

# Inertsil® C8-4

Though ODS (C18) phases are the most widely used reverse phase columns, Octyl (C8) columns can often provide good resolution with much shorter retention times. Unlike many competitive brands, Inertsil C8-4 offers the very same selectivity as Inertsil ODS-4, making it simple to change columns without additional method development work. Uniquely among C8 phases, Inertsil C8-4 can be used with 100% aqueous phases without loss of resolution caused by phase collapse.

## Physical Properties

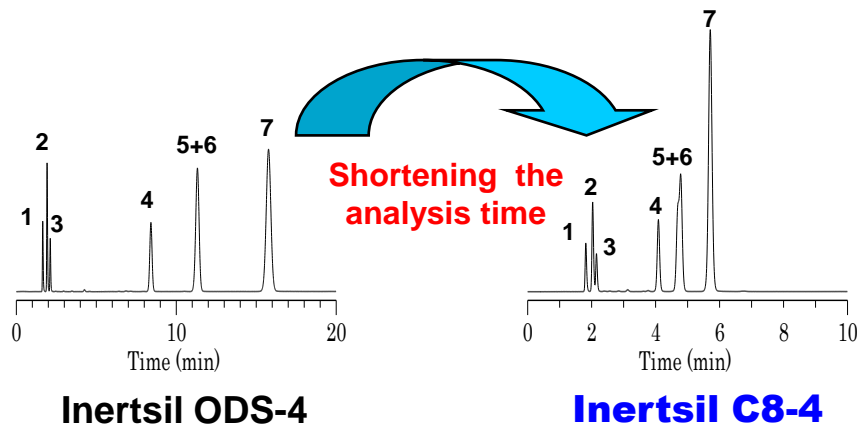
Silica:	High Purity Spherical Silica Gel
Particle Size:	5µm
Surface Area:	450 m <sup>2</sup> /g
Pore Size:	100Å
Pore Volume:	1.05 mL/g
Bonded Phase:	Octyl groups (C8)
End-capping:	Yes
Carbon Loading:	5%
USD Code:	L7

## Comparison of retention and separation pattern

### Analytical Conditions

<b>System:</b>	GL7400 HPLC system
<b>Column:</b>	5µm, 150 x 4.6 mmI.D.
<b>Eluent :</b>	A) CH <sub>3</sub> OH B) H <sub>2</sub> O (A / B) = (80 / 20)
<b>Flow Rate:</b>	1.0 mL/min
<b>Col. Temp.:</b>	40 °C
<b>Detection:</b>	UV 254 nm
<b>Sample:</b>	1. Uracil 2. Caffeine 3. Phenol 4. n-Butylbenzene 5. o-Terphenyl 6. n-Amylbenzene 7. Triphenylene

1. Virtually the same retentivity
2. The same separation pattern



## Adsorption performance on various compounds

### Basic Compound (Dextromethorphan)

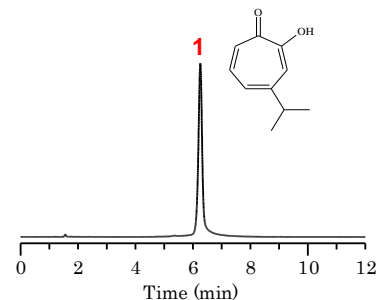
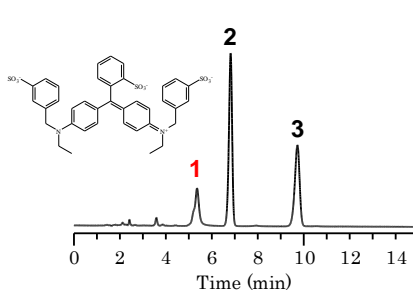
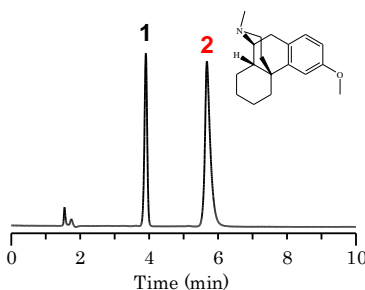
Column: Inertsil C8-4 5µm 150x4.6mmI.D.  
 Eluent: A) CH<sub>3</sub>CN  
 B) 25 mM Phosphate buffer ; pH 7.0  
 (A / B) = (40 / 60)  
 Flow rate: 1.0 mL/min  
 Col.Temp.: 40 °C  
 Detection: UV at 220 nm  
 Sample: 1.0 µL (0.1 mg / mL)  
 1) Phenol  
 2) Dextromethorphan hydrobromide

### Acidic Compound (Brilliant Blue FCF)

Column: Inertsil C8-4 5µm 150x4.6mmI.D.  
 Eluent : A) CH<sub>3</sub>CN  
 B) 0.1% H<sub>3</sub>PO<sub>4</sub>  
 (A / B) = (25 / 75)  
 Flow rate: 1.0 mL/min  
 Col.Temp.: 40 °C  
 Detection: UV at 254 nm  
 Sample: 3.0 µL  
 1) Brilliant Blue FCF (0.05 mg / mL)  
 2) Phenol (0.3 mg / mL)  
 3) Salicylic acid (0.2 mg / mL)

### Chelating Compound (Hinokitiol)

Column: Inertsil C8-4 5µm 150x4.6mmI.D.  
 Eluent: A) CH<sub>3</sub>CN  
 B) 0.1% H<sub>3</sub>PO<sub>4</sub>  
 (A / B) = (40 / 60)  
 Flow rate: 1.0 mL/min  
 Col.Temp.: 40 °C  
 Detection: UV at 254 nm  
 Sample: 1.0 µL (0.1 mg / mL)  
 1) β-Thujaplicin (Hinokitiol)



# Strength and Advantage of Inertsil C8-4

- Useful for reducing the analysis time, and therefore increasing productivity, for very hydrophobic samples as compared to use of ODS phase.

\* For the purpose of shortening the analysis time further.

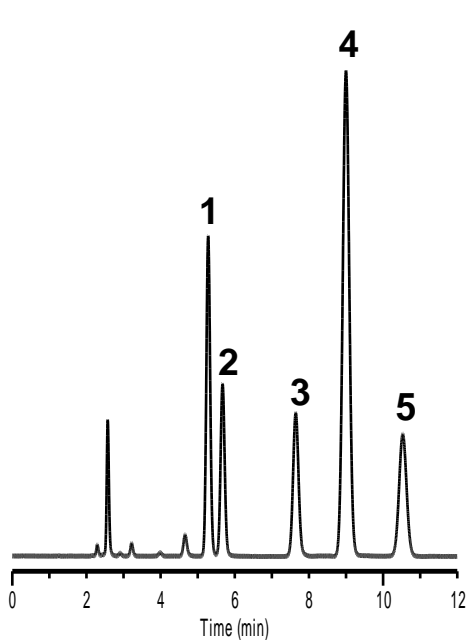
\* For the purpose of reducing the amount of organic solvent used.

