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ANPEL Laboratory Technologies (Shanghai) Inc.

CNW Technologies

Chromatography Consumable Products Catalogue

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20th anniversary

1997-2017

ANPEL Laboratory Technologies (Shanghai) Inc. was established in 1997, which specializes in research and development, manufacturing and distribution of chromatographic products, chemical reagents and standards, labwares and analytical instrument consumables. As the leading manufacturer and supplier of chromatography and lab consumables in China, ANPEL has over 100 employees now , and the sale amount has reached more than 100 million RMB for recent four years.

ANPEL can provide about 500,000 kinds of products to scientific research personnel all over the country. The main customers cover pharmaceutical, environment, chemistry, clinical, food, biology, government, university, research institutions. ANPEL keeps fast and stable developping step. Now, we have about 5,000 customers which have long-term business, and the totally customers quantity is about 10,000. Customers enjoy our honest service and professional work.

Furthermore, ANPEL is awarded by Dun & Bradstreet as “Credit RI1”, achieved best credit degree and passed the certification of International Organization for Standardization again in 2008.

We have two parts of sale department – domestic and international. Our sales representatives operate in individual areas. Besides Shanghai – the headquarters, we also have 10 offices in main large cities of China that are Beijing,Guangzhou, Chengdu, Nanjing, Qingdao, Wuhan,Shenzhen,Shenyang and Zhengzhou, which makes a full distribution network. The international department take charge of Africa, Asia, America and Oceania.

ANPEL established a wholly owned subsidiary Grand Stable Analysis Technics (Shanghai) Co., Ltd., which take charge of R&D and production of our own products, two brands “ANPEL” and “CNW”. In the production process, Grand Stable strictly implements the "6S" management and approved with ISO9001:2008 certification by Germany TüV. We have two labs, one application lab, focus on application explore, hot spots study. Another QC lab, focus on product quality check. We have some Agilent, Shimadzu GC and HPLC, ultraviolet spectrophotometer, Metrohm Karl Fischer titrator. The Production Department has many advanced equipments for manufacture and check. Parts of process are under the management of computer – the quality management system.

We have three departments to control product quality and study hot spots of analysis. The Market and Technique department,the Production Department and Laboratories.

The Market and Technique department has two parts: Market department and Technique department, In Market department, there are several product managers, who take charge of different lines. Technique department take charge of training and application. Customers can get support in the shortest possible time.

The size of our warehouse is over 2000 m2. The total products keep in stock are more than 15 million RMB. We have some own trucks which help us to distribute products all over China, We use Bar Code Management System to control the stock.The Purchasing Department take charge of the procurement from suppliers all over the world.

The Finance Department use software of financial affairs management with electronic data processing accounting.The system can screen and control every business and charge, to confirm the good running of the company.Our website http://www.anpel.com.cn or www.anpelsci.com—— which provide general product prices, professional technical literatures and the newest information , which becomes a communicating platform between customers and ANPEL.

For the future we remain heavily committed to our development, to allow us to continue to bring innovative technologies and services to our valued partners and customers in analytical science in all corners of the world.

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Sample Preparation

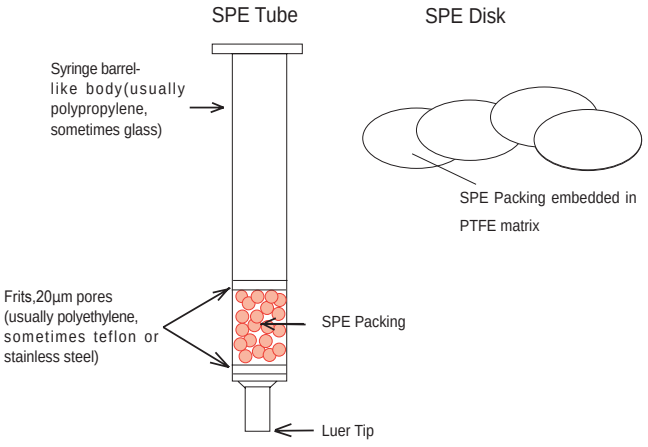
Solid phase extraction (SPE)

Introduction of Solid phase extraction (SPE) technique

What is SPE, and what problems can SPE solve

Solid phase extraction (SPE) is a popular pretreatment method for purifying liquid samples with solid sorbents. Normally, SPE is used before chromatography or other analysis for sample purification, concentration, desalination, derivation or isolation.

Typical SPE Tube and Disk



The advantage of SPE compared with conventional LLE

The function of SPE and LLE (liquid/liquid extraction) is similar. LLE is the extraction of two immiscible liquid phases, while SPE is the extraction from liquid phase to solid phase. The advantage of SPE compared with LLE including:

- Avoid emulsification phenomena
- Make two-phase separation easier, and easy to perform
- Higher quantitative recoveries, and better purification effects
- Use less solvent
- Available in a wide variety of sorbents, and have more options than LLE
- Can be automated, enlarge treatment capacity

How to use SPE(Method development and key points of operating)

SPE is a five-step process:

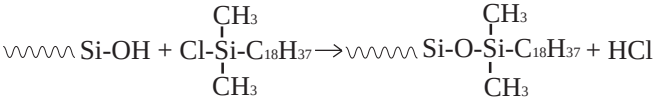
STEP ONE: Select suitable SPE product

■ 1. SPE Theory and Pattern

SPE Theory: How Compounds Are Retained by the Sorbent

Reversed Phase SPE

Reversed phase separations involve a polar (usually aqueous) or moderately polar sample matrix (mobile phase) and a nonpolar stationary phase. The analyte of interest is typically mid- to nonpolar. Several SPE materials, such as the alkyl- or aryl-bonded silicas (C18, C8, C4, and Phenyl) are in the reversed phase category.



Here, the hydrophilic silanol groups at the surface of the raw silica packing (typically 60Å pore size, 40μm particle size) have been chemically modified with hydrophobic alkyl or aryl functional groups by reaction with the corresponding silanes.Retention of organic analytes from polar solutions (e.g. water) onto these SPE materials is due primarily to the attractive forces between the carbon-hydrogen bonds in the analyte and the functional groups on the silica surface. These nonpolar-nonpolar attractive forces are commonly called van der Waals forces, or dispersion forces. To elute an adsorbed compound from a reversed phase SPE tube or disk, use a nonpolar solvent to disrupt the forces that bind the compound to the packing. All silicabased bonded phases have some percentage of residual unreacted silanols that act as secondary interaction sites. These secondary interactions may be useful in the extraction or retention of highly polar analytes or contaminants, but may also irreversibly bind analytes of interest.

Carbon-GCB(Graphitized Carbon Black) and PSD(styrene-divinylbenzene copolymer) also are used under reversed phase conditions.Carbonaceous adsorption media, such as the Carbon-GCB materials,consist of graphitic, nonporous carbon that has a high attraction for organic polar and nonpolar compounds from both polar and nonpolar matrices. The carbon surface is comprised of atoms in hexagonal ring structures, interconnected and layered in graphitic sheets. The hexagonal ring structure demonstrates a strong selectivity for planar aromatic or hexagonal ring-shaped molecules and hydrocarbon chains with potential for multiple surface contact points. Retention of analytes is based primarily on the analyte's structure (size and shape), rather than on interactions of functional groups on the analyte with the sorbent surface. Elution is performed with mid- to nonpolar solvents. The unique structure and selectivity of Carbon-GCB materials, compared to bonded alkyl-silicas, makes them an excellent alternative when the bonded silicas will not work for an application.PSA is a styrene/divinylbenzene material that is used for retaining hydrophobic compounds which contain some hydrophilic functionality, especially aromatics.

Phenols are sometimes difficult to retain on C18-modified silica under reversed phase conditions, mainly due to their greater solubility in water than in organic matrices. The PSA material has been shown to retain phenols well under reversed phase conditions. Elution steps can be done with mid- to nonpolar solvents, because the polymeric packing is stable in almost all matrices.

Normal Phase SPE

Normal phase SPE procedures typically involve a polar analyte, a mid- to nonpolar matrix (e.g. acetone, chlorinated solvents, and hexane), and a polar stationary phase. Polar-functionalized bonded silicas (e.g. CN, NH_2, and Diol), and polar adsorption media (e.g. Si, Florisil, and

Alumina) typically are used under normal phase conditions. Retention of an analyte under normal phase conditions is primarily due to interactions between polar functional groups of the analyte and polar groups on the sorbent surface. These include hydrogen bonding, pi-pi interactions, dipole-dipole interactions, and dipole-induced dipole interactions, among others. A compound adsorbed by these mechanisms is eluted by passing a solvent that disrupts the binding mechanism — usually a solvent that is more polar than the sample's original matrix.

The bonded silicas (e.g. CN, NH2, and Diol) have short alkyl chains with polar functional groups bonded to the surface.These silicas are much more hydrophilic relative to the bonded reversed phase silicas, because of their polar functional groups. As with typical normal phase silicas, these packings can be used to adsorb polar compounds from nonpolar matrices. Such SPE tubes have been used to adsorb and selectively elute compounds of very similar structure (e.g. isomers), or complex mixtures or classes of compounds such as drugs and lipids. These materials also can be used under reversed phase conditions (with aqueous samples), to exploit the hydrophobic properties of the small alkyl chains in the bonded functional groups. The Si material is underivatized silica commonly used as the backbone of all of the bonded phases. This silica is extremely hydrophilic, and must be kept dry. All samples used with this material must be relatively water-free. The functional groups that are involved in the adsorption of compounds from nonpolar matrices are the free hydroxyl groups on the surface of the silica particles. Si may be used to adsorb polar compounds from nonpolar matrices with subsequent elution of the compounds in an organic solvent that is more polar than the original sample matrix. In most cases, LC-Si is used as an adsorption media, where an organic extract is applied to the silica bed, the analyte of interest passes through unretained, and the unwanted compounds adsorb onto the silica and are discarded. This procedure is usually called sample cleanup.

Florisil SPE tubes are packed with a magnesium silicate that is used typically for sample cleanup of organic extracts. This highly polar material strongly adsorbs polar compounds from nonpolar matrices. There's a Florisil SPE tubes are made with either Teflon® or stainless steel frits, a configuration necessary for environmental procedures specified in US EPA methods. This Florisil SPE tubes is specifically tested for low backgrounds via GC analysis.

Alumina SPE tubes are also used in adsorption/sample cleanup-type procedures. The aluminum oxide materials can either be of acidic (Alumina-A, pH ~4.5), basic (Alumina-B, pH~9.5), or neutral (Alumina-N, pH ~7.5) pH, and are classified as having Brockmann Activities of I. The activity level of the alumina may be altered from grade I through grade IV with the controlled addition of water, prior to or after packing this material into tubes.

Ion Exchange SPE

Ion exchange SPE can be used for compounds that are charged when in a solution (usually aqueous, but sometimes organic).Anionic (negatively charged) compounds can be isolated onSAX or NH_2 bonded silica cartridges. Cationic (positively charged) compounds are isolated by using SCX or WCX bonded silica cartridges. The primary retention mechanism of the compound is based mainly on the electrostatic attraction of the charged functional group on the compound to the charged group that is bonded to the silica surface. In order for a compound to retain by ion exchange from an aqueous solution, the pH of the sample matrix must be one at which both the compound of interest and the functional group on the bonded silica are charged. Also, there should be few, if any, other species of the same charge as the compound in the matrix that may interfere with the adsorption of the compound of interest. A solution having a pH that neutralizes either the compound's functional group or the functional group on the sorbent surface is used to elute the compound of interest. When one of these functional groups is neutralized, the electrostatic force that binds the two together is disrupted and the compound is eluted. Alternatively, a solution that has a high ionic strength, or that contains an ionic species that displaces the adsorbed compound, is used to elute the compound.

Anion Exchange SPE: The SAX material is comprised of an aliphatic quaternary amine group that is bonded to the silica surface. A quaternary amine is a strong base and exists as a positively-charged cation that exchanges or attracts anionic species in the contacting solution — thus the term strong anion exchanger (SAX). The pKa of a quaternary amine is very high (greater than 14), which makes the bonded functional group charged at all pHs when in an aqueous solution. As a result, SAX is used to isolate strong anionic (very low pKa, <1) or weak anionic (moderately low pKa,>2) compounds, as long as the pH of the sample is one at which the compound of interest is charged. For an anionic (acidic) compound of interest, the pH of the matrix must be 2 pH units above its pKa for it to be charged. In most cases, the compounds of interest are strong or weak acids. Because it binds so strongly, SAX is used to extract strong anions only when recovery or elution of the strong anion is not desired (the compound is isolated and discarded). Weak anions can be isolated and eluted from SAX because they can be either displaced by an alternative anion or eluted with an acidic solution at a pH that neutralizes the weak anion (2 pH units below its pKa). If recovery of a strongly anionic species is desired, use NH_2.The NH_2 SPE material that is used for normal phase separations is also considered to be a weak anion exchanger (WAX) when used with aqueous solutions. The NH_2 material has an aliphatic aminopropyl group bonded to the silica surface. The pKa of this primary amine functional group is around 9.8. For it to be used as an anion exchanger, the sample must be applied at a pH at least 2 units below 9.8. The pH must also be at a value where the anionic compound of interest is also charged (2 pH units above its own pKa). NH_2 is used to isolate and recover both strong and weak anions because the amine functional group on the silica surface can be neutralized (2 pH units above its pKa) in order to elute the strong or weak anion. Weak anions also can be eluted from LC-NH_2 with a solution that neutralizes the adsorbed anion (2 pH units below its pKa), or by adding a different anion that displaces the analyte.

Cation Exchange: The SCX material contains silica with aliphatic sulfonic acid groups that are bonded to the surface. The sulfonic acid group is strongly acidic (pKa <1), and attracts or exchanges cationic species in a contacting solution – thus the term strong cation exchanger (SCX). The bonded functional group is charged over the whole pH range, and therefore can be used to isolate strong cationic (very high pKa, >14) or weak cationic (moderately high pKa, <12) compounds, as long as the pH of the solution is one at which the compound of interest is charged. For a cationic (basic) compound of interest, the pH of the matrix must be 2 pH units below its pKa for it to be charged. In most cases, the compounds of interest are strong or weak bases. SCX SPE tubes should be used to isolate strong cations only when their recovery or elution is not desired. Weak cations can be isolated and eluted from SCX; elution is done with a solution at 2 pH units above the cation's pKa (neutralizing the analyte), or by adding a different cation that displaces the analyte. If recovery of a strongly cationic species is desired, use WCX. The

WCX SPE material contains an aliphatic carboxylic acid group that is bonded to the silica surface. The carboxylic acid group is a weak anion, and is thus considered a weak cation exchanger (WCX). The carboxylic acid functional group in WCX has a pKa of about 4.8, will be negatively charged in solutions of at least 2 pH units above this value, and will isolate cations if the pH is one at which they are both charged. WCX can be used to isolate and recover both strong and weak cations because the carboxylic acid functional group on the silica surface can be neutralized (2 pH units below its pKa) in order to elute the strong or weak cation. Weak cations also can be eluted from WCX with a solution that neutralizes the adsorbed cation(2 pH units above its pKa), or by adding a different cation that displaces the analyte. In many cases, the analyte in ion exchange SPE is eluted in an aqueous solution. If you must use an acidic or basic solution to elute an analyte from an SPE tube, but the extracted sample must be analyzed in an organic solvent that is not miscible with water, try to elute the compound with acidic methanol (98% methanol/2% concentrated HCl) or basic methanol (98% methanol/2%NH4OH). The methanol can be evaporated quickly, and the sample may be reconstituted in a different solvent. If you need a stronger (more nonpolar) solvent to elute the analyte from the SPE tube, add methylene chloride, hexane, or ethyl acetate to the acidic or basic methanol.

Secondary Interactions

The primary retention mechanisms for compounds on the SPE materials are described above. For the bonded silicas, it is possible that secondary interactions will occur. For reversed phase bonded silicas, the primary retention mechanism involves nonpolar interactions. However, because of the silica particle backbone, some polar secondary interactions with residual silanols — such as those described for normal phase SPE – could occur. If a nonpolar solvent does not efficiently elute a compound from a reversed phase SPE packing, the addition of a more polar solvent (e.g. methanol) may be necessary to disrupt any polar interactions that retain the compound. In these cases, methanol can hydrogen-bond with the hydroxyl groups on the silica surface, thus breaking up any hydrogen bonding that the analyte may be incurring. The silanol group at the surface of the silica, Si-OH, can also be acidic, and may exist as an Si-O- group above pH 4. As a result, the silica backbone may also have cation exchange secondary interactions, attracting cationic or basic analytes of interest. In this case, a pH adjustment of the elution solvent may be necessary to disrupt these interactions for elution (acidic to neutralize the silanol group, or basic to neutralize the basic analyte). This can be done by using acidic methanol (98% MeOH:2% concentrated HCl) or basic methanol (98% MeOH:2% concentrated NH4OH), or by mixtures of these with a more nonpolar, methanol-miscible solvent. Normal phase bonded silicas will exhibit primary polar retention mechanisms via the bonded functional group, but also can have some secondary nonpolar interactions of the analyte with the small alkyl chain that supports the functional group. In this case, a more nonpolar solvent, or a mix of polar and nonpolar solvents, may be needed for elution. As with the reversed phase silicas, secondary polar or cation exchange interactions of the adsorbed compound may occur with the silica backbone. Ion exchange bonded silicas can provide secondary nonpolar interactions of analytes with the nonpolar portions of their functional groups, as well as polar and cation exchange interactions of the analyte with the silica backbone. A delicate balance of pH, ionic strength, and organic content may be necessary for elution of the analyte of interest from these packings.

The Role of pH in SPE

Solutions used in SPE procedures have a very broad pH range. Silica-based packings, such as those used in HPLC columns, usually have a stable pH range of 2 to 7.5. At pH levels above and below this range, the bonded phase can be hydrolyzed and cleaved off the silica surface, or the silica itself can dissolve. In SPE, however, the solutions usually are in contact with the sorbent for short periods of time. The fact that SPE cartridges are disposable, and are meant to be used only once, allows one to use any pH to optimize retention or elution of analytes. If stability of the SPE cartridge at an extreme pH is crucial, polymeric or carbonbased SPE materials such as PSA or Carbon-GCB may be used. These materials are stable over the pH range of 1-14.

For reversed phase SPE procedures on bonded silicas, if trapping the analyte in the tube is desired, the pH of the conditioning solution and sample (if mostly or entirely aqueous) should be adjusted for optimum analyte retention. If the compound of interest is acidic or basic you should, in most cases, use a pH at which the compound is not charged. Retention of neutral compounds (no acidic or basic functional groups) usually is not affected by pH. Conversely, you can use a pH at which the unwanted compounds in the sample are retained on the SPE packing, but the analyte of interest passes through unretained. Secondary hydrophilic and cation exchange interactions of the analyte can be used for retention at a proper pH. (For more detail, see Secondary Interactions).For adsorption media (e.g. Carbon-GCB and PSA) that are used under reversed phase conditions, a pH should be chosen to maximize retention of analytes on the sorbent as with reversed phase bonded silicas. Elution is usually done with an organic solvent, so pH is usually not a factor at this point. Surprisingly, phenols retain better on PSA when applied in solutions at a neutral pH, where phenols can be charged, than at an acidic pH levels where they are neutral. This shows that adsorption media may have different selectivities than the bonded silicas for certain compounds, and that a range of pH levels of the sample and conditioning solutions should be investigated when using these materials. In normal phase SPE procedures on bonded silicas or adsorption media, pH is usually not an issue, because the solvents used in these processes are typically nonpolar organic solvents, rather than water. Retention in ion exchange SPE procedures depends heavily on the pH of the sample and the conditioning solutions. For retention of the analyte, the pH of the sample must be one at which the analyte and the functional groups on the silica surface are charged oppositely.

SPE Pattern

SPE has two patterns as following:

1.Sample Concentration: The content of analytes of interest is low, they are retained when the sample passes through the solid phase packing, collect the adsorbed compounds of interest through elution then do test.

2.Sample Cleanup: Only impurities or disturbing substances are retained on the SPE packing but the compounds of interest are not adsorpted in the packing.

2.Select SPE Phase Types and Bed Weight

SPE Phase Types

Reversed Phase (Hydrophobic)		
LC-C18	octadecyl bonded, endcapped silica	High acid and alkali resistance, and have high capacity for non-polar compounds. For reversed phase extraction of nonpolar to moderately polar compounds, such as antibiotics, barbiturates, benzodiazepines, caffeine, drugs, dyes, essential oils, fat soluble vitamins, fungicides, herbicides, pesticides, hydrocarbons, parabens, phenols, phthalate esters, steroids, surfactants, theophylline, and water soluble vitamins.
HC-C18	octadecyl bonded, endcapped silica	Higher carbon content, and higher hydrophobicity, can greatly increase capacity and recovery, 17% carbon content can resist extreme pH conditions. For reversed phase extraction of nonpolar to moderately polar compounds, such as antibiotics, caffeine, drugs,dyes, essential oils, fat soluble vitamins, fungicides, herbicides, pesticides, PNAs, hydrocarbons, parabens, phenols, phthalate esters, steroids, surfactants, water soluble vitamins.
C8	octyl bonded, endcapped silica	High acid and alkali resistance, and have high capacity for non-polar compounds. For reversed phase extraction of nonpolar to moderately polar compounds, such as barbiturates, benzodiazepines, caffeine, drugs, dyes, essential oils,fat soluble vitamins, fungicides, herbicides, pesticides, hydrocarbons, parabens, phenols, phthalate esters, steroids, surfactants, theophylline, and water soluble vitamins.
PHE	phenyl bonded silica	Slightly less retention than C18 or C8 material. For reversed phase extraction of nonpolar to moderately polar compounds, especially aromatic compounds.
Normal Phase(Hydrophilic)		
CN	cyanopropyl bonded, endcapped silica	For reversed phase extraction of moderately polar compounds, normal phase extraction of polar compounds, such as aflatoxins, antibiotics, dyes, herbicides, pesticides, phenols, steroids. Weak cation exchange for carbohydrates and cationic compounds.
Diol	diol bonded silica	For normal phase extraction of polar compounds.
NH_2	aminopropyl bonded silica	For normal phase extraction of polar compounds, weak anion exchange for carbohydrates, weak anions, and organic acids.
Ion Exchange（Anion and Cation）		
PSA	ethylenediamine-N-propyl, polymerically bonded	For normal and anion exchange, similar to aminopropyl SPE phases (NH_2) in terms of selectivity, but has a much higher capacity. Suitable for removing fatty acids, organic acids, and some polar pigments and sugars.
SAX	quaternary amine bonded silica	For strong anion exchange of anions, organic acids, nucleic acids, nucleotides, and surfactants.
MAX	polymerically bonded quaternary amine	For reversed and anion exchange of acidic compounds and their products.
WCX	carboxylic acid bonded silica	For weak cation exchange of cations, amines, antibiotics, drugs, amino acids, catecholamines, nucleic acid bases, nucleosides, and surfactants.
PRS	propanesulfonic acid	For caution exchange of for pyridine, cationic, antibiotics, drugs, organic bases, amino acids, catecholamines, herbicides, nucleic acid bases, nucleosides, and surfactants.
SCX	benzene sulfonic acid bonded silica	For strong cation exchange for cations, antibiotics, drugs, organic bases, amino acids, catecholamines, herbicides, nucleic acid bases, nucleosides, and surfactants.
MCX	polymerically bonded benzene sulfonic acid	For reversed and caution exchange of alkaline compounds and their products.
Adsorption（Multifunction）		
Carbon-GCB	graphitized carbon black	For adsorption extraction of polar and nonpolar compounds, especially the separation or removing of pigments (such as chlorophyll and carotenoids), sterols, phenol, p-chloroaniline, organochlorine pesticides, carbamate, triazine herbicides in various media.
Florisil	magnesium silicate	For adsorption extraction of polar compounds, such as alcohols, aldehydes, amines, drugs, dyes, herbicides, pesticides, PCBs, ketones, nitro compounds, organic acids, phenols, and steroids.
Alumina-A	acidic Alumina	For anion exchange and adsorption extraction of polar compounds, such as vitamins.
Alumina-N	neutral Alumina	For adsorption extraction of polar compounds. With pH adjustment, cation or anion exchange. For extraction of vitamins, antibiotics, essential oils, enzymes,glycosides, and hormones.
Alumina-B	basic Alumina	For adsorption extraction of polar compounds, and cation exchange.
Silica	silica gel with no bonded phase	For extraction of polar compounds, such as alcohols, aldehydes, amines, drugs, dyes,herbicides, pesticides, ketones, nitro compounds, organic acids, phenols, and steroids.
PSD	styrene-divinylbenzene copolymer	For extraction of polar aromatic compounds such as phenols from aqueous samples. Also for adsorption extraction of nonpolar to midpolar aromatic compounds.
HLB	modified styrene-divinylbenzene copolymer	For extraction of hydrophilic and hydrophobic compound, While retaining polar compounds such as polychlorinated phenols phosphate, and drugs and other non-polar compounds.

Comparison Table of Common SPE column brands

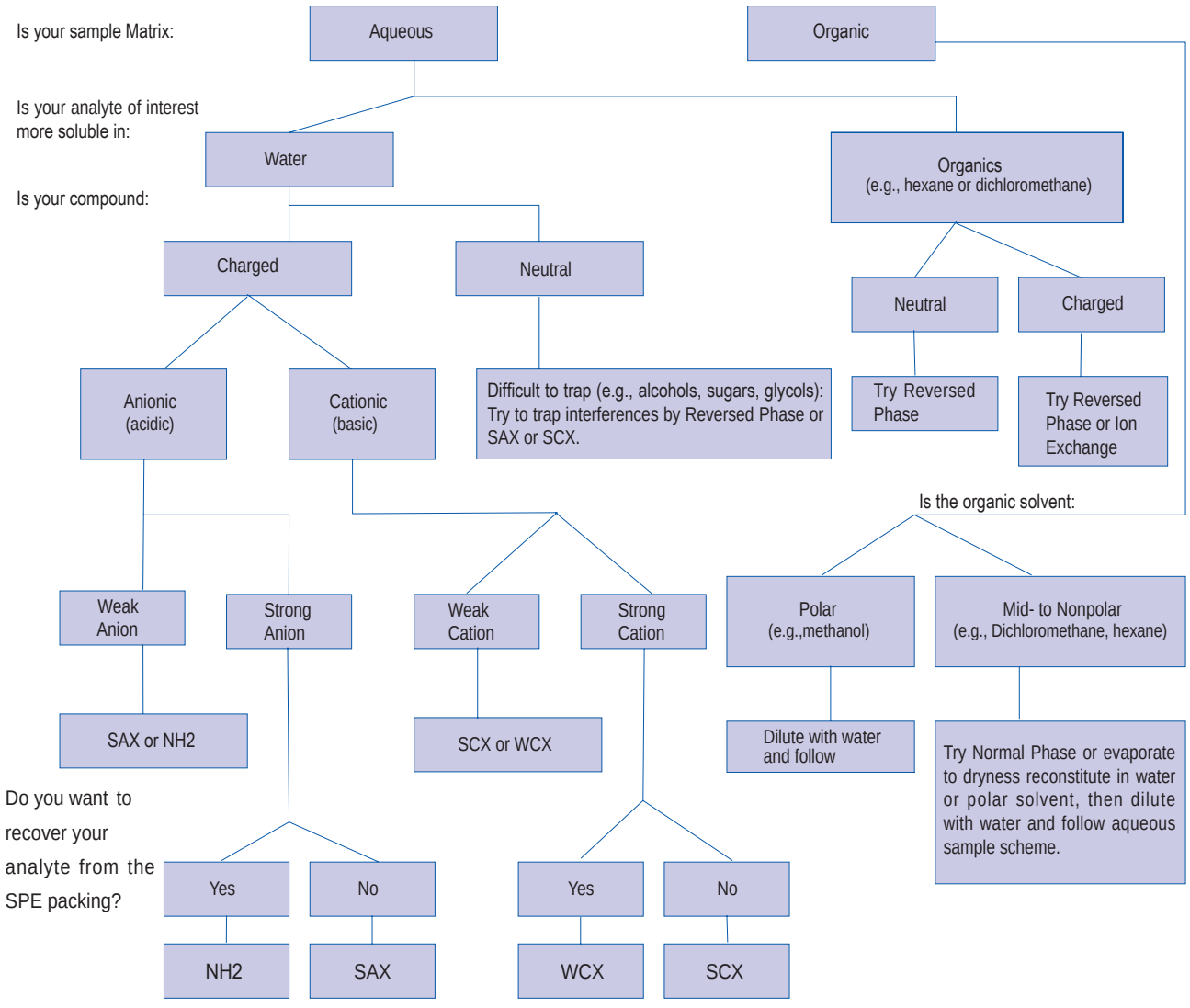
Functional groups	CNW	Waters	Phenomenex	Supelco	Agilent (varian)
Si（Silicon）	CNWBOND Si	Sep-pak Silica	Strata Si-1	DSC-Si,LC-Si	Bond Elut SI
Florisil	CNWBOND Florisil		Strata Florisil	LC and ENVI Florisil	
	CNWBOND Florisil PR	Sep-pak Florisil	Strata Florisil-PR		Bond Elut Florisil
Alumina-A	CNWBOND Alumina-A	Sep-pak Alumina A		LC-Alumina A	Bond Elut AL-A
Alumina-N	CNWBOND Alumina-N	Sep-pak Alumina N		LC-Alumina N	Bond Elut AL-N
Alumina-B	CNWBOND Alumina-B	Sep-pak Alumina B		LC-Alumina B	Bond Elut AL-B
GCB（Graphitized Carbon Black）	CNWBOND Carbon-GCB			ENVI-Carb	Bond Elut Carbon
GCB/NH_2	CNWBOND GCB/NH_2			ENVICarb-II/NH_2	Bond Elut Carbon/NH_2
GCB/PSA	CNWBOND GCB/PSA			ENVICarb-II/PSA	

Functional groups	CNW	Waters	Phenomenex	Supelco	Agilent (varian)
C2	Cnwbond C2-ne	Sep-Pak tC2			Bond Elut C2
C4	Cnwbond C4			LC-4	
	Cnwbond C4-ne				
C8	Cnwbond c8	Sep-Pak C8	Strata C8	DSC-8,Envi-8,LC-8	Bond Elut C8
	Cnwbond c8-ne				
C18	Cnwbond LC-C18	Sep-Pak C18	Strata C18-U	LC-18	Bond Elut C18 OH
	Cnwbond HC-C18	Sep-Pak tC18	Strata C18-E	ENVI-18,DSC-18	Bond Elut C18
CH（Cyclohexane）	Cnwbond CYH				Bond Elut CH
Ph （Phenyl）	Cnwbond PHE		Strata Phenyl	DSC-Ph,LC-Ph	Bond Elut PH
CN（Cyanopropyl）	Cnwbond CN	Sep-Pak CN	Strata CN	DSC-CN,LC-CN	Bond Elut CN-U
Diol	Cnwbond diol	Sep-Pak Diol		DSC-Diol，LC-Diol	Bond Elut 2OH
NH2（Aminopropyl）	Cnwbond NH2	Sep-Pak Amino Propyl	Strata NH2	DSC-NH2，LC-NH	Bond Elut NH2
	Cnwbond NH2-ne				
PSA（Ethylenediamine-N-propyl）	Cnwbond PSA				Bond Elut PSA
CBA（Weak Cation Exchange）	Cnwbond WCX				Bond Elut CBA
SAX（Strong Anion Exchange）	Cnwbond SAX	Accell Plus QMA	Strata SAX	DSC-SAX,LC-SAX	Bond Elut SAX
SCX（Strong Cation Exchange）	Cnwbond SCX	Accell Plus CM		DSC-SCX,LC-SCX	Bond Elut SCX
PRS（Propanesulfonic Acid）	Cnwbond PRS				Bond Elut PRS
PS-DVB（Styrene-divinylbenzene）	poly-sery PSD		Strata SDB-L	Envi-Chrom P	Bond Elut ENV/LMS
PS-DVB-NVP NVP（Vinyl Pyrrolidone）	poly-sery HLB	Oasis HLB	Strata X		Bond Elut Plexa
PS-DVB-NVP/ Sulfonic Acid	poly-sery MCX	Oasis MCX	Strata XC		Bond Elut Plexa PCX
PS-DVB-NVP/ Quaternary Ammonium Salts	poly-sery MAX	Oasis MAX			Bond Elut Plexa PAX
Phthalazinone Cyclohexane	poly-sery PWAX	Oasis WAX			

Packings Selection Guide

You can select directly if the sample is liquid, while you should extract the sample by solvent if the sample is solid, then take the extract as sample matrix to select refer to this table.

Sample Characteristics Determine Your SPE Procedure:



3、Select Solvents

Commonly used solvents procedures for SPE tubes

	Normal Phase	Reverse Phase	Ion Exchange	
Packing Type	Silica,Florisil,NH_2,CN,Diol	Silica C18,C8,C4,NH_2, CN,PHE,PSD,HLB	Anion Exchange	Cation Exchange
Packing Polarity	Strong	Weak	Strong	
Sample Matrix	Organic Solvent	Organic Solvent, Water Solution(Buffer)	Organic Solvent, Water Solution (Buffer)	
Analyte of Interest	Mid-polar, Neutral	Non-polar, Neutral	Acidic	Basic
Condition the Packing	Organic Extract Solvent or Methanol	Water-Organic Mixed Solvent ex. Methanol	Water-Organic Mixed Solvent ex.Methanol or Water Solution	
Add the Sample	Dissolve the Sample in Weak-Polar Organic Solvent ex. Methyl cyanide, Methylbenzene, Dichloromethane	Dissolve the Sample in Strong-Polar Organic Solvent ex. Methanol/Water, Methyl cyanide/ Water	Dissolve the Sample in Strong-Polar Organic Solvent ex. Water, Buffer	
Wash the Packing	Non-polar Solvent(5% Polar Solvent can be considered to add)	Water Solution /Buffer or Polar Solvent ex. Water/ Methanol	Water Solution(Organic Solvent can be considered to Include) ex. Water/ Methanol	
Elute the Compounds of Interest	Non-polar and Polar Mixed Solvent(5-50% Polar Solvent) ex. Hexane contain 10% Polar Solvent	Non-polar or Polar Organic Solvent(Water or Buffer can be considered to Include) ex. Methanol, Methyl cyanide	Polar Solvent(Acid or Alkalis can be considered to Include) ex. Water, Buffer	

As show in the table, three washing procedures are used correspond to different modes of compounds concentration that normal phase, reverse phase and ion exchange.

