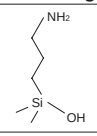


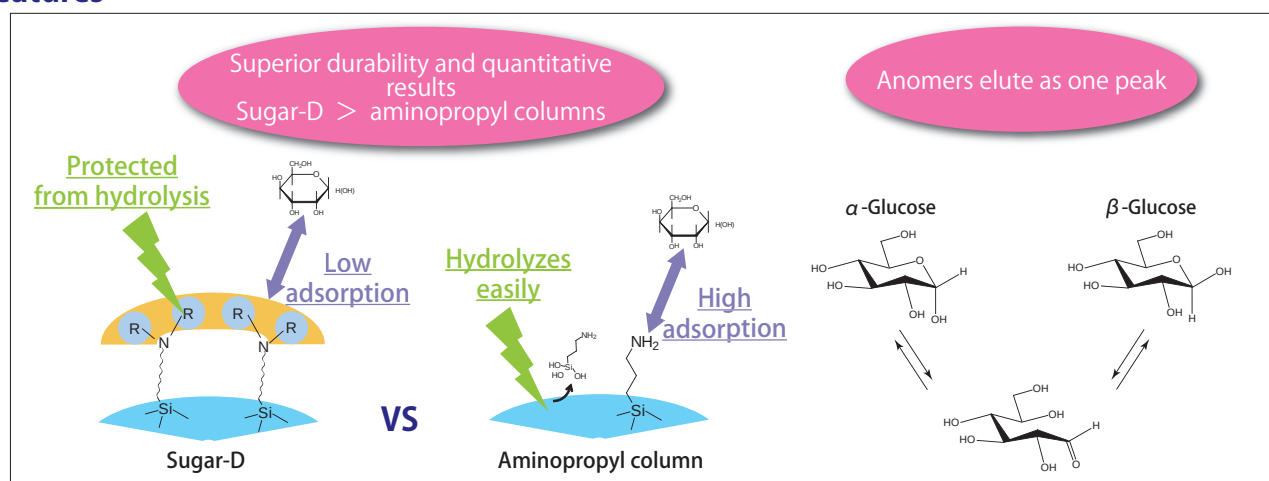
7. Mono- and Oligosaccharide Analysis Columns

Saccharides are not retained on standard C₁₈ columns because of their low hydrophobicity. COSMOSIL Sugar-D and NH₂-MS are specifically designed for separation of saccharides. COSMOSIL C₁₈-PAQ is recommended for hydrophobic glycosides and saccharide derivatives.

Specifications

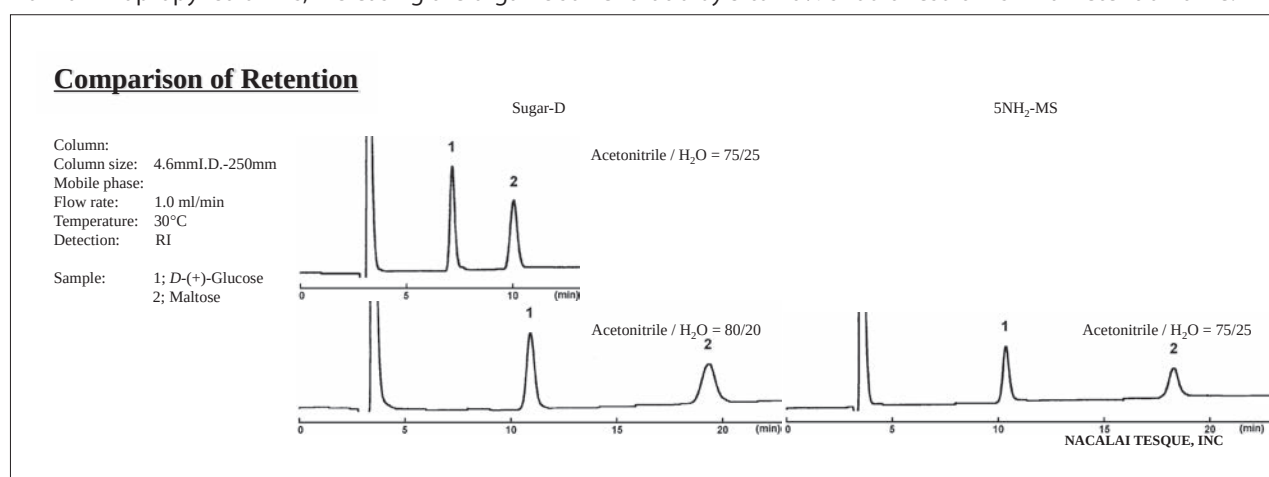
Packing Material	Sugar-D	NH ₂ -MS
Silica Gel	High purity porous spherical silica	
Average Particle Size	5 μ m	
Average Pore Size	—	120 Å
Specific Surface Area	—	300 m ² /g
Bonded Phase Structure	—	
Bonded Phase	Polyamine	Aminopropyl group
Main Interaction	Hydrophilic interaction	
Features	- First choice for saccharide analysis - High durability - Good quantitative analysis	Different selectivity from Sugar-D

