FORENSICS

UCT

SAMPLE PREP COLUMNS DESIGNED SPECIFICALLY FOR THE RACING INDUSTRY

XtrackT® DAU

XtrackT® DAU

XtrackT® DAU is a series of reproducible copolymerically bonded silicas created especially for the screening and confirmation of drugs in dog and horse urine.

The use of new and powerful drugs in sports requires new techniques for the clean extraction of very low levels of compounds. XtrackT® offers a simple, easy solution to this extraction problem, whether it's a comprehensive screen or low level quantitation by either GC/MS or LC/MS.

Through original research on the concept and use of copolymeric bonding of silicas for sample preparation, UCT, Inc. has pioneered this generation of hybrid extraction sorbents.

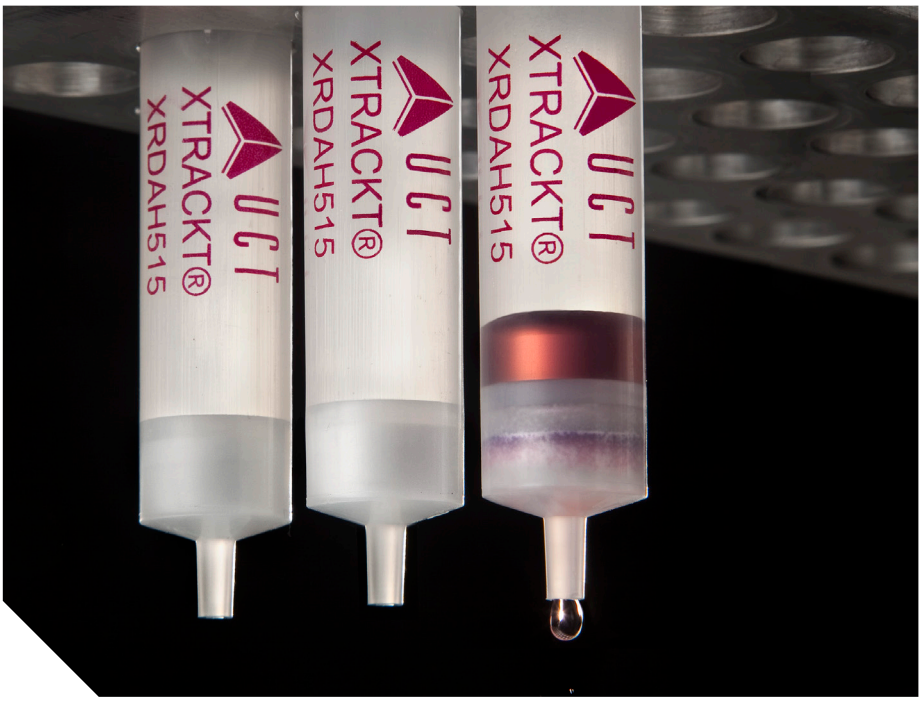
XtrackT® DAU has both hydrophobic and ion exchange functionalities, thus providing several primary retention mechanisms. The copolymers are used to enhance and improve mixed mechanisms which have been known to exist for sometime. XtrackT® utilizes several different chemical characteristics of compounds to produce very clean extracts.

The recovery of drugs is at least equivalent to and in most cases significantly better than recovery by liquid-liquid extraction. XtrackT® extracts both free and glucuronide bound drugs.

A single column extraction provides broad coverage of drugs, separating extracts into acidic/neutral, steroid and basic fractions. It produces cleaner extracts and eliminates the need for special liquid-liquid extraction procedures for different drug classes. The columns are designed to give uniform flow even with the most viscous of samples.

A SCREENING PROCEDURE FOR ACIDIC, NEUTRAL AND BASIC DOPING AGENTS FROM HUMAN, EQUINE AND CANINE URINE USING XtrackT® EXTRACTION COLUMNS

1. Hydrolyze conjugates
2. Adjust sample pH to 6.0
3. Condition column
4. Apply sample to column
5. Wash
6. Dry column
7. Elute acidic and neutral drugs
8. Elute steroids
9. Wash column
10. Elute basic drugs
11. Evaporate and reconstitute



3-HYDROXY LIDOCAINE, 4-HYDROXY GUANABENZ, 4-HYDROXY MEPIVICANE, 4-HYDROXY XYLAZINE, DETOMIDINE, AND O-DESMETHYL TRAMADOL IN EQUINE URINE BY LC/MS

XtrackT®
Solid Phase Extraction Columns

200 mg XtrackT® DAU Extraction Column - Part #: XRDAH206
Select pH Buffer Pouches 100mM Phosphate pH 6.0 - Part #: SPHPHO6001-10

1. Prepare Sample:
To 1 mL of 100 mM phosphate buffer (pH= 6) add 2 mL of Urine
Add Internal standards. Add 3 mL of 100 mM phosphate buffer
Mix/ vortex
Centrifuge as appropriate

2. Condition XtrackT® DAU Extraction Column:
1 x 3 mL CH_3OH
1 x 3 mL D.I. H_2O
1 x 3 mL 100 mM phosphate buffer (pH= 6)
NOTE: Aspirate at full vacuum or pressure

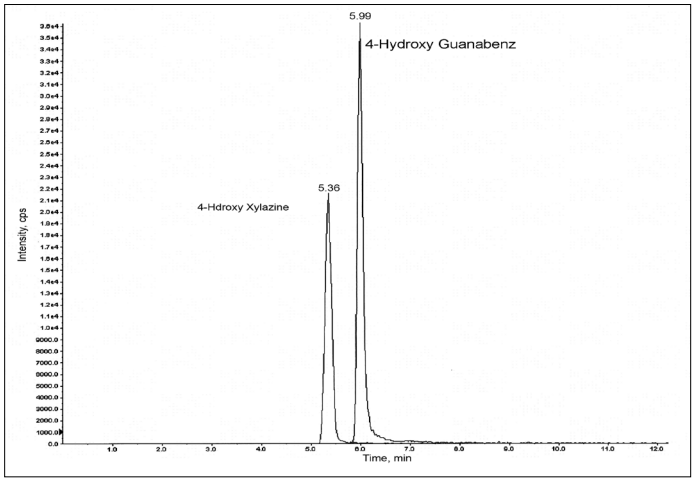
3. Apply Sample:
Load at 1 to 2 mL/ minute

