# ANALYTICAL HPLC COLUMNS

50 Essential Selectivities for small organic molecules
Identification, Quantification & Purification
Ideal for Analysts & Chemists

Uptisphere® CS Evolution
Uptisphere® Strategy™
Uptisphere® 120Å
puriFlash®

Advion Interchim scientific

# OUR SILICA TECHNOLOGIES

All of our Uptisphere® silicas (120Å, CS Evolution, Strategy™, puriFlash® & puriFlash® Bio) follow rigorous and innovative manufacturing processes. Base silicas are produced in ceramic reactors from standard particles for purification or totally free of all traces of metals for analysis. Each of the different synthesis steps is strictly controlled.

This rigor leads to extremely mechanically stable particles. The particle size and porosity distributions, as well as the specific surface areas, are perfectly defined and reproducible.

Our puriFlash® & puriFlash® Bio silicas are specifically designed to meet the requirements of preparative liquid chromatography. They combine quality and cost effectiveness.

## Our silicas have three major advantages:

### 1. A perfect control of the surface state.

We physically or chemically modify the surface of the silica to choose the type, the amount of silanols or the overall surface energy according to the objective to be achieved.

### 2. Cylindrical pores.

The quantity of free silanols and their excellent accessibility allows to obtain a homogeneous and particularly dense functionalization (grafting). This results in a very good loading capacity and a good stability of these stationary phases under aggressive mobile phase conditions such as basic buffers.

### 3. High mechanical stability.

Our stationary phases can withstand multiple packings and de-packings without damaging the integrity of the substrate. They are the tool of choice for preparative chromatography.

## Modified silicas:

The Laboratoire d'Etude des Techniques et des Instruments d'Analyse Moléculaire (LETIAM), a constituent unit of the analytical chemistry group of Paris Sud located at the IUT of Orsay, played a fundamental role in our reflection which led to the development of our stationary phases.

The laboratory of Sciences and Separative Methods - (SMS) of the Institute of Research in Fine Organic Chemistry - (IRCOF) has concretized part of our ideas by developing innovative synthesis schemes for the modification of our «Core-Shell» silicas Uptisphere® CS Evolution.

Today, we offer about 50 selectivities to meet the needs of analysts and chemists for the identification, quantification and purification of small organic molecules, peptides and proteins.

# SILICAS FOR (U)HPLC, PREP-LC & FLASH COLUMNS

## Uptisphere® CS Evolution

Core Shell columns for fast & highly efficient identification & quantification of small molecules.

## Uptisphere® Strategy™

(U)HPLC, Analytical & prep LC columns with high Surface Area for identification, quantification & purification of small molecules & pharma compounds.

## Uptisphere® 120Å

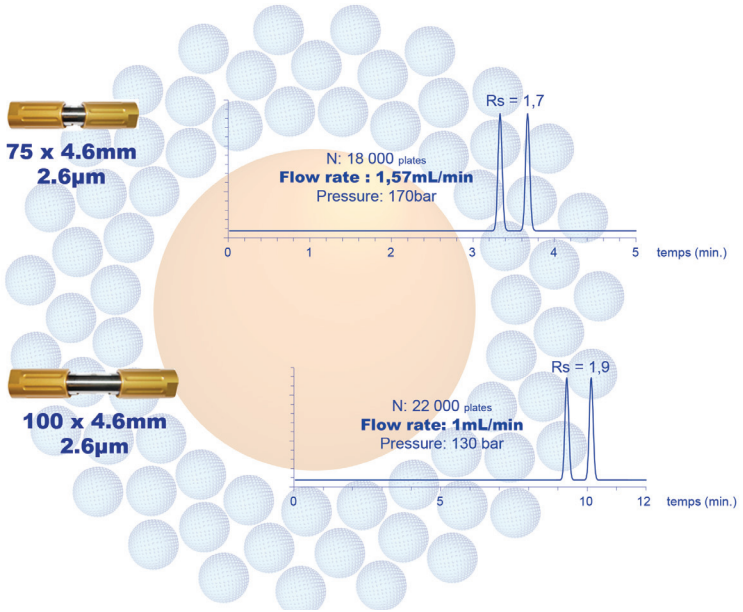
HPLC & prep LC columns for the identification, quantification of small molecules & pharma compounds.

## puriFlash®

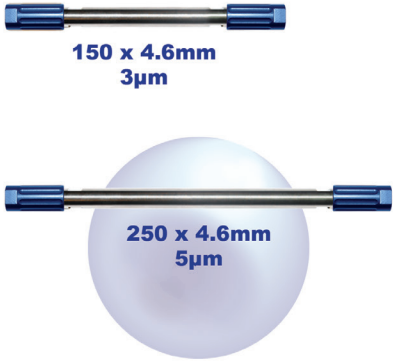
Analytical, prep-LC & Flash columns with High Load-ability for routine analysis & easy transfer to purification of small organic molecules in pharma applications.

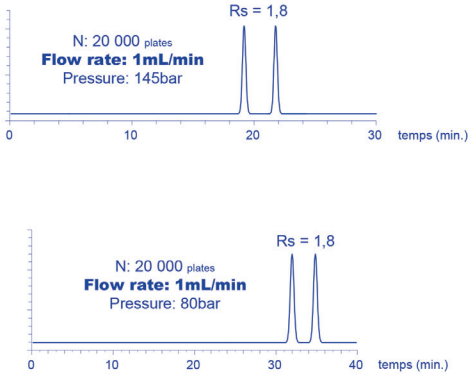
# TECHNICAL DATA

## Core-shell silica




## Totally Porous silica



# TECHNICAL DATA

## High Performance Hardware™

- 1200 bar maximum pressure
- Used for HPLC & UHPLC columns
- High performance

(2.1 - 3.0 - 4.0 - 4.6 - 10.0 - 21.2 - 30.0 - 50.8) mm x (25 - 50 - 100 - 125 - 150 - 250) mm
Easy transfert from any columns to "ready-to-go" & secured Analytical, or Gradient Purification, Method

