

Application Guide

For Researching

Pain Management Drugs

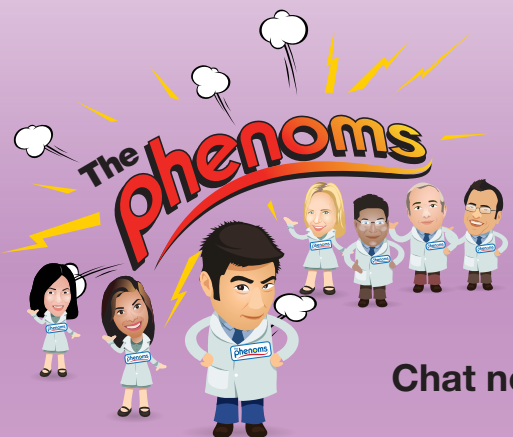


- Comprehensive drug research panel in under 4 minutes
- Fast class-specific applications for opiates and benzodiazepines
- 3 different research panel selectivities to choose from
- Simplified, rapid sample cleanup

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...breaking with traditionSM



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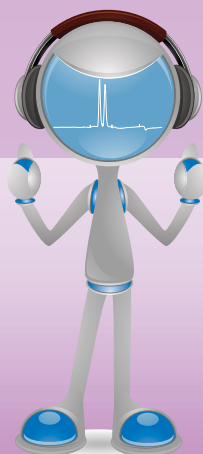
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FULL PAIN PANEL SCREEN

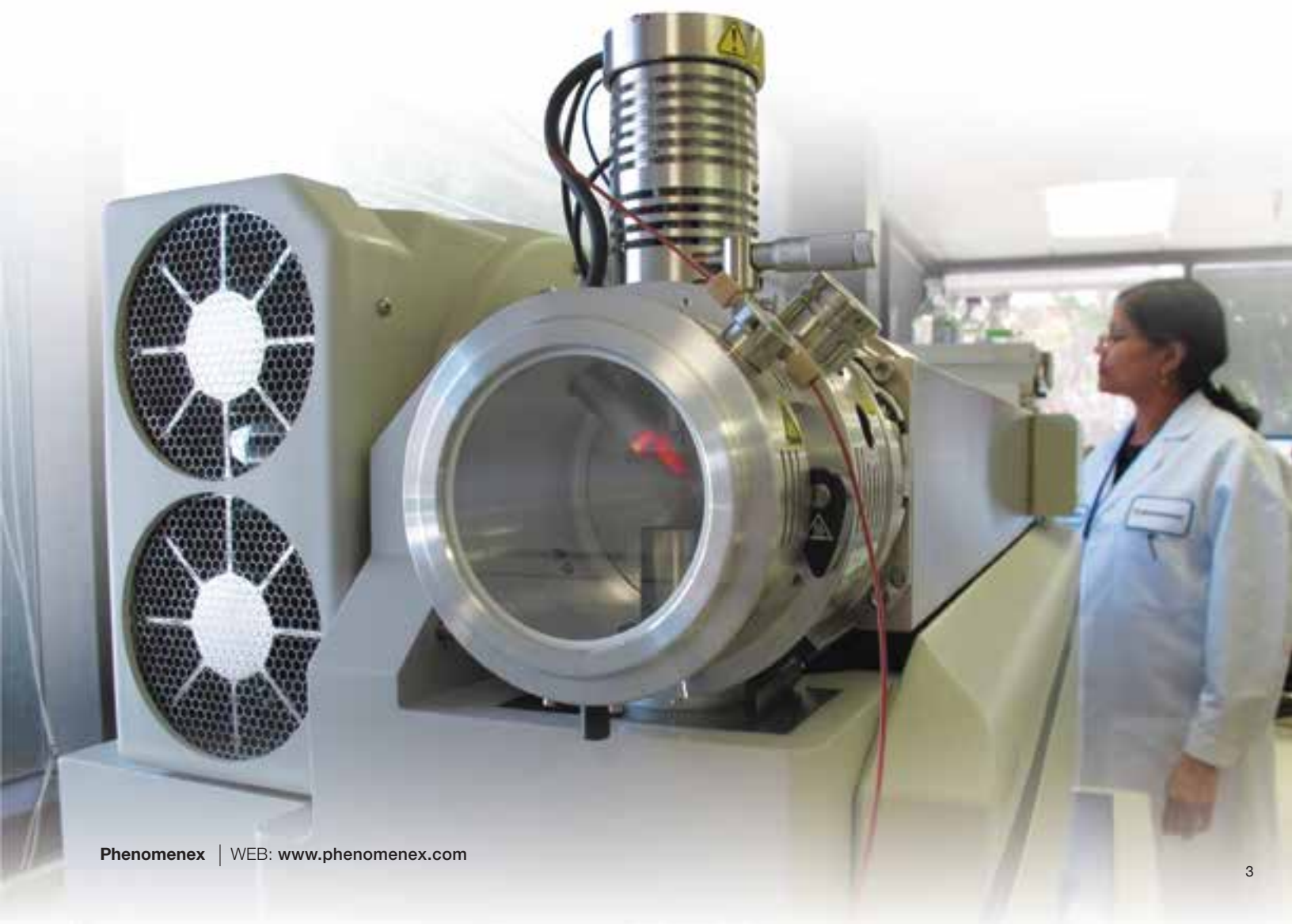
Choose from 3 different core-shell stationary phases to customize your work

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Simple Sample Preparation

Effective and highly reproducible methodology helps you ensure results and reduce costs. With guaranteed high quality products from Phenomenex, you can easily push your research to the next level.

guarantee

If Phenomenex products in this brochure do not provide at least an equivalent separation as compared to other products of the same phase and dimensions, return the product with comparative data within 45 days for a FULL REFUND.

Solid Phase Extraction (SPE)

Strata-X-Drug B

strata[®]X
Polymeric SPE

- Designed and quality controlled for basic drugs of abuse
- Time and solvent saving polymeric strong cation-exchange SPE sorbent
- No equilibration or condition steps needed



Beta-Glucuronidase Enzyme Removal

β-Gone

β-Gone[™]
β-Glucuronidase Removal Products

- β-glucuronidase removal in 1-step and less than 1 minute
- No method development
- 3x greater sensitivity than dilute-and-shoot
- Increases column lifetime
- Reduces need for system maintenance



HPLC/UHPLC Analysis

Kinetex[®] Biphenyl Core-Shell Technology

- Rugged and reliable core-shell columns
- Incredible performance and efficiencies
- Enhanced polar and basic retention
- Quality controlled for basic drugs of abuse



Rapid, Simple Cleanup

Sample Pretreatment

Urine:		Serum / Plasma / Saliva:
Acid Hydrolysis	Enzymatic Hydrolysis	
<ol style="list-style-type: none">1. To 2 mL urine sample, add 500 μL concentrated hydrochloric acid.2. Heat at 90 °C for 2 hours.3. Add 2 mL of 200 mM Sodium acetate buffer (pH 4.0).4. Add 1 mL of 6 N Potassium hydroxide (KOH). Vortex.5. Centrifuge for 5-6 minutes at 5,000-5,500 rpm (20-22 °C).6. Verify pH of sample is between 4.0 – 6.0.7. Load pretreated sample directly onto Strata®-X-Drug B sorbent (see procedure below).	<ol style="list-style-type: none">1. Dilute 500 μL urine with 100 μL buffer* and 20 μL of 1,000,000 units/mL β-glucuronidase in a 96-well collection plate.2. Vortex for 5-6 seconds.3. Incubate in a water bath at 62 °C for 30 minutes.4. If performing SPE, transfer sample to a 96-well collection plate or autosampler vial, seal and centrifuge for 10 minutes at 2,000 rpm. Load supernatant onto Strata-X-Drug B sorbent (see procedure below.) If performing rapid removal of β-glucuronidase, dilute 200 μL urine hydrolysate with 133 μL of 0.1% formic acid in methanol	<ol style="list-style-type: none">1. Dilute plasma/serum 3:1 with 1 % Acetic acid.2. Vortex.3. Centrifuge for 5-6 minutes at 3,000-3,500 rpm (20-22 °C).4. Load pretreated sample directly onto Strata-X-Drug B sorbent (see procedure below).

