

HPLC column

SunArmor

SunArmor C18

RP-AQUA

New NH2



ChromaNik Technologies Inc.



The evolution of further surface modification *



Development of a novel silyl-reagent which bonded with multifunctional end-capping reagents

Final TMS treatment



★ C18 phase can be used at pH range from 2 to 12 as well as hybrid C18s.

☆ An excellent peak for acidic, basic and metal chelating compounds without effect of residual silanol groups



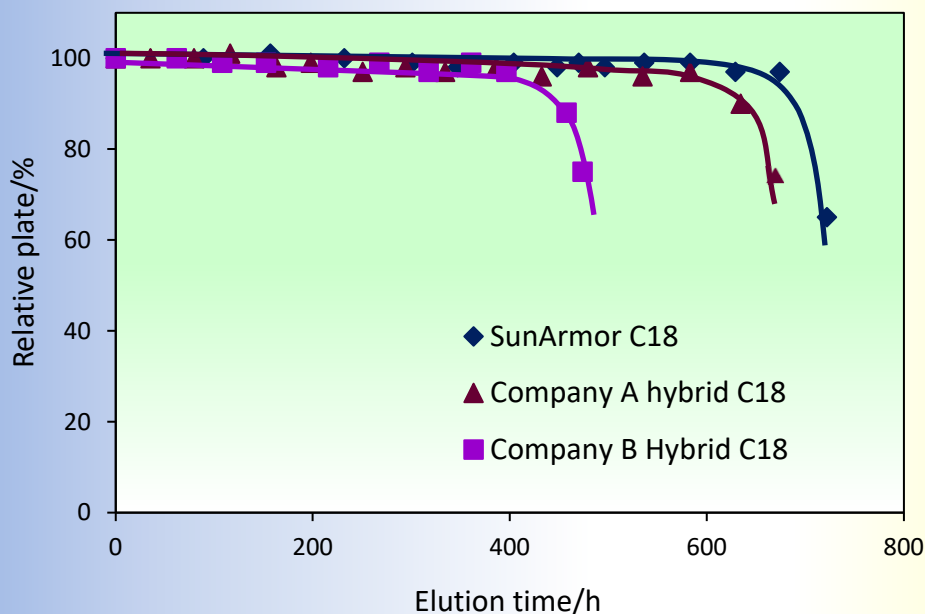
Characteristics of SunArmor

Stationary Phase	Particle size (μm)	Pore diameter (nm)	Specific surface area (m ² /g)	Carbon loading (%)	Ligand	pH range for usage	USP Category
SunArmor C18	3 and 5	12	340	17	C18	2 - 12	L1
SunArmor RP-AQUA	3 and 5	12	340	18	C30	2 - 10	L62
SunArmor NH2	3 and 5	12	340	6.5	Aminopropyl	2 - 12	L8

Stability under basic pH condition

SunArmor C18

Almost same stability to compare with the hybrid C18s.

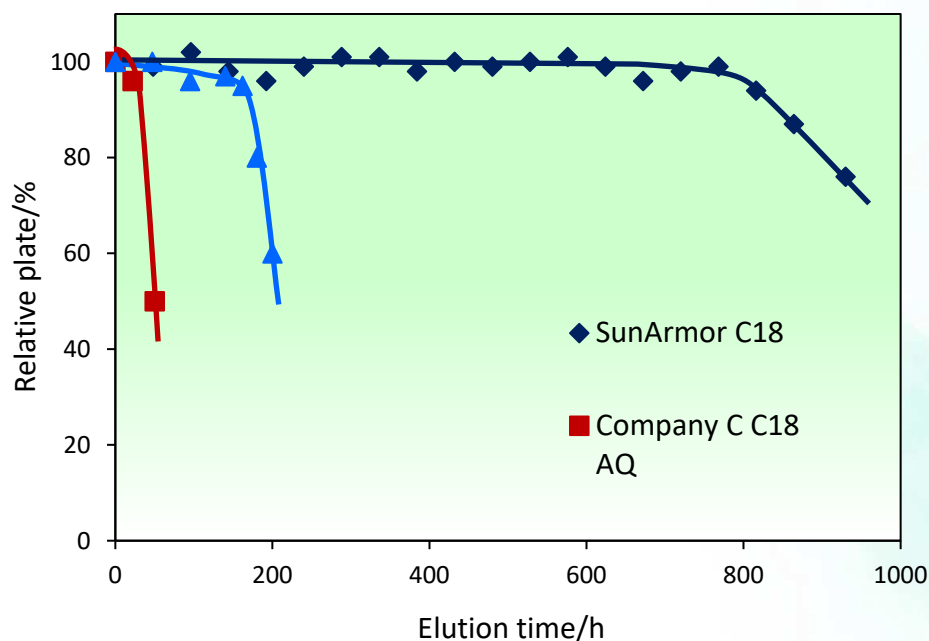


Durable test condition
Column size: 50 x 2.1 mm
Mobile phase: CH₃OH/10mM Ammonium bicarbonate (pH10.5)=30/70
Flow rate: 0.8 mL/min
Temperature: 60 °C

Measurement condition
Column size: 50 x 2.1 mm
Mobile phase: CH₃CN/H₂O=60/40
Flow rate: 0.2 mL/min
Temperature: 40 °C
Sample: 1 = Butylbenzene

Stability under neutral pH condition at 80 °C

SunArmor C18



Durable test condition
Column size: 50 x 2.1 mm
Mobile phase: CH₃OH/10mM Ammonium acetate (pH6.8)=30/70
Flow rate: 0.2 mL/min
Temperature: 80 °C