## Protects all 1.7 up to 5µm silicas columns

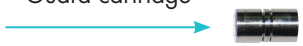
- 900 bar maximum pressure
- Low dead volume
- High performance

| Core Shell Guard cartridges | Reverse Phase | Hilic Mode | Normal Phase |
|---|---|---|---|
| 2.6µm - 5 x 2.1mm - 3u | CS-RP-2.6-005/021 | CS-HILIC-2.6-005/021 | --- |
| 2.6µm - 5 x 4.0mm - 3u | CS-RP-2.6-005/046 | CS-HILIC-2.6-005/046 | --- |

| Guard cartridges | Reverse Phase | Hilic Mode | Normal Phase |
|---|---|---|---|
| 1.7µm - 5 x 2.1mm - 3u | UP-RP-1.7-005/021 | --- | --- |
| 1.7µm - 5 x 4.0mm - 3u | UP-RP-1.7-005/046 | --- | --- |
| 2.2µm - 5 x 2.1mm - 3u | UP-RP-2.2-005/021 | UP-HILIC-2.2-005/021 | UP-NP-2.2-005/021 |
| 2.2µm - 5 x 4.0mm - 3u | UP-RP-2.2-005/046 | UP-HILIC-2.2-005/046 | UP-NP-2.2-005/046 |
| 3µm - 5 x 2.1mm - 3u | UP-RP-3-005/021 | UP-HILIC-3-005/021 | UP-NP-3-005/021 |
| 3µm - 5 x 4.0mm - 3u | UP-RP-3-005/046 | UP-HILIC-3-005/046 | UP-NP-3-005/046 |
| 5µm - 5 x 2.1mm - 3u | UP-RP-5-005/021 | UP-HILIC-5-005/021 | UP-NP-5-005/021 |
| 5µm - 5 x 4.0mm - 3u | UP-RP-5-005/046 | UP-HILIC-5-005/046 | UP-NP-5-005/046 |

Guard Holder
**P/N : AGHP-5**

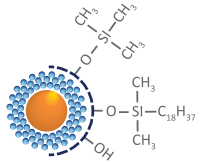
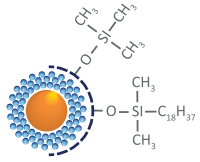
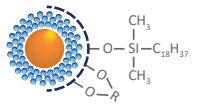
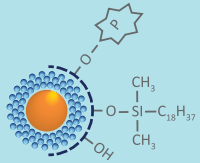
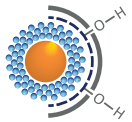
Guard cartridge



# UPTISPHERE® CS EVOLUTION STATIONARY PHASES

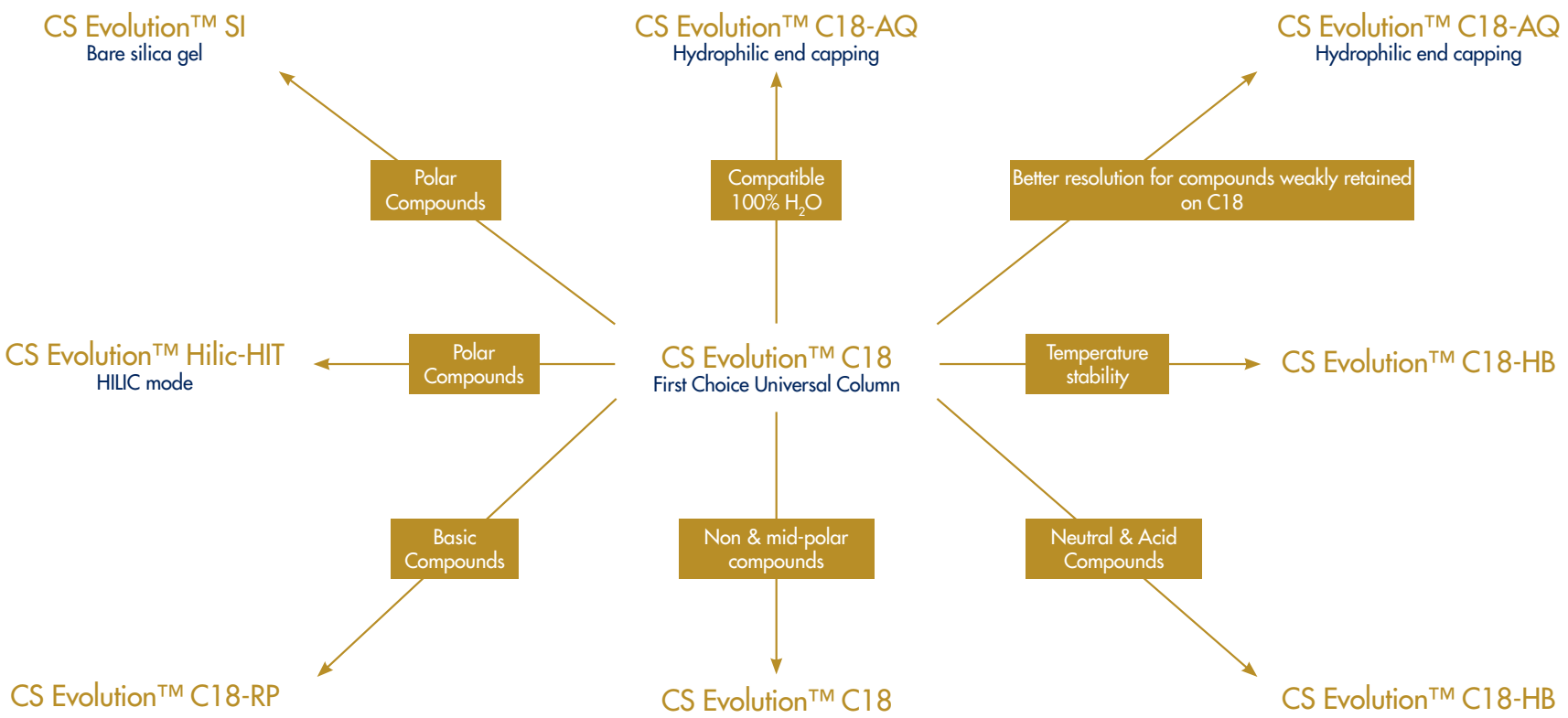
(MOST* Grade)