- Virtually the same separation pattern can be obtained when comparing to the the same brand/series of an ODS column.

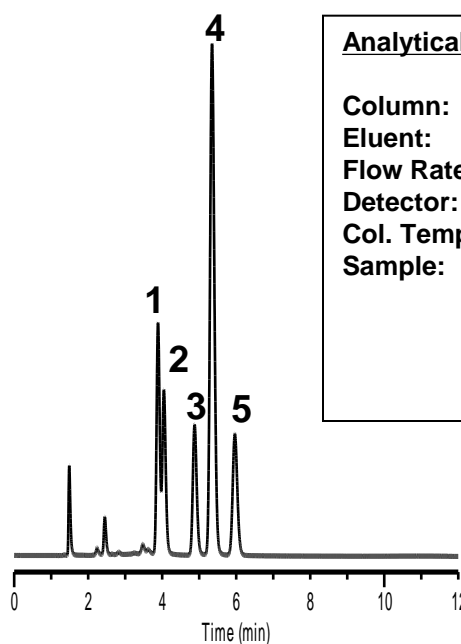
\* Rarely necessary alter the analytical conditions when switching from an ODS (C18) to a C8 column.

	Carbon Loading of ODS (%)	Carbon Loading of C8 (%)	Ratio
Inertsil 2 Series	18.50%	10.50%	10.5/18.5=0.57
Inertsil 3 Series	15.00%	9.00%	9.0/15.0=0.60
Inertsil 4 Series	11.00%	5.00%	5.0/11.0=0.45
The Length of Alkyl Chain	C18	C8	8 / 18=0.44

## Comparison of Analysis Time between ODS-3 & C8-3



**Inertsil ODS-3**



**Inertsil C8-3**

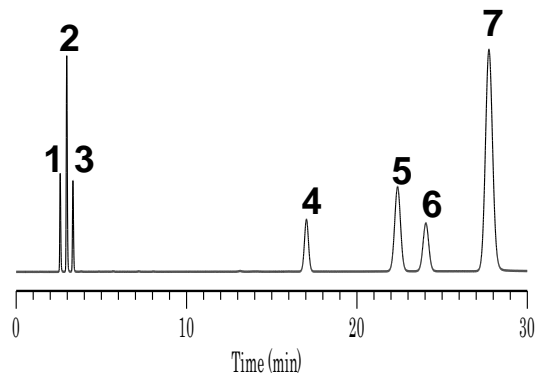
### Analytical Condition

**Column:** 150 x 4.6 mm I.D.  
**Eluent:** CH<sub>3</sub>CN / H<sub>2</sub>O = 70 / 30  
**Flow Rate:** 1.0 mL/min  
**Detector:** UV 254nm  
**Col. Temp.:** 40C  
**Sample:** 1) Naphthalene  
 2) Ethylbenzene  
 3) Propylbenzene  
 4) Anthracene  
 5) Butylbenzene

# Compare Selectivities of Inertsil 3 series vs. new 4 series

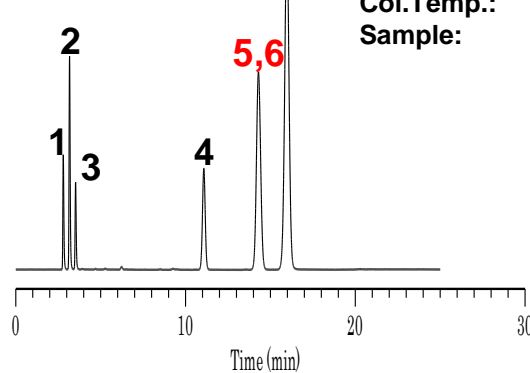
## Analytical Conditions

**Column:** 250 x 4.6 mm I.D.  
**Eluent:** CH<sub>3</sub>OH / H<sub>2</sub>O = 80 / 20  
**Flow Rate:** 1.0 mL/min  
**Detector:** UV 254nm  
**Col.Temp.:** 40C  
**Sample:** 1) Uracil  
 2) Caffeine  
 3) Phenol  
 4) Butylbenzene  
 5) o-Terphenyl  
 6) Amylbenzene  
 7) Triphenylene



**Inertsil ODS-3**

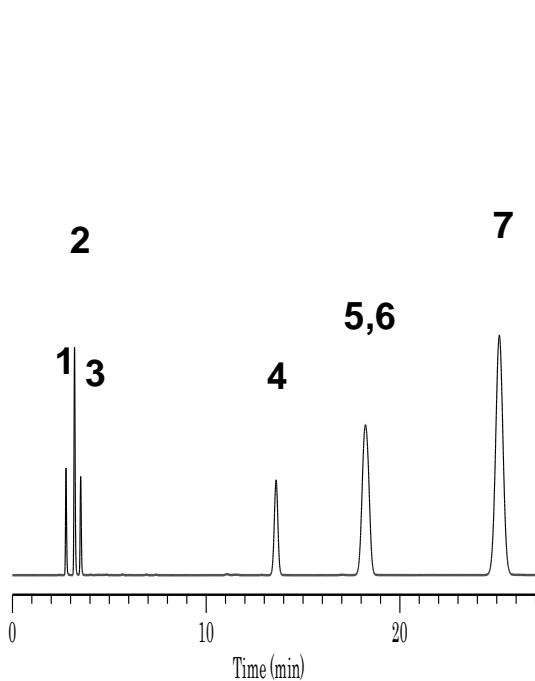
**Carbon Loading = 15%**



**Inertsil C8-3**

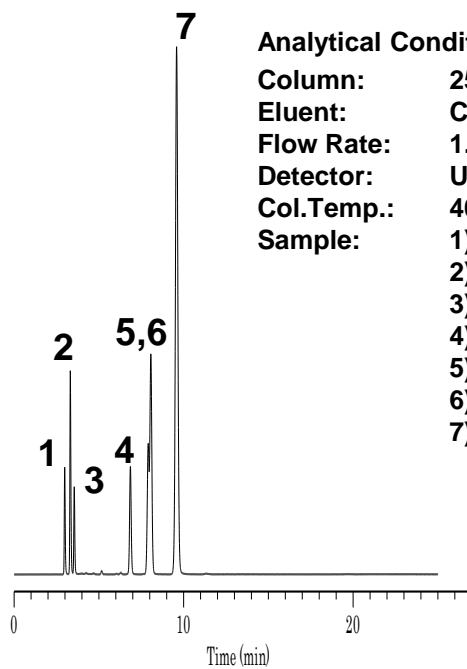
**Carbon Loading = 9%**

The bonding density of the functional group is high on a commercially available C8 column when comparing to the same brand/series of their ODS column. Since the silica surface properties will therefore be different, the separation pattern (selectivity) may change depending on the sample.



