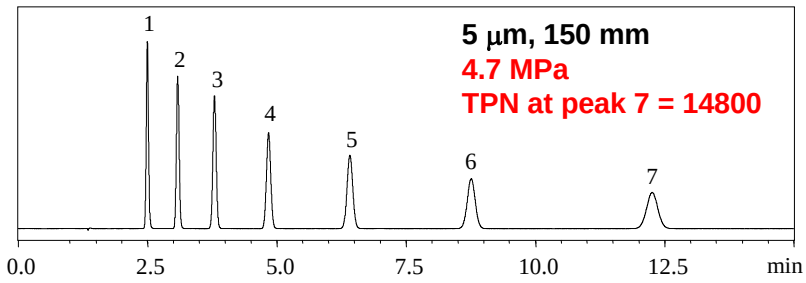
SHIMADZU

Nexera
Ultra High Performance Liquid Chromatograph

Nexera Application Data Sheet No. 3

The UHPLC with the Ultimate in Resolution

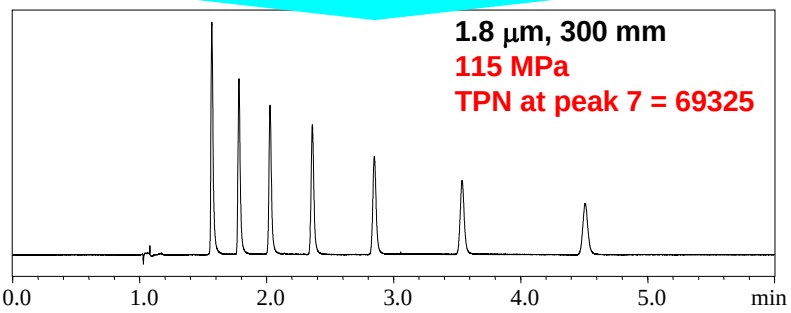
Nexera supports the use of long analytical columns thereby maximizing separation efficiency thanks to a high pressure limit of up to 130MPa. In this example, two 150 mm columns with 1.8 µm particle size were connected sequentially thereby increasing Nexera's theoretical plate number to about 70,000.



Column : ODS (4.6 mm I.D. x 150 mm, 5 µm)
Mobile Phase : Water/Acetonitrile = 3/7
Flow Rate : 1.0 mL/min
Column Temp. : 40 ℃
Detection : UV 245 nm

1. Acetophenone
2. Propiophenone
3. Butyrophenone
4. Valerophenone
5. Hexanophenone
6. Heptanophenone
7. Octanophenone

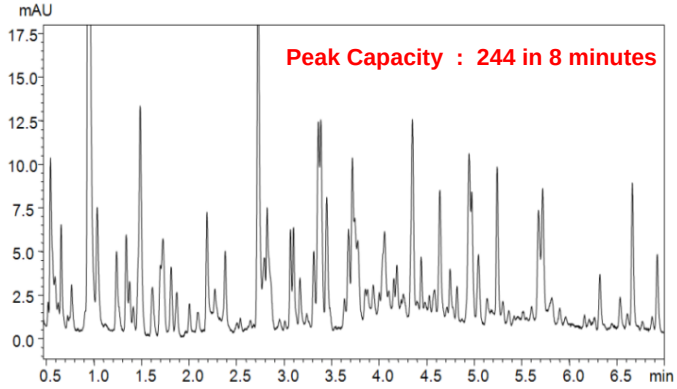
5 times higher separation efficiency



Column : ODS (2.1 mm I.D. x 150 mm x 2, 1.8 µm)
Mobile Phase : Water/Acetonitrile = 2/8
Flow Rate : 0.5 mL/min
Column Temp. : 50 ℃
Detection : UV 245 nm

Ultra-High Resolution Analysis of Trypsin-digested BSA

The peak capacity shows how many peaks can be separated during a given analysis time. For researchers it's a key factor in achieving high peak resolution of complex samples. The extremely small dead volume of Nexera insures high peak capacity of any analysis. As shown by a gradient elution of 1 pmol/µL of the BSA digested with Trypsin the peak capacity can reach 244 peaks in 8 minutes, or one peak every 2 seconds.



Trypsin Digested BSA

Column : ODS (2.1 mm I.D. x 100 mm, 1.8 µm)
Mobile Phase : A : 0.03% TFA in Water
B : 0.03% TFA in Acetonitrile
Gradient : B 5% → 40% (8 min)
Flow Rate : 0.9 mL/min
Column Temp. : 40 ℃
Detection : UV 214 nm

The following formula was used to calculate peak capacity: Peak Capacity $= \frac{t_g}{W} + 1$ where t_g is gradient time and W stands for the USP peak width.

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