* MOST : Maximum Operational Surface Technology

| | USP Code | Ø Pore | Surface | 2.6µm | Bonding | Functionalization | % Carbon | End-Capping | pH stability | Use Mode | Application |
|---|---|---|---|---|---|---|---|---|---|---|---|
|  C18 | L1 | 85Å | 130m²/g | x | C18 - octadecyl | mono-functional | 9.0% | One step | 1.5 - 7.5 | RP | Serves a broad-ship of analytical & prep LC requirements for separating non polar compounds. |
|  C18-HB | L1 | 85Å | 130m²/g | x | C18 - octadecyl | mono-functional | 8.0% | One step | 1.5 - 8.0 | RP | Suitable for non polar compounds separation. Exhibits a very hydrophobic surface. HB shows excellent stability under high temperature. |
|  C18-RP | L1 | 85Å | 130m²/g | x | C18 - octadecyl | mono-functional | 6.0% | Mixte | 1.5 - 8.0 | RP | Suitable for mid & non polar compounds separation. RP shows excellent mechanical stability that make it an excellent tool for analysis under acidic or basic conditions. |
|  **C18-AQ** | **L1** | **85Å** | **130m²/g** | **x** | **C18 - octadecyl** | **mono-functional** | **6.5%** | **Mixte** | **1.5 - 7.0** | **RP** | **Suitable for mid & non polar compound separation. Shows excellent stability under 100% aqueous mobile phase condition.** |
|  HIT | L3 | 85Å | 130m²/g | x | Proprietary | Proprietary | --- | Proprietary | 1.5 - 7.0 | Hilic | Aqueous normal phase separation (ANP) of water-soluble compounds . Typical mobile phase: water / ACN (> 70%) ANP is an excellent alternative to RP purification for highly polar compounds. |

# SELECTION GUIDE

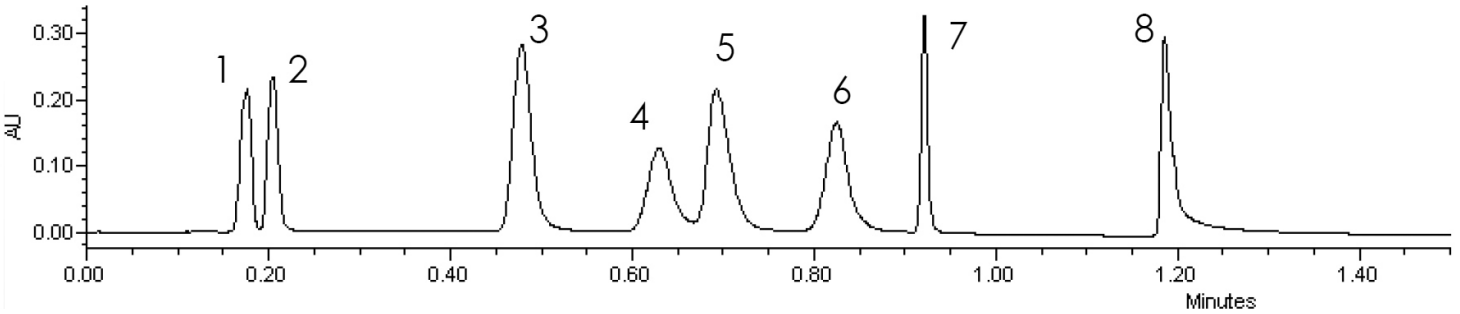
## Uptisphere® (U)HPLC Core Shell Silicas




MOST : Maximum Operational Surface Technology

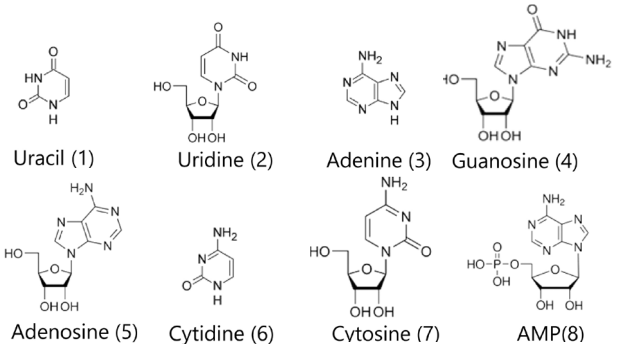
# APPLICATION

## Nucleobases, Nucleosides & Nucleotides




### Column Uptisphere® CS Evolution™ 2.6µm HIT 50 x 2,1mm

Gradient: ACN / 20mM formiate d'ammonium pH 3,
Flow rate: 1mL/min, Temp : 30°C, UV 254nm




| | $pKa_{acid}$ | $pKa_{basic}$ | logP |
|---|---|---|---|
| Uracil | 9.80-13.80 | --- | -0.86 |
| Uridine | 9.70-12.60 | --- | -2.42 |
| Adenine | 9.90 | 5.20 | -0.53 |
| Adenosine | 12.45 | 4.99 | -2.09 |
| Adenosine monophosphate | --- | --- | -5.19 |
| Cytosine | 9.98 | 2.35 | -1.24 |
| Cytidine | 12.80-13.60 | --- | -2.80 |
| Guanosine | 10.20 | 1.8 | -2.71 |

