FORENSICS

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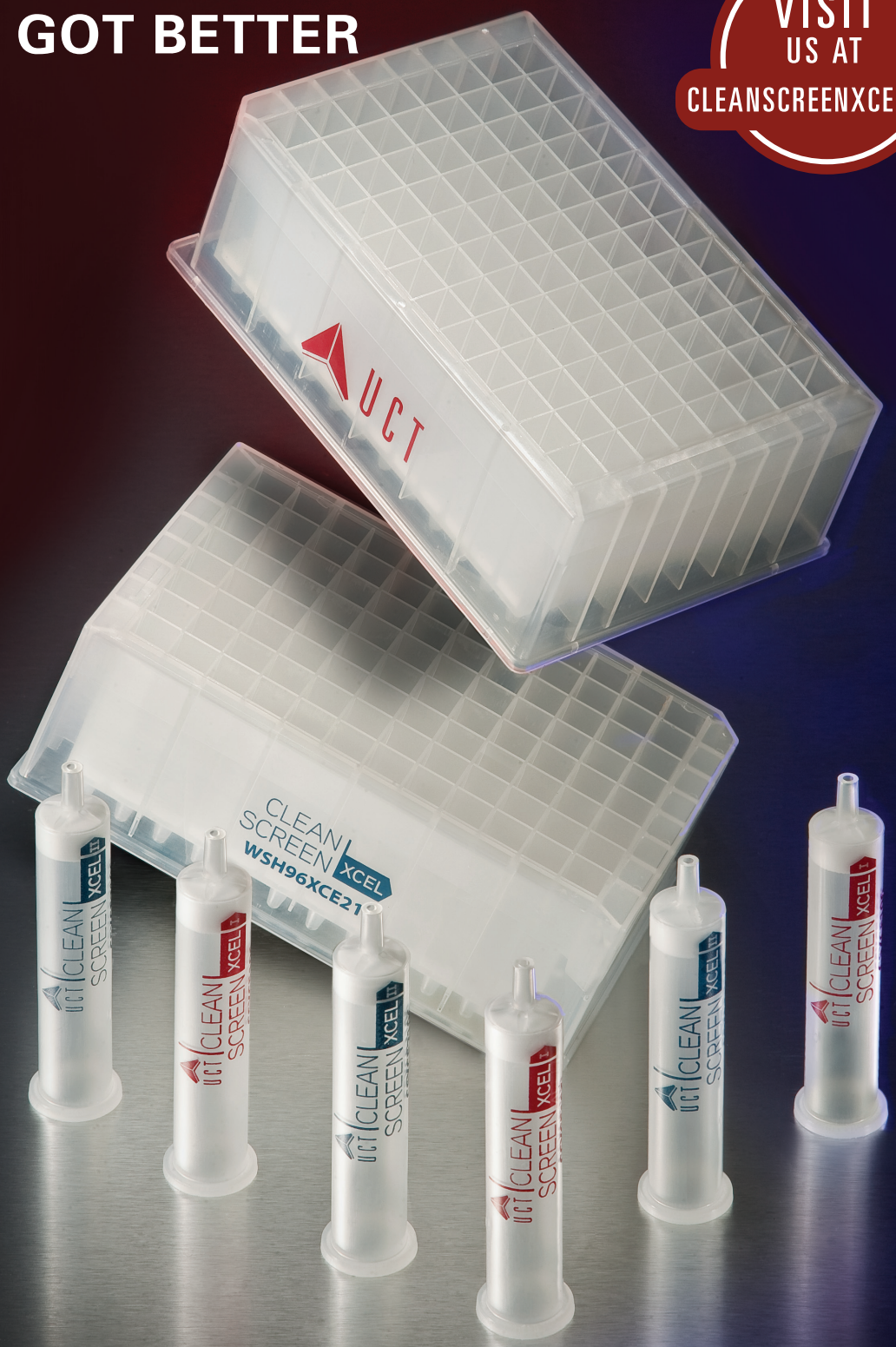
UCT



CLEAN SCREEN XCEL™ SPE COLUMNS

ENVIRO FORENSICS PHARMA

CLEAN SCREEN XCEL I

EXTRACTION OF BASIC DRUGS AND METABOLITES FROM URINE/ BLOOD USING SPE CARTRIDGES

130mg Clean Screen Xcel I Column
Part #: CSXCE106 6 mL - 130 mg Cartridge
Part #: CSXCE103 3 mL - 130 mg Cartridge

September 9, 2009

(Urine Hydrolysis Step)

To 1-2 mL urine sample add 500 µL of 0.1M acetate buffer (pH= 5.0) containing 5,000 units/mL ß-glucuronidase. Optionally, add 500 µL of acetate buffer and 25 µL of concentrated ß-glucuronidase. Add appropriate volume and concentration internal standards. Vortex and heat for 1-2 hours at 65 °C.
Allow sample to cool. Do not adjust pH- sample is ready to be added to extraction column.

(Blood Sample Preparation)

To 1-2 mL blood add 2 ml of 0.1M phosphate buffer (pH= 6.0). Add appropriate volume and concentration internal standards. Sample is ready to be added to extraction column.

Applying Sample to Column

Load sample directly to column without any preconditioning.
Pull sample through at a rate of 1-2 mL/ minute.
Dry column thoroughly under vacuum (10 mm Hg) or positive pressure (~ 80-100 psi) for 1 minute.

