



# SELECTRA® AQUEOUS C18 HPLC COLUMNS



INNOVATION THROUGH CHEMISTRY

## Product Benefits

- Similar non-polar retention to traditional C18
- Some selectivity differences for polar analytes
- Suitable in up to 100% aqueous mobile phases
- Greater range of mobile phase options
- Carbon Load 10%
- Conforms to USP L1



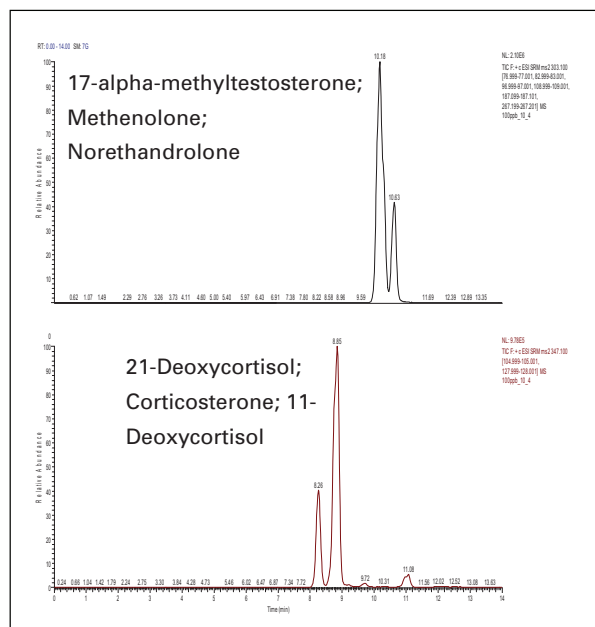
Selectra® Aqueous C18 HPLC Columns		
Dimensions	Particle Size	Part Numbers
50 x 2.1 mm	1.8 µm	SLAQ50ID21-18UM
100 x 2.1 mm	1.8 µm	SLAQ100ID21-18UM
50 x 4.6 mm	1.8 µm	SLAQ50ID46-18UM
100 x 4.6 mm	1.8 µm	SLAQ100ID46-18UM
10 x 2.1 mm guard (sold as a 2 pack)	1.8 µm	SLAQGDC20-18UMOPT
10 x 4.6 mm guard (sold as a 2 pack)	1.8 µm	SLAQGDC46-18UMOPT
50 x 2.1 mm	3 µm	SLAQ50ID21-3UM
100 x 2.1 mm	3 µm	SLAQ100ID21-3UM
50 x 4.6 mm	3 µm	SLAQ50ID46-3UM
100 x 4.6 mm	3 µm	SLAQ100ID46-3UM
150 x 4.6 mm	3 µm	SLAQ150ID46-3UM
10 x 2.1 mm guard (sold as a 2 pack)	3 µm	SLAQGDC20-3UM
10 x 4.6 mm guard (sold as a 2 pack)	3 µm	SLAQGDC46-3UM
50 x 2.1 mm	5 µm	SLAQ50ID21-5UM
100 x 2.1 mm	5 µm	SLAQ100ID21-5UM
50 x 4.6 mm	5 µm	SLAQ50ID46-5UM
100 x 4.6 mm	5 µm	SLAQ100ID46-5UM
150 x 4.6 mm	5 µm	SLAQ150ID46-5UM
250 x 4.6 mm	5 µm	SLAQ250ID46-5UM
10 x 2.1 mm guard (sold as a 2 pack)	5 µm	SLAQGDC20-5UM
10 x 4.6 mm guard (sold as a 2 pack)	5 µm	SLAQGDC46-5UM

HPLC Guard Holder	
HPLC Guard Cartridge Holder	SLGRDHLDR
UHPLC Direct Connect Guard Cartridge Holder	SLGRDHLDR-HPOPT
Replacement Peek Tip for Holder	SLGRDHLDR-TIP (2/pk)

Because of the hydrophobic nature of C18 stationary phases, it is difficult to retain polar compounds on the surface. Typically, in an effort to gain added retention and move polar compounds away from the void volume, the initial percent organic is reduced. As the percent aqueous increases to account for this, C18 phases can undergo phase collapse or more properly 'dewetting.' Dewetting occurs when column flow is stopped, which minimizes the pressure needed to force water into the hydrophobic pores of the substrate. The water is then evacuated from the pores and regardless of a flow restart, will not re-enter. Since most of the surface area for analyte interaction is located within the pore structure, this phenomenon causes significant loss in retention.

