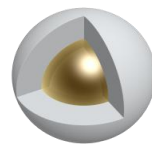


Sepsil Core C18, 2 μm , 2.6 μm , 5 μm



物理参数

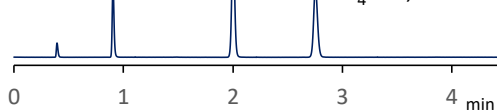
	粒径	孔径	比表面积	含碳率	键合相	封尾	最大耐压	pH范围
Sepsil Core C18	2.0 μm	9 nm	120 m^2/g	6.5%	C18	Yes	100 MPa	1.5 - 10
Sepsil Core C18	2.6 μm	9 nm	150 m^2/g	7%	C18	Yes	60 MPa	1.5 - 10
Sepsil Core C18	4.6 μm	9 nm	90 m^2/g	5.5%	C18	Yes	50 MPa	1.5 - 10

壳核填料能发挥全多孔填料1.4-1.5倍的性能

Sepsil Core C18, 2.0 μm 2.1 x 100 mm

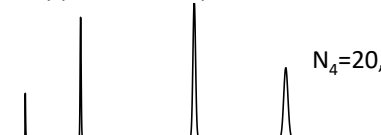
Mobile phase: Acetonitrile/water=70/30
Flow rate: 0.4 mL/min

$N_4=29,400$



Fully porous C18, 2 μm 2.1 x 100 mm

$N_4=20,300$

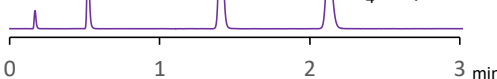


1.45 times higher

Sepsil Core C18, 2.0 μm 2.1 x 50 mm

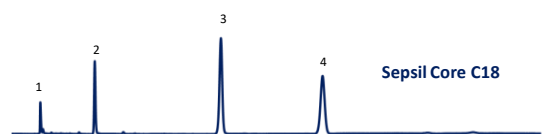
Mobile phase: Acetonitrile/water=60/40
Flow rate: 0.5 mL/min

$N_4=14,100$

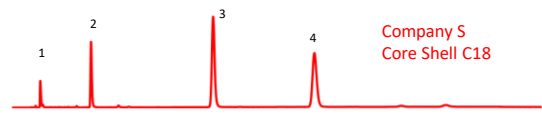


与其他公司的2 μm 产品的理论塔板数对比

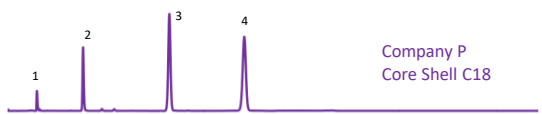
对比用柱: Sepsil Core C18 2 μm , Ascentis Express C18 2 μm , Kinetex C18 1.7 μm , Acquity BEH C18 1.7 μm , Titan C18 1.9 μm



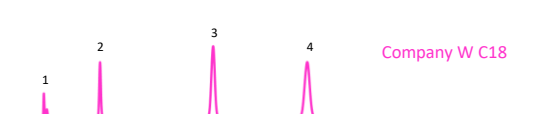
Sepsil Core C18



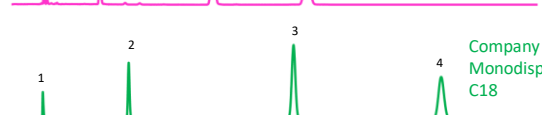
Company S
Core Shell C18



Company P
Core Shell C18



Company W C18



Company S
Monodisperse
C18

Column: Sepsil Core C18, 2 μm 100 x 2.1 mm

Company S Core Shell C18, 2 μm 100 x 2.1 mm

Company P Core Shell C18, 1.7 μm 100 x 2.1 mm

Company W C18, 1.7 μm 100 x 2.1 mm

Company S Monodisperse C18, 1.9 μm 100 x 2.1 mm

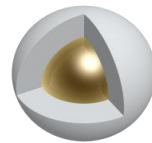
Mobile phase: $\text{CH}_3\text{CN}/\text{H}_2\text{O}=60/40$