**Inertsil ODS-4**

**Carbon Loading = 11%**



**Inertsil C8-4**

**Carbon Loading = 5%**

Nearly the same Bonding Density

Retentivity nearly Proportional to the Alkyl Chain Length

# Adsorption Performance on Strong Basic Compound

## Analytical Conditions

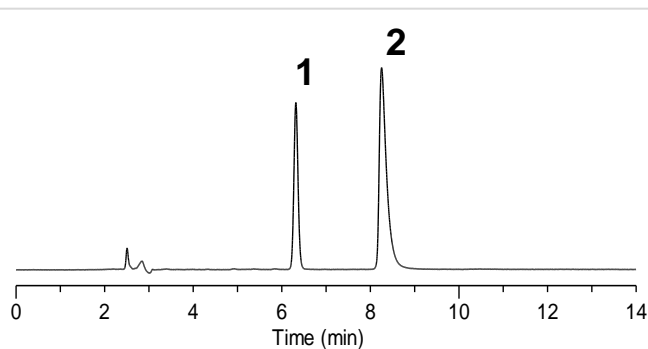
Eluent: A) CH<sub>3</sub>CN  
B) 25 mM Phosphate buffer ; pH 7.0  
(A / B) = (40 / 60)

Flow Rate: 1.0 mL/min

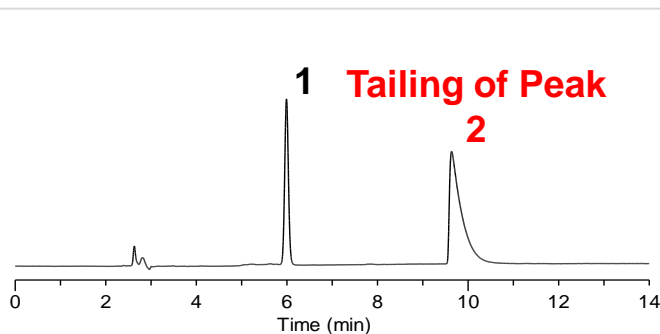
Col.Temp.: 40C

Detection: UV at 220 nm

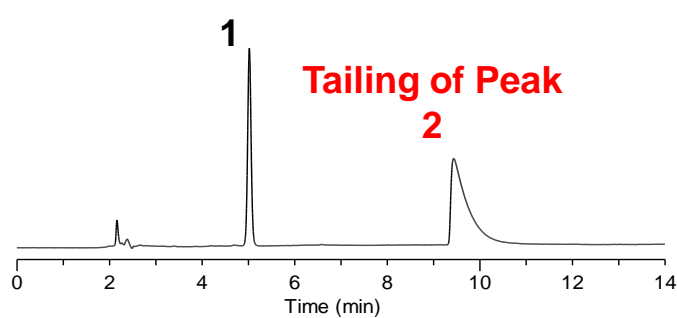
Sample: 1.0 µL  
1) Phenol (0.015 mg/mL)  
2) Dextromethorphan Hydrobromide (0.1mg/mL)



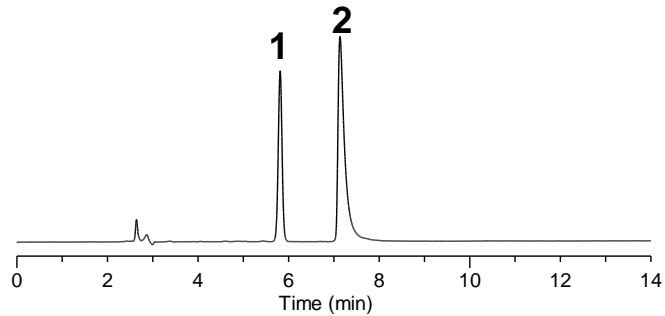
**Inertsil C8-4 5um**  
**4.6 x 250mm**



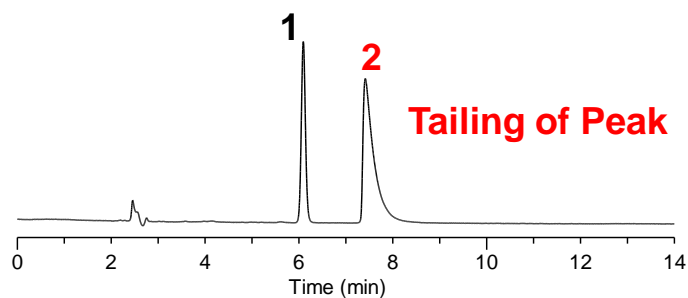
YMC-Pack Pro C8 5um  
4.6mm x 250mm (S/N: 0425020742W)



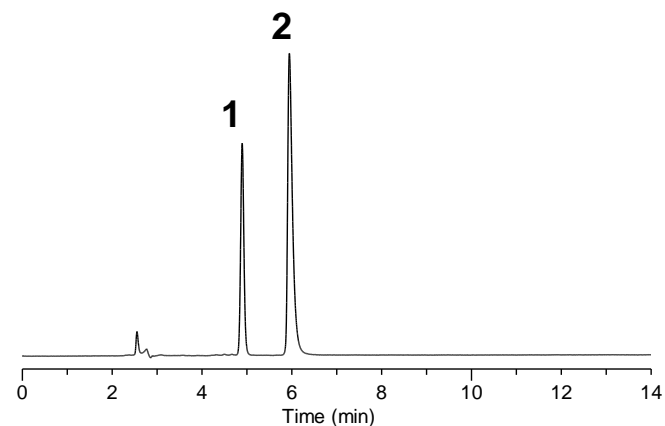
ZORBAX Eclipse-Plus C8 5um  
4.6mm x 250mm (S/N: USUTA01326)



Luna C8(2) 5um  
4.6mm x 250mm (S/N: 462435-6)



SunFire C8 5um  
4.6mm x 250mm (S/N: 01103914212103)



XBridge C8 5um  
4.6mm x 250mm (S/N: 01073909313003)