Characteristics of Solvents Commonly Used in SPE

Polarity			Solvent	Miscible in Water
Nonpolar	Strong Reversed Phase	Weak Normal Phase	Hexane	No
			Isooctane	No
			Carbon tetrachloride	No
			Chloroform	No
			Methylene chloride (dichloromethane)	No
			Tetrahydrofuran	Yes
			Diethyl ether	No
			Ethyl acetate	Poorly
			Acetone	Yes
			Acetonitrile	Yes
			Isopropanol	Yes
			Methanol	Yes
			Water	Yes
Polar	Weak Reversed Phase	Strong Normal Phase	Acetic acid	Yes

4. Selecting an SPE Tube or Disk: Size

Selecting SPE Tube Size If Your Sample Is···	Use Tube Size . . .
< 1mL	1mL
1mL to 250mL and the extraction speed is not critical	3mL
1mL to 250mL and a fast extraction procedure is required	6mL
10mL to 250mL and higher sample capacity is needed	12, 20, or 60mL
< 1 liter and extraction speed is not critical	12, 20, or 60mL
Selecting SPE Disk Size If Your Sample Is . . .	**Use Disk Size . . .**
100mL to 1 liter	47mm
>1 liter and higher sample capacity is needed	90mm

5. Selecting an SPE Tube: Bed Weight

Reversed Phase, Normal Phase,and Adsorption-Type Procedures:

The mass of the compounds to be extracted should not be more than 5% of the mass of the packing in the tube. In other words, if you are using a 100mg/1mL SPE tube, do not load more than 5mg of analytes.

Ion Exchange Procedures:

- You must consider ion exchange capacity.
- SAX and SCX tubes have ~0.2meq/gram of sorbent capacity (1 meq = 1mmole of [+1] or [-1] charged species).
- NH_2 and WCX tubes: ion exchange capacities should be determined for your own application.

STEP TWO: Condition the SPE tube packing

To condition the SPE tube packing, rinse it with up to one tube-full of solvent before extracting the sample. For disks, use a volume of 5-10mL. Reversed phase type silicas and nonpolar adsorption media usually are conditioned with a water-miscible organic solvent such as methanol, followed by water or an aqueous buffer. Methanol wets the surface of the sorbent and penetrates bonded alkyl phases, allowing water to wet the silica surface efficiently. Sometimes a pre-conditioning solvent is used before the methanol step. This solvent is usually the same as the elution solvent (see step 5), and is used to remove any impurities on the SPE tube that could interfere with the analysis, and may be soluble only in a strong elution solvent. Normal phase type SPE silicas and polar adsorption media usually are conditioned in the organic solvent in which the sample exists. Ion exchange packings that will be used for samples in nonpolar, organic solvents should be conditioned with the sample solvent. For samples in polar solvents, use a watermiscible organic solvent, then an aqueous solution with the proper pH, organic solvent content, and salt concentration. To ensure that the SPE packing does not dry between conditioning and sample addition, allow about 1mm of the last conditioning solvent to remain above the top tube frit or above the surface of the disk. If the sample is to be introduced from a reservoir or filtration tube, add an additional 0.5mL of the final conditioning solution to a 1mL SPE tube, 2mL to a 3mL tube, 4mL to a 6mL tube, and so on. This prevents the tube from drying out before the sample actually reaches the tube. If the packing dries before the sample is added, repeat the conditioning procedure. Flush buffer salts from the tube with water before reintroducing organic solvents. If appropriate, attach the sample reservoir at this time using a tube adapter.

STEP THREE: Add the Sample

Accurately transfer the sample to the tube or reservoir, using a volumetric pipette or micropipette. The sample must be in a form that is compatible with SPE. Total sample volume can range from microliters to liters (see step 1). When excessive volumes of aqueous solutions are extracted, reversed phase silica packings gradually lose the solvent layer acquired through the conditioning process. This educes extraction efficiency and sample recovery. For samples >250mL, add small amounts of water-miscible solvents (up to 10%) to maintain proper wetting of reversed phase packings. Maximum sample capacity is specific to each application and the conditions used. If recoveries are low or irreproducible, test for analyte breakthrough using the following technique: Attach two

conditioned SPE tubes of the same packing together using an adapter. Pass the sample through both tubes. When finished, detach each tube and elute it separately. If the analyte is found in the extract of the bottom tube, the sample volume is too great or bed weight is too small, resulting in analyte breakthrough. To enhance retention of appropriate compounds on the packing, and elution or precipitation of unwanted compounds, adjust the pH, salt concentration, and/or organic solvent content of the sample solution. To avoid clogging SPE tube frits or the SPE disk, pre-filter or centrifuge samples prior to extraction if possible. Slowly pass the sample solution through the extraction device, using either vacuum or positive pressure. The flow rate can affect the retention of certain compounds. Generally, the flow rate should not exceed 2mL/min for ion exchange SPE tubes, 5mL/min for other SPE tubes, and may be up to 50mL/min for disks. Dropwise flow is best, when time is not a factor. For some difficult sample matrices, additional pretreatment may be necessary. See SamplePretreatment on the next page.

STEP FOUR: Wash the Packing

If compounds of interest are retained on the packing, wash off unwanted, unretained materials using the same solution in which the sample was dissolved, or another solution that will not remove the desired compounds. Usually no more than a tube volume of wash solution is needed, or 5-10mL for SPE disks.

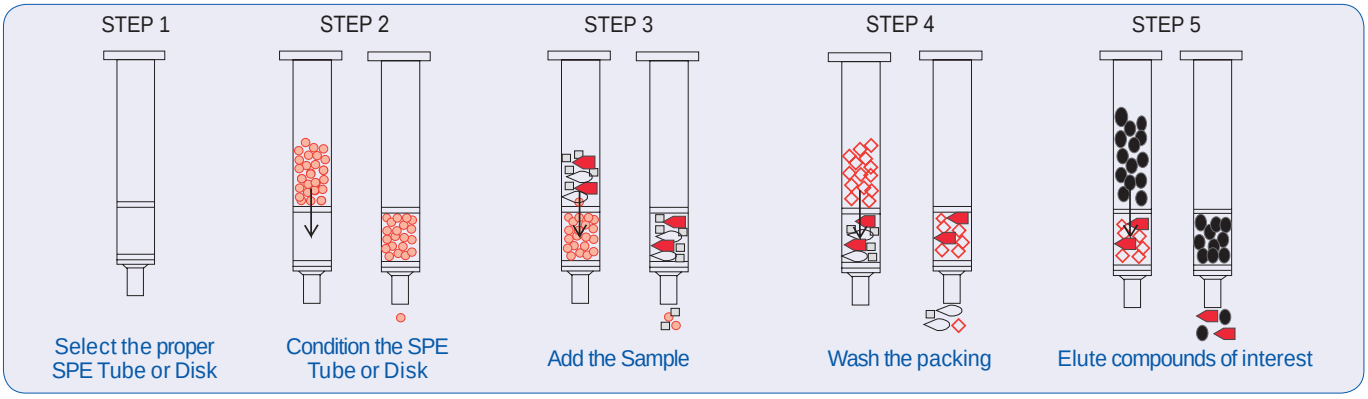
To remove unwanted, weakly retained materials, wash the packing with solutions that are stronger than the sample matrix, but weaker than needed to remove compounds of interest. A typical solution may contain less organic or inorganic salt than the final eluant. It also may be adjusted to a different pH. Pure solvents or mixtures of solvents differing sufficiently in polarity from the final eluant may be useful wash solutions. If you are using a procedure by which compounds of interest are not retained on the packing, use about one tube volume of the sample solvent to remove any residual, desired components from the tube, or 5-10mL to remove the material from a disk. This rinse serves as the elution step to complete the extraction process in this case.

STEP FIVE: Rinse the packing

Rinse the packing with a small volume (typically 200uL to 2mL depending on the tube size, or 5-10mL depending on the disk size) of a solution that removes compounds of interest, but leaves behind any impurities not removed in the wash step. Collect the eluate and further prepare as appropriate.

Two small aliquots generally elute compounds of interest more efficiently than one larger aliquot. Recovery of analytes is best when each aliquot remains in contact with the tube packing or disk for 20 seconds to 1 minute. Slow or dropwise flow rates in this step are beneficial.

Rinse the packing



Technique Service of ANPEL

SPE Method development Information Table

Analyte	
Name of Analyte	
CAS of Analyte	
Structure of Analyte（Main Function Group）	
pKa of Analyte	
Approximate Concentration of Analyte in Sample Matrix	
Which solvents is your Analyte more soluble in	
Approximate Loading Sample volume	
Maximum Concentration Pemitted	
pH Stability of Analyte	
Thermal Stability and volatility of Analyte	
Is Derivatization Needed	
Sample Matrix	
Description of Sample Matrix	
pH of Sample Matrix	
Ion Strength of Sample Matrix	
Main disturbance and other components in Sample Matrix	
Analytic Method	
Instrument（GC/GC-MS/HPLC/LC-MS)	
the Minimum Concentration of Analytes Detective	
HPLC：Column and Mobile Phase	
Gradient Elution Procedures	
Internal Standard	

ANPEL can provide technical service for method development, you can call technique service department（021-54890099-697）or fill the above table and send to techservice@anpel.com.cn, we can provide method development for your experiment.

SPE Trouble Shooting

Analyte recovery is low All or parts of analyte not retained by sorbent(If analyte and sample matrix pass through the SPE tube together)	1. SPE tubes haven’ t been pre-treated properly 2. Polarity of SPE tubes is improper 3. Analyte's affinity to sampel solvent is stronger than to SPE tubes. 4. When large volume water pass through SPE tubes, reverse phase packing lost methanol used in tubes pre-treatment 5. Load speed is too fast	1. Reverse phase tubes：Treat tubes with methanol, isopropanol or ethanol, then treat with diluted sample solvent. Caution, don’ t let the tubes become dry. 2. Select SPE packings have obvious selectivity of analyte 3. Change the polarity or pH of sample to reduce the affinity of analyte in sample. 4. Add 1%-2% methanol, isopropanol or methyl cyanide to sample solvent 5. Load sample about 1drop/s to slow ion exchage rate
Analyte recovery is low Analyte don’ t be eluted from SPE tubes	1. Improper polarity of SPE tubes 2. Elute solvent is not strong enough that can’t elute the analytes from SPE tubes 3. The volume of elute solvent is too small 4. Analytes are irreversibly adsorbed on the SPE support.The strength of support is too high (Secondary interactions is too strong 5. Elute speed is too fast	1. Select other SPE tubes have weak polarity or selectivity 2. Change pH of the elute solvent to increase the affinity of analyte in sample 3. Increase solvent volume 4. Select end-capped packings 5. Elute about 1drop/s to slow ion exchange rate
Poor Extraction Reproducibility	1.The SPE tubes have been dried before loading sample 2. Exceed the SPE tubes’ capacity 3. The speed sample pass through the tubes is too fast 4. Elute speed is too fast 5. Analytes’ solubilityin sample solvent is too big, analytes don’t retain in the packings 6. SPE tubes are treated with polar solvent, but elute solvent is incompatible non-polar solvent 7. The strength of elute solvent is too strong, and part of analytes are eluted together with impurities. The loss of analytes in this step depends on the flow speed of elute solvent,characteristics SPE and volume of elute solvent 8. The volume of elute solvent is too small	1. Pre-treat the SPE tubes again 2. Reduce sample volume or select SPE tubes have big volume 3. Slow the flow rate, especially for ion exchange, the flow rate should be less than 5mL/min 4. Let elute solvent permeate the SPE tubes before use external force. Elute with 500mL solvent twice may be better than elute with 1000mL once 5. Change polarity or pH of sample to change the analyte's solubility 6. Dry the SPE tubes before using non-polar solvent 7. Reduce the strength of elute solvent 8. Increase elute solvent volume

If low recovery or poor reproducibility appear in your experiment, or the removal of impurities is not satisfied , you can analyze the cause refer to the table above or you call technique service department（021-54890099-697）for consultation. If the packing type selection is improper, we can provide free samples for further trial.

Customization Service and Free Sample Trial of ANPEL

ANPEL can provide customization service of SPE tubes, please give the information include packing types, bed weight, and tube material and specifications to our sales representative. We'll provide proper products according to your requirement.

We can also provide free samples for your test: please fill the table below and provide experimental chromatogram and data after trial, in order to help us provide better service! Thank you for your support！

Trial Feedback Table of SPE Tubes

Trial information:

Name			
Company			
Address			
Telphone			
Mobile phone			
E-mail			
Trial date			
Do you want to Purchase after Trial	☐ Yes	☐ No(Please specify the reason):	☐ Other（Please specify）:
Remarks			

SPE Tube Information：

Cat. No.	
Description	
Packaging	
Quantity	

Trial Feedback：

Analyte				
Sample Matrix				
Sample Source(e.g. extraction or synthesis from drinks, plants, bloods)				
Main disturbance and other components in Sample Matrix				
Analytic Method（Reference Standard）				
Operation Steps		Solvent	Volume	Flow Rate
	Activation			
	Condition			
	Load the Sample			
	Wash the Packing			
	Elute the Compounds of Interest			
	After			
Instrument（GC/GC-MS/HPLC/LC-MS）				
Chromatography Condition	Column			
	GC（Temperature-Programming, Carrier Gas, etc.）/LC(Column Temperature, Mobile Phase Condition, etc.)			
	Detector（Condition）			
	Inject Volume			
Trial Effect	☐ Meet the test requirement	☐ Can't meet the test requirement:	☐ Other（Please specify）:	
Comments and Suggestions				

Appendix: Experimental Chromatogram

Experimental data

SPE Columns

Adsorption SPE Columns

CNWBOND Si (Silica)

CNWBOND Silica is the most polar sorbent presenting a slightly acidic character, it is often used to extract various compounds from non-polar solvents using hydrogen bonding, then accomplishing the elution successively with increasing the solvent polarity.

Technical parameters

Particle size	Pore size	Endcapped / Non-endcapped
40-63μm	60Å	Non-endcapped

CNWBOND Si SPE Cartridge

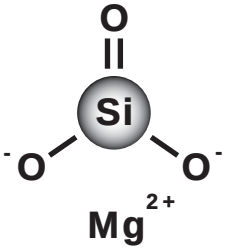
Description	Packaging	Cat. No.
50mg, 1mL	100 pcs. per box	2.CA1350.0001
100mg, 1mL	100 pcs. per box	2.CA1351.0001
200mg, 3mL	50 pcs. per box	2.CA1352.0001
500mg, 3mL	50 pcs. per box	2.CA1353.0001
500mg, 6mL	30 pcs. per box	2.CA1354.0001
1g, 6mL	30 pcs. per box	2.CA1355.0001
2g, 6mL	30 pcs. per box	2.CA1356.0001
1g, 10mL	20 pcs. per box	2.CA1357.0001
2g, 10mL	20 pcs. per box	2.CA1358.0001
10g, 60mL	16 pcs. per box	2.CA1361.0001
20g, 60mL	16 pcs. per box	2.CA1362.0001

CNWBOND Si SPE Bulk Packing

Description	Packaging	Cat. No.
40-63μm, 60Å	100 g. per box	2.CA1301.0100

CNWBOND Florisil

CNWBOND Florsil is a magnesia-loaded silica gel, which is a polar sorbent presenting slightly basic character used to extract polar to moderately polar compounds from non-polar matrices. It is utilized for the separation of chlorinated pesticides, amines, herbicides, PCBs, ketones, organic acids and phenols.



Technical parameters

Mesh	Surface area
100-200 mesh	289 m^2/g

CNWBOND Florisil SPE Cartridge

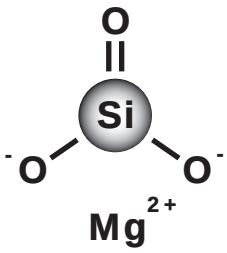
Description	Packaging	Cat. No.
50mg, 1mL	100 pcs. per box	2.CA1550.0001
100mg, 1mL	100 pcs. per box	2.CA1551.0001
200mg, 3mL	50 pcs. per box	2.CA1552.0001
500mg, 3mL	50 pcs. per box	2.CA1553.0001
500mg, 6mL	30 pcs. per box	2.CA1554.0001
1g, 6mL	30 pcs. per box	2.CA1555.0001
2g, 6mL	30 pcs. per box	2.CA1556.0001
1g, 10mL	20 pcs. per box	2.CA1557.0001
2g, 10mL	20 pcs. per box	2.CA1558.0001
10g, 60mL	16 pcs. per box	2.CA1561.0001
20g, 60mL	16 pcs. per box	2.CA1562.0001

CNWBOND Florisil SPE Bulk Packing

Description	Packaging	Cat. No.
100-200 mesh, 289 m^2/g	100 g. per box	2.CA1501.0001

CNWBOND Florisil PR

CNWBOND Florisil PR is utilized for the separation of chlorinated pesticides, amines, herbicides, PCBs, ketones, organic acids and phenols. It has bigger particle size, and is suitable for US method EPA 608.



Technical parameters

Mesh
60-100 mesh

CNWBOND Florisil SPE Cartridge

Description	Packaging	Cat. No.
50mg, 1mL	100 pcs. per box	2.CA3750.0001
100mg, 1mL	100 pcs. per box	2.CA3751.0001
200mg, 3mL	50 pcs. per box	2.CA3752.0001
500mg, 3mL	50 pcs. per box	2.CA3753.0001
500mg, 6mL	30 pcs. per box	2.CA3754.0001
1g, 6mL	30 pcs. per box	2.CA3755.0001
2g, 6mL	30 pcs. per box	2.CA3756.0001
1g, 10mL	20 pcs. per box	2.CA3757.0001
2g, 10mL	20 pcs. per box	2.CA3758.0001
10g, 60mL	16 pcs. per box	2.CA3761.0001
20g, 60mL	16 pcs. per box	2.CA3762.0001

CNWBOND Florisil PR SPE Bulk Packing

Description	Packaging	Cat. No.
60-100 mesh	100 g. per box	2.CA3701.0100

CNWBOND Alumina-A

Alumina-A has a slightly cationic nature through pretreatment with acidic solutions, so it is suitable for retention of neutral and anionic species.

Al_2O_3

Technical parameters

Mesh	pH	Activity
100-300 Mesh	pH~4.5	Brockman Act. I

Test Method of the Activity of Alumina

1 Definition of Activity

According to different water content, Alumina-N can be devided into five activity levels. Brockmann defines the alumina firing at 450°C for 12h as I class, and Ⅱ、Ⅲ、Ⅳ、V class alumina are made of I class alumina mixed with 3%、6%、10%、15% water.

2 Testing

2.1 Chromatography Column: Glass chromatography column, φ15 mm×H150 mm, put a few of cotton wool on the bottom, load alumina for 50mm height, and knocked.

2.2 Solvent: Benzene + petroleum ether.

2.3 The preparation of activity testing solution: Follow the combination mode below, take each azo dyes 20g, and use solution（B.2.2）to constant volume to 50mL, then get the mixed dye solution.

First pair (Ⅰ): azobenzene, AB and p-methoxyazobenzene, MAB；

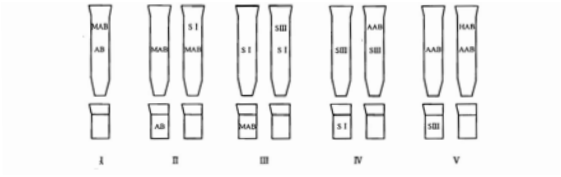
Second pair (Ⅱ): MAB and Sudan I, S I；

Third pair (III): Sudan III and S III;

Fourth pair (IV): Sudan III and p-aminoazobenzene, AAB;

Fifth pair (V): AAB and p-hydroxyazobenzene, HAB

2.4 Load 10mL each mixed dye solution to five pieces of alumina chromatography column,add 20mL solution（B.2.2）after mixed dye solution drain away. Check the migration of coloured dyes in column after all solution drain away to define the activity of alumina, as shown in the following figure. If the first pair of dye solution is completely absorbed in the column, the activity of alumina is I class. If MAB in the first pair of dye solution is absorbed in the column, but AB flow out, while two compounds in the second pair of dye solution are absorbed in the column, the activity of alumina is II class. If MAB in the second pair of dye solution flow out, while two compounds in the third pair of dye solution are absorbed in the column, the activity of alumina is III class. And so on.



CNWBOND Alumina-A SPE Cartridge

Description	Packaging	Cat. No.
50mg, 1mL	100 pcs. per box	2.CA1750.0001
100mg, 1mL	100 pcs. per box	2.CA1751.0001
200mg, 3mL	50 pcs. per box	2.CA1752.0001
500mg, 3mL	50 pcs. per box	2.CA1753.0001
500mg, 6mL	30 pcs. per box	2.CA1754.0001
1g, 6mL	30 pcs. per box	2.CA1755.0001
2g, 6mL	30 pcs. per box	2.CA1756.0001
1g, 10mL	20 pcs. per box	2.CA1757.0001
2g, 10mL	20 pcs. per box	2.CA1758.0001
10g, 60mL	16 pcs. per box	2.CA1761.0001
20g, 60mL	16 pcs. per box	2.CA1762.0001

CNWBOND Alumina-A SPE Bulk Packing

Description	Packaging	Cat. No.
100-300 Mesh, pH~4.5, Brockman Act. I	100 g. per box	2.CA1701.0100

CNWBOND Alumina-N

CNWBOND Alumina-N is an extremely polar sorbent which is similar to silica, but Alumina-N is more stable under high pH conditions than unbonded silica. It is utilized for removing aromatic species and aliphatic amines.

Al_2O_3

Technical parameters

Mesh	pH	Activity
100-300 Mesh	pH~7.0	Brockman Act. I

CNWBOND Alumina-N SPE Cartridge

Description	Packaging	Cat. No.
50mg, 1mL	100 pcs. per box	2.CA1850.0001
100mg, 1mL	100 pcs. per box	2.CA1851.0001
200mg, 3mL	50 pcs. per box	2.CA1852.0001
500mg, 3mL	50 pcs. per box	2.CA1853.0001
500mg, 6mL	30 pcs. per box	2.CA1854.0001
1g, 3mL	30 pcs. per box	2.CA1849.0001
1g, 6mL	30 pcs. per box	2.CA1855.0001
2g, 6mL	30 pcs. per box	2.CA1856.0001
1g, 10mL	20 pcs. per box	2.CA1857.0001
2g, 10mL	20 pcs. per box	2.CA1858.0001
10g, 60mL	16 pcs. per box	2.CA1861.0001
20g, 60mL	16 pcs. per box	2.CA1862.0001

CNWBOND Alumina-N SPE Bulk Packing

Description	Packaging	Cat. No.
100-300 Mesh, pH~7.0, Brockman Act.I	100 g. per box	2.CA1801.0001

CNWBOND Alumina-B

The surface of Alumina-B has a slightly anionic nature, so it is suitable for retention of neutral and cationic compounds. Strong hydrogen bonding on Alumina-B is also effective for polar cations.

Al_2O_3

Technical parameters

Mesh	pH	Activity
100-300 Mesh	pH~9.5	Brockman Act. I

CNWBOND Alumina-B SPE Cartridge

Description	Packaging	Cat. No.
50mg, 1mL	100 pcs. per box	2.CA1950.0001
100mg, 1mL	100 pcs. per box	2.CA1951.0001
200mg, 3mL	50 pcs. per box	2.CA1952.0001
500mg, 3mL	50 pcs. per box	2.CA1953.0001
1g, 3mL	30 pcs. per box	2.CA1949.0001
500mg, 6mL	30 pcs. per box	2.CA1954.0001
1g, 6mL	30 pcs. per box	2.CA1955.0001
2g, 6mL	30 pcs. per box	2.CA1956.0001
1g, 10mL	20 pcs. per box	2.CA1957.0001
2g, 10mL	20 pcs. per box	2.CA1958.0001
10g, 60mL	16 pcs. per box	2.CA1961.0001
20g, 60mL	16 pcs. per box	2.CA1962.0001

CNWBOND Alumina-B SPE Bulk Packing

Description	Packaging	Cat. No.
100-300 Mesh, pH~9.5, Brockman Act.I	100 g per box	2.CA1901.0100

CNWBOND Celite545

CNWBOND Celite545 is a filter aid, treated with sodium carbonate, calcined diatomaceous silica. It is usually prepared for chromatography and other laboratory applications.

SiO_2

Technical parameters

Particle size	pH
≤125μm	pH>8.5

CNWBOND Celite545 SPE Cartridge

Description	Packaging	Cat. No.
4g, 12mL	20 pcs. per box	2.CA4099.0001

CNWBOND Celite 545/Na_2SO_4 SPE Cartridge

Description	Packaging	Cat. No.
4g/2g, 12mL	20 pcs. per box	2.CA5489.0001

CNWBOND Celite545 SPE Bulk Packing

Description	Packaging	Cat. No.
≤125μm， pH>8.5	100 g per box	2. CA4001.0100

CNWBOND Coconut Charcoal

CNWBOND Coconut Charcoal is a activated coconut charcoal which is developed specifically for EPA Method 521 (Determination of Nitrosamines in Drinking Water) and EPA Method 522 (Determination of 1,4-Dioxane in Drinking Water)

Technical parameters

Mesh
80-120 mesh

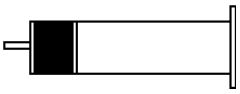
CNWBOND Coconut Charcoal SPE Cartridge

Description	Packaging	Cat. No.
2g, 6mL	30 pcs. per box	2.CA4256.0001

CNWBOND Coconut Charcoal SPE Bulk Packing

Description	Packaging	Cat. No.
80-120 mesh	100 g per box	2. CA4201.0100

CNWBOND Carbon-GCB



CNWBOND Carbon-GCB is the type of graphitized non-porous carbon, which surface comprises of hexagonal ring structures, interconnected and layered into graphitic sheets. It has extreme affinity for organic polar and non-polar compounds from both non-polar and polar matrices when used under reversed-phase conditions, while its special structure has a strong retention towards planar molecules. As its special character, it is widely utilized for replacement of C8 and C18 coated on silica when extraction for polar pesticides in water, those C8 and C18 have shown very poor efficiency of polar compounds even lower than that of technique of liquid/liquid extraction. Furthermore, non-porous nature of the carbon-GCB allows for rapid processing because of adsorption does not require analyte dispersion into solid phase pores. Its typical application includes isolation/removal of pigments, sterols, phenols, chloroanilines, organochlorine pesticides, Carbamates, Triazine, Herbicides and Chloroanilines from various matrices like ground water, fruits and vegetables etc.

Technical parameters

Mesh	surface area
120-400 mesh	100 m^2/g

CNWBOND Carbon-GCB SPE Cartridge

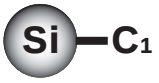
Description	Packaging	Cat. No.
50mg, 1mL	100 pcs. per box	2.CA1650.0001
100mg, 1mL	100 pcs. per box	2.CA1651.0001
250mg, 3mL	50 pcs. per box	2.CA1663.0001
250mg, 6mL	30 pcs. per box	2.CA1664.0001
500mg, 6mL	30 pcs. per box	2.CA1654.0001
1g, 10mL	20 pcs. per box	2.CA1657.0001
2g, 10mL	20 pcs. per box	2.CA1658.0001
10g, 60mL	16 pcs. per box	2.CA1661.0001
20g, 60mL	16 pcs. per box	2.CA1662.0001

CNWBOND Carbon-GCB SPE Bulk Packing

Description	Packaging	Cat. No.
120-400 mesh, 100 m^2/g	50 g per box	2. CA1600.0050

Reverse phase SPE Columns

CNWBOND C1



CNWBOND C1 has the lowest hydrophobicity of all alkyl group bonded phases. Due to the single carbon functional group, the sorbent is useful in the separation of large biomolecules that have extensive hydrophobic regions, and polar compounds that are easier to be retained and eluted.

Technical parameters

Particle Size	Mean Pore Size	Carbon Loading	Endcapped/ Non- endcapped
40-63μm	60Å	5%	Endcapped

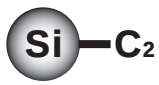
CNWBOND C1 SPE Cartridge

Description	Packaging	Cat. No.
50mg, 1mL	100 pcs. per box	2.CA0150.0001
100mg, 1mL	100 pcs. per box	2.CA0151.0001
200mg, 3mL	50 pcs. per box	2.CA0152.0001
500mg, 3mL	50 pcs. per box	2.CA0153.0001
500mg, 6mL	30 pcs. per box	2.CA0154.0001
1g, 6mL	30 pcs. per box	2.CA0155.0001
2g, 6mL	30 pcs. per box	2.CA0156.0001
1g, 10mL	20 pcs. per box	2.CA0157.0001
2g, 10mL	20 pcs. per box	2.CA0158.0001
10g, 60mL	16 pcs. per box	2.CA0161.0001
20g, 60mL	16 pcs. per box	2.CA0162.0001

CNWBOND C1 SPE Bulk Packing

Description	Packaging	Cat. No.
40-63μm, 60Å	100 g. per box	2.CA0101.0100

CNWBOND C2-ne



CNWBOND C2-ne is a non-polar sorbent with low hydrophobicity which can be used to replace C18 and C8 when compounds are retained too strongly on the C18 and C8. It is popular for the extraction of drugs from plasma and serum.

Technical parameters

Particle Size	Mean Pore Size	Carbon Loading	Endcapped/Non-endcapped
40-63μm	60Å	6%	Non- endcapped

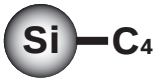
CNWBOND C2-ne SPE Cartridge

Description	Packaging	Cat. No.
50mg, 1mL	100 pcs. per box	2.CA0250.0001
100mg, 1mL	100 pcs. per box	2.CA0251.0001
200mg, 3mL	50 pcs. per box	2.CA0252.0001
500mg, 3mL	50 pcs. per box	2.CA0253.0001
500mg, 6mL	30 pcs. per box	2.CA0254.0001
1g, 6mL	30 pcs. per box	2.CA0255.0001
2g, 6mL	30 pcs. per box	2.CA0256.0001
1g, 10mL	20 pcs. per box	2.CA0257.0001
2g, 10mL	20 pcs. per box	2.CA0258.0001
10g, 60mL	16 pcs. per box	2.CA0261.0001
20g, 60mL	16 pcs. per box	2.CA0262.0001

CNWBOND C2-ne SPE Bulk Packing

Description	Packaging	Cat. No.
40-63μm, 60Å	100 g. per box	2.CA0201.0100

CNWBOND C4



CNWBOND C4 has moderate hydrophobicity which is used to extract large biomolecules like proteins/peptides in aqueous samples. It works best for molecules with a large hydrophilic region or in case where the hydrophobic region is buried with the 3D structure.

Technical parameters

Particle Size	Mean Pore Size	Carbon Loading	Endcapped/ Non- endcapped
40-63μm	60Å	8%	Endcapped

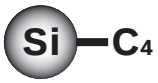
CNWBOND C4 SPE Cartridge

Description	Packaging	Cat. No.
50mg, 1mL	100 pcs. per box	2.CA0350.0001
100mg, 1mL	100 pcs. per box	2.CA0351.0001
200mg, 3mL	50 pcs. per box	2.CA0352.0001
500mg, 3mL	50 pcs. per box	2.CA0353.0001
500mg, 6mL	30 pcs. per box	2.CA0354.0001
1g, 6mL	30 pcs. per box	2.CA0355.0001
2g, 6mL	30 pcs. per box	2.CA0356.0001
1g, 10mL	20 pcs. per box	2.CA0357.0001
2g, 10mL	20 pcs. per box	2.CA0358.0001
10g, 60mL	16 pcs. per box	2.CA0361.0001
20g, 60mL	16 pcs. per box	2.CA0362.0001

CNWBOND C4 SPE Bulk Packing

Description	Packaging	Cat. No.
40-63μm, 60Å	100 g. per box	2.CA0301.0100

CNWBOND C4-ne



Due to shorter alkyl chains and non-endcapped the silica surface is not completely shielded, CNWBOND C4-ne is similar to C4 but more polar so as to enhance retention of basic and polar compounds.

Technical parameters

Particle Size	Mean Pore Size	Carbon Loading	Endcapped/ Non- endcapped
40-63μm	60Å	8%	Non- endcapped

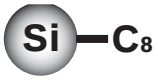
CNWBOND C4-ne SPE Cartridge

Description	Packaging	Cat. No.
50mg, 1mL	100 pcs. per box	2.CA0450.0001
100mg, 1mL	100 pcs. per box	2.CA0451.0001
200mg, 3mL	50 pcs. per box	2.CA0452.0001
500mg, 3mL	50 pcs. per box	2.CA0453.0001
500mg, 6mL	30 pcs. per box	2.CA0454.0001
1g, 6mL	30 pcs. per box	2.CA0455.0001
2g, 6mL	30 pcs. per box	2.CA0456.0001
1g, 10mL	20 pcs. per box	2.CA0457.0001
2g, 10mL	20 pcs. per box	2.CA0458.0001
10g, 60mL	16 pcs. per box	2.CA0461.0001
20g, 60mL	16 pcs. per box	2.CA0462.0001

CNWBOND C4-ne SPE Bulk Packing

Description	Packaging	Cat. No.
40-63μm, 60Å	100 g. per box	2.CA0401.0100

CNWBOND C8



CNWBOND C8 has moderate hydrophobicity that works well for separating a wide range of compounds and to be used instead of C18 when too strongly retention on C18. The C8 is widely utilized in the simultaneous extraction of fat- and water-soluble vitamins from human serum and herbicides, fungicides, pesticides from waste material.

