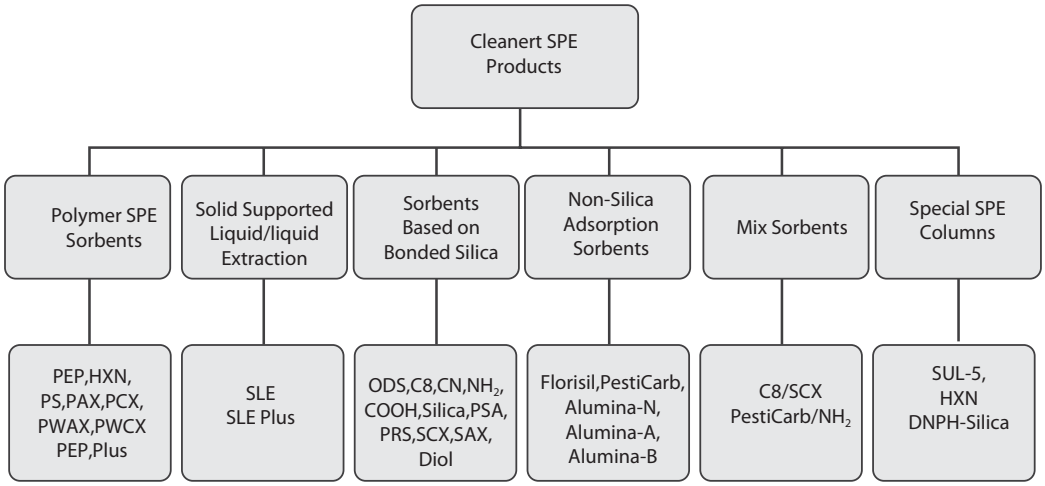
Phone (302)533-5646
Fax (302)737-4547

Solid Phase Extraction (SPE)

Cleanert SPE Columns, Wellplates and Media

GS-Tek has expanded our offerings to a full line of SPE sorbents, columns and wellplates for your sampling preparation needs. Preparation of samples is an integral part of a successful analysis. Thus, the more efficient, reproducible and selective the sample prep step, the more reliable results you can trust.



Cross Reference Table

	GS-Tek	Waters	Supelco	Aglient	Varian
ODS C18	Cleanert C18	Sep-pak C18	ENVI-18 LC-C18	—	Bond Elut C18
ODS C18-N(Non-endcapped)	Cleanert C18-N	—	—	AccuBOND C18	Bond Elut C18-OH
C8	Cleanert C8	Sep-pak C8	ENVI-8	AccuBOND C8	Bond Elut C8
CN Cyanopropyl	Cleanert CN	Sep-pak CN	LC-CN	AccuBOND CN	Bond Elut CN
NH2 Aminopropyl	Cleanert NH2	Sep-pak NH2	LC-NH2	AccuBOND NH2	Bond Elut NH2
PSA(N-aminoethyl Aminopropyl)	Cleanert PSA	—	—	—	Bond Elut PSA
SAX(Strong anion exchanger)	Cleanert SAX	—	LC-SAX	AccuBOND SAX	Bond Elut SAX
COOH(Weak cation exchanger)	Cleanert COOH	—	LC-WCX	—	Bond Elut CBA
PRS(Propane sulfonic acid)	Cleanert PRS	—	—	—	Bond Elut PRS
SCX(Strong cation exchanger)	Cleanert SCX	—	LC-SCX	AccuBOND SCX	Bond Elut SCX
Silica	Cleanert Silica	Sep-pak Silica	LC-Silica	AccuBOND Silica	Bond Elut Silica
Diol	Cleanert Diol	Sep-pak Diol	LC-Diol	AccuBOND Diol	Bond Elut Diol
PS	Cleanert PS	—	ENVI-Chrom P	AccuBOND ENV PS-DVB	—
PEP(Polar polymers)	Cleanert PEP	Oasis HLB	—	—	Bond Elut Plexa
PAX	Cleanert PAX	Oasis MAX	—	—	—
PCX	Cleanert PCX	Oasis MCX	—	—	—
HXN	Cleanert HXN	—	—	—	—

Cleanert Plus SPE Columns and 96 Wellplates

Cleanert Plus SPE products use the particles with narrowly controlled size distribution, a novel frit material & design, unique pre-activation process on reverse phase, and a pre-drying on normal phase columns.

Benefits

- Stable flow rate, clog free
- No activation step is needed, saving 1/3 of work load and time
- More consistent performance from normal phase by pre-drying
- Faster and reliable alternative to liquid/liquid extraction

Application Example: SPE-HPLC Analysis of Terramycin in Serum of Mouse using Cleanert PEP Plus

Method and the Result of Cleanert PEP 60mg/3mL	Method and the Result of Cleanert PEP Plus 60 mg/3mL
Wash with 2mL methanol, 2mL water 12 mins by gravity	Preconditioned 0 mins
Load 2mL sample solution(the mouse serum which contains 10ppm terramycin); 15 mins by gravity	Load 2mL sample solution(the mouse serum which contains 10ppm terramycin); 4 mins by gravity
Wash with 3mL water, then drying the column fully	Wash with 3mL water, then drying the column fully
Elute terramycin with 3mL methanol	Elute terramycin with 3mL methanol
Evaporate the elution by nitrogen at room temperature; dissolve the residue with 2mL mobile phase	Evaporate the elution by nitrogen at room temperature; dissolve the residue with 2mL mobile phase
Recovery: 83.2%	Recovery: 81.4%

Cleanert PEP Plus

Ordering Info

Material	Sorbent	Vol	Tubes/box	P/N
A hydrophilic and lipophilic balanced material, made of polydivinyl benzene functionalized with a polar group	30mg	1mL	100	PE0301-P
	50mg	1mL	100	PE0501-P
	60mg	3mL	50	PE0603-P
	100mg	3mL	50	PE1003-P
	200mg	6mL	30	PE2006-P
	500mg	6mL	30	PE5006-P
	15mg/well	2mL	96-wellplate	PE0152-WP
	30mg/well	2mL	96-wellplate	PE0302-WP
	50mg/well	2mL	96-wellplate	PE0502-WP

Cleanert Florisil Plus

The new Cleanert Florisol Plus SPE products feature a special frit design making the columns clog-free. The SPE columns also offer a unique "pre-drying" function by removing water that is contained in the samples. These columns have unprecedented consist and reliable performance.