Measurement condition
Column size: 50 x 2.1 mm
Mobile phase: CH₃CN/H₂O=60/40
Flow rate: 0.2 mL/min
Temperature: 40 °C
Sample: 1 = Butylbenzene

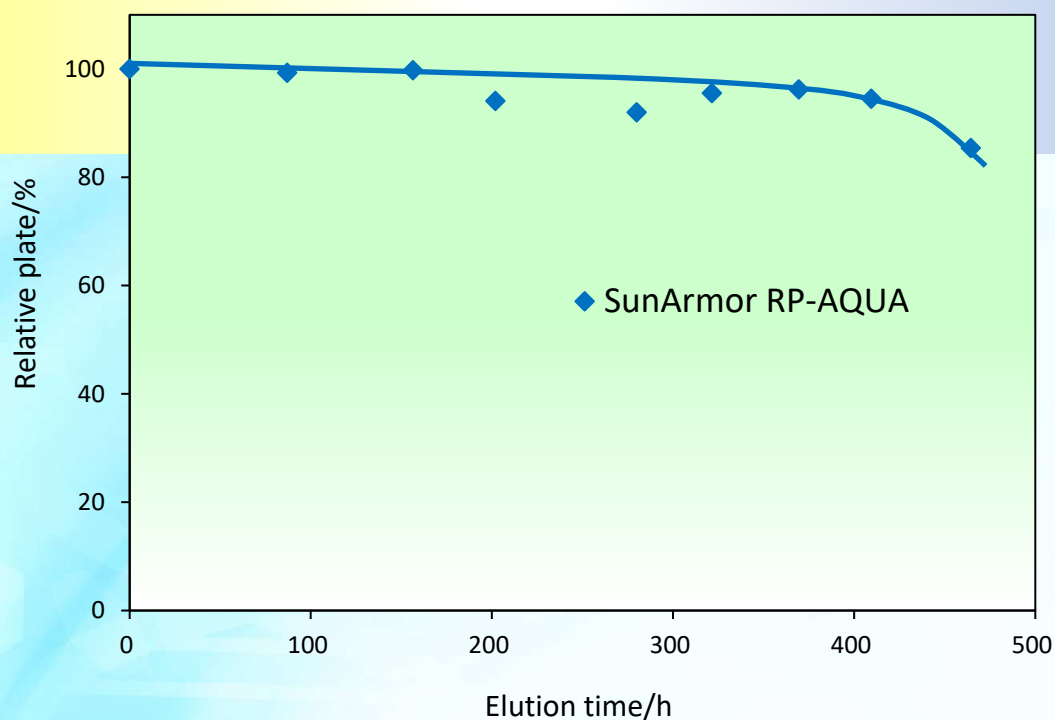


Stability under basic pH condition

SunArmor RP-AQUA



Stability under 100% aqueous basic pH10 condition



Durable test condition
Column size: 50 x 2.1 mm
Mobile phase:
10mM Ammonium bicarbonate (pH10.0)
Flow rate: 0.2 mL/min
Temperature: 40 °C

Measurement condition
Column size: 50 x 2.1 mm
Mobile phase: CH₃CN/H₂O=70/30
Flow rate: 0.2 mL/min
Temperature: 40 °C
Sample: 1 = Butylbenzene

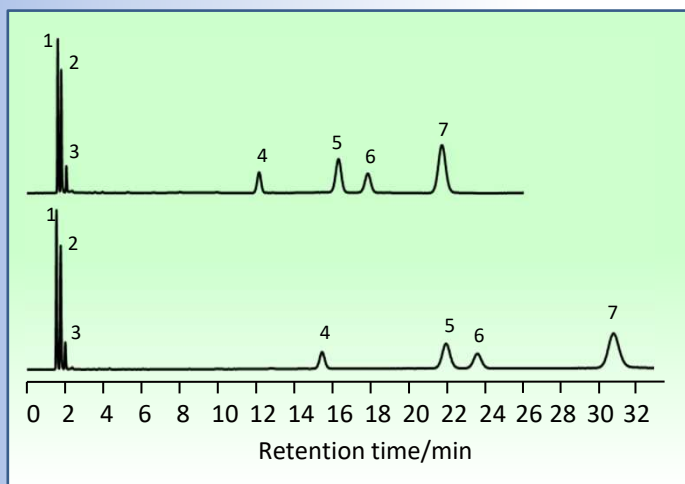
Parameter using standard sample

Evaluation of hydrogen bonding, hydrophobicity and steric selectivity

Reproducibility in retention



Separation of standard sample of SunArmor C18, RP-AQUA



Condition

Column: SunArmor C18, RP-AQUA 5 μm, 150 x 4.6 mm

Mobile phase: CH₃OH/H₂O=75/25

Flow rate: 1.0 mL/min

Temperature: 40 °C

Sample:

1 = Uracil



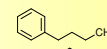
2 = Caffeine



3 = Phenol



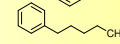
4 = Butylbenzene



5 = o-Terphenyl



6 = Amylbenzene

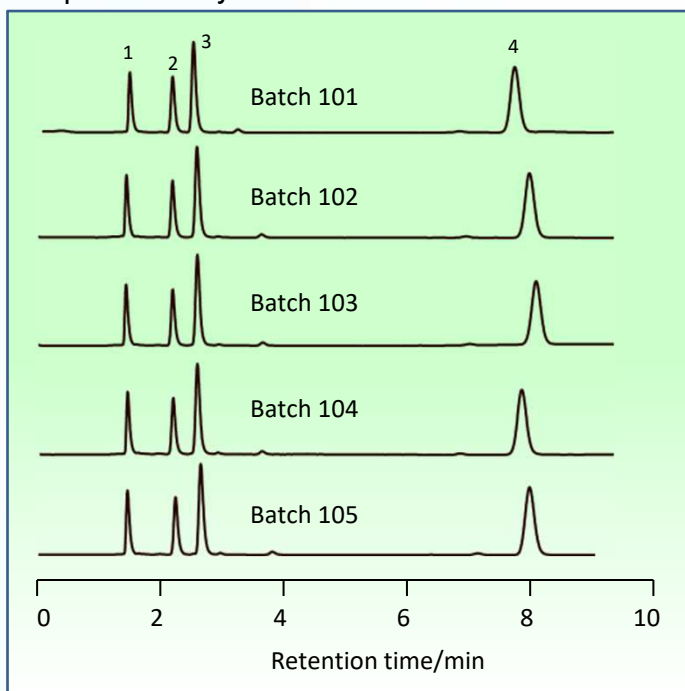


7 = Triphenylene



	Hydrogen bonding (Caffeine/Phenol)	Hydrophobicity (Amylbenzene/Butylbenzene)	Steric selectivity (Triphenylene/o-Terphenyl)
SunArmor C18	0.40	1.54	1.35
SunArmor RP-AQUA	0.48	1.59	1.43

Reproducibility in retention of SunArmor C18



Retention time of amitriptyline

Batch	Retention time
101	7.69 min
102	7.97 min
103	8.12 min
104	7.85 min
105	7.93 min
Average (Av)	7.91 min
Standard deviation (σ)	0.14 min

Condition (amitriptyline)

Column dimension: 150 x 4.6 mm

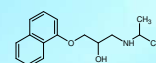
Mobile phase: Acetonitrile/20mM phosphate buffer pH7.0=(60:40)

Flow rate: 1.0 mL/min

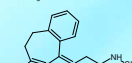
Temp.: 40°C

Sample: 1=Uracil

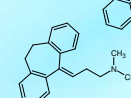
2=Propranolol



3= Nortriptyline



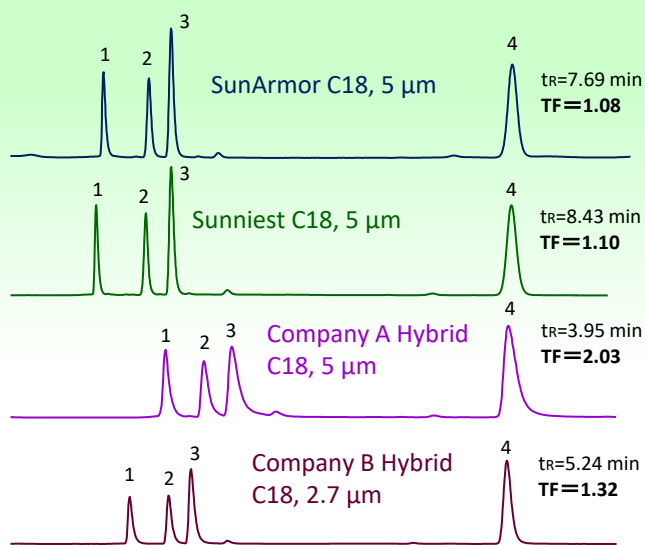
4=Amitriptyline





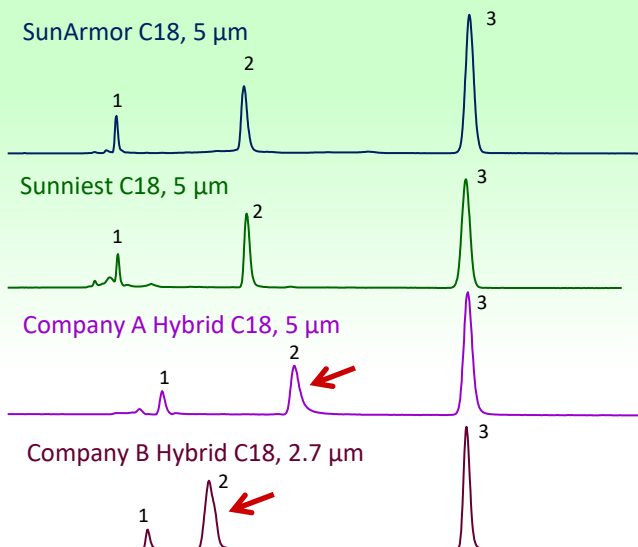
Peak Shape of basic compound

Comparison of amitriptyline (4) using phosphate buffer

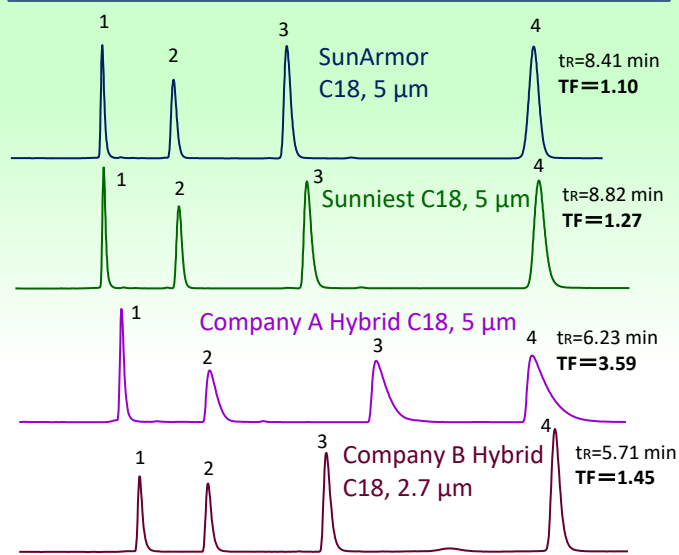


<tr: retention time, TF: tailing factor>

Comparison of pyridine (2) using methanol/water mobile phase



Comparison of amitriptyline (4) using ammonium acetate buffer



<tr: retention time, TF: tailing factor>

Condition (amitriptyline)

