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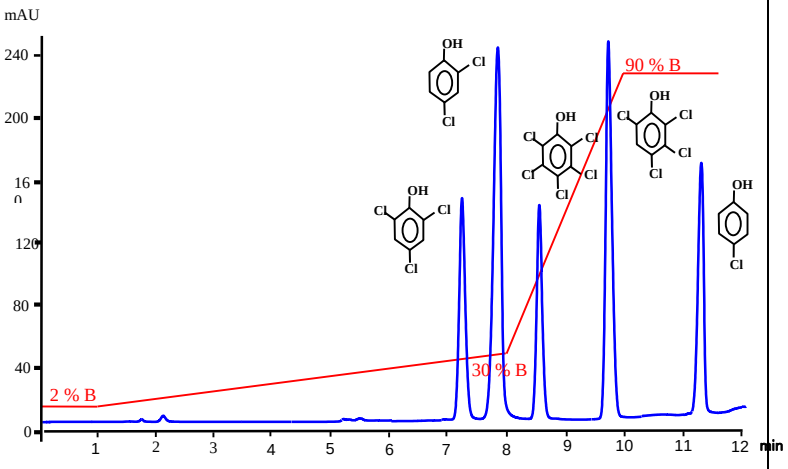
APPLICATION NOTE

STYROS® 2R Simulated-Monolith™ Polymeric Reversed Phase. Use of Narrow Bore column of 2.1 mm ID using high pH's to separate 5 Chlorophenols.

The use of polymerics at all pH's is an added advantage for the end user to explore better separations while keeping in mind the compatibility of the solvents' additives with mass spectrometers. The present application note highlights such advantage using 5 closely related Chlorophenols at basic pH's with smaller bore columns.



Chromatogram 1
Separation of 5 Chlorophenols on **STYROS® 2R/NB** Simulated-Monolith™
Flow Rate: 0.2 ml/min over 4,500 cm/hr. at basic pH.

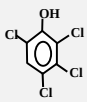
Operating parameters.

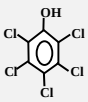
HPLC System.	Agilent 1290 with thermostatted column compartment.
Columns	**STYROS® 2R/NB 2.1 X 150 mm**
Mobile phase.	A: DI H2O with 20 mM NH4OH, pH=12 B: A:ACN, 5:95
Flow rate	0.2 ml/min over 4,500 cm/hr.
Gradient	2 % B for 1 min. to 30 % B in 8 min. to 90 % B in 10 minutes.
Temperature	60°C
Detection	254 nm
Injection volume	1 µl
Pressure Drop	40 bar (~580 psi) at the start of gradient
Sample:	0.2 mg/ml each of 5 Chlorophenols

p-chlorophenol 

2,4-dichlorophenol 

2,4,6-trichlorophenol 

2,3,4,6-tetrachlorophenol 

pentachlorophenol 

These are closely related compounds that exhibit baseline separations using a 2.1 x 150 mm STYROS® Simulated-Monolith™ reversed phase column:

Overall the advantages that Simulated-Monolith™ polymeric columns offer are notable:

- Similar to monolith, Simulated-Monolith™ does not have the restriction of pore size and is considered universal.
- The low pressure drop of the column allows its use in non UHPLC instruments as well.
- It provides the capability of longer columns to provide higher plates. (the column used for this application is 150 mm long, yet the pressure drop is only 40 bar at 0.2 ml/min and ~2 % ACN).
- As a hard gel polymeric it has the mechanical strength of silica without its brittleness and rigidity.
- It is inherently and uniformly hydrophobic and does not need any additional ligand for reversed phases.
- The higher retention of compounds compared to silica is also convenient for its use with mass spectrometers.
- The chemical stability provides a wider range of separation capability that cannot be explored with unstable media.
- The separation is based on fast convective process rather than the slow diffuse one.
- The reconditioning of the column is less time consuming.
- Separations can routinely be run at linear velocities of 9,000 cm/hr and above depending on the complexity of the samples and the requirements of the mass spectrometers.

Note the high amount of organic needed for complete sample elution and the low back pressure of the column.