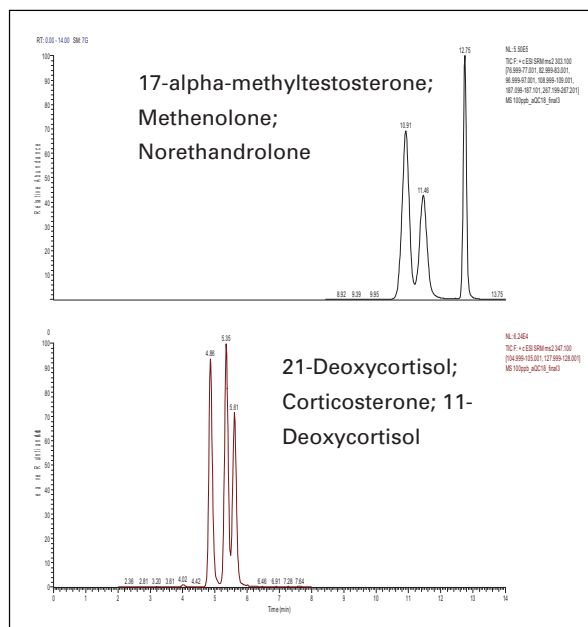
UCT has created a unique C18 ligand and bonding procedure that creates a true C18 phase that is also compatible with up to 100% aqueous mobile phases. Even after flow is stopped and restarted, no significant loss in retention is observed. Additionally, many polar analytes exhibit enhanced retention and selectivity using the Selectra® Aqueous C18 column.

