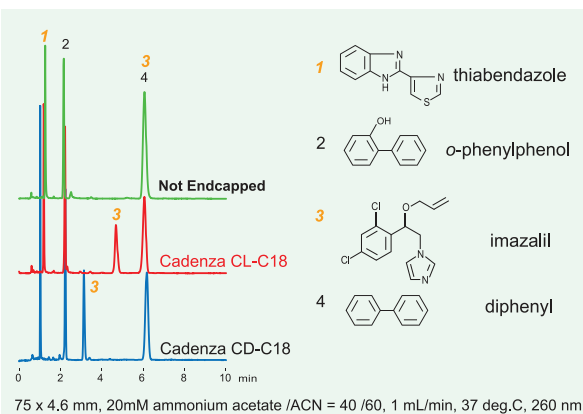
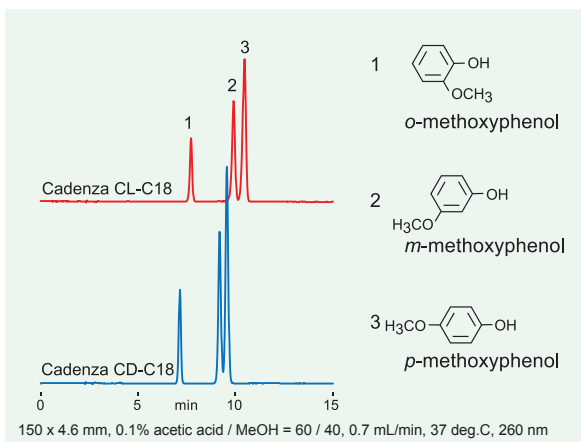


- Controlled, partial endcapping exposes residual silanols and offers unique selectivity
- Changing organic solvent varies the retention of steroid hormones

