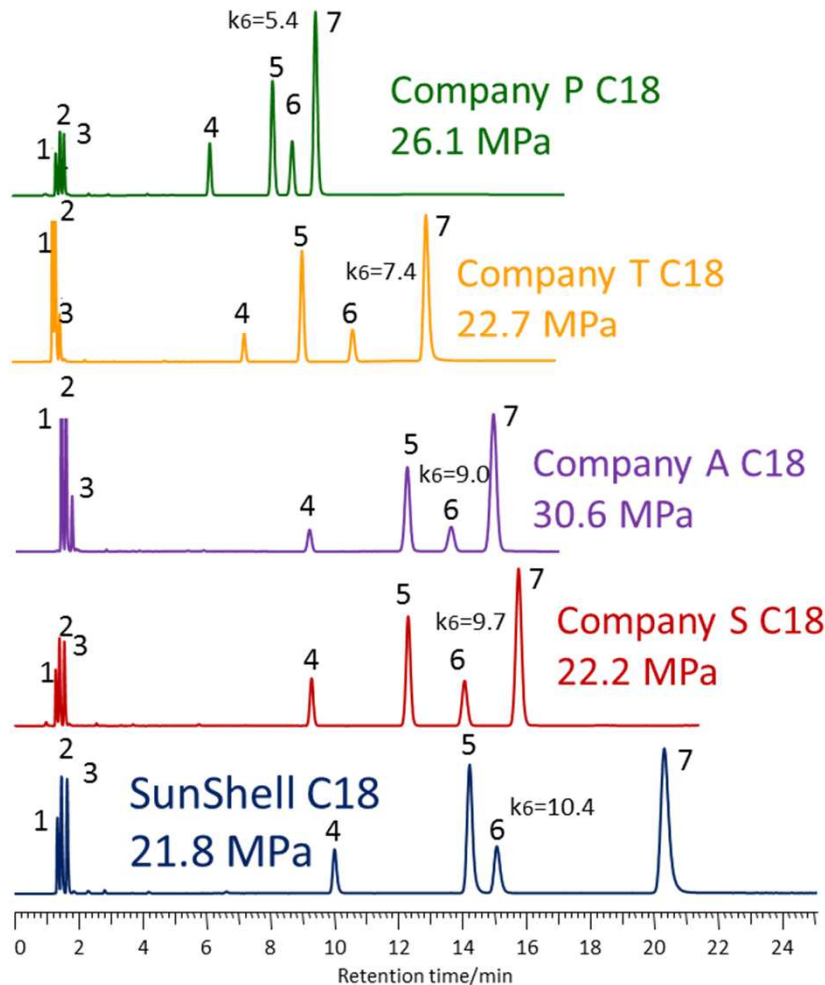


Comparison data of 5 kinds of core shell C18 column

Column name

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

Comparison of standard samples



Column:

- Company P C18, 2.6 μm 150 x 4.6 mm (26.1 MPa)
- Company T C18, 2.6 μm 150 x 4.6 mm (22.7 MPa)
- Company A C18, 2.7 μm 150 x 4.6 mm (30.6 MPa)
- Company S C18, 2.7 μm 150 x 4.6 mm (22.2 MPa)
- SunShell C18, 2.6 μm 150 x 4.6 mm (21.8 MPa)

