An Innovative ODS column with amazing peak responses

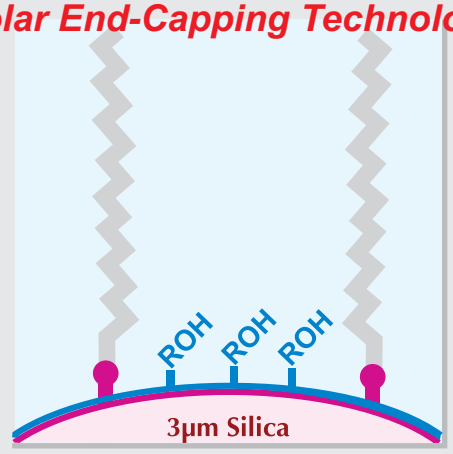
Cadenza *CX-C18*

A general purpose ODS phase for a wide-range of compound polarities
Amazing peak responses for basic compounds in formic acid mobile phase
Superior steric selectivity and molecular recognition for similar structures
Low pressure - high performance 3µm particles

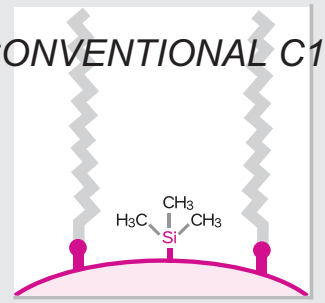
Spherical porous silica / 3um particle / 12nm pore / C18 phase / pH 2-10 / MW up to 10 kDa / USP L1