Characteristics

Average particle diameter: 80-100μm; Pore size: 80Å; Specific surface area: 250-300m2/g

Cleanert Florisol Plus Ordering Info

Material	Sorbent	Vol	Tubes/box	P/N
Sodium sulfate/Florisil	100mg	1mL	100	FS1001-P
	200mg	3mL	100	FS2003-P
	500mg	3mL	50	FS5003-P
	500mg	6mL	50	FS5006-P
	1g	6mL	30	FS0003-P
	2g	10mL	15	FS2000-P
	100mg/well	2mL	96-wellplate	FS1002-WP

Cleanert Silica Plus

The new Cleanert Silical Plus SPE products feature a special frit design making the columns clog-free. The SPE columns also offer a unique "pre-drying" function by removing water that is contained in the samples. These columns have unprecedented consist and reliable performance.

Characteristics

Average particle diameter: 40-60μm; Pore size: 60Å; Specific surface area: 480m2/g

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Ordering Info

Material	Sorbent	Vol	Tubes/box	P/N
Sodium sulfate/Silica	100mg	1mL	100	SI1001-P
	200mg	3mL	100	SI2003-P
	500mg	3mL	50	SI5003-P
	500mg	6mL	50	SI5006-P
	1g	6mL	30	SI0006-P
	50mg/well	2mL	96-wellplate	SI0502-WP
	100mg/well	2mL	96-wellplate	SI1002-WP

PEP (Polar Polymers) Alternative to Oasis HLB

PEP is made of polydivinylbenzene functionalized with vinyl prolidone. The material has a balanced hydrophilic and hydrophobic property and can be used in the entire pH range of 1-14.

PEP can be used to extract a variety of polar and non-polar compounds. Some highly hydrophilic compounds which have little retention on C18 columns, such as chlorinated phenols, phosphate esters and drug metabolites, can be effectively retained on PEP.

Particle Characteristics

Functionalized polymer sorbents; Average particle size: 35µm.Average pore size: 80Å; Surface area: 600m2/g

Ordering Info

Material	Sorbent	Vol	Tubes/box	P/N
Cleanert PEP	30mg	1mL	100	PE0301
	60mg	3mL	50	PE0603
	100mg	3mL	50	PE1003
	200mg	6mL	30	PE2006
	500mg	6mL	30	PE5006
	30mg/well	2mL	96-wellplate	PE0302-W
	50mg/well	2mL	96-wellplate	PE0502-W
	10g			PE0010
	100g			PE0100

PEP Plus (Pre-conditioned and Clog Resistant)

The PEP Plus columns are packed with high quality PEP sorbents. The sorbents contain high surface area polydivinylbenzene spherical particles that are modified with polar groups to offer a balanced hydrophilicity and hydrophobicity. The characteristics of the sorbent are water-wettable (undesirable drying effects are minimized), wide pH range (1-14), optimized retention for polar compounds and high capacity.

PEP Plus has a novel frit material & design and it has undergone a pre-activation process step during manufacturing. The pre-activation step during manufacturing eliminates the end user's need for an activation step prior to use thus reducing working load by ~30% which is more than 1/3 saved work load!

Particle Characteristics

Polar and spherical particles: Average particle size: 40µm; Average pore size: 70Å; Special surface area: 600m2/g

Ordering Info

Material	Sorbent	Vol	Tubes/box	P/N
Cleanert PEP Plus	30mg	1mL	100	PE0301-P
	60mg	3mL	50	PE0603-P
	100mg	3mL	50	PE1003-P
	200mg	6mL	30	PE2006-P
	500mg	6mL	30	PE5006-P
	30mg/well	2mL	96-wellplate	PE0302-WP
	50mg/well	2mL	96-wellplate	PE0502-WP
	10g			PE0010-P
	100g			PE0100-P

PAX (RP/Strong Anion Exchange)

It is designed to overcome the limitations of traditional silica based mixed-mode SPE sorbents such as C18/SAX. It is a RP/strong anion exchange mixed mode polystyrene/divinylbenzene sorbent, stable from pH 0-14.

Particle Characteristics

Based on functionalized polystyrene/divinylbenzene
Average particle diameter: 40μm; Average pore size: 70Å; Volume of pore: 1.2cm2/g; Specific surface area: 600m2/g.

Ordering Info

Material	Sorbent	Vol	Tubes/box	P/N
Cleanert PAX	30mg	1mL	100	AX0301
	60mg	3mL	50	AX0603
	100mg	3mL	50	AX1003
	200mg	6mL	30	AX2006
	500mg	6mL	30	AX5006
	30mg/well	2mL	96-wellplate	AX0302-W
	50mg/well	2mL	96-wellplate	AX0502-W
	10g			AX0010
	100g			AX0100

PCX (RP/Strong Cation Exchange)

PCX is a mixed-mode, strong cation exchange sorbent. It has reverse-phase and anion-exchange dual functionality. Its high surface area has wide usable pH range of 0-14.

Particle Characteristics

Based on Functionalized polystyrene/divinylbenzene
Average particle diameter: 40μm; Average pore size: 70Å; Volume of pore: 1.2cm2/g; Specific surface area: 600m2/g.

Ordering Info

Material	Sorbent	Vol	Tubes/box	P/N
Cleanert PCX	30mg	1mL	100	CX0301
	60mg	3mL	50	CX0603
	100mg	3mL	50	CX1003
	200mg	6mL	30	CX2006
	500mg	6mL	30	CX5006
	30mg/well	2mL	96-wellplate	CX0302-W
	50mg/well	2mL	96-wellplate	CX0502-W
	10g			CX0010
	100g			CX0100

PWAX (RP/Weak Anion Exchange)

Cleanert PWAX provides the dual modes of retention, weak anion exchange and reverse phase on a stable polymer sorbent, which improves the retention for acidic analytes.

Particle Characteristics

Based on partially functionalized aminopolystyrene/divinylbenzene; Average particle diameter: 40μm; Average pore size: 70Å; Volume of pore: 1.2cm2/g; Specific surface area: 600m2/g.

Ordering Info

Material	Sorbent	Vol	Tubes/box	P/N
Cleanert PWAX	30mg	1mL	100	WAX0301
	60mg	3mL	50	WAX0603
	100mg	3mL	50	WAX1003
	200mg	6mL	30	WAX2006
	500mg	6mL	30	WAX5006
	30mg/well	2mL	96-wellplate	WAX0302-W
	50mg/well	2mL	96-wellplate	WAX0502-W
	10g			WAX0010
	100g			WAX0100

PWCX (RP/Weak Cation Exchange)

Cleanert PWCX provides the dual modes of retention, weak cation exchange and reverse phase on a stable polymer sorbent, which improves the retention for basic analytes.