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

Flow rate: 1.0 mL/min

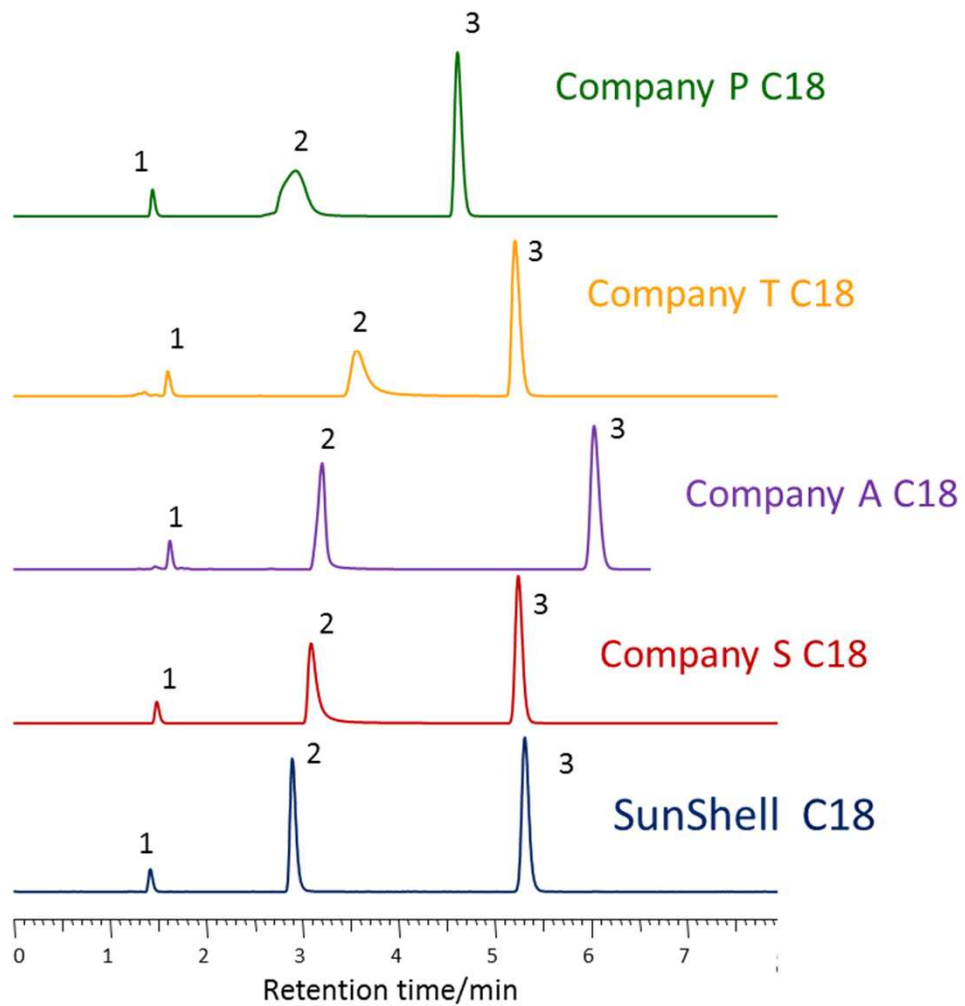
Temperature: 40 $^\circ\text{C}$

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 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 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 $^\circ\text{C}$

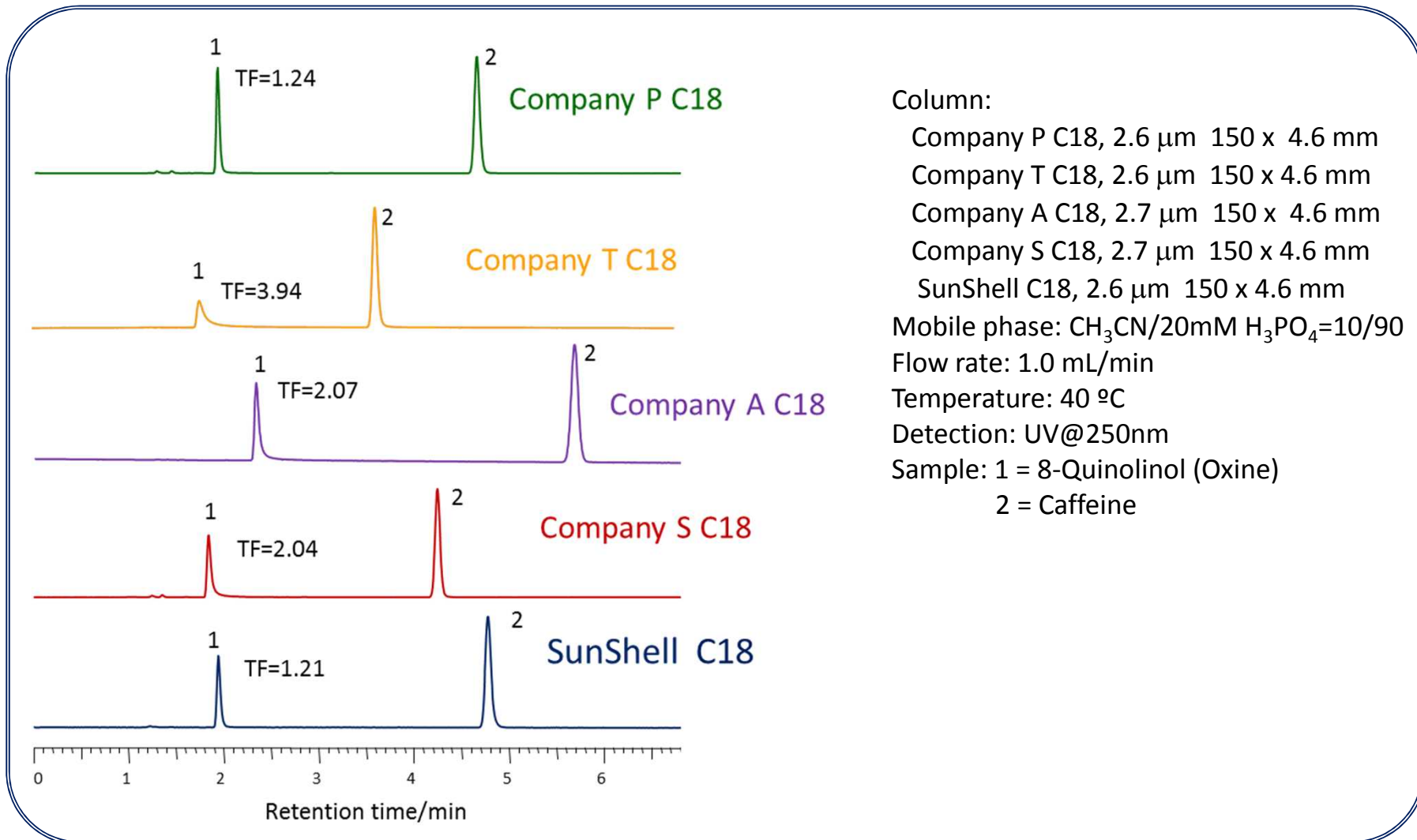
Detection: UV@250nm

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 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