# APPLICATIONS IN ENVIRONMENT

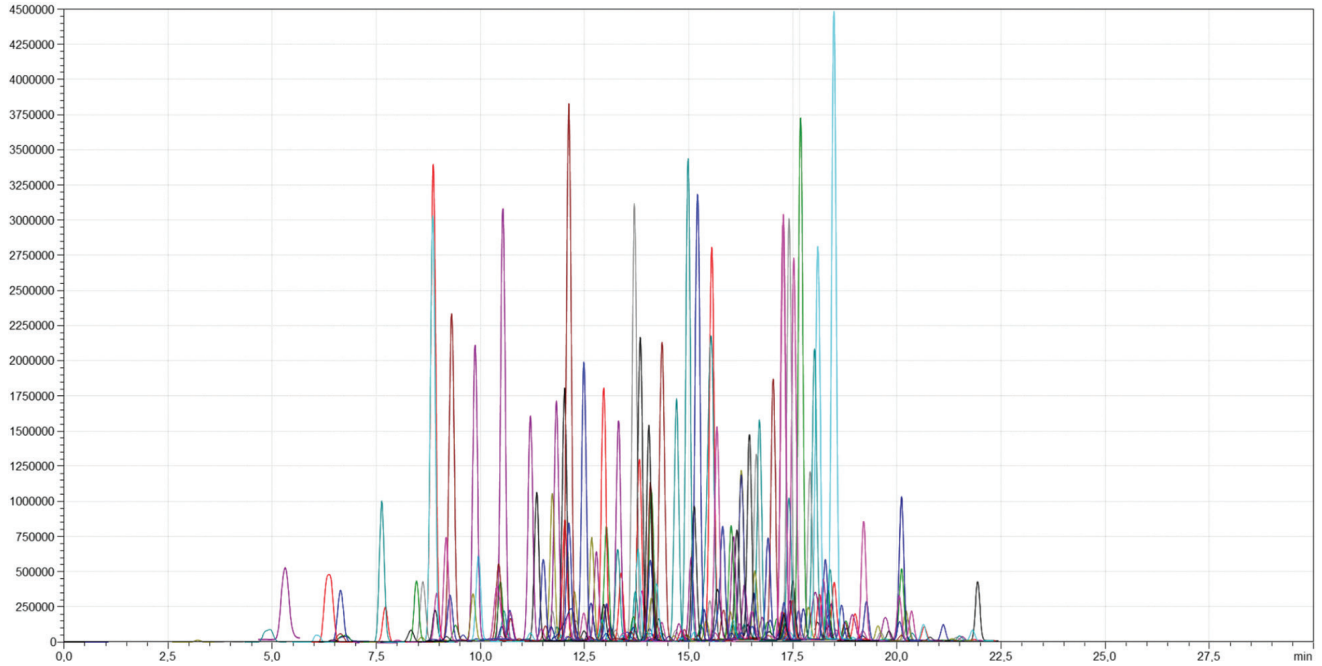
## Automatic, simultaneous and rapid analysis of pesticides in surface and underground water by online SPE and UHPLC-MS/MS

Doriane Toinon , Alban Huteau, SHIMADZU France, le Luzard II, bat A, Bd Allende, Noisiel, 77448 Marne La Vallée cedex 2, France.

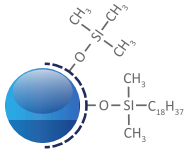
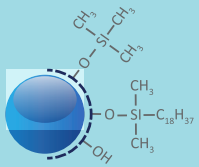
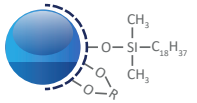
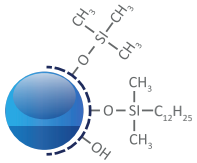
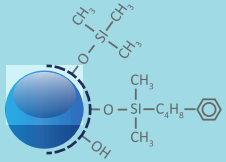
### Uptisphere® CS Evolution 2.6µm C18-AQ 150x3.0mm

A: water + 0.002% formic acid
+ 2mM ammonium formate
B: 50/50 acetonitrile/Methanol
+ 0.002% formic acid
+ 2mM ammonium formate
Flow: 0.7mL/min, 40°C
System: Shimadzu Nexera X2

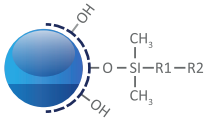
### Method validated with LOQ up to 1ng/L for 272 pesticides on water matrix



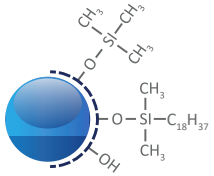
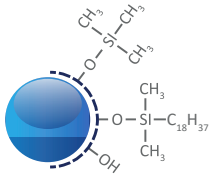
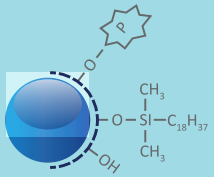
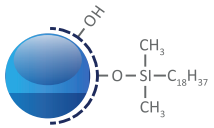
# UPTISPHERE® STRATEGY™ STATIONARY PHASES

| | | USP Code | Ø Pore | Surface | 1.7µm | 2.2µm | 3µm | 5µm | Bonding | Functionalization | % Carbon | End-Capping | pH stability | Use Mode | Application |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
|  | C18-3 | L1 | 100Å | 425m²/g | --- | --- | x | x | C18 - octadecyl | mono-functional | 22.0% | Multi step | 1.0 - 12 | RP | The high bonding density of C18-3 facilitiates a strong separation of non polar compounds. Multi step bonding technology guarantees a fully end-capped phase, stable under basic pH conditions. C18-3 is an excellent phase for the separation of basic drugs at up to pH: 12. |
|  | **C18-HQ** | **L1** | **100Å** | **425m²/g** | **x** | **x** | **x** | **x** | **C18 - octadecyl** | **mono-functional** | **19.0%** | **Multi step** | **1.0 - 10** | **RP** | **This utility phase serves many pharmaceutical applications. Its 425m²/g surface area providing excellent loading capacity.** |
|  | C18-RP | L1 | 100Å | 425m²/g | --- | x | x | x | C18 - octadecyl | mono-functional | 16.0% | Multi step Mixte | 1.5 - 8.0 | RP | Suitable for mid & non polar compounds separation. RP shows excellent mechanical stability that make it an excellent tool for purification under acidic or basic conditions. |
|  | C12 | --- | 100Å | 425m²/g | --- | x | --- | x | C12 - dodecyl | mono-functional | 16.0% | One step | 1.5 - 8.0 | RP | Non polar compounds. Less retentive than C18 with greater capacity. |
|  | **PHC4** | **L11** | **100Å** | **300m²/g** | **---** | **x** | **x** | **x** | **Phenyl - Butyl** | **mono-functional** | **12.0%** | **One step** | **1.5 - 7.5** | **RP** | **Very selective for compounds with aromatic cycles and mid-polar compounds.** |