Technical parameters

Particle Size	Mean Pore Size	Carbon Loading	Endcapped/ Non- endcapped
40-63μm	60Å	12%	Endcapped

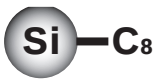
CNWBOND C8 SPE Cartridge

Description	Packaging	Cat. No.
50mg, 1mL	100 pcs. per box	2.CA0550.0001
100mg, 1mL	100 pcs. per box	2.CA0551.0001
200mg, 3mL	50 pcs. per box	2.CA0552.0001
500mg, 3mL	50 pcs. per box	2.CA0553.0001
500mg, 6mL	30 pcs. per box	2.CA0554.0001
1g, 6mL	30 pcs. per box	2.CA0555.0001
2g, 6mL	30 pcs. per box	2.CA0556.0001
1g, 10mL	20 pcs. per box	2.CA0557.0001
2g, 10mL	20 pcs. per box	2.CA0558.0001
10g, 60mL	16 pcs. per box	2.CA0561.0001
20g, 60mL	16 pcs. per box	2.CA0562.0001

CNWBOND C8 SPE Bulk Packing

Description	Packaging	Cat. No.
40-63μm, 60Å	100 g. per box	2.CA0501.0100

CNWBOND C8-ne



CNWBOND C8-ne is similar to C8 but is non-endcapped, which has enhanced retention of more polar and basic compounds at the same time.

Technical parameters

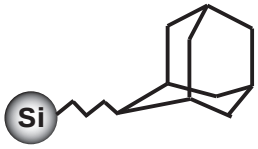
Particle Size	Mean Pore Size	Carbon Loading	Endcapped/ Non- endcapped
40-63μm	60Å	12%	Non- endcapped

CNWBOND C8-ne SPE Cartridge

Description	Packaging	Cat. No.
50mg, 1mL	100 pcs. per box	2.CA0650.0001
100mg, 1mL	100 pcs. per box	2.CA0651.0001
200mg, 3mL	50 pcs. per box	2.CA0652.0001
500mg, 3mL	50 pcs. per box	2.CA0653.0001
500mg, 6mL	30 pcs. per box	2.CA0654.0001
1g, 6mL	30 pcs. per box	2.CA0655.0001
2g, 6mL	30 pcs. per box	2.CA0656.0001
1g, 10mL	20 pcs. per box	2.CA0657.0001
2g, 10mL	20 pcs. per box	2.CA0658.0001
10g, 60mL	16 pcs. per box	2.CA0661.0001
20g, 60mL	16 pcs. per box	2.CA0662.0001

CNWBOND C8-ne SPE Bulk Packing

Description	Packaging	Cat. No.
40-63μm, 60Å	100 g. per box	2.CA0601.0000



CNWBOND C12

CNWBOND C12 has a polarity similar to C18 with additional steric bulk to provide additional separation characteristics.

Technical parameters

Particle Size	Mean Pore Size	Carbon Loading	Endcapped/Non-endcapped
40-63μm	60Å	16%	Endcapped

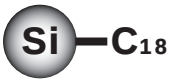
CNWBOND C12 SPE Cartridge

Description	Packaging	Cat. No.
50mg, 1mL	100 pcs. per box	2.CA0750.0001
100mg, 1mL	100 pcs. per box	2.CA0751.0001
200mg, 3mL	50 pcs. per box	2.CA0752.0001
500mg, 3mL	50 pcs. per box	2.CA0753.0001
500mg, 6mL	30 pcs. per box	2.CA0754.0001
1g, 6mL	30 pcs. per box	2.CA0755.0001
2g, 6mL	30 pcs. per box	2.CA0756.0001
1g, 10mL	20 pcs. per box	2.CA0757.0001
2g, 10mL	20 pcs. per box	2.CA0758.0001
10g, 60mL	16 pcs. per box	2.CA0761.0001
20g, 60mL	16 pcs. per box	2.CA0762.0001

CNWBOND C12 SPE Bulk Packing

Description	Packaging	Cat. No.
40-63μm, 60Å	100 g. per box	2.CA0701.0100

CNWBOND HC-C18



CNWBOND HC-C18 is the traditional matrix for reversed-phase chromatography. It is widely used as the most hydrophobic silica-based sorbent for nonpolar compounds. Considered as the least selective phase since it retains most organic analytes from aqueous matrices, offer a benefit when the compounds of interest vary widely in structure. C18 can also be utilized for desalting aqueous matrices prior to ion exchange because salts pass through it without retained. The high loading of HC-C18 provides the highest degree of hydrophobicity which increases binding capacities and higher recoveries, higher carbon loading also offer greater resistance to extreme pH conditions.

C18 is utilized for cleaning, extracting and concentrating pollutants from aqueous environmental samples, herbicides, fungicides and pesticides from waste material, foods and beverages, typically drugs and metabolites from physiological fluids.

Technical parameters

Particle Size	Mean Pore Size	Carbon Loading	Endcapped/ Non- endcapped
40-63μm	60Å	17%	Endcapped

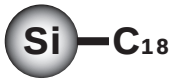
CNWBOND HC-C18 SPE Cartridge

Description	Packaging	Cat. No.
50mg, 1mL	100 pcs. per box	2.CA0850.0001
100mg, 1mL	100 pcs. per box	2.CA0851.0001
200mg, 3mL	50 pcs. per box	2.CA0852.0001
500mg, 3mL	50 pcs. per box	2.CA0853.0001
500mg, 6mL	30 pcs. per box	2.CA0854.0001
1g, 6mL	30 pcs. per box	2.CA0855.0001
2g, 6mL	30 pcs. per box	2.CA0856.0001
1g, 10mL	20 pcs. per box	2.CA0857.0001
2g, 10mL	20 pcs. per box	2.CA0858.0001
10g, 60mL	16 pcs. per box	2.CA0861.0001
20g, 60mL	16 pcs. per box	2.CA0862.0001

CNWBOND HC-C18 SPE Bulk Packing

Description	Packaging	Cat. No.
40-63μm, 60Å	100 g. per box	2.CA0801.0100

CNWBOND LC-C18



CNWBOND LC-C18 has lower carbon loading than HC-C18, which gives unique selectivities. It is also a highly retentive nonpolar silica-based sorbent due to the long hydrocarbon chain, the lower percent carbon loading has been optimized for polar analytes and very strong nonpolar compounds which is too strongly retained on high carbon loading C18. Its typical sample types are nonpolar compounds from water and aqueous biological fluids.

Technical parameters

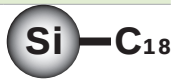
Particle Size	Mean Pore Size	Carbon Loading	Endcapped/ Non- endcapped
40-63μm	60Å	11%	Endcapped

CNWBOND LC-C18 SPE Cartridge

Description	Packaging	Cat. No.
50mg, 1mL	100 pcs. per box	2.CA0950.0001
100mg, 1mL	100 pcs. per box	2.CA0951.0001
200mg, 3mL	50 pcs. per box	2.CA0952.0001
500mg, 3mL	50 pcs. per box	2.CA0953.0001
500mg, 6mL	30 pcs. per box	2.CA0954.0001
1g, 6mL	30 pcs. per box	2.CA0955.0001
2g, 6mL	30 pcs. per box	2.CA0956.0001
1g, 10mL	20 pcs. per box	2.CA0957.0001
2g, 10mL	20 pcs. per box	2.CA0958.0001
10g, 60mL	16 pcs. per box	2.CA0961.0001
20g, 60mL	16 pcs. per box	2.CA0962.0001

CNWBOND LC-C18 SPE Bulk Packing

Description	Packaging	Cat. No.
40-63μm, 60Å	100 g. per box	2.CA0901.0100



CNWBOND C18-ne

CNWBOND C18-ne is a non-endcapped octadecyl bonded phase that enables the silica surface to be more active. The silanol activity permits fractionation of metabolites and enhances retention of basic compounds compared with endcapped C18. So its retention mechanism includes moderately nonpolar and polar secondary interactions, typically it is used for extracting compounds from biological matrics and aqueous samples.

Technical parameters

Particle Size	Mean Pore Size	Carbon Loading	Endcapped/ Non- endcapped
40-63μm	60Å	17%	Non-endcapped

CNWBOND C18-ne SPE Cartridge

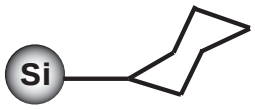
Description	Packaging	Cat. No.
50mg, 1mL	100 pcs. per box	2.CA1050.0001

Description	Packaging	Cat. No.
100mg, 1mL	100 pcs. per box	2.CA1051.0001
200mg, 3mL	50 pcs. per box	2.CA1052.0001
500mg, 3mL	50 pcs. per box	2.CA1053.0001
500mg, 6mL	30 pcs. per box	2.CA1054.0001
1g, 6mL	30 pcs. per box	2.CA1055.0001
2g, 6mL	30 pcs. per box	2.CA1056.0001
1g, 10mL	20 pcs. per box	2.CA1057.0001
2g, 10mL	20 pcs. per box	2.CA1058.0001
10g, 60mL	16 pcs. per box	2.CA1061.0001
20g, 60mL	16 pcs. per box	2.CA1062.0001

CNWBOND C18-ne SPE Bulk Packing

Description	Packaging	Cat. No.
40-63μm, 60Å	100 g. per box	2.CA1001.0100

CNWBOND CYH(Cyclohexyl)



CNWBOND CYH (Cyclohexyl) is a sorbent of medium polarity used in reversed-phase chromatography. The properties of CH functional groups have ability to retain polar analytes such as phenol from aqueous matrices, because it has a different selectivity than the other nonpolar sorbent like C18, C8, C4 and Phenyl, it is usually used when those nonpolar sorbents fail to provide the desired selectivity.

Technical parameters

Particle Size	Mean Pore Size	Carbon Loading	Endcapped/ Non- endcapped
40-63μm	60Å	10%	Endcapped

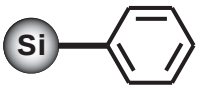
CNWBOND CYH SPE Cartridge

Description	Packaging	Cat. No.
50mg, 1mL	100 pcs. per box	2.CA1150.0001
100mg, 1mL	100 pcs. per box	2.CA1151.0001
200mg, 3mL	50 pcs. per box	2.CA1152.0001
500mg, 3mL	50 pcs. per box	2.CA1153.0001
500mg, 6mL	30 pcs. per box	2.CA1154.0001
1g, 6mL	30 pcs. per box	2.CA1155.0001
2g, 6mL	30 pcs. per box	2.CA1156.0001
1g, 10mL	20 pcs. per box	2.CA1157.0001
2g, 10mL	20 pcs. per box	2.CA1158.0001
10g, 60mL	16 pcs. per box	2.CA1161.0001
20g, 60mL	16 pcs. per box	2.CA1162.0001

CNWBOND CYH SPE Bulk Packing

Description	Packaging	Cat. No.
40-63μm, 60Å	100 g. per box	2.CA1101.0100

CNWBOND PHE (Phenyl)



CNWBOND PHE (Phenyl) sorbent has medium polarity used in nonpolar extractions. It has similar retention to C8 but with a different selectivity especially for planar and conjugated molecules containing aromatics and fatty acids because of its electron density of aromatic ring.

Technical parameters

Particle Size	Mean Pore Size	Carbon Loading	Endcapped/ Non- endcapped
40-63μm	60Å	9%	Endcapped

CNWBOND PHE SPE Cartridge

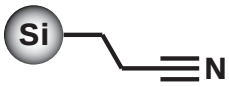
Description	Packaging	Cat. No.
50mg, 1mL	100 pcs. per box	2.CA1250.0001
100mg, 1mL	100 pcs. per box	2.CA1251.0001
200mg, 3mL	50 pcs. per box	2.CA1252.0001
500mg, 3mL	50 pcs. per box	2.CA1253.0001
500mg, 6mL	30 pcs. per box	2.CA1254.0001
1g, 6mL	30 pcs. per box	2.CA1255.0001
2g, 6mL	30 pcs. per box	2.CA1256.0001
1g, 10mL	20 pcs. per box	2.CA1257.0001
2g, 10mL	20 pcs. per box	2.CA1258.0001
10g, 60mL	16 pcs. per box	2.CA1261.0001
20g, 60mL	16 pcs. per box	2.CA1262.0001

CNWBOND PHE SPE Bulk Packing

Description	Packaging	Cat. No.
40-63μm, 60Å	100 g. per box	2.CA1201.0100

Normal phase SPE Columns

CNWBOND CN(Cyano)



CNWBOND CN (Cyano) can be used both in normal and reversed-phase chromatography as its less polar compared to silica and less hydrophobic compared to C18 and C8. The sorbent is usually used to extract acidic, neutral, and basic compounds from aqueous solutions.

Technical parameters

Particle Size	Mean Pore Size	Carbon Loading	Endcapped/ Non- endcapped
40-63μm	60Å	7%	Endcapped

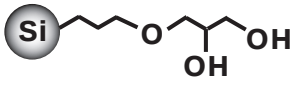
CNWBOND CN SPE Cartridge

Description	Packaging	Cat. No.
50mg, 1mL	100 pcs. per box	2.CA1450.0001
100mg, 1mL	100 pcs. per box	2.CA1451.0001
200mg, 3mL	50 pcs. per box	2.CA1452.0001
500mg, 3mL	50 pcs. per box	2.CA1453.0001
500mg, 6mL	30 pcs. per box	2.CA1454.0001
1g, 6mL	30 pcs. per box	2.CA1455.0001
2g, 6mL	30 pcs. per box	2.CA1456.0001
1g, 10mL	20 pcs. per box	2.CA1457.0001
2g, 10mL	20 pcs. per box	2.CA1458.0001
10g, 60mL	16 pcs. per box	2.CA1461.0001
20g, 60mL	16 pcs. per box	2.CA1462.0001

CNWBOND CN SPE Bulk Packing

Description	Packaging	Cat. No.
40-63μm, 60Å	100 g. per box	2.CA1401.0100

CNWBOND Diol



CNWBOND Diol is used as polar sorbent in normal phase, which has the ability to form hydrogen bonds and the capacity to separate structural isomers like unbonded silica. However, it also has a different selectivity than bare silica gel and slight modifications in the composition of the solvent mixture may be necessary to obtain a similar retention. Usually, it is utilized for isolation of drugs and metabolites from physiological fluids.

Technical parameters

Particle Size	Mean Pore Size	Carbon Loading	Endcapped/Non-endcapped
40-63μm	60Å	7%	Non- endcapped

CNWBOND Diol SPE Cartridge

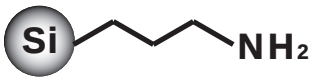
Description	Packaging	Cat. No.
50mg, 1mL	100 pcs. per box	2.CA2050.0001
100mg, 1mL	100 pcs. per box	2.CA2051.0001
200mg, 3mL	50 pcs. per box	2.CA2052.0001
500mg, 3mL	50 pcs. per box	2.CA2053.0001
500mg, 6mL	30 pcs. per box	2.CA2054.0001
1g, 6mL	30 pcs. per box	2.CA2055.0001
2g, 6mL	30 pcs. per box	2.CA2056.0001
1g, 10mL	20 pcs. per box	2.CA2057.0001
2g, 10mL	20 pcs. per box	2.CA2058.0001
10g, 60mL	16 pcs. per box	2.CA2061.0001
20g, 60mL	16 pcs. per box	2.CA2062.0001

CNWBOND Diol SPE Bulk Packing

Description	Packaging	Cat. No.
40-63μm, 60Å	100 g. per box	2.CA2001.0100

Ion exchange SPE Columns

CNWBOND NH_2



CNWBOND NH_2 is an aminopropyl phase that is very polar in nature utilizing both hydrogen bonding and anion exchange. Since the pKa of NH2 is 9.8, when used at pH ≤ 7.8, the functional groups are positively charged. Therefore, it is a weaker anion exchanger for retention of very strong anions such as sulfonic acids which may be retained irreversibly on SAX.

Its typical application includes separation of peptides, drugs and metabolites from physiological fluids, and also it is used for extraction of mono- and polysaccharides, steroids, cholesterol and triglycerides.

Technical parameters

Particle Size	Mean Pore Size	Exchange Capacity	Endcapped/ Non- endcapped
40-63μm	60Å	1.6 meq/g	Endcapped

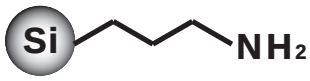
CNWBOND NH_2 SPE Cartridge

Description	Packaging	Cat. No.
50mg, 1mL	100 pcs. per box	2.CA2150.0001
100mg, 1mL	100 pcs. per box	2.CA2151.0001
200mg, 3mL	50 pcs. per box	2.CA2152.0001
500mg, 3mL	50 pcs. per box	2.CA2153.0001
500mg, 6mL	30 pcs. per box	2.CA2154.0001
1g, 6mL	30 pcs. per box	2.CA2155.0001
2g, 6mL	30 pcs. per box	2.CA2156.0001
1g, 10mL	20 pcs. per box	2.CA2157.0001
2g, 10mL	20 pcs. per box	2.CA2158.0001
10g, 60mL	16 pcs. per box	2.CA2161.0001
20g, 60mL	16 pcs. per box	2.CA2162.0001

CNWBOND NH_2 SPE Bulk Packing

Description	Packaging	Cat. No.
40-63μm, 60Å	100 g. per box	2.CA2101.0100

CNWBOND NH_2-ne



CNWBOND NH_2-ne is non-endcapped of CNWBOND NH_2. Non-endcapped of is NH_2 similar to that with endcapped aminopropyl, and it has additional retention of polar and cationic compounds.

Technical parameters

Particle Size	Mean Pore Size	Exchange Capacity	Endcapped/ Non- endcapped
40-63μm	60Å	1.6 meq/g	Non- endcapped

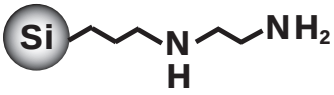
CNWBOND NH_2-ne SPE Cartridge

Description	Packaging	Cat. No.
50mg, 1mL	100 pcs. per box	2.CA2150.0001
100mg, 1mL	100 pcs. per box	2.CA2151.0001
200mg, 3mL	50 pcs. per box	2.CA2152.0001
500mg, 3mL	50 pcs. per box	2.CA2153.0001
500mg, 6mL	30 pcs. per box	2.CA2154.0001
1g, 6mL	30 pcs. per box	2.CA2155.0001
2g, 6mL	30 pcs. per box	2.CA2156.0001
1g, 10mL	20 pcs. per box	2.CA2157.0001
2g, 10mL	20 pcs. per box	2.CA2158.0001
10g, 60mL	16 pcs. per box	2.CA2161.0001
20g, 60mL	16 pcs. per box	2.CA2162.0001

CNWBOND NH_2-ne SPE Bulk Packing

Description	Packaging	Cat. No.
40-63μm, 60Å	100 g. per box	2.CA2101.0100

CNWBOND PSA



CNWBOND PSA is similar to CNWBOND NH_2 in terms of selectivity. As an anion exchange sorbent bonded with ethylenediamine-N-propyl, PSA has two amine groups that offer much higher ionic capacity, and exhibits a pKa of 10.1 and 10.9. Therefore, PSA has strong affinity and high capacity for removing fatty acids, organic acids, and some polar pigments and sugars when conducting multi-residue pesticide analysis in foods, its functional group is a very good bidentate ligandmaking PSA an excellent sorbent for chelation.

Technical parameters

Particle Size	Mean Pore Size	Exchange Capacity	Endcapped/ Non- endcapped
40-63μm	60Å	1.4 meq/g	Endcapped

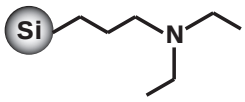
CNWBOND PSA SPE Cartridge

Description	Packaging	Cat. No.
50mg, 1mL	100 pcs. per box	2.CA2450.0001
100mg, 1mL	100 pcs. per box	2.CA2451.0001
200mg, 3mL	50 pcs. per box	2.CA2452.0001
500mg, 3mL	50 pcs. per box	2.CA2453.0001
500mg, 6mL	30 pcs. per box	2.CA2454.0001
1g, 6mL	30 pcs. per box	2.CA2455.0001
2g, 6mL	30 pcs. per box	2.CA2456.0001
1g, 10mL	20 pcs. per box	2.CA2457.0001
2g, 10mL	20 pcs. per box	2.CA2458.0001
10g, 60mL	16 pcs. per box	2.CA2461.0001
20g, 60mL	16 pcs. per box	2.CA2462.0001

CNWBOND PSA SPE Bulk Packing

Description	Packaging	Cat. No.
40-63μm, 60Å	100 g. per box	2.CA2401.0100

CNWBOND WAX



CNWBOND WAX has some resemblance to CNWBOND NH_2 and CNWBOND PSA in its properties. It has a pKa of 10.5 because of diethylaminopropyl functional group, and is preferred over CNWBOND SAX when performing release of interest compounds which has strong ions. The additional carbon chains make WAX a more nonpolar character than NH_2, and even less polar than C2 and CN.

Technical parameters

Particle Size	Mean Pore Size	Exchange Capacity	Endcapped/ Non- endcapped
40-63μm	60Å	1.2 meq/g	Endcapped

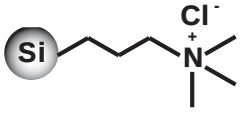
CNWBOND WAX SPE Cartridge

Description	Packaging	Cat. No.
50mg, 1mL	100 pcs. per box	2.CA2350.0001
100mg, 1mL	100 pcs. per box	2.CA2351.0001
200mg, 3mL	50 pcs. per box	2.CA2352.0001
500mg, 3mL	50 pcs. per box	2.CA2353.0001
500mg, 6mL	30 pcs. per box	2.CA2354.0001
1g, 6mL	30 pcs. per box	2.CA2355.0001
2g, 6mL	30 pcs. per box	2.CA2356.0001
1g, 10mL	20 pcs. per box	2.CA2357.0001
2g, 10mL	20 pcs. per box	2.CA2358.0001
10g, 60mL	16 pcs. per box	2.CA2361.0001
20g, 60mL	16 pcs. per box	2.CA2362.0001

CNWBOND WAX SPE Bulk Packing

Description	Packaging	Cat. No.
40-63μm, 60Å	100 g. per box	2.CA2301.0100

CNWBOND SAX



CNWBOND SAX is a strongest anion exchange sorbent because of its quaternary amine functional group. The sorbent is always positive charged, which is good choice for retention of weaker anions such as carboxylic acids that may not retain strongly enough on WAX or NH_2 and PSA. Since the chloride counter ion is bound to the ammonium, it may be suited to activate the ion exchanger by conditioning it with appropriate buffers.

Technical parameters

Particle Size	Mean Pore Size	Exchange Capacity	Endcapped/ Non- endcapped
40-63μm	60Å	1.1 meq/g	Non- endcapped

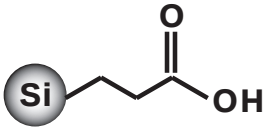
CNWBOND SAX SPE Cartridge

Description	Packaging	Cat. No.
50mg, 1mL	100 pcs. per box	2.CA2550.0001
100mg, 1mL	100 pcs. per box	2.CA2551.0001
200mg, 3mL	50 pcs. per box	2.CA2552.0001
500mg, 3mL	50 pcs. per box	2.CA2553.0001
500mg, 6mL	30 pcs. per box	2.CA2554.0001
1g, 6mL	30 pcs. per box	2.CA2555.0001
2g, 6mL	30 pcs. per box	2.CA2556.0001
1g, 10mL	20 pcs. per box	2.CA2557.0001
2g, 10mL	20 pcs. per box	2.CA2558.0001
10g, 60mL	16 pcs. per box	2.CA2561.0001
20g, 60mL	16 pcs. per box	2.CA2562.0001

CNWBOND SAX SPE Bulk Packing

Description	Packaging	Cat. No.
40-63μm, 60Å	100 g. per box	2.CA2501.0100

CNWBOND WCX



CNWBOND WCX is a carboxy propyl functionalized silica which has a medium polarity. It is primarily used as a weak cation exchanger that does not require extreme basic conditions fro elution because of its 4.5 pKa. CNWBOND WCX is often the best choice for cation exchange especially when dialing with very strong cations in case of making release of the compound of interest on SCX is difficult because of the strong interaction between the two strong ions.

Technical parameters

Particle Size	Mean Pore Size	Exchange Capacity	Endcapped/ Non- endcapped
40-63μm	60Å	1.4 meq/g	Endcapped

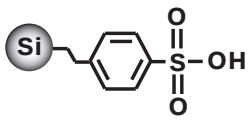
CNWBOND WCX SPE Cartridge

Description	Packaging	Cat. No.
50mg, 1mL	100 pcs. per box	2.CA2650.0001
100mg, 1mL	100 pcs. per box	2.CA2651.0001
200mg, 3mL	50 pcs. per box	2.CA2652.0001
500mg, 3mL	50 pcs. per box	2.CA2653.0001
500mg, 6mL	30 pcs. per box	2.CA2654.0001
1g, 6mL	30 pcs. per box	2.CA2655.0001
2g, 6mL	30 pcs. per box	2.CA2656.0001
1g, 10mL	20 pcs. per box	2.CA2657.0001
2g, 10mL	20 pcs. per box	2.CA2658.0001
10g, 60mL	16 pcs. per box	2.CA2661.0001
20g, 60mL	16 pcs. per box	2.CA2662.0001

CNWBOND WCX SPE Bulk Packing

Description	Packaging	Cat. No.
40-63μm, 60Å	100 g. per box	2.CA2601.0100

CNWBOND SCX



CNWBOND SCX is a strongest cation exchange sorbent because of its benzenesulfonic acid functional group. It has been optimized for use in organic applications, which will not dissolve in methanol or any other solvents. The presence of the benzene ring on its surface exhibits nonpolar character which is useful with compounds that has both cationic and nonpolar properties in aqueous solvent.

Technical parameters

Particle Size	Mean Pore Size	Exchange Capacity	Endcapped/Non-endcapped
40-63μm	60Å	0.8 meq/g	Endcapped

CNWBOND SCX SPE Cartridge

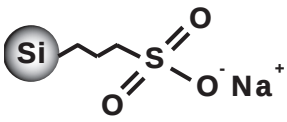
Description	Packaging	Cat. No.
50mg, 1mL	100 pcs. per box	2.CA2850.0001
100mg, 1mL	100 pcs. per box	2.CA2851.0001

Description	Packaging	Cat. No.
200mg, 3mL	50 pcs. per box	2.CA2852.0001
500mg, 3mL	50 pcs. per box	2.CA2853.0001
500mg, 6mL	30 pcs. per box	2.CA2854.0001
1g, 6mL	30 pcs. per box	2.CA2855.0001
2g, 6mL	30 pcs. per box	2.CA2856.0001
1g, 10mL	20 pcs. per box	2.CA2857.0001
2g, 10mL	20 pcs. per box	2.CA2858.0001
10g, 60mL	16 pcs. per box	2.CA2861.0001
20g, 60mL	16 pcs. per box	2.CA2862.0001

CNWBOND SCX SPE Bulk Packing

Description	Packaging	Cat. No.
40-63μm, 60Å	100 g. per box	2.CA2801.0100

CNWBOND PRS



CNWBOND PRS is a strong cation exchange sorbent which is similar to CNWBOND SCX but slightly less acidic. It maintains a negative charge throughout the pH scale, so it is most effective for weaker cations such as pyridinium compounds. Its typical application includes malachite green and other basic molecules from water and biological samples.

Technical parameters

Particle Size	Mean Pore Size	Exchange Capacity	Endcapped/Non-endcapped
40-63μm	60Å	1.0 meq/g	Endcapped

CNWBOND PRS SPE Cartridge

Description	Packaging	Cat. No.
50mg, 1mL	100 pcs. per box	2.CA2750.0001
100mg, 1mL	100 pcs. per box	2.CA2751.0001
200mg, 3mL	50 pcs. per box	2.CA2752.0001
500mg, 3mL	50 pcs. per box	2.CA2753.0001
500mg, 6mL	30 pcs. per box	2.CA2754.0001
1g, 6mL	30 pcs. per box	2.CA2755.0001
2g, 6mL	30 pcs. per box	2.CA2756.0001
1g, 10mL	20 pcs. per box	2.CA2757.0001
2g, 10mL	20 pcs. per box	2.CA2758.0001
10g, 60mL	16 pcs. per box	2.CA2761.0001
20g, 60mL	16 pcs. per box	2.CA2762.0001

CNWBOND PRS SPE Bulk Packing

Description	Packaging	Cat. No.
40-63μm, 60Å	100 g. per box	2.CA2701.0100

CNWBOND C8/SAX

CNWBOND C8/SAX sorbent contains both octyl (C8) and quaternary amine (SAX) bondings, which exhibits dual retention mechanism for isolating of neutral, basic, acidic and zwitterionic compounds. Its mixed-mode anion exchange character develops for superior selectivity of sample clean up when extracting acidic and neutral compounds from aqueous solutions, typically salicylic acid, ibuprofen, acetaminophen, drugs and metabolites from physiological fluids.

Technical parameters

Particle Size	Mean Pore Size	Endcapped/Non- endcapped
40-63μm	60Å	Endcapped

CNWBOND C8/SAX SPE Cartridge

Description	Packaging	Cat. No.
50mg, 1mL	100 pcs. per box	2.CA3050.0001
100mg, 1mL	100 pcs. per box	2.CA3051.0001
200mg, 3mL	50 pcs. per box	2.CA3052.0001
500mg, 3mL	50 pcs. per box	2.CA3053.0001
500mg, 6mL	30 pcs. per box	2.CA3054.0001
1g, 6mL	30 pcs. per box	2.CA3055.0001
2g, 6mL	30 pcs. per box	2.CA3056.0001
1g, 10mL	20 pcs. per box	2.CA3057.0001
2g, 10mL	20 pcs. per box	2.CA3058.0001
10g, 60mL	16 pcs. per box	2.CA3061.0001
20g, 60mL	16 pcs. per box	2.CA3062.0001

CNWBOND C8/SCX

CNWBOND C8/SCX sorbent contains both octyl (C8) and benzenesufonic acid (SCX) bondings, which exhibits dual retention mechanism for isolating of neutral, basic, acidic and zwitterionic compounds. Its mixed-mode cation exchange character develops for superior selectivity of sample clean up when extracting basic and neutral compounds from aqueous solutions, typically drugs and metabolites from physiological fluids.

Technical parameters

Particle Size	Mean Pore Size	Endcapped/Non- endcapped
40-63μm	60Å	Endcapped

CNWBOND C8/SCX SPE Cartridge

Description	Packaging	Cat. No.
50mg, 1mL	100 pcs. per box	2.CA2950.0001
100mg, 1mL	100 pcs. per box	2.CA2951.0001
200mg, 3mL	50 pcs. per box	2.CA2952.0001
500mg, 3mL	50 pcs. per box	2.CA2953.0001
500mg, 6mL	30 pcs. per box	2.CA2954.0001
1g, 6mL	30 pcs. per box	2.CA2955.0001
2g, 6mL	30 pcs. per box	2.CA2956.0001
1g, 10mL	20 pcs. per box	2.CA2957.0001
2g, 10mL	20 pcs. per box	2.CA2958.0001
10g, 60mL	16 pcs. per box	2.CA2961.0001
20g, 60mL	16 pcs. per box	2.CA2962.0001

Poly-Sery SPE Columns

Poly-Sery PSD(styrene/divinylbenzene copolymer)

Poly-Sery PSD is a highly crosslinked, neutral, specially cleaned styrene/divinylbenzene copolymer material that is used for retaining hydrophobic compounds which contain some hydrophilic functionality under reversed phase conditions. This material can resist extreme pH condition, it is typically used for aromatics and phenols from aqueous matrics. Phenols are sometimes difficult to retain on silica-based C18 under reversed phase conditions, mainly due to their greater solubility in water than in organic matrices.

Technical parameters

Particle Size	Mean Pore Size	Surface Area
80-160μm	110-175Å	900m^2/g

Poly-Sery PSD SPE Cartridge

Description	Packaging	Cat. No.
50mg, 1mL	100 pcs. per box	2.CA3550.0001
100mg, 1mL	100 pcs. per box	2.CA3551.0001
200mg, 3mL	50 pcs. per box	2.CA3552.0001

Description	Packaging	Cat. No.
500mg, 3mL	50 pcs. per box	2.CA3553.0001
500mg, 6mL	30 pcs. per box	2.CA3554.0001
1g, 6mL	30 pcs. per box	2.CA3555.0001
2g, 6mL	30 pcs. per box	2.CA3556.0001
1g, 10mL	20 pcs. per box	2.CA3557.0001
2g, 10mL	20 pcs. per box	2.CA3558.0001
10g, 60mL	16 pcs. per box	2.CA3561.0001
20g, 60mL	16 pcs. per box	2.CA3562.0001

Poly-Sery PSD Packing

Description	Packaging	Cat. No.
80-160μm, 110-175Å	50 g. per box	2.CA3500.0050

Poly-Sery XAD2(styrene-divinylbenzene matrix)

Poly-Sery XAD2 is a polyaromatic adsorbent resin which is nonionic macroreticular styrene-divinylbenzene matrix usually used for adsorbing and releasing ionic species through hydrophobic and polar interactions under isocratic conditions. Its typical application is hydrophobic compounds up to MW 20,000 like phenols, organic removal, surfactants, aroma compounds, antibiotic recovery and sometimes used as support for catalyst or metals removal.

Technical parameters

Particle Size	Mean Pore Size	Surface Area
20-60μm	90Å	300m^2/g

Poly-Sery XAD2 SPE Cartridge

Description	Packaging	Cat. No.
300mg, 3mL	50 pcs. per box	2.CA3686.0001

Poly-Sery XAD2 Packing

Description	Packaging	Cat. No.
20-60μm, 90Å	100 g. per box	2.CA3601.0100

Poly-Sery HLB

Poly-Sery HLB is used for nearly all the acidic, basic, and neutral compounds, and is a hydrophilic modified copolymer which developed for a broad range of compounds from aqueous samples under reversed phase condition. Compared with conventional silica, there're hydrophilic and hydrophobic group on the surface of HLB polymer, it has good wettability and is stable in pH range 1-14. So it has properties of retaintion for various different analytes, especially for polar compounds, the relative retention capacity is three times higher than conventional silica SPE.