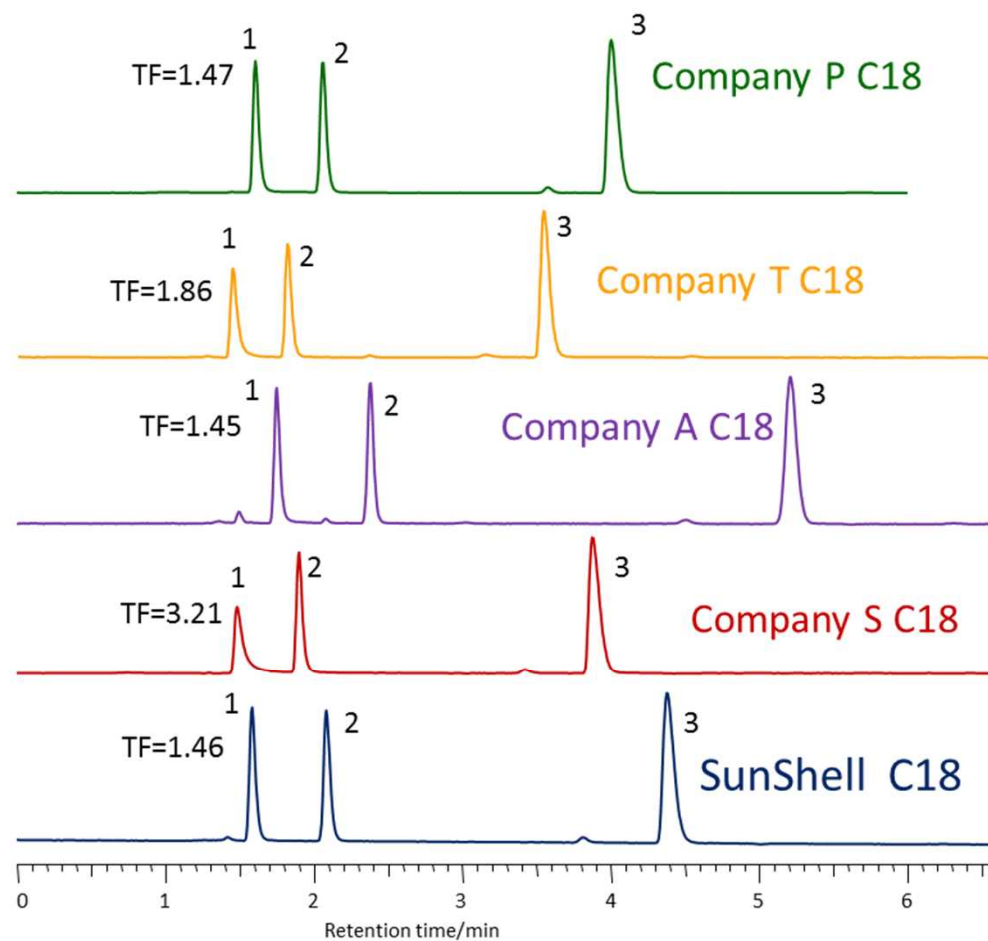
Temperature: 40 $^\circ\text{C}$

Detection: UV@250nm

Sample: 1 = 8-Quinololinol (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 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	Pyridine	Oxine	Formic acid	Point
SunShell C18	⊙21.8	10.4	⊙	⊙	⊙	12
Ascentis Express C18	⊙22.2	9.7	△	△	×	5
PoroShell C18 EC	×30.6	9.0	⊙	△	⊙	7
Accucore C18	⊙22.7	7.4	×	×	△	4
Kinetex C18	△26.1	5.4	×	⊙	⊙	7