Wash (Blood Only)

Wash sample with 2 mL of 0.1M phosphate buffer (pH=6.0+0.5).

Wash (Urine and Blood)

Wash sample with 1 mL of 2% glacial acetic acid/ 98 % methanol.
Dry column thoroughly under vacuum (10 mm Hg) or positive pressure (~ 80-100 psi) for a minimum of 5 minutes.

NOTE 1: (It is important to dry the column thoroughly to achieve the highest recovery of all compounds. Any residual moisture will slow down the drying of the elution solvents prior to derivatization for GC/MS analysis. Also, any residual moisture could reduce the reactivity of the derivatization agent resulting in low GC/MS sensitivity.)

Elution

Elute samples with ~1-2 mL dichlormethane /iso-Propanol/ ammonium hydroxide (78/20/2)
Evaporate fraction to complete dryness under stream of dry air or nitrogen at ~ 35 °C.
(Note: For amphetamine group analysis, add 200 µL of 1% HCl/ 99% MeOH to eluate to minimize amphetamine group loss to volatilization.)

GC/MS Analysis

Derivatize compounds with appropriate derivatizing procedure or reconstitute in 100 µL ethyl acetate and inject 1-2 µL into the GC/MS system for analysis.

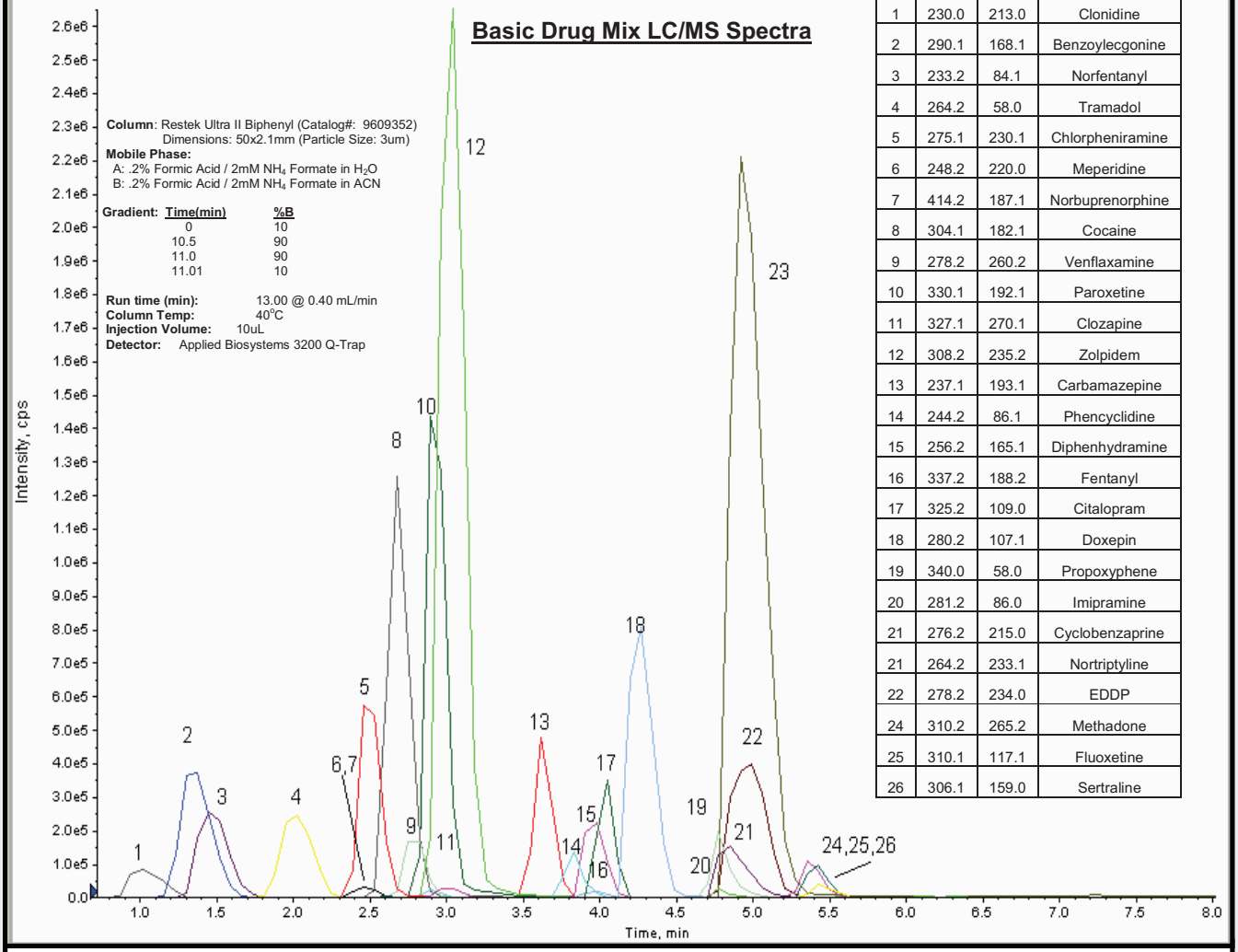
LC/MS Analysis

Reconstitute in methanol or appropriate mobile phase.