Particle Characteristics

Based on partially functionalized polystyrene/divinylbenzene; Average particle diameter: 40μm; Average pore size: 70Å; Volume of pore: 1.2cm2/g; Specific surface area: 600m2/g.

Ordering Info

Material	Sorbent	Vol	Tubes/box	P/N
Cleanert PWCX	30mg	1mL	100	WCX0301
	60mg	3mL	50	WCX0603
	100mg	3mL	50	WCX1003
	200mg	6mL	30	WCX2006
	500mg	6mL	30	WCX5006
	30mg/well	2mL	96-wellplate	WCX0302-W
	50mg/well	2mL	96-wellplate	WCX0502-W
	10g			WCX0010
	100g			WCX0100

PEP-ED

PEP-ED is made of the polydivinylbenzene having a surface functionalized with an electron donating group. They can be used in the entire pH 1-14. The surface has a balanced hydrophilic and hydrophobic property and can extract a variety of polar and non-polar compounds, especially with electron-deficient structures.

Particle Characteristics

Adsorption sorbents; Average particle size: 35μm.Average pore size: 80Å; Surface area: 600m2/g

Ordering Info

Material	Sorbent	Vol	Tubes/box	P/N
Cleanert PEP ED	30mg	1mL	100	PE0301-E
	60mg	3mL	50	PE0603-E
	100mg	3mL	50	PE1003-E
	200mg	6mL	30	PE2006-E
	500mg	6mL	30	PE5006-E
	30mg/well	2mL	96-wellplate	PE0302-WE
	50mg/well	2mL	96-wellplate	PE0502-WE
	10g			PE0010-E
	100g			PE0100-E

PEP-ER

PEP-ER is made of the polydivinylbenzene having a surface functionalized with an electron withdrawing group. They can be used in the entire pH 1-14. The surface has a balanced hydrophilic and hydrophobic property and can extract a variety of polar and non-polar compounds, especially having an electron-rich structure

Particle Characteristics

Adsorption sorbents; Average particle size: 35µm.Average pore size: 80Å; Surface area: 600m2/g

Ordering Info

Material	Sorbent	Vol	Tubes/box	P/N
Cleanert PEP ER	30mg	1mL	100	PE0301-R
	60mg	3mL	50	PE0603-R
	100mg	3mL	50	PE1003-R
	200mg	6mL	30	PE2006-R
	500mg	6mL	30	PE5006-R
	30mg/well	2mL	96-wellplate	PE0302-WR
	50mg/well	2mL	96-wellplate	PE0502-WR
	10g			PE0010-R
	100g			PE0100-R

PS

PS is made of non-substituted polydivinylbenzene. It has larger surface areas (>600m2/g.) and thus greater capacity than reverse phase bonded silica.PS can be used for the extraction of non-polar and polar compounds.

Particle Characteristics

Based on polystyrene/divinylbenzene; Average particle diameter: 40µm;
Average pore size: 70Å; Volume of pore: 1.2cm2/g; Specific surface area: 600m2/g.

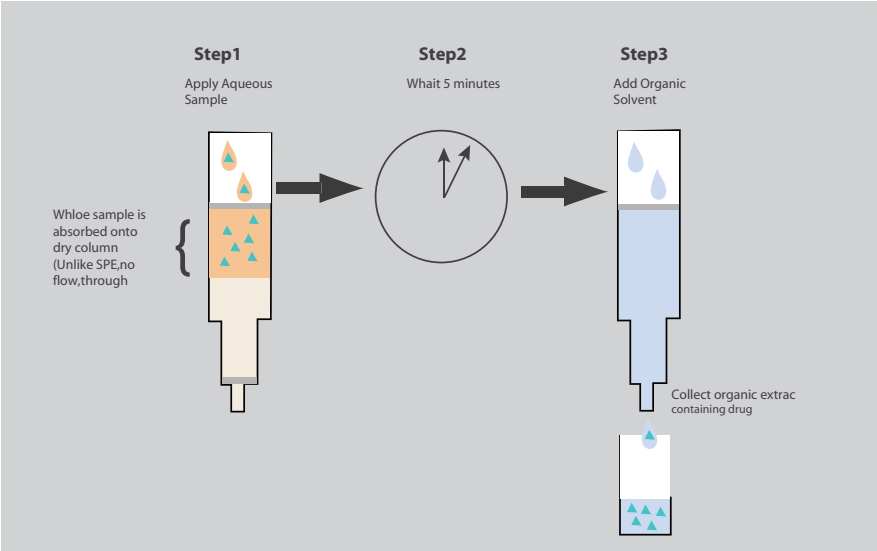
Ordering Info

Material	Sorbent	Vol	Tubes/box	P/N
Cleanert PS	30mg	1mL	100	PS0301
	60mg	3mL	50	PS0603
	100mg	3mL	50	PS1003
	200mg	6mL	30	PS2006
	500mg	6mL	30	PS5006
	30mg/well	2mL	96-wellplate	PS0302-W
	50mg/well	2mL	96-wellplate	PS0502-W
	10g			PS0010
	100g			PS0100

SLE (Solid Supported Liquid/Liquid Extraction) Technique

Procedure

- A modified form of diatomaceous earth is packed in a cartridge.
- Biological fluid can be applied to the cartridge using gravity flow.
- The aqueous sample is deposited as a thin film on the hydrophilic surface.
- The analytes are extracted with a water immiscible organic solvent



SLE

Solid supported liquid/liquid Extraction columns and plates use specially treated diatomiteous materials as a solid support for liquid/liquid extractions. The SPE procedures can be easily automated.

The General Method Includes:

1. Load an aqueous sample into the column by gravity or a soft vacuum
2. Apply one or a multiple organic solvents by gravity or well-controlled vacuum
3. Vacuum the organic solution which contains the analyte out from bottom of the columns or plates, collect the solution
4. Concentrate the collected solution

Ordering Info

Material	Sorbent	Vol	Tubes/box	P/N
Special treated diatomite	200mg	3mL	100	SL2003
	500mg	3mL	50	SL5003
	500mg	6mL	50	SL5006
	1g	6mL	30	SL0006
	14g	40mL	10	SL1400
	300mg/well	2mL	96-wellplate	SL3002-W
	500mg/well	2mL	96-wellplate	SL5002-W

SLE Plus

Solid Supported Liquid/Liquid Extraction columns and plates use the specially treated diatomite materials to run liquid/liquid extractions on the solid supports, which are easily automated in parallel to save significant time.

Compared with SLE, the SLE Plus has a special frit design which keeps the columns clog-free for very nasty samples.

