

APPLICATIONS

Extraction of NSAIDs from Urine using Strata® DE Supported Liquid Extraction (SLE)

Matt Brusius and Chandrika Nippani
Phenomenex, Inc., 411 Madrid Ave., Torrance, CA 90501 USA

Overview

In this application, we provided a Supported Liquid Extraction method using Strata DE for the clean-up of non-steroidal anti-inflammatory drugs (NSAIDs). This method provides recoveries greater than 95% with % CVs less than 5% for all analytes tested using an extraction solvent of Ethyl acetate/Hexane (3:1). Methyl tert-butyl ether (MTBE) was also screened as an extracting solvent but yielded higher RSDs (<12%) and lower recoveries (>75%).

Materials and Methods

Sample Pre-treatment:

Dilute 100 µL of spike urine (100 ng/mL) with 100 µL of 0.1 % formic acid.

SLE Protocol

96-Well Plate: Strata DE 200 µL

Part No.: 8E-S325-FGB

Load: 200 µL Pre-treated sample

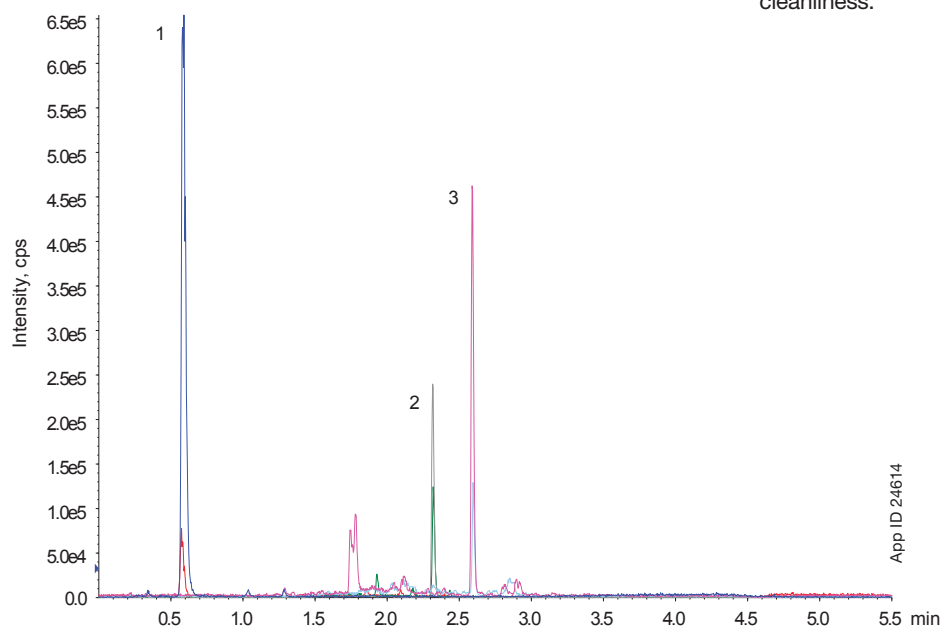
Wait: 6 minutes

Elute: 2x 600 µL Ethyl acetate/Hexane (3:1)

Dry: Sample under slow stream of Nitrogen at 30 °C

Reconstitute: 100 µL 0.1 % Formic acid in Methanol with 100 ng/mL concentration of Diclofenac D4, Acetaminophen D7, Naproxen D3

Figure 1.
TIC for Extracted Sample



LC-MS/MS Conditions

Columns: Kinetex® 2.6 µm C18
Dimensions: 50 x 2.1 mm
Part No.: 00B-4462-AN
Mobile Phase: A: 0.1 % Formic acid in Water
 B: 0.1 % Formic acid in Acetonitrile
Gradient:

Time (min)	% B
0	10
2.5	100
3.5	100
3.51	10

Flow Rate: 0.5 mL/min
Injection: 3 µL
Detection: MS/MS (SCIEX API 4000™)
Sample: 1. Acetaminophen
 2. Naproxen
 3. Diclofenac

Table 1.
Recovery Values

	Acetaminophen	Naproxen	Diclofenac
% Recovery	95	109	109
% RSD (n=6)	3	1	5

Results and Conclusion

Figure 1 in this application note is a representative TIC for the Ethyl acetate/Hexane (3:1) elution solvent. **Table 1** shows that the extraction is accurate (>95% recovery) and precise (<5% RSD). Ethyl acetate as an elution solvent also yielded similar results, however the Ethyl acetate/Hexane mixture provided additional cleanliness.



APPLICATIONS

Ordering Information

Kinetex® Core-Shell LC Column

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
C18	00A-4462-AN	00B-4462-AN	00C-4462-AN	00D-4462-AN	00F-4462-AN	AJ0-8782

† SecurityGuard ULTRA Cartridges require holder, Part No.: AJ0-9000

for 2.1 mm ID

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
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

Presston 100 Tube Adapter Kits (for AH0-9334)

Part No.	Description
AH0-9344	1 mL Tube Adapter Kit
AH0-9345	3 mL Tube Adapter Kit
AH0-9346	6 mL Tube Adapter Kit



Australia
t: +61 (0)2-9428-6444
f: +61 (0)2-9428-6445
auiinfo@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

Switzerland
t: +41 61 692 20 20
f: +41 61 692 20 22
swissinfo@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



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 www.phenomenex.com/TermsAndConditions.

Trademarks
Strata and Kinetex are registered trademarks and Presston and SecurityGuard are trademarks of Phenomenex. API 4000 is a trademark of AB SCIEX Pte. Ltd. AB SCIEX is being used under license.

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

© 2017 Phenomenex, Inc. All rights reserved.