NEW!

Ultra II™ LC Columns

The Column Line Designed for Optimal Chromatography on **Any LC System**, Based on Highly Inert Restek Silica

Available Phases:

- C18
- Biphenyl
- Aromax
- Silica
- PFP Propyl
- Aqueous C18

Available Particle Sizes:

- 1.9µm for UHPLC
- 2.2µm for UFLC and RRLC
- 3µm and 5µm for HPLC

More phases coming soon!

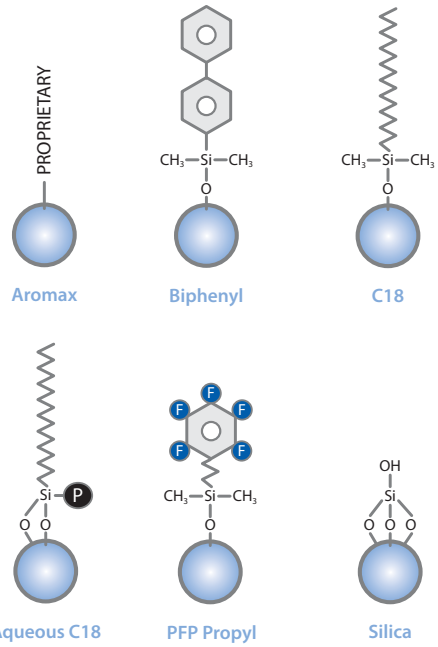


RESTEK

Chromatography Products

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NEW! Ultra II™ LC Columns



Ultra II™ is the first LC column line specifically designed for universal application—optimal chromatography on any system. This column line is built on a highly inert, high surface area silica that is completely Restek manufactured, providing excellent column-to-column reproducibility. Only Ultra II™ columns are available in a comprehensive range of particle sizes (1.9µm, 2.2µm, 3µm, and 5µm), creating truly scalable chromatography on any type of LC instrument, from conventional to ultra-high pressure systems. Ultra II™ columns are available in traditional phases (C18, Aqueous C18, Silica) and unique chemistries which provide alternate selectivity (Biphenyl, Aromax, PFP Propyl).

Ultra II™ Aromax Columns (USP L11)

Ultra II Aromax is a unique reversed phase material that exhibits superior retention and selectivity for aromatic and/or unsaturated compounds, compared to conventional alkyl and phenyl phases. This column is a great alternative to our Biphenyl phase when increased retention is required. A very suitable choice for analysis of steroids, tetracyclines, drug metabolites, and other compounds that contain some degree of unsaturation.

Ultra II™ Biphenyl Columns (USP L11)

A unique reversed phase material that exhibits both increased retention and selectivity for aromatic and/or unsaturated compounds, compared to conventional alkyl and phenyl phases. This is a great alternative to a C18 column when alternative selectivity is desired. An excellent choice for the analysis of steroids, tetracyclines, drug metabolites, and other compounds that contain some degree of unsaturation.

Ultra II™ C18 Columns (USP L1)

A retentive, highly pure material that exhibits excellent peak shape for a wide range of compounds. This is a robust and very reproducible general-purpose reversed phase column.

Ultra II™ Aqueous C18 Columns (USP L1)

Highly retentive and selective for reversed phase separations of polar analytes. Highly base-deactivated. Compatible with highly aqueous (up to 100%) mobile phases.

Ultra II™ PFP Propyl Columns (USP L43)

A pentafluorophenyl phase with a propyl spacer. Highly retentive for basic analytes. An excellent phase for separating nucleosides, nucleotides, purines, pyrimidines, and halogenated compounds.

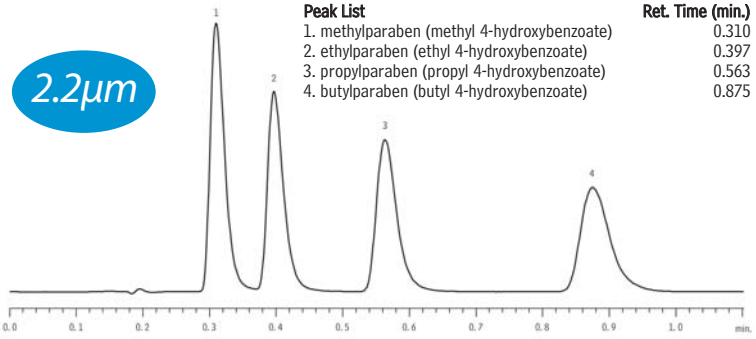
Ultra II™ Silica Columns (USP L3)

High surface area. Type B silica packing.

Parabens on Ultra II™ C18

2.2µm

Peak List	Ret. Time (min.)
1. methylparaben (methyl 4-hydroxybenzoate)	0.310
2. ethylparaben (ethyl 4-hydroxybenzoate)	0.397
3. propylparaben (propyl 4-hydroxybenzoate)	0.563
4. butylparaben (butyl 4-hydroxybenzoate)	0.875



LC_PH0486

Sample:
Inj.: 1µL
Conc.: 50µg/mL each component
Sample diluent: methanol

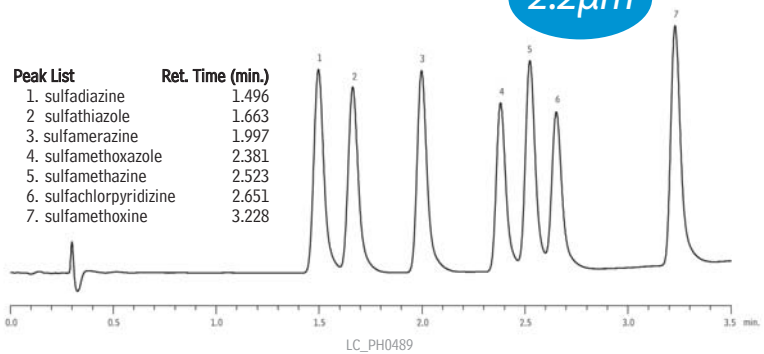
Column: Ultra II™ C18
Cat.#: 9604853
Dimensions: 50mm x 3.0mm
Particle size: 2.2µm
Pore size: 100Å