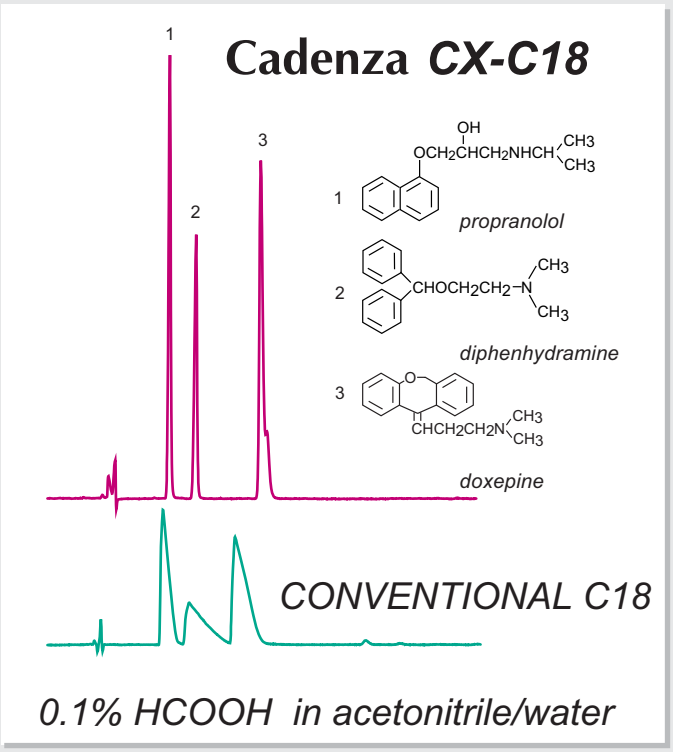
A Novel Surface Modification Technology

Polar End-Capping Technology



CONVENTIONAL C18





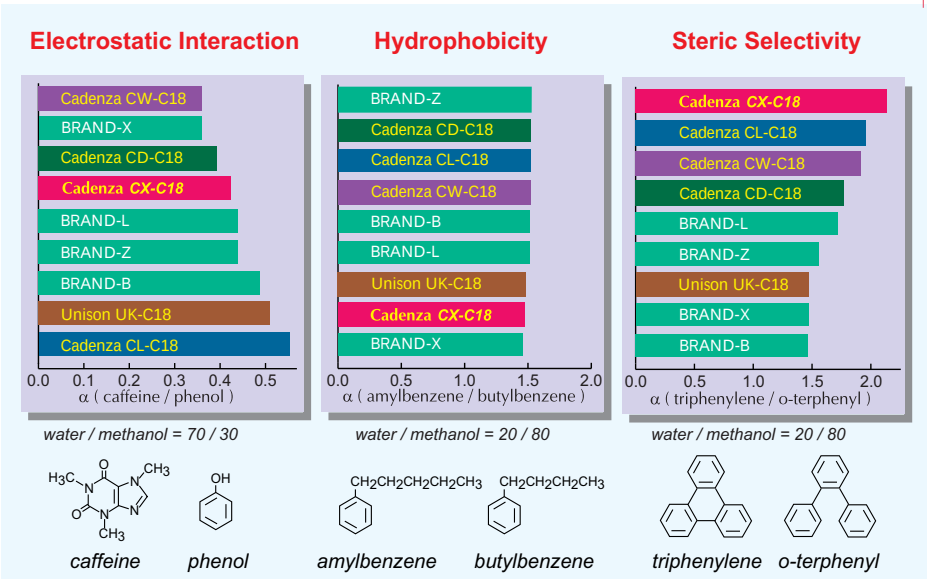
Conventional ODS columns, including hybrid-silica type columns, require extensive end-capping in order to decrease residual silanols, which may negatively affect peak shape for basic compounds. Traditionally, this end-capping process has used methyl silane compounds which have a mild hydrophobic interaction. Viewing this interaction in terms of reversed-phase mode, the surface of the stationary phase presents two very different kinds of hydrophobic structures, octadecyl ligands(C18) and the methyl end-capping. These different hydrophobicities may provide an inconsistent response against a solutes interaction with the stationary phase, resulting in poor peak shape and reduced plate counts.

Instead of relying on traditional end-capping with trimethyl silane (TMS) compounds, we have succeeded to develop a revolutionary surface modification technology using alcohol structures, which has been adapted to our brand new Cadenza CX-C18. This means that electrostatic interaction from the polar end-capped surface and hydrophobic interaction from the C18 ligand will localize the polarity of the surface and increase the recognition power of a complex compounds hydrophobic/hydrophilic structure. Therefore, Cadenza CX-C18 will have an alternative selectivity for certain compounds and possibly improved peak shape compared to conventional end-capped ODS columns.

Superior peak shape and molecular recognition

A novel polar end-capping technology for Cadenza CX-C18, vastly different from traditional methods, will improve peak response due to a dramatic reduction in residual surface silanols, and also improve molecular recognition.

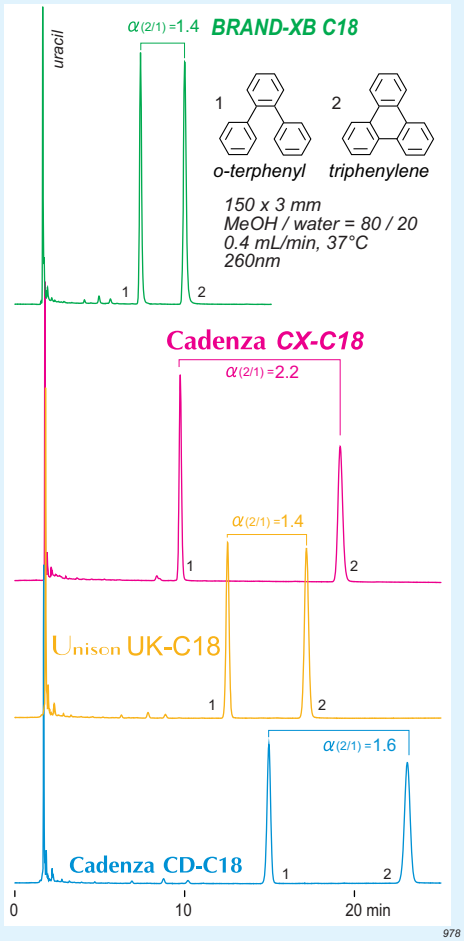
Basic Interactions



The unique polar end-capping structure on Cadenza CX-C18 provides significantly different retention and separation characteristics from traditionally end-capped C18 columns.
In terms of hydrophobicity, it is similar to more traditional material like our UK-C18, due to a similar ODS ligand density. Electrostatic interaction is much less than Unison UK-C18, but slightly higher than Cadenza CD-C18.
Steric selectivity is the largest among comparable ODS phases, due to the unique polar end-capping structure. High steric selectivity may be useful for isomer separation, especially for compounds that are not resolved well using traditional ODS columns.

