

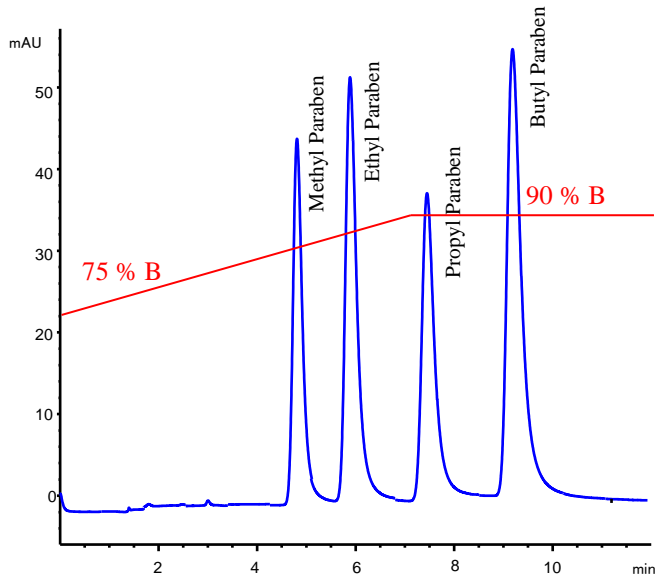
APPLICATION NOTE

STYROS® 2R Simulated-Monolith™ Polymeric Reversed Phase.

Advantages of using Narrow Bore instead of Normal Bore columns for LC separations.

The improvement of mass spectrometers has reached a point where the injection of a mixture allows the detection of its components without the need of any prior separation on an LC column. The focus is now the contamination of the samples due to the leaching of the LC columns.

In the present application, we are using a Narrow Bore column of 2.1 mm ID and suggest STYROS® polymeric media as Simulated-Monolith™ to replace Normal Bore columns of 4.6 mm ID.



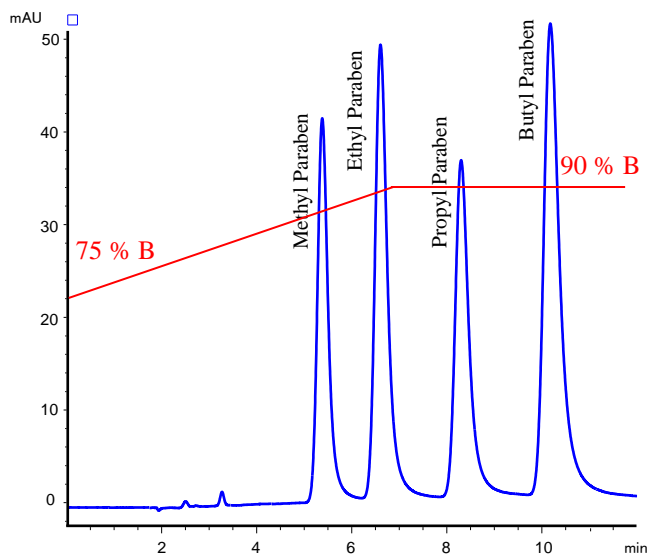
Chromatogram 1

Separation of 4 Parabens on **STYROS® 2R/XH** 4.6 x 150 mm
Flow Rate: 1 ml/min.

Table 1. Operating parameters.

HPLC System.	Agilent 1290 Infinity with thermostatted column compartment.
Columns	STYROS® 2R/XH 4.6X150 mm
Mobile phase.	A: DI H2O B: MeOH
Flow rate	1 ml/min.
Gradient	75 to 90 % B in 7 minutes at 1ml/min.
Temperature	30°C
Detection	254 nm
Injection volume	10 µl
Pressure Drop	165 bar at the start of gradient (includes the system pressure)
Sample:	Supelco HPLC Gradient System Mix part number 48270-U

This run is compared with a run using a Narrow Bore column of 2.1 mm ID and the same length. The total solvent used for the run was 12 ml compared to 2.4 ml with the Narrow Bore. 5 times less sample was used as well to generate less waste. The column requires regeneration which does contribute to unnecessary waste generation as well.



Chromatogram 2

Separation of 4 Parabens on **STYROS® 2R/NB** 2.1x150 mm
Flow Rate: 0.2 ml/min.

Table 2. Operating parameters.

HPLC System.	Agilent 1290 Infinity with thermostatted column compartment.
Columns	STYROS® 2R/NB 2.1X150 mm
Mobile phase.	A: DI H2O B: MeOH
Flow rate	0.2 ml/min.
Gradient	75 to 90 % B in 7 minutes at 0.2 ml/min.
Temperature	30°C
Detection	254 nm
Injection volume	2 µl
Pressure Drop	73 bar at the start of gradient (includes the system pressure)
Sample:	Supelco HPLC Gradient System Mix part number 48270-U

As Simulated-Monolith™ the separations can be run at high linear velocities and so can the column regeneration. Notice the high organic concentration during elution that is characteristic of STYROS® polymeric media. It is important to keep in mind the dwell volume of the instrument when using small bore columns as too large of a dwell volume is not helpful in properly achieving the required gradient.

