Preamble

As an integral part of an analysis, sample preparation has considerably evolved in the last few years. It is the most important step of the analytical process. Some studies show that sample preparation generally represents about 60% of a laboratory technician's work time and is one of the main sources of errors affecting the analysis result. With this in mind, it is easy to understand why good sample preparation has a direct impact on the detection limit, reproducibility and repeatability of the analysis. Its impact on the quality of the analysis is fundamental.

The matrices to be treated (blood, plasma, water, organs, meats, poisons, vegetables,...) require the use of various techniques: filtration, dialysis, liquid-liquid extraction, solid phase extraction (SPE). Among these, the solid phase extraction is certainly the technique that has evolved the most in the last years.
It is now present in most laboratories and allows efficient purification and concentration of the sample before HPLC, GC or GC/MS analysis. The level of quality required for SPE products has therefore increased. Thus, new technological innovations such as high surface area polymers, ion exchange polymers and pure spherical silicas have become essential.

Efficiency, capacity, selectivity and reproducibility are the main virtues that analysts expect from their sample processing methods. Thanks to our experience, our laboratories have developed the Upti-Clean® brand, pure spherical silica supports, as well as the Atoll™ and PolyClean™ brands, ultra-pure spherical polymers.
These product lines are perfectly suited to the needs of modern methods and contribute to making them more reliable, more reproducible and more robust.

TECHNICAL TIP

- Check the miscibility of the solvents to be used.
- Always leave the solvent level above the sorbent to maintain its activation.
- For silicas bonded with an ion exchanger activate with methanol, water and then with buffered water at the desired pH.

General SPE Methodology

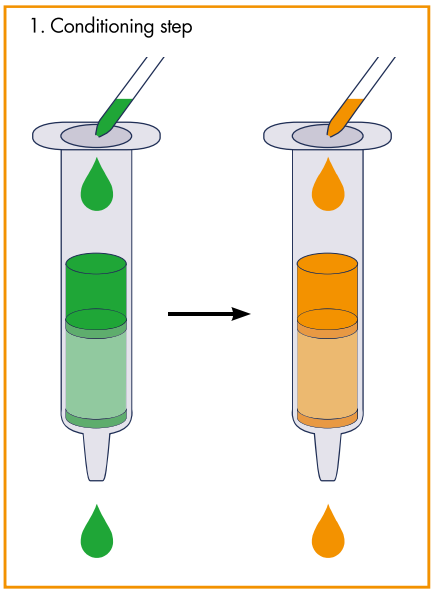
All sorbents filled in cartridges, columns or 96 well plates are single use (except for the on-line trapping columns used with an LC system).
Using an automated SPE workstation is recommended for the percolation of the different solvents (vacuum manifold, positive pressure automate, syringes).

The choice of the column is defined by the volume of the sample, the concentration of analytes and the types of exchanges sought. In envorinmental application areas, volumes of multiple hundred milliliters may be necessary for a good pre-concentration (e.g. organic pollutants). On the other hand, in the pharmaceutical industry, the volume of samples to be purified is only a few milliliters. The sorbent selected must have an excellent affinity with the target compounds. It must also have a minimum affinity with the matrix interferents.

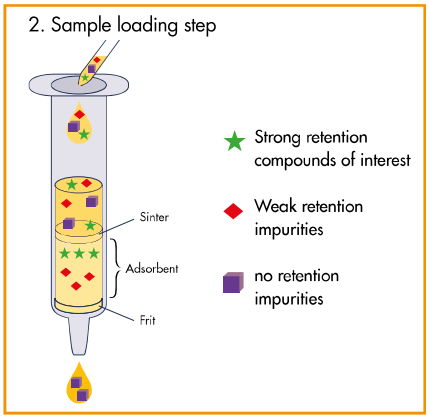
A SPE protocol consists of several steps:

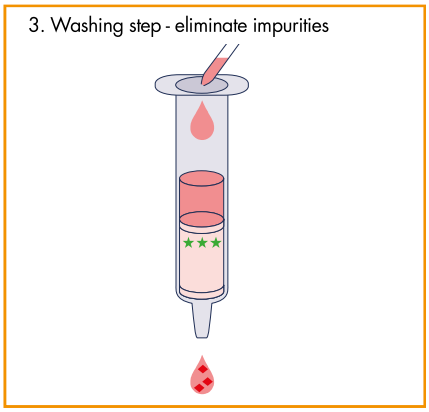
1. Conditioning

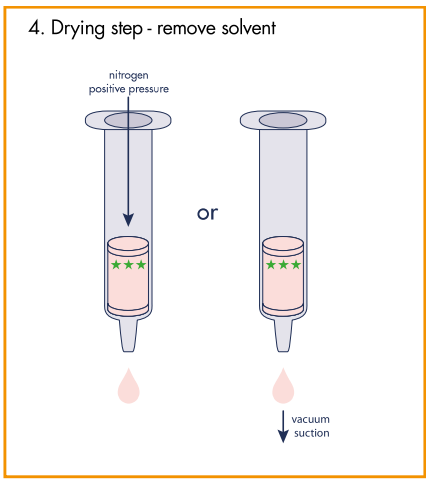
Activation step with an organic solvent or a mixture of solvents allows the removal of the contaminants and promotes exchanges in the sorbent. This step allows to "wet" the column frits.
Hexane, cyclohexane or dichloromethane are solvents regularly used in "normal phase" mode to condition virgin or bonded silica aminopropyl (R-NH2), dihydroxypropyl (R-R'OH-R''OH), cyanopropyl (R-CN), ...
In "reverse phase" mode, for C18, C8, C2, phenyl, cyclohexyl grafted silicas, methanol or even acetonitrile are commonly used.

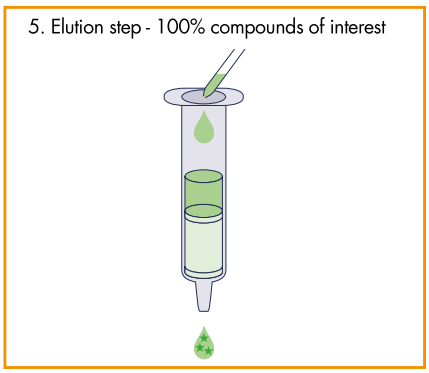


SAMPLE PREPARATION
Solid phase extraction - SPE technique









2. Sample Loading Step
Load the sample onto the upper part of the sorbent bed. Matrix contaminants may pass through the column unretained, and additionally, other matrix components may be more or less strongly retained on the sorbent surface. To get a maximum purification efficiency, the sample flow must be controlled.
[It is necessary to analyze the unretained fraction to check if all compounds of interest have been retained]

The experimental values of the flows observed for particle sizes of approximately 50 µm are:

- 0.7-1 mL/min for 1mL columns
- 2-3 mL/min for 3 mL columns
- 5-7 mL/min for 6 mL columns
- 7-10 mL/min for 15 mL columns
- 10-15 mL/min for 25 mL columns
- 0.6-1.1 mL/min for 96 well plates
- 4-5 mL/min for closed cartridges

During the first tests, it is imperative to verify that all the compounds of interest in the sample have been fixed on the sorbent to analyze the elution fraction. In ion exchange, the pH of the sample must be identical to the pH of the buffer used during the sorbent activation step.
The percolation of viscous samples through a column can be facilitated by using sorbents of 90 to 140 µm. The exchange capacity and selectivity are not affected.

3. Washing Step
Passing solvents through columns washes away interfering compounds, leaving the analyte undisturbed on the sorbent bed. Different solvents or solvent mixtures may be used to improve the rinsing efficiency.

4. Drying Step
A drying step may sometimes be necessary. Solvent traces are evaporated by circulating air through the column over a 2 to 10 minute time period. This improves the extraction yield.

5. Elution Step
An appropriate solvent is passed through the column to disrupt the analyte-sorbent interaction and to elute 100% of the compounds of interest.
The appropriate solvent must have maximum interaction with the compound of interest and a minimal interaction with the remaining impurities, leaving them undisturbed on the sorbent bed. In addition, the volume of the elution solvent needs to be as small as possible to maximize the concentration factor.
[Sorbent with low particle size (e.g 30,50 µm) gives a lower elution volume than larger sorbent particle size (e.g 90, 140 µm)].

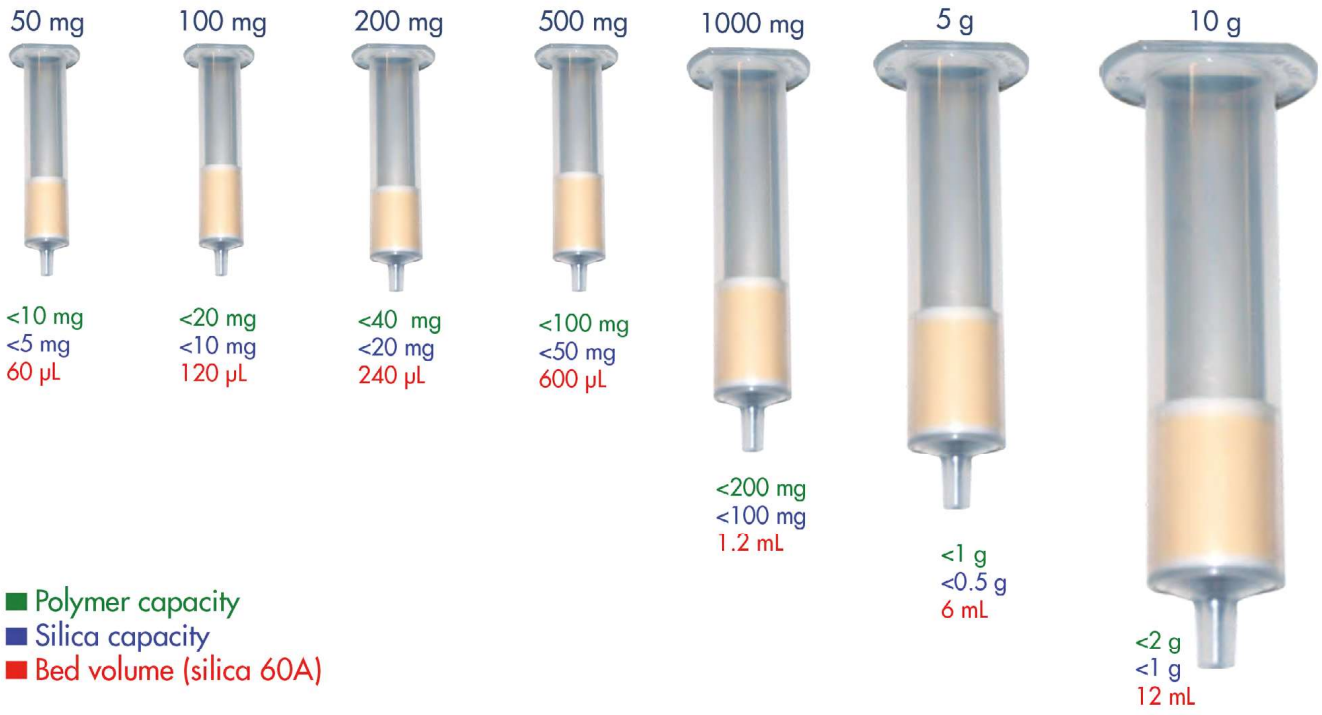
6. Drying
If necessary, the eluate can be dried with anhydrous sodium sulfate to remove any traces of water.

7. Concentration
The purpose of this step is to concentrate the compounds of interest in the elution fraction. It is generally carried out by evaporation of a part of the solvent. The concentrate obtained is either directly usable, or taken up in an analysis solvent. Once optimized, these steps guarantee a more sensitive analysis (increased concentration of the compounds of interest), more reproducible and resolutive (elimination of impurities that can modify the robustness of the analysis).

Bed volume

The bed volume is defined as the minimum volume of necessary solvent to wet the defined amount of sorbent within the column. This can vary depending on the nature of the sorbent.
e.g. :

- ~ 120 µL per 100mg of silica gel sorbent 60 Å
- ~ 180 µL per 100mg of polymeric sorbent



Incomplete elution of the compound of interest will occur if the sorbent mass is too large for the volume of solvent used. Incomplete retention of the compounds of interest will occur if there is an inadequate sorbent mass leading to compound eluting in the fraction or in the washing solvent. Such cases lead to lower recovery rates.

Sorbent Selection?

Sorbent selection requires consideration of sample volume, the nature of the analyte, analyte concentration and the inherent properties of the sorbent itself.

For environmental studies, a volume of several hundred milliliters might be necessary for a good pre-concentration (e.g., organic pollutants) whereas in the pharmaceutical industry, the sample volumes that require cleaning may only be milliliters.

The selected sorbent needs to have an excellent affinity for the compounds of interest and at the same time a weak affinity for irrelevant compounds within the matrix.

Choosing the correct sorbent results in a specific selectivity for the compounds of interest. A sufficient loading capacity also needs to be identified to optimize retention volumes of the desired compound.

There are four general modes used in Solid Phase Extraction: reversed phase, normal phase and ion exchange that require different sorbent types, namely hydrophobic, hydrophilic, ion-exchange and mixed mode.

Polymer Atoll™ & PolyClean™

- Very chemically stable, they usually resist to a pH between 1 and 14.
- Weakly selective compared to grafted silicas (except ion exchange polymers).
- They have a much higher loading capacity than traditional silicas and allow the purification of a very large number of molecules or families of molecules whatever the matrix (water, oil, plasma, urine, ...)

The mass of adsorbable compounds can be up to 30% of the mass of polymer contained in the column. It is therefore possible to perform the same purification process with a quantity of polymer of 2 to 3 times less than a silica. The elution volume is much smaller, which leads to a higher concentration, a reduced evaporation time and finally a faster sample preparation.

Sorbent	Weight sorbent	Surface area	Capacity of charge
Silica	500 mg	500 m^2/g	5 - 50 mg
Polymer	500 mg	800 m^2/g	15 - 100 mg
Polymer high capacity	500 mg	1500 m^2/g	15 - 150 mg

Silica Upti-Clean®

- Less chemically stable than polymers, they are stable at a pH between 2 and 7.5.
- Much more selective and specific than polymers with a lower loading capacity due to their lower specific surface (about 3 to 10 % of the sorbent mass) silicas are still used as reference sorbents.