# Compare to the Competition for Basic Compounds

## Analytical Conditions

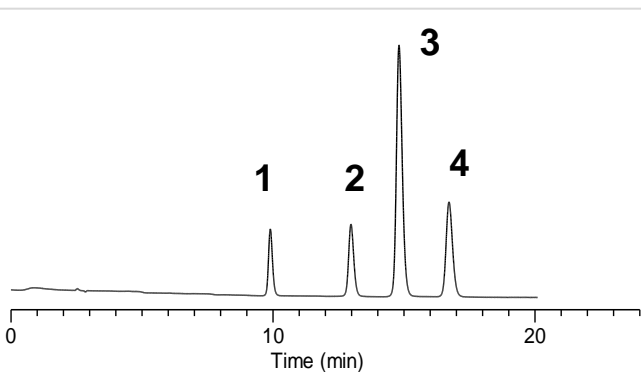
Eluent: A) CH<sub>3</sub>CN  
B) 25 mM Phosphate buffer ; pH 7.0  
(A / B) = (50 / 50)

Flow Rate: 1.0 mL/min

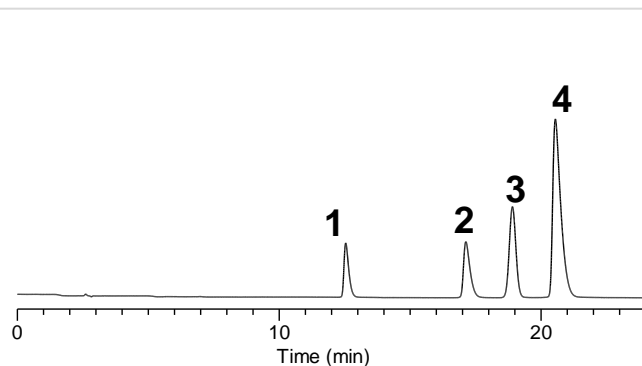
Col.Temp.: 40C

Detection: UV at 220 nm

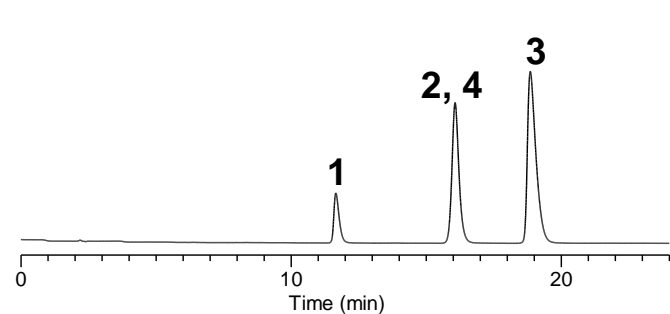
Sample: 1) Imipramine HCl (0.05 mg/mL)  
2) Amitriptyline HCl (0.05 mg/mL)  
3) Clomipramine HCl (0.2 mg/mL)  
4) Mianserine HCl (0.1 mg/mL)



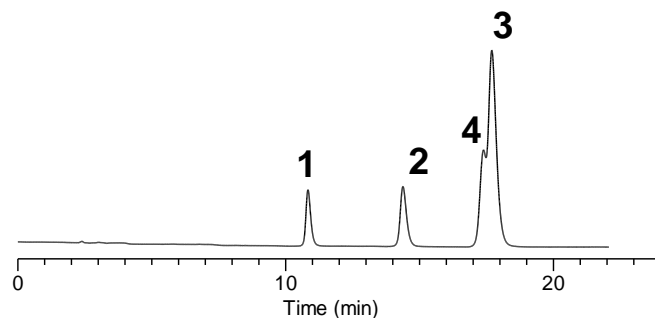
**Inertsil C8-4 5um**  
**4.6 x 250mm**



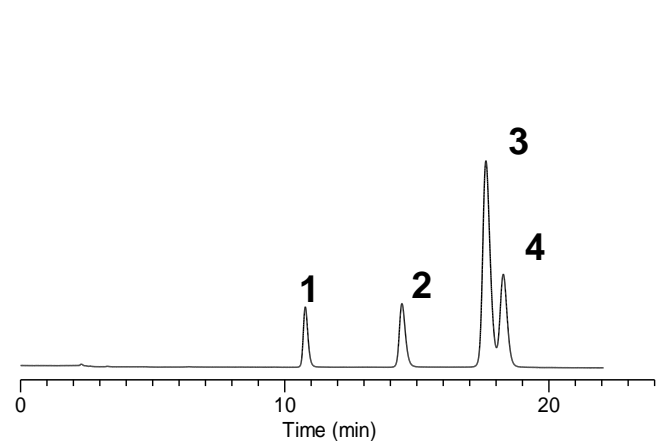
YMC-Pack Pro C8 5um  
4.6mm x 250mm (S/N: 0425020742W)



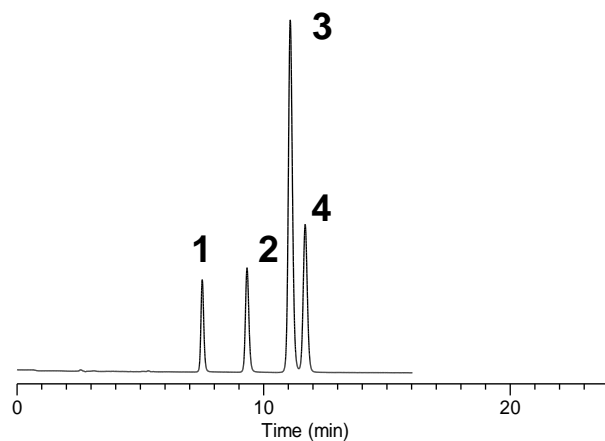
ZORBAX Eclipse-Plus C8 5um  
4.6mm x 250mm (S/N: USUTA01326)



Luna C8(2) 5um  
4.6mm x 250mm (S/N: 462435-6)



SunFire C8 5um  
4.6mm x 250mm (S/N: 01103914212103)



XBridge C8 5um  
4.6mm x 250mm (S/N: 01073909313003)

# Compare to the competition for strongly acidic compounds

Eluent: A) CH<sub>3</sub>CN  
B) 0.1% H<sub>3</sub>PO<sub>4</sub>  
(A / B) = (25 / 75)