### Traditional C18 column



Only capable of resolving 2 of the 3 steroids

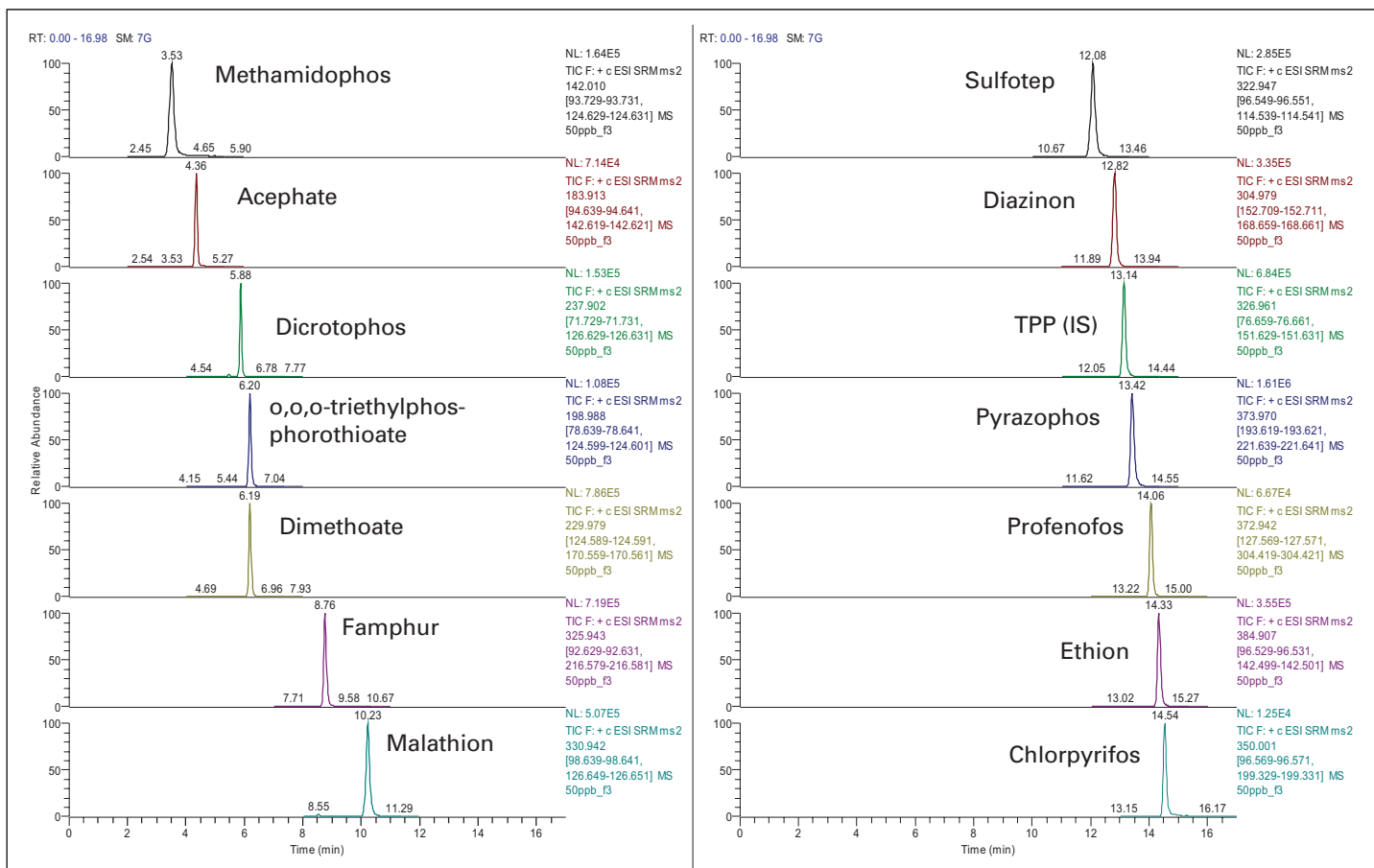
### SELECTRA® AQUEOUS C18 column



Capable of resolving all 3 steroids



## Organophosphate Pesticides in Urine



### HPLC Conditions

**Instrument:** Thermo Scientific Dionex UltiMate 3000® LC System  
**Column:** UCT, Selectra® Aqueous C18, 100 x 2.1 mm, 3 µm  
**Guard column:** UCT, Selectra® Aqueous C18, 10 x 2.0 mm, 3 µm  
**Column temperature:** 40°C  
**Column flow rate:** 0.300 mL/min  
**Auto-sampler temperature:** 10 °C  
**Injection volume:** 10 µL  
**Mobile Phase A:** 20 mM ammonium formate in water  
**Mobile Phase B:** 0.1% formic acid in MeOH  
**Gradient:**

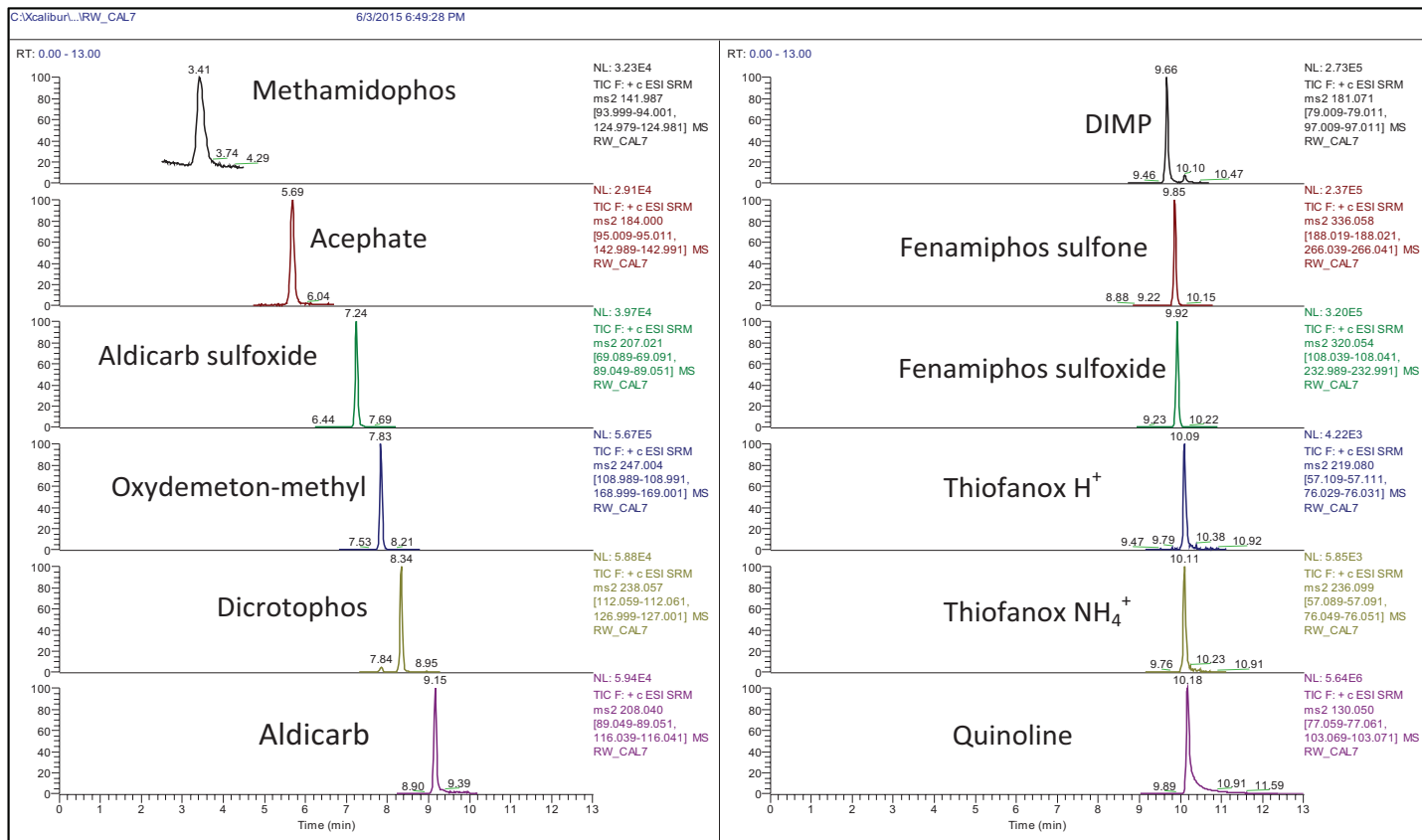
Time	%A	%B
0	100	0
0.5	100	0
3	50	50
4.5	50	50
6	35	65
9	35	65
13	5	95
15	5	95
15.1	100	0
19	100	0

Divert mobile phase to waste from  
0 - 2 and 16 - 19 min to prevent  
ion source contamination.

