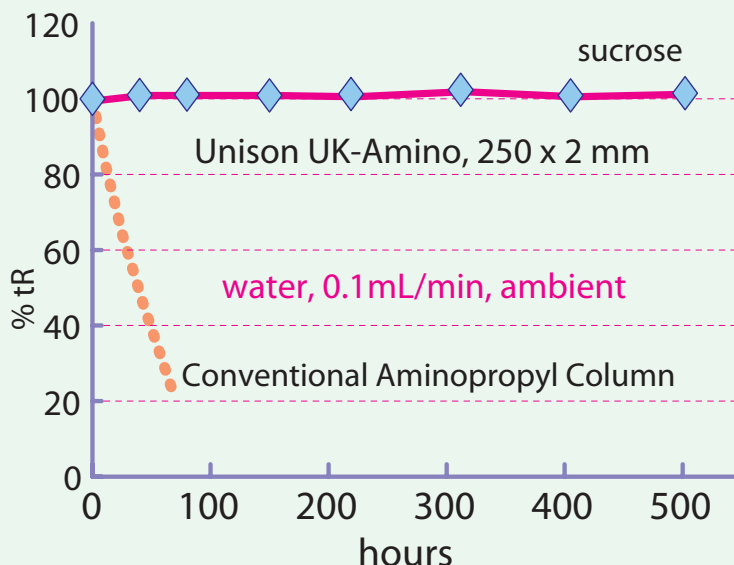
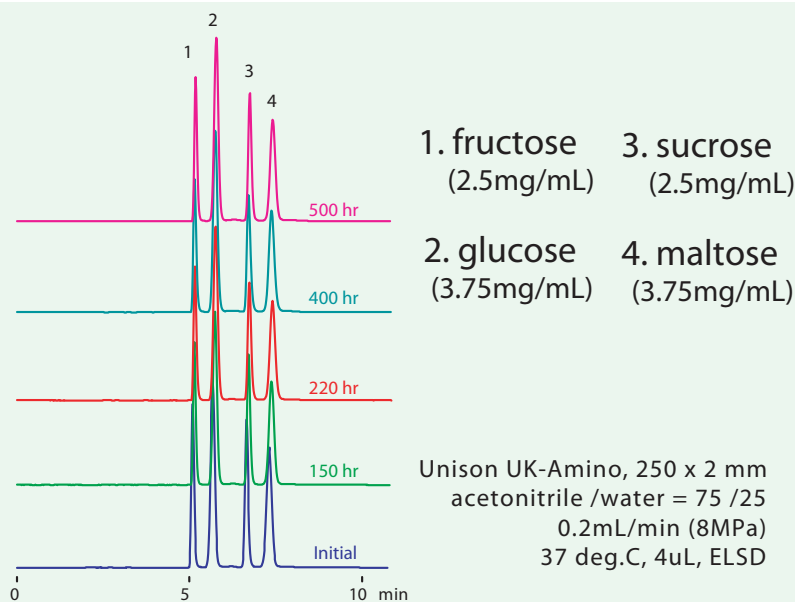


- Revolutionary aqueous durability for aminopropyl phase
- Aqueous to non-aqueous Normal Phase separation
- 3µm particle high-speed and superior resolution
- LC-MS applicable
- Pure spherical porous silica 3µm particle Aminopropyl phase



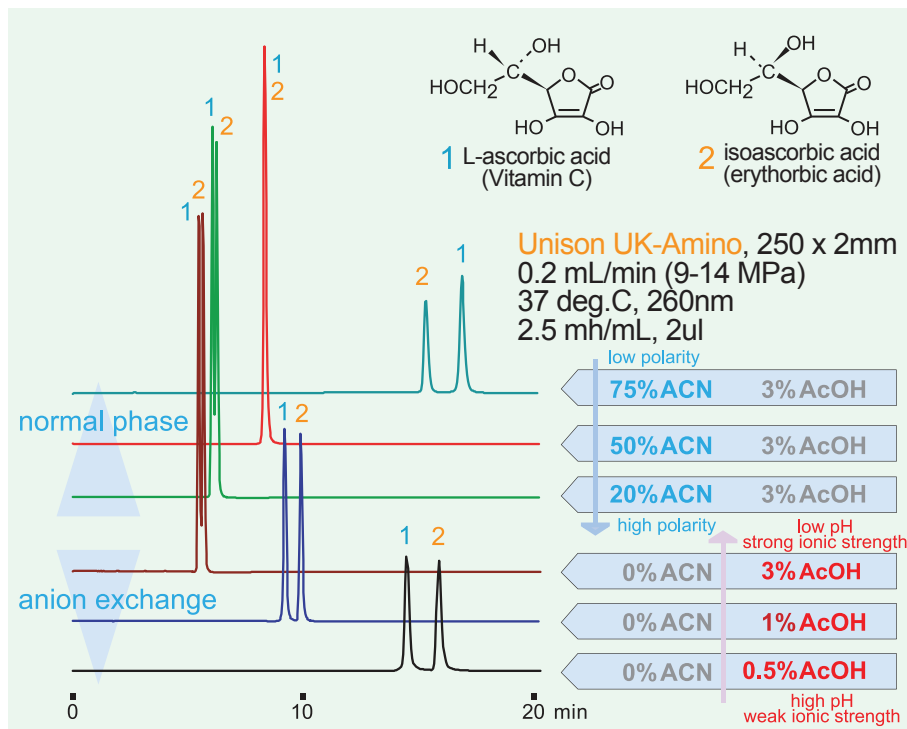
Aqueous durable silica-based aminopropyl columns have been used for a long time as a normal phase column for carbohydrate separation. However, these aminopropyl columns have a fatal flaw: "column bleeding" or the rapid deterioration in retention as a result of ligand desorption under aqueous elution.

