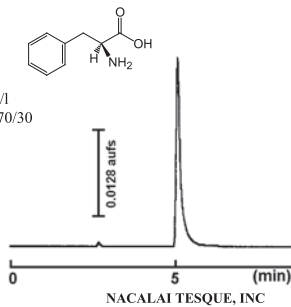
### COSMOSIL Chromatogram Index

Sample: D-Pantoic Acid  
CAS No.: [79-83-4]  
Molecular formula:  $C_9H_{17}NO_5$   
Column: HILIC  
Column size: 4.6mm I.D.-250mm  
Mobile phase: Acetonitrile/ 10mmol/l  
Ammonium acetate =50/50  
Flow rate: 1.0 ml/min  
Temperature: 30°C  
Detection: UV220 nm  
Attenuation: 0.128 auFS  
Sample conc.: 10.0mg/ml  
Injection volume: 1.0µl  
Retention time: 13.21min  
Capacity factor: 3.60



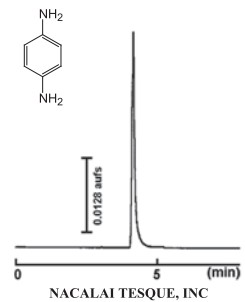
### COSMOSIL Chromatogram Index

Sample: L-(-)-Phenylalanine  
CAS No.: [63-91-2]  
Molecular formula: C<sub>9</sub>H<sub>9</sub>NO<sub>2</sub>  
Column: HILIC  
Column size: 4.6mm I.D.-250mm  
Mobile phase: Acetonitrile/ 10mmol/l Ammonium acetate=70/30  
Flow rate: 1.0 ml/min  
Temperature: 30°C  
Detection: UV 254nm  
Attenuation: 0.128 auFS  
Sample conc.: 10.0mg/ml  
Injection volume: 0.5µl  
Retention time: 5.10min  
Capacity factor: 0.94



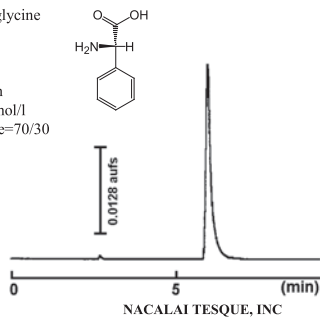
### COSMOSIL Chromatogram Index

Sample: p-Phenylenediamine  
CAS No.: [106-50-3]  
Molecular formula: C<sub>6</sub>H<sub>8</sub>N<sub>2</sub>  
Column: HILIC  
Column size: 4.6mm I.D.-250mm  
Mobile phase: Acetonitrile/ 10mmol/l Ammonium acetate =95/5  
Flow rate: 1.0 ml/min  
Temperature: 30°C  
Detection: UV254 nm  
Attenuation: 0.128 auFS  
Sample conc.: 0.1mg/ml  
Injection volume: 0.5µl  
Retention time: 4.15min  
Capacity factor: 0.36



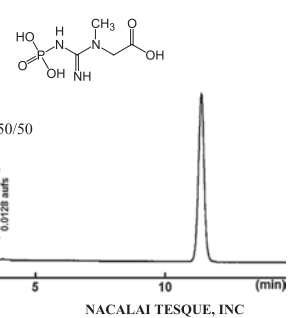
### COSMOSIL Chromatogram Index

Sample: L-(+)-α-Phenylglycine  
CAS No.: [2935-35-5]  
Molecular formula: C<sub>9</sub>H<sub>9</sub>NO<sub>2</sub>  
Column: HILIC  
Column size: 4.6mm I.D.-250mm  
Mobile phase: Acetonitrile/ 10mmol/l Ammonium acetate=70/30  
Flow rate: 1.0 ml/min  
Temperature: 30°C  
Detection: UV254 nm  
Attenuation: 0.128 auFS  
Sample conc.: 5.0mg/ml  
Injection volume: 1.0µl  
Retention time: 5.96min  
Capacity factor: 1.27



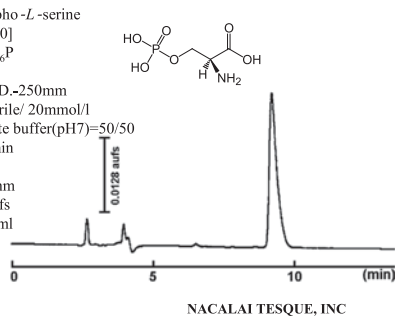
### COSMOSIL Chromatogram Index

Sample: Phosphocreatine  
CAS No.: [67-07-2]  
Molecular formula: C<sub>4</sub>H<sub>10</sub>N<sub>3</sub>O<sub>5</sub>P  
Column: HILIC  
Column size: 4.6mm I.D.-250mm  
Mobile phase: Acetonitrile/ 10mmol/l Phosphate buffer(pH7)=50/50  
Flow rate: 1.0 ml/min  
Temperature: 30°C  
Detection: UV220 nm  
Attenuation: 0.128 auFS  
Sample conc.: 1.0mg/ml  
Injection volume: 1.0µl  
Retention time: 11.42min  
Capacity factor: 3.00



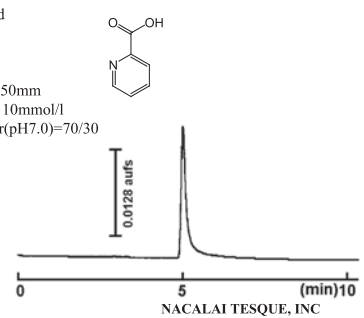
### COSMOSIL Chromatogram Index

Sample: O-Phospho-L-serine  
CAS No.: [407-41-0]  
Molecular formula: C<sub>3</sub>H<sub>7</sub>NO<sub>6</sub>P  
Column: HILIC  
Column size: 4.6mm I.D.-250mm  
Mobile phase: Acetonitrile/ 20mmol/l Phosphate buffer(pH7)=50/50  
Flow rate: 1.0 ml/min  
Temperature: 30°C  
Detection: UV210 nm  
Attenuation: 0.128 auFS  
Sample conc.: 10.0mg/ml  
Injection volume: 3.0µl  
Retention time: 9.19min  
Capacity factor: 2.24



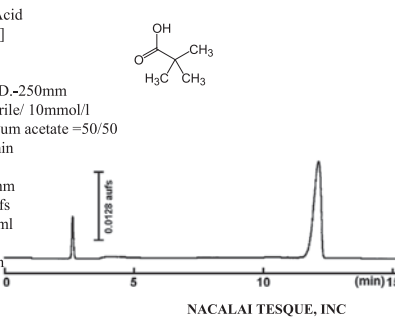
### COSMOSIL Chromatogram Index

Sample: Picolinic acid  
CAS No.: [98-98-6]  
Molecular formula: C<sub>6</sub>H<sub>5</sub>NO<sub>2</sub>  
Column: HILIC  
Column size: 4.6mm I.D.-250mm  
Mobile phase: Acetonitrile/ 10mmol/l Citrate buffer(pH7.0)=70/30  
Flow rate: 1.0 ml/min  
Temperature: 30°C  
Detection: UV254 nm  
Attenuation: 0.128 auFS  
Sample conc.: 0.5mg/ml  
Injection volume: 0.5µl  
Retention time: 5.03min  
Capacity factor: 0.92