Features



Retention Comparison

Compared to conventional aminopropyl columns, Sugar-D exhibits slightly lower retention. When transferring methods from aminopropyl columns, increasing the organic solvent ratio by 5 to 10% should result in similar retention time.



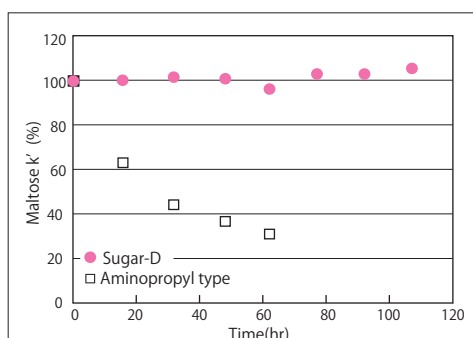
COSMOSIL Sugar-D



- Different selectivity from aminopropyl columns
- Superior durability compared to conventional amino columns
- Minimized undesirable adsorption

Comparison of Durability

The decrease of retention time was compared between COSMOSIL Sugar-D and conventional aminopropyl bonded stationary phase with a severe 100% water eluent between tests. The retention factor of Sugar-D did not decrease.



Decomposition Condition
 Solution Water
 Flow Rate 1.0 mL/min
 Temperature Room Temperature

Column 4.6 mm I.D. × 250 mm
 Mobile Phase Acetonitrile : Water = 70 : 30
 Flow Rate 1.0 mL/min
 Temperature 30°C
 Detection RI
 Sample Maltose

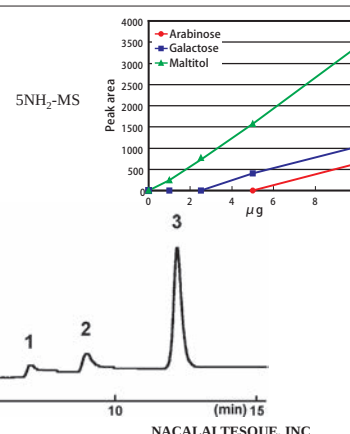
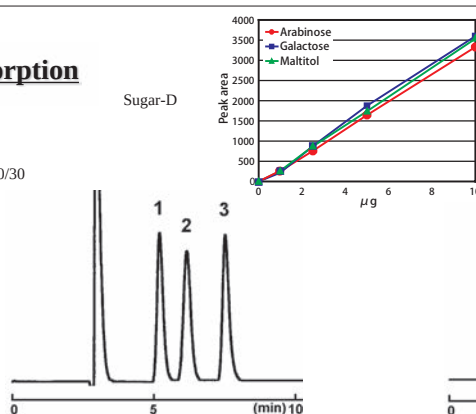
Comparison of Adsorption

Certain types of saccharides, such as arabinose or galactose, are partially or temporarily adsorbed on conventional aminopropyl stationary phases, causing tailing or no elution at all. COSMOSIL Sugar-D provides superior separation and high recovery for these saccharides.

