

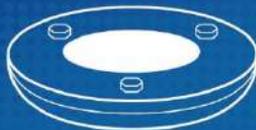


affinisep

The Art of making
sample preparation easier



WATER & ENVIRONMENTAL ANALYSIS SOLUTIONS



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Sampling and sample Preparation

AFFINISEP provides a multitude of chemical phases and formats to help you to face the increasingly challenges of sampling and sample preparation methods for single and multi analysis.

Solid Phase Extraction

SPE Disks

Passive samplers

POCIS, SPATT, Based on
Disks, Silicone rubber

Membranes & filtration

**SPE Manifolds and
Accessories**

AttractSPE® Disks for environmental applications

AttractSPE® Disks are **thin** and **uniform** membranes based chromatography for extraction/separation, purification and concentration of analyte molecules from a liquid or air sample.



AttractSPE® Disks

AttractSPE® Disks are Solid Phase Extraction Disks for the extractions of a broad range of contaminants. **AttractSPE® Disks** are **thin, dense** and **uniform** SPE disks for retention of targeted analytes without any breakthrough. Our innovative SPE disks allow the best interactions with analytes and a maximal flow rates without any channeling.

Important Fact

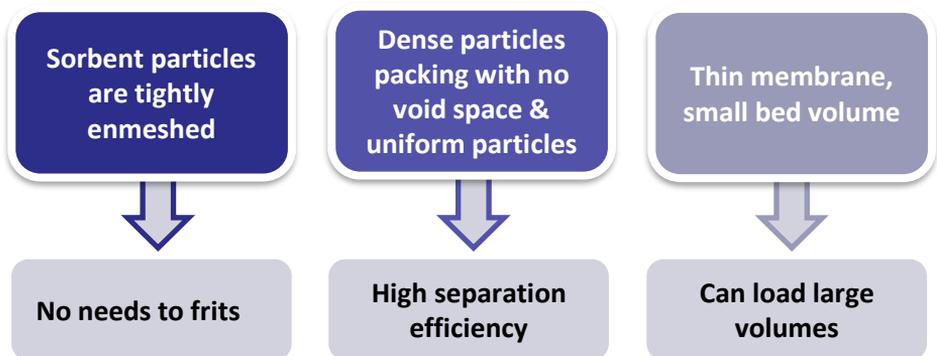
AFFINISEP is manufacturer of its own resins from A to Z (from monomers to polymers) and can tailor-made chemistries with different physico-chemical properties.

Compared to other Disks available on the market :

- ✓ Higher density avoiding channeling
- ✓ No bubbling
- ✓ More diversity on chemistry **including HLB**
- ✓ More diversity in term of capacity (different particle sizes and porosities)
- ✓ Large diversity of applications for passive sampling (based on disks and POCIS) as well as for protein and peptide purifications
- ✓ Can handle dirty samples
- ✓ Compatible with manual and automated holders
- ✓ Multimode or Specific application like disks for Glyphosate

AttractSPE® Disks Advantages

- The membrane has a high exposed surface area of active particles
- AttractSPE® Disks are used to prepare samples of large volumes for environmental analysis with a very high flow rate
- AttractSPE® Disks are available in a broad diversity of chemistry, HLB, C18, SDB-XC, SDB-RPS, anion and cation exchanges as well as multimode HLB and ionics
- AttractSPE® Disks has an excellent hold
- Make possible the loading of high volume of water in a short time with excellent performances
- Usable as Passive sampler such as ChemCatchers
- Disks format for contaminants enrichment – 47mm or 90mm



AttractSPE® Disks Environment

AttractSPE® Disks Environment have been designed for environmental applications such as high volume loading (including in compliance with EPA methods) or passive sampling use.

| Product | Compatible with analytical methods |
|--|---|
| AttractSPE® Disks HLB | EPA methods : 532 (Phenylurea compounds), 548 (Endothall), 625 (Acids and Base/Neutrals including PCBs), 8081 (Organochlorine Pesticides), 8082 (PCBs), 8270 (Semivolatiles Organic Compounds), 8315 (Carbonyl Compounds), 8318 (N-Methylcarbamates), 8330 (Nitroaromatics & Nitramines) and also Hormones, sex steroids, PAHs, PPCPs, Pharmaceutical compounds, Endocrine disruptors |
| AttractSPE® Disks C18 & AttractSPE® Disks C18 Polar | EPA methods : 506 (Phthalate & Adipate Esters), 507 (Nitrogen- & Phosphorus-Containing Pesticides), 508.1 (Chlorinated Pesticides), 525 (Organic Compounds), 532 (Phenylurea compounds), 548 (Endothall), 550.1 (PAHs), 553.1 (Benzidine & Nitrogen-containing Pesticides), 554 (Carbonyl Compounds & Formaldehyde), 608 (Organochlorine Pesticides), 1613 (Dioxins & Furans), 1614, 1657 (Organophosphorus Pesticides), 1668 (PCBs), 8061 (Phthalate Esters), 8081 (Organochlorine Pesticides), 8082 (PCBs), 8315 (Carbonyl Compounds) and also Bisphenols & Alkyl phenols, PBDEs, Dioxins & Furans, Phthalates, Herbicides, PAHs, Carbaryl, Microcystins |
| AttractSPE® Disks SDB-XC | EPA method 515.2 chlorinated acids |
| AttractSPE® Disks SDB-RPS | Explosives Residues (HDX, RDX) |
| AttractSPE® Disks Anion Exchange - SR | EPA methods: 548.1 Rev. 1 (Endothall), EPA Method 552.1 Rev. 1 (Haloacetic Acids and Dalapon) And also Pesticides, Pharmaceutical compounds and analytes containing carboxylic acid groups |
| AttractSPE® Disks Cation Exchange - SR | Metals, Amines |
| AttractSPE® Disks Oil & Grease | Oil & grease |

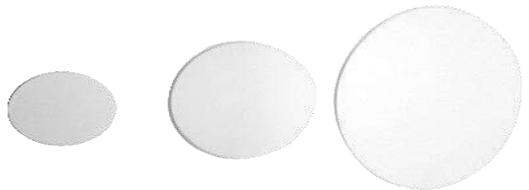
AttractSPE® Disks Environment

| Designation | Description | Reference - 47mm -20/pk | Reference -90mm - 10/pk |
|--|---|-------------------------------|-------------------------------|
| AttractSPE® Disks HLB | HLB sorbent | SPE-Disks-HLB-47.T1.20 | SPE-Disks-HLB-90.T1.10 |
| AttractSPE® Disks C18 | C18 sorbent | SPE-Disks-C18-47.T1.20 | SPE-Disks-C18-90.T1.10 |
| AttractSPE® Disks C18 Polar | C18 Polar sorbent | SPE-Disks-C18P-47.T1.20 | SPE-Disks-C18P-90.T1.10 |
| AttractSPE® Disks SDB | PS-DVB sorbent | SPE-Disks-DVB-47.T1.20 | SPE-Disks-DVB-90.T1.10 |
| AttractSPE® Disks SDB-RPS | Modified SDB-RPS sorbent | SPE-Disks-RPS-47.T1.20 | SPE-Disks-RPS-90.T1.10 |
| AttractSPE® Disks Anion Exchange SR | SAX sorbent | SPE-Disks-AN-47.T1.20 | SPE-Disks-AN-90.T1.10 |
| AttractSPE® Disks Cation Exchange SR | SCX sorbent | SPE-Disks-CAT-47.T1.20 | SPE-Disks-CAT-90.T1.10 |
| AttractSPE® Disks Oil & Grease | For oil and grease | SPE-Disks-OIL-47.T1.20 | SPE-Disks-OIL-90.T1.10 |
| AttractSPE® Disks Chelating | For multivalent metal | SPE-Disks-MET-47.T1.20 | SPE-Disks-MET-90.T1.10 |
| AttractSPE® Disks SAX-HLB | SAX-HLB mixture | SPE-Disks-SAX-HLB-47.T1.20 | SPE-Disks-SAX-HLB-90.T1.10 |
| AttractSPE® Disks High Spectrum | Mix HLB-WCX-WAX for non-targeted screening | SPE-Disks-screening1-47.T1.20 | SPE-Disks-screening1-90.T1.10 |
| AttractSPE® Disks High Spectrum | Mix HLB-SCX-SAX for non-targeted screening | SPE-Disks-screening2-47.T1.20 | SPE-Disks-screening2-90.T1.10 |
| AFFINIMIP® SPE Disks Picolinic Herbicides | Based on AFFINIMIP® SPE Picolinic herbicides for extraction of picloram Clopyralid, Aminopyralid | SPE-Disks-PICO-47.T1.20 | SPE-Disks-PICO-90.T1.10 |

AttractSPE® Disks Applications

- **Extraction/separation, purification** and concentration of analytes from a large volume aqueous sample.
- **Passive Sampling** Devices based on **disks**
- **Air sampling** to identify and quantify health hazards

AttractSPE® Disks are available
with 3 diameters: 25mm,
47mm and 90mm.



AttractSPE® Disks Manifolds
Available for all formats

AttractSPE® Disks Manifolds and accessories

AttractSPE® disks Manifolds

One-, three- or six-station filtration manifolds allow the simultaneous extractions of several 1-L samples on a very simple and easy-to-handle way. The manifold is a very compact stainless steel device with a filtration glassware. Each station is controlled through an independent flow control valve.

Manifolds 47mm



| Designation | Reference |
|---|-------------------|
| AttractSPE® disks Manifolds - 1 station - 47mm | ACC-DISKSPE-G47-1 |
| AttractSPE® disks Manifolds - 3 stations - 47mm | ACC-DISKSPE-G47-3 |
| AttractSPE® disks Manifolds - 6 stations - 47mm | ACC-DISKSPE-G47-6 |
| 4L Polycarbonate Trap with 2m vacuum hose | ACC-TRAP-4L |



AttractSPE® Prefilter Glassfiber

AttractSPE® Prefilter Glassfiber are required on top of AttractSPE® Disks to prevent clogging when loading water rich of suspended particles



| Description | Reference | Description | Reference |
|------------------|------------------|-------------------|-------------------|
| 25mm, 1µm, 50/pk | PF-GF-50.T1.25.1 | 90mm, 1µm, 50/pk | PF-GF-50.T1.90.1 |
| 25mm, 3µm, 50/pk | PF-GF-50.T1.25.3 | 90mm, 3µm, 50/pk | PF-GF-50.T1.90.3 |
| 47mm, 1µm, 50/pk | PF-GF-50.T1.47.1 | 100mm, 1µm, 50/pk | PF-GF-50.T1.100.1 |
| 47mm, 3µm, 50/pk | PF-GF-50.T1.47.3 | 100mm, 3µm, 50/pk | PF-GF-50.T1.100.3 |

Passive Sampling Solutions



POCIS



SPATT

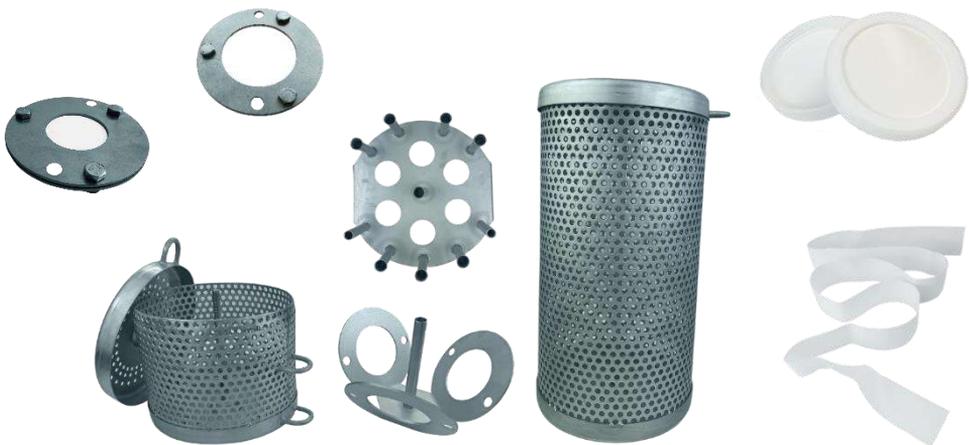


Disks-based passive samplers



Silicone rubbers

Passive sampling enables the monitoring of contaminants in water (surface water, groundwater, coastal water...) for a short (at least 7 days) to long period (with an average field deployment of one month) for which no power, maintenance and supervision is required. An average of the concentration of collected contaminants is measured in the laboratory.



Passive samplers

Advantages of Passive Sampling

- Can generate a time-weighted average (TWA) concentration of the contaminants in water
- Deployable in harsh conditions
- No a priori preparation or supervision
- Very simple use

Passive Samplers and Applications

POCIS

Pesticides and drug residus



Passive sampler based on Disks

Pesticides and drug residus



SPATT

Biotoxins tracking



Silicone rubbers

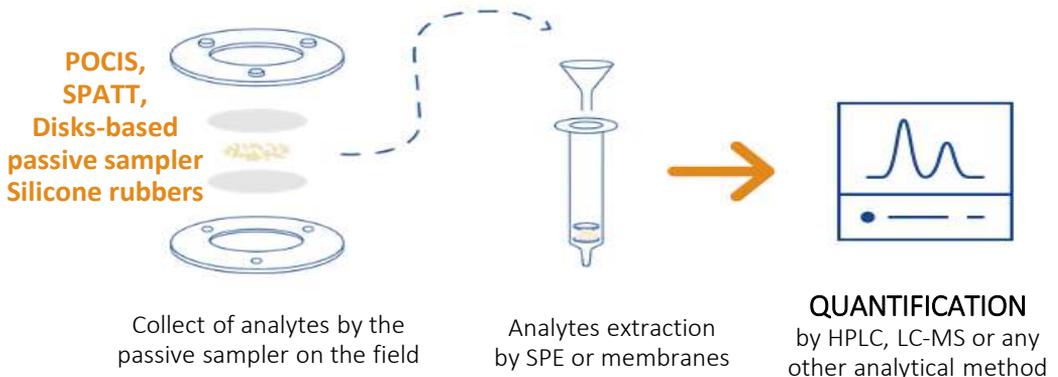
Hydrophobic micropollutants



Passive samplers

Steps from water to analysis

The sorbent adsorbs the contaminant(s) in water. The organic compounds are then extracted from the sorbent in the POCIS, following a SPE procedure and analyzed using classical analytical methods by HPLC, and LC-MS,



Broad range of applications for your sample preparation

| | |
|--|--|
| Hormons and EDCs Natural & synthetic estrogens, Bisphenols & analog, Phenolics | Pesticides Glyphosate & AMPA, Aminopyralid, Clopyralid, Picloram, Organophosphorus & Organochlorine pesticides |
| Drug residues Carbamazepine, Sulfamethoxazole, Diclofenac, Propranolol, Tetracyclines, ... | Other contaminants Caffeine, Perfluorinated cmpds, Organometals, PAHs, Biotoxins |

Passive samplers

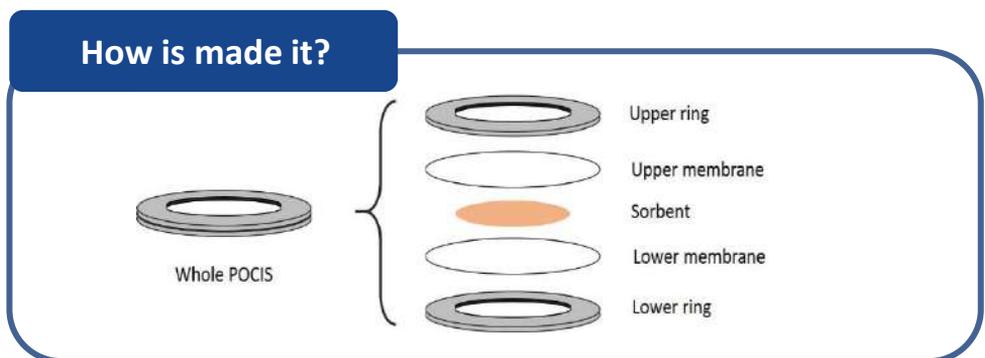
POCIS portfolio

Polar Organic Chemical Integrative Sampler (POCIS) are used for water monitoring of a wide range of organic molecules :

- **AttractSPE® POCIS HLB** for drug residues and pesticides
- **AttractSPE® POCIS Pesticides** for pesticides
- **AFFINIMIP® POCIS GLYPHOSATE** for Glyphosate and AMPA
- **AFFINIMIP® POCIS EDC** for the retention of Phenolic endocrine disrupters such as natural/synthetic estrogens, Bisphenols...

Our POCIS with PRC at the concentration you require !

Performance and reference compound (PRC) is a compound not present in the environment (*e.g.*, a deuterated molecule), which is spiked in the sorbent phase of the POCIS before its exposure as internal standards.



AttractSPE® SPATT Biotoxins

AttractSPE® SPATT Biotoxins is used to evaluate the contamination of shellfish with biotoxins in seawater such as Pectenotoxin, Yessotoxin, Okadaic acid/ Dinophysistoxin and Azaspiracids.

Passive samplers

Passive sampler based on SPE disks

- **AttractSPE® Disks Passive Sampler HLB**
- **AttractSPE® Disks Passive Sampler SDB-RPS**



For the analysis of pesticides and drug residues
Devices equivalent to Chemcatchers™ with a 40mm window to adsorb the contaminants on the field.
Available for groundwater analysis with rectangular shape.



Do you know ?

AFFINISEP provides a complete range of SPE Disks suitable for Chemcatchers™ and any disk –based passive samplers use (see page SPE Disks for more information).

Silicone rubbers

Attract Silicone Rubber SR are PDMS membrane SSP-M823 (250µm) used to extract a broad range of nonpolar compounds ($\log K_{ow} >2-3$) such as organophosphorus or organochlorine pesticides, PolyChloroBiphenyl (PCB), Polycyclic Aromatic Hydrocarbons (PAHs) and a lot of persistent organic pollutants (POP).



Passive sampling PRODUCT LIST

Several kits are available **with or without a performance reference compounds (PRC)** to correct for in situ exposure known to affect uptake rates. These kits also include empty fritted cartridges to make easiest the extraction step of the contaminants.



| Designation | Description | Composition | Reference |
|---|--|--|----------------------------|
| AFFINIMIP® POCIS GLYPHOSATE | POCIS containing AFFINIMIP® GLYPHOSATE - AMPA for the retention of glyphosate and AMPA | 1 POCIS | POCIS.GLY.90.55.A.1 |
| | | Kit of 10 POCIS + empty fritted cartridges | POCIS.GLY.90.55.kit.10 |
| AFFINIMIP® POCIS EDC | POCIS containing AFFINIMIP® Estrogens and AFFINIMIP® Bisphenols for the retention of endocrine disrupters such as natural/synthetic estrogens, Bisphenols... | 1 POCIS | POCIS.EDC.90.55.A.1 |
| | | Kit of 10 POCIS + empty fritted cartridges | POCIS.EDC.90.55.kit.10 |
| AttractSPE® POCIS Pesticides | POCIS containing mixture of sorbent for the retention of several pesticides | 1 POCIS | POCIS.PEST.90.55.A.1 |
| | | Kit of 10 POCIS + empty fritted cartridges | POCIS.PEST.90.55.kit.10 |
| | | Kit of 1 POCIS with a sorbent containing DIA as PRC - 3 cartridges containing the sorbents with Désisopropylatrazine (DIA) d5 - empty fritted cartridges | POCIS.PEST.90.55.kit.1.DIA |
| AttractSPE® POCIS HLB | POCIS containing Attract HLB for the retention of pharmaceutical drug residues | 1 POCIS | POCIS.HLB.90.55.A.1 |
| | | Kit of 10 POCIS + empty fritted cartridges | POCIS.HLB.90.55.kit.10 |
| | | Kit of 1 POCIS with a sorbent containing DIA as PRC - 3 cartridges containing the sorbents with Désisopropylatrazine (DIA) d5 - empty fritted cartridges | POCIS.HLB.90.55.kit.1.DIA |

Passive sampling PRODUCT LIST

POCIS for groundwater

| Designation | Definition | Reference |
|---|---|--------------------|
| AttractSPE® POCIS HLB for Groundwater | 1 POCIS containing Attract HLB for the retention of pharmaceutical drug residues & pesticides - 30cm x 5cm - mass sorbent equivalent to 2 rounds POCIS | POCIS.HLB.30.5.A.1 |
| | POCIS containing Attract HLB for the retention of pharmaceutical drug residues & pesticides - 1 unit = 3 pocis of 10cmx4cm equivalent to 2 round POCIS | POCIS.HLB.10.4.A.3 |
| AFFINIMIP®SPE POCIS GLYPHOSATE for Groundwater | 1 POCIS containing AFFINIMIP® Glyphosate - 30cm x 5cm - mass sorbent equivalent to 2 rounds POCIS | POCIS.GLY.30.5.A.1 |
| | POCIS containing AFFINIMIP® Glyphosate in Groundwater - 1 unit = 3 pocis of 10cmx4cm equivalent to 2 round POCIS | POCIS.GLY.10.4.A.3 |

AFFINISEP provides POCIS with specific shapes for groundwater.

Do not hesitate to contact for the POCIS of interest.



POCIS FOR GROUNDWATER

1 unit = **3 pocis of 10cmx4cm**



POCIS FOR GROUNDWATER

1 unit = **30cm x 5cm**

Disks-based passive samplers

| Designation | Description | Reference |
|--|---|---------------------------|
| AttractSPE®Disks Passive Sampler HLB | Disks - based passive samplers with AttractSPE®Disks HLB + ready to use PES membranes, 10/pk Outer diameter of 90mm and with a single-sided opening of 40mm. Compliant with 3-PS holders | DBPS.HLB.90.40.kit .10 |
| AttractSPE® Disks Passive Sampler SDB-RPS | Disks - based passive samplers with AttractSPE®Disks SDB-RPS + ready to use PES membranes, 10/pk Outer diameter of 90mm and with a single-sided opening of 40mm. Compliant with 3-PS holders | DBPS.RPS.90.40.kit. 10 |

Front and back sides of disks passive samplers-compliant with POCIS holder.

Available formats for groundwater analysis.



Passive sampling PRODUCT LIST

AttractSPE® SPATT

| Designation | Description | Composition | Reference |
|--|---|--------------------|---------------------------------|
| AttractSPE® SPATT BIOTOXINS | SPATT containing HP-20 sorbent for the retention of biotoxins. Nylon mesh membrane | 10 SPATT Biotoxins | SPATT.BIOTOX.90 .55.300.A.10 |

Attract Silicone rubber - PDMS membrane SSP-M823 (250µm)

| Designation | Description | Reference |
|---------------------------------------|--|--------------------|
| Attract Silicone Rubber SR | Silicone rubber strips – 10/pk – No PRC | SR.0.100.3.A1.10 |
| | Silicone rubber strips with PRCs – 10/pk | SR.PRC.100.3.A1.10 |

AFFINISEP provides a complete set of accessories for the use of **Passive sampler**.

| Designation | Description | Reference |
|--|--|--------------|
| CANISTER – 3 POCIS | 1 Canister for 3 POCIS – Empty (holder not supplied) | CAN-3P.A.1 |
| CANISTER AND HOLDER FOR 3 POCIS | 1 Canister and 1 holder for 3 POCIS/DBPS | CH-3P.A.1 |
| CANISTER 24cm | 1 Canister 24cm – Empty - Requires two holders for 3 passive samplers each (not included) | CAN24.A.1 |
| CANISTER 29cm | 1 Canister 29cm – Empty - Requires 2 holders for 3 passive samplers each + 1 spider holder for silicone rubber/SPMD (not included) | CAN29.A.1 |
| HOLDER – 3 POCIS | 1 Holder for 3 POCIS | HOLD-3P.A.1 |
| HOLDER - SPIDER | 1 Holder – Spider for silicone rubber or SPMD | HOLD-SPI.A.1 |



CANISTER - 29cm



CANISTER – 3 POCIS



HOLDER – 3 POCIS

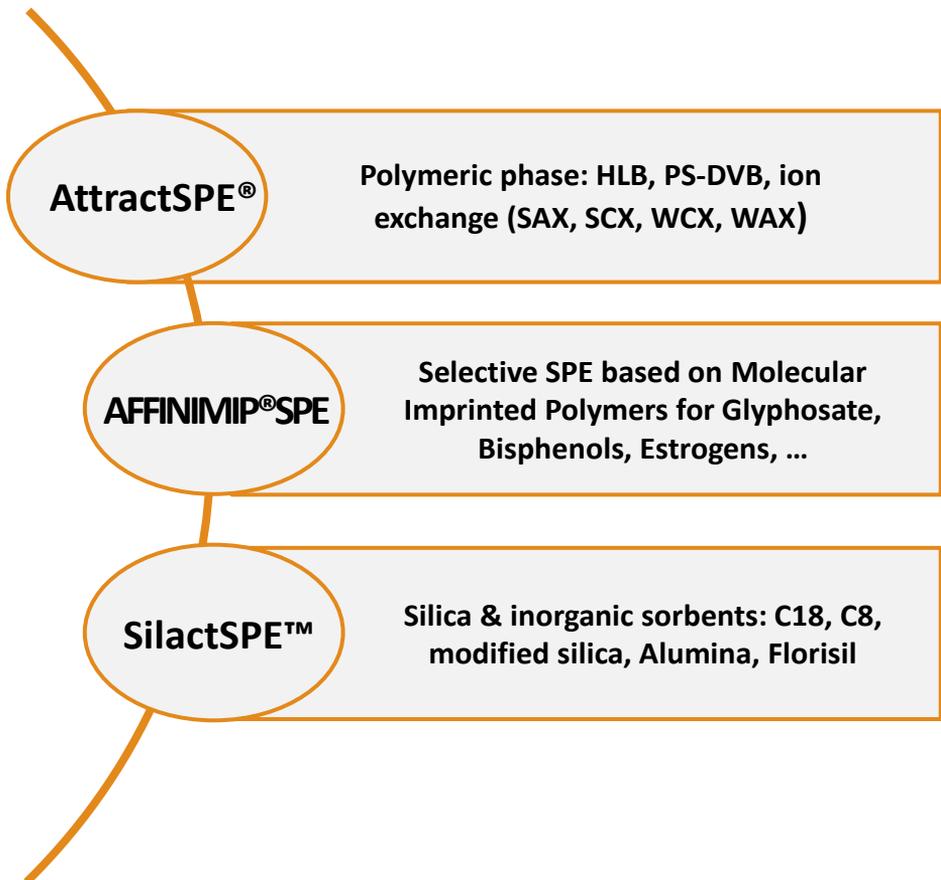


HOLDER – SPIDER

Solid Phase Extraction from every angle!

AFFINISEP offers a complete range of sorbents for solid phase extraction:

- from very specific to crude clean-up phases,
- from silica to polymers,
- from conventional to more sophisticated sorbents for various applications.



AFFINIMIP® SPE

Based on Molecularly Imprinted Polymers for
the Selective Extraction of Trace Analytes from
Complex Matrices



Antibiotics and drug residues

- Chloramphenicol
- Aminoglycosides
- Amphetamines
- Sulfonamides
- ...

Pesticides

- Glyphosate, AMPA & Glufosinate
- Aminopyralid, Clopyralid, Picloram
- Atrazine & derivatives

Other contaminants

- Hydroxylated PAHs
- PAHs
- PCBs
- Cyanuric acid

Endocrine disruptors

- Natural & synthetic Estrogens
- Bisphenols & analogs
- Parabens
- Phenolics



**Glyphosate, AMPA,
Glufosinate in Waters:
Geothermal, mineral, river
sea or underground**

- **NO DERIVATIZATION** required to extract the analytes



AFFINIMIP® SPE **Glyphosate**

- FS113-03B for 6mL – 50/pk
- FS113-15-03B for 6mL – 50/pk
- FS113-03C for 12mL – 50/pk



**Picloram,
Aminopyralid,
Clopyralid in Water,
Compost, Cereal, Soil...**



AFFINIMIP®SPE **Picolinic Herbicides**

- FS115-03 for 3mL – 50/pk
- FS115-03B for 6mL – 50/pk



**Broad family of natural
and synthetic estrogens**



AFFINIMIP®SPE **Estrogens**

- FS104-03A for 1mL – 50/pk
- FS104-03 for 3mL – 50/pk
- FS104-03B for 6mL – 50/pk
- FS104-1.96W 96 well plate – 1 unit



Bisphenols such as Bisphenol A and closely 18 related structures



AFFINIMIP® SPE Bisphenols

- FS106-03 for 3mL – 50/pk
- FS106-03B for 6mL – 50/pk
- FS106-03C for 12mL – 50/pk
- FS106-1.96W 96 well plate – 1 unit



Parabens, carnosic acid, hydroxylated PAHs , Tocopherols, Nitrophenols, Chlorophenols, ...



AFFINIMIP®SPE Phenolics

- FS103-03 for 3mL – 50/pk
- FS103-03B for 6mL – 50/pk
- FS103-03C for 12mL – 50/pk
- FS103-1.96W 96 well plate – 1 unit



Benzo[a]anthracen B[a]A; Benzo[a]pyren B[a]P; Benzo[a] fluoranthen B[a]F; Chrysen (CHR), etc.



AFFINIMIP®SPE PAHs

- FS1119-03-NG for 3mL – 50/pk
- FS1119-03B for 6mL – 50/pk



PFBA, PFPeA, PFHxA, PFHpA, PFOA, PFNA, PFDA, PFTA, PFBS, PFHxS, PFOS



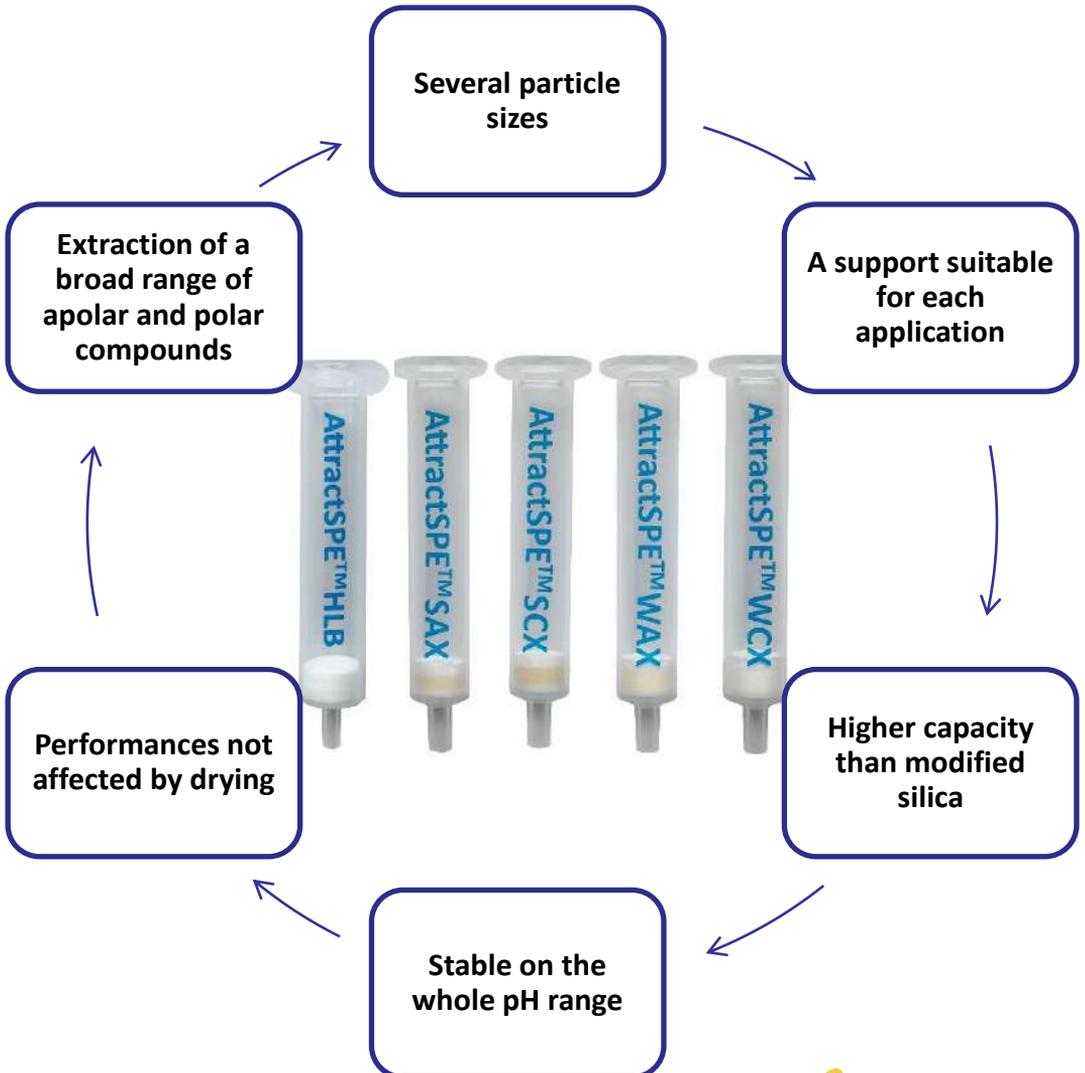
AttractSPE™ WAX-PFC

- WAX-PFC-50.S.6.150
- for 6mL – 150mg– 50/pk
- WAX-PFC-50.S.6.200
- for 6mL – 200mg– 50/pk

AttractSPE[®] Cartridges

Polymeric- based SPE
A broad range of chemistries
& formats for your application:

HLB – DVB – SAX – SCX – WAX - WCX



A powerful Sorbent for your extraction

AttractSPE[®] Disk HLB

SPE Disk membranes – For very large samples at high flow rate and for chemcatchers.



AttractSPE[®] HLB

Cartridges for SPE automates High throughput and automated analysis.



AttractSPE[®] HLB

Cartridges for Solid phase extraction 1, 3, 6, 12, 25, 60mL - PP or Glass – LRC. Several formats available.

On-line AttractSPE[®] HLB

On-line SPE column for your HPLC.



Attract POCIS HLB

Passive sampler for a long and cumulative uptake of drug residues/pesticides/P AHs in natural water (underground, surface...).



AttractSPE[®] Disks Passive Sampler HLB

Passive sampler for a long and cumulative uptake of drug residues/pesticides/PAHs in natural water (underground, surface...).



AttractSPE[®] HLB – AttractSPE[®] DVB

AttractSPE[®]HLB is an **uncharged Hydrophilic and Lipophilic** sorbent interacting with both, hydrophilic and hydrophobic interactions. It particularly suits for the extraction of a wide range of analytes (polar, apolar, neutral, acid, basic...)



| Format, amount | #/box | AttractSPE [®] HLB -40µm | AttractSPE [®] HLB -80µm |
|-------------------------|-------|-----------------------------------|-----------------------------------|
| 6mL, 200mg | 50 | HLB-50.S.6.200 | HLB-50.S.6.200GP |
| 6mL, 500mg | 50 | HLB-50.S.6.500 | HLB-50.S.6.500GP |
| 10mL LRC, 60mg | 50 | HLB-50.LRC.10.60 | |
| 12mL, 500mg | 25 | HLB-25.S.12.500 | |
| 12mL, 1g | 25 | HLB-25.S.12.1000 | |
| 12mL, 2g | 25 | | HLB-25.S.12.2000GP |
| 20mL, 1g | 25 | HLB-25.S.20.1g | |
| 20mL, 2g | 25 | | HLB-25.S.20.2g |
| Reversible 0.7mL, 100mg | 50 | HLB-50.REV.1.F | |
| Reversible 2mL, 225mg | 50 | HLB-50.REV.2.N10 | |

Reversed phase SPE for extraction of hydrophobic analytes.

AttractSPE[®]DVB is a polystyrene-divinylbenzene copolymer. It particularly suits for the extraction of hydrophobic analytes.



| Format, amount | #/box | AttractSPE [®] DVB -40µm | AttractSPE [®] DVB -80µm |
|-------------------------|-------|-----------------------------------|-----------------------------------|
| 6mL, 200mg | 50 | DVB-50.S.6.200 | DVB-50.S.6.200GP |
| 6mL, 500mg | 50 | DVB-50.S.6.500 | DVB-50.S.6.500GP |
| 10mL LRC, 60mg | 50 | DVB-50.LRC.10.60 | |
| 12mL, 500mg | 25 | DVB-25.S.12.500 | |
| 12mL, 1g | 25 | DVB-25.S.12.1000 | |
| 12mL, 2g | 25 | | DVB-25.S.12.2000GP |
| 20mL, 1g | 25 | DVB-25.S.20.1g | |
| 20mL, 2g | 25 | | DVB-25.S.20.2g |
| Reversible 0.7mL, 100mg | 50 | DVB-50.REV.1.F | |
| Reversible 2mL, 225mg | 50 | DVB-50.REV.2.N10 | |

Mixed-mode SPE for extraction of strong acid analytes

AttractSPE® WAX is a weak anion exchange sorbent. It particularly suits for the extraction of strong acids.

| Format, amount | #/box | AttractSPE®WAX-40µm | AttractSPE® WAX -80µm |
|-------------------------|-------|---------------------|-----------------------|
| 6mL, 200mg | 50 | WAX-50.S.6.200 | WAX-50.S.6.200GP |
| 6mL, 500mg | 50 | WAX-50.S.6.500 | WAX-50.S.6.500GP |
| 10mL LRC, 60mg | 50 | WAX-50.LRC.10.60 | |
| 12mL, 500mg | 25 | WAX-25.S.12.500 | |
| 12mL, 1g | 25 | WAX-25.S.12.1000 | |
| 12mL, 2g | 25 | | WAX-25.S.12.2000GP |
| 20mL, 1g | 25 | WAX-25.S.20.1g | |
| 20mL, 2g | 25 | | WAX-25.S.20.2g |
| Reversible 0.7mL, 100mg | 50 | WAX-50.REV.1.F | |
| Reversible 2mL, 225mg | 50 | WAX-50.REV.2.N10 | |



Mixed-mode SPE for extraction of strong basic analytes.

AttractSPE® WCX is a weak cation exchange sorbent. It particularly suits for the extraction of strong bases and quaternary amines.

| Format, amount | #/box | AttractSPE®WCX-40µm | AttractSPE® WCX -80µm |
|-------------------------|-------|---------------------|-----------------------|
| 6mL, 200mg | 50 | WCX-50.S.6.200 | WCX-50.S.6.200GP |
| 6mL, 500mg | 50 | WCX-50.S.6.500 | WCX-50.S.6.500GP |
| 10mL LRC, 60mg | 50 | WCX-50.LRC.10.60 | |
| 12mL, 500mg | 25 | WCX-25.S.12.500 | |
| 12mL, 1g | 25 | WCX-25.S.12.1000 | |
| 12mL, 2g | 25 | | WCX-25.S.12.2000GP |
| 20mL, 1g | 25 | WCX-25.S.20.1g | |
| 20mL, 2g | 25 | | WCX-25.S.20.2g |
| Reversible 0.7mL, 100mg | 50 | WCX-50.REV.1.F | |
| Reversible 2mL, 225mg | 50 | WCX-50.REV.2.N10 | |



AttractSPE® SAX - AttractSPE® SCX

Mixed-mode SPE for extraction of weak acid analytes

AttractSPE®SAX is a strong anion exchange sorbent. It particularly suits for the extraction of weak acids.

| Format, amount | #/box | AttractSPE® SAX -40µm | AttractSPE® SAX -80µm |
|-------------------------|-------|-----------------------|-----------------------|
| 6mL, 200mg | 50 | SAX-50.S.6.200 | SAX-50.S.6.200GP |
| 6mL, 500mg | 50 | SAX-50.S.6.500 | SAX-50.S.6.500GP |
| 10mL LRC, 60mg | 50 | SAX-50.LRC.10.60 | |
| 12mL, 500mg | 25 | SAX-25.S.12.500 | |
| 12mL, 1g | 25 | SAX-25.S.12.1000 | |
| 12mL, 2g | 25 | | SAX-25.S.12.2000GP |
| 20mL, 1g | 25 | SAX-25.S.20.1g | |
| 20mL, 2g | 25 | | SAX-25.S.20.2g |
| Reversible 0.7mL, 100mg | 50 | SAX-50.REV.1.F | |
| Reversible 2mL, 225mg | 50 | SAX-50.REV.2.N10 | |



Mixed-mode SPE for extraction of weak basic analytes

AttractSPE®SCX is a strong cation exchange sorbent. It particularly suits for the extraction of weak bases.

| Format, amount | #/box | AttractSPE® SCX -40µm | AttractSPE® SCX -80µm |
|-------------------------|-------|-----------------------|-----------------------|
| 6mL, 200mg | 50 | SCX-50.S.6.200 | SCX-50.S.6.200GP |
| 6mL, 500mg | 50 | SCX-50.S.6.500 | SCX-50.S.6.500GP |
| 10mL LRC, 60mg | 50 | SCX-50.LRC.10.60 | |
| 12mL, 500mg | 25 | SCX-25.S.12.500 | |
| 12mL, 1g | 25 | SCX-25.S.12.1000 | |
| 12mL, 2g | 25 | | SCX-25.S.12.2000GP |
| 20mL, 1g | 25 | SCX-25.S.20.1g | |
| 20mL, 2g | 25 | | SCX-25.S.20.2g |
| Reversible 0.7mL, 100mg | 50 | SCX-50.REV.1.F | |
| Reversible 2mL, 225mg | 50 | SCX-50.REV.2.N10 | |



Everything you might need!

Reversed phase based silica

C8
moderately hydrophobic

Phenyl
moderately hydrophobic

C18
Strongly hydrophobic

More polar Silica based phase

SiWCX
Weak cation exchanger

SiSCX
Strong cation exchanger

SiSAX
Strong anion exchanger

Amino (SiWAX)
Weak anion exchanger

Cyano
Cyano propyl
Polar phase

PSA
primary secondary amine

Normal phase

Silica
Very polar

Alumina (A, B, N)
Highly active

Florisil PR
polar –highly active – weakly basic

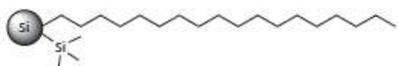


SilactSPE™ C18

Strongly hydrophobic and non-polar sorbent

It was recently developed as an innovative C18 phase characterized by a homogeneous coverage of the silane on the surface.

SilactSPE™ C18 particularly suits for the extraction of acidic, neutral and basic compounds from aqueous solutions, various organic compounds from water, and drugs and metabolites from physiological fluids.



SilactSPE™ C18 end-capped



SilactSPE™ C18NEC not end-capped

| Cartridges format, Sorbent amount | #/box | SilactSPE™ C18 (end capped) | SilactSPE™ C18 NEC (not end capped) |
|-----------------------------------|-------|-----------------------------|-------------------------------------|
| 1mL, 50mg | 100 | C18-100.S.1.50 | C18nec-100.S.1.50 |
| 1mL, 100mg | 100 | C18-100.S.1.100 | C18nec-100.S.1.100 |
| 3mL, 200mg | 50 | C18-50.S.3.200 | C18nec-50.S.3.200 |
| 3mL, 500mg | 50 | C18-50.S.3.500 | C18nec-50.S.3.500 |
| 6mL, 500mg | 50 | C18-50.S.6.500 | C18nec-50.S.6.500 |
| 6mL, 1g | 50 | C18-50.S.6.1g | C18nec-50.S.6.1g |
| 10mL LRC, 500mg | 50 | C18-50.LRC.10.500 | C18nec-50.LRC.10.500 |
| 12mL, 2g | 20 | C18-20.S.12.2g | C18nec-20.S.12.2g |
| Reversible 0.7mL, 260mg | 25 | C18-25.REV.1.260 | C18nec-25.REV.1. 360 |
| Reversible 2mL, 1g | 25 | C18-25.REV.2.1000 | C18nec-25.REV.2.1000 |

Moderately hydrophobic and non-polar sorbent

› SilactSPE™ C8:

Sorbent C8 is more selective than **Sorbent C18** for big compounds such as PAH, vitamin D, and oils as well as greasy compounds. Suits for the extraction of extremely non-polar compounds.

› SilactSPE™ Phenyl:

Suits for the extraction of non-polar compounds with different selectivities through π - π interactions including aromatic compounds and other non-polar phases.

| Cartridges format, Sorbent amount | #/box | SilactSPE™ C8 | SilactSPE™ Phenyl |
|-----------------------------------|-------|------------------|-------------------|
| 6mL, 500mg | 50 | C8-50.S.6.500 | Phe-50.S.6.500 |
| 6mL, 1g | 50 | C8-50.S.6.1g | Phe-50.S.6.1g |
| 12mL, 2g | 20 | C8-20.S.12.2g | Phe-20.S.12.2g |
| Reversible 0.7mL, 260mg | 25 | C8-25.REV.1. 260 | Phe-25.REV. 1.260 |
| Reversible 2mL, 1g | 25 | C8-25.REV.2.1000 | Phe-25.REV.2.1000 |

Most polar sorbent

› SilactSPE™ Silica :

It presents a slightly acidic character and is used to extract various compounds from non-polar solvents through hydrogen bonding.

› SilactSPE™ Cyano :

As a normal phase (less polar compared to silica), particularly suits for the extraction of acidic, basic and neutral compounds from aqueous solutions. As a reversed-phase (less hydrophobic than C8 and C18).

| Cartridges format, Sorbent amount | #/box | SilactSPE™ Silica | SilactSPE™ Cyano |
|-----------------------------------|-------|---------------------------|-----------------------------|
| 6mL, 500mg | 50 | Si-50.S.6.500 | CN-50.S.6.500 |
| 6mL, 1g | 50 | Si-50.S.6.1g | CN-50.S.6.1g |
| 12mL, 2g | 20 | Si-20.S.12.2g | CN-20.S.12.2g |
| Reversible 0.7mL | 25 | Si-25.REV.1.240 for 240mg | CN-25.REV.1. 260 for 260mg |
| Reversible 2mL | 25 | Si-25.REV.2.900 for 900mg | CN-25.REV.2.1000 for 1000mg |

Weak anion exchanger silica-based sorbent

› SilactSPE™ Amine (SiWAX):

Avoids irreversible retention of acidic molecules ($pK_a < 3$) and suits for the separation of peptides, drugs and metabolites from physiological fluids, poly- and monosaccharides and structural isomers.

› SilactSPE™ PSA:

Less polar sorbent than **SilactSPE™ Amine** used for its replacement with analytes that are too strongly retained on an amine phase.

| Cartridges format, Sorbent amount | #/box | SilactSPE™ Amine or SiWAX | SilactSPE™ PSA |
|-----------------------------------|-------|---------------------------|-------------------|
| 6mL, 500mg | 50 | NH2-50.S.6.500 | PSA-50.S.6.500 |
| 6mL, 1g | 50 | NH2-50.S.6.1g | PSA-50.S.6.1g |
| 12mL, 2g | 20 | NH2-20.S.12.2g | PSA-20.S.12.2g |
| Reversible 0.7mL, 260mg | 25 | NH2-25.REV.1.260 | PSA-25.REV.1.260 |
| Reversible 2mL, 1000mg | 25 | NH2-25.REV.2.1000 | PSA-25.REV.2.1000 |

Weak cation exchanger silica-based sorbent with carboxylic acid

› **SilactSPE™ SiWCX:** Suits to extract strong basic molecules ($pK_a > 9$).

Strong cation exchanger silica-based sorbent positively charged with tosic acid moieties.

› **SilactSPE™ SiSCX:** Suits to extract basic molecules (pK_a 7-10).

| Cartridges format, Sorbent amount | #/box | SilactSPE™ SiWCX | SilactSPE™ SiSCX |
|-----------------------------------|-------|---------------------|---------------------|
| 6mL, 500mg | 50 | SiWCX-50.S.6.500 | SiSCX-50.S.6.500 |
| 6mL, 1g | 50 | SiWCX-50.S.6.1g | SiSCX-50.S.6.1g |
| 12mL, 2g | 20 | SiWCX-20.S.12.2g | SiSCX-20.S.12.2g |
| Reversible 0.7mL, 260mg | 25 | SiWCX-25.REV.1.260 | SiSCX-25.REV.1.260 |
| Reversible 2mL, 1000mg | 25 | SiWCX-25.REV.2.1000 | SiSCX-25.REV.2.1000 |

SilactSPE™ SiSAX - Florisil PR - Na₂SO₄/Florisil

Strong anion exchanger silica-based sorbent using trimethyl ammonium moieties

➤ **SilactSPE™ SiSAX:** Suits to extract acidic molecules (pKa 3-5).

| Cartridges format, Sorbent amount | #/box | SilactSPE™ SiSAX |
|-----------------------------------|-------|---------------------|
| 6mL, 500mg | 50 | SiSAX-50.S.6.500 |
| 6mL, 1g | 50 | SiSAX-50.S.6.1g |
| 10mL LRC, 500mg | 50 | SiSAX-50.LRC.10.500 |
| 12mL, 2g | 20 | SiSAX-20.S.12.2g |
| Reversible 0.7mL, 260mg | 25 | SiSAX-25.REV.1.260 |
| Reversible 2mL, 1000mg | 25 | SiSAX-25.REV.2.1000 |

Polar sorbent

➤ **SilactSPE™ Florisil PR** (MgO₃Si):

They present a basic character used to extract non-polar to moderately polar compounds from non-polar solvents.

Suits for the retention of chlorinated pesticides, PCB's and polysaccharides due to the magnesium ion.

| Cartridges format, Sorbent amount, #/box | SilactSPE™ Florisil PR |
|--|------------------------|
| 6mL, 500mg, 50/pk | FloPR-50.S.6.500 |
| 6mL, 1g, 50/pk | FloPR-50.S.6.1g |
| 12mL, 2g, 20/pk | FloPR-20.S.12.2g |
| Reversible 0.7mL, 300mg, 25/pk | FloPR-25.REV.1.300 |
| Reversible 2mL, 900mg, 25/pk | FloPR-25.REV.2.900 |

➤ **SilactSPE™ Na₂SO₄/Florisil** contains an upper layer of sodium sulfate anhydrous (Na₂SO₄) to dry the solution and a bottom layer of Florisil for the determination of hydrocarbons in water according to DIN-H-53/ ISO 9377-4.

| Cart. format, Sorbent amount #/box | SilactSPE™ Na ₂ SO ₄ /Florisil |
|------------------------------------|--|
| 6mL PP, 2g+2g, 50/pk | FloNa2SO4-50.S.6.2g.2g |
| 12mL PP, 3g+3g, 25/pk | FloNa2SO4-25.S.12.3g.3g |

ON-LINE SPE – description and product list

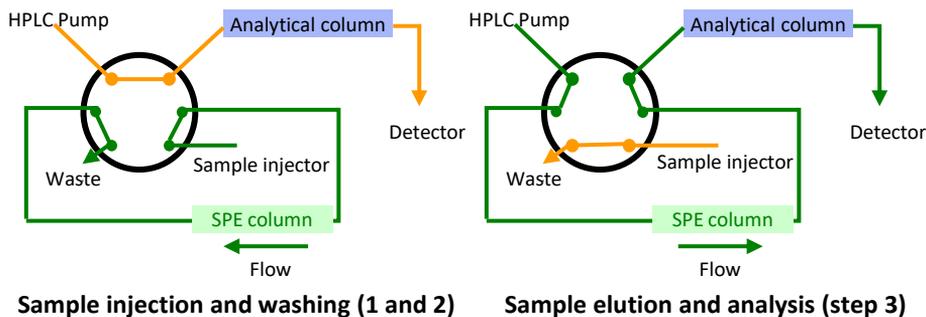
ON-LINE SPE PROCEDURE STEPS

SPE technique can be coupled on-line to HPLC for a high sensitivity or for limited amount of sample. An on-line SPE column containing the SPE sorbents is coupled. A three steps process is used:

1- Sample injection: The valve is configured with the injector directly in contact with the on-line SPE column. The sample is injected and goes through the on-line SPE column where the analytes remain.

2- Washing: a solution is used to wash out most interferences.

3- Analysis: The valve is switched. The analytes are eluted out of the sorbent by the LC mobile phase and transferred into the analytical column for their analyses.



ON-LINE SPE COLUMNS



| Product | Product reference | Number column | I.D. (mm) | Length (mm) |
|---|----------------------|---------------|-----------|-------------|
| On-line AttractSPE® HLB columns | OnlineSPE-HLB-1.2.20 | 1 | 2.1 | 20 |
| | OnlineSPE-HLB-1.5.20 | 1 | 4.6 | 20 |
| On-line AFFINIMIP® PHENOLICS columns | OnlineSPE-PHE-1.2.20 | 1 | 2.1 | 20 |
| | OnlineSPE-PHE-1.5.20 | 1 | 4.6 | 20 |
| On-line AFFINIMIP® ESTROGENS columns | OnlineSPE-EST-1.2.20 | 1 | 2.1 | 20 |
| | OnlineSPE-EST-1.5.20 | 1 | 4.6 | 20 |

For other on-line SPE products, please contact us!

AFFINISEP can provide you with on-line SPE of all products on demand.

AttractSPE® Manifolds

AttractSPE® disks Manifolds

One-, three- or six-station filtration manifolds allow the simultaneous extractions of several 1-L samples on a very simple and easy-to-handle way. The manifold is a very compact stainless steel device with a filtration glassware. Each station is controlled through an independent flow control valve.



AttractSPE® Vacuum Manifold

very flexible, allows you to control the flow and to process up to 12 or 24 samples simultaneously, to gain significantly time during sample preparation steps.



AttractSPE® Manifolds

AttractSPE® Vacuum Manifold



| | | |
|-------------------------|--------------------|---|
| Vacuum Manifold | ACC-MAN2 | Like all chromatography techniques, use of SPE cartridges needs a precise control of flow rate for maintaining reproducible extractions. Solid Phase extraction Vacuum Manifold allows you to control the flow and to process up to 12 (12-port version) or 24 (24-port version) AFFINIMIP® SPE samples simultaneously, to gain significantly time during sample preparation steps. |
| Mini PUMP | ACC-PUMP | Diaphragm vacuum pump for solid phase extraction experiments ➤5.5L/min ➤~120 torr vacuum ➤Oil-free ➤Portable |
| Vacuum pump trap | ACC-TRAP-1L | SPE Vacuum pump trap kit. Installed between the manifold and the vacuum pump, it collects all liquids that are aspirated preventing contamination of the vacuum pump with a capacity of 1L. |

Open Cartridge



Formats: 1mL, 3mL, 6mL, 15mL, 20mL, 60mL

Materials: Polypropylene glass (6mL)

Frits: Polyethylene, PTFE , Glass fiber

Sorbents: powder or disk

Luer compatible

Cartridge for Automates



Formats: 1mL, 3mL, 6mL

Material: Polypropylene

Frit: Polyethylene

Automate: Gerstel, Gilson...

LRC Cartridge



Formats: 10mL

Material: Polypropylene

Frit: Polyethylene

Luer compatible

On-line SPE Cartridge



I.D: 2,1 and 4,6mm

Length: 20mm

FORMATS

Disks

Formats:

Diameters

- 25mm
- 47mm
- 90mm



SPE Tips

Formats:

T1, T2, T3



96 Well-plates



Reversible Cartridge



Formats: 0,7mL, 2mL

Material: Polypropylene

Frit: Polyethylene

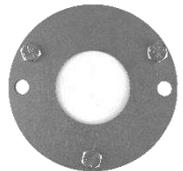
Luer compatible

Passive Samplers

Pocis



**Disks-based
on passive
samplers**



Application notes

1. Determination of Pharmaceuticals in water with AttractSPE® Disks HLB - EPA method 1694
2. PAHs with AttractSPE® Disks HLB
3. PAHs with AttractSPE® Disks C18 – EPA method 550.1 : Comparison with 3M Empore SPE Disks C18
4. Multiresidues analysis with AttractSPE® Disks HLB : Comparison with competitor SPE Disks HLB
5. Acid Herbicides with AttractSPE® Disks HLB
6. Ionic herbicides with AttractSPE® Disks Anion exchange SR
7. Analysis of Seven tetracyclines in water using AttractSPE® Disks HLB
8. Glyphosate - AMPA and Glufosinate in Water– No derivatization – LC-MS/MS
9. Glyphosate - AMPA and Glufosinate in Water– Capillary Electrophoresis analysis
10. Glyphosate - AMPA and Glufosinate in several waters – FMOc derivatization – LC-MS/MS
11. Monitoring of glyphosate - AMPA with a passive sampler AFFINIMIP® POCIS Glyphosate
12. Determination of Estrogens in water by GC-MS/MS
13. Determination of Estrogens in water by GC-HRMS

AttractSPE® Disks HLB is successfully tested in similar conditions of **EPA 1694** and showed recovery yields >80% for most the analytes.

| Analyte | Blank | Spiked recovery % | Concentration (ng/L) |
|--------------------------|-------|----------------------|-------------------------|
| Penicilin V | 0 | 105 | 160 |
| Flucloxacillin | 0 | 105 | 80 |
| Sulfathiazole | 0 | 92 | 16 |
| Sulfadimethoxine | 0 | 84 | 16 |
| Sulfamethazine | 0 | 88 | 80 |
| Sulfadiazine | 0 | 95 | 32 |
| Caffeine | 0 | 106 | 80 |
| Carbamazepine | 0 | 98 | 16 |
| 4-epitetraacycline | 0 | 107 | 820 |
| 4-epioxytetraacycline | 0 | 104 | 440 |
| Oxytetraacycline | 0 | 78 | 1160 |
| Tetraacycline | 0 | 102 | 860 |
| 4-epichlorotetraacycline | 0 | 113 | 720 |
| Chlorotetraacycline | 0 | 87 | 800 |
| Doxycycline | 0 | 49 | 800 |

INSTALLATION AND CONDITIONING

Put the SPE disk on the holder

Loading solution: One liter of reagent water put to pH 2-2,5 with HCl 37%. Add 80mg of sodium thiosulfate, and 500 mg of EDTA-Na₄2H₂O. Solution is then spiked with analytes of interest.

Important: For each conditioning and elution step, apply a fast vacuum to soak the disk and wait 1 minute before starting elution.

LOADING

- 1 L of loading solution in 15 minutes

WASHING

- 20 mL ultrapure water
- Apply vacuum for 30 s to dry the disk

ELUTION

- 20 mL Methanol
- (for tetracyclines only)4*20 mL Methanol +3% Formic Acid

ANALYSIS

- Evaporation under N₂ and dissolved in mobile phase.
- Tetracyclines: Elutions mixed and diluted by 4 with water 5mM Oxalic Acid, prior to analysis. (Can also be evaporated

Catalog number:

AttractSPE® Disks HLB - 47mm diameter,
20/pk : SPE-Disks-HLB-47.T1.20

PROTOCOL OF PURIFICATION

Sample preparation

1L of water was put to pH<2 with HCl 37% (optional) and spiked at 20ng/L with each analyte (Benzo[a]anthracene, Chrysene, benzo[b]fluoranthene, Benzo[a]pyrene, benzo[k]fluoranthene, Dibenz[a,h]anthracene, Benzo[g,h,i]perylene).

Purification with a AttractSPE®Disks HLB

Equilibration

- Put the SPE disk on the holder
- 10 mL Acetone
- 10 mL Isopropanol
- 10 mL Methanol
- 50 mL of ultrapure water

Loading

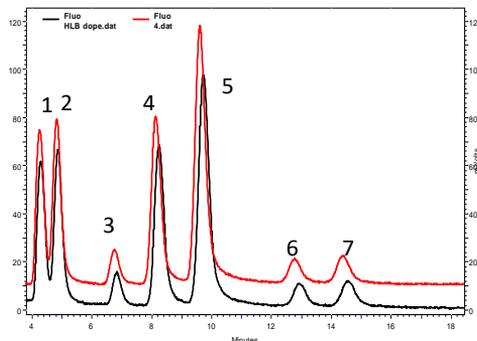
- 1 L of loading solution

Elution (E)

- 10 mL Methanol
- 4x10 mL Ethyl Acetate

Evaporate the elution solution and reconstitute with 5mL Acetonitrile prior to analysis

RESULTS



Fluorescence chromatograms ($\lambda_{exc/em}$ 252nm / 400nm) for 7 PAHs (1 - BaA, 2 – CHR, 3- BbFA, 4 – BkFA, 5- BaP, 6- DbahA, 7 - BghiP)

The black profile uses the **AttractSPE® Disks HLB** to concentrate the 20ng/L PAHs contained in 1L of water while the red one is the solution with PAHs standards.

Conditions of analysis:

LC-Fluorescence. Column: Zorbax eclipse PAH 4,6*50mm (1,8 μ m), at 30°C. Injection volume: 50 μ L. Isocratic: Water / Acetonitrile 15 / 85. Flow rate: 0.5 mL/min, run of 25min.

Fluorescence detection: $\lambda_{exc/em}$ 252nm / 400nm

Recovery yields obtained for the loading of 1L of water spiked with 7 PAHs at 20 ng/L each and concentrated using **AttractSPE® Disks HLB**

| | AttractSPE® Disks HLB | |
|-----------------------------|-----------------------|--------|
| | Blank | Spiked |
| Benzo[a]anthracene BaA | 0 | 90% |
| Chrysene CHR | 0 | 90% |
| benzo[b]fluoranthene BbFA | 0 | 90% |
| benzo[k]fluoranthene BjFA | 0 | 96% |
| Benzo[a]pyrene BaP | 0 | 91% |
| Dibenz[a,h]anthracene DBahA | 0 | 92% |
| Benzo[g,h,i]perylene BghiP | 0 | 99% |

Catalog number:

AttractSPE® Disks HLB - 47mm diameter,
20/pk : SPE-Disks-HLB-47.T1.20

PROTOCOL OF PURIFICATION

Sample preparation

1L of water was put to pH<2 with HCl 37% (optional) and spiked at 20ng/L with each analyte (Benzo[a]anthracene, Chrysene, benzo[b]fluoranthene, benzo[k]fluoranthene, Benzo[a]pyrene, Dibenz[a,h]anthracene, Benzo[g,h,i]perylene).

Purification with a AttractSPE®Disks C18

Equilibration

- Put the SPE disk on the holder
- 10 mL Ethyl Acetate
- 10 mL Methanol
- 50 mL of ultrapure water

Loading

- 1 L of loading solution

Elution (E)

- 10 mL Methanol
- 4x10 mL Ethyl Acetate

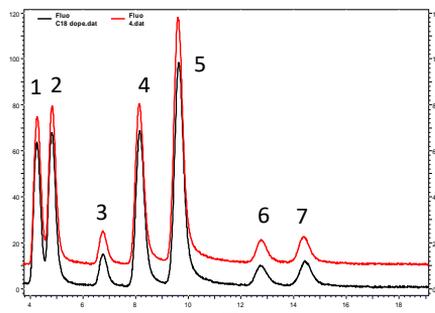
Evaporate the elution solution and reconstitute with 5mL Acetonitrile prior to analysis

Recovery yields obtained for the loading of 1L of water spiked with 7 PAHs at 20 ng/L each and using either **AttractSPE® Disks C18** or 3M Empore SPE disks C18

| | AttractSPE® Disks C18 | | 3M Empore SPE disks C18 | |
|------------------------------------|-----------------------|--------|-------------------------|--------|
| | Blank | Spiked | Blank | Spiked |
| Benzo[a]anthracene BaA | 0 | 96% | 0 | 96% |
| Chrysene CHR | 0 | 98% | 0 | 96% |
| benzo[b]fluoranthene BbFA | 0 | 94% | 0 | 93% |
| benzo[k]fluoranthene BkFA | 0 | 98% | 0 | 100% |
| Benzo[a]pyrene BaP | 0 | 91% | 0 | 94% |
| Dibenz[a,h]anthracene DBahA | 0 | 88% | 0 | 96% |
| Benzo[g,h,i]perylene BghiP | 0 | 97% | 0 | 97% |

These experiments show that **AttractSPE® Disks C18** behave similarly to 3M Empore SPE Disks C18.

RESULTS



Fluorescence chromatograms ($\lambda_{exc/em}$ 252nm / 400nm) for 7 PAHs (1 - BaA, 2 - CHR, 3- BbFA, 4 - BkFA, 5- BaP, 6- DbahA, 7- BghiP) The black profile uses the **AttractSPE® Disks C18** to concentrate the 20ng/L PAHs contained in 1L of water while the red one is the solution with PAHs standards.

Conditions of analysis:

LC-Fluorescence. Column: Zorbax eclipse PAH 4,6*50mm (1,8µm), at 30°C. Injection volume: 50 µL. Isocratic: Water / Acetonitrile 15 / 85. Flow rate: 0.5 mL/min, run of 25min. Fluorescence detection: $\lambda_{exc/em}$ 252nm / 400nm

Catalog number:

AttractSPE® Disks C18 - 47mm diameter, 20/pk : **SPE-Disks-C18-47.T1.20**

PROTOCOL OF PURIFICATION

Sample preparation

2L of water were spiked at 200ng/L with each molecule (Caffeine, Diclofenac and Metolachlor ESA).

Purification with a **AttractSPE® Disks HLB** using **SPE-DEX 4790 Automated**

Extractor System **

Equilibration

- Put the SPE disk on the holder
- 50 mL Methanol
- 50 mL of ultrapure water

Loading

- 2 L of loading solution

Elution (E)

- 50 mL Methanol

Dilute by 10 with ultrapure water prior to analysis

RESULTS

Conditions of analysis for Caffeine and Diclofenac:

LC-MS/MS HPLC U3000 - QTRAP 4000. Column: Hypersil Gold 150x2.1cm 3µm, pre-column (hypersil gold 1cm) at 30°C. Injection volume: 20 µL. Gradient: Water with 0.1% Formic acid and Acetonitrile with 0.1% Formic acid. Flow rate: 0.3 mL/min.

Conditions of analysis for Metolachlor ESA:

LC-MS/MS HPLC U3000 - QTRAP 4000. Column: Hypersil Gold 150x2.1cm 3µm, pre-column (hypersil gold 1cm) at 30°C. Injection volume: 20 µL. Gradient: Water with 0.01% Formic acid and Acetonitrile. Flow rate: 0.3 mL/min.

Recovery yields obtained for the loading of 2L of water spiked with several analytes at 200 ng/L each and using either **AttractSPE® Disks HLB** or competitor SPE disks HLB

| | AttractSPE® Disks HLB | | Competitor SPE disks HLB | |
|------------------------|-----------------------|--------|--------------------------|--------|
| | Blank | Spiked | Blank | Spiked |
| Caffeine | 0 | 98% | 0 | 54% |
| Diclofenac | 0 | 102% | 0 | 33% |
| Metolachlor ESA | 0 | 88% | 0 | 13% |

Catalog number:

AttractSPE® Disks HLB - 47mm diameter, 20/pk : **SPE-Disks-HLB-47.T1.20**

** The testings were carried out with SPE-DEX 4790 Automated Extractor System by Toxem (Le Havre, France)

PROTOCOL OF PURIFICATION

Sample preparation

One liter of water was spiked at 1 µg/L of aminopyralid, clopyralid and picloram.

Purification with a AttractSPE®Disks

Anion exchange SR

Equilibration

- Put the SPE disk on the holder
- 50 mL of methanol
- 50mL of ultrapure water

Loading

- 1 L of loading solution

Washing (E)

- 50 mL Ultrapure water

Elution (E)

- 50 mL Methanol with 3% formic acid

Dilute by 10 with mobile phase prior to analysis

Conditions of analysis:

LC-MS/MS HPLC U3000 - QTRAP 4000. Column: Hypersil Gold 150x2.1cm 3µm, pre-column (hypersil gold 1cm) at 30°C. Injection volume: 20 µL. Gradient: Water with 0.1% Formic acid and Acetonitrile with 0.1% Formic acid. Flow rate: 0.3 mL/min.

RESULTS

Recovery yields obtained for the loading of 1L of water spiked with 1µg/L each using **AttractSPE® Disks Anion exchange SR** to concentrate

| | Recovery yield % | | |
|-----------------|------------------|-------------|----------|
| | Amino pyralid | Clo pyralid | Picloram |
| Ultrapure water | 102 | 102 | 108 |
| Tap water | 80 | 90 | 87 |



Catalog number:

AttractSPE® Disks Anion Exchange SR - 47mm diameter, 20/pk : SPE-Disks-SAX-47.T1.20

PROTOCOL OF PURIFICATION

Sample preparation

One liter of water was spiked at 1 µg/L of metolachlor OA and metolachlor ESA.

Purification with a AttractSPE® Disks HLB

Equilibration

- Put the SPE disk on the holder
- 50 mL of methanol
- 50mL of ultrapure water

Loading

- 1 L of loading solution

Washing (E)

- 50 mL Ultrapure water

Elution (E)

- 50 mL Methanol with 3% formic acid

Dilute by 10 with mobile phase prior to analysis.

Conditions of analysis:

LC-MS/MS HPLC U3000 - QTRAP 4000. Column: Hypersil Gold 150x2.1cm 3µm, pre-column (hypersil gold 1cm) at 30°C. Injection volume: 20 µL. Gradient: Water with 0.1% Formic acid and Acetonitrile with 0.1% Formic acid. Flow rate: 0.3 mL/min.

RESULTS

Recovery yields obtained for the loading of 1L of water spiked with 1µg/L each using **AttractSPE® Disks HLB** to concentrate

| | Recovery yield % | |
|-----------------|------------------|-----------------|
| | Metolachlor OA | Metolachlor ESA |
| Ultrapure water | 100 | 102 |
| Tap water | 98 | 90 |



Catalog number:

AttractSPE® Disks HLB - 47mm diameter, 20/pk :
SPE-Disks-HLB-47.T1.20

AttractSPE® Disks HLB was successfully tested for the seven tetracyclines above and showed high recovery yields.



| Analyte | Blank | Spiked recovery | Concentration |
|-------------------------|-------|-----------------|---------------|
| | | % | (ng/L) |
| 4-epitetracycline | ND | 70 | 68,6 |
| 4-epioxytetracycline | ND | 97 | 36,6 |
| Oxytetracycline | ND | 87 | 96,6 |
| Tetracycline | ND | 75 | 71,3 |
| 4-epichlorotetracycline | ND | 105 | 59,9 |
| Chlorotetracycline | ND | 75 | 66,6 |
| Doxycycline | ND | 93 | 66,6 |

Loading solution: To one liter of water, 22,195g of Disodium Hydrogen Phosphate heptahydrate, 11,257g of Citric Acid, and 500mg of ETDA- $\text{Na}_4 \cdot 2\text{H}_2\text{O}$ are added. The solution is mixed until total dissolution (pH measured = 4,2) and spiked with tetracyclines.

Important: For each conditioning and elution step, apply a fast vacuum to soak the disk and wait 1 minute before starting elution.

Condition of analysis: LC/MS-MS ESI+, Please find complete method available at our website.

CONDITIONING Step

Put the SPE disk on the holder

- 20 mL Acetone
- 50 mL Methanol
- 20 mL of ultrapure water

LOADING

- 1 L of loading solution in 15 minutes

WASHING

- 20 mL ultrapure water
- Apply vacuum for 30 s to dry the disk

ELUTION

- 20 mL Methanol
- 20 mL Methanol +3% Formic Acid

ANALYSIS

- Evaporation under N_2 and dissolved with water 5mM Oxalic Acid, prior to analysis.

Table: Recovery yields obtained for the loading of 1L of spiked solution.

Catalog number:

AttractSPE® Disks HLB - 47mm diameter,
20/pk : SPE-Disks-HLB-47.T1.20

PROTOCOL OF PURIFICATION

**Purification with a 6mL AFFINIMIP® SPE
Glyphosate cartridge**

Equilibration

6mL pure Water

Loading

100mL spiked water

Washing of interferences

6mL Water

Elution (E)

8mL water with HCl 0.1M

Elutions are evaporated under vacuum at 60°C for 2 hours and dissolved in 3 mL of mobile phase containing EDTA-Na₂ 0,8mM.

HPLC Method with LC – MS/MS

Analysis by HPLC – MS/MS (QTRAP 4000)

Column: Acclaim trinity Q1 100mm x 3mm ID (3µm)

Mobile phase: gradient with Ammonium formate 50 mM pH = 2.9 (A) – Acetonitrile (B)

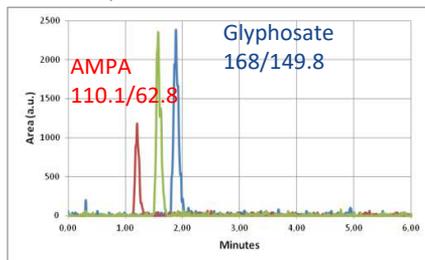
| Time (min) | % A | % B |
|------------|-----|-----|
| 0 | 100 | 0 |
| 3 | 100 | 0 |
| 3,2 | 0 | 100 |
| 6,0 | 0 | 100 |
| 6,2 | 100 | 0 |
| 10,2 | 100 | 0 |

Flow rate: 0,5mL/min

Injection volume: 20µL.

RESULTS

Glufosinate
179.9/63.1



Chromatograms obtained after a clean-up with **AFFINIMIP® SPE Glyphosate** for 100mL water spiked at 3µg/L of each molecule

Recovery of Glyphosate, AMPA and Glufosinate after **AFFINIMIP® SPE Glyphosate** clean-up of water spiked at 3µg/L each. No derivatization was performed.

| | Glyphosate | AMPA | Glufosinate |
|-----------|------------|------|-------------|
| Yield (%) | 91 % | 70 % | 80 % |
| RSD (n=3) | 2 % | 1 % | 6 % |

Catalog number:

6mL format with enhanced performances
FS113-15-03B for 50 cartridges

12mL format

FS113-03C for 50 cartridges

Efficient clean-up and enrichment

PROTOCOL OF PURIFICATION

Sample preparation

Purification with a 6mL AFFINIMIP®

SPE Glyphosate cartridge

Equilibration

6mL pure Water

Loading

3 to 500 mL

Washing of interferences

3mL Water

Elution (E)

4-8 mL water with HCl 0.1M

CE analysis (no derivatization)

Column: fused-silica capillary of 60.2 cm (effective length, 50 cm) x 50 µm ID at 25°C

Mobile phase: 7.5 mM phthalic acid - 51.3 mM histidine running buffer (pH 6.5, ionic strength of 21.8 mM, buffer capacity 25 mM L⁻¹ pH⁻¹) containing 1 mM CTAB

Voltage : +25kV

Detection UV-DAD (240nm)

RESULTS

Recovery yields of glyphosate and AMPA after **AFFINIMIP® SPE Glyphosate** clean-up of mineral water spiked at 25µg/mL.

Loading volume 3mL

Analysis done by CE without derivatization

| Analytes | Recoveries % |
|------------|--------------|
| Glyphosate | 85 |
| AMPA | 87 |

Publication:

Preliminary recovery study of a commercial molecularly imprinted polymer for the extraction of glyphosate and AMPA in different environmental waters using MS, B. Claude, C. Berho, S. Bayouhd, L. Amalric, E. Coisy, R. Nehmé, P. Morin, *Environ Sci Pollut Res*, 24: 12293 (2017).

Catalog number:

6mL format

FS113-03B for 50 cartridges

Performance not affected by physico chemical properties of Water Loading with up to 1L

Physico chemical properties of tested waters

Salt concentrations (mg/L) and pH of analyzed solutions

| | Ca | Na | Mg | K | HCO ₃ | Cl | NO ₃ | SO ₄ | Fe | pH |
|------------------|-------|--------|-------|------|------------------|--------|-----------------|-----------------|------|-----|
| Groundwater | 15,7 | 11,3 | 4,9 | 1,3 | 76 | 9,7 | <0,5 | 1,2 | 7,5 | 7,1 |
| Groundwater | 22,3 | 105,7 | 17 | 4,7 | 136 | 159 | 8,9 | 15,8 | 0,17 | 6,4 |
| Groundwater | 104,1 | 13,9 | 6,9 | 1,8 | 203 | 28,1 | 113,7 | 33 | | 7,1 |
| Geothermal water | 799 | 5163,5 | 189,5 | 71,9 | | 9759,7 | | 702,2 | 3,2 | |
| Mineral water | 80 | 6,5 | 24 | 1 | 360 | 3,8 | 3,7 | 12,6 | | 7,2 |

AFFINIMIP® SPE Glyphosate performance for tested waters

Above five waters spiked at various concentrations with AMPA and Glyphosate

| Sample | Concentration range | Average Recoveries % |
|------------|---------------------|----------------------|
| Glyphosate | 100 to 750ng/L | >70% |
| AMPA | 100 to 750ng/L | >75% |

Method UPLC – MS/MS

Column: UPLC HSS T3 (2.1mm x 100mm, 1,8µm)

Mobile phase: A:
Water/Ammonium Acetate 5mM
B: Acetonitrile

| Time (min) | A % | B % |
|------------|-----|-----|
| 0 | 90 | 10 |
| 2 | 90 | 10 |
| 7 | 50 | 50 |
| 7.5 | 0 | 100 |
| 11 | 0 | 100 |

Flow rate: 0.2mL/min

MS detection: m/z 321 (ESI⁻)

Injection volume: 20µL.

Same protocol than previous page

Publication:

B. Claude, C. Berho, S. Bayouth, L. Amalric, E. Coisy, R. Nehmé, P. Morin, *Environ Sci Pollut Res*, 24: 12293 (2017).

Catalog number:

6mL format

FS113-03B for 50 cartridges



AFFINIMIP® POCIS
Glyphosate

Passive Sampling with POCIS

Polar Organic Chemical Integrative Sampler (POCIS) is a passive sampler designed to provide the time weighted average (TWA) concentration of chemicals during a sampling period of several weeks.

AFFINIMIP® POCIS **Glyphosate** enables the sampling of Glyphosate and AMPA in water (Groundwater, geothermal, mineral...). Then the powder is collected in an empty SPE column for the extraction of Glyphosate and AMPA.

PROTOCOL OF EXTRACTION

Extraction of collected Glyphosate and AMPA from AFFINIMIP® POCIS **Glyphosate** with a SPE.

Extraction of the analytes (E)

HCl solution (100mM)

The extraction solution is then evaporated and reconstituted with water prior analysis.

Catalog number:

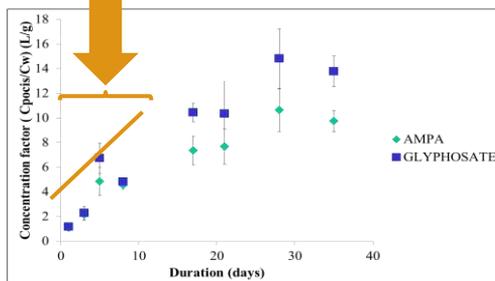
POCIS-GLY.90.55.A.1 for 1 **AFFINIMIP® POCIS** **Glyphosate**

POCIS-GLY.90.55.A.10 for 10 **AFFINIMIP® POCIS** **Glyphosate**

RESULTS

Laboratory sampling rates estimation for AMPA and glyphosate using the AFFINIMIP® POCIS **Glyphosate**

Sampling rates: 130mL/day/200mg **AFFINIMIP® POCIS** **Glyphosate** in agreement with other pesticides in classical POCIS.



Mineral water (pH = 7) fortified at 500ng/L of AMPA and glyphosate. Concentrations kept constant during whole experiment.

Pesticides concentration in the tank, temperature, TOC and conductivity monitored during the experimental period to verify the stability of physico-chemical conditions in water.

Publications:

Laboratory calibration of a POCIS-like sampler based on molecularly imprinted polymers for glyphosate and AMPA sampling in water, C. Berho, B. Claude, E. Coisy, A. Togola, S. Bayouhdh, P. Morin, L. Amalric, *Anal Bioanal Chem* 409: 2029 (2017)

PROTOCOL OF PURIFICATION

Sample preparation

100mL of tap water spiked with 17β -E2-d₃ to a final concentration of 75ng/L was the loading solution.

Purification with a 3mL AFFINIMIP® SPE Estrogens cartridge

Equilibration

- 3mL Acetonitrile
- 3mL Water

Loading solution from sample preparation

Washing of interferences

- 3mL water
- 3mL Water/Acetonitrile (60/40)

Elution (E)

3mL Methanol

The elution fraction was then evaporated to dryness under a stream of nitrogen. Residues was treated with 10 μ L of a mixture containing BSTFA +1 % TMCS and 8 μ L of pyridine (dried with solid KOH). After a vortex stirring, derivatisation was performed for 30 min at 55 °C. The derivatives were cooled to room temperature, 2- μ L aliquots of the recovery standard (pyrene-d10) were added to each vial and the samples were subjected to GC-MS analysis.

GC-MS/MS Analysis

Column: Rtx-5 fused silica capillary columns (30 m, 0.25-mm ID, 0.25- μ m film thickness)

Gas carrier: Helium at a flow 1.2mL/min

Injection temperature: 50 to 300 °C at 100 °C/min, held at 300 °C for 10 min

GC-MS transfer line temperature: 280°C

Temperature program: 100°C during 2min; 10°C/min to 265°C; 265°C during 2min ;

10°C/min to 300°C; 300°C during 3 min ;

20°C/min to 310°C; 310°C during 3min

Injection volume: 5 μ L

Detector : GC-MS/MS EI⁺ mode

Detection mode: Selected reaction monitoring (SRM)

RESULTS

Method validation for 17β -E2 and 17α -EE2 by GC-MS/MS

| | 17β -E2 | 17α -EE2 |
|-----------------------------|---------------|-----------------|
| Linearity range,ng/ L | 0.08-80.0 | 0.08-80.0 |
| Linearity (R ²) | 0.995 | 0.9998 |
| m-LOQ, ng/L | 0.08 | 0.08 |
| Spiking level ng/L (n=5) | 4 | 4 |
| Recovery % | 111 | 104 |
| Precision (n=5) | 6.2 | 6.8 |
| Spiking level ng/L (n=5) | 20 | 20 |
| Recovery % | 108 | 110 |
| Precision (n=5) | 9.7 | 15.3 |

Publications

Data extracted from **Determination of steroidal oestrogens in tap water samples using solid-phase extraction on a molecularly imprinted polymer sorbent and quantification with gas chromatography-mass spectrometry (GC-MS)**, D. Zacs, I. Perkons, V. Bartkevics, *Environ Monit Assess* 188, 433, 2016.

Catalog number:

3mL format

FS104-03 for 50 cartridges

PROTOCOL OF PURIFICATION

Sample preparation

100mL of tap water spiked with 17 β -E2-d₃ to a final concentration of 75ng/L was the loading solution.

Purification with a 3mL/100mg AFFINIMIP® SPE Estrogens cartridge

Equilibration

- 3mL Acetonitrile
- 3mL Water

Loading solution from sample preparation

Washing of interferents

- 3mL water
- 3mL Water/Acetonitrile (60/40)

Elution (E)

3mL Methanol

The elution fraction was then evaporated to dryness under a stream of nitrogen. Residues was treated with 10 μ L of a mixture containing BSTFA +1 % TMCS and 8 μ L of pyridine (dried with solid KOH). After a vortex stirring, derivatisation was performed for 30 min at 55 °C. The derivatives were cooled to room temperature, 2- μ L aliquots of the recovery standard (pyrene-d10) were added to each vial and the samples were subjected to GC-MS analysis.

GC-HRMS Analysis

Column: Rtx-5 fused silica capillary columns (30 m, 0.25-mm ID, 0.25- μ m film thickness)

Gas carrier: Helium at a flow 1.2mL/min

Injection temperature: 260°C

GC-MS transfer line temperature: 280°C

Temperature program: 100°C during 2min; 10°C/min to 265°C; 265°C during 2min ; 10°C/min to 300°C; 300°C during 3 min ; 20°C/min to 310°C; 310°C during 3min

Injection volume: 1 μ L

Detector : GC-MS/MS EI+ mode

Detection mode: Selected Ion Recording (SIR)

RESULTS

Method validation for 17 β -E2 and 17 α -EE2 by GC-MS/MS

| | 17 β -E2 | 17 α -EE2 |
|-----------------------------|----------------|------------------|
| Linearity range,ng/ L | 0.08-80.0 | 0.08-80.0 |
| Linearity (R ²) | 0.9990 | 0.9990 |
| m-LOQ, ng/L | 0.08 | 0.08 |
| Spiking level ng/L (n=5) | 4 | 4 |
| Recovery % | 113 | 111 |
| Precision (n=5) | 4.6 | 5.4 |
| Spiking level ng/L (n=5) | 20 | 20 |
| Recovery % | 99 | 106 |
| Precision (n=5) | 4.3 | 14.3 |

Publications

Data extracted from **Determination of steroidal oestrogens in tap water samples using solid-phase extraction on a molecularly imprinted polymer sorbent and quantification with gas chromatography-mass spectrometry (GC-MS)**, D. Zacs, I. Perkons, V. Bartkevics, *Environ Monit Assess* 188, 433, 2016.

Catalog number:

3mL format

FS104-03 for 50 cartridges



THE ART OF MAKING SAMPLE PREPARATION EASIER

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