



# On-Line

## SPE CARTRIDGES

for Rapid Cleanup  
and Extraction  
of Analytes



# User's Guide

## What is the strata-X on-line SPE cartridge?

The strata-X on-line cartridge combines the revolutionary benefits of the patent pending SPE sorbent strata-X:

- Strong  $\pi$ - $\pi$  retention mechanism for high recoveries of aromatic analytes
- Deconditioning resistant sorbent bed that can run dry without losing extraction ability
- Multiple retention mechanism gives enhanced selectivity for polar compounds

<b>Particle Size</b>	25 $\mu$ m
<b>Pore Size</b>	85Å
<b>Surface Area</b>	800m <sup>2</sup> /g
<b>pH stability</b>	1-14
<b>Recommended Flow Rates</b>	1-4mL/min
<b>Maximum Pressure</b>	4000 psi

With the benefits of on-line SPE:

- Simple to use cartridge that eliminates the dry down and reconstitution steps associated with conventional off-line SPE
- Easy to use format that allows for complete automation of the sample preparation process
- Reusable hardware that can be used in tandem with an LC column or in a stand alone format for fast sample cleanup



# What should you expect from strata-X on-line cartridges?

## **Extremely Rapid Method Development**

strata-X has  $\pi$ - $\pi$ , hydrophobic, and H-bonding retention mechanisms and can be used to extract acidic, basic and neutral compounds. The multiple retention mechanisms of strata-X combined with the ability to handle fast gradients equates to rapid SPE method development that provides high recoveries for a wide spectrum of analytes.

## **Elimination of Storage Solvents**

strata-X is deconditioning resistant and will not lose extraction ability even if the sorbent runs dry. This unique feature means that the strata-X cartridge does not need to be stored in solvent after use.

## **Reduced Sample Preparation Time**

The on-line format is easily automated, thus reducing the number of steps that are involved with traditional sample preparation. Samples are pretreated and then directly injected onto the strata-X cartridge for extraction. The typical analysis time for extraction can range from 1 to 3 minutes.

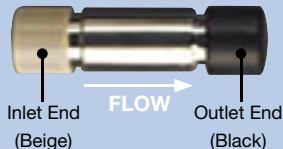
## **Longer Column Lifetimes**

strata-X sorbent is extremely robust, resulting in long column lifetimes. This unique feature allows for the development of extremely rugged methods. In fact, strata-X can handle greater than 200 injections per cartridge.

## Easy to Use Hardware

The strata-X on-line hardware is a reusable stainless steel holder designed to accommodate 20mm x 2.0mm cartridges. This revolutionary holder is easy to use and can be quickly installed by the following steps:

- 1** Insert the cartridge in the male end of holder. Remember to note flow direction-the beige frit cap is the inlet end, and the black frit cap is the outlet end. Thread the female end onto the male end and hand tighten.
- 2** Tighten the holder NO MORE THAN  $\frac{1}{8}$  to  $\frac{1}{4}$  turn with a standard  $\frac{1}{2}$  and  $\frac{1}{4}$  inch wrench.
- 3** Repeat this process to change a cartridge.
- 4** Please make sure pressure DOES NOT EXCEED 4000psi and flow rate DOES NOT EXCEED 4mL/min.





## Additional Considerations

To ensure efficient and reproducible extractions, it is advised that the user:

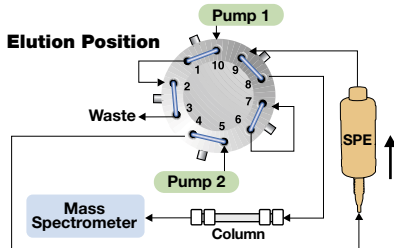
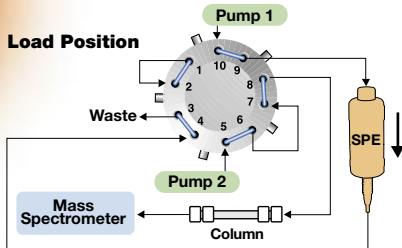
- Minimize tubing lengths
- Use 0.007 ID tubing or smaller
- Minimize the use of unions and other connectors

## General Set Up

On-line cartridges can be used in a stand alone fashion or in tandem with an analytical column. Both tandem and stand alone methods may employ very fast gradients. For methods that require MS detection, a 10:1 split is recommended so only 300-400 $\mu$ L/min enters the mass

spectrometer. The extraction set up should include two pumps, cartridge column and analytical column (for tandem analysis), a detector such as a mass spectrometer, and a switching valve (general set up is illustrated below.)

## Schematic of On-line Set Up



## Recommended Starting Parameters for strata-X On-line

Time	Extraction Conditions		Valve position
	Pump 1 (3mL/min)	Pump 2 (1mL/min)	
0	95% A : 5% B	95% A : 5% B	Load position
0.5		95% A : 5% B	Switch position Load to Elute
2.8		15% A : 85% B	Switch position Elute to Load
3	95% A : 5% B	95% A : 5% B	Load position

**Mobile Phase:** A: 0.1% formic acid/water B: 0.1% formic acid/acetonitrile

**Injection:** 50µL of diluted porcine plasma (1:1)

**Detection:** Bruker Esquire 2000 Ion-Trap MS analyzer

**Source:** ESI-Positive mode

**Scan Range:** m/z 100-500

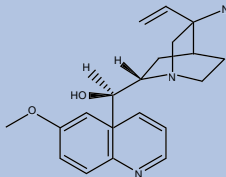
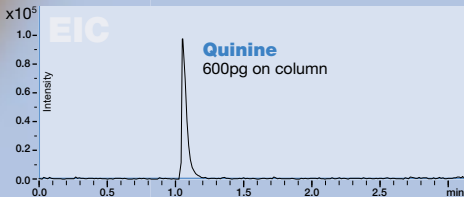
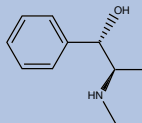
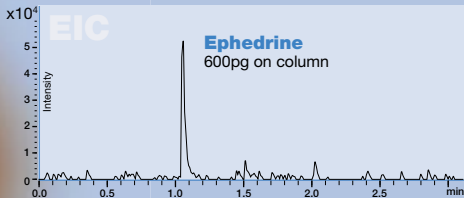
**Run Time:** 3 minutes (with analytical column)

**Run Time:** 1.2 minutes (without analytical column) (1 minute gradient)

# Extraction of Polar and Non-polar Compounds

## Ephedrine and Quinine

Lyophilized porcine plasma samples diluted 1:1 with water were spiked with the appropriate concentration of analyte. The strata-X on-line extraction method was used.

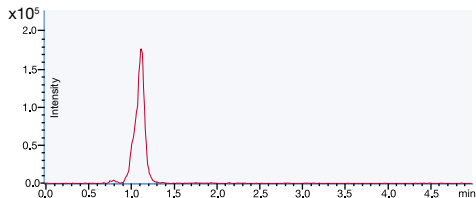
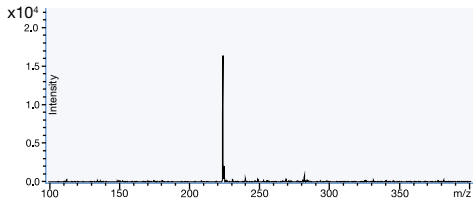


Compound	Log P	Polarity
Ephedrine	1.13	Polar
Quinine	3.44	Non-Polar



# Rapid Cleanup

## Extraction of Acyclovir



## On-line SPE Conditions

**Cartridge:** strata-X 20 x 2.0mm cartridge plus holder

**Order No:** 00M-S033-B0-CB

**Mobile Phase:** A = water B = acetonitrile

**Flow Rate:** **Pump 1** 3mL/min, cartridge

**Pump 2** 1mL/min, analytical column

**Load:** **Pump 1** 100% A (cartridge)

**Elution:** **Pump 2** 80% B : 20% A  
(analytical column)

**HPLC Column:** Luna® 3µm NH<sub>2</sub> 50 x 3.0mm

**Order No:** 00B-4377-Y0

**Mobile Phase:** 80% B : 20% A

**Flow Rate:** 1mL/min

**MS:** Bruker Esquire 2000 Ion-Trap MS analyzer

**Source:** ESI-Negative mode








**Scan Range:** m/z 100-400

Sample	% Recovery	%RSD	Note: NO buffers are used in this method
Acyclovir 40ng/mL	92.4	4.4	
Acyclovir 20ng/mL	97.9	2.3	

# strata-X Ordering Information

## Traditional Screening

### strata-X Tubes

						
1mL (100/box)	3mL (50/box)			6mL (30/box)		
<b>30mg</b>	<b>60mg</b>	<b>200mg</b>	<b>500mg</b>	<b>100mg</b>	<b>200mg</b>	<b>500mg</b>
8B-S100-TAK	8B-S100-UBJ	8B-S100-FBJ	8B-S100-HBJ	8B-S100-ECH	8B-S100-FCH	8B-S100-HCH

Note: tube sizes not proportional nor actual size.

## High-throughput Screening

### 96-Well Plates (2/box)

5mg	10mg	30mg	60mg
8E-S100-NGB	8E-S100-AGB	8E-S100-TGB	8E-S100-UGB

## Rapid Screening

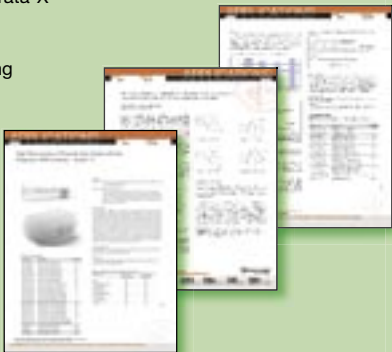
### On-line Extraction Cartridges (1/box)

Order No.	Dimensions
00M-S033-B0-CB	strata-X on-line extraction cartridge, 25µm, 20 x 20mm
CH0-5845	Cartridge holder, 20mm

## Technical Notes Available

- Extraction of Acyclovir from Plasma using a strata-X On-line Cartridge (TN-009)
- Extraction of Phenols from Water using strata-X (TN-001)
- Extraction of Nitroanilines from Water using strata-X (TN-003)
- Extraction of Acidic, Basic, and Neutral Compounds using strata-X (TN-004)
- Extraction of TCA's from Serum using strata-X (TN-006)

**Contact Phenomenex  
to Request a FREE  
Technical Note Today**



## FREE Help is Available

Phenomenex technical consultants are available to help with your SPE method development. Please feel free to contact us for SPE:

- Troubleshooting
- Converting Liquid/Liquid Extraction to SPE
- Technical Solutions
- Method Optimization



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