Conditions:
Instrument: Shimadzu Prominence UFLCXR
Mobile phase: 0.1% formic acid in water:methanol (35:65)
Flow: 1.5mL/min.
Temp.: 30°C
Det.: UV @ 254nm

Sulfa Drugs on Ultra II™ Biphenyl

2.2µm

Peak List	Ret. Time (min.)
1. sulfadiazine	1.496
2. sulfathiazole	1.663
3. sulfamerazine	1.997
4. sulfamethoxazole	2.381
5. sulfamethazine	2.523
6. sulfachlorpyridizine	2.651
7. sulfamethoxine	3.228



LC_PH0489

Sample:
Inj.: 3µL
Conc.: 25µg/mL each component
Sample diluent: methanol

Column: Ultra II™ Biphenyl
Cat.#: 9609853
Dimensions: 50mm x 3.0mm
Particle size: 2.2µm
Pore size: 100Å

Conditions:
Instrument: Shimadzu Prominence UFLCXR
Mobile phase: 0.1% formic acid in water:methanol (75:25)
Flow: 1.0mL/min.
Temp.: 30°C
Det.: UV @ 254nm

Famotidine on Ultra II™ Aromax

Fast! 5µm

Peak List	Ret. Time (min.)
1. impurity A	3.779
2. famotidine	8.264
3. impurity D	9.180
4. impurity C	9.911
5. impurity B	14.018

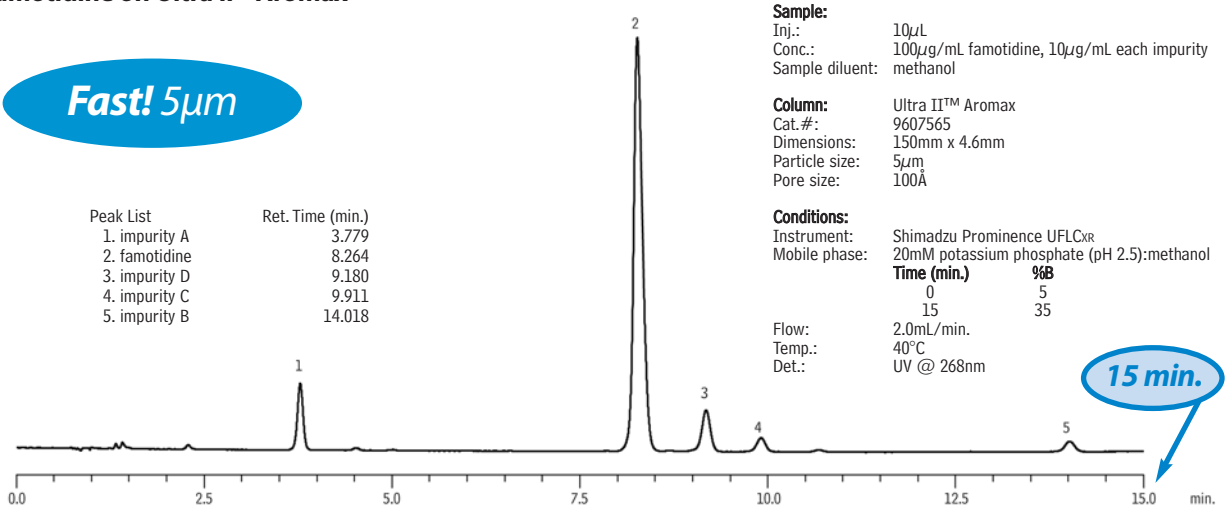
Sample:
Inj.: 10µL
Conc.: 100µg/mL famotidine, 10µg/mL each impurity
Sample diluent: methanol

Column: Ultra II™ Aromax
Cat.#: 9607565
Dimensions: 150mm x 4.6mm
Particle size: 5µm
Pore size: 100Å

Conditions:
Instrument: Shimadzu Prominence UFLCXR
Mobile phase: 20mM potassium phosphate (pH 2.5):methanol

Time (min.)	**%B**
0	5
15	35

Flow: 2.0mL/min.
Temp.: 40°C
Det.: UV @ 268nm



LC_PH0495

Faster! 3µm

Peak List	Ret. Time (min.)
1. impurity A	2.094
2. famotidine	4.460
3. impurity D	4.937
4. impurity C	5.334
5. impurity B	7.480