### MS Parameters

**Detector:** Thermo Scientific TSQ Vantage tandem MS  
**Polarity:** ESI +  
**Spray voltage:** 5000 V  
**Vaporizer temperature:** 378 °C  
**Ion transfer capillary temperature:** 200 °C  
**Sheath gas pressure:** 50 arbitrary units  
**Auxiliary gas pressure:** 5 arbitrary units  
**Q1 and Q3 peak width (FWHM):** 0.4 and 0.7 Da  
**Collision gas and pressure:** Ar at 1.5 mTorr  
**Cycle time:** 1 sec  
**Acquisition method:** EZ Method (scheduled SRM)

# EPA 538: Selected Organic Contaminants in Drinking Water



## HPLC Conditions

**Instrument:** Thermo Scientific Dionex UltiMate 3000® LC System

**Column:** UCT, Selectra® Aqueous C18, 100 x 2.1 mm, 3 µm

**Guard column:** UCT, Selectra® Aqueous C18, 10 x 2.0 mm, 3 µm

**Column temperature:** 40 °C

**Column flow rate:** 0.300 mL/min

**Auto-sampler temperature:** 10 °C

**Injection volume:** 50 µL

**Mobile Phase A:** 20 mM ammonium formate in water

**Mobile Phase B:** MeOH

**Gradient:**

Time	%A	%B
0	100	0
2	100	0
9	15	85
12	15	85
12.1	100	0
16	100	0
Divert mobile phase to waste from 0 - 2 and 14 - 16 min to prevent ion source contamination.		

## MS Parameters

**Detector:** Thermo Scientific TSQ Vantage tandem MS

**Polarity:** ESI +

**Spray voltage:** 5000 V

**Vaporizer temperature:** 378 °C

**Ion transfer capillary temperature:** 200 °C

**Sheath gas pressure:** 40 arbitrary units:

**Auxiliary gas pressure:** 5 arbitrary units:

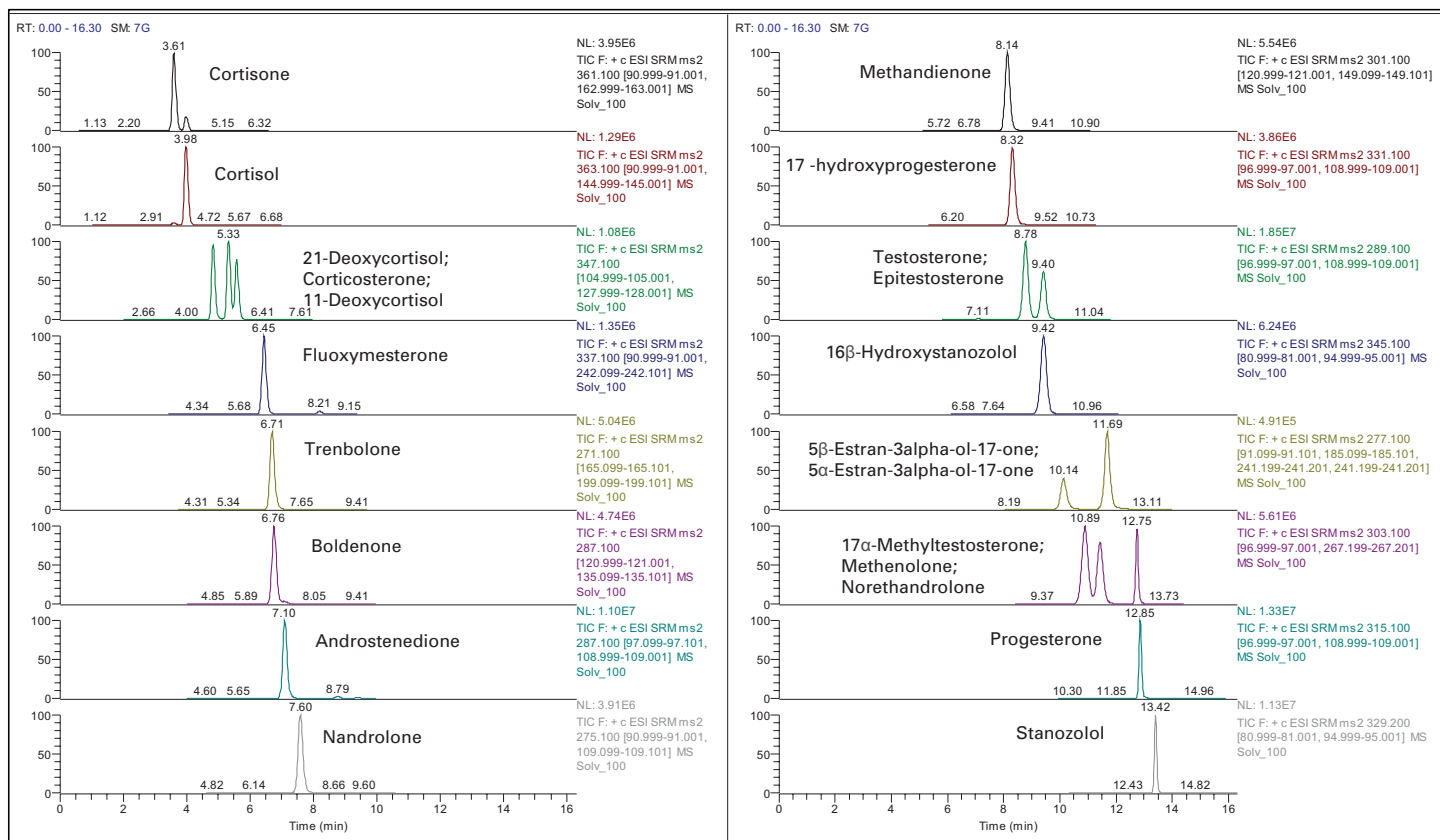
**Q1 and Q3 peak width (FWHM):** 0.2 and 0.7 Da