Comparison of Adsorption

Column:
 Column size: 4.6mm I.D. × 250mm
 Mobile phase: Acetonitrile / H₂O = 70/30
 Flow rate: 1.0 ml/min
 Temperature: 30°C
 Detection: RI

Sample:
 1; D-(-)-Arabinose
 2; D-(+)-Galactose
 3; Maltitol



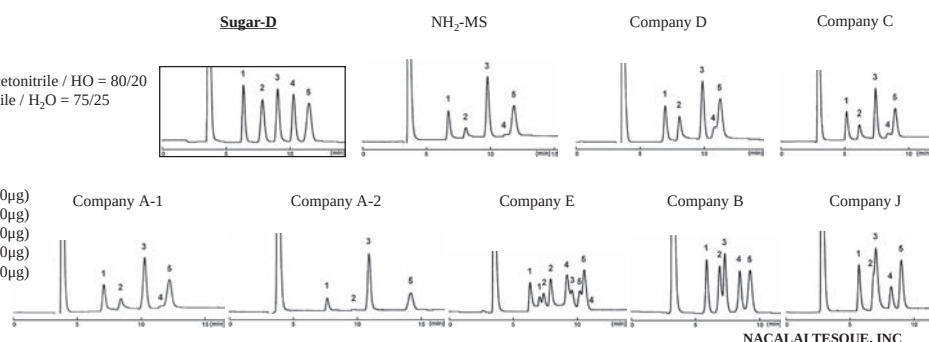
Comparison to competitor columns

The separation and the adsorption of monosaccharides were compared using COSMOSIL Sugar-D and competitor columns. Separation of aldoses, which have an aldehyde group, is usually problematic with undesirable adsorption. COSMOSIL Sugar-D provides excellent separations for these saccharides.

Comparison with competitor Columns

Column:
 Column size: 4.6mm I.D. × 250mm
 Mobile phase: (Sugar-D, Company B) Acetonitrile / H₂O = 80/20
 (Other columns) Acetonitrile / H₂O = 75/25
 Flow rate: 1.0 ml/min
 Temperature: 30°C
 Detection: RI

Sample:
 1; L-(-)-Rhamnose (10μg)
 2; D-(+)-Xylose (10μg)
 3; D-(-)-Fructose (10μg)
 4; D-(+)-Mannose (10μg)
 5; D-(+)-Glucose (10μg)



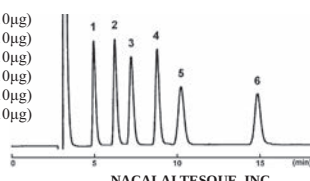
Applications

● Mono- and Oligosaccharides

COSMOSIL Application Data

Column: COSMOSIL Sugar-D
Column size: 4.6mm I.D.-250mm
Mobile phase: Acetonitrile / H₂O = 75/25
Flow rate: 1.0 ml/min
Temperature: 30°C
Detection: RI

Sample: 1; L-(+)-Rhamnose (10µg)
2; D-(-)-Fructose (10µg)
3; D-(+)-Glucose (10µg)
4; Sucrose (10µg)
5; Maltose (10µg)
6; D-(+)-Raffinose (10µg)



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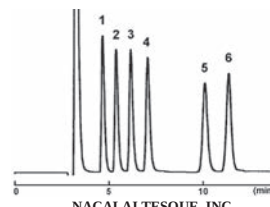
AP-0329

● Polyols

COSMOSIL Application Data

Column: COSMOSIL Sugar-D
Column size: 4.6mm I.D.-250mm
Mobile phase: Acetonitrile / H₂O = 75/25
Flow rate: 1.0 ml/min
Temperature: 30°C
Detection: RI

Sample: 1; Glycerol (10µg)
2; meso-Erythritol (10µg)
[meso-Erythrite] (10µg)
3; Xylitol (10µg)
4; D-Glucitol (10µg)
5; Maltitol (10µg)
6; myo-Inositol (10µg)



