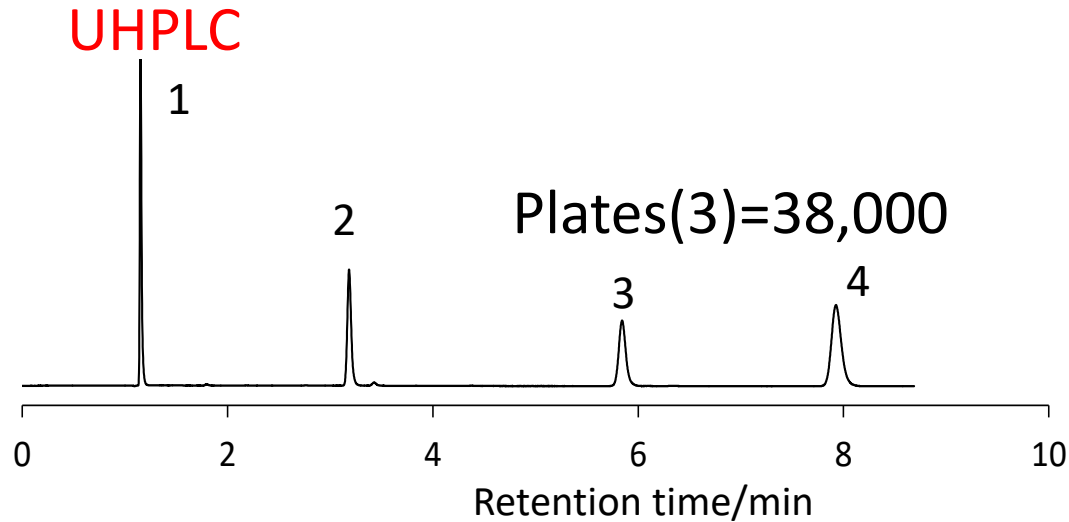


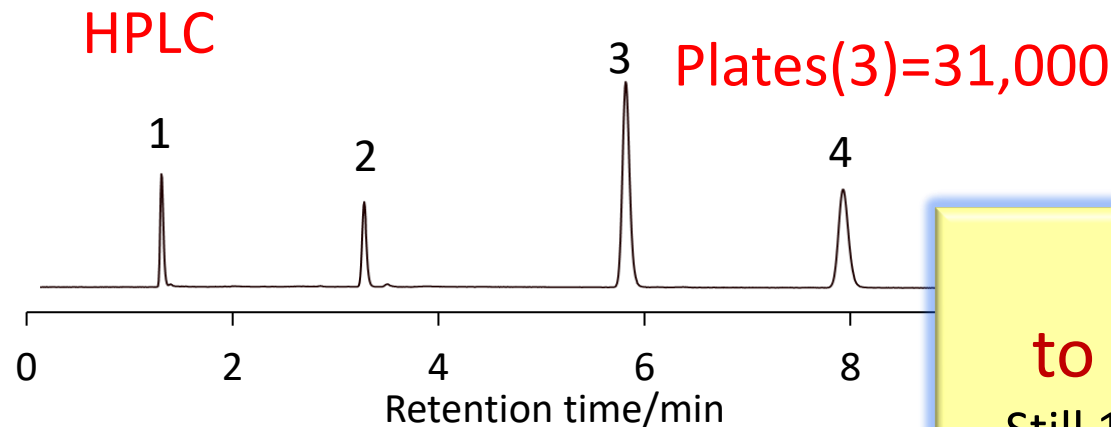
# Comparison between HPLC and UHPLC



Column: SunShell C18, 2.6  $\mu\text{m}$   
150 x 4.6 mm  
Mobile phase:  $\text{CH}_3\text{CN}/\text{H}_2\text{O}=70/30$   
Flow rate: 1.0 mL/min  
Pressure: 13.5 MPa  
Temperature: 25  $^\circ\text{C}$

Sample:

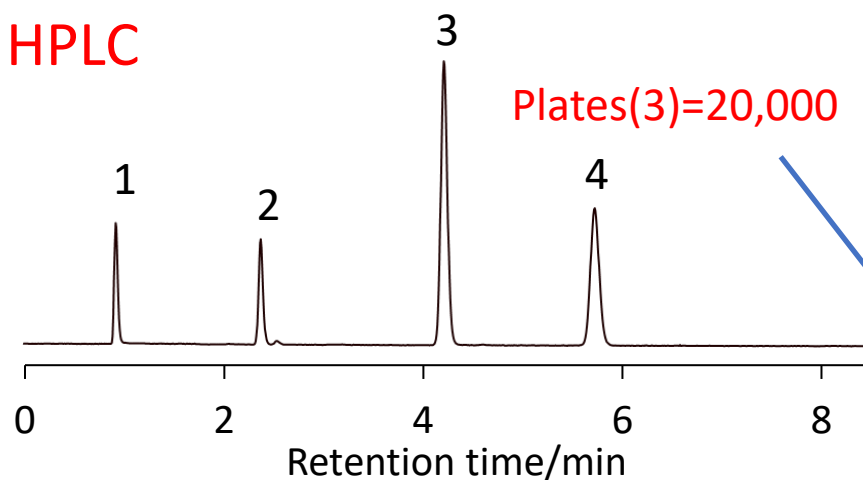
- 1 = Uracil
- 2 = Toluene
- 3 = Acenaphthene
- 4 = BUtylbenzene



**80% performance  
to compare with UHPLC**  
Still 1.5 times more separation than  
that of a 3  $\mu\text{m}$  column

# Separation of standard samples using HPLC

HPLC



Column: SunShell C18, 2.6  $\mu\text{m}$  100 x 4.6 mm  
150 x 4.6 mm

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

Flow rate: 1.0 mL/min

Pressure: 9.5 MPa, 13.5 MPa

Temperature: 25 °C

Sample: 1 = Uracil

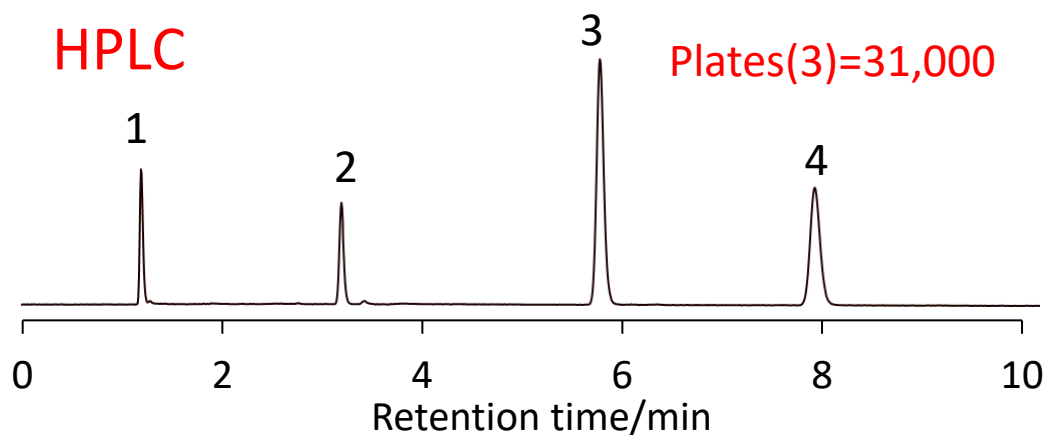
2 = Toluene

3 = Acenaphthene

4 = BUtylbenzene



HPLC



The same efficiency as 5  $\mu\text{m}$ ,  
250 x 4.6 mm



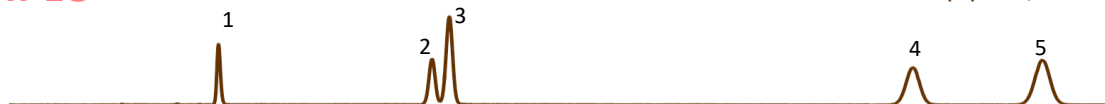
Saving 60% for analytical time  
and consumption of solvent