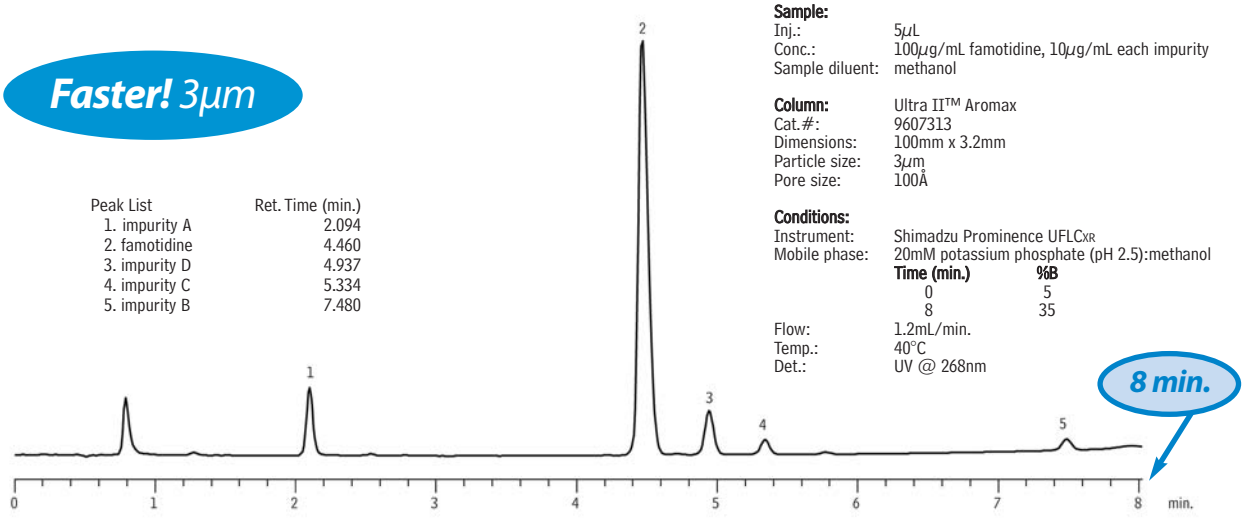
Sample:
Inj.: 5µL
Conc.: 100µg/mL famotidine, 10µg/mL each impurity
Sample diluent: methanol

Column: Ultra II™ Aromax
Cat.#: 9607313
Dimensions: 100mm x 3.2mm
Particle size: 3µm
Pore size: 100Å

Conditions:
Instrument: Shimadzu Prominence UFLCXR
Mobile phase: 20mM potassium phosphate (pH 2.5):methanol

Time (min.)	**%B**
0	5
8	35

Flow: 1.2mL/min.
Temp.: 40°C
Det.: UV @ 268nm



LC_PH0494

Fastest! 2.2µm

Peak List	Ret. Time (min.)
1. impurity A	0.892
2. famotidine	2.082
3. impurity D	2.292
4. impurity C	2.517
5. impurity B	3.540

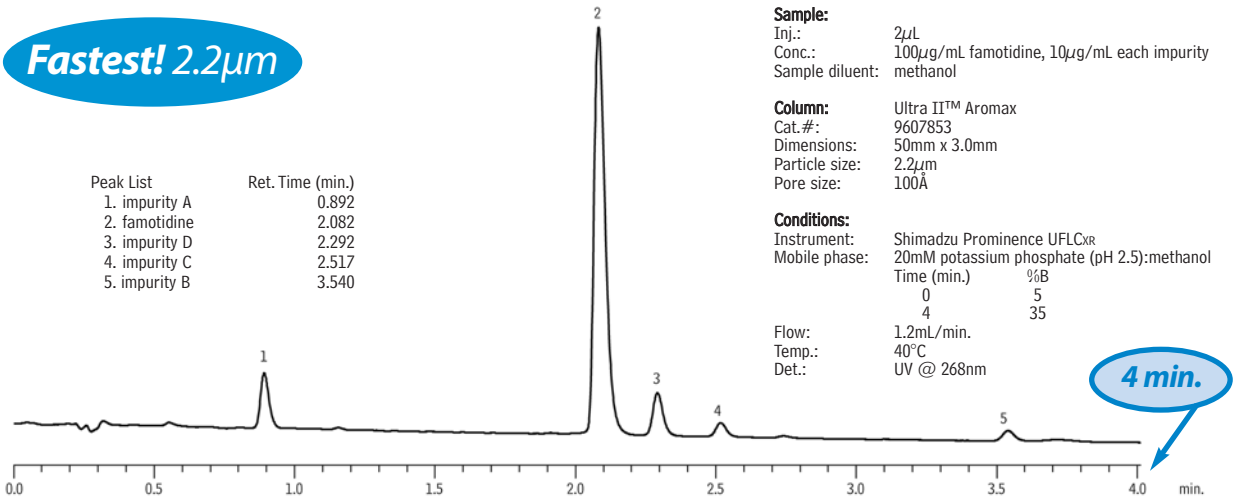
Sample:
Inj.: 2µL
Conc.: 100µg/mL famotidine, 10µg/mL each impurity
Sample diluent: methanol

Column: Ultra II™ Aromax
Cat.#: 9607853
Dimensions: 50mm x 3.0mm
Particle size: 2.2µm
Pore size: 100Å

Conditions:
Instrument: Shimadzu Prominence UFLCXR
Mobile phase: 20mM potassium phosphate (pH 2.5):methanol