a. Mobile phase, methanol:water=75:25, 40 °C, 1mL/min 150 x 4.6mm

b. Retention factor of amylobenzene

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

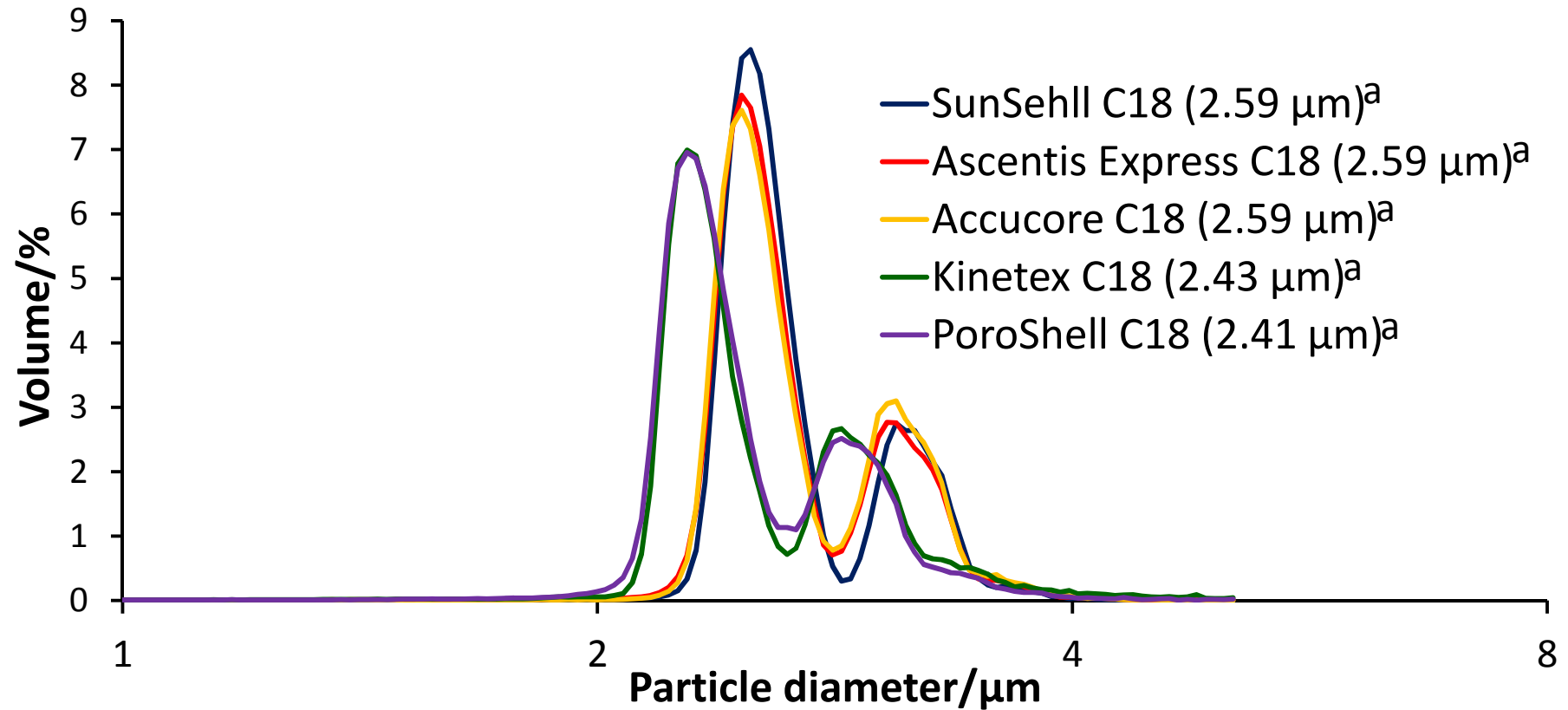
Characteristics

	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
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.

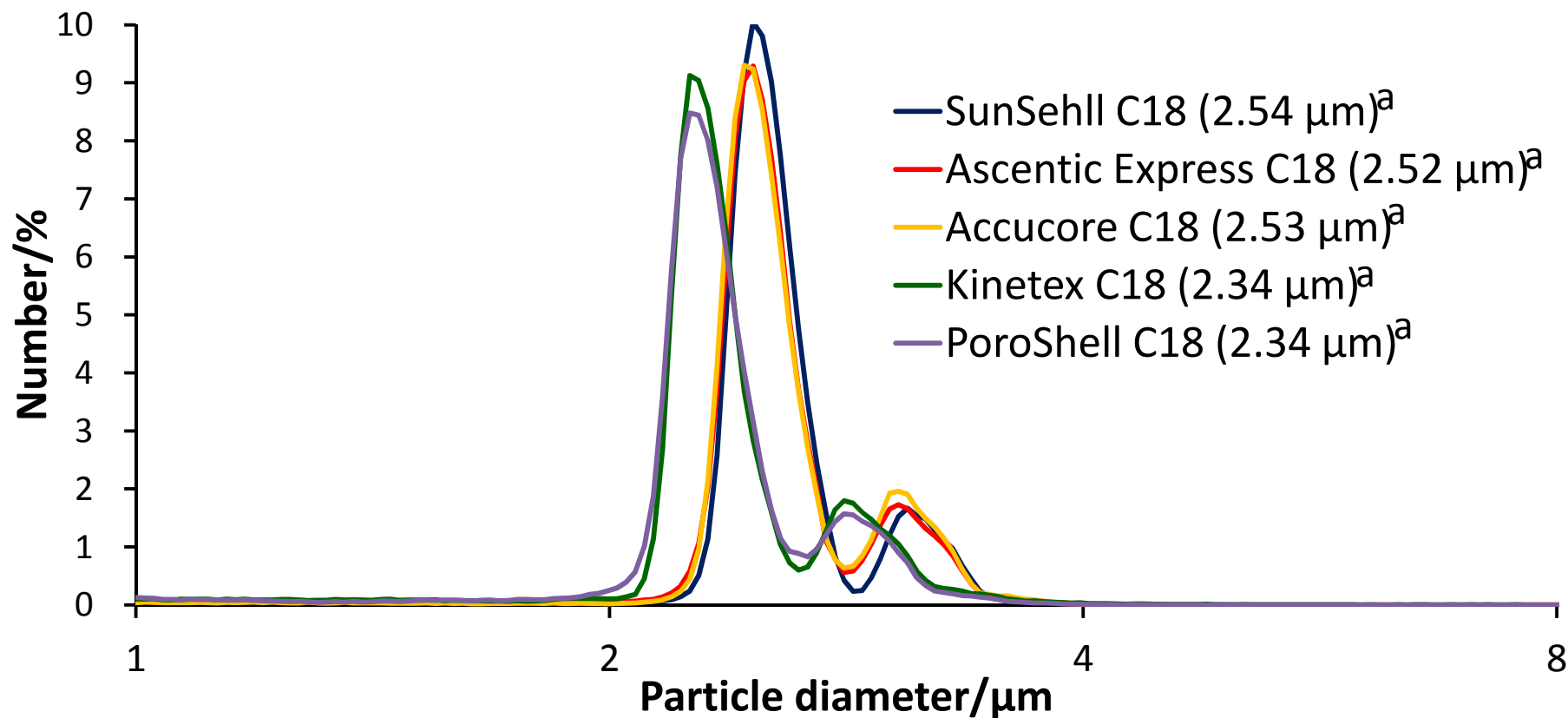
Particle distribution I



*Measured using Beckman Coulter Multisizer 3 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 different from that of the original core shell silica.

