SOLUTIONS FOR SAMPLE PREPARATION

SILICYCLE

SILICYCLE

Founded in 1995, SiliCycle is specialized in the development, manufacturing and commercialization of high value silica gels and specialty products for chromatography, purification and synthesis.

Solutions for Sample Preparation

SPE Cartridges and Well Plates

- Wide variety of sorbents
- Tight particle size distribution
- Very good packing (*no fines*)
- High recovery and yield

Silica-based Silia*Prep*™ and Polymeric Silia*PrepX*™

Solid-phase extraction (*SPE*) is designed for rapid sample preparation and purification prior to chromatographic analysis.

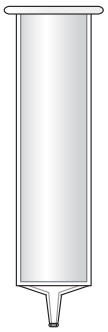
Our Silia*Prep* (*silica-based*) and Silia*PrepX* (*polymeric*) families of SPE cartridges and well plates have been created to cover the entire spectrum of solid-phase extraction. This complete range of sorbents allows treatment of most common matrices:

- human and animal biological fluids
- waste waters
- petrochemical residues
- toxicological residues
- food and beverage

Silia*Prep* and Silia*PrepX* products are made using state-of-the-art technology, giving you the highest quality and the best lot-to-lot reproducibility. These advanced sorbents are providing you a clean extract, reducing ion suppression and increasing selectivity for LC/MS/MS applications.
All our *ultrapure* Silia*Flash* silica gels and functionalized Silia*Bond* silica gels are available in SPE formats. Just tell us what you need!

Cartridge sizes

We can provide a complete range of SPE cartridge lengths and diameters.

Silia*Prep* Cartridge Sizes								
Tips Micro-SPE Cartridges		Mini-Silia*Prep* SPE Cartridges		SPE Cartridges				
		500 mg	1 g	1 mL	3 mL	6 mL	10 mL	12 mL	25 mL
									

Bigger sizes (*70 mL, 150 mL & 276 mL*) are also available under Silia*Sep* OT branding.

Tips for your method development

Tips for Your Method Development		
Sorbent Type	Silica-Based (*SiliaPrep*)	Polymeric (*SiliaPrepX*)
Sorbent Capacity	Load up to 5 % of bed weight: 100 mg of silica-based sorbent will retain up to 5 mg of sample	Load up to 10 % of bed weight: 100 mg of polymeric sorbent will retain up to 10 mg of sample
Not enough sorbent: ANALYTE LOSS ► low recovery and reproducibility Too much sorbent: MORE EXPENSIVE ► more solvent used, taller SPE cartridges Concentrated samples: double the bed weight to avoid analyte loss		

Product Selection Guide by Technical Characteristics

Product Selection Guide by Technical Characteristics (*typical values*)								
SiliaPrep / SiliaPrepX	Sorbent Number	Particle Size	Pore Size	Surface Area	Carbon Load	Endcapping	Ionic Capacity	pH Stability
Silica-Based Non Polar Phases								
SiliaPrep C18 Plus	SPE-R00830B-xxx	40 - 63 µm	60 Å	500 m^2/g	17 %	Proprietary	-	2 - 10
SiliaPrep C18 *nec*	SPE-R35530B-xxx	40 - 63 µm	60 Å	500 m^2/g	17 %	No	-	2 - 10
SiliaPrep C18 WPD	SPE-R33229G-xxx	37 - 55 µm	125 Å	300 m^2/g	13 %	Yes	-	2 - 10
SiliaPrep C8	SPE-R31030B-xxx	40 - 63 µm	60 Å	500 m^2/g	12 %	Yes	-	2 - 10
SiliaPrep C8 *nec*	SPE-R31130B-xxx	40 - 63 µm	60 Å	500 m^2/g	12 %	No	-	2 - 10
SiliaPrep Phenyl (*PH*)	SPE-R34030B-xxx	40 - 63 µm	60 Å	500 m^2/g	9 %	Yes	-	2 - 10
SiliaPrep PFP	SPE-R67530B-xxx	40 - 63 µm	60 Å	500 m^2/g	11 %	Yes	-	2 - 10
Silica-Based Polar Phases								
SiliaPrep Cyano (*CN*)	SPE-R38030B-xxx	40 - 63 µm	60 Å	500 m^2/g	7 %	Yes	-	2 - 10
SiliaPrep Diol *nec*	SPE-R35030B-xxx	40 - 63 µm	60 Å	500 m^2/g	8 %	No	-	2 - 10
SiliaPrep Florisil	SPE-AUT-0014-xxx	40 - 75 µm	100 Å	250 m^2/g	-	-	-	3 - 8
SiliaPrep Florisil LP	SPE-AUT-0014LP-xxx	75 - 150 µm	100 Å	250 m^2/g	-	-	-	3 - 8
SiliaPrep Florisil PR	SPE-AUT-0015-xxx	150 - 250 µm	-	200 m^2/g	-	-	-	3 - 8
SiliaPrep Silica	SPE-R10030B-xxx	40 - 63 µm	60 Å	500 m^2/g	-	-	-	2 - 9
SiliaPrep Silica WPD	SPE-R10029G-xxx	37 - 55 µm	125 Å	300 m^2/g	-	-	-	2 - 9
SiliaPrep Acidic Alumina	SPE-AUT-0053-xxx	75 - 150 µm	70 Å	150 - 320 m^2/g	-	-	-	3 - 8
SiliaPrep Neutral Alumina	SPE-AUT-0054-xxx	75 - 150 µm	70 Å	150 - 320 m^2/g	-	-	-	3 - 8
SiliaPrep Basic Alumina	SPE-AUT-0055-xxx	75 - 150 µm	70 Å	150 - 320 m^2/g	-	-	-	3 - 8
Silica-Based Ion Exchange Phases								
SiliaPrep SAX *nec*	SPE-R66530B-xxx	40 - 63 µm	60 Å	500 m^2/g	10 %	No	0.90 meq/g	2 - 10
SiliaPrep SAX-2 *nec*	SPE-R66430B-xxx	40 - 63 µm	60 Å	500 m^2/g	9 %	No	0.71 mmol/g	2 - 10
SiliaPrep Carbonate	SPE-R66030B-xxx	40 - 63 µm	60 Å	500 m^2/g	6 %	Yes	0.46 mmol/g	2 - 10
SiliaPrep Amine (*WAX*)	SPE-R52030B-xxx	40 - 63 µm	60 Å	500 m^2/g	7 %	Yes	1.2 mmol/g	2 - 10
SiliaPrep SCX	SPE-R60530B-xxx	40 - 63 µm	60 Å	500 m^2/g	9 %	Yes	0.54 meq/g	2 - 10
SiliaPrep SCX-2	SPE-R51230B-xxx	40 - 63 µm	60 Å	500 m^2/g	5 %	Yes	0.63 meq/g	2 - 10
SiliaPrep WCX	SPE-R70030B-xxx	40 - 63 µm	60 Å	500 m^2/g	7 %	Yes	0.92 mmol/g	2 - 10
Specialty Phases								
SiliaPrep PCB	SP2-R00650030B-xxx	40 - 63 µm	60 Å	500 m^2/g	3 %	Proprietary	-	2 - 10
SiliaPrep CleanDRUG	SPEC-R651230B-xxx	40 - 63 µm	60 Å	500 m^2/g	9 %	Proprietary	-	2 - 10
SiliaPrep CleanENVI	SPEC-R31930B-xxx	40 - 63 µm	60 Å	500 m^2/g	19 %	Proprietary	-	2 - 10
SiliaPrep PAH	SP2-R0610030B-xxx	40 - 63 µm	60 Å	500 m^2/g	13 %	Proprietary	-	2 - 10
Polymeric Phases								
SiliaPrepX DVB	SPE-P0001-xxx	85 µm	60 Å	1,000 m^2/g	90 %	-	-	1 - 14
SiliaPrepX HLB	SPE-P0002-xxx	40 µm	110 Å	850 m^2/g	88 %	-	-	1 - 14
SiliaPrepX SCX	SPE-P0005-xxx	85 µm	60 Å	800 m^2/g	80 %	-	0.80 meq/g	1 - 14
SiliaPrepX SAX	SPE-P0010-xxx	85 µm	60 Å	900 m^2/g	85 %	-	0.20 meq/g	1 - 14
SiliaPrepX WCX	SPE-P0015-xxx	85 µm	60 Å	800 m^2/g	85 %	-	0.70 meq/g	1 - 14
SiliaPrepX WAX	SPE-P0020-xxx	85 µm	60 Å	800 m^2/g	86 %	-	0.50 meq/g	1 - 14

Reversed and Normal Phases - Typical Applications

The table below will help you select the right media to purify your compounds of interest, in either reversed-phase or normal phase.

SPE Cartridges & Well Plates Portfolio (*Reversed and Normal Phases*)		
Mode	**Silia*Prep* Phases**	**Applications**
Reversed-Phases: non-polar sorbents	Silia*Prep* C18 (*Plus, WPD Widepore, nec*)	For organic compounds from water, drugs & metabolites from fluids
	Silia*Prep* C8 (*endcapped & nec*)	For extremely non-polar and large compounds (*vitamin D, oils*)
	Silia*Prep* Phenyl (*PH*) & Pentafluorophenyl (*PFP*)	For aromatic compounds, complex natural products
Polymeric Reversed-Phases	Silia*PrepX* HLB & DVB	For drugs & metabolites from biological fluids, API from tablets and cream
Normal Phases: polar sorbents	Silia*Prep* Cyano (*CN*)	For acidic, basic and neutral compounds from aqueous solutions
	Silia*Prep* Diol *nec*	For polar compounds from non-polar solvents, structural isomers
	Silia*Prep* Florisil & Florisil PR (*Pesticide Residues*)	For chlorinated pesticides, PCB's and polysaccharides
	Silia*Prep* Silica & Silica WPD (*Widepore*)	For various compounds from non-polar solvents, structural isomers
	Silia*Prep* Alumina (*Acidic, Neutral & Basic*)	For aromatic compounds and aliphatic amines

Experimental Procedures

Generic protocols are presented below, for reversed-phase and normal phase SPE, to help you develop your method depending on the sorbent used, the sample matrix and the analyte properties.

These are only convenient starting points for method development. Further optimization may be required to tailor the method to the application needs.

Reversed-Phases

Extraction of neutral, acidic & basic organic compounds

Extraction of neutral, acidic & basic organic compounds	
CONDITIONNING STEP	1 x CV[(1)] of **Methanol**
EQUILIBRATION STEP	1 x CV of **water**
LOADING STEP	Aqueous sample, **pH** adjusted **2 units above pK_a** (*bases*) or **below pKa** (*acids*)
WASHING STEP	1 x CV of **5 % Methanol[(2)] in water**
ELUTION STEP	1 x CV of **Methanol**

Normal Phases

Extraction of compounds from non-polar solvents

Extraction of compounds from non-polar solvents	
CONDITIONNING STEP	1 x CV of **Isopropanol**
EQUILIBRATION STEP	1 x CV of **Hexane** (*or other low polar solvent*)
LOADING STEP	Sample diluted in **Hexane**
WASHING STEP	1 x CV of **5 % Isopropanol in Hexane**
ELUTION STEP	1 x CV of **50 - 95 % Isopropanol in Hexane**

Notes:

(1) Abbreviation used: CV = Column Volume

(2) For polymeric sorbents used in reversed-phase, you can add up to 60 % Methanol in water during the washing step, if your application requires it.

Ion Exchange Phases - Typical Applications

The table below will help you select the right media according to the pK_a of your analyte.

SPE Cartridges & Well Plates Portfolio (*Ion Exchange Phases*)		
Mode	**Silia*Prep* Phases**	**Applications**
Ion Exchange Phases: ionic sorbents	**Silia*Prep* SAX & SAX-2 (*TMA Chloride & Acetate*) nec**	For weakly acidic molecules (pK_a *3 - 5*)
	Silia*Prep* Carbonate	For scavenging of TFA, extraction of acids (*boronic acids & acidic phenols*)
	Silia*Prep* Amine (*WAX*)	For strongly acidic molecules (pK_a *< 3*), structural isomers, saccharides
	Silia*Prep* SCX & SCX-2 (*Tosic & Propylsulfonic Acids*)	For weakly basic molecules (pK_a *7 - 9*), catch & release of amines
	Silia*Prep* WCX (*Carboxylic Acid*)	For strongly basic compounds (pK_a *> 9*)
Polymeric Ion Exchange Phases	**Silia*PrepX* SAX & WAX**	For acidic compounds & metabolites, highly stable in organic solvents
	Silia*PrepX* SCX & WCX	For basic compounds, highly stable in organic solvents

Experimental Procedures

Strong Anion Exchangers (*SAX*)

Extraction of weak acids (pK_a *3 - 5*[3])	
CONDITIONNING STEP	1 x CV of **Methanol**
LOADING STEP	Aqueous sample, **pH** adjusted at **7.0 - 8.0**
WASHING STEP	1 x CV of **Methanol** (*elution of basic & neutral compounds*)
ELUTION STEP	1 x CV of **2 - 5 % HCO_2H in Methanol** (*elution of weak acidic compounds*)

Strong Cation Exchangers (*SCX*)

Extraction of weak bases (pK_a *7 - 9*)	
CONDITIONNING STEP	1 x CV of **Methanol**
EQUILIBRATION STEP	1 x CV of **water**
LOADING STEP	Aqueous sample, **pH** adjusted at **3.0 - 4.0**
WASHING STEP 1	1 x CV of **water**
WASHING STEP 2	1 x CV of **Methanol** (*elution of acidic & neutral compounds*)
ELUTION STEP	1 x CV of **2 - 5 % NH_4OH[4] in Methanol** (*elution of weak basic compounds*)

Weak Anion Exchangers (*WAX*)

Extraction of strong acids (pK_a *< 3*)	
CONDITIONNING STEP	1 x CV of **Methanol**
EQUILIBRATION STEP	1 x CV of **water**
LOADING STEP	Aqueous sample, **pH** adjusted at **4.0 - 5.0**
WASHING STEP 1	1 x CV of **water**
WASHING STEP 2	1 x CV of **Methanol** (*elution of basic & neutral compounds*)
ELUTION STEP	1 x CV of **2 - 5 % NH_4OH[4] in Methanol** (*elution of strong acidic compounds*)

Weak Cation Exchangers (*WCX*)

Extraction of strong bases (pK_a *> 9*)	
CONDITIONNING STEP	1 x CV of **Methanol**
EQUILIBRATION STEP	1 x CV of **water**
LOADING STEP	Aqueous sample, **pH** adjusted at **8.0**
WASHING STEP 1	1 x CV of **water**
WASHING STEP 2	1 x CV of **Methanol** (*elution of acidic & neutral compounds*)
ELUTION STEP	1 x CV of **2 - 5 % HCO_2H in Methanol** (*elution of strong basic compounds*)

Notes:

[3] For extraction of Phenol (pK_a *10*), we recommend using a polymeric phase (*Silia*PrepX *SAX*) and load the sample with a pH adjusted to 12.

[4] For silica-based sorbents, NH_4OH can be too aggressive. You can use NH_3 (*7M*) in Methanol to avoid degrading the phase.

Specialty Phases & Metal Scavengers - Typical Applications

The table below presents our specialty phases, to remove specific compounds from your samples.

SPE Cartridges & Well Plates Portfolio (*Specialty Phases & Metal Scavengers*)		
Mode	**Silia*Prep* Phases**	**Applications**
Specialty Phases	Silia*Prep* PCB	For extraction of PCB's from waste oil (*hexane extract*)
	Silia*Prep* CleanDRUG	For drugs of abuse applications
	Silia*Prep* CleanENVI	For PAH's, PCB's, herbicides and pesticides from waste waters
	Silia*Prep* PAH	For PAH's from waste waters
Metal Scavengers	Silia*Prep* Cysteine, Diamine, DMT, DOTA, TAAcOH, TAAcONa, Thiol, Thiourea, Imidazole, Triamine	For lowering the residual metal concentration of various metal complexes (*Pd, Pt, Rh, Ru, Ni, Sn, etc*) to single digit ppm

Experimental Procedures

The procedures below are only convenient starting points for method development. Further optimization may be required to tailor the method to your application needs.

Specialty Phases

Extraction of PCBs, drugs and PAHs

PCBs from waste oil with Silia*Prep* PCB	
CONDITIONNING STEP	1 x CV[1] of **Hexane**
LOADING STEP	**Diluted sample** (*with **Hexane***)
ELUTION STEP	1 x CV of **Hexane**

Drugs of abuse with Silia*Prep* CleanDRUG	
CONDITIONNING STEP	1 x CV of **Methanol**
EQUILIBRATION STEP	1 x CV of **water** (*buffered at **pH 6.0***)
LOADING STEP	**Aqueous sample** (*buffered at **pH 6.0***)
WASHING STEP	1 x CV of **water** then 1 x CV of **Methanol**
ELUTION STEP	1 x CV of **Isopropanol:NH_4OH (*90:10*)**

Environmental samples with Silia*Prep* CleanENVI & PAH	
CONDITIONNING STEP	1 x CV of **Dichloromethane** then 1 x CV of **Methanol**
EQUILIBRATION STEP	1 x CV of **water**
LOADING STEP	**Aqueous sample**
WASHING STEP	1 x CV of **5 - 50 % Methanol in water**
ELUTION STEP	1 x CV of **Dichloromethane**

Metal Scavengers

Catch of the metal & release of your analyte

Catch and release of the analyte	
EQUILIBRATION STEP	1 x CV of **sample solvent**
LOADING STEP[2]	**Diluted sample**
RINSING STEP	1 x CV of **sample solvent**

Notes:

[1] Abbreviation used: CV = Column Volume

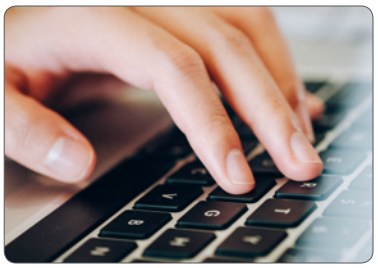
[2] Non retentive SPE (*Catch & Release*): analyte won't retain on the sorbent and will elute directly during loading and rinsing steps. Scavenged compounds will remain in the SPE cartridge.

Product Selection Guide by Manufacturer

The table below will help you find equivalences to products of well-known SPE manufacturers.