Analyte Peak Name	RRT (min)	% Recovery (Urine)	% Recovery (Blood)
6-MAM	4.14	97%	100%
Codeine	4.13	96%	99%
Hydrocodone	4.48	98%	94%
Hydromorphone	3.22	91%	91%
Morphine	2.83	92%	85%
Nalorphine	3.97	99%	97%
Naloxone	3.94	99%	94%
Naltrexone	4.40	99%	90%
Oxycodone	4.37	98%	94%
Oxymorphine	2.94	94%	88%

Analyte Peak Name	RRT (min)	% Recovery (Urine)	% Recovery (Blood)
Amphetamine	4.35	112%	104%
Benzoylecgonine	3.19	54%	58%
Buprenorphine	6.21	92%	92%
Chlorpheniramine	3.72	85%	94%
Citalopram	6.05	99%	95%
Clonidine	2.35	85%	98%
Clozapine	5.34	98%	94%
Cocaine	4.85	103%	96%
Cyclobenzaprine	7.48	102%	92%
Diphenhydramine	6.29	87%	88%
Doxepin	6.39	97%	93%
EDDP	7.52	85%	88%
Ephedrine	3.86	75%	57%
Fentanyl	6.31	88%	89%
Fluoxetine	7.95	97%	92%
Imipramine	7.18	97%	97%
MDA	5.08	95%	84%
MDEA	6.14	100%	93%
MDMA	5.62	99%	90%
Meperidine	4.59	82%	95%
Methadone	7.93	92%	93%
Methamphetamine	4.93	99%	104%
Norfentanyl	3.41	84%	85%
Nortriptyline	7.24	79%	89%
Paroxetine	7.09	90%	92%
Phencyclidine	5.72	90%	93%
Propoxyphene	7.22	90%	95%
Pseudoephedrine	3.86	79%	56%
Sertraline	8.08	75%	70%
Tramadol	4.01	89%	81%
Venlafaxine	4.94	102%	93%
Zolpidem	5.23	92%	95%

Basic Drug Mix LC/MS Spectra



Column: Restek Ultra II Biphenyl (Catalog#: 9609352)
Dimensions: 50x2.1mm (Particle Size: 3um)
Mobile Phase:
A: .2% Formic Acid / 2mM NH_4 Formate in H_2O
B: .2% Formic Acid / 2mM NH_4 Formate in ACN

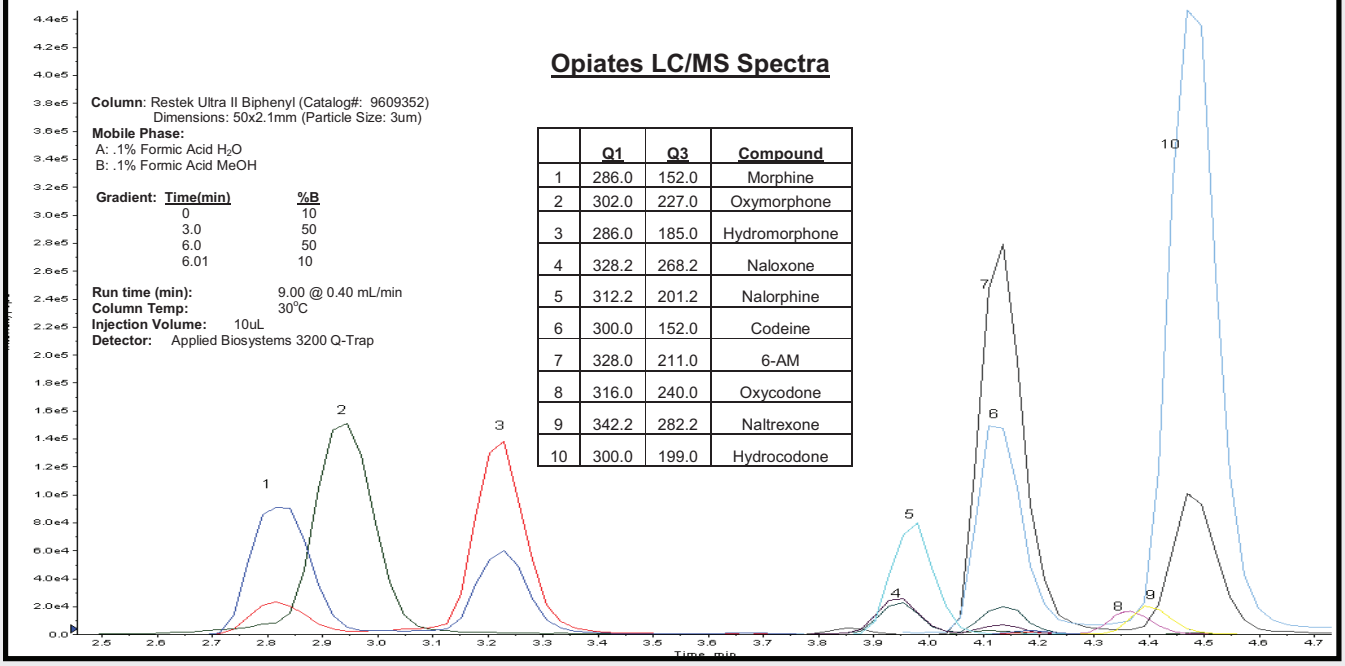
Gradient:

Time(min)	%B
0	10
10.5	90
11.0	90
11.01	10

Run time (min): 13.00 @ 0.40 mL/min
Column Temp: 40°C
Injection Volume: 10uL
Detector: Applied Biosystems 3200 Q-Trap