*Buffer prepared by adding 800 mL deionized water and 111 mL glacial acetic acid to a 1 L volumetric flask, adjust final volume to the line with a 50 % KOH solution and mix by inversion.

For Ultra Clean and Concentrated Samples

Strata-X-Drug B SPE Steps

Procedure designed for 60 mg bed mass Strata-X-Drug B and can be adjusted for smaller or larger bed masses.

- Condition:** Not required
- Equilibrate:** Not required
- Load:** Pretreated sample (see above for pretreatment recommendations)
- Wash:** 2 mL of 100 mM Sodium acetate buffer (pH 5.0)
- Wash 2:** 2 mL Methanol
- Elute:** 2 mL Ethyl acetate/Isopropanol/Ammonium hydroxide (pH 5.0) (7:2:1)
- Evaporate:** to dryness under a stream of Nitrogen at 50 °C
- Reconstitute:** 1 mL 15 % Methanol
- Inject:** 5 μ L



Reduce solvent consumption; no conditioning or equilibration required!

For Single-Step Removal of β -Glucuronidase

β -Gone Steps

1. Load diluted sample onto plate/tube. Apply 2-5 psi vacuum or positive pressure and collect eluent.



β -glucuronidase removal in less than 1 minute!

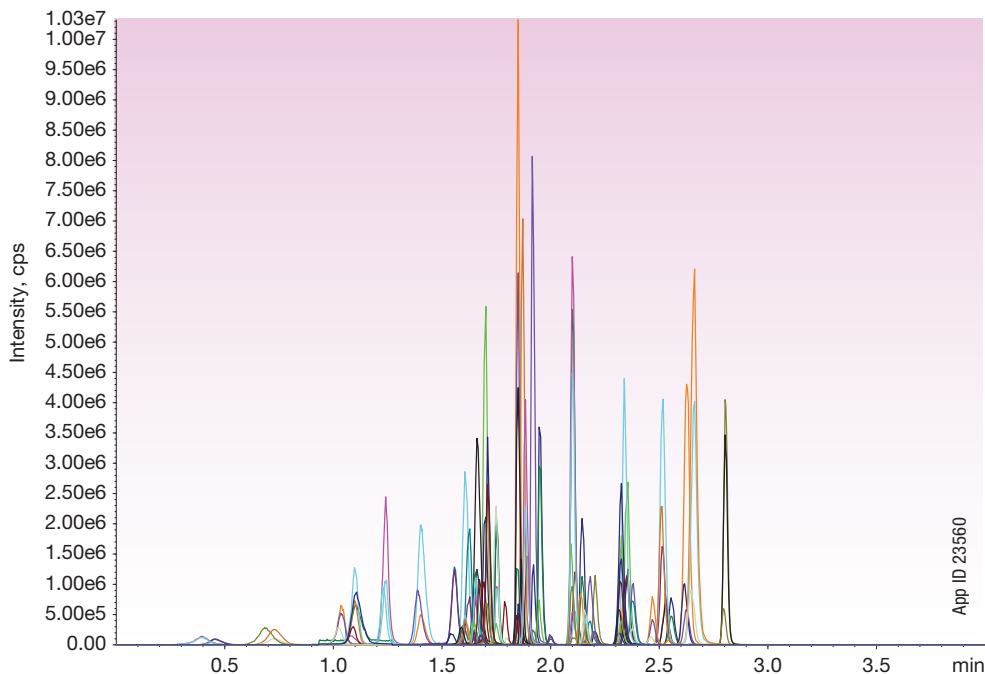
Comprehensive Drug Research Panel - Fastest Runtime

Detection Mode: LC/MS/MS

Stationary Phase: Kinetex® Core-Shell Biphenyl

Rugged, reliable and really fast

TIC of ESI+panel



Analyte	Retention Time (min)
6-MAM	1.7
7-Aminoclonazepam	2.0
α-Hydroxyalprazolam	2.5
Alprazolam	2.7
Amitriptyline	2.4
Amphetamine	1.1
Benzoyllecgonine	1.8
Buprenorphine	2.2
Carisoprodol	2.1
Citalopram	2.1
Codeine	1.6
Cotinine	1.7
Diazepam	2.8
EDDP	2.3
Fentanyl	2.1
Fluoxetine	2.2
Gabapentin	0.7
Hydrocodone	1.7
Hydromorphone	1.2
Imipramine	2.3
Lorazepam	2.3
MDMA	1.6
Meperidine	1.9
Meprobamate	1.9
Methadone	2.5

Analyte	Retention Time (min)
Methamphetamine	1.4
Methylphenidate	1.9
Morphine	1.0
Naloxone	1.6
Norbuprenorphine	2.0
Nordiazepam	2.5
Norfentanyl	1.8
Norhydrocodone	1.6
Noroxycodone	1.5
Normorphine	0.4
Nortriptyline	2.3
O-Desmethyltramadol	1.6
Oxycodone	1.7
Oxymorphone	1.1
Paroxetine	2.3
PCP	2.2
Pregabalin	0.4
Sertraline	2.5
Tapentadol	1.8
Temazepam	2.6
Tramadol	1.9
Zolpidem	2.1
Zolpidem-4-carboxylic Acid	1.9

Positive ESI Panel

LC Conditions

Columns: Kinetex 2.6 μm Biphenyl

Dimensions: 30 x 2.1 mm

Part No.: 00A-4622-AN

Guard: SecurityGuard™ ULTRA Biphenyl Cartridges: AJ0-9209

SecurityGuard ULTRA Holder: AJ0-9000

Mobile Phase: A: 10 mM Ammonium Formate in Water (pH unadjusted)
B: 0.1% Formic Acid in Methanol

Gradient	Time (min)	% B
	0	5
	1.2	30
	1.3	55
	2.3	70
	2.4	95
	2.7	95
	2.72	5
	4	5