Flow rate: 0.5 mL/min

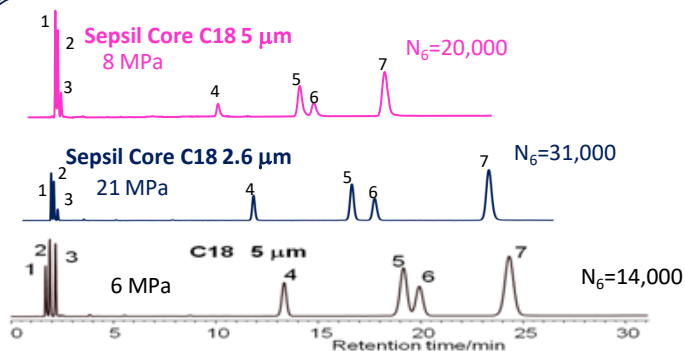
Temperature: 40 $^\circ\text{C}$

Sample: 1 = Uracil, 2 = Ethylbenzoate, 3 = Acenaphthene, 4 = Butylbenzene

	范		柱压 (MPa)	理论塔板数/柱压 (MPa^{-1})
	理论塔板数	拖尾因子		
Sepsil Core C18	29,721	1.04	48.5	613
Company S Core Shell C18	25,533	1.19	53.5	477
Company P Core Shell C18	24,700	0.97	53.8	458
Company W C18	14,511	1.01	54.1	269
Company S Monodisperse C18	26,592	1.05	43.9	605



用HPLC进行数据比较



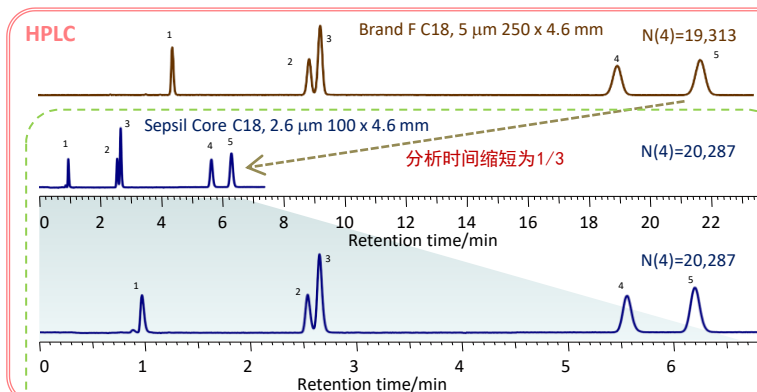
Column size: 150 x 4.6 mm
 Mobile phase: CH₃OH/H₂O=75/25
 Flow rate: 1.0 mL/min
 Temperature: 40 °C
 Sample: 1 = Uracil
 2 = Caffeine
 3 = Phenol
 4 = Butylbenzene
 5 = o-Terphenyl
 6 = Amylbenzene
 7 = Triphenylene
 HPLC: Hitachi LaChrom ELITE
 (Tubing, 0.25 mm i.d.)



	全多孔硅胶C18, 5 μm		Sepsil Core C18, 2.6 μm		Sepsil Core C18, 5 μm	
比表面积	340 m ² /g		150 m ² /g		90 m ² /g	
装填量 (150x4.6mm)	1.5 g		2.7 g		3.2 g	
单柱表面积	510 m ² /g (100%)		405 m ² /g (79%)		288 m ² /g (56%)	
	Retention time (t _R)	Retention factor (k)	Retention time (t _R)	Retention factor (k)	Retention time (t _R)	Retention factor (k)
1) Uracil	1.70	0	1.34	0	1.30	0
6) Amylbenzene	19.96	10.74	16.56	11.36	13.43	9.33
Relative value of Amylbenzene	100%	100%	83%	106%	67%	87%

填料比表面积基本与保留时间成比例，在保留系数上没有太大的差别。

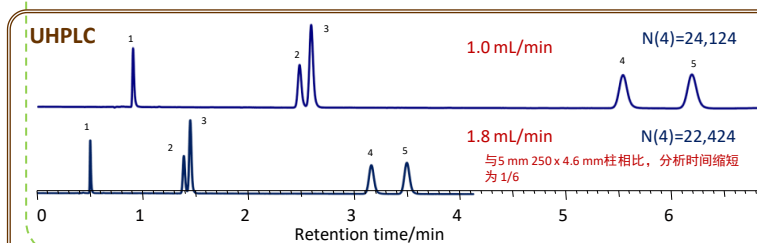
从全多孔5μm硅胶C18柱转换为2.6μm壳核柱



Column:
 Brand F C18, 5 μm 250 x 4.6 mm
 Sepsil Core C18, 2.6 μm 100 x 4.6 mm
 Mobile phase:
 CH₃CN/20mM Phosphoric acid = 45/55
 Flow rate: 1.0 mL/min,
 1.8 mL/min at the lowest chromatogram
 Temperature: 25 °C
 Pressure: 9.5 MPa for Brand F C18 5 μm
 13.4 MPa for SunShell C18 2.6 μm
 Detection: UV@230 nm

