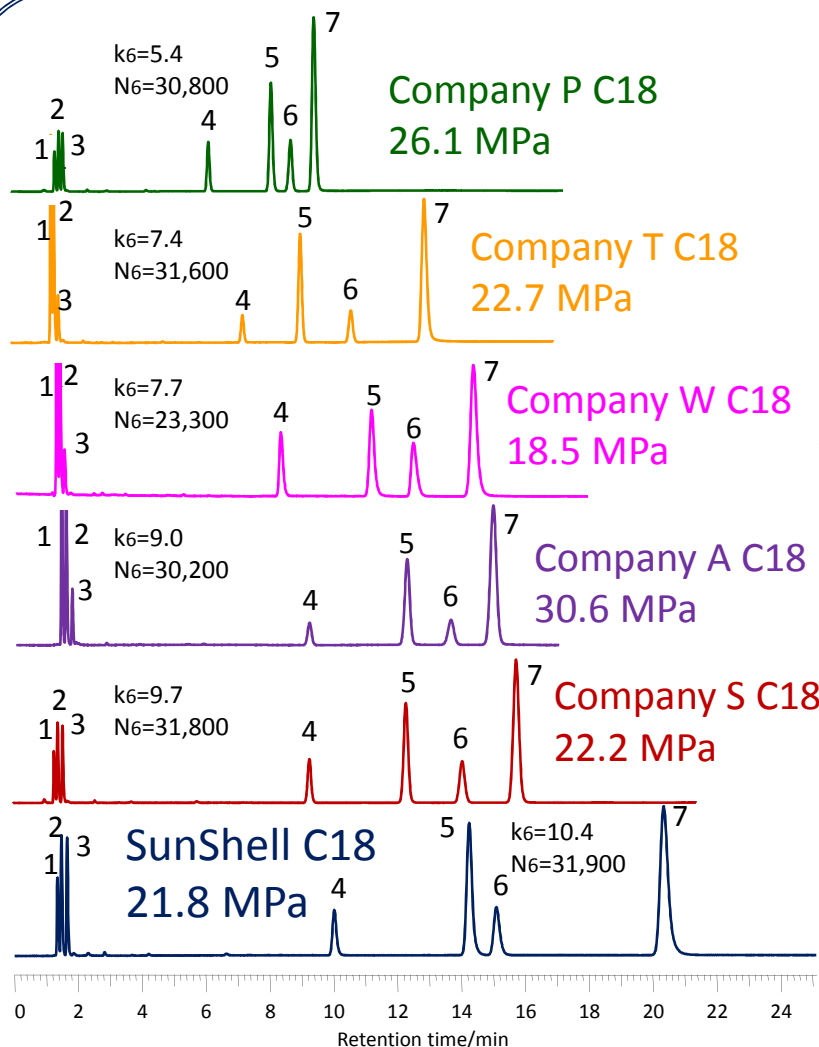


Comparison data of 6 kinds of core shell C18 columns

Column name

1. Company P C18, 2.6 μm : Kinetex C18
2. Company T C18, 2.6 μm : Accucore C18
3. Company W C18, 2.7 μm : Cortecs C18
4. Company A C18, 2.7 μm : PoroShell C18 EC
5. Company S C18, 2.7 μm : Ascentis Express C18
6. SunShell C18, 2.6 μm

Comparison of standard samples



Column:

Company P C18, 2.6 μm 150 x 4.6 mm (26.1 Mpa, 30,800 plate)
 Company T C18, 2.6 μm 150 x 4.6 mm (22.7 Mpa, 31,600 plate)
 Company W C18, 2.7 μm 150 x 4.6 mm (18.5 Mpa, 23,300 plate)
 Company A C18, 2.7 μm 150 x 4.6 mm (30.6 Mpa, 30,200 plate)
 Company S C18, 2.7 μm 150 x 4.6 mm (22.2 Mpa, 31,800 plate)
 SunShell C18, 2.6 μm 150 x 4.6 mm (21.8 Mpa, 31,900 plate)