Flow Rate: 1.0 mL/min

Injection Volume: 15 μL

Column Temperature: 30 °C

MS/MS Conditions

Conditions: SCIEX 6500 QTRAP®

Mode: Positive electrospray ionization

Scan Type: MRM

Curtain Gas (CUR): 30

Gas 1 (GS1): 70

Gas 2 (GS1): 80

IS: 2000 V

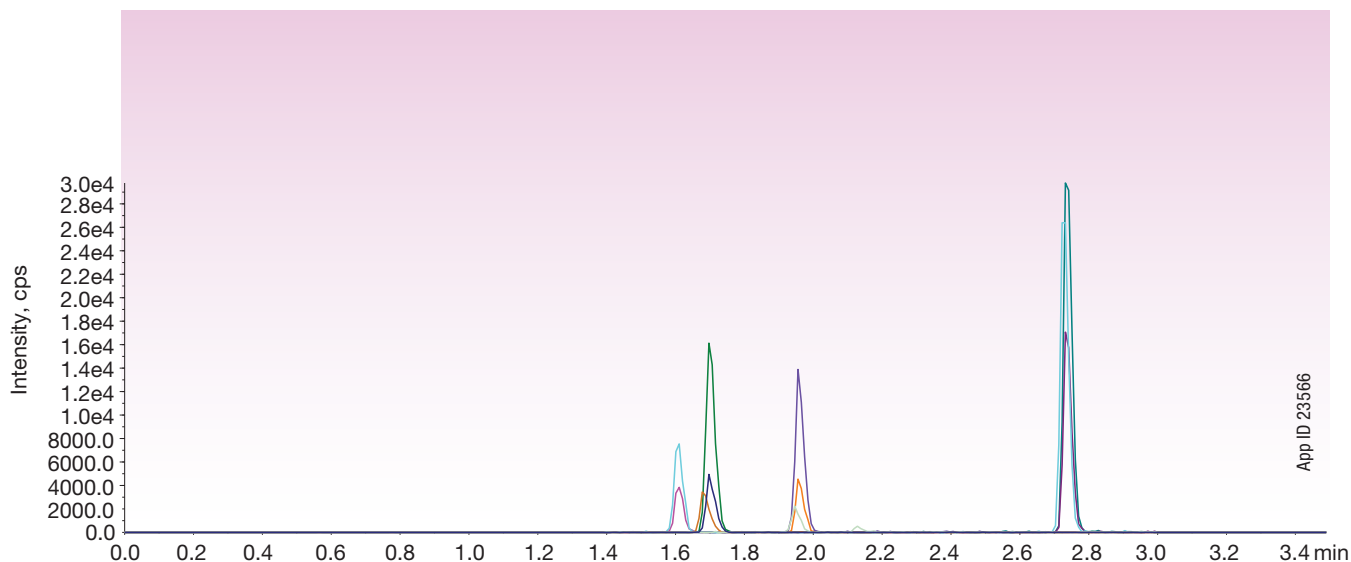
Temperature (TEM): 550 °C

Interface Heater: ON

Collision Gas (CAD): Medium

Using the high performance and versatility of the Kinetex® 2.6 µm Biphenyl with a ballistic gradient allows you to cut down even more time from your cycles and significantly improve productivity.

TIC of ESI-panel



App ID 23566

Analyte	Retention Time (min)
Butalbital	1.7
Phenobarbital	1.6
Secobarbital	2
THC-COOH	2.7

Negative ESI Panel

LC Conditions:

Column: Kinetex 2.6 µm Biphenyl

Dimensions: 30 x 2.1 mm

Part No.: 00A-4622-AN

Guard: SecurityGuard™ ULTRA Biphenyl
Cartridges: AJ0-9209

SecurityGuard ULTRA Holder: AJ0-9000

Mobile Phase: A: 10 mM Ammonium Formate in Water (pH unadjusted)
B: 0.1% Formic Acid in Methanol

Gradient:	Time (min)	% B
	0	10
	0.2	10
	2.5	90
	2.9	90
	3	10
	3.5	10

Flow Rate: 1.0 mL/min

Injection Volume: 15 µL

Column Temperature: 40 °C

MS/MS Conditions

Conditions: SCIEX 6500 QTRAP®

Mode: Negative electrospray ionization

Scan Type: MRM

Curtain Gas (CUR): 30

Gas 1 (GS1): 60

Gas 2 (GS1): 65

IS: -4500 V

Temperature (TEM): 650 °C

Interface Heater: ON

Collision Gas (CAD): Medium

Entrance Potential (EP): 10 V

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www.phenomenex.com/clinicalguides

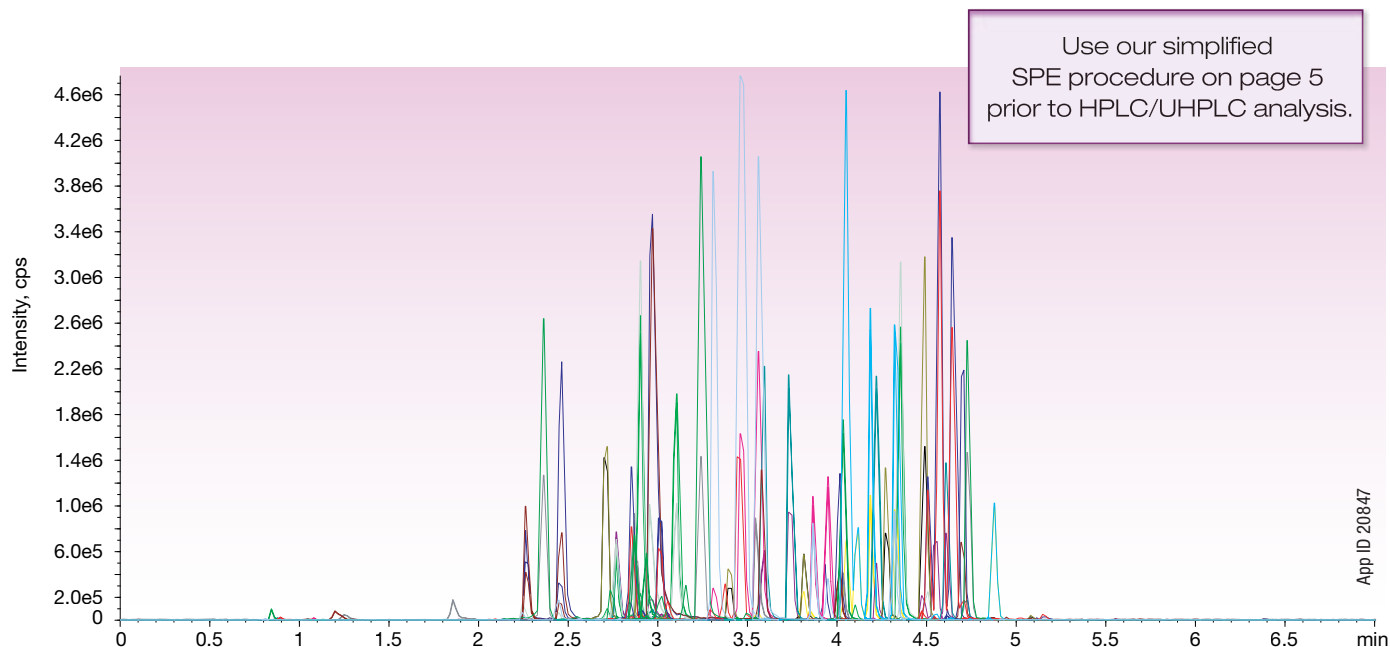


Comprehensive Drug Research Panel - Alternative Selectivity

Detection Mode: LC/MS/MS

Stationary Phase: Kinetex® Core-Shell Phenyl-Hexyl

Achieve excellent resolution and separation of 41 drugs using Kinetex core-shell Phenyl-Hexyl HPLC/UHPLC columns, a great choice for an alternative selectivity as compared to a C18 or Biphenyl column.