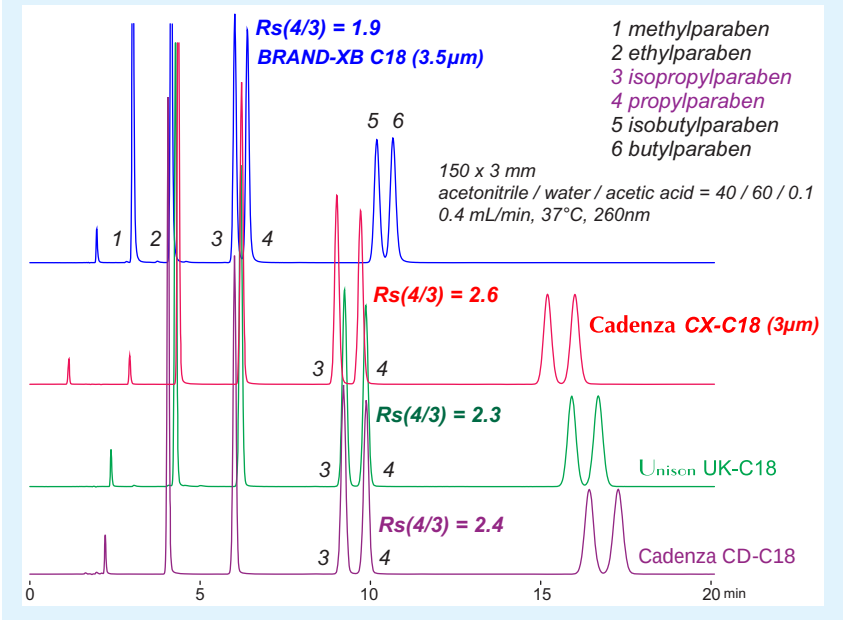
One example is the structural isomers of paraben. Here you can see that traditional ODS columns, relying predominantly on hydrophobic mechanisms, struggle with this isomer separation. Cadenza CX-C18 shows better results than our previous products and other company's columns, such as Brand-XB C18 column, highlighting the usefulness of its high steric selectivity.

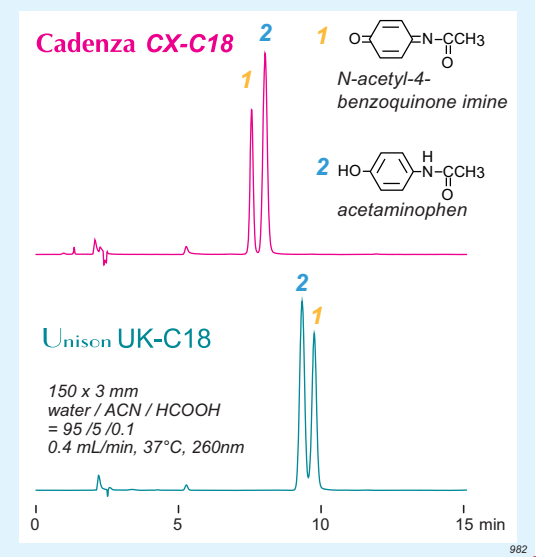
Steric Selectivity



Cadenza CX-C18 also benefits from having high molecular structure recognition.
A planer triphenylene and bulky terphenyl are well separated on CX-C18, due to the advantage of having a polar surface structure. It is worth noting here that the differences between these compounds are not hydrophobic.
Therefore, CX-C18 may be effective to resolve similar compounds where separation issues predominate using traditional ODS columns.

Isomers /Analogs





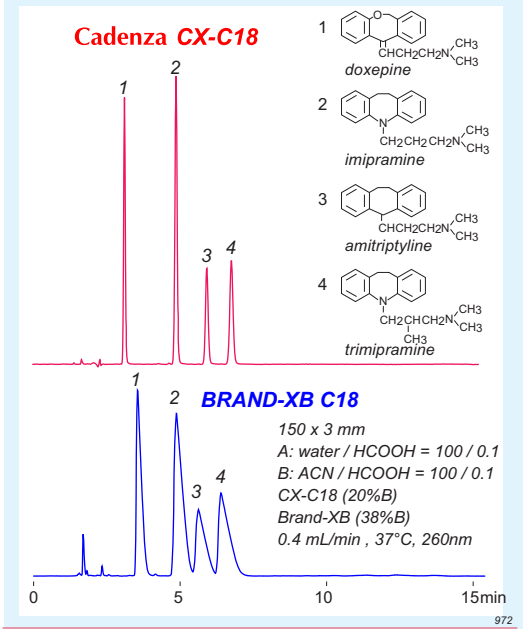
Comparing selectivity between CX-C18 and UK-C18, you can see that elution order was reversed for these compounds. This is likely due to differences in the surface polarity from the unique polar end-capping.