**Collision gas and pressure:** Ar at 1.5 mTorr

**Cycle time:** 1 sec

**Acquisition method:** EZ Method (scheduled SRM)

## Anabolic Steroids



### HPLC Conditions

**Instrument:** Thermo Scientific Dionex UltiMate 3000® LC System

**Column:** UCT, Selectra®, AqueousC18, 100 x 2.1 mm, 3 µm

**Guard column:** UCT, Selectra®, Aqueous C18, 10 x 2.0 mm, 3 µm

**Column temperature:** 40 °C

**Column flow rate:** 0.300 mL/min

**Auto-sampler temperature:** 10 °C

**Injection volume:** 10 µL

**Mobile Phase A:** 20 mM ammonium formate in water

**Mobile Phase B:** 0.1% formic acid in MeOH

**Gradient:**

Time	%A	%B
0	50	50
2	40	60
9	40	60
12	0	100
15	0	100
15.1	50	50
19	50	50
Divert mobile phase to waste from 0 - 3 and 15 - 19 min to prevent ion source contamination.		

### MS Parameters

**Detector:** Thermo Scientific TSQ Vantage tandem MS

**Polarity:** ESI +

**Spray voltage:** 3000 V

**Vaporizer temperature:** 409 °C

**Ion transfer capillary temperature:** 249 °C

**Sheath gas pressure:** 20 arbitrary units

**Auxiliary gas pressure:** 40 arbitrary units

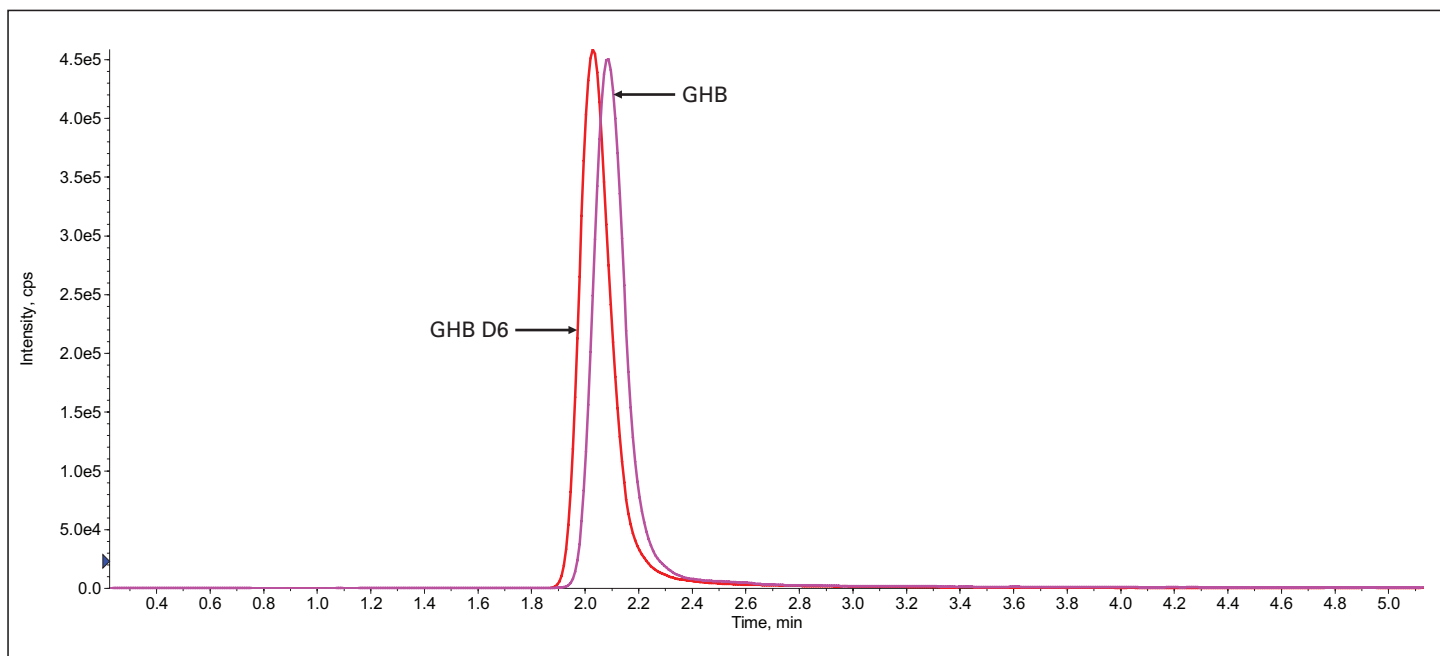
**Q1 and Q3 peak width (FWHM):** 0.4 and 0.7 Da