Mobile phase: $\text{CH}_3\text{OH}/\text{H}_2\text{O}=75/25$

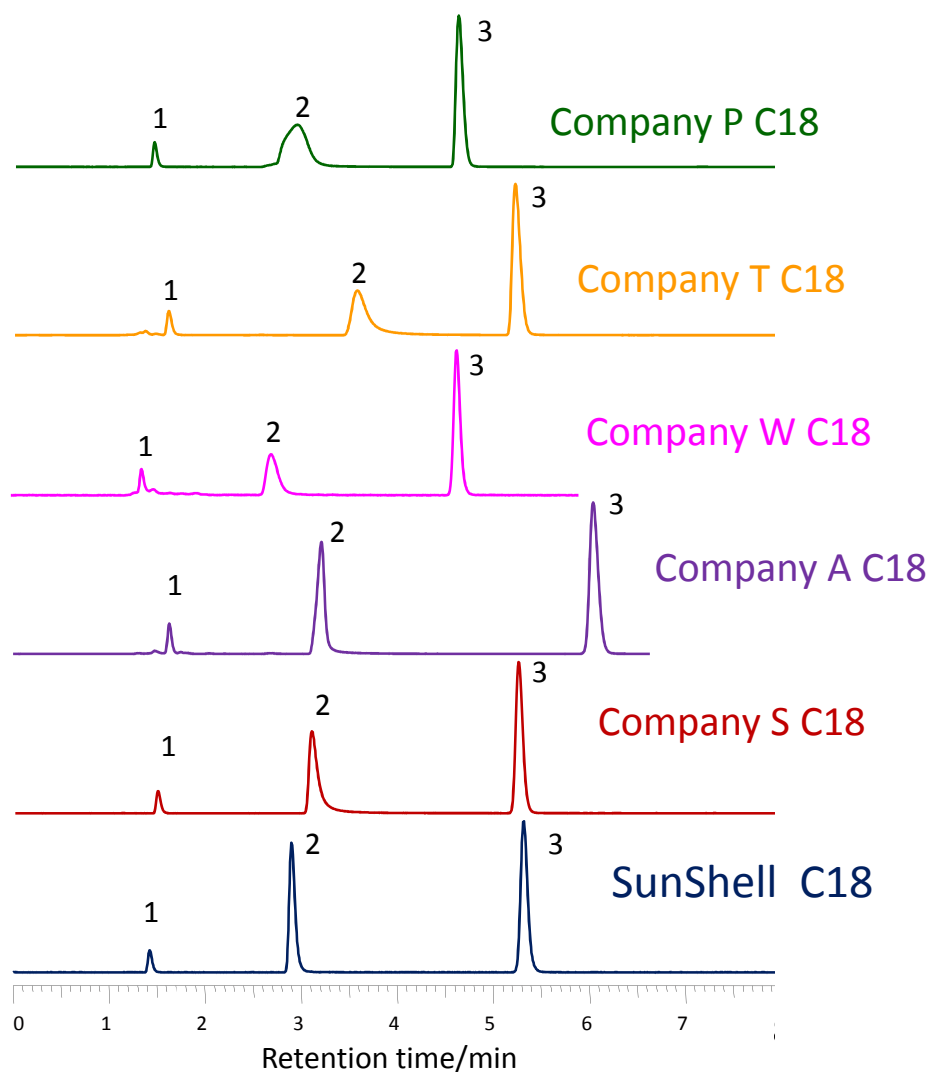
Flow rate: 1.0 mL/min

Temperature: 40 $^\circ\text{C}$

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)
Company P C18	0.48	1.54	1.20
Company T C18	0.35	1.56	1.50
Company W C18	0.38	1.59	1.32
Company A C18	0.42	1.57	1.25
Company S C18	0.44	1.60	1.31
SunShell C18	0.39	1.60	1.46

Comparison of pyridine



Column:

Company P C18, 2.6 μm 150 x 4.6 mm
 Company T C18, 2.6 μm 150 x 4.6 mm
 Company W C18, 2.7 μm 150 x 4.6 mm
 Company A C18, 2.7 μm 150 x 4.6 mm
 Company S C18, 2.7 μm 150 x 4.6 mm
 SunShell C18, 2.6 μm 150 x 4.6 mm

Mobile phase: $\text{CH}_3\text{OH}/\text{H}_2\text{O}=30/70$

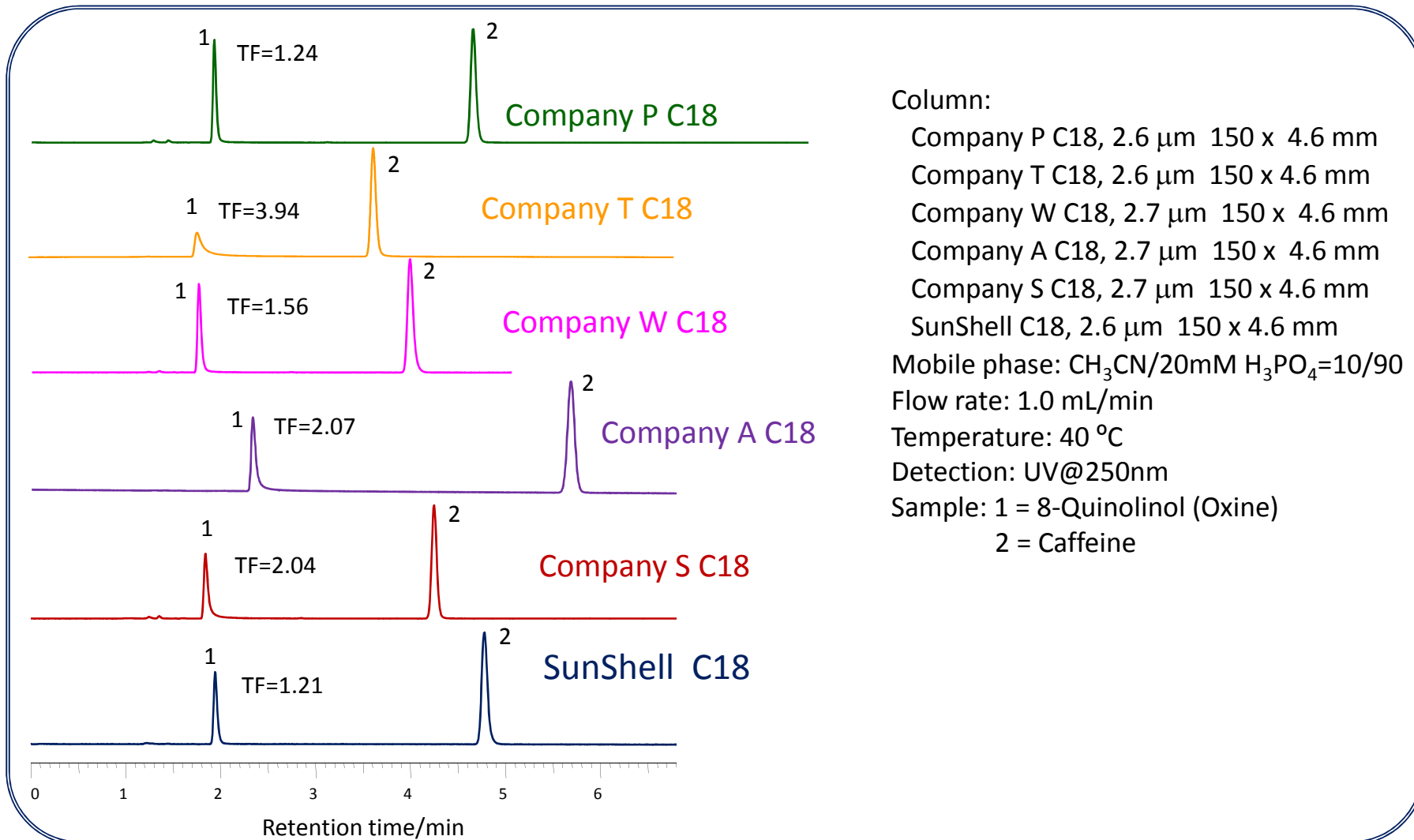
Flow rate: 1.0 mL/min

Temperature: 40 $^\circ\text{C}$

Detection: UV@250nm

Sample: 1 = Uracil
 2 = Pyridine
 3 = Phenol

Comparison of oxine, metal chelating compound



Column:

Company P C18, 2.6 μm 150 x 4.6 mm

Company T C18, 2.6 μm 150 x 4.6 mm

Company W C18, 2.7 μm 150 x 4.6 mm

Company A C18, 2.7 μm 150 x 4.6 mm

Company S C18, 2.7 μm 150 x 4.6 mm

SunShell C18, 2.6 μm 150 x 4.6 mm

Mobile phase: $\text{CH}_3\text{CN}/20\text{mM H}_3\text{PO}_4=10/90$

Flow rate: 1.0 mL/min

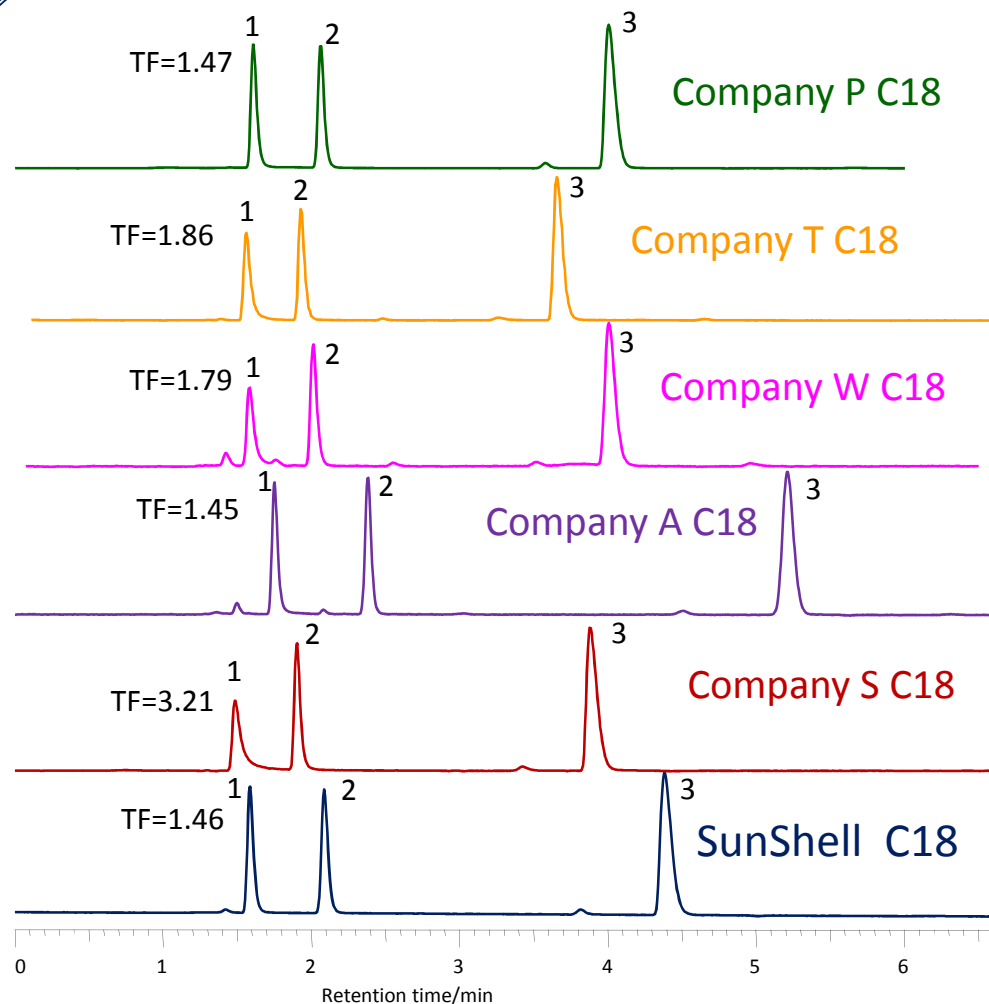
Temperature: 40 $^\circ\text{C}$

Detection: UV@250nm

Sample: 1 = 8-Quinolinol (Oxine)

2 = Caffeine

Comparison of formic acid



Column:

Company P C18, 2.6 μm 150 x 4.6 mm
 Company T C18, 2.6 μm 150 x 4.6 mm
 Company W C18, 2.7 μm 150 x 4.6 mm
 Company A C18, 2.7 μm 150 x 4.6 mm
 Company S C18, 2.7 μm 150 x 4.6 mm
 SunShell C18, 2.6 μm 150 x 4.6 mm

Mobile phase: $\text{CH}_3\text{CN}/0.1\% \text{H}_3\text{PO}_4=2/98$

Flow rate: 1.0 mL/min

Temperature: 40 $^\circ\text{C}$

Detection: UV@210nm

Sample: 1 = Formic acid

2 = Acetic acid

3 = Propionic Acid

Summary of standard samples

	Pressure ^a	Retention ^b	Plate ^c	Pyridine	Oxine	Formic acid	Point
SunShell C18	○21.8	10.4	◎31,900	◎	◎	◎	14
Ascentis Express C18	○22.2	9.7	◎31,800	△	△	×	7
PoroShell C18 EC	×30.6	9.0	◎30,002	◎	△	◎	10
Cortecs C18	◎18.5	7.7	×23,300	×	○	△	6
Accucore C18	○22.7	7.4	◎31,600	×	×	△	6
Kinetex C18	△26.1	5.4	◎30,800	×	◎	◎	10