	Q1	Q3	Compound
1	230.0	213.0	Clonidine
2	290.1	168.1	Benzoylecgonine
3	233.2	84.1	Norfentanyl
4	264.2	58.0	Tramadol
5	275.1	230.1	Chlorpheniramine
6	248.2	220.0	Meperidine
7	414.2	187.1	Norbuprenorphine
8	304.1	182.1	Cocaine
9	278.2	260.2	Venflaxamine
10	330.1	192.1	Paroxetine
11	327.1	270.1	Clozapine
12	308.2	235.2	Zolpidem
13	237.1	193.1	Carbamazepine
14	244.2	86.1	Phencyclidine
15	256.2	165.1	Diphenhydramine
16	337.2	188.2	Fentanyl
17	325.2	109.0	Citalopram
18	280.2	107.1	Doxepin
19	340.0	58.0	Propoxyphene
20	281.2	86.0	Imipramine
21	276.2	215.0	Cyclobenzaprine
21	264.2	233.1	Nortriptyline
22	278.2	234.0	EDDP
24	310.2	265.2	Methadone
25	310.1	117.1	Fluoxetine
26	306.1	159.0	Sertraline

Opiates LC/MS Spectra



Column: Restek Ultra II Biphenyl (Catalog#: 9609352)
Dimensions: 50x2.1mm (Particle Size: 3um)
Mobile Phase:
A: .1% Formic Acid H_2O
B: .1% Formic Acid MeOH

Gradient:

Time(min)	%B
0	10
3.0	50
6.0	50
6.01	10

Run time (min): 9.00 @ 0.40 mL/min
Column Temp: 30°C
Injection Volume: 10uL
Detector: Applied Biosystems 3200 Q-Trap

	Q1	Q3	Compound
1	286.0	152.0	Morphine
2	302.0	227.0	Oxymorphone
3	286.0	185.0	Hydromorphone
4	328.2	268.2	Naloxone
5	312.2	201.2	Nalorphine
6	300.0	152.0	Codeine
7	328.0	211.0	6-AM
8	316.0	240.0	Oxycodone
9	342.2	282.2	Naltrexone
10	300.0	199.0	Hydrocodone

CLEAN SCREEN XCEL I

EXTRACTION OF BENZODIAZEPINES FROM URINE/ BLOOD USING SPE CARTRIDGES

130mg Clean Screen Xcel I Column
Part #: CSXCE106 6 mL - 130 mg Cartridge
Part #: CSXCE103 3 mL - 130 mg Cartridge

September 9, 2009

(Urine Hydrolysis Step)

To 1-2 mL urine sample add 500 µL of 0.1M acetate buffer (pH= 5.0) containing 5,000 units/mL
ß-glucuronidase. Optionally, add 500 µL of acetate buffer and 25 µL of concentrated ß-glucuronidase.
Add appropriate volume and concentration internal standards.
Vortex and heat for 1-2 hours at 65 °C.
Allow sample to cool.
Do not adjust pH- sample is ready to be added to extraction column.

(Blood Sample Preparation)

To 1-2 mL blood add 2 mL of 0.1M phosphate buffer (pH= 6.0+0.5).
Add appropriate volume and concentration internal standards.
Sample is ready to be added to extraction column.

Applying Sample to Column

Load sample directly to column without any preconditioning.
Pull sample through at a rate of 1-2 mL/ minute.
Dry column thoroughly under vacuum (10 mm Hg) or positive pressure (~ 80-100 psi) for 1 minute.

Wash (Blood Only)

Wash sample with 2 mL of 0.1M phosphate buffer (pH=6.0±0.5).

Wash (Urine and Blood)

Wash sample with 1 mL of methylene chloride.
Dry column thoroughly under vacuum (10 mm Hg) or positive pressure (~ 80-100 psi) for a minimum of 5 minutes.

NOTE 1: (It is important to dry the column thoroughly to achieve the highest recovery of all compounds. Any residual moisture will slow down the drying of the elution solvents prior to derivatization for GC/MS analysis. Also, any residual moisture could reduce the reactivity of the derivatization agent resulting in low GC/MS sensitivity.)

Elution

Elute samples with 1 mL ethyl acetate/ ammonium hydroxide (98/2)
Evaporate fraction to complete dryness under stream of dry air or nitrogen at ~ 35 °C.

GC/MS Analysis

It is recommended to add 50 µL of Ethyl Acetate to 50 µL of derivatization agent and react at ~70 °C for 15 minutes. Inject 1-2 µL of cooled (50:50) solution in the GC/MS system for analysis.