Column: Kinetex 2.6 µm Phenyl-Hexyl
Dimensions: 50 x 4.6 mm
Part No.: 00B-4495-E0
Guard: SecurityGuard™ ULTRA Phenyl-Hexyl
Cartridges: AJ0-8774
SecurityGuard™ ULTRA Holder: AJ0-9000
Mobile Phase: A: 10 mM Ammonium formate
B: 0.1 % Formic Acid in Methanol
Gradient:

Time (min)	% B
0	5
4	100
5	100
5.1	5
7	5

Flow Rate: 0.6 mL/min
Injection Volume: 10 µL
Column Temperature: 22 °C
Backpressure: 76.25 bar
HPLC System: Agilent® 1260
Detection: MS/MS (SCIEX API 5000™)



Analyte	Q1	Q3	Retention Time (min)
6-MAM 1 (quantifier)	328.1	165.2	3.0
6-MAM 2 (confirmation)	328.1	211.2	3.0
Alprazolam 1	309.1	281	4.9
Alprazolam 2	309.1	205.1	4.9
Amphetamine 1	136.1	91.0	2.9
Amphetamine 2	136.1	119.0	2.9
Benzoyllecgonine 1	290.2	168.1	3.6
Benzoyllecgonine 2	290.2	105.0	3.6
Buprenorphine 1	468.3	396.1	4.3
Buprenorphine 2	468.3	414.2	4.3
Carisoprodol 1	261.2	176.2	4.6
Carisoprodol 2	261.2	97.2	4.6
Clonazepam 1	316.0	270.1	4.8
Clonazepam 2	316.0	214.2	4.8
Codeine 1	300.1	152.1	2.8
Codeine 2	300.1	115.1	2.8
Diazepam 1	285.1	193.1	5.2
Diazepam 2	285.1	154.0	5.2
EDDP 1	278.3	234.2	4.3
EDDP 2	278.3	186.2	4.3
Fentanyl 1	337.2	105.1	4.3
Fentanyl 2	337.2	188.1	4.3
Flunitrazepam 1	314.1	268.2	4.9
Flunitrazepam 2	314.1	239.2	4.9
Flurazepam 1	388.2	315.1	4.4
Flurazepam 2	388.2	134.1	4.4
Hydrocodone 1	300.1	199.1	3.0
Hydrocodone 2	300.1	128.1	3.0
Hydromorphone 1	286.2	185.0	2.3
Hydromorphone 2	286.2	128.0	2.3
Hydroxylalprazolam 1	325.1	297.0	4.8
Hydroxylalprazolam 2	325.1	216.1	4.8
Lorazepam 1	321.0	275.1	4.8

Analyte	Q1	Q3	Retention Time (min)
Lorazepam 2	321.0	229.1	4.8
MDA 1	180.1	105.0	3.1
MDA 2	180.1	133.0	3.1
MDEA 1	208.2	163.2	3.4
MDEA 2	208.2	105.2	3.4
MDMA 1	194.1	163.2	3.2
MDMA 2	194.1	105.2	3.2
Meperidine 1	248.2	220.0	3.8
Meperidine 2	248.2	174.1	3.8
Meprobamate 1	219.2	158.2	4.0
Meprobamate 2	219.2	97.1	4.0
Methadone 1	310.2	265.2	4.7
Methadone 2	310.2	105.0	4.7
Methamphetamine 1	150.1	91.2	3.0
Methamphetamine 2	150.1	119.2	3.0
Midazolam 1	326.1	291.1	4.6
Midazolam 2	326.1	249.1	4.6
Morphine 1	286.2	152.0	2.1
Morphine 2	286.2	165.0	2.1
Naloxone 1	328.1	212.0	2.7
Naloxone 2	328.1	253.1	2.7
Naltrexone 1	342.2	267.1	2.9
Naltrexone 2	342.2	212.1	2.9
Norbuprenorphine 1	414.3	101.1	4.1
Norbuprenorphine 2	414.3	165.1	4.1
Nordiazepam 1	271.1	140.0	5.0
Nordiazepam 2	271.1	165.1	5.0
Norfentanyl 1	233.2	84.1	3.5
Norfentanyl 2	233.2	150.0	3.5
Normeperidine 1	234.1	160.2	3.9
Normeperidine 2	234.1	188.1	3.9
Norpropoxyphene 1	308.2	100.1	4.4
Norpropoxyphene 2	308.2	143.2	4.4

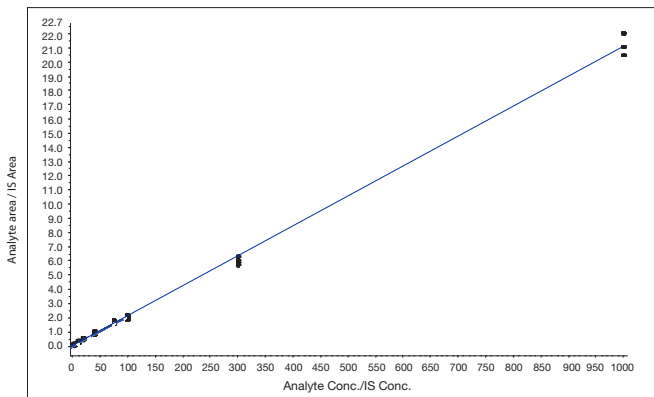
Analyte	Q1	Q3	Retention Time (min)
Oxazepam 1	287.1	241.0	4.8
Oxazepam 2	287.1	269.1	4.8
Oxycodone 1	316.2	241.0	3.0
Oxycodone 2	316.2	256.0	3.0
Oxymorphone 1	302.1	227.0	2.2
Oxymorphone 2	302.1	198.1	2.2
PCP 1	244.3	91.0	4.2
PCP 2	244.3	159.3	4.2
Propoxyphene 1	340.2	266.3	4.5
Propoxyphene 2	340.2	91.1	4.5
Sufentanil 1	387.2	238.2	4.5
Sufentanil 2	387.2	111.0	4.5
Temazepam 1	301.1	255.1	5.0
Temazepam 2	301.1	177.1	5.0
Tramadol 1	264.2	58.1	3.7
Tramadol 2	264.2	42.1	3.7
6-MAM-d3	331.1	165.0	3.0
Amphetamine-d5	141.1	93.0	2.9
Benzoyllecgonine-d3	293.2	171.2	3.6
Codeine-d6	306.2	152.1	2.8
Fentanyl-d5	342.2	105.1	4.3
Hydrocodone-d6	306.2	202.1	3.0
Hydromorphone-d6	292.1	185.1	2.3
Meperidine-d4	252.2	224.2	3.8
Methadone-d3	313.2	105.0	4.7
Methamphetamine-d5	155.2	92.0	3.0
Morphine-d6	292.2	152.1	2.1
Nordiazepam-d5	276.1	140.0	5.0
Normeperidine-d4	238.2	164.2	3.9
Norpropoxyphene-d5	313.2	100.1	4.5
PCP-d5	249.3	96.0	4.2

Transition 1 for each analyte is used as the quantifier transition.
Transition 2 for each analyte is used as the qualifier transition.