- a. Mobile phase; methanol:water=75:25, 40 °C, 1mL/min, 150 x 4.6mm
- b. Retention factor of amylbenzene
- c. Theoretical plate of amylbenzene

◎: 3 point, ○: 2 point, △: 1 point, ×: 0 point

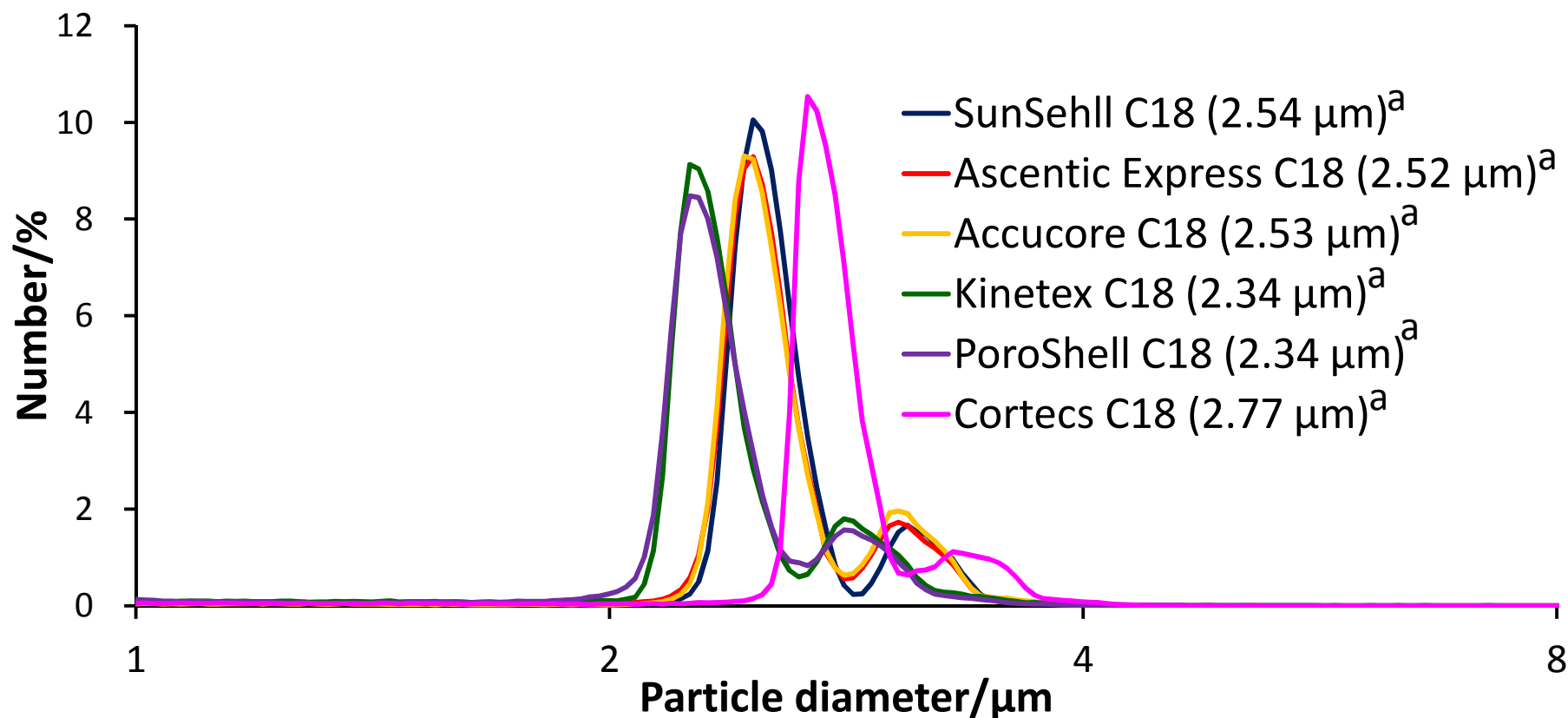
Characteristics

	Carbon loading (%)	Specific surface area ^a (m ² /g)	Pore volume ^a (mL)	Pore diameter ^a (nm)
SunShell C18	7.3 (7) ^b	125 (150) ^b	0.261	8.34 (9) ^b
Ascentis Express C18	8.0	133 (150) ^b	0.278	8.20 (9) ^b
PoroShell C18 EC	8.5 (8) ^b	135 (130) ^b	0.414	12.3 (12) ^b
Accucore C18	8.8 (9) ^b	130 (130) ^b	0.273	8.39 (8) ^b
Cortecs C18	7.3 (6.6) ^b	113	0.264	9.32
Kinetex C18	4.9 (12 effective) ^b	102 (200 effective) ^b	0.237	9.25 (10) ^b

- a. Measured after C18 materials were sintered at 600 degree Celsius for 8 hours. The measured value of each sintered core shell silica is considered to be smaller than that of the original core shell silica.
- b. Value written in each brochure or literature

All data were measured in ChromaNik laboratory.