a. Median particle size

Particle distribution II



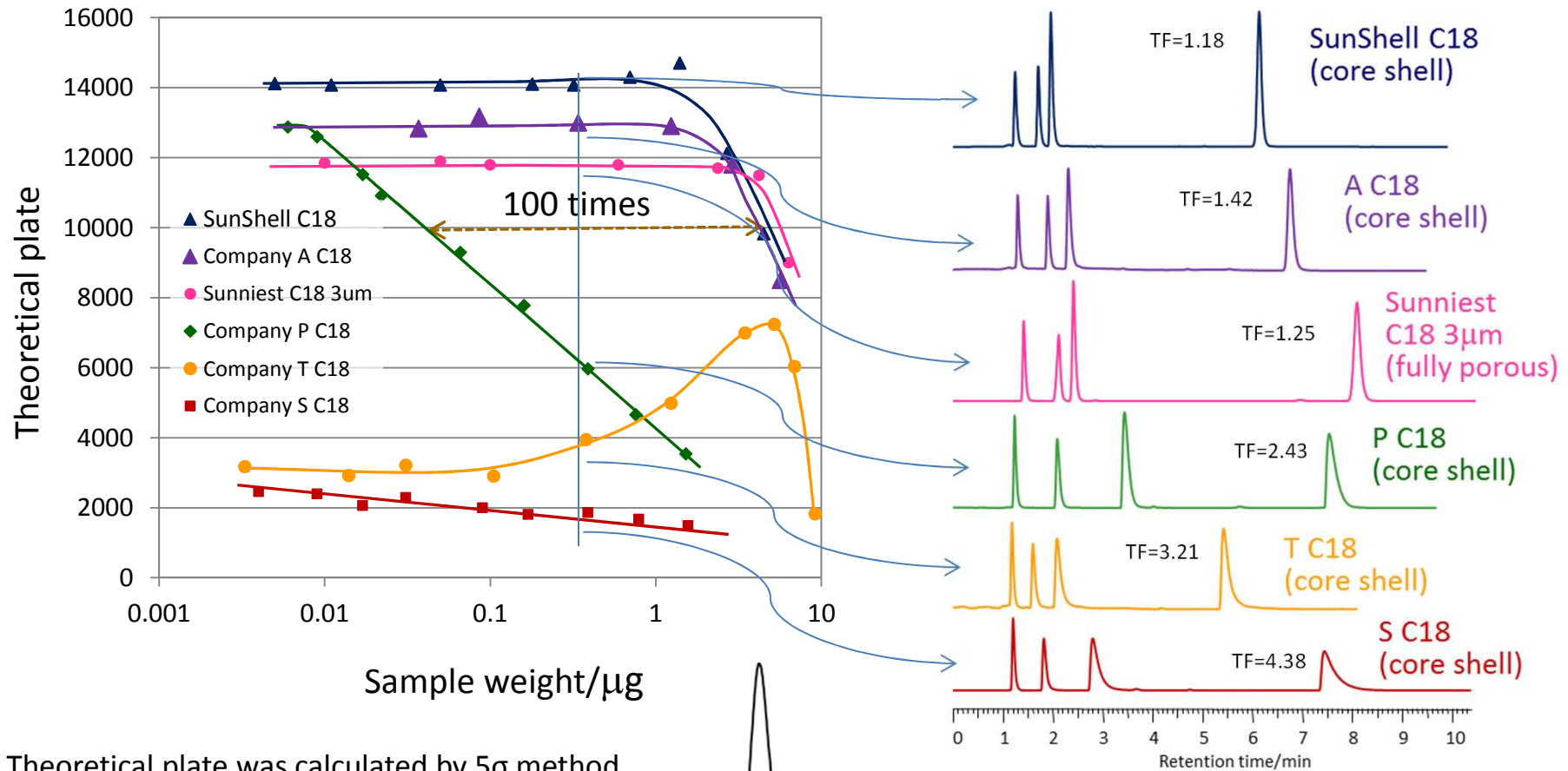
*Measured using Beckman Coulter Multisizer 3 after C18 materials were sintered at 600 degree Celsius for 8 hours. The measured value of each sintered core shell silica is considered to be different from that of the original core shell silica.