Technical parameters

Particle Size	Mean Pore Size	Surface Area
60μm	180Å	710m^2/g

Poly-Sery HLB SPE Cartridge

Description	Packaging	Cat. No.
10mg, 1mL	100 pcs. per box	2.CA3177.0001
30mg, 1mL	100 pcs. per box	2.CA3178.0001
60mg, 3mL	50 pcs. per box	2.CA3179.0001
30mg, 3mL	50 pcs. per box	2.CA3180.0001
200mg, 6mL	30 pcs. per box	2.CA3185.0001
500mg, 6mL	30 pcs. per box	2.CA3154.0001
500mg, 10mL	20 pcs. per box	2.CA3182.0001
1g, 10mL	20 pcs. per box	2.CA3157.0001

Poly-Sery HLB Packing

Description	Packaging	Cat. No.
60μm, 180Å	50 g. per box	2.CA3100.0050

Poly-Sery PWAX

Poly-Sery PWAX is mixed weak anion exchange SPE column, it has excellent selectivity for strong acid compounds.Differ from conventional silica SPE columns, PWAX is a modified styrene-divinylbenzene copolymer, there’ re hydrophilic and hydrophobic group on its surface, it is stable in pH range 1-14, and has excellent wettability. So it has special selectivity for various analytes. Poly-Sery PWAX is widely used for the purification of different matrixes such as plasma, urine, or acid compounds in foods.

Technical parameters

Particle Size	Mean Pore Size	Surface Area
40μm	120Å	900m^2/g

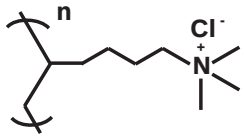
Poly-Sery PWAX SPE Cartridge

Description	Packaging	Cat. No.
60mg, 3mL	50 pcs. per box	2.CA3879.0001
150mg, 6mL	30 pcs. per box	2.CA3881.0001
500mg, 6mL	30 pcs. per box	2.CA3854.0001

Poly-Sery PWAX Packing

Description	Packaging	Cat. No.
40μm, 120Å	50 g per box	2.CA3800.0050

Poly-Sery MAX



Poly-Sery MAX is a mixed-mode anion exchange and reversed phase sobent, which has high selectivity and sensitivity for acidic and neutral compounds. Unlike traditional silica-based sorbent, its modified styrene divinylbenzene polymeric surface has hydrophilic and hydrophobic mechanisms, which is stable in pH ranges 0 to 14 and is water-wettable, therefore, it exhibits unique selectivity to cover a diverse spectrum of analytes, simplify the method development process for fast and efficient sample preparation and completely eliminate recovery or reproducibility problems. The strong anion exchange mechanism gives consistent and extremely cleaning up of acidic compounds and fractionation of bases from basic and neutral impurities. The Poly-Sery MAX is widely utilized in separation of clean acidic extracts from different matrices such as plasma, urine, plastic products and food.

Technical parameters

Particle Size	Mean Pore Size	Surface Area	Ion Exchange Capacity
40μm or 100μm	100Å	600m^2/g	0.3 meq/g

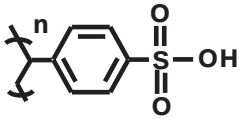
Poly-Sery MAX SPE Cartridge

Description	Packaging	Cat. No.
40μm, 10mg, 1mL	100 pcs. per box	2.CA3377.0001
40μm, 30mg, 1mL	100 pcs. per box	2.CA3378.0001
40μm, 60mg, 3mL	50 pcs. per box	2.CA3379.0001
40μm, 30mg, 3mL	50 pcs. per box	2.CA3380.0001
40μm, 150mg, 6mL	30 pcs. per box	2.CA3381.0001
100μm, 500mg, 6mL	30 pcs. per box	2.CA3354.0001
100μm, 500mg, 10mL	20 pcs. per box	2.CA3382.0001
100μm, 1g, 10mL	20 pcs. per box	2.CA3357.0001

Poly-Sery MAX Packing

Description	Packaging	Cat. No.
40μm, 100Å	50 g per box	2.CA3300.0050

Poly-Sery MCX



Poly-Sery MCX is a mixed-mode cation exchange and reversed phase sobent, which has high selectivity and sensitivity for basic and neutral compounds. Unlike traditional silica-based sorbent, its modified styrene divinylbenzene polymeric surface has hydrophilic and hydrophobic mechanisms, which is stable in pH ranges 0 to 14 and is water-wettable, therefore, it exhibits unique selectivity to cover a diverse spectrum of analytes, simplify the method development process for fast and efficient sample preparation and completely eliminate recovery or reproducibility problems. The strong cation exchange mechanism gives consistent and extremely cleaning up of basic compounds and fractionation of bases from acidic and neutral impurities. The Poly-Sery MCX is widely utilized in separation of clean basic extracts from different matrices such as plasma, urine, plastic products and food.

Technical parameters

Particle Size	Mean Pore Size	Surface Area	Ion Exchange Capacity
40μm or 100μm	100Å	600m^2/g	0.8 meq/g

Poly-Sery MCX SPE Cartridge

Description	Packaging	Cat. No.
40μm, 10mg, 1mL	100 pcs. per box	2.CA3277.0001
40μm, 30mg, 1mL	100 pcs. per box	2.CA3278.0001
40μm, 60mg, 3mL	50 pcs. per box	2.CA3279.0001
40μm, 30mg, 3mL	50 pcs. per box	2.CA3280.0001
40μm, 150mg, 6mL	30 pcs. per box	2.CA3281.0001

Poly-Sery MCX Packing

Description	Packaging	Cat. No.
40μm, 100Å	50 g per box	2.CA3200.0050

Dual Layer SPE Columns

CNWBOND GCB/NH_2

CNWBOND GCB/NH_2 dual layer SPE columns combine the advantages with both GCB and NH_2 sorbents. Similar to GCB/PSA, GCB/NH_2 offers superior clean up of pigments, sterols, fatty acids and organic acids in food matrices, and is suitable for the analysis of multi-residue pesticide in food like meats, fruits, vegetables etc.

CNWBOND GCB/NH_2 SPE Cartridge

Description	Packaging	Cat. No.
200mg/200mg, 3mL	50 pcs. per box	2.CA5066.0001
250mg/500mg, 3mL	50 pcs. per box	2.CA5048.0001
200mg/200mg, 6mL	30 pcs. per box	2.CA5067.0001
300mg/600mg, 6mL	30 pcs. per box	2.CA5068.0001
500mg/500mg, 6mL	30 pcs. per box	2.CA5069.0001
500mg/300mg, 6mL	30 pcs. per box	2.CA5070.0001
1g/500mg, 6mL	30 pcs. per box	2.CA5071.0001
1g/500mg, 10mL	20 pcs. per box	2.CA5072.0001
500mg/500mg, 10mL	20 pcs. per box	2.CA5073.0001

CNWBOND GCB/PSA

CNWBOND GCB/PSA is a dual layer SPE cartridge that combines advantages with both GCB and PSA sorbents. Similar to GCB/NH_2, Carbon-GCB offers superior clean up of pigments, sterols, fatty acids and organic acids in food matrices, and is suitable for the analysis of multi-residue pesticide in food like fruits, vegetables, meats, aquatic products, grains and dairy products etc.

Both PSA and NH_2 can effectively retain interferents in the analysis of multi-residue pesticide, such as fatty acids (include oleic acid, palmitic acid, linoleic acid etc.), organic acids, some polar dyes and sugars etc. PSA can retain more than 99% fatty acids, which greatly reduce signal interference caused by the matrix system in the GC analysis.

CNWBOND GCB/ PSA SPE Cartridge

Description	Packaging	Cat. No.
200mg/200mg, 3mL	50 pcs. per box	2.CA5166.0001
250mg/500mg, 3mL	50 pcs. per box	2.CA5148.0001
200mg/200mg, 6mL	30 pcs. per box	2.CA5167.0001
300mg/600mg, 6mL	30 pcs. per box	2.CA5168.0001
500mg/500mg, 6mL	30 pcs. per box	2.CA5169.0001
500mg/300mg, 6mL	30 pcs. per box	2.CA5170.0001
1g/500mg, 6mL	30 pcs. per box	2.CA5171.0001
1g/500mg, 10mL	20 pcs. per box	2.CA5172.0001
500mg/500mg, 10mL	20 pcs. per box	2.CA5173.0001

CNWBOND SAX/PSA

CNWBOND SAX/PSA is a dual layer SPE cartridge that contains CNWBOND SAX (upper layer) and CNWBOND PSA (lower layer) SPE sorbents. It combines advantages with both SAX and PSA sorbents, SAX has a strong affinity towards nearly all the acidic compounds in different matrices, while PSA can effectively retains fatty acids, organic acids, some polar pigments and sugars in food matrices. Therefore, CNWBOND SAX/PSA offers superior removing of matrix interference and enhancement of multi-residue pesticide from food for analysis.

CNWBOND SAX/PSA SPE Cartridge

Description	Packaging	Cat. No.
200mg/200mg, 3mL	50 pcs. per box	2.CA5266.0001
200mg/200mg, 6mL	30 pcs. per box	2.CA5267.0001
300mg/600mg, 6mL	30 pcs. per box	2.CA5268.0001
500mg/500mg, 6mL	30 pcs. per box	2.CA5269.0001
500mg/300mg, 6mL	30 pcs. per box	2.CA5270.0001
1g/500mg, 6mL	30 pcs. per box	2.CA5271.0001
1g/500mg, 10mL	20 pcs. per box	2.CA5272.0001
500mg/500mg, 10mL	20 pcs. per box	2.CA5273.0001

CNWBOND Na_2SO_4/Florisil

CNWBOND Na_2SO_4/Florisil is a dual layer SPE cartridge that contains Na_2SO_4 (upper layer) and Florisil (lower layer). Na_2SO_4 layer aids in removing aqueous sample residues that may hinder Florisil performance and/or subsequent GC analysis. It is Suitable for the determination of the hydrocarbon oil index in water (surface, waste, and sewage treatment plants) by GC-FID analysis.

CNWBOND Na_2SO_4/Florisil SPE Cartridge

Description	Packaging	Cat. No.
2g/2g, 6mL	30 pcs. per box	2.CA5595.0001

CNWBOND GCB/NH_2/Si

CNWBOND GCB/NH_2/Si is a tri-layer SPE cartridge that combines advantages with all the three sorbents, it offers superior clean up of multi-residue pesticide from food like meats, fruits, vegetables etc.

CNWBOND GCB/NH_2/Si SPE Cartridge

Description	Packaging	Cat. No.
500mg/500mg/500mg, 10mL	20 pcs. per box	2.CA6190.0001
500mg/400mg/600mg, 10mL	20 pcs. per box	2.CA6191.0001

CNWBOND GCB/SAX/PSA

CNWBOND GCB/SAX/PSA is a tri-layer SPE cartridge that combines advantages with all the three sorbents, it offers superior clean up of multi-residue pesticide from food like meats, fruits, vegetables etc.

CNWBOND GCB/SAX/PSA SPE Cartridge

Description	Packaging	Cat. No.
500mg/500mg/500mg, 10mL	20 pcs. per box	2.CA6090.0001
500mg/400mg/600mg, 10mL	20 pcs. per box	2.CA6091.0001

CNW Dispersive SPE Products QuEChERS（dSPE）

1.Introduction of QuEChERS

QuEChERS was first proposed at EPRW conference in 2002, and aimed to establish a quick, cheap pretreatment method for multi-residue pesticide analysis in fruits, vegetables, grains and low-fat products. Specifically, solid-phase extraction adsorbents are dispersed in sample extractions to adsorb interference and retain analytes, and then the purified sample can be analysed directly by chromatography. Such as the abbreviation of "QuEChERS"(Quick, Easy, Cheap, Effective, Rugged and Safe), this method is Quick, Easy, Cheap, Effective, Rugged and Safe. QuEChERS is approved by AOAC and EN European Pesticide Residue Monitoring Committee. Compared QuEChERS with the traditional method extensively used throughout Europe for 15–20 years and calculated an approximate 95% reduction in solvent consumption (10 versus 535 mL), an approximate 95% reduction in consumable costs, and an approximate 90% reduction in time.

2.Standard operation procedure for QuEchERS

STEP 1 1add 10g Comminuted sample in to 50ml centrifuge tube with cap, add 10ml ACETONITRILE (or 1% acetic acid ACETONITRILE) and 100ul internal standard, shake 1min

STEP 2 Add $MgSO_4$,NaCl, buffer(NaAcetate or NaCitrate) ,adjust PH to 5 , most pesticide are stable in this condition, shake 1min, 4000r/min centrifuge 5min

STEP 3 Add PSA(remove fatty acid) GCB(remove pigment) and $MgSO_4$(remove water), shake 1min, 4000r/min centrifuge 5min

STEP 4 GC, LC or GC/MS LC/MS

3.QuEchERS Products

The original QuEChERS method is non-buffered, in order to extract some pH sensitive compounds and decrease the pesticide decomposition, a certain amount of buffer is added into the extraction tube to expand the detection range. But now the two popular method AOAC 2007.1 and EN 15662 introduce NaAcetate or NaCitrate to be the buffer. Based on different matrix's pH and different types of interferences, we have special extraction tubes and clean up tubes as below:

AOAC 2007 method

STEP 1 Add 15g Comminuted sample in to 50ml centrifuge tube with cap, add 15ml 1% acetic acid ACETONITRILE and 100ul internal standard, shake 1min

STEP 2 Add 6g $MgSO_4$ 1.5g NaAcetate(AOAC 2007.01 centrifuge tube for sample extraction) shake 1min, 4000r/min centrifuge 5min

STEP 3 Judged by the content of pigment, fatty and waxy in the matrix, collect different AOAC 2007.01 clean-up centrifuge tubes, add the upper layer liquid, shake 30s, 4000r/min centrifuge 5min

EN 15662 method

STEP 1 Add 10g Comminuted sample in to 50ml centrifuge tube with cap, add 10ml ACETONITRILE and 100ul internal standard, shake 1min

STEP 2 Add 4g $MgSO_4$ 1g Nacl 0.5g disodium citrate Sesquihydrate, 1g NaCitrate (EN 15662 centrifuge tube for sample extraction) shake 1min, 4000r/min centrifuge 5min

STEP 3 Judged by the content of pigment, fatty and waxy in the matrix, collect different EN 15662clean-up centrifuge tubes, add the upper layer liquid, shake 30s, 4000r/min centrifuge 5min

AOAC.2007 Method Centrifuge Tube

Description	Packaging	Cat. No.
dSPE clean up tube(AOAC 2007.01：General Fruits and Vegetables) 150mg $MgSO_4$，50mg PSA，2mL	100 pcs. per box	2.CA8319.0001
dSPE clean up tube(AOAC 2007.01：General Fruits and Vegetables) 1.2g $MgSO_4$，400mg PSA，15mL	25pcs/bag	2.CA8321.0001
dSPE clean up tube(AOAC 2007.01：General Fruits and Vegetables) 1.2g $MgSO_4$，400mg PSA，50mL	25pcs/bag	2.CA8323.0001
dSPE clean up tube(AOAC 2007.01：Fatty/Waxy Fruits and Vegetables) 150mg $MgSO_4$，50mg PSA，50mg C18，2mL	100 pcs. per box	2.CA8425.H001
dSPE clean up tube(AOAC 2007.01：Fatty/Waxy Fruits and Vegetables) 1.2g $MgSO_4$，400mg PSA，400mg C18，15mL	25pcs/bag	2.CA8428.0001
dSPE clean up tube(AOAC 2007.01：Fatty/Waxy Fruits and Vegetables) 1.2g $MgSO_4$，400mg PSA，400mg C18，50mL	25pcs/bag	2.CA8431.0001
dSPE clean up tube(AOAC 2007.01：Fruits and Vegetables with little color) 150mg $MgSO_4$，50mg PSA，50mg GCB，2mL	100 pcs. per box	2.CA8534.0001
dSPE clean up tube(AOAC 2007.01：Fruits and Vegetables with little color) 1.2g $MgSO_4$，400mg PSA，400mg GCB,15mL	25pcs/bag	2.CA8538.0001
dSPE clean up tube(AOAC 2007.01：Fruits and Vegetables with little color) 1.2g $MgSO_4$，400mg PSA，400mg GCB，50mL	25pcs/bag	2.CA8541.0001
dSPE clean up tube(AOAC 2007.01：Pigment/Waxy Fruits and Vegetables) 150mg $MgSO_4$，50mg PSA，50mg GCB，50mg C18，2mL	100 pcs. per box	2.CA8642.H001
dSPE clean up tube(AOAC 2007.01：Pigment/Waxy Fruits and Vegetables) 1.2g $MgSO_4$，400mg PSA，400mg GCB，400mg C18，15mL	25pcs/bag	2.CA8643.0001
dSPE clean up tube(AOAC 2007.01：Pigment/Waxy Fruits and Vegetables) 1.2g $MgSO_4$，400mg PSA，400mg GCB，400mg C18，50mL	25pcs/bag	2.CA8644.0001

EN15662 Method Centrifuge Tube

Description	Packaging	Cat. No.
dSPE extraction tube(EN 15662) 4gMgSO4，1gNaCl，0.5g disodium citrate Sesquihydrate，1g NaCitrate，15mL	50pcs/box	2.CA8010.B001
dSPE clean up tube(EN 15662：General Fruits and Vegetables) 150mg MgSO4，25mg PSA，2mL	100 pcs. per box	2.CA8318.0001
dSPE clean up tube(EN 15662：General Fruits and Vegetables) 900mg MgSO4，150mg PSA，15mL	25pcs/bag	2.CA8320.0001
dSPE clean up tube(EN 15662：General Fruits and Vegetables) 900mg MgSO4，150mg PSA，50mL	25pcs/bag	2.CA8322.0001
dSPE clean up tube(EN 15662：Fatty/Waxy Fruits and Vegetables) 900mg MgSO4，150mg PSA，150mg C18，15mL	25pcs/bag	2.CA8426.0001
dSPE clean up tube(EN 15662：Fatty/Waxy Fruits and Vegetables) 900mg MgSO4，150mg PSA，150mg C18，50mL	25pcs/bag	2.CA8429.0001
dSPE clean up tube(EN 15662：Fruits and Vegetables with little color) 150mg MgSO4，25mg PSA，2.5mg GCB，2mL	100 pcs. per box	2.CA8532.0001
dSPE clean up tube(EN 15662：Fruits and Vegetables with high color) 150mg MgSO4，25mg PSA，7.5mg GCB，2mL	100 pcs. per box	2.CA8533.0001
dSPE clean up tube(EN 15662：Fruits and Vegetables with little color) 900mg MgSO4，150mg PSA，15mg GCB，15mL	25pcs/bag	2.CA8535.0001
dSPE clean up tube(EN 15662：Fruits and Vegetables with high color) 900mg MgSO4，150mg PSA，45mg GCB，15mL	25pcs/bag	2.CA8536.0001
dSPE clean up tube(EN 15662：Fruits and Vegetables with high color) 900mg MgSO4，150mg PSA，45mg GCB，50mL	25pcs/bag	2.CA8539.0001

Glass Tubes used in analysis of PAEs in different food matrixes

Description	Suitable Matrix types	Packaging	Cat. No.
dSPE Extraction tube (A set for oil matrix)	General edible oil etc.(don't contain too many additives)	1.0g,12mL test tubes,100pcs/box	2. CA8645.0001
dSPE Extraction tube (B set for most oil and a little water matrix)	Matrix containing more than 80% oil: such as sauce packets of instant noodles, and hot pot oil	3.0g,16mL test tubes,100pcs/box	2. CA8647.0001
dSPE Extraction tube (C set for emulsion matrix)	Pure milk etc.(contain less than 10% oil or fat, and don't contain too many additives)	6.0g,16mL test tubes,100pcs/box	2. CA8648.0001
dSPE Extraction tube (C set for emulsion matrix)		1.0g,12mL test tubes,100pcs/box	2. CA8649.0001
dSPE Extraction tube (oil-free matrix)	Liquor(wine and others), water-based drinks: water, juice, energy drinks and cola etc.	2.0g,12mL test tubes,100pcs/box	2. CA8650.0001

Typical Application: PAEs in Wine

1. Sample pretreatment

Put 1mL wine (Alcohol content is 56% V/V) into 4mL water, and then put them into dSPE Extraction tube (oil-free matrix, 1. CA8650.0001), add 5mL n-hexane, mix. Get the upper layer after standing (centrifuge if necessary), add 1g anhydrous sodium sulphate, shake.Gather the upper layer to sample collection vessel, concentrate to less than 1mL under N2, add n-hexane to 1mL, detece by GC or GC-MS.

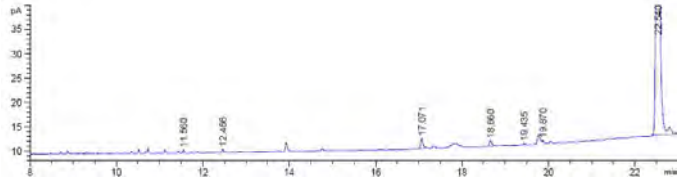
2. GC-FID Method

Column：	CD-5 capillary column（30m*0.25mm*0.25μm，1.521511.0001）
Inject temperature：	250℃
Detect temperature：	300℃
Temp：	60℃(1min)， 20℃/min to 220℃，hold 1min， 5℃/min to 280℃，hold 4min
Carrier gas：	N2，1mL/min
Injection method：	Splitless
Injection volumn：	1μL

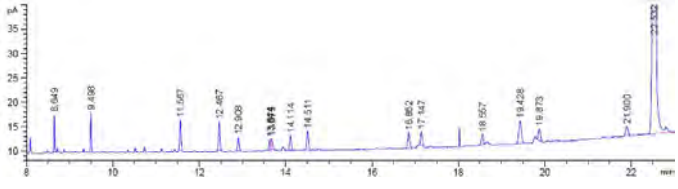
Experimental Data

No.	Abbreviation	Compounds	RT /min	Recovery /%
1	DMP	Dimethyl phthalate	8.65	93.27
2	DEP	Diethyl phthalate	9.5	105.12
3	DIBP	Diisobutyl phthalate	11.571	99.16
4	DBP	Phthalic acid, bis-butyl ester	12.471	114.44
5	DMEP	Phthalic Acid Bis(2-methoxyethyl) Ester	12.914	83.02
6	BMPP	Phthalic acid, bis-4-methyl-2-pentyl ester	13.648	84.89
7	DEEP	Bis(2-ethoxyethyl)phthalate	13.68	86.82
8	DPP	Diamyl Phthalate	14.118	98.56
9	DHXP	Phthalic acid, bis-hexyl ester	14.512	97.28
10	BBP	Butyl benzyl phthalate	16.854	93.06
11	DBEP	Phthalic acid, bis-2－butoxy ester	17.146	75.55
12	DCHP	Dicyclohexyl phthalate	18.555	78.27
13	DEHP	Di(2-ethylhexyl)phthalate	19.429	85.59
14	—	Diphenyl phthalate	19.874	81.24
15	DNOP	Di-n-octyl phthalate	21.902	79.63
16	DNP	Dinonyl phthalate	22.517	507.29

Chromatogram



GC-FID Chromatogram of spirit blank



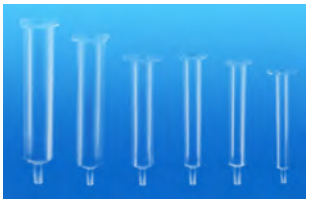
GC-FID Chromatogram of added 1ppm PAEs

Attention:

This chromatogram just show the chromatogram after 8min,there may be some flavor compounds in spirit before 8min,such as alcohols,ester,etc.

SPE Tube Accessories

Empty SPE Tubes and Frits



CNW CNWBOND and Poly-Sery SPE tubes are available in sizes from 1 mL to 60 mL made with serological grade polypropylene to be straight-walled syringe barrels. Clean 20 µm polyethylene frits are precut to fit into CNW SPE columns for either filtration or custom packing needs.

Empty Polypropylene SPE Tube (no frits)

Description	Packaging	Cat. No.
volume 1mL	100 pcs. per box	2.CR0001.0001
volume 3mL	100 pcs. per box	2.CR0003.0001
volume 6mL	100 pcs. per box	2.CR0006.0001

Description	Packaging	Cat. No.
volume 10mL	100 pcs. per box	2.CR0010.0001

Polyethylene Frits

Description	Packaging	Cat. No.
for 1mL tube	100 pcs. per box	2.CR01PE.0001
for 3mL tube	100 pcs. per box	2.CR03PE.0001
For 6mL tube	100 pcs. per box	2.CR06PE.0001

Description	Packaging	Cat. No.
For 10mL tube	100 pcs. per box	2.CR10PE.0001

SPE Tube Adapter

Tube adapters serve many purposes:

1. They can be used to connect SPE tubes in series to provide different selectivities.
2. A larger empty syringe barrel can be stacked on top of a smaller SPE tube to act as a larger load reservoir
3. They can also serve as an adapter for positive pressure methods.

SPE Tube Adapter, PP

Description	Packaging	Cat. No.
SPE Tube Adapter for 1,3,and 6mL, PP	12 pcs. per box	2.CR0002.0001

CNW SPE Vacuum Manifolds & Accessories

SPE Vacuum Manifold

CNW can offer 12-, 16-, and 24-port configurations SPE vacuum manifolds and 10-port large volume Flash vacuum manifold, which can achieve continuous sample extraction and filtering, simplify complex sample preparation procedures and save time.

Instruction: The manifolds consist of a clear glass chamber and lid to which a vacuum is applied to draw a sample through an SPE column, cartridge, or disk. Adjustable racks placed in the glass vacuum chamber will accommodate a variety of sample collection vessels, including test tubes, autosampler vials, volumetric flasks, and Erlenmeyer flasks. Eluants are deposited directly into the collection vessel of choice via polypropylene, optional stainless steel, or Teflon needles. Drying attachments will direct a flow of air or nitrogen into the collection vessels to dry eluants prior to further analysis. Drying attachments can also be connected, via adapters, to SPE columns or cartridges in order to dry the column or cartridge prior to final elusion. Optional disposable solvent resistant polypropylene containers are available for the 12-port manifolds. These waste containers greatly simplify sample preparation, solvent disposal, and clean-up.

12 Position Vacuum Manifold Set-Complete

Description	Packaging	Cat. No.
Includes: • 1 glass chamber • 1 cover, gasket, & 12 stopcocks • 1 vacuum gauge & valve assembly • 12 polypropylene needles • 12 test tube, glass, 16×100mm • Collection rack shelves, legs, clips, & posts • 6 plates • 1 waste container • 12 test tube, glass, 12×75mm	1 pcs.per box	2.CG1012.0001

16 Position Vacuum Manifold Set-Complete

Description		Packaging	Cat. No.
Includes: • 1 glass chamber • 1 cover, gasket, & 16 stopcocks • 1 vacuum gauge & valve assembly • 16 test tube, glass, 12×75mm	• 16 polypropylene needles • Collection rack shelves, legs, clips, & posts • 4 plates • 16 test tube, glass, 16×100mm	1 pcs.per box	2.CG1416.0001

24 Position Vacuum Manifold Set-Complete

Description		Packaging	Cat. No.
Includes: • 1 glass chamber • 1 cover, gasket, & 24 stopcocks • 1 vacuum gauge & valve assembly • 24 test tube, glass, 12×75mm	• 24 polypropylene needles • Collection rack shelves, legs, clips, & posts • 4 plates, & 24 tubes • 24 test tube, glass, 16×100mm	1 pcs.per box	2.CG1824.0001

10 Position Flash Vacuum Manifold

If your application method need to use large column from 10 to 70g, these introduced processing stations target the large SPE and Flash columns. Typically vacuum manifolds can handle only 12, 16, or 24 normal size columns, but for those samples that require larger capacity, we have developed a new larger manifold. With 10 positions, the unit is able to handle the larger solvent volumes.

10 Position Flash Vacuum Manifold Set-Complete

Description		Packaging	Cat. No.
Includes: • 1 glass chamber • 1 cover, gasket, & 10 stopcocks • 1 vacuum gauge & valve assembly	• 10 polypropylene needles • Collection rack shelves, legs, clips, & posts • 4 plates	1 pcs.per box	2.CR2010.0001

Drying Attachments

Drying Attachments are available for the 12-, 16-, and 24-port manifolds and 10-port flash manifold, which will direct the flow of air or nitrogen into the collection vessels to concentrate eluants, prior to further analysis. Drying attachments can also be connected directly to columns, cartridges, or disks via adapters to permit drying sorbent beds, prior to final elution.

Description	Packaging	Cat. No.
12 Position Drying Attachment	1 pcs.per box	2.CR1027.0001
16 Position Drying Attachment	1 pcs.per box	2.CR1431.0001
24 Position Drying Attachment	1 pcs.per box	2.CR1839.0001
10 Position Drying Attachment for Flash Manifold	1 pcs.per box	2.CR2025.0001

Needles - Polypropylene

Needles - Stainless Steel

Needles - Teflon

Large Volume Sampler

Large Volume Sampler

Large volume sampler enables you to transfer low viscosity samples directly from any sample container to conventional SPE tubes on the SPE vacuum manifold. It contains 1/8-inch PTFE tubing with a SPE adapter at one end for connecting SPE tubes and a stainless steel weight at the other end for touching the bottom of sample container. Note that large volume sampler can only be used with polypropylene SPE tubes.

Description	Packaging	Cat. No.
For use with 3 or 6mL SPE tubes	1 pcs.per box	2.CR3001.0001

Optional Needles for Vacuum Manifold

The optional disposable solvent resistant PP needles and stainless steel needles are used for most applications.

Disposable Teflon Needles are designed to fit through the manifold lid via the luer fitting. These needles deliver the eluant directly from the SPE extraction column or cartridge into the collection vessel in the vacuum chamber. These needles, when used in conjunction with Teflon columns and Teflon frits ensure zero extractables from the column, frits, and fluid path. This combination is especially useful for critical sample analysis, such as environmental samples.

Needles - Polypropylene

Description	Packaging	Cat. No.
For use with 12-port manifold	12pcs.per box	2.CR1017.0001
For use with 16-port manifold	16 pcs.per box	2.CR1421.0001
For use with 24-port manifold	12pcs.per box	2.CR1829.0001
For use with 10-port flash manifold	10 pcs.per box	2.CR1017.0001

Needles - Stainless Steel

Description	Packaging	Cat. No.
For use with 12, 16, 24-port manifold	12 pcs.per box	2.CR1018.0001

Needles - Teflon

Description	Packaging	Cat. No.
For use with SPE Vacuum Manifolds	50pcs.per box	2.CR1205.0001
For use with SPE Vacuum Manifolds	100pcs.per box	2.CR1210.0001

Other Vacuum Manifold Components

Gaskets

Stopcocks

Gaskets

Description	Packaging	Cat. No.
Gaskets, for use with 12-port manifold	1pcs.per box	2.CR1015.0001
Gaskets, for use with 16-port manifold	2 pcs.per box	2.CR1419.0001
Gaskets, for use with 24-port manifold	1pcs.per box	2.CR1827.0001
Gaskets, for use with 10-port flash manifold	2 pcs.per box	2.CR2013.0001

Stopcocks

Description	Packaging	Cat. No.
For use with 16-port manifold	16 pcs.per box	2.CR1430.0001
For use with 10-port flash manifold	10 pcs.per box	2.CR2024.0001

Collection Rack Shelves, Legs, Clips, & Posts

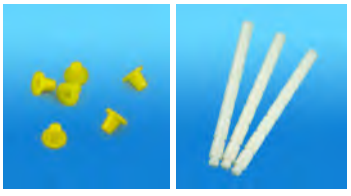
Description	Packaging	Cat. No.
Collection Rack Shelves, Legs, Clips, & Posts,for use with 12-port manifold	1 pcs.per box	2.CR1019.0001
Collection Rack Shelves, Legs, Clips, & Posts, for use with 16-port manifold	1 pcs.per box	2.CR1423.0001
Collection Rack Shelves, Legs, Clips, & Posts, for use with 24-port manifold	1 pcs.per box	2.CR1831.0001
Collection Rack Shelves, Legs, Clips, & Posts, for use with 10-port flash manifold	1 pcs.per box	2.CR2017.0001

Female Luer Fittings, & Male Luer Fittings

Description	Packaging	Cat. No.
Female Luer Fittings, for use with 12-, 16-, and 24-port manifolds and 10-port flash manifold	2 pcs.per box	2.CR1102.0001
Male Luer Fittings, for use with 12-, 16-, and 24-port manifolds and 10-port flash manifold	2 pcs.per box	2.CR1103.0001

Legs for Cover - Black

Description	Packaging	Cat. No.
Black legs, for use with 12-, 16-, and 24-port manifolds and 10-port flash manifold	4 pcs.per box	2.CR1105.0001



Vacuum Manifold Plugs

Description	Packaging	Cat. No.
plugs, for use with 12-, 16-, and 24-port manifolds and 10-port flash manifold	2 pcs.per box	2.CR1110.0001

Support Posts for Rack

Description	Packaging	Cat. No.
Support posts, included with 12-, 16-, and 24-port manifolds	3 pcs.per box	2.CR1104.0001
Support posts, included with 10-port flash manifold	3 pcs.per box	2.CR2026.0001

Retaining Clips

Description	Packaging	Cat. No.
Retaining clips, included with 12-, 16-, and 24-port manifolds and 10-port flash manifold	12 pcs.per box	2.CR1109.0001

Plate-Base

Description	Packaging	Cat. No.
For use with 12-port manifold	1 pcs.per box	2.CR1025.0001
For use with 16-port manifold	1 pcs.per box	2.CR1429.0001
For use with 24-port manifold	1 pcs.per box	2.CR1837.0001
For use with 10-port flash manifold	1 pcs.per box	2.CR2023.0001

Plate-Dimple

Description	Packaging	Cat. No.
For use with 12-port manifold	1 pcs.per box	2.CR1024.0001
For use with 16-port manifold	1 pcs.per box	2.CR1428.0001
For use with 24-port manifold	1 pcs.per box	2.CR1836.0001
For use with 10-port flash manifold	1 pcs.per box	2.CR2022.0001

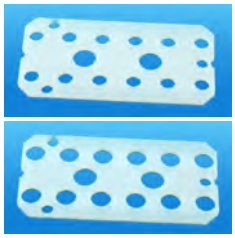


Plate- Test tubes

Description	Packaging	Cat. No.
13mm plate, for use with 12-port manifold	1 pcs.per box	2.CR1020.0001
13mm plate, for use with 16-port manifold	1 pcs.per box	2.CR1424.0001
13mm plate, for use with 24-port manifold	1 pcs.per box	2.CR1832.0001
16mm plate, for use with 12-port manifold	1 pcs.per box	2.CR1022.0001
16mm plate, for use with 16-port manifold	1 pcs.per box	2.CR1426.0001
16mm plate, for use with 24-port manifold	1 pcs.per box	2.CR1834.0001

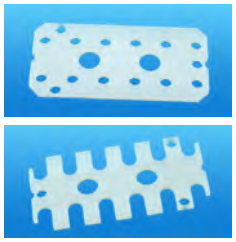


Plate-Autosampler Vial

Description	Packaging	Cat. No.
Autosampler Vial plate, included with 12-port manifold only	1 pcs.per box	2.CR1023.0001

Plate-Volumetric Flask

Description	Packaging	Cat. No.
Volumetric Flask plate, included with 12-port manifold only	1 pcs.per box	2.CR1021.0001

Plate-Test tubes

Description	Packaging	Cat. No.
19mm plate, included with 10-port flash manifold only	1 pcs.per box	2.CR2018.0001
25mm plate, included with 10-port flash manifold only	1 pcs.per box	2.CR2020.0001
13mm plate, for use with 24-port manifold	1 pcs.per box	2.CR1832.0001
16mm plate, for use with 12-port manifold	1 pcs.per box	2.CR1022.0001
16mm plate, for use with 16-port manifold	1 pcs.per box	2.CR1426.0001
16mm plate, for use with 24-port manifold	1 pcs.per box	2.CR1834.0001

Glass Test Tubes

Description	Packaging	Cat. No.
Test tubes, without rim, 5mL, 12 mm × 75 mm.	12 pcs.per box	2.CR9005.0001
Test tubes, without rim, 12mL, 16 mm × 100 mm.	12 pcs.per box	2.CR9012.0001

SPE Disk Manifolds & Accessories

SPE Disk Manifolds

SPE Disk Manifolds are specially designed as support systems for SPE disks. The 3- station SPE Disk Manifolds offered by CNW can handle 3 different samples at the same time, each sample can be controlled separately, and each port can be taken apart and changed separately. According to disks with different diameters such as 47mm and 90mm, there're two support bases. The whole set have 3- station support bases, 1000mL glass sample reservoir, PTFE disk support screen, and 25×200mm sample collection vessel(about 70mL). Sample collection vessel is with standard 24mm screw thread, you can also use quantified tube with same screw thread, and then detect directly.