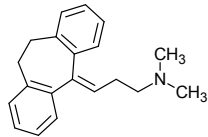
Particle distribution



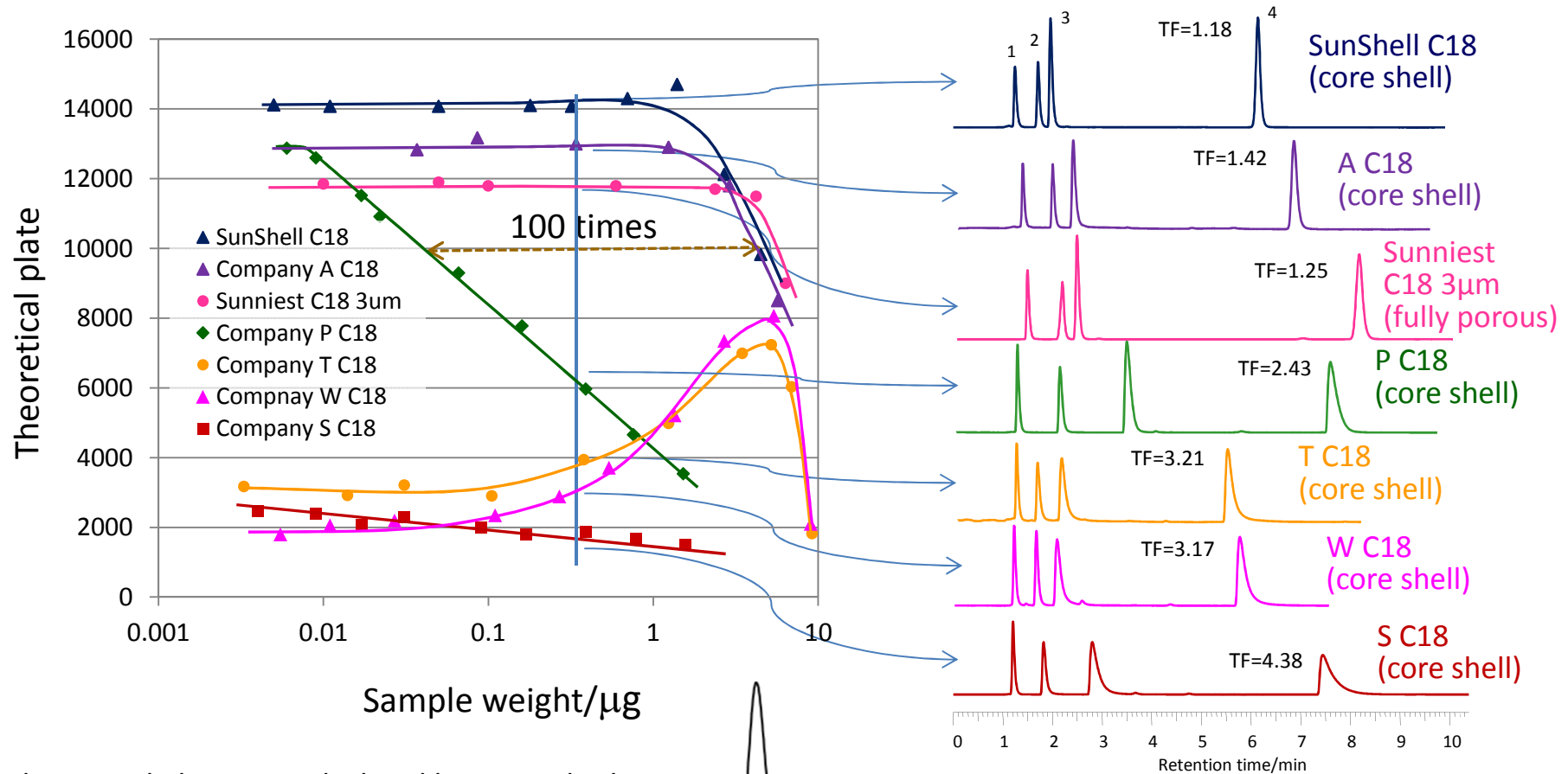
*Measured using Beckman Coulter Multisizer 3 after C18 materials were sintered at 600 degree Celsius for 8 hours. The value measure by Coulter Counter method is smaller than the real value because a porous material includes an electrolyte solution and the resistance value decreases.

a. Median particle size