Column dimension: 150 x 4.6 mm

Mobile phase:

A) Acetonitrile/**20mM phosphate buffer pH7.0**=(60:40)

B) Acetonitrile/**10mM ammonium acetate pH6.8**=(40:60)

Flow rate: 1.0 mL/min

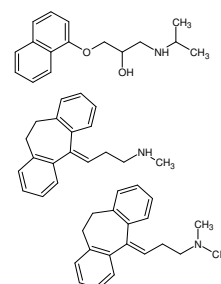
Temp.: 40°C

Sample: 1=Uracil

2=Propranolol

3= Nortriptyline

4=Amitriptyline



Condition (pyridine)

Column dimension: 150 x 4.6 mm

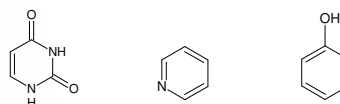
Mobile phase: CH₃OH/H₂O=30/70

Flow rate: 1.0 mL/min

Temperature: 40 °C

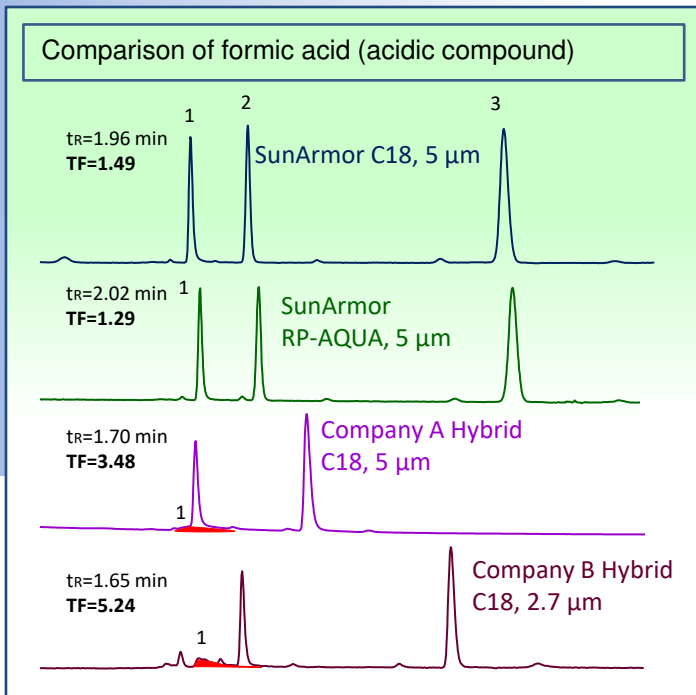
Detection: UV@250nm

Sample: 1 = Uracil, 2 = Pyridine, 3 = Phenol



The result of the comparison data in this catalog is not the representative example of all application.

Peak shape of acidic and metal chelating compounds

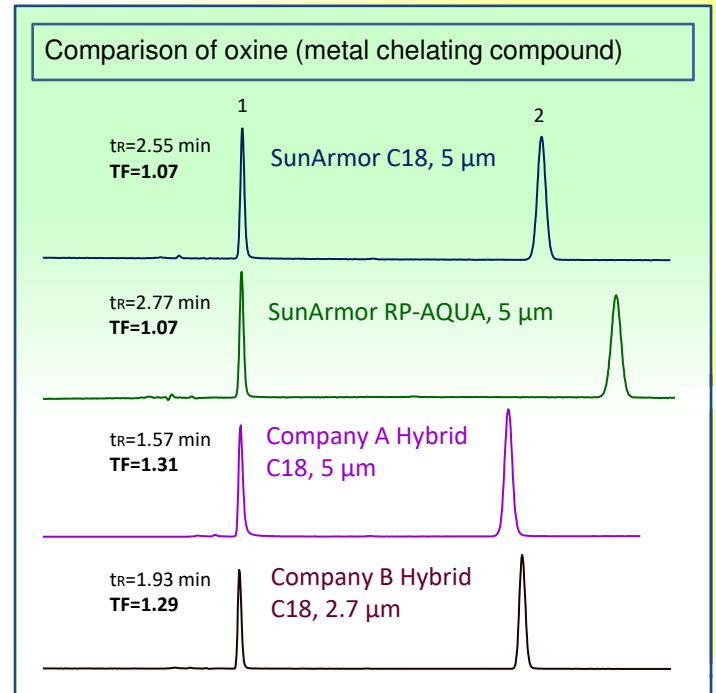


<tr: retention time, TF: tailing factor>

Condition (formic acid)

Column dimension: 150 x 4.6 mm
 Mobile phase: CH₃CN/0.1% H₃PO₄=2/98
 Flow rate: 1.0 mL/min
 Temperature: 40 °C
 Detection: UV@210nm
 Sample: 1 = Formic acid
 2 = Acetic acid
 3 = Propionic Acid

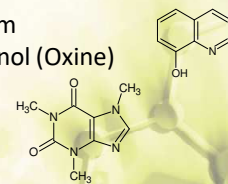
*Hybrid C18s showed a very poor peak shape for formic acid. It is doubted that some amines as a by-product remained on the surface of packing materials.