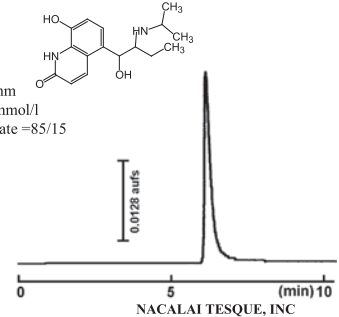
### COSMOSIL Chromatogram Index

Sample: Pivalic Acid  
CAS No.: [75-98-9]  
Molecular formula: C<sub>5</sub>H<sub>10</sub>O<sub>2</sub>  
Column: HILIC  
Column size: 4.6mm I.D.-250mm  
Mobile phase: Acetonitrile/ 10mmol/l Ammonium acetate =50/50  
Flow rate: 1.0 ml/min  
Temperature: 30°C  
Detection: UV210 nm  
Attenuation: 0.128 auFS  
Sample conc.: 10.0mg/ml  
Injection volume: 1.0µl  
Retention time: 12.14min  
Capacity factor: 3.28



### COSMOSIL Chromatogram Index

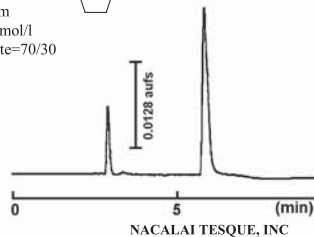
Sample: Procaterol  
CAS No.: [72332-33-3]  
Molecular formula: C<sub>16</sub>H<sub>22</sub>N<sub>2</sub>O<sub>3</sub>  
Column: HILIC  
Column size: 4.6mm I.D.-250mm  
Mobile phase: Acetonitrile/ 20mmol/l Ammonium acetate =85/15  
Flow rate: 1.0 ml/min  
Temperature: 30°C  
Detection: UV254 nm  
Attenuation: 0.128 auFS  
Sample conc.: 0.5mg/ml  
Injection volume: 0.5µl  
Retention time: 6.17min  
Capacity factor: 1.25



### COSMOSIL Chromatogram Index

Sample: L-Proline  
CAS No.: [147-85-3]  
Molecular formula:  $C_5H_9NO_2$   
Column: HILIC  
Column size: 4.6mm I.D.-250mm  
Mobile phase: Acetonitrile/ 10mmol/l  
Ammonium acetate=70/30

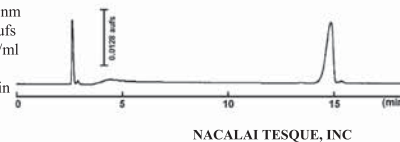
Flow rate: 1.0 ml/min  
Temperature: 30°C  
Detection: UV210 nm  
Attenuation: 0.128 auFS  
Sample conc.: 10.0mg/ml  
Injection volume: 1.0µl  
Retention time: 5.83min  
Capacity factor: 1.22



### COSMOSIL Chromatogram Index

Sample: Propionic Acid  
CAS No.: [79-09-4]  
Molecular formula:  $C_3H_6O_2$   
Column: HILIC  
Column size: 4.6mm I.D.-250mm  
Mobile phase: Acetonitrile/ 10mmol/l  
Ammonium acetate=50/50

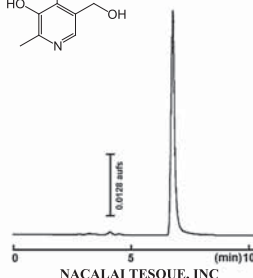
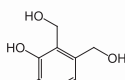
Flow rate: 1.0 ml/min  
Temperature: 30°C  
Detection: UV210 nm  
Attenuation: 0.128 auFS  
Sample conc.: 10.0mg/ml  
Injection volume: 2.0µl  
Retention time: 14.85min  
Capacity factor: 4.24



### COSMOSIL Chromatogram Index

Sample: Pyridoxine  
CAS No.: [65-23-6]  
Molecular formula:  $C_8H_{10}NO_3$   
Column: HILIC  
Column size: 4.6mm I.D.-250mm  
Mobile phase: Acetonitrile/ 10mmol/l  
Ammonium acetate=90/10

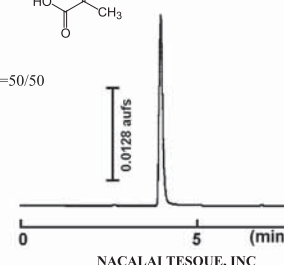
Flow rate: 1.0 ml/min  
Temperature: 30°C  
Detection: UV220 nm  
Attenuation: 0.128 auFS  
Sample conc.: 1.0mg/ml  
Injection volume: 0.5µl  
Retention time: 6.78min  
Capacity factor: 1.35



### COSMOSIL Chromatogram Index

Sample: Pyruvic Acid  
CAS No.: [127-17-3]  
Molecular formula:  $C_3H_4O_3$   
Column: HILIC  
Column size: 4.6mm I.D.-250mm  
Mobile phase: Acetonitrile/ 20mmol/l  
Phosphate buffer(pH7)=50/50

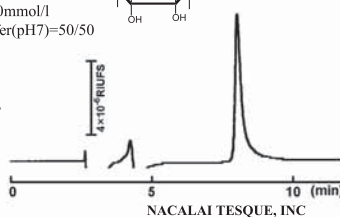
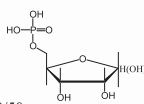
Flow rate: 1.0 ml/min  
Temperature: 30°C  
Detection: UV220 nm  
Attenuation: 0.128 auFS  
Sample conc.: 1.0mg/ml  
Injection volume: 2.0µl  
Retention time: 3.97min  
Capacity factor: 0.39



### COSMOSIL Chromatogram Index

Sample: Ribose-5-phosphate  
CAS No.: [4300-28-1]  
Molecular formula:  $C_5H_{11}O_8P$   
Column: HILIC  
Column size: 4.6mm I.D.-250mm  
Mobile phase: Acetonitrile/ 20mmol/l  
Phosphate buffer(pH7)=50/50

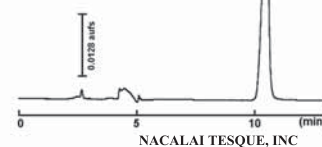
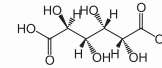
Flow rate: 1.0 ml/min  
Temperature: 30°C  
Detection: RI  
Attenuation:  $4 \times 10^{-5}$  RIU/FS  
Sample conc.: 10.0mg/ml  
Injection volume: 5.0µl  
Retention time: 8.02min  
Capacity factor: 2.06



### COSMOSIL Chromatogram Index

Sample: D-Saccharic Acid  
CAS No.: [87-73-0]  
Molecular formula:  $C_6H_{10}O_8$   
Column: HILIC  
Column size: 4.6mm I.D.-250mm  
Mobile phase: Acetonitrile/ 10mmol/l  
Phosphate buffer(pH7)=50/50

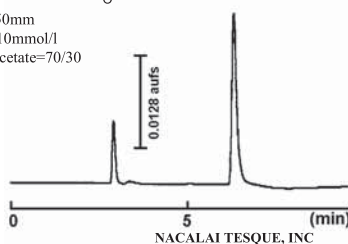
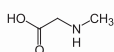
Flow rate: 1.0 ml/min  
Temperature: 30°C  
Detection: UV210 nm  
Attenuation: 0.128 auFS  
Sample conc.: 10.0mg/ml  
Injection volume: 2.0µl  
Retention time: 10.48min  
Capacity factor: 2.69