Flow Rate: 1.0 mL/min

Col.Temp.: 40C

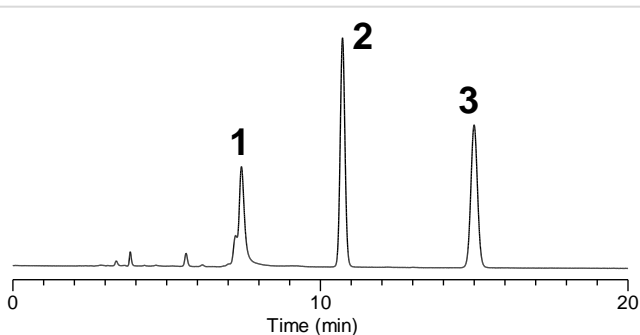
Detection: UV at 254 nm

Sample: 3.0 µL

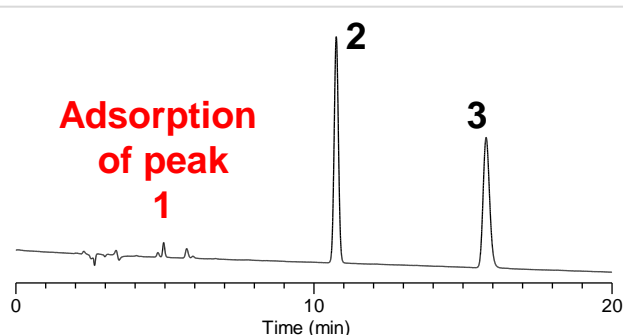
1) Brilliant Blue FCF (0.05 mg / mL)

2) Phenol (0.3 mg / mL)

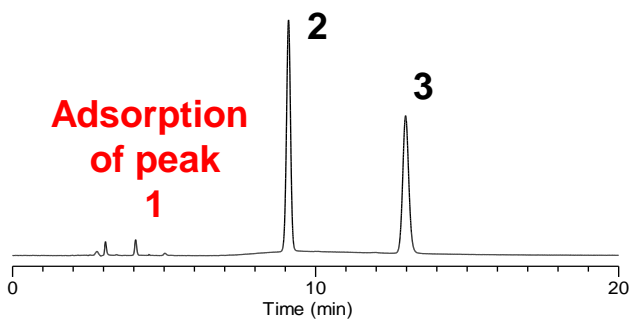
3) Salicylic acid (0.2 mg / mL)



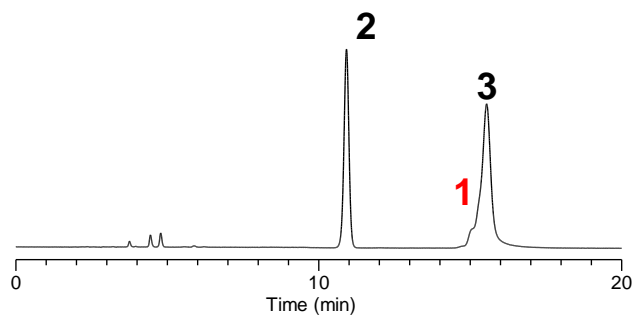
**Inertsil C8-4 5um**  
**4.6 x 250mm**



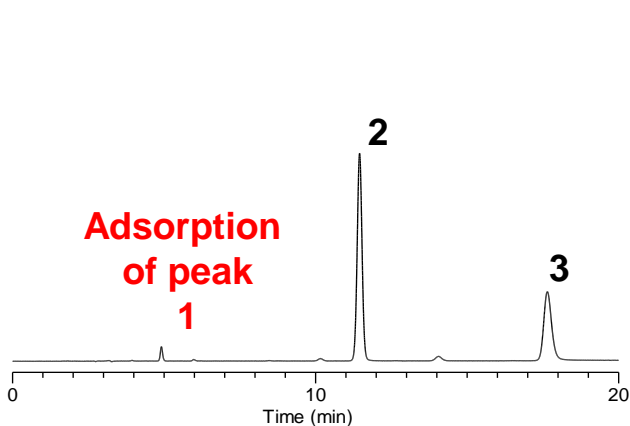
YMC-Pack Pro C8 5um  
4.6mm x 250mm (S/N: 0425020742W)



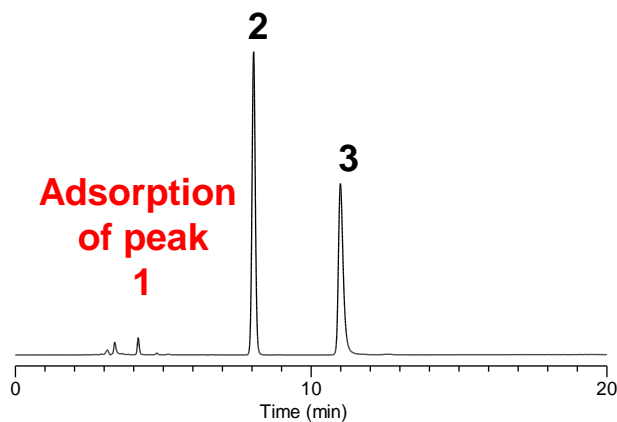
ZORBAX Eclipse-Plus C8 5um  
4.6mm x 250mm (S/N: USUTA01326)



Luna C8(2) 5um  
4.6mm x 250mm (S/N: 462435-6)



SunFire C8 5um  
4.6mm x 250mm (S/N: 01103914212103)



XBridge C8 5um  
4.6mm x 250mm (S/N: 01073909313003)

# Compare to the Competition for Strong Chelator

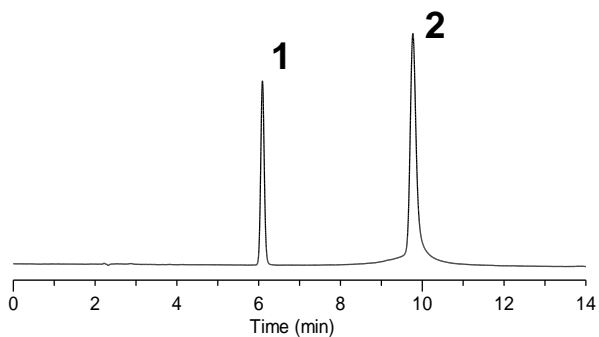
Eluent: A) CH<sub>3</sub>CN  
B) 0.1% H<sub>3</sub>PO<sub>4</sub>  
(A / B) = (40 / 60)