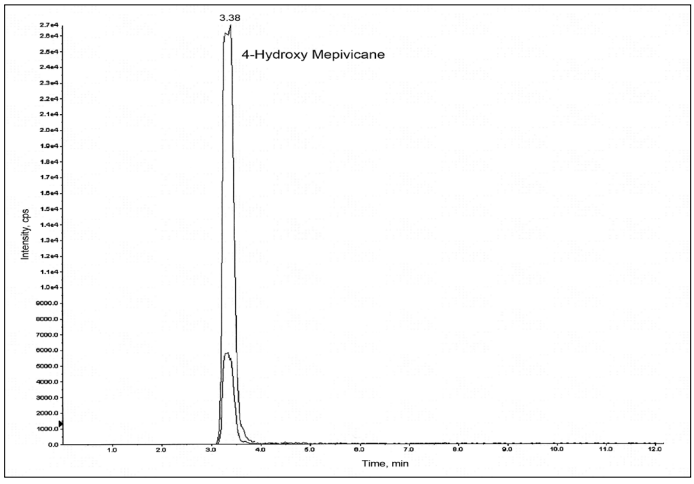
4. Wash Column:
1 x 3 mL D.I. H_2O
1 x 3 mL CH_3OH/ 2% glacial acetic acid
Dry column (5 minutes at full vacuum or pressure)

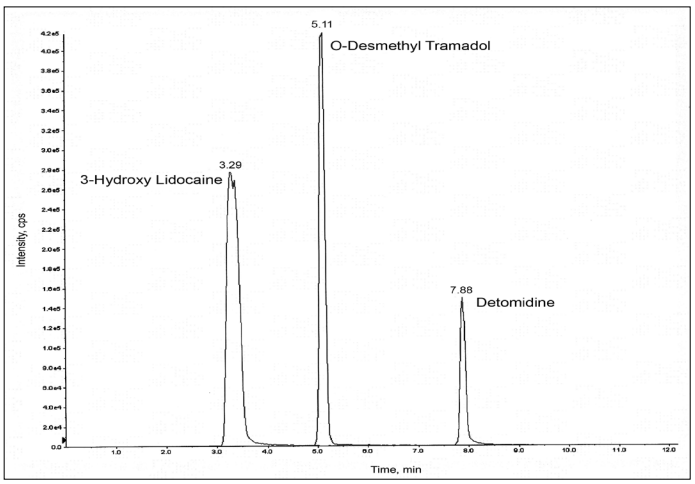
5. Elute:
1 x 3 mL DCM/IPA/ NH_4OH (78/20/2)
Collect the eluate at 1-2 mL minute (or gravity)

6. Dry Eluate:
Evaporate to dryness at < 40°C

7. Analysis:
Inject 10 µL sample







Compound	RT	Precursor Ion	Product Ion
3-Hydroxy Lidocaine	3.29	251.5	86.0
4-Hydroxy Mepivicane	3.38	264.1	98.1
O-Desmethyl Tramadol	5.11	250.4	58.0
4-Hydroxy Xylazine	5.36	237.9	137.0
4-Hydroxy Guanabenz	5.99	248.9	189.9
Detomidine	7.88	188.1	81.0

CLENBUTEROL AND SALBUTAMOL IN EQUINE URINE FOR GC/MS CONFIRMATIONS

200 mg XtrackT® DAU Extraction Column - Part #: XRDAH206
Select pH Buffer Pouches 100mM Phosphate pH 6.0 - Part #: SPHPHO6001-10
BSTFA w/1% TMCS - Part #: SBSTFA-1-1

1. Prepare Sample:
To 1 mL of 100 mM phosphate buffer (pH= 6) add 1 mL of Urine
Add Internal standards Add 3 mL of 100 mM phosphate buffer
Mix/ vortex
Centrifuge as appropriate

2. Condition XtrackT® DAU Extraction Column:
1 x 3 mL CH_3OH
1 x 3 mL D.I. H_2O
1 x 3 mL 100 mM phosphate buffer (pH= 6)
NOTE: Aspirate at full vacuum or pressure