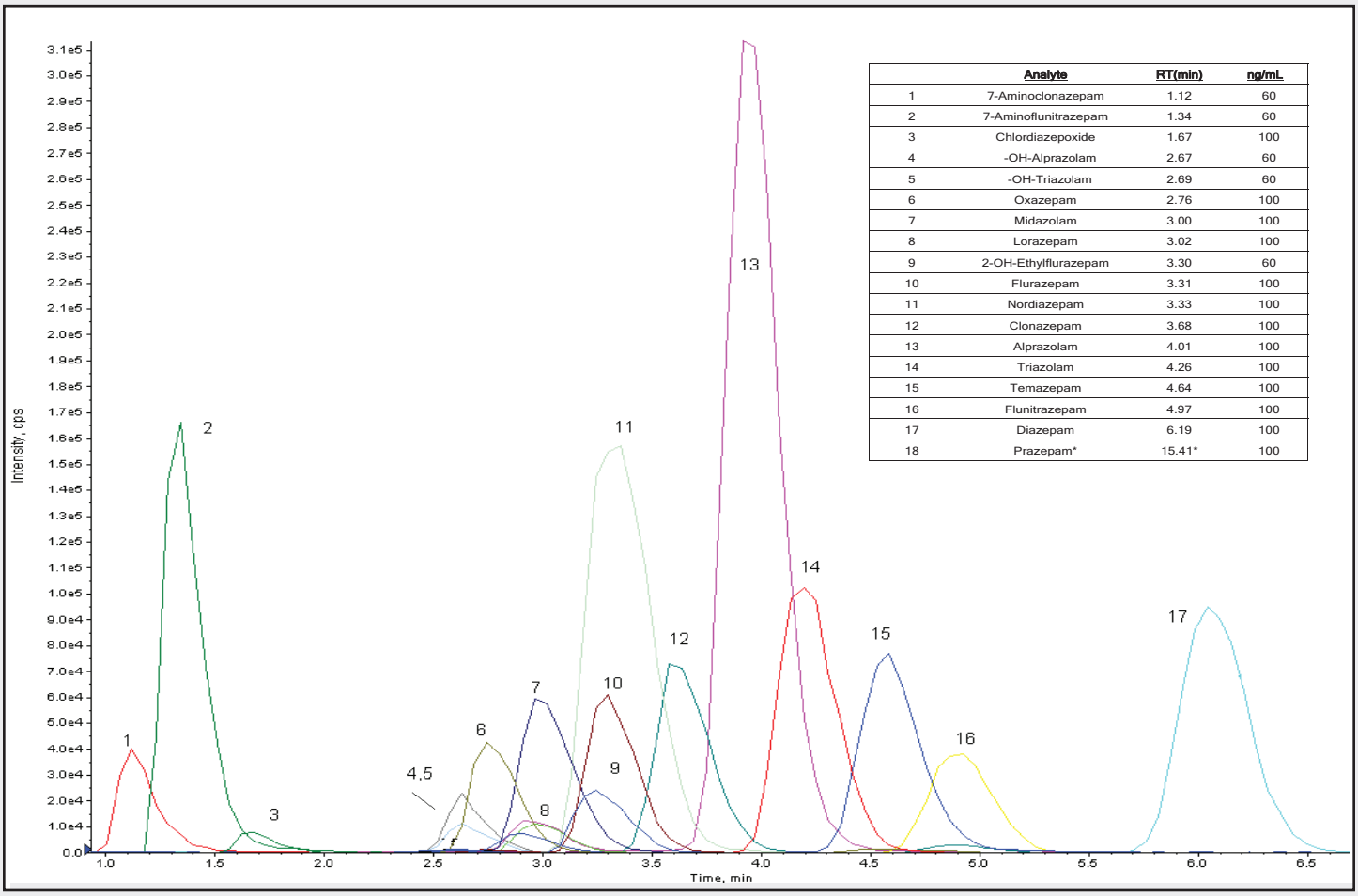
LC/MS Analysis

Reconstitute in methanol or appropriate mobile phase.

Benzodiazepine Analytes Extracted

Diazepam Clonazepam Alprazolam Midazolam

Analyte Peak Name	Analyte Peak Area (counts)	RRT (min)	% Recovery (Urine)	% Recovery (Blood)
2-Hydroxyethylflurazepam	1.98E+05	3.25	97%	89%
7-Aminoclonazepam	1.27E+05	1.12	93%	95%
7-Aminoflunitrazepam	9.50E+05	1.32	80%	83%
alpha-Hydroxyalprazolam	1.16E+05	2.64	103%	82%
alpha-Hydroxytriazolam	6.59E+04	2.64	97%	82%
Alprazolam	2.33E+06	3.93	90%	89%
Chlordiazepoxide	2.33E+04	1.67	75%	96%
Clonazepam	4.97E+05	3.60	78%	78%
Diazepam	4.64E+05	6.19	100%	90%
Flunitrazepam	3.39E+05	4.87	85%	85%
Flurazepam	9.75E+05	3.31	73%	78%
Lorazepam	7.17E+04	3.02	93%	76%
Midazolam	2.35E+05	3.00	89%	89%
Nordiazepam	4.01E+05	3.29	101%	80%
Oxazepam	1.93E+05	2.75	78%	96%
Prazepam	2.97E+06	15.1	89%	98%
Temazepam	2.64E+05	4.64	79%	68%
Triazolam	8.24E+05	4.18	95%	82%



	Analyte	RT(min)	ng/mL
1	7-Aminoclonazepam	1.12	60
2	7-Aminoflunitrazepam	1.34	60
3	Chlordiazepoxide	1.67	100
4	-OH-Alprazolam	2.67	60
5	-OH-Triazolam	2.69	60
6	Oxazepam	2.76	100
7	Midazolam	3.00	100
8	Lorazepam	3.02	100
9	2-OH-Ethylflurazepam	3.30	60
10	Flurazepam	3.31	100
11	Nordiazepam	3.33	100
12	Clonazepam	3.68	100
13	Alprazolam	4.01	100
14	Triazolam	4.26	100
15	Temazepam	4.64	100
16	Flunitrazepam	4.97	100
17	Diazepam	6.19	100
18	Prazepam*	15.41*	100