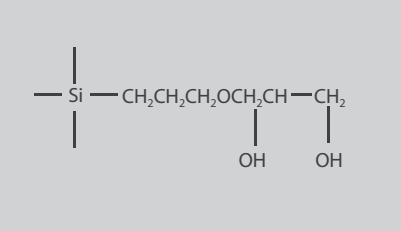
The General Method Includes:

1. Load an aqueous sample into the column by gravity or a soft vacuum
2. Apply one or a multiple organic solvents by gravity or well-controlled vacuum
3. Vacuum the organic solution which contains the analyte out from bottom of the columns or plates, collect the solution
4. Concentrate the collected solution

Ordering Info

Material	Sorbent	Vol	Tubes/box	P/N
Special treated diatomite	200mg	3mL	100	SL2003-P
	500mg	3mL	50	SL5003-P
	500mg	3mL	50	SL5006-P
	1g	6mL	30	SL0006-P
	14g	40mL	10	SL1400-P
	300mg/well	2mL	96-wellplate	SL3002-WP
	500mg/well	2mL	96-wellplate	SL5002-WP

Bonded Silica SPE
ODS C18 (End-capped)



ODS C18 products columns and plates are packed with reverse phase, octadecylsilane bonded silica sorbents. The sorbent is double endcapped and has a high bonding density (%C>17). These columns can be used as a replacement for BondElute C18 and Super clean ENVI C18. These products can be used for desalting biomolecules, such as proteins and DNAs.

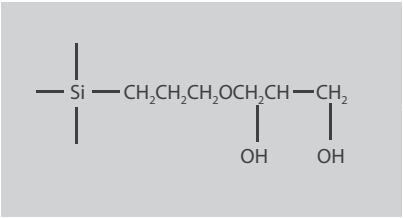
Particle Characteristics

Based on silica; C%: 18-19%; Average particle diameter: 50µm
Average pore size: 60Å; Volume of pore: 0.8cm2/g; Specific surface area: 4802/g

Ordering Info

Material	Sorbent	Vol	Tubes/box	P/N
Cleanert ODS(C18,end-capped)	100mg	1mL	100	181001
	200mg	3mL	50	182003
	500mg	3mL	50	185003
	500mg	6mL	30	185006
	1g	6mL	30	180006
	50mg/well	2mL	96-wellplate	180502-W
	100mg/well	2mL	96-wellplate	181002-W
	10g			180010
	100g			18010

ODS C18-N (Non-end-capped)



ODS C18-N products have silica based reverse phase sorbents bonded with octadecylsilane without endcapping. The extra silanol residue of the sorbent provides additional polar interactions associated with surface silanol groups which enhance the retention of basic compounds. These columns are similar to Agilent AccuBond C18 and BondElute C18 OH.

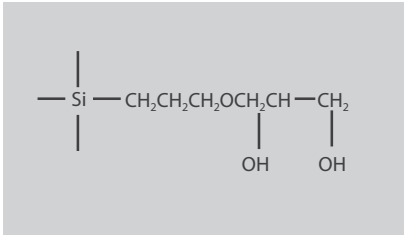
Particle Characteristics

Based on silica; C%: 17-18%; Average particle diameter: 50µm;
Average pore size: 60Å; Volume of pore: 0.8cm2/g; Specific surface area: 480m2/g

Ordering Info

Material	Sorbent	Vol	Tubes/box	P/N
Cleanert (C18,Non-end-capped)	100mg	1mL	100	181001-N
	200mg	3mL	50	182003-N
	500mg	3mL	50	185003-N
	500mg	6mL	30	185006-N
	1g	6mL	30	180006-N
	50mg/well	2mL	96-wellplate	180502-N-W
	100mg/well	2mL	96-wellplate	181002-N-W
	10g			180010-N
	100g			180100-N

C8 (Octyl)



The property of C8 products is similar to ODS C18 products. However, this sorbent is slightly less retentive than C18, which facilitates the elution of more hydrophobic substance. C8 is successfully used for the extraction of both water-soluble and fat-soluble vitamins from serum, as well as the desalting of biological macromolecules.

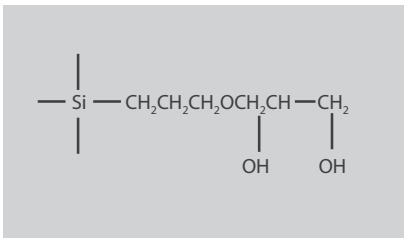
Particle Characteristics

Based on silica; C%: 9-10%; Average particle diameter: 50μm;
Average pore size: 60Å; Volume of pore: 0.8cm2/g; Specific surface area: 480m2/g

Ordering Info

Material	Sorbent	Vol	Tubes/box	P/N
Cleanert C8	100mg	1mL	100	81001
	200mg	3mL	50	82003
	500mg	3mL	50	85003
	500mg	6mL	30	85006
	1g	6mL	30	80006
	50mg/well	2mL	96-wellplate	080502-W
	100mg/well	2mL	96-wellplate	081002-W
	10g			80010
	100g			80100

CN (Cyanopropyl)



Cyano(CN) SPE have silica based sorbents bonded with cyanopropyl functional group. This polar sorbent exhibits both polar and non-polar interactions. It can be used for extraction of both polar and non-polar molecules in either normal phase reverse phase mode.

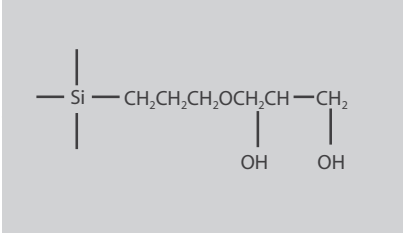
Particle Characteristics

Based on silica; C%: 5-6%; Average particle diameter: 50μm;
Average pore size: 60Å; Volume of pore: 0.8cm2/g; Specific surface area: 480m2/g

Ordering Info

Material	Sorbent	Vol	Tubes/box	P/N
Cleanert CN	100mg	1mL	100	CN1001
	200mg	3mL	50	CN2003
	500mg	3mL	50	CN5003
	500mg	6mL	30	CN5006
	1g	6mL	30	CN0006
	50mg/well	2mL	96-wellplate	CN0502-W
	100mg/well	2mL	96-wellplate	CN1002-W
	10g			CN0010
	100g			CN0100

NH2 (Aminopropyl)



NH2 SPE products have silica based sorbents bonded with aminopropyl funtional group. This sorbent can be used in either normal phase or reverse phase mode. It retains the analytes either by a polar adsorption (from non-polar solution) or by weak anion exchange (from aqueous solution). pKa=9.8.

