Reduction of Solvent Consumption in HPLC (2020 #3) –Column Selection

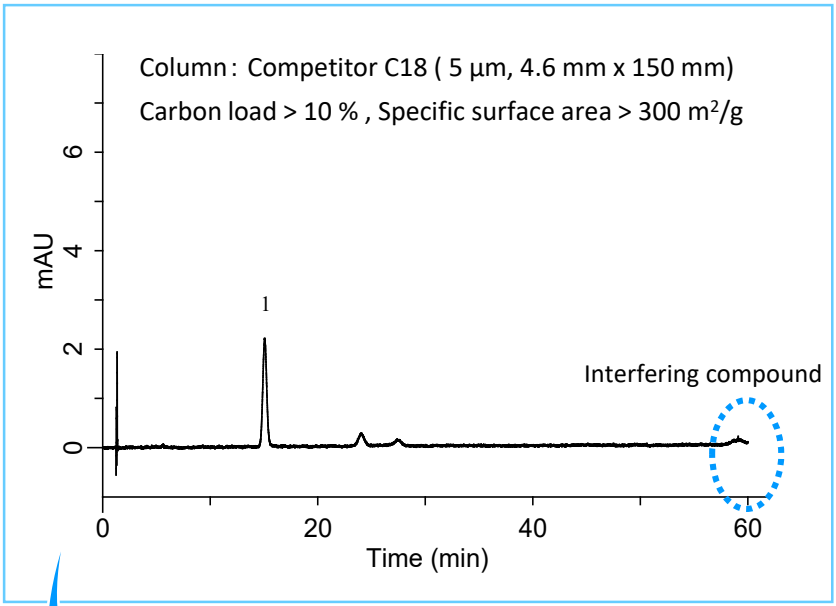
GL Sciences has been suggesting reduction of solvent consumption in HPLC for more than 15 years. This technical note describes how to reduce analysis times and solvent consumption by selection of C18 columns. The example here includes the use of low retentivity C18 columns and changing the column dimensions, which do not require adjustment of the isocratic conditions.

(K. Suzuki)

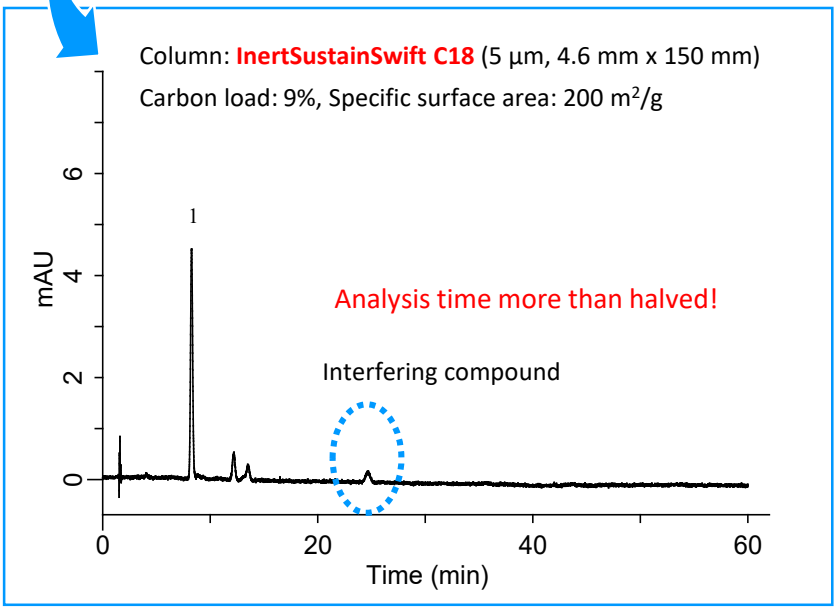
Low Retentivity C18 Columns

Analysis times and solvent consumption can be reduced only by changing the packing material without any change in conditions or column dimensions. Below is an example of column change from a high retentivity C18 column to InertSustainSwift C18, the retentivity of which is low because of a low carbon load (9%) and a small specific surface area (200 m^2/g). If the peaks are separated enough, this technique is recommended as a simple way to reduce the analysis time and solvent consumption.

Analysis of Carotenoids in Seawead



Change to a low retentivity column (same dimensions)



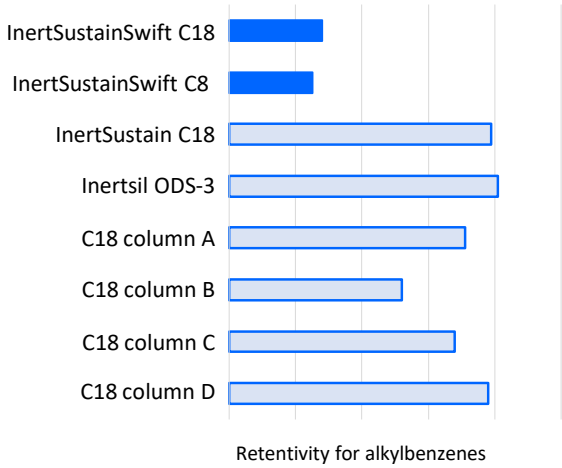
Conditions

System	: GL7700
Column	: C18 column A (5 µm, 4.6 mm x 150 mm)
Mobile phase	: A) CH_3CN B) H_2O A/B = 75/25, v/v
Flow rate	: 1.0 mL/min
Column Temp.	: 40 ℃
Detection	: VIS 500 nm
Inj. Vol.	: 20 µL
Analyte	: Seaweed extract

1. Fucoxanthin

Note: Please refer to LT030 for the sample pretreatment.

