

## A Polar Stationary Phase for Non-Polar Compounds: XSelect HSS Cyano Columns

- Highly stable chemistry for normal- and reversed-phase separations
- Versatile alternative to standard C<sub>18</sub> column chemistries
- Reproducible scaling and methods transfer from HPLC to UPLC® instrument platforms



The XSelect™ HSS (High Strength Silica) HPLC column family has a new selectivity option – Cyano [CN]. If you are used to using traditional reversed-phase ligands [*e.g.*, C<sub>8</sub>, C<sub>18</sub>] the XSelect HSS Cyano column will expand your ability to solve more chromatographic problems. Cyano phases are not exotic phases. In fact, XSelect HSS Cyano columns are designed using the most modern LC technology available, making them stable, reproducible and scalable to ACQUITY UPLC® sub-2 µm particles.

Selectivity differences are important for difficult separations. However, XSelect HSS Cyano columns are equally suited for when weaker chromatographic retention is desired for strongly retained compounds. When using C<sub>18</sub> phases, it is common practice to increase the organic content to reduce compound retention times. In this instance, it is much more cost effective to use a Cyano column. The moderate retention characteristics of a Cyano column allow you to use less organic solvent in the mobile phase giving you faster chromatography.

The XSelect HSS Cyano column uses multiple retention mechanisms to provide many options for achieving a desired separation. The featured nitrile group has a strong dipole interaction with polar compounds while the propyl ligand provides hydrophobic interaction with the analyte. One of the most versatile features of the Cyano column is its ability to be used in both reversed-phase and normal-phase chromatography.

### Achieve Faster Chromatography without Compromising Performance

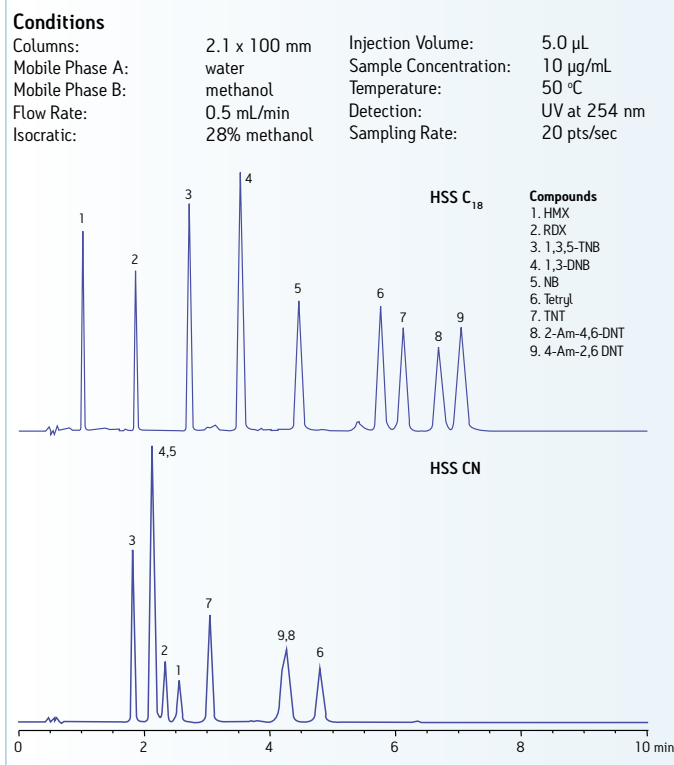


Figure 1. Using the XSelect HSS Cyano column provides alternative selectivity and decreased retention for very hydrophobic compounds. This example uses a standard mix of explosives with isocratic conditions, and shows a change in elution order with a decrease in retention for compounds 7, 8 and 9.

A Column for Both Reversed-Phase and Normal-Phase Applications

Reversed-Phase Conditions

Columns: XSelect HSS Cyano, 2.1 x 100 mm, 3.5 µm  
 Flow Rate: 0.361 mL/min  
 Isocratic Mobile Phase: 50/50 acetonitrile/water  
 Injection Volume: 0.6 µL  
 Run Time: 6.0 min  
 Temperature: 30 °C  
 Detection: UV at 240 nm  
 Sample Diluents: 50/50 acetonitrile/water

Normal-Phase Conditions

Columns: XSelect HSS Cyano, 2.1 x 100 mm, 3.5 µm  
 Isocratic Mobile Phase A: 94% hexane, 6% dichloromethane  
 Isocratic Mobile Phase B: IPA  
 Isocratic Condition: 87.2% A:12.8% B  
 Flow Rate: 0.361 mL/min  
 Injection Volume: 0.6 µL  
 Run Time: 6.0 min  
 Temperature: 30 °C  
 Detection: UV at 240 nm

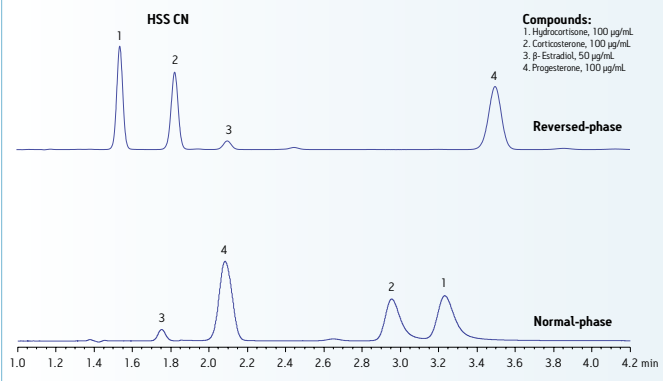


Figure 2. The XSelect HSS Cyano column can be used for both reversed-phase and normal-phase chromatography. Different selectivity is observed when a mixture of structurally similar steroids are separated using reversed-phase and normal-phase methods.