This is one example of how CX-C18 may be effective for changing selectivity compared to conventional ODS columns.

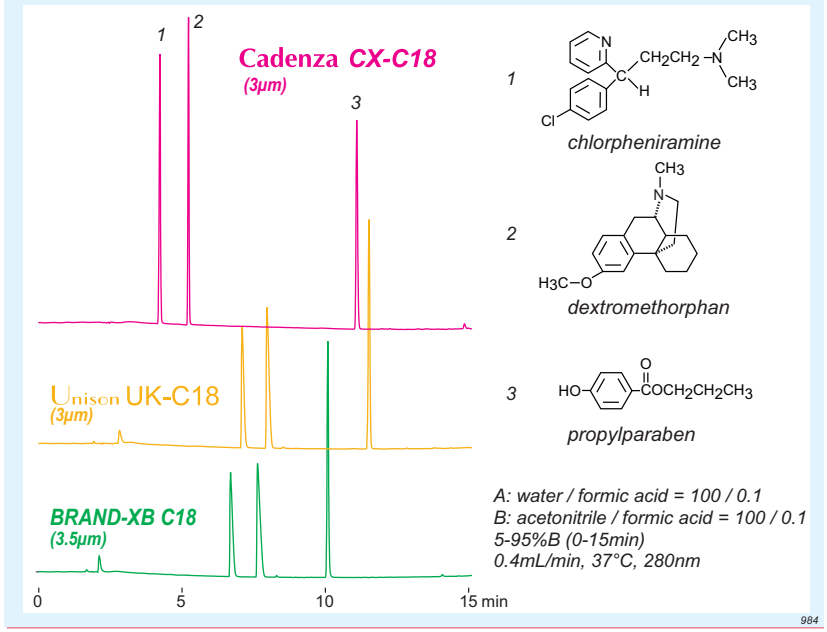
Excellent peak shape for basic compounds under acidic conditions

It is common to use acidic mobile phases when analyzing basic compounds, but this often leads to peak tailing. This is because the dissociated positive cation(s) on basic compounds may interact in an inconsistent way with residual silanol anions. Cadenza CX-C18, which has a homogeneous surface due to a more complete coverage of these surface silanols, provides excellent peak shape for basic compounds under acidic conditions.

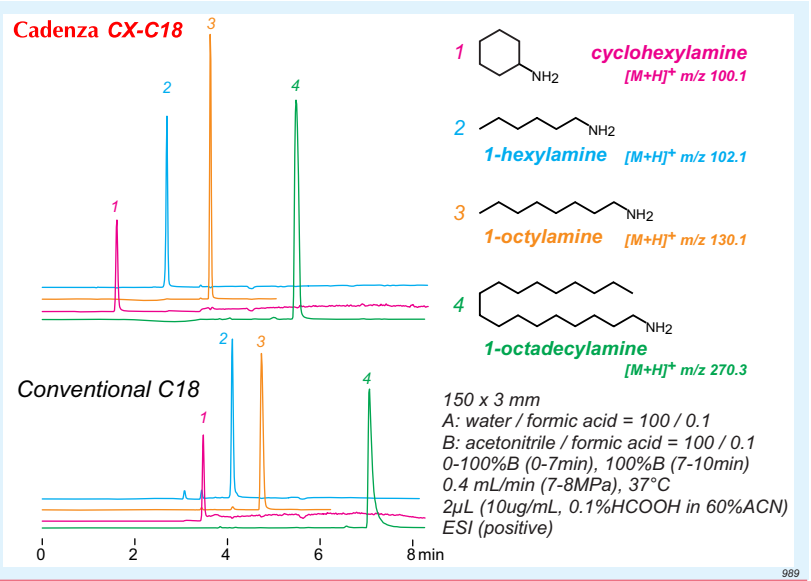
Basic Compounds (Acidic Mobile Phase)



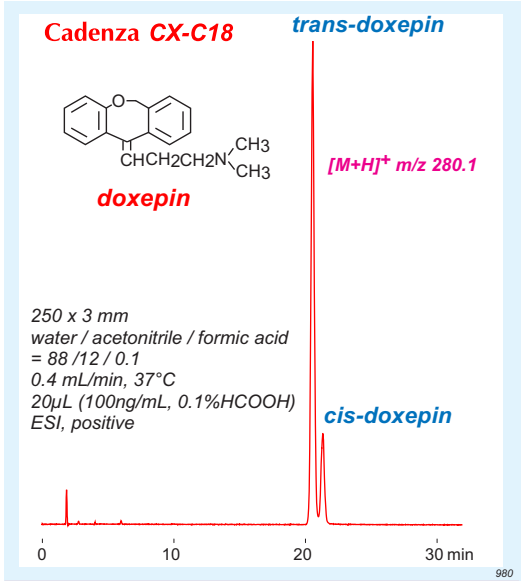
Tricyclic antidepresants tend to show peak tailing under acidic conditions. Cadenza CX-C18 provides excellent sharp peaks for these compounds.