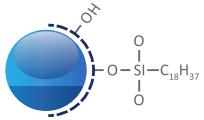
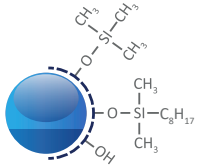
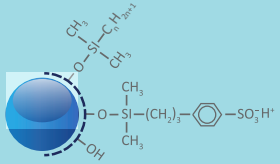
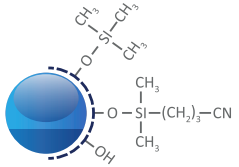
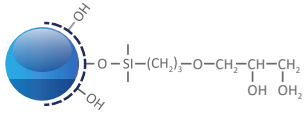
# UPTISPHERE® STRATEGY™ STATIONARY PHASES

| | | USP Code | Ø Pore | Surface | 2.2µm | 3µm | 5µm | Bonding | Functiona-lization | End-Capping | pH stability | Use Mode | Application |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
|  | HILIC- HIT | L3 | 100Å | 425m²/g | x | x | x | Proprietary | Proprietary | Proprietary | 1.5 - 7.0 | Hilic | Aqueous normal phase separation (ANP) of water-soluble compounds.<br>Typical mobile phase: water / ACN (> 70%).<br>ANP is an excellent alternative to RP purification for highly polar compounds. |
|  | HILIC-HIA | L3 | 100Å | 300m²/g | x | x | x | Proprietary | Proprietary | Proprietary | 2.0 - 7.0 | Hilic | Aqueous normal phase separation (ANP) of water-soluble compounds. Typical mobile phase: water / ACN (> 70%).<br>ANP is an excellent alternative to RP purification for highly polar compounds. |
|  | SI | L3 | 100Å | 425m²/g | x | x | x | Ultra pure silica | --- | none | 1.5 - 7.0 | NP | Non-ionic, polar organic compounds. |

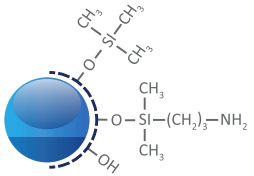
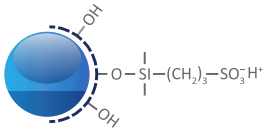
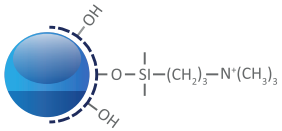
# UPTISPHERE® 120Å STATIONARY PHASES

| | | USP Code | Ø Pore | Surface | 2.2µm | 3µm | 5µm | Bonding | Functiona-lization | % Carbon | End-Capping | pH stability | Use Mode | Application |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
|  | C18-HSC | L1 | 60Å | --- | --- | x | x | C18 - octadecyl | mono -functional | 20.0% | Multi step | 1.5 - 8.0 | RP | Non-polar compounds. |
|  | C18-ODB | L1 | 120Å | 320m²/g | x | x | x | C18 - octadecyl | mono -functional | 18.0% | One step | 1.5 - 7.0 | RP | Serves a broad-ship of analytical & prep LC requirements for separating non polar compounds. |
|  | **C18-HDO** | **L1** | **120Å** | **320m²/g** | **x** | **x** | **x** | **C18 - octadecyl** | **mono -functional** | **17.0%** | **Mixte** | **1.5 - 7.0** | **RP** | **Suitable for mid & non polar compound separation. Shows excellent stability under 100% aqueous mobile phase condition.** |
|  | C18-NEC | L1 | 120Å | 320m²/g | x | x | x | C18 - octadecyl | mono -functional | 16.0% | none | 1.5 - 6.5 | RP | NEC strongly retains the polar and mid-polar compounds.It overcome peak tailing with compounds that contains chains and / or carbon cycles combined with numerous polar groups and/or basic in character. |

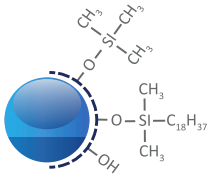
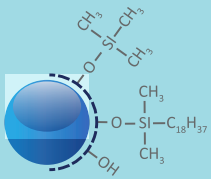
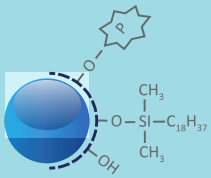
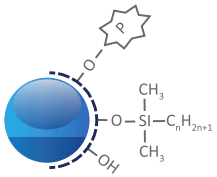
# UPTISPHERE® 120Å STATIONARY PHASES

| | USP Code | Ø Pore | Surface | 3µm | 5µm | Bonding | Functiona-lization | % Carbon | End-Capping | pH stability | Use Mode | Application |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
|  C18-TF | L1 | --- | --- | --- | x | C18 - octadecyl | poly -functional | 14.0% | One step | 1.5 - 8.0 | RP | Alternative selectivity for challenging separations & for - but not limited to - aromatic, polyphenol, PAHs etc. |
|  C8 | L7 | 120Å | 320m²/g | (x) | x | C8 - octyl | mono -functional | 11.0% | One step | 2.0 - 7.0 | RP | Mid-polar and non polar compounds. Less retentive than C18. |
|  **MM1** | **L44** | **120Å** | **320m²/g** | **- - -** | **x** | **C8 /SCX** | **mono -functional** | **- - -** | **One step** | **2.0 - 6.5** | **RP / EI** | **Ion exchange and hydrophobic chains are bonded onto the surface of silica providing unique selectivity. Compounds that possess basic functionality are retained by ion exchange functionality. An organic solvent will elute hydrophobic compounds.** |
|  CN | L10 | 120Å | 320m²/g | x | x | CN - cyano | mono -functional | 8.0% | One step | 2.0 - 7.0 | RP / NP | CN functional groups can be used either in normal phase to purify polar compounds or in reversed phase for mid-polar compounds. |
|  OH | L20 | 120Å | 320m²/g | --- | (x) | OH - diol | mono -functional | 6.0% | none | 1.5 - 6.5 | RP / NP | The diol fonction provide globally a neutral surface onto the silica. It leads to greater separation of basic compounds by normal phase vs. regular silica. |