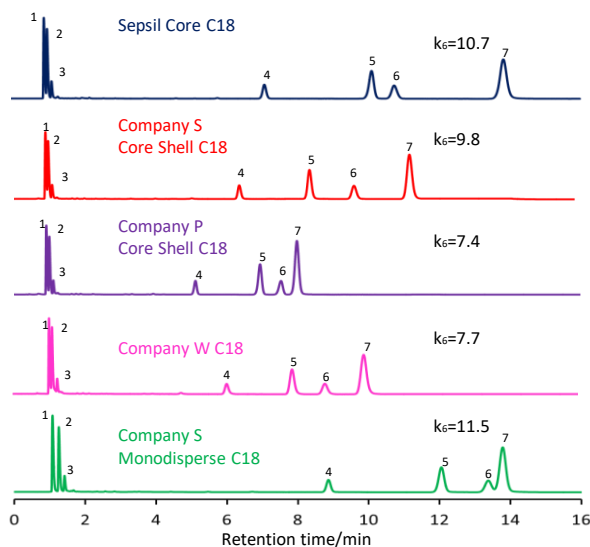
Sample: 1 = Benzylamine
 2 = Ketoprofen
 3 = Naproxen
 4 = Indomethacin
 5 = Ibuprofen

HPLC: Hitachi LaChrom ELITE (Tubing, 0.25 mm i.d.)
 UHPLC: Jasco X-LC



Sepsil Core C18 2 μ m2 μ m壳核柱与亚2 μ m硅胶柱的比较使用色谱柱: Sepsil Core C18 2 μ m, Ascentis Express C18 2 μ m, Kinetex C18 1.7 μ m, Acquity BEH C18 1.7 μ m, Titan C18 1.9 μ m

标准样品的分离

Column: Sepsil Core C18, 2 μ m 100 x 2.1 mmCompany S Core Shell C18, 2 μ m 100 x 2.1 mmCompany P Core Shell C18, 1.7 μ m 100 x 2.1 mmCompany W C18, 1.7 μ m 100 x 2.1 mmCompany S Monodisperse C18, 1.9 μ m 100 x 2.1 mmMobile phase: CH₃OH/H₂O=75/25

Flow rate: 0.2 mL/min

Temperature: 40 °C

Sample: 1 = Uracil, 2 = Caffeine, 3 = Phenol, 4 = Butylbenzene

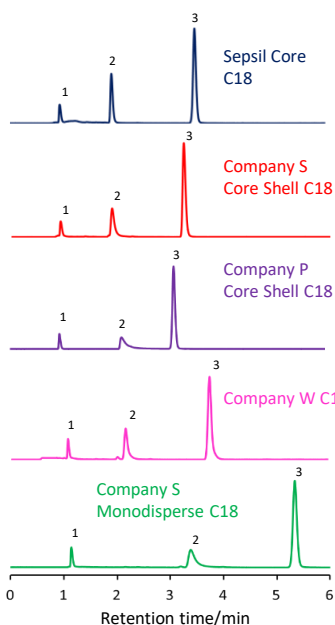
5 = o-Terphenyl, 6 = Amylbenzene, 7 = Triphenylene

	氢结合性 (Caffeine/Phenol)	疏水 (Amylbenzene/Butylbenzene)	选择性 (Triphenylene/o-Terphenyl)
Sepsil Core C18	0.43	1.59	1.41
Company S Core Shell C18	0.37	1.59	1.38
Company P Core Shell C18	0.45	1.57	1.17
Company W C18	0.35	1.55	1.30
Company S Monodisperse C18	0.53	1.58	1.16