Our newly-designed Unison UK-Amino offers a different approach from conventional columns: high durability against aqueous eluent. As the above chromatogram demonstrates, conventional columns experience a significant decline in retention when an aqueous mobile phase elutes through the column. UK-Amino, on the other hand, does not show any change in separation or retention. This is a significant development in the history of aminopropyl columns.

UK-Amino's design not only provides analytical power, but the 3µm particle high-resolution column has other benefits, including the minimization of LC-MS and LC-ELSD noise levels. UK-Amino can be applied to aqueous normal phase conditions, and separation optimization is possible while comparing to ODS columns using reversed-phase mode. One can expect significant results from this normal phase column of UK-Amino.

## ● Normal Phase and Anion Exchange Modes

Aminopropyl stationary phases generally employ both a normal phase separation mode and an anion exchange mode derived from amino groups. There are two methods using Unison UK-Amino to separate ascorbic acid and its isomer isoascorbic acid (erythorbic acid).



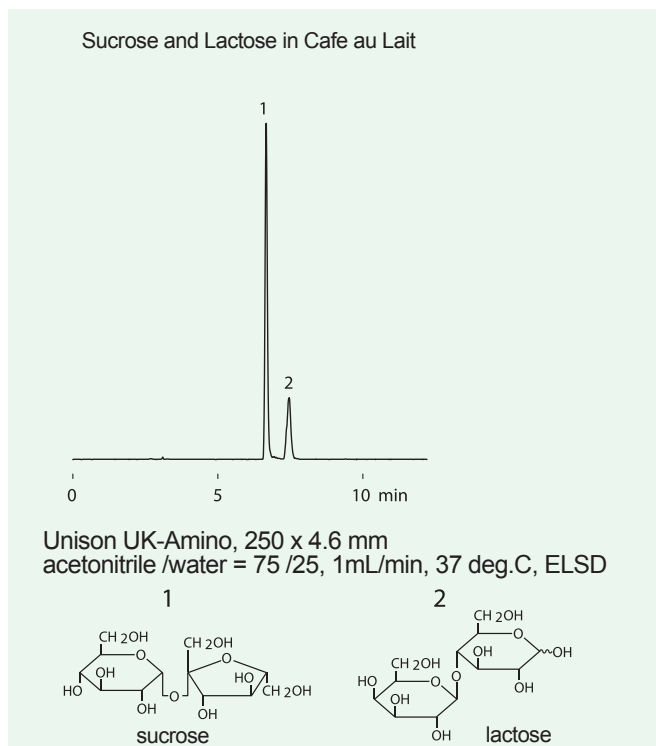
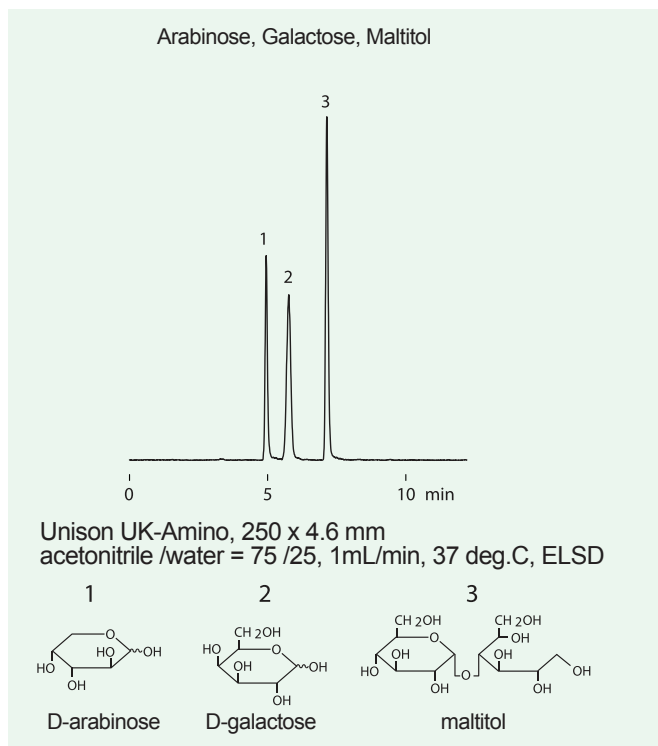
### Normal phase + Anion exchange mode

In the normal phase mode, retention deteriorates as the polarity in the mobile phase rises. However, as the acetonitrile partition rises, retention increases and the two compounds completely separate at 75% acetonitrile. Moreover, the elution order is reversed from anion exchange mode due to the difference in interactions.