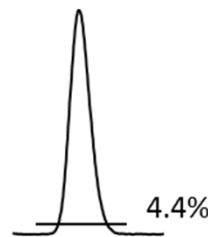
Loading capacity of amitriptyline I



Mobile phase: Acetonitrile/**20mM phosphate buffer pH7.0**=(60:40)
Column dimension: 150 x 4.6 mm, Flow rate: 1.0 mL/min, Temp.: 40°C



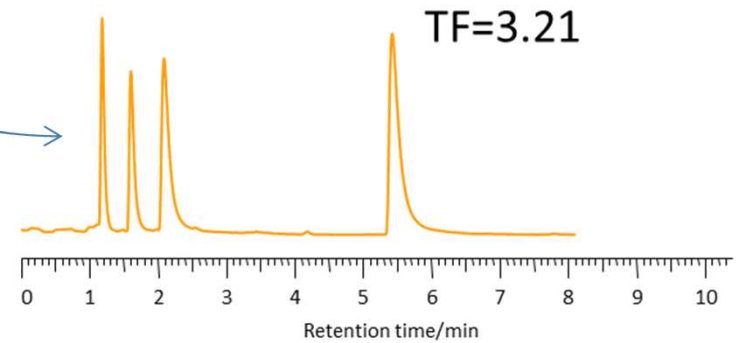
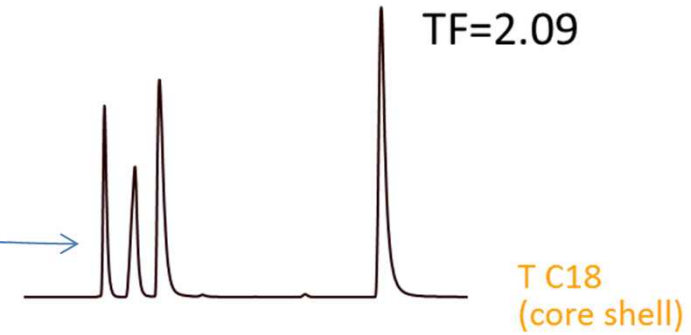
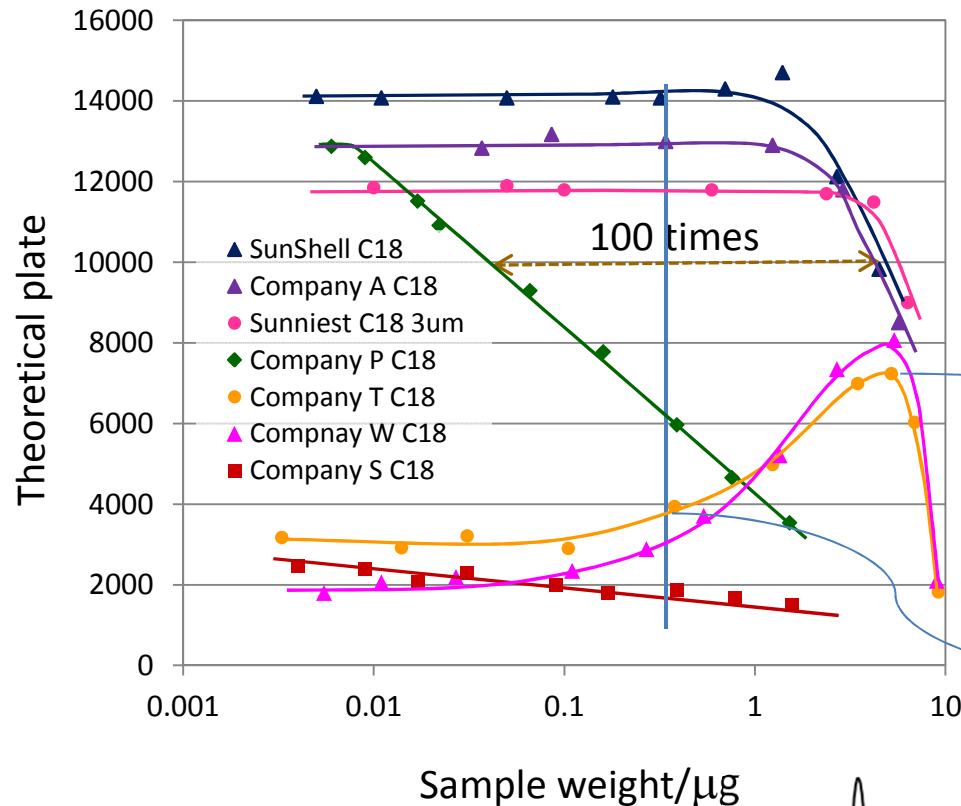
Theoretical plate was calculated by 5σ method using peak width at 4.4% of peak height.