BENZODIAZEPINE LC/MS PARAMETERS

PEAK LIST:

Q1	Q3	Dwell Time (MS)	Compound	DP (volts)	EP (volts)	Cerilliant Part #
333.10	211.20	150	2-Hydroxyethylflurazepam	60	10	F-901
286.10	121.10	150	7-Aminoclonazepam	60	10	A-915
284.10	135.10	150	7-Aminoflunitrazepam	60	10	A-911
325.10	205.10	150	Alpha-Hydroxyalprazolam	60	10	A-905
341.00	297.00	150	Alpha-Hydroxymidazolam	60	10	H-902
359.00	239.10	150	alpha-Hydroxytriazolam	60	10	T-911
309.10	281.10	150	Alprazolam	60	10	A-903
300.00	227.00	150	Chlordiazepoxide	60	10	C-022
316.10	270.10	150	Clonazepam	60	10	C-907
289.00	140.10	150	Desalkylflurazepam	60	10	D-915
300.10	245.20	150	Desmethylflunitrazepam	60	10	D-918
285.10	193.10	150	Diazepam	60	10	D-907
314.10	268.10	150	Flunitrazepam	60	10	F-907
388.10	315.10	150	Flurazepam	60	10	F-003
321.00	229.10	150	Lorazepam	60	10	L-901
326.10	291.10	150	Midazolam	60	10	M-908
271.10	140.10	150	Nordiazepam	60	10	N-905
287.10	241.10	150	Oxazepam	60	10	O-902
325.10	271.10	250	Prazepam	60	10	P-906
301.10	255.10	150	Temazepam	60	10	T-907
343.00	239.00	150	Triazolam	60	10	T-910

COLUMN:

Restek Ultra II Biphenyl
Catalog#: 9609352
Dimensions: 50 x 2.1mm
Particle Size: 3 µm

CONDITIONS:

Mobile Phase: A: .2% Formic Acid / 2mM NH_4 Formate in H_2O
B: .2% Formic Acid / 2mM NH_4 Formate in ACN

Isocratic Flow: .2 mL/min A : .1 mL/min B
Run time: 20 minutes
Injection Volume: 10 µL
Column Temp: 40°C
Detector: Applied Biosystems 3200 Q-Trap LC/MS/MS

CLEAN SCREEN XCEL II

SPE EXTRACTION OF THC-DELTA-9-CARBOXY METABOLITE FROM URINE/ BLOOD

130mg Clean Screen Xcel II Column
PART #: CSXCE2106 6 ML - 130 MG CARTRIDGE

September 9, 2009

(Urine Sample Preparation - Hydrolysis / Neutralization Step)
To 2 mL urine sample add appropriate volume and concentration internal standards.
Add 50 µL of 10N NaoH and heat for 15 minutes at 70 °C.
Add 50 µL of 1:1 (glacial acetic acid: DI water). pH should be ~ 6.5.
Add 100 µL 0.1M pH=7.0 phosphate buffer
Sample is ready to be added to extraction column.

(Blood Sample Preparation)
To 1-2 mL blood add appropriate volume and concentration internal standards
Add 2 mL of 0.1M phosphate buffer (pH= 7.0).
Sample is ready to be added to extraction column.

(Alternate Blood Preparation)
To 1-2 mL blood add appropriate volume and concentration internal standards
Add dropwise 1-2 mL of cold acetonitrile. Centrifuge and decant acetonitrile.
Reduce acetonitrile by evaporating at ≤ 40 °C to ~ 100-200 µL.
Add 2 mL of 0.1M phosphate buffer (pH= 7.0).
Sample is ready to be added to extraction column.

Applying Sample to Column
Load sample directly to column without any preconditioning.
Pull sample through at a rate of 1-2 mL/ minute.
Dry column thoroughly under vacuum (10 mm Hg) or positive pressure (~ 80-100 psi) for ~1 minute.

Wash (Blood Only)
Wash sample with 2 mL of 0.1M phosphate buffer (pH= 7.0).
Wash (Urine and Blood)
Wash sample with 1-2 mL of hexane.
Dry column thoroughly under vacuum (10 mm Hg) or positive pressure (~ 80-100 psi)
for a minimum of 5-10 minutes.

NOTE 1: (It is important to dry the column thoroughly to achieve the highest recovery of all compounds. Any residual moisture will slow down the drying of the elution solvents prior to derivatization for GC/MS analysis. Also, any residual moisture could reduce the reactivity of the derivatization agent resulting in low GC/MS sensitivity.)

Elution
Elute samples with ~1-2 mL hexane/ ethyl acetate/ glacial acetic acid (49/49/2)
Evaporate fraction to complete dryness under stream of dry air or nitrogen at ~ 35 °C.

GC/MS Analysis
Derivatize compounds with appropriate derivatizing procedure inject 1-2 µL into the GC/MS system.

