

APPLICATIONS

Extraction of a Comprehensive Drug Research Panel From Urine Using Strata[®] DE Supported Liquid Extraction (SLE)

Matthew Brusius
Phenomenex, Inc., 411 Madrid Ave., Torrance, CA 90501 USA

Overview

In this application note, drugs of abuse are extracted from urine using Strata DE and the results are compared to Biotage[®] ISOLUTE[®] SLE+. **Table 1** shows the recovery values and % CVs for both Strata DE (diatomaceous earth) Supported Liquid Extraction (SLE) and Biotage ISOLUTE SLE+. While recoveries vary slightly between different analytes, both products exhibit > 85 % recovery for all analytes included. For this sample set the Strata DE maintains an average % CV of 9 %, while the Biotage ISOLUTE SLE+ plate has a slightly higher average % CV of 10 %.

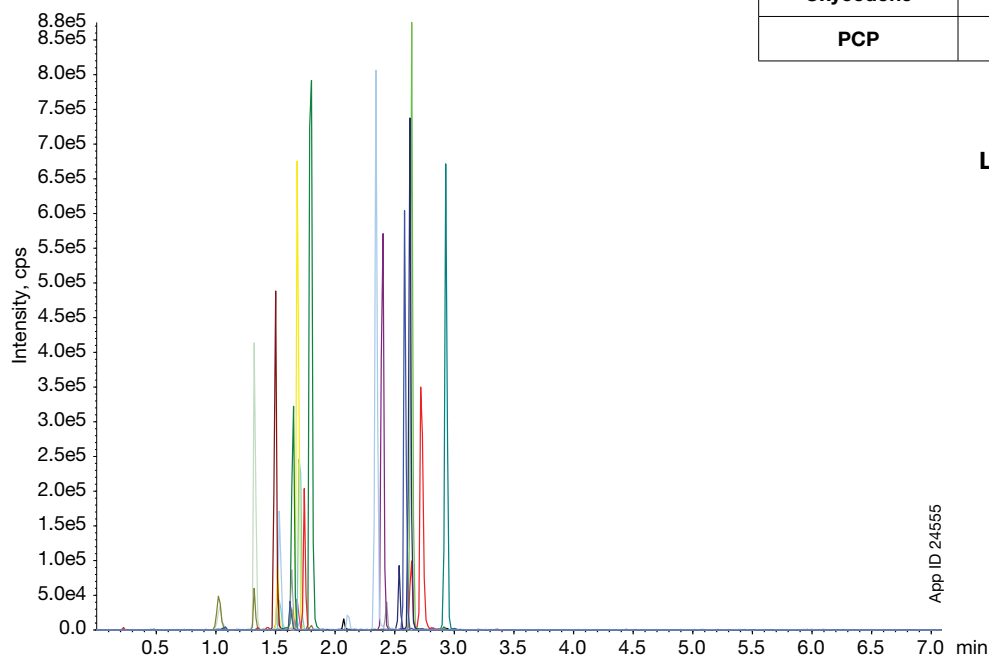
Pre-treatment

Combine 100 µL of spiked urine, 15 µL Campbell β-Glucuronidase (Part No. DR2102), 35 µL 100 mM Ammonium Acetate (pH 4), and 150 µL of 100 mM Ammonium Bicarbonate (pH 10).

SLE Protocol

96-Well Plate:	Strata DE SLE 400 µL 96-Well Plate Biotage ISOLUTE SLE+ 400 µL 96-Well Plate
Part No.:	8E-S325-5GB (Strata DE)
Load:	300 µL pre-treated sample onto plate (apply vacuum or positive pressure to pull/push sample into sorbent if necessary)
Wait:	6 minutes
Elute:	3x 600 µL Dichloromethane/IPA (95:5)
Apply:	Vacuum or apply positive pressure at 5-10" Hg for 10 seconds
Dry:	Sample under slow stream of Nitrogen at 30°C
Reconstitute:	100 µL 0.1% Formic Acid/Methanol (4:1) with internal standard

Extracted Chromatogram on Strata DE SLE



Recovery Values and % CVs: Strata DE vs. Biotage ISOLUTE SLE+

	Strata DE		Biotage ISOLUTE SLE+	
	Recovery	%CV (n=8)	Recovery	%CV (n=8)
6-MAM	98	9	88	16
Alprazolam	104	10	98	11
Benzoylcegonine	88	6	98	11
Buprenorphine	93	7	102	15
Codeine	99	12	93	9
Diazepam	107	7	104	6
Fentanyl	85	5	94	8
Hydrocodone	104	11	93	11
Hydromorphone	95	9	93	11
Lorazepam	94	8	98	8
Methamphetamine	92	16	102	8
Morphine	98	12	94	12
Norbuprenorphine	101	11	92	11
Nordiazepam	100	9	92	8
Norfentanyl	113	7	110	11
Oxycodone	97	5	93	11
PCP	90	7	98	6

LC-MS/MS Conditions

Column: Kinetex[®] 2.6 µm Biphenyl
Dimensions: 50 x 2.1mm
Part No.: 00B-4622-AN
Guard Cartridge: SecurityGuard[™] ULTRA Biphenyl
Guard Part No.: AJ0-9209
Mobile Phase: A: 0.1 % Formic acid in Water
 B: 0.1 % Formic acid in Acetonitrile
Gradient:

Time (min)	% B
0	5
4	100
5	100
5.01	5
7.01	5

Injection Volume: 5 µL
Flow Rate: 0.5 mL/min
Detection: MS/MS (SCIEX API 4000[™]), ESI+

Comparative separations may not be representative of all applications.