The key part is PTFE supports, there're three shift swithes on it.One is elution shift, if place on this shift, organic solvent will be collected to the sample reservoir under the support. The middle shift is close, which can keep solvent don't

drop.And the other is loading and washing shift, water is connected to output tube through the hose, and then connect to aspirator bottle or vacuum pump.The flow rate of loading and washing can be controlled by the angle that the hand shank deviate to the middle, the maximum flow rate is obtained when put the hand shank in 45°.

The extraction process can be finished without stopping after you install the sample reservoir (or quantified tube). Eluting and loading solvent has different flow path, it avoid the problem that you should change sample reservoir or eluting and loading solvent share the same flow path as other brands' products. Especially for multi-position mainford, there'll have no cross contamination when use different eluting solvents.

Single Station SPE Disk Manifold, 47mm

Description	Packaging	Cat. No.
A complete 47mm single station comes with mounting hardware, Glass Sample Reservoir, Disk Support Screen and 25×200mm Sample Collection Vessel.	1 pcs.per box	2.CP0383.0001

2 - Station SPE Disk Manifold, 47mm

Description	Packaging	Cat. No.
A complete 47mm 2-station comes with mounting hardware, Glass Sample Reservoir, Disk Support Screen and 25×200mm Sample Collection Vessel.	1 pcs.per box	2.CP0200.0001

3 - Station SPE Disk Manifold, 47mm

Description	Packaging	Cat. No.
A complete 47mm 3-station comes with mounting hardware, Glass Sample Reservoir, Disk Holder and 25×200mm Sample Collection Vessel.	1 pcs.per box	2.CP0100.0001

6 - Station SPE Disk Manifold, 47mm

Description	Packaging	Cat. No.
A complete 47mm 6-station comes with mounting hardware, Glass Sample Reservoir, Disk Holder and 25×200mm Sample Collection Vessel.	1 pcs.per box	2.CP0080.0001

Racks for Disk Manifolds

Description	Packaging	Cat. No.
Rack for 3-station	1 pcs.per box	2.CP0351.0001
Rack for 6-station	1 pcs.per box	2.CP0352.0001

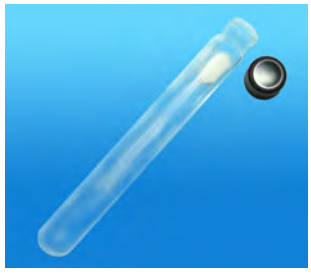
Sample Reservoir

Description	Packaging	Cat. No.
1000mL, for use with 47mm Manifold	1 pcs.per box	2.CP0432.0001

Disk Holder

The disk holder includes 316 SS disk support screen, a threaded screw cap to provide attachment of sample reservoir and a PTFE valve to control solvent fluid.

Description	Packaging	Cat. No.
Disk holder, for use with 47mm Manifold	1 pcs.per box	2.CP0236.0001
Disk holder, for use with 90mm Manifold	1 pcs.per box	2.CP0336.0001



Sample Collection Vessel

Description	Packaging	Cat. No.
Sample Collection Vessel, for use with 47mm and 90mm Manifolds, 25×200mm, round bottom	1 pcs.per box	2.CP0502.0001
Sample Collection Vessel, for use with 47mm and 90mm Manifolds, 28×95mm, flat bottom	1 pcs.per box	2.CP0501.0001
Disk SPE Concentration Tube, for use with 47mm and 90mm Manifolds, 15mL	1 pcs.per box	2.CP0503.0001

Typical Application: EPA 525.2 Organics in Water

There're more than 110 kinds of compounds this method can analyses, include pesticide residues (such as organochlorine, organic phosphorus, and pyrethroids, etc.), PAHs, PCBs, PAEs and adilic acid, etc.

Use three batches of 3M Empore C18 disk to check EPA 525.2 method, the MDLs is 0.03-2.4μg/L, recovery og analytes is 20-180%. The average recovery for different kinds of analytes: pesticide residues is 108%, PCBs is 108%, PAEs is 116%, and PAHs is 112%.

Sample Preparation:

Add 5mL methanol into 1L water sample filtered by aqueous phase filter, mix completely, take it as purified solution;

▼

Active 3M Empore C18 disk (47mm) by 5mL acetic ether:dichloromethane(1:1), 5mL methanol and 5mL deionized water, and keep there's always 3-5mm deionized water on the disk;

▼

Load sample to the active disk slowly, and the flow rate is about 50mL/min. And then elute, sample reservoir should be rinse by 3mL acetic ether:dichloromethane(1:1) beforehand. First, load 5mL acetic ether rinse sample vessel and then transfer it to disk, flow along the filter beaker, open vacuum pump to let about 2.5mL acetic ether pass through disk,then close vacuum pump, open vacuum pump after acetic ether rinsing disk forn about 1min. And then elute accordingly by 5mL dichloromethane and 2×3mL ether:dichloromethane(1:1);

▼

Collect all eluent, pass through 5-7g anhydrous sodium sulfate to remove water, concentrate to 1mL under N2, and detect by GD-MSD.

Liquid-liquid extraction (LLE)

CNW macroporous diatomite tube

What's SLE, and what's the difference between SLE and LLE/SPE

SLE: solid supported liquid-liquid extraction: is a method to use high capacity solid packings as supporter to achieve higher extraction efficiency. After packings absorbe water-soluble samples, analytes spread on the water layer of packings' surface.And then add proper water insoluble organic solution, there will form a boundary which has specific surface area, to achive maximum extraction efficiency.

Application

The products are always used in clinical chemistry and toxicology, and used for pretreatment of urine, whole blood, plasma, serum, gastric juice, amniotic fluid, feces, and animal/plant tissue. And also used in environment and residual analysis, such as industrial water, drinking water, and waste water analysis. And for acid and alkali compounds,such as drug and drug metabolism in body fluid.

The advantage compared with traditional LLE（liquid-liquid extraction）:

- Simplify extraction method
- Prevents emulsification
- Reduced glassware requirements
- Use less sample processing time
- Greater reproducibility
- More suitable for automated,enlarge treatment capacity

The difference between SPE（Solid Phase Extraction）and SLE:

SLE has excellent extraction effect for high concentration samples, while SPE is more suitable for the concentration of low concentration samples.

Physical characteristics and parameter of packing:

The support of SLE is diatomaceous earth with high pore volume, which undergo high temperature purification, and have high water sucking capacity.

Loading capacity comparison table

Tube capacity	Packing	Maximum treatmentcapacity	Waiting time	Elutionvolumn
1 mL	250 mg	0.25 mL	5 min	3 mL
3 mL	500 mg	0.5 mL	5 min	6 mL
6 mL	1 g	1 mL	5–10 min	8 mL
15 mL	3 g	3 mL	5–10 min	12 mL
30 mL	4.5 g	5 mL	5–10 min	16 mL
45 mL	8.3 g	10 mL	10–15 min	24 mL
70 mL	14.5 g	20 mL	10–15 min	40 mL
150 mL	37.5 g	50 mL	10–15 min	90 mL

How to use CNW macroporous diatomite tube

1. Water sample preparation: Add sodium chloride to accelerate two-phase distribution,use buffer to adjust the ionic state of analytes (low pH to extract acidic compounds, high pH to extract basic compounds)

2. Choose suitable tube according to maximum treatment capacity

3. Load sampel into extraction tube, just rely on gravity

4. Wait for 3-10min, let packing absorbe water sample sufficiently

5. Elute by organic solvent immiscible with water, if it is mixed solvent, you should consider the content of water-soluble solvent to make sure it is immiscible with water

6. Collect concentrated eluent or detect directly

Common elute solvent:

dichloromethane	chloroform	tert butyl ether	acetic ether
diethyl ether	n-hexane	cyclohexane	methybenzene
chloroform -methanol(90:10,v/v)(85:15,v/v)		diethyl ether -ethanol(90:10,v/v)(80:20,v/v)	
dichloromethane –isopropanol (90:10,v/v) (85:15,v/v)			

Description	Packaging	Cat. No.
CNWBOND Cartridge for dyes test in textiles	18g，60mL/100pcs	2.CA3938.0001
	18g，60mL/50pcs	2.CA3939.0001

SPE Application

Food safety

Benzo(e)pyrene in edible oils

Sample pretreatment:

Less than or equal to 0.5g oil sample is diluted with 2mL hexane

▼

Condition MIP-BAP column(Cat. No.:2.CA4854.0001) with 5mL CH2Cl2, and 5mL Hexane

▼

Load: 5mL of diluted sample

▼

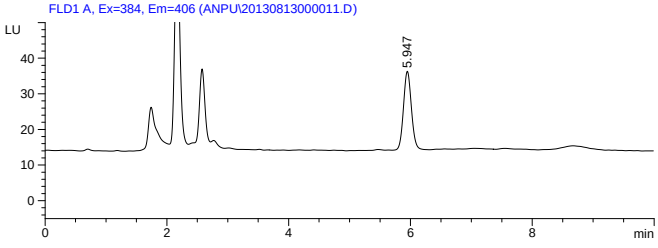
Wash: 10mL Hexane

▼

Elute: 5mL CH2Cl2

▼

For LC-FLD analysis, to dryness under N2 at 40℃. Then dilute with CH3CN to 1mL. Filter the 1mL through a 0.22μm hydrophilic PTFE filter.



10ppb Benzo(e)pyrene spiked in edible oil

FLD-HPLC Condition:

Column:	Athena C18-WP HPLC Column,4.6 × 250mm,5um
Mobile phase:	acetonitrile/ water=95:5, v/v
Flow rate(mL/min):	1.0mL/min
column temperature:	35℃
Detector:	FLD, λex384nm, λem406nm

Recoveries of MIP-BAP column used for extraction of Benzo(e) pyrene in edible oils

No.	5ppb	10ppb	20ppb
1	101.35%	101.10%	99.52%
2	102.47%	106.01%	110.75%
3	108.52%	101.38%	97.10%
4	104.03%	101.28%	97.17%

PAHs in edible oils

Sample pretreatment:

Less than or equal to 0.5g oil sample is diluted with 2mL hexane

▼

Condition MIP-PAHs column(Cat. No.:2.CA6757.0001) with 5mL CH2Cl2, and 5mL Hexane

▼

Load: 2mL of diluted sample

▼

Wash: 3mL Hexane/2mL Hexane

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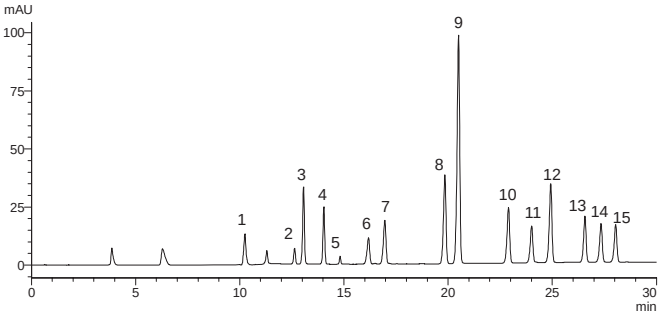
Elute: 10mL Ethyl Acetate

▼

For LC-FLD analysis, to dryness under N2 at 40 ℃. Then dilute with CH3CN to 1mL. Filter the 1mL through a 0.22μm hydrophilic PTFE filter.



FLD-HPLC Condition:

Column: Athena PAHs HPLC Column,4.6 × 250mm,5um

Mobile phase:

Time(min)	Water(%)	Acetonitrile(%)
0	60	40
25	0	100
35	0	100
45	60	40

Flow rate(mL/min):	2.0mL/min
column temperature:	30℃
Detector:	FLD, λex384nm, λem406nm

Recoveries of MIP-PAHs column used for extraction of PAHs in edible oils

No.	PAHs	PAH addition (μg/kg)	recovery rate percent	RSD percent(n=3)
1	Na	2	……a	……a
		10	……a	……a
		20	56.1	23.4
2	Ace	2	102.0	4.5
		10	56.0	4.8
		20	70.2	5.8
3	F	2	105.0	7.1
		10	73.6	3.4
		20	92.5	2.2
4	Phe	2	……a	……a
		10	75.2	3
		20	104.9	4.2
5	Ant	2	105.0	4.2
		10	71.6	7
		20	82.7	4.3
6	Flu	2	90.0	4.2
		10	90.2	3.4
		20	109.1	2.9
7	Pyr	2	106.0	5.6
		10	84.4	4.6
		20	93.5	3.7
8	BaA	2	107.0	6.3
		10	92.6	6
		20	103.9	3.5
9	Chr	2	108.0	3.9
		10	96.6	5.1
		20	105.1	3.7
10	BbF	2	109.0	4.1
		10	91.2	4.8
		20	101.4	3.7
11	BkF	2	87.0	3.5
		10	92.0	3.8
		20	104.0	2.6
12	BaP	2	96.0	4.2
		10	91.2	4.8
		20	102.2	3.2
13	DahA	2	87.0	3.6
		10	81.2	4.4
		20	89.7	5.1
14	BghiP	2	101.0	4.8
		10	93.2	4
		20	95.6	5.2
15	IcdP	2	102.0	4.7
		10	89.8	2.9
		20	103.7	3

Pesticide residual

Organic phosphorus pesticide in tea leaf

Sample preparation:

Put 2g tea leaf into water overnight, and put it into 10mL n-hexane: acetone (1:1), homogenize, extract for 2-3 times.

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Gather all the extract, mix, centrifuge and get the upper layer.

▼

Add proper anhydrous sodium sulfate and centrifuge, get the upper layer, evaporate supernatant to 1mL at 35℃.

▼

Condition CNWBOND Carbon-GCB SPE tube (250mg/3mL or 500mg/6mL) with 5mL n-hexane: acetone (1:1).

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Load 1mL samples onto SPE tube, elute with 20mL n-hexane: acetone (1:1).

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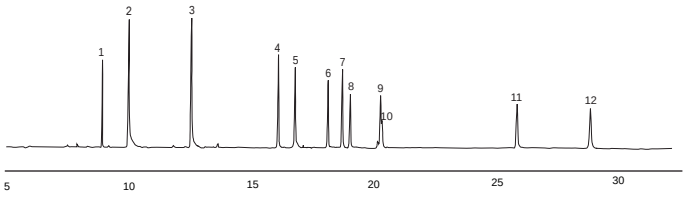
Gather all eluent and concentrate to dryness under N2 at 40℃, reconstitute in 1mL n-hexane: acetone (1:1), detect by GC-FPD.



GC-FPD Condition:

Column:	HP-5, 30m×0.25mm I.D., 0.25μm
Temp:	50℃(1min), 15℃/min to 200℃,5℃/min to 260℃,hold 8min
Inject:	Splitless, 250℃
Detect:	FPD, 250℃
Carrier gas:	N2, 1.0mL/min
Injection volumn:	1.0μL

Recovery of Carbon-GCB used for extraction of organic phosphorus pesticide

No.	Compounds	Recovery /% (%)
1	Dichlorvos	61
2	Methamidophos	52
3	Acephate	52
4	Iprobenfos	95
5	Dimethoate	94
6	Chlorpyrifos	81
7	Malathion	88
8	Fenitrothion	80
9	Isocarbophos	94
10	Quinalphos	95
11	Triazophos	84
12	EPN	62

Pyrethroid in tea leaf

Use CNWBOND Carbon-GCB and Florisil SPE together is suitable for the analysis of multi-residual pesticide in food, especially for pyrethroid which has good retaining in Florisil adsorbent. These combine the advantages of two packings to remove interference for GC detection, and are widely used now.

Sample preparation:

Preparetion and extraction of tea leaf refer to the condition "organic phosphorus pesticide in tea leaf"

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The clean up of CNWBOND Carbon-GCB SPE tube refer to above, concentrate eluent to about 2mL under N2 at 40℃

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Condition CNWBOND Florisil SPE tube (1g/ 6mL) with 5mL n-hexane

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Load 2mL sample onto Florisil tube, elute with 8mL aether: acetone: n-hexane (2:2:1)

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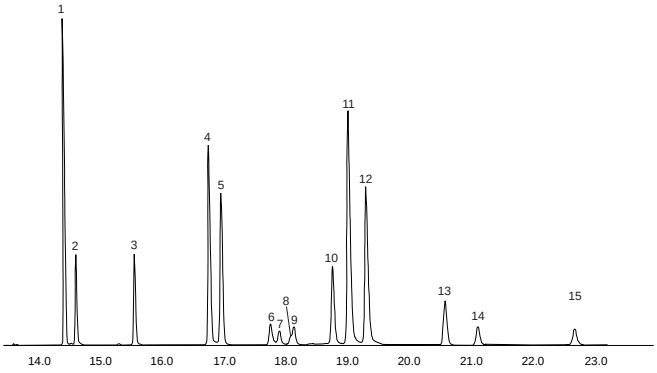
Gather all eluent and concentrate to dryness under N2 at 40℃,reconstitute in 1mL acetone :n-hexane (1:1), detect by GC-MSD.



GC-FPD Condition:

Column:	DB-5, 30m×0.25mm I.D., 0.25μm
Temp:	40℃(2min), 8℃/min to 300℃(5min)
Inject:	Splitless (4.5min), 300℃
Detect:	MSD, 200℃
Scan:	m/z 85-500
Carrier gas:	He, 1.0mL/min
Injection volumn:	1.0μL

Recovery of Florisil used for extraction of Pyrethroid

No.	Compounds	Recovery /% (%)
1	Bifenthrin	105
2	Fenpropathrin	105
3	Cyhalothrin	108
4	Cis-Permethrin	142
5	Trans-Permethrin	142
6	Cyfluthrin-1	168
7	Cyfluthrin-2	89
8	Cyfluthrin-3	89
9	Cyfluthrin-4	89
10	Cypermethrin	112
11	Ethofenprox	95
12	Silafluofen	153
13	Fenvalerate	115
14	Esfenvalerate	115
15	Deltamethrin	110

Pesticide residual in tea leaf

Sample extraction:
Put 2g tea leaf into water overnight, and put it into 10mL n-hexane: acetone (1:1), homogenize, extract for 2-3 times. Gather all the extraction, mix, centrifuge and get the upper layer. Add proper anhydrous sodium sulfate and centrifuge, get the upper layer, evaporate supernatant to 1mL at 35℃.

▼

SPE condition:
Condition CNWBOND Carbon-GCB SPE tube（2.CA1663.0001 or 2.CA1654.0001） with 5mL n-hexane: acetone (1:1)

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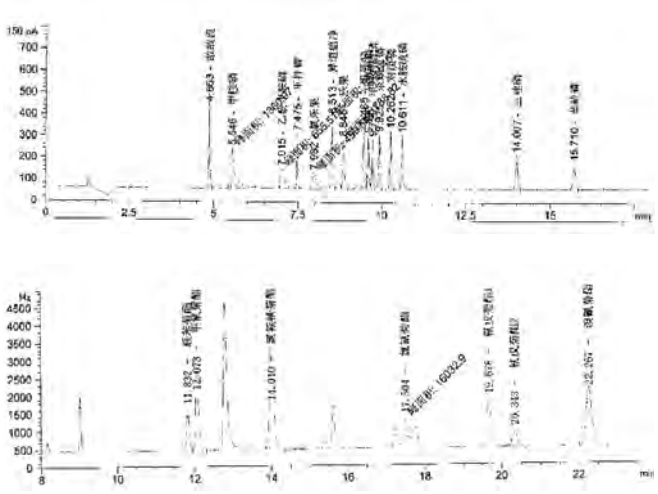
Load:
Load 1mL extract onto conditioned SPE tube

▼

Elution:
Elute with 10mL n-hexane: acetone (1:1), gather all eluent and concentrate to dryness under N2 at 40℃, reconstitute in 1mL n-hexane: acetone (1:1), detect by GC.



Instrument: 7890A, FPD and ECD detector

Recovery:

Compounds	Concentration of Internal Standards (ppm)	GCB Recovery	Compounds	Concentration of Internal Standards (ppm)	GCB Recovery
Dichlorvos	0.05	98.88%	Fenvalerate1	0.07	75.90%
Phorate	0.05	99.80%	Fenvalerate2	0.03	27.33%
Iprobenfos	0.05	100.01%	Deltamethrin	0.10	100.81%
Dimethoate	0.05	100.86%	α-BHC	0.04	97.60%
Chlorpyrifos	0.05	45.51%	β-BHC	0.04	100.83%
Malathion	0.05	101.13%	γ-BHC	0.04	101.16%
MethylParathion	0.05	99.05%	δ-BHC	0.04	102.32%
Fenitrothion	0.05	101.38%	Octachlor odipropyl ether	0.02	104.09%
Parathion	0.05	99.94%			
Isocarbophos	0.05	100.91%	END-1	0.02	104.58%
Triazophos	0.05	100.24%	DDT	0.04	100.59%
EPN	0.05	99.50%	END-2	0.02	49.12%
Bifenthrin	0.10	104.18%	DDT	0.04	100.35%
Fenpropathrin	0.10	97.03%	DDT	0.04	105.00%
Cyhalothrin	0.10	98.15%	DDT	0.04	100.10%
Cyfluthrin	0.10	108.04%	Dicofol	0.10	99.48%

Carbamate pesticides in vegetables and fruits

Sample extraction:
Put 25g samples into 50mL acetonitrile, homogenize, centrifuge and get the upper layer. Add 5-7g sodium chloride, mix, and centrifuge. Suck 10mL acetonitrile layer, concentrate to dryness under N2 at room temperature, reconstitute in 2mL methanol: dichloromethane (1:99).

▼

SPE condition:
Condition CNWBOND NH2 SPE tube（2.CA2154.0001） with 4mL methanol: dichloromethane (1:99).

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Load:
Load 1mL extract onto SPE tube at the flow rate of the flow rate of about 1 drop/s

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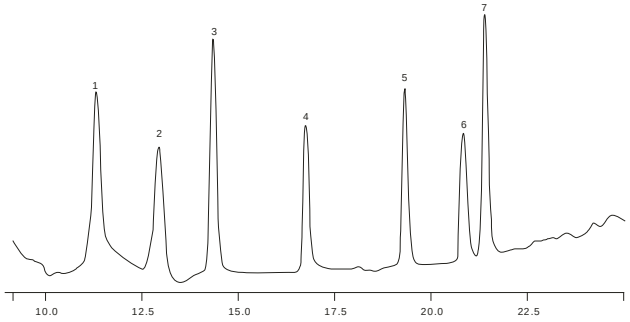
Elution:
Elute with 4mL methanol: dichloromethane (1:99), concentrate to dryness under N2 at room temperature, reconstitute in 2.5mL methanol, detect by FLD-HPLC.



Chromatogram of 7 kinds of carbamate pesticides in pimento

FLD-HPLC Condition:

Column: Cnwsil C18, 25cm×4.6mm I.D., 5μm

Mobile phase:

Time(min)	Water(%)	Methanol(%)	Flow rate(mL/min)
0	85	15	0.5
2	75	25	0.5
8	75	25	0.5
9	60	40	0.8
10	55	45	0.8
19	20	80	0.8
25	20	80	0.8
26	85	15	0.5

Oven temperature: 42℃

Detector: FLD, λex330nm, λem465nm

Post-column derivation: 0.05moL/L NaOH and OPA, flow rate 0.3 mL/min; hydrolysis temperature 100℃,derivation temperature: room temperature

Injection: 20μL

Recovery of NH2 tube used for extraction of carbamate pesticides in pimento

No.	Compounds	Recovery /% (%)
1	Aldicarb-sulfoxide	96
2	Aldicarb-sulfone	98
3	Methomyl	100
4	Carbofuran-3-hydroxy	99
5	Aldicarb	99
6	Carbofuran	97
7	Carbaryl	98

Organic phosphorus pesticide in fruits

Carbon-GCB is suitable for removing pigments (such as chlorophyll and carotenoids) from fruits and food, and sterols, etc.

Both PSA and NH2 can effectively retain interferents in the analysis of multi-residual pesticide, such as fatty acids (include oleic acid, palmitic acid, linoleic acid etc.), organic acids, some polar dyes and sugars etc. PSA can retain more than 99% fatty acids, which greatly reduce signal interference caused by the matrix system in the GC analysis.

Add 10g fruits into 20mL acetonitrile, homogenize

▼

Add 2-4g NaCl, mix, centrifuge and get the acetonitrile layer

▼

Add proper anhydrous sodium sulfate and centrifuge, get the upper layer, evaporate supernatant to 1mL at 35℃

▼

Condition CNWBOND GCB/PSA or CNWBOND GCB/NH2 SPE tube with 5mL acetonitrile: methylbenzene (3:1)

▼

Load 1mL extract onto SPE tube, elute with 10-15mL acetonitrile: methylbenzene (3:1)

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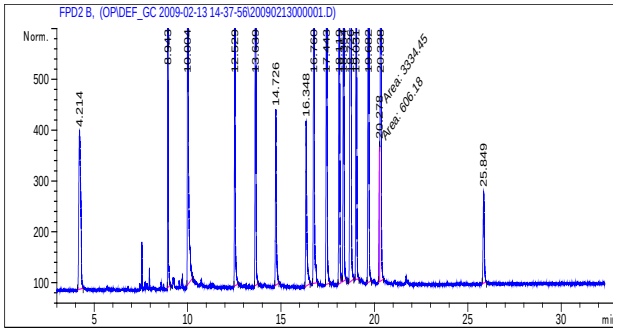
Gather eluent, concentrate to dryness under N2 at 40℃, reconstitute in 1mL acetone: n-hexane (1:1), detect by GC-FPD.



GC-FPD Condition:

Column:	HP-5, 30m×0.25mm I.D., 0.25μm
Temp.:	50℃(1min), 15℃/min to 200℃(2min), 5℃/min to 260℃(8min)
Inject:	Splitless, 250℃
Detect:	FPD, 250℃
Carrier gas:	N2, 1.0mL/min
Injection volumn:	1.0μL

Recovery of Dual-layer SPE tube used for extraction of organic phosphorus pesticide in fruits (%)

RT(min)	Compounds	GCB/PSA	GCB/NH2
4.214	Dipterex	56	135
8.943	Dichlorvos	109	83
10.004	Methamidophos	88	113
12.529	Acephate	55	134
13.639	Phorate	100	109
14.726	Omethoate	132	166
16.348	Monocrotophos	164	189
16.76	Dimethoate	129	148
17.443	Methyl Parathion	121	135
18.119	Chlorpyrifos	106	119
18.354	Pirimiphos-methyl	108	123
18.726	Malathion	112	125
19.031	Fenitrothion	109	124
19.682	Parathion	110	125
20.278	Isocarbophos	146	175
20.338	Quinalphos	114	130
25.849	Triazophos	142	174

Residual of chlorothalonil, fipronil, beta-cyfluthrin, bifenthrin, and fenpropathrin in edible fungi

Sample extraction:
Add 2g NaCl to 10g sample, elute with 20.0mL methyl cyanide, centrifuge and gather 4mL methyl cyanide layer, concentrate to dryness, reconstitute in 2.0mL n-hexane

▼

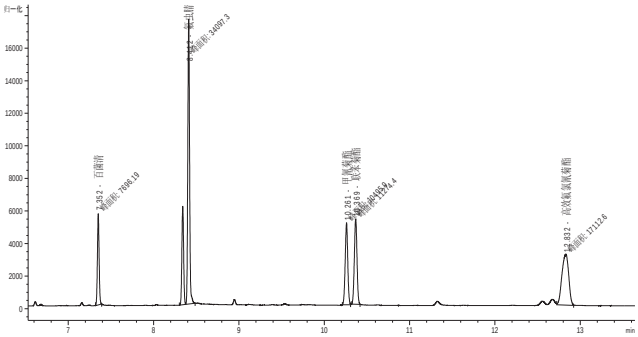
SPE condition:
use CNWBOND Carbon-GCB（upper layer）and CNWBOND Florisil SPE（lower layer）,condition with 5mL n-hexane

▼

Load:
Load 2mL sample

▼

Elution:
elute with 5mL*3 n-hexane /acetone（9:1）. Evaporate supernatant eluent to dryness, and then dry by pepetting rubber ball, reconstitute in 2.0mL n-hexane: acetone, detect by GC



GC-MS condition:

Column:	HP-5, 30m×0.25mm I.D., 0.25μm
Temp.:	80℃hold 2min,ramp 15℃/min to 280℃,hold 5min
Carrier gas:	He,1.0mL/min
Inj.:	200℃
Inject volume:	1.0μL
Injection condition:	Splitless
Solvent Delay	5min
Source Temp:	230℃
GC-MS Transfer Temp:	280℃

Recovery of CNWBOND Carbon-GCB and CNWBOND Florisil SPE used for etraction of pesticides

Compounds	Concentration of Internal Standards	Average Recovery(%)
chlorothalonil	100ppb	88.1
Fipronil	100ppb	103.3
Bifenthrin	100ppb	99.7
Fenpropathrin	100ppb	93.4
Beta-cyfluthrin	100ppb	98.8

SPE Application

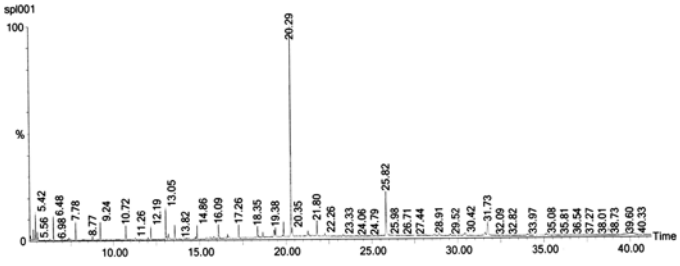
Multi-pesticide and relative chemicals residual in vegetables and fruits

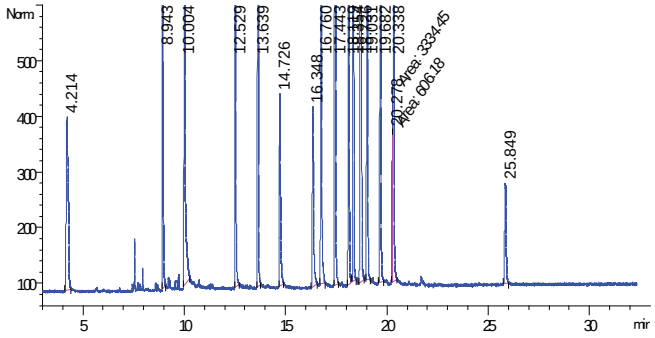
Sample extraction: Put 10g fruits sample into 20mL acetonitrile, homogenize. Add 2-4g NaCl, mix, centrifuge and get the upper acetonitrile layer. Add proper anhydrous sodium sulfate into acetonitrile extrction, mix, centrifuge and get the upper layer, evaporate supernatant to 1mL at 35℃.

SPE Condition: Condition CNWBOND GCB/PSA or CNWBOND GCB/NH2 SPEtube with 5mL acetonitrile: methylbenzene(3:1).