# UPTISPHERE® 120Å STATIONARY PHASES

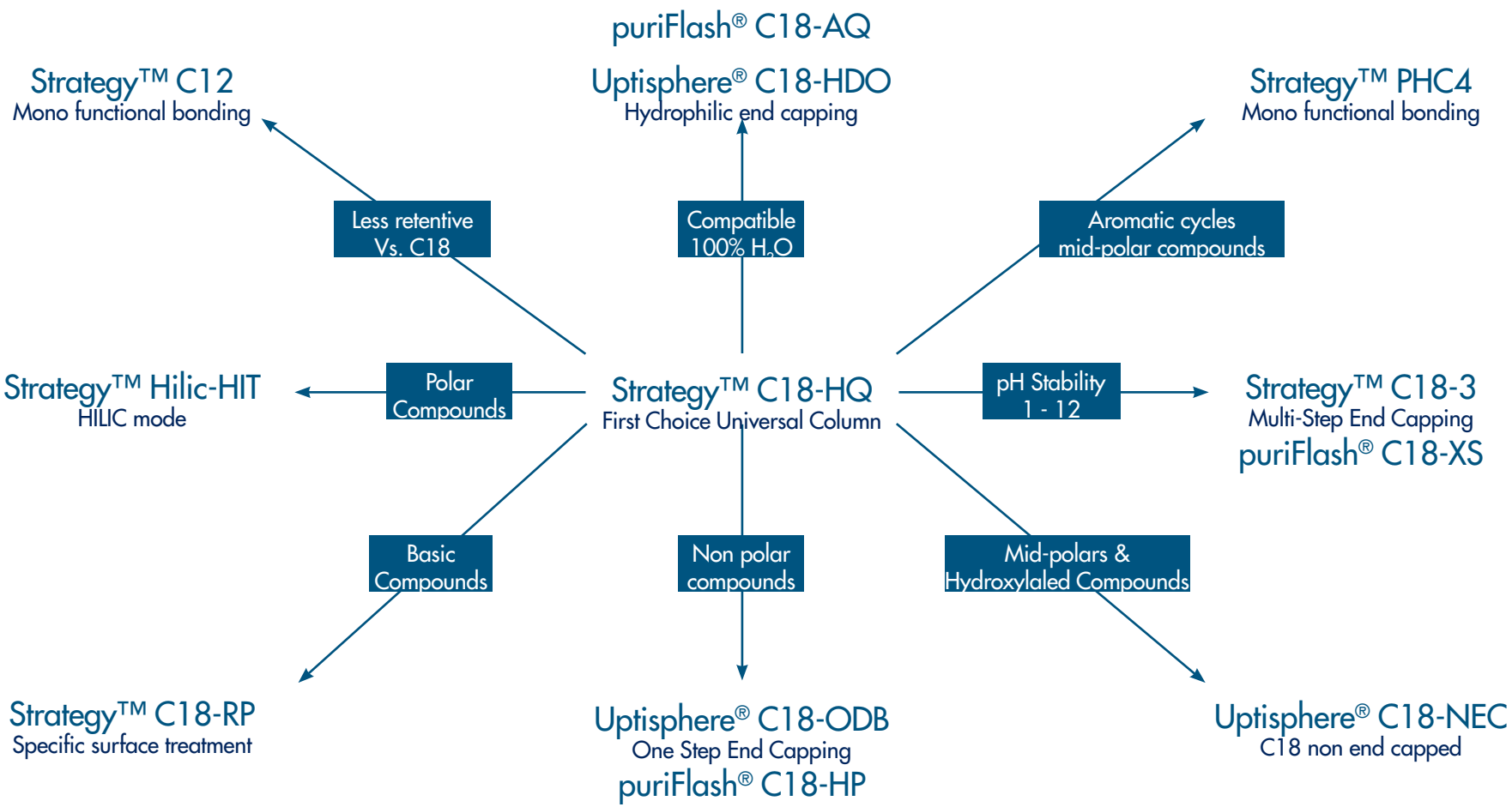
| | | USP Code | Ø Pore | Surface | 2.2µm | 3µm | 5µm | Bonding | Functiona-lization | % Carbon | End-Capping | pH stability | Use Mode | Application |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
|  | NH2 | L8 | 120Å | 320m²/g | x | x | x | NH2 - amino | mono -functional | 5.0% | none | 2.0 - 6.5 | RP / NP / EI | Can be either weak anion exchangers for strong acids, or polar media that can interact with OH, NH, SH… |
|  | SCX | L50 | 120Å | 320m²/g | --- | | x | Strong Cation Exchanger | mono -functional | --- | none | 1.0 - 7.5 | EI | Strong cation exchange (SCX) contains sulfonic acid used to analyze weak basic compounds which have one or more positive charges. |
|  | SAX | L14 | 120Å | 320m²/g | --- | | x | Strong Anion Exchanger | mono -functional | --- | none | 1.0 - 7.5 | EI | Strong anion exchange (SAX) contains quaternary amine used to analyze weak acid compounds which have one or more negative charged, nucleotides, nucleosides, organic acids… |