Comparison of retentivity among InertSustain and other brands' C18 columns



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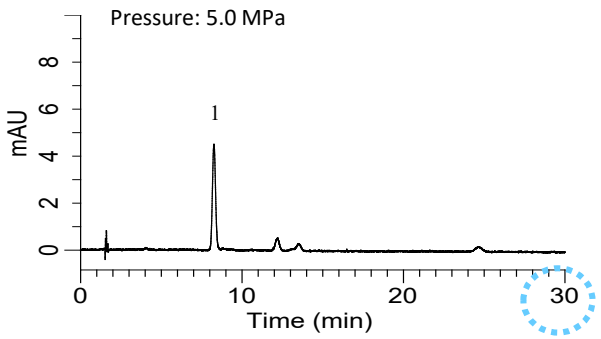
Further Reduction of Analysis Time is Possible!

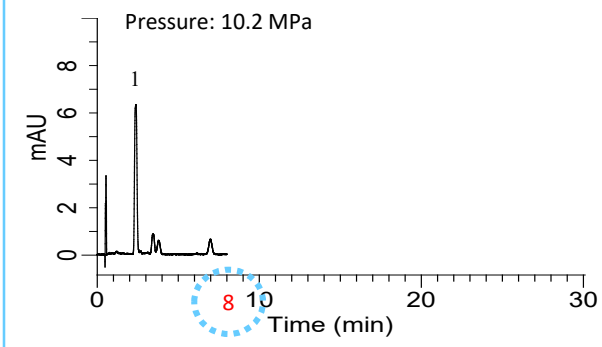
This technique does not require any change in the analytical conditions such as the mobile phase composition. In the example below, a 3-fold reduction of the analysis time is achieved by simply changing the particle diameter and column dimensions. This reduction of the analysis time also decreases the solvent consumption.

3-fold Reduction of Analysis Time and Solvent Consumption!

Column : InertSustainSwift C18
5 µm, 4.6 mm x 150 mm
Flow rate : 1.0 mL/min



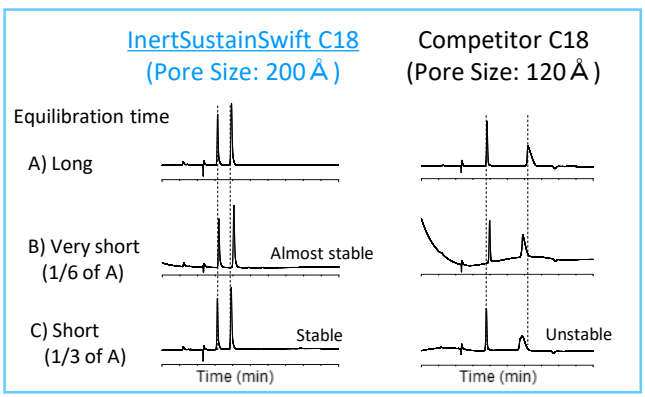
Column : InertSustainSwift C18
3 µm, 3.0 mm x 100 mm
Flow rate : 1.0 mL/min



Other Features of InertSustainSwift C18

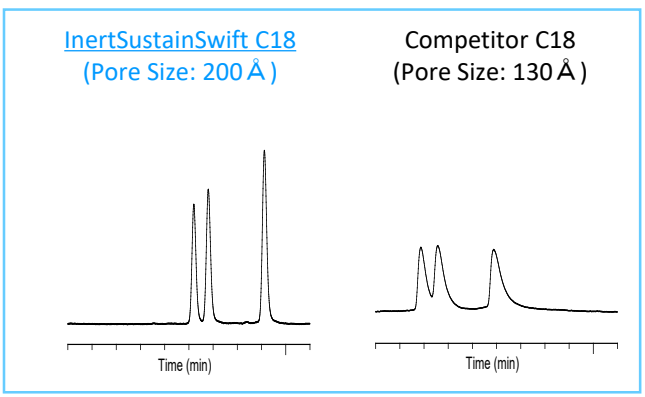
- Fast equilibration!
- For small and mid-sized (up to $M_w \approx 20{,}000$) molecules!

Comparison of Equilibration



Please contact us for more detailed technical information.

Analysis of 3 oligonucleic acids



Please refer to LB514 for the analytical conditions.

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