### COSMOSIL Chromatogram Index

Sample: Sarcosine  
CAS No.: [107-97-1]  
Molecular formula:  $C_3H_7NO_2$   
Column: HILIC  
Column size: 4.6mm I.D.-250mm  
Mobile phase: Acetonitrile/ 10mmol/l  
Ammonium acetate=70/30

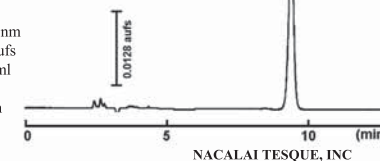
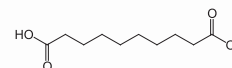
Flow rate: 1.0 ml/min  
Temperature: 30°C  
Detection: UV 210nm  
Attenuation: 0.128 auFS  
Sample conc.: 10.0mg/ml  
Injection volume: 1.0µl  
Retention time: 6.30min  
Capacity factor: 1.40



### COSMOSIL Chromatogram Index

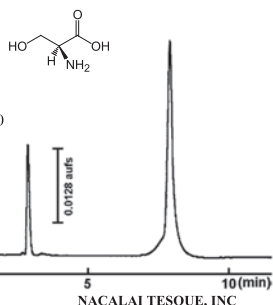
Sample: Sebacic Acid  
CAS No.: [111-20-6]  
Molecular formula:  $C_{18}H_{34}O_4$   
Column: HILIC  
Column size: 4.6mm I.D.-250mm  
Mobile phase: Acetonitrile/ 10mmol/l  
Phosphate buffer(pH7)=50/50

Flow rate: 1.0 ml/min  
Temperature: 30°C  
Detection: UV210 nm  
Attenuation: 0.128 auFS  
Sample conc.: 5.0mg/ml  
Injection volume: 1.5µl  
Retention time: 9.43min  
Capacity factor: 2.28



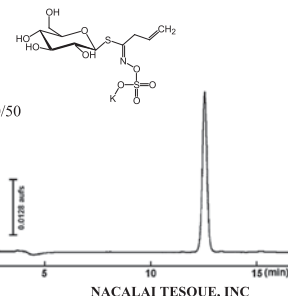
### COSMOSIL Chromatogram Index

Sample: L-Serine  
CAS No.: [56-45-1]  
Molecular formula:  $C_3H_7NO_3$   
Column: HILIC  
Column size: 4.6mm I.D.-250mm  
Mobile phase: Acetonitrile/ 10mmol/l Ammonium acetate=70/30  
Flow rate: 1.0 ml/min  
Temperature: 30°C  
Detection: UV210 nm  
Attenuation: 0.128 aufs  
Sample conc.: 10.0mg/ml  
Injection volume: 2.0µl  
Retention time: 7.92min  
Capacity factor: 2.01



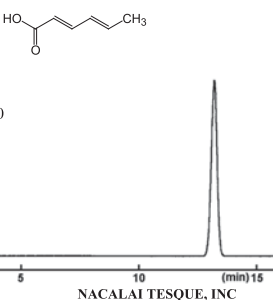
### COSMOSIL Chromatogram Index

Sample: Sinigrin  
CAS No.: [3952-98-5]  
Molecular formula:  $C_{16}H_{19}KNO_9S_2$   
Column: HILIC  
Column size: 4.6mm I.D.-250mm  
Mobile phase: Acetonitrile/ 10mmol/l Ammonium acetate =50/50  
Flow rate: 1.0 ml/min  
Temperature: 30°C  
Detection: UV210 nm  
Attenuation: 0.128 aufs  
Sample conc.: 1.0mg/ml  
Injection volume: 1.0µl  
Retention time: 12.57min  
Capacity factor: 3.38



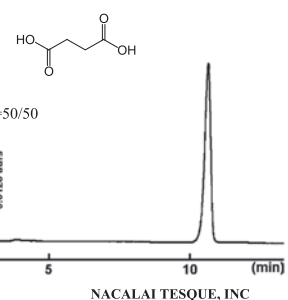
### COSMOSIL Chromatogram Index

Sample: Sorbic Acid  
CAS No.: [110-44-1]  
Molecular formula:  $C_8H_8O_2$   
Column: HILIC  
Column size: 4.6mm I.D.-250mm  
Mobile phase: Acetonitrile/ 10mmol/l Ammonium acetate=50/50  
Flow rate: 1.0 ml/min  
Temperature: 30°C  
Detection: UV254 nm  
Attenuation: 0.128 aufs  
Sample conc.: 0.1mg/ml  
Injection volume: 0.5µl  
Retention time: 13.19min  
Capacity factor: 3.59



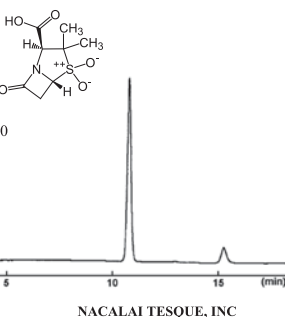
### COSMOSIL Chromatogram Index

Sample: Succinic Acid  
CAS No.: [110-15-6]  
Molecular formula:  $C_4H_6O_4$   
Column: HILIC  
Column size: 4.6mm I.D.-250mm  
Mobile phase: Acetonitrile/ 10mmol/l Phosphate buffer(pH7)=50/50  
Flow rate: 1.0 ml/min  
Temperature: 30°C  
Detection: UV210 nm  
Attenuation: 0.128 aufs  
Sample conc.: 10.0mg/ml  
Injection volume: 0.5µl  
Retention time: 10.64min  
Capacity factor: 2.74



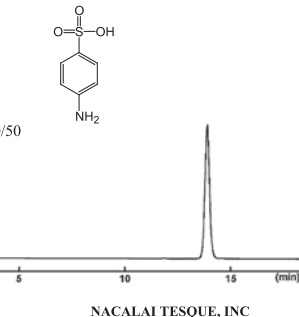
### COSMOSIL Chromatogram Index

Sample: Sulbactam  
CAS No.: [68373-14-8]  
Molecular formula:  $C_8H_{11}NO_3S$   
Column: HILIC  
Column size: 4.6mm I.D.-250mm  
Mobile phase: Acetonitrile/ 10mmol/l Ammonium acetate =50/50  
Flow rate: 1.0 ml/min  
Temperature: 30°C  
Detection: UV220 nm  
Attenuation: 0.128 aufs  
Sample conc.: 5.0mg/ml  
Injection volume: 0.5µl  
Retention time: 10.86min  
Capacity factor: 2.81



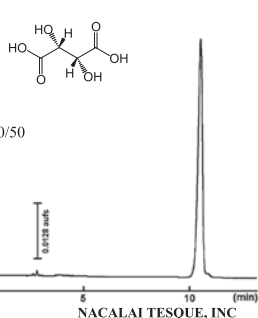
### COSMOSIL Chromatogram Index

Sample: Sulfamic acid  
CAS No.: [121-57-3]  
Molecular formula:  $C_6H_7NO_3S$   
Column: HILIC  
Column size: 4.6mm I.D.-250mm  
Mobile phase: Acetonitrile/ 10mmol/l Ammonium acetate =50/50  
Flow rate: 1.0 ml/min  
Temperature: 30°C  
Detection: UV254 nm  
Attenuation: 0.128 aufs  
Sample conc.: 0.10mg/ml  
Injection volume: 1.0µl  
Retention time: 13.87min  
Capacity factor: 3.87



