LC Technical Note
LT185
GL Sciences Inc.

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

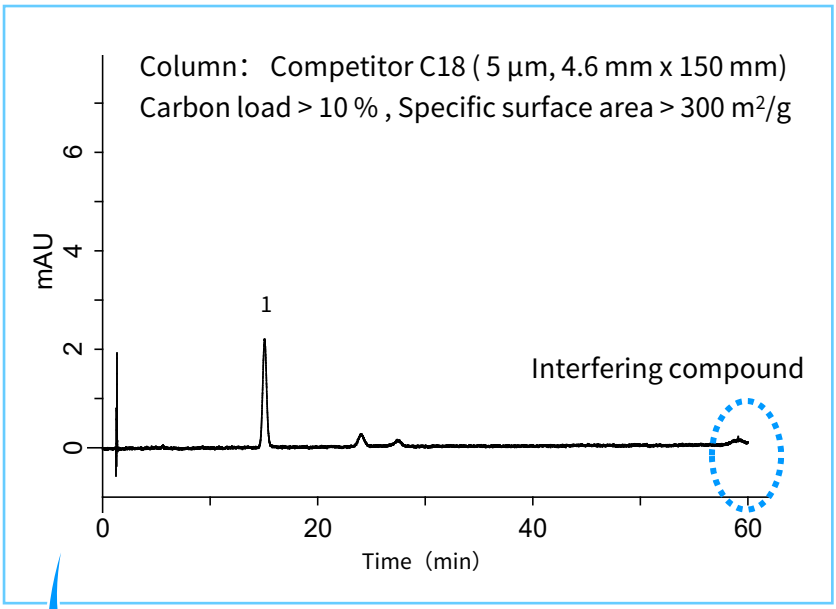
GL Sciences has been suggesting reduction of solvent consumption in HPLC for more than 15 years. This technical note describes how to reduce analysis times and solvent consumption by selection of C18 columns. The example here includes the use of low retentivity C18 columns and changing the column dimensions, 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

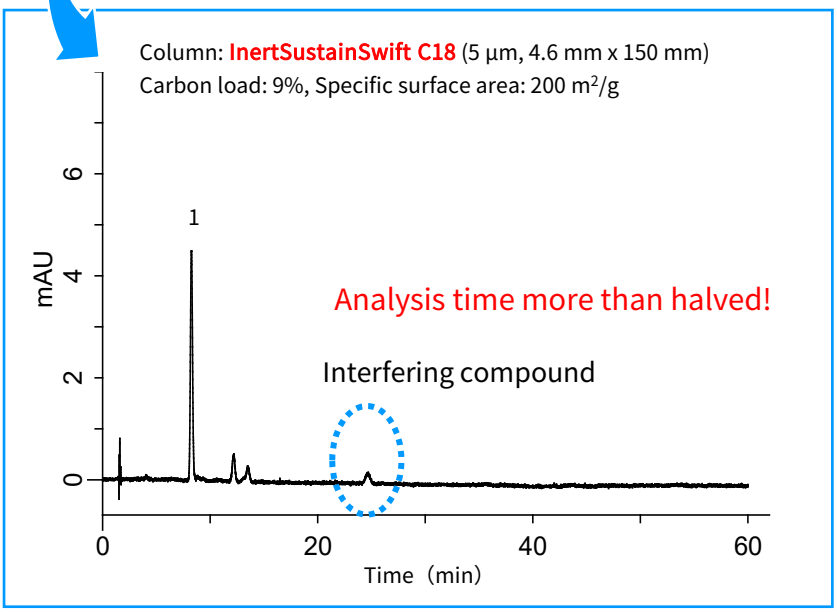


Conditions

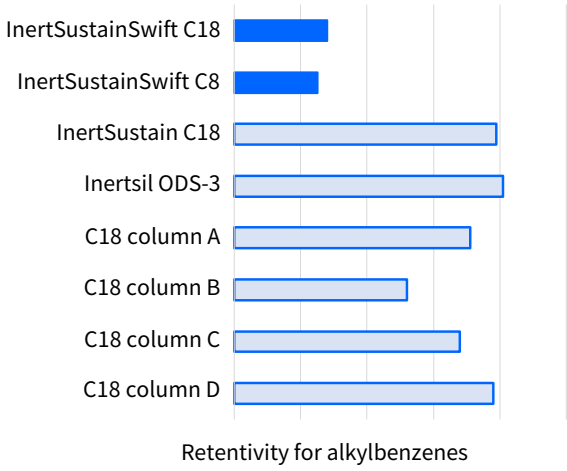
System	:	GL7700
Column	:	C18 column A (5 µm, 4.6 mm x 150 mm)
Mobile phase	:	A) CH_3CN B) H_2O A/B = 75/25, v/v
Flow rate	:	1.0 mL/min
Column Temp.	:	40 °C
Detection	:	VIS 500 nm
Inj. Vol.	:	20 µL
Analyte	:	Seaweed extract **1. Fucoxanthin**

Note: Please refer to LT030 for the sample pretreatment.

Change to a low retentivity column (same dimensions)



Comparison of retentivity among InertSustain and other brands' C18 columns



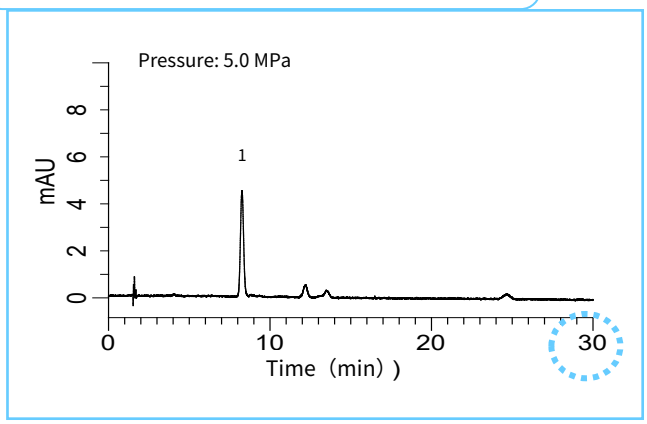
GL Sciences

Further Reduction of Analysis Time is Possible!

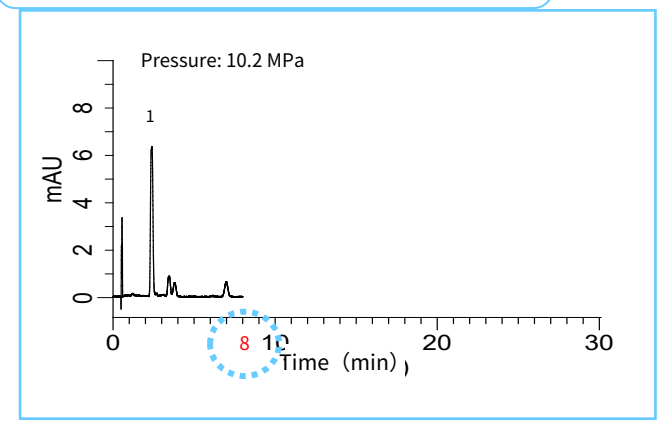
This technique does not require any change in the analytical conditions such as the mobile phase composition. In the example below, a 3-fold reduction of the analysis time is achieved by simply changing the particle diameter and column dimensions. This reduction of the analysis time also decreases the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

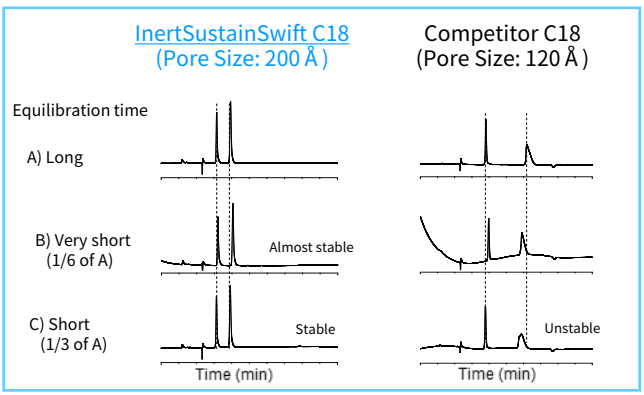


Other Features of InertSustainSwift C18

· Fast equilibration!

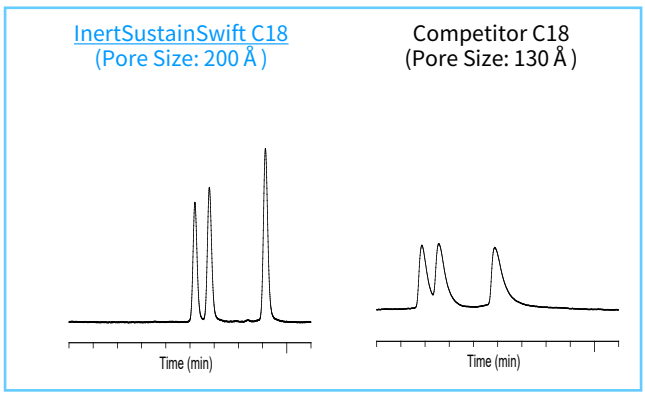
· For small and mid-sized (up to $M_w \approx 20{,}000$) molecules!

Comparison of Equilibration



Please contact us for more detailed technical information.

Analysis of 3 oligonucleic acids



Please refer to LB514 for the analytical conditions.

GL Sciences Inc. Japan
22-1 Nishishinjuku 6-chome
Shinjuku-ku, Tokyo
163-1130, Japan

Phone: +81-3-5323-6620
Fax: +81-3-5323-6621
Email: world@gls.co.jp
Web: www.glsciences.com

GL Sciences Inc. USA
4733 Torrance Blvd. Suite 255
Torrance, CA 90503
USA

Phone: +1-310-265-4424
Fax: +1-310-265-4425
Email: info@glsciencesinc.com
Web: www.glsciencesinc.com

GL Sciences B.V.
Dillenburgstraat 7C
5652AM, Eindhoven
The Netherlands

Phone: +31-40-254-9531
Email: info@glsciences.eu
Web: www.glsciences.eu

GL Sciences (Shanghai) Limited
Tower B, Room 2003
Far East International Plaza
No.317 Xianxia Road, Changning District
Shanghai, China 200051

Phone: +86-21-62782272
Email: contact@glsciences.com.cn
Web: www.glsciences.com.cn

GL Sciences
International Distributors
Visit our Website at www.glsciences.com/distributors