3. Apply Sample:
Load at 1 to 2 mL/ minute

4. Wash Column:
1 x 3 mL D.I. H_2O
1 x 3 mL CH_3OH
Dry column (5 minutes at full vacuum or pressure)

5. Elute Clenbuterol / Salbutamol:
1 x 3 mL CH_3OH containing 4% NH_4OH
Collect the eluate at 1-2 mL minute (or gravity)

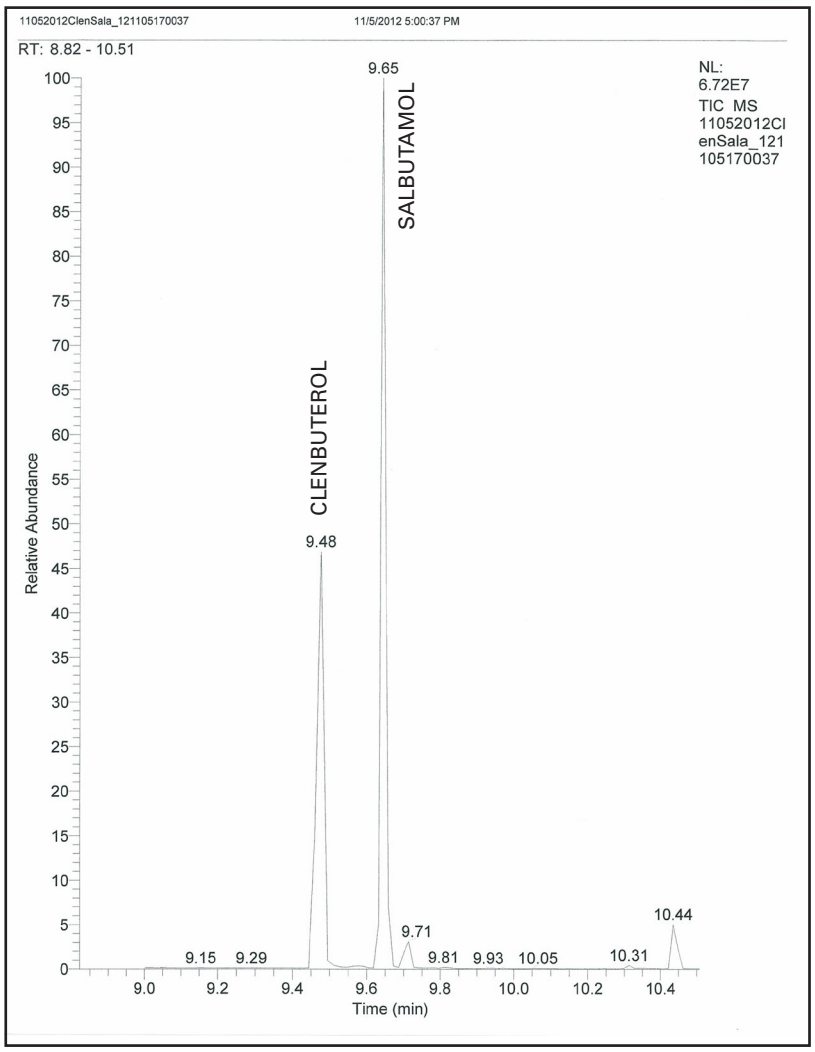
6. Dry Eluate:
Evaporate to dryness at < 40°C

7. Derivatize:
Add 50 µL Ethyl Acetate
Add 50 µL BSTFA w/1% TMCS
Heat at 70 °C for 30 minutes
Cool to room temperature
NOTE: Do not evaporate this solution

8. Analysis:
Inject 1 to 2 µL onto gas chromatograph

Select pH Buffer Pouches

Pre-measured salts for sample preparation



Compound	Primary Ion*	Secondary Ion	Tertiary Ion
Clenbuterol-TMS	86	262	243
Clenbuterol-D3-TMS†	95	262	243
Salbutamol-TMS	369	86	207
Salbutamol-D3-TMS†	372	86	210

*Quantitation Ion
†Suggested internal standard for GC/MS

COCAINE AND METABOLITES IN BLOOD, PLASMA/ SERUM, URINE AND TISSUE FOR GC/MS CONFIRMATIONS

200 mg XtrackT® DAU Extraction Column - Part #: XRDAH206 with CLEAN-THRU® Tips, without Tips Part #: XCDAH206
CLEAN-THRU® Tips Part #: CLTTP050
Select pH Buffer Pouches 100mM Phosphate pH 6.0 - Part #: SPHPHO6001-10
BSTFA w/1% TMCS - Part #: SBSTFA-1-1

1. Prepare Sample:
To 1 mL of of 100 mM phosphate buffer (pH= 6.0) add internal standards
Add 2 mL of blood, plasma/ serum, urine or 1 g (1:4) tissue homogenate . Mix/vortex. Add 2 mL of 100 mM phosphate buffer (pH= 6). Mix/vortex.

Sample pH should be 6.0 ± 0.5
Adjust pH accordingly with 100 mM monobasic or dibasic sodium phosphate
Centrifuge as appropriate

2. Condition XtrackT® DAU Extraction Column:
1 x 3 mL CH_3OH
1 x 3 mL D.I. H_2O
1 x 1 mL 100 mM phosphate buffer (pH= 6.0)
NOTE: Aspirate at full vacuum or pressure

3. Apply Sample:
Load at 1 to 2 mL/ minute

4. Wash Column:
1 x 3 mL D.I. H_2O
1 x 2 mL 100 mM HCl
1 x 3 mL CH_3OH
Dry column (5 minutes at full vacuum or pressure)

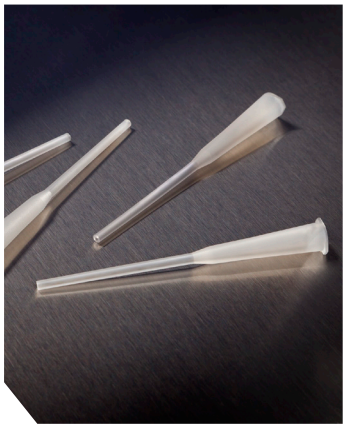
5. Elute Cocaine and Benzoylecgonine:
1 x 3 mL Methylene Chloride/Isopropanol/ Ammonium Hydroxide (78:20:2)
Collect eluate at 1 to 2 mL/minute
NOTE: Prepare elution solvent daily. Add IPA/NH_4OH, mix, then add CH_2Cl_2 (pH 11-12)