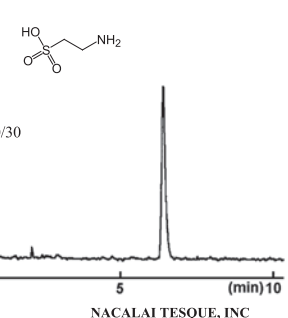
### COSMOSIL Chromatogram Index

Sample: L-(+)-Tartaric Acid  
CAS No.: [87-69-4]  
Molecular formula:  $C_4H_6O_6$   
Column: HILIC  
Column size: 4.6mm I.D.-250mm  
Mobile phase: Acetonitrile/ 10mmol/l Phosphate buffer(pH7)=50/50  
Flow rate: 1.0 ml/min  
Temperature: 30°C  
Detection: UV210 nm  
Attenuation: 0.128 aufs  
Sample conc.: 10.0mg/ml  
Injection volume: 1.5µl  
Retention time: 10.52min  
Capacity factor: 2.70



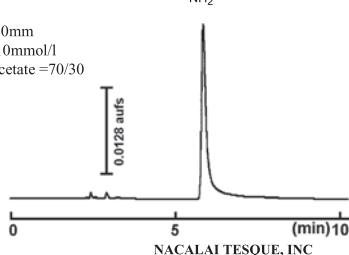
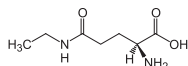
### COSMOSIL Chromatogram Index

Sample: Taurine  
CAS No.: [107-35-7]  
Molecular formula:  $C_2H_7NO_3S$   
Column: HILIC  
Column size: 4.6mm I.D.-250mm  
Mobile phase: Acetonitrile/ 10mmol/l Ammonium acetate =70/30  
Flow rate: 1.0 ml/min  
Temperature: 30°C  
Detection: ELSD  
Attenuation: Gain=6, Atten=8  
Sample conc.: 1.0mg/ml  
Injection volume: 1.0µl  
Retention time: 6.40min  
Capacity factor: 1.25



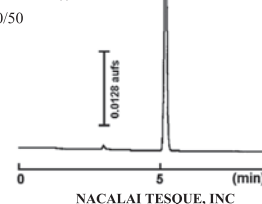
### COSMOSIL Chromatogram Index

Sample: L-Theanine  
CAS No.: [3081-61-6]  
Molecular formula:  $C_7H_{14}N_2O_3$   
Column: HILIC  
Column size: 4.6mm I.D.-250mm  
Mobile phase: Acetonitrile/ 10mmol/l  
Ammonium acetate =70/30  
Flow rate: 1.0 ml/min  
Temperature: 30°C  
Detection: UV220 nm  
Attenuation: 0.128 auFS  
Sample conc.: 5.0mg/ml  
Injection volume: 0.5µl  
Retention time: 5.89min  
Capacity factor: 1.21



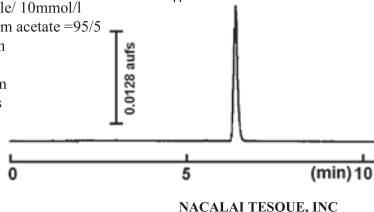
### COSMOSIL Chromatogram Index

Sample: 2-Thiobarbituric Acid  
CAS No.: [504-17-6]  
Molecular formula:  $C_4H_4N_2O_2S$   
Column: HILIC  
Column size: 4.6mm I.D.-250mm  
Mobile phase: Acetonitrile/ 10mmol/l  
Phosphate buffer(pH7)=50/50  
Flow rate: 1.0 ml/min  
Temperature: 30°C  
Detection: UV254 nm  
Attenuation: 0.128 auFS  
Sample conc.: 0.1mg/ml  
Injection volume: 0.5µl  
Retention time: 5.18min  
Capacity factor: 0.82



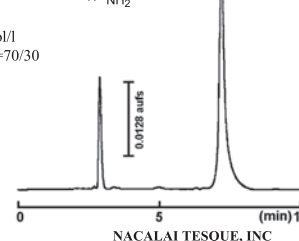
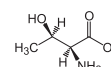
### COSMOSIL Chromatogram Index

Sample: 2-Thiouracil  
CAS No.: [141-90-2]  
Molecular formula:  $C_4H_4N_2OS$   
Column: HILIC  
Column size: 4.6mm I.D.-250mm  
Mobile phase: Acetonitrile/ 10mmol/l  
Ammonium acetate =95/5  
Flow rate: 1.0 ml/min  
Temperature: 30°C  
Detection: UV260 nm  
Attenuation: 0.128 auFS  
Sample conc.: 0.1mg/ml  
Injection volume: 0.5µl  
Retention time: 6.38min  
Capacity factor: 1.11



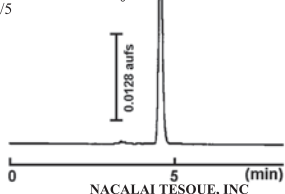
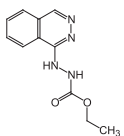
### COSMOSIL Chromatogram Index

Sample: L-Threonine  
CAS No.: [72-19-5]  
Molecular formula:  $C_4H_9NO_3$   
Column: HILIC  
Column size: 4.6mm I.D.-250mm  
Mobile phase: Acetonitrile/ 10mmol/l  
Ammonium acetate=70/30  
Flow rate: 1.0 ml/min  
Temperature: 30°C  
Detection: UV210 nm  
Attenuation: 0.128 auFS  
Sample conc.: 10.0mg/ml  
Injection volume: 2.0µl  
Retention time: 7.19min  
Capacity factor: 1.73



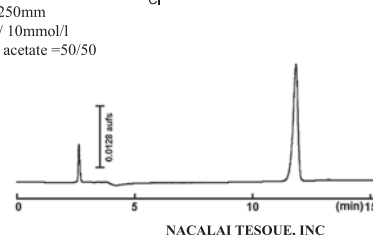
### COSMOSIL Chromatogram Index

Sample: Todalazine  
CAS No.: [14679-73-3]  
Molecular formula:  $C_{11}H_{13}N_3O_2$   
Column: HILIC  
Column size: 4.6mm I.D.-250mm  
Mobile phase: Acetonitrile/ 10mmol/l  
Ammonium acetate =95/5  
Flow rate: 1.0 ml/min  
Temperature: 30°C  
Detection: UV240 nm  
Attenuation: 0.128 auFS  
Sample conc.: 0.5mg/ml  
Injection volume: 0.5µl  
Retention time: 4.56min  
Capacity factor: 0.51



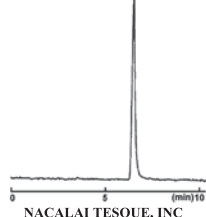
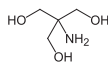
### COSMOSIL Chromatogram Index

Sample: Trichloroacetic Acid  
CAS No.: [76-03-9]  
Molecular formula:  $C_2HCl_3O_2$   
Column: HILIC  
Column size: 4.6mm I.D.-250mm  
Mobile phase: Acetonitrile/ 10mmol/l  
Ammonium acetate =50/50  
Flow rate: 1.0 ml/min  
Temperature: 30°C  
Detection: UV210 nm  
Attenuation: 0.128 auFS  
Sample conc.: 1.0mg/ml  
Injection volume: 1.0µl  
Retention time: 11.83min  
Capacity factor: 3.17