We distinguish 4 families of silicas by their mode of operation as well as by their selectivity:

Silica for "Reverse Phase" mode

In "Reverse Phase" mode, the hydrophobic grafts work according to Van der Walls type interactions. The extraction allows an isolation of apolar or weakly polar compound families.
The addition of buffer is preferable when the compounds are ionizable (acids, bases).
The apolar phases not post-silanized (non-end capped) give, with the surface silanol groups, additional polar interactions which can improve the polar interactions with the surface silanol groups. Therefore, it can improve the retention of compounds containing polar functionalities.
For the same eluent, the shorter the carbon chain, the lower the retention of a compound.
For aromatic compounds, phenyl shows better interactions.
Methanol or acetonitrile are elution solvents regularly used.

Silica for "Normal Phase" mode

The "normal phase" mode remains a very interesting compromise for the extraction of molecules or families of molecules whose structure presents polar functions. The choice of the solvent is very important and directly influences on the type of interaction implemented for the extraction (an apolar solvent favors polar interactions between the sorbent and the compounds).

- Cyano bonded sorbent (CN) can be used either in "normal phase" for the extraction of polar compounds or in "reverse phase" for medium polar molecules.
- Diol bonded sorbent is an alternative to virgin silica for the extraction of polar compounds. Mixed phase, amino silica (NH2) can be used as a weak anion exchanger (for very strong acids) or as a polar sorbent that can interact with functional groups.
- Mixed phase, amino silica (NH2) can be used as a weak anion exchanger (for very strong acids) or as a polar sorbent that can interact with functional groups -OH, -NH, -SH-, ...

Silica for ion exchange mode

With "ion exchange" mode, the retention mechanism is ionic interaction based. The sorbent creates a strong attraction on the sample compound(s) with antagonistic ionizable function(s). The interaction of the ion exchange phases depends mainly on the pH and the ionic strength of the counterion. The stronger acid and base pairing, the stronger of the bond strength, which can be problematic for the elution step and for obtaining a good recovery rate. This is why there are different ion exchange phases:

- Anion exchange phases (SAX) are usually a very strong quaternary amine. They are used to extract weak acids with negative charge(s).
- Cation exchange phases (SCX) with a sulfonic functionality are used to extract all weak basic compounds carrying a positive charge(s).

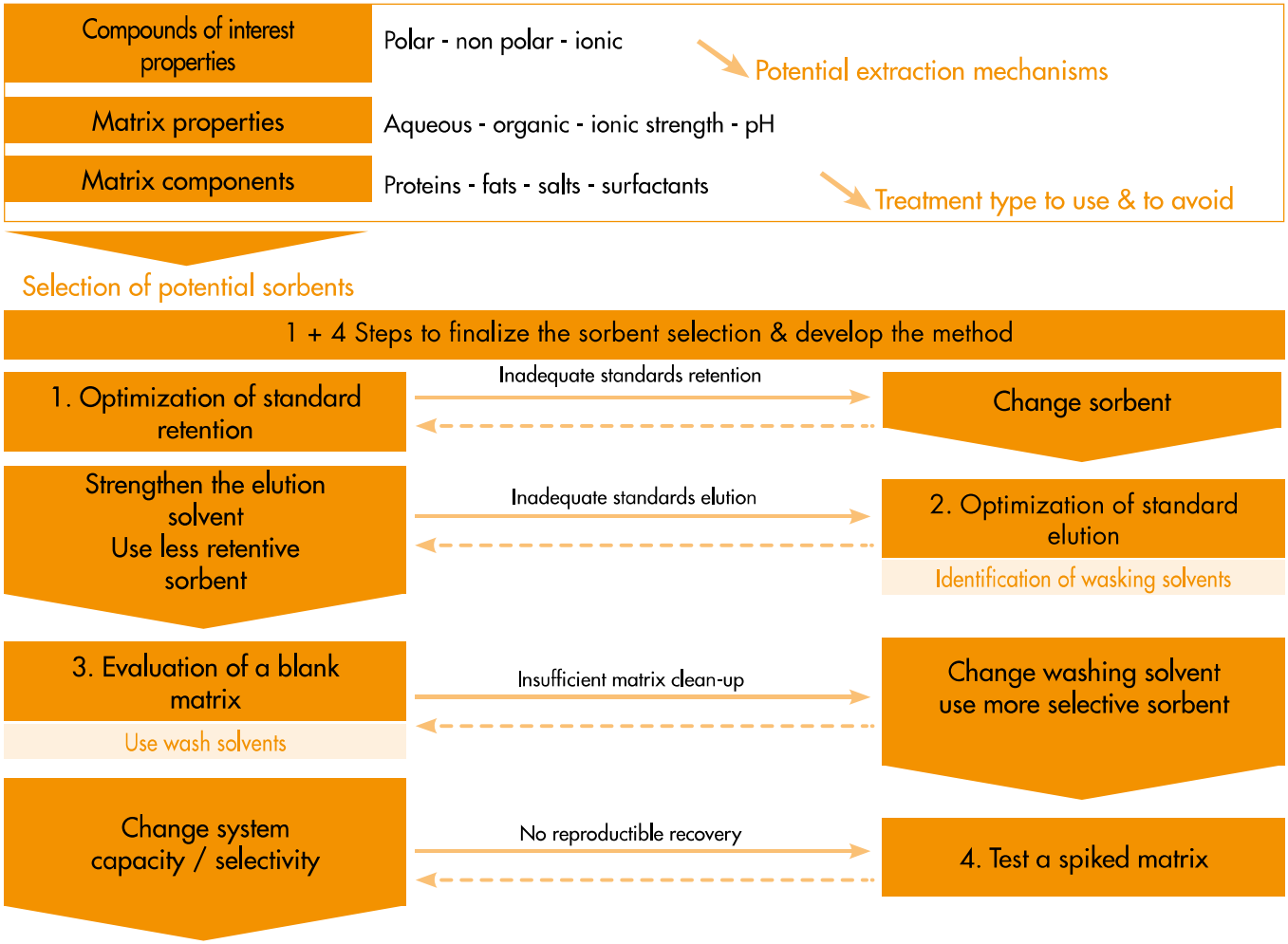
- Anion exchange phases, (DEAE, DEA, NH2,...) on a less strong amine base than SAX, are used to extract strong acids with negative charge(s).
- Cation exchange phases (WCX) are functionalized by a carboxylic acid and are used to extract all strong basic compounds with positive charge(s).

Mixed mode silicas

One of the most selective techniques of bonded silica sorbent is the "mixed mode" technique. The double grafting (ion exchange and hydrophobic carbon chains) brings new selectivities. The compounds of interest, which must imperatively have an acid or basic function, are retained on the ion exchange graft. To begin, a powerful washing using pH eliminates the ionizable impurities. It is then possible to remove the other impurities retained on the hydrophobic grafting by an organic solvent. This technique is widely used for the extraction of basic compounds (drugs, medicines and metabolites) in biological fluids (blood, plasma, urine, ...).

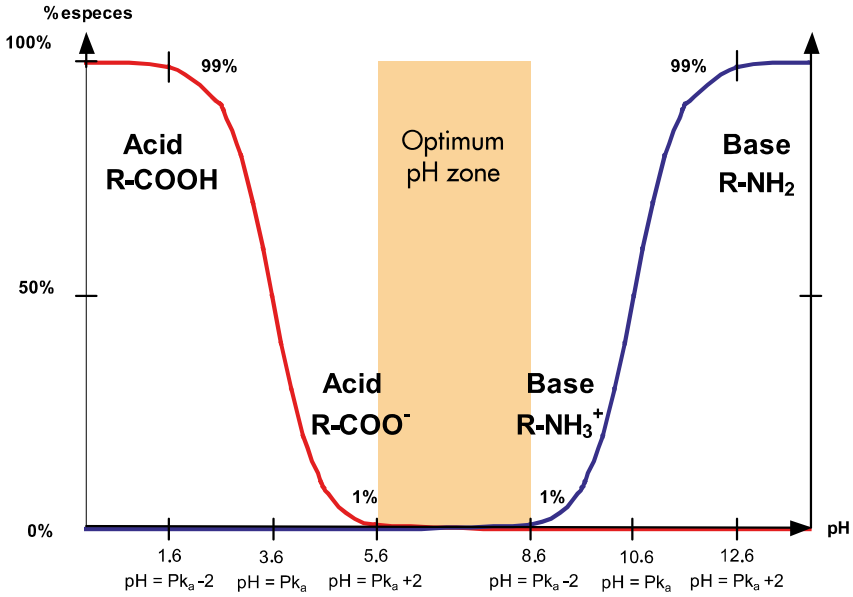
As in "ion exchange," there are different grafts specific to the compounds of interest:
The "mixed mode" phases (RP/SCX) are composed of a strong acid (sulfonic) and a hydrophobic graft. They are used to extract weak bases carrying one or more positive charges.

- The "mixed mode" phases (RP/SAX) are based on a quaternary amine and hydrophobic graft. They are used to extract weak acids carrying negative charge(s).
- The "mixed mode" phases (RP/WCX) are based on a weak acid (carboxylic) and hydrophobic grafts. They are used to extract strong bases carrying one or more negative charges.
- The "mixed mode" phases (RP/NH2) are based on a weak amine and hydrophobic grafts. They are used to extract strong acids with negative charge(s).



SAMPLE PREPARATION
Solid phase extraction - SPE technique

Distribution according to the pH of the acid/conjugated base of an acidic (red) and basic (blue) ionizable compound in solution

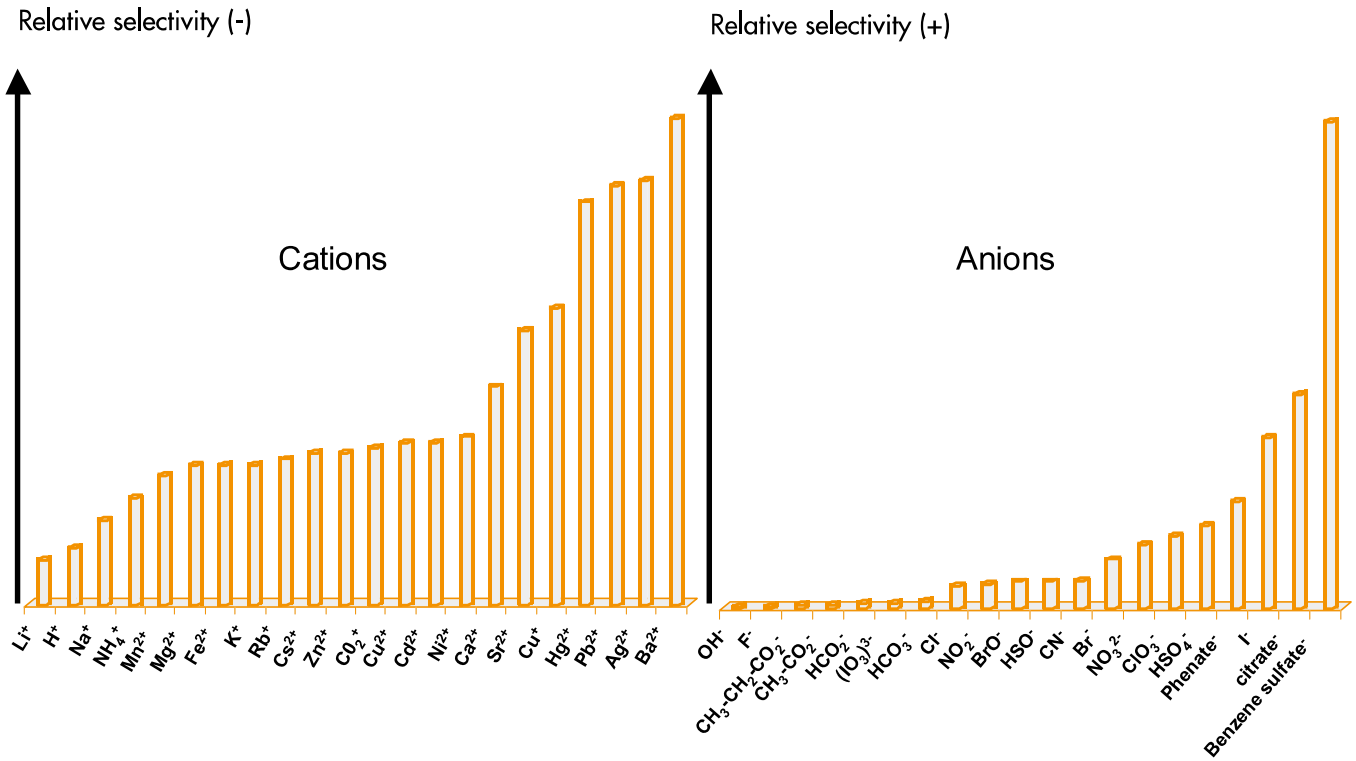


TECHNICAL TIP

SPE extraction methods based on "Ion Exchange" and "Mixed Modes" are relatively complex to implement. At the sample level, the acids and bases in solution must be in their ionized forms to develop interactions with the sorbent.
To make the recovery rates reproducible and repeatable, it is essential to buffer the sample and the sorbent at the optimum pH.
Ex: For the pH range between 5.6 and 8.6 in the attached example, all acidic (pKa 3.6) and basic (pKa 10.6) compounds pair up to form a strong ionic bond.

Relative selectivity of the counter-ions

A counter-ion is an ionic entity able to interact with an ion exchange sorbent.
It improves the efficiency of cleaning steps including elution according to its concentration in solution and its affinity with the exchanger sorbent.



To develop a **robust, reproducible and repeatable** SPE method, it is fundamental to adequately choose:
The type of sorbent (silicas or polymers), **the nature of the sorbent, the mass of sorbent and the volume of the container.**
These four parameters are essential to obtain:
A purification selectivity intrinsic to the sample, a necessary and sufficient **loading capacity**, a preconcentration **factor and an optimum extraction yield.**
Implementing a SPE extraction requires, at minimum, knowledge about the matrix, the impurities and the analytes to be extracted which will be analyzed afterwards. The method development kits are powerful and relevant tools to quickly assess the type of sorbent to use and the selectivity it provides to perform your extractions.
For more information, our service is committed to providing you with the best support and cutomized solutions do not hesitate to contact us.

Indicative protocol for the development of SPE methods on polymers

***Sample pre-treatment** (Soxhlet, Lig/Liq extraction (LLE), Liquid/Solid extraction (SLE), Filtration, Protein precipitation...)

1- Sample pre-treatment:
Different protocols may be necessary before loading the sample on a SPE column (filtration, liquid/liquid extraction, extraction with a Soxhlet Soxhlet type equipment). These steps depend on the nature of the sample (mainly solid or liquid).

2 - Conditioning:
We use mainly organic solvents like Methanol, Acetonitrile, Dichloromethane. For aqueous samples, a second conditioning with water may be necessary.

3 - Sample loading

5 - Washing:
Washing removes interfering compounds from the matrix that would have a slight affinity with the stationary phase of the SPE column.
- A slightly acidic wash eliminates the weak acids present in the medium.
- A slightly basic wash eliminates the weak bases present in the medium.

6 - Elution:
The compounds of interest are desorbed from the stationary phase.
- An organic solvent (Methanol, Acetonitrile, Dichloromethane) is generally used for the elution of the compounds by order of decreasing polarity (here reverse phase).
- In ion exchange it is necessary to adjust the pH corresponding to the zone in where the analyte is in neutral form.

Custom manufacturing on demand

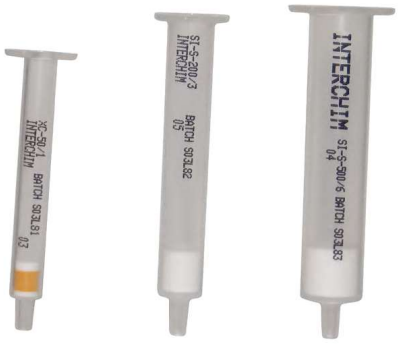
We manufacture columns and multi-well plates according to your specifications.
To do so, simply send a request to :

instrumentation@advion-interchim.com |
consumables.eu@advion-interchim.com
Tel.: +33 4 70 03 88 55

Specify the following points:

- the type of sorbent desired
- the mass of sorbent
- the nature of the column and the container
- the volume of the column and the container
- the nature and porosity of the frit
- the quantity of columns desired

Printed SPE columns



One of our specialists will contact you within 48 hours to validate the project feasibility.
A confidentiality agreement can be signed between the two parties.

Type of sorbent

It can be:

- a sorbent manufactured by you. In this case, you must specify its nature and physical characteristics as well as its safety data sheet.
- a sorbent marketed and/or manufactured by another company
- an Advion Interchim Scientific sorbent

Sorbent weigth

It can be between 15 mg and 70 g (depending on the volume of the column or the chosen plate). The accuracy of our weighing can go up to 1%.
Three types of columns are available:

- Straight polypropylene tank
- Large capacity tank (LRC) in polypropylene
- Straight glass tank

We can fill any other type of container if it is compatible with our filling systems.

Volume of the column or container

- 1 - 3 - 6 - 15 - 25 - 75 - 150 mL for straight polypropylene tubes
- 15 mL for polypropylene LRC tanks
- 6 mL for glass straight tubes

Nature and porosity of the frit

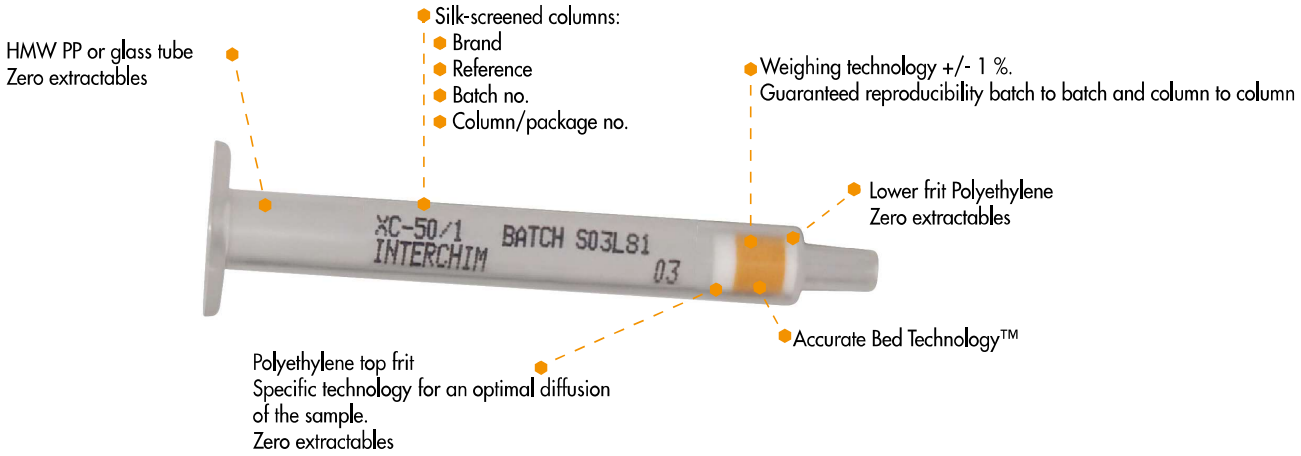
- Polyethylene for polypropylene straight tubes and LRC tubes
- PTFE for glass straight tubes

Hardwares

Format	Picture	Material	Volumes	Frits
Columns		PP Medical Grade	1 - 3 - 6 - 15 - 25 - 75 - 150 mL	20 µm Polyethylene
LRC columns		PP Medical Grade	Robotic Large Capacity (LRC) 15 mL	20 µm Polyethylene
Glass columns		Glass	6 mL	20 µm PTFE
Cartridges		PP Medical Grade	Type 300 - 600 - 900 mg	20 µm Polyethylene

Advion Interchim Scientific Accurate Bed Technology™

The manufacturing process Interchim® Accurate Bed Technology™ has been developed to ensure a unique batch to batch and column to column reproducibility.
Our SPE sorbents have an optimized particle size distribution and are drastically controlled.
The amount of sorbents are loaded by weighing with an accuracy of +/- 1%.
A weighting certificate is delivered.
This allows the optimization of the analysis technique and the interpretation of the results.
Our SPE columns are supplied in HDPE / Al packaging dedicated to long-term storage.
Our flexibility and our experience give us full confidence in satisfaying any custom manufacturing request.
This approach provides technical solutions to our customers to ensure the development and optimization of their sample preparation.



SAMPLE PREPARATION

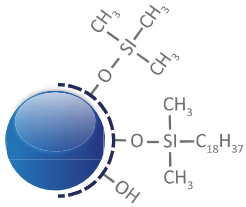
Solid Phase Extraction - Sorbent selection guide

Phases & Features Advion-Interchim Scientific

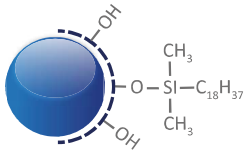
Type	Code	Bonding	Pore size Å	Surface area m^2/g	Modification	% C	IE Capacity meq/g	Particule size µm µm
Atoll Xtrem Capacity	XC	PSDVB	60	1500				70
Atoll X	X	PSDVB	100	800				40
PolyClean 2H	302H	Polymer modified	100	850	Hydrophile / Lipophile			30
PolyClean 2H	2H	Polymer modified	100	850	Hydrophile / Lipophile			60
PolyClean HCX	30HCX	Polymer modified	100	850	Strong cation exchange		1.0	30
PolyClean HCX	HCX	Polymer modified	100	850	Strong cation exchange		1.0	60
PolyClean HAX	30HAX	Polymer modified	100	850	Strong anion exchange		0.3	30
PolyClean HAX	HAX	Polymer modified	100	850	Strong anion exchange		0.3	60
Recovery C18	REC18	Spherical silica	120	350	C18	15		50
Recovery Silice	RESI	Spherical silica	120	350	Silica			50
Upti-Clean C18-S	C18-S	Spherical silica	60	500	C18	18		50
Upti-Clean C18U-S	C18U-S	Spherical silica	60	500	C18 No end-capped	16		50
Upti-Clean C18 RPAQ	C18-RPAQ	Spherical silica	60	500	C18 Hydrophile	14		50
Upti-Clean C18-S2F	C18-S2F	Spherical silica	60	500	C18 High flowrate			140
Upti-Clean C8-S	C8-S	Spherical silica	60	500	C8	11		50
Upti-Clean CN-S	CN-S	Spherical silica	60	500	Cyano	8		50
Upti-Clean PH-S	PH-S	Spherical silica	60	500	Phenyl	9		50
Upti-Clean NH2-S	NH2-S	Spherical silica	60	500	Amino	4		50
Upti-Clean Silice	SI-S	Spherical silica	60	500				50
Upti-Clean Diol	OH	Spherical silica	60	500	Diol	7		50
Upti-Clean SCX	SCX	Spherical silica	100	400	Strong cation exchange		0.5	50
Upti-Clean MM1	MM1	Spherical silica	100	400	RP /Strong cation exchange		0.09	50
Upti-Clean WCX	WCX	Spherical silica	100	400	Weak cation exchange		0.22	50
Upti-Clean SAX	SAX	Spherical silica	100	400	Weak anion exchange		0.5	50
Upti-Clean DEAE	DEAE	Spherical silica	60	450	Weak anion exchange		0.33	60
Alumine Acid	ALA	Alumine	60	200	Acid			32/63
Alumine Neutral	ALN	Alumine	60	200	Neutral			32/63
Alumine Basic	ALB	Alumine	60	200	Basic			32/63
Florisil 60/100	FL	Florisil	150/250		Standard			200
Florisil PR 60/100	FLPR	Florisil	150/250		Grade Pesticides			200
Polyamide	P6	Polyamide			P6			100

	pH range	Capacity of charge	General application
	0.0 - 14	30	Ultra high capacity universal polymer designed for cleaning a wide range of hydrophobic compounds from various matrices (water, oil, plasma, urine ...).
	0.0 - 14	20	Universal high capacity polymer designed for cleaning a wide range of hydrophobic compounds from various matrices (water, oil, plasma, urine ...).
	1.0 - 13	20	Universal high capacity polymer designed for cleaning a wide range of hydrophilic / hydrophobic compounds from various matrices (water, oil, plasma, urine ...).
	1.0 - 13	20	
	1.0 - 13		High selectivity and sensitivity for the extraction of charged and basic cationic organic compounds (pKa <11).
	1.0 - 13		
	1.0 - 13		High selectivity and sensitivity for the extraction of charged organic and acidic anionic compounds (pKa >3).
	1.0 - 13		
	1.0 - 8.0	6	Extraction of polar and non-polar compounds from aqueous matrices.
	1.0 - 7.5	10	Extraction of non-ionic polar organic compounds from a non-polar matrix.
	1.0 - 8.0	5	Extraction of polar and non-polar compounds from aqueous matrices.
	1.0 - 7.0	5	Extraction of polar and non-polar compounds from an aqueous matrix.
	1.0 - 7.5	5	Extraction of polar, mid polar and non-polar compounds from an aqueous matrix- 100% water compatible.
	1.0 - 8.0	5	Extraction of polar and non-polar compounds from a complex aqueous matrix such as serum, plasma, urine, ...
	1.5 - 7.5	7	Extraction of polar and medium polar compounds from an aqueous matrix.
	1.5 - 7.0	7	Extraction of polar compounds from non-polar solvents or medium polar compounds from an aqueous matrix.
	1.5 - 7.0	5	Extraction of polar and medium polar aromatic compounds from aqueous matrix or non-polar solvents.
	2.0 - 6.5	7	Weak anion exchanger (for strong acids) (pH <8), or polar media that can interact with OH, NH, SH ... Amino groups are nitrogen scavengers for acid chlorides, isocyanates.
	1.5 - 6.5	10	Cleaning of non-ionic polar organic compounds from non-polar solvents.
	1.5 - 7.0	7	Provides a totally neutral surface to the silica. It allows a better cleaning of basic compounds compared to regular silica.
	1.0 - 7.5		Extraction of weak bases.
	1.0 - 7.5		Highly selective extraction of non-polar and cationic compounds.
	1.0 - 7.5		Extraction of strong bases.
	1.5 - 7.0		Extraction of weak acids.
	1.5 - 7.0		Weak exchanger for the extraction of negatively charged polar organic compounds. Polar selectivity complementary to NH2 and SAX.
	1.0 - 12	5	The acid treatment of alumina allows an ideal selectivity for cationic compounds.
	1.0 - 12	5	Extraction of non-ionizable polar compounds. Used for the extraction of dioxin.
	1.0 - 12	5	The basic treatment of alumina allows an important selectivity for anionic compounds.
		8	Extraction of polar compounds. Separation of lipids, decoloration ...
		8	Special "residue" grade for the extraction of pesticides.
			Flavonoids and other natural compounds.

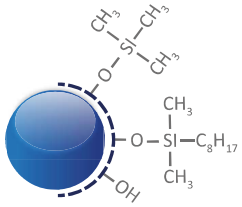
SAMPLE PREPARATION
Solid Phase Extraction - Columns Upti-Clean®



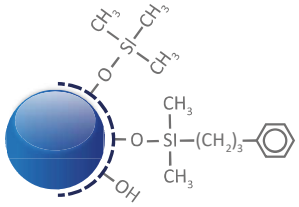
Upti-Clean® C18-S
60 Å - 500 m²/g - 50 µm
C18 end-capped
% C: 18
pH range: 1.0 - 8.0
Extraction of apolar and moderately polar compounds in aqueous matrices.



Upti-Clean® C18U-S
60 Å - 500 m²/g - 50 µm
C18
% C: 16
pH range: 1.0 - 7.0
Extraction of apolar, moderately polar and polar compounds in aqueous matrices.



Upti-Clean® C8-S
60 Å - 500 m²/g - 50 µm
C8 end-capped
% C: 11
pH range: 1.0 - 7.5
Extraction of polar and moderately polar compounds in aqueous matrices.



Upti-Clean® PH-S
60 Å - 500 m²/g - 50 µm
Phenyl
% C: 9
pH range: 1.5 - 7.0
Extraction of polar and medium polar aromatic compounds in aqueous matrices or apolar organic solvents.

Upti-Clean® S-Series

Upti-Clean® S-Series columns are easy to use, efficient SPE cleaning devices with widespread applications throughout the pharmaceutical, toxicology and clinical areas.

Reverse Phase Columns

Weight	Vol.	Qty	C18-S	C18U-S	RPAQ
Standard columns - frits PE					
50 mg	1 mL	50 u	C18-S-50/1	C18U-S-50/1	RPAQ-50/1
100 mg	1 mL	100 u	C18-S-100/1	C18U-S-100/1	RPAQ-100/1
100 mg	3 mL	50 u	C18-S-100/3	C18U-S-100/3	RPAQ-100/3
200 mg	3 mL	50 u	C18-S-200/3	C18U-S-200/3	RPAQ-200/3
500 mg	3 mL	50 u	C18-S-500/3	C18U-S-500/3	RPAQ-500/3
500 mg	6 mL	30 u	C18-S-500/6	C18U-S-500/6	RPAQ-500/6
1000 mg	6 mL	30 u	C18-S-1G/6	C18U-S-1G/6	RPAQ-1G/6
2000 mg	6 mL	20 u	C18-S-2G/6	C18U-S-2G/6	RPAQ-2G/6
2000 mg	15 mL	20 u	C18-S-2G/15	C18U-S-2G/15	RPAQ-2G/15
2000 mg	25 mL	20 u	C18-S-2G/25	C18U-S-2G/25	RPAQ-2G/25
LRC columns - Frits PE					
100 mg	LRC 15	50 u	C18-S-100LRC	C18U-S-100LRC	RPAQ-100LRC
200 mg	LRC 15	50 u	C18-S-200LRC	C18U-S-200LRC	RPAQ-200LRC
500 mg	LRC 15	50 u	C18-S-500LRC	C18U-S-500LRC	RPAQ-500LRC
Glass columns - Frits PTFE					
200 mg	6 mL	30 u	C18-S-200/6G	C18U-S-200/6G	RPAQ-200/6G
500 mg	6 mL	30 u	C18-S-500/6G	C18U-S-500/6G	RPAQ-500/6G
1000 mg	6 mL	30 u	C18-S-1G/6G	C18U-S-1G/6G	RPAQ-1G/6G

Weight	Vol.	Qty	C8-S	PH-S
Standard columns - frits PE				
50 mg	1 mL	50 u	C8-S-50/1	PH-S-50/1
100 mg	1 mL	100 u	C8-S-100/1	PH-S-100/1
100 mg	3 mL	50 u	C8-S-100/3	PH-S-100/3
200 mg	3 mL	50 u	C8-S-200/3	PH-S-200/3
500 mg	3 mL	50 u	C8-S-500/3	PH-S-500/3
500 mg	6 mL	30 u	C8-S-500/6	PH-S-500/6
1000 mg	6 mL	30 u	C8-S-1G/6	PH-S-1G/6
2000 mg	6 mL	20 u	C8-S-2G/6	PH-S-2G/6
2000 mg	15 mL	20 u	C8-S-2G/15	PH-S-2G/15
2000 mg	25 mL	20 u	C8-S-2G/25	PH-S-2G/25
LRC columns - Frits PE				
100 mg	LRC 15	50 u	C8-S-100LRC	PH-S-100LRC
200 mg	LRC 15	50 u	C8-S-200LRC	PH-S-200LRC
500 mg	LRC 15	50 u	C8-S-500LRC	PH-S-500LRC
Glass columns - Frits PTFE				
200 mg	6 mL	30 u	C8-S-200/6G	PH-S-200/6G
500 mg	6 mL	30 u	C8-S-500/6G	PH-S-500/6G
1000 mg	6 mL	30 u	C8-S-1G/6G	PH-S-1G/6G

Columns - Normal phase

Weight	Vol.	Qty	SI-S	NH2-S	CN-S	OH
SPE columns - Frits PE						
50 mg	1 mL	50 u	SI-S-50/1	NH2-S-50/1	CN-S-50/1	OH-50/1
100 mg	1 mL	100 u	SI-S-100/1	NH2-S-100/1	CN-S-100/1	OH-100/1
100 mg	3 mL	50 u	SI-S-100/3	NH2-S-100/3	CN-S-100/3	OH-100/3
200 mg	3 mL	50 u	SI-S-200/3	NH2-S-200/3	CN-S-200/3	OH-200/3
500 mg	3 mL	50 u	SI-S-500/3	NH2-S-500/3	CN-S-500/3	OH-500/3
500 mg	6 mL	30 u	SI-S-500/6	NH2-S-500/6	CN-S-500/6	OH-500/6
1000 mg	6 mL	30 u	SI-S-1G/6	NH2-S-1G/6	CN-S-1G/6	OH-1G/6
2000 mg	6 mL	20 u	SI-S-2G/6	NH2-S-2G/6	CN-S-2G/6	OH-2G/6
2000 mg	15 mL	20 u	SI-S-2G/15	NH2-S-2G/15	CN-S-2G/15	OH-2G/15
2000 mg	25 mL	20 u	SI-S-2G/25	NH2-S-2G/25	CN-S-2G/25	OH-2G/25
LRC columns - PE frits						
100 mg	LRC 15	50 u	SI-S-100LRC	NH2-S-100LRC	CN-S-100LRC	OH-100LRC
200 mg	LRC 15	50 u	SI-S-200LRC	NH2-S-200LRC	CN-S-200LRC	OH-200LRC
500 mg	LRC 15	50 u	SI-S-500LRC	NH2-S-500LRC	CN-S-500LRC	OH-500LRC
Glass columns - PTFE frits						
200 mg	6 mL	30 u	SI-S-200/6G	NH2-S-200/6G	CN-S-200/6G	OH-200/6G
500 mg	6 mL	30 u	SI-S-500/6G	NH2-S-500/6G	CN-S-500/6G	OH-500/6G
1000 mg	6 mL	30 u	SI-S-1G/6G	NH2-S-1G/6G	CN-S-1G/6G	OH-1G/6G

Standard column

PP straight tube
PE frit 20 µm

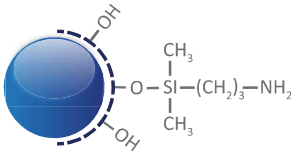
LRC column

PP tube
PE frit 20 µm

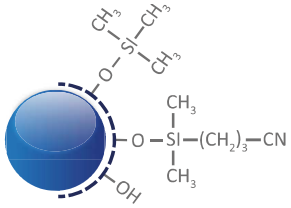
Glass column

Glass tube
PTFE frit 20 µm

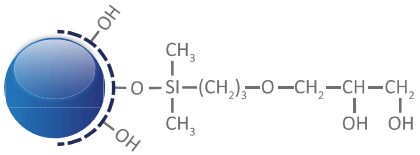
Upti-Clean® SI-S
60 Å - 500 m²/g - 50 µm
pH range: 1.5 - 6.5
Clean-up of polar, non-ionic organic compounds in apolar solvents.



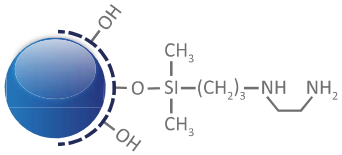
Upti-Clean® NH2-S
60 Å - 500 m²/g - 50 µm
Amino
% C: 4
pH range: 2.0 - 6.5
Weak anion exchanger (for strong acids at pH < 8), good polar selectivity with OH, NH, SH GROUPS. Scavenger for chlorinated acids and isocyanates.



Upti-Clean® CN-S
60 Å - 500 m²/g - 50 µm
Cyano
% C: 8
pH range: 100 - 7.0
Extraction of polar compounds in apolar solvents and of moderately polar compounds in aqueous matrices.



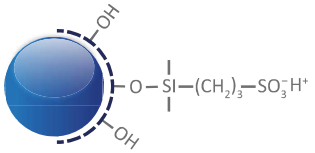
Upti-Clean® OH
60 Å - 500 m²/g - 50 µm
Diol
% C: 7
pH range: 1.5 - 7.0
The surface of the silica is globally neutral, allowing a better clean-up of basic compounds compared to silica without bonding.



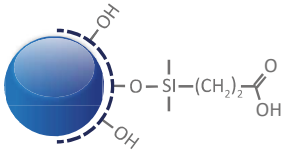
Upti-Clean® PSA-S
60 Å - 500 m²/g - 50 µm
%C: 7
pH range: 2.0 - 6.5
Weak anion exchanger (pKa: 10.5) for the extraction of charged polar organic compounds.

SAMPLE PREPARATION

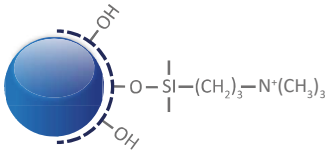
Solid phase extraction - Upti-Clean® Columns



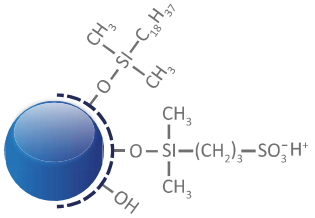
Upti-Clean® SCX
100 Å - 400 m²/g - 50 µm
Exchange capacity: 0.5 meq/g
pH range: 1.0 - 7.5
Strong cation exchanger for the extraction of weak bases.



Upti-Clean® WCX
100 Å - 400 m²/g - 50 µm
Exchange capacity: 0.22 meq/g
pH range: 1.0 - 7.5
Weak cation exchanger for the extraction of strong bases.



Upti-Clean® SAX
100 Å - 400 m²/g - 50 µm
Exchange capacity: 0.5 meq/g
pH range: 1,5 - 7,0
Strong anion exchanger for the extraction of weak acids.



Upti-Clean® MM1
100 Å - 400 m²/g - 50 µm
Reverse phase/SCX
Exchange capacity: 0.09 meq/g
pH range: 1.0 - 7.5
Selective extraction of apolar and cationic compounds.

Upti-Clean® Series-S

Ion exchange columns

Weight	Vol.	Qty	SCX	WCX	SAX
Standard columns - PE frits					
50 mg	1 mL	50 u	SCX-50/1	WCX-50/1	SAX-50/1
100 mg	1 mL	100 u	SCX-100/1	WCX-100/1	SAX-100/1
100 mg	3 mL	50 u	SCX-100/3	WCX-100/3	SAX-100/3
200 mg	3 mL	50 u	SCX-200/3	WCX-200/3	SAX-200/3
500 mg	3 mL	50 u	SCX-500/3	WCX-500/3	SAX-500/3
500 mg	6 mL	30 u	SCX-500/6	WCX-500/6	SAX-500/6
1000 mg	6 mL	30 u	SCX-1G/6	WCX-1G/6	SAX-1G/6
2000 mg	6 mL	20 u	SCX-2G/6	WCX-2G/6	SAX-2G/6
2000 mg	15 mL	20 u	SCX-2G/15	WCX-2G/15	SAX-2G/15
2000 mg	25 mL	20 u	SCX-2G/25	WCX-2G/25	SAX-2G/25
LRC columns - PE frits					
100 mg	LRC 15	50 u	SCX-100LRC	WCX-100LRC	SAX-100LRC
200 mg	LRC 15	50 u	SCX-200LRC	WCX-200LRC	SAX-200LRC
500 mg	LRC 15	50 u	SCX-500LRC	WCX-500LRC	SAX-500LRC
Glass columns - PTFE frits					
200 mg	6 mL	30 u	SCX-200/6G	WCX-200/6G	SAX-200/6G
500 mg	6 mL	30 u	SCX-500/6G	WCX-500/6G	SAX-500/6G
1000 mg	6 mL	30 u	SCX-1G/6G	WCX-1G/6G	SAX-1G/6G

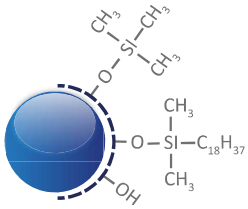
Mixed mode columns

Weight	Vol.	Qty	MM1
Standard columns - PE frits			
50 mg	1 mL	50 u	MM1-50/1
100 mg	1 mL	100 u	MM1-100/1
100 mg	3 mL	50 u	MM1-100/3
200 mg	3 mL	50 u	MM1-200/3
500 mg	3 mL	50 u	MM1-500/3
500 mg	6 mL	30 u	MM1-500/6
1000 mg	6 mL	30 u	MM1-1G/6
2000 mg	6 mL	20 u	MM1-2G/6
2000 mg	15 mL	20 u	MM1-2G/15
2000 mg	25 mL	20 u	MM1-2G/25
LRC columns - PE frits			
100 mg	LRC 15	50 u	MM1-100LRC
200 mg	LRC 15	50 u	MM1-200LRC
500 mg	LRC 15	50 u	MM1-500LRC
Glass tube - PTFE frits			
200 mg	6 mL	30 u	MM1-200/6G
500 mg	6 mL	30 u	MM1-500/6G
1000 mg	6 mL	30 u	MM1-1G/6G

Upti-Clean® Series S2F

Filled with pure 140 µm spherical particles, Upti-Clean S2F Series columns enable to purify apolar and medium polar compounds from viscous matrices without clogging or plugging.
The columns are available in medical grade polypropylene for use with standard solvents. Glass columns remain the most reliable container when using strong organic solvents. They avoid contamination of samples by extractables from frit or standard plastic tubes.

- Applications: urine, plasma, oil, ...



Upti-Clean® C18-S2F
60 Å - 500 m²/g - 140 µm
C18 end-capped
pH range : 1.0 - 8.0
Extraction of apolar and moderately polar compounds in complex aqueous matrices (serum, plasma, urine...).

Reverse phase columns

Weight	Vol.	Qtéy	C18-S2F
Standard columns - PE frits			
50 mg	1 mL	50 u	C18-S2F-50/1
100 mg	1 mL	100 u	C18-S2F-100/1
100 mg	3 mL	50 u	C18-S2F-100/3
200 mg	3 mL	50 u	C18-S2F-200/3
500 mg	3 mL	50 u	C18-S2F-500/3
500 mg	6 mL	30 u	C18-S2F-500/6
1000 mg	6 mL	30 u	C18-S2F-1G/6
2000 mg	6 mL	20 u	C18-S2F-2G/6
2000 mg	15 mL	20 u	C18-S2F-2G/15
2000 mg	25 mL	20 u	C18-S2F-2G/25
LRC columns - PE Frits			
100 mg	LRC 15	50 u	C18-S2F-100LRC
200 mg	LRC 15	50 u	C18-S2F-200LRC
500 mg	LRC 15	50 u	C18-S2F-500LRC

Standard column

PP straight tube
PE frit 20 µm

LRC column

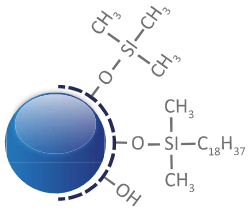
PP tube
PE frit 20 µm

RELATED PRODUCTS

UptiVial Advion-Interchim Scientific GC / LC certified vials kit: Vials and caps are tested and delivered with a certificate.
See chapter: Vials & Capsules

SAMPLE PREPARATION

Solid phase extraction - Upti-Clean® Columns



Upti-Clean® Recovery™ REC18
120 Å - 350 m²/g - 50 µm
C18 end-capped
% C: 15
pH range: 1.0 - 8.0
Extraction of apolar and moderately polar compounds in aqueous matrices.

Upti-Clean® Recovery™ RESI
120 Å - 350 m²/g - 50 µm
pH range: 1.0 - 7.5
Extraction of non polar compounds in apolar matrices.

Upti-Clean Recovery®

Advion Interchim Scientific Recovery™ columns address recovery and reproducibility problems, highlighted in recent studies, that are associated with only a part of the standard 60 Å silica's specific surface area accessibility in SPE silica based cleanup procedures.
Recovery™ columns extractables use an optimized version of Upti-prep™ silica. They prevent from physical phenomenons related to older generations of silica sorbent and use 100% of their specific surface area. Recovery™ can be used in all solvent conditions (including 100% water) achieving greater reproducibility and consistency.

Upti-Clean Recovery® REC18

C18, fully end-capped for non-polar, mid-polar & polar compounds in aqueous environments.

Upti-Clean Recovery® RESI

Virgin silica for polar and mid-polar compounds from organic matrices.
Applications: Pharmaceutical & Environmental.

Weight	Vol.	Qty	REC18	RESI
Standard columns - PE frits				
50 mg	1 mL	50 u	REC18-50/1	RESI-50/1
100 mg	1 mL	100 u	REC18-100/1	RESI-100/1
100 mg	3 mL	50 u	REC18-100/3	RESI-100/3
200 mg	3 mL	50 u	REC18-200/3	RESI-200/3
500 mg	3 mL	50 u	REC18-500/3	RESI-500/3
500 mg	6 mL	30 u	REC18-500/6	RESI-500/6
1000 mg	6 mL	30 u	REC18-1G/6	RESI-1G/6
2000 mg	6 mL	20 u	REC18-2G/6	RESI-2G/6
2000 mg	15 mL	20 u	REC18-2G/15	RESI-2G/15
2000 mg	25 mL	20 u	REC18-2G/25	RESI-2G/25
LRC columns - PE frits				
100 mg	LRC 15	50 u	REC18-100LRC	RESI-100LRC
200 mg	LRC 15	50 u	REC18-200LRC	RESI-200LRC
500 mg	LRC 15	50 u	REC18-500LRC	RESI-500LRC
Glass columns - PTFE frits				
200 mg	6 mL	30 u	REC18-200/6G	RESI-200/6G
500 mg	6 mL	30 u	REC18-500/6G	RESI-500/6G
1000 mg	6 mL	30 u	REC18-1G/6G	RESI-1G/6G

RELATED PRODUCTS

For annual subscriptions and bulk orders, contact Advion Interchim Scientific teams:
analytical-sciences@advion-interchim.com - Tel +33 470037309
Online form:
https://www.interchim.com/vials_and_filters_subscription.php

Upti-Clean® Special Series

Complementing the S and S2F Series, the Upti-Clean® Special Series column range offers users new selectivity for SPE extraction. The medical grade polypropylene column hardwares are compatible with most extraction solvents. The ultra-pure polyethylene frit provides excellent wettability. Solvent and sample flows are perfectly reproducible, thus avoiding extraction yield variability.

Resistant to aggressive solvents, glass columns with PTFE frits guarantee purifications without any extractables.

Florisil

Working on the basis of polar interactions, Florisil or magnesium silicate is ideal for rapidly trapping polar impurities within non-polar matrices.
It can be used as an alternative to traditional virgin silica when working with viscous solvents. The PR (Pesticides Residus) grade is perfectly suited to the methods of purification of chlorinated pesticides in organic media.

Weight	Vol.	Qty	FL	FLPR
Standard columns - PE frits				
200 mg	3 mL	50 u	FL-200/3	FLPR-200/3
500 mg	3 mL	50 u	FL-500/3	FLPR-500/3
500 mg	6 mL	30 u	FL-500/6	FLPR-500/6
1000 mg	6 mL	30 u	FL-1G/6	FLPR-1G/6
2000 mg	6 mL	20 u	FL-2G/6	FLPR-2G/6
2000 mg	15 mL	20 u	FL-2G/15	FLPR-2G/15
2000 mg	25 mL	20 u	FL-2G/25	FLPR-2G/25
LRC columns - PE frits				
200 mg	LRC 15	50 u	FL-200LRC	FLPR-200LRC
500 mg	LRC 15	50 u	FL-500LRC	FLPR-500LRC
Glass columns - PTFE frits				
200 mg	6 mL	30 u	FL-200/6G	FLPR-200/6G
500 mg	6 mL	30 u	FL-500/6G	FLPR-500/6G
1000 mg	6 mL	30 u	FL-1G/6G	FLPR-1G/6G

Standard column

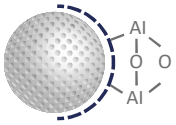
PP straight tube
PE frit 20 µm

LRC column

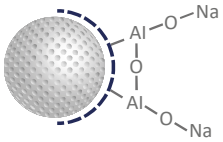
PP tube
PE frit 20 µm

Glass column

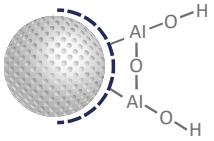
Glass tube
PTFE frit 20 µm



Upti-Clean® ALN
60 Å - 200 m²/g - 32/63 µm
Alumina
pH range: 1.0 - 12.0
Extraction of non-ionizable polar compounds.
Extraction of dioxins.



Upti-Clean® ALB
60 Å - 200 m²/g - 32/63 µm
Activated alumina, basic
pH range: 1.0 - 12.0
The basic treatment gives a good selectivity for anionic compounds.



Upti-Clean® ALA
60 Å - 200 m²/g - 32/63 µm
Activated alumina, acid
pH range: 1.0 - 12.0
The acid treatment gives a good selectivity for cationic compounds.

Upti-Clean® Special Series

Alumina

The aluminum atom lacks two electrons within its center that are responsible for ion pairing interaction.
The acidic treatment of Alumina favors the retention of cationic species whilst a basic treatment of Alumina leads to the retention of anionic species.
Neutral Alumina is suitable to clean non ionizable compounds with polar function.
Applications: Environmental (dioxines, PCBs,..)

Weight	Vol.	Qty	Acidic Alumina	Basic Alumina	Neutral Alumina
Standard columns - PE frits					
200 mg	3 mL	50 u	ALA-200/3	ALB-200/3	ALN-200/3
500 mg	3 mL	50 u	ALA-500/3	ALB-500/3	ALN-500/3
500 mg	6 mL	30 u	ALA-500/6	ALB-500/6	ALN-500/6
1000 mg	6 mL	30 u	ALA-1G/6	ALB-1G/6	ALN-1G/6
2000 mg	6 mL	20 u	ALA-2G/6	ALB-2G/6	ALN-2G/6
2000 mg	15 mL	20 u	ALA-2G/15	ALB-2G/15	ALN-2G/15
2000 mg	25 mL	20 u	ALA-2G/25	ALB-2G/25	ALN-2G/25
LRC columns - PE frits					
200 mg	LRC15	50 u	ALA-200LRC	ALB-200LRC	ALN-200LRC
500 mg	LRC15	50 u	ALA-500LRC	ALB-500LRC	ALN-500LRC

Amberlite™

Amberlite™ is the first generation of polymer resins. They are used for fast separation of a variety of compounds from biological fluids. Amberlite™ suffers from weak selectivity.

Weight	Vol.	Qty	XAD-2
Standard columns - PE frits			
100 mg	1 mL	100 u	XAD2-100/1
200 mg	3 mL	50 u	XAD2-200/3
500 mg	3 mL	50 u	XAD2-500/3
500 mg	6 mL	30 u	XAD2-500/6
1000 mg	6 mL	30 u	XAD2-1G/6
1000 mg	12 mL	20 u	XAD2-1G/12
2000 mg	6 mL	30 u	XAD2-2G/6
2000 mg	12 mL	20 u	XAD2-2G/12
5000 mg	35 mL	20 u	XAD2-5G/35
10000 mg	60 mL	12 u	XAD2-10G/60
20000 mg	60 mL	12 u	XAD2-20G/60

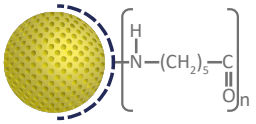
PP straight tube
20 µm PE frits

Upti-Clean® Special Series

Polyamide

Amide functionality bonded to a Nylon support. Polyamide columns are typically used for aromatic and natural compound extraction such as PAH or flavanoids

Weight	Vol.	Qty	P6
Standard columns - PE frits			
100 mg	1 mL	100 u	P6-100/1
100 mg	3 mL	50 u	P6-100/3
200 mg	3 mL	50 u	P6-200/3
500 mg	3 mL	50 u	P6-500/3
500 mg	6 mL	30 u	P6-500/6
1000 mg	6 mL	30 u	P6-1G/6
2000 mg	6 mL	20 u	P6-2G/6
2000 mg	15 mL	20 u	P6-2G/15
2000 mg	25 mL	20 u	P6-2G/25



Upti-Clean® P6
100 µm
Selective extraction of flavonoids and other natural products

RELATED PRODUCTS

For annual subscriptions and bulk orders, contact Advion Interchim Scientific teams:
analytical-sciences@advion-interchim.com - Tel +33 470037309
Online form:
https://www.interchim.com/vials_and_filters_subscription.php

Upti-Clean® Cartridges

Upti-Clean® cartridges are easy to use and have been specially developed for the fast and efficient implementation of SPE purifications.

It is not necessary to have a specific SPE device. Lueur tip syringes will allow the transfer of the sample to the sorbent.

C18 media ensures the extraction of apolar and polar compounds for most aqueous matrices. Virgin silica allows the extraction of polar compounds in apolar solvents. The polypropylene protective shell is compatible with a large number of solvents.

- Common applications: Pharmaceutical, Toxicology, Clinical monitoring...
- Diverted applications: Storage and transport of samples.

PP cartridge
PE frits 20 µm

Type	REC18	Qty	Type	RESI	Qty
Recovery™ sorbent					
300 mg	REC18-390/SC	50 u	300 mg	RESI-300/SC	50 u
600 mg	REC18-910/SC	50 u	600 mg	RESI-700/SC	50 u
900 mg	REC18-1690/SC	50 u	900 mg	RESI-1300/SC	50 u

Type	C18-S	Qty	Type	SI-S	Qty	Type	Sodium sulfate	Qty
Upti-Clean® sorbent								
300 mg	C18-390/SC	50 u	300 mg	SI-300/SC	50 u			
600 mg	C18-910/SC	50 u	600 mg	SI-700/SC	50 u			
900 mg	C18-1690/SC	50 u	900 mg	SI-1300/SC	50 u	900 mg	SS-1320/SC	50 u

Extraction of PAHs from water or soil

Developed for the extraction of polycyclic aromatic hydrocarbons (PAHs) in water or soil matrices, Advion Interchim Scientific SPE application kits allow adsorption of polar impurities and trapping of water traces contained in the matrix.
The compounds of interest have no interaction with the sorbents and are generally analyzed by gas chromatography.
Containers can be polypropylene or glass with polyethylene or PTFE frits. A glass container with PTFE frits guarantees the solvent fractions without extractables.
A first processing step is necessary: PAHs are extracted by Liq./Liq. or Solid/Liq. extraction (PSE, soxhlet ...)

Description	P/N	Qty
SPE kit for the extraction of PAHs from water or soil 4g/6mL - PP columns - PE frits	SPE-SA2	30 u
SPE kit for the extraction of PAHs from water or soil 4g/6mL - Glass columns - PTFE frits	SPE-SA3	30 u

Extraction of PAHs from water containing humic acids

Developed for the extraction of polycyclic aromatic hydrocarbons (PAHs) from waters containing humic acids, Advion Interchim Scientific SPE application kits allow the pre-concentration of PAHs, while strongly retaining humic acids.
The available container is polypropylene with polyethylene sintering.

Description	P/N	Qty
SPE Kit for the extraction of PAHs from water containing humic acids - 1.5g/6mL - PP columns - PE frits	SPE-SA4	30 u

Indicative protocol:

- Column conditioning: 5 mL MeOH then 7 mL DI H_2O/EtOH (9/1 v/v)
- Matrix preparation: 500 mL (sample) + 20-30 mL EtOH
- Column washing 1: 2 mL MeOH/H_2O with 100 mM acetic acid (5/95 v/v)
- Column washing 2: 1-3 mL DI H_2O/EtOH (9/1 v/v)
- Drying: 15 min
- Elution: 5 mL Dichloromethane

Extraction of PAHs from soils & oils

Developed for the extraction of PAHs from soils and oils, Advion Interchim Scientific SPE application kits allow the adsorption of polar impurities as well as the selective adsorption of PAHs.
Containers can be polypropylene or glass with polyethylene or PTFE frits. A glass container with PTFE frits guarantees solvent fractions without extractables.
Indicative protocol available on request

Description	P/N	Qty
SPE Kit for the extraction of PAHs from soils & oils 1.5g/6mL - PP columns - PE frits	SPE-SA5	30 u
SPE Kit for the extraction of PAHs from soils & oils 1.5g/6mL - Glass columns - PTFE frits	SPE-SA6	30 u

PUBLICATIONS

PAH & Aliphatic hydrocarbons (C12 up to C41) from petroleum residues
Publication Name : Roberto Alzaga and all, Environmental Chemistry Department, IIQABCSIC, Jordi Girona 18-26, E-08034 Barcelona, Spain ; Journal of Chromatography A, 1025 (2004) 133-138 ; Fast solid-phase extraction - gas chromatography - mass spectrometry procedure for oil fingerprinting Application to the Prestige oil spill.

Extraction of PCBs from oils

Advion Interchim Scientific SPE application kits are used for organic sample treatment and allow the removal of impurities which may interfere with PCBs during the gas chromatography analysis.

Description	P/N	Qty
SPE Kit for the extraction of PCBs from oils 1g/3mL - PP columns - PE frits	SPE-SA12	50 u
SPE Kit for the extraction of PCBs from oils 1g/6mL -PP columns - PE frits	SPE-SA13	30 u

Applications: EN61619 Norm

The Upti-Clean® CT20 columns are used for the treatment of organic samples and allow the removal of impurities which could interfere with PCBs during gas chromatography analysis.
These columns have undergone an acidic treatment that makes sample cleaning more efficient in particular by oxidation of some impurities.

Applications: EN61619 Norm

Description	P/N	Qty
Custom SPE columns CT-20 - 3 mL	CT-20F	50 u
Custom SPE columns CT-20 - 6 mL	CT-20G	30 u

Extraction of PAHs and PCBs from sludge

Upti-Clean® CT-33 columns are used for the treatment of organic samples. They allow the removal of sulfur compounds. Polar impurities are also retained on the sorbent. Sodium sulfate is a drying agent to trap water traces. PAHs and PCBs can be analyzed by liquid or gas chromatography.

Applications: XP X33-012 Norm

Description	P/N	Qty
SPE Custom columns CT-33 - 6 mL	CT-33A	30 u
SPE Custom columns CT-33 - 3 mL	CT-33B	50 u

PBDEs extraction from sediments and sewage sludge

Upti-Clean CT-35 columns are used for the treatment of organic samples and allow the removal of impurities which could interfere with polybrominated diphenyl ethers (PBDE) during gas chromatography analysis.

Applications: NF EN ISO 22032

Description	P/N	Qty
SPE Custom columns CT-35 - 6 mL	CT-35A	50 u

Extraction and Purification of dioxin-like PCDD / PCDF & PCBs

The extraction and purification products necessary for the implementation of NF EN 1948 are available on request (used in the analysis process of dioxin-like Polychlorodibenzo-p-dioxin (PCDD), polychlorodibenzo-furan (PCDF) and polychlorinated biphenyls (PCBs).
To do this, simply send your request to:
analytical-sciences@advion-interchim.com

Extraction of basic drugs from biological fluids*

Description	P/N	Qty
Extraction of basic drugs from biological fluids	SPE-SA1	50 u

Extraction of Oil & Grease from aqueous matrices* (EPA Method 1664)

Description	P/N	Qty
Extraction of Oil & Grease from aqueous matrices (EPA Method 1664) - 1 g/6 mL	SPE-SA7	30 u
Extraction of Oil & Grease from aqueous matrices (EPA Method 1664) - 500 mg/3 mL	SPE-SA8	50 u

Extraction of Pesticides and Herbicides from aqueous matrices*

Description	P/N	Qty
Extraction of Pesticides and Herbicides from aqueous matrices	SPE-SA10	50 u

Extraction of Steroids from biological fluids*

Description	P/N	Qty
Extraction of Steroids from biological fluids	SPE-SA11	50 u

Extraction of SVOCs from water (EPA 525)*

Description	P/N	Qty
Extraction of SVOCs from water (EPA 525)	SPE-SA14	30 u

*Protocol available on request

Multilayer columns and bulk sorbents available on request.

SAMPLE PREPARATION

Solid phase extraction - PolyClean™ Columns

Introduction

Advion Interchim Scientific offers a complete range of Polymers of various chemical natures, with specific intrinsic characteristics allowing the purification and/or pre-concentration of molecules and macromolecules from all types of matrices.

- PolyClean™, range of mixed polymers (hydrophilic / hydrophobic) made of ultrapure spherical particles, modified or unmodified by ion exchange groups, for extraction and pre-concentration of acidic, basic and neutral compounds.
- Atoll™, range of PSDVB hydrophobic polymers, with different loading capacities for non-polar to moderately polar compounds.

The complete PolyClean™ and Atoll™ ranges provide specific selectivities adapted to all types of matrices and families of compounds.
Advion Interchim Scientific expertise and know-how in terms of filling quality guarantee perfect repeatability and reproducibility of extraction rates.
Each products are delivered in a packaging specially designed for long term storage, protected from air and light, accompanied by an individual certificate mentioning the manufacturing number and the batch number of the sorbent used.
The PolyClean™ and Atoll™ columns can be used with all automated SPE workstations.

Name	Code	Type	Particule size	Surface area	Modification	IE capacity
PolyClean 2H	302H 2H	Mixed Polymer (hydrophilic /hydrophobic)	30 µm 60 µm	850 m^2/g	non	n.a
PolyClean HCX	30HCX HCX	Mixed Polymer (hydrophilic /hydrophobic)	30 µm 60 µm	850 m^2/g	Strong Cation Exch.	1 meq/g
PolyClean HAX	30HAX HAX	Mixed Polymer (hydrophilic /hydrophobic)	30 µm 60 µm	850 m^2/g	Strong Anion Exch.	0,3 meq/g
Atoll Xtrem	X	PSDVB	40 µm	800 m^2/g	no	n.a
Atoll Xtrem Capacity	XC	PSDVB	70 µm	1500 m^2/g	no	n.a

Please refer to our sorbent selection guide in the beginning of this chapter for more information.

PolyClean™ 2H & 302H, Hydrophilic/Hydrophobic interactions

From the latest Advion Interchim Scientific R & D developments, the Polyclean™ 2H polymer has a proprietary structure made of chemical groups providing mixed mode Hydrophilic / Hydrophobic interactions.

The Polyclean™ 2H optimizes the methods developed on sorbents conventionally used in reverse phase (bonded silicas or polymers) which do not have the required selectivity and loading capacity.

Available in 30 & 60 µm, ultrapure spherical polymer particles allow the extraction of acidic, basic and neutral compounds in all matrices.

Use 60 µm particle size for viscous samples.
The 30 µm version provides a higher pre-concentration factor (using the same sorbent weight) compared to the 60 µm.

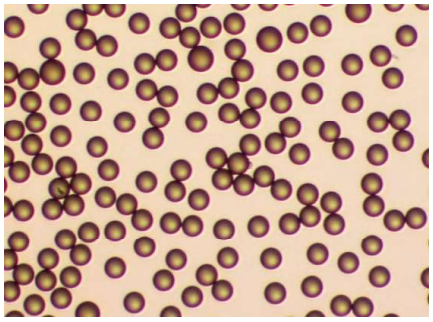
Applications :

- Pharmaceutical compounds and their metabolites in biological fluids and tissues.
- Traces of organic pollutants in environmental matrices.
- Endocrine disruptors.

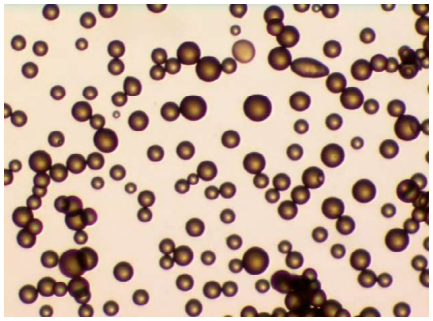
Weight	Vol.	Qty	PolyClean™ 2H 60 µm	PolyClean™ 302H 30 µm
Standard columns - PE frits				
30 mg	1 mL	50 u	2H-30/1	302H-30/1
100 mg	1 mL	50 u	2H-100/1	302H-100/1
30 mg	3 mL	50 u	2H-30/3	302H-30/3
60 mg	3 mL	50 u	2H-60/3	302H-60/3
100 mg	3 mL	50 u	2H-100/3	302H-100/3
200 mg	3 mL	50 u	2H-200/3	302H-200/3
150 mg	6 mL	30 u	2H-150/6	302H-150/6
200 mg	6 mL	30 u	2H-200/6	302H-200/6
500 mg	6 mL	30 u	2H-500/6	302H-500/6
500 mg	15 mL	20 u	2H-500/15	302H-500/15
1000 mg	15 mL	20 u	2H-1G/15	302H-1G/15
1000 mg	25 mL	20 u	2H-1G/25	302H-1G/25
LRC columns - PE frits				
30 mg	LRC	50 u	2H-30LRC	302H-30LRC
60 mg	LRC	50 u	2H-60LRC	302H-60LRC
Glass columns - PTFE frits				
200 mg	6 mL	30 u	2H-200/6G	302H-200/6G

PolyClean™

Accurate Bed Technology™ vs Competitors

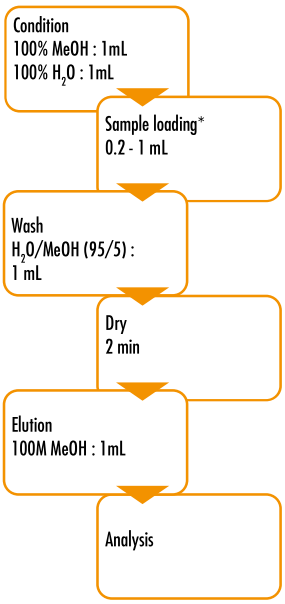


PolyClean™ 2H 60 µm



Competitor W 60 µm

Standard Protocol PolyClean™ 2H

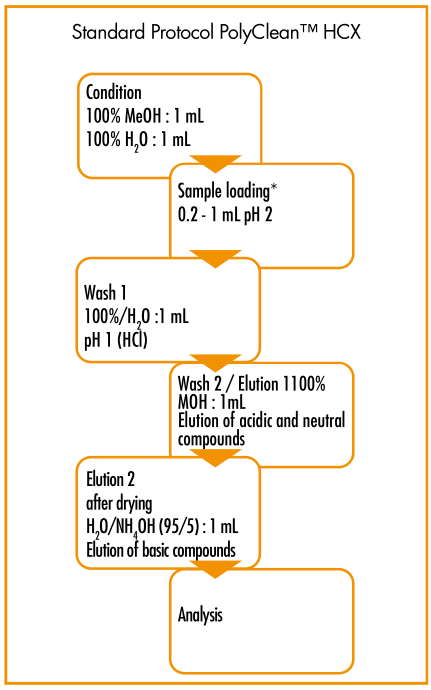


*H_3PO_4 (2% of total sample volume) can be added to ensure protein elimination from the matrix

SAMPLE PREPARATION

Solid phase extraction - PolyClean™ Columns

PolyClean



PolyClean™ HCX, Mixed Mode / SCX for the extraction of Basic compounds

The Polyclean™ HCX is a mixed polymer Hydrophilic / Hydrophobic modified with an SCX (Strong Cation Exchange) group. It induces a high selectivity for weak bases in purification and preconcentration.

- SCX interaction (IE capacity of 1meq / g).
- Mixed Hydrophilic / Hydrophobic interaction.

Applications :

- Pharmaceutical compounds and their metabolites from biological matrices (Blood, urine, plasma, tissues ...)
- Environmental analysis: Pesticides, Herbicides.

Weight	Vol.	Qty	PolyClean™ HCX 60 µm	PolyClean™ HCX 30 µm
Standard columns - PE frits				
30 mg	1 mL	50 u	HCX-30/1	30HCX-30/1
100 mg	1 mL	50 u	HCX-100/1	30HCX-100/1
30 mg	3 mL	50 u	HCX-30/3	30HCX-30/3
60 mg	3 mL	50 u	HCX-60/3	30HCX-60/3
100 mg	3 mL	50 u	HCX-100/3	30HCX-100/3
200 mg	3 mL	50 u	HCX-200/3	30HCX-200/3
150 mg	6 mL	30 u	HCX-150/6	30HCX-150/6
200 mg	6 mL	30 u	HCX-200/6	30HCX-200/6
500 mg	6 mL	30 u	HCX-500/6	30HCX-500/6
500 mg	15 mL	20 u	HCX-500/15	30HCX-500/15
1000 mg	15 mL	20 u	HCX-1G/15	30HCX-1G/15
1000 mg	25 mL	20 u	HCX-1G/25	30HCX-1G/25
LRC columns - PE frits				
30 mg	LRC	50 u	HCX-30LRC	30HCX-30LRC
60 mg	LRC	50 u	HCX-60LRC	30HCX-60LRC
Glass columns - PTFE frits				
200 mg	6 mL	30 u	HCX-200/6G	30HCX-200/6G

RELATED PRODUCTS

UptiVial Advion Interchim Scientific GC / LC certified vials kit: Vials and caps are tested and delivered with a certificate.
See chapter : Vials & Caps

PolyClean™ HAX, mixed mode/ SAX for the separation of acidic compounds

PolyClean™ HAX polymer, modified by a SAX (Strong Anion Exchange) type exchanger, is dedicated to the purification and preconcentration of weak acids.

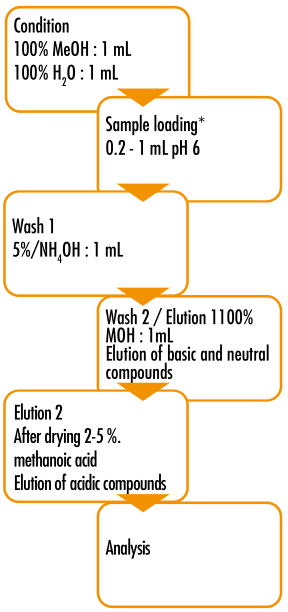
Different retention mechanisms are used:
Strong SAX type interaction (ionic exchange capacity of 0.3meq/g).
Mixed Hydrophilic/Hydrophobic interaction.

Applications :
- Metabolites, acidic compounds from biological fluids and tissues.
- Food hygiene: preservatives, contaminants.

Weight	Vol.	Qty	PolyClean™ HAX 60 µm	PolyClean™ HAX 30 µm
Standard columns - PE frits				
30 mg	1 mL	50 u	HAX-30/1	30HAX-30/1
100 mg	1 mL	50 u	HAX-100/1	30HAX-100/1
30 mg	3 mL	50 u	HAX-30/3	30HAX-30/3
60 mg	3 mL	50 u	HAX-60/3	30HAX-60/3
100 mg	3 mL	50 u	HAX-100/3	30HAX-100/3
200 mg	3 mL	50 u	HAX-200/3	30HAX-200/3
150 mg	6 mL	30 u	HAX-150/6	30HAX-150/6
200 mg	6 mL	30 u	HAX-200/6	30HAX-200/6
500 mg	6 mL	30 u	HAX-500/6	30HAX-500/6
500 mg	15 mL	20 u	HAX-500/15	30HAX-500/15
1000 mg	15 mL	20 u	HAX-1G/15	30HAX-1G/15
1000 mg	25 mL	20 u	HAX-1G/25	30HAX-1G/25
LRC columns - PE frits				
30 mg	LRC	50 u	HAX-30LRC	30HAX-30LRC
60 mg	LRC	50 u	HAX-60LRC	30HAX-60LRC
Glass columns - PTFE frits				
200 mg	6 mL	30 u	HAX-200/6G	30HAX-200/6G

PolyClean

Standard Protocol PolyClean™ HAX



RELATED PRODUCTS

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analytical-sciences@advion-interchim.com - Tel +33 470037309
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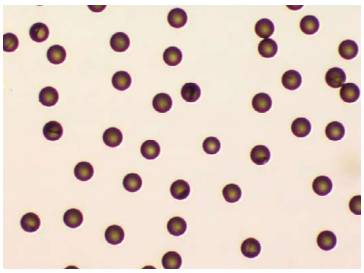
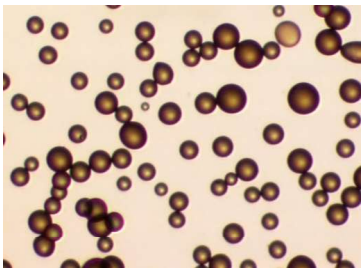
SAMPLE PREPARATION

Solid phase extraction - Atoll™ Columns

Accurate Bed Technology™ vs Competitors



Atoll™ XC



Competitor

Atoll™ Xtrem

The Atoll™ Xtrem polymer of the Polystyrenedivinyl benzene (PSDVB) type is presented as a hydrophobic support dedicated to the extraction and pre-concentration of apolar to moderately polar compounds thanks to a larger specific surface area than traditional silicas.
Atoll™ Xtrem is a first alternative choice to the media classically used in reverse phase (C18, C8 grafted silicas, ...).
Unlike silicas, the polymer has the advantage of being stable at all pH and compatible with all common solvents.

Resistant to aggressive solvents, glass columns with PTFE sintered guarantee purifications without any extractables.

Applications :

- Apolar and moderately polar compounds in aqueous or organic samples.

Weight	Vol.	Qty	Atoll™ X
Standard columns - PE frits			
30 mg	1 mL	50 u	X-30/1
100 mg	1 mL	50 u	X-100/1
30 mg	3 mL	50 u	X-30/3
60 mg	3 mL	50 u	X-60/3
100 mg	3 mL	50 u	X-100/3
200 mg	3 mL	50 u	X-200/3
150 mg	6 mL	30 u	X-150/6
200 mg	6 mL	30 u	X-200/6
500 mg	6 mL	30 u	X-500/6
500 mg	15 mL	20 u	X-500/15
1000 mg	15 mL	20 u	X-1G/15
1000 mg	25 mL	20 u	X-1G/25
LRC columns - PE frits			
30 mg	LRC	50 u	X-30LRC
60 mg	LRC	50 u	X-60LRC
Glass columns - PTFE frits			
200 mg	6 mL	30 u	X-200/6G

Atoll™ Xtrem Capacity

With the highest specific surface area on the market (1,500 m^2/g), the polymer Atoll™ Xtrem Capacity is a universal sorbent for the purification and pre-concentration of polar and apolar compounds.

The loading capacity is 2 to 3 times higher than conventional silicas.

The nature of the interactions allows the adsorption of acid, basic and neutral molecules.

Its highly cross-linked structure is stable at a pH between 0 and 14.

The pure spherical particles, available in 70 µm, allow a perfect reproducibility of purifications regardless of the matrices and solvents used.

Resistant to aggressive solvents, the glass columns with PTFE sintered guarantee purifications without any extractables.

- Pharmaceutical applications: drugs and their metabolites in biological fluids (whole blood, plasma, urine, ...)
- Environmental applications: apolar or polar compounds in water or other matrix (PAHs, PCBs, carbamates, phenyl-ureas, acrylamide, glyphosate, etc.)

Weight	Vol.	Qty	Atoll™ XC
Standard columns - PE frits			
30 mg	1 mL	50 u	XC-30/1
100 mg	1 mL	50 u	XC-100/1
30 mg	3 mL	50 u	XC-30/3
60 mg	3 mL	50 u	XC-60/3
100 mg	3 mL	50 u	XC-100/3
200 mg	3 mL	50 u	XC-200/3
150 mg	6 mL	30 u	XC-150/6
200 mg	6 mL	30 u	XC-200/6
500 mg	6 mL	30 u	XC-500/6
500 mg	15 mL	20 u	XC-500/15
1000 mg	15 mL	20 u	XC-1G/15
1000 mg	25 mL	20 u	XC-1G/25
LRC columns - PE frits			
30 mg	LRC	50 u	XC-30LRC
60 mg	LRC	50 u	XC-60LRC
Glass columns - PTFE frits			
200 mg	6 mL	30 u	XC-200/6G

Standard column

PP straight tube
PE frit 20 µm

LRC column

PP tube
PE frit 20 µm

Glass column

Glass tube
PTFE frit 20 µm

SAMPLE PREPARATION

Solid phase extraction - Kit for method development

Please refer to our sorbent selection guide in the beginning of this chapter for more information.

Extraction and Pre-concentration of Acid, Basic & Neutral compounds

These kits are composed of the following sorbents:

- Polymer Atoll™ XC
- Polymer PolyClean™ 302H
- Polymer PolyClean™ 30HCX
- Polymer PolyClean™ 30HAX

Description	P/N	Qty
Kit SPE 30 mg / 1 mL	SPE-D142	4 x 10 u
Kit SPE 60 mg / 3 mL	SPE-D143	4 x 10 u
Kit SPE 100 mg / 3 mL	SPE-D144	4 x 10 u

Pre-concentration of hydrophobic analytes in aqueous matrices

These kits are composed of the following sorbents:

- Silica Recovery C18
- Silica Upti-Clean® C18-S
- Polymer Atoll™ XC
- Polymer PolyClean™ 2H
- Polymer Atoll™ X

Description	P/N	Qty
Kit SPE 200 mg / 6 mL	SPE-D137	5 x 10 u
Kit SPE 200 mg / 3 mL	SPE-D138	5 x 10 u

Pre-concentration of hydrophilic analytes

These kits are composed of the following sorbents:

- Virgin silica Upti-Clean®
- Silica Upti-Clean® NH2
- Silica Upti-Clean® CN

Description	P/N	Qty
Kit SPE 500 mg / 6 mL	SPE-D128	3 x 10 u
Kit SPE 500 mg / 3 mL	SPE-D129	3 x 10 u

Any development kit can be made to order. Please contact us.

Removal of polar impurities from aqueous and organic matrices

These kits are composed of the following sorbents:

- Silica vierge Upti-Clean®
- Silica Upti-Clean® NH2
- Silica Upti-Clean® Florisil

Description	P/N	Qty
Kit SPE 500 mg / 6 mL	SPE-D130	3 x 10 u
Kit SPE 500 mg / 3 mL	SPE-D131	3 x 10 u

Extraction of Acidic, Basic or Neutral compounds from aqueous or organic matrices is written twice

This kit is composed of the following sorbents:

- Polymer Atoll™ XC
- Polymer PolyClean™ 2H 30 µm
- Polymer PolyClean™ 2H 60 µm
- Polymer Atoll™ X

Description	P/N	Qty
Kit SPE 100 mg / 3 mL	SPE-D139	4 x 10 u

Extraction of weak bases from aqueous matrices

This kit is composed of the following sorbents:

- Silica Upti-Clean® SCX
- Silica Upti-Clean® MM1

Description	P/N	Qty
Kit SPE 500 mg / 6 mL	SPE-D134	2 x 10 u

Generic SPE method available on request.
For more information, please contact our technical department.

RELATED PRODUCTS

For annual subscriptions and bulk orders, contact Advion Interchim Scientific teams:
analytical-sciences@advion-interchim.com - Tel +33 470037309
Online form:
https://www.interchim.com/vials_and_filters_subscription.php

Upti-trap™

Upti-trap™ allows extraction and/or pre-concentration of samples before HPLC analyses without clogging or damaging the analytical column.

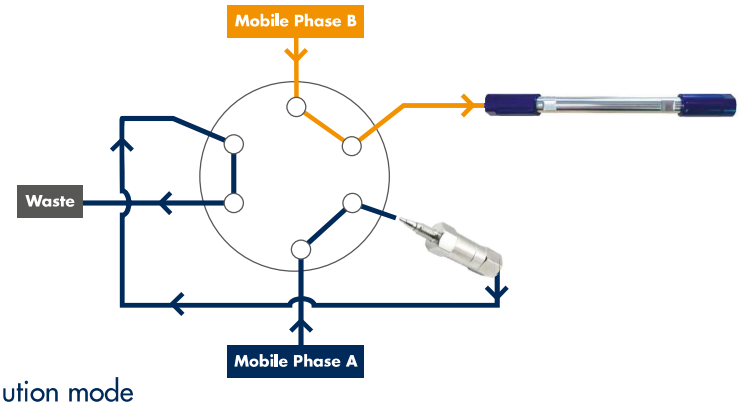
The Upti-Trap™ are available in multiple sizes
- 20 x 4.0 mm
- 10 x 2.0 mm

This technique is very applicable to the analysis of biological fluids where the search for drug candidates, drugs and their metabolites must be fast and efficient.
Upti-trap™ is an excellent pre-concentration tool for environmental samples (analysis of polyaromatic hydrocarbons (PAH), polychlorinated biphenyls (PCBs), phenyl-ureas, triazines, carbamates, ...)

On-line extraction represents real time savings compared to an off-line method, while keeping a high sensitivity. This reproducible and repeatable method is easily automated.

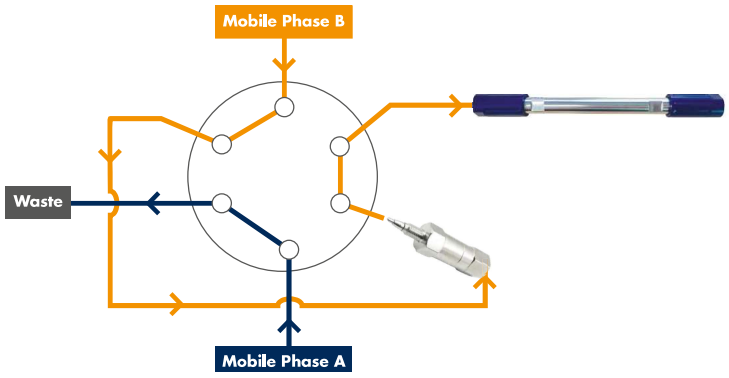
1- Extraction mode

The compound(s) of interest are blocked on the sorbent while the rest is eluted to waste thanks to the washing solvent (mobile phase A). Two HPLC pumps are needed, one for extraction, the other for elution.

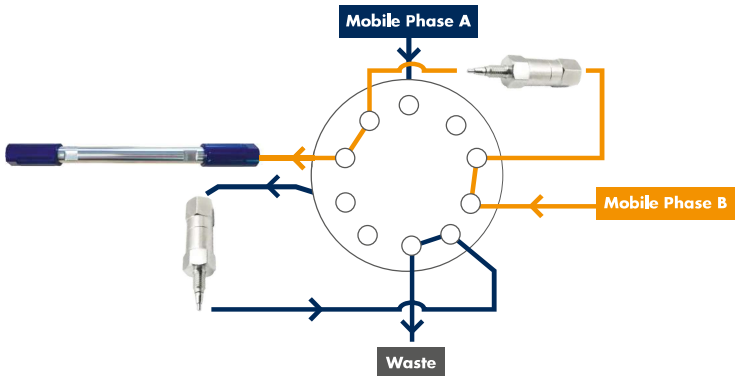


2- Elution mode

The mobile phase of the second pump (mobile phase B) elutes the compound(s) of interest to the HPLC column.



The use of a 10-way / 2-position valve increases productivity. One sample is extracted while a second one is being analyzed.



Sorbent		Particle size	10 x 2.0 mm	20 x 4.0 mm
PolyClean™ 302H	Hydrophilic / Hydrophobic	30 µm	302H-010/020	302H-020/040
PolyClean™ 30HCX	Hydrophilic / Hydrophobic-SCX	30 µm	30HCX-010/020	30HCX-020/040

Description	P/N
Column holder 10x2.0mm	SPEOL-10H
Column holder 20x4.0mm	SPEOL-20H

SPE columns Upti-trap™

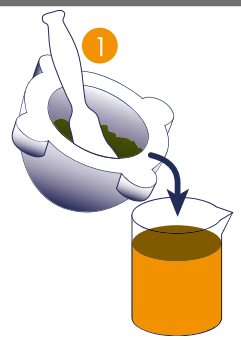
SPE columns Upti-trap™

QuEChERS (Quick, Easy, Cheap, Effective, Rugged & Safe)

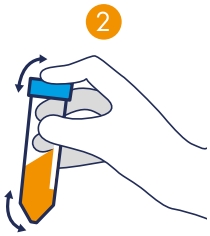
The improvement and optimization of analytical techniques (LC/MS, GC/MS) make it possible to achieve high levels of sensitivity. Meanwhile, the sample preparation step prior analysis becomes increasingly crucial to achieve the desired results, especially for trace analysis and to prolong the life of the analytical instruments.
Research and determination of pesticide residues in food is an important topic for many years. As classical sample preparation methods like liquid/liquid extraction (LLE) are not able to achieve the required levels of sensitivity, a new technique called QuEChERS appeared.
It follows precise methodology, from drastic EN or AOAC norms to detect contaminants. It is a simple, fast and efficient method with only two implementation steps and can determine more than 200 pesticides residues from a variety of matrices (fruits, vegetables, meat, fish...), with high recoveries.

Quick Start Guide

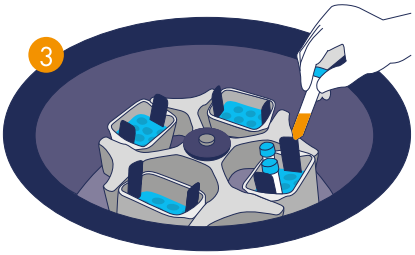
Step 1 - Liq/Liq extraction



Grind & homogenize the sample in a crucible.
Add the internal standard within the extraction solvent.

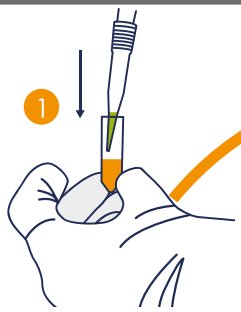


Transfer the mixture to a 50mL extraction tube containing QuEChERS salts.
Immediately stir vigorously for a min.

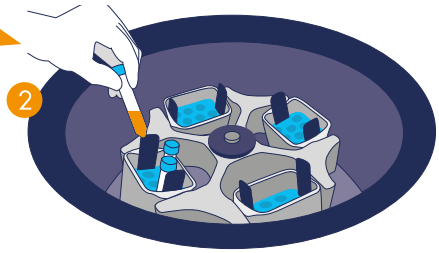


Centrifuge the 50mL tube for 1 to 5 min @ high speed.

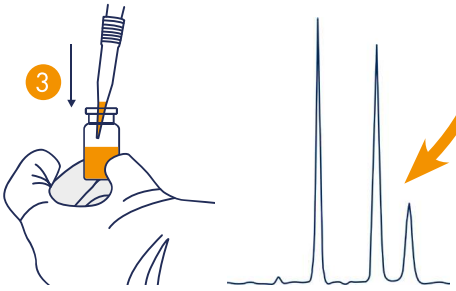
Step 2 - Dispersive SPE process (dSPE)



Transfer supernatant to a 2mL or 15mL tube that contains dSPE sorbents, then shake the tube.



Centrifuge the tube for 1 to 5 min @ high speed.



Transfer supernatant to an auto-sampler vial for further LC or GC analysis.

- Magnesium Sulfate (MgSO4): eliminates H2O traces and enhances the homogeneisation of the sample for a better treatment of the organic extract.
- Primary Secondary Amine (PSA) bonded silica: eliminates acidic compounds, polar pigments, sugars and fatty acids.
- Octadecyl (C18) bonded silica: eliminates lipids, sterols, …
- Graphitized Carbon Black (GCB): eliminates carotenoids, pigments such as chlorophyll, planar molecules, …

Original QuEChERS Method	AOAC 2007.01 QuEChERS Method	EN 15662 QuEChERS Method
Step 1 - Liq/Liq extraction		
Extraction of Pesticide Residues and other compounds such as organic acids		
Add 10 mL of Acetonitrile to 10 g of sample in a 50 mL centrifuge tube containing 4 g anhydrous $MgSO_4$ & 1 g NaCl. Add Internal Standard Shake & Centrifuge	Add 15 mL of Acetonitrile/ Acetic Acid 1% to 15 g sample in a 50 mL centrifuge tube containing 6 g anhydrous $MgSO_4$ & 1.5 g Na Acetate. Add Internal Standard	Add 10 mL Acetonitrile to 10g sample in a 50 mL centrifuge tube containing 4g anhydrous MgSO4, 1g NaCl, 1g Na3Citrate Dihydrate & 0.5g Na2HCitrate Sesquihydrate. Add Internal Standard Shake & Centrifuge
Recover 1 mL aliquo of supernatant	Recover 1-8 mL aliquot of supernatant	Recover X mL aliquot of supernatant
Step 2 - Dispersive SPE process (dSPE)		
Final cleaning step of Pesticides Residues		
Transfer the aliquot obtained from step 1 in a micro centrifuge tube containing 150 mg anhydrous $MgSO_4$ & 50 mg PSA Shake & Centrifuge	Transfer the aliquot obtained from step 1 in a micro centrifuge tube containing 150 mg anhydrous $MgSO_4$ and 50 mg PSA per mL of supernatant Shake & Centrifuge	Transfer the aliquot obtained from step 1 in a micro centrifuge tube containing X*150 mg anhydrous $MgSO_4$ and X*25 mg PSA Add GCB for samples containing high levels of chlorophyll or carotenoids Shake & Centrifuge
Transfer 0.5 mL of extract for LC or GC analysis	Transfer extract preserved with 6.7 mM Formic Acid for LC analysis. Transfer extract preserved with toluene for GC analysis. Add triphenylphosphate (TPP)	Transfer Y mL of extract preserved with Y*10 µL Acetonitrile/Formic Acid 5 % (10 µL/mL extract) for LC or GC analysis

Pigments contained in plants are frequently a problem for the analysis. To reduce interferences, the weight ratio of GCB may be modified.

SAMPLE PREPARATION
Solid phase extraction - QuEChERS

The tube kits (*) are delivered with the sorbents in the tubes

Extraction Kits - Step 1

Composition	Application	Method
4 g $MgSO_4$ + 1 g NaCl + 1g NaCitr, + 0.5 g NaCitr, Sesquihydrate	General	EN 15662
6 g $MgSO_4$ + 1.5 g Na Acetate	General	AOAC 2007.01
4 g $MgSO_4$ + 1 g NaCl	General	Original
6 g $MgSO_4$ + 1.5 g NaCl	General	-
8 g $MgSO_4$ + 3.5 g NaCl	General	-
6 g $MgSO_4$ + 1.5 g NaCl + 1.5g NaCitr, + 0.75g NaCitr, Sesquihydrate	General	-
4 g $MgSO_4$ + 1.75 g NaCl	General	-
4 g $MgSO_4$ + 0.5 g NaCl	Acrylamides	-

Purification Kits - Step 2

Composition	Application	Method
900 mg $MgSO_4$ + 300 mg C18 + 150 mg PSA	General	-
150 mg $MgSO_4$ + 50 mg PSA + 50 mg C18 + 7,5 mg GCB	High lipid content	AOAC 2007.01
900 mg $MgSO_4$ + 300 mg PSA + 150 mg GCB	Wine & berries	-
150 mg $MgSO_4$ + 25 mg PSA	Fruits & vegetables	EN 15662
900 mg $MgSO_4$ + 150 mg PSA	Fruits & vegetables	EN 15662
150 mg $MgSO_4$ + 50 mg PSA	Fruits & vegetables	AOAC 2007.01
1200 mg $MgSO_4$ + 400 mg PSA	Fruits & vegetables	AOAC 2007.01
150 mg $MgSO_4$ + 50 mg C18	Lightly pigmented fruits & vegetables	-
150 mg $MgSO_4$ + 25 mg PSA + 2,5 mg GCB	Pigmented fruits & vegetables	EN 15662
900 mg $MgSO_4$ + 150 mg PSA + 15 mg GCB	Pigmented fruits & vegetables	EN 15662
885 mg $MgSO_4$ + 150 mg PSA + 15 mg GCB	Pigmented fruits & vegetables	EN 15662
150 mg $MgSO_4$ + 50 mg PSA + 50 mg C18 + 50 mg GCB	Pigmented fruits & vegetables	AOAC 2007.01
1200 mg $MgSO_4$ + 400 mg PSA + 400 mg GCB	Pigmented fruits & vegetables	AOAC 2007.01
150 mg $MgSO_4$ + 25 mg PSA + 7,5 mg GCB	Highly pigmented fruits & vegetables	EN 15662
900 mg $MgSO_4$ + 150 mg PSA + 45 mg GCB	Highly pigmented fruits & vegetables	EN 15662
855 mg $MgSO_4$ + 150 mg PSA + 45 mg GCB	Highly pigmented fruits & vegetables	EN 15662
1200 mg $MgSO_4$ + 400 mg C18 + 400 mg PSA + 400 mg GCB	Fruits & vegetables with pigments & fats	AOAC 2007.01
150 mg $MgSO_4$ + 25 mg PSA + 25 mg C18	Fruits & vegetables with fats & waxes	EN 15662
900 mg $MgSO_4$ + 150 mg C18 + 150 mg PSA	Fruits & vegetables with fats & waxes	EN 15662
150 mg $MgSO_4$ + 50 mg PSA + 50 mg C18	Fruits & vegetables with fats & waxes	AOAC 2007.01
1200 mg $MgSO_4$ + 400 mg C18 + 400 mg PSA	Fruits & vegetables with fats & waxes	AOAC 2007.01

*Bulk purification tubes kits are designed with 15ml or 2ml tubes depending on the composition of the sorbents mix.

Empty centrifuge tubes

Description	Qty	P/N
Empty centrifuge tubes 50 mL, blue caps	500 u	1A0142
Empty centrifuge tubes 15 mL, blue caps	500 u	1A0132
Empty centrifuge tubes 2 mL, white caps	500 u	1A1600
Empty centrifuge tubes 2 mL, blue caps	500 u	118930

	P/N Kits tubes* 50 mL (50 u)	P/N - Reloaded pouches (50 u)	P/N Kits tubes* 50 mL Bulk (500 u)	P/N - Reloaded pouches Bulk (500 u)
	JO3910	SST600	SST590	1L9810
	JO3900	SST660	SST650	1L9800
	JO3920	SST640	SST630	1L9820
	1A3420	SST700	SST690	1L9750
	1A1440	SST720	SST710	1L9760
	1D2630	SST680	SST670	1L9770
	1E9820	SST620	SST610	1L9780
	1F4740	SST570	SST560	1L9790

	P/N Kits tubes* 15 mL (50 u)	P/N Kits tubes* 2 mL (100 u)	P/N - Reloaded pouches (50 u)	P/N - Reloaded pouches (100 u)	P/N Kits tubes* Bulk (500 u)
	1A1360	---	SST140	---	SST130
	---	SST100	---	SST120	SST110
	JO4090	---	SST550	---	SST540
	---	JO3950	---	SST320	SST300
	JO3960	---	SST310	---	SST290
	---	JO3930	---	SST280	SST260
	JO3970	---	SST270	---	SST250
	---	SST330	---	SST350	SST340
	---	JO4050	---	SST510	SST490
	JO4040	---	SST500	---	SST480
	1F9240	---	SST530	---	SST520
	---	JO4070	---	SST450	SST440
	JO4060	---	SST470	---	SST460
	---	JO3990	---	SST410	SST390
	JO3980	---	SST400	---	SST370
	1F9260	---	SST430	---	SST420
	JO4080	---	SST240	---	SST230
	---	JO4000	---	SST220	SST200
	JO4030	---	SST210	---	SST190
	---	JO4010	---	SST180	SST160
	JO4020	---	SST170	---	SST150

SAMPLE PREPARATION

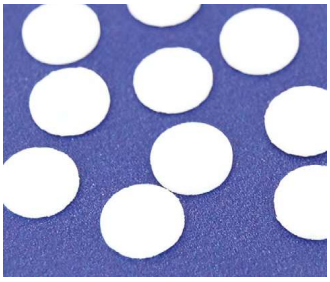
Solid phase extraction - Empty SPE tubes

Empty column

Column + one polyethylene 20µm frit

Polypropylene tubes

Volume	P/N	Qty
Empty columns		
1 mL	541410	100 u
3 mL	541420	100 u
6 mL	541430	100 u
12 mL	541440	100 u
25 mL	541450	100 u
75 mL	823370	50 u
150 mL	S28581	25 u
Column + one polyethylene 20µm frit		
1 mL	F97660	100 u
3 mL	F97710	100 u
6 mL	F97730	100 u
12mL	F97750	100 u
25 mL	F97760	100 u
75 mL	HQ3270	50 u



Polyethylene frit

Polyethylene frits

Volume column	P/N	Qty
1/16" frits - 20µm		
1 mL	779530	100 u
3 mL	841880	100 u
6 mL	858750	100 u
12 mL	823280	100 u
25 mL	885460	100 u
75 mL	823380	50 u
1/8" frits - 20µm		
15 mL	S08600	100 u
25 mL	S08610	100 u
75 mL	S08620	50 u
150 mL	S28600	50 u
Caps		
1 mL	F97350	100 u
3 mL	F97360	100 u
6 mL	F97370	100 u
12 mL	F97440	100 u
25 mL	F97470	100 u
75 mL	F97490	50 u
Male luer plug for bottom of SPE column 1 at 150 mL	F97510	100 u

Cap F97350

Cap F97510

Adapters for SPE columns

Attached to the top of the 1, 3 and 6 mL SPE columns, these female luer tip compatible adapters have several functions:

- Increase the overall available volume of the columns by adding a larger capacity reservoir (15, 25 or 75 mL) to the adapter.
- Allow multiple selectivities by stacking columns filled with different sorbents one on top of the other.

Description	P/N	Qty
Universal adapter 1, 3, 6 mL	920941	15 u

920941