<tr: retention time, TF: tailing factor>

Condition (oxine)

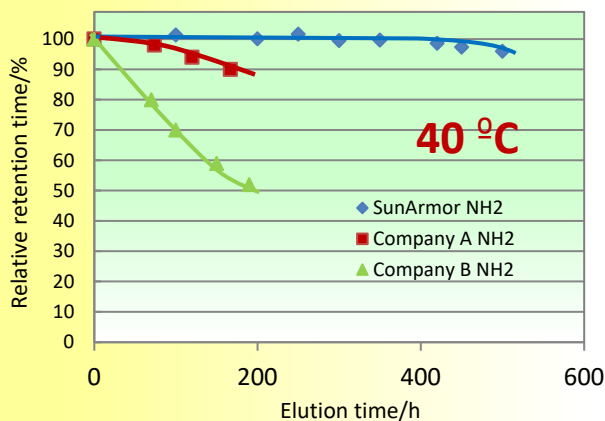
Column dimension: 150 x 4.6 mm
 Mobile phase: CH₃CN/20mM H₃PO₄=10/90
 Flow rate: 1.0 mL/min
 Temperature: 40 °C
 Detection: UV@250nm
 Sample: 1 = 8-Quinololinol (Oxine)
 2 = Caffeine





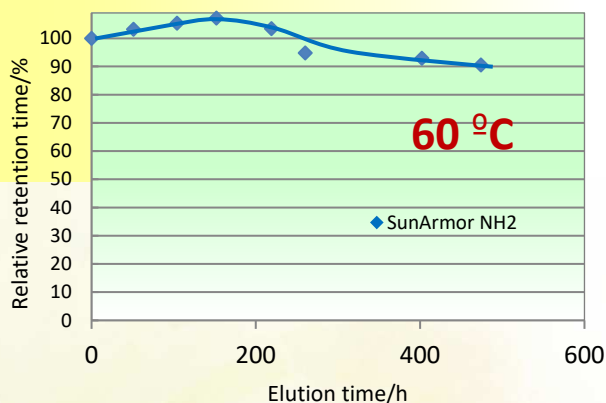
Stability of SunArmor NH2

SunArmor NH2



Duration test condition

Column: SunArmor NH2 5 μm, 250 x 4.6 mm
 Other NH2 5 μm, 250 x 4.6 mm
 Mobile phase: Acetonitrile/water = 75/25
 Flow rate: 1.0 mL/min,
 Temperature: 40 °C
 Detector: RI
 Sample: Sucrose



Duration test condition

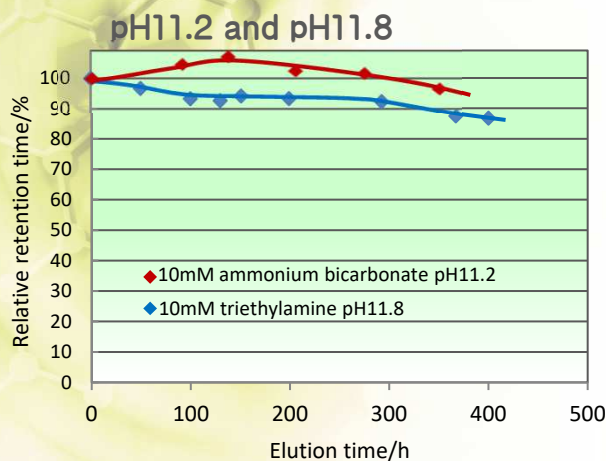
Mobile phase: Acetonitrile/water = 75/25
 Flow rate: 1.0 mL/min, Temperature: 60 °C

Measurement condition

Mobile phase: Acetonitrile/water = 75/25
 Flow rate: 1.0 mL/min, Temperature: 40 °C
 Detection: RI, Sample: Sucrose

Stability under basic pH

SunArmor NH2



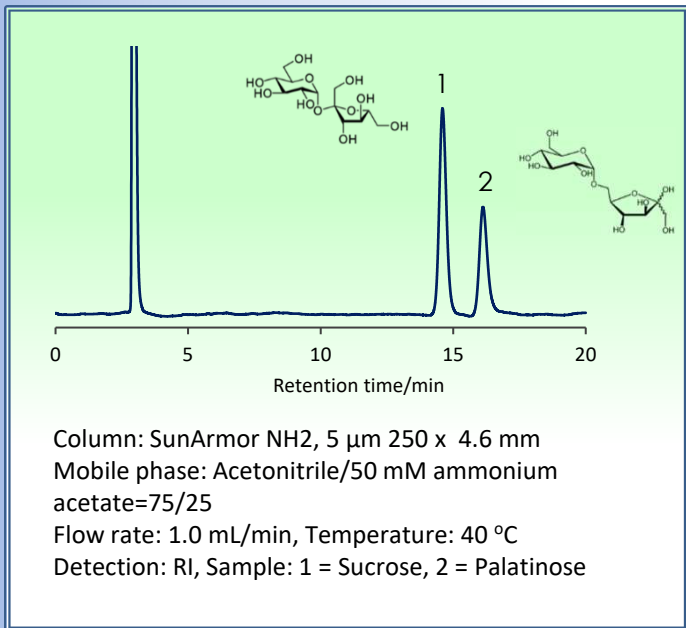
Duration test condition

Mobile phase:
 Acetonitrile/10mM triethylamine pH11.8 = 75/25
 Acetonitrile/10mM ammonium bicarbonate pH11.2 = 75/25
 Flow rate: 1.0 mL/min, Temperature: 40 °C