6. Dry Eluate:
Evaporate to dryness at < 40°C

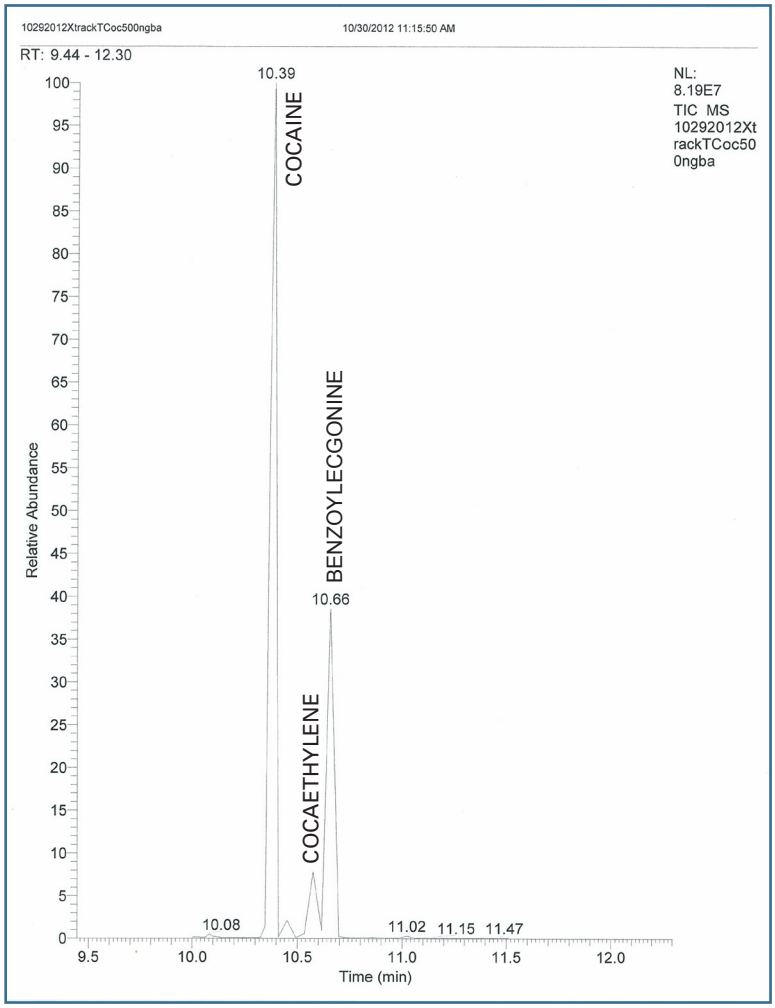
7. Derivatize:
Add 50 µL ethyl acetate and 50 µL BSTFA w/1% TMCS
Overlay with Nitrogen and cap. Mix/vortex
React 20 minutes at 70°C
Remove from heat source to cool
NOTE: Do not evaporate BSTFA solution

8. Quantitate:
Inject 1 to 2 µL onto gas chromatograph

CLEAN-THRU® Tips



Minimize sample cross contamination potential



Compound	Primary Ion*	Secondary Ion	Tertiary Ion
Cocaine	182	198	303
Cocaine-D3†	185	201	306
Cocaethylene	196	317	82
Cocaethylene-D8†	204	325	196
Benzoylecgonine-TMS	240	256	361
Benzoylecgonine-D3-TMS†	243	259	364

*Quantitation Ion
†Suggested internal standard for GC/MS

BARBITURATES IN URINE FOR GC/MS CONFIRMATIONS

200 mg XtrackT® DAU Extraction Column - Part #: XRDAH206 with CLEAN-THRU® Tips, without Tips Part #: XCDAH206
CLEAN-THRU® Tips Part #: CLTTP050
OPTIONAL: TMPAH - Part #: STMPAH-0-1

1. Prepare Sample:
To 2 mL of urine add internal standard(s) and 1 mL of 100 mM phosphate buffer (pH= 5.0)
Mix/vortex.
Sample pH should be 5.0 ± 0.5
Adjust pH accordingly with 100 mM monobasic or dibasic sodium phosphate

2. Condition XtrackT® DAU Extraction Column:
1 x 3 mL CH_3OH
1 x 3 mL D.I. H_2O
1 x 1 mL 100 mM phosphate buffer (pH= 5.0)
NOTE: Aspirate at full vacuum or pressure

3. Apply Sample:
Load at 1 to 2 mL/ minute

4. Wash Column:
1 x 3 mL D.I. H_2O
1 x 1 mL 100 mM acetic acid
Dry column (5 minutes at full vacuum or pressure)
1 x 2 mL hexane

5. Elute Barbituates:
1 x 3 mL hexane/ethyl acetate (50:50);
Collect eluate at 1 to 2 mL / minute

6. Dry Eluate:
Evaporate to dryness at < 40°C
Reconstitute with 100 µL ethyl acetate
OPTIONAL DERIVATIZATION
Add 25-50 µL of 0.2 M TMPAH
Reaction occurs in injection port
Inject 1 to 2 µL onto gas chromatograph

7. Quantitative
Add 50 µL of both Ethyl Acetate and BSTFA

Positive Pressure Manifold

Extract up to 48 samples with even flow across all channels

Other Barbituates that can be extracted using this method
Underivatized

Compound	Primary Ion*	Secondary Ion	Tertiary Ion
Amobarbital	156	141	157
Butalbital	168	167	181
Pentobarbital	156	141	195
Thiopental	172	157	173