Achieve Excellent Results, Every Time

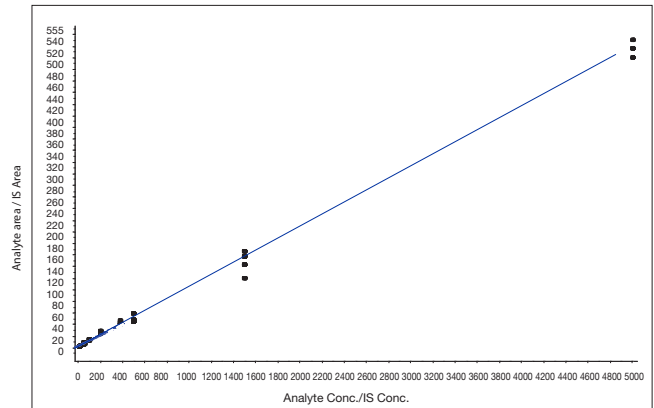
Recovery, Reproducibility, and Linearity of α -Hydroxylalprazolam

Concentration (ng/mL)	Precision (n = 3)	Accuracy
25	2.388	111.4
200	3.384	102.4



Recovery, Reproducibility, and Linearity of Methamphetamine

Concentration (ng/mL)	Precision (n = 3)	Accuracy
125	2.474	113.5
1000	4.489	110.8

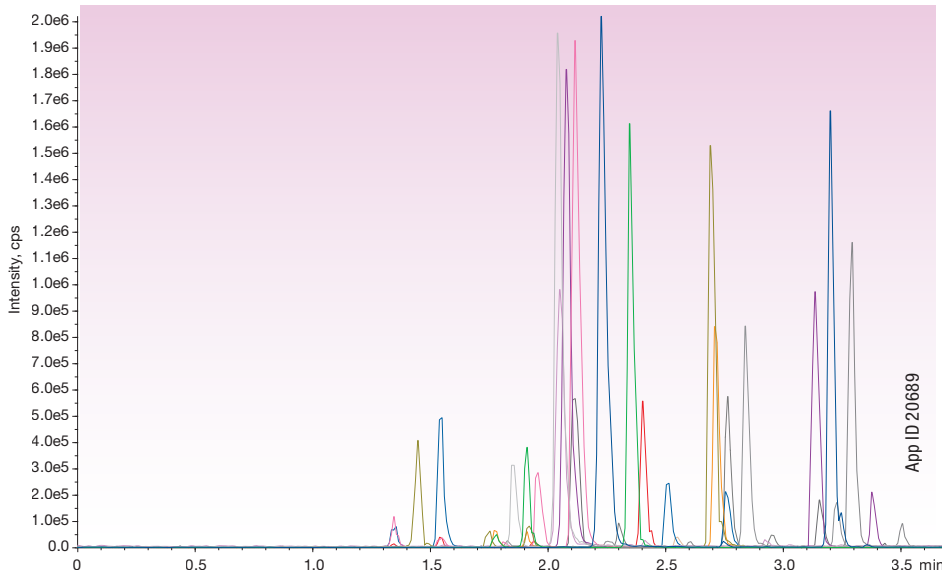


Comprehensive Drug Research Panel - C18 Workhorse

Detection Mode: LC/MS/MS

Stationary Phase: Kinetex® Core-Shell C18

Rapidly separate 41 drugs, including critical isobars, using Kinetex core-shell C18 HPLC/UHPLC columns.



Column: Kinetex 2.6 μm C18
Dimensions: 50 x 3.0 mm
Part No.: 00B-4462-Y0
Guard: SecurityGuard™ ULTRA C18
 Cartridges: AJ0-8775
 SecurityGuard™ ULTRA Holder:
 AJ0-9000
Mobile Phase: A: 10 mM Ammonium formate
 B: 0.1 % Formic Acid in Methanol
Gradient:

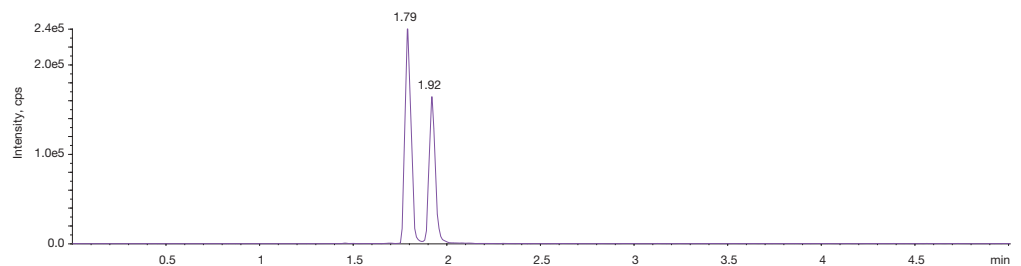
Time (min)	% B
0	5
3	100
4	100
4.1	5
5	5

Flow Rate: 0.5 mL/min
Injection Volume: 10 μL
Column Temperature: 22 °C
Detection: MS/MS (SCIEX API 4000™)

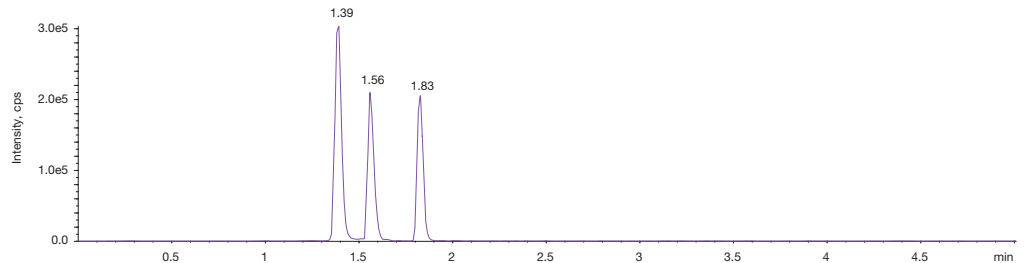
Analyte	Q1	Q3
Oxymorphone	302.1	227
Morphine	286.2	152
Hydromorphone	286.2	185
Amphetamine	136.1	91
Methamphetamine	150.1	91.2
Oxycodone	316.2	241
MDA	180.1	133
MDMA	194.1	163.2
Codeine	300.1	152.1
Naltrexone	342.2	267.1
MDEA	208.2	163.2
6-MAM	328.1	165.2
Hydrocodone	300.1	199.1
Benzoylcegonine	290.2	168.1
Norfentanyl	233.2	84.1
Tramadol	264.2	58.1
Naloxone	328.1	212
Normeperidine	234.1	160.2
Meperidine	248.2	220
Meprobamate	219.2	158.2
PCP	244.3	91
Norbuprenorphine	414.3	101.1
EDDP	278.3	234.2
Norpropoxyphene	308.2	100.1
Clonazepam	316	270.1
Flunitrazepam	314.1	268.2
α-Hydroxyalprazolam	325.1	297
Carisoprodol	261.2	176.2
Oxazepam	287.1	241
Methadone	310.2	265.2
Lorazepam	321	275.1
Fentanyl	337.2	105.1
Flurazepam	388.2	315.1
Alprazolam	309.1	281
Temazepam	301.1	255.1
Propoxyphene	340.2	266.3
Nordiazepam	271.1	140
Diazepam	285.1	193.1
Midazolam	326.1	291.1
Sufentanil	387.2	238.2
Buprenorphine	468.3	396.1