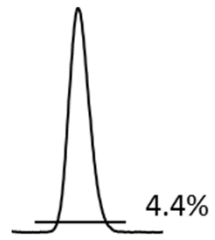
Sample: 1=Uracil, 2=Propranolol, 3= Nortriptyline, 4=Amitriptyline

Loading capacity of amitriptyline I

Mobile phase: Acetonitrile/**20mM phosphate buffer pH7.0**=(60:40)
 Column dimension: 150 x 4.6 mm, Flow rate: 1.0 mL/min, Temp.: 40°C



Theoretical plate was calculated by 5σ method using peak width at 4.4% of peak height.

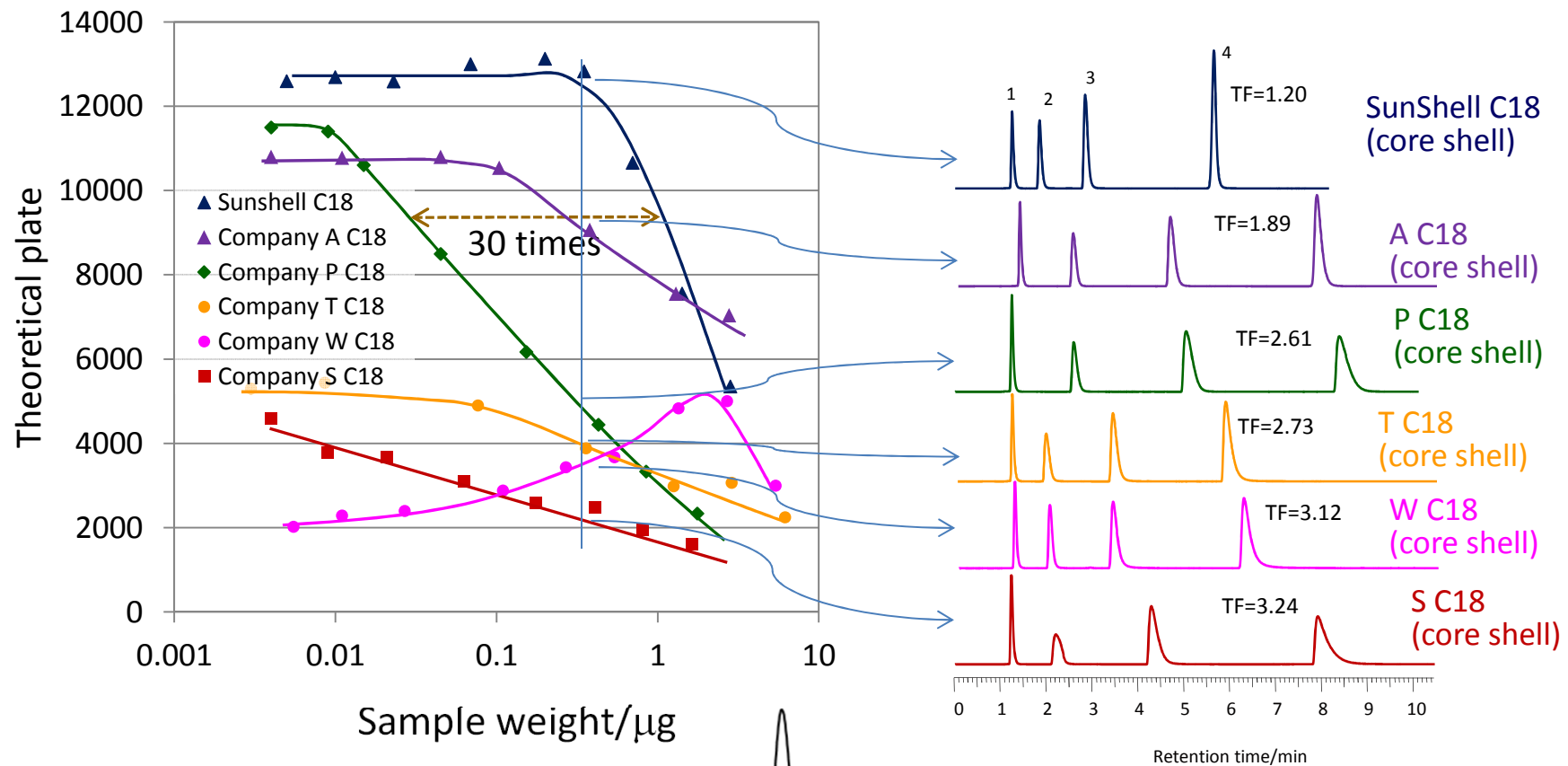


Sample: 1=Uracil, 2=Propranolol, 3= Nortriptyline, 4=Amitriptyline

Loading capacity of amitriptyline II

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

Column dimension: 150 x 4.6 mm, Flow rate: 1.0 mL/min, Temp.: 40°C



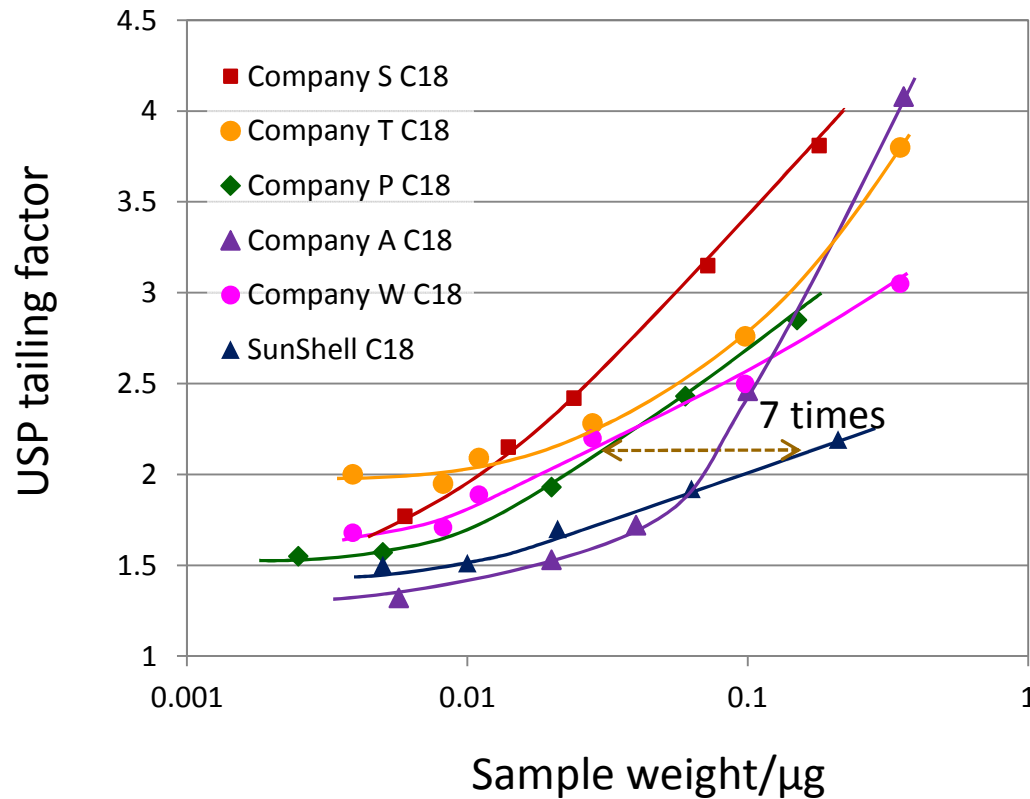
Theoretical plate was calculated by 5σ method using peak width at 4.4% of peak height.

Sample: 1=Uracil, 2=Propranolol, 3= Nortriptyline, 4=Amitriptyline

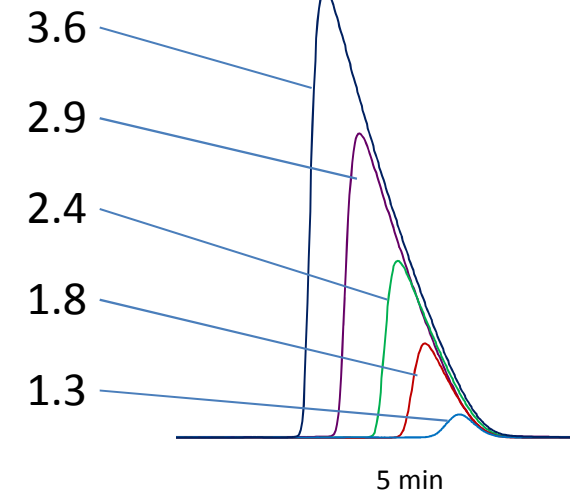
Loading capacity of amitriptyline III

Mobile phase: Acetonitrile/**0.1% formic acid**=(30:70)