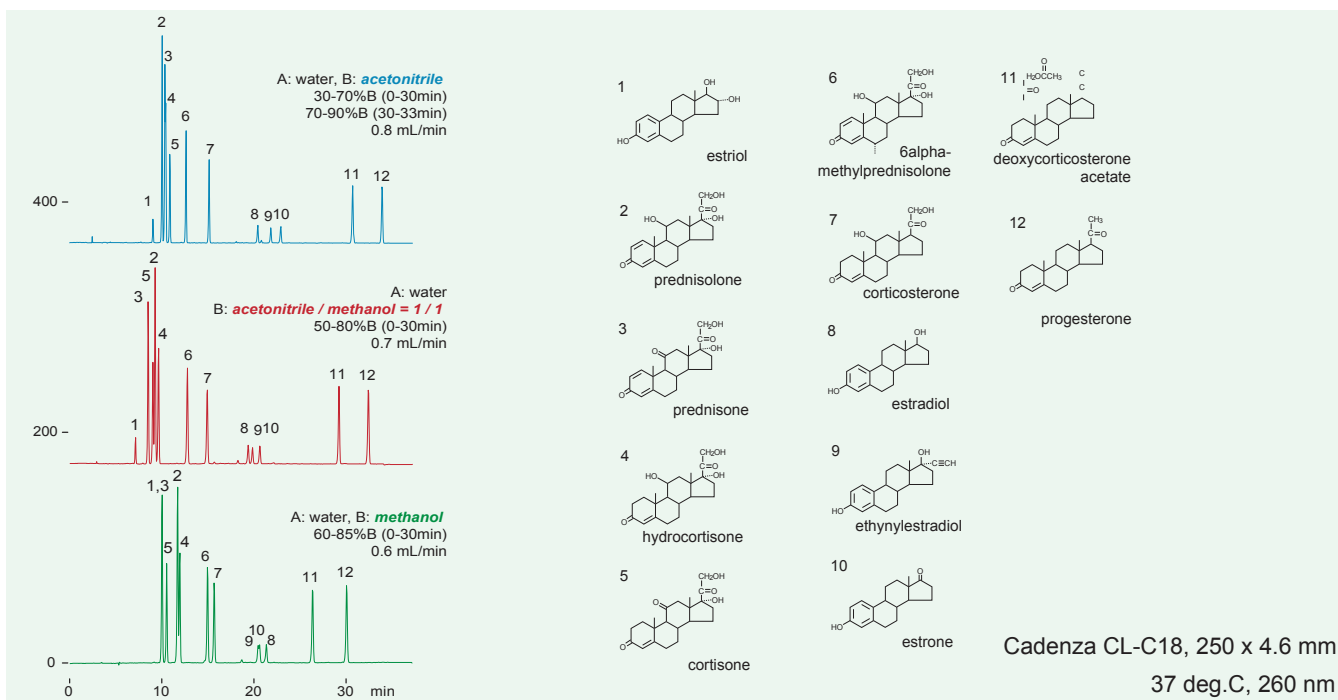


Due to its partial endcapping, the Cadenza CL-C18 opens a new world of separation possibilities. Almost all recent ODS columns have complete endcapping. However, complete endcapping makes some separations impossible. Conversely, ODS columns without any endcapping provide poor elution characteristics due to the influence of silanol. Our new Cadenza CL-C18 with partial endcapping uniquely optimizes the remaining silanol.

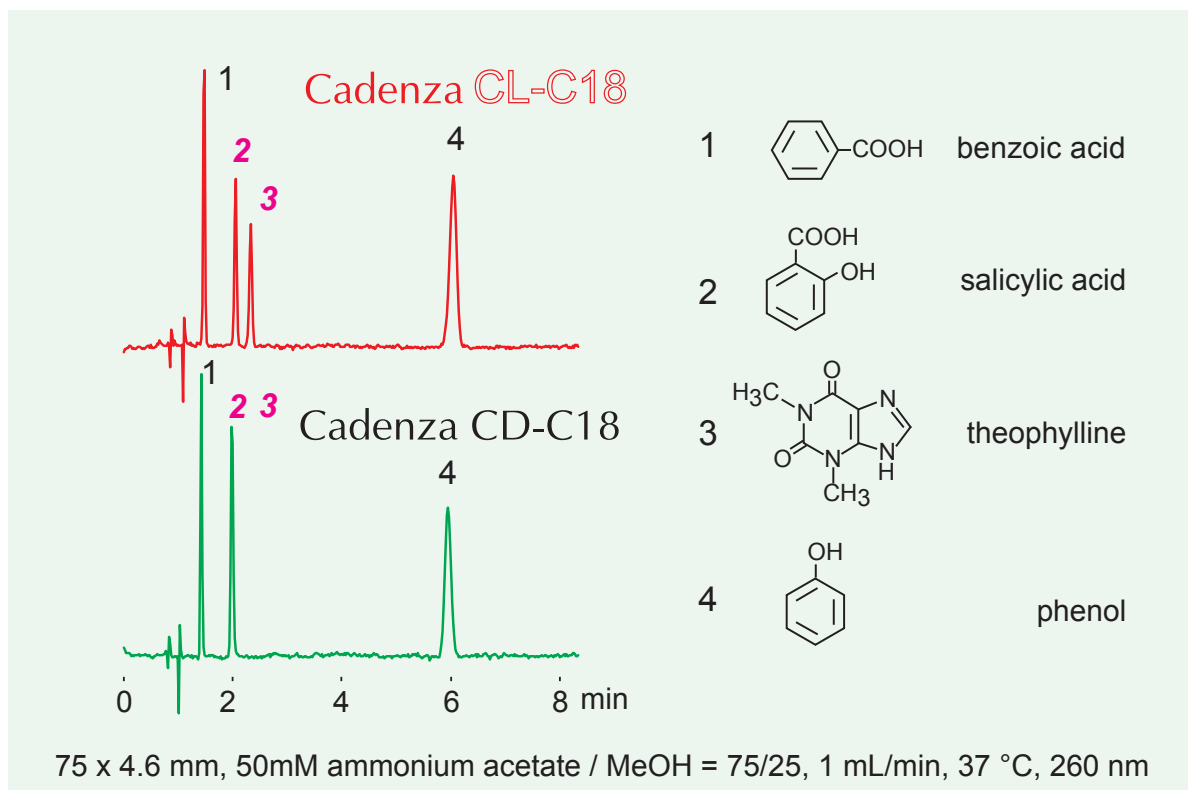


The difference between Cadenza CL-C18 and CD-C18 is that CL-C18 has more silanol remaining on the material surface. An example of the retention activity for an ionized compound (imazalil, $pK_a \approx 6$) is pictured (above left) and shows the influence on eluent separation and retention of CL-C18's remaining silanol. Imazalil retention is greatest with columns that are not endcapped, followed by CL-C18, and CD-C18, in that order.