Resolution of Critical Isobars

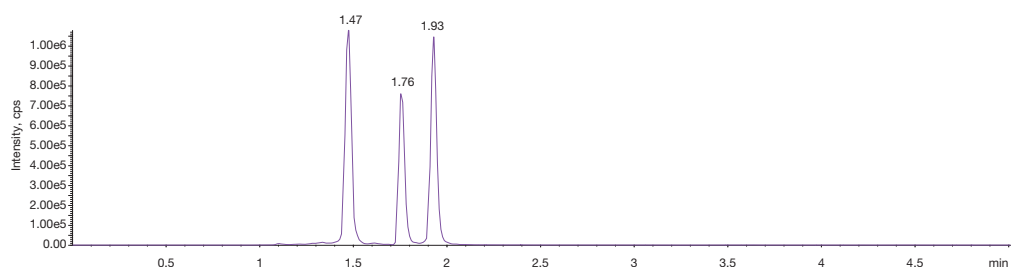
Codeine/Hydrocodone



Morphine/Hydromorphone/Norhydrocodone



Oxymorphone/Dihydrocodeine/Noroxycodone

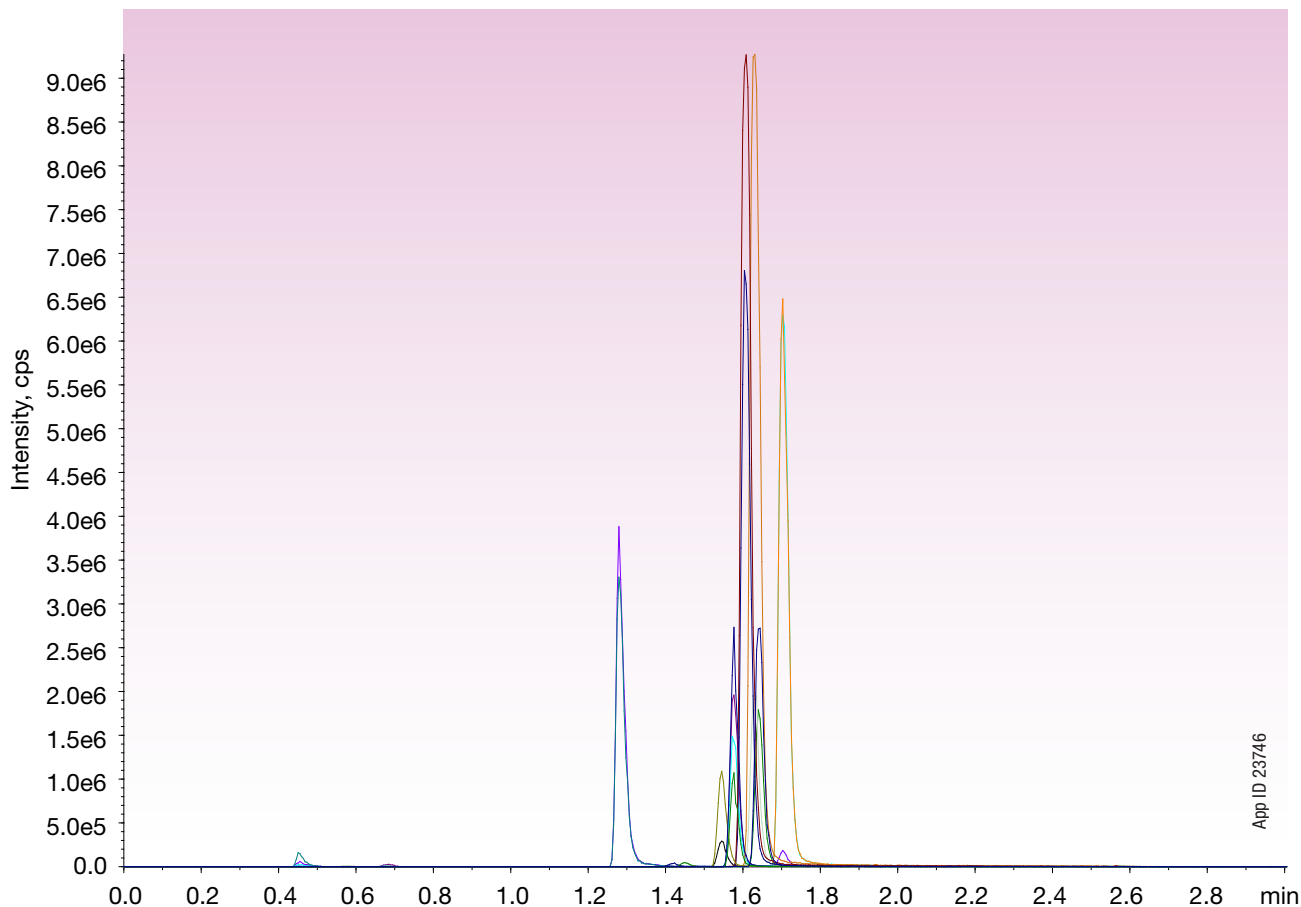


Fast Benzodiazepines

Detection Mode: LC/MS/MS

Stationary Phase: Kinetex® Core-Shell Biphenyl

Accurately and reliably analyze benzodiazepines using Kinetex core-shell Biphenyl HPLC/UHPLC columns.



Analyte	Retention Time (min)
7-Aminoclonazepam	1.28
Lorazepam	1.54
α -Hydroxyprazolam	1.58
Oxazepam	1.58
Alprazolam	1.61
Temazepam	1.63
Nordiazepam	1.64
Diazepam	1.7