Column dimension: 150 x 4.6 mm, Flow rate: 1.0 mL/min, Temp.: 40°C

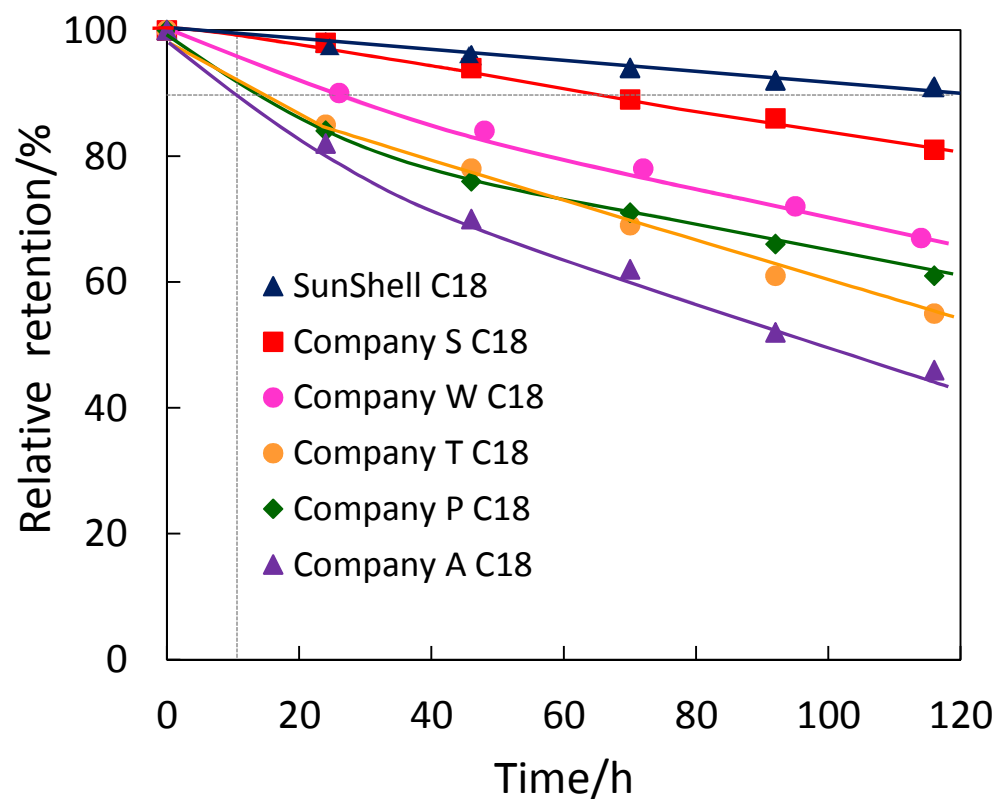


USP tailing factor



In the case of using acetonitrile /0.1% formic acid as a mobile phase, amitriptyline peak shows more tailing because a loading capacity decreases in an acidic, low-ionic-strength mobile phase.

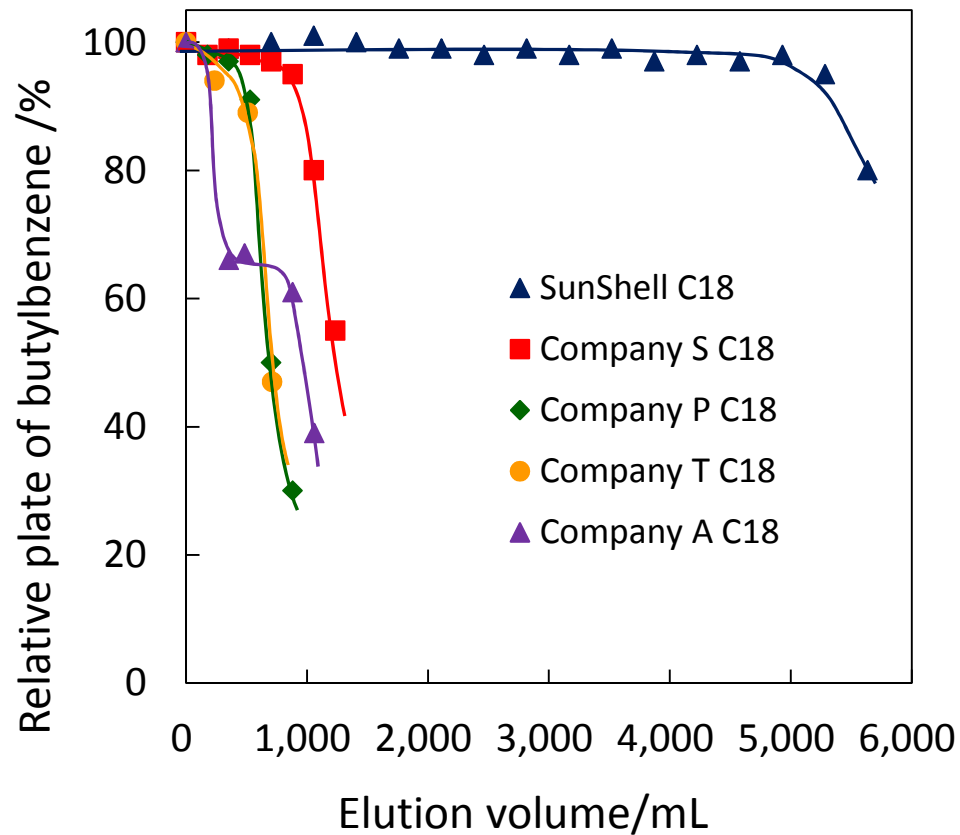
Stability under acidic pH condition



Durable test condition
 Column size: 50 x 2.1 mm
 Mobile phase: CH₃CN/1.0% TFA,
 pH1=10/90
 Flow rate: 0.4 mL/min
 Temperature: 80 °C

Measurement condition
 Column size: 50 x 2.1 mm
 Mobile phase: CH₃CN/H₂O=60/40
 Flow rate: 0.4 mL/min
 Temperature: 40 °C
 Sample: 1 = Uracil
 2 = Butylbenzene

Stability under basic pH condition



Durable test condition

Column size: 50 x 2.1 mm

Mobile phase:

CH₃OH/20mM Sodium borate/10mM NaOH=30/21/49 (pH10)

Flow rate: 0.4 mL/min

Temperature: 50 °C

Measurement condition

Column size: 50 x 2.1 mm

Mobile phase: CH₃OH/H₂O=70/30

Flow rate: 0.4 mL/min

Temperature: 40 °C

Sample: 1 = Butylbenzene

Summary of Stability

	Acidic condition pH 1	Basic condition pH 10	pH range written in each brochure
SunShell C18	⊙	⊙	1.5 - 10
Ascentis Express C18	○	○	2 - 9
Cortecs C18	○	not tested	2 - 8
PoroShell C18 EC	△	△	2 - 9
Accucore C18	△	△	1 - 11
Kinetex C18	△	△	1.5 - 10


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