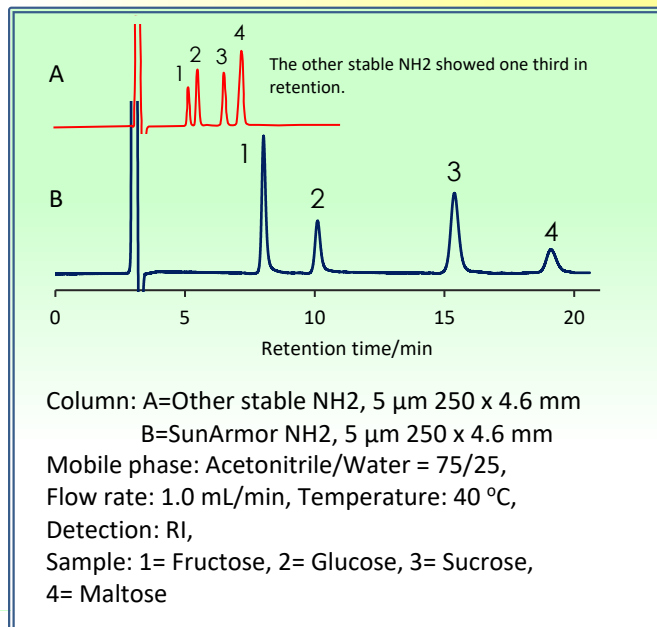
Measurement condition

Mobile phase: Acetonitrile/water = 75/25
 Flow rate: 1.0 mL/min, Temperature: 40 °C
 Detection: RI, Sample: Sucrose

Separation of sucrose and palatinose

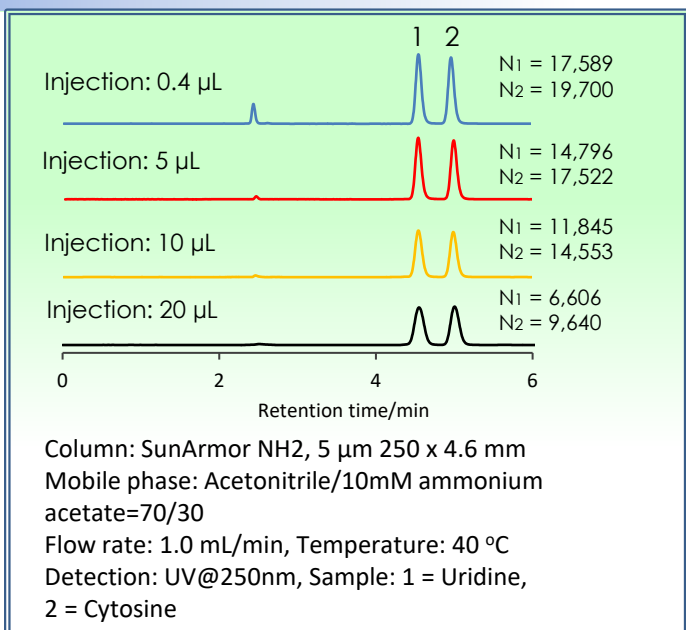


Comparison of retention time

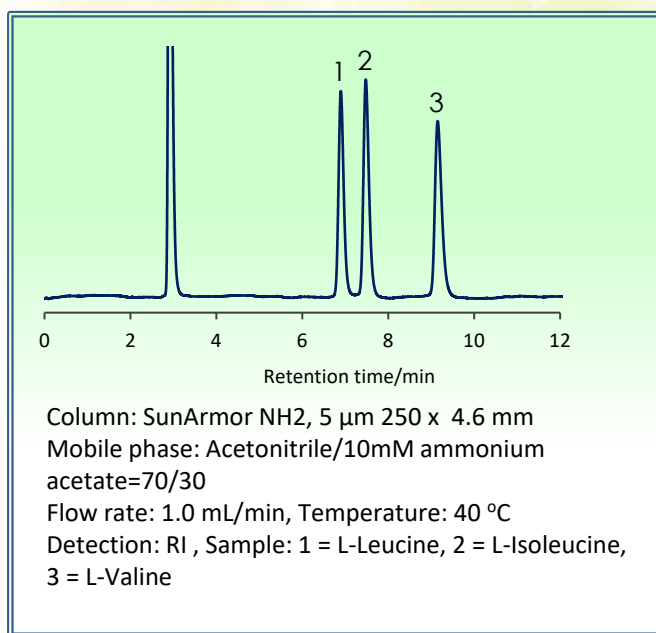


★Hydrophobic end-capping makes retention short while hydrophilic end-capping keeps retention. Furthermore, hydrophilic end-capping makes stability high. SunArmor NH2 shows large retention and high stability.