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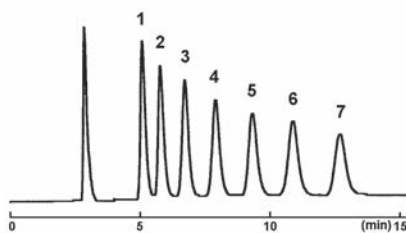
AP-0330

● Oligomaltoses

COSMOSIL Application Data

Column: COSMOSIL Sugar-D
Column size: 4.6mm I.D.-250mm
Mobile phase: Acetonitrile / H₂O = 65/35
Flow rate: 1.0 ml/min
Temperature: 30°C
Detection: RI

Sample: 1; D-(+)-Glucose (10µg)
2; Maltose (10µg)
3; Maltotriose (10µg)
4; Maltotetraose (10µg)
5; Maltopentaose (10µg)
6; Maltohexaose (10µg)
7; Maltotetraose (10µg)



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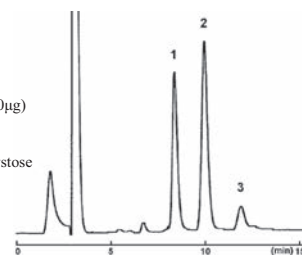
AP-0331

● Oligofructoses

COSMOSIL Application Data

Column: COSMOSIL Sugar-D
Column size: 4.6mm I.D.-250mm
Mobile phase: Acetonitrile / H₂O = 70/30
Flow rate: 1.0 ml/min
Temperature: 30°C
Detection: RI

Sample: Fructooligosaccharides (50µg)
1; 1-Kestose
2; Nystose
3; 1-Fructofuranosyl-D-nystose



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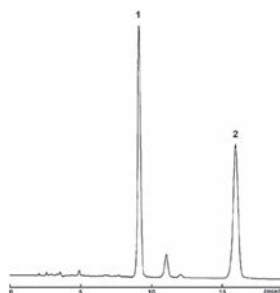
AP-0320

● Sweeteners

COSMOSIL Application Data

Column: COSMOSIL Sugar-D
Column size: 4.6mm I.D.-250mm
Mobile phase: Acetonitrile / H₂O = 85/15
Flow rate: 1.0 ml/min
Temperature: 30°C
Detection: UV210nm

Sample: 1; Stevioside
2; Rebaudioside A



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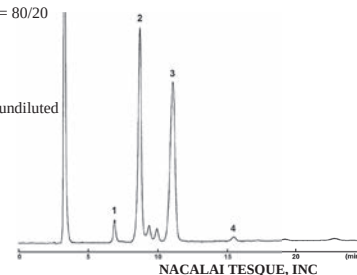
AP-1194

● Rare Sugar Soda

COSMOSIL Application Data

Column: COSMOSIL Sugar-D
Column size: 4.6mm I.D.-250mm
Mobile phase: Acetonitrile / H₂O = 80/20
Flow rate: 1.0 ml/min
Temperature: 30°C
Detection: RI

Sample: Rare-Sugar Soda, undiluted
1; D-Psicose
2; D-(-)-Fructose
3; D-(+)-Glucose
4; Sucrose
Inj. Vol.: 2.0µl



NACALAI TESQUE, INC

AP-1436

Ordering Information

● COSMOSIL Sugar-D Analytical / Preparative Columns (Particle Size: 5 µm)

Packed Column

I.D. x Length (mm)	Product Number
2.0×150	05688-41
2.0×250	05689-31
3.0×150	05690-91
3.0×250	05691-81

I.D. x Length (mm)	Product Number
4.6×150	05395-71
4.6×250	05397-51
10×250	05692-71
20×250	05693-61

Guard Column / Guard Cartridge

I.D. x Length (mm)	Product Number
4.6×10	05394-81
4.6×10 Cartridge*	19185-04
10×20	05696-31
20×50	05694-51

* 2 cartridges included. Guard cartridge holder required; refer to page 78.

COSMOSIL NH₂-MS

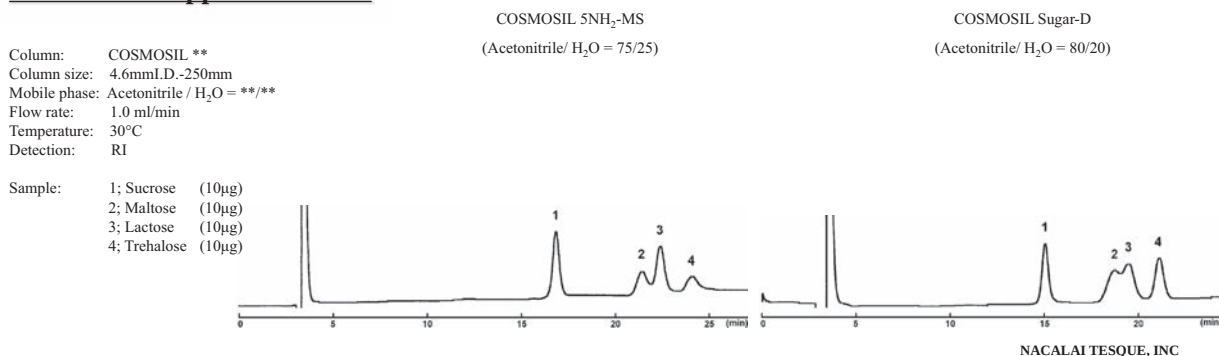


- Aminopropyl-bonded stationary phase
- Different selectivity from Sugar-D

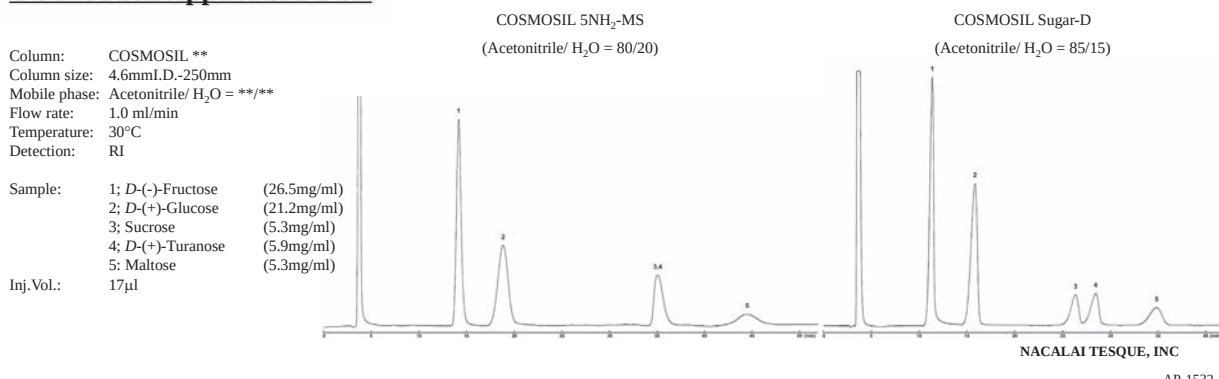
Comparison of Adsorption

COSMOSIL NH₂-MS offers better separation than COSMOSIL Sugar-D for some samples.

COSMOSIL Application Data



COSMOSIL Application Data



Ordering Information

- COSMOSIL 5NH₂-MS Analytical / Preparative Columns (Particle Size: 5 μm)

Packed Column

I.D. x Length (mm)	Product Number	I.D. x Length (mm)	Product Number
4.6 × 150	38245-11	10 × 250	38249-71
4.6 × 250	38246-01	20 × 250	38250-31

Guard Column / Guard Cartridge

I.D. x Length (mm)	Product Number
4.6 × 10	38241-51
4.6 × 10 Cartridge*	19182-34
10 × 20	38242-41
20 × 50	06093-91

* 2 cartridges included. Guard cartridge holder required; refer to page 78.