# Examples of transfer (isocratic separation)

**HPLC**

ACE C18, 5  $\mu\text{m}$  250 x 4.6 mm

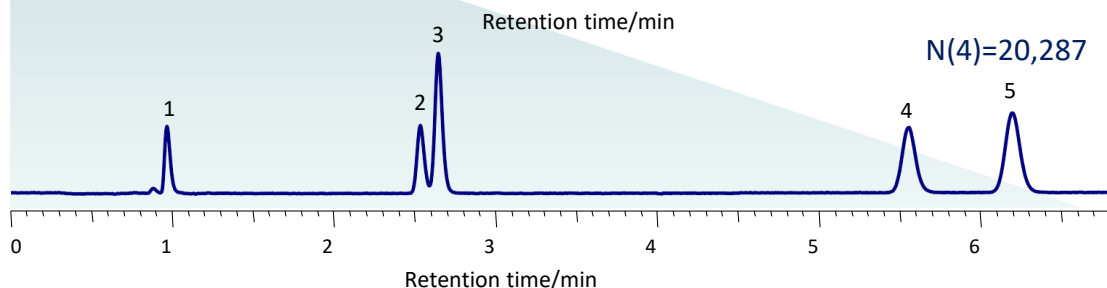
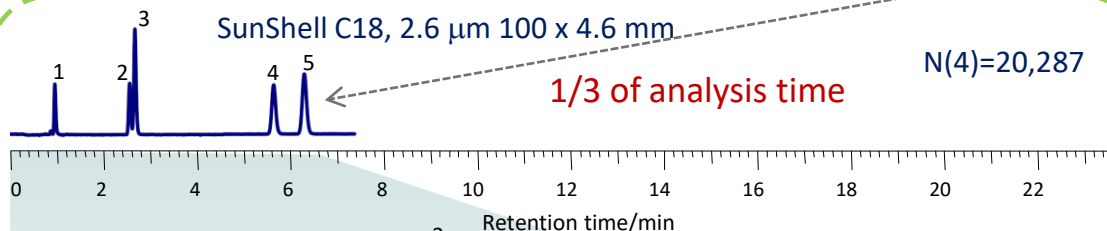
N(4)=19,313



SunShell C18, 2.6  $\mu\text{m}$  100 x 4.6 mm

N(4)=20,287

1/3 of analysis time



Column:

Brand F C18, 5  $\mu\text{m}$  250 x 4.6 mm

SunShell C18, 2.6  $\mu\text{m}$  100 x 4.6 mm

Mobile phase:

CH<sub>3</sub>CN/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  $\mu\text{m}$

13.4 MPa for SunShell C18 2.6  $\mu\text{m}$

Detection: UV@230 nm

Sample: 1 = Benzydamine

2 = Ketoprofen

3 = Naproxen

4 = Indomethacin

5 = Ibuprofen

**UHPLC**

1.0 mL/min

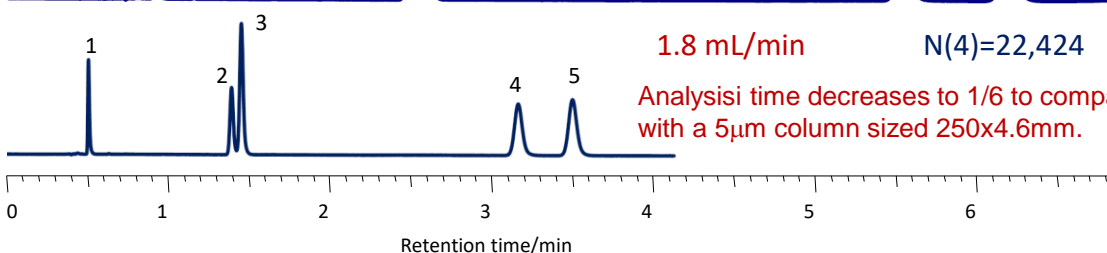
N(4)=24,124



1.8 mL/min

N(4)=22,424

Analysis time decreases to 1/6 to compare with a 5  $\mu\text{m}$  column sized 250x4.6mm.



HPLC: Hitachi LaChrom ELITE

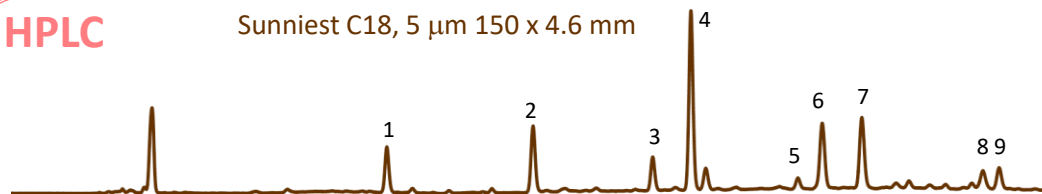
(using 0.25 mm i.d. tubing)