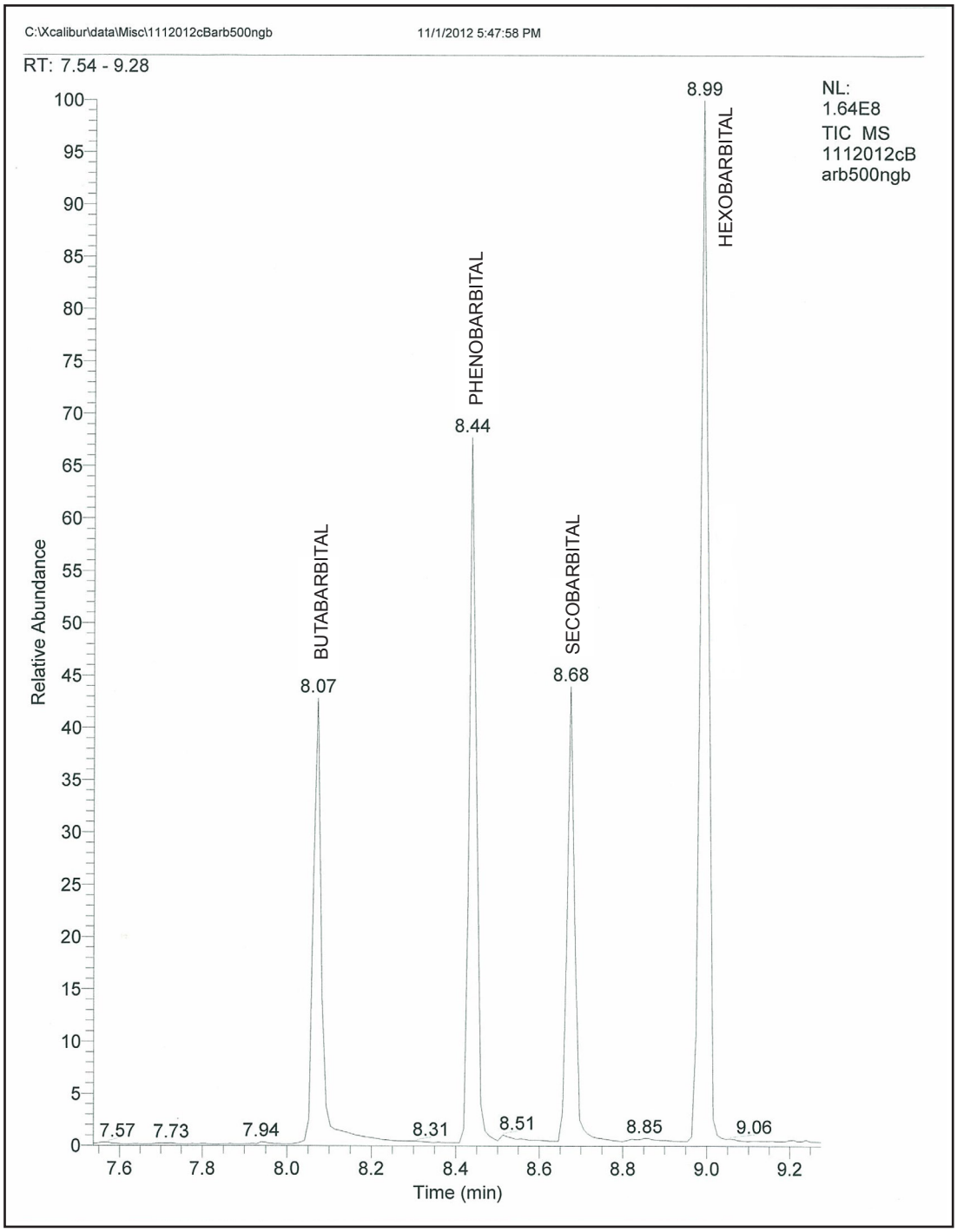
*Quantitation Ion

Derivatized

Compound	Primary Ion*	Secondary Ion	Tertiary Ion
Butalbital	196	195	209
Butalbital-D5†	201	214	
Amobarbital	169	184	185
Pentobarbital	169	184	112
Secobarbital	196	195	181
$^{13}C_4$ Secobarbital†	200	185	
Phenobarbital	232	146	175
Phenobarbital-D5†	237	151	

*Quantitation Ion
†Suggested internal standard for GC/MS

BARBITURATES IN URINE SPECTRA - UNDERIVATIZED



Underivatized

Compound	Primary Ion*	Secondary Ion	Tertiary Ion
Butabarbital	156	141	157
Phenobarbital	204	232	117
Secobarbital	168	167	195
Hexobarbital†	221	157	236

*Quantitation Ion

†Suggested internal standard for GC/MS

THC, THC-OH, AND CARBOXY-THC IN URINE FOR GC/MS CONFIRMATIONS

200 mg XtrackT® DAU Extraction Column - Part #: XRDAH206
Select pH Buffer Pouches 1M Acetate pH 5.0 - Part #: SPHACE5010-10
BSTFA w/1% TMCS - Part #: SBSTFA-1-1
β - Glucuronidase - Part #: KUBETA-GLUC-10

1. Prepare Sample - Enzymatic and Base Hydenzymatic and Base Hydrolysis of Glucuronides:
To 1 mL of urine add internal standard (s) and 50 µL of Beta Glucuronidase solution (*Haliotis rufescens*), add 2 mL of 1 M Acetate buffer pH= 5. Mix and incubate at 65 °C for 3 hours. Cool to room temperature

Add 100 of 10 M NaOH. Mix/vortex
Hydrolyze for 20 minutes at 60°C. Cool before proceeding
Adjust sample pH to 3.0 with approx. 1.0 mL of glacial acetic acid. Check pH to insure that the pH value is ~ 3.0
Sample pH should be 6.0 ± 0.5
Adjust pH accordingly with 100 mM monobasic or dibasic sodium phosphate
Centrifuge as appropriate

2. Condition XtrackT® DAU Extraction Column:
1 x 3 mL CH_3OH
1 x 3 mL D.I. H_2O
1 x 1 mL Acetate buffer (pH= 3.0)
NOTE: Aspirate at full vacuum or pressure