Steroid Hormones



● Separation properties for acidic compounds on CL-C18

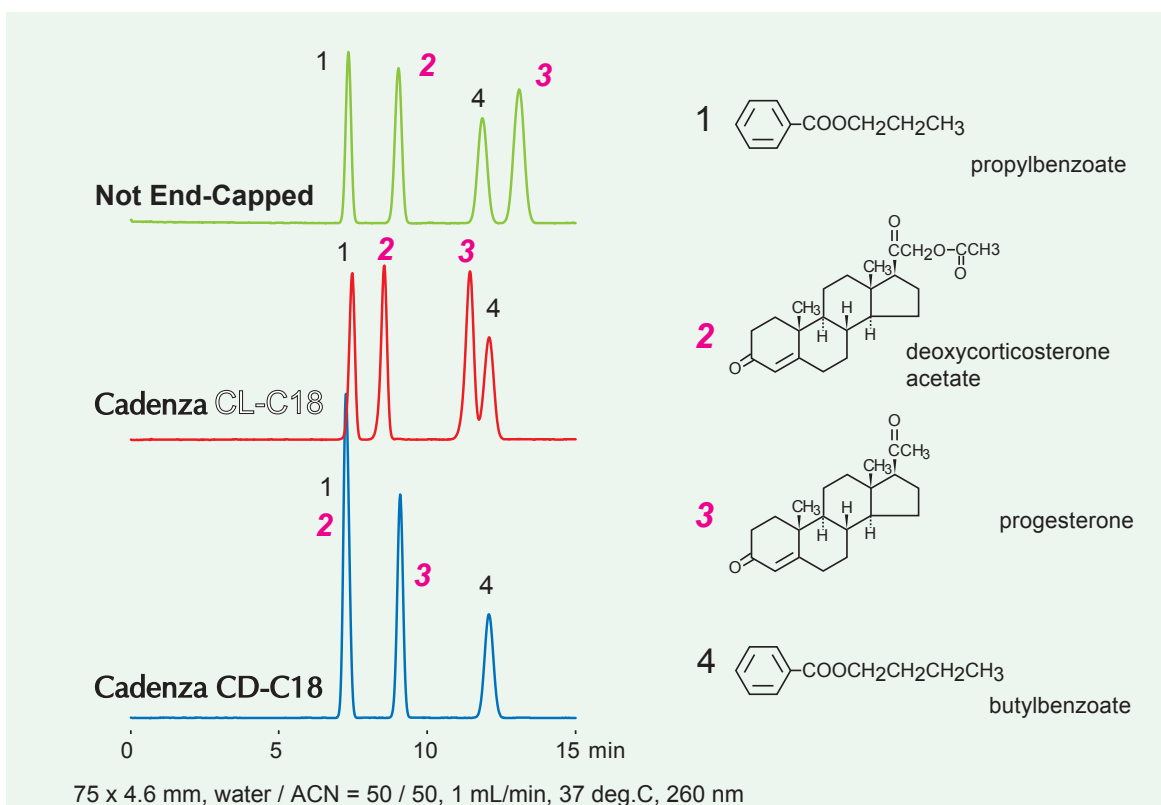


Cadenza CD-C18 and Cadenza CL-C18 have the same base silica and ODS ligand density. The only difference between the two phases is the amount of residual silanols on the silica surface.

For certain applications, better separation can be achieved by using CL-C18 instead of CD-C18. Analytes differing by pK_a value or structure, that co-elute on CD-C18, may in fact be separated by CL-C18.

In the figure above, the separation of ionized salicylic acid (neutral pH conditions) and theophylline is obtained on CL-C18, but not on CD-C18. The observed longer retention for theophylline on CL-C18 is due to an increase in electrostatic interaction between analyte and residual silanols. On the other hand, acidic compounds (benzoic acid and salicylic acid) showed similar retention on both ODS phases. This shows that there is no ion-exclusion between these ionized acidic compounds and silanols.