Flow Rate: 1.0 mL/min

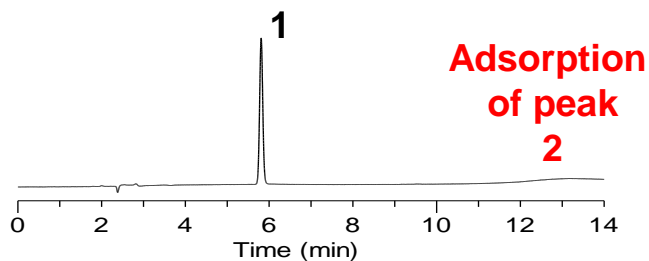
Col.Temp.: 40C

Detection: UV at 254 nm

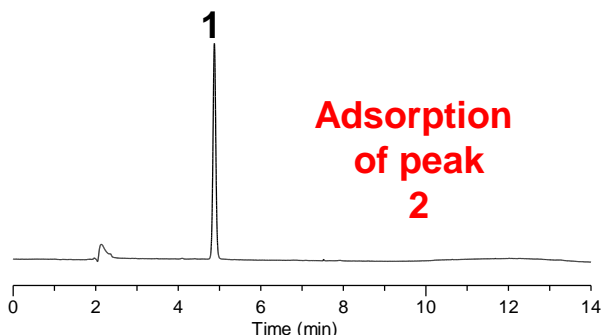
Sample: 2.0 µL  
1) Phenol (0.25 mg/mL)  
2) β-Thujaplicin/Hinokitiol (0.05 mg/mL)



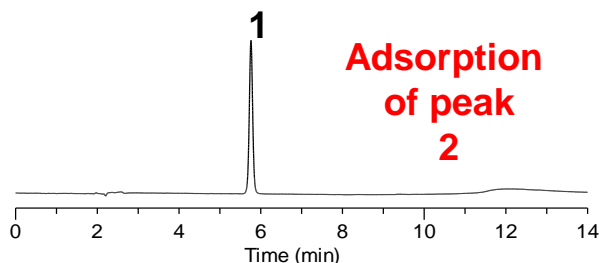
**Inertsil C8-4 5um**  
**4.6 x 250mm**



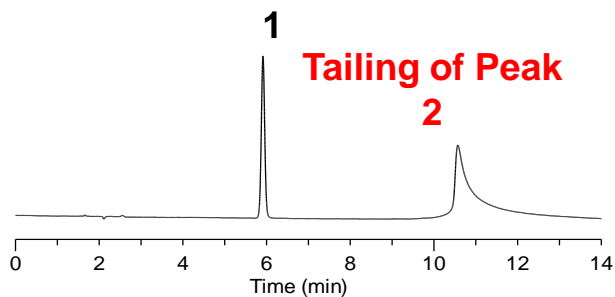
YMC-Pack Pro C8 5um  
4.6mm x 250mm (S/N: 0425020742W)



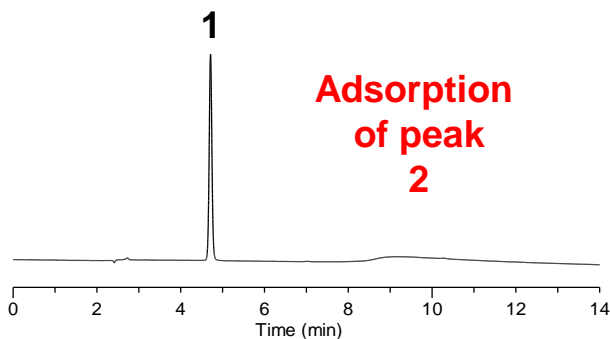
ZORBAX Eclipse-Plus C8 5um  
4.6mm x 250mm (S/N: USUTA01326)



Luna C8(2) 5um  
4.6mm x 250mm (S/N: 462435-6)



SunFire C8 5um  
4.6mm x 250mm (S/N: 01103914212103)



XBridge C8 5um  
4.6mm x 250mm (S/N: 01073909313003)

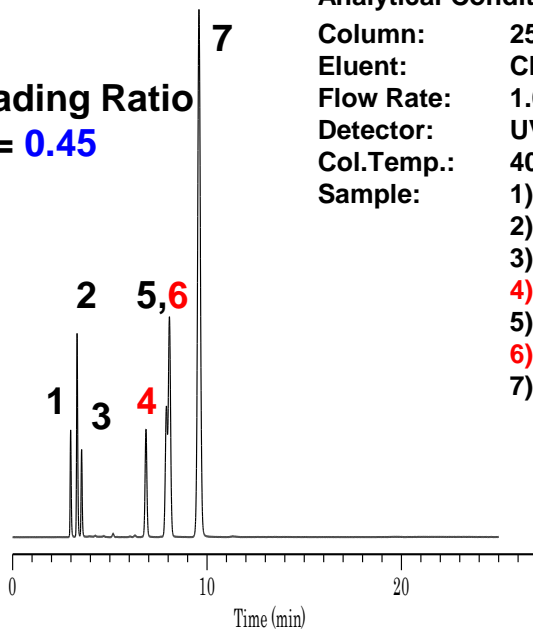
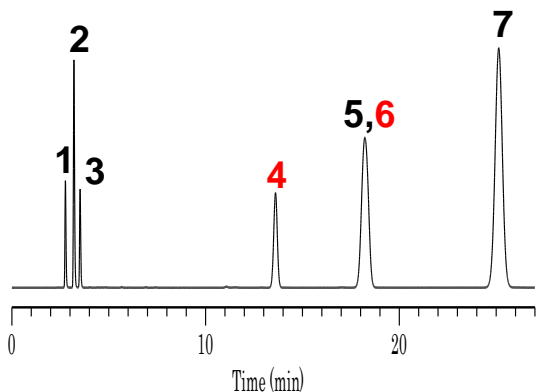
# Compare Inertsil ODS-4 / C8-4 with Competitor's ODS / C8 Families

## Analytical Conditions

Column: 250 x 4.6 mm I.D.  
 Eluent: CH<sub>3</sub>OH / H<sub>2</sub>O = 80 / 20  
 Flow Rate: 1.0 mL/min  
 Detector: UV 254nm  
 Col.Temp.: 40C  
 Sample:

- 1) Uracil
- 2) Caffeine
- 3) Phenol
- 4) Butylbenzene
- 5) o-Terphenyl
- 6) Amylbenzene
- 7) Triphenylene

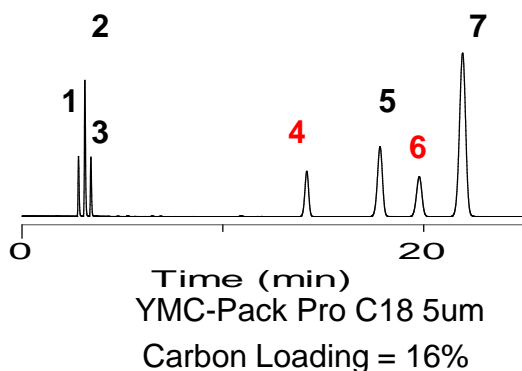
Carbon Loading Ratio  
 $5/11 = 0.45$



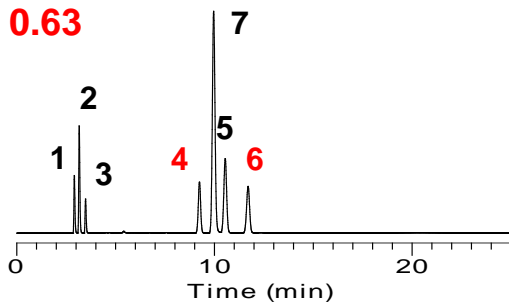
**Inertsil ODS-4 5um**  
**Carbon Loading = 11%**