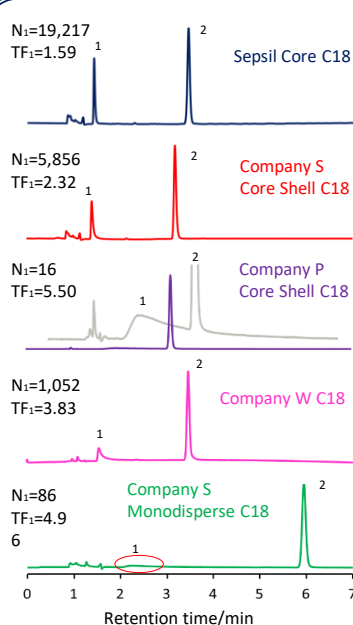
吡啶

喹啉

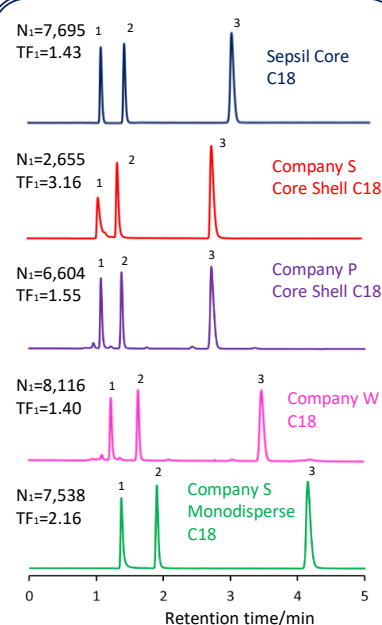
蚁酸



Column dimension: 100 x 2.1 mm
 Mobile phase: CH₃OH/H₂O=30/70
 Flow rate: 0.2 mL/min
 Temperature: 40 °C
 Detection: UV@250nm
 Sample: 1 = Uracil
 2 = Pyridine
 3 = Phenol



Column dimension: 100 x 2.1 mm
 Mobile phase: CH₃CN/20mM H₃PO₄=10/90
 Flow rate: 0.2 mL/min
 Temperature: 40 °C
 Detection: UV@250nm
 Sample: 1 = 8-Quinololinol (Oxine)
 2 = Caffeine



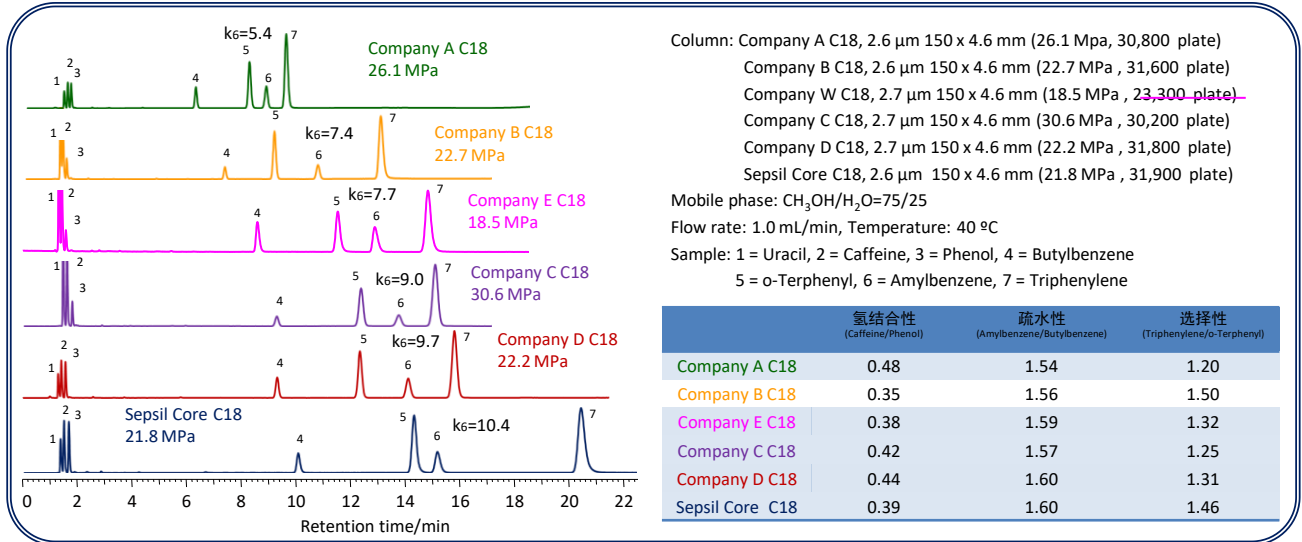
Column dimension: 100 x 2.1 mm
 Mobile phase: CH₃CN/0.1% H₃PO₄=2/98
 Flow rate: 0.2 mL/min
 Temperature: 40 °C
 Detection: UV@210nm
 Sample: 1 = Formic acid
 2 = Acetic acid
 3 = Propionic Acid