a. Median particle size

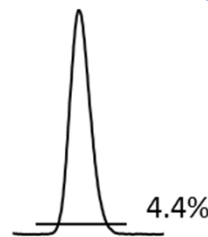
Loading capacity of amitriptyline I

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



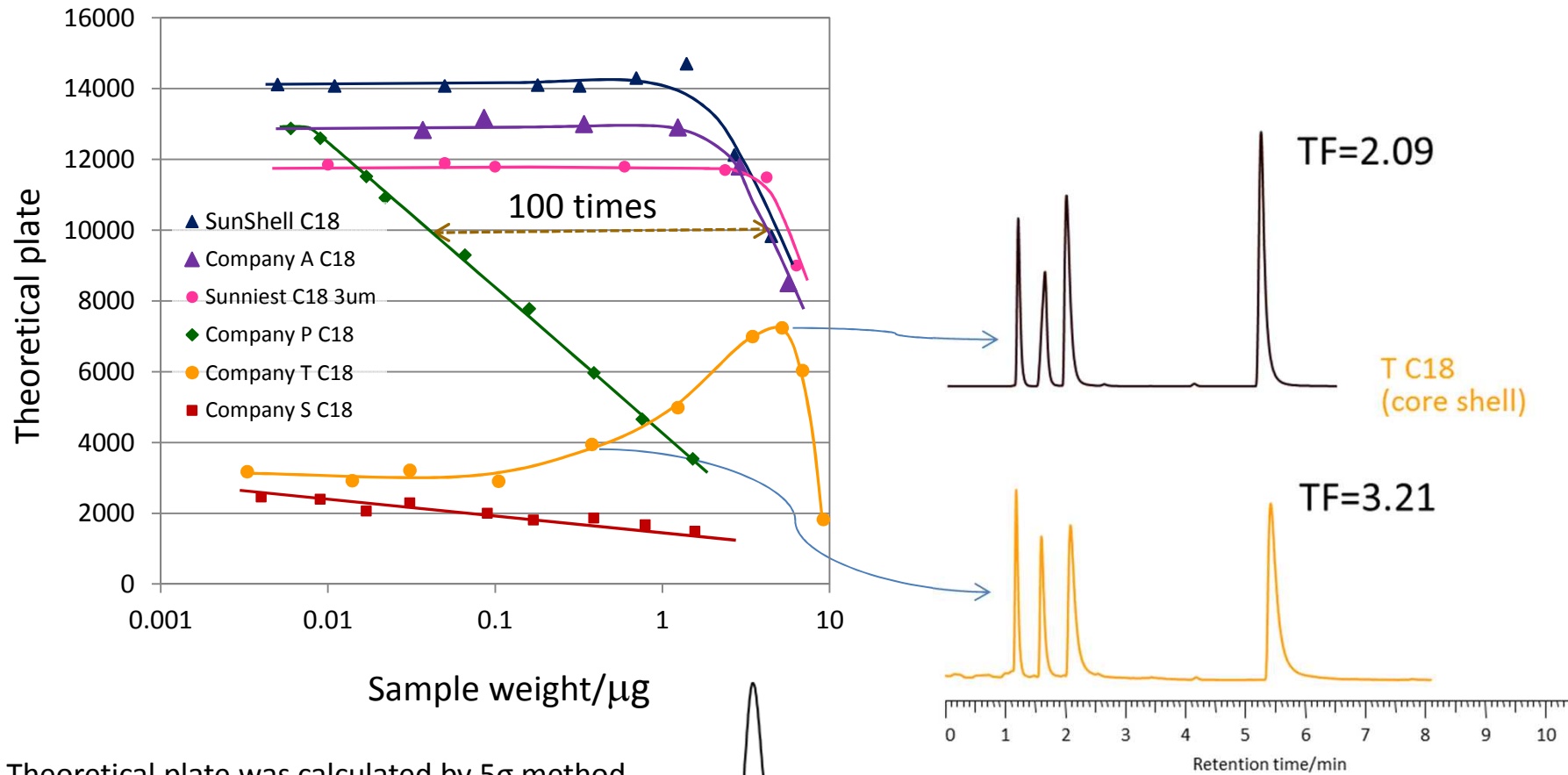
Theoretical plate was calculated by 5σ method using peak width at 4.4% of peak height.



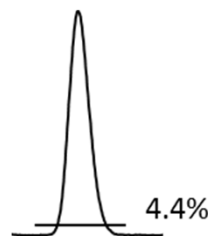
Sample: 1=Uracil, 2=Propranolol, 3= Nortriptyline, 4=Amitriptyline

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



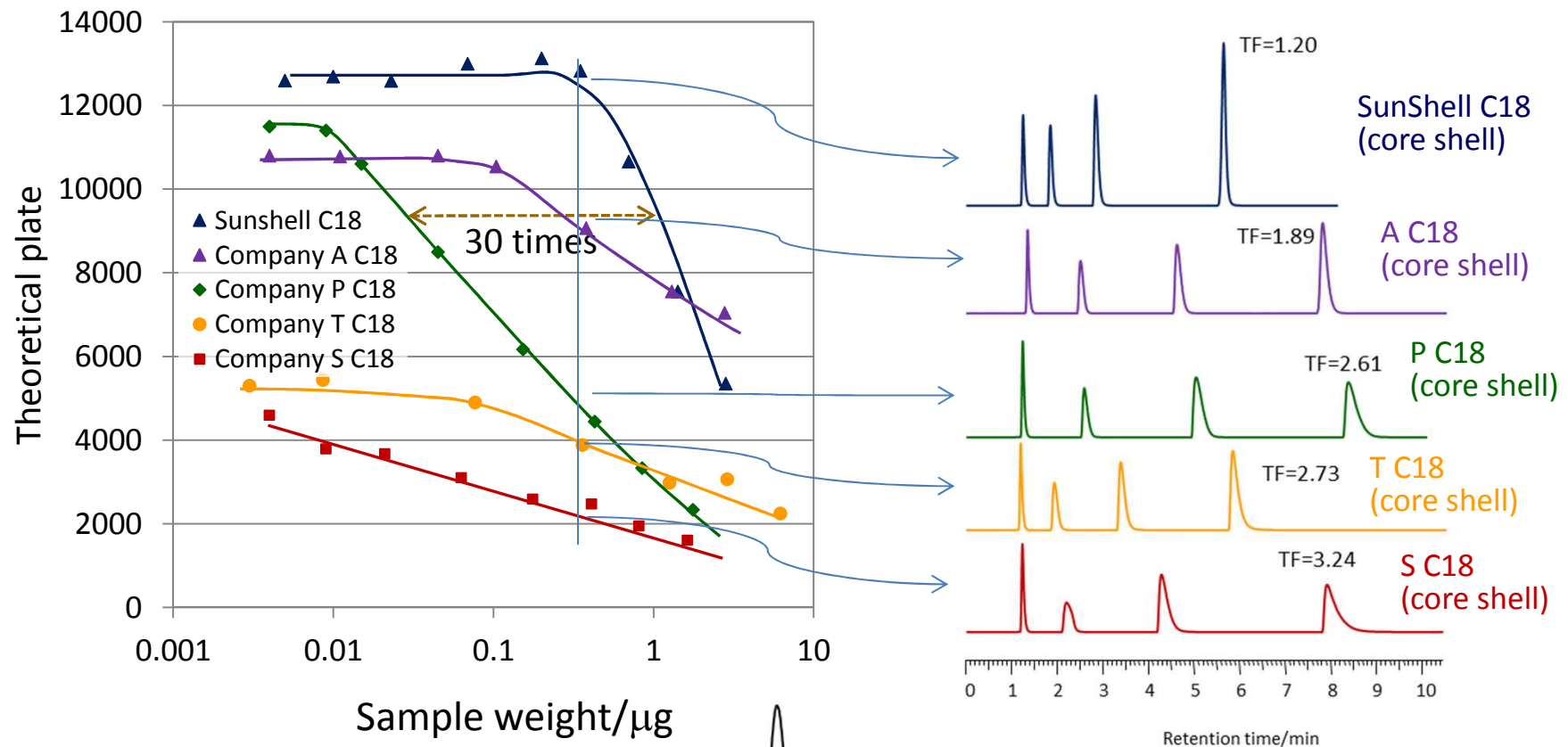
Theoretical plate was calculated by 5σ method using peak width at 4.4% of peak height.