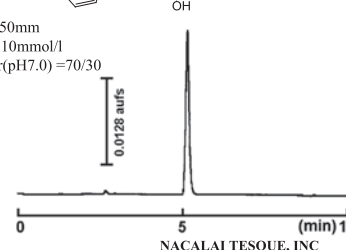
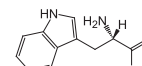
### COSMOSIL Chromatogram Index

Sample: Tris(hydroxymethyl)aminomethane  
CAS No.: [77-86-1]  
Molecular formula:  $C_4H_{11}NO_3$   
Column: HILIC  
Column size: 4.6mm I.D.-250mm  
Mobile phase: Acetonitrile/ 10mmol/l  
Ammonium acetate =80/20  
Flow rate: 1.0 ml/min  
Temperature: 30°C  
Detection: ELSD  
Attenuation: Gain=6, Atten=8  
Sample conc.: 2.0mg/ml  
Injection volume: 1.0µl  
Retention time: 6.47min  
Capacity factor: 1.48



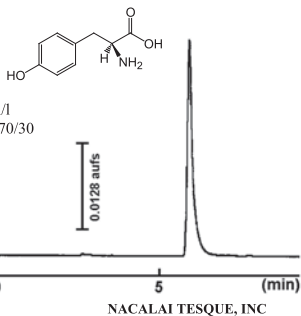
### COSMOSIL Chromatogram Index

Sample: L-Tryptophan  
CAS No.: [73-22-3]  
Molecular formula:  $C_{11}H_{12}N_2O_2$   
Column: HILIC  
Column size: 4.6mm I.D.-250mm  
Mobile phase: Acetonitrile/ 10mmol/l  
Citrate buffer(pH7.0)=70/30  
Flow rate: 1.0 ml/min  
Temperature: 30°C  
Detection: UV254 nm  
Attenuation: 0.128 auFS  
Sample conc.: 0.5mg/ml  
Injection volume: 0.5µl  
Retention time: 5.14min  
Capacity factor: 0.95



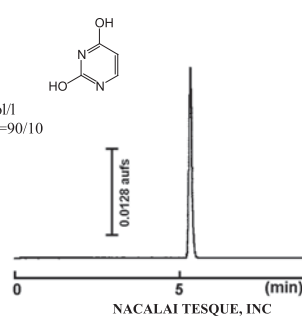
### COSMOSIL Chromatogram Index

Sample: L-Tyrosine  
 CAS No.: [60-18-4]  
 Molecular formula:  $C_9H_9NO_3$   
 Column: HILIC  
 Column size: 4.6mm I.D.-250mm  
 Mobile phase: Acetonitrile/ 10mmol/l Ammonium acetate=70/30  
 Flow rate: 1.0 ml/min  
 Temperature: 30°C  
 Detection: UV 254nm  
 Attenuation: 0.128 aufs  
 Sample conc.: 5.0mg/ml  
 Injection volume: 1.0µl  
 Retention time: 5.92min  
 Capacity factor: 1.25



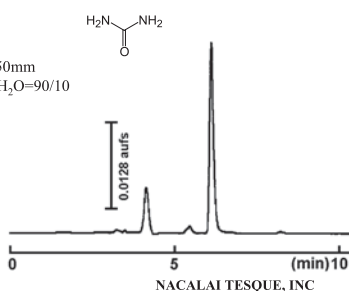
### COSMOSIL Chromatogram Index

Sample: Uracil  
 CAS No.: [66-22-8]  
 Molecular formula:  $C_4H_4N_2O_2$   
 Column: HILIC  
 Column size: 4.6mm I.D.-250mm  
 Mobile phase: Acetonitrile/ 10mmol/l Ammonium acetate =90/10  
 Flow rate: 1.0 ml/min  
 Temperature: 30°C  
 Detection: UV260 nm  
 Attenuation: 0.128 aufs  
 Sample conc.: 0.1mg/ml  
 Injection volume: 0.5µl  
 Retention time: 5.33min  
 Capacity factor: 0.84



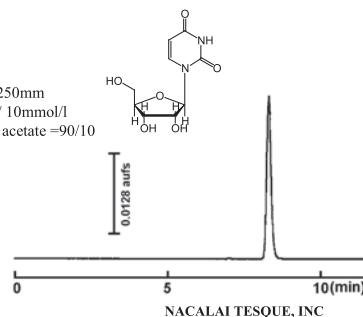
### COSMOSIL Chromatogram Index

Sample: Urea  
 CAS No.: [57-13-6]  
 Molecular formula:  $CH_4N_2O$   
 Column: HILIC  
 Column size: 4.6mm I.D.-250mm  
 Mobile phase: Acetonitrile/  $H_2O=90/10$   
 Flow rate: 1.0 ml/min  
 Temperature: 30°C  
 Detection: UV210 nm  
 Attenuation: 0.128 aufs  
 Sample conc.: 10.0mg/ml  
 Injection volume: 2.0µl  
 Retention time: 6.12min  
 Capacity factor: 1.15



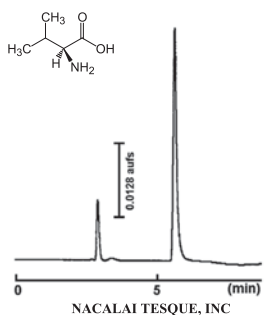
### COSMOSIL Chromatogram Index

Sample: Uridine  
 CAS No.: [58-96-8]  
 Molecular formula:  $C_9H_{12}N_2O_6$   
 Column: HILIC  
 Column size: 4.6mm I.D.-250mm  
 Mobile phase: Acetonitrile/ 10mmol/l Ammonium acetate =90/10  
 Flow rate: 1.0 ml/min  
 Temperature: 30°C  
 Detection: UV260 nm  
 Attenuation: 0.128 aufs  
 Sample conc.: 0.1mg/ml  
 Injection volume: 1.0µl  
 Retention time: 8.30min  
 Capacity factor: 1.86



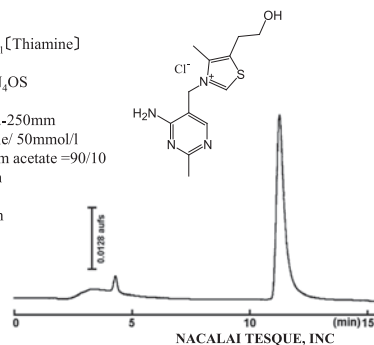
### COSMOSIL Chromatogram Index

Sample: L-Valine  
 CAS No.: [72-18-4]  
 Molecular formula:  $C_6H_{11}NO_2$   
 Column: HILIC  
 Column size: 4.6mm I.D.-250mm  
 Mobile phase: Acetonitrile/ 10mmol/l Ammonium acetate=70/30  
 Flow rate: 1.0 ml/min  
 Temperature: 30°C  
 Detection: UV210 nm  
 Attenuation: 0.128 aufs  
 Sample conc.: 10.0mg/ml  
 Injection volume: 1.0µl  
 Retention time: 5.63min  
 Capacity factor: 1.14