2.6 μm C18壳核柱的比较

使用色谱柱

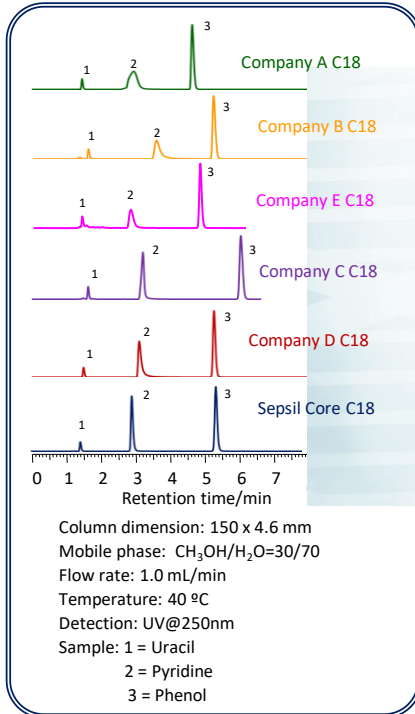
1. Kinetex C18, 2.6 μm
2. Accucore C18, 2.6 μm
3. Poroshell C18 EC, 2.7 μm
4. Ascentis Express C18, 2.7 μm
5. Cortecs C18, 2.7 μm
6. SunShell C18, 2.6 μm

标准样品的分离



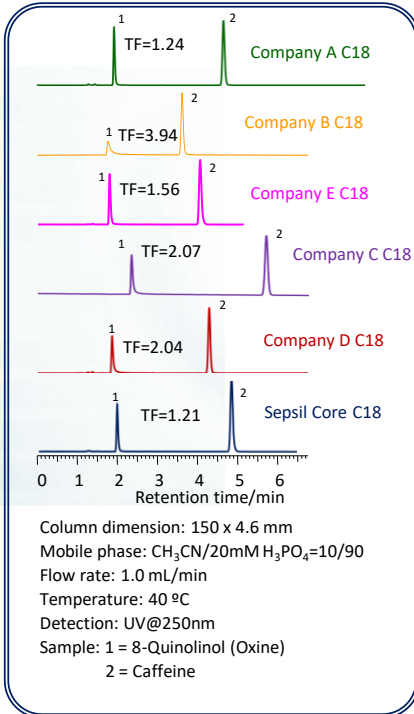
与其他公司的壳核C18柱在同等条件下相比, Sepsil Core C18的保留时间最长, 约为A公司C18柱的2倍。同时柱压低, 理论塔板数高。

吡啶



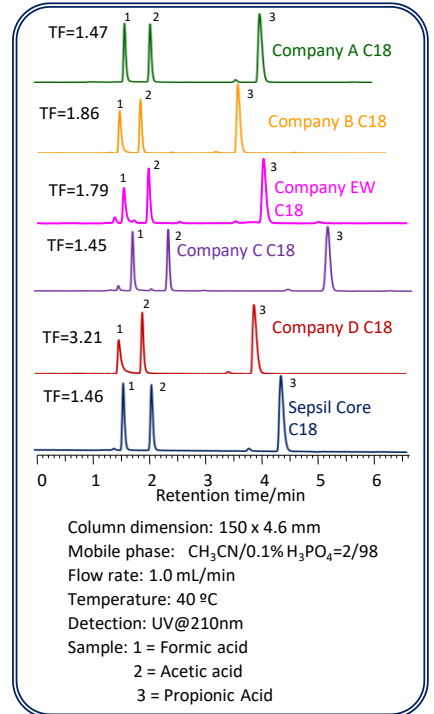
吡啶是由于表面残留羟基的存在而容易引起拖尾的化合物, 以上均为新柱进行的实验, 峰形比较怪异的A公司C18柱的填料表面有酸残留的可能。