Time (min.)	%B
0	5
4	35

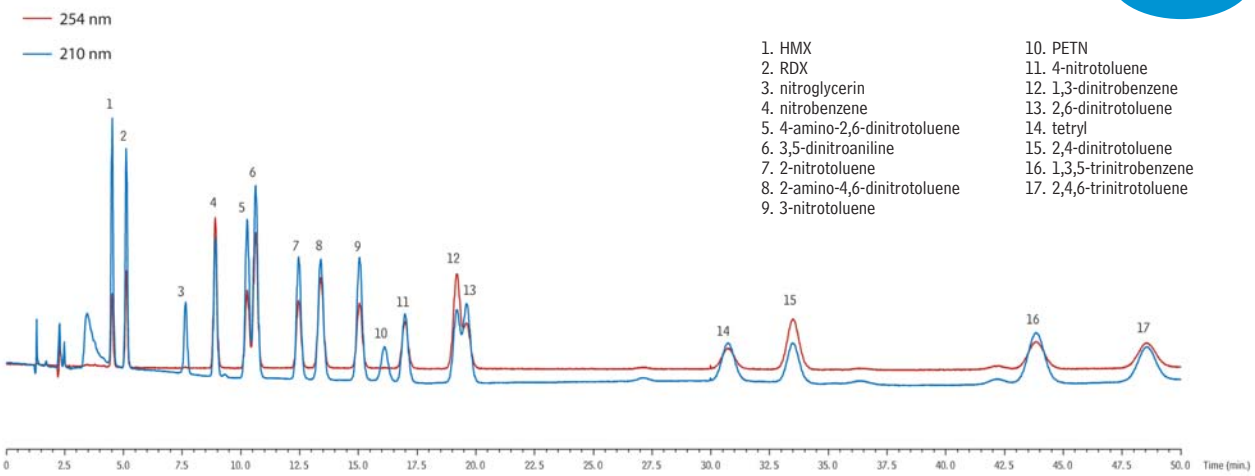
Flow: 1.2mL/min.
Temp.: 40°C
Det.: UV @ 268nm



LC_PH0493

Explosives on Ultra II™ Aromax

5µm



1. HMX
2. RDX
3. nitroglycerin
4. nitrobenzene
5. 4-amino-2,6-dinitrotoluene
6. 3,5-dinitroaniline
7. 2-nitrotoluene
8. 2-amino-4,6-dinitrotoluene
9. 3-nitrotoluene
10. PETN
11. 4-nitrotoluene
12. 1,3-dinitrobenzene
13. 2,6-dinitrotoluene
14. tetryl
15. 2,4-dinitrotoluene
16. 1,3,5-trinitrobenzene
17. 2,4,6-trinitrotoluene

LC_EV0484

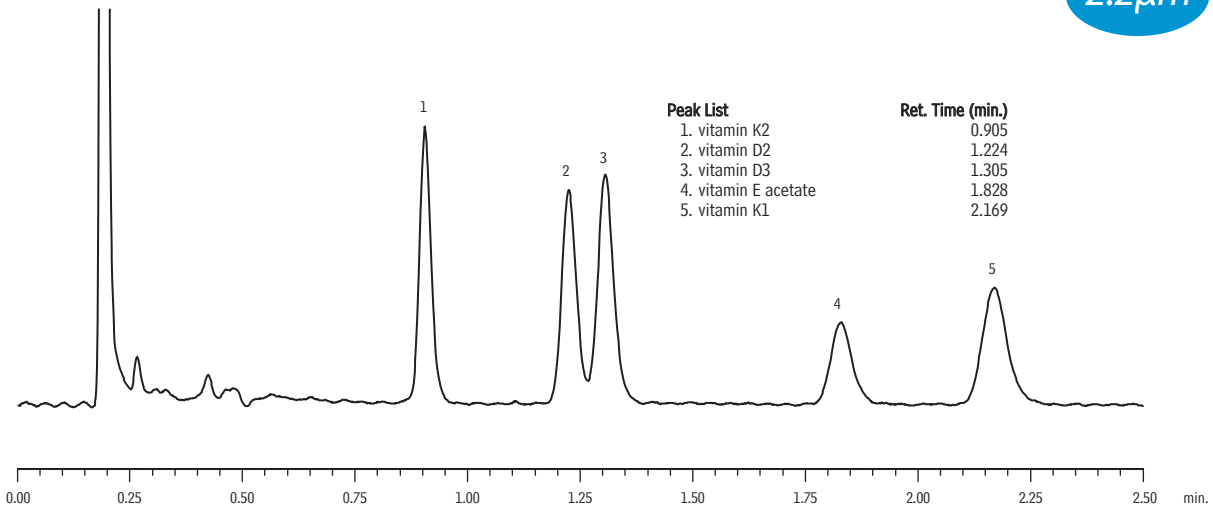
Sample: Nitroaromatics and Nitramine Explosives by HPLC, EPA 8330B (cat.# 33204)
Inj.: 10µL
Conc.: 10µg/mL each component
Sample diluent: methanol

Column: Ultra II™ Aromax
Cat.#: 9607575
Dimensions: 250mm x 4.6mm
Particle size: 5µm
Pore size: 100Å

Conditions:
Instrument: Shimadzu Prominence UFLCXR
Mobile phase: water:methanol, 35:65 (v/v)
Flow: 1.2mL/min.
Temp.: 30°C
Det.: UV @ 254nm and 210nm

Fat Soluble Vitamins on Ultra II™ C18

2.2µm



Peak List	Ret. Time (min.)
1. vitamin K2	0.905
2. vitamin D2	1.224
3. vitamin D3	1.305
4. vitamin E acetate	1.828
5. vitamin K1	2.169