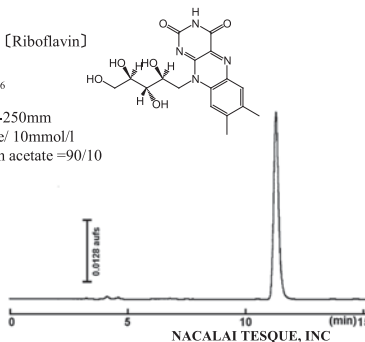
### COSMOSIL Chromatogram Index

Sample: Vitamin B<sub>1</sub> [Thiamine]  
 CAS No.: [67-03-8]  
 Molecular formula:  $C_{12}H_{17}ClN_4OS$   
 Column: HILIC  
 Column size: 4.6mm I.D.-250mm  
 Mobile phase: Acetonitrile/ 50mmol/l Ammonium acetate =90/10  
 Flow rate: 1.0 ml/min  
 Temperature: 30°C  
 Detection: UV220 nm  
 Attenuation: 0.128 aufs  
 Sample conc.: 1.0mg/ml  
 Injection volume: 1.0µl  
 Retention time: 11.25min  
 Capacity factor: 2.93



### COSMOSIL Chromatogram Index

Sample: Vitamin B<sub>2</sub> [Riboflavin]  
 CAS No.: [83-88-5]  
 Molecular formula:  $C_{17}H_{20}N_4O_6$   
 Column: HILIC  
 Column size: 4.6mm I.D.-250mm  
 Mobile phase: Acetonitrile/ 10mmol/l Ammonium acetate =90/10  
 Flow rate: 1.0 ml/min  
 Temperature: 30°C  
 Detection: UV220 nm  
 Attenuation: 0.128 aufs  
 Sample conc.: 1.0mg/ml  
 Injection volume: 0.5µl  
 Retention time: 11.33min  
 Capacity factor: 2.92







## Reference List

### References list

No.	Title	AUTHOR	JOURNAL	ISSUE	PAGE	YEAR
1	Characterization of the decomposition of compounds derived from imidazolidinyl urea in cosmetics and patch test materials	Takahiro Doi, Akihiro Takeda, Akiko Asada, Keiji Kajimura	Contact Dermatitis	67 (5)	284–292	2012
2	A simple graphical representation of selectivity in hydrophilic interaction liquid chromatography	Mohammed E.A. Ibrahim, Yang Liu, Charles A. Lucy	Journal of Chromatography A	1260	126-131	2012
3	Comparison of 2-amino-[3-11C] isobutyric acid and 2-deoxy-2-[18F]fluoro-D-glucose in nude mice with xenografted tumors and acute inflammation	Tsuji, Atsushi B; Kato, Koichi; Sugyo, Aya; Okada, Maki; Sudo, Hitomi; Yoshida, Chisato; Wakizaka, Hidekatsu; Zhang, Ming-Rong; Saga, Tsuneo	Nuclear Medicine Communications	33 (10)	1058–1064	2012
4	In Vitro and in Vivo Metabolism of Verproside in Rats	Min Gi Kim, Deok-Kyu Hwang, Hyeon-Uk Jeong, Hye Young Ji, Sei-Ryang Oh, Yongnam Lee, Ji Seok Yoo, Dae Hee Shin and Hye Suk Lee	Molecules	17 (10)	11990-12002	2012
5	Functional expression of carnitine/organic cation transporter OCTN1 in mouse brain neurons: Possible involvement in neuronal differentiation	Noritaka Nakamichi, Takayuki Taguchi, Hiroshi Hosotani, Tomohiko Wakayama, Takuya Shimizu, Tomoko Sugiura, Shoichi Iseki, Yukio Kato,	Neurochemistry International	In Press		2012
6	Characterization and use of hydrophilic interaction liquid chromatography type stationary phases in supercritical fluid chromatography	Caroline West, Syame Khater, Eric Lesellier	Journal of Chromatography A	1250	182-195	2012
7	Analysis of 8-hydroxy-2'-deoxyguanosine in human urine using hydrophilic interaction chromatography with tandem mass spectrometry	Chiemi Hosozumi, Akira Toriba, Thanyarat Chuesaard, Takayuki Kameda, Ning Tang, Kazuichi Hayakawa	Journal of Chromatography B	893-894	173-176	2012
8	A NOVEL NORMAL PHASE HPLC METHOD FOR THE QUANTIFICATION OF N-FORMYL IMPURITY IN AZACITIDINE ACTIVE PHARMACEUTICAL INGREDIENTS AND PHARMACEUTICAL DOSAGE FORMS	T. Satyanarayana Raju, L. Kalyanaraman, K. S. V. Raghavachary & P. Yadagiri Swamy	Journal of Liquid Chromatography & Related Technologies	35 (8)	1070-1080	2012
9	Determination of Histamine in Seafood by Hydrophilic Interaction Chromatography/Tandem Mass Spectrometry	Tatsuo YOSHIDA, Hirotoshi HAMADA, Hiroshi MURAKAWA, Hidekazu YOSHIMOTO, Toshiaki TOBINO, Kei TODA	Analytical Sciences	28 (2)	179-182	2012
10	Triazole-Linked DNA as a Primer Surrogate in the Synthesis of First-Strand cDNA	Dr. Tomoko Fujino, Dr. Ken-ichi Yasumoto, Naomi Yamazaki, Ai Hasome, Prof. Kazuhiro Sogawa, Prof. Hiroyuki Isobe	Chemistry – An Asian Journal	6 (11)	2956-2960	2011
11	Retention and selectivity of stationary phases for hydrophilic interaction chromatography	Yong Guo, Sheetal Gaiki	Journal of Chromatography A	1218 (35)	5920-5938	2011
12	Chromatographic characterization of hydrophilic interaction liquid chromatography stationary phases: Hydrophilicity, charge effects, structural selectivity, and separation efficiency	Yuusuke Kawachi, Tohru Ikegami, Hirotaka Takubo, Yuka Ikegami, Masatoshi Miyamoto, Nobuo Tanaka	Journal of Chromatography A	1218 (35)	5903-5919	2011
13	The different decomposition properties of diazolidinyl urea in cosmetics and patch test materials	Takahiro Doi, Keiji Kajimura, Shuzo Taguchi	Contact Dermatitis	65 (2)	81-91	2011
14	Stationary and mobile phases in hydrophilic interaction chromatography: a review	Pavel Jandera	Analytica Chimica Acta	692 (1-2)	1-25	2011
15	Degradation of N-Acetyl-D-glucosamine and D-Glucosamine in Subcritical Water and Properties of the Degradation Products	Rongchun WANG, Takashi KOBAYASHI and Shuji ADACHI	Food Science and Technology Research	17 (4)	273-278	2011
16	Determination of isoascorbic acid in fish tissue by hydrophilic interaction liquid chromatography–ultraviolet detection	Spyros Drivelos, Marilena E. Dasenaki and Nikolaos S. Thomaidis	Analytical and Bioanalytical Chemistry	397 (6)	2199-2210	2010
17	Hepatoprotective Effects of Flavonoids from Shekwasha (Citrus depressa) against D-Galactosamine-Induced Liver Injury in Rats	Toshiyuki AKACHI, Yasuyuki SHIINA, Yayoi OHISHI, Takumi KAWAGUCHI, Hirokazu KAWAGISHI, Tatsuya MORITA, Makoto MORI and Kimio SUGIYAMA	J. Nutr Sci Vitaminol	56 (1)	60-67	2010