● Separation properties for neutral compounds on CL-C18



When molecular structures contain oxygen-rich functional groups, different selectivity can be obtained on different ODS phases. The neutral compounds with oxygen-rich structures had improved separation on CL-C18 due to the effect of silanol.

Neutral compounds that are rich in oxygen atoms can have more secondary (electrostatic) interactions with the stationary phase than neutral compounds that lack these structures. In the figure above, the steroid compounds (peaks 2 and 3) show more retention on the ODS phase without endcapping than on the fully endcapped ODS phase (CD-C18). The two steroid compounds have multiple keto groups, which are polar functional groups that have strong electrostatic interactions with the silica surface. On the other hand, peaks 1 and 4 contain an ester group, and there seems to be little secondary interaction with the silica surface (retention time for peaks 1 and 4 is similar on all 3 ODS phases). Hydrophobic interaction with the alkyl chain group seems to be the main interaction for peaks 1 and 4.

● Ordering Information for Cadenza CL-C18

| 3µm Column, Pressure limits of up to: 50MPa, 500 bar, 7,500 psi | | | | | | 3µm, 100MPa, 1000 bar, 15,000 psi | |
|---|--------|--------|--------|--------|--------|-----------------------------------|--------|
| Column Length | ID | | | | | Column Length | ID |
| | 1.0 mm | 1.5 mm | 2.0 mm | 3.0 mm | 4.6 mm | | 2.0 mm |
| 10 | | | CL020T | CL030T | CL000T | 10 | |
| 20 | | | CL029T | CL039T | CL009T | 20 | |
| 30 | CL011T | CL071T | CL021T | CL031T | CL001T | 30 | CL021U |
| 50 | CL012T | CL072T | CL022T | CL032T | CL002T | 50 | CL022U |
| 75 | CL013T | CL073T | CL023T | CL033T | CL003T | 75 | CL023U |
| 100 | CL014T | CL074T | CL024T | CL034T | CL004T | 100 | CL024U |
| 150 | CL015T | CL075T | CL025T | CL035T | CL005T | 150 | CL025U |
| 250 | CL016T | CL076T | CL026T | CL036T | CL006T | 250 | CL026U |

| 3µm Column, Pressure limits of up to: 20MPa, 250 bar, 3,000 psi | | | | | | | |
|---|-------------------|--------|--------|--------|--------|--------|---------|
| Column Length | Internal Diameter | | | | | | |
| | 1.0 mm | 1.5 mm | 2.0 mm | 3.0 mm | 4.6 mm | 6.0 mm | 10.0 mm |
| 10 | | | CL020 | CL030 | CL000 | | |
| 20 | | | CL029 | CL039 | CL009 | | |
| 30 | CL011 | CL071 | CL021 | CL031 | CL001 | CL061 | CL0P1 |
| 50 | CL012 | CL072 | CL022 | CL032 | CL002 | CL062 | CL0P2 |
| 75 | CL013 | CL073 | CL023 | CL033 | CL003 | CL063 | CL0P3 |
| 100 | CL014 | CL074 | CL024 | CL034 | CL004 | CL064 | CL0P4 |
| 150 | CL015 | CL075 | CL025 | CL035 | CL005 | CL065 | CL0P5 |
| 250 | CL016 | CL076 | CL026 | CL036 | CL006 | CL066 | CL0P6 |
| 500 | | | | | CL007 | | |

| Guard Column System for Unison Cadenza CD-C18 | | | | | | | |
|---|-------------------|--------|--------|--------|--------|--------|---------|
| | Internal Diameter | | | | | | |
| | 1.0 mm | 1.5 mm | 2.0 mm | 3.0 mm | 4.6 mm | 6.0 mm | 10.0 mm |
| Guard Holder | GCH01S | GCH01S | GCH01S | GCH01S | GCH01S | GCH01S | GCH02M |
| Guard Cartridge (Set of 3) | GCCL0C | GCCL0C | GCCL0S | GCCL0S | GCCL0S | GCCL0S | GCCL0M |

All of our stationary phases can also be made in the following internal diameters:
Nano: 0.05mm, 0.075mm **Capillary:** 0.1mm, 0.3mm, 0.5mm **Semi-Prep:** 20mm, 28mm