喹啉

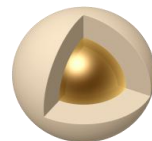


喹啉为金属螯合化合物, 填料内如有金属杂质的存在, 就会产生拖尾现象。

蚁酸



酸性化合物在大部分C18柱上均出峰, 蚁酸是比较容易拖尾的酸性化合物代表, E、B、D公司的C18柱对蚁酸均显示拖尾。

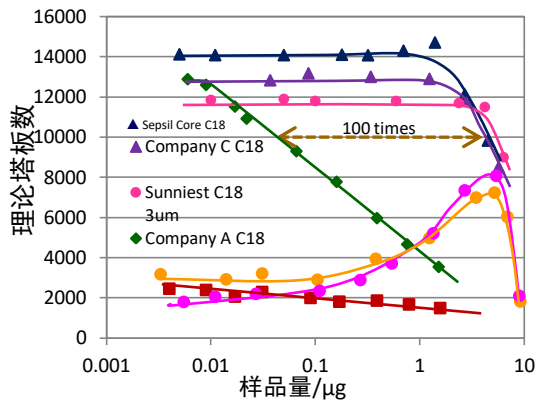


碱性化合物（阿米替林）的载量测试

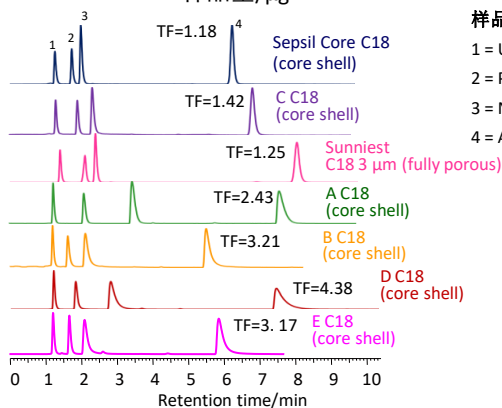
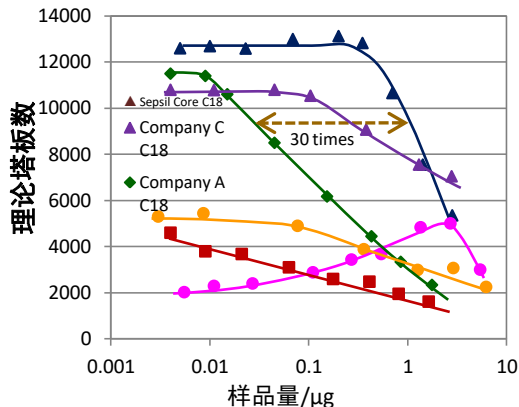
与甲醇/缓冲液流动相相比，阿米替林的上样过载更容易发生在乙腈/缓冲液的流动相下，以下使用乙腈和20mM缓冲液、10mM醋酸铵水溶液及0.1%蚁酸水溶液作为流动相，与其他公司的壳核C18进行比较。

相同条件：Column dimension, 150 x 4.6 mm, flow rate; 1.0 mL/min, temperature; 40 °C

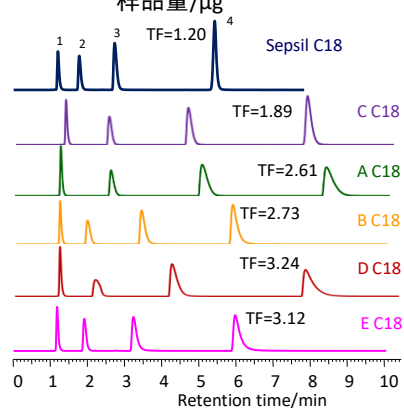
流动相：乙腈 / 20mM 磷酸缓冲液 pH7.0=(60:40)



流动相：乙腈 / 10mM 醋酸铵 pH6.8=(40:60)



样品：
1 = Uracil (0.07μg)
2 = Propranolol (1.53μg)
3 = Nortriptyline (0.32μg)
4 = Amitriptyline (0.32μg)



物理特性值比较

	含碳量 (%)	比表面积 ^a (m ² /g)	孔容积 ^a (mL)	孔径 ^a (nm)
Sepsil 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. 取出色谱柱内填料在600度下烧结8小时后测定。
b. 产品目录记载值。

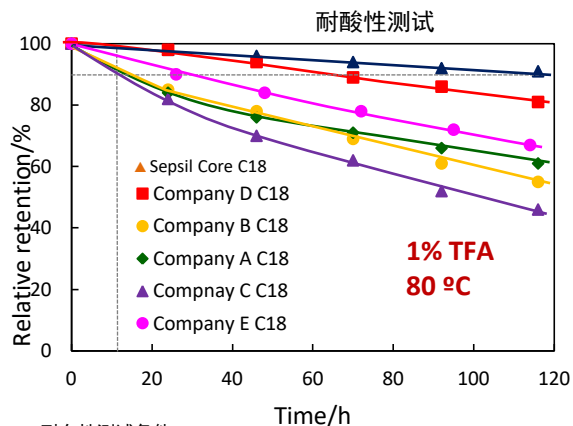
使用色谱柱：

1. Kinetex C18, 2.6 μm
2. Accucore C18, 2.6 μm
3. PoroShell C18 EC, 2.7 μm
4. Ascentis Express C18, 2.7 μm
5. Cortecs C18 2.7 μm
6. Sepsil C18, 2.6 μm



所有使用色谱柱均为壳核填料柱，规格为1.5×4.6mm柱的柱效除了E公司外，均具有240,000/m左右的理论塔板数，这是使用中性化合物得出的数值，如果使用碱性化合物分离性能会大不相同，柱效会下降。D公司C18对碱性化合物产生拖尾，A公司的C18在上样量超过0.01μg后柱效下降明显，我公司Sepsil Core C18在上样量增加到0.5μg柱效也没有明显下降。