LC_PH0492

Sample:
Inj.: 1µL
Conc.: 100µg/mL each component
Sample diluent: acetone

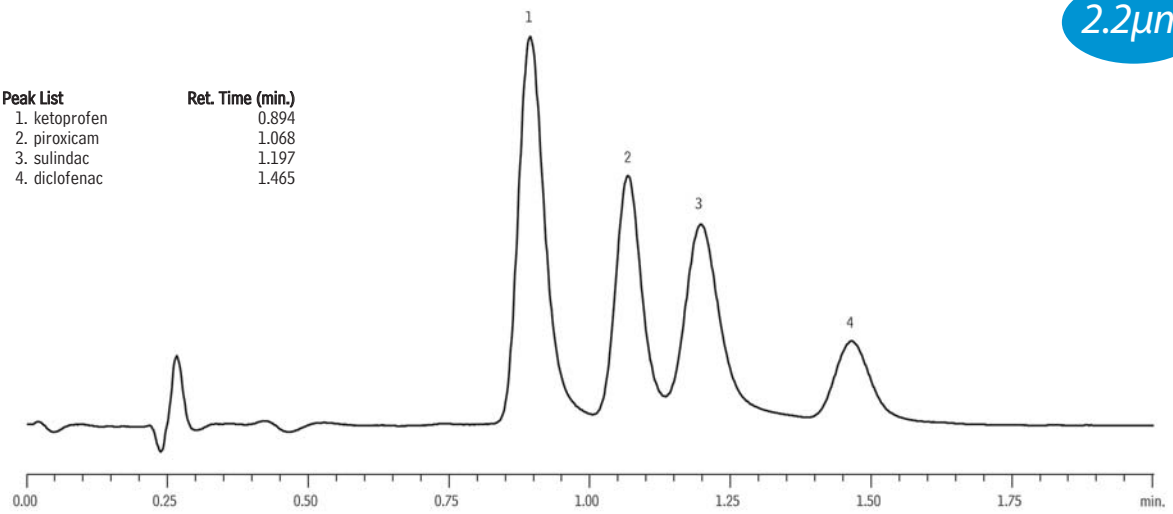
Column: Ultra II™ C18
Cat.#: 9604853
Dimensions: 50mm x 3.0mm
Particle size: 2.2µm
Pore size: 100Å

Conditions:
Instrument: Shimadzu Prominence UFLCXR
Mobile phase: acetonitrile:methanol (85:15)
Flow: 1.5mL/min.
Temp.: ambient
Det.: UV @ 230nm

NSAIDs on Ultra II™ Biphenyl

2.2µm

Peak List	Ret. Time (min.)
1. ketoprofen	0.894
2. piroxicam	1.068
3. sulindac	1.197
4. diclofenac	1.465



LC_PH0487

Sample:
Inj.: 5µL
Conc.: 15µg/mL each component
Sample diluent: methanol

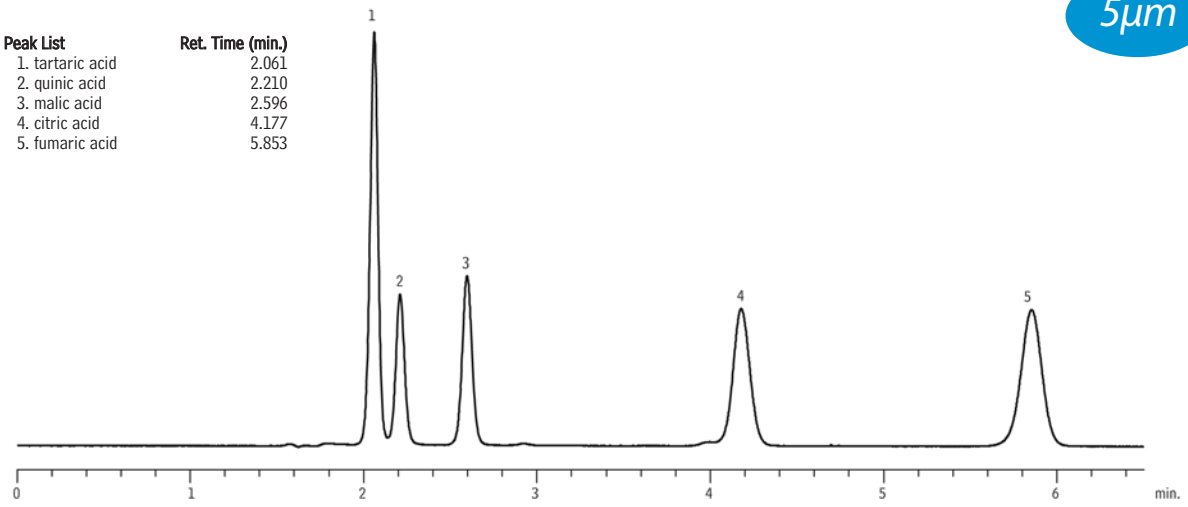
Column: Ultra II™ Biphenyl
Cat.#: 9609853
Dimensions: 50mm x 3.0mm
Particle size: 2.2µm
Pore size: 100Å

Conditions:
Instrument: Shimadzu Prominence UFLCXR
Mobile phase: 20mM potassium phosphate, pH 2.5 with H_3PO_4:methanol (30:70)
Flow: 1.2mL/min.
Temp.: 40°C
Det.: UV @ 254nm

Organic Acids on Ultra II™ Aqueous C18

5µm

Peak List	Ret. Time (min.)
1. tartaric acid	2.061
2. quinic acid	2.210
3. malic acid	2.596
4. citric acid	4.177
5. fumaric acid	5.853



LC_PH0498

Sample:
Inj.: 5µL
Conc.: 10µg/mL fumaric acid, 2,000µg/mL each other acids
Sample diluent: water