Load: Load 1mL sample onto SPE tube, flow rate is about 1drop/s

Elution: Elute SPE tube with 10-15mL acetonitrile:methylbenzene(3:1). Gather all eluent and concentrate to dryness under N2 at 40℃, reconstitute in 1mL acetone: n-hexane(1:1),detect by GC





GC-MS condition:

Column:	DB-35MS, 30m×0.25mm I.D., 0.25μm
Temp.:	50℃ hold 1min, ramp 25℃/min to 150℃,ramp 8℃/min to 280℃,hold 1min, ramp 5℃/min to 300℃,hold 15min
Carrier gas:	He,1.0mL/min
Inj.:	230℃
Injection volume:	1.0μL
Injection condition:	Split 50:1
Solvent delay	5min
Source Temp:	230℃
GC-MStransfer temp:	280℃

GC-FPD condition:

Column:	HP-5, 30m×0.25mm I.D., 0.25μm
Temp:	50℃(1min), 15℃/min to 200℃(2min), 5℃/min to 260℃(8min)
Inj.:	Splitless, 250℃
Det.:	FPD, 250℃
Carrier gas:	N2, 1.0mL/min
Injection volume:	1.0μL

Recovery of GCB/PSA SPE tube used for organic chlorine and pyrethroid pesticide residuals in Guanxi honey pomelo (%)

Compounds	Concentration of Internal Standards	Average Recovery(%)
Dichlorvos	200ppb	90
α-HCH	200ppb	94
β-HCH	200ppb	98
γ-HCH	200ppb	94
δ-HCH	200ppb	93
Fenitrothion	200ppb	100
Chlorpyrifos	200ppb	94
Parathion	200ppb	100
Fenthion	200ppb	99
Quinalphos	200ppb	98
Buprofezin	200ppb	91
Fenpropathrin	200ppb	103

Recovery of GCB/PSA and GCB/NH2 SPE tube used for organic chlorine in fruits (%)

Compounds	Concentration of Internal Standards	GCB/PSA	GCB/NH2
Dipterex	20ppb	56	135
Dichlorvos	20ppb	109	83
Methamidophos	20ppb	88	113
Acephate	20ppb	55	134
Phorate	20ppb	100	109
Omethoate	20ppb	132	166
Monocrotophos	20ppb	164	189
Dimethoate	20ppb	129	148
MethylParathion	20ppb	121	135
Chlorpyrifos	20ppb	106	119
Pirimiphos-methyl	20ppb	108	123
Malathion	20ppb	112	125
Fenitrothion	20ppb	109	124
Parathion	20ppb	110	125
Isocarbophos	20ppb	146	175
Quinalphos	20ppb	114	130
(Triazophos	20ppb	142	174

Pesticides in spinach

Take frozen spinach, grind and mix, weigh out 10.00g, add 138 pesticides solution, place overnight. Analyse according to "analytical methods for residual compositional substances of agricultural chemicals, feedstuff additives,and veterinary drugs in food" ,use 2pcs GCB tubes and 1 pcs NH2 tube, to get recovery.

Compounds	Concentration of Internal Standards(ng)	Average Recovery(%)	Compounds	Concentration of Internal Standards(ng)	Average Recovery(%)
Propoxur	100	97.76	稻丰散	50	98.57
Methamidophos	500	74.62	Quinalphos	20	112.35
Dichlorvos	200	54.92	Triflumizole	10	106.10
Metolcarb	100	122.01	Triadimenol	50	131.72
Acephate	500	53.68	Procymidone	50	78.35
Methacrifos	100	80.40	Propaphos	20	100.58
Carbaryl	500	115.00	Bromophos-ethyl	10	68.95
Isoprocarb	50	94.63	Methidathion	100	118.55
Fenobucarb	10	98.25	Butachlor	50	69.46
Ethoprophos	20	76.63	Hexythiazox	250	146.40
Trifluralin	10	79.90	Chlordane	20	76.35
Bendiocarb	400	96.80	Paclobutrazol	20	122.73
Monocrotophos	500	109.06	Butamifos	50	106.48
Salithion	200	118.18	Endosulfan	250	77.66
Cadusafos	400	51.85	Isoprothiolane	20	129.73
Phorate	100	71.87	Prothiophos	50	90.15
α--HCH	100	77.61	Profenofos	100	124.29
Thiometon	250	82.10	PP-DDE	10	90.50
Hexachlorobenzene	100	63.44	Pyraclostrobin	20	112.20
Dimethoate	200	116.01	Myclobutanil	50	112.15
Carbofuran	400	125.10	Flusilazole	10	139.00
Atrazine	20	118.50	Fipronil	20	115.80
Propetamphos	50	84.70	Buprofezin	50	66.21
β--HCH	200	108.28	Tricyclazole	500	130.56
Pentachloronitrobenzene	50	71.42	Chlorfenapyr	100	111.44
Diazinon	50	66.08	Dieldrin	50	57.95
Cyanophos	50	112.51	Fluazifop-P-butyl	20	87.25
Terbufos	100	67.49	Oxazoline	500	129.23
γ--HCH	200	108.28	Fensulfothion	200	129.81
Pyrimethanil	50	108.90	Endrin	200	120.38
Disulfoton	50	54.22	Ethion	20	77.78
chlorothalonil	200		PP-DDD	10	94.70
Etrimfos	100	82.61	OP-DDT	50	114.02
Kitazine	100	121.41	Triazophos	100	122.93
Pirimicarb	50	111.73	sulprofos	400	82.14
δ--HCH	100	68.50	Propiconazol	50	109.84
Iprobenfos	20	120.93	Carbophenothion	20	91.93
Formothion	250	91.56	Cyanofenphos	50	95.01
Dichlorofenthion	20	61.90	Phenamiphos	100	149.83
Acetochlor	100	87.16	Edifenphos	100	153.55
2,4-D butyl ester	250	83.09	PP-DDT	50	110.16
Chlorpyrifos-methyl	20	82.58	Propargite	100	114.55
Vinclozolin	50	68.07	Carbosulfan	50	110.16
Alachlor	50	102.57	Pridaphenthion	50	103.25
Parathion-methyl	250	119.29	Bifenthrin	10	133.05
Tolclofos-methyl	10	65.05	Tetramethrin	100	115.83
Ametryn	100	94.99	EPN	200	113.66
Metalaxyl	50	101.62	Bomopropylat	50	122.91
Prometryn	20	79.30	Fenpropathrin	100	82.45
Paraoxon	500	123.88	Tbufenpyrad	50	124.60
Heptachlor	50	101.38	Ainphosmethyl	250	98.28
Pirimiphos-methyl	10	72.00	Tradifon	50	98.99
Fenitrothion	50	116.38	Phosalone	50	136.12
Malathion	100	90.79	Cyhalothrin	100	105.86
Metolachlor	20	89.95	Phosmet	250	107.00
Chlorpyrifos	20	70.35	Azinphos-ethyl	250	111.06
Fenthion	50	82.55	Pyraclofos	200	143.09
Benthiocarb	50	93.18	Permethrin	100	108.26
Parathion	50	108.49	Coumaphos	250	119.06
Triazolone	100	88.33	Pyridaben	100	105.56
Isocarbophos	200	134.45	Prochloraz	250	112.00
Aldrin	50	57.74	Cyfluthrin	200	105.08
Pyrimithate	10	64.75	Cypermethrin	200	99.97
Dicofol	250	110.93	Flucythrinate	50	124.59
Bromophos	20	93.53	Fenvalerate	100	117.92
Fosthiazate	500	108.58	Fluvalinate	100	105.42
Isofenphos-methyl	20	74.63	Difenoconazole	200	122.11
Pendimethalin	100	94.82	Indoxacarb	200	161.44
Cyprodinil	100	90.97	Deltamethrin	500	114.77
Chlorfenvinphos	50	114.16	Pyraclostrobin	50	109.42
Omethoate	500	70.70	Famoxadone	500	110.65

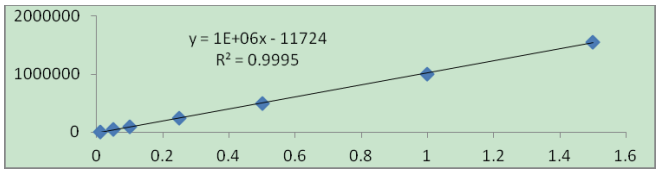
Bifenthrin and chlorfenapyr in eggplant

Sample extraction: Put 10g eggplant sample into 20mL acetonitrile, add 7g NaCl, ultrasonic extract, centrifuge and get 10mL upper layer, evaporate supernatant to dryness, place to dry, reconstitute in petroleum ether

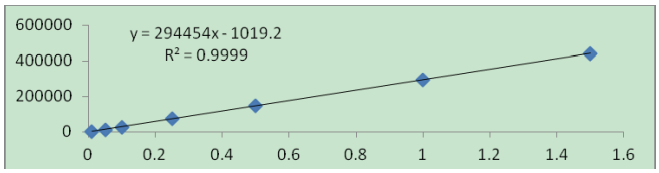
SPE Condition: Condition CNWBOND Florisil PR SPE tube with 5mL petroleum ether

Load: Load sample onto SPE tube about 1drop/s

Elution: Elute with petroleum ether/acetone（9:1）, 5mL each time for 4 times.Gather eluent, evaporate supernatant to dryness at 35ºC, place to dry. Reconstitute in petroleum ether/acetone（9:1）, and detect.



Chlorfenapyr standard curve:0.01, 0.05, 0.1, 0.25, 0.5, 1, 1.5mg/L



Bifenthrin standard curve:0.01, 0.05, 0.1, 0.25, 0.5, 1, 1.5mg/L

GC-ECD condition:

Column:	DB-1700, 30m×0.32mm I.D., 0.25μm
Temp:	150℃(2min), 5℃/min to 240℃(5min)
Inj.:	240℃
Det.:	ECD, 300℃
Carrier gas:	N2, 2.0mL/min
Injection volume:	2.0μL
RT:	Chlorfenapyr 19.27min;Bifenthrin 20.50min

Compounds	Concentration of Internal Standards（ppb）	Average Recovery（%）
Chlorfenapyr	10	117
	500	103
	2000	104
Bifenthrin	10	115
	500	103
	2000	105

Veterinary drug residual

Patulin in drinks

Sample extraction: Collect 2.5mL drink sample（for unfiltered muddy juicy , centrifuge 7000 r/min for 10min）

Condition: Condition Poly-Sery HLB SPE tube (Cat. No.: 2.CA3179.0001) with 3mL methanol, 3mL deionized water

Load: Load 2.5mL sample onto SPE tube in the flow rate of the flow rate of the flow rate of about 1 drop/s

Wash: Wash with 1mL 1% sodium carbonate, 1mL 1% acetic acid, dry SPE tube at low vacuum

Elution: Elute with 2mL acetic ether: ether（1:9）(concentrate to dryness under N2 at room temperature, reconstitute in 1mL 0.1% acetic acid,detect by LC-MS)

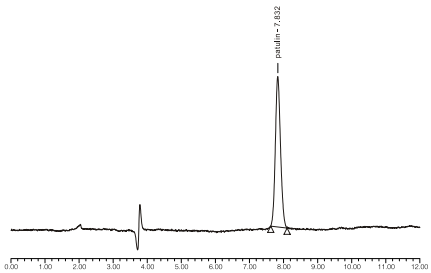


Fig 1. Patulin standard solution(1ppm)

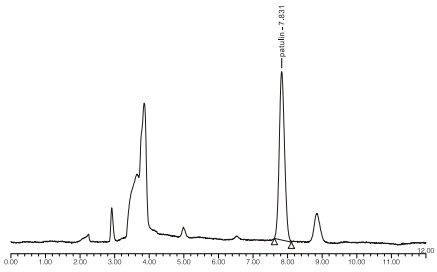


Fig 2. Drink sample added 1μg patulin

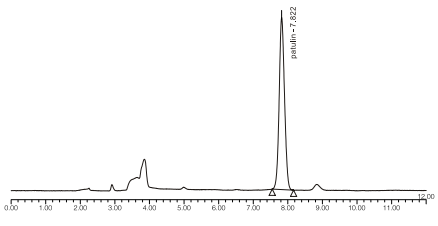


Fig 3. Drink sample added 5μg patulin

UV-HPLC condition:

Column:	C18, 25cm×4.6mm I.D., 5μm
Mobile phase:	acetonitrile:0.5mmol/L acetic acid: ammonia=14:86
Flow rate:	0.7mL/min
Det.:	UV 276nm
Injection volume:	20μL

Patulin concentration(μg/mL)	Extraction recovery of Poly-Sery HLB
1.0	117.7%
2.0	102.8%
5.0	90.5%

Macrolide antibiotic residuals in honey

Sample preparation:

Sample extraction:
Weigh out 2g sample（accurate to 0.01g）,dissolve in 15mL 0.1M sodium dihydrogen phosphate buffer（pH8.0）,mix

▼

SPE Condition:
Condition CNWBOND LC-C18 SPE tube (Cat. No.:2.CA0953.0001) with 5mLmethanol, 5mL deionized water

▼

Load:
Load 15mL sample onto SPE tube in the flow rate of 2-3mL/min

▼

Wash:
Wash with 5mL deionized water,5mL 20%methanol, dry LC-C18 tube at low vacuum

▼

Elution:
Elute with 2×3mL methanol, reconstitute in 10mL water, detect by HPLC-MS

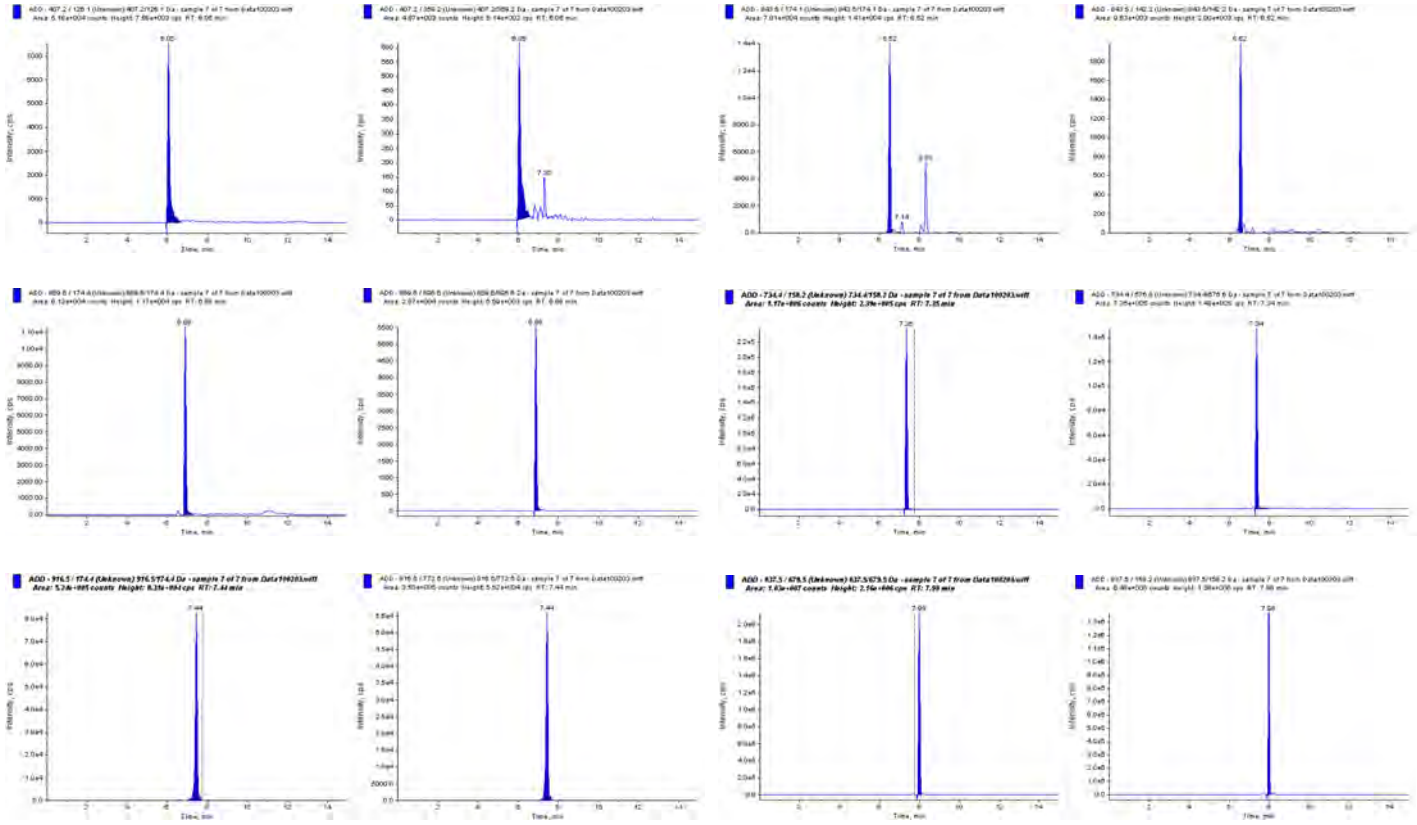
HPLC-MS condition:

Column: C18, 15cm×4.6mm I.D., 5μm
Mobile phase Gradient elution
Flow rate: 400μL/ min
Oven: 35℃
Det.: ESI(+)
Injection volume: 20μL

Time(min)	Mobile phase	
	acetonitrile/(%)	0.15% formic acid
0	20	80
2	20	80
7.5	80	20
7.6	95	5
8.7	95	5
8.8	20	80
14	20	80

Recovery of CNWBOND LC-C18 SPE used for extraction of macrolide antibiotic

No.	Compounds	Absolute Recovery(%)
1	Lincomycin	51.09
2	Spiramycin	30.00
3	Tilmicosin	37.61
4	Erythromycin	75.97
5	Tylosin	80.46
6	Roxithromycin	74.64



Honey sample addes 10ppb macrolide antibiotic

SPE Application

Chloramphenicol in meat and meat products

Sample extraction: Collect 10g sample, add anhydrous sodium sulfate and 30mL acetic etherhomogenize, centrifuge,get acetic ether layer, evaporate supernatant and reconstitute in 1mL methanol-sodium chloride and 4mL n-hexane,mix, centrifuge,remove n-hexane layer,add 4mL acetic ether,mix again,centrifuge,get acetic ether layer,dry and reconstitute in 5mL deionized water

▼

SPE Condition: Condition CNWBOND LC-C18 SPE tube(200mg/3mL) with 5mL methanol and 5mL deionized water Condition

▼

Load: Load 5mL sample onto SPE tube in the flow rate of 1 drop/s

▼

Wash: Wash with 5mL deionized water:methanol (8:2)

▼

Elution: Elute with 25mL methanol (concentrate to dryness under N2 at 50℃, detect by GC-MS after derivatization)

Chloramphenicol residual in aquatic products

Extracte samples with acetic ether, change to aquatic phase,remove oils with n-hexane. Extracte with acetic ether again, concentrate to dryness, reconstitute in 1mL 5% acetonitrile

▼

SPE tube: CNWBOND LC-C18 SPE tube (2. CA0953.0001)

▼

Condition: Condition SPE tube with 5mL methanol

▼

Equilibrium: 5mL deionized water

▼

Load: Load sample, in the flow rate of less than 1drop/s

▼

Wash: Wash with 5mL deionized water

▼

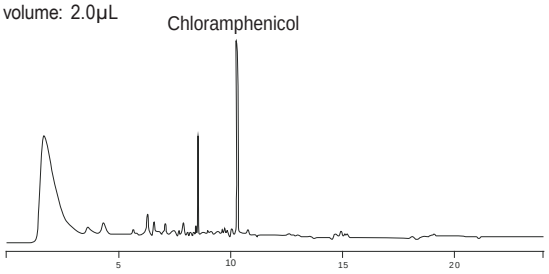
Elution: Elute with 2×3mL acetonitrile

▼

Gather eluent, concentrate to dryness under N2 at 50℃,add proper BSTFA:TMCS (99:1) derive, detect by GC-ECD

GC-ECD condition:

Column:	CD-5, 30m×0.25mm I.D., 0.25μm
Temp:	150℃(1min), 15℃/min to 260℃(10min), 30℃/min to 280℃(5min)
Inj.:	Splitless, 260℃
Det.:	ECD, 300℃
Carrier gas:	N2, 1.0mL/min
Injection volume:	2.0μL



Recovery of used for aquatic products added 45ppb Chloramphenicol is 98.7%

Oxytetracycline, Tetracycline, Aureomycin residual in aquatic products

Sample preparation: Extract fish with 0.5% perchloric acid, add 1 mL n-hexane to remove oils, gather aquatic phase

▼

SPE tube :LC-C18（2.CA0953）

▼

Condition: 5mL methanol

▼

Equilibrium: 2mL 5% EDTA,5mL water

▼

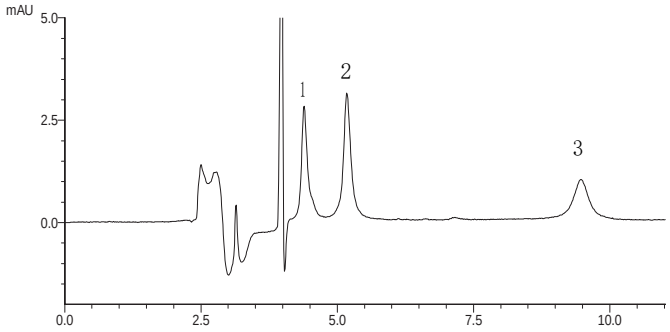
Load: 5mL sample

▼

Wash: 10mL water

▼

Elution: 5mL methanol



Internal standard added to fish meat

Chromotography method

Column:	CNW Athena C18-WP,5um,4.6*250mm,MF1A27
Mobile phase:	acetonitrile+0.01moL/L sodium dihydrogen phosphatee(26+74)
Flow rate:	1mL/min
Detect:	355nm
Oven:	37°C

Recovery

No.	Compounds	Recovery(%)
1	Oxytetracycline,	85.4%
2	Tetracycline	92.6%
3	Aureomycin	85.5%

Malachite green and crystal violet residual in aquatic products

Sample preparation:

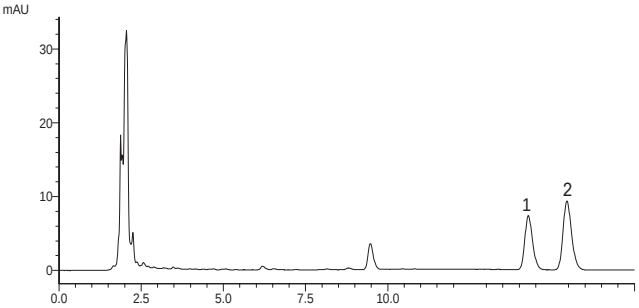
Sample extraction:
Collect 5g sample, reductive malachite green or crystal violet residual with potassium borohydride to their metabolite leucomalachite green or leucocrystal violet, extract with acetonitrile-ammonium acetate, then Liquid-liquid extract with dichloromethane, concentrate to dryness and reconstitute in 2.5mL acetonitrile

SPE Condition:
Connect CNWBOND Alumina-A SPE tube (500mg/3mL, upper layer) and CNWBOND PRS SPE tube (500mg/3mL, lower layer) with adapter, condition with 5mL acetonitrile

Load:
Load 2.5mL sample onto tube in the flow rate of 1drop/s

Wash:
Wash with 2×2.5mL acetonitrile, get rid of Alumina-A SPE tube, dry PRS SPE tube at low vacuum

Elution:
Elute with 3mL acetonitrile:0.1N pH10 ammonium acetate(1:1) (reconstitute in 3 mL acetonitrile,detect by HPLC-FLD)



Internal standard added to fish meat

Chromotography method

Column:	CNW Athena C18-WP,5um,4.6*250mm,MF1A27
Mobile phase:	acetonitrile+0.125moL/L ammonium acetate pH=4.5(80+20)
Flow rate:	1.3mL/min
Detect:	265nm
Oven:	35°C

Recovery

No.	Compounds	Recovery(%)
1	Malachite green	87.1
2	Crystal Violet	90.2

Hexestrol, diethylstilbestrol, dienestrol in pork

Sample preparation:

Sample extraction:
Weigh out 5g sample, add 10mL 0.2M ammonium acetate buffer (pH5.2),100μL β- glucuronidase,10mL diethyl ether,mix, centrifuge at 3000r/min for 5min.Gather upper layer, extract residual twice again,gather all extract, concentrate to dryness, add 2mL trichlormethanand 5mL 1mol/L NaOH,mix for 2min, centrifuge at 2000r/min for 5min,extract with NaOH once more, gather all sample

SPE Condition:
Condition Poly-Sery MAX SPE tube(Cat. No.:2.CA3379.0001) with 5mLmethanol, 5mL deionized water

Load:
Load sample onto SPE tube in the flow rate of 2mL/min

Wash:
Wash with 5mL 1mol/L NaOH,5mL 0.1mol/L NaOH methanol solution:water(7:3), dry MAX tube at low vacuum

Elution:
Elute hexestrol,diethylstilbestrol,dienestrol with 5mL tert-butyl methyl ether: methanol(9:1,contain 2% formic acid) (concentrate to dryness under N2 at 45°C, reconstitute in 1mL 50%methanol, detect by HPLC-MS)

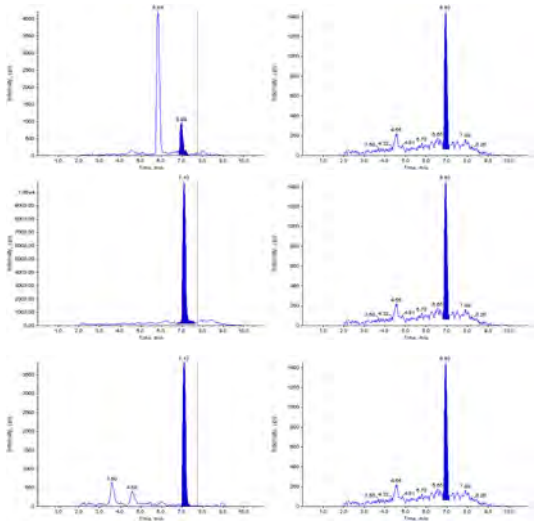


Figure 1. Pork added 1ppb diethylstilbestrol, hexestrol, dienestrol, internal standard is Diethylstilbestrol-D8

HPLC-MS condition:

Column:	C18, 50mm×4.6mm I.D., 1.8μm
Mobile phase:	Graduate Elution
Flow rate:	0.5mL/min
Oven:	Room temperature
Det.:	ESI(-)
Injection volume:	20μL

Time(min)	Mobile phase	
	acetonitrile/(%)	water/(%)
0	5	95
3	5	95
7	99	1
11	99	1
11.1	5	95

Recovery of Poly-Sery MAX SPE tube used to extract estrogen

No.	Compounds	Recovery(%)
1	Diethylstilbestrol	104.0
2	Hexestrol	97.8
3	Dienestrol	91.4

Multi-residual basic drugs in animal derived food

The sample preparation and LC-MS detect of 76 kinds of veterinary drugs residual (β- adrenergic agonists, sulfonamide, benzodiazepines, nitroimidazoles, benzimidazole, triphenylmethanes) in animal derived food (pork, pork liver, eggs, shrimps, milk)

Sample preparation:

Sample extraction:
Weight out 5 g sample, add 30 mL acetonitrile, 2 mL isopropanol, 10 mL 0.1M citrate buffer（pH 2.5, contain 0.1M MgCl）to extract, centrifuge, get upper layer, add 6 mL isopropanol, evaporate supernatant to 5mL at 40 ℃. Centrifuge at 4 ℃, 8500 r/min for 10 min, filter by 0.45 μm membrane

▼

Condition:
Link CNW Poly-Sery HLB tube（Cat.No.: 2.CA3179.0001）and CNW Poly-Sery MCX tube（Cat.No.:2.CA3279.0001）together, condition with 3 mL methanol, 3 mL water and 3 mL above-mentioned citrate buffer

▼

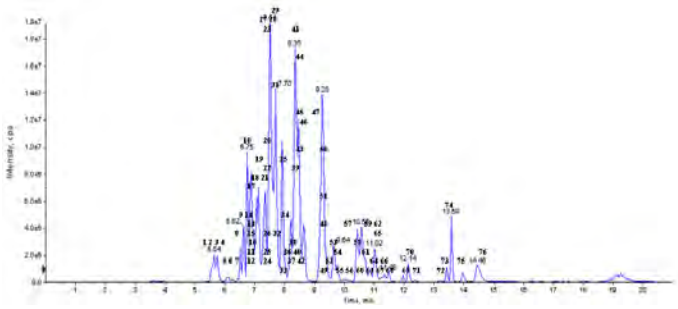
Load:
With the flow rate of 2 mL/min

▼

Wash:
3 mL above-mentioned citrate buffer, 3 mLwater, 3 mL 5 %methanol, dry for 5min

▼

Elution:
Elute with 4 mL methanol and 6 mL 5% ammonia-methanol, concentrate to dryness under N2 at 40±2℃, reconstitute in 5%methanol (0.1%formic acid), filter by 0.22 μm membrane



TIC chromatogram of 76 kinds of veterinary drug standards

HPLC-MS/MS condition:

a)Column : C18,150 mm×4.6 mm(i.d.),grain size 3.0 μm or equal;
b)Mobile phase: A:acetonitrile(contain 0.1%formic acid)
B:2mmol/L ammonium acetate+methanol (95+5,V1+V2) (contain 0.1%formic acid)
Flow rate: 600 μL/min,graduate elution program refer to table1;
c)Oven: 35 ℃;
d)Injection volume: 20 mL.

Table1. Graduate elution program

Time(min)	Mobile phaseA（%）	Mobile phaseB(%)
0	0	100
3.0	25	75
4.0	40	60
7.0	50	50
9.0	50	50
13.0	100	0
18.0	100	0
18.5	0	100
23.0	0	100

Scan: multi-reaction monitor MRM;

1) IS:4500 V;
2) GS1:448.175kPa（65Psi）;
3) CUR:206.85kPa（30Psi）;
4) GS2: 482.65 kPa(70 Psi);
5) CAD: 34.475 kPa(5Psi)
6) TEM: 550℃;
7) EP: 10V, CXP: 13V.

Table 2.Result of add 76 kings of internal standard in shrimps, pork, pork liver, milk, eggs

		Limit of detection（μg/Kg）	Internal standard（μg/Kg）	Recovery(%)
Benzodiazepines	Clonazepam, Chlordiazepoxide, Triazolam,etc.	1.0	1	59.4-115.3
			2	61.0-105.2
			4	62.4-108.7
Nitroimidazoles	Metronidazole, dimetridazole, Ornidazole, Ipronidazole-OH,etc.	1.0	1	59.6-115.6
			2	59.8-107.6
			4	62.6-106.3
β-adrenoceptor agonist	(Lean meat powder)Ractopamine, Salbutamol, Clenbuterol, Terbutaline, Penbutolol,etc.	0.5	0.5	61.0-115.1
			1	63.2-103.3
			2	65.3-103.9
Triphenylmethane	Leucomalachite Green , Leucocrystal violet	0.5	0.5	70.9-102.5
			1	63.1-103.0
			2	65.7-98.9
Benzimidazole	Albendazole, Flubendazole, Oxibendazole, Amino mebendazole, Thiabendazole	5.0	5	62.4-106.5
			10	60.6-101.2
			20	62.1-102.3
Sulfonamides	Sulfadiazine, Sulfathiazole, Sulfapyridine, Sulfamethazine, Sulfamethoxazole,etc.	20	20	61.1-109.0
			40	62.0-106.9
			80	60.0-103.5

Fluoroquinolones drug residual in animal derived food

Sample preparation: Extract egg, pork samples with phosphate buffered solution

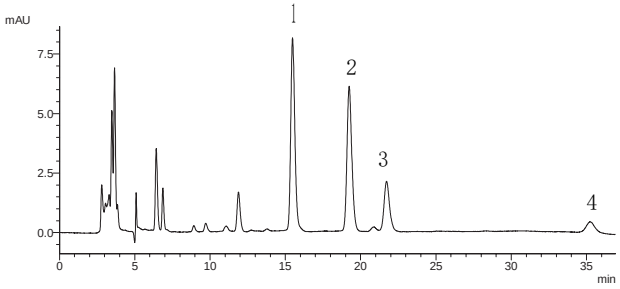
SPE tube :LC-C18（2.CA0953.0001）

Condition: With 2mL methanol

Equilibrium: With 2mL phosphate buffered solution

Load: Load 5mL upper layer solution, wash with 1mL water

Elution: With acetonitrile+0.05moL/L phosphate / triethylamine（18+82）



Internal standard added to pork

Chromotography method

Column:	CNW Athena C18-WP,5um,4.6*250mm,MF1A27
Mobile phase:	acetonitrile+0.05moL/L phosphate / triethylamine（18+82）
Flow rate:	0.8mL/min
Detect:	280nm
Oven:	35°C

No.	Compounds	Recovery(%)	No.	Compounds	Recovery(%)
1	Ciprofloxacin	78.3	3	Enrofloxacin	58.2
2	Danofloxacin	73.0	4	Sarafloxacin	66.8

Clenbuterol, Ractopamine, Salbutamol, Terbutaline residual in animal derived food

Sample extraction: Put 10g sample in 20mL ammonium acetate buffer(pH5.2),mix, add 50μL β- glucuronidase - arylsulphatase,ultrasonic for 15min,enzymolysis at 37°C for 16h, centrifuge, get 5mL upper layer as sample

SPE Condition: Connect CNWBOND LC-C18 tube (500mg/3mL, upper layer) and CNWBOND SCX tube (500mg/3mL, lower layer) with tube adapter. Condition with 5mL methanol, 5mL deionized water,5mL 0.03N HCl

Load: 5mL sample at the flow rate of 1drop/s

Wash: 5mL deionized water, 5mLmethanol, dry at low vacuum,get rid of LC C18 tube

Elution: Elute SCX tube with 12mL 3% ammonia acetic ether solution (concentrate to dryness at 40°C, reconstitute in 1mL acetonitrile:water(1:9), detect by LC-MS)

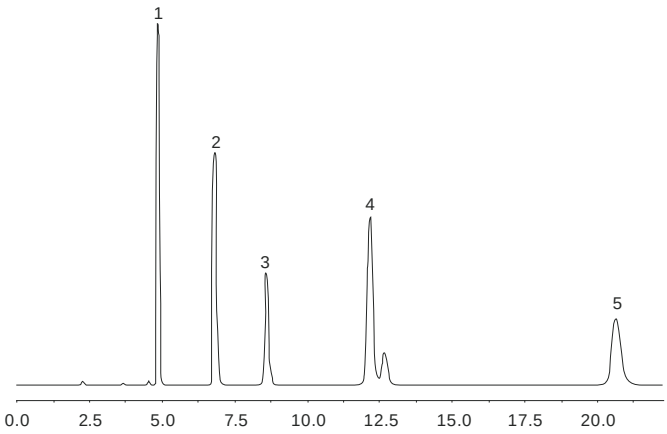
Sulfonamides drugs residual in feedstuff

Sample extraction:
Put 2g feedstuff into 35mL acetonitrile, mix and extract for 30min, centrifuge and get the upper layer, wash residual with 3X10mL acetonitrile, gather all samples, reconstitute in acetonitrile to 50mL as sample

SPE Condition:
Condition CNWBOND Alumina-B SPE SPE tube (Cat. No.:2.CA1949.0001) 5mL acetonitrile

Load:
Load 4mL sample at the flow rate of 1drop/s, dry at low vacuum

Elution:
Elute with 2×2mL mobile phase（refer to condition）, reconstitute to 4mL, detect by UV-HPLC



