

APPLICATIONS

Strata® Basic Screen: Solid Phase Extraction (SPE) for Analysis of Basic and Neutral Drugs of Abuse from Urine

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Overview

In this application note a Large Reservoir Cartridge (LRC) Solid Phase Extraction (SPE) product is utilized to perform a sample clean-up and concentration of common drugs of abuse found in urine samples.

Experimental Conditions

Pre-treatment: In a single tube, combine 2 mL of urine with 2 mL 0.1 % Formic acid in Water. Then add 100 µL of Cambell β-Glucuronidase Enzyme (Part Number: DR2102) and 20 µL of 1 µg/mL internal standard.

*Urinary hydrolysis procedure has not been optimized

SPE Protocol

Cartridge: Strata Basic Screen 200 mg/10 mL
Part No.: 8B-S327-FTH
Condition: 2.4 mL Methanol
Equilibrate: 2.4 mL 0.1 % Formic acid in Water
Load: 4.1 mL Pre-treated Urine Sample
Wash 1: 2.4 mL 0.1% Formic acid in Water
Wash 2: 2.4 mL 30% Methanol
Dry: Vacuum at 10" Hg for 5 minutes
Elute: 2x 1.2 mL Acetonitrile/Methanol (1:1) with 5 % NH₄OH
Reconstitute: 200 µL 0.1 % Formic acid/Methanol (4:1) with internal standard

LC-MS/MS Conditions

Column: Kinetex® 2.6 µm Biphenyl
Dimensions: 50 x 3.0 mm
Part No.: 00B-4622-Y0
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

Flow Rate: 0.6 mL/min
Injection Volume: 1 µL
Detection: MS/MS (SCIEX API 4000™), ESI+

Results and Discussion

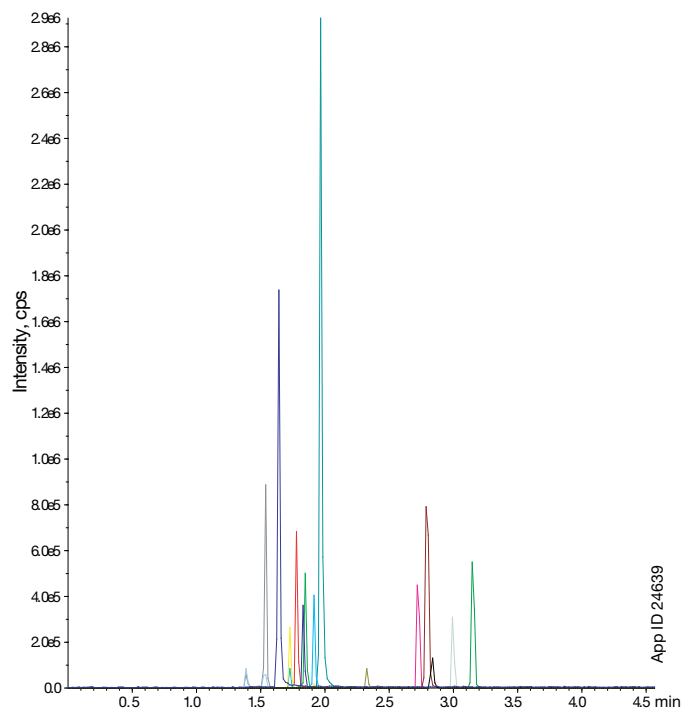
Figure 1 shows the recovery values and % CVs for Strata Basic Screen SPE. All recovery values are greater than 87 % with the exception of Benzoyllecgonine (recovery at 60 %) and analytes show a relative standard deviation of less than 18 %. To improve upon the clean-up of polar bases, such as opiates, the wash step strength can be adjusted from the recommended method to 100 % Methanol. This is not recommended for panels containing neutral compounds, and in this example, a 100% Methanol wash will compromise the recovery of benzodiazepines.

Figure 2 is a representative TIC which shows good separation of the 17 compounds analyzed.

Figure 1.
Recovery values and % CVs for compounds tested

Analyte	% Recovery	% CVs (n=6)
6-MAM	99	15
Amphetamine	99	9
Benzoyllecgonine	60	10
Buprenorphine	104	7
Codeine	89	12
Diazepam	96	7
Fentanyl	101	4
Hydrocodone	103	11
Hydromorphone	98	10
Methamphetamine	110	8
Morphine	106	10
Norbuprenorphine	91	8
Nordiazepam	97	2
Oxycodone	109	8
PCP	101	6
Temazepam	88	7
Oxazepam	87	18

Figure 2.
TIC of Extracted Analytes



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Ordering Information

Kinetex® Biphenyl Core-Shell LC Columns

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.

Strata® Basic Screen SPE

Strata Basic Screen			
Format	Sorbent Mass	Part Number	Unit
Large Reservoir Cartridge	200 mg/10 mL	8B-S327-FTH	30/box

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