

# Supported Liquid Extraction (SLE)

## For Pharmaceutical Applications

### Novum™ Synthetic SLE

Unique, Synthetic Sorbent that Provides Consistent, Reliable Results

### Strata® DE Diatomaceous Earth SLE

Cost-Effective, Guaranteed Alternative to Traditional Diatomaceous Earth SLE Sorbents



 **phenomenex**<sup>®</sup>  
...breaking with tradition<sup>SM</sup>

[www.phenomenex.com/PharmaSLE](http://www.phenomenex.com/PharmaSLE)



# Choose the Best SLE Solution for Your Analysis

Phenomenex provides two options for your SLE analysis, a unique synthetic sorbent and a traditional diatomaceous earth sorbent, each of which provides its own benefits. Select the best option for your work by using the chart below.



## Synthetic

## Sorbent

## Diatomaceous Earth

Lot-to-lot consistency and reproducibility

## Advantages

Cost effective and large volume capabilities

Ethyl Acetate, Methyl Tert-Butyl Ether (MTBE)

## Extraction Solvents

Dichloromethane (DCM), Hexane, MTBE, Ethyl Acetate

MINI 96-Well Plates, MAX 96-Well Plates

## Plate Formats

200 µL 96-Well Plates, 400 µL 96-Well Plates

1 cc, 3 cc, 6 cc, 12 cc

## Tube Formats

12 cc and 60 cc

## Need Help Selecting the Right SLE Option?



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or



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# Explore Your SLE Options and Applications

## **Novum™ SLE**

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# Synthetic SLE

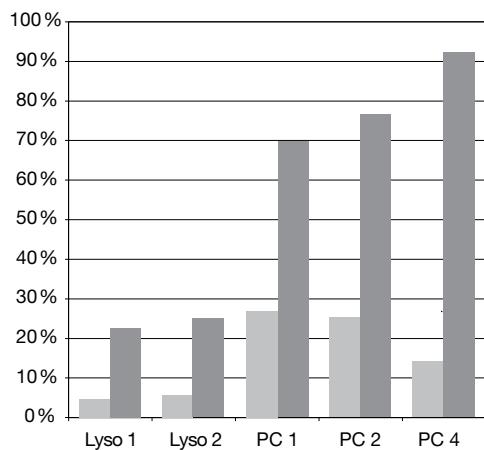
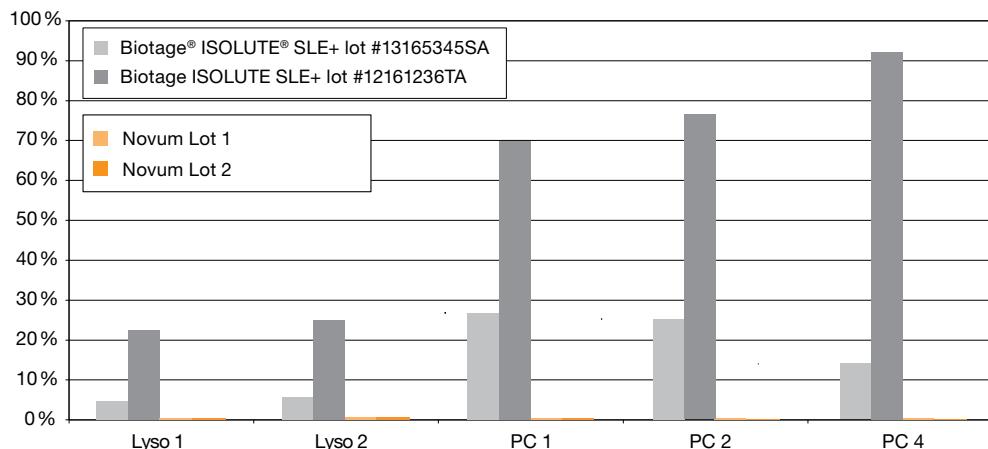


As a unique, synthetic SLE sorbent, expect Novum to provide reliable, more consistent lot-to-lot cleanup that excels under extraction conditions where traditional diatomaceous earth SLE falls short, such as ethyl acetate.

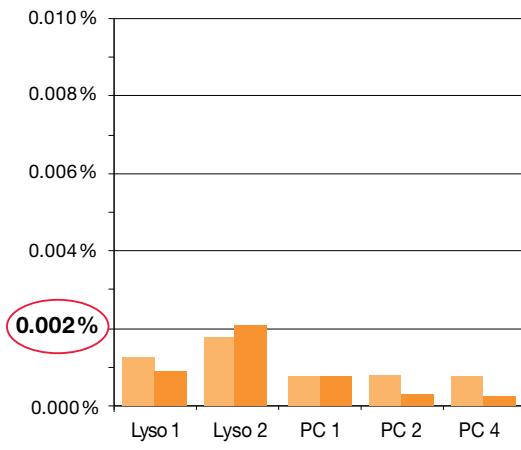
## Recommended Uses:

- Ethyl acetate extractions
- Smaller volume samples

## Lot-to-Lot Phospholipid Breakthrough: Novum SLE vs. Traditional Diatomaceous Earth SLE



Consistently  
remove > 99.9 % of  
phospholipids



Lyso 1: 1-Palmitoyl-2-OH-sn-glycero-phosphocholine (m/z 496-184)  
Lyso 2: 1-Oleoyl-2-OH-sn-glycero-phosphocholine (m/z 522-184)  
PC 1: 1-Palmitoyl-2-Oleoyl-sn-glycero-phosphocholine (m/z 761-184)  
PC 2: 1-Stearoyl-2-Lindoleoyl-sn-glycero-phosphocholine (m/z 787-184)  
PC 4: 1-Oleoyl-2-Lindoleoyl-sn-glycero-phosphocholine (m/z 784-184)

Plasma extractions were performed using 200 $\mu$ L plates and ethyl acetate as an elution solvent. The recommended protocol provided with each product was followed. Comparative separations may not be representative of all applications.

# Diatomaceous Earth SLE



Packed with diatomaceous earth, Strata DE is a cost-effective alternative to traditional SLE products such as Biotage® ISOLUTE® SLE+, Thermo Fisher® Hypersep™ SLE, and Agilent® Chem Elut™ SLE that won't require you to sacrifice your results.

## Recommended Uses:

- Direct alternative to traditional diatomaceous earth SLE sorbents
- Non-oxygenated extraction solvents such as DCM and Hexane



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

Analyte	Strata DE		Biotage ISOLUTE SLE+	
	% Recovery	% CV (n=8)	% Recovery	% CV (n=8)
6-MAM	98	9	88	16
Alprazolam	104	10	98	11
Benzoylecgonine	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
Norprenorphine	101	11	92	11
Nordiazepam	100	9	92	8
Norfentanyl	113	7	110	11
Oxycodone	97	5	93	11
PCP	90	7	98	6

## Achieve the Same Recoveries as Biotage ISOLUTE SLE+, at a Lower Price!

### 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

Comparative separations may not be representative of all applications.

# Basic Drugs from Plasma

Many drugs within pharmaceutical labs are proprietary, "Basic Drug A" is analyzed as a representative drug that contains an amine group and hydrophobic ring structures, both of which are common to most pharmaceutical drugs.

## Sample Pre-treatment

Dilute 150 $\mu$ L Plasma with 140 $\mu$ L 2 % NH<sub>4</sub>OH and 10 $\mu$ L "Basic Drug A" spiking solution (1  $\mu$ g/mL)

## SLE Protocol

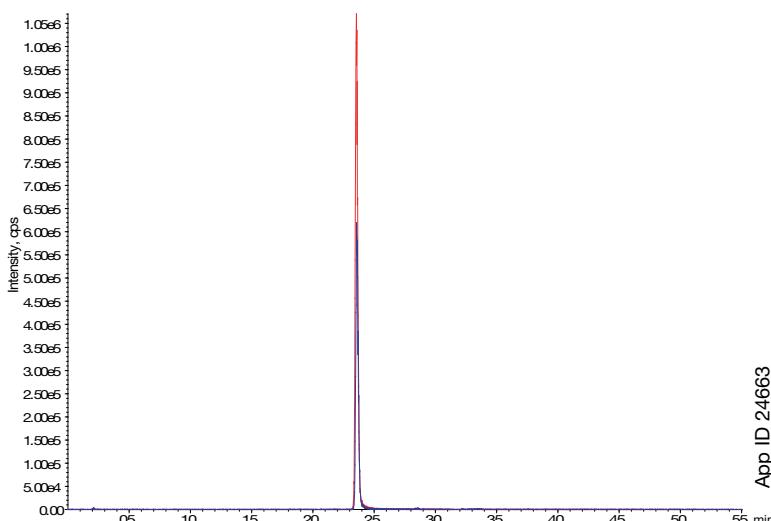
<b>96-Well Plate:</b>	Strata <sup>®</sup> DE 200 $\mu$ L
<b>Part No.:</b>	8E-S325-FGB
<b>Load:</b>	200 $\mu$ L Pre-treated sample onto plate (apply vacuum or positive pressure to pull/push sample into sorbent)
<b>Wait:</b>	5 minutes
<b>Elute:</b>	2x 600 $\mu$ L Heptane
<b>Apply:</b>	Vacuum or apply positive pressure at 5-10" Hg for 10 seconds
<b>Dry:</b>	Sample under slow stream of Nitrogen at 30 °C
<b>Reconstitute:</b>	100 $\mu$ L Methanol/Water (80:20) with internal standard



- **Heptane Extraction with High Recovery**
- **Automatable for High Throughput Processing**

Analyte	% Recovery	%CV (n=8)
Basic Drug A	92	6

## Extracted Chromatogram After Clean-up Using Strata DE SLE



## LC-MS/MS Conditions

**Column:** Kinetex<sup>®</sup> 2.6  $\mu$ m Biphenyl  
**Dimensions:** 50 x 2.1 mm  
**Part No.:** 00B-4622-AN  
**Mobile Phase:** A: 0.1 % Formic acid in Water  
B: 0.1 % Formic acid in Acetonitrile  
**Gradient:** Time (min) % B  
0 20  
3 70  
4 70  
4.01 20  
5.5 120  
**Flow Rate:** 0.5 mL/min  
**Injection Volume:** 5  $\mu$ L  
**Detection:** MS/MS (SCIEX API 4000<sup>™</sup>), ESI+

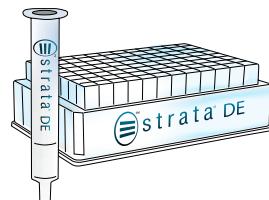
# NSAIDs from Urine

## Pre-treatment

Dilute 100  $\mu$ L of spike urine (100 ng/mL) with 100  $\mu$ L of 0.1 % Formic acid.

## SLE Protocol

<b>96-Well Plate:</b>	Strata <sup>®</sup> DE 200 $\mu$ L
<b>Part No.:</b>	8E-S325-FGB
<b>Load:</b>	200 $\mu$ L Pre-treated sample
<b>Wait:</b>	6 minutes
<b>Elute:</b>	2x 600 $\mu$ L Ethyl acetate/Hexane (3:1)
<b>Dry:</b>	Sample under slow stream of Nitrogen at 30 °C
<b>Reconstitute:</b>	100 $\mu$ L 0.1 % Formic acid in Methanol with 100 ng/mL concentration of Diclofenac D4, Acetaminophen D7, Naproxen D3

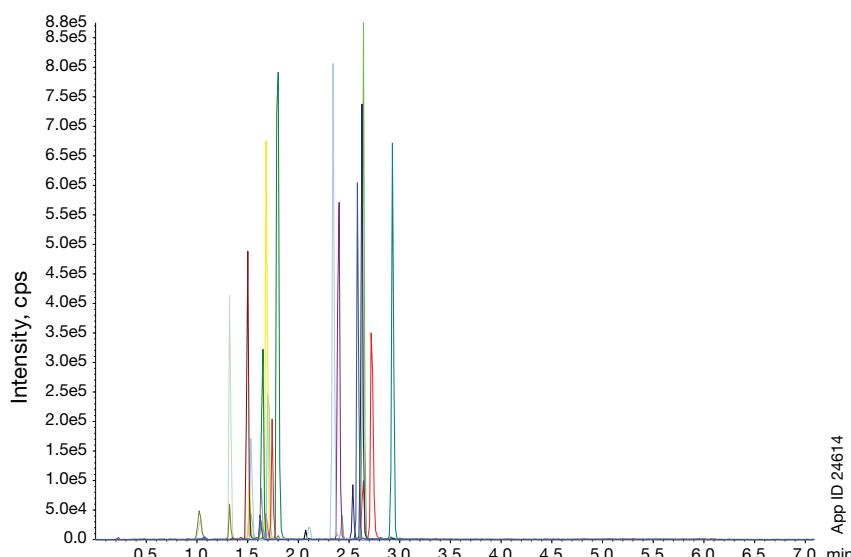


- **Small Sample Volume**
- **High Recovery for NSAIDs**
- **Cost Effective NSAID Extraction**

## Recovery Values

	Acetaminophen	Naproxen	Diclofenac
<b>% Recovery</b>	96	84	109
<b>% RSD (n=8)</b>	9	9	5

## TIC for Extracted Sample



## LC-MS/MS Conditions

**Columns:** Kinetex<sup>®</sup> 2.6  $\mu$ m C18  
**Dimensions:** 50 x 2.1 mm  
**Part No.:** 00B-4462-AN  
**Guard Cartridge:** SecurityGuard<sup>™</sup> ULTRA C18  
**Part No.:** AJ0-8782  
**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  $\mu$ L  
**Detection:** MS/MS (SCIEX API 4000<sup>™</sup>)

# NSAIDs from Plasma

## Sample Pre-treatment

Dilute 200 $\mu$ L Plasma with 200 $\mu$ L of 1 % Formic acid in water. Vortex briefly (3-5 seconds).

## SLE Protocol

<b>96-Well Plate:</b>	Novum™ SLE MAX
<b>Part No.:</b>	8E-S138-5GA
<b>Load:</b>	Pre-treated sample and pulse vacuum (~5" Hg) for 5-10 seconds or until sample has completely entered the sorbent
<b>Wait:</b>	5 minutes
<b>Elute:</b>	2x 900 $\mu$ L of % Ethyl acetate in Dichloromethane, allow to elute via gravity (~5 minutes per aliquot)
<b>Apply:</b>	Vacuum or apply positive pressure at 5" Hg for 20-30 seconds to complete the elution
<b>Dry:</b>	Sample under slow stream of Nitrogen at 30 °C
<b>Reconstitute:</b>	200 $\mu$ L Methanol/Water (10:90) by vortexing the plate at 1400 rpm for 2 minutes

Analyte	% Average Recovery	% CV
Ibuprofen	82	6.70
Diclofenac	79	3.20
Naproxen	96	2.80
Ketoprofen	96	3.10
Mefenamic Acid	77	12.6
Flurbiprofen	82	12.0
Sulindac	87	10.1
Salicylic Acid	93	7.30



- **Consistently High Recoveries Using Hexane/Ethyl Acetate (3:1) as Extraction Solvent**
- **Good Sensitivity of THC-COOH**

To learn more about Novum and Strata® DE SLE products, go to [www.phenomenex.com/SLE](http://www.phenomenex.com/SLE)

# Start your new SLE Method

## Synthetic SLE

### Novum™ SLE 96-Well Plates



Novum Simplified Liquid Extraction SLE Well Plates		
Part No.	Description	Unit
8E-S138-FGA	Novum SLE MINI 96-Well Plate	1/pk
8E-S138-5GA	Novum SLE MAX 96-Well Plate	1/pk

### Novum SLE Tubes

#### Novum Simplified Liquid Extraction SLE Tubes

Part No.	Description	Unit
8B-S138-FAK	Novum SLE 1 cc Tubes	100/pk
8B-S138-5BJ	Novum SLE 3 cc Tubes	50/pk
8B-S138-JCH	Novum SLE 6 cc Tubes	30/pk
8B-S138-KDG	Novum SLE 12 cc Tubes	20/pk

## Diatomaceous Earth SLE



### Strata® DE SLE 96-Well Plates

#### Strata DE Diatomaceous Earth SLE Well Plates

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

## Strata DE SLE Tubes

#### Strata DE Diatomaceous Earth SLE Tubes

Part No.	Description	Unit
8B-S325-KDG	Strata DE SLE 12 cc Tubes	20/pk
8B-S325-VFF	Strata DE SLE 60 cc Tubes	16/pk

guarantee

If Phenomenex SLE products do not perform as well or better than your current SLE product, return the product with comparative data within 45 days for a FULL REFUND.



presston™ 100

## Presston 100 Positive Pressure Manifold

#### Presston 100

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

The Presston 100 96-Well Positive Pressure Manifold can also process 1, 3, and 6 mL tubes using the following adapter kits:

#### Presston 100 Tube Adapter Kits (for AHO-9334)

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



## Vacuum Manifolds

#### Vacuum Manifolds

Part No.	Description	Unit
AHO-6023	12-Position Tube Vacuum Manifold Set	ea
AHO-6024	24-Position Tube Vacuum Manifold Set	ea
AHO-8950	96-Well Plate Manifold, Universal with Vacuum Gauge	ea



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](http://www.phenomenex.com) Preston for complete warranty information.



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# Sample Preparation Resources

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# Supported Liquid Extraction (SLE)

## For Pharmaceutical Applications

**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  
cninfo@phenomenex.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

**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

**Portugal**  
t: +351 221 450 488  
f: +34 91-413-2290  
ptinfo@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



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Novum is patent pending.

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