Chromatogram of sulfonamides drugs added to feedstuff

UV-HPLC condition:

Column:	Cnwsil C18, 15cm×4.6mm I.D., 5μm
Mobile phase:	Add 3mL glacial acetic acid into 750mL deionized water, then add 250mL acetonitrile
Flow rate:	1.0mL/min
Oven:	25°C
Det.:	UV 270nm
Injection volume:	20μL

Recovery of Alumina-B SPE SPE used to extraction of sulfonamides drugs

No.	Compounds	Recovery(%)
1	Sulfadiazine	96
2	Sulfamethazine	97
3	Sulfamonomethoxine	97
4	Sulfamethoxazole	96
5	Sulfachinoxalin	89

Additives（include forbiddened）

Sudan dyes in chilli sauce

Sample extraction:
Put 5g chilli sauce into 10mL n-hexane:acetone=3:1,ultrasonic mix for 15min, centrifuge and get the n-hexane layer, ultrasonic extraction residual with 2X5mL n-hexane.Gather all n-hexane layer, add proper anhydrous sodium sulfate, filter by 0.45μm membrane, concentrate to 5mL under N2 as sample

▼

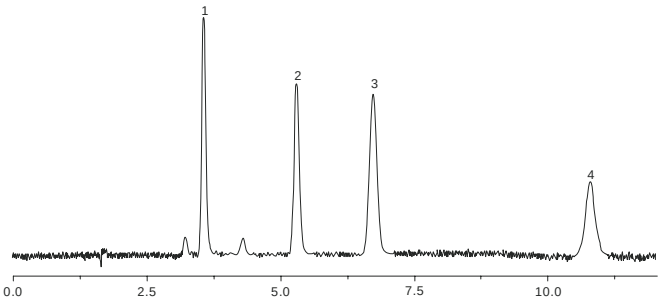
SPE Condition:
Condition CNWBOND Alumina-N special SPE tube for Sudan (Cat. No.:2.CA1808.0001) with 5mL n-hexane

▼

Load:
Load sample at the flow rate of 1drop/s, wash with 3×5mL n-hexane, dry SPE tube

▼

Elution:
Elute with 5mL n-hexane(5%acetone), dry under N2, fix to 1mL with methanol, detect by UV-HPLC



Chromatogram of Sudan Ⅰ, Ⅱ, Ⅲ, Ⅳ added to chilli sauce

UV-HPLC condition:

Column:	Cnwsil C18, 15cm×4.6mm I.D., 5μm
Mobile phase:	acetonitrile: water（95:5）
Flow rate:	1.0mL/min
Oven:	35℃
Det.:	UV-Vis 500nm
Injection volume:	20μL

Recovery of special SPE column for Sudan used to extract Sudan dyes in Chilli sauce

No.	Compounds	Recovery(%)
1	Sudan Ⅰ	86
2	Sudan Ⅱ	88
3	Sudan Ⅲ	82
4	Sudan Ⅳ	82

Melamine and cyanuric acid in food

Put 2g milk podwer into 3mL deionized water, add 100μL 1μg/mL melamine-15N3 isotope internal standard and 200μL 1μg/mL cyanuric acid-13C3 isotope internal standard after dissolved

▼

Add 7 mL acetonitrile, and then add proper 1 mol/L hydrochloric acid solution to adjust pH to 2.0 3.0,mix and ultrasonic for 15 min, centrifuge at 4℃,8000 r/min for 5 min

▼

Filter the upper layer, put 2mL filtrate into 0.8mL deionized water, dilute with acetonitrile: water(1:1) to 5mL as sample

▼

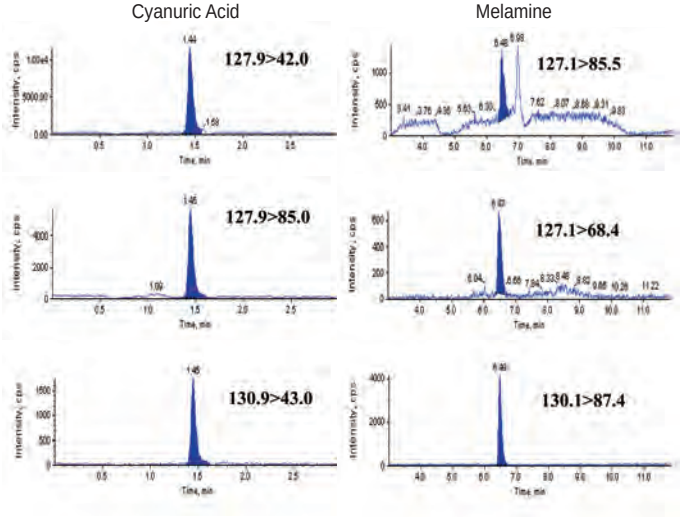
Condition Anpelclean MCT SPE tube (150mg/3mL) with 3mL methanol,3mL acetonitrile:water(1:1)

▼

Load 5mL sample onto SPE tube within the flow rate of 1drop/s , wash with 2mL acetonitrile: water(1:1), dry at low vacuum,elute with 2 mL methanol,2×2 mL 5% ammonia methanol solution

▼

Gather eluent, dry under Na at 40℃, fix to 1mL with 100 mmol/L ammonium formate: acetonitrile(1:9),pH 3.2, detect by HPLC-MSD



MRM chromatogram of 200ppb cyanuric acid and 100ppb melamine added to milk powder

HPLC-MS condition:

Column:	HILIC, 15cm×2.1mm I.D., 5μm
Mobile phase:	A:100 mmol/L ammonium formate :acetonitrile(1:9),pH3.2; B: acetonitrile(include 0.1%formic acid)
Flow rate:	0.4mL/min
Oven:	Room temperature
Det.:	ESI, alternative
Injection volume:	10μL

Time（min）	A（%）	B（%）
0	0	100
2.5	0	100
4	100	0
8	100	0
8.5	0	100
12	0	100

Recovery of Anpelclean MCT SPE tube used to extract melamine and cyanuric acid in milk powder

No.	Compounds	Recovery(%)
1	Melamine	94
2	Cyanuric Acid	91

Melamine in milk

Sample preparation:

Put 2g milk powder(or milk, icecream,milk sugar, etc.) sample into 15mL 1% trichloroacetic acid and 5mL acetonitrile,ultrasonic and extracte, centrifuge, filter the upper layer by filter paper wetted by trichloroacetic acid, fix to 25mL with trichloroacetic acid,get 5mL filtrate, add 5mL deionized water,mix

▼

Condition Poly-Sery MCX SPE tube (60mg/3mL) 3mLmethanol and 3mL deionized water

▼

Add 10mL sample onto conditioned SPE tube,wash with 3mL deionized water and 3mL methanol,elute with 2×3mL 5% ammonia methanol

▼

Gather eluent,dry under N2 at 40°C,fix to 1mL mobile phase, detect by UV-HPLC

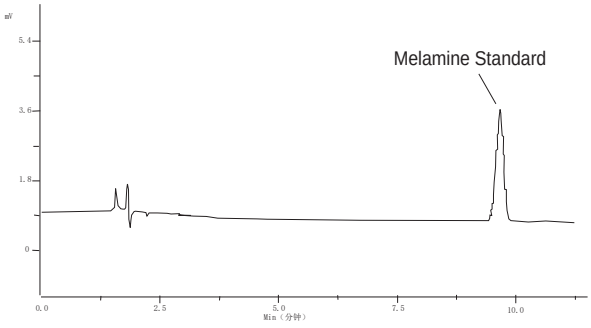


Figure1: Recovery of 1ppm melamine standard is 100.46%

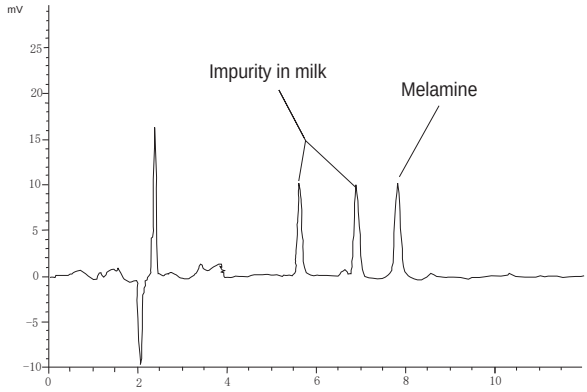


Figure 2: Recovery of milk powder added 5ppm melamine is 99.84%

UV-HPLC condition:

Column:	Cnwsil C18, 150mm×4.6mm I.D., 5μm
Mobile phase:	Ion pair reagent buffer:acetonitrile (90:10), Ion pair reagent buffer:weigh out 2.02g sodium hexanesulfonate (or sodium heptanesulfonate) and 2.10g citric acid,put into 1L volumetric flask,dissolve and fix with water.
Flow rate:	1.0mL/min
Oven:	40℃
Det.:	UV 240nm
Injection volume:	20μL

Aflatoxin M1 in milk

Sample preparation:

Weigh out 50g milk to centrifuge tube with stopper,heat in waterbath to 35-37℃, centrifuge at 4000rpm for 15min, remove butterfat in upper layer,clean up all samples with SPE tube

▼

Connect immunoaffinity column to 10ml or 50ml syringe

▼

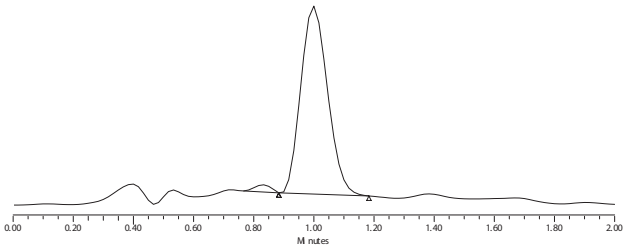
Load all sample onto immunoaffinity column

▼

Wash SPE tube with 10mL 10% methanol/water twice, get rid of eluent, and purge 2mL-3mL air to get through the tube

▼

Elute with 1.0mL methanol:acetonitrile（2:3）at the flow rate of 1mL/min Gather all eluent to glass test tube for detect



10ppb internal standard in milk

HPLC detect:

Column:	C18,5cm×2.1mm,1.7μm
Mobile phase:	methanol:water（V:V）（45:55）
Flow rate:	0.4 mL/min.
Oven:	30℃
FLD:	excitation wavelength 360nm, emission wavelength 440nm
Injection volume	2μL

No.	Compounds	Recovery(%)
1	Aflatoxin M1	91.62

PAEs in milk

Put 2mLmilk, extract with 5mLn-hexane, centrifuge at 4000r/min,get upper layer as sample

▼

SPE clean-up:1g,6mL glass silica gel tube

▼

Condition: with 5mL n-hexane

▼

Load: 5mL n-hexane sample

▼

Wash: with 2mL n-hexane

▼

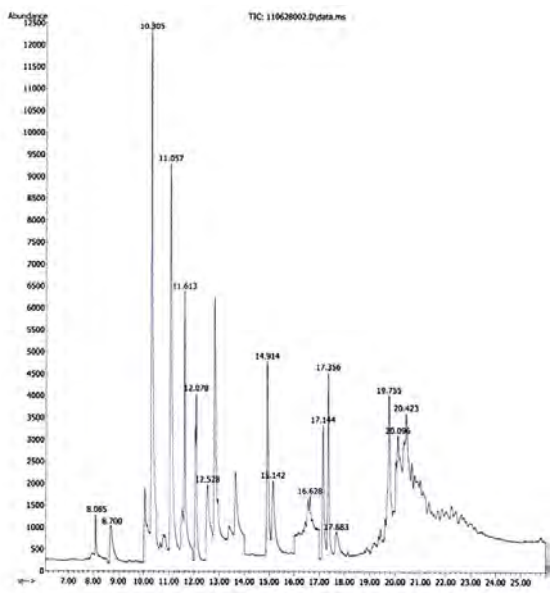
Elution: with 5mL methanol

▼

Dry,dissolve in 1mL n-hexane,load

▼

The concentration of internal standards is about 1ppm,and the recovery is between 70-90%



Chromotography method: GB/T 21911-2008

PAEs in oil sample

Oil sample: weigh out 0.4g oil sample, dissolve with 2mL n-hexane saturated with acetonitrile, extract with 4mL acetonitrile saturated with n-hexane twice, centrifuge,gather acetonitrile layer, clean up with PSA glass tube

▼

Condition: 5mL acetonitrile

▼

Load: Load acetonitrile layer as sample

▼

Elution: 2mL acetonitrile

▼

Gather all acetonitrilesolution, blow to dryness, dissolve in 1mLn-hexane, detect by GC-MS.

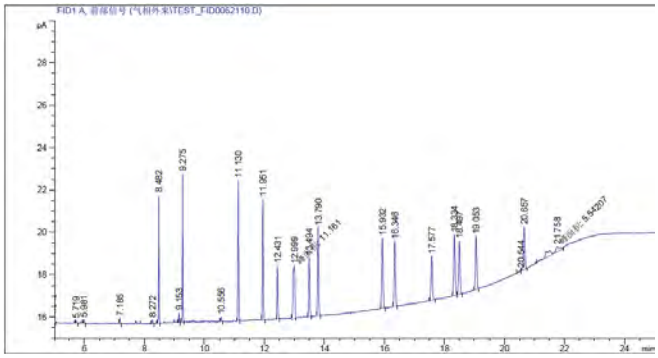
Recovery of PAEs in oil sample is between 65%-90%

Explication: acetonitrile is immiscibility with a lot of saturated hydrocarbons,when add acetonitrile to n-hexane, they may mix as one phase at the beginning, and then split phase after saturation,the density of acetonitrile is bigger, so it's on the lower layer.

Put proper two reagents together, mix, the upper layer is n-hexane saturated with acetonitrile,and the lower layer is acetonitrile saturated with n-hexane.

PAEs in different food metrix（Glass dSPE method）

1, Water-based beverages: drinking water, fruit juice, energy drinks, coke Put 5mL sample（for Cola, ultrasonic for 20min to remove CO2; for drinks include solids, centrifuge and get the upper layer）into dSPE glass extraction tube(oil-free matrix dSPE extraction tube, 2.CA8650.OOO1-glass); add 2mL n-hexane,mix, centrifuge at 4000r/min for5min,get the upper layer,detect by GC-MS.



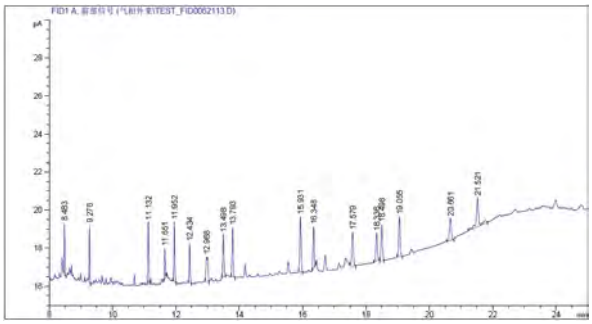
a. GC-FID chromatogram of 1ppm PAEs added in water

Peak	RT[min]	Peak Area[pA*s]	Concentration ppm
DMP	8.48	7.71	0.75
DEP	9.28	9.37	0.80
DIBP	11.13	12.17	0.89
DBP	11.95	11.67	0.90
DMEP	12.43	5.39	0.68
BMPP	13.00	11.16	0.81
DEEP	13.49	6.86	0.78
DPP	13.79	10.56	0.80
DHXP	15.93	10.05	0.80
BBP	16.35	9.09	0.78
DBEP	17.58	6.72	0.78
DCHP	18.33	9.67	0.75
DEHP	18.50	8.56	0.77
DOP	19.05	7.98	0.82
DNOP	20.66	7.45	0.68
DNP	21.76	5.54	0.87

2, Common edible oil（not include much additives）:

Weigh out 0.5g oil sample, dissolve in 2mL n-hexane saturated with acetonitrile, extract with 2X4mL acetonitrile saturated with n-hexane twice, centrifuge, gather acetonitrile layer and add into dSPE glass extraction tube (oil matrix dSPE extraction tube, 2.CA8645.0001-glass) mix, centrifuge at 4000r/min for 5min, get the upper layer, detect by GC-MS.

For the detection of lower concentration PAEs in oil matrix, you can increase the sampling amount, clean up with dSPE glass tube,and then concentrate.

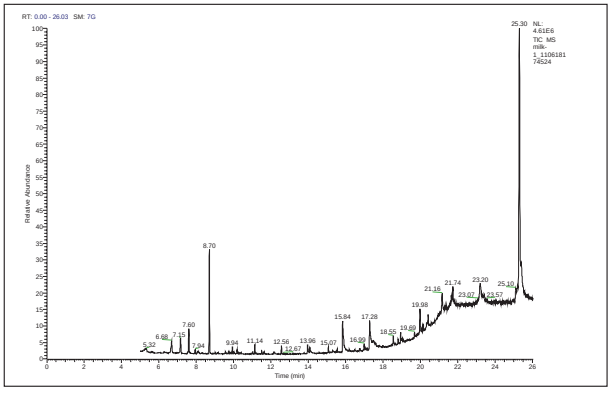


b. GC-FID Chromatogram of 0.5ppm internal standard add to corn oil

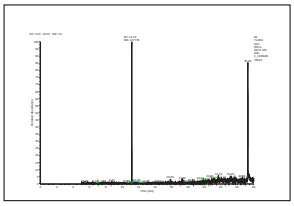
Recovery of the first 14 compounds is between 68 to 140%, recovery of DNOP is 83%

3, Pure milk（include less than 10% oil or fat ,not include much additives）:

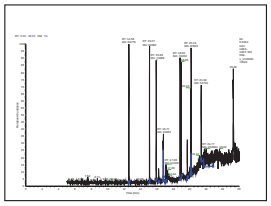
Put 2mL solution into dSPE glass extraction tube (C set,2.CA8649.0001-glass),weigh exactly,add 4mL 10% tert-butyl methyl ether acetonitrile,mix, centrifuge at 4000r/min for 5min,add the upper layer into dSPE glass extraction tube (C set,2.CA8648.0001-glass,16 mL test tube),mix for 1min, centrifuge at 4000r/min for 5min, get the upper layer, detect by GC-MS.



milk-TIC



Milk-163(m/z)

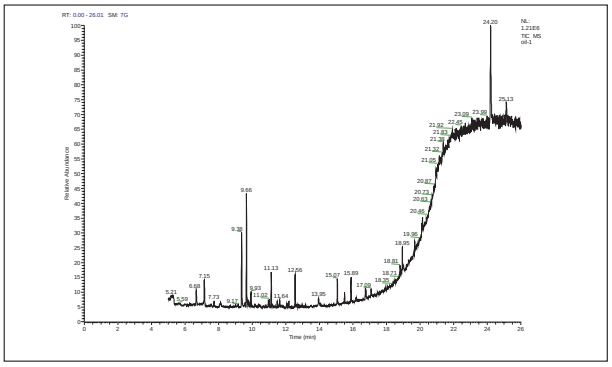


Milk-149(m/z)

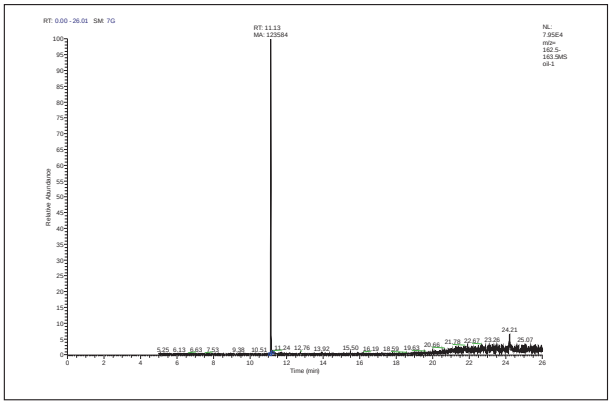
Recovery of the first 14 compounds is between 71 to 111%, recovery of DNP is around 65%

4, Oil matrix including more than 80% oil: such as sauce of instant noodles, hot pot oil, etc.

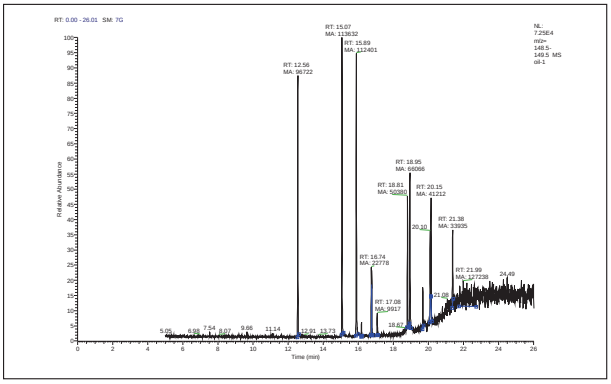
Oil-water mixture:get 1.0g sample,dissolve in 2mL n-hexane saturated with acetonitrile, extract with 2X4mL acetonitrile saturated with n-hexane, centrifuge, gather all acetonitrile layer,add into dSPE glass extraction tube (B set for most oil and a little water matrix dSPE extraction tube, 2.CA8647.0001-glass) mix, centrifuge at 4000r/min for 5min, get the upper layer, detect by GC-MS.



Oil-TIC



Oil-m/z163

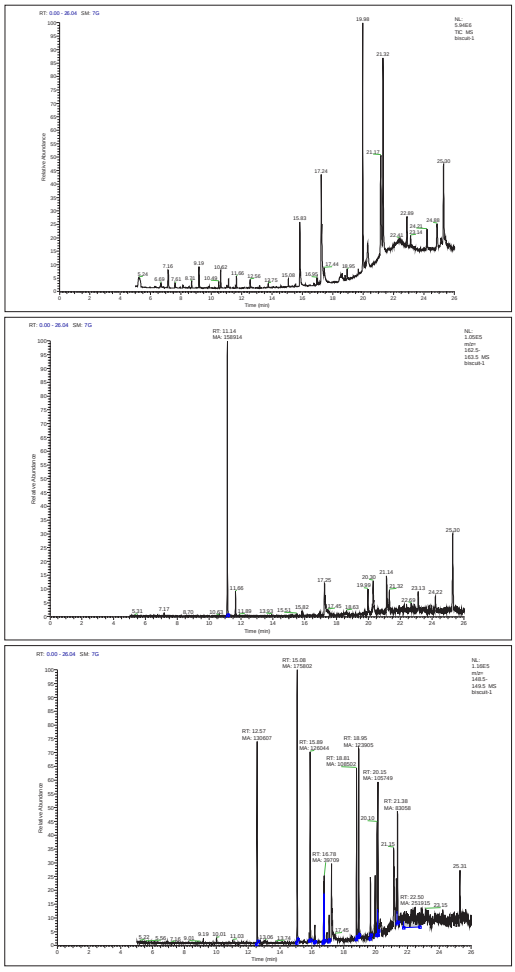


Oil-m/z149

Recovery of the first 14 compounds is between 70 to 94%, recovery of DNOP and DNP is around 60%

5, Solid sample:

Such as biscuit, add proper water to 1g sample,mix to pulpiness, prepare according to the method of sample include less than 10% oil or fat,detect by GC-MS.



Recovery of the first 14 compounds is between 73 to 114%, recovery of DNOP and DNP is around 60%

6- benzyladenine residual in bean sprouts

Clean up method of CNWBOND HC-C18 tube, Cat.No. 2.CA0853.0001 （According to DB 11T 279-2006 method, recovery of internal standard added in bean sprouts is around 40%）

Sample preparation:

Quash 10g bean sprouts,extract with 20mL acidified methanol（methanol/water=60:40,add 50μL acetic acid）, centrifuge, get the upper layer, evaporate supernatant to remove methanol,adjust pH to about 9.0)

↓

Condition:5mL methanol

↓

Equilibrium:5mL deionized water

↓

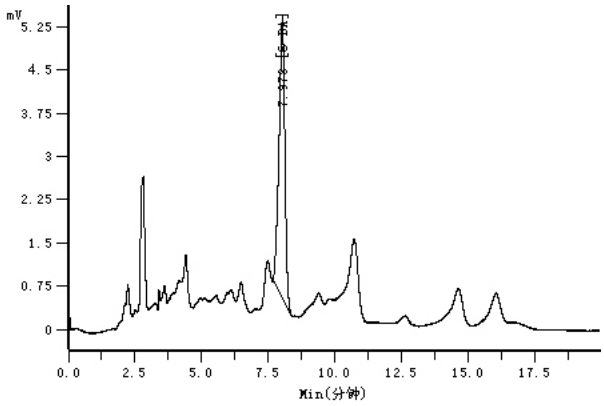
Load:1drop/s

↓

Wash:3mL acidified water（add 50μL acetic acid to 40mL water）3mL water 3mL 20% methanol

↓

Elution:5mL methanol



3ppm internal standard added in bean sprouts

Detect wavelenthen(nm):	UV267nm
Column:	C18column(4.6*250,5μm)
Flow rate(ml/min):	1.0mL/min
Mobile phase:	methanol/1% acetic acid=50/50
Oven(℃):	30
Injection volume:	20μL
Column series:	OAH72U30

Clean-up method of CNW poly-sery MAX tube, Cat.No.: 2.CA3379.0001 (Recovery of add internal standard to bean sprouts is above 80%)

Sample preparation:

Quash 10g bean sprouts,extract with 20mL acidified methanol（methanol/water=60:40,add 50μL acetic acid）, centrifuge, get the upper layer, evaporate supernatant to remove methanol,adjust pH to about 9.0)

↓

Condition:5mL methanol

↓

Equilibrium:5mL deionized water

↓

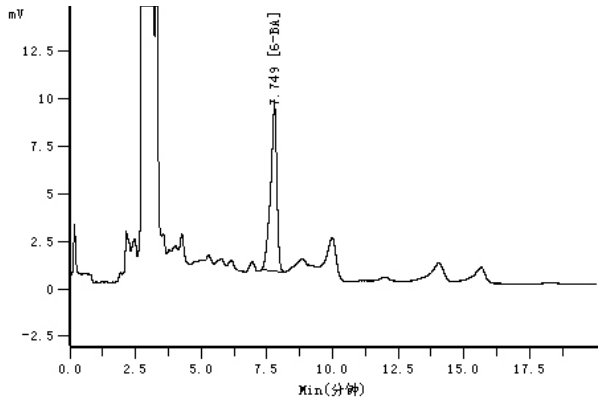
Load: flow rate 0.5drop/s

↓

Wash: 3mL deionized water 3mL 20%methanol,dry

↓

Elution: 5mL 2% acetic acidmethanol



Recovery of 3ppm internal standard added in bean sprouts

Citrus red 2 residual in citrus and juice

Sample extraction:
Add 10mL n-hexane:acetone=3:1 into 5g juice（add 10mL n-hexane to 5g orange peel）,mix and ultrasonic for 15min, centrifug, get the n-hexane layer, extract residual with 2X5mL n-hexaneultrasonic. Gather all the n-hexane layer, add proper anhydrous sodium sulfate, filter by 0.45μm membrane and concentrate to 5mL under N2

▼

SPE Condition:
Condition CNWBOND Alumina-N tube for Sudan red (Cat. No.:2.CA1808) with 5mL n-hexane

▼

Load:
Load sample onto SPE tube at the flow rate of 1drop/s, wash with 5mL n-hexane,and dry the tube

▼

Elution:
Elute with 3×2.5mL n-hexane:acetone(4:1), concentrate to dryness under N2, fix to 1mL with methanol,detect by UV-HPLC

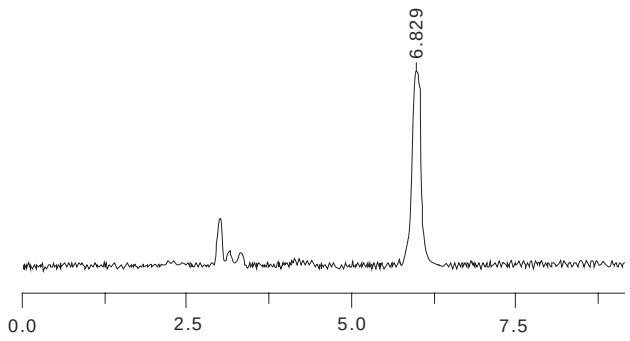


Figure 1: Orange peel added 1ppm Citrus red 2,recovery is 99.97%

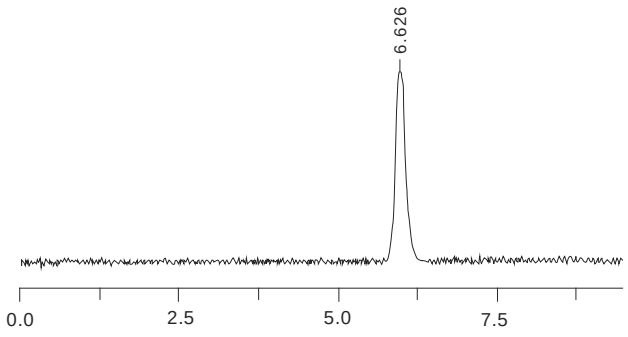


Figure 2:Juicy added 1ppm Citrus red 2,recovery is 98.75%

UV-HPLC condition:

Column:	Cnwsil C18, 15cm×4.6mm I.D., 5μm
Mobile phase:	acetonitrile: water（80:20）
Flow rate:	1.0mL/min
Oven:	35℃
Det.:	UV-Vis 500nm
Injection volume:	20μL

Environment

EPA525.2 Organics in drinking water

The compounds can be detected by this method are as many as 110 kinds, that include pesticide residues (such as organochlorine, organophosphorus, and pyrethroid, etc.), PAHs, PCBs, PAEs and adipic acid, etc.

Use three batches of 3M Empore C18 disks to test EPA 525.2method,method detect limitation(MDLs)is 0.03-2.4μg/L,compounds recovery is 20-180%. For different kinds of compounds,the average recovery:pesticide is 108%, PCBs is 108%, PAEs and adipic acid is 116%, PAHs is 112%.

Add 5mL methanol into 1L water sample filtered by aqueous phase filter, mix completely, take it as purified solution;

▼

Active 3M Empore C18 disk (47mm) by 5mL acetic ether:dichloromethane(1:1), 5mL methanol and 5mL deionized water, and keep there's always 3-5mm deionized water on the disk;

▼

Load sample to the active disk slowly, and the flow rate is about 50mL/min. And then elute, sample reservoir should be rinse by 3mL acetic ether:dichloromethane(1:1) beforehand. First, load 5mL acetic ether rinse sample vessel and then transfer it to disk, flow along the filter beaker, open vacuum pump to let about 2.5mL acetic ether pass through disk,then close vacuum pump, open vacuum pump after acetic ether rinsing disk forn about 1min. And then elute accordingly by 5mL dichloromethane and 2×3mL ether:dichloromethane(1:1);

▼

Gather all eluent, pass through 5-7g anhydrous sodium sulfate to remove water, concentrate to 1mL under N2 at room remperature,detect by GC-MSD

Simazine, atrazine, propazine herbicide in groundwater

Sample extraction:
Filter 20mL groundwater by 0.45μm membrane to remove particles

▼

SPE Condition:
Condition CNWBOND LC-C18 tube (500mg/3mL) with 2mL methanol and 2mL deionized water

▼

Load:
Load 20mL groundwater onto SPE tube at the flow rate of 1 drop/s

▼

Wash:
With 1mL deionized water:acetonitrile:methanol(4:3:1)

▼

Elution:
Elute with 1mL methanol
(fix to 2mL with deionized water,detect by HPLC-UV)

Alkyl mercury in water

Sample preparation cartridge: CNWBOND SPE Cartridge for Methyl mercury test ,50mg, 3mL/50pcs

▼

SPE condition: 3ml methanol

▼

Equilibrium: 3ml deionized water

▼

Load: Load water sample onto SPE tube in the flow rate of 5ml/min

▼

Elution: 2ml*2times 5%(m/v) thiourea / 0.5%(v/v) hydrochloric acid (1:1). Adding 40μl 50% ammonia neutralize to neutral.