### Anion Exchange Mode

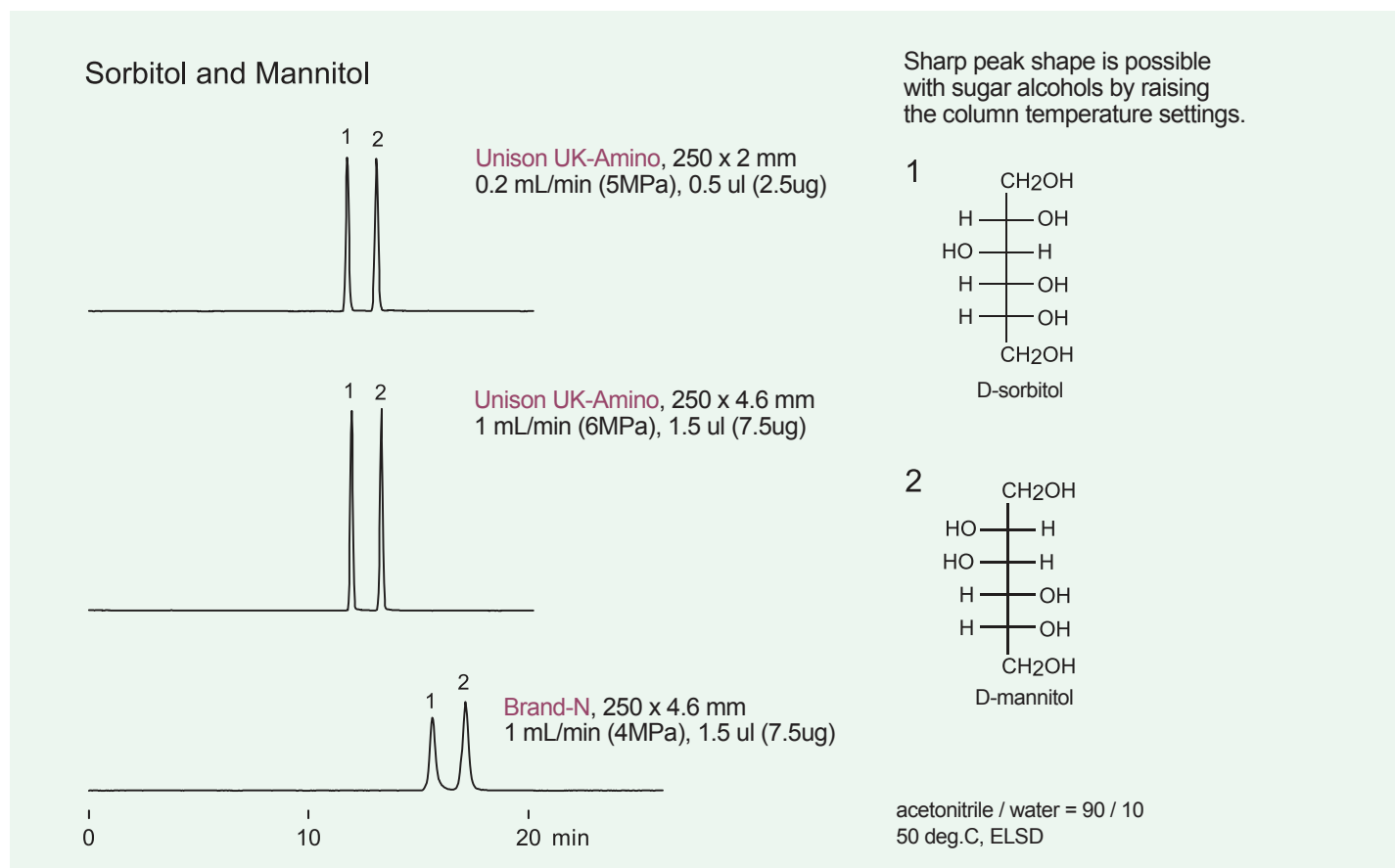
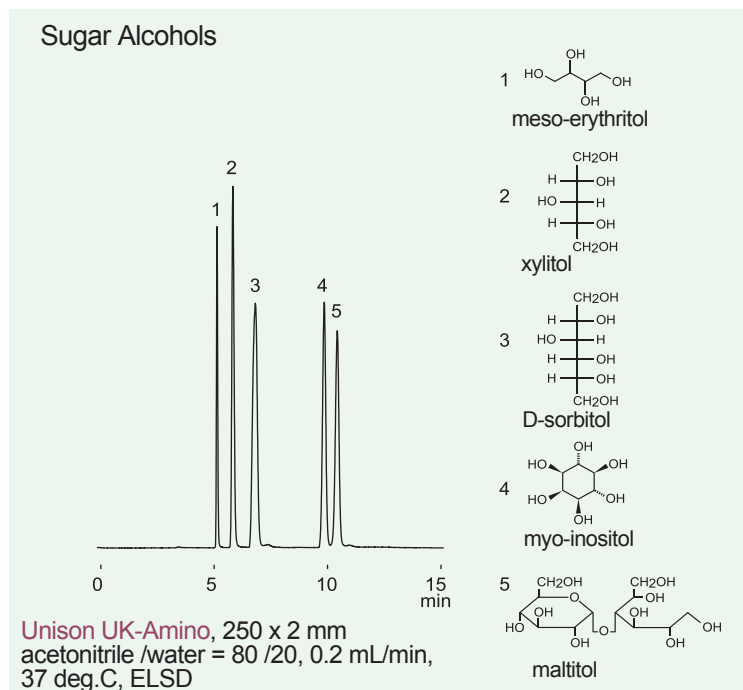
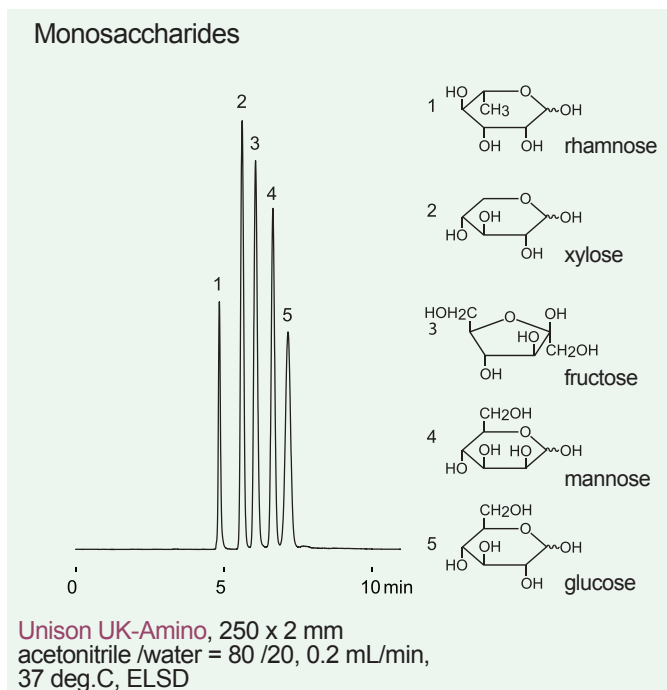
In anion exchange mode, retention deteriorates as the ionic strength grows larger and pH-driven ionic interactions grow weaker (in this case, high acidic density = low pH). In this example, two compounds are completely separated with only a 0.5% acetic acid aqueous solution.