## Reference List

No.	Title	AUTHOR	JOURNAL	ISSUE	PAGE	YEAR
18	A Novel Glucosylation Reaction on Anthocyanins Catalyzed by Acyl-Glucose-Dependent Glucosyltransferase in the Petals of Carnation and Delphinium	Yuki Matsuba, Nobuhiro Sasaki, Masayuki Tera, Masachika Okamura, Yutaka Abe, Emi Okamoto, Haruka Nakamura, Hisakage Funabashi, Makoto Takatsu, Mikako Saito, Hideaki Matsuoka, Kazuo Nagasawa and Yoshihiro Ozekia	The Plant Cell	22 (10)	3374-3389	2010
19	Molecular identification of unsaturated uronate reductase prerequisite for alginate metabolism in <i>Sphingomonas</i> sp. A1	Ryuichi Takasea, Akihito Ochiai, Bunzo Mikami, Wataru Hashimoto, Kousaku Murata,	Biochimica et Biophysica Acta (BBA) - Proteins & Proteomics	1804 (9)	1925-1936	2010
20	Inhibitory Effects of Acylated Acyclic Sesquiterpene Oligoglycosides from the Pericarps of <i>Sapindus rarak</i> on Tumor Necrosis Factor- $\alpha$ -Induced Cytotoxicity	Toshio Morikawa, Yuanyuan Xie, Kiyofumi Ninomiya, Masaki Okamoto, Osamu Muraoka, Dan Yuan, Masayuki Yoshikawa and Takao Hayakawa	Chem. Pharm. Bull.	58 (9)	1276-1280	2010
21	Approach to hydrophilic interaction chromatography column selection: Application to neurotransmitters analysis	Raluca-Ioana Chirita, Caroline West, Adriana-Luminita Finaru, Claire Elfakir	Journal of Chromatography A	1217 (18)	3091-3104	2010
22	Medicinal Flowers. Part 29. Acylated Oleanane-Type Triterpene Bisdesmosides: Perennisaponins G, H, I, J, K, L, and M with Pancreatic Lipase Inhibitory Activity from the Flowers of <i>Bellis perennis</i>	Toshio Morikawa, Xuezheng Li, Eriko Nishida, Seikou Nakamura, Kiyofumi Ninomiya, Hisashi Matsuda, Yoshimi Oda, Osamu Muraoka, Masayuki Yoshikawa	Helvetica Chimica Acta	93 (3)	573-586	2010
23	Unusual amino acid derivatives from the mushroom <i>Pleurocybella porrigens</i>	Takumi Kawaguchi, Tomohiro Suzuki, Yuka Kobayashi, Shinya Kodani, Hirofumi Hirai, Kaoru Nagai, Hirokazu Kawagishi	Tetrahedron	66 (2)	504-507	2010
24	Structures of Acetylated Oleanane-Type Triterpene Saponins, Rarasaponins IV, V, and VI, and Anti-hyperlipidemic Constituents from the Pericarps of <i>Sapindus rarak</i>	Yasunobu Asao, Toshio Morikawa, Yuanyuan Xie, Masaki Okamoto, Makoto Hamao, Hisashi Matsuda, Osamu Muraoka, Dan Yuan and Masayuki Yoshikawa	Chem. Pharm. Bull.	57 (2)	198-203	2009
25	Development and validation of a reversed-phase high-performance liquid chromatographic method for quantification of peptide dendrimers in human skin permeation experiments	S. Mutalik, A.K. Hewavitharana, P.N. Shaw, Y.G. Anissimov, M.S. Roberts, H.S. Parekh,	Journal of Chromatography B	877 (29)	3556-3562	2009
26	Determination of para-aminohippuric acid (PAH) in human plasma and urine by liquid chromatography-tandem mass spectrometry	Phey Yen Han, P. Nicholas Shaw, Carl M.J. Kirkpatrick	Journal of Chromatography B	877 (27)	3215-3220	2009
27	Oxidation of Methionine to Dehydromethionine by Reactive Halogen Species Generated by Neutrophils	Alexander V. Peskin, Rufus Turner, Ghassan J. Maghzal, Christine C. Winterbourn and Anthony J. Kettle	Biochemistry	48 (42)	10175-10182	2009
28	Oleanane-type triterpene oligoglycosides with pancreatic lipase inhibitory activity from the pericarps of <i>Sapindus rarak</i>	Toshio Morikawa, Yuanyuan Xie, Yasunobu Asao, Masaki Okamoto, Chihiro Yamashita, Osamu Muraoka, Hisashi Matsuda, Yutana Pongpiriyadacha, Dan Yuan, Masayuki Yoshikawa	Phytochemistry	70 (9)	1166-1172	2009
29	Direct Evidence for Efficient Transport and Minimal Metabolism of L-Cephalixin by Oligopeptide Transporter 1 in Budded Baculovirus Fraction	Keisuke Mitsuoka, Ikumi Tamai, Yasushi Morohashi, Yoshiyuki Kubo, Ryoichi Saitoh, Akira Tsuji and Yukio Kato	Biol. Pharm. Bull.	32 (8)	1459-1461	2009
30	Simultaneous measurement of diazolidinyl urea, urea, and allantoin in cosmetic samples by hydrophilic interaction chromatography	Takahiro Doi, Keiji Kajimura, Satoshi Takatori, Naoki Fukui, Shuzo Taguchi, Shozo Iwagami	Journal of Chromatography B	877 (10)	1005-1010	2009
31	A Perspective of Hydrophilic Interaction Chromatography -Development and the Characteristics of the separation mode	Tohru Ikegami, Hirotaka Takubo, Nobuo Tanaka	Chromatography	29 (2)		2008
32	Tetrodotoxin poisoning evidenced by solid-phase extraction combining with liquid chromatography-tandem mass spectrometry	Hsiao-Chin Jen, Shin-Jung Lin, Yung-Hsiang Tsai, Chun-Hsiang Chen, Zu-Chun Lin, Deng-Fwu Hwang,	Journal of Chromatography B	871 (1)	95-100	2008

## INDEX

	Sample name	Page
A	Acesulfame	10
	Acetamide	12
	Acetazolamide	12
	Acetrizoic Acid	12
	Acrylic Acid	12
	L- $\alpha$ -Alanine	12
	$\beta$ -Alanine	12
	Allantoic Acid	11
	Allantoin	11, 12
	p-Aminobenzamidine	12
	p-Aminobenzoic Acid	13
	4-Amino-n-butyric Acid [GABA]	13
	6-Aminohexanoic Acid [6-Amino-n-caproic Acid]	13
	5-Aminolevulinic Acid	13
	2-Aminopyridine	13
	3-Aminopyridine	13
	5-Amino-1H-tetrazole	13
	3-Amino-1H-1,2,4-triazole	13
	5-Aminouracil	14
	Ammelide	8
	Ammeline	8
	Amphotericin B	14
	Angiotensin I (Human)	14
	Angiotensin II (Human)	5, 14
	Angiotensin II, [Asn <sup>1</sup> ,Val <sup>6</sup> ]	5, 8, 14
	Angiotensin II, [Sar <sup>1</sup> ,Ala <sup>8</sup> ]	5, 14
	Angiotensin II, [Sar <sup>1</sup> ,Ile <sup>8</sup> ]	5, 8, 14
	Angiotensin II, [Sar <sup>1</sup> ,Thr <sup>8</sup> ]	5, 14
	Angiotensin II, [Val <sup>6</sup> ]	5, 8, 15
	Angiotensin II, Des-Asp <sup>1</sup> -[Ile <sup>8</sup> ]	5, 8, 15
	L-Arginine	15
	Ascorbic Acid	4, 7, 8
	L-(+)-Ascorbic Acid[Vitamin C]	8, 15
L-Asparagine	15	
Aspartame	10	
L-Aspartic Acid	15	
6-Azauracil	15	
Aztreonam	15	
B	Benzamidine	16
	Benzenesulfonic Acid	16
	Benzoic Acid	10, 16
	Benzylamine	16
	Bromoacetic Acid	16
C	Cacotheline	16
	Caffeine	10
	Camostat	16
	L-Carnitine	16
	Ceftriaxone	17
	Chloroacetic Acid	17
	Citrazinic Acid	17
	L-Citrulline	8
	Choline Chloride	11