# PURIFLASH® STATIONARY PHASES

| | | USP Code | Ø Pore | Surface | 5µm | Bonding | Functionalization | % Carbon | End-Capping | pH stability | Use Mode | Application |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
|  | C18-XS | L1 | 100Å | 300m²/g | x | C18 - octadecyl | mono -functional | 17.0% | Multi-step | 1.0 - 10.0 | RP | The proprietary multi-step bonding technology guarantees a fully end-capped phase, stable under basic pH conditions up to pH: 10. It's an excellent phase for the integral purification of basic drugs. |
|  | **C18-HP** | | **100Å** | **300m²/g** | **x** | **C18 - octadecyl** | **mono -functional** | **16.5%** | **One-step** | **1.5 - 7.5** | **RP** | **Serves many pharmaceutical applications. Excellent choice for routine purification in reverse phase mode.** |
|  | **C18-AQ** | **L1** | **100Å** | **300m²/g** | **x** | **C18 - octadecyl** | **mono -functional** | **14.0%** | **Mixte** | **2.0 - 7.5** | **RP** | **The bonding chemistry allow to start gradient with 100% of water. Suitable for the purification of mid and non polar compounds.** |
|  | RP-AQ | L7 | 60Å | 500m²/g | x | RP-alkyl | mono-functional | 6.0% | Mixte | 2.0 - 7.5 | RP | The bonding chemistry allow to start gradient with 100% of water. Suitable for the purification of high and mid polar compounds. Compare to C18, peaks are elutes earlier from he beginning of the gradient. |

# SELECTION GUIDE

## (U)HPLC Fully Porous Silicas



# APPLICATION

## Characterization of Furosemid within rat plasma & broncho-alveolar washing

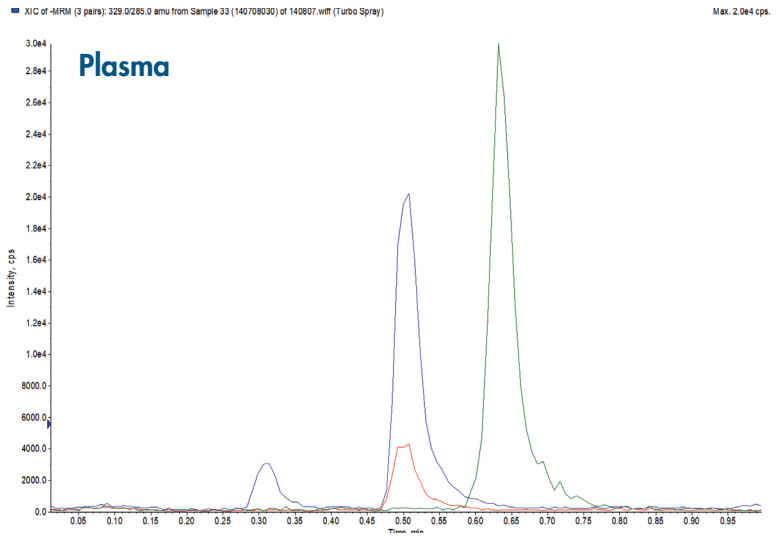
### Uptisphere® Strategy™ 1.7µm C18-HQ, 50 x 2.1mm

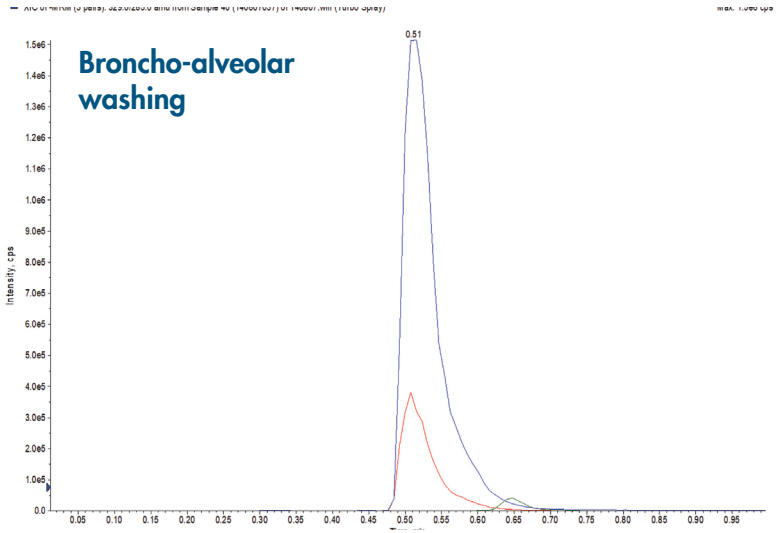
**Conditions:**

Agilent 1200 RRLC + Qtrap 4000
Solvent A: 0.1% $CH_3COOH$
Solvent B: ACN + 0.1% $CH_3COOH$
Isocratic (50/50)
Flow rate: 600µL/min @ 500bar (7000psi)
LD: 2.14µg/L
Injection: 10µL
MS: 329 to 285
System: Shimadzu Nexera X2

**Comments:**

*This study will be published.*
We can see a big peak within the plasma and nothing except the Internal Standard (IS) within the broncho-alveolar washing.
IS run time: 0.5min
Furosemid run time: 0.64min - a "supposed" metabolite is elute within the plasma extract at 0.3min.
Total run time: 1min.