## ● Normal Phase Separation of Saccharides

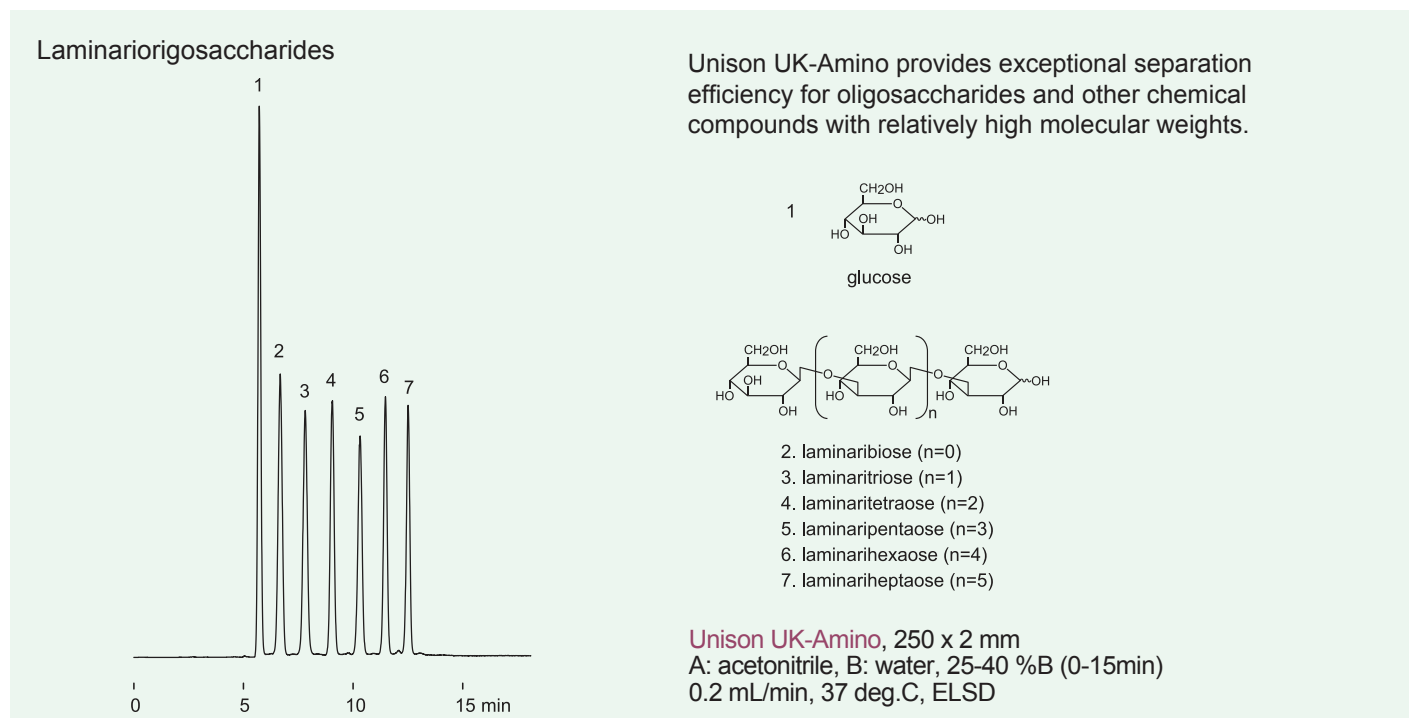
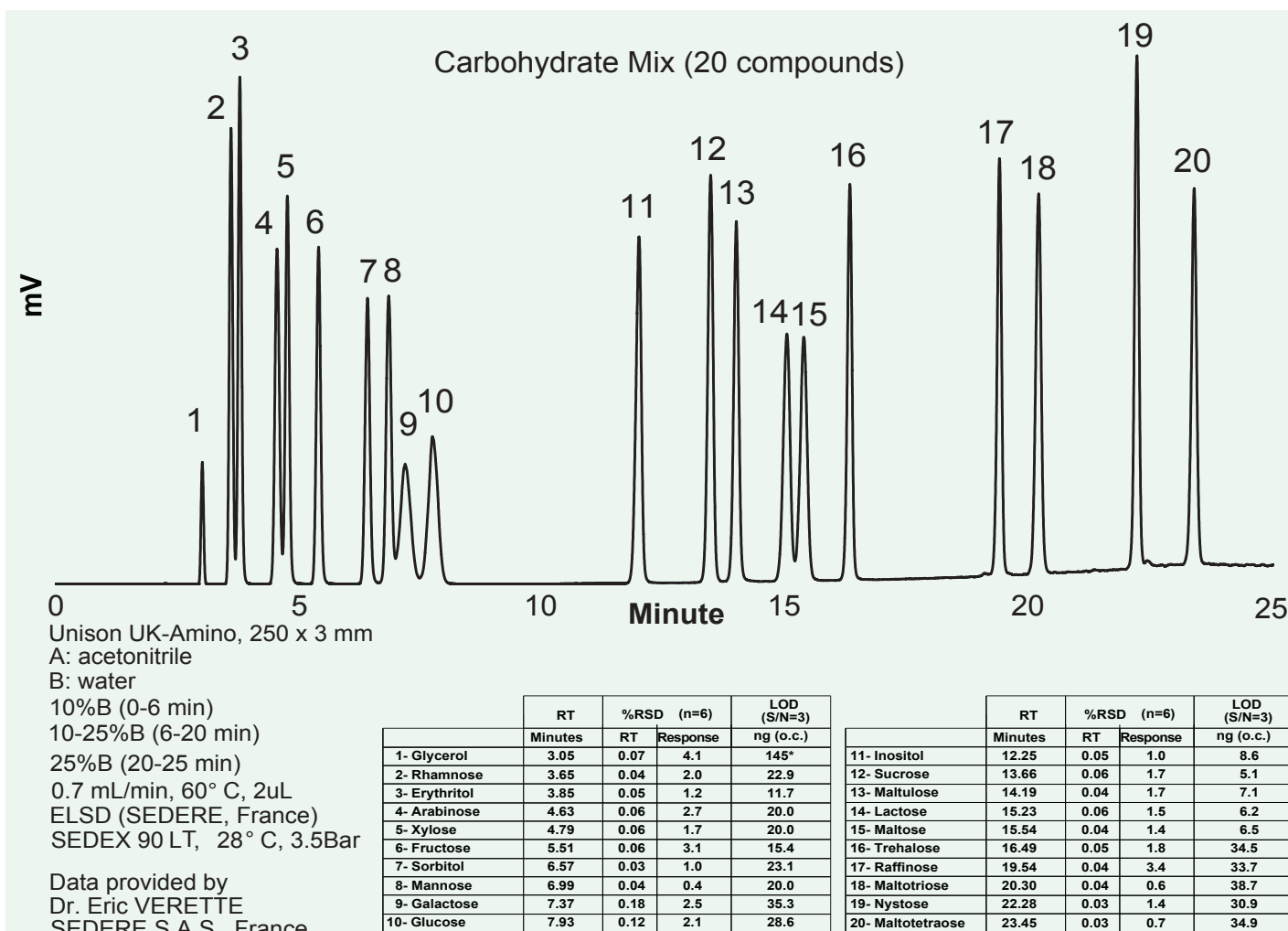