Product Selection Guide by Manufacturer					
SiliCycle	**Waters**	**Phenomenex**	**Agilent**	**Biotage**	**Macherey-Nagel**
Silia*Prep* C18 Plus	Sep-Pak® tC18	Strata® C18-E	Bond Elut® C18	Isolute® C18 (*EC*)	Chromabond® C18 ec
Silia*Prep* C18 *nec*		Strata® C18-U	Bond Elut® C18 OH	Isolute® C18	Chromabond® C18
Silia*Prep* C18 WPD	Sep-Pak® C18	Strata® C18-T	Bond Elut® C18 EWP	Isolute® MFC18	Chromabond® C18 ec f
Silia*Prep* C8	Sep-Pak® C8	Strata® C8	Bond Elut® C8	Isolute® C8 (*EC*)	
Silia*Prep* C8 *nec*				Isolute® C8	Chromabond® C8
Silia*Prep* Phenyl (*PH*)		Strata® Phenyl	Bond Elut® PH	Isolute® PH	Chromabond® C_6H_5
Silia*Prep* PFP					
Silia*Prep* Cyano (*CN*)	Sep-Pak® Cyanopropyl	Strata® CN	Bond Elut® Cyano (*CN*)	Isolute® CN	Chromabond® CN
Silia*Prep* Diol *nec*	Sep-Pak® Diol		Bond Elut® Diol (*2OH*)	Isolute® DIOL	Chromabond® OH (*Diol*)
Silia*Prep* Silica		Strata® Silica (*Si-1*)	Bond Elut® SI	Isolute® SI	Chromabond® SiOH
Silia*Prep* Silica WPD	Sep-Pak® Silica				
Silia*Prep* Florisil LP & Florisil PR	Sep-Pak® Florisil®	Strata® FL-PR (*Florisil®*)	Bond Elut® Florisil	Isolute® FL	Chromabond® Florisil®
Silia*Prep* Alumina (*Acidic, Neutral, Basic*)	Sep-Pak® Alumina (*A, N, B*)	Strata® Alumina-N (*AL-N*)	Bond Elut® Alumina (*-A, -N, -B*)	Isolute® ALUMINA (*AL-A, AL-N & AL-B*)	Chromabond® Alox (*A, N, B*)
Silia*Prep* SAX *nec* (*TMA Chloride*)	Sep-Pak® Accell™ Plus QMA	Strata® SAX	Bond Elut® SAX	Isolute® SAX	Chromabond® SB
Silia*Prep* SAX-2 *nec* (*TMA Acetate*)				Isolute® PE-AX	
Silia*Prep* Carbonate	Accell Plus QMA Carbonate Plus Light			Isolute® Si-Carbonate (*Si-TMA-CO_3*)	
Silia*Prep* Amine (*WAX*)	Sep-Pak® Amino	Strata® NH_2	Bond Elut® NH2	Isolute® NH_2	Chromabond® NH_2
Silia*Prep* Tosic Acid (*SCX*)		Strata® SCX	Bond Elut® SCX	Isolute® SCX-3	Chromabond® SA
Silia*Prep* SCX-2 (*Propylsulfonic Acid*)			Bond Elut® PRS	Isolute® SCX-2	Chromabond® PSA
Silia*Prep* WCX (*Carboxylic Acid*)	Sep-Pak® Accell™ Plus CM	Strata® WCX	Bond Elut® CBA	Isolute® CBA	Chromabond® PCA
Silia*Prep* PCB			Bond Elut® PCB		Chromabond® SA/SiOH
Silia*Prep* CleanDRUG		Strata® Screen-C	Bond Elut® Certify	Isolute® HCX	Chromabond® Drug
Silia*Prep* CleanENVI & Silia*Prep* PAH		Strata® PAH	EnvirElut®	Isolute® PAH	Chromabond® C18 PAH
Silia*PrepX* HLB	Oasis® HLB	Strata®-X	Bond Elut® NEXUS		Chromabond® HLB
Silia*PrepX* DVB			Bond Elut® ENV	Isolute® 101	Chromabond® HR-X
Silia*PrepX* SAX	Oasis® MAX	Strata®-X-A	Bond Elut® Plexa PAX	Evolute® Express AX	Chromabond® HR-XA
Silia*PrepX* WAX	Oasis® WAX	Strata®-X-AW		Evolute® Express WAX	Chromabond® HR-XAW
Silia*PrepX* SCX	Oasis® MCX	Strata®-X-C	Bond Elut® Plexa PCX	Evolute® Express CX	Chromabond® HR-XC
Silia*PrepX* WCX	Oasis® WCX	Strata®-X-CW	Bond Elut® NEXUS WCX	Evolute® Express WCX	Chromabond® HR-XCW

Ordering Information



To build your own product number, just add the **Phase** to the **Format PN**

Examples:

- SPE-R67530B-06P for Silia*Prep* PFP, 6 mL / 500 mg cartridges
- SPE-P0002-12S for Silia*PrepX* HLB, 12 mL / 500 mg cartridges
- SPEC-R31930B-06S for Silia*Prep* CleanENVI, 6 mL / 1 g cartridges

Silica-based Phases

Silia*Prep* Phases	
Phases	**Code**
Reversed-phases	
C18 Plus	**R00830B**
C18 WPD	**R33229G**
C18 nec	**R35530B**
C8	**R31030B**
C8 nec	**R31130B**
Phenyl (PH)	**R34030B**
PFP	**R67530B**
Normal Phases	
Cyano (CN)	**R38030B**
Diol nec	**R35030B**
Florisil	**AUT-0014**
Florisil LP	**AUT-0014LP**
Florisil PR	**AUT-0015**
Silica	**R10030B**
Silica WPD	**R10029G**
Acidic Alumina	**AUT-0053**
Neutral Alumina	**AUT-0054**
Basic Alumina	**AUT-0055**
Ion Exchange Phases	
SAX nec	**R66530B**
SAX-2 nec	**R66430B**
Carbonate	**R66030B**
Amine (WAX)	**R52030B**
Tosic Acid (SCX)	**R60530B**
SCX-2	**R51230B**
WCX	**R70030B**
Scavengers	
Cysteine	**R80530B**
DMT	**R79030B**
TAAcOH	**R69030B**
TAAcONa	**R69230B**
Thiol	**R51030B**
Thiourea	**R69530B**
Imidazole	**R79230B**
Triamine	**R48030B**

Silia*Prep* Formats		
Formats	**Qty/Box**	**Format PN**
Silia*Prep* SPE Cartridges		
1 mL / 50 mg	100	**SPE-PHASE-01B**
1 mL / 100 mg	100	**SPE-PHASE-01C**
3 mL / 200 mg	50	**SPE-PHASE-03G**
3 mL / 500 mg	50	**SPE-PHASE-03P**
6 mL / 500 mg	50	**SPE-PHASE-06P**
6 mL / 1 g	50	**SPE-PHASE-06S**
6 mL / 2 g	50	**SPE-PHASE-06U**
12 mL / 2 g	20	**SPE-PHASE-12U**
25 mL / 5 g*	20	**SPE-PHASE-20X**
70 mL / 10 g*	16	**FLH-PHASE-70Y**
70 mL / 15 g*	16	**FLH-PHASE-70i**
70 mL / 20 g*	16	**FLH-PHASE-70Z**
150 mL / 25 g*	10	**FLH-PHASE-95K**
150 mL / 50 g*	10	**FLH-PHASE-95M**
150 mL / 70 g*	10	**FLH-PHASE-95N**
276 mL / 100 g*	12	**FLH-PHASE-276F**
Silia*Prep* Large Reservoir Volume SPE Cartridges		
10 mL / 200 mg	50	**SPC-PHASE-10G**
10 mL / 500 mg	50	**SPC-PHASE-10P**
Mini-Silia*Prep* SPE Cartridges		
500 mg	50	**SPS-PHASE-P**
1 g	50	**SPS-PHASE-S**
Silia*Prep* 96-Well Plates		
2 mL / 50 mg	1	**96W-PHASE-B**
2 mL / 100 mg	1	**96W-PHASE-C**

Polymeric Phases

SiliaPrepX Phases	
Phase	Code
DVB	P0001
HLB	P0002
SCX	P0005
SAX	P0010
WCX	P0015
WAX	P0020

SiliaPrepX Formats		
Formats	Qty/Box	Format PN
SiliaPrepX SPE Cartridges		
1 mL / 30 mg	100	SPE-PHASE-01AA
3 mL / 30 mg	50	SPE-PHASE-03AA
3 mL / 60 mg	50	SPE-PHASE-03BB
6 mL / 100 mg	30	SPE-PHASE-06C
6 mL / 200 mg	30	SPE-PHASE-06G
6 mL / 500 mg	30	SPE-PHASE-06P
12 mL / 500 mg	20	SPE-PHASE-12P
12 mL / 1 g	20	SPE-PHASE-12S
25 mL / 1 g*	20	SPE-PHASE-20S
25 mL / 2 g*	20	SPE-PHASE-20U
70 mL / 5 g*	16	FLH-PHASE-70X
SiliaPrepX 96-Well Plates		
2 mL / 10 mg	1	96W-PHASE-1A
2 mL / 30 mg	1	96W-PHASE-AA
2 mL / 60 mg	1	96W-PHASE-BB

Specialty Phases

SiliaPrep Specialty Phases	
Phase	Code
PCB	R00650030B
PAH	R0610030B
CleanDRUG	R651230B
CleanENVI	R31930B

SiliaPrep Specialty Formats			
Formats	Qty/Box	PCB & PAH	CleanDRUG & CleanENVI
SiliaPrep SPE Cartridges			
1 mL / 50 mg	100	SP2-PHASE-01B	SPEC-PHASE-01B
1 mL / 100 mg	100	SP2-PHASE-01C	SPEC-PHASE-01C
3 mL / 200 mg	50	SP2-PHASE-03G	SPEC-PHASE-03G
3 mL / 500 mg	50	SP2-PHASE-03P	SPEC-PHASE-03P
6 mL / 500 mg	50	SP2-PHASE-06P	SPEC-PHASE-06P
6 mL / 1 g	50	SP2-PHASE-06S	SPEC-PHASE-06S
6 mL / 2 g	50	SP2-PHASE-06U	SPEC-PHASE-06U
12 mL / 2 g	20	SP2-PHASE-12U	SPEC-PHASE-12U
25 mL / 5 g*	20	SP2-PHASE-20X	SPEC-PHASE-20X
70 mL / 10 g*	16	FLH-PHASE-70Y	
70 mL / 15 g*	16	FLH-PHASE-70i	
70 mL / 20 g*	16	FLH-PHASE-70Z	
150 mL / 25 g*	10	FLH-PHASE-95K	
150 mL / 50 g*	10	FLH-PHASE-95M	
150 mL / 70 g*	10	FLH-PHASE-95N	
276 mL / 100 g*	12	FLH-PHASE-276F	
SiliaPrep Large Reservoir Volume SPE Cartridges			
10 mL / 200 mg	50	SPC-PHASE-10G	
10 mL / 500 mg	50	SPC-PHASE-10P	
Mini-SiliaPrep SPE Cartridges			
500 mg	50	SPS-PHASE-P	
1 g	50	SPS-PHASE-S	

* Commercialized under SiliaSepX OT branding.

SiliaPrep™ and SiliaPrepX™ Applications

Forensics

Food

Environment

Extraction of Methadone from Human Urine and Serum

CARTRIDGE	Silia*PrepX* SCX 6 mL / 200 mg Part Number: SPE-P0005-06G
SAMPLE PRETREATMENT	200 µL of Phosphoric Acid 2 % was added to 1 mL of urine / serum sample
CONDITIONNING STEP	6 mL of Methanol
EQUILIBRATION STEP	6 mL of Water
LOADING STEP	Treated sample was slowly aspirated through the cartridge
WASHING STEP	6 mL of Hydrochloric Acid 0.1N then 6 mL of Methanol, dry the cartridge
ELUTION STEP	2 x 3 mL of 10 % Ammonia in Methanol
FURTHER TREATMENT	Evaporation under Nitrogen, reconstitution with Acetonitrile / Water and quantification by LC/MS
RECOVERY	at 1 µg/mL
	Methadone in urine 90 %
	Methadone in serum 95 %

Extraction of Methadone and EDDP from Human Urine

CARTRIDGE	Silia*PrepX* HLB 1 mL / 30 mg Part Number: SPE-P0002-01AA
SAMPLE PRETREATMENT	40 µL of internal standard (*Methadone-d9 at 200 ng/mL in Methanol*) was added to 200 µL of urine sample and 200 µL of Ammonium Hydroxide 4 %
CONDITIONNING STEP	1 mL of Methanol
EQUILIBRATION STEP	1 mL of Ammonium Hydroxide 2 %
LOADING STEP	Urine sample was slowly aspirated through the cartridge
WASHING STEP	1 mL of Methanol / Ammonium Hydroxide 2 % (*50:50*) then 1 mL of Methanol / Ammonium Hydroxide 2 % (*80:20*)
ELUTION STEP	1 mL of Methanol / water (*80:20*)
FURTHER TREATMENT	Quantification by LDTD/MS/MS (*collaboration with Phytronix*)
RECOVERY	at 1,000 ng/mL
	Methadone 91 %
	EDDP 85 %

Extraction of Fentanyl and Norfentanyl from Urine

CARTRIDGE	Silia*Prep* CleanDRUG 1 mL / 100 mg Part Number: SPEC-R651230B-01C
SAMPLE PRETREATMENT	200 µL of urine was added to 600 µL of Sodium Acetate in water and 40 µL of internal standard (*200 ng/mL in Methanol*)
CONDITIONNING STEP	1 mL of Methanol
EQUILIBRATION STEP	1 mL of Water and 1 mL of Sodium Acetate in Water (*100 mM, pH 6.0*)
LOADING STEP	Urine sample was slowly aspirated through the cartridge
WASHING STEP	1 mL of Water then 1 mL of Methanol
ELUTION STEP	1 mL of Ethyl Acetate / Isopropanol / Ammonium Hydroxide (*78:20:2*)
FURTHER TREATMENT	Evaporation, reconstitution and quantification by LDTD/MS/MS (*collaboration with Phytronix*)
RECOVERY	at 500 ng/mL
	Fentanyl 96 %
	Norfentanyl 98 %

Extraction of Codeine from Human Urine and Serum

CARTRIDGE	Silia*PrepX* SCX 6 mL / 200 mg Part Number: SPE-P0005-06G
SAMPLE PRETREATMENT	200 µL of Phosphoric Acid 2 % was added to 1 mL of urine / serum sample
CONDITIONNING STEP	6 mL of Methanol
EQUILIBRATION STEP	6 mL of water
LOADING STEP	Treated sample was slowly aspirated through the cartridge
WASHING STEP	6 mL of Hydrochloric Acid 0.1 N then 6 mL of Methanol, dry the cartridge
ELUTION STEP	2 x 3 mL of 5 % Ammonia in Methanol
FURTHER TREATMENT	Evaporation under Nitrogen, reconstitution with Methanol / water and quantification by LC/MS
RECOVERY	at 1 µg/mL
	Codeine in urine 70 %
	Codeine in serum 92 %

FORENSICS APPLICATIONS

Extraction of Tricyclic Antidepressants from Serum

CARTRIDGE	Silia*PrepX* WCX 3 mL / 60 mg Part Number: SPE-P0015-03BB
SAMPLE PRETREATMENT	250 µL of serum were diluted with 1 mL of 10 % Formic Acid in Water
CONDITIONNING STEP	3 mL of Methanol
EQUILIBRATION STEP	3 mL of Water
LOADING STEP	Treated sample was slowly aspirated through the cartridge
WASHING STEP	1 mL of 5 % Formic Acid in Water then 1 mL Methanol, dry the cartridge
ELUTION STEP	3 mL of 5 % Formic Acid in Methanol
FURTHER TREATMENT	Evaporation under Nitrogen, reconstitution with Methanol / Water and quantification by LC/MS
RECOVERY	at 1 µg/mL

Doxepine	79 %
Imipramine	79 %
Amitriptyline	91 %
Trimipramine	98 %

Extraction of Pharmaceutical Drugs from Serum

CARTRIDGE	Silia*PrepX* SCX 6 mL / 200 mg Part Number: SPE-P0005-06G
SAMPLE PRETREATMENT	200 µL of Phosphoric Acid 2 % was added to 1 mL of serum sample
CONDITIONNING STEP	6 mL of Methanol
EQUILIBRATION STEP	6 mL of Water
LOADING STEP	Treated sample was slowly aspirated through the cartridge
WASHING STEP	6 mL of Chlorhydric Acid 0.1 N, dry the cartridge
ELUTION STEP	2 x 3 mL of Methanol (*acidic and neutrals analytes*) and 2 x 3 mL of 10 % Ammonia in Methanol (*basic analytes*)
FURTHER TREATMENT	Evaporation under Nitrogen, reconstitution with Methanol / Water and quantification by LC/MS
RECOVERY	at 1 µg/mL

Indomethacin	33 %	**Phenobarbital**	108 %
Tolmetin	73 %	**Trimipramine**	92 %
Hexobarbital	80 %	**Amitriptyline**	94 %
Naproxen	85 %	**Imipramine**	95 %
Suprofen	108 %	**Doxepin**	101 %

Ropinirole & Amitriptyline Detection in Human Plasma

CARTRIDGE	Silia*Prep* CleanDRUG 3 mL / 500 mg Part Number: SPEC-R651230B-03P
SAMPLE PRETREATMENT	Mix 0.1 mL of plasma with 0.1 mL of Methanol and Water (*50:50*) and 2 mL of 1 % Acetic Acid
CONDITIONNING STEP	3 mL of Methanol
EQUILIBRATION STEP	3 mL of Water
LOADING STEP	Plasma sample was slowly aspirated through the cartridge
WASHING STEP	3 mL of Water then 3 mL of Methanol
ELUTION STEP	3 mL of 5 % Ammonium Hydroxide in Methanol
FURTHER TREATMENT	Evaporation under Nitrogen, reconstitution with Acetonitrile / Water and quantification by LC/MS
RECOVERY	at 10 ng/mL

Ropinirole	94 %
Amitriptyline	90 %

Extraction of Pharmaceutical Drugs from Serum

CARTRIDGE	Silia*PrepX* SAX 6 mL / 200 mg Part Number: SPE-P0010-06G
SAMPLE PRETREATMENT	pH of serum sample was adjusted to basic value with Sodium Hydroxide 1 N
CONDITIONNING STEP	6 mL of Methanol
EQUILIBRATION STEP	6 mL of Water
LOADING STEP	Treated sample was slowly aspirated through the cartridge
WASHING STEP	6 mL of Water, dry the cartridge
ELUTION STEP	2 x 3 mL of Methanol (*basic analytes*) and 2 x 3 mL of Formic Acid 10 % in Methanol (*acidic analytes*)
FURTHER TREATMENT	Evaporation under Nitrogen, reconstitution with Methanol / Water and quantification by LC/MS
RECOVERY	at 1 µg/mL

Nortriptyline	69 %	**Imipramine**	80 %
Doxepine	72 %	**Tolmetin**	85 %
Trimipramine	73 %	**Naproxen**	86 %
Protriptyline	75 %	**Suprofen**	96 %
Amitriptyline	78 %		

Extraction of Tricyclic Antidepressants from Serum

CARTRIDGE	Silia*PrepX* DVB 6 mL / 200 mg Part Number: SPE-P0001-06G
CONDITIONNING STEP	5 mL of Methanol
EQUILIBRATION STEP	5 mL of Water
LOADING STEP	1 mL of serum sample (*pH value adjusted with 25 µL of Phosphoric Acid*) was slowly aspirated through the cartridge
WASHING STEP	5 mL of Water, dry the cartridge
ELUTION STEP	2 x 3 mL of Methanol
FURTHER TREATMENT	Quantification by LC/MS
RECOVERY	

Protriptyline	80 %
Nortriptyline	75 %
Doxepine	91 %
Imipramine	88 %
Amitriptyline	88 %
Trimipramine	88 %

Extraction of Barbiturates from Serum

CARTRIDGE	Silia*PrepX* DVB 6 mL / 200 mg Part Number: SPE-P0001-06G
CONDITIONNING STEP	6 mL of Methanol
EQUILIBRATION STEP	6 mL of Water
LOADING STEP	1 mL of serum sample was slowly aspirated through the cartridge
WASHING STEP	6 mL of Water, dry the cartridge
ELUTION STEP	6 x 1 mL of Methanol
FURTHER TREATMENT	Evaporation under Nitrogen, reconstitution with Acetonitrile / water and quantification by LC/MS
RECOVERY	at 100 ng/ml

Phenobarbital	99 %
Pentobarbital	69 %
Hexobarbital	86 %

Extraction of Antibacterial Drugs from Serum

CARTRIDGE	Silia*PrepX* DVB 6 mL / 200 mg Part Number: SPE-P0001-06G
SAMPLE PRETREATMENT	Mix 0.1 mL of plasma with 2 mL of 1 % Acetic Acid
CONDITIONNING STEP	6 mL of Methanol
EQUILIBRATION STEP	6 mL of Water
LOADING STEP	1 mL of serum sample was slowly aspirated through the cartridge
WASHING STEP	6 mL of Water, dry the cartridge
ELUTION STEP	2 x 3 mL of Methanol
FURTHER TREATMENT	Evaporation under Nitrogen, reconstitution with Acetonitrile / Water and quantification by LC/MS
RECOVERY	

Cinoxacin	100 %
Penicillin G	94 %
Penicillin V	90 %
Cloxacillin	88 %

Sibutramine Detection in Human Plasma

CARTRIDGE	Silia*Prep* CleanDRUG 3 mL / 500 mg Part Number: SPEC-R651230B-03P
SAMPLE PRETREATMENT	Mix 0.1 mL of plasma with 2 mL of 1 % Acetic Acid
CONDITIONNING STEP	3 mL of Methanol
EQUILIBRATION STEP	3 mL of Water
LOADING STEP	Plasma sample was slowly aspirated through the cartridge
WASHING STEP	3 mL of Water then 3 mL of Methanol
ELUTION STEP	3 mL of 5 % Ammonium Hydroxide in Methanol
FURTHER TREATMENT	Evaporation under Nitrogen, reconstitution with Methanol / Water and quantification by LC/MS
RECOVERY	at 5 ng/mL: 82 %

Extraction of Acidic Pharmaceuticals from Serum

CARTRIDGE	Silia*PrepX* SAX 6 mL / 200 mg Part Number: SPE-P0010-06G
SAMPLE PRETREATMENT	pH of serum sample was adjusted to basic value with Sodium Hydroxide 1 N
CONDITIONNING STEP	6 mL of Methanol
EQUILIBRATION STEP	6 mL of Water
LOADING STEP	Treated sample was slowly aspirated through the cartridge
WASHING STEP	6 mL of Water, then 6 mL of Sodium Hydroxide 0.1 N and 6 mL of Methanol, dry the cartridge
ELUTION STEP	6 mL of 1 % Formic Acid in Methanol
FURTHER TREATMENT	Evaporation under Nitrogen, reconstitution with Methanol / Water and quantification by LC/MS