Column: Kinetex 2.6 μ m Phenyl-Hexyl

Dimensions: 50 x 3.0 mm

Part No.: 00B-4495-Y0

Mobile Phase: A: 10 mM Ammonium Formate in Water
B: 0.1% Formic Acid in Methanol

Gradient:	Time (min)	% B
	0	40
	0.5	95
	1.5	95
	1.51	40
	3	40

Flow Rate: 600 μ L/min

Injection Volume: 10 μ L

Column Temperature: Ambient

Detector: SCIEX 4500

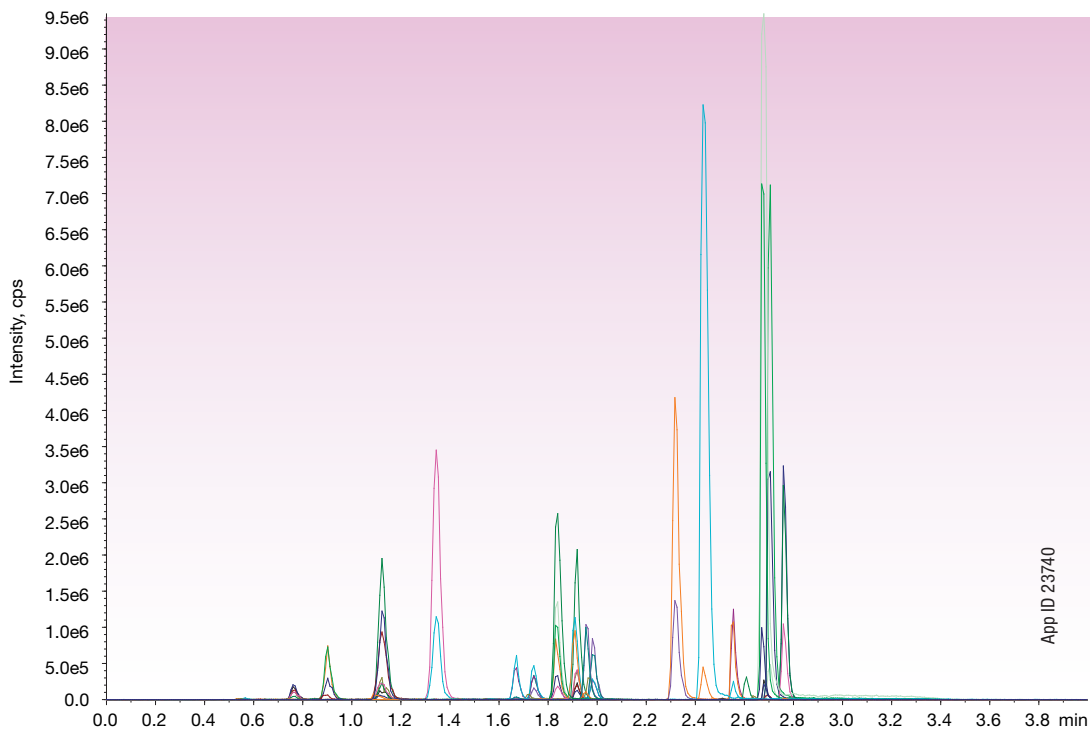
Detection Mode: ESI +

Fast Opiates

Detection Mode: LC/MS/MS

Stationary Phase: Kinetex® Core-Shell Biphenyl

Achieve resolution of critical isobars such as Morphine/Hydromorphone and Codeine/Hydrocodone using Kinetex core-shell Biphenyl HPLC/UHPLC columns.



Analyte	Retention Time (min)
Morphine	0.76
Oxymorphone	0.9
Hydromorphone	1.12
Pregabalin	1.13
Gabapentin	1.34
Naloxone	1.67
Codeine	1.74
O-Desmethyltramadol	1.84
Oxycodone	1.91
6-MAM	1.95
Hydrocodone	1.98
Norfentanyl	2.32
Tramadol	2.44
Meperidine	2.56
Norbuprenorphine	2.64
Buprenorphine	2.68
Fentanyl	2.68
EDDP	2.7
Methodone	2.76

Column: Kinetex 2.6 µm Phenyl-Hexyl
Dimensions: 50 x 3.0 mm
Part No.: 00B-4495-Y0
Guard: SecurityGuard™ ULTRA Biphenyl
 Cartridges: AJ0-9208
 SecurityGuard™ ULTRA Holder:
 AJ0-9000
Mobile Phase: A: 0.1 % Formic Acid in Water
 B: 0.1 % Formic Acid in Methanol

Gradient:

Time (min)	% B
0	10
0.2	10
1.5	40
2	95
2.5	95
2.51	10
4	10

Flow Rate: 700 µL/min
Injection Volume: 10 µL
Column Temperature: Ambient
Detector: SCIEX 4500
Detection Mode: ESI +

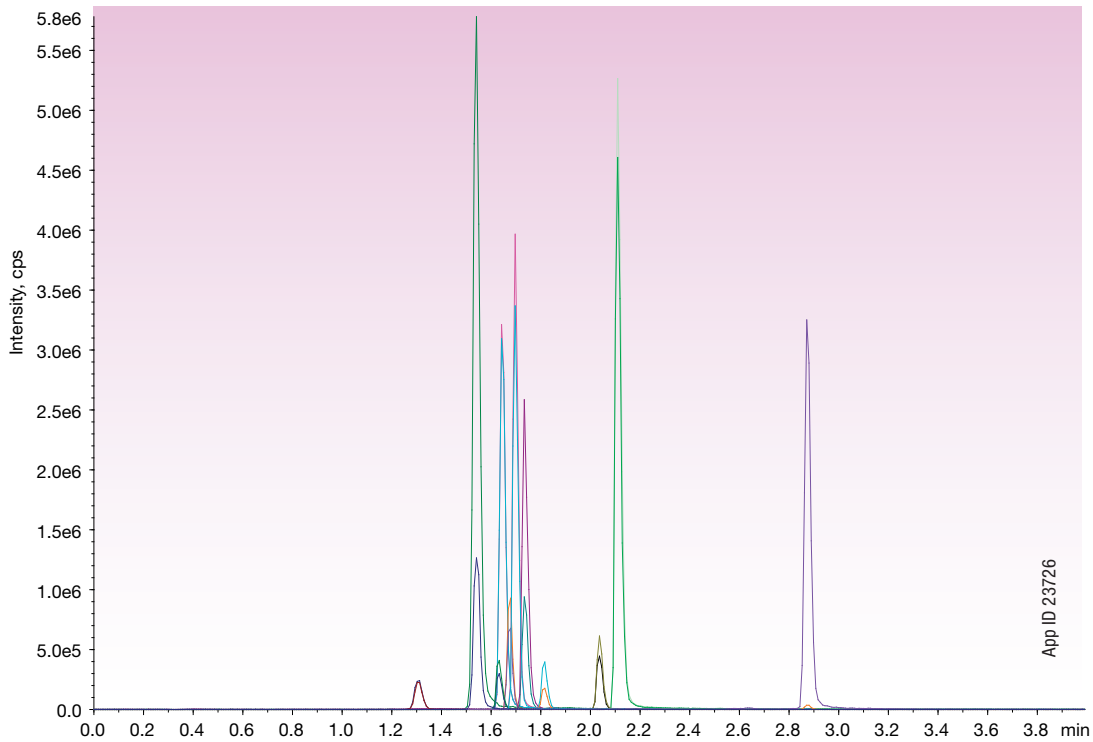


SAMHSA 5

Detection Mode: LC/MS/MS

Stationary Phase: Kinetex® Core-Shell Biphenyl

Separation of common drugs across the SAMHSA 5 categories:
amphetamines, cocaine, marijuana, opiates, and PCP.