Particle Characteristics

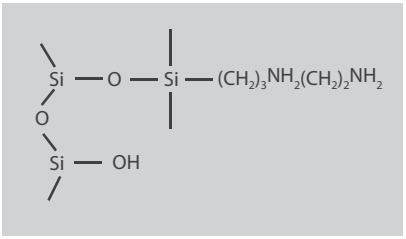
Based on silica; Average particle diameter: 50μm;
Average pore size: 60Å; Volume of pore: 0.8cm2/g; Specific surface area: 480m2/g

Ordering Info

Material	Sorbent	Vol	Tubes/box	P/N
Cleanert NH2	100mg	1mL	100	NH1001
	200mg	3mL	50	NH2003
	500mg	3mL	50	NH5003
	500mg	6mL	30	NH5006
	1g	6mL	30	NH0006
	50mg/well	2mL	96-wellplate	NH0502-W
	100mg/well	2mL	96-wellplate	NH1002-W
	10g			NH0010
	100g			NH0100

PSA〔(N-aminoethyl) Aminopropyl〕

PSA SPE is similar to Cleanert-NH2. PSA has two amino groups with pKa=10.1 and 10.9 respectively. This sorbent is an anion exchanger slightly stronger than NH2. It can be used for the extraction of metal ions by chelating interactions. It is also commonly used to remove organic acids, pigments and metal ions from organic samples such as vegetables and fruits.



Particle Characteristics

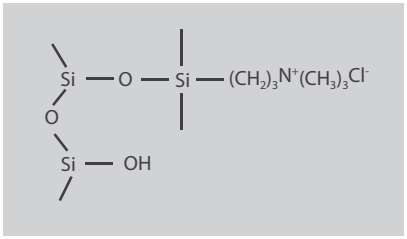
Based on silica; Average particle diameter: 50μm;
Average pore size: 60Å; Volume of pore: 0.8cm2/g; Specific surface area: 480m2/g

Ordering Info

Material	Sorbent	Vol	Tubes/box	P/N
Cleanert PSA	100mg	1mL	100	PA1001
	200mg	3mL	50	PA2003
	500mg	3mL	50	PA5003
	500mg	6mL	30	PA5006
	1g	6mL	30	PA0006
	50mg/well	2mL	96-wellplate	PA0502-W
	100mg/well	2mL	96-wellplate	PA1002-W
	10g			PA0010
	100g			PA0100

SAX (Strong Anion Exchanger)

SAX SPE products have silica based sorbents bonded with a quaternary amine. This strong anion exchanger is used to extract compounds capable of carrying a negative charge from both aqueous and non-aqueous solutions. They are ideally suit to extraction of weak acids and desalting of biological macromolecules, like BondElute-SAX.



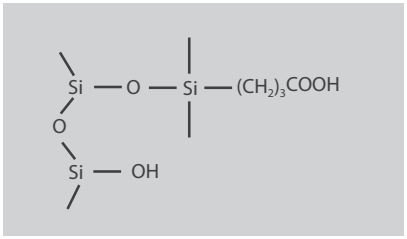
Particle Characteristics

Based on silica; C%: 9-10%; Average particle diameter: 50μm; Average pore size: 60Å;
Volume of pore: 0.8cm2/g Specific surface area: 480m2/g The ion exchange degree: 0.5meq/g.

Ordering Info

Material	Sorbent	Vol	Tubes/box	P/N
Cleanert SAX	100mg	1mL	100	SA1001
	200mg	3mL	50	SA2003
	500mg	3mL	50	SA5003
	500mg	6mL	30	SA5006
	1g	6mL	30	SA0006
	50mg/well	2mL	96-wellplate	SA0502-W
	100mg/well	2mL	96-wellplate	SA1002-W
	10g			SA0010
	100g			SA0100

COOH (Weak Cation Exchanger)



COOH SPE products consist of a propane carboxylic acid on the inner silica surface. The pKa of the carboxylic acid group is approximately 3.8. It is a useful sorbent for quaternary ammonium salt and other strong cations.

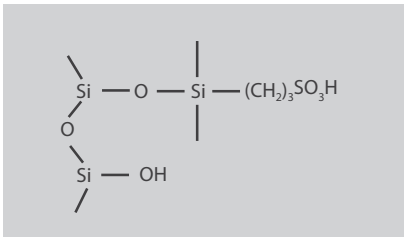
Particle Characteristics

Based on silica; C%: 5-6%; Average particle diameter: 50μm; Average pore size: 60Å; Volume of pore: 0.8cm2/g; Specific surface area: 480m2/g

Ordering Info

Material	Sorbent	Vol	Tubes/box	P/N
Cleanert COOH	100mg	1mL	100	CH1001
	200mg	3mL	50	CH2003
	500mg	3mL	50	CH5003
	500mg	6mL	30	CH5006
	1g	6mL	30	CH0006
	50mg/well	2mL	96-wellplate	CH0502-W
	100mg/well	2mL	96-wellplate	CH1002-W
	10g			CH0010
	100g			CH0100

PRS (Propane Sulfonic Acid)



RS SPE sorbent is a silica gel based strong cation exchanger. This sorbent, consisting of a propane sulfonic acid, has slightly less exchange capability than SCX. It can be applied to the extraction of weak cations, such as pyridine, with high recovery.

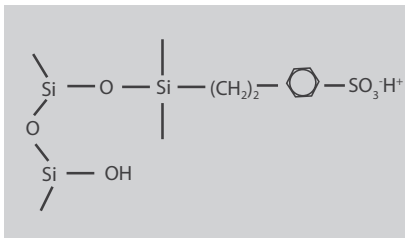
Particle Characteristics

Based on silica; Average particle diameter: 50μm; Average pore size: 60Å; Volume of pore: 0.8cm2/g; Specific surface area: 480m2/g The ion exchange degree: 0.3meq/g.

Ordering Info

Material	Sorbent	Vol	Tubes/box	P/N
Cleanert PRS	100mg	1mL	100	PR1001
	200mg	3mL	50	PR2003
	500mg	3mL	50	PR5003
	500mg	6mL	30	PR5006
	1g	6mL	30	PR0006
	50mg/well	2mL	96-wellplate	PR0502-W
	100mg/well	2mL	96-wellplate	PR1002-W
	10g			PR0010
	100g			PR0100

SCX (Strong Cation Exchanger)



SCX products are strong cation exchangers based on silica gel, with benzene sulfonic acid. The sorbent is used to extract positively charged basic compounds or remove the salt from biological samples. It can also be mixed with C18 sorbent to extract the organic bases.