# APPLICATION

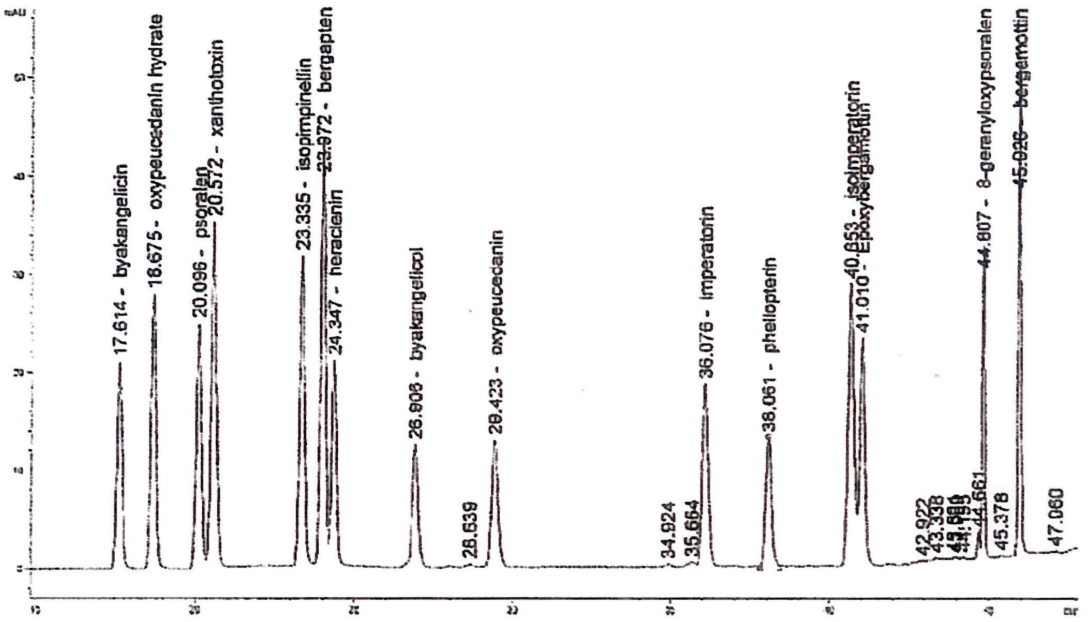
## Analysis of Furocoumarins in Citrus Essential Oils

### Uptisphere® 3µm C18-ODB, 150 x 2.1mm

**Conditions:**

Solvent A: water - acetonitrile - THF (85/10/5)
Solvent B: acetonitrile - methanol - THF (65/30/5)
Flow rate: 0.3mL/min
DAD: 310nm

| Time min | 0 to 5 | 5 to 20 | 20 to 24 | 24 to 38 | 38 to 40 | Rinse | Equilibration |
|---|---|---|---|---|---|---|---|
| % B | 0 | 0 - 32 | 32 | 32 - 55 | 55 - 90 | 90 | 0 |
| | isocratic | linear | isocratic | linear | linear | 10min | 10min |



# APPLICATION

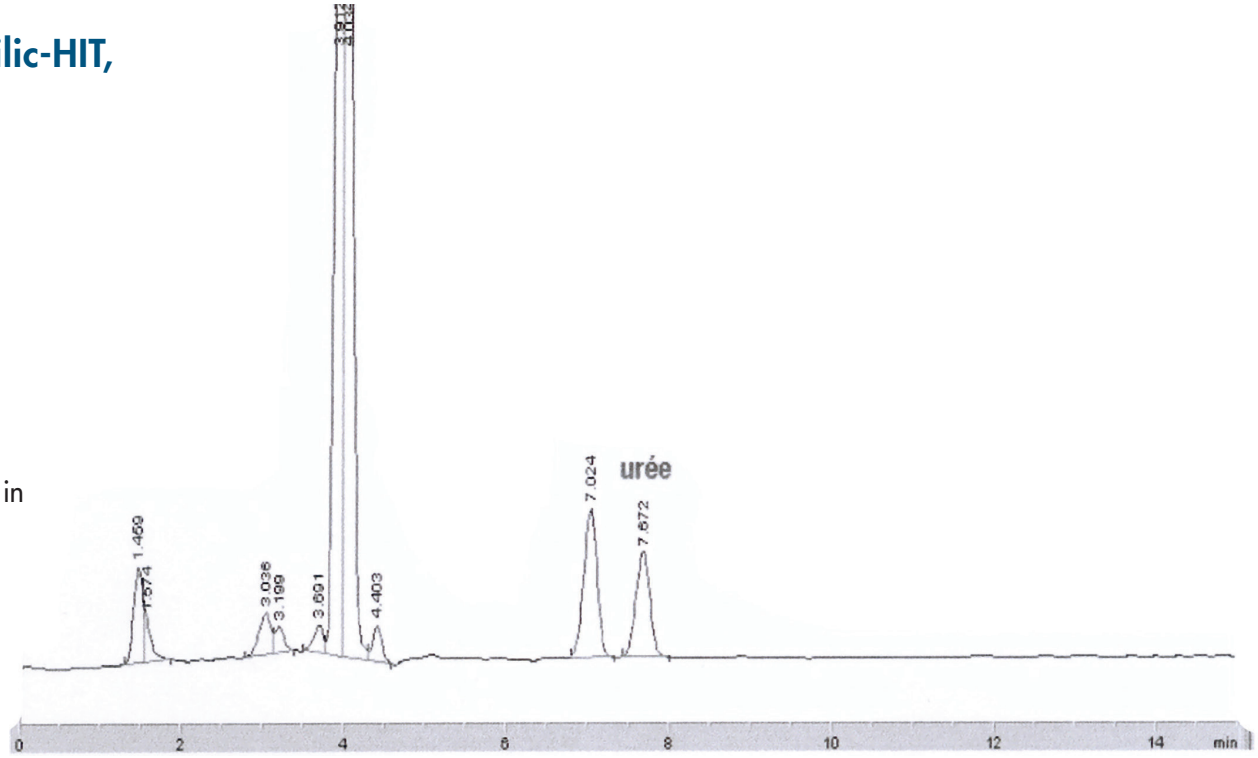
## Urea from diesel particles extracts

### Uptisphere® Strategy™ 5µm Hilic-HIT, 250 x 4.6mm

**Conditions:**
Acetonitrile 100%
Flow rate: 1mL/min
Temperature: 20°C
DAD: 195nm
Injection: 10µL

**Comments:**
The column provides the following advantage in comparison to the previous one

- Better Urea retention
- Deletion of interferences
- Symmetric Urea peak




Uptisphere® Strategy™ 5µm Hilic-HT, 250 x 4.6mm

# Advion Interchim scientific

## How to request more information, a quotation or to place an order

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