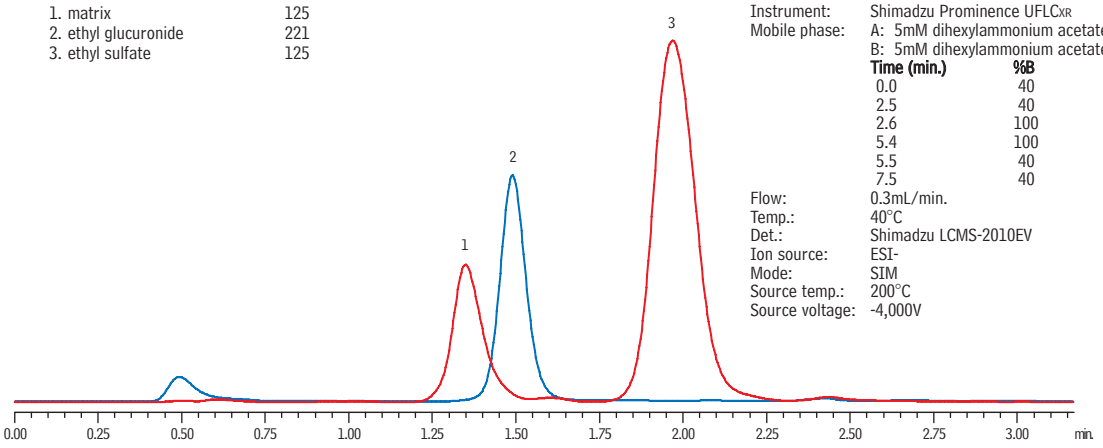
Column: Ultra II™ Aqueous C18
Cat.#: 9608565
Dimensions: 150mm x 4.6mm
Particle size: 5µm
Pore size: 100Å

Conditions:
Instrument: Shimadzu Prominence UFLCXR
Mobile phase: 100% 20mM potassium phosphate (pH 2.5)
Flow: 1.0mL/min.
Temp.: 30°C
Det.: UV @ 226nm

Alcohol Metabolites on Ultra II™ Biphenyl

5µm

Peak List	m/z
1. matrix	125
2. ethyl glucuronide	221
3. ethyl sulfate	125



LC_CF0500

Sample:
Inj.: 5µL
Conc.: 5µg/mL each component
Sample diluent: urine diluted 1:10 with mobile phase

Column: Ultra II™ Biphenyl
Cat.#: 9609552
Dimensions: 50mm x 2.1mm
Particle size: 5µm
Pore size: 100Å

Conditions:
Instrument: Shimadzu Prominence UFLCXR
Mobile phase: A: 5mM dihexylammonium acetate in water
B: 5mM dihexylammonium acetate in methanol

Time (min.)	%B
0.0	40
2.5	40
2.6	100
5.4	100
5.5	40
7.5	40

Flow: 0.3mL/min.
Temp.: 40°C
Det.: Shimadzu LCMS-2010EV
Ion source: ESI-
Mode: SIM
Source temp.: 200°C
Source voltage: -4,000V

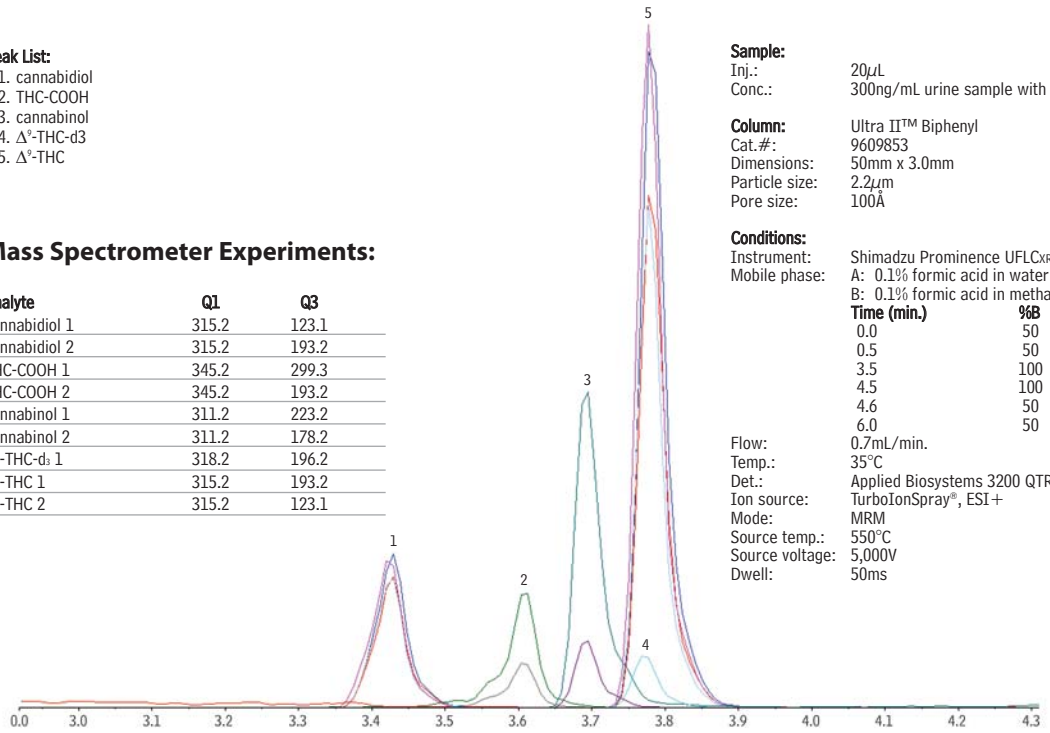
Cannabinoids on Ultra II™ Biphenyl

2.2µm

Peak List:
1. cannabidiol
2. THC-COOH
3. cannabinol
4. Δ⁹-THC-d3
5. Δ⁹-THC

Mass Spectrometer Experiments:

Analyte	Q1	Q3
cannabidiol 1	315.2	123.1
cannabidiol 2	315.2	193.2
THC-COOH 1	345.2	299.3
THC-COOH 2	345.2	193.2
cannabinol 1	311.2	223.2
cannabinol 2	311.2	178.2
Δ⁹-THC-d₃ 1	318.2	196.2
Δ⁹-THC 1	315.2	193.2
Δ⁹-THC 2	315.2	123.1



LC_CF0499

Sample:
Inj.: 20µL
Conc.: 300ng/mL urine sample with 50ng/mL internal standard

Column: Ultra II™ Biphenyl
Cat.#: 9609853
Dimensions: 50mm x 3.0mm
Particle size: 2.2µm
Pore size: 100Å

Conditions:
Instrument: Shimadzu Prominence UFLCXR
Mobile phase: A: 0.1% formic acid in water
B: 0.1% formic acid in methanol

Time (min.)	%B
0.0	50
0.5	50
3.5	100
4.5	100
4.6	50
6.0	50

Flow: 0.7mL/min.
Temp.: 35°C
Det.: Applied Biosystems 3200 QTRAP™ LC/MS/MS system
Ion source: TurboIonSpray®, ESI+
Mode: MRM
Source temp.: 550°C
Source voltage: 5,000V
Dwell: 50ms

Ultra II™ Silica Columns (USP L3)

Physical Characteristics:

particle size: 1.9µm, 2.2µm, 3µm or 5µm, spherical
pore size: 100Å
carbon load: 0%
endcap: no
pH range: 2.5 to 7.5
temperature limit: 80°C

1.9µm Column, 2.1mm	cat. #
30mm	9600232
50mm	9600252
100mm	9600212
2.2µm Column, 3.0mm	**cat. #**
30mm	9600833
50mm	9600853
100mm	9600813
3µm Column, 1.0mm	**cat. #**
30mm	9600331
50mm	9600351
100mm	9600311
150mm	9600361
3µm Column, 2.1mm	**cat. #**
30mm	9600332
50mm	9600352
100mm	9600312
150mm	9600362
3µm Column, 3.2mm	**cat. #**
30mm	9600333
50mm	9600353
100mm	9600313
150mm	9600363
3µm Column, 4.6mm	**cat. #**
30mm	9600335
50mm	9600355
100mm	9600315
150mm	9600365
5µm Column, 1.0mm	**cat. #**
30mm	9600531
50mm	9600551
100mm	9600511
150mm	9600561
200mm	9600521
250mm	9600571
5µm Column, 2.1mm	**cat. #**
30mm	9600532
50mm	9600552
100mm	9600512
150mm	9600562
200mm	9600522
250mm	9600572
5µm Column, 3.2mm	**cat. #**
30mm	9600533
50mm	9600553
100mm	9600513
150mm	9600563
200mm	9600523
250mm	9600573
5µm Column, 4.6mm	**cat. #**
30mm	9600535
50mm	9600555
100mm	9600515
150mm	9600565
200mm	9600525
250mm	9600575

Ultra II™ Biphenyl Columns (USP L11)

Physical Characteristics:

particle size: 2.2µm, 3µm or 5µm, spherical
pore size: 100Å
carbon load: 15%
endcap: fully endcapped
pH range: 2.5 to 7.5
temperature limit: 80°C

2.2µm Column, 3.0mm	cat. #
30mm	9609833
50mm	9609853
100mm	9609813
3µm Column, 1.0mm	**cat. #**
30mm	9609331
50mm	9609351
100mm	9609311
150mm	9609361
3µm Column, 2.1mm	**cat. #**
30mm	9609332
50mm	9609352
100mm	9609312
150mm	9609362
3µm Column, 3.2mm	**cat. #**
30mm	9609333
50mm	9609353
100mm	9609313
150mm	9609363
3µm Column, 4.6mm	**cat. #**
30mm	9609335
50mm	9609355
100mm	9609315
150mm	9609365
5µm Column, 1.0mm	**cat. #**
30mm	9609531
50mm	9609551
100mm	9609511
150mm	9609561
200mm	9609521
250mm	9609571
5µm Column, 2.1mm	**cat. #**
30mm	9609532
50mm	9609552
100mm	9609512
150mm	9609562
200mm	9609522
250mm	9609572
5µm Column, 3.2mm	**cat. #**
30mm	9609533
50mm	9609553
100mm	9609513
150mm	9609563
200mm	9609523
250mm	9609573
5µm Column, 4.6mm	**cat. #**
30mm	9609535
50mm	9609555
100mm	9609515
150mm	9609565
200mm	9609525
250mm	9609575

1.9µm coming soon!

Ultra II™ Aromax Columns (USP L11)

Physical Characteristics:

particle size: 3µm or 5µm, spherical
pore size: 100Å
carbon load: 17%
endcap: fully endcapped
pH range: 2.5 to 7.5
temperature limit: 80°C

3µm Column, 1.0mm	cat. #
30mm	9607331
50mm	9607351
100mm	9607311
150mm	9607361
3µm Column, 2.1mm	**cat. #**
30mm	9607332
50mm	9607352
100mm	9607312
150mm	9607362
3µm Column, 3.2mm	**cat. #**
30mm	9607333
50mm	9607353
100mm	9607313
150mm	9607363
3µm Column, 4.6mm	**cat. #**
30mm	9607335
50mm	9607355
100mm	9607315
150mm	9607365
5µm Column, 1.0mm	**cat. #**
30mm	9607531
50mm	9607551
100mm	9607511
150mm	9607561
200mm	9607521
250mm	9607571
5µm Column, 2.1mm	**cat. #**
30mm	9607532
50mm	9607552
100mm	9607512
150mm	9607562
200mm	9607522
250mm	9607572
5µm Column, 3.2mm	**cat. #**
30mm	9607533
50mm	9607553
100mm	9607513
150mm	9607563
200mm	9607523
250mm	9607573
5µm Column, 4.6mm	**cat. #**
30mm	9607535
50mm	9607555
100mm	9607515
150mm	9607565
200mm	9607525
250mm	9607575

1.9µm & 2.2µm coming soon!

ordering note

For guard cartridges for these columns, visit our website at **www.restek.com**.