RECOVERY at 1 µg/mL

Carprofen	69 %	**Diclofenac**	95 %
Ibuprofen	88 %	**Fenoprofen**	98 %
Ketoprofen	90 %	**Fenoprop**	104 %
Meclofenamic Acid	92 %	**Flurbiprofen**	106 %

Extraction of Anti-inflammatory Drugs From Serum

CARTRIDGE	Silia*PrepX* DVB 6 mL / 200 mg Part Number: SPE-P0001-06G
CONDITIONNING STEP	6 mL of Methanol
EQUILIBRATION STEP	6 mL of Water
LOADING STEP	1 mL of serum sample (*pH value adjusted with 25 µL of Phosphoric Acid*) was slowly aspirated through the cartridge
WASHING STEP	6 mL of 5 % Metanol in Water, dry the cartridge
ELUTION STEP	2 x 3 mL of Methanol
FURTHER TREATMENT	Evaporation under Nitrogen, reconstitution with Acetonitrile / Water and quantification by LC/MS

RECOVERY

Suprofen	89 %	**Naproxen**	87 %
Tolmetin	89 %	**Flurbiprofen**	87 %
Sulindac	84 %	**Indomethazin**	85 %
Piroxicam	86 %	**Acetyl Salicylic Acid**	72 %

Determination of Clenbuterol in Human Plasma

CARTRIDGE	Silia*Prep* CleanDRUG 1 mL / 100 mg Part Number: SPEC-R651230B-01C
SAMPLE PRETREATMENT	50 µL of internal standard (*Clenbuterol-d9 at 20 ng/mL in Methanol*) was added to 500 µL of plasma and 500 µL of Sodium Acetate (*100 mM, pH 6.0*)
CONDITIONNING STEP	1 mL of Methanol
EQUILIBRATION STEP	1 mL of Water and 1 mL of Sodium Acetate (*100 mM, pH 6.0*)
LOADING STEP	Plasma sample was slowly aspirated through the cartridge
WASHING STEP	1 mL of Water, then 1 mL of Acetic Acid 1 M and 2 x 1 mL of Methanol
ELUTION STEP	1 mL of Ethyl Acetate / Isopropanol / Ammonium Hydroxide (*78:20:2*)
FURTHER TREATMENT	Evaporation under Nitrogen, reconstitution with Methanol / Water and quantification by LDTD/MS/MS (*collaboration with Phytronix*)
RECOVERY	at 100 pg/mL: 94 %

Extraction of Atenolol from Human Urine

CARTRIDGE	Silia*PrepX* WCX 3 mL / 60 mg Part Number: SPE-P0015-03BB
SAMPLE PRETREATMENT	9 mL of urine was mixed with 1 mL of a solution of Atenolol in Methanol / Water (*10:90*)
CONDITIONNING STEP	2 mL of Methanol
EQUILIBRATION STEP	2 mL of Water
LOADING STEP	1 mL of sample solution was slowly aspirated through the cartridge
WASHING STEP	2 mL of Monopotassium Phosphate 25 mM (*pH 5.0*) then 2 mL of Methanol, dry the cartridge
ELUTION STEP	2 mL of 2 % Formic Acid in Methanol
FURTHER TREATMENT	Evaporation under Nitrogen, reconstitution with Acetonitrile / Water and quantification by LC/MS
RECOVERY	at 10 µg/mL: 90 %

Determination of Testosterone in Human Urine

CARTRIDGE	Mini-Silia*Prep* C18 WPD 500 mg Part Number: SPS-R33229G-P
CONDITIONNING STEP	5 mL of Methanol
EQUILIBRATION STEP	5 mL of Water
LOADING STEP	2mL of urine sample was slowly aspirated through the cartridge
WASHING STEP	5 mL of Water then 5 mL of Hexane
ELUTION STEP	5 mL of Methanol
FURTHER TREATMENT	Evaporation under Nitrogen, derivatization using Girard-P and quantification by LC/MS/MS
RECOVERY	at 250 ng/mL: 95 %

Extraction of Steroids from Serum

CARTRIDGE	Silia*PrepX* DVB 6 mL / 200 mg Part Number: SPE-P0001-06G	
CONDITIONNING STEP	5 mL of Methanol	
EQUILIBRATION STEP	5 mL of Water	
LOADING STEP	1 mL of serum sample was slowly aspirated through the cartridge	
WASHING STEP	5 mL of 5 % Metanol in Water, dry the cartridge	
ELUTION STEP	2 x 3 mL of Methanol	
FURTHER TREATMENT	Evaporation under Nitrogen, reconstitution with Acetonitrile / Water and quantification by LC/MS	
RECOVERY	**Methyl-6a-hydroxy-11ß-progesterone**	89 %
	Methyl-6a-hydroxy-17a-progesterone	86 %
	Methyl-6a-hydroxy-17a-progesterone acetate	84 %
	Hydrocortisone-21-acetate	31 %

Isolation of Synthetic Cannabinoid Metabolites from Urine

CARTRIDGE
SiliaPrep CleanDRUG 1 mL / 30 mg
Part Number: SPEC-R651230B-03G

SAMPLE PRETREATMENT
1 mL of synthetic urine was spiked with the metabolites and deuterated internal standard, then diluted with 2 mL of a Phosphate buffer solution (*pH 6.0*)

CONDITIONNING STEP
3 mL of Methanol

EQUILIBRATION STEP
3 mL of Water and 1 mL of Phosphate buffer

LOADING STEP
Urine sample was slowly aspirated through the cartridge

WASHING STEP
3 mL of Water then 3 mL of Phosphate buffer / Acetonitrile (*80:20*)

ELUTION STEP
6 mL of Ethyl Acetate / Methanol (*90:10*)

FURTHER TREATMENT
Evaporation under Nitrogen, derivatization using BSTFA and TMCS, and quantification by GC/MS

RECOVERY

at 1,000 ng/mL	SiliaPrepX Clean DRUG	Bond Elut® Certify II	HyperSep™ Verify AX	Clean Screen® CSTHC
JWH-018	102 %	109 %	112 %	97 %
JWH-122	96 %	72 %	111 %	80 %
JWH-250	101 %	71 %	118 %	89 %

CONCLUSION
Our SiliaPrep CleanDRUG performs as well as competitive products to extract cannabinoid metabolites from urine.

Source: Thesis *"An Evaluation of Commercially Available Solid Phase Extraction Cartridges for the Isolation of Synthetic Cannabinoid Metabolites from urine"*, by Amanda Marie Forni, B.S., Ohio University, **2011**

Detection of Δ^9-Tetrahydrocannabinol in Human Plasma

CARTRIDGE
SiliaPrep CleanENVI 3 mL / 500 mg
Part Number: SPEC-R31930B-03P

SAMPLE PRETREATMENT
250 µL of plasma was added to 1 mL Phosphate buffer (*0.1 M, pH 6.0*)

CONDITIONNING STEP
3 mL of Methanol, then 3 mL of Hydrochloric Acid 1 M and 3 mL of Water

EQUILIBRATION STEP
5 mL of Water

LOADING STEP
Plasma sample was slowly aspirated through the cartridge

WASHING STEP
2 mL of Water, then 1 mL of Acetic Acid 1 M and 2 mL of 20 % Methanol in Water

ELUTION STEP
5 mL of Methanol

FURTHER TREATMENT
Evaporation under Nitrogen, derivatization using Dansyl Chloride, liquid-liquid extraction, centrifugation, evaporation under Nitrogen, reconstitution with Formic Acid / Acetone and quantification by LC/MS

RECOVERY

at 2 ng/mL	
THC	80 %
THC-COOH	99 %
THC-OH	92 %

Extraction of Phencyclidine (*PCP*) from Human Urine

CARTRIDGE	Silia*PrepX* HLB 1 mL / 30 mg Part Number: SPE-P0002-01AA
SAMPLE PRETREATMENT	40 µL of internal standard (*PCP-d5 at 200 ng/mL in Methanol*) was added to 200 µL of urine sample and 200 µL of Ammonium Hydroxide 4 %
CONDITIONNING STEP	1 mL of Methanol
EQUILIBRATION STEP	1 mL of Ammonium Hydroxide 2 %
LOADING STEP	Urine sample was slowly aspirated through the cartridge
WASHING STEP	1 mL of Methanol / Ammonium Hydroxide 2 % (*50:50*) then 1 mL of Methanol / Ammonium Hydroxide 2 % (*80:20*)
ELUTION STEP	1 mL of Methanol / Hydrochloric Acid 0.02 N (*80:20*)
FURTHER TREATMENT	Quantification by LDTD/MS/MS (*collaboration with Phytronix*)
RECOVERY	at 25 ng/mL: 99 %

Drugs of Abuse Determination in Human Urine

CARTRIDGE	Silia*Prep* CleanDRUG 3 mL / 200 mg Part Number: SPEC-R651230B-03G
SAMPLE PRETREATMENT	0.5 mL of urine sample was mixed with 2.5 mL Sulfuric Acid 0.1 M
CONDITIONNING STEP	3 mL of Methanol
EQUILIBRATION STEP	3 mL of Sulfuric Acid 0.1 M
LOADING STEP	2 mL of urine sample was slowly aspirated through the cartridge
WASHING STEP	3 mL of Phosphate buffer (*pH 7.0*), then 3 mL of Sulfuric Acid 0.1 M and 3 mL of Methanol
ELUTION STEP	2 x 3 mL of Ammonium Hydroxide (*5 % in Methanol*)
FURTHER TREATMENT	Evaporation under Nitrogen, reconstitution with Water / Methanol and quantification by LC/MS
RECOVERY	at 25 ng/mL

MDMA	92 %
MDEA	89 %
Amphetamine	82 %

Amphetamine Quantification in Human Urine

CARTRIDGE	Silia*PrepX* HLB 3 mL / 60 mg Part Number: SPE-P0002-03BB
SAMPLE PRETREATMENT	100 µL of TFA was added to 10 mL of urine
CONDITIONNING STEP	3 mL of Methanol
EQUILIBRATION STEP	3 mL of Water
LOADING STEP	1 mL of urine sample was slowly aspirated through the cartridge
WASHING STEP	3 mL of (*5:95*) Methanol / Water with 2 % Ammonium Hydroxide; then 3 mL of (*20:80*) Methanol / Water with 2 % Ammonium Hydroxide and 1 mL of (*80:20*) Methanol / Water
ELUTION STEP	3 mL of Methanol then 3 mL of 2 % Formic Acid in Methanol
FURTHER TREATMENT	Evaporation under Nitrogen, reconstitution with Methanol / Water (*70:30*) and quantification by LC/MS

RECOVERY

at 100 ng/mL	Silia*PrepX* HLB	Bond Elut® Plexa	Oasis® HLB	Strata™-X
Amphetamine	91 %	88 %	75 %	87 %
MDA	86 %	86 %	91 %	98 %
MDEA	95 %	97 %	90 %	101 %
MDMA	92 %	94 %	91 %	101 %
Methamphetamine	92 %	95 %	86 %	101 %
Phentermine	99 %	93 %	90 %	97 %

CONCLUSION: Silia*PrepX* HLB allows to extract amphetamines from urine with recoveries as good as competitive products.

FORENSICS APPLICATIONS

Extraction of Camphorsulfonic Acid from Serum

CARTRIDGE	Silia*PrepX* WAX 3 mL / 60 mg Part Number: SPE-P0020-03BB
SAMPLE PRETREATMENT	5 mL of serum was mixed with 5 µL of a solution of Camphorsulfonic Acid (*0.5 mg/mL*) and 5 mL of Phosphoric Acid 4 %
CONDITIONNING STEP	2 mL of Methanol
EQUILIBRATION STEP	2 mL of Water
LOADING STEP	2 mL of sample solution was slowly aspirated through the cartridge
WASHING STEP	2 mL of 2 % Formic Acid in Water then 2 mL of Methanol, dry the cartridge
ELUTION STEP	2 mL of 5 % Ammonia in Methanol
FURTHER TREATMENT	Evaporation under Nitrogen, reconstitution with Acetonitrile / Water and quantification by LC/MS
RECOVERY	at 0.25 µg/mL: 99 %

Extraction of Alkaloids from Serum

CARTRIDGE	Silia*PrepX* DVB 6 mL / 200 mg Part Number: SPE-P0001-06G
CONDITIONNING STEP	6 mL of Methanol
EQUILIBRATION STEP	6 mL of Water
LOADING STEP	1 mL of serum sample was slowly aspirated through the cartridge
WASHING STEP	6 mL of Methanol, dry the cartridge
ELUTION STEP	2 x 3 mL of Acetone
FURTHER TREATMENT	Evaporation under Nitrogen, reconstitution with Acetonitrile / Water and quantification by LC/MS

RECOVERY

at 2 µg/mL	
Atropine	99 %
Papaverine	97 %
Noscapine	95 %
Strychnine	94 %
Quinine	60 %

Extraction of Caffeine, Cotinine & Nicotine from Human Urine

CARTRIDGE	Silia*PrepX* HLB 3 mL / 60 mg Part Number: SPE-P0002-03BB
SAMPLE PRETREATMENT	500 µL of urine was mixed with 1.5 mL of Sodium Hydroxide 0.1 M
CONDITIONNING STEP	3 mL of Methanol
EQUILIBRATION STEP	3 mL of Water
LOADING STEP	1 mL of urine sample was slowly aspirated through the cartridge
WASHING STEP	3 mL of Water and dry the cartridge
ELUTION STEP	3 mL of Methanol
FURTHER TREATMENT	Evaporation under Nitrogen, reconstitution with Methanol / Water and quantification by LC/MS

RECOVERY

at 100 ng/mL	Silia*PrepX* HLB	Bond Elut® Plexa	Oasis® HLB	Strata™-X
Caffeine	97 %	99 %	96 %	97 %
Cotinine	99 %	100 %	98 %	99 %
Nicotine	89 %	86 %	90 %	89 %

CONCLUSION

Silia*PrepX* HLB is as efficient as competitive products to extract caffeine, cotinine and nicotine from urine.

Extraction of Fungicides in Apple Juice

CARTRIDGE	Silia*PrepX* SCX 6 mL / 200 mg Part Number: SPE-P0005-06G
SAMPLE PRETREATMENT	0.5 mL of Sodium Hydroxide 0.1 N was added to 5 mL of apple juice
CONDITIONNING STEP	6 mL of Methanol
EQUILIBRATION STEP	6 mL of Ammonia 2 %
LOADING STEP	Treated sample was slowly aspirated through the cartridge
WASHING STEP	3 mL of Ammonia 2 %, 3 mL of 30 % Methanol in Ammonia 5 %, 3 mL of Hydrochloric Acid 0.1 N and 3 mL of Methanol, dry the cartridge
ELUTION STEP	6 mL of 30 % Methanol in Ammonia 5 %
FURTHER TREATMENT	Evaporation under Nitrogen, reconstitution with Water / Methanol and quantification by LC/MS
RECOVERY	at 1 µg/mL

Carbendazime	89 %
Thiabendazole	92 %

Extraction of Patulin from Apple Juice

CARTRIDGE	Silia*PrepX* HLB 3 mL / 60 mg Part Number: SPE-P0002-03BB
SAMPLE PRETREATMENT	100 µL of internal standard (*250 µg/mL of Patulin-13C (3) in water*) and 75 µL of Pectinase Aspergillus Aculeatus were added to 9 mL of apple juice, centrifugate at 3,000 rpm
CONDITIONNING STEP	3 mL of Methanol
EQUILIBRATION STEP	3 mL of Water
LOADING STEP	2 mL of sample supernatant was slowly aspirated through the cartridge
WASHING STEP	3 mL of 1 % Sodium Bicarbonate and 1 mL of 0.1 % Acetic Acid, dry the cartridge
ELUTION STEP	2 x 1.5 mL of Ethyl Acetate
FURTHER TREATMENT	Evaporation under Nitrogen, reconstitution with Acetonitrile / Water and quantification by LC/MS
RECOVERY	at 150 ng/kg: 85 %

Determination of Carbendazim in Orange Juice

CARTRIDGE	Silia*PrepX* SCX 3 mL / 60 mg Part Number: SPE-P0005-03BB
SAMPLE PRETREATMENT	Centrifugate 5 mL of orange juice 5 min at 3,000 rpm. Sample 1 mL of the supernatant. Add 2 mL of Acetic Acid 10 % and vortex 1 min
CONDITIONNING STEP	3 mL of Methanol
EQUILIBRATION STEP	3 mL of Acetic Acid 10 %
LOADING STEP	3 mL of the treated sample was slowly aspirated through the cartridge
WASHING STEP	2 mL of Acetic Acid 10 % then 2 mL of Methanol
ELUTION STEP	3 mL of 5 % Ammonium Hydroxide in Methanol
FURTHER TREATMENT	Evaporation under Nitrogen, reconstitution with Water / Methanol and quantification by LC/MS
RECOVERY	at 100 ng/mL

Silia*PrepX* SCX	93 %
Bond Elut® Plexa PCX	92 %
Oasis® MCX	92 %
Strata™-X-C	91 %

CONCLUSION	Silia*PrepX* SCX performs as well as Waters, Phenomenex & Agilent products to extract carbendazim from orange juice.

FOOD APPLICATIONS

Enrichment of Streptomycin in Honey

CARTRIDGE	Silia*PrepX* DVB 6 mL / 200 mg Part Number: SPE-P0001-06G
SAMPLE PRETREATMENT	Add 2 g of honey to 8 mL of phosphate buffer (*pH 2.0*), filter, dilute to 16 mL (*with the same phosphate buffer*) and adjust pH value to 7.5
CONDITIONNING STEP	5 mL of Methanol
EQUILIBRATION STEP	3 mL of Water
LOADING STEP	Treated sample was slowly aspirated through the cartridge
WASHING STEP	5 mL of Water, dry the cartridge
ELUTION STEP	5 mL of 3 % Formic Acid in Methanol
FURTHER TREATMENT	Evaporation under Nitrogen, reconstitution with Water / Acetonitrile and identification by LC/UV
RECOVERY	at 10 µg/kg: 30 %

Extraction of Melamine from Milk

CARTRIDGE	Silia*PrepX* SCX 6 mL / 200 mg Part Number: SPE-P0005-06G
SAMPLE PRETREATMENT	1 mL of Hydrochloric Acid 1 N was added to 10 mL of milk sample, then mixed with 10 mL of Methylene Chloride. After 15 min centrifugation, remove aqueous layer and extract again organic layer 2 times with 5 mL of Hydrochloric Acid 0.1N. Combine the 3 aqueous fractions.
CONDITIONNING STEP	6 mL of Methanol
EQUILIBRATION STEP	6 mL of Water
LOADING STEP	Combined aqueous fractions were slowly aspirated through the cartridge
WASHING STEP	6 mL of Hydrochloric Acid 0.1 N then 6 mL of Methanol, dry the cartridge
ELUTION STEP	2 x 6 mL of 30 % Methanol in Ammonia 5 %
FURTHER TREATMENT	Evaporation under Nitrogen, reconstitution with Water / Methanol and quantification by LC/MS
RECOVERY	at 1 µg/mL: 99 %

Sulfonamides, Tetracyclines & Pyrimethamine Determination in Milk

CARTRIDGES	Silia*PrepX* HLB 3 mL / 60 mg Part Number: SPE-P0002-03BB OR Silia*PrepX* DVB 3 mL / 60 mg Part Number: SPE-P0001-03BB
SAMPLE PRETREATMENT	Vortex 2 min 600 µL of bovine milk with 250 µL of 20 % Trichloroacetic Acid in Water. Add 2.5 mL of McIlvain buffer (*vortex 3 min*). Adjust pH of the solution at 5.5 with 1 M Sodium Hydroxide. Centrifugate at 3,000 rpm for 5 min.
CONDITIONNING STEP	3 mL of Methanol
EQUILIBRATION STEP	3 mL of Water
LOADING STEP	1 mL of the treated sample was slowly aspirated through the cartridge
WASHING STEP	2 x 3 mL of 10 % Methanol in Ammonium Acetate buffer (*pH 5.5*), dry the cartridge
ELUTION STEP	3 mL of Methanol
FURTHER TREATMENT	Evaporation under Nitrogen, reconstitution with Methanol / Water and quantification by LC/MS

RECOVERY

at 1,000 pg/mL	Silia*PrepX* HLB	Silia*PrepX* DVB	Bond Elut® Plexa	Oasis® HLB	Strata®-X
Sulfathiazol	84 %	83 %	85 %	83 %	86 %
Sulfadiazine	90 %	89 %	88 %	87 %	85 %
Sulfamethoxypyridazine	87 %	89 %	85 %	83 %	87 %
Sulfamethazole	88 %	84 %	87 %	89 %	82 %
Sulfamethazine	83 %	84 %	86 %	86 %	84 %
Pyrimethamine	90 %	90 %	91 %	89 %	86 %
Tetracycline	96 %	96 %	95 %	84 %	88 %
Oxytetracycline	96 %	96 %	93 %	80 %	87 %

CONCLUSION: Silia*PrepX* HLB and DVB are both equivalent to competitive products to extract sulfonamides, tetracyclines and pyrimethamine from milk.