	Sample name	Page
C	Choline Hydrogen Tartrate	11
	Creatine	17
	Creatinine	10, 17
	Cyanoacetic Acid	17
	Cyanuric Acid	8, 17
	L-Cysteine	17
	L-(-)-Cystine	18
	Cytidine	18
	Cytosine	18
	D	2'-Deoxyguanosine
3,4-Diaminobenzoic Acid		18
3,5-Diaminobenzoic Acid		18
2,4-Diaminophenol		18
DL-2,6-Diaminopimelic Acid		18
DL-2,3-Diaminopropionic Acid		18
Diatrizoic Acid		19
Diethylene Glycol		8
Dipicolinic Acid		19
Dithiouracil		19
L-DOPA		19
Dopamine		19
E		L-(+)-Ergothioneine
	meso-Erythritol	3, 9, 19
	Ethylene Glycol	9
F	Famotidine	19
	Folic Acid	20
	Folinic Acid	20
	Formamide	20
	D-Fructose-6-phosphate	9, 20
	Fuchsine, Acid [Rubin S]	20
	Fumaric Acid	20
G	GABA[4-Amino-n-butyric Acid]	13
	Gluconic Acid	20
	Glucose	9
	D-Glucose-6-phosphate	9, 20
	$\alpha$ -D-Glucose-1-phosphate	9, 21
	D-Glucuronic Acid	21
	L-Glutamic Acid	21
	L-Glutamine	21
	Glutaric Acid	21
	Glutathione(Reduced Form)	21
	Glyceric Acid	3,9
	DL-Glyceric Acid	21
	Glycerol	8,9
	Glycinamide	21
	Glycine	2, 9, 22
Glycolic Acid	22	
Glycylglycine	2, 9, 22	
Guanidoacetic Acid	22	
H	1,2,6-Hexanetriol	22
	L-Histidine	22
	L-Homocystine	22

## INDEX

	Sample name	Page
H	L-Homoserine	22
	Hydantoic Acid	23
	Hydantoin	23
	Hydroxylamine-O-sulfonic Acid	23
	8-Hydroxy-2'-Deoxyguanosine	10
	8-Hydroxy Guanosine	10
	cis-4-Hydroxy-D-proline	23
	L-Hydroxyproline [trans-4-Hydroxy-L-proline]	23
	N-Hydroxysuccinimide	23
	I	Indigo carmine
Isoascorbic Acid[Erythorbic Acid]		4, 7, 8
D-Isoascorbic Acid		23
Isocinchomeric Acid [Pyridine-2,5-dicarboxylic Acid]		24
Isoleucine		9
L-Isoleucine		24
Isonicotinic Acid		24
Isonicotinohydrazide		24
Isopropyl β-D-1-thiogalactopyranoside [IPTG]		24
K		Kojic Acid
L	Leucine	9
	L-Leucine	24
	D-Leucyl-L-tyrosine	24
	L-Lysine	25
M	Melamine	4, 8, 25
	Maleic Acid	25
	Malic Acid	8
	L-(-)-Malic Acid	25
	Malonic Acid	25
	Mecobalamin	25
	Metanilic Acid	25
	L-Methionine	25
	N-Methylglucamine	26
	N-Methylhydroxylamine	26
	2-Methylimidazole	10
	4-Methylimidazole	10
	6-Methyl-2-thiouracil	26
	Mucic Acid	26
	Murexide	26
	N	1,5-Naphthalenedisulfonic Acid
Nicotinamide		8, 26
Nicotinic Acid		8, 26
L-Noradrenaline [Norepinephrine]		26
Norepinephrine [L-Noradrenaline]		26
DL-Norleucine		27
DL-Norvaline		27
O	L-Ornithine	27
	Orotic Acid	27
	Oxalic Acid	3, 9, 27
	Oxamic Acid	3, 9, 27
	Oxytocin	27
	P	D-Pantothenic Acid
Perennisaponin J		34, 35

	Sample name	Page	
P	Perennisaponin K	34, 35	
	L-(-)-Phenylalanine	28	
	p-Phenylenediamine	28	
	L-(+)-α-Phenylglycine	28	
	Phosphocreatine	28	
	O-Phospho-L-serine	28	
	Picolinic Acid	28	
	Pivalic Acid	28	
	Procaterol	28	
	L-Proline	29	
Q	Propionic Acid	29	
	Pyridoxine[Vitamin B <sub>6</sub> ]	8, 29	
	Pyruvic Acid	29	
	Quinine	10	
	R	Riboflavin[Vitamin B <sub>2</sub> ]	8, 32
		Ribose-5-phosphate	29
	S	D-Saccharic Acid	29
		Saccharin	10
		Sarcosine	29
		Sebacic Acid	29
L-Serine		30	
Sinigrin		30	
Sorbic Acid		8, 10, 30	
Succinic Acid		30	
Sulbactam		30	
Sulfanilic Acid		30	
T	L-(+)-Tartaric Acid	30	
	Taurine	10, 30	
	L-Theanine	31	
	Thiamine[Vitamin B <sub>1</sub> ]	32	
	2-Thiobarbituric Acid	31	
	2-Thiouracil	31	
	L-Threonine	31	
	Todalazine	31	
	Trichloroacetic Acid	31	
	Trimethylene Glycol	9	
U	Tris(hydroxymethyl)aminomethane	3, 9, 31	
	Tryptophan	7	
	L-Tryptophan	31	
	L-Tyrosine	32	
	Uracil	10, 32	
	Urea	10, 32	
	Uridine	10, 32	
	V	Valine	9
		L-Valine	28
		Vitamin B <sub>1</sub> [Thiamine]	28
Vitamin B <sub>2</sub> [Riboflavin]		8, 32	
Vitamin B <sub>6</sub> [Pyridoxine]		8, 29	
Vitamin C[L-(+)-Ascorbic Acid]		8, 15	





**Warranties and Disclaimers:**

Nacalai Tesque warrants that its products shall conform to the description of such products as provided by Nacalai Tesque through its catalog, analytical data or other literature. Nacalai Tesque makes no other warranty, express or implied, as to the fitness of these products for any particular purpose. Nacalai Tesque shall not in any event be liable for incidental or consequential damages that may result from any use or failure of the products.

For more information on products and pricing, please contact your local distributor.

**NACALAI TESQUE, INC.**

Nijo Karasuma, Nakagyo-ku, Kyoto 604-0855 JAPAN

TEL : +81 (0)75 251 1730

FAX : +81 (0)75 251 1763

E-mail : [info.intl@nacalai.com](mailto:info.intl@nacalai.com)

[www.nacalai.com](http://www.nacalai.com)