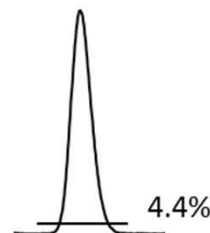
Sample: 1=Uracil, 2=Propranolol, 3= Nortriptyline, 4=Amitriptyline

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.

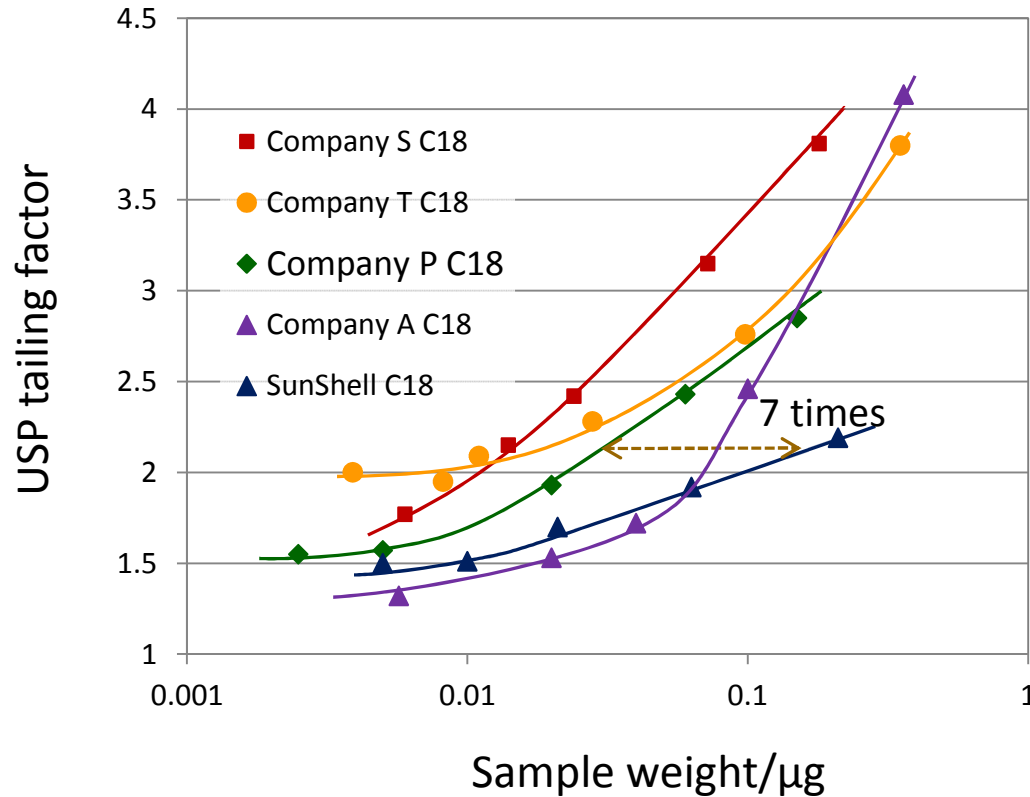


Sample: 1=Uracil, 2=Propranolol, 3= Nortriptyline, 4=Amitriptyline

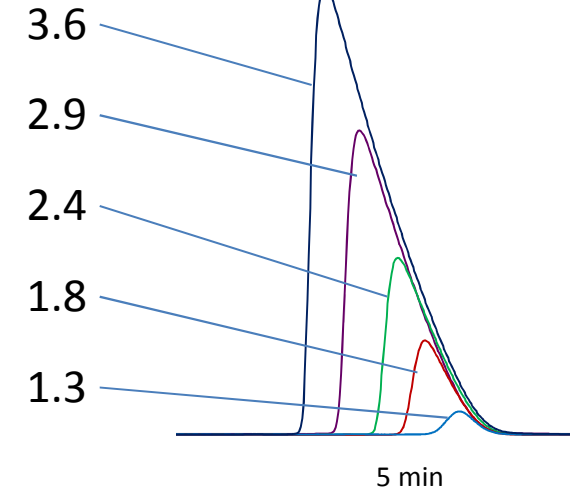
Loading capacity of amitriptyline III