UHPLC: Jasco X-LC

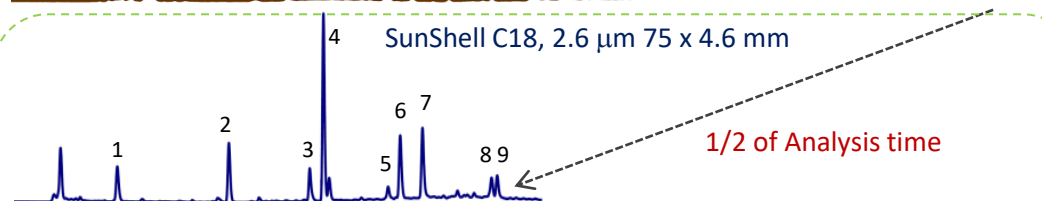
# Examples of transfer (gradient separation)

**HPLC**

Sunniest C18, 5  $\mu$ m 150 x 4.6 mm

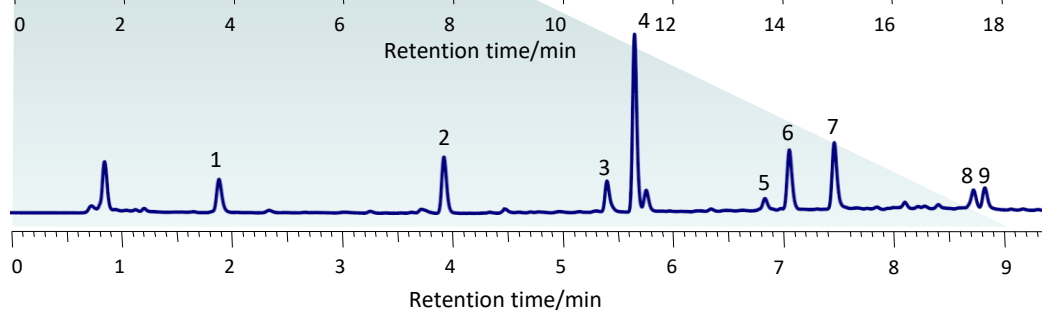


SunShell C18, 2.6  $\mu$ m 75 x 4.6 mm



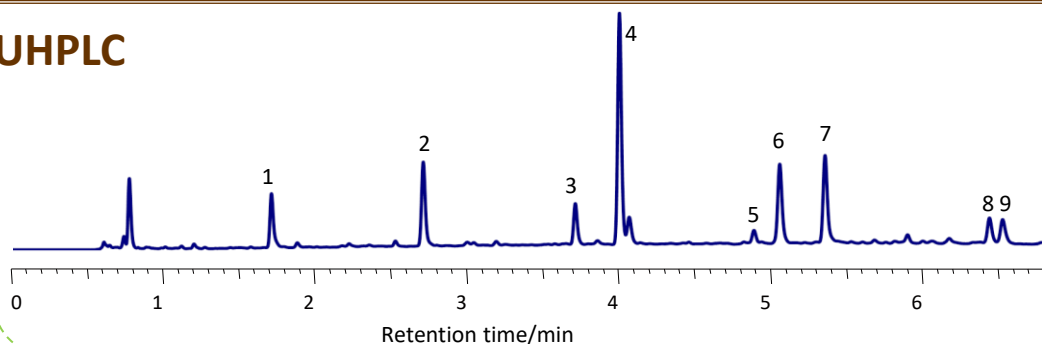
1/2 of Analysis time

Retention time/min



Retention time/min

**UHPLC**



Retention time/min

Column:

Sunniest C18, 5  $\mu$ m 150 x 4.6 mm

SunShell C18, 2.6  $\mu$ m 75 x 4.6 mm

Mobile phase:

A) 0.1% Phosphoric acid

B) CH<sub>3</sub>CN

Gradient program for Brand G C18

Time	0 min	15 min	20 min
%B	2%	25%	25%

for SunShell C18

Time	0 min	7.5 min	10 min
%B	2%	25%	25%

Flow rate: 1.0 mL/min,

Temperature: 25 °C

Detection: UV@250 nm

Sample: Oolong tea

1 = Gallic acid, 2 = Epigallocatechin, 3 = Catechin, 4 = Caffeine, 5 = Epicatechin, 6 = Epigallocatechin gallate, 7 = Gallic acid, 8 = Epicatechin gallate, 9 = Catechin gallate

HPLC: Hitachi LaChrom ELITE

(using 0.25 mm i.d. tubing)

UHPLC: Jasco X-LC