**Collision gas and pressure:** Ar at 1.5 mTorr

**Cycle time:** 1 sec

**Acquisition method:** EZ Method (scheduled SRM)

## GHB



### HPLC Conditions

**Instrument:** Agilent 1200 Binary Pump SL

**Column:** UCT, Selectra®, Aqueous C18, 100 x 2.1 mm, 3 µm

**Guard column:** UCT, Selectra®, Aqueous C18, 10 x 2.0 mm, 3 µm

**Column temperature:** 50 °C

**Column flow rate:** 0.300 mL/min

**Auto-sampler temperature:** 10 °C

**Injection volume:** 10 µL

**Mobile Phase A:** 0.1% formic acid in H<sub>2</sub>O

**Mobile Phase B:** 0.1% formic acid in MeOH

**Gradient:**

Time	%A	%B
0	100	0
1.5	100	0
2.0	0	100
3.0	0	100
3.2	100	0
7.0	100	0
Divert mobile phase to waste from 0 - 1 and 3 - 7 min to prevent ion source contamination.		

### MS Parameters

**Detector:** AB Sciex API 4000 QTrap MS/MS

**Polarity:** ESI (-)

**Spray voltage:** 4200 V

**Vaporizer temperature:** 650 °C

**Ion transfer capillary temperature:** 250 °C

**Sheath gas pressure:** 40 arbitrary units

**Auxiliary gas pressure:** 40 arbitrary units

**Q1 and Q3 peak width (FWHM):** 0.4 and 0.7 Da

**Collision gas and pressure:** Medium

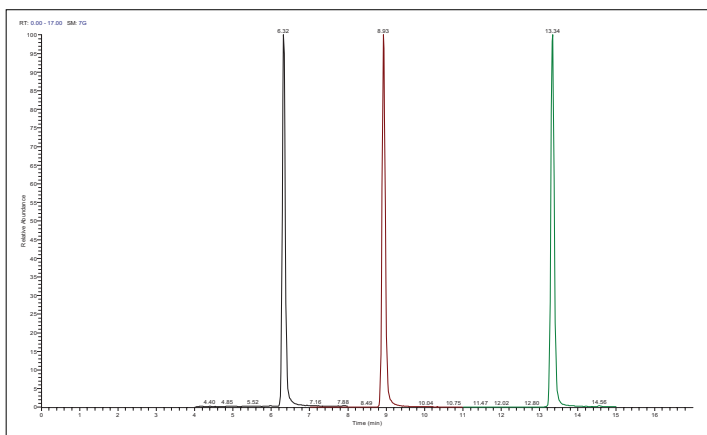
**Cycle time:** 1.2 sec

**Acquisition method:** EZ Method (scheduled SRM)

## Lot to Lot Reproducibility

Selectra® Aqueous C18 columns are manufactured under strict quality control guidelines which supports UCT's ongoing tradition of lot-to-lot consistent performance.