## ● Normal Phase Separation of Saccharides

Unison UK-Amino provides excellent peak shape with 3µm particles for hydrophilic monosaccharides and sugar alcohols separation.



● Simultaneous HPLC/LT-ELSD Analysis of Polyols, Mono-, Di- and Oligosaccharides

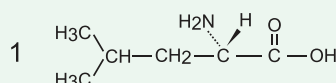
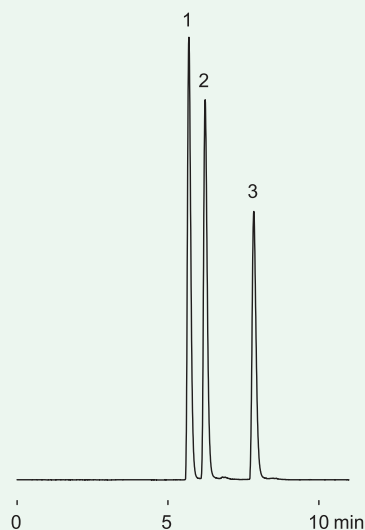


## ● Aqueous Normal Phase Separation

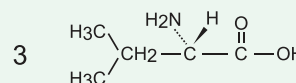
Unison UK-Amino can conduct aqueous normal phase separation even with chemical compounds other than carbohydrates. The column can optimally handle various compounds with its combination of electrostatic interactions and anion exchange mode. In that case, LCUV/VIS, LC-ELSD, and LC-MS is possible by optimizing the organic solvent strength and type, and by adjusting the buffer pH and ionic strength.

### Branched-Chain Amino Acids

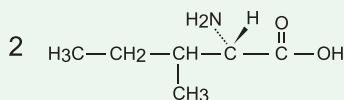
In amino acid separation with both electrolytes, sharp peak shape is possible by controlling pH and ion strength with neutral acetate ammonium.



L-leucine



L-valine

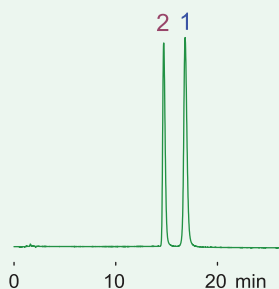


L-isoleucine

Unison UK-Amino, 150 x 2 mm  
acetonitrile /10mM ammonium acetate = 85 /15  
0.2 mL/min, 37 deg.C, ELSD

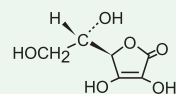
### Ascorbic Acid and Erythorbic Acid

Ascorbic acid and its isomer erythorbic acid can be separated in either normal phase or ion exchange modes. Unison UK-Amino can be used with acetic acid, a mild pH adjusting agent. Moreover, separation mode differences allow column users to select different elution orders and separation modes to suit their needs.