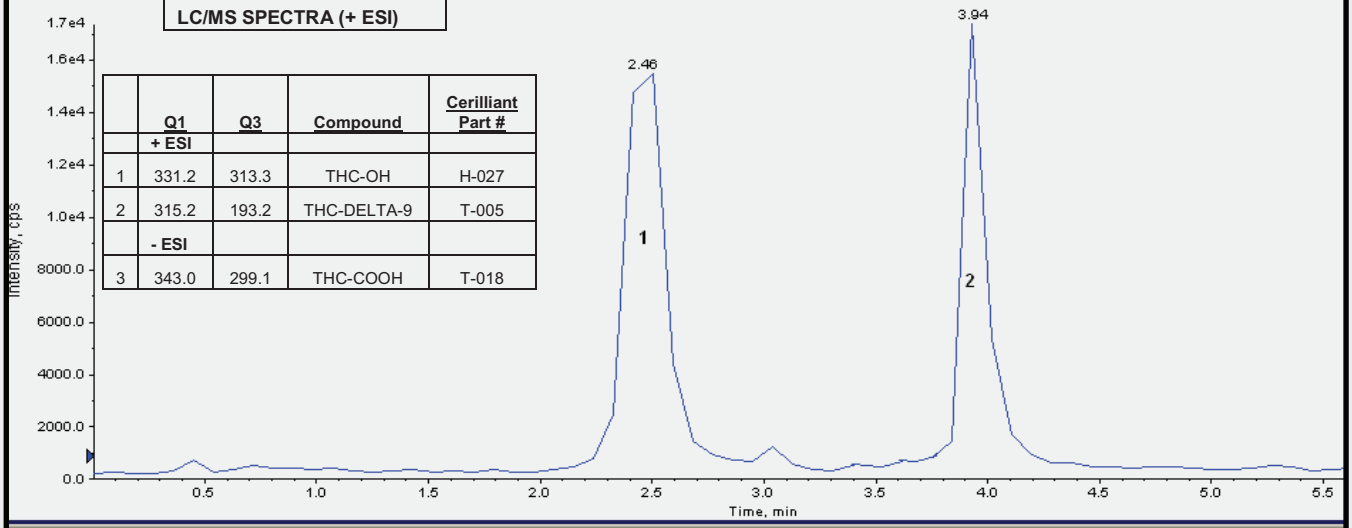
LC/MS Analysis
Reconstitute in methanol or appropriate mobile phase.

THC-delta-9-COOH Comparison of Extraction Methods Xcel II versus Liquid/ Liquid

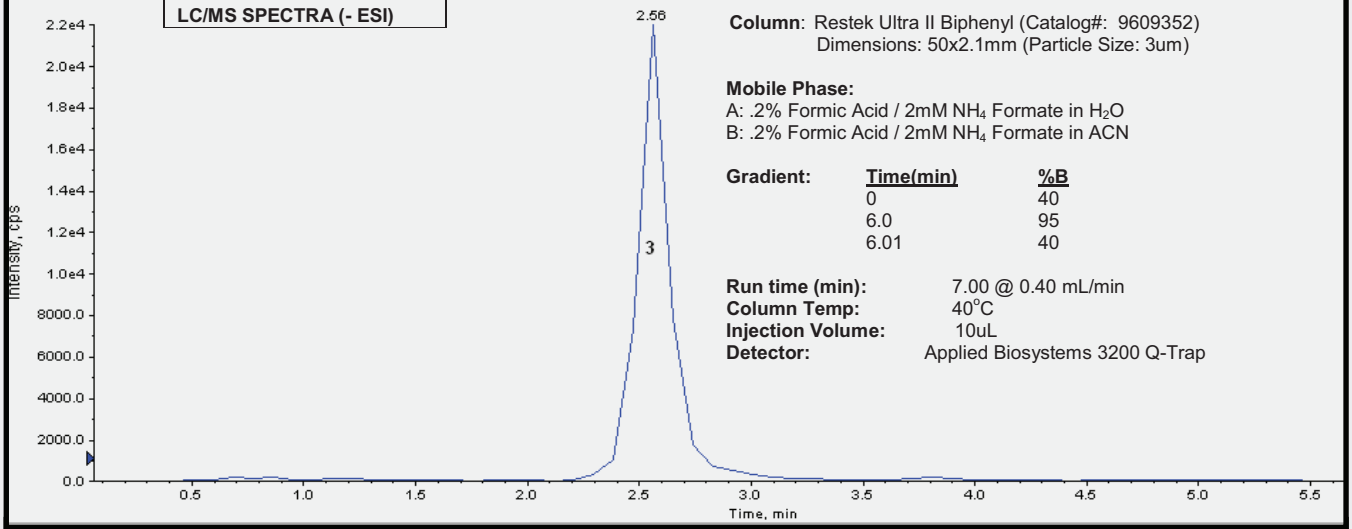
SAMPLE ID #	Liquid/ Liquid Result (ng/ml)	2 Step Xcel II SPE Result (ng/ml)	Liquid/ Liquid Area Response	2 Step Xcel II SPE Area Response
60 control	60.8	63.2	193689	521993
300 control	226	299	663859	1793767
9141-1	157	171	366285	1210294
9141-2	26	30.1	74689	283042
9141-4	57	73	125662	497268
9141-5	13.8	14	50238	168674
9141-6	57.9	56.2	148767	469350
30 control	26.5	27	95809	215516
9140-2	602	617	1475613	1874264
9140-6	158	183	315248	421658
9140-8	24.3	36	92673	187997
9140-9	23.7	29	89165	203170
9148-3	15	12	48302	65258
9152-08	259	218	929062	1271537
9154-13	257	238	945812	1536918
9154-10	31	38	83919	198698
9153-6	△500	476	2119187	2516835
9153-3	68	48	56757	53761
9152-8	259	219	929062	1271537
Control-70	72	65	218237	415581