◆ 耐久性评价



耐久性测试条件

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

保留时间测试条件

Column size: 50 x 2.1 mm

Mobile phase: CH₃CN/H₂O=60/40

Flow rate: 0.4 mL/min

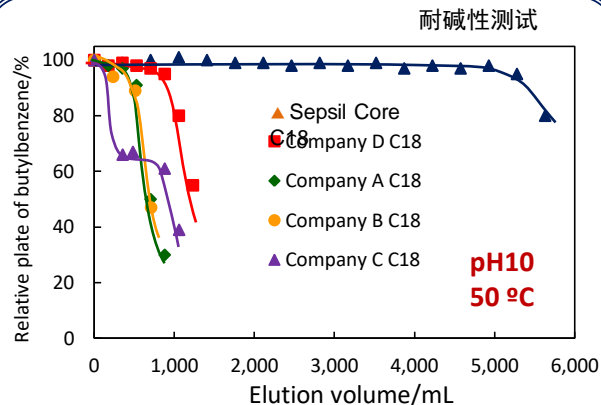
Temperature: 40 °C

Sample: 1 = Uracil (t₀)

2 = Butylbenzene

酸性条件下的使用性能下降是由于硅烷基遇水分解从硅胶表面脱落，从而保留时间缩短。丁苯的保留基本上与烷基的结合量成比例，因此用5种壳核C18柱来比较丁苯的变化，C公司的C18柱性能下降最快。

★ 我公司Sepsil Core C18耐久性最强，能达到A、B和C公司的10倍以上。



耐久性测试条件

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

理论塔板数测试条件

Column Size: 50 x 2.1 mm

Mobile phase: CH₃CN/H₂O=60/40

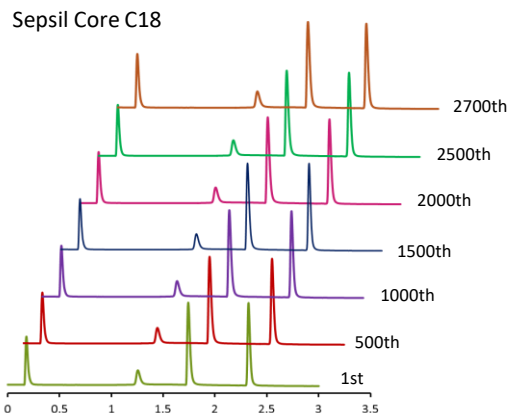
Flow rate: 0.4 mL/min

Temperature: 40 °C

Sample: 1 = Butylbenzene

★ 我公司Sepsil Core C18在通过5000mL碱性流动相后仍然可以保持上样分析状态。其他公司的C18从通过500-1000mL的流动相开始性能就开始大幅下降，Sepsil Core C18的耐碱性要高于其他公司的C18柱5-10倍。

◆ 碱性条件下 (pH9.5) 的连续分析。



Column: Sepsil Core C18, 2.6 μm 50 x 2.1 mm

Mobile phase: A) 10 mM Ammonium bicarbonate pH 9.5
B) Acetonitrile

Gradient program:

Flow rate: 0.5 mL/min

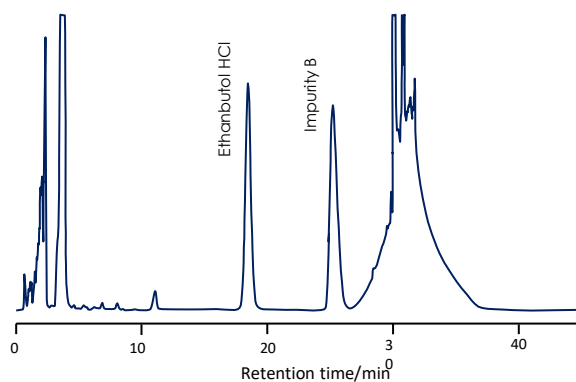
Temperature: 40 °C

Detection: UV@250 nm

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

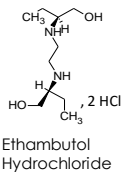
Sepsil Core

盐酸乙胺丁醇的分离

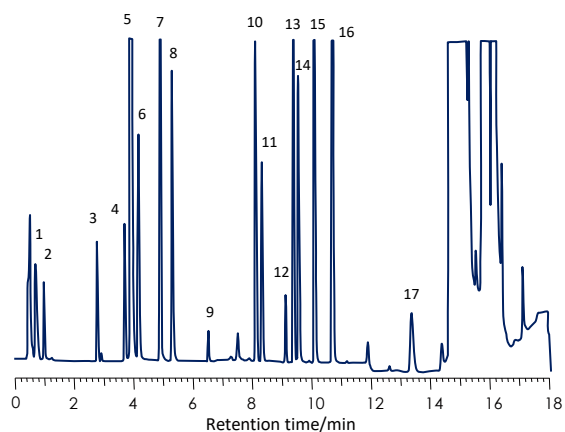


Column: Sepsil Core C18, 2.6 μ m 100 x 4.6 mm
Mobile phase: A) Methanol/water (50/50 V/V)
B) Methanol