Comparison of plate using 100% aqueous samples

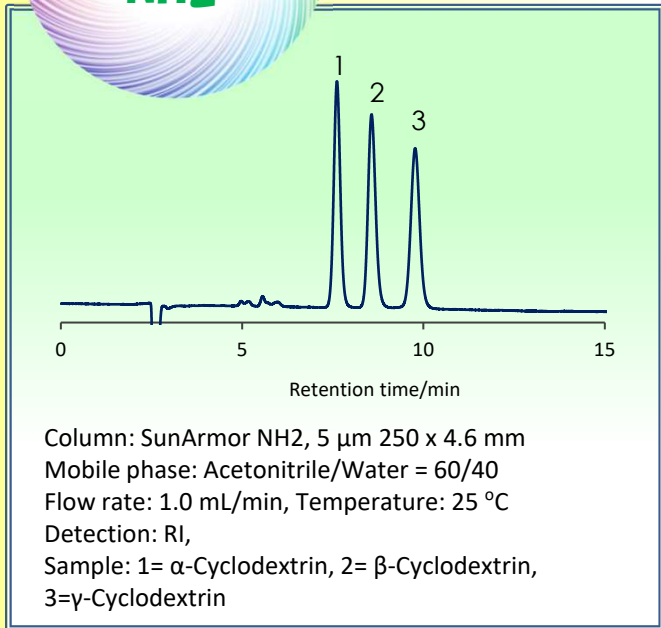


Separation of branched-chain amino acid

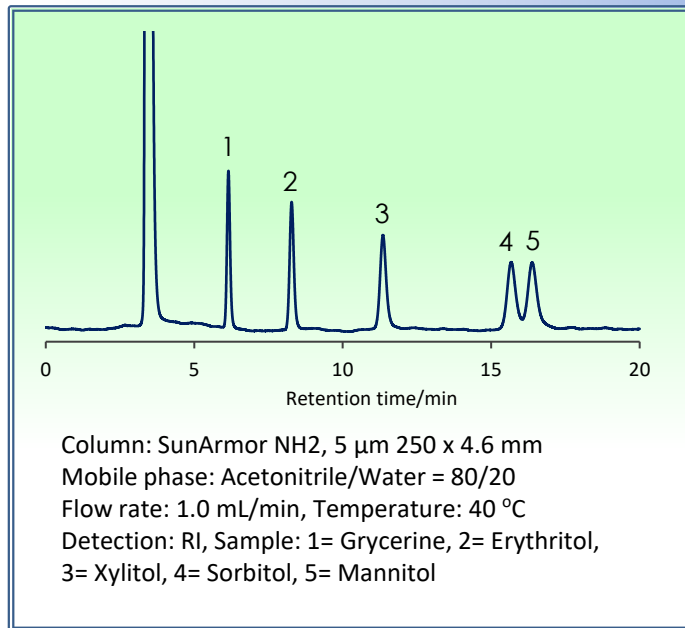




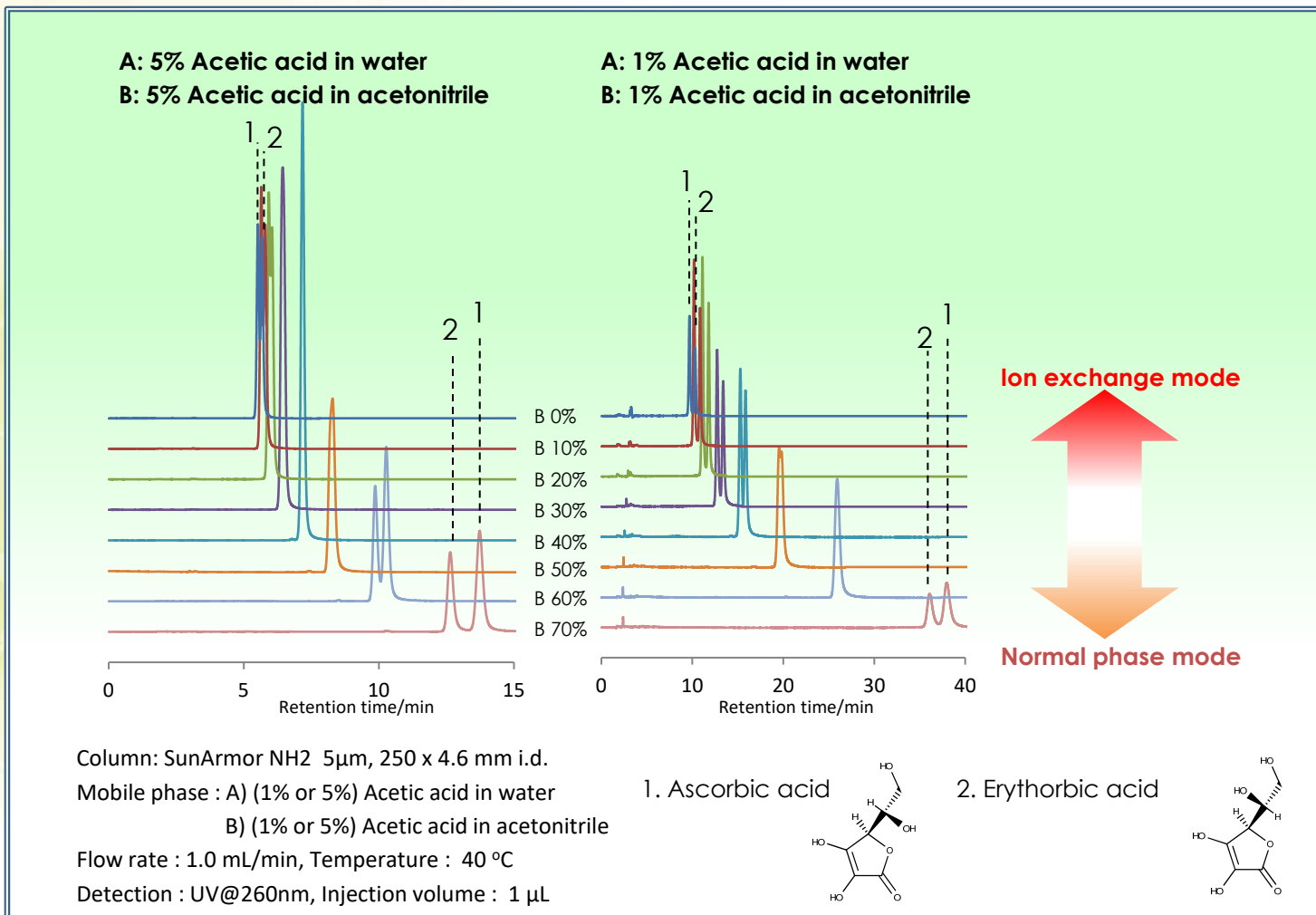
Separation of cyclodextrin



Separation of sugar alcohol

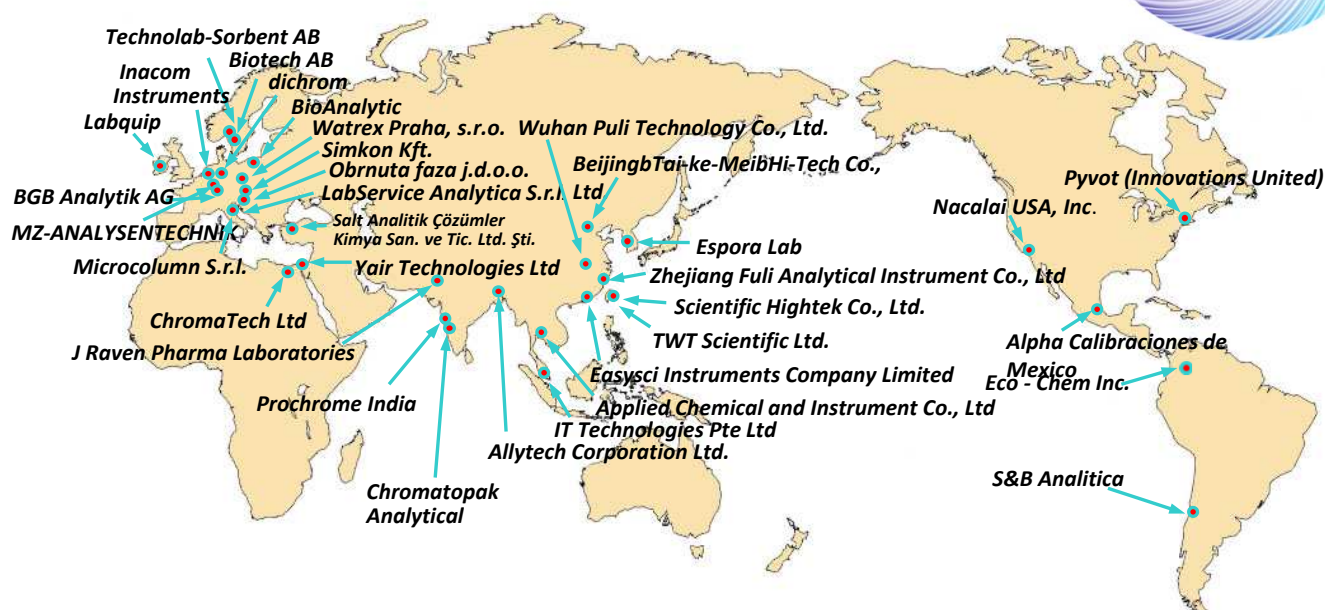


Separation under ion exchange mode and normal phase mode





*Distributor network



Ordering information of SunArmor

Packings	Inner diameter (mm)	2.0	3.0	4.6	10	20	USP category
	Length (mm)	Catalog No.	Catalog No.	Catalog No.	Catalog No.	Catalog No.	
SunArmor C18, 3 µm	30	HB2231	-----	-----	-----	-----	L1
	50	HR2241	HB2341	HB2441	-----	-----	
	75	HB2251	-----	-----	-----	-----	
	100	HB2261	HB2361	HB2461	-----	-----	
	150	HB2271	HB2371	HB2471	-----	-----	
SunArmor C18, 5 µm	250	-----	HB2381	HB2481	-----	-----	L1
	50	HB3241	HB3341	HB3441	-----	-----	
	100	HB3261	HB3361	HB3461	-----	-----	
	150	HB3271	HB3371	HB3471	-----	-----	
SunArmor RP-AQUA, 3 µm	250	HB3281	HB3381	HB3481	HB3781	HB3881	Equivalent to L62
	30	HR2231	-----	-----	-----	-----	