Extraction of Marbofloxacin & Sarafloxacin from Salmon

CARTRIDGE	Silia*PrepX* SCX 3 mL / 60 mg Part Number: SPE-P0005-03BB
SAMPLE PRETREATMENT	Add 2 g of salmon and 15 mL of 3 % H_3PO_4 aqueous solution in a 50 mL tube. Shake the tube in a horizontal position for 15 min. Add 5 mL of hexane and vortex for 2 min. Centrifugate at 3,000 rpm for 5 min. Recuperate the aqueous phase from the gelled organic phase by filtration.
CONDITIONNING STEP	3 mL of Methanol
EQUILIBRATION STEP	3 mL of Hydrochloric Acid 1 M and 3 mL of water
LOADING STEP	3 mL of the filtered sample was slowly aspirated through the cartridge
WASHING STEP	2 mL of Hydrochloric Acid 2 M then 1 mL of Methanol
ELUTION STEP	3 mL of 10 % Ammonium Hydroxide in Methanol
FURTHER TREATMENT	Evaporation under Nitrogen, reconstitution with Water / Methanol and quantification by LC/MS
RECOVERY	at 50 ppb

Marbofloxacin	97 %
Sarafloxacin	87 %

Extraction of Clenbuterol and Ractopamine from Beef

CARTRIDGE	Silia*PrepX* WCX 3 mL / 60 mg Part Number: SPE-P0015-03BB
SAMPLE PRETREATMENT	100 µL of internal standard (*250 µg/mL of Ractopamine d-6 and 250 µg/mL of Clenbuterol-d9 in Methanol*) were added to 1g of chopped beef. Add 5 mL of 0.2 N Sodium Acetate (*pH 5.2*) and 50 µL of Beta-Glucuronidase / Arylsufatase. Add 2.5 mL of 0.1 M Perchloric Acid, 2 mL of Phosphoric Acid 4 % in Acetonitrile and 5 mL of 0.5 M Glycine (*pH 10.5*). Adjust to pH 10.5. Add 10 mL of Acetonitrile, 4 g of $MgSO_4$ and 1 g of NaCl. Evaporation and reconstitution with 0.1 M Perchloric Acid.
CONDITIONNING STEP	3 mL of Methanol
EQUILIBRATION STEP	3 mL of Water
LOADING STEP	2 mL of treated sample was slowly spirated through the cartridge
WASHING STEP	1.5 mL of Phosphate buffer 25 mM (*pH 7.0*), then 3 mL of Water and 1 mL of Methanol
ELUTION STEP	3 mL of Formic Acid 2 % in Methanol
FURTHER TREATMENT	Evaporation under Nitrogen, reconstitution with Methanol / Water and quantification by LC/MS
RECOVERY	at 70 ppb

Clenbuterol	92 %
Ractopamine	91 %

Extraction of Glycoalkaloids from Potatoes

CARTRIDGE	Silia*PrepX* DVB 6 mL / 200 mg Part Number: SPE-P0001-06G
SAMPLE PRETREATMENT	Extract 3 g of potato powder with 20 mL of Water / Acetic Acid / Sodium Metabisulfite (*95:5:0.5*). Centrifugate for 10 min and filtrer.
CONDITIONNING STEP	5 mL of Acetonitrile
EQUILIBRATION STEP	5 mL of Water / Acetic Acid / Sodium Metabisulfite (*95:5:0.5*)
LOADING STEP	10 mL of treated sample was slowly aspirated through the cartridge
WASHING STEP	4 mL of 0.5 % Ammonium Hydroxide, then 4 mL of Water and 4 mL of Acetonitrile / Water (*15:85*). Dry the cartridge.
ELUTION STEP	5 mL of Acetonitrile / Potassium Dihydrogen Phosphate 10 mM (*60:40*), pH 7.6
FURTHER TREATMENT	Qualitative analysis by TLC

Acrylamide Determination in Fried Potato Chips

CARTRIDGES	Step 1: Silia*PrepX* HLB 6 mL / 200 mg Part Number: SPE-P0002-06G Step 2: Silia*PrepX* SCX 3 mL / 60 mg Part Number: SPE-P0005-03BB
SAMPLE PRETREATMENT	Extraction 1: vortex for 1 min 1g of potato chips and 8 mL of Sodium Chloride aqueous 4 M. Incubate 30 min at 60°C (*vortex 10 sec every 10 min*). Centrifugate for 10 min at 4,500 rpm and collect the supernatant. Extraction 2: repeat previous 3 steps with same potato chips. Add 1 mL of solution Cirraz 1 (*15 g of $K_3[Fe(CN)_6]$ in 100 mL Water*) and 1 mL of solution Cirraz 2 (*30 g of $Zn(O_2CCH_3)_2$ in 100 mL Water*).
CONDITIONNING STEP (1) [SILIA*PREPX* HLB]	3 mL of Methanol
EQUILIBRATION STEP (1)	3 mL of Water
LOADING STEP (1)	1.5 mL of the treated sample was slowly aspirated through the cartridge
WASHING STEP (1)	1.5 mL of Water
ELUTION STEP (1)	3 mL of Methanol
CONDITIONNING STEP (2) [SILIA*PREPX* SCX]	3 mL of Methanol
LOADING STEP (2)	The treated sample eluted from Silia*PrepX* HLB was slowly aspirated through the cartridge (*collect this fraction*)
WASHING STEP (2)	1 mL of Methanol (*mix this fraction with the one previously collected*)
FURTHER TREATMENT	Evaporation to dryness, reconstitution with Water / Methanol and quantification by LC/MS
RECOVERY	at 100 µg/kg: 88 %

Determination of Pesticides in Drinking Water

CARTRIDGE
Silia*PrepX* HLB 6 mL / 200 mg
Part Number: SPE-P0002-06G

CONDITIONNING STEP
6 mL of Methanol

EQUILIBRATION STEP
6 mL of Water (*HPLC grade*)

LOADING STEP
100 mL of drinking water was slowly aspirated through the cartridge

WASHING STEP
6 mL of Water (*HPLC grade*)

ELUTION STEP
2 x 6 mL of Methanol

FURTHER TREATMENT
Evaporation under Nitrogen, reconstitution with Methanol and quantification by LC/MS

RECOVERY

at 1,000 pg/mL	Atrazine	Benalaxyl	Carbendazim	Chloroxuron	Imazalil
Silia*PrepX* HLB	75 %	76 %	103 %	91 %	78 %
Oasis® HLB	66 %	48 %	103 %	99 %	78 %

	Methalaxyl	Myclobutanil	Propoxur	Simazine	Thiambazole
Silia*PrepX* HLB	87 %	91 %	70 %	98 %	91 %
Oasis® HLB	61 %	101 %	42 %	79 %	80 %

CONCLUSION
Silia*PrepX* HLB compares favorably with Oasis® HLB for the extraction of 8 pesticides out of 10.

Pesticides Determination in Drinking Water

CARTRIDGE
Silia*Prep* CleanENVI 6 mL / 1 g
Part Number: SPEC-R31930B-06S

CONDITIONNING STEP
10 mL of Methanol

EQUILIBRATION STEP
10 mL of Water (*HPLC grade*)

LOADING STEP
10 mL of drinking water was slowly aspirated through the cartridge

WASHING STEP
2 x 5 mL of Water (*HPLC grade*)

ELUTION STEP
2 x 3 mL of Acetone

FURTHER TREATMENT
Evaporation under Nitrogen, reconstitution with Water / Methanol and quantification by LC/MS

RECOVERY

at 50 ng/mL	
Atrazine	84 %
Simazine	95 %
Alachlor	68 %

Pesticides Determination in Water

CARTRIDGE
Silia*PrepX* LRV SAX 10 mL / 60 mg
Part Number: SPC-P0010-10BB

CONDITIONNING STEP
3 mL of Methanol

EQUILIBRATION STEP
3 mL of Water (*HPLC grade*)

LOADING STEP
100 mL of sample water was slowly aspirated through the cartridge

WASHING STEP
3 mL of Water (*HPLC grade*)

ELUTION STEP
3 mL of Methanol then 3 mL of Methanol with Formic Acid 2 %

FURTHER TREATMENT
Quantification by LC/MS/MS

RECOVERY
at 1,000 pg/mL: > 80 % for 23 pesticides

ENVIRONMENT APPLICATIONS

Glyphosate & AMPA Determination in Water

CARTRIDGE	SiliaPrepX HLB 3 mL / 60 mg Part Number: SPE-P0002-03BB
SAMPLE PRETREATMENT	Derivatization with FMOC-Cl: to 5 mL of sample water was added 325 µL of Sodium Borate 50 mM, 200 µL of EDTA 0.1 M, 4.5 mL of Acetonitrile and 0.6 mL of FMOC-Cl 50 mg/mL. Evaporate. Aqueous supernatant was mixed with 2 mL Ethyl Acetate. Adjust pH of the aqeous layer to 3 by adding 100 µL of Formic Acid 5 %.
CONDITIONNING STEP	3 mL of Methanol
EQUILIBRATION STEP	3 mL of Water and 3 mL of Formic Acid 0.1 %
LOADING STEP	Derivatized sample was slowly aspirated through the cartridge
WASHING STEP	1 mL of Formic Acid 0.1 % then 2 x 500 µL of Water, dry the cartridge
ELUTION STEP	3 mL of Methanol
FURTHER TREATMENT	Evaporation under Nitrogen, reconstitution with Water / Acetonitrile and quantification by LC/MS/MS
RECOVERY	at 5 ng/mL

Glyphosate	120 %
AMPA	106 %

Diquat & Paraquat Determination in Water

CARTRIDGE	SiliaPrepX WCX 3 mL / 60 mg Part Number: SPE-P0015-03BB
CONDITIONNING STEP	3 mL of Methanol
EQUILIBRATION STEP	3 mL of Water
LOADING STEP	100 mL of sample water was slowly aspirated through the cartridge
WASHING STEP	3 mL of Water then 3 mL of Methanol
ELUTION STEP	2 x 3 mL of Acetonitrile / Isopropanol / Formic Acid (*40:40:20*)
FURTHER TREATMENT	Quantification by LC/MS/MS
RECOVERY	at 10 ppb

Diquat	90 %
Paraquat	90 %

Determination of Pesticides in Water (*by GC/ECD*)

CARTRIDGE	SiliaPrepX HLB 3 mL / 60 mg Part Number: SPE-P0002-03BB
CONDITIONNING STEP	3 mL of 30 % Acetone in Toluene then 3 mL of Methanol
EQUILIBRATION STEP	3 mL of distilled Water
LOADING STEP	100 mL of sample water was slowly aspirated through the cartridge
WASHING STEP	3 mL of distilled Water, dry the cartridge
ELUTION STEP	500 µL of Acetone, then 2 mL of 30 % Acetone in Toluene and 2.5 mL of 30 % Acetone in Toluene
FURTHER TREATMENT	Qualification by GC/ECD
RECOVERY	

Trifluralin	90 %	**Endrin**	95 %
Lindane	88 %	**4,4'-DDT**	75 %
Aldrin	78 %	**Diclofop-methyl**	90 %
Heptachlor Epoxide	88 %	**Methoxychlor**	86 %
Dieldrin	90 %	**Chlordane**	79 %

Extraction of Desphenyl Chloridazon from Water

CARTRIDGE	Silia*PrepX* SAX 3 mL / 60 mg Part Number: SPE-P0010-03BB
SAMPLE PRETREATMENT	100 µL of Ammonium Hydroxide 5 % was added to 1 mL of water sample
CONDITIONNING STEP	1 mL of Methanol
EQUILIBRATION STEP	1 mL of Ammonium Hydroxide 5 %
LOADING STEP	Treated sample was slowly aspirated through the cartridge
WASHING STEP	1 mL of Ammonium Hydroxide 5 % then 1 mL of Methanol
ELUTION STEP	2 x 1 mL of 5 % Formic Acid in Ethyl Acetate
FURTHER TREATMENT	Evaporation under Nitrogen, reconstitution with Acetonitrile / Water and quantification by LC/MS
RECOVERY	at 10 µg/mL: 83 %

Quantification of Acidic Herbicides

CARTRIDGE	Silia*PrepX* SAX 6 mL / 200 mg Part Number: SPE-P0010-06G
SAMPLE PRETREATMENT	pH of sample was adjusted to basic value with Sodium Hydroxide 1 N
CONDITIONNING STEP	6 mL of Methanol
EQUILIBRATION STEP	6 mL of Water
LOADING STEP	Treated sample was slowly aspirated through the cartridge
WASHING STEP	3 mL of Sodium Acetate then 3 mL of Methanol, dry the cartridge
ELUTION STEP	2 x 3 mL of Formic Acid 10 % in Methanol
FURTHER TREATMENT	Evaporation under Nitrogen, reconstitution with Methanol / water and quantification by LC/MS
RECOVERY	at 1 µg/mL

Bentazon	79 %
Dicamba	87 %
2,4-Dichlorophenoxy Acetic Acid	82 %
4-Chloro-2-methylphenoxy Acetic Acid	76 %

Isothiazolinone Biocides in an Aqueous Sample

CARTRIDGE	Silia*PrepX* DVB 6 mL / 200 mg Part Number: SPE-P0001-06G
SAMPLE PRETREATMENT	5 mL of Isothiazolinones standard solution (*1 µg/mL*) are diluted in 50 mL Water and 500 µL Formic Acid. The solution is filled up to 100 mL.
CONDITIONNING STEP	6 mL of Methanol
EQUILIBRATION STEP	6 mL of 0.1 % Formic Acid in Water
LOADING STEP	5 mL of sample was slowly aspirated through the cartridge
WASHING STEP	6 mL 0.1 % Formic Acid in Water, dry the cartridge
ELUTION STEP	3 mL of Methanol then 6 mL of Acetonitrile
FURTHER TREATMENT	Evaporation under Nitrogen, reconstitution with Methanol / Water and quantification by LC/MS
RECOVERY	at 50 ng/L

Methylisothiazolinone	93 %
Chloromethylisothiazolinone	96 %
Benzisothiazolinone	85 %
Butylbenzisothiazolinone	88 %
Octylisothiazolinone	90 %
Dichloroctylisothiazolinone	83 %

ENVIRONMENT APPLICATIONS

Extraction of Bisphenol A, Triclosan & Ethynyl Estradiol from Water

CARTRIDGE	Silia*PrepX* HLB 3 mL / 60 mg Part Number: SPE-P0002-03BB
SAMPLE PRETREATMENT	To 25 mL of sample water was added 250 µL of internal standard (*1 ppb of 17α-Ethynyl Estradiol d-6, 1 ppb of Bisphenol A d-16 and 0.4 ppb of Triclosan d-3 in Methanol*)
CONDITIONNING STEP	3 mL of Methanol
EQUILIBRATION STEP	3 mL of Water and 1 mL of Acetic Acid 100 mM
LOADING STEP	Treated sample was slowly aspirated through the cartridge
WASHING STEP	3 mL of Water, 1 mL of Acetic Acid 100 mM and 2 mL of 20 % Methanol in Water, dry the cartridge
ELUTION STEP	2 x 3 mL of Dichloromethane / Acetone (*50:50*)
FURTHER TREATMENT	Evaporation under Nitrogen, reconstitution with Sodium Carbonate in Water, derivatization with Dansyl Chloride and quantification by LC/MS/MS
RECOVERY	**17α-Ethynyl Estradiol** 93 % **Bisphenol A** 115 % **Triclosan** 98 %

Analysis of Bisphenol A in Bottled Water

CARTRIDGE	Silia*Prep* C18 Plus 6 mL / 200 mg (*glass*) Part Number: SPE-R00830B-06G
SAMPLE PRETREATMENT	100 µL of internal standard (*Bisphenol A-d16 in methanol, 1 µg/mL*) was added to 50 mL of bottled water
CONDITIONNING STEP	3 mL of Methanol
EQUILIBRATION STEP	3 mL of Water (*HPLC grade*) and 1 mL of Acetic Acid 100 mM
LOADING STEP	The whole sample was aspirated through the cartridge using SiliCycle MiniBlock equipment (*2 drops / second*)
WASHING STEP	5 mL of Water (*HPLC grade*), dry the cartridge
ELUTION STEP	3 mL of Methanol
FURTHER TREATMENT	Evaporation to dryness, derivatization using Dansyl Chloride, liquid-liquid extraction, evaporation, reconstitution with Methanol and quantification by LC/MS/MS
RECOVERY	at 3,000 pg/mL: 97 %

Pharmaceutical Drugs Determination in Water

CARTRIDGE
SiliaPrepX HLB (*200 mg*) + SAX (*60 mg*) / 10 mL
Part Number: SPC-P0210-10i

SAMPLE PRETREATMENT
100 mL of sample water was mixed with 5 mL of Sodium Acetate 10 %.
pH was adjusted to 9.5 with a buffer solution (*NH_4Cl 0.5 M and NH_4OH 0.5 M in water*).