Analyte	Retention Time (min)
Amphetamine	1.49
Methamphetamine	1.58
MDA	1.61
MDMA	1.66
MDEA	1.73
PCP	1.98
Morphine	1.22
Benzococaine	1.92
Codeine	1.56
6-MAM	1.62
THC-COOH	2.65

Column: Kinetex 5 µm Biphenyl
Dimensions: 50 x 3.0 mm
Part No.: 00B-4627-Y0
Guard: SecurityGuard™ ULTRA Biphenyl
Cartridges: AJ0-9208
SecurityGuard™ ULTRA Holder:
AJ0-9000
Mobile Phase: A: 0.1% Formic Acid in Water
B: 0.1% Formic Acid in Methanol



Gradient: Time (min) % B
0 5
1.5 98
2.5 98
2.51 5
4 5
Flow Rate: 0.6 mL/min
Injection Volume: 10 µL
Temperature: Ambient
Detection: MS/MS (SCIEX API 5000™)



Ordering Information



Strata-X-Drug B SPE

Strata-X-Drug B				
Format	Sorbent Mass	Part Number	Unit	Price
Tube				
	10 mg	8B-S128-AAK	1 mL (100/box)	
	30 mg	8B-S128-TAK	1 mL (100/box)	
	30 mg	8B-S128-TBJ	3 mL (50/box)	
	60 mg	8B-S128-UBJ	3 mL (50/box)	
	60 mg	8B-S128-UCH	6 mL (30/box)	
	60 mg	8B-S128-UCL	6 mL (200/box)	
96-Well Plate				
	10 mg	8E-S128-AGB	2 Plates/box	
	30 mg	8E-S128-TGB	2 Plates/box	
	60 mg	8E-S128-UGB	2 Plates/box	



β-Gone β-Glucuronidase Removal Products

β-Gone				
Part No.	Description	Unit	Price	
8B-S139-TAK	1 mL Tubes, Recombinant Enzyme	100/Box		
8B-S322-DAK	1 mL Tubes, Non-Recombinant Enzyme	100/Box		
8E-S139-TGA	96-Well Plate, Recombinant Enzyme	1/Box		
8E-S322-DGA	96-Well Plate, Non-Recombinant Enzyme	1/Box		



Presston 100 Positive Pressure Manifold

Presston		
Part No.	Description	Unit Price
AH0-9334	Presston 100 Positive Pressure Manifold, 96-Well Plate	
AH0-9342	Presston 100 Positive Pressure Manifold, 1 mL Tube Complete Assembly	
AH0-9347	Presston 100 Positive Pressure Manifold, 3 mL Tube Complete Assembly	
AH0-9343	Presston 100 Positive Pressure Manifold, 6 mL Tube Complete Assembly	



Phenomenex warrants that for a period of 12 months following delivery, the Presston 100 Positive Pressure Manifold you have purchased will perform in accordance with the published specifications and will be free from defects in materials or workmanship. In the event that the Presston 100 Positive Pressure Manifold does not meet this warranty, Phenomenex will repair or replace defective parts. Please visit www.phenomenex.com/Presston for complete warranty information.



Meet Presston at
www.phenomenex.com/presston

Ordering Information



5 µm Minibore Columns (mm)					SecurityGuard™ ULTRA Cartridges [‡]
Phases	30 x 2.1	50 x 2.1	100 x 2.1	150 x 2.1	3/pk
Biphenyl	00A-4627-AN	00B-4627-AN	00D-4627-AN	—	AJO-9209
C18	00A-4601-AN	00B-4601-AN	00D-4601-AN	00F-4601-AN	AJO-8782
Phenyl-Hexyl	—	00B-4603-AN	00D-4603-AN	—	AJO-8788

for 2.1 mm ID

5 µm MidBore™ Columns (mm)				SecurityGuard ULTRA Cartridges [‡]
Phases	50 x 3.0	100 x 3.0	150 x 3.0	3/pk
Biphenyl	00B-4627-YO	00D-4627-YO	00F-4627-YO	AJO-9208
C18	00B-4601-YO	00D-4601-YO	00F-4601-YO	AJO-8775
Phenyl-Hexyl	00B-4603-YO	00D-4603-YO	—	AJO-8781

for 3.0 mm ID

5 µm Analytical Columns (mm)					SecurityGuard ULTRA Cartridges [‡]
Phases	50 x 4.6	100 x 4.6	150 x 4.6	250 x 4.6	3/pk
Biphenyl	00B-4627-E0	00D-4627-E0	00F-4627-E0	00G-4627-E0	AJO-9207
C18	00B-4601-E0	00D-4601-E0	00F-4601-E0	00G-4601-E0	AJO-8768
Phenyl-Hexyl	00B-4603-E0	00D-4603-E0	00F-4603-E0	00G-4603-E0	AJO-8774

for 4.6 mm ID

2.6 µm Minibore Columns (mm)						SecurityGuard ULTRA Cartridges [‡]
Phases	30 x 2.1	50 x 2.1	75 x 2.1	100 x 2.1	150 x 2.1	3/pk
Biphenyl	00A-4622-AN	00B-4622-AN	—	00D-4622-AN	00F-4622-AN	AJO-9209
C18	00A-4462-AN	00B-4462-AN	00C-4462-AN	00D-4462-AN	00F-4462-AN	AJO-8782
Phenyl-Hexyl	00A-4495-AN	00B-4495-AN	00C-4495-AN	00D-4495-AN	00F-4495-AN	AJO-8788

for 2.1 mm ID

2.6 µm MidBore™ Columns (mm)						SecurityGuard ULTRA Cartridges [‡]
Phases	30 x 3.0	50 x 3.0	75 x 3.0	100 x 3.0	150 x 3.0	3/pk
Biphenyl	—	00B-4622-YO	—	00D-4622-YO	00F-4622-YO	AJO-9208
C18	00A-4462-YO	00B-4462-YO	00C-4462-YO	00D-4462-YO	00F-4462-YO	AJO-8775
Phenyl-Hexyl	—	—	—	00D-4495-YO	00F-4495-YO	AJO-8781

for 3.0 mm ID

2.6 µm Analytical Columns (mm)						SecurityGuard ULTRA Cartridges [‡]
Phases	30 x 4.6	50 x 4.6	75 x 4.6	100 x 4.6	150 x 4.6	3/pk
Biphenyl	—	00B-4622-E0	—	00D-4622-E0	00F-4622-E0	AJO-9207
C18	00A-4462-E0	00B-4462-E0	00C-4462-E0	00D-4462-E0	00F-4462-E0	AJO-8768
Phenyl-Hexyl	—	00B-4495-E0	00C-4495-E0	00D-4495-E0	00F-4495-E0	AJO-8774

for 4.6 mm ID

1.7 µm Minibore Columns (mm)					SecurityGuard ULTRA Cartridges [‡]
Phases	30 x 2.1	50 x 2.1	100 x 2.1	150 x 2.1	3/pk
Biphenyl	—	00B-4628-AN	00D-4628-AN	00F-4628-AN	AJO-9209
C18	00A-4475-AN	00B-4475-AN	00D-4475-AN	00F-4475-AN	AJO-8782
Phenyl-Hexyl	—	00B-4500-AN	00D-4500-AN	00F-4500-AN	AJO-8788

for 2.1 mm ID

1.7 µm MidBore Columns (mm)			SecurityGuard ULTRA Cartridges [‡]
Phases	50 x 3.0	100 x 3.0	3/pk
C18	00B-4475-YO	00D-4475-YO	AJO-8775

for 3.0 mm ID

1.3 µm Minibore Columns (mm)		
Phases	30 x 2.1	50 x 2.1
C18	00A-4515-AN	00B-4515-AN



If Phenomenex products in this brochure do not provide at least an equivalent separation as compared to other products of the same phase and dimensions, return the product with comparative data within 45 days for a FULL REFUND.

[‡]SecurityGuard ULTRA cartridges require holder, Part No.: AJO-9000

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