Visit us at **www.restek.com/ultra2** for our most complete listing of Ultra II™ columns.

Ultra II™ C18 Columns (USP L1)

Physical Characteristics:

particle size: 1.9µm, 2.2µm, 3µm or 5µm, spherical
pore size: 100Å
carbon load: 19%
endcap: fully endcapped
pH range: 2.5 to 7.5
temperature limit: 80°C

1.9µm Column, 2.1mm	cat. #
30mm	9604232
50mm	9604252
100mm	9604212
2.2µm Column, 3.0mm	**cat. #**
30mm	9604833
50mm	9604853
100mm	9604813
3µm Column, 1.0mm	**cat. #**
30mm	9604331
50mm	9604351
100mm	9604311
150mm	9604361
3µm Column, 2.1mm	**cat. #**
30mm	9604332
50mm	9604352
100mm	9604312
150mm	9604362
3µm Column, 3.2mm	**cat. #**
30mm	9604333
50mm	9604353
100mm	9604313
150mm	9604363
3µm Column, 4.6mm	**cat. #**
30mm	9604335
50mm	9604355
100mm	9604315
150mm	9604365
5µm Column, 1.0mm	**cat. #**
30mm	9604531
50mm	9604551
100mm	9604511
150mm	9604561
200mm	9604521
250mm	9604571
5µm Column, 2.1mm	**cat. #**
30mm	9604532
50mm	9604552
100mm	9604512
150mm	9604562
200mm	9604522
250mm	9604572
5µm Column, 3.2mm	**cat. #**
30mm	9604533
50mm	9604553
100mm	9604513
150mm	9604563
200mm	9604523
250mm	9604573
5µm Column, 4.6mm	**cat. #**
30mm	9604535
50mm	9604555
100mm	9604515
150mm	9604565
200mm	9604525
250mm	9604575

Ultra II™ Aqueous C18 Columns (USP L1)

Physical Characteristics:

particle size: 2.2µm, 3µm or 5µm, spherical
pore size: 100Å
carbon load: 15%
endcap: no
pH range: 2.5 to 7.5
temperature limit: 80°C

2.2µm Column, 3.0mm	cat. #
30mm	9608833
50mm	9608853
100mm	9608813
3µm Column, 1.0mm	**cat. #**
30mm	9608331
50mm	9608351
100mm	9608311
150mm	9608361
3µm Column, 2.1mm	**cat. #**
30mm	9608332
50mm	9608352
100mm	9608312
150mm	9608362
3µm Column, 3.2mm	**cat. #**
30mm	9608333
50mm	9608353
100mm	9608313
150mm	9608363
3µm Column, 4.6mm	**cat. #**
30mm	9608335
50mm	9608355
100mm	9608315
150mm	9608365
5µm Column, 1.0mm	**cat. #**
30mm	9608531
50mm	9608551
100mm	9608511
150mm	9608561
200mm	9608521
250mm	9608571
5µm Column, 2.1mm	**cat. #**
30mm	9608532
50mm	9608552
100mm	9608512
150mm	9608562
200mm	9608522
250mm	9608572
5µm Column, 3.2mm	**cat. #**
30mm	9608533
50mm	9608553
100mm	9608513
150mm	9608563
200mm	9608523
250mm	9608573
5µm Column, 4.6mm	**cat. #**
30mm	9608535
50mm	9608555
100mm	9608515
150mm	9608565
200mm	9608525
250mm	9608575

1.9µm coming soon!

Ultra II™ PFP Propyl Columns (USP L43)

Physical Characteristics:

particle size: 2.2µm, 3µm or 5µm, spherical
pore size: 100Å
carbon load: 11%
endcap: fully endcapped
pH range: 2.5 to 7.5
temperature limit: 80°C

2.2µm Column, 3.0mm	cat. #
30mm	9606833
50mm	9606853
100mm	9606813
3µm Column, 1.0mm	**cat. #**
30mm	9606331
50mm	9606351
100mm	9606311
150mm	9606361
3µm Column, 2.1mm	**cat. #**
30mm	9606332
50mm	9606352
100mm	9606312
150mm	9606362
3µm Column, 3.2mm	**cat. #**
30mm	9606333
50mm	9606353
100mm	9606313
150mm	9606363
3µm Column, 4.6mm	**cat. #**
30mm	9606335
50mm	9606355
100mm	9606315
150mm	9606365
5µm Column, 1.0mm	**cat. #**
30mm	9606531
50mm	9606551
100mm	9606511
150mm	9606561
200mm	9606521
250mm	9606571
5µm Column, 2.1mm	**cat. #**
30mm	9606532
50mm	9606552
100mm	9606512
150mm	9606562
200mm	9606522
250mm	9606572
5µm Column, 3.2mm	**cat. #**
30mm	9606533
50mm	9606553
100mm	9606513
150mm	9606563
200mm	9606523
250mm	9606573
5µm Column, 4.6mm	**cat. #**
30mm	9606535
50mm	9606555
100mm	9606515
150mm	9606565
200mm	9606525
250mm	9606575

1.9µm coming soon!

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