LC/MS SPECTRA (+ ESI)

	Q1	Q3	Compound	Cerilliant Part #
	+ ESI			
1	331.2	313.3	THC-OH	H-027
2	315.2	193.2	THC-DELTA-9	T-005
	- ESI			
3	343.0	299.1	THC-COOH	T-018



LC/MS SPECTRA (- ESI)



Column: Restek Ultra II Biphenyl (Catalog#: 9609352)
Dimensions: 50x2.1mm (Particle Size: 3um)

Mobile Phase:
A: .2% Formic Acid / 2mM NH_4 Formate in H_2O
B: .2% Formic Acid / 2mM NH_4 Formate in ACN

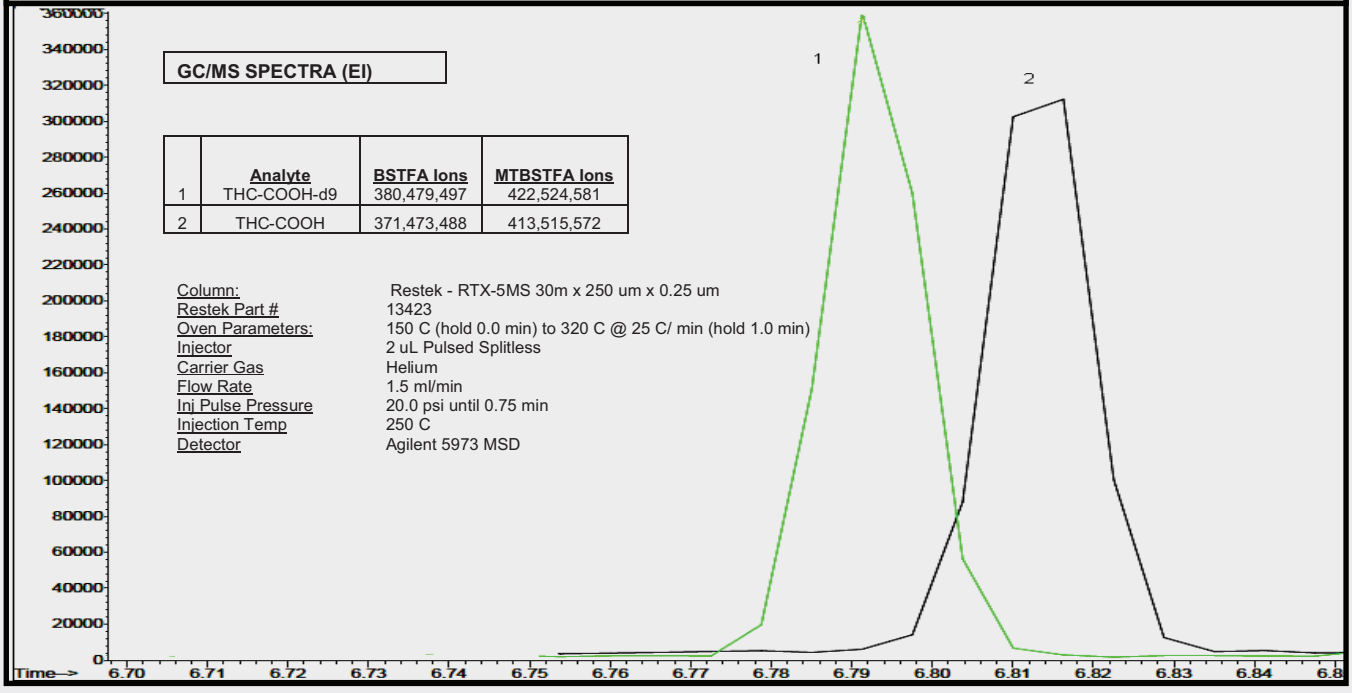
Gradient:	Time(min)	%B
	0	40
	6.0	95
	6.01	40

Run time (min): 7.00 @ 0.40 mL/min
Column Temp: 40°C
Injection Volume: 10uL
Detector: Applied Biosystems 3200 Q-Trap

GC/MS SPECTRA (EI)

	Analyte	BSTFA Ions	MTBSTFA Ions
1	THC-COOH-d9	380,479,497	422,524,581
2	THC-COOH	371,473,488	413,515,572

Column:	Restek - RTX-5MS 30m x 250 um x 0.25 um
Restek Part #	13423
Oven Parameters:	150 C (hold 0.0 min) to 320 C @ 25 C/ min (hold 1.0 min)
Injector	2 uL Pulsed Splitless
Carrier Gas	Helium
Flow Rate	1.5 ml/min
Inj Pulse Pressure	20.0 psi until 0.75 min
Injection Temp	250 C
Detector	Agilent 5973 MSD



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. Lewistown, PA 17044. 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. Secondly, the defective product must be returned within 30 days after proper approval from our Quality Manager. All returns must indicate the purchase order number, the lot number and the shipping date. UCT's total liability is limited to the replacement cost of UCT products.

This warranty does not apply to damage resulting from misuse.

Placing An Order

Phone: 215.781.9255
800.541.0559
Fax: 215.785.1226

Mail

UCT, LLC
2731 Bartram Rd.
Bristol, PA 19007

Technical Support

Phone: 215.781.9255
800.385.3153
Fax: 215.785.1226
Email: info@unitedchem.com
Forum: forums.unitedchem.com
Web: www.unitedchem.com

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