### Lot 1

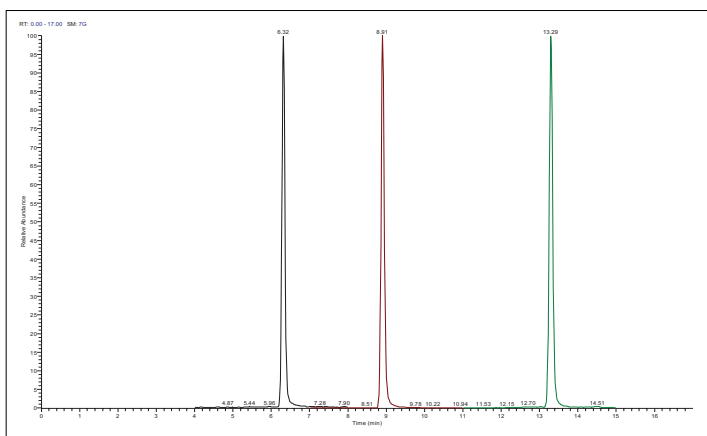


**Column:** UCT, Selectra®, Aqueous C18, 100 x 2.1 mm, 3 µm  
**Guard column:** UCT, Selectra®, Aqueous C18, 10 x 2.0 mm, 3 µm  
**Column temperature:** 40 °C  
**Column flow rate:** 0.300 mL/min  
**Auto-sampler temperature:** 10 °C  
**Injection volume:** 10 µL  
**Mobile Phase A:** 20 mM ammonium formate in water  
**Mobile Phase B:** 0.1% formic acid in MeOH

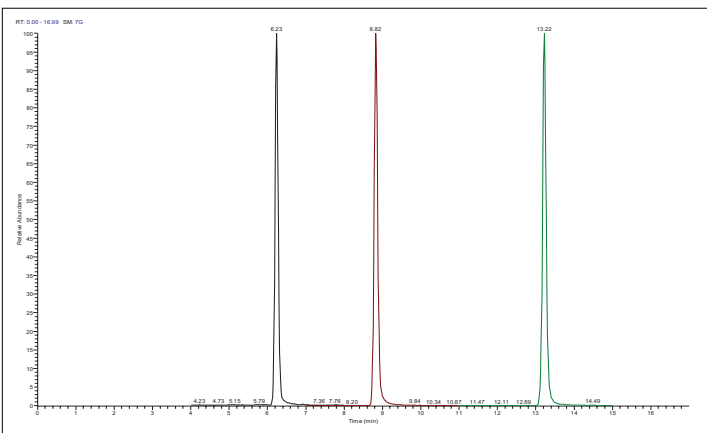
### Performance of 3 Selectra® Aqueous C18 columns

Compound	3 lots total (n=61)	
	RT (min)	Rt RSD%
Methamidophos	3.65	1.7
Acephate	4.41	0.6
Diclotophos	5.94	0.5
o,o,o-triethylphosphorothioate	6.26	0.4
Dimethoate	6.26	0.4
Famphur	8.85	0.4
Malathion	10.37	0.5
Sulfotep	12.23	0.5
Diazinon	12.97	0.4
TPP	13.25	0.3
Pyrazophos	13.54	0.3
Profenofos	14.16	0.3
Ethion	14.40	0.2
Chlorpyrifos	14.61	0.2

### Lot 2



### Lot 3





## Column Care & Usage

Each UCT, Inc. high performance liquid chromatography (HPLC) column is individually packed and tested to ensure superior performance. A HPLC CoA is included with each column. It contains a chromatogram, the column serial number, and the lot number of the packing material. Retain this information for as long as you have the column; it may be useful if troubleshooting is ever required.

### Guard Columns & Filters

The use of in-line filters and/or guard cartridges can prolong the life of an analytical column. Commonly used to capture impurities that may otherwise lodge on the HPLC column, they are especially useful with samples emanating from a biological source. Guard cartridges should be the same phase as the column they are protecting and be replaced when the chromatography begins to deteriorate or when excessive back pressure is noted on the HPLC system.

### Pressure Recommendation

UCT, Inc. HPLC columns are silica based. To ensure optimal column life, operating pressures of 3000psi or lower are recommended. Pressures may increase with time due to accumulation of particulates on the column. Sudden increases in pressure are usually a result of a blocked frit. Make note that pressure will vary with different mobile phase systems. For example Water/Methanol mixtures will generally give higher back pressure than Water/Acetonitrile mobile phases.



### Mobile Phase

When shipped, the column contains the storage solvent listed on its HPLC CoA. Before initial usage, ensure that your planned mobile phase system is compatible with this solvent. If it is not, you must flush the column with an intermediate solvent that is compatible with both the storage solvent and your planned mobile phase. Be especially cognizant if you are using buffers; the storage solvent for most columns contains greater than 50% organic solvent, and contact with a buffer could cause a salting out effect. The resulting precipitate can plug the column.

### Flow Direction & Flow Rate

The arrows on the column label indicate the recommended flow direction.

Begin by connecting the inlet end of the column to the injector or autosampler and allow mobile phase to flow from the outlet end of the column into a beaker for 10–15 minutes. Gradually increase the flow rate. Next, stop the mobile phase flow and connect the column to your detector. Because every LC system is unique, especially when used in gradient mode, your results may slightly differ from those obtained in our laboratory. UCT, Inc. technical service can assist you in optimizing your separations. Be sure to record the operating pressure before calling.