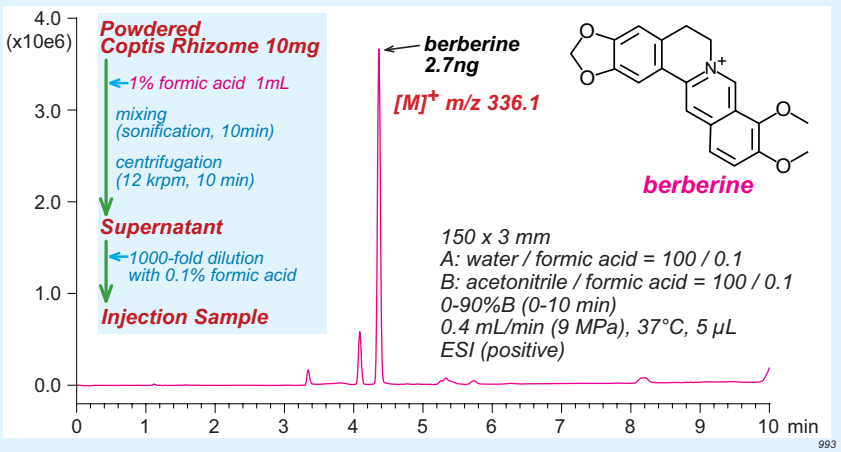
Basic drug compounds are a primary ingredient of cold medicine. Cadenza CX-C18 provides better peak shape, even under acidic conditions.



Cadenza CX-C18 will respond better, not only for polar compounds, but also hydrophobic amines under acidic conditions.



Doxepin has both cis and trans isomeric structures. Traditional columns struggle to separate these isomers under acid conditions using formic acid on LC-MS due to peak tailing. Cadenza CX-C18 shows dramatically reduced tailing under these conditions.

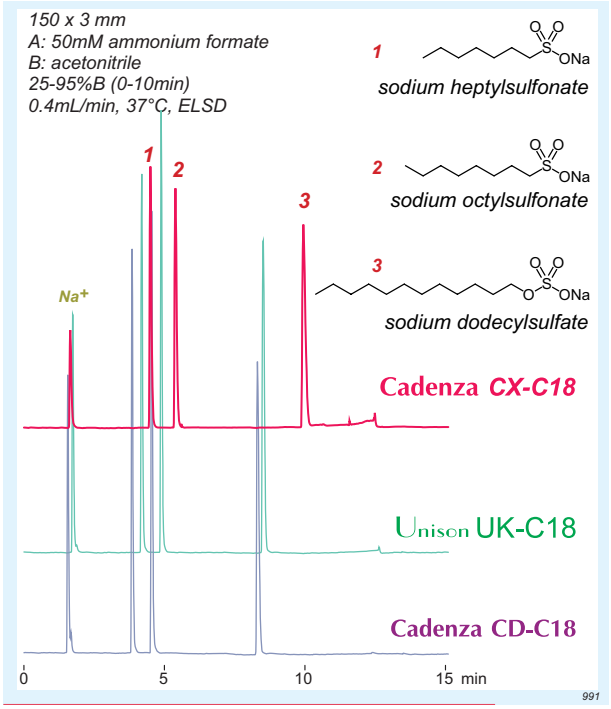


Berberine alkaloid in an herbal natural medicine is well analysed on LC-MS using Cadenza CX-C18 under acidic conditions