**Inertsil C8-4 5um**  
**Carbon Loading = 5%**

Carbon Loading Ratio  
 $10/16 = 0.63$

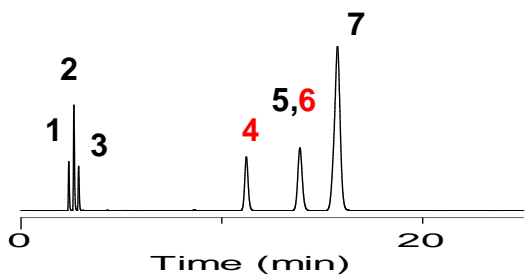


YMC-Pack Pro C18 5um  
 Carbon Loading = 16%

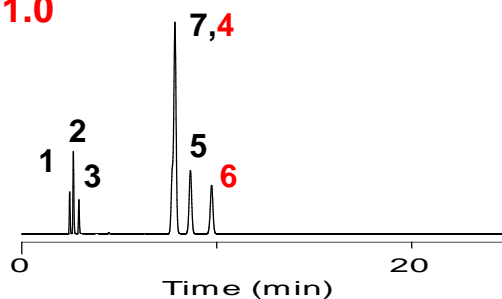


YMC-Pack Pro C8 5um  
 Carbon Loading = 10%

Carbon Loading Ratio  
 $8/8 = 1.0$



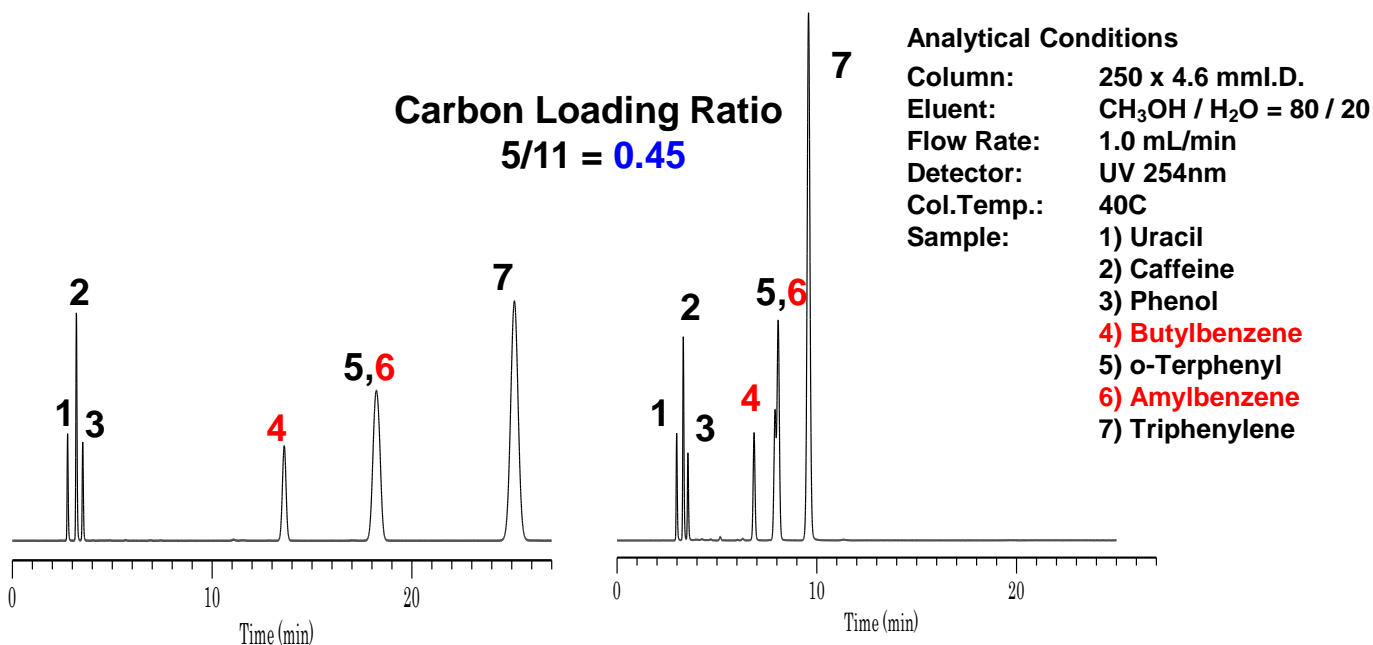
ZORBAX Eclipse-Plus C18 5um  
 Carbon Loading = 8%