Particle Characteristics

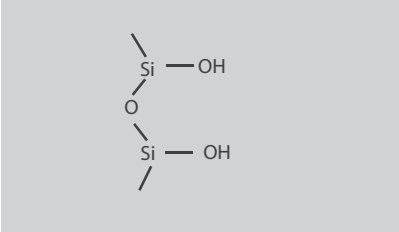
Based on silica; Average particle diameter: 50μm; Average pore size: 60Å;Volume of pore: 0.8cm2/g; Specific surface area: 480m2/g The ion exchange degree: 0.5meq/g.

Ordering Info

Material	Sorbent	Vol	Tubes/box	P/N
	100mg	1mL	100	SC1001
	200mg	3mL	50	SC2003
	500mg	3mL	50	SC5003
	500mg	6mL	30	SC5006
Cleanert SCX	1g	6mL	30	SC0006
	50mg/well	2mL	96-wellplate	SC0502-W
	100mg/well	2mL	96-wellplate	SC1002-W
	10g			SC0010
	100g			SC0100

Silica

Silica SPE product has unbonded, activated irregular silica as the sorbent. This sorbent exhibits high polar interaction and is used for the extraction of weak-polar or non-polar compound, such as oil. In addition, the silanol groups are ionzable at intermediate pH, so it can be used as a weak cation exchanger.



Particle Characteristics

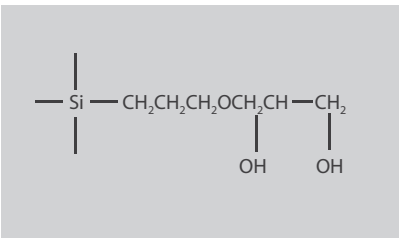
Based on silica; Average particle diameter: 50μm; Average pore size: 60Å;Volume of pore: 0.8cm2/g; Specific surface area: 480m2/g

Ordering Info

Material	Sorbent	Vol	Tubes/box	P/N
	100mg	1mL	100	SI1001
	200mg	3mL	50	SI2003
	500mg	3mL	50	SI5003
	500mg	6mL	30	SI5006
Cleanert Silica	1g	6mL	30	SI0006
	50mg/well	2mL	96-wellplate	SI0502-W
	100mg/well	2mL	96-wellplate	SI1002-W
	10g			SI0010
	100g			SI0100

Diol

Silica based dihydroxy SPE. It is used to extract polar analytes from non-polar solutions. It is a neutral sorbent and extracts compounds by forming hydrogen bonding or polar-polar interaction. As an example, it can be used to extract THC.



Particle Characteristics

Based on silica; C%: 5-6%; Average particle diameter: 50μm;
Average pore size: 60Å;Volume of pore: 0.8cm2/g;Specific surface area: 480m2//g

Ordering Info

Material	Sorbent	Vol	Tubes/box	P/N
	100mg	1mL	100	DI1001
	200mg	3mL	50	DI2003
	500mg	3mL	50	DI5003
	500mg	6mL	30	DI5006
Cleanert Diol	1g	6mL	30	DI0006
	50mg/well	2mL	96-wellplate	DI0502-W
	100mg/well	2mL	96-wellplate	DI1002-W
	10g			DI0010
	100g			DI0100

Non-Silica Adsorption Sorbent Florisil (Magnesia Silica)

PestiCarb is made of graphitized carbon by a distinct surface modification process and has been used for sample cleanup in pesticide residues in plant or animal tissues. This sorbent can effectively reduce the background noise and increase the sensitivity, the functions of which are similar to Supelco Envicarb.

Particle Characteristics

Adsorption sorbents; Average particle diameter: 80-100μm (40-60μm optional);
Average pore size: 80Å; Specific surface area: 291m2/g

Ordering Info

Material	Sorbent	Vol	Tubes/box	P/N
Cleanert Florisil	100mg	1mL	100	FS1001
	200mg	3mL	50	FS2003
	500mg	3mL	50	FS5003
	500mg	6mL	30	FS5006
	1g	6mL	30	FS0006
	50mg/well	2mL	96-wellplate	FS0502-W
	100mg/well	2mL	96-wellplate	FS1002-W
	10g			FS0010
	100g			FS0100

PestiCarb (Graphitized Carbon)

PestiCarb is made of graphitized carbon by a distinct surface modification process, and has been used for sample cleanup in pesticide residues in plants or animal tissues. This sorbent can effectively reduce the background noise and increase the sensitivity, the functions of which are similar to Supelco Envicarb.

Particle Characteristics

Adsorption sorbents; Average particle size: 120-400 mesh.

Ordering Info

Material	Sorbent	Vol	Tubes/box	P/N
Cleanert PestiCarb	100mg	1mL	100	PC1001
	200mg	3mL	50	PC2003
	500mg	3mL	50	PC5003
	500mg	6mL	30	PC5006
	1g	6mL	30	PC0006
	50mg/well	2mL	96-wellplate	PC0502-W
	100mg/well	2mL	96-wellplate	PC1002-W
	10g			PC0010
	100g			PC0100

Alumina N (Aluminium Oxide;Neutral)

Alumina N sorbents(pH=7.5) can adsorb molecules by interaction with the aluminum metal center. The neutralized surface allows interaction with compounds whose heteroatoms are electronegative (e.g.N,S,P) or with an electron-rich ,highly aromatic structure.

Particle Characteristics

Adsorption sorbents;
Average particle size: 150 mesh; Average pore size: 58Å

Ordering Info

Material	Sorbent	Vol	Tubes/box	P/N
	100mg	1mL	100	AL1001-N
	200mg	3mL	50	AL2003-N
	500mg	3mL	50	AL5003-N
	500mg	6mL	30	AL5006-N
Cleanert Alumina N	1g	6mL	30	AL0006-N
	50mg/well	2mL	96-wellplate	AL0502-N-W
	100mg/well	2mL	96-wellplate	AL1002-N-W
	10g			AL0010-N
	100g			AL0100-N

Alumina A (Aluminium Oxide; Acidic)

Alumina A sorbents(pH=4.5) can be used as strong polar absorbents or mild cation exchangers. This sorbent is processed with a special deactivation procedure which ensures high analyte recovery.

Particle Characteristics

Adsorption sorbents; Average particle size: 150 mesh; Average pore size: 58Å

Ordering Info

Material	Sorbent	Vol	Tubes/box	P/N
	100mg	1mL	100	AL1001-A
	200mg	3mL	50	AL2003-A
	500mg	3mL	50	AL5003-A
	500mg	6mL	30	AL5006-A
Cleanert Alumina A	1g	6mL	30	AL0006-A
	50mg/well	2mL	96-wellplate	AL0502-A-W
	100mg/well	2mL	96-wellplate	AL1002-A-W
	10g			AL0010-A
	100g			AL0100-A

Alumina B (Aluminium Oxide; Basic)

Alumina B products(pH=10) can be used to remove organic acids and phenols in the sample matrix. They have been pre-treated by special deactivation to ensure high analyte recovery.

Particle Characteristics

Adsorption sorbents; Average particle size: 150 mesh; Average pore size: 58Å.

Ordering Info

Material	Sorbent	Vol	Tubes/box	P/N
	100mg	1mL	100	AL1001-B
	200mg	3mL	50	AL2003-B
	500mg	3mL	50	AL5003-B
	500mg	6mL	30	AL5006-B
Cleanert Alumina B	1g	6mL	30	AL0006-B
	50mg/well	2mL	96-wellplate	AL0502-B-W
	100mg/well	2mL	96-wellplate	AL1002-B-W
	10g			AL0010-B
	100g			AL0100-B

Mixed and Layered Phases
PestiCarb/NH2

PestiCarb/NH2 SPE column is packed with 500mg PestiCarb and 500mg NH2. It has been widely used in analysis of pesticides residue, especially for the Japanese Positive List System. It can be used in pesticide residue analysis, coloring matter, fatty acid and hydroxybenzene.

Particle Characteristics

See Pesticarb and Cleanert NH2

Ordering Info

Material	Sorbent	Vol	Tubes/box	P/N
Cleanert PestiCarb/NH2	500mg/500mg	6ml	30	PN0006

C8/SCX

Mixed mode SPE based on silica of C8 and strong cation-exchange. It is usually used for the extraction of basic drugs from urine or blood

Particle Characteristics

See C8 and SCX

Ordering Info

Material	Sorbent	Vol	Tubes/box	P/N
Cleanert C8/SCX	50mg	3mL	50	CS0503
	130mg	3mL	50	CS1303
	300mg	3mL	50	CS3003
	500mg	6mL	30	CS5006
	1g	6mL	30	CS0006
	50mg/well	2mL	96-wellplate	CS0502-W
	100mg/well	2mL	96-wellplate	CS1002-W
	10g			CS0010
	100g			CS0100

Cleanert Pre-IC:

Sample Clean-up Cartridges for Ion Chromatography

The sample preparation is necessary not only for HPLC but also for IC. The demands for sample preparation of IC led to a development of a new SPE product family, which was named "Cleanert Pre-IC". Cleaner Pre-IC can perform superior sample preparation for IC analysis thanks to their high capacity sorbent and a excellent flow characteristics.

Part No.	Resin Type	Average particle size	Capacity	Application
IC-RP	divinylbenzene resin	40μm	300mg/ 1cc cartridge	To remove substances such as aromatic dyes, some aromatic carboxylic acids, hydrocarbons, and surfactants from sample matrices
IC-P	polyvinylpyrrolidone(PVP) polymer resin	40μm	350mg/ 1cc cartridge	To remove the phenolic fraction of humic acids, tannic acids, lignins, anthocyanins, and azodyes from samples.
IC-A	16% cross-linked,styrene-based,anion-exchangeresin in thebicarbonate form.	40μm	0.7meq/ 1cc cartridge	To remove anion contaminant and neutralize the strongly acidic sample solution.
IC-H	16% cross-linked,sulfonic acid ,sulfonic acid ,styrene-based,sulfonic acid ,cation-exchangeresin in thehydrogen form	40μm	2.0-2.2meq/ 1cc cartridge	To remove high levels of alkaline earths and transition metals from sample matrices and in the neutralization of highly alkaline samples such as sodium hydroxide or sodium carbonate.
IC-Na	16% cross-linked,sulfonic acid ,sulfonic acid ,styrene-based,sulfonic acid ,cation-exchangeresin in thesodium form.	40μm	2.0-2.2me/1cc cartridge	To remove high levels of alkaline earths and transition metals from sample matrices without acidifying the sample. This ensures good recovery of acid labile analytes such as nitrite.
IC-Ag	16% cross-linked,styrene-based,sulfonic acid,cation-exchangeresin in the silverstyrene-based,styrene-based,form.	40μm	2.0-2.2meq/ 1cc cartridge	To remove chloride, bromide, and iodide from sample matrices. An IC- H cartridge should be used after the IC- Ag cartridge to remove dissolved Ag.
IC-Ba	styrene-based,sulfonic acid ,cation-exchangeresin in thebarium form.	40μm	2.0-2.2meq/ 1cc cartridge	To remove SO42- For reproducible, quantitative determinations in low-ionic-strength samples, these cartridges should be activated with a chloride-based activating solution. Then the added chloride need to be removed.

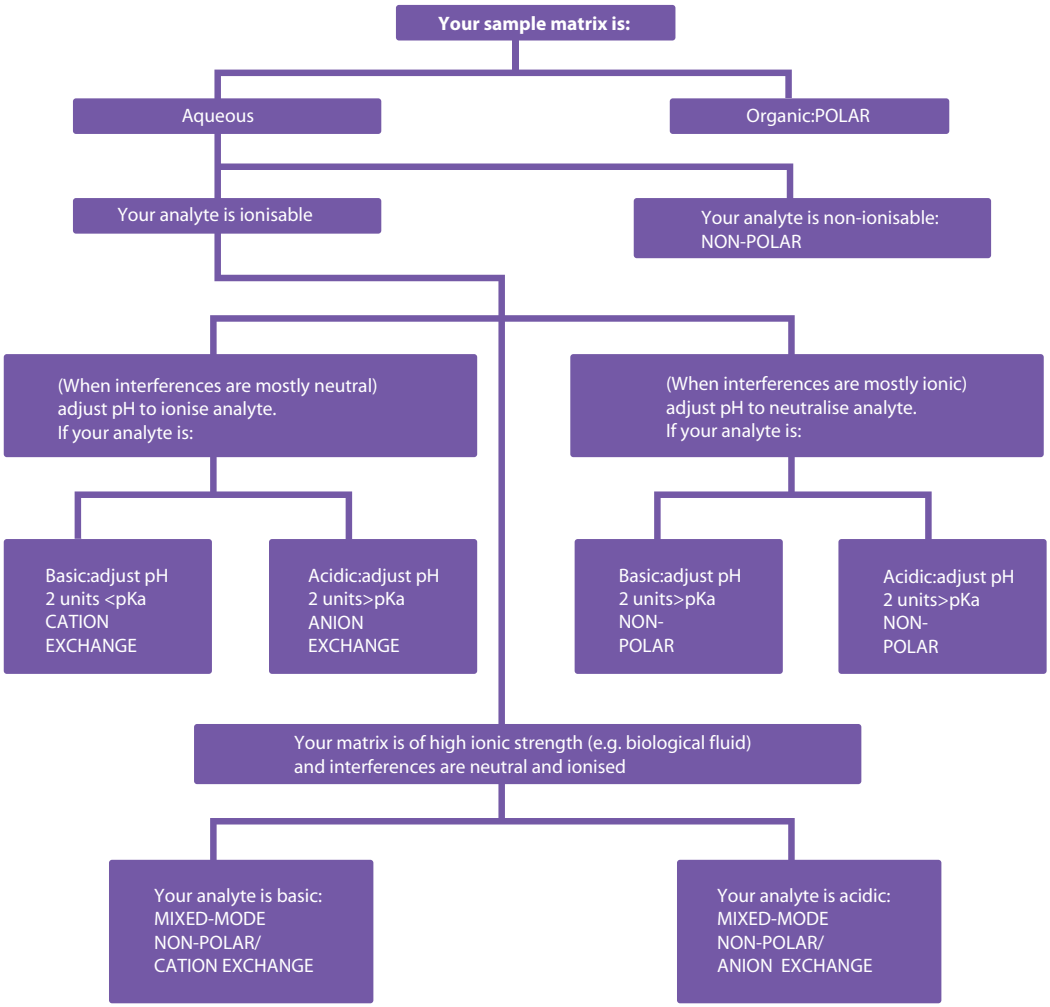
Part No.	Resin Type	Average particle size	Capacity	Application
IC-M	iminodiacetateresin in theammonium form	40µm	0.4meqmg/1cc cartridge	To remove transition metals and matrix elimination of alkali and alkaline earth metals.
IC-Ag/H	It is a layered cartridge that contains IC- Ag resin and IC- H resin.			
IC-Ba/Ag/H	It is a layered cartridge that contains IC-Ba resin, IC- Ag resin and IC- H resin.			

SPE Method Guideline

There are many factors influencing the method for SPE, and the following are the four main ones which must be considered:

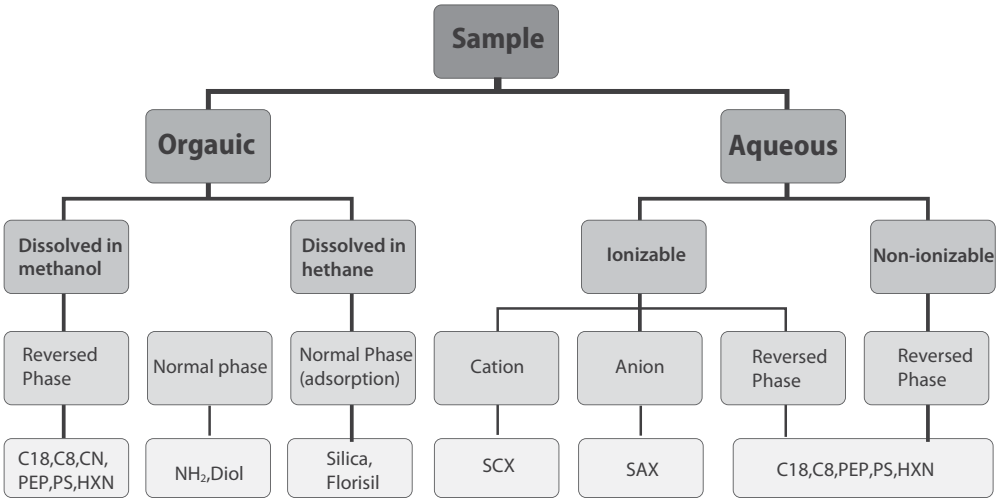
1. The Selection of Sorbent Retention Mechanism

The guide briefly outlines the decision making process required to choose a suitable extraction mechanism starting with understanding the sample matrix properties.



2. The Selection of SPE Columns

The guide page briefly outlines the decision making process required to choose a suitable sorbent.



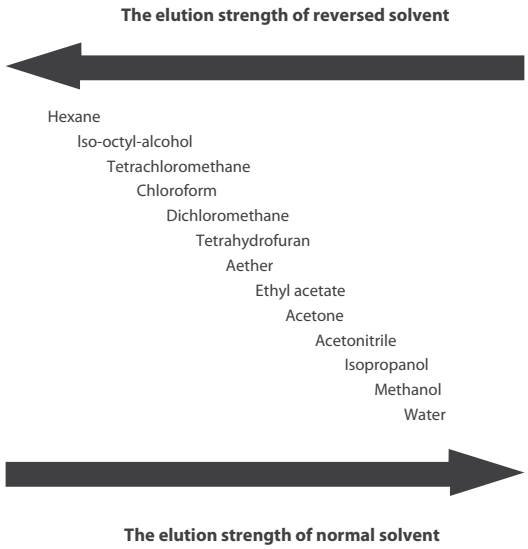
The selection of column packaging and the parameter of sample loading and elution

For the normal phase and reversed phase SPE cartridges, the weight of the sample can not exceed 5% of cartridges load capacity. For the ion-exchange mode, the capacity of the ion-exchange must be considered.

Table below shows the capacity and elution parameters of SPE:

Specification	Loading Sample	The Minimum Volume of Elution
50mg/1mL	2.5mg	125μL
100mg/1mL	5mg	250μL
200mg/3mL	10mg	500μL
500mg/6mL	25mg	1.2mL
1g/6mL	50mg	2.4mL

3. The Selection of Ideal Elution Solvent



Applications

Application*	Recommended SPE	Instrument
Oleic Acid in Human Plasma	Cleanert PAX, 30mg/mL	HPLC-MS
Pseudoephedrine Hydrochloride in Human Plasma	Cleanert PCX, 100mg/mL	HPLC-MS
Evodiamine and Rutecarpine in Human Serum	Cleanert C18, 200mg/3mL	LC-MS
Malachite Green in Salmon	Cleanert Alumina B; Cleanert SCX	HPLC
Clenbuterol in Urine	Mixed Phase SPE Cleanert C18/SCX 500mg/3mL	LC-MS
Chloramphenicol	Cleanert Florisil 1000mg/6mL	LC-MS
Seven Hydroxybenzenes in Water	Cleanert PEP, 4 nitrophenol	HPLC
Nitroanilines	Cleanert PEP	HPLC (Venusil AQ-C18)
Aniline	Cleanert PEP	HPLC (Venusil AQ-C18)
N,N-dimethylaniline	Cleanert PEP	HPLC (Venusil AQ-C18)
Praziquantel	Cleanert PEP	HPLC (Venusil AQ C18)
Gliclazide	Cleanert PEP	HPLC (Promosil C18)

*Please contact GS-Tek for specifics