Flow rate: 1.0 mL/min
Temperature: 40 $^{\circ}$ C
Detection: UV 215 nm
Injection volume: 10 μ L



衍生化氨基酸的分离

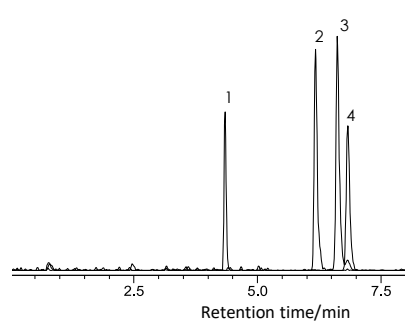


Column: Sepsil Core C18 2.6 μ m, 150 x 2.1 mm
Mobile phase: A) 10mM Na_2PO_4 + 10mM $\text{Na}_2\text{B}_4\text{O}_7$ + 0.5mM Na_3P (pH7.8)
B) Acetonitrile/Methanol/Water (45/45/10%)

Flow rate: 0.61 mL/min
Temperature: 40 $^{\circ}$ C
Detection: UV@338 nm

Sample: 1=Aspartic acid, 2=Glutamic acid, 3=Serine, 4=Histidine, 5=Glycine, 6=Threonine, 7=Arginine, 8=Alanine, 9=Tyrosine, 10=Valine, 11=Methionine, 12=Tryptophan, 13=Pheylalanine, 14=Isoleucine, 15=Leucine, 16=Lysine, 17=Proline

女性荷尔蒙的分离



Column: Sepsil Core C18 2.6 μ m, 100 x 2.1 mm
Mobile phase:

A) H_2O with 0.1% formic acid.
B) CH_3CN with 0.1% formic acid.

Gradient program:

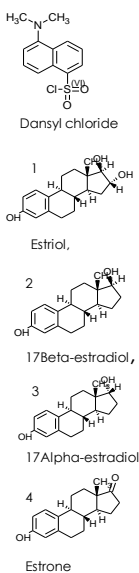
0 - 0.5 min: 10% B
0.51 - 3.0 min: 10 - 72% B
3.01 - 6.0 min: 72% B
6.01 - 7.0 min: 72 - 100% B
7.01 - 10.0 min: 100% B

Flow rate: 0.45 mL/min.
Temperature: 40 $^{\circ}$ C

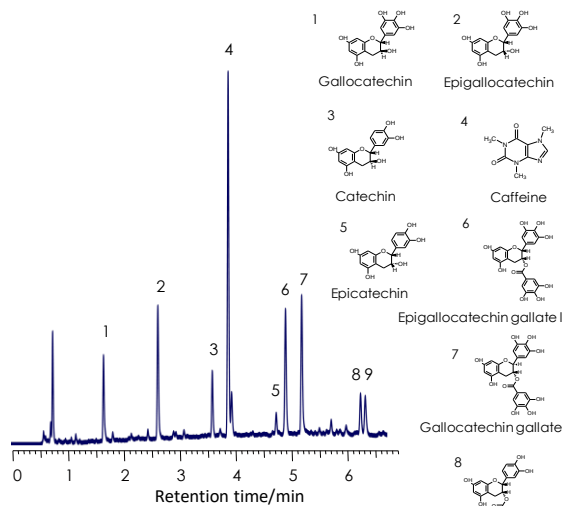
Detection: MS(sim), m/z, 522.20, 506.20, 504.20

Samples: 1. Dansylated estriol, 2. Dansylated 17beta-estradiol,
3. Dansylated 17alpha-estradiol, 4. Dansylated estrone

Courtesy of Department of Chemistry & Biochemistry, The University of Texas at Arlington



乌龙茶



Column: Sepsil Core C18 2.6 μ m, 75 x 4.6 mm
Mobile phase:

A) 0.1% Phosphoric acid
B) CH_3CN

Gradient program

Flow rate: 1.0 mL/min,
Temperature: 25 $^{\circ}$ C

Detection: UV@250 nm
Sample: Oolong tea