### Increasing Column Lifetime

Silica based UCT, Inc. HPLC column packing materials have a pH operating range of 2-8. Extended use of any column at extreme pH can shorten column lifetime.

The upper temperature limit for silica based HPLC columns is 80 °C. Elevated temperatures can improve efficiency by lowering solvent viscosity, but column lifetime may be compromised.

Use of HPLC-Grade solvents is strongly recommended. Residue and chemical contaminants in non-HPLC grade solvents can alter a column's selectivity and, potentially plug the inlet frit leading to an increased system pressure. Mobile phase filtering and degassing (either off-line or in-line) is highly recommended.

Column lifetime is also governed by stationary phase type. Hydrocarbon phases, such as C18, are relatively chemically inert. Polar phases, such as cyano or amino, require somewhat more care as they can be chemically active.

## Column Maintenance

Columns should not be subjected to mechanical or pressure shock. This can cause irreversible damage to the column.

Columns should be run in the flow direction as marked on the column. The one exception is for column cleaning. The flow can be reversed to back-flush frits if blockages occur.

Do not store the column in an aqueous buffer, this will promote microbiological contamination. First flush the column with water and then with 50/50 organic solvent/water prior to storage.

### Washing Procedure for Reverse-Phase Columns

Washing the column successively with non-polar eluents will usually remove accumulated impurities. Follow the washing sequence below, using 30 mL of each solvent, to thoroughly clean the column.

1. Distilled water 90%, 10% Methanol
2. 0.5M  $\text{H}_3\text{PO}_4$  90%, 10% Methanol (Optional)\*
3. Distilled water 90%, 10% Methanol (Optional)\*
4. Methanol
5. Methanol/Chloroform (1:1) (Optional)
6. Methanol or Acetonitrile (Optional)
7. Distilled water 90%, 10% Methanol
8. Eluent to recondition column

**\*NOTE:** Whenever step 2 is used, it must be followed by step 3.

It is recommended that columns be dedicated for the specific method when ion pairing reagents are used. This is because it is difficult to remove all of the ion pairing reagent.

### Protein Contamination

Proteins can adsorb onto columns causing loss of performance. In this situation, rinse the column overnight with 20% 0.1M nitric acid/80% isopropanol at a flow rate of 1/5th the usual flow rate (i.e. at 0.2 mL/min for 4.6mm ID columns). Ensure that the rinse solution is sent directly to solvent waste and not through the detector.

### Lipid Contamination

If lipids or other highly hydrophobic compounds have contaminated the column use the full washing procedure except replace step 5 with 100% chloroform or dichloromethane.

# SELECTRA® AQUEOUS C18 HPLC COLUMNS

## PRICES AND TERMS

Our prices are subject to change without notice. The price in effect when we receive your order will apply. All prices are in US Dollars and are F.O.B. Terms of payment are net 30 days.

## MINIMUM ORDERS

We welcome all orders, therefore, we do not have a minimum order requirement. When ordering, please include your purchase order number, complete "Ship To" and "Bill To" address, catalog number, quantity, and description of product(s). Also include your name and a phone number where you can be reached should we have any questions concerning your order.

## SHIPMENTS

Normal processing is within 24 hours after receipt of an order. Unless special shipping requests have been made, our trained staff will send all orders by UPS Ground service. The appropriate shipping charges (freight & insurance costs) will be added to the invoice, unless otherwise instructed by the customer.

## SPECIAL PRICING

We offer special pricing for volume purchases and standing orders. These discounts apply to bonded phase extraction column purchases only. Please call a sales representative for more information on special pricing qualifications.

## RETURN POLICY

Our Quality Manager will handle all returns. Before returning merchandise, please call to obtain a return authorization number from the quality manager. We will need to know the reason for the return, date of purchase, purchase order number and invoice number in order to issue a return authorization number. Return merchandise must be received before a credit can be issued. Returns will not be accepted after 90 days. A restocking fee of 25% of the price paid, or a minimum of \$25.00 (whichever is greater) will be charged on all returns.

## WARRANTY

All products manufactured by UCT are guaranteed against defects in materials and workmanship for a period of 90 days after shipment. UCT will replace any items that prove to be defective during this time period. The exclusive remedy requires the end user to first advise UCT of the defective product by phone or in writing and must include order number, the lot number and the shipping date.

To initiate this action, photographs of the product, including packaging and labeling of the containers, must be submitted to the UCT Representative for approval. With approval a return authorization can be initiated, and must be received within 30 days. Once the materials arrive at UCT a further inspection of the materials must be completed and accepted by our Quality Manager prior to further action of credits or replacement. UCT's total liability is limited to the replacement cost of UCT products.

This warranty does not apply to damage resulting from misuse.

## Contact Us

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