Chromatography condition (LC-AFS method):

Chromotography parameter

RP C18 column:	Athena C18 (150 mm×4.6 mm i.d., 5μm)
Mobile phase:	5% acetonitrile+60mM ammonium acetate+10mM cysteine
Flow rate:	1.0 mL/min
Inj volumn:	100μL

Hydride generation parameter

Reductant:	1.5% KBH4 / 0.5% KOH
Carrier current:	7 % HCl
Oxidant:	1%K2S2O8/0.5% KOH

AFS parameter

UV lamp:	Open
Element lamp:	Hg
Negative high voltage:	300V
Lamp current:	35mA
Carrier gas:	400mL/min
Shield gas:	600mL/min

Chromatography condition (LC-ICP-MS method):

Chromotography parameter
Agilent 1200

RP C18 column:	Athena C18 (150 mm×4.6 mm i.d., 5μm)
Mobile phase:	5% methanol+60mM ammonium acetate+10mM cysteine
Flow rate:	1.0 mL/min
Inj volumn:	50μL

ICP-MS parameter
Agilent 8800

RF power(W):	1550
Sampling depth(mm):	8.0
Flow rate(L/min):	1.05
Atomizing chamber temp℃:	2
Pump speed:	0.3
Mass number:	201

Chromatogram: LC-AFS method

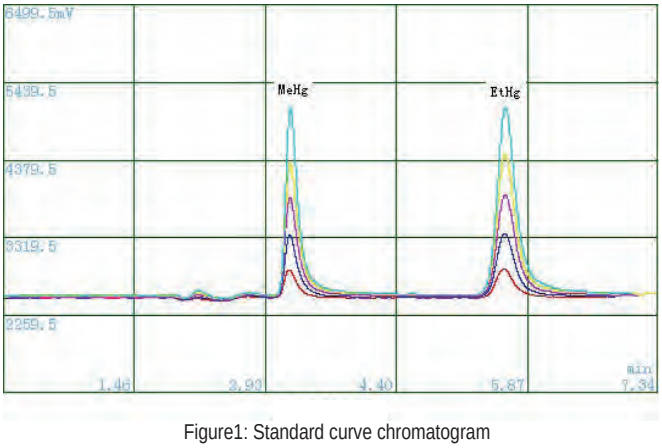


Figure1: Standard curve chromatogram

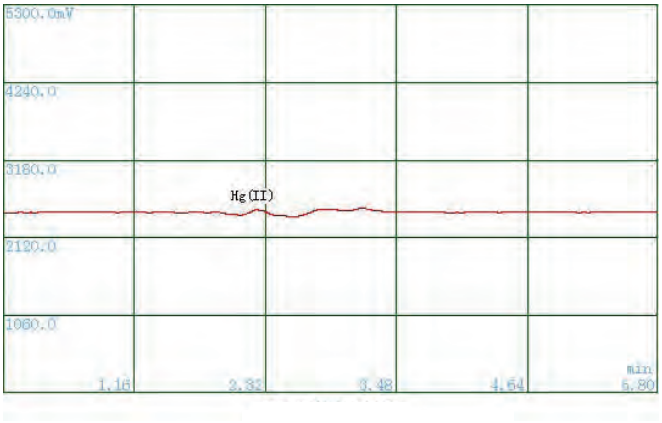


Figure2: Water sample blank chromatogram

PAHs in drinking water

250mL~1L water sample, adjust pH to <2 with 6N HCl at room temperature,add 2mL methanol,mix

▼

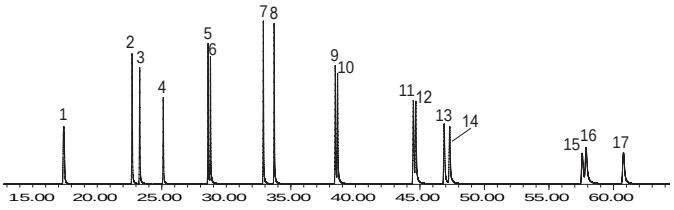
Condition CNWBOND HC-C18 SPE tube (1g/6mL or 2g/6mL) with 6mL dichloromethane,6mL methanol and 6mL deionized water

▼

Load sample onto conditioned SPE tube at the flow rate of about 5mL/min, wash SPE tube with 6mL deionized water, dry under low vacuum,elute with 3×1mL dichloromethane

▼

Gather all eluent, concentrate to 0.5mL under N2 at room temperature, add 0.5mL internal standard perylene-d12 that has equal concentration with tested composition,detect by GC-MSD（internal standard quantity analysis）



GC-MSD condition:

Column:	DB-5MS, 60m×0.25mm I.D., 0.25μm
Temp:	100℃(1min), 6℃/min to 300℃(30min),
Inj.:	Splitless(10min), 280℃
Det.:	MSD, 280℃
Scan:	m/z 50-450
Carrier gas:	He, 1.0mL/min
Injection volume:	1.0μL

Recovery of HC-C18 used to extraction of PAHs in drinking water

No.	Compounds	Recovery(%)
1	Naphthalene	83
2	Acenaphthylene	88
3	Acenaphthene	85
4	Fluorene	91
5	Phenanthrene	95
6	Anthracene	95
7	Fluoranthene	98
8	Pyrene	98
9	Benzo[a]anthracene	100
10	Chrysene	99
11	Benzo[b]fluoranthene	98
12	Benzo[k]fluoranthene	98
13	Benzo[a]pyrene	96
15	Indeno[1,2,3-cd]Pyrene	100
16	Dibenz[a,h] anthracene	102
17	Benzo[g,h,i]perylene	101

PAHs in soil

The method of CNWBOND PSA SPE is also suitable for the detection of PAHs in dyes, plastic raw materials,releasing agent,mineral oil,rubber and their products, the recovery and stability are more bigger than traditional silica tubes,meanwhile, it can remove the interference which disturb GC-MSD detect, get more exact quantity, and higher efficiency.

Sample extraction:put10g soil sample into 100mL dichloromethane:n-hexane(1:1) and proper anhydrous sodium sulfate, extract in Soxhlet-extraction apparatus for 4 hours;gather extract，concentrat to 1mL under N2 at room temperature,dilute to 3mL with n-hexane as sample

▼

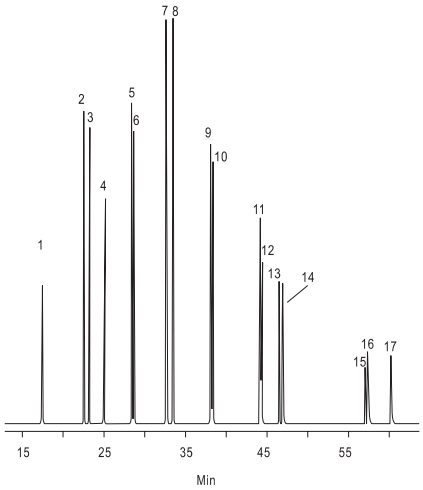
Condition: Condition CNWBOND Si SPE tube (Cat.No.:2.CA1354.0001 or 2.CA1355.0001 or 2.CA1356.0001) with 5mL n-hexane

▼

Load:Load 3mL sample onto conditioned SPE tube,and then wash with 2X1mL n-hexane

▼

Elution: Elute with 5mL dichloromethane:n-hexane(2:3);gather all eluent, concentrat to 0.5mL under N2 at room temperature, add 0.5mL internal standard perylene-d12 that has equal concentration with tested composition,detect by GC-MSD（internal standard quantity analysis）



GC-MSD condition:

Column:	CD-5MS, 60m×0.25mm I.D., 0.25μm(Cat.No.:1.554424.0001)
Temp:	100℃ (1min),6℃/min to 300℃(30min)
Inj.:	Splitless(10min),280℃
Det.:	MSD,280℃
Scan:	m/z 50-450
Carrier gas:	He, 1.0mL/min
Injection volume:	1.0μL

Peak Sequence

No.	Compounds
1	Naphthalene
2	Acenaphthylene
3	Acenaphthene
4	Fluorene
5	Phenanthrene
6	Anthracene
7	Fluoranthene
8	Pyrene
9	Benzo[a]anthracene
10	Chrysene
11	Benzo[b]fluoranthene
12	Benzo[k]fluoranthene
13	Benzo[a]pyrene
14	Indeno[1,2,3-cd]pyrene
15	Dibenzo[a,h]anthracene
16	Benzo[g,h,i]perylene

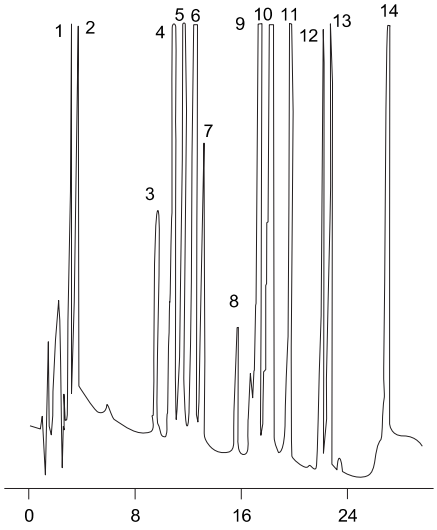
Nonvolatile pesticide in water

Sample extraction:
Take 100mL-1L water(filter by 0.45μm membrane if there's obvious particles) as sample,pesticide concentration is 10-50μg/L

SPE Condition:
Condition CNWBOND Carbon-GCB SPE SPE tube (Cat. No.:2.CA1663.0001)with 5mL dichloromethane:methanol(4:1),1mLmethanol,10mL 2% acetic acid

Load:
Load sample onto SPE tube at the flow rate of 5mL/min,dry GCB tube at low vacuum

Elution:
Elute pesticide with 1mL methanol,2×3.5mL dichloromethane:methanol(4:1),concentrate to 0.4-0.5mL under N2 at room temperature,fix to 1mL with methanol,detect by UV-HPLC or HPLC-MS



UV-HPLC condition:

Column:	Cnwsil C18, 25cm×4.6mm I.D., 5μm
Mobile phase:	A:water:acetonitrile（90:10） B:acetonitrile
	Graduation:20%B（5min）,30min to 70%B
Flow rate:	1.5mL/min
Det.:	UV 220nm
Injection volume:	20μL

Recovery of Carbon-GCB tube used for extraction of nonvolatile pesticide

No.	Compounds	Recovery(%)
1	Oxamyl	111
2	Methomyl	105
3	Aldicarb	96
4	Simazine	86
5	Monuron	99
6	Cyanazine	90
7	Metribuzin	97
8	Carbofuran	106
9	Atrazine	89
10	Carbaryl	97
10	Fluometuron	106
11	Diuron	88
12	Propham	95
13	Propachlor	96
14	Linuron	88

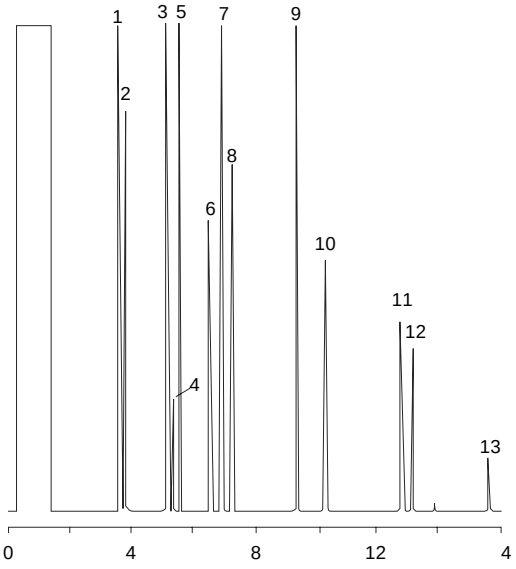
Phenol in water

Sample extraction:
Take 100mL water sample (filter by 0.45μm membrane if there's obvious particles) , adjust pH to about 5.0

SPE Condition:
Condition Poly-Sery PSD tube (250mg/6mL) with 6mL acetic ether,6mL methanol,6mL deionized water

Load:
Load sample onto SPE tube at the flow rate of less than 5mL/min,dry PSD tube at low vacuum

Elution:
Elute phenol with 2×2.5mLacetic ether (fix to 5mL with acetic ether,detect byGC-FID)



GC-MSD condition:

Column:	CD-5, 15m×0.53mm I.D., 0.5μm
Temp:	65℃to185℃(10℃/min,hold 1min),20℃/Min to 275℃(5min)
Inj.:	Splitless(45s),200℃
Det.:	FID,330℃
Carrier Gas:	N2, 1.0mL/min
Injection volume:	1.0μL

Recovery of Poly-Sery PSD SPE tube used for extraction of phenol

No.	Compounds	Recovery(%)
1	Phenol	102
2	2-Chlorophenol	105
3	2-Methylphenol	107
4	o-Bromophenol	115
5	3-Methylphenol	105
6	2-Nitrophenol	96
7	2,4-Dimethylphenol	105
8	2,4-Dichlorophenol	106
9	4-Chloro-3-methylphenol	105
10	2,4,6-Trichlorophenol	104
11	4-Nitrophenol	100
12	2,3,4,6-Tetrachlorophenol	105
13	Pentachlorophenol	98

BPA in water

Sample preparation:

Take 100mL water (filter by 0.45μm membrane if there's obvious particles) as sample

▼

SPE tube:CNWBOND LC-C18 SPE tube ,2.CA0953.0001

▼

Condition:6mLmethanol

▼

Equilibrium:6mL deionized water

▼

Load: Load sample at the flow rate of 1drop/s

▼

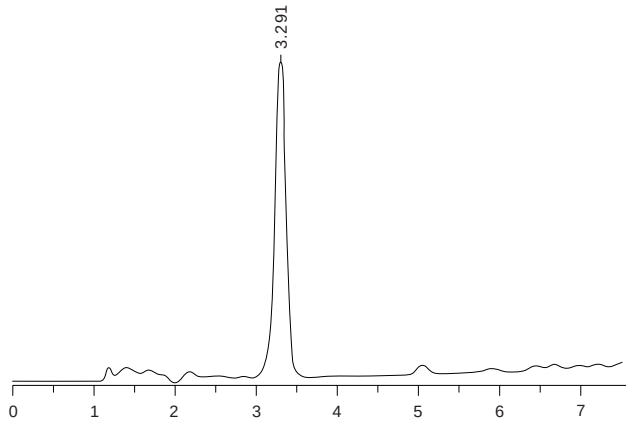
Wash:6mL 20%methanol,dry

▼

Elution:2×3mLmethanol

▼

Dry under N2 at 45℃,fix to 1mL with acetonitrile,detect by HPLC



Water added 200ppb BPA,recovery of BPA is 90.89%

UV-HPLC condition:

Column:	Cnwsil C18, 15cm×4.6mm I.D., 5μm
Mobile phase:	Graduation Elution

Time（min）	Mobile phase	
	acetonitrile%	Water%
0	60	40
7	95	5

Flow rate:	1.0mL/min
Oven:	35℃
Det.:	UV 261nm
Injection volume:	20μL

Tetracycline in water

Sample preparation:

Sample extraction:
Take 100mL water (filter by 0.45μm membrane if there's obvious particles) as sample

▼

SPE Condition:
Condition Poly-Sery HLB SPE tube (Cat. No.:2.CA3179.0001) with 3mL methanol,3mL deionized water

▼

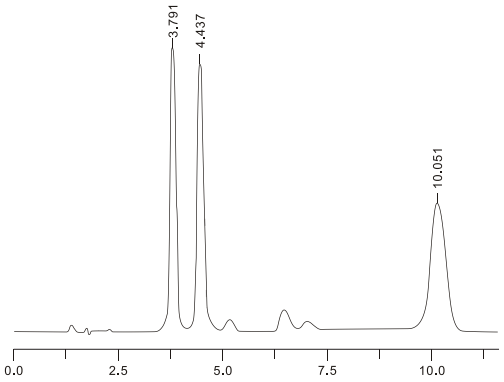
Load:
Load 100mL sample at the flow rate of 5mL/min

▼

Wash:
Wash with 3mL 5% methanol,dry HLB tube at low vacuum

▼

Elution:
Elute tetracycline with 2×3mL methanol (dry under N2 at 45℃,fix to 1mL with methanol,detect by HPLC)



Water sample added 100ppb tetracycline

UV-HPLC condition:

Column:	Cnwsil C18, 15cm×4.6mm I.D., 5μm
Mobile phase:	0.01M oxalic acid:acetonitrile:methanol=70:15:15
Flow rate:	1.0mL/min
Det.:	UV-Vis 355nm
Injection volume:	20μL

Recovery of Poly-Sery HLB SPE tube used for extraction of tetracycline

RT (min)	Compounds	Poly-Sery HLB	BrandW	BrandA	Silica C18
3.791	Oxytetracycline	80.51%	76.64%	75.11%	28.5%
4.437	Tetracycline	80.53%	77.06%	73.42%	19.56%
10.051	Chlortetracycline	78.46%	82.29%	74.81%	14.77%

Test result:

- Compared with similar products of W and A on the market, CNW Poly-Sery HLB tube has optimal recovery to tetracycline;
- Compared with traditional silica C18 tube,Poly-Sery HLB SPE tube is more simply, convenient and efficient.

Quinolones in water

Sample extraction:
Take 100mL water sample,adjust pH to pH 4.2 with phosphoric acid (filter by 0.45μm membrane if there's obvious particles)

SPE Condition:
Condition Poly-Sery HLB SPE tube(Cat. No.:2.CA3179.0001) with 3mL methanol,6mL deionized water (pH 4.2)

Load:
Load 100mL sample onto the SPE tube at the flow rate of 5mL/min

Wash:
3mL 5%methanol,dry HLB tube at low vacuum

Elution:
Elute fluoroquinolones with 2×3mL methanol (dry under N2 at 45℃,fix to 1mL with methanol,detect by HPLC)

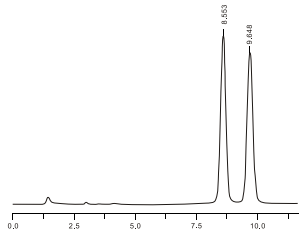


Figure 1. Water sample added 50ppb ofloxacin and ciprofloxacin

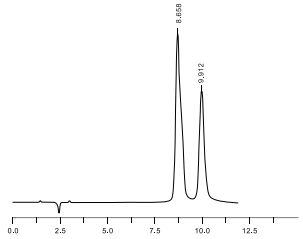


Figure 2. Water sample added 50ppb norfloxacin and ciprofloxacin

UV-HPLC condition:

Column:	Cnwsil C18, 15cm×4.6mm I.D., 5μm
Mobile phase:	25mM phosphate（pH3.0）:acetonitrile=85:15
Flow rate:	1.0mL/min
Det.:	UV 254nm
Injection volume:	20μL

Table 1. Recovery of Poly-Sery HLB SPE tube used for extraction of ofloxacin and ciprofloxacin

Time	Compounds	Poly-Sery HLB	BrandW	BrandA	SilicaC18
8.553	Ofloxacin	79.55%	78.45%	42.19%	14.46%
9.648	Ciprofloxacin	58.04%	58.70%	17.60%	12.23%

Table2. Recovery of Poly-Sery HLB SPE tube used for extraction of norfloxacin and ciprofloxacin

Time	Compounds	Poly-Sery HLB	BrandW	BrandA	SilicaC18
8.658	Norfloxacin	57.28%	56.67%	43.82%	11.49%
9.912	Ciprofloxacin	61.78%	61.84%	15.35%	11.68%

Test result:

- Compared with similar products of W and A on the market, CNW Poly-Sery HLB tube has optimal recovery and repeatability to fluoroquinolones;
- Compared with traditional silica C18 tube ,Poly-Sery HLB SPE tube is more suitable for compounds has big polarity（this kind of compounds has weak retaining on C18 packings）.

PFOA and PFOS in water

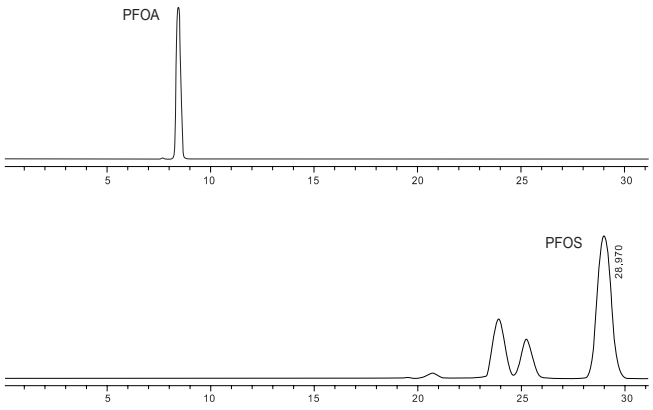
Sample extraction:
Get 500mL water (adjust pH to 2 with HCl,filter by 0.45μm membrane) as sample

SPE Condition:
Condition Poly-Sery HLB SPE tube(Cat. No.:2.CA3179.0001) with 5mL methanol,5mL deionized water

Load:
Load 500mL sample at the flow rate of 5mL/min

Wash:
5mL deionized water,dry HLB tube at low vacuum

Elution:
Elute PFOA and PFOS with 2×3mL methanol (dry under N2 at 45℃,fix to 1mL with methanol,detect by HPLC-MS)



Water sample added 20ppb PFOA and PFOS, recovery of PFOA is 86.84%,recovery of PFOS is 91.19%.

HPLC-MS condition:

Column:	C18, 15cm×4.6mm I.D., 5μm
Mobile phase:	10mM ammonium acetate:acetonitrile=55:45
Flow rate:	0.5mL/min
Oven:	40℃
Det.:	ESI(-)
Injection volume:	10μL

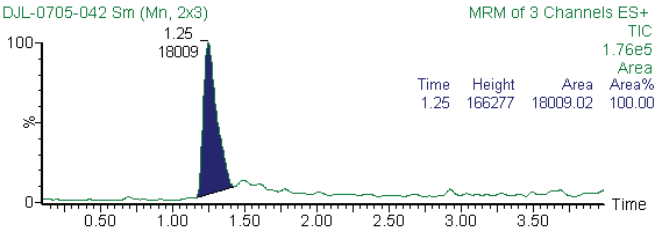
Carbendazim in water of paddy field

Sample extraction:
Get 100mL water of paddy field,add 5mL formic acid

SPE Condition:
Condition CNWBOND SCX tube（Cat.No.:2CA2853.0001）with 3mL methanol,3mL water

Load:
Load 100mL water onto SPE tube through large volume sampler at the flow rate of 1drop/s.Wash with 3mL water, 3mL methanol,get rid of eluent,dry tube at low vacuum

Elution:
Elute with 3mL 5% ammonia methanol solution, gather eluent. Vacuum distillation eluent to dryness at 30ºC, dissolve in 1mL mobile phase,filter by membrane,detect by UPLC/MS/MS



UPLC-MS/MS method

Column: waters UPLC BEH C18 5cm*1.7
MS/MS: Quattro premier XEXE
Mobile phase graduation:

Time	Flow rate（ml/min）	Mobile phaseA（water）	Mobile phaseB（methanol）
0	0.2	90	10
0.25	0.2	15	85
2.25	0.2	0	100
3.5	0.2	0	100
4	0.2	90	10

Compounds	Concentration of Internal Standards	Average Recovery(%)
Carbendazim	20ppb	91

Chemical industry

PAHs in dyes and inks

Put 2g sample into 5mL dichloromethane,mix, centrifuge and get dichloromethane layer,extract for 2-3 times again

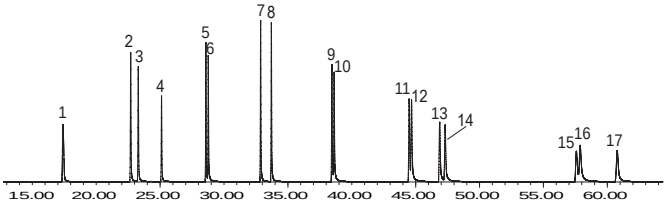
Gather dichloromethane eluent,concentrate to dryness under N2 at room temperature,dissolve in 1mL n-hexane

Condition CNWBOND PSA SPE tube with 5mL n-hexane

Load 1mL sample onto conditioned SPE tube,wash with 2X1 mL n-hexane ,elute with 5mL n-hexane:dichloromethane(3:2)

Gather all eluent, concentrate to about 0.5mL under N2 at room temperature, add 0.5mL internal standard perylene-d12 that has equal concentration with tested composition,detect by GC-MSD（internal standard quantity analysis）

The method is also suitable for the detection of PAHs in dyes, plastic raw materials,releasing agent,mineral oil,rubber and their products, the recovery and stability are more bigger than traditional silica tubes,meanwhile, it can remove the interference which disturb GC-MSD detect, get more exact quantity, and higher efficiency.



GC-MSD condition:

Column: DB-5MS, 60m×0.25mm I.D., 0.25μm
Temp: 100℃(1min), 6℃/min to 300℃(30min),
Inj.: Splitless(10min), 280℃
Det.: MSD, 280℃
Scan: m/z 50-450
Carrier gas: He, 1.0mL/min
Injection volume: 1.0μL

Recovery of CNWBOND PSA used for extraction of PAHs

No.	Compounds	Recovery(%)
1	Naphthalene	76
2	Acenaphthylene	91
3	Acenaphthene	85
4	Fluorene	88
5	Phenanthrene	95
6	Anthracene	95
7	Fluoranthene	98
8	Pyrene	98
9	Benzo[a]anthracene	100
10	Chrysene	99
11	Benzo[b]fluoranthene	98
12	Benzo[k]fluoranthene	96
13	Benzo[a]pyrene	98
15	Indeno[1,2,3-cd]pyrene	98
16	Dibenzo[a,h]anthracene	99
17	Benzo[g,h,i]perylene	95

Drugs

Saponin in health food

Sample extraction:
Weight out appropriate amount sample, place in 50ml volumetric flask, dissolve with water, ultrasonic for 30min, place to room temperature, adding water dilute to scale, centrifuge at 3000r/min for 5min, filter by 0.45 membrane. For non-ethanol sample, filter by 0.45 membrane, take 1ml(decide by total saponins in the sample) sample solid phase extraction.

▼

Take supernatant to collecting tube (> 2mL) and place it in the Sepline automatic solid phase extraction system. Follow the following steps to absorb and eluate.

▼

Condition: Within SPE cartridge (CNWBOND Alumina-N/XAD-2 SPE Cartridge, 0.8g/2.7g, 6mL/30 pcs), rinse 25ml 70% ethanol at flow rate 2.5 mL/min, then rinse 25ml water at flow rate 2.5 mL/min.

▼

Load: Load 1ml sample onto SPE tube in the flow rate of 1ml/min.

▼

Wash: Wash with 25ml water in the flow rate of 0.8ml/min, drying for 10min.

▼

Elution: Elute with 25ml 70% ethyl alcohol, collect 70% ethyl alcohol eluant.

▼

Transfer eluant to 50ml centrifuge tube, concentrate to dryness under N2 at 60℃.

Coloration and testing

Add 0.2ml 5% Vanillin acetic acid solution to eluant, dissolve the residue, then add 0.8ml perchloric acid, mix, heat for 10min in 60℃ water bath. After cool down, add 5ml glacial acetic acid, mix, colorimetric test with standard tube at the wavelength of 560nm in 1cm Cuvette.

Test results of sample recovery(n=6)

Name	New method (ANPEL customized SPE cartridge)		Traditional method	
	Average recovery (%)(n=6)	RSD (%)	Average recovery (%)(n=6)	RSD (%)
American ginseng tablet	98.3	0.4	98.1	4.3
Diet tea	99.5	0.9	98.3	2.2
hypolipidemic tablet	100.0	1.2	100.1	5.2
Donkey-hide glue oral solution	102.4	2.2	100.2	6.1

Hydroxyl PAHs in human metabolite

Sample preparation:
Mix sample, using 1mol/L NaOH or HCl adjust pH to 5, load 10ml sample into 50ml volumetric flask, add 2ml Sodium acetate-β-glucuronidase mixed solution(using Acetic acid- Sodium acetate buffer solution (pH=5) as solvent, compound concentration about 1000U/ml β-glucuronidase solution), mix, avoid light hydrolysis overnight at 37℃ in thermostatic oscillator. Centrifuge sample for 10min(3000r/min), take supernatant.

▼

Condition: 5ml methanol.

▼

Equilibrium: 5ml water.

▼

Load: Load supernatant into C18 SPE cartridge (2.CA0921.0001, CNWBOND LC-C18 SPE Cartridge,400mg, 6mL/30pcs)

▼

Wash: Wash out impurity with 10ml pure water, drying for 10min.

▼

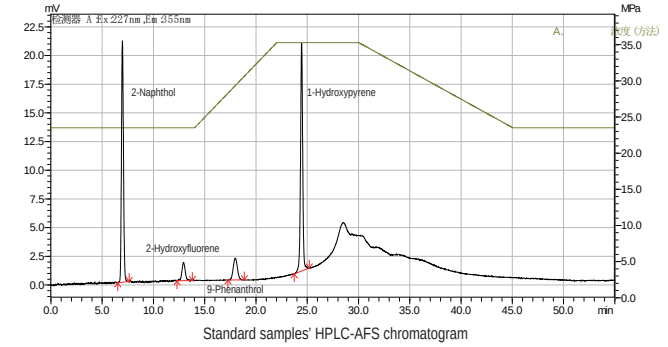
Elution: Elute with 4ml 30% methanol in graduated tube, evaporate with weak nitrogen flow to 0.5ml, reconstitute in initial ratio mobile phase, filter by 0.45 membrane, load 2μl and analyzed by chromatography.

Chromatography condition:

Column: Athena C18 (150 mm×4.6 mm, 5μm)
Mobile phase: A:methanol, B:water
Flow rate: 0.8ml/min
Temp: 40℃

Gradient elution program and wavelength switching procedure as follow:

0.01	RF-10AXL(DET.A) Emission Wavelength	355
0.01	RF-10AXL(DET.A) Excitation Wavelength	227
1.00	Pumps B.Conc	40
14.00	Pumps B.Conc	40
14.00	RF-10AXL(DET.A) Emission Wavelength	369
14.00	RF-10AXL(DET.A) Excitation Wavelength	254
20.00	RF-10AXL(DET.A) Emission Wavelength	392
20.00	RF-10AXL(DET.A) Excitation Wavelength	239
22.00	Pumps B.Conc	10
30.00	Pumps B.Conc	10
45.00	Pumps B.Conc	40
55.00	Pumps B.Conc	40
55.01	Controller Stop	



Standard samples' HPLC-AFS chromatogram

Recovery data

Concentration of internal Standards	2-Naphthol	2-Hydroxyfluorene	9-Phenanthrol	1-Hydroxypyrene
20 ppb	93.08 %	88.73 %	88.87 %	81.80 %
50 ppb	98.40 %	89.34 %	94.81 %	87.88 %

Clonidine Hydrochloride in Chinese medicine matrix

Chinese medicine powder,dissolve in 0.1mol/L HCl,ultrasonic,filter

▼

SPE tube :CNW Poly-Sery MCX(60mg/3ml) (2.CA3279.0001)

▼

Condition:5mLmethanol

▼

Equilibrium:3mLwater,3mL 0.1mol/L HCl

▼

Load: sample

▼

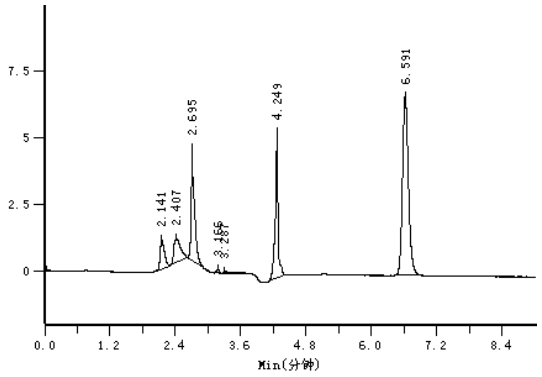
Wash:5 mL 0.1mol/L HCl,5mL water, 5mL 30% methanol,5mL methanol (dry)

▼

Elution:5mL 5% ammonia methanol (dry)

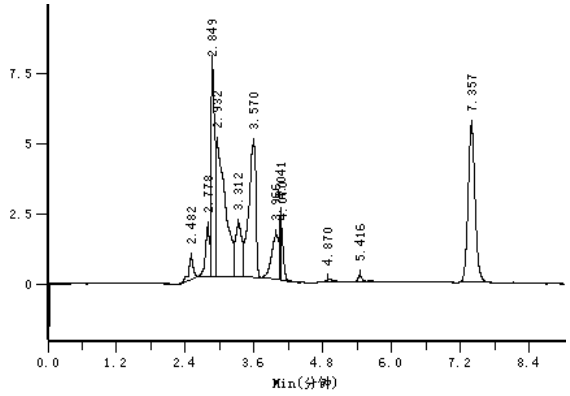
▼

Dry under N2, fix with buffer



Clonidine Hydrochloride:1.5ppm standard（0.01M HCl）

Peak	RT	Peak Area	Resolution	Tailing factor
Clonidine Hydrochloride	6.591	101505.8	18.119	1.205



1.5ppm standard recovery

Peak	RT	Peak Area	Resolution	Tailing factor
Clonidine Hydrochloride	7.357	95245.2	11.504	1.096

Filtration Products

Why need for filtration

Sample and mobile phase filtration are simple, economical practices to extend the life of chromatography consumable. A basic HPLC system consists of solvent reservoir, pump,injector, column, detector, and data recording system. Particles and microbial not removed by filtration interfere with nearly every system component.

Mobile phase filtration

Mobile phase filtration can reduce the possibility of sieve blockage, accessories pollution, valve damage, capillary occlusion, peak distortion, and the occurrence of interfering peaks and baseline noise.

Protection for pump

Pump is the most important single component of the HPLC system, the most common problem include check valves, pump seals, blockage, and air bubbles. Incorrect pump functioning results in increased baseline noise, irreproducible retention times and increased operating pressures. Check valves control the solvent flow direction through the pump head and ensure steady pressures when sealed properly. Particle in check valves can leak or stick causing flow and/or pressure problems. A pump seal facilitates piston movement in the pump head. Pump seals wear more quickly than other pump parts, and therefore require changing every three to six months. A failing pump seal is evident from an inability to pump at high pressures, leakage behind the pump head, and changing in sample retention. Pump seal wear can result in sloughing seals and contamination from this material. Buffer crystals built up from evaporated mobile phase also will accelerate wear. Pump seal life can be extended by filtering the mobile phase solvents to remove the particles responsible for accelerated seal wear.

Protection for injector

The rotor and the stator rotates when injector valve working, the micro-channels on the surface converse to achieve the LOAD and INJECT function. The existence of particles may damage the surface, then results leak or blockage. Loop may be blocked, and it results in high back pressure, loop filling difficulty, and peak area decrease. Particulate-free samples are essential for auto samplers to decrease blocked sample needles. Sample, mobile phase and in-line filtration are efficient protection for injector and column.

In-line filters and guard columns

In-line filters are ideal because it is impossible to avoid particulate from system wear, such as polymeric seal wear from the pump and sample injector, except with an in-line filter. The normal pore hole of removable frits of in-line filters are 0.5µm and 2.0 µm.

Guard columns can collect chemical and physical waste that block the main column inlet, cause column voids and degrade performance. The guard column retains irreversible and strongly retained components that degrade the column and decrease its lifetime, providing an inexpensive alternative to frequent column replacement. The frits of a guard column are typically 2.0 µm, which is not sufficient for particulate removal. Sample and mobile phase filtration will preserve the capacity of the guard column for its intended use: chemical contamination removal.

Columns

Significant problems with HPLC columns are chemical absorption, blocked frits and channel voids. Chemical changes are prevented with guard columns. Voids are created by particulate matter and pressure shock. If poor peak shapes become evident by badly tailing and splitting, without a change in retention time, blocked frits or a column void has occurred.

Daily maintenances commented to protect columns and whole system include:

1.Filtering solvents through filter membrane.

2.Filtering samples through syringe filter.

3.Utilizing a 0.5 µm in-line filter to trap injector and pump particulates.

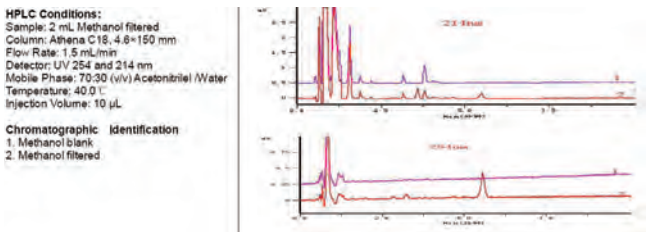
Quality assurance for anpel&cnw membranes and syringe filters

Quality control

ANPEL&CNW filtration products undergo many quality control tests to assure the quality stability. The quality control tests include visual examination, HPLC certification, bