Struggling with SPE?

- Are you wasting solvent, time and money using conventional SPE?
- Are you short of time to optimize your existing SPE method?

SGE Analytical Science

www.sge.com

AUSTRALIA & PACIFIC REGION CHINA EUROPE INDIA JAPAN MIDDLE EAST USA

Meet Mighty MEPS™! Mighty fast, miniaturized SPE

Together eVol® + MEPS™ = Mighty MEPS™

Together eVol® MEPS™ offers improvements in workflow and resource savings. eVol® custom programming means MEPS™ can be semi-automated – you can control the speed and volume of each step making eVol® MEPS™ ideal for:

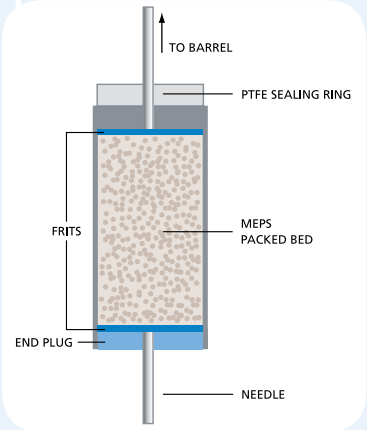
- Sample preparation
- Method development
- Sample clean up

SGE Analytical Science

Miniaturized SPE

Miniaturized SPE works like conventional SPE, but on a reduced scale.

This is especially useful when:
- Your sample is limited.
- You want to reduce solvent use and waste.
- You need to get results quickly.
- You want to reduce your costs.



MEPS™ = Micro Extraction by Packed Sorbent

MEPS™ incorporates packed phase in a micro-cartridge or BIN (Barrel Insert in Needle) which is then integrated into an SGE quality analytical syringe making miniaturized SPE possible.

With MEPS™, the sample processing, extraction and injection steps are performed using the same syringe. MEPS™ allows you to semi or fully automate your process since the syringe configuration can be readily used with eVol® or integrated into automated sample systems.

MEPS™ advantages over conventional SPE:

- Less sample required – giving you greater flexibility when you have small sample quantities.
- Less solvent used – reducing solvent use means less solvent waste and ultimately reduced expense.
- Faster – reduce preparation time from hours to minutes allowing you to improve your laboratory workflow.

MEPS™ Extraction Comparison of LLE and SPE with MEPS™

Description	Liq-Liq Extraction	Liq-Solid Extraction	MEPS™ Extraction
Concentration of sample	5 ng/mL	5 ng/mL	5 ng/mL
Extraction volume	1000 mL	20 mL	1 mL
Volume of solvent used	150 mL DCM	3 mL DCM	0.04 mL DCM
Concentration in solvent	33.33 ng/mL	33.33 ng/mL	125.00 ng/mL
Final volume of extract	1 conc vol (mL)	0.2 conc vol (mL)	NO CONCENTRATION STEP REQUIRED
Concentration in final volume	5000 ng/mL	500 ng/mL	
Injection volume	1 µL inj	2 µL inj	2 µL inj
Concentration of injection volume	5 ng per µL	0.5 ng per µL	0.125 ng per µL
Concentration injection on column	5 ng	1 ng	0.25 ng
Approx. time to prepare	Extraction to injection ~2-3 hours	Extraction to injection ~40-60 min	Extraction to injection ~5-10 min
Approx. volume of waste generated	Waste Generated ~1+ Liter	Waste Generated ~50 mL	Waste Generated <2 mL

MEPS™ is reusable. MEPS™ packing material will last on average 40-100 sample extractions and more for cleaner samples. The packing material is washed between samples. MEPS™ BINs are available in a variety of common SPE phases. Phases available: C18, C8, C4 and APS spherical silicas and divinyl benzene co-polymers.

MEPS™ has a sorbent bed mass of 4 mg so the capacity is:
4 mg X 3% = **120 µg**
4 mg X 5% = **200 µg**

Conventional silica-based SPE products have a bed volume that can be estimated as 1.5 µL per mg of sorbent. MEPS™ uses 4mg of packing so: 1.5 µL X 4 mg = **6 µL bed volume**.

How to use eVol® MEPS™

eVol®
The world's first digital analytical syringe

2010 R&D 100

MEPS™ Applications

MEPS™ has been used successfully in these industries:

Environment

Environmental (Example: Determination of organic priority pollutants and emerging compounds in wastewater and snow samples)

Forensics

Forensics (Example: Contribution of microextraction in packed sorbent for the analysis of cotinine in human urine by GC-MS)

Pharmaceuticals

Pharmaceutical (Example: Liquid chromatographic analysis of oxcarbazepine and its metabolites in plasma and saliva)

Food

Food and Flavor (Example: Determination of 2,4,6-trichloroanisole and 2,4,6-tribromoanisole in Wine)

Life Sciences

Life Sciences (Example: Rapid and Sensitive Method for Determination of Cyclophosphamide in Patients Plasma Samples).

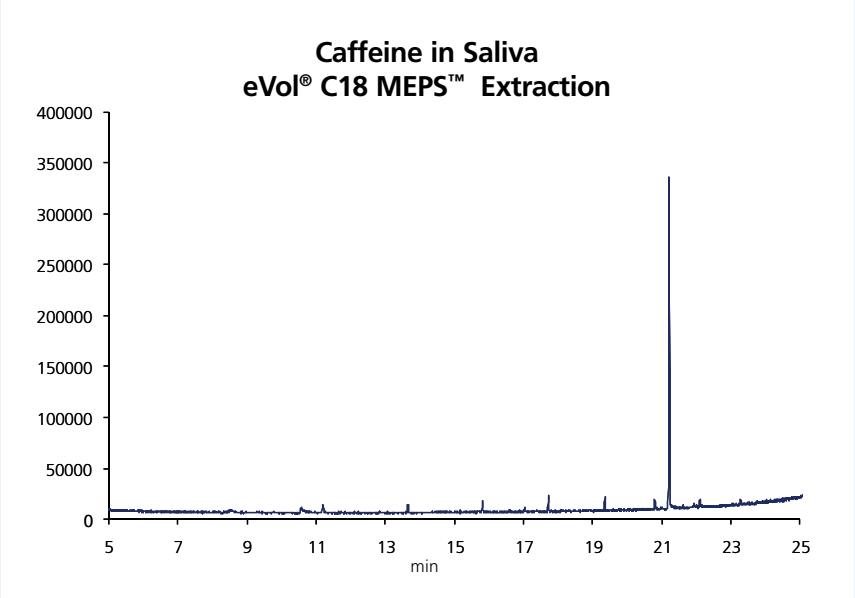
For an up to date list of published MEPS™ applications visit www.sge.com/products/meps

eVol® MEPS™ Custom Programed Method

eVol® MEPS™ Example Method - Caffeine Extraction from Saliva

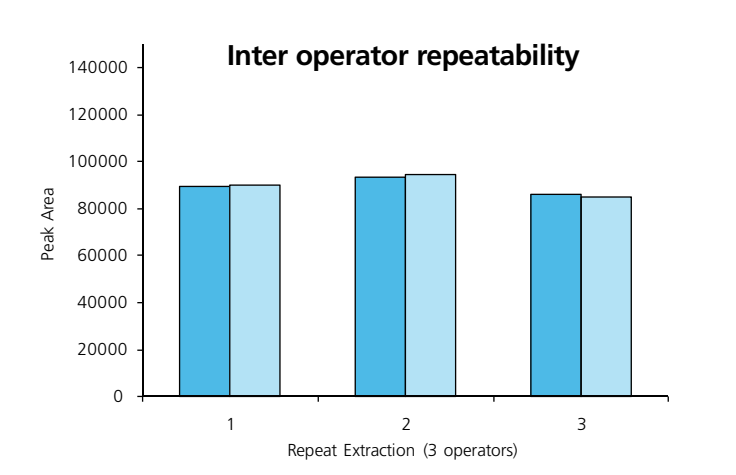
Step	Mode	Amount (µL)	Speed
Methanol Conditioning			
1	Aspirate	20	4 (20 µL/sec)
2	Dispense	20	4
3	Aspirate	20	4
4	Dispense	20	4
5	Aspirate	20	4
6	Dispense	20	4
H_2O Equilibration			
7	Aspirate	20	4
8	Dispense	20	4
9	Aspirate	20	4
10	Dispense	20	4
11	Aspirate	20	4
12	Dispense	20	4
Sample Bind			
13	Aspirate	50	4
14	Dispense	50	4
15	Aspirate	50	4
16	Dispense	50	4
17	Select Mix x8	50	4
H_2O Wash			

Step	Mode	Amount (µL)	Speed
18	Aspirate	20	4
19	Dispense	20	4
Saturated sodium tetraborate			
20	Aspirate	20	4
21	Dispense	20	4
H_2O Wash			
22	Aspirate	20	4
23	Dispense	20	4
Air Dry			
24	Aspirate	50	4
25	Dispense	50	10 (83 µL/sec)
26	Aspirate	50	4
27	Dispense	50	10
28	Aspirate	50	4
29	Dispense	50	10
Methanol Elute			
30	Aspirate	20	4
31	Dispense	20	4
32	Aspirate	20	4
33	Dispense	20	4



Caffeine extraction using eVol® MEPS™ method:

- 100 µL eVol® MEPS™ syringe
- 8 separate prompted functions
- 33 steps
- Total time: ~ 3 minutes



Three different operators, two independent extractions, same day, same MEPS™ cartridge.

6 injections = 4.17 % RSD*

*auto injector repeatability on 6 standard injections = 2.94 % RSD

Together eVol® + MEPS™ = Mighty MEPS™

1. Choose your eVol®

eVol® – Electronic Syringe

Description	Part No.
eVol® Electronic Syringe Starter Kit Contains: • eVol® Electronic Syringe • 3 eVol® Syringes – 5 µL, 50 µL and 500 µL. • Stand. • Universal Charger. • Comprehensive Instruction Manual. • Disc with Manual in Multiple Languages.	2910000
eVol® Electronic Syringe	2910005

2. Choose your eVol® MEPS™ syringe by volume

eVol® MEPS™ Syringes

Description	Replacement Plunger Part No.	# per Pack	Syringe Part No.
50 µL for MEPS™ applications*	2910382	1	2910027
100 µL for MEPS™ applications*	2910383	1	2910028
500 µL for MEPS™ applications*	2910384	1	2910026

** The 50 µL, 100 µL and 500 µL eVol® MEPS™ syringes can be used with the range of MEPS™ BINs.*

3. Choose your phase

MEPS™ BINs (Barrel Insert in Needle)

All LC needles are 55.5 mm in length, 22 gauge and dome tipped.

All GC needles are 55.5 mm in length, 23 gauge and cone tipped.

All packs contain 5 MEPS™ BINs and can be used with 50, 100 and 500 µL eVol® MEPS™ syringes.

Phase	LC Needle Part No.	GC Needle Part No.
C18	2900701	2900711
C8	2900702	2900712
C2	2900707	2900717
APS - amino-propyl silane	2900703	2900713
DVB - hydrophobic polystyrene-divinylbenzene copolymer	2900705	2900715
SDVB - styrene-divinylbenzene	2900706	2900716

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