	50	HR2241	HR2341	HR2441	-----	-----	
	75	HR2251	-----	-----	-----	-----	
	100	HR2261	HR2361	HR2461	-----	-----	
SunArmor RP-AQUA, 5 µm	150	HR2271	HR2371	HR2471	-----	-----	Equivalent to L62
	250	-----	HR2381	HR2481	-----	-----	
	50	HR3241	HR3341	HR3441	-----	-----	
	100	HR3261	HR3361	HR3461	-----	-----	
SunArmor NH2, 3 µm	150	HR3271	HR3371	HR3471	-----	-----	L8
	250	HR3281	HR3381	HR3481	HR3781	HR3881	
	150	HN2271	-----	HN2471	-----	-----	
SunArmor NH2, 5 µm	250	HN2281	-----	HN2481	-----	-----	L8
	150	HN3271	-----	HN3471	-----	-----	
	250	HN3281	-----	HN3481	HN3781	HN3881	

Guard Cartridge column of SunArmor

product	Particle size	Catalog No.
SunArmor C18, 5 µm Guard cartridge column (1-pak + Holder) 4 x 10mm	5 µm	HB3A1H
SunArmor RP-AQUA, 5 µm Guard cartridge column (1-pak + Holder) 4 x 10mm	5 µm	HR2A1H
SunArmor C18, 5 µm Guard cartridge (4-pak) 4 x 10mm	5 µm	HB3A1C
SunArmor RP-AQUA, 5 µm Guard cartridge (4-pak) 4 x 10mm	5 µm	HR3A1C
SunArmor Guard cartridge holder	---	HHO1C



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