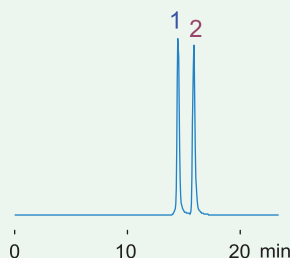


#### normal phase

Unison UK-Amino, 150 x 2 mm  
acetonitrile /water /acetic acid = 80 /20 /2  
0.2 mL/min (5MPa)  
37 deg.C, 260 nm,  
1uL (1.3ug)

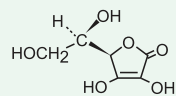


1 L-ascorbic acid  
(vitamin C)



#### anion exchange

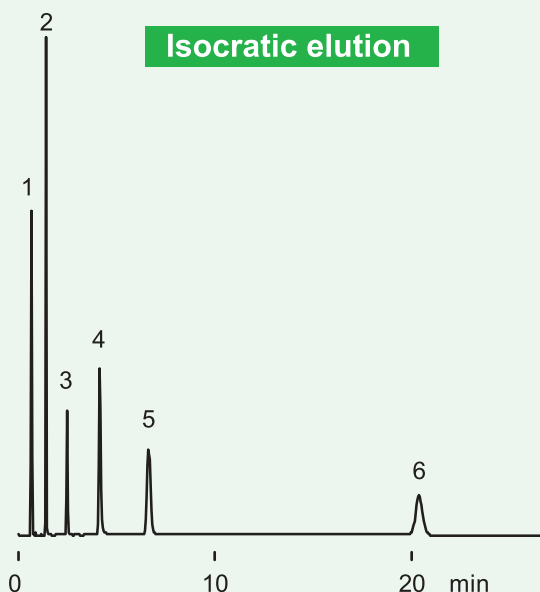
Unison UK-Amino, 250 x 2 mm  
water /acetonitrile = 100 /0.5  
0.2 mL/min (14MPa)  
37 deg.C, 260 nm,  
0.2uL (0.5ug)



2 isoascorbic acid  
(erythorbic acid)

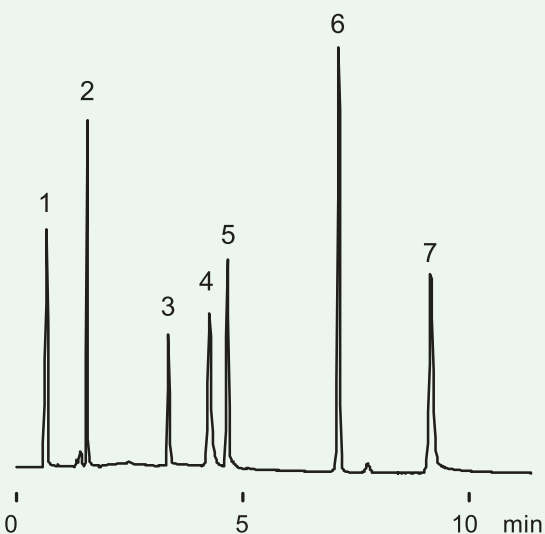
## ● Aqueous Normal Phase Separation (Water-Soluble Vitamins)

### Water-Soluble Vitamins



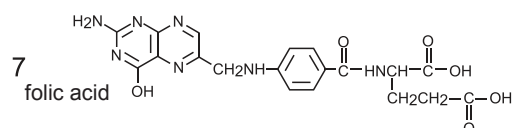
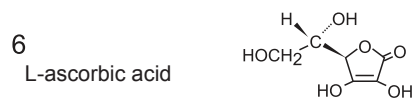
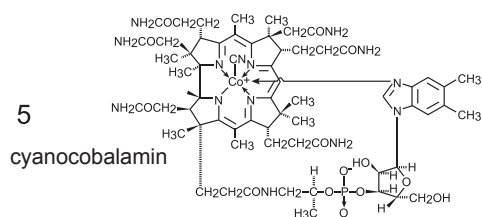
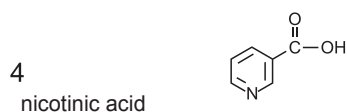
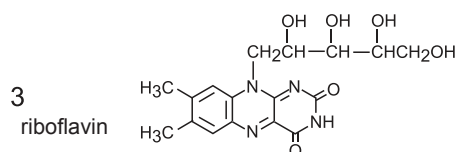
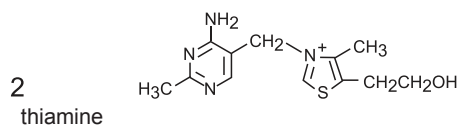
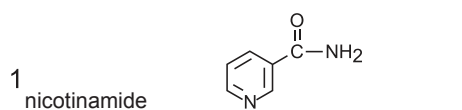
Unison UK-Amino, 100 x 4.6 mm  
 ACN / water / acetic acid = 90 / 10 / 5  
 1mL/min, 37 deg.C, 260 nm

### Gradient elution



Unison UK-Amino, 100 x 4.6 mm  
 A: ACN / acetic acid = 100 / 5  
 A: water / acetic acid = 100 / 5  
 2-70 %B (0-10min)  
 1mL/min, 37 deg.C, 260 nm

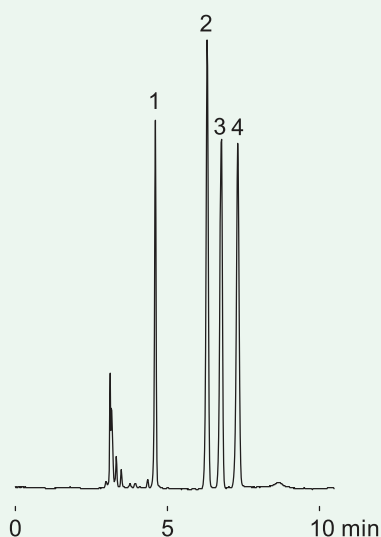
Simple analysis is obtainable using acetic acid with water-soluble vitamins. There is no need for ion-pair mode via reversed-phase separation. Moreover, gradient elution enables high speed analysis for a wide range of vitamins.