CONDITIONNING STEP
6 mL of Methanol

EQUILIBRATION STEP
6 mL of Water and 6 mL of buffer pH 9.5

LOADING STEP
Treated sample was slowly aspirated through the cartridge

WASHING STEP
3 mL of buffer pH 9.5 and 3 mL of Water, dry the cartridge

ELUTION STEP
2 mL of Methanol and 2 mL of Formic Acid 2 % in Methanol

FURTHER TREATMENT
Evaporation under Nitrogen, reconstitution with Water / Acetonitrile and quantification by LC/MS/MS

RECOVERY
at 100 ppt

Trimethroprim	105 %	**Caffeine C13**	96 %
Sulphamethoxazole	100 %	**Acetaminophen**	93 %
Naproxen	100 %	**Norfloxacin**	70 %
Ibuprofen	85 %	**Maprotiline**	79 %
Carbamazepine	102 %		

Determination of Tricyclic Antidepressants in Water

CARTRIDGE
SiliaPrepX DVB 3 mL / 60 mg
Part Number: SPE-P0001-03BB

CONDITIONNING STEP
1 mL of Methanol

EQUILIBRATION STEP
1 mL of Water

LOADING STEP
1 mL of sample was slowly aspirated through the cartridge

WASHING STEP
1 mL of Water

ELUTION STEP
1 mL of Acetonitrile

FURTHER TREATMENT
Quantification by LC/MS

RECOVERY
at 1 µg/mL

Protriptyline	93 %
Nortriptyline	90 %

ENVIRONMENT APPLICATIONS

Determination of Explosives in Well Water

CARTRIDGE: SiliaPrepX DVB 6 mL / 200 mg
Part Number: SPE-P0001-06G

CONDITIONNING STEP: 6 mL of Methanol, 6 mL of Acetonitrile

EQUILIBRATION STEP: 10 mL of Water

LOADING STEP: 1 L of well water (*with 5 g of Sodium Chloride*) was slowly aspirated through the cartridge

WASHING STEP: 10 mL of Water, DO NOT dry the cartridge

ELUTION STEP: 6 of mL Methanol / Acetonitrile (*50:50*)

FURTHER TREATMENT: Evaporation under Nitrogen, reconstitution with Methanol / Water and quantification by LC/MS

RECOVERY: at 1 µg/L

Hexanitrodiphenylamine	96 %	**4-Amino-2,6-dinitrotoluene**	95 %
Diphenylamine	100 %	**2-Amino-4,6-dinitrotoluene**	94 %
Pentaerythritol Tetranitrate	108 %	**2,4,6-Trinitrotoluene**	92 %
3-Nitrotoluene	78 %	**Nitroglycerine**	88 %
4-Nitrotoluene	81 %	**1,3-Dinitrobenzene**	86 %
2-Nitrotoluene	67 %	**1,3,5-Trinitrobenzene**	96 %
2,6-Dinitrotoluene	94 %	**Ethylene Glycol Dinitrate**	95 %
2,4-dinitrotoluene	85 %	**Picric Acid**	92 %
Octogen	94 %	**Diethylene Glycol Dinitrate**	74 %

Determination of Surfactants in Water

CARTRIDGE: SiliaPrepX WAX 3 mL / 60 mg
Part Number: SPE-P0020-03BB

CONDITIONNING STEP: 2 mL of 5 % Ammonia in Methanol then 2 mL of Methanol

EQUILIBRATION STEP: 2 mL of Water

LOADING STEP: 500 mL of water sample was slowly aspirated through the cartridge

WASHING STEP: 2 mL of Water, then 2 mL of Acetone / Acetonitrile / Formic Acid (*50:50:1*) and 2 mL of Methanol

ELUTION STEP: 2 mL of 5 % Ammonia in Methanol

FURTHER TREATMENT: Evaporation under Nitrogen, reconstitution with Methanol / Water and quantification by LC/MS

RECOVERY: at 20 µg/L

Perfluorooctane Sulfonate Potassium Salt	81 %
Perfluoropentanoic Acid	94 %
Perfluorohexanoic Acid	94 %
Perfluorooctanoic Acid	95 %
Perfluoropropionic Acid	103 %
Perfluorododecanoic Acid	82 %

Quantification of Phenolic Acids

CARTRIDGE: SiliaPrepX SAX 6 mL / 200 mg
Part Number: SPE-P0010-06G

SAMPLE PRETREATMENT: pH of sample was adjusted to basic value with Sodium Hydroxide 1 N

CONDITIONNING STEP: 6 mL of Methanol

EQUILIBRATION STEP: 6 mL of water

LOADING STEP: Treated sample was slowly aspirated through the cartridge

WASHING STEP: 3 mL of water, then 3 mL of Sodium Hydroxide 0.1 N and 3 mL of Methanol, dry the cartridge

ELUTION STEP: 2 x 3 mL of Formic Acid 5 % in Methanol

FURTHER TREATMENT: Evaporation under Nitrogen, reconstitution with Methanol / water and quantification by LC/MS

RECOVERY: at 1 µg/mL

Syringic Acid	70 %
Vanillic Acid	86 %
p-Hydroxybenzoic Acid	97 %

Extraction of Amines from an Aqueous Sample

CARTRIDGE
SiliaPrepX SCX 6 mL / 200 mg
Part Number: SPE-P0005-06G

SAMPLE PRETREATMENT
200 µL of Phosphoric Acid 2 % was added to 1 mL of aqueous sample

CONDITIONNING STEP
6 mL of Methanol

EQUILIBRATION STEP
6 mL of Water

LOADING STEP
Treated sample was slowly aspirated through the cartridge

WASHING STEP
6 mL of Hydrochloric Acid 0.1 N then 6 mL of Methanol, dry the cartridge

ELUTION STEP
2 x 3 mL of 10 % Ammonia in Methanol

FURTHER TREATMENT
Evaporation under Nitrogen, reconstitution with Methanol / Water and quantification by LC/MS

RECOVERY
at 100 ppm

2-Naphthylamine	65 %	**4,4´-Methylene-bis-(2-chloro-aniline)**	75 %
Benzidine	104 %	**4,4´-Oxydianiline**	104 %
5-Nitro-o-toluidine	80 %	**4,4´-Methylenedianiline**	109 %
Xenylamine	89 %	**4,4´-Thiodianiline**	100 %
o-Aminoazotoluene	89 %	**4,4´-Methylendi-o-toluidine**	110 %
4-Aminoazobenzene	99 %	**3,3-Dichlorobenzidine**	110 %

Extraction of PAHs from Drinking Water

CARTRIDGE
SiliaPrep PAH 6 mL / 1.5 g
Part Number: SP2-R0610030B-06T

CONDITIONNING STEP
5 mL of 2-Propanol

EQUILIBRATION STEP
5 mL of water / 2-Propanol (*92:8*)

LOADING STEP
500 mL of drinking water was slowly aspirated through the cartridge

WASHING STEP
3 mL of Dichloromethane HPLC grade, soak the sorbent for 10 minutes before eluting. Repeat a second time.

ELUTION STEP
2 mL of Dichloromethane HPLC grade, soak the sorbent for 10 minutes before eluting. Combine the 3 eluates.

FURTHER TREATMENT
Evaporation under Nitrogen, reconstitution with Acetone / Water and qualification by HPLC (*Fluorescence*)

RECOVERY

	Benzo[b]fluoranthene	Benzo[k]fluoranthene	Benzo[a]pyrene
SiliaPrep PAH	118 %	99 %	94 %
BAKERBOND PAH Aqua	117 %	102 %	100 %

	Benzo[ghi]perylene	Indeno[1,2,3-cd]pyrene
SiliaPrep PAH	117 %	126 %
BAKERBOND PAH Aqua	115 %	114 %

CONCLUSION
SiliaPrep PAH performs as well as BAKERBOND PAH Aqua for the extraction of PAHs from water.

Analysis of Pesticides in Oats, after a Fatty Acids Cleanup

CARTRIDGE	Silia*Prep* Diamine 6 mL / 500 mg Part Number: SPE-R49030B-06P
SAMPLE PRETREATMENT	10 g of oat was added to 100 mL of Water and 200 mL of Acetone. 35 g of NaCl and 100 mL of 50 % Ethylacetate in Cyclohexane were added for liquid-liquid extraction. The organic layer (*200 mL*) was dried with $NaSO_4$, filtered, evaporated and reconstituted with 10 mL of 50 % Ethylacetate in Cyclohexane.
CONDITIONNING STEP	3 mL of Methanol
EQUILIBRATION STEP	3 mL of Acetone and 3 mL of 50 % Ethyl Acetate in Cyclohexane
LOADING STEP	1 mL of treated sample was slowly aspirated through the cartridge (*collect the eluted solvent*)
WASHING STEP	6 mL of Hydrochloric Acid 0.1 N then 6 mL of Methanol, dry the cartridge
ELUTION STEP	15 mL of 50 % Ethyl Acetate in Cyclohexane (*mix with the fraction previously collected*)
FURTHER TREATMENT	Evaporation under Nitrogen, reconstitution with Acetonitrile, derivatization using HMDS and TFA, and quantification by GC/MS
RECOVERY	> 80 % for 84 pesticides < 1 % for fatty acids

Source: Steinbach P. *et al.*, *J. Chromatogr. A*, **2014,** *1323*, 28 - 38

Triacylglycerols Profiling of Marine Microalgae

CARTRIDGE	Silia*Prep* Silica 3 mL / 500 mg Part Number: SPE-R10030B-03P
SAMPLE PRETREATMENT	Algal extracts were extracted with Hexane, washed with water and evaporated
CONDITIONNING STEP	3 mL of Hexane
EQUILIBRATION STEP	3 mL of distilled Water
LOADING STEP	50 mg of lipid sample in 300 µL of Hexane was slowly aspirated through the cartridge
ELUTION STEP	Elution 1 (*for triacylglycerols*): Hexane / Diethyl Ether / Acetic Acid (*80:20:1*) Elution 2 (*for polar lipids and chlorophyl*): Acetone
FURTHER TREATMENT	Evaporation, reconstitution with Hexane and quantification by LC/MS/MS

Source: Franz A. *et al.*, *Journal of Lipid Research*, **2011**, *52*, 2101 - 2108

Extraction of Allantoin from a Cosmetic Product

CARTRIDGE	Silia*PrepX* SAX 3 mL / 60 mg Part Number: SPE-P0010-03BB
SAMPLE PRETREATMENT	1 g of cosmetic was diluted in 100 mL of Water, pH was adjusted to 10°C with Ammonium Hydroxide 5 %
CONDITIONNING STEP	3 mL of Methanol
EQUILIBRATION STEP	3 mL of Ammonium Hydroxide 5 %
LOADING STEP	1 mL of treated sample was slowly aspirated through the cartridge
WASHING STEP	3 mL of Ammonium Hydroxide 5 % then 3 mL of Methanol
ELUTION STEP	2 x 1 mL of Hydrochloric Acid 0.6 %
FURTHER TREATMENT	Add Acetonitrile / Ammonium Chloride 30 mM, and qualification by HPLC

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- Recoveries
- HPLC or GC analysis

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Suggested Protocols for Various Analytes & Matrices

Chart of Suggested Protocols				
Application	**Matrix**	**Analytes**	**SPE Cartridge**	**Sample Pretreatment before Loading**
Aflatoxins	Peanut butter	Aflotoxin M1, Aflotoxin G2, Aflotoxin G1, Aflotoxin B2, Aflotoxin B1	SiliaPrep Florisil PR 500 mg / 3 mL SPE-AUT-0015-03P and SiliaPrep Silica 200 mg / 3 mL SPE-R10030B-03G	Add 40 mL of Methanol / Water (*80:20*) and 0.2 g of Sodium Chloride to 5 g of peanut butter. Stir for 2 hours, filter on paper and rinse with 15 mL of Methanol. Dry the combined extracts with Magnesium Sulfate and evaporate under Nitrogen. Reconstitute with 500 µL of Methanol / Water (*80:20*).
Aminoglycoside Antibiotics	Milk, meat (*beef, chicken, pork*) and eggs	Spectinomycin, Apramycin, Dihydrostreptomycin, Gentamicin, Hygromycin B, Kanamycin, Neomycin B, Streptomycin, Amikacin, Netilmicin, Paromomycin, Sisomycin, Tobramycin	SiliaPrepX WCX 500 mg / 6 mL SPE-P0015-06P	Weigh 5 g of mixed eggs or frozen and milled meat samples, or 10 mL of bovine milk. Add 20 mL of the extraction solution: NH_4OAc (*10 mM*), EDTA (*0.4 mM*), NaCl (*0.5 %*) and Trichloroacetic Acid (*2 %*) in Water. Vortex and centrifugate at 4,000 rpm for 10 minutes. Transfer the supernatant to a clean tube. Repeat extraction and combine supernatants. Adjust pH to 6.5.
Barbiturates	Biological fluids (*blood, plasma, serum, urine or tissue*)	Phenobarbital, Butalbital, Amobarbital, Pentobarbital, Secobarbital, Butabarbital, Hexobarbital	SiliaPrep CleanDRUG 200 mg / 6 mL SPEC-R651230B-06G	Add 3 mL of Phosphate buffer (*100 mM, pH 6.0*) to 2 mL of blood / plasma / serum / urine (*or 1 g of tissue homogenate*). Mix / vortex. Adjust pH to 6.0 ± 0.5 with Sodium Phosphate (*100 mM*). Centrifugate at 2,000 rpm for 10 minutes and discard cellular debris.
Benzodiazepines	Urine	Nordiazepam, 7-Aminoclonazepam, Desalkylflurazepam, Temazepam, Alprazolam, Clonazepam, Midazolam, Flurazepam, 7-Aminoflunitrazepam, Diazepam, Oxazepam, Chlordiazepoxide, Flunitrazepam, Lorazepam	SiliaPrepX SCX 30 mg / 3 mL SPE-P0005-03AA	Dilute 1 mL of urine with 2 mL of 2 % Formic Acid.
Biomarkers of Alcohol Consumption	Urine	Ethyl Glucuronide (*EtG*), Ethyl Sulfate (*EtS*)	SiliaPrep Amine (*WAX*) 100 mg / 1 mL SPE-R52030B-01C	Add 50 µL of HCl (*6 M*) and 1 mL of Acetonitrile to 100 µL of urine, centrifugate.
Buprenorphine & Norbuprenorphine	Whole blood	Buprenorphine, Norbuprenorphine	SiliaPrepX SCX 30 mg / 3 mL SPE-P0005-03AA	Dilute 0.5 mL of blood with 3 mL of Phosphate buffer (*0.1 M, pH 6.0*). Vortex, centrifugate and discard cellular debris.
Caffeine, Theophylline & Theobromine	Biological fluids (*blood, plasma, serum, urine or tissue*)	Caffeine, Theophylline, Theobromine	SiliaPrep CleanDRUG 200 mg / 6 mL SPEC-R651230B-06G	Add 3 mL of Acetic Acid (*100 mM*) to 1 mL of blood / serum / plasma / urine. Vortex, centrifugate.
Cocaine and Metabolites	Biological fluids (*whole blood, urine or plasma*)	Ecgonine Methyl Ester, Anhydroecgonine Methyl Ester, Benzoylecgonine, Norcocaine, Cocaine, Cocaethylene	SiliaPrepX SCX 1 mL / 30 mg SPE-P0005-01AA	**Plasma and Urine**: dilute 100 µL of sample with 300 µL of Ammonium Acetate buffer (*50 mM, pH 6.0*). **Whole blood**: lyse red blood cells by 10 minutes sonication in buffer, centrifugate at 11,000 rpm for 10 minutes, discard cellular debris.
Explosives	Surface water	Nitrobenzene, 2-Nitrotoluene, 3-Nitrotoluene, 4-Nitrotoluene, 1,3-Dinitrobenzene, 2,6-Dinitrotoluene, 2,4-Dinitrotoluene, 1,3,5-Trinitrobenzene, 2,4,6-Trinitrotoluene, RDX, 4-Amino-2,6-Dinitrotoluene, 3,5-Dinitroaniline, 2-Amino-4,6-Dinitrotoluene, Tetryl	SiliaPrepX DVB 500 mg / 6 mL SPE-P0001-06P	No sample pretreatment required.

Note: convenient starting points for method development, further optimization may be required

Chart of Suggested Protocols					
Conditionning	**Equilibration**	**Loading**	**Washing**	**Elution**	**Further Treatment**
Better recoveries when no conditionning	Better recoveries when no equilibration	Pretreated sample	2 x 3 mL of Methanol / Water (*80:20*) 2 x 3 mL of Methanol	2 x 3 mL of Acetone / Water / Formic Acid (*96:3.5:0.5*)	Combine elution fractions, evaporate under Nitrogen and reconstitute with 2 mL of Hexane / Chloroform (*50:50*). Condition the Silia*Prep* Silica cartridge with 2 x 3 mL of Hexane and load the sample extracted from Silia*Prep* Florisil PR cartridge. Wash with 3 x 2 mL of Methanol / Chloroform (*50:50*). Combine loading and washing fractions, evaporate under Nitrogen, reconstitute with 0.1 % Formic Acid and Ammonium Acetate (*5 mM*) in Water / Methanol (*50:50*) and quantify by LC/MS.
10 mL of Methanol	10 mL of Water	Pretreated sample	10 mL of Ammonium Acetate buffer (*50 mM, pH 7.0*) Dry the cartridge	6 mL of 2 % Formic Acid in Water	Dilute with 4 mL of Water, filter on 0.2 µm and quantification by LC/MS/MS.
3 mL of Methanol	3 mL of Phosphate buffer (*100 mM, pH 6.0*)	Pretreated sample	3 mL of Water 1 mL of Acetic Acid (*100 mM*) Dry the cartridge 2 mL of Hexane	3 mL of Ethyl Acetate / Hexane (*50:50*)	Evaporation under Nitrogen, reconstitution with 0.1 % Formic Acid in Water and quantification by LC/MS/MS. Or dissolution in Ethyl Acetate and quantification by GC/MS.
1 mL of Methanol	1 mL of Water	Pretreated sample	2 mL of 2 % Formic Acid 2 mL of Methanol / Water (*50:50*)	1 mL of 5 % Ammonium Hydroxide in Methanol	Evaporation under Nitrogen, reconstitution with 0.1 % Formic Acid in Methanol and quantification by LC/MS/MS.
2 mL of Methanol	2 mL of Water 2 mL of 0.2 % Acetic Acid in Acetonitrile	Pretreated sample	1 mL of Hexane Dry the cartridge	2 x 750 µL of 2 % Ammonium Hydroxide in Methanol	Evaporation under Nitrogen, reconstitution with Water and quantification by LC/MS/MS.
3 mL of Methanol	3 mL of water	Pretreated sample	2 x 2 mL of 2 % Formic Acid 3 mL of Methanol / 2 % Formic Acid (*70:30*) Dry the cartridge	2 x 1.5 mL of 5 % Ammonium Hydroxide in Ethyl Acetate / Isopropanol (*80:20*)	Evaporation under Nitrogen, reconstitution with 0.1 % Formic Acid in Methanol / Water (*15:85*) and quantification by LC/MS/MS.
3 mL of Methanol 3 mL of Water	1 mL of Acetic Acid (*100 mM*)	Pretreated sample	3 mL of Water 3 mL of Acetic Acid (*100 mM*) Dry the cartridge	3 mL of Ethyl Acetate / Methanol (*90:10*)	Evaporation under Nitrogen, reconstitution with 0.1 % Formic Acid in Water and identification by HPLC.
1 mL of Methanol	1 mL of Ammonium Acetate (*50 mM, pH 6.0*)	Pretreated sample	1 mL of Ammonium Acetate buffer (*50 mM, pH 6.0*) 1 mL of 2 % Formic Acid in Water 1 mL of Methanol	2 x 0.5 mL of 5 % Ammonium Hydroxide in Methanol	Evaporation under Nitrogen, reconstitution with Water / Methanol (*80:20*) and quantification by LC/MS.
6 mL of Ethyl Acetate	6 mL of Methanol 6 mL of Water	1 L of water sample Dry the cartridge	No washing required	6 mL of Ethyl Acetate	Evaporation down to 1 mL under Nitrogen and identification by HPLC.

Suggested Protocols for Various Analytes & Matrices (*continued*)

Chart of Suggested Protocols				
Application	**Matrix**	**Analytes**	**SPE Cartridge**	**Sample Pretreatment before Loading**
FAMEs	Olive oil	C11:0, C16:0, C16:1 cis 9, C18:0, C18:1 cis 9, C18:2 cis 9,12, C18:3 cis 9,12,15, C20:0, C20:1 cis 11	Silia*Prep* Silica 1 g / 6 mL SPE-R10030B-06S	Dilute 0.12 g of oil in 0.5 mL of Hexane.
Fermentable Sugars	Beer	Fructose, Glucose, Maltose, Maltotriose, Maltotetraose, Maltopentaose, Maltohexaose, Maltoheptaose	Silia*Prep* C18 Plus 500 mg / 6 mL SPE-R00830B-06P	Remove carbon dioxide by shaking the beer.
Fluoroquinolones	Milk	Norfloxacin, Ofloxacin, Ciprofloxacin, Pefloxacin, Lomefloxacin, Danofloxacin, Enrofloxacin, Sarafloxacin, Difloxacin, Oxolinic Acid, Flumequine	Silia*PrepX* DVB 60 mg / 3 mL SPE-P0001-03BB	Add 15 mL of Trichloroacetic Acid / Acetonitrile (*10:90*) to 1 g of milk. Mix / vortex. Centrifugate at 5,000 rpm at 4°C for 10 minutes.
Halocetic Acids	Surface water	Chloroacetic Acid, Bromoacetic Acid, Dichloroacetic Acid, Dalapon, Trichloroacetic Acid, Bromochloroacetic Acid, Bromodichloroacetic Acid, Dibromoacetic Acid, Chlorodibromoacetic Acid, Tribromoacetic Acid	Silia*Prep* SAX 500 mg / 6 mL SPE-R66530B-06P	Add 0.5 mL of aqueous Ammonium Chloride to 50 mL of water sample. Adjust pH to 4.5 - 5.5 with Sulfuric Acid.
Hormones	Serum	Aldosterone, Cortisol, Cortisone, Corticosterone, 11-Deoxycortisol, β-Estradiol, Testosterone, 11-Deoxycorticosterone, Androstenedione, Estrone, 17αOH Progesterone, DHT, Progesterone	Silia*PrepX* DVB 30 mg / 1 mL SPE-P0001-01AA	Add 400 µL of a 0.5 % Formic Acid solution to 100 µL of serum. Vortex, centrifugate, discard cellular debris.
Lipids	Tissue	Fatty Acids, Phospholipids, Cholesteryl Ester, Triglycerides, Cholesterol, Diglycerides, Monoglycerides	Silia*Prep* Amine (*WAX*) 500 mg / 3 mL SPE-R52030B-03P	Evaporate extract to dryness under Nitrogen and dissolve in 0.5 mL of Chloroform.
Melamine & Analogues	Powdered infant milk	Melamine, Ammeline, Ammelide	Silia*PrepX* SCX 60 mg / 3 mL SPE-P0005-03BB	Add 20 mL of Water to 1 g of powdered infant milk, vortex. Take 1 mL and add 2 mL of HCl (*0.1 N*).
Melamine & Analogues	Powdered infant milk	Cyanuric Acid	Silia*PrepX* SAX 60 mg / 3 mL SPE-P0010-03BB	Add 20 mL of Water to 1 g of powdered infant milk, vortex. Take 1 mL and add 2 mL of Sodium Hydroxide (*0.1 N*).
Metal Ions	Surface water	Cu(II), Hg(II), Se(IV), Zn(II)	Silia*Prep* Amine (*WAX*) 50 mg / 1 mL SPE-R52030B-01B	No sample pretreatment required.
MMA & Succinic Acid	Plasma	Methylmalonic Acid (*MMA*), Succinic Acid	Silia*PrepX* WAX 30 mg / 1 mL SPE-P0020-01AA	Dilute 100 µL of plasma with 0.5 mL of 0.1 % Acetic Acid.
Opiates	Urine	Morphine, Codeine, Hydromorphone, Norcodeine, Hydrocodone, Oxycodone, Oxymorphone	Silia*PrepX* SCX 30 mg / 3 mL SPE-P0005-03AA	Add 125 µL of concentrated HCl to 0.5 mL of urine. Heat at 95°C for 1.5 hour. Cool, add 2 mL of Sodium Acetate buffer (*0.1 M, pH 4.5*). Neutralize with 250 µL of Potassium Hydroxide (*7 N*), vortex. pH should be inferior to 6.0. Centrifugate at 6,000 rpm for 20 minutes.