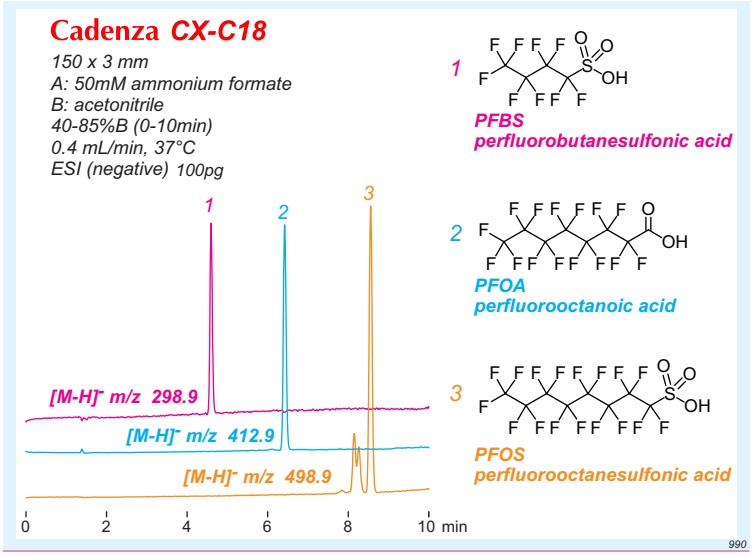
Compatibility for various compounds

Cadenza CX-C18 has the potential to analyze not only basic compounds but also a variety of acidic and neutral compounds with different selectivities.

Acidic Compounds

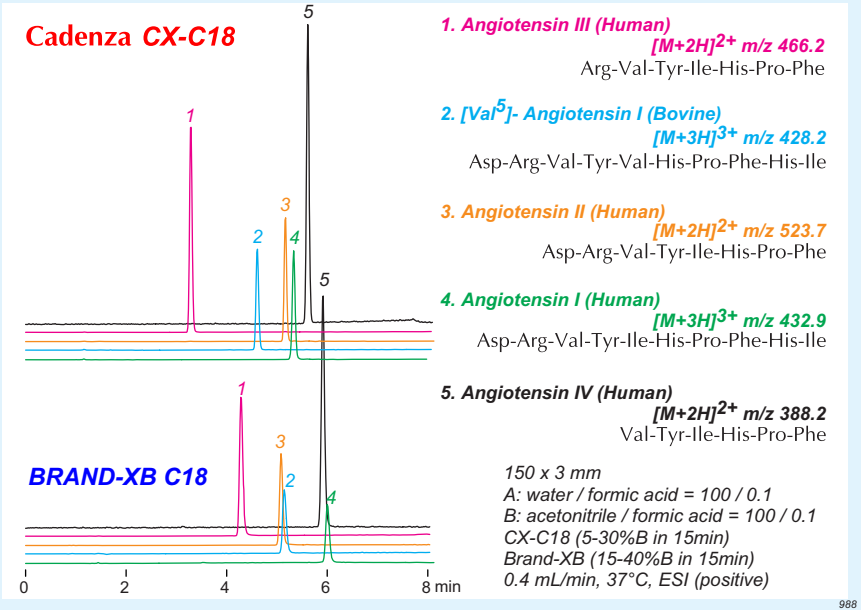


Cadenza CX-C18 enables separation of ionic detergents. These compounds are challenging because they have both hydrophobic chains and anionic functionality. Hydrophobic alkyl sulfate/sulfonate are well-retained and separated on Cadenza CX-C18.



Organo-fluoro compounds such as PFOS and PFOA are important in resolving issues related to the environment.
Cadenza CX-C18 enables high sensitivity LC-MS analysis, using neutral pH and ESI-Negative mode.

Peptide Selectivity



It is common to use formic acid mobile phases for peptide LC-MS analysis.

Cadenza CX-C18 has a benefit, not only for basic compounds, but also for peptides under acidic conditions.

Cadenza CX-C18 has many opportunities to improve peak shape and resolution for a wide variety of compound analyses under formic acid and LC-MS conditions.

PRODUCT INFORMATION

Micro/Nano and Metal-free columns are available.

PRODUCT NAME	COLUMN I.D.	COLUMN LENGTH	GUARD SYSTEM
Cadenza *CX-C18* (3µm) Cadenza *5CX-C18*(5µm)	1mm, 1.5mm, 2mm, 3mm 4.6mm, 6mm, 10mm 20mm(5µm), 28mm(5µm)	10mm, 20mm, 30mm, 50mm 75mm, 100mm, 150mm 250mm, 500mm(3µm)	Guard Holder Cartridge Column

Pacings: 3µm 5µm; Pore: 12nm, Stationary phase: Octadecyl, Polar end-capping, Pressure: 250bar (HT:500bar, UP:1000bar) , USP L1

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