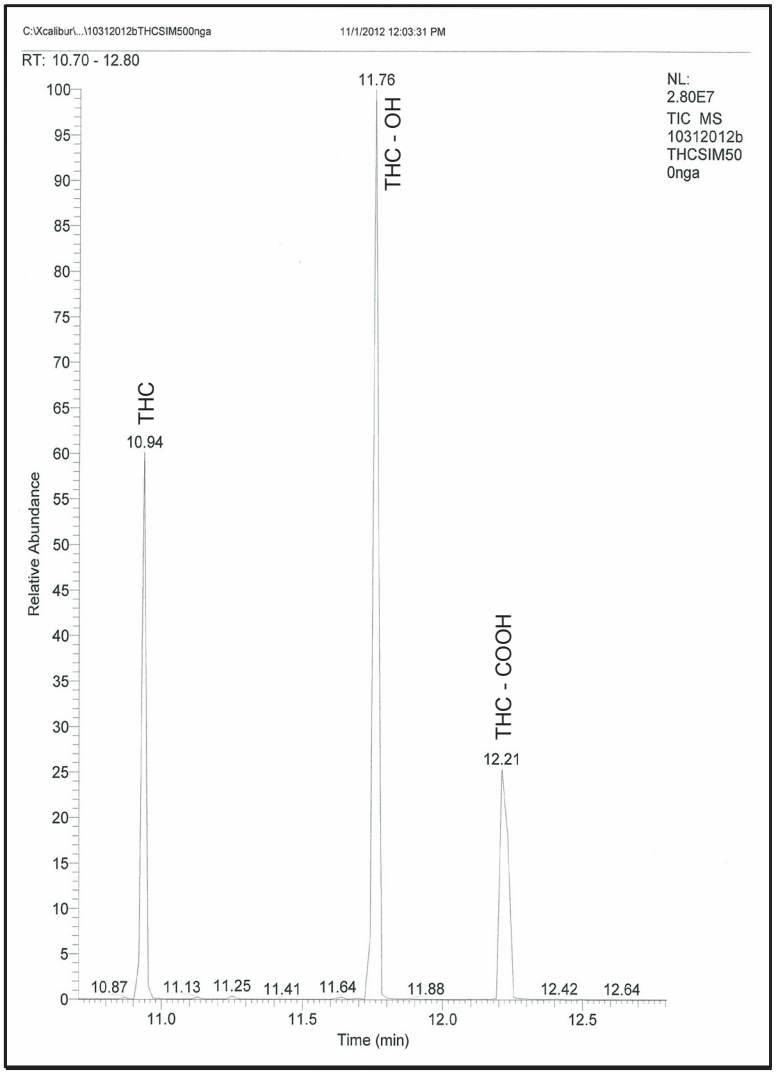
3. Apply Sample:
Load at 1 to 2 mL/ minute

4. Wash Column:
1 x 2 mL D.I. H_2O
1 x 2 mL 100 mM HCl/acetonitrile (95:5)
Dry column (5-10 minutes at full vacuum or pressure)
1 x 200 1 mL hexane; Aspirate. (Additional step to remove any residual moisture)

5. Elute Cannabinoids:
1 x 3 mL hexane/ethyl acetate/ glacial acetic acid (49:49:2)
Collect eluate at 1 to 2 mL/minute
NOTE: Before proceeding, insure there are no water droplets at the bottom of the collection tube. This may increase drying time and decrease BSTFA derivatizing efficiency

6. Dry Eluate:
Evaporate to dryness at < 40°C

7. Derivatize:
Add 50 µL ethyl acetate and 50 µL BSTFA w/1% TMCS
Mix/vortex
React 20 minutes at 70°C
Remove from heat source to cool
NOTE: Do not evaporate BSTFA
Inject 1 to 2 µL onto gas chromatograph



Compound	Primary Ion*	Secondary Ion	Tertiary Ion
THC-TMS	371	343	366
THC-D3-TMS†	374	346	889
THC-OH-TMS	371	459	474
THC-OH-D3-TMS†	374	462	471
THC-COOH-TMS	371	473	488
THC-COOH-D3-TMS†	374	476	491

*Quantitation Ion
†Suggested internal standard for GC/MS

BENZODIAZEPINES IN URINE FOR GC/MS CONFIRMATIONS

200 mg XtrackT® DAU Extraction Column - Part #: XRDAH206
Select pH Buffer Pouches 100mM Phosphate pH 6.0 - Part #: SPHPHO6001-10
BSTFA w/1% TMCS - Part #: SBSTFA-1-1
β - Glucuronidase - Part #: KUBETA-GLUC-10

1. Prepare Sample - ß-Glucuronidase Hydrolysis:
To 2 mL of urine add internal standard(s) and 1 mL of ß-glucuronidase solution.
ß-glucuronidase solution contains: 5,000 F units/mL *Haliotis rufescens* in 100 mM acetate buffer (pH=5.0).
Mix/vortex.
Hydrolyze for 3 hours at 65°C.
Centrifuge for 10 minutes at 2000 rpm and discard pellet.

2. Condition XtrackT® DAU Extraction Column:
1 x 3 mL CH_3OH
1 x 3 mL D.I. H_2O
1 x 1 mL 100 mM phosphate buffer (pH= 6.0)
NOTE: Aspirate at full vacuum or pressure

3. Apply Sample:
Load at 1 mL/ minute

4. Wash Column:
1 x 2 mL D.I. H_2O
1 x 2 mL 20% acetonitrile in 100 mM phosphate buffer (pH= 6.0)
Dry column (5 minutes at full vacuum or pressure)
1 x 2 mL hexane

5. Elute Benzodiazepines:
1 x 5 mL ethyl acetate containing 4% ammonium hydroxide collect eluate at 1 to 2 mL/minute

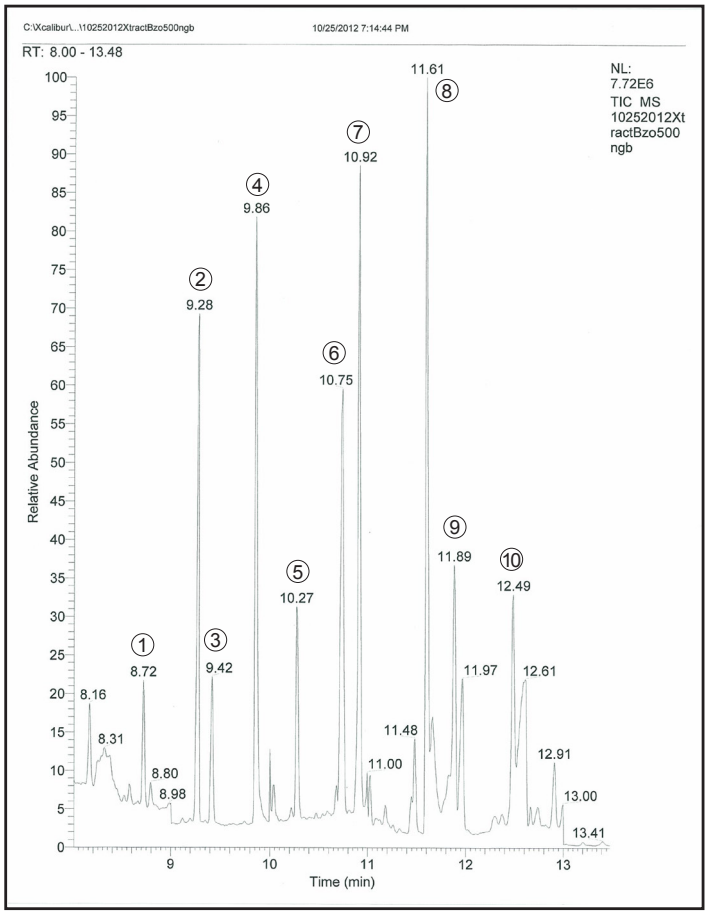
6. Dry Eluate:
Evaporate to dryness at < 40°C