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

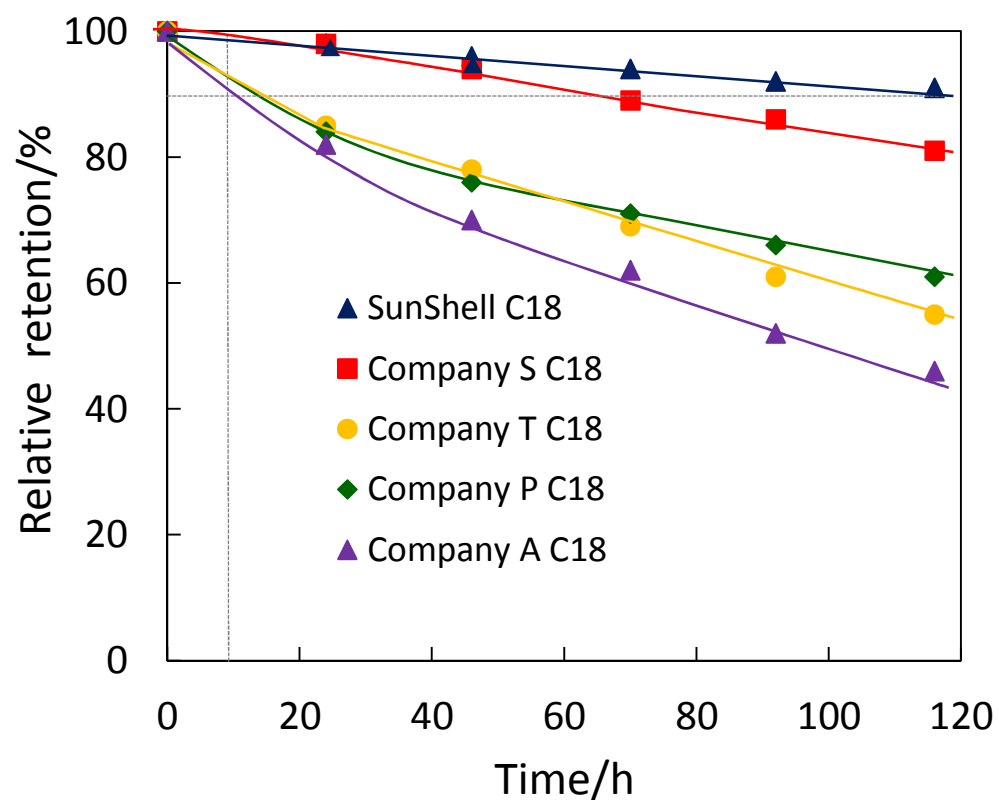


USP tailing factor



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.

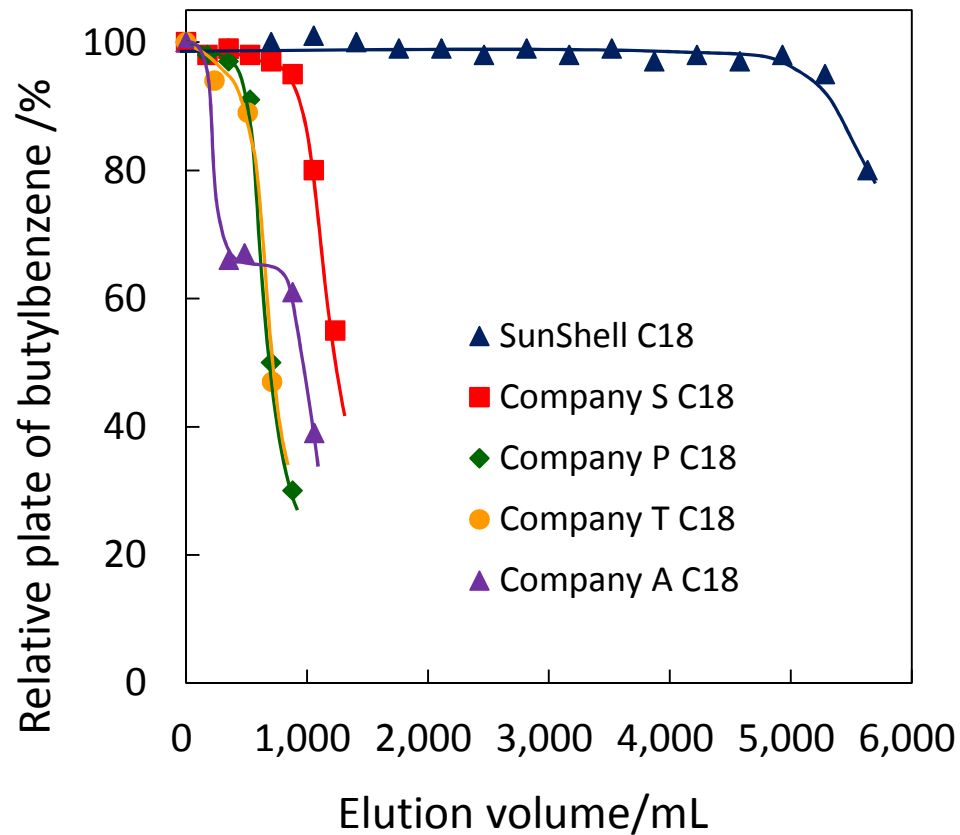
Stability under acidic pH condition



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
PoroShell C18 EC	△	△	2 - 9
Accucore C18	△	△	1 - 11
Kinetex C18	△	△	1.5 - 10