APPLICATIONS

Ordering Information

Kinetex[®] Core-Shell LC Columns

Kinetex 2.6 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-4622-AN	00B-4622-AN	00D-4622-AN	00F-4622-AN	AJO-9209 for 2.1 mm ID

Kinetex 2.6 µm MidBore [™] Columns (mm)				SecurityGuard ULTRA Cartridges [†]	
Phases	50 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 for 3.0 mm ID	

[†] SecurityGuard ULTRA Cartridges required holder, Part No.: AJO-9000.

Other particle sizes and dimensions are available. Visit www.phenomenex.com/Kinetex for a complete list of available columns.

Australia

t: +61 (0)2-9428-6444
f: +61 (0)2-9428-6445
auinfo@phenomenex.com

Austria

t: +43 (0)1-319-1301
f: +43 (0)1-319-1300
anfrage@phenomenex.com

Belgium

t: +32 (0)2 503 4015 (French)
t: +32 (0)2 511 8666 (Dutch)
f: +31 (0)30-2383749
beinfo@phenomenex.com

Canada

t: +1 (800) 543-3681
f: +1 (310) 328-7768
info@phenomenex.com

China

t: +86 400-606-8099
f: +86 (0)22 2532-1033
phen@agela.com

Denmark

t: +45 4824 8048
f: +45 4810 6265
nordicinfo@phenomenex.com

Finland

t: +358 (0)9 4789 0063
f: +45 4810 6265
nordicinfo@phenomenex.com

France

t: +33 (0)1 30 09 21 10
f: +33 (0)1 30 09 21 11
franceinfo@phenomenex.com

Germany

t: +49 (0)6021-58830-0
f: +49 (0)6021-58830-11
anfrage@phenomenex.com

India

t: +91 (0)40-3012 2400
f: +91 (0)40-3012 2411
indiainfo@phenomenex.com

Ireland

t: +353 (0)1 247 5405
f: +44 1625-501796
eireinfo@phenomenex.com

Italy

t: +39 051 6327511
f: +39 051 6327555
italiainfo@phenomenex.com

www.phenomenex.com

Phenomenex products are available worldwide. For the distributor in your country, contact Phenomenex USA, International Department at international@phenomenex.com

Luxembourg

t: +31 (0)30-2418700
f: +31 (0)30-2383749
nlinfo@phenomenex.com

Mexico

t: 01-800-844-5226
f: 001-310-328-7768
tecnicomx@phenomenex.com

The Netherlands

t: +31 (0)30-2418700
f: +31 (0)30-2383749
nlinfo@phenomenex.com

New Zealand

t: +64 (0)9-4780951
f: +64 (0)9-4780952
nzinfo@phenomenex.com

Norway

t: +47 810 02 005
f: +45 4810 6265
nordicinfo@phenomenex.com

Puerto Rico

t: +1 (800) 541-HPLC
f: +1 (310) 328-7768
info@phenomenex.com

Spain

t: +34 91-413-8613
f: +34 91-413-2290
espinfo@phenomenex.com

Sweden

t: +46 (0)8 611 6950
f: +45 4810 6265
nordicinfo@phenomenex.com

United Kingdom

t: +44 (0)1625-501367
f: +44 (0)1625-501796
ukinfo@phenomenex.com

USA

t: +1 (310) 212-0555
f: +1 (310) 328-7768
info@phenomenex.com

All other countries Corporate Office USA

t: +1 (310) 212-0555
f: +1 (310) 328-7768
info@phenomenex.com

Strata[®] DE Supported Liquid Extraction

Part No.	Description	Unit
8E-S325-FGB	Strata DE SLE 200 µL 96-Well Plate	2/pk
8E-S325-5GB	Strata DE SLE 400 µL 96-Well Plate	2/pk
8B-S325-KDG	Strata DE SLE 12 cc Tube	20/pk
8B-S325-VFF	Strata DE SLE 60 cc Tube	16/pk

Presston[™] 100 Positive Pressure Manifold

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

Presston 100 Tube Adapter Kits (for AHO-9334)

Part No.	Description
AHO-9344	1 mL Tube Adapter Kit
AHO-9345	3 mL Tube Adapter Kit
AHO-9346	6 mL Tube Adapter Kit



WARRANTY 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.



If Phenomenex products in this technical note 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.

Terms and Conditions

Subject to Phenomenex Standard Terms and Conditions, which may be viewed at <http://www.phenomenex.com/TermsAndConditions>.

Trademarks

Strata and Kinetex are registered trademarks and Presston, MidBore, SecurityGuard are trademarks of Phenomenex. Biotage and ISOLUTE are registered trademarks of Biotage AB Corp. API 4000 is a trademark of AB SCIEX, Pte, Ltd. AB SCIEX[™] is being used under license.

Disclaimer

Comparative separations may not be representative of all applications. Phenomenex is not affiliated with Biotage AB Corp.

FOR RESEARCH PURPOSES ONLY. Not for use in diagnostic procedures.

© 2017 Phenomenex, Inc. All rights reserved.