7. Derivatize:
Add 50 µL ethyl acetate and 50 µL BSTFA w/1% TMCS
Overlay with Nitrogen and cap. Mix/vortex
React 20 minutes at 70°C. Remove from heat source to cool
NOTE: Do not evaporate BSTFA solution

8. Quantitate:
Inject 1 to 2 µL onto gas chromatograph

Derivatizing Reagents

High Purity Reagents in a variety of package sizes; derivatize extracts prior to GC/MS analysis



Compound	Primary Ion*	Secondary Ion	Tertiary Ion
1. Diazepam	256	283	221
2. Nordazepam TBDMS	327	383	369
3. Midazepam	310	325	297
4. Oxazepam - 2TBDMS	457	513	383
Oxazepam - D5 2TBDMS†	462	519	
5. Temazepam	357	283	385
6. 7-aminoclonazepam TBDMS	342	399	328
7. Lorazepam 2TBDMS	491	513	533
8. Clonazepam	372	326	429
9. Alprazolam	279	204	308
Alprazolam - D5†	284	313	
10. Alphahydroxyl alprazolam TBDMS	381	423	346

*Quantitation Ion
†Suggested internal standard for GC/MS

CARISOPRODOL/MEPROBAMATE IN URINE FOR GC/MS CONFIRMATIONS

200 mg XtrackT® DAU Extraction Column - Part #: XRDAH206
Select pH Buffer Pouches 100mM Phosphate pH 6.0 - Part #: SPHPHO6001-10
BSTFA w/1% TMCS - Part #: SBSTFA-1-1

1. Prepare Sample:
To 2 mL of urine add internal standard(s) and 1 mL of 100 mM phosphate buffer (pH= 6)
Mix/vortex
Sample pH should be 6.0 ± 0.5
Adjust pH accordingly with 100 mM monobasic or dibasic sodium phosphate
Centrifuge at 3000 RPM for 10 minutes

2. Condition XtrackT® DAU Extraction Column:
1 x 3 mL CH_3OH
1 x 3 mL D.I. H_2O
1 x 1 mL 100 mM phosphate buffer (pH= 6)
NOTE: Aspirate at full vacuum or pressure

3. Apply Sample:
Load at 1 to 2 mL/ minute

4. Wash Column:
1 x 3 mL D.I. H_2O
1 x 1 mL 100 mM acetic acid
Dry column (5 minutes at full vacuum or pressure)
1 x 2 mL hexane

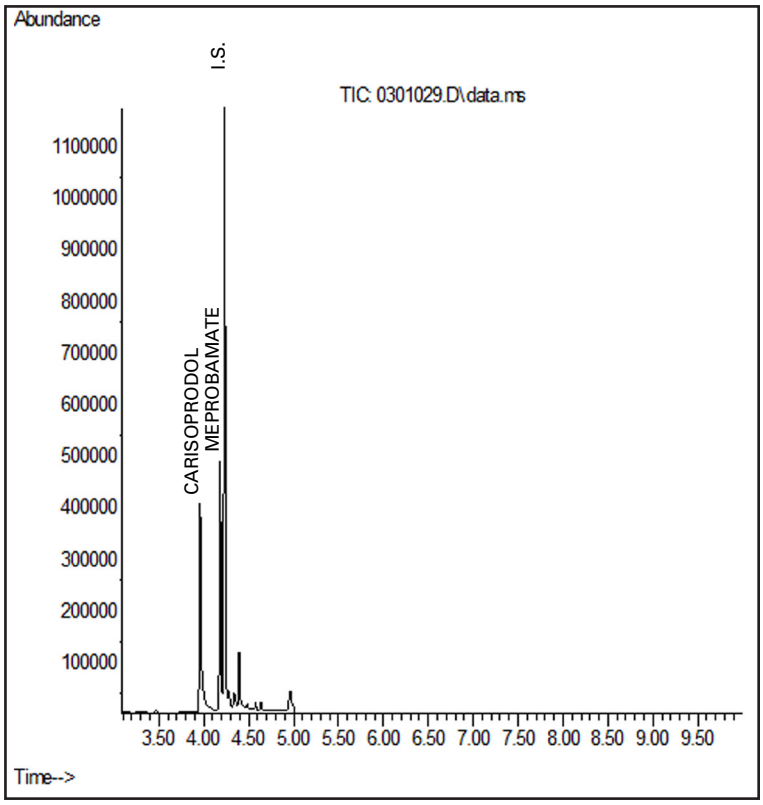
5. Elute Barbituates:
1 x 3 mL hexane/ethyl acetate (50:50); Collect eluate at 1 to 2 mL / minute

6. Dry Eluate:
Evaporate to dryness at < 40°C
Reconstitute with 100 µL ethyl acetate

7. Derivatize:
Add 50µL ethyl acetate and 50µL BSTFA w/1% TMCS
Mix/vortex
React 20 minutes at 70°C
Remove from heat source to cool
NOTE: Do not evaporate BSTFA