ZORBAX Eclipse-Plus C8 5um  
 Carbon Loading = 8%

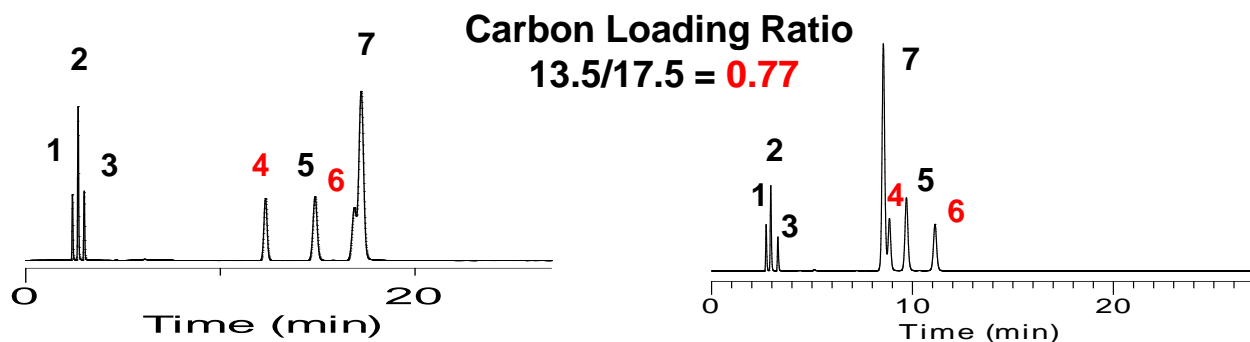


# Compare Inertsil ODS-4 / C8-4 with Competitor's ODS / C8 Families



**Inertsil ODS-4 5um**  
**Carbon Loading = 11%**

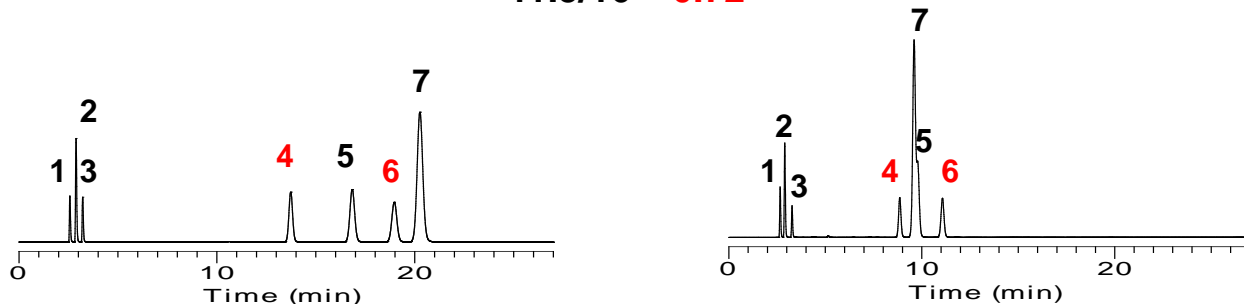
**Inertsil C8-4 5um**  
**Carbon Loading = 5%**



Luna C18(2) 5um  
Carbon Loading = 17.5%

Luna C8(2) 5um  
Carbon Loading = 13.5%

**Carbon Loading Ratio**  
 $11.5/16 = 0.72$

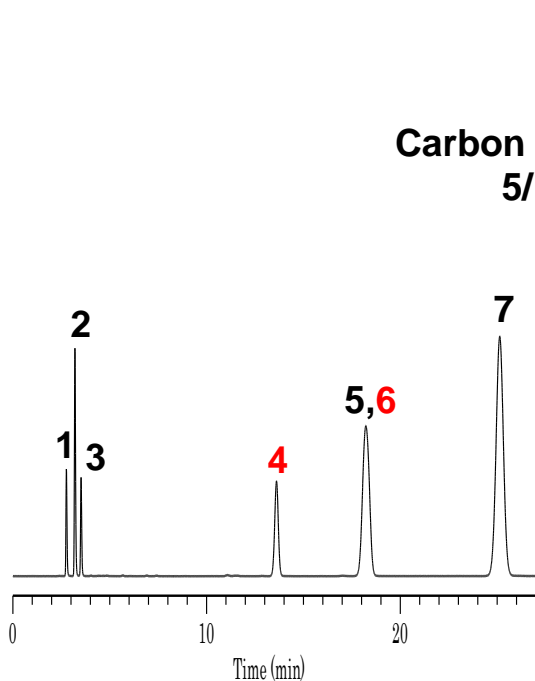


SunFire C18 5um  
Carbon Loading = 16%

SunFire C8 5um  
Carbon Loading = 11.5%

# Compare Inertsil ODS-4 / C8-4 to Waters XBridge ODS / C8

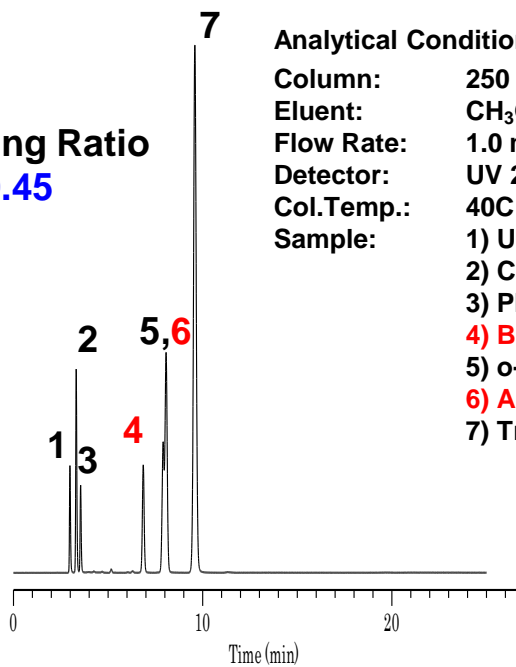
Carbon Loading Ratio  
 $5/11 = 0.45$



**Inertsil ODS-4 5um**  
**Carbon Loading = 11%**

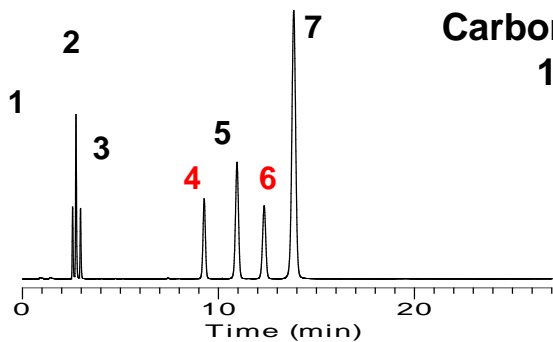
## Analytical Conditions

Column: 250 x 4.6 mm I.D.  
 Eluent: CH<sub>3</sub>OH / H<sub>2</sub>O = 80 / 20  
 Flow Rate: 1.0 mL/min  
 Detector: UV 254nm  
 Col.Temp.: 40C  
 Sample: 1) Uracil  
 2) Caffeine  
 3) Phenol  
 4) Butylbenzene  
 5) o-Terphenyl  
 6) Amylbenzene  
 7) Triphenylene

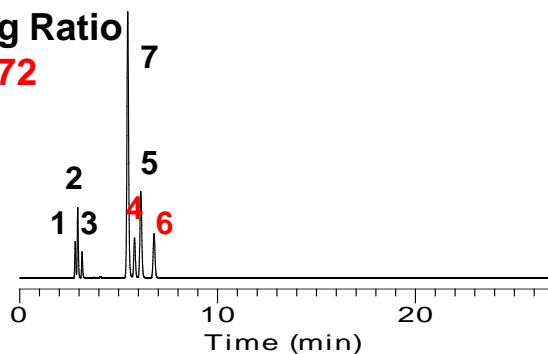


**Inertsil C8-4 5um**  
**Carbon Loading = 5%**

Carbon Loading Ratio  
 $13/18 = 0.72$



**XBridge C18 5um**  
**Carbon Loading = 18%**



**XBridge C8 5um**  
**Carbon Loading = 13%**