Note: convenient starting points for method development, further optimization may be required

Chart of Suggested Protocols					
Conditionning	**Equilibration**	**Loading**	**Washing**	**Elution**	**Further Treatment**
No conditioning required	6 mL of Hexane	Pretreated sample	No washing required	10 mL of Hexane / Diethyl Ether (*87:13*)	Evaporation under Nitrogen, reconstitution with Hexane, esterification and identification by GC/FID.
6 mL of Methanol	6 mL of Water	0.5 mL of beer	No washing required	6 mL of Water	Identification by HPLC.
3 mL of Methanol	3 mL of Water	Pretreated sample	3 mL of Methanol / Water (*10:90*) Dry the cartridge	3 mL of Methanol	Evaporation under Nitrogen, reconstitution with mobile phase and identification by HPLC.
10 mL of Methanol	10 mL of Water	Pretreated sample	10 mL of Methanol	3 mL of 10 % Sulfuric Acid / Methanol	Esterification and identification by GC/µECD.
1 mL of 0.5 % Formic Acid in Methanol	1 mL of 0.5 % Formic Acid in Water	Pretreated sample	1 mL of Methanol / Water (*30:70*) Dry the cartridge	2 x 0.25 mL of Methanol	Evaporation under Nitrogen, reconstitution with Methanol / Water (*50:50*) and quantification by LC/MS/MS.
No conditionning required	2 x 2 mL of Hexane	Pretreated sample	• Elution of Neutral Lipids: 4 mL of Chloroform / 2-Propanol (*2:1*). • Elution of Fatty Acids: 4 mL of 2 % Acetic Acid in Diethyl Ether. • Elution of Phospholipids: 4 mL of Methanol. With Neutral Lipids fraction: Evaporation under Nitrogen, reconstitution with 0.2 mL of Hexane, load on a second SPE cartridge (*same equilibration step*). • Elution of Cholesteryl Ester: 4 mL of Hexane. Connect a third SPE cartridge below the second one (*same equilibration step*). • Elution of Triglycerides: 6 mL of Diethyl Ether / Methylene Chloride / Hexane (*1:10:89*), through both SPE cartridges. • Elution of Cholesterol: 12 mL of 5 % Ethyl Acetate in Hexane, through both SPE cartridges. On the second SPE cartridge only now. • Elution of Diglycerides: 4 mL of 15 % Ethyl Acetate in Hexane. • Elution of Monoglycerides: 4 mL of Chloroform / Methanol (*2:1*).		
3 mL of Methanol	3 mL of Water	Pretreated sample	3 mL of 2 % Formic Acid in Water 3 mL of Methanol / Acetonitrile (*50:50*)	3 mL of 5 % Ammonium Hydroxide in Methanol / Acetonitrile (*50:50*)	Evaporation under Nitrogen, reconstitution with Methanol / Acetonitrile (*50:50*) and quantification by LC/MS.
3 mL of Methanol	3 mL of Water	Pretreated sample	3 mL of Water 3 mL of Methanol	3 mL of 5 % Acetic Acid in Methanol	Evaporation under Nitrogen, reconstitution with Methanol / Acetonitrile (*50:50*) and quantification by LC/MS.
3 mL of Methanol	3 mL of Water	50 mL water sample	3 mL of Water Dry the cartridge	3 mL of a Nitric Acid solution (*100 mM*)	Quantification by ICP-AES.
1 mL of Methanol	1 mL of 0.1 % Acetic Acid in Water	Pretreated sample	0.5 mL of Methanol / Water (*50:50*) Dry the cartridge	2 x 0.6 mL of 2 % Ammonium Hydroxide in Methanol	Evaporation under Nitrogen, reconstitution with 0.1 % Formic Acid in Water and quantification by LC/MS/MS.
0.5 mL of Methanol	1 mL of Water	Pretreated sample	1 mL of 2 % Formic Acid 1 mL of Methanol Dry the cartridge	2 mL of Ammonium Hydroxide / Methanol (*20:100*)	Evaporation under Nitrogen, reconstitution with 0.1 % Formic Acid in Methanol / Water (*5:95*) and quantification by LC/MS/MS.

Suggested Protocols for Various Analytes & Matrices (*continued*)

Chart of Suggested Protocols				
Application	**Matrix**	**Analytes**	**SPE Cartridge**	**Sample Pretreatment before Loading**
Organophosphates	Surface water	Tris (1-Chloro-2-Propyl)-Phosphate (*TCPP*), Tris (2-Chloroethyl)-Phosphate (*TCEP*), Tris (1,3-Dichloro-2-Propyl)-Phosphate (*TDCP*), Tri-n-Butylphosphate (*TnBP*), Tri-Isobutylphosphate (*TiBP*), Tris(2-Butoxyethyl)-Phosphate (*TBEP*)	SiliaPrepX HLB 100 mg / 1 mL SPE-P0002-01C	No sample pretreatment required.
PAHs	Chocolate	Naphthalene, Acenaphthylene, Acenaphthene, Fluorene, Phenanthrene, Anthracene, Fluoranthene, Pyrene, Benzo[c]fluorene, Benzo[a]anthracene, Chrysene, Cyclopental[cd]pyrene, Triphenylene, 5-methyl-Chrysene, Benzo[b]fluoranthene, Benzo[k]fluoranthene, Benzo[j]fluoranthene, Benzo[a]pyrene, Dibenz[a,h]anthracene, Indeno[1,2,3-cd]pyrene, Benzo[ghi]perylene, Dibenzo[a,l]pyrene, Dibenzo[a,e]pyrene, Dibenzo[a,i]pyrene, Dibenzo[a,h]pyrene	SiliaPrep Silica 1 g / 6 mL SPE-R10030B-06S	Grind 1 g of chocolate with 10 mL of Methanol to extract fats and coca butter. Evaporate Methanol under Nitrogen. Add 10 mL of Water then 5 mL of n-Pentane and proceed to liquid-liquid extraction. Repeat the extraction with another 5 mL of n-Pentane. Combine the two portions of 5 mL of n-Pentane, evaporate to 2 mL under Nitrogen.
Parabens	Cosmetics (*toothpaste*)	Methyl Paraben, Propyl Paraben	SiliaPrep C8 500 mg / 3 mL SPE-R31030B-03P	Add 10 mL of Methanol to 1 g of toothpaste, vortex, centrifugate. Take 100 µL of mixture and dilute to 2 mL with Methanol.
PCB	Surface water	2-Chlorobiphenyl, 4-Chlorobiphenyl, 2,4'-Dichlorobiphenyl, 2,2',5-Trichlorobiphenyl, 2,4,4'-Trichlorobiphenyl, 2,2',3,5'-Tetrachlorobiphenyl, 2,2',5,5'-Tetrachlorobiphenyl, 2,3',4',5-Tetrachloroobiphenyl, 2,3,3',4',6-Pentachlorobiphenyl, 2,3',4,4',5-Pentachlorobiphenyl, 2,2',3,4,4',5'-Hexachlorobiphenyl, 2,2',3,4',5',6-Hexachlorobiphenyl, 2,2',4,4',5,5'- Hexachlorobiphenyl, 2,2',3,4,4',5,5'-Heptachlorobiphenyl	SiliaPrep C18 Plus 1.5 g / 6 mL SPE-R00830B-06T	Add 0.1 g of L-Ascorbic Acid, 0.35 g of Ethylenediamine Tetra Acetic Acid Trisodium salt and 9.4 g of Potassium Citrate Monobasic to 1 L of surface water.
Penicillins	Surface water	Amoxicillin, Ampicillin, Penicillin G, Penicillin V, Oxacillin, Cloxacillin, Nafcillin, Dicloxacillin	SiliaPrep C18 Plus 200 mg / 3 mL SPE-R00830B-03G	Spike standards in 2 mL of water sample.
Peptides	Plasma, serum	Angiotensin I, Angiotensin II, Angiotensin III	SiliaPrepX HLB 30 mg / 1 mL SPE-P0002-01AA	Add 300 µL of Water to 300 µL of serum. Mix.
Peptides	Plasma, serum	Oxytocin, Vasopressin	SiliaPrepX WCX 30 mg / 2 mL 96W-P0015-AA	Add 300 µL of 4 % Phosphoric Acid to 300 µL of plasma / serum. Mix.
Per- and Polyfluoroalkyl Substances (*PFASs*)	Drinking water	PFBA, PFPeA, PFHxA, PFHpA, PFOA, PFNA, PFDA, PFUdA, PFDoA, PFTrDA, PFTeDA, PFBS, PFPeS, PFHxS, PFHpS, PFOS, PFNS, PFDS, FOSA, 4:2 FTS, 6:2 FTS, 8:2 FTS, FOSAA, N-MeFOSAA, N-EtFOSAA, PFHxPA	SiliaPrep Amine (*WAX*) 200 mg / 6 mL SPE-R52030B-06G	Adjust pH between 6.0 and 8.0 with HCl or NaOH (*100 mM*).
Phenols	Drinking water	Phenol, 2-Chlorophenol, 2-Methylphenol, 2-Nitrophenol, 2,4-Dimethylphenol, 2,4-Dichlorophenol, 4-Chloro-3-Methylphenol, 2,4,6-Trichlorophenol, 2,4-Dinitrophenol, 4-Nitrophenol, 2-Methyl-4,6-Dinitrophenol, 2,4,6-Tribromophenol, Pentachlorophenol	SiliaPrepX DVB 500 mg / 6 mL SPE-P0001-06P	Adjust pH of 1 L water sample to 2.0 with Phosphoric Acid (*0.1 M*).
Phthalates	Drinking water	Dimethyl Phthalate, Diethyl Phthalate, Diallyl Phthalate, Dibutyl Phthalate, Diamil Phthalate	SiliaPrep C8 500 mg / 3 mL SPE-R31030B-03P	No sample pretreatment required.

Note: convenient starting points for method development, further optimization may be required

Chart of Suggested Protocols					
Conditionning	Equilibration	Loading	Washing	Elution	Further Treatment
1 mL of Methanol	1 mL of Methanol / Acetonitrile (*50:50*)	2 L of water sample Dry the cartridge	No washing required	2 x 0.5 mL of Methanol / Acetonitrile (*50:50*)	Quantification by GC/MS.
6 mL of Methanol	6 mL of THF 6 mL of n-Pentane	Pretreated sample	3 mL of n-Pentane	2 x 5 mL of Methanol / THF (*10:90*)	Evaporation under Nitrogen, reconstitution with Methanol and quantification by GC/MS.
3 mL of Methanol	3 mL of Water	Pretreated sample	3 mL of Water Dry the cartridge	1 mL of Methanol	Evaporation under Nitrogen, reconstitution with Water / Methanol (*62:38*) and identification by HPLC.
5 mL of Ethyl Acetate / Dichloromethane (*50:50*) Dry the cartridge 10 mL of Methanol	6 mL of Water	Pretreated sample Dry the cartridge	No washing required	5 mL of Ethyl Acetate 5 mL of Dichloromethane	Dry fraction with Sodium Sulfate, evaporation down to 1 mL under Nitrogen and quantification by LC/MS/MS.
4 mL of Methanol	4 mL of Water	Pretreated sample	4 mL of 0.1 % Formic Acid in Water	2 x 2 mL of Acetonitrile	Evaporation under Nitrogen, reconstitution with Water and quantification by LC/MS/MS.
1 mL of Methanol	1 mL of Water	Pretreated sample	1 mL of Methanol / 0.1 % TFA in Water (*10:90*) Dry the cartridge	1 mL of 2 % Ammonium Hydroxide in Methanol / Water (*50:50*)	Evaporation under Nitrogen, reconstitution with 0.1 % TFA in Water and identification by HPLC.
1 mL of Methanol	1 mL of Water	Pretreated sample	1 mL of 4 % Phosphoric Acid 1 mL of Methanol / Water (*30:70*) Dry wells	2 x 0.75 mL of 1 % TFA in Acetonitrile / Methanol (*50:50*)	Evaporation under Nitrogen, reconstitution with 1 % TFA in 0.1 % Formic Acid / 50 % Methanol in Acetonitrile with 0.1 % Formic Acid (*80:20*) and quantification by LC/MS/MS.
3 mL of Methanol	5 mL of Phosphate buffer (*100 mM, pH 7.0*)	Pretreated sample Dry the cartridge	No washing required	6 mL of 1 % Ammonium Hydroxide in Methanol	Evaporation down to 1 mL under Nitrogen and quantification by LC/MS/MS.
6 mL of Dichloromethane	6 mL of Methanol 6 mL of HCl (*0.05 N*)	1 L of water sample Dry the cartridge	No washing required	6 mL of Dichloromethane	Evaporation down to 1 mL under Nitrogen and identification by HPLC.
3 mL of Methanol	3 mL of Water	200 mL water sample	3 mL of Water	2 x 0.5 mL of Ethyl Acetate	Quantification by GC/MS.

Suggested Protocols for Various Analytes & Matrices (*continued*)

Chart of Suggested Protocols				
Application	**Matrix**	**Analytes**	**SPE Cartridge**	**Sample Pretreatment before Loading**
Steroids	Urine, serum	Cortisone, Cortisol, 21-Deoxycortisol, Corticosterone, 11-Deoxycortisol, Fluoxymesterone, Trenbolone, Boldenone, Androstenedione, Nandrolone, Methandienone, 17 α-Hydroxyprogesterone, Testosterone, 16 β-Hydroxystanozolol, Epitestosterone, 5 β-Estran-3α-ol-17-one, 17 α-Methyltestosterone, Methenolone, 5 α-Estran-3α-ol-17-one, Norethandrolone, Progesterone, Stanozolol	SiliaPrep C8/SAX *nec* 200 mg / 6 mL SPM-R022830B-06G	**Serum**: add 4 mL of Phosphate buffer (*100 mM, pH 7.0*) to 1 mL of sample. Vortex. **Urine**: add 1 mL of Acetate buffer (*100 mM, pH 5.0*) and 50 µL of β-glucuronidase to 1 mL of sample. Vortex, heat at 65°C for 1 or 2 hours. Add 2 mL of Phosphate buffer (*100 mM, pH 7.0*). Vortex.
Sulfonamides	Honey	Sulfanilamide, Sulfathiazole, Sulfamerazine, Sulfamethoxazole, Sulfaquinoxaline	SiliaPrepX SCX 60 mg / 3 mL SPE-P0005-03BB	Add 1 mL of Hydrochloric Acid (*2 M*) to 1 g of honey, sonicate for 30 minutes and dilute to 5 mL with Citric Acid (*300 mM*).
Sympathomimetic Amines	Biological fluids (*blood, plasma, serum, urine or tissue*)	Phenylpropanolamine, Ephedrine, Phentermine, Diethylproprion, Pheniramine, Doxylamine, Chlorpheniramine, Brompheniramine, Diphenhydramine, Amphetamine, Methamphetamine, MDA, MDMA, Pseudoephedrine, Phenylephrine	SiliaPrep CleanDRUG 200 mg / 6 mL SPEC-R651230B-06G	Add 3 mL of Phosphate buffer (*100 mM, pH 6.0*) to 2 mL of blood / plasma / serum / urine (*or 1 g of tissue homogenate*). Mix / vortex. Adjust pH to 6.0 ± 0.5 with Sodium Phosphate (*100 mM*). Centrifugate at 2,000 rpm for 10 minutes and discard cellular debris.
Synthetic Dyes & Metabolites	Seafood	Malachite Green, Leucomalachite Green, Crystal Violet, Leucocrystal Violet, Nile Blue, Azure B, Methylene Blue, Brilliant Green, Victoria Blue	SiliaPrep CleanDRUG 200 mg / 6 mL SPEC-R651230B-06G	Add 10 mL of 1 % Formic Acid in Acetonitrile and 1 mL of Ascorbic Acid (*1 M, used as antioxidant*) to 2 g of sample. Vortex for 15 minutes, centrifugate for 10 minutes at 3,000 rpm and 4°C. Take the supernatant and add 20 mL of McIlvaine's buffer (*0.1 M, pH 3.5*). Vortex and centrifugate again.
Tetracyclines	Honey	Oxytetracycline, Tetracycline, Chlortetracycline	SiliaPrepX WCX 60 mg / 3 mL SPE-P0015-03BB	Dilute honey in Sodium Acetate (*100 mM, pH 5.0*).
Tobacco	Oral fluid	Cotinine, Anabasine, Nicotine	SiliaPrepX SCX 30 mg / 2 mL 96W-P0005-AA	Collect oral fluid according to instructions on the device, place sample in adequate buffer solution and centrifugate. Add 1 mL of 1 % Formic Acid to 0.5 mL of supernatant.
Topical anesthetics	Serum	Benzocaine, Procaine, Mepivacaine	SiliaPrep C8 500 mg / 6 mL SPE-R31030B-06P	Add 500 µL of internal standard solution to 500 µL of serum. Vortex.
Triazoles	Plasma	Fluconazole, Voriconazole, Posaconazole, Ketoconazole, Hydroxy-itraconazole, Itraconazole	SiliaPrepX DVB 30 mg / 1 mL SPE-P0001-01AA	Dilute 300 µL of plasma to 1 mL, adjust pH to 2.0.
Urinary Catecholamines	Urine	Dopamine, Norepinephrine, Epinephrine, Normetanephrine, Metanephrine	SiliaPrepX WCX 10 mg / 2 mL 96W-P0015-1A	Dilute 75 µL of urine with 150 µL of Ammonium Acetate (*250 mM*), mix.
Vitamin B3 & Metabolites	Plasma, serum	Nicotinic Acid, Nicotinuric Acid, Niacinamide	SiliaPrep SCX *nec* 50 mg / 1 mL SPE-R60430B-01B	Add 150 µL of 2 % aqueous Acetic Acid to 50 µL of serum, mix.
Vitamin B7	Serum	Biotin (*Vitamin B7*)	SiliaPrepX SAX 100 mg / 3 mL SPE-P0010-03C	Add 750 µL of 0.1 % Ammonium Hydroxide in Water to 250 µL of serum. Vortex.

Note: convenient starting points for method development, further optimization may be required

Chart of Suggested Protocols					
Conditionning	**Equilibration**	**Loading**	**Washing**	**Elution**	**Further Treatment**
3 mL of Methanol	3 mL of Phosphate buffer (*100 mM, pH 7.0*)	Pretreated sample	3 mL of Water 3 mL of Methanol / Water (*30:70*) Dry the cartridge	2 x 1.5 mL of Methanol	Evaporation under Nitrogen, reconstitution with Methanol / Water (*50:50*) and quantification by LC/MS/MS.
2 mL of Methanol	2 mL of Water	Pretreated sample	2 x 2 mL of Water 2 x 2 mL of Methanol / Acetonitrile (*50:50*) Dry the cartridge	2 mL of 2 % Ammonium Hydroxide in Methanol	Evaporation under Nitrogen, reconstitution with 0.1 % Formic Acid in Water / Acetonitrile (*90:10*) and quantification by LC/MS/MS.
3 mL of Methanol	3 mL of Water 3 mL of Phosphate buffer (*100 mM, pH 6.0*)	Pretreated sample	3 mL of Water 3 mL of Acetic Acid (*100 mM*) 3 mL of Methanol Dry the cartridge	3 mL of Dichloromethane / Isopropanol / Ammonium Hydroxide (*78:20:2, pH 11 - 12*)	Evaporation under Nitrogen, reconstitution with 0.1 % Formic Acid in Water and quantification by LC/MS/MS. Or evaporation under Nitrogen, fluoroacylation with PFPA, evaporation under Nitrogen, reconstitution with Ethyl Acetate and quantification by GC/MS.
3 mL of Methanol	3 mL of Water 1 mL of McIlvaine's buffer (*0.1 M, pH 3.5*)	Pretreated sample (*supernatant*)	3 mL of 0.1 % Formic Acid in Water 3 mL of 0.1 % Formic Acid in Methanol Dry the cartridge	4 mL of 1 % Triethylamine and 0.5 % Formic Acid in Methanol	Quantification by LC/MS/MS.
2 mL of Methanol	2 mL of Water	4 mL of pretreated sample	4 mL of Water 4 mL of Methanol Dry the cartridge	2 mL of 2 % Formic Acid in Methanol	Evaporation under Nitrogen, reconstitution with Oxalic Acid (*10 mM, pH 2.0*) / Acetonitrile (*80:20*) and identification by HPLC.
1 mL of Methanol	1 mL of Water	Pretreated sample	1 mL of Water 1 mL of Acetone / Water (*50:50*) Dry wells	2 x 500 µL of Ethyl acetate / Isopropanol / Ammonium Hydroxide (*70:20:10*)	Evaporation under Nitrogen, reconstitution with Ammonium Bicarbonate (*20 mM, pH 8.2*) / Methanol (*90:10*) and quantification by LC/MS/MS.
6 mL of Methanol	6 mL of Water	Pretreated sample	6 mL of Water / Methanol (*75:25*) Dry the cartridge	2 mL of Methanol	Evaporation under Nitrogen, reconstitution with Chloroform and identification by GC.
1 mL of Methanol	1 mL of Water	Pretreated sample	1 mL of 1 % Ammonium Hydroxide in Water 1 mL of Water / Methanol (*70:30*)	1 mL of Methanol	Evaporation under Nitrogen, reconstitution with Water / Methanol (*50:50*) and identification by HPLC.
500 µL of Methanol	500 µL of Ammonium Acetate (*10 mM*)	150 µL of pretreated sample	500 µL of Ammonium Acetate (*10 mM*) 500 µL of Isopropanol	125 µL of 0.1 % Formic Acid / Isopropanol (*85:15*)	Quantification by LC/MS/MS.
1 mL of Methanol	1 mL of 2 % Acetic Acid	Pretreated sample	2 x 1 mL of Water / Methanol / Acetic Acid (*68:30:2*) 2 x 1 mL of 2 % Acetic Acid in Methanol	2 x 400 µL of 5 % Ammonium Hydroxide in Methanol	Evaporation under Nitrogen, reconstitution with 0.1 % Formic Acid and quantification by LC/MS/MS.
3 mL of Methanol	3 mL of 0.1 % Ammonium Hydroxide in Water	Pretreated sample	3 mL of 0.1 % Ammonium Hydroxide in Water 3 mL of Methanol	2 x 1 mL of 2 % Formic Acid in Methanol	Evaporation under Nitrogen, reconstitution with 0.1 % Formic Acid in Water and quantification by LC/MS/MS.

SPE Accessories

*Maximize your Productivity with Silia*Prep* Accessories!*

SiliCycle offers various accessories for SPE Cartridges and Well Plates to simplify method development and expedite high throughput analysis:

- Vacuum Manifolds
- Empty Tubes
- Adapters & Vacuum Adapters
- 96-Well Collection Plates
- Phase Separator Cartridges
- and Other SPE Accessories...

Silia*Prep* SPE Vacuum Manifolds

Run multiple samples simultaneously, with a controlled flow rate for higher reproducibility, with Silia*Prep* SPE Vacuum Manifolds. These manifolds are available in 12 and 24-Positions configurations and allow consistent extraction. No possibility of cross-contamination from one sample to another.

The design consists in a clear glass chamber equipped with replaceable individual stopcocks (*also known as control valves*) and solvent guide needles. The adjustable rack allows the use of a wide variety of collection vessels including 13 and 16 mm test tubes, autosampler vials and volumetric flasks.

Simply apply a vacuum source to elute sample through a cartridge directly to the collection vessel of choice.

Complete sets include:

- Glass chamber, vacuum gauge & bleed valve
- Cover, gasket, male and female luer fittings
- Individual stopcocks and needles
- Collection rack with posts, shelves and retaining clips.

Silia*Prep* SPE Vacuum Manifolds (*Complete Sets*)

Product Number	Description
AUT-0128-12	12-Positions Silia*Prep* SPE Vacuum Manifold
AUT-0129-24	24-Positions Silia*Prep* SPE Vacuum Manifold

Silia*Prep* Vacuum Manifold Accessories

Various replacement parts are available for the two Silia*Prep* Vacuum Manifolds offered by SiliCycle.

Silia*Prep* Vacuum Manifold Accessories			
Description		**12-Positions Vacuum Manifold**	**24-Positions Vacuum Manifold**
Silia*Prep* Vacuum Manifold Complete Set		AUT-0128-12 (*1/box*)	AUT-0129-24 (*1/box*)
Spare Parts Ordering Information			
INCLUDED IN COMPLETE SET	Glass chamber [Dimensions: Length x Width x Height]	AUT-0182-2 (*1/box*) [7" x 5.25" x 7"]	AUT-0185 (*1/box*) [12" x 5.25" x 7"]
	Vacuum gauge, valve & glass chamber kit	AUT-0187 (*1/box*)	AUT-0189 (*1/box*)
	Top cover, gasket & polypropylene stopcocks kit	AUT-0313 (*1/box*)	AUT-0315 (*1/box*)
	Top cover gasket	AUT-0174 (*2/box*)	AUT-0193 (*2/box*)
	Polypropylene stopcocks	AUT-0146 (*12/box*)	AUT-0147 (*24/box*)
	Polypropylene needles	AUT-0154 (*12/box*)	AUT-0155 (*24/box*)
	Collection rack kit (*posts, shelves and retaining clips included*)	AUT-0202 (*1/box*)	AUT-0204 (*1/box*)
	Plate for 13 mm test tubes	AUT-0205 (*1/box*)	AUT-0207 (*1/box*)
	Plate for 16 mm test tubes	AUT-0208 (*1/box*)	AUT-0210 (*1/box*)
	Plate for autosampler vials	AUT-0213 (*1/box*)	-
	Plate for volumetric flasks	AUT-0214 (*1/box*)	-
	Female luer fittings	AUT-0326 (*10/box*)	AUT-0326 (*10/box*)
	Male luer fittings	AUT-0327 (*10/box*)	AUT-0327 (*10/box*)
	Legs for cover (*black*)	AUT-0329 (*4/box*)	AUT-0329 (*4/box*)
	Vacuum manifold plugs (*yellow*)	AUT-0333 (*50/box*)	AUT-0333 (*50/box*)

Note: Stainless Steel needles and Teflon® needles are available upon request.

Silia*Prep* Waste Containers

Disposable solvent resistant polypropylene containers are available for the 12-Positions manifold. These waste containers greatly simplify sample preparation, solvent disposal and clean-up. Depending on the nature of the solvent used, the waste container can be reused many times prior to discarding.

Note: Waste containers not available for the 24-Positions vacuum manifold.

AUT-0176 (*10/box*)

Silia*Prep* Drying Manifold Covers

Silia*Prep* Drying Manifold Covers can be used to concentrate samples with a flow of air or gaz (*nitrogen*).

Silia*Prep* Drying Manifold Covers	
Product Number	**Description**
AUT-0215-12	12-Positions Silia*Prep* Drying Manifold Cover (*1/box*)
AUT-0215-24	24-Positions Silia*Prep* Drying Manifold Cover (*1/box*)

AUT-0215-12

Silia*Prep* Adapters

Enable cartridge stacking and easy SPE cartridge connection with syringe or gas lines (*for positive pressure*).

Silia*Prep* Adapters	
Product Number	**Description**
AUT-0172	Silia*Prep* Adapter for 1, 3, 6 & 12 mL SPE (*10/box*)
AUT-0173	Silia*Prep* Adapter for 25 & 70 mL SPE (*10/box*)

AUT-0172

AUT-0173

Silia*Prep* Vacuum Adapters

Fast, user-friendly, and economical adapters for SPE cartridges. Only a vacuum source is needed.

Silia*Prep* Vacuum Adapter - Flasks		
Joint	**PN**	**Description**
24/40	AUT-0043	24/40 - Silia*Prep* Vacuum Adapter (*1/box*)
19/22	AUT-0044	19/22 - Silia*Prep* Vacuum Adapter (*1/box*)
14/22	AUT-0045	14/22 - Silia*Prep* Vacuum Adapter (*1/box*)

Silia*Prep* Vacuum Adapter - Screw Thread Vials		
Thread	**PN**	**Description**
22/400	AUT-0046	22/400 Vial - Silia*Prep* Vacuum Adapter Without Vial Connector (*1/box*)
22/400	AUT-0047	22/400 Vial - Silia*Prep* Vacuum Adapter With Vial Connector (*1/box*)

AUT-0043

AUT-0044

AUT-0045

AUT-0046

AUT-0047

Silia*Prep* Empty Tubes

You can use our Silia*Prep* Empty Tubes to pack your own SPE cartridges with bulk sorbents of your choice.

Silia*Prep* Empty Tubes	
Formats	**Description**
SIM-0007-001	Empty 1 mL SPE tube with 2 frits (*100/box*)
SIM-0008-003	Empty 3 mL SPE tube with 2 frits (*100/box*)
SIM-0002-006	Empty 6 mL SPE tube with 2 frits (*100/box*)
SIM-0003-012	Empty 12 mL SPE tube with 2 frits (*100/box*)
SIM-0004-020	Empty 25 mL SPE tube with 2 frits (*100/box*)
SIM-0006-060	Empty 60 mL SPE tube with 2 frits (*100/box*)
SIM-0009-150	Empty 150 mL SPE tube with 2 frits (*20/box*)

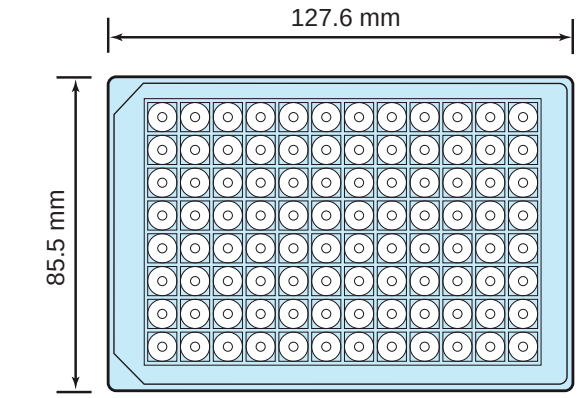
Silia*Prep* 96-Well Collection Plates

SiliCycle offers Silia*Prep* 96-Well Collection Plates, made from polypropylene with extremely low extractable levels.

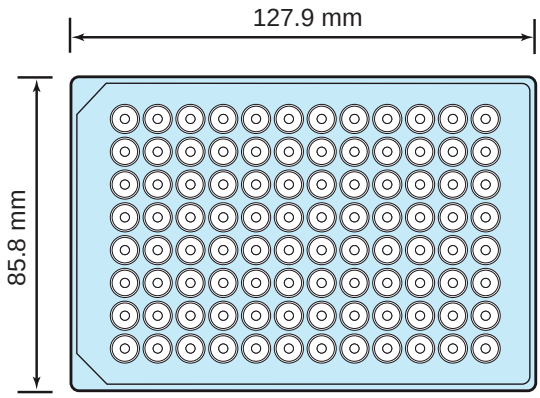
These collection plates are available with square deep shape in both 1.0 mL and 2.0 mL well volume (*V-shaped bottom*), and with round bottom in 1 mL only. Cap mats are available for all of these collection plates.

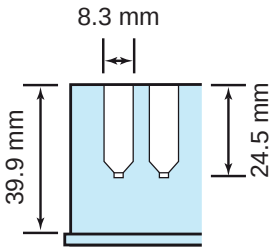
Silia*Prep* 96-Well Collection Plates	
Product Number	**Description**
96W-0009	Silia*Prep* 96-Well Collection Plate Square Bottom, 2 mL (*50/box*)
96W-0010	Silia*Prep* 96-Well Collection Plate Square Bottom, 1 mL (*50/box*)
96W-0011	Silia*Prep* 96-Well Collection Plate Round Bottom, 1 mL (*50/box*)

96-Well Collection Plates Square Shape

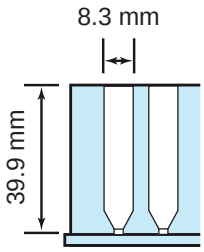


96-Well Collection Plates Round Shape

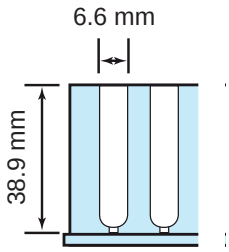




1.0 mL Well Volume



2.0 mL Well Volume



1.0 mL Well Volume

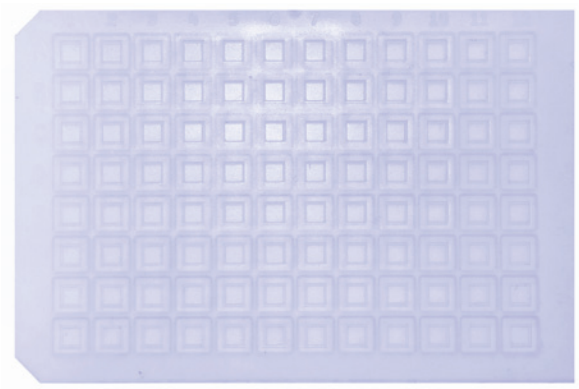
Silia*Prep* Disposable Reservoir Trays for 96-Well Plates

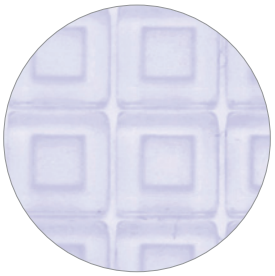
SiliCycle offers Silia*Prep* Disposable Reservoir Trays to collect waste solvents used during activation, loading and washing steps.
These disposable trays are made of polycarbonate and are compatible with all manifolds used with well plates.

Silia*Prep* Disposable Reservoir Trays	
Product Number	**Description**
96W-0012	Silia*Prep* Disposable Reservoir Trays (*25/box*)

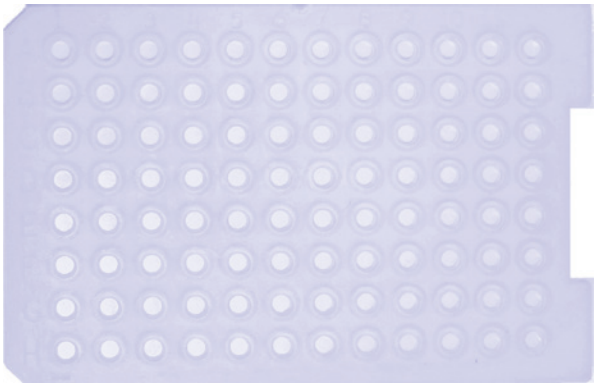
Silia*Prep* 96-Well Plate Cap Mats

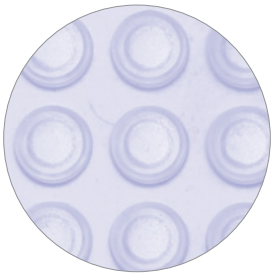
SiliCycle offers Silia*Prep* 96-Well Plate Cap Mats compatible with most 96-Well Plates available on the market. These cap mats are made of premium-quality silicone, with a PTFE coating for ultra low bleed. Slit and 384-Well Plate cap mats are available under request.





Silia*Prep* 96-Well Plate Square
Silicone / PTFE Cap Mats





Silia*Prep* 96-Well Plate Round
Silicone / PTFE Cap Mats

Silia*Prep* 96-Well Plate Cap Mats			
Well Shape	**Quantity**	**Product Number**	**Description**
Square	5/box	96M-0001S	Silia*Prep* 96-Well Plate Square Silicone / PTFE Cap Mats (*to be used with 96W-0009 & 96W-0010 collection plates*)
	25/box	96M-0001S-25	
	50/box	96M-0001S-50	
	100/box	96M-0001S-100	
Round	5/box	96M-0001R	Silia*Prep* 96-Well Plate Round Silicone / PTFE Cap Mats (*to be used with 96W-0011 collection plates*)
	25/box	96M-0001R-25	
	50/box	96M-0001R-50	
	100/box	96M-0001R-100	

Note: Contact us if you are looking for a cap mat not listed above: sampleprep@silicycle.com

Silia*Prep* Phase Separator Cartridges

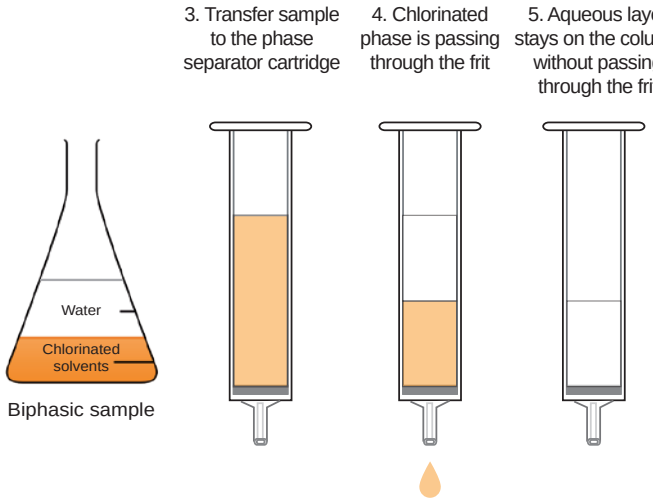
SiliCycle offers Silia*Prep* Phase Separator Cartridges to separate the aqueous phase from heavier chlorinated solvents, under gravity. These ready-to-use cartridges are fitted with a proprietary hydrophobic frit and are a great alternative to liquid-liquid extraction, the most popular technique to do this separation. However, this last method is time consuming, requires the use of a glass funnel (*which needs to be washed between each separate extraction*) and is not suitable for multiple extractions. Silia*Prep* Phase Separator Cartridges solve these drawbacks and offer many advantages:

- Ease of use
- Efficient and cost saving
- Compatible with automated systems

Silia*Prep* Phase Separator Cartridges	
Product Number	**Description**
PS-012	Silia*Prep* Phase Separator Cartridges, 12 mL (*100/box*)
PS-060	Silia*Prep* Phase Separator Cartridges, 60 mL (*50/box*)
PS-150	Silia*Prep* Phase Separator Cartridges, 150 mL (*25/box*)

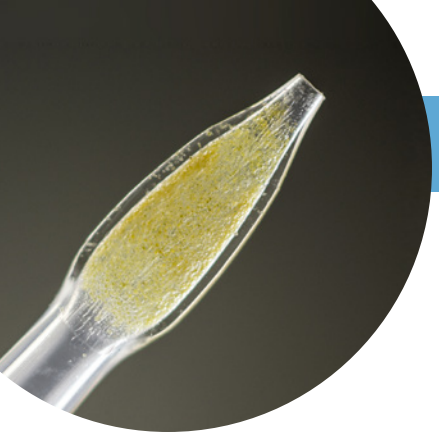
Typical Experimental Procedure

1. Select the appropriate size of Silia*Prep* Phase Separator Cartridge to hold your entire sample volume (*both aqueous and chlorinated phases*).
2. Connect the Silia*Prep* Phase Separator Cartridge on a vacuum manifold. Ensure the collection vessel volume is large enough to entirely recover the organic layer.
   Note: Do not connect the manifold to a vacuum source
3. Transfer the biphasic sample on top of the Silia*Prep* Phase Separator Cartridge.
4. After a few seconds (*under gravity*), the water immiscible chlorinated solvent will start to pass through the frit.
5. The proprietary frit used in the Silia*Prep* Phase Separator Cartridge allows the aqueous layer to be left on the column for at least 48 hours without passing through the frit.



Important Advice

- **Process under gravity only - Do not apply vacuum or positive pressure**
  The Silia*Prep* Phase Separator Cartridges are designed to be used under gravity only. The use of a vacuum or positive pressure source can lead to a loss of separation efficiency.
- **Biphasic system required**
  The sample needs to contain water and a water immiscible solvent (*with greater density than water, to form the lower layer*).
  Most common solvents are dichloromethane, chloroform and other chlorinated solvents.
  Try to minimize the presence of water miscible solvent (*i.e. methanol, ethanol or acetone*), which can cause problems in obtaining a truly biphasic system. The phase separator may not work effectively if the two phases are merging.
- **More efficient compound partition**
  To obtain a more efficient compound partition between aqueous and organic layers, a liquid-liquid extraction can be done prior to use the phase separator column.



Micro-SPE Tips

SiliaPrep Tips for Micro Sample Preparation

- Simple, fast analyte retention & elution with minimal loss
- Sorbents directly embedded into inner cartridge wall
- High binding capacity
- No back-pressure

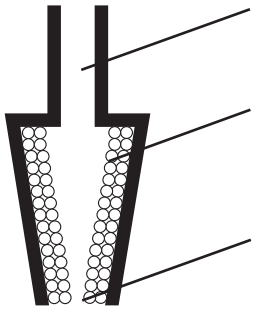
Overview

SiliaPrep Micro-SPE Tips are designed for micro-purification and micro-extraction of femtomole (*fmol*) to picomole (*pmol*) quantities of analytes prior to the analysis by chromatographic techniques and / or mass spectrometry.

The constant improvement in these techniques of analysis has allowed scientists to decrease the limit of quantification in several applications. This lower limit has pushed SPE manufacturers to design new SPE cartridges accepting smaller volumes of analyte.

These tips are specially designed to achieve extraction and purification of small molecules, peptides, phosphopeptides and proteins. They are packed with our SiliaBond functionalized silica gels and specialty phases to cover the broadest spectrum of applications requiring small volume of analytes.

The phases are embedded directly in the inner surface of the tip to provide consistent flow rates. Finally, no glue is used during packing procedures in order to prevent any contamination of the analyte.



A - Flow-Through Channel
Eliminates back-pressure.

B - Sorbent
Sorbent is embedded without any glue or binding polymer.

C - Modified Pipette Tip
Easy to fill and release the sample.

SiliaPrep Micro-SPE Tips Sizes

SiliaPrep Micro-SPE Tips are available in 3 different cartridge formats, based on the binding capacity of each embedded sorbent.

SiliaPrep Micro-SPE Tips Specifications

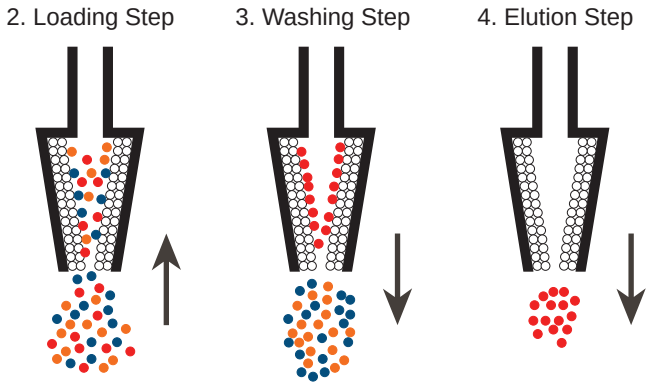
Tip Volume (µL)	Sample Volume (µL)	Binding Capacity (µg)	Sorbent Weight (µg)	Product Number
1 - 10	0.5 - 10	1	30	-T1
10 - 200	2 - 25	2.5	75	-T2
10 - 200	5 - 50	15	400	-T3

SiliaPrep Micro-SPE Tips are sold in box of 96.

Silia*Prep* Tips General Experimental Procedure

The following lines present the general experimental procedure for the purification and enrichment of small molecules, peptides and proteins using Silia*Prep* Micro-SPE Tips.

1. **Conditionning Step**:
   Attach the Silia*Prep* Tips to a micropipette.
   Aspirate / expel the elution solution 5 times and the binding solution 3 times.
2. **Loading Step**:
   Aspirate / expel the sample 20 to 50 times to allow compounds to adsorb onto the sorbent.
3. **Washing Step**:
   Aspirate / expel the binding solution 10 times and discard the expelled solution each time.
4. **Elution Step**:
   Aspirate / expel the elution solution 10 times and collect the expelled solution in a suitable clean tube. Repeat with a fresh portion of elution solution if you want to be sure to collect all of the adsorbed compounds.
   Note: repeat 3 - 5 times for carbon black sorbent



Silia*Prep* Micro-SPE Tips Application

Micro-Extraction of Dextromethorphan from Plasma	
CARTRIDGE	Silia*PrepX* Tips C18 10 µL / 30 µg Part Number: SPET-C18-T1
SAMPLE PRETREATMENT	8 µL of plasma sample was mixed with 2 µL of internal standard (*Dextromethorphan-d3 at 10 ng/mL in Methanol*)
CONDITIONNING STEP	8 µL of Methanol (*10 aspirate / expel*)
EQUILIBRATION STEP	8 µL of water (*10 aspirate / expel*)
LOADING STEP	Plasma sample (*30 aspirate / expel*)
WASHING STEP	8 µL of water (*10 aspirate / expel*) then 8 µL of 25 % Methanol in water (*10 aspirate / expel*)
ELUTION STEP	8 µL of Acetonitrile (*30 aspirate / expel*)
FURTHER TREATMENT	Quantification by LDTD/MS/MS (*collaboration with Phytronix*)
RECOVERY	at 10 ng/mL
Dextromethorphan	86 %
Dextromethorphan d-3	80 %

Silia*Prep* Tips Sorbent Selection Guide

Silia*Prep* Tips Sorbent Selection Guide			
Molecule	**Application**	**Analyte**	**Sorbent**
Small Molecules	Desalting	All	C18; Carbon Black
	Protein removal	All	C18; HILIC
	Metal scavenging	All	Cysteine; DMT; Imidazole; PSA; TAAcOH; TAAcONa; Thiol; Thiourea; Triamine
	Enrichment	Hydrophobic	C18; HLB; DVB; Carbon Black; HILIC
		Hydrophilic	Silica; Cyano; Carbon Black; HILIC
		Neutral	C18; HLB; DVB; Carbon Black; HILIC; Cyano
		Cationic	SCX; WCX; Polymeric SCX & WCX
		Anionic	SAX; NH_2; Polymeric SAX & WAX
		Fluorinated Compounds	Fluoro
Peptides	Desalting	All	C4; C8; C18; Carbon Black; HILIC
	SDS removal	All	SDS Removal
	Enrichment	Glycopeptide	Carbon Black; HILIC; TiO_2
		Phosphopeptide	TiO_2; ZrO_2; TiO_2/ZrO_2; SAX; NH_2; Polymeric SAX & WAX
		Other peptide	SAX; NH_2; SCX; WCX; Polymeric SAX, WAX, SCX & WCX
Proteins	SDS removal	All	SDS Removal
	Tryptic digestion	All	Trypsin
	Enrichment	Phosphoprotein	TiO_2; ZrO_2; TiO_2 / ZrO_2; SAX; NH_2; Polymeric SAX & WAX
		Other protein	SAX; NH_2; SCX; WCX; Polymeric SAX, WAX, SCX & WCX
Oligo-saccharides	Desalting	All	Carbon Black
	Enrichment	Sulfated glycan	SAX; XSAX
		Sialo-glycan	SAX; XSAX
		Other oligosaccharide	Carbon Black; HILIC; TiO_2

Silia*Prep* XL Tips for Bigger Volumes

For bigger volumes, we also offer Silia*Prep* XL Micro-SPE Tips, in 3 different formats.
Please note these tips are top loading instead of by aspiration.

Silia*Prep* XL Micro-SPE Tips Specifications				
Tip Volume (*µL*)	**Sample Volume (*µL*)**	**Binding Capacity (*µg*)**	**Sorbent Weight (*mg*)**	**Product Number**
1 - 10	1 - 10	400	4	-T1
10 - 200	2 - 25	1,000	10	-T2
100 - 1,000	20 - 1,000	5,000	50	-T3

Silia*Prep* XL Micro-SPE Tips T1 and T2 are sold in box of 96, T3 in box of 20.

Silia*Prep* Tips Sorbent Descriptions & Ordering Information

Silia*Prep* Tips Sorbent Descriptions and Ordering Information					
Sorbent	**Description**		**Product Number**		
			10 µL / 30 µg	**200 µL / 75 µg**	**200 µL / 400 µg**
C18	Highest hydrophobic character sorbent. Mainly used for small peptides and small molecules purification & enrichment or protein / peptide desalting analysis.		SPET-C18-T1	SPET-C18-T2	SPET-C18-T3
C8	Mid-level hydrophobic sorbent. Mainly used for sample treatment of proteins and peptides requiring a lower hydrophobic capacity, and protein / peptide desalting analysis.		SPET-C8-T1	SPET-C8-T2	SPET-C8-T3
C4	Lowest hydrophobic character sorbent. Mainly used for protein purification & enrichment or protein / peptide desalting analysis.		SPET-C4-T1	SPET-C4-T2	SPET-C4-T3
HLB	Polymeric sorbent with an hydrophilic-lipophilic balance. Mainly used for hydrophobic and neutral molecules enrichment.		SPET-HLB-T1	SPET-HLB-T2	SPET-HLB-T3
DVB	Higly hydrophobic polymeric sorbent. Mainly used for hydrophobic and neutral molecules enrichment.		SPET-DVB-T1	SPET-DVB-T2	SPET-DVB-T3
Carbon Black	Hydrophilic and hydrophobic character. Mainly used for purification of oligosaccharides and other macromolecules containing sugar functions, or protein / peptide desalting.		SPET-CB-T1	SPET-CB-T2	SPET-CB-T3
HILIC	Moderatly polar sorbent. Mainly used for proteins removal, peptides desalting, small molecules enrichment and detergent removal (*broad spectrum of detergents*).		SPET-HI-T1	SPET-HI-T2	SPET-HI-T3
Cyano (*CN*)	Both polar and hydrophobic character. Mainly used for hydrophilic and neutral molecules enrichment.		SPET-CN-T1	SPET-CN-T2	SPET-CN-T3
Silica	Most polar sorbent. Mainly used for hydrophilic molecules enrichment.		SPET-SI-T1	SPET-SI-T2	SPET-SI-T3
SAX	Strong anion exchanger sorbent. Mainly used for weak acids enrichment.		SPET-SAX-T1	SPET-SAX-T2	SPET-SAX-T3
NH_2 (*WAX*)	Weak anion exchanger sorbent. Mainly used for strong acids enrichment (*phosphopeptides and phosphoproteins*).		SPET-NH2-T1	SPET-NH2-T2	SPET-NH2-T3
SCX	Strong cation exchanger sorbent. Mainly used for weak bases enrichment.		SPET-SCX-T1	SPET-SCX-T2	SPET-SCX-T3
WCX	Weak cation exchanger sorbent. Mainly used for strong bases enrichment.		SPET-WCX-T1	SPET-WCX-T2	SPET-WCX-T3
SAX Polymeric	Polymeric sorbent functionalized by a strong anion exchanger. Mainly used for weak acids enrichment.		SPET-XSAX-T1	SPET-XSAX-T2	SPET-XSAX-T3
WAX Polymeric	Polymeric sorbent functionalized by a weak anion exchanger. Mainly used for strong acids enrichment (*phosphopeptides and phosphoproteins*).		SPET-XWAX-T1	SPET-XWAX-T2	SPET-XWAX-T3
SCX Polymeric	Polymeric sorbent functionalized by a strong cation exchanger. Mainly used for weak bases enrichment.		SPET-XSCX-T1	SPET-XSCX-T2	SPET-XSCX-T3
WCX Polymeric	Polymeric sorbent functionalized by a weak cation exchanger. Mainly used for strong bases enrichment.		SPET-XWCX-T1	SPET-XWCX-T2	SPET-XWCX-T3
TiO_2	High selectivity for multiple phosphorylated peptides. Mainly used for phosphopeptide enrichment and phospholipid removal.		SPET-TI-T1	SPET-TI-T2	SPET-TI-T3
ZrO_2	High selectivity for mono-phosphorylated peptides. Mainly used for phosphopeptide enrichment and phospholipid removal.		SPET-ZR-T1	SPET-ZR-T2	SPET-ZR-T3
TiO_2 / ZrO_2	Excellent alternative for the enrichment of a broad spectrum of phosphopeptides (*litterature suggests only 30 % overlap in phosphopeptides isolated by TiO_2 versus ZrO_2*) and phospholipid removal.		SPET-TIZR-T1	SPET-TIZR-T2	SPET-TIZR-T3
SDS Removal	Used to remove SDS from peptides and proteins.		SPET-SDS-T1	SPET-SDS-T2	SPET-SDS-T3
Trypsin	Used to cleave proteins and peptides at the C-terminal side, with minimal protease contaminants.		SPET-TRYP-T1	SPET-TRYP-T2	SPET-TRYP-T3
Fluoro	Fluorinated sorbent. Mainly used for fluorine containing molecules enrichment.		SPET-FL-T1	SPET-FL-T2	SPET-FL-T3
Metal Scavengers	Choice of 9 metal scavenging sorbents. Mainly used to lower the residual metal concentration of various metal complexes (*Pd, Pt, Rh, Ru, Ni, Sn, etc*).	Cysteine	SPET-CYS-T1	SPET-CYS-T2	SPET-CYS-T3
		DMT	SPET-DMT-T1	SPET-DMT-T2	SPET-DMT-T3
		Imidazole	SPET-IMIDAZ-T1	SPET-IMIDAZ-T2	SPET-IMIDAZ-T3
		Diamine	SPET-PSA-T1	SPET-PSA-T2	SPET-PSA-T3
		TAAcOH	SPET-TAACOH-T1	SPET-TAACOH-T2	SPET-TAACOH-T3
		TAAcONa	SPET-TAACONA-T1	SPET-TAACONA-T2	SPET-TAACONA-T3
		Thiol	SPET-THIOL-T1	SPET-THIOL-T2	SPET-THIOL-T3
		Thiourea	SPET-THIOUREA-T1	SPET-THIOUREA-T2	SPET-THIOUREA-T3
		Triamine	SPET-TRINH2-T1	SPET-TRINH2-T2	SPET-TRINH2-T3

Note: Add "XL" after "SPET" for ordering Silia*Prep* XL Tips. For example: SPETXL-C18-T1.

Sample Preparation & Pesticide Analysis

If you want to improve your sample prep & cleanup procedures, Silia*Fast*™ cartridges offer a simple, economical and highly performant alternative.

FaPEx® : One of the Fastest Extraction / Clean-up Approaches for Pesticide Residue Analysis!

FaPEx stands for *"**Fa**st **P**esticide **Ex**traction"* and may be considered as *"QuEChERS made even easier"*. This 1-step extraction method preceding LC/MS/MS or GC/MS/MS analysis will ensure you:

- **Extraction of thousands of pesticides simultaneously**
- **Reduction of at least 60 % labor cost**
- **Faster than existing methods**
- **Less operating equipment, less organic solvents and waste than QuEChERS**
- **Impressive versatility**
- **High reliability**

Pesticide residues in agricultural products are receiving ongoing and considerable attention from consumers. As global requirements for food safety are growing in numbers and complexity, safer, faster and more refined methods are needed to increase efficiency and overall capacity of pesticide residue testing laboratories. Sample preparation has most frequently been the rate-limiting step of analytic labs, **and it is within this context that the FaPEx technology plays its full role**.

Currently, the fastest and most internationally recognized rapid extraction technique for pesticide residue analysis is the QuEChERS methodology (*see previous page*). It is an excellent alternative to more conventional and tedious methods that combine a first Liquid / Liquid Extraction (*or LLE*) followed by a second Solid Phase Extraction (*or SPE*).

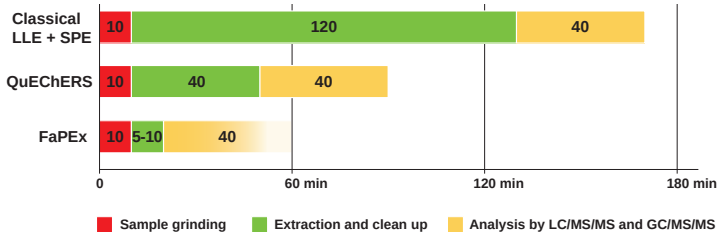
With overall enhancement in instrument performances (*sensitivity, detection ability, resolving power, throughput, other performance attributes*), sample preparation techniques had no choice but to keep up with these developments and follow the trend.

A New, Easy, Reliable & Costs Saving Method

FaPEx is an innovative, simple and fast method for the preparation of samples, a crucial step preceding LC/MS/MS or GC/MS/MS analysis.

The FaPEx methodology is based on the same principles than the QuEChERS method, while simplifying it to the extreme. It relies on single-use pre-filled sealed cartridges. After homogenization, the sample is directly treated with a FaPEx cartridge. The resulting cleaned filtrate is ready for injection and chromatographic analysis. Because of its ease of use and great simplicity, FaPEx minimizes handling errors while providing high recovery yields.

More than simply increasing yields of extraction, reducing time and costs associated with pesticide separation, FaPEx also scales down labor time, glassware requirements, specialized equipments and laboratory space requirement. It also significantly diminishes the amount of waste solvents and other chemicals.



Time savings using FaPEx vs standard methods

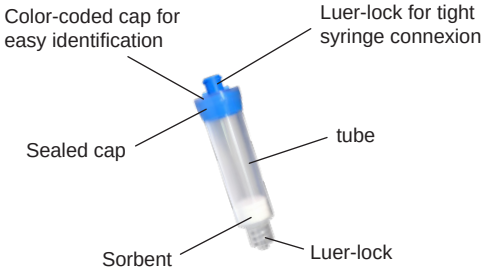
Design

The basic principle of FaPEx is based on the partitioning of a sample between:

- **a liquid phase**: the food matrix (*fruits, vegetables, cereals, tobacco, etc.*) and key analytes (*pesticides*).
- **a stationary phase**: the adsorbent (*composed of various reagents, depending on the need*).

Reagents for removal of matrix interferences:

- **dewatering agents**: dry the liquid phase and allow a better partition coefficient.
- **PSA** (*Primary Secondary Amine*): removes sugars, fatty acids, organic acids, lipids, certain pigments. In combination with a C18 phase, also removes sterols and other types of lipids.
- **C18**: removes nonpolar organic compounds, saturated hydrocarbons and sterols.
- **Carbon black**: removes pigments, polyphenols, and other polar organic compounds.



Portfolio

Silia*Fast*™ is SiliCycle's brand for FaPEx® cartridges.

Four different FaPEx products are available according to the various matrices and compound classes below:

Silia*Fast* FaPEx Portfolio		
Cartridge	**Name**	**Matrices**
	Silia*Fast*™ **FaPEx-GEN**	General matrices and all forms. Non-pigmented and non-fat containing matrices.
	Silia*Fast*™ **FaPEx-CER**	Cereal, rice and grains.
	Silia*Fast*™ **FaPEx-PM**	Pigmented matrices. Chlorophyll containing matrices.
	Silia*Fast*™ **FaPEx-HPM**	Highly pigmented matrices. Green tea and other highly pigmented matrices.

Learn more & Order

Visit **www.silicycle.com/fapex**

Contact us: **sampleprep@silicycle.com**

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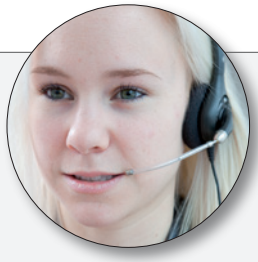

Technical Support

At SiliCycle, we are committed to providing the best technical support possible.

Our worldwide Technical Support Group is comprised of a team of highly qualified M. Sc., Ph. D. Chemists and Engineers, Technical Support Professionals and Service Coordinators who are prepared to troubleshoot, answer questions and provide solutions for your service and applications needs.

In order to better respond to your technical inquiries, feel free to contact us in three different ways:

E-mail: **support@silicycle.com**

Phone:
- International **+1 418.874.0054**
- USA and Canada **+1 877.745.4292** (*Toll Free*)

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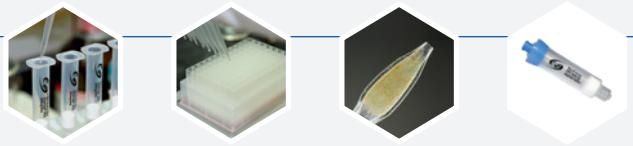

ANALYTICAL & PREPARATIVE CHROMATOGRAPHY

Silia*Sphere*™ – Spherical Silica Gels
Silia*Chrom*® – HPLC Columns

ORGANIC SYNTHESIS

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