8. Quantitative:
Inject 1 to 2 µL onto gas chromatograph

Elution Profile – (1) Carisoprodol, (2) Meprobamate, (3) Hexobabital (Internal Standard)



Compound	Primary Ion
Carisoprodol	221
Meprobamate	157
Hexobarbital	236

BUPRENORPHINE AND NORBUPRENORPHINE IN EQUINE URINE FOR GC/MS CONFIRMATIONS

XtrackT®
Solid Phase Extraction Columns

200 mg XtrackT® DAU Extraction Column - Part #: XRDAH206
Select pH Buffer Pouches 100mM Acetate pH 5.00 - Part #: SPHACE5001-10
BSTFA w/1% TMCS - Part #: SBSTFA-1-1

1. Prepare Sample:
To 1 mL of 100 mM Acetate buffer (pH= 5) add internal standard.
Mix/ vortex and add 1 mL of Equine Urine.
Add 2 mL of 100 mM Acetate buffer (pH= 5) and mix/ vortex

Sample pH should be 6.0 ± 0.5.
Adjust pH accordingly with 100 mM monobasic or dibasic sodium phosphate.
Centrifuge as appropriate.

Enzyme Hydrolysis of Glucuronides.
To 1 mL of 100 mM Acetate buffer add internal standard.
Add 1 mL of Equine Urine. Mix/ vortex.
Add 2 mL of 100 mM Acetate buffer (pH= 5).

Hydrolyze with Helix Pomatia (5,000 units/mL), heat for 3 hours at 60°C Cool before proceeding.

2. Condition XtrackT® DAU Extraction Column:
1 x 3 mL CH_3OH
1 x 3 mL D.I. H_2O
1 x 1 mL 100 mM Acetate buffer (pH= 5.0)
NOTE: Aspirate at < 3 Inches Hg to prevent sorbent drying

3. Apply Sample:
Load at 1 to 2 mL/ minute

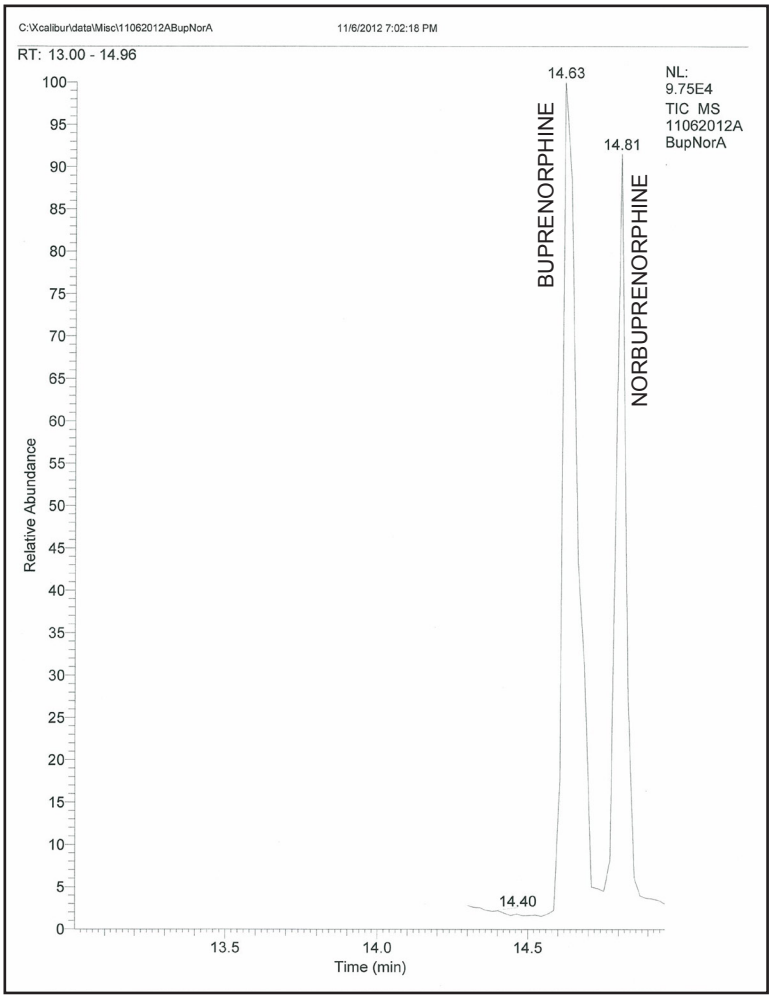
4. Wash Column:
1 x 2 mL D.I. H_2O
1 x 3 mL 100 mM acetate buffer (pH=5.0)
1 x 3 mL Methanol
Dry column (5-10 minutes at full vacuum or pressure

5. Elute Buprenorphine / Norbuprenorphine:
1 x 3 mL methylene chloride / iso-propano / ammonium hydroxide (78/20/12). (Make elution solvent fresh)
Collect eluate at 1 to 2 mL/minute
NOTE: Before proceeding, insure there are no water droplets at the bottom of the collection tube. This may increase drying time and decrease BSTFA derivitizing efficiency

6. Dry Eluate:
Evaporate to dryness at < 40°C

7. Derivatize:
Add 50 µL ethyl acetate and 50 µL BSTFA w/1 % TMCS
React 20 minutes at 70°C
Remove from heat source to cool
NOTE: Do not evaporate BSTFA

8. Quantitative:
Inject 1 to 2 µL onto gas chromatograph/mass spectrometer



Compound	Primary Ion*	Secondary Ion	Tertiary Ion
Buprenorphine-TMS	452	467	487
Buprenorphine-D4-TMS†	455	470	489
Norbuprenorphine-TMS	468	500	510
Norbuprenorphine-D5-TMS†	503	525	542

*Quantitation Ion
†Suggested internal standard for GC/MS

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.

Select Biobliography of XtrackT® publications from the racing industry

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