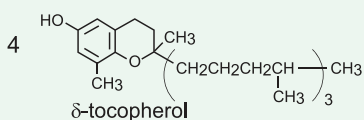
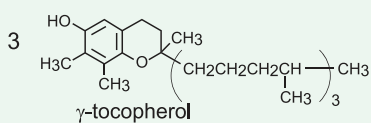
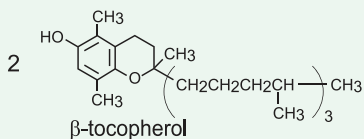
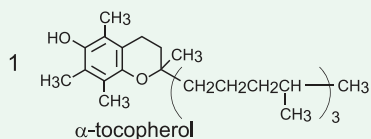
## ● Non-Aqueous Normal Phase Separation

Unison UK-Amino has a highly polar stationary phase, which enables non-aqueous normal phase separation similar to silica columns. However, the presence of a dissociative group (amino group) and bound water in the stationary phase means that highly reproducible analysis is possible by adding acetic acid and other pH modifiers.

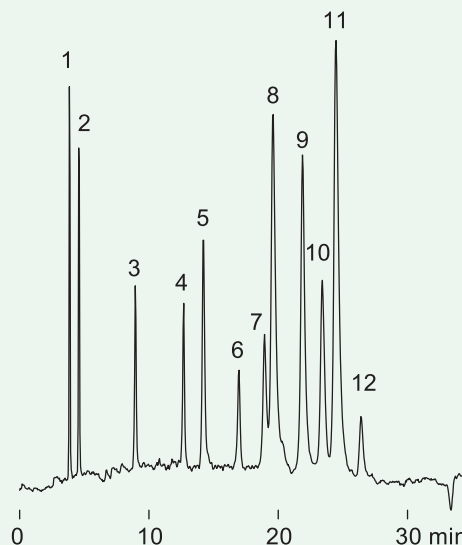
### Tocopherols



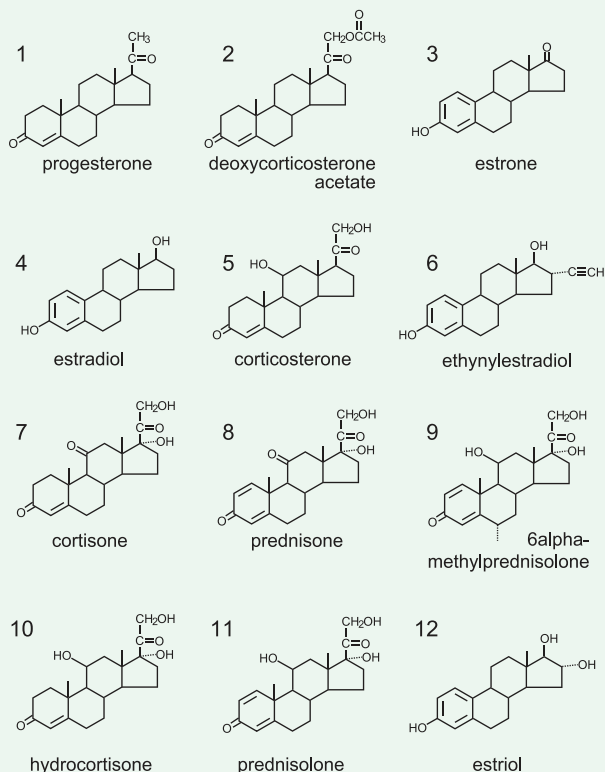
Unison UK-Amino, 250 x 4.6 mm  
hexane / ethyl acetate / acetic acid = 80 / 20 / 0.1  
1 mL/min, 37 deg.C, 295 nm



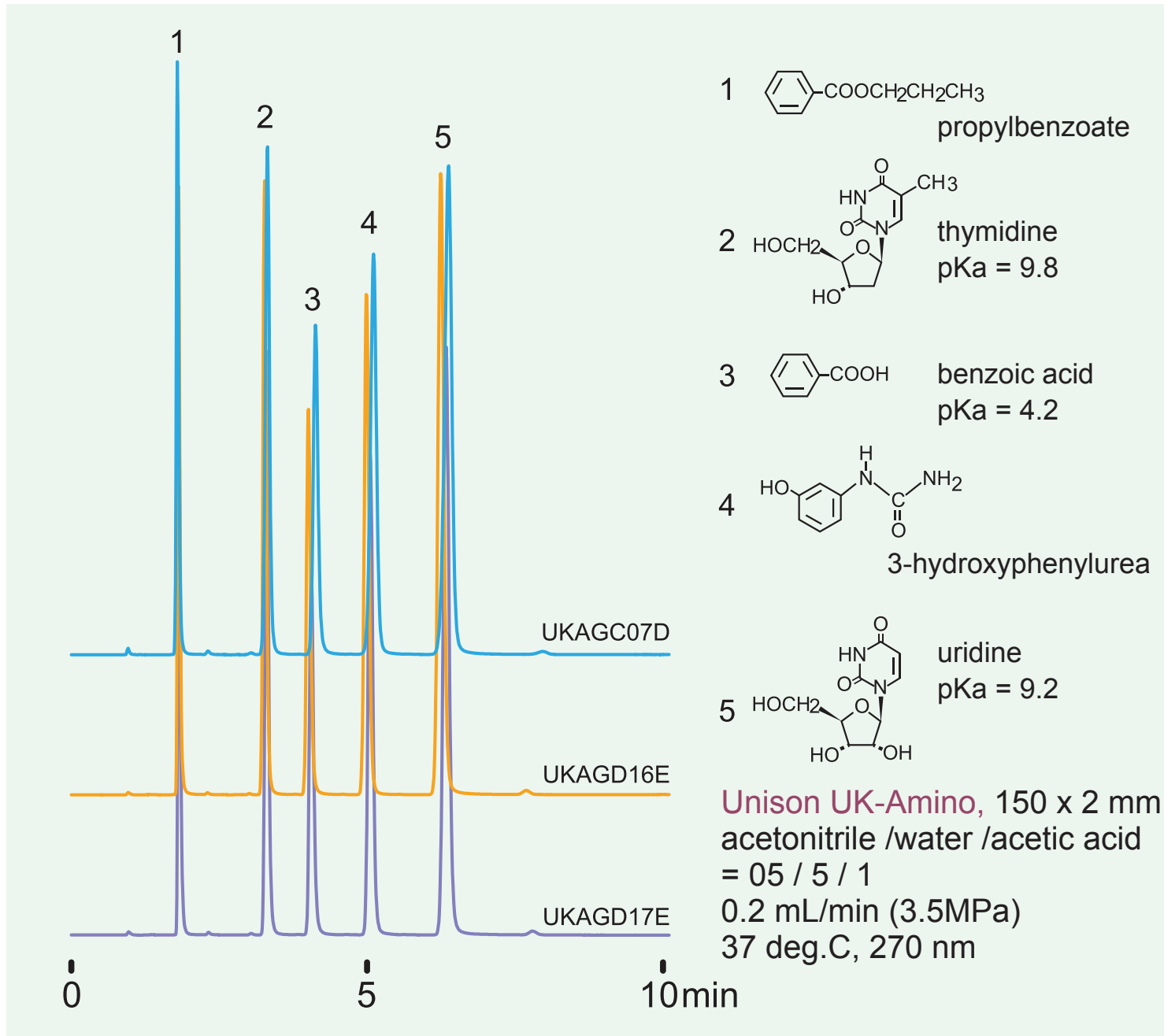
### Steroids



Unison UK-Amino, 250 x 4.6 mm  
A: hexane / acetic acid = 100 / 0.1  
B: ethanol / acetic acid = 100 / 1  
10-30 %B (0-30 min), 1 mL/min, 37 deg.C, 260 nm



● UK-Amino Batch-to-Batch Reproducibility



Conventional aminopropyl stationary phases struggle to achieve solute retention and repeatable separations because the interactions are complicated due to the presence of both normal phase and anion exchange modes. Unison UK-Amino addresses this problem with a novel stationary phase design that provides excellent reproducibility.



## ● Ordering Information for Unison UK-Amino

3µm Columns, Pressure limits of up to: 50MPa, 500 bar, 7,500 psi						3µm, 100MPa, 1000 bar, 15,000 psi	
Column Length	ID					Column Length	ID
	1.0 mm	1.5 mm	2.0 mm	3.0 mm	4.6 mm		2.0 mm
10			UKA20T	UKA30T	UKA00T	10	
20			UKA29T	UKA39T	UKA09T	20	
30	UKA11T	UKA71T	UKA21T	UKA31T	UKA01T	30	UKA21U
50	UKA12T	UKA72T	UKA22T	UKA32T	UKA02T	50	UKA22U
75	UKA13T	UKA73T	UKA23T	UKA33T	UKA03T	75	UKA23U
100	UKA14T	UKA74T	UKA24T	UKA34T	UKA04T	100	UKA24U
150	UKA15T	UKA75T	UKA25T	UKA35T	UKA05T	150	UKA25U
250	UKA16T	UKA76T	UKA26T	UKA36T	UKA06T	250	UKA26U

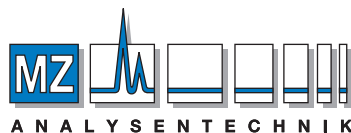
3µm Columns, Pressure limits of up to: 20MPa, 250 bar, 3,000 psi							
Column Length	Internal Diameter						
	1.0 mm	1.5 mm	2.0 mm	3.0 mm	4.6 mm	6.0 mm	10.0 mm
10			UKA20	UKA30	UKA00		
20			UKA29	UKA39	UKA09		
30	UKA11	UKA71	UKA21	UKA31	UKA01	UKA61	UKAP1
50	UKA12	UKA72	UKA22	UKA32	UKA02	UKA62	UKAP2
75	UKA13	UKA73	UKA23	UKA33	UKA03	UKA63	UKAP3
100	UKA14	UKA74	UKA24	UKA34	UKA04	UKA64	UKAP4
150	UKA15	UKA75	UKA25	UKA35	UKA05	UKA65	UKAP5
250	UKA16	UKA76	UKA26	UKA36	UKA06	UKA66	UKAP6
500					UKA07		

Guard Column System for Unison UK-Amino							
	Internal Diameter						
	1.0 mm	1.5 mm	2.0 mm	3.0 mm	4.6 mm	6.0 mm	10.0 mm
Guard Holder	GCH01S	GCH01S	GCH01S	GCH01S	GCH01S	GCH01S	GCH02M
Guard Cartridge (Set of 3)	GCUKAC	GCUKAC	GCUKAS	GCUKAS	GCUKAS	GCUKAS	GCUKAM

All of our stationary phases can also be made in the following internal diameters:  
**Nano:** 0.05mm, 0.075mm **Capillary:** 0.1mm, 0.3mm, 0.5mm **Semi-Prep:** 20mm, 28mm

Four Easy Ways To Order:

1. Call us at (215) 665-8902
2. Order by fax (501) 646-3497
3. Through VWR (vendor code 8070779) or Fisher (vendor code VN101253)
4. Via [www.imtaktusa.com](http://www.imtaktusa.com) with any major credit card



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