XSelect HSS Cyano Ligand Characteristics

Particle Size	2.5, 3.5, 5 µm
Ligand Density*	2.0 µmol/m <sup>2</sup>
Carbon Load*	5%
Endcap Style	None
pH Range	2-8
Low pH Temp. Limit	45 °C
High pH Temp. Limit	45 °C
Pore Diameter*	100Å
Surface Area*	230 m <sup>2</sup> /g

\*Expected or approximate value

ORDERING INFORMATION

XSelect HSS Cyano Columns

Dimension	Type	Particle Size	Part Number
1.0 x 50 mm	Column	3.5 µm	186005901
1.0 x 100 mm	Column	3.5 µm	186005903
1.0 x 150 mm	Column	3.5 µm	186005904
2.1 x 20 mm IS*	Column	3.5 µm	186005905
2.1 x 30 mm	Column	3.5 µm	186005906
2.1 x 50 mm	Column	3.5 µm	186005907
2.1 x 75 mm	Column	3.5 µm	186005908
2.1 x 100 mm	Column	3.5 µm	186005909
2.1 x 150 mm	Column	3.5 µm	186005910
3.0 x 20 mm IS	Column	3.5 µm	186005911
3.0 x 30 mm	Column	3.5 µm	186005912
3.0 x 50 mm	Column	3.5 µm	186005913
3.0 x 75 mm	Column	3.5 µm	186005914
3.0 x 100 mm	Column	3.5 µm	186005915
3.0 x 150 mm	Column	3.5 µm	186005916
4.6 x 20 mm IS	Column	3.5 µm	186005917
4.6 x 30 mm	Column	3.5 µm	186005918
4.6 x 50 mm	Column	3.5 µm	186005919
4.6 x 75 mm	Column	3.5 µm	186005920
4.6 x 100 mm	Column	3.5 µm	186005921
4.6 x 150 mm	Column	3.5 µm	186005922
4.6 x 250 mm	Column	3.5 µm	186005923
2.1 x 10 mm	Guard Cartridge, 2/pk	3.5 µm	186005924
3.0 x 20 mm	Guard Cartridge, 2/pk	3.5 µm	186005925
4.6 x 20 mm	Guard Cartridge, 2/pk	3.5 µm	186005926
2.1 x 20 mm IS	Column	5 µm	186005927
2.1 x 30 mm	Column	5 µm	186005928
2.1 x 50 mm	Column	5 µm	186005929
2.1 x 100 mm	Column	5 µm	186005931
2.1 x 150 mm	Column	5 µm	186005932
3.0 x 20 mm IS	Column	5 µm	186005933
3.0 x 30 mm	Column	5 µm	186005934
3.0 x 50 mm	Column	5 µm	186005935
3.0 x 100 mm	Column	5 µm	186005937
3.0 x 150 mm	Column	5 µm	186005938
3.0 x 250 mm	Column	5 µm	186005939
4.6 x 20 mm IS	Column	5 µm	186005940
4.6 x 30 mm	Column	5 µm	186005941
4.6 x 50 mm	Column	5 µm	186005942
4.6 x 75 mm	Column	5 µm	186005943
4.6 x 100 mm	Column	5 µm	186005944
4.6 x 150 mm	Column	5 µm	186005945
4.6 x 250 mm	Column	5 µm	186005946
2.1 x 10 mm	Guard Cartridge, 2/pk	5 µm	186005947
3.0 x 20 mm	Guard Cartridge, 2/pk	5 µm	186005948
4.6 x 20 mm	Guard Cartridge, 2/pk	5 µm	186005949

ACQUITY UPLC HSS Cyano Columns

Dimension	Type	Particle Size	Part Number
1.0 x 50 mm	Column	1.8 µm	186005982
1.0 x 100 mm	Column	1.8 µm	186005983
1.0 x 150 mm	Column	1.8 µm	186005984
2.1 x 30 mm	Column	1.8 µm	186005985
2.1 x 50 mm	Column	1.8 µm	186005986
2.1 x 75 mm	Column	1.8 µm	186005987
2.1 x 100 mm	Column	1.8 µm	186005988
2.1 x 150 mm	Column	1.8 µm	186005989
3.0 x 30 mm	Column	1.8 µm	186005990
3.0 x 50 mm	Column	1.8 µm	186005991
3.0 x 75 mm	Column	1.8 µm	186005992
3.0 x 100 mm	Column	1.8 µm	186005993
3.0 x 150 mm	Column	1.8 µm	186005994

VanGuard™ Pre-Column 3-Packs

Description	Dimension	Particle Size	Part Number
HSS Cyano	2.1 x 5 mm	1.8 µm	186005995

HSS Cyano Method Transfer Kits

Description	Particle Size	Part Number
HSS Cyano Method Transfer Kit	1.8, 5 µm	186006000
HSS Cyano Method Transfer Kit	1.8, 3.5 µm	186006001
HSS Cyano High Rs Method Transfer Kit	1.8, 3.5 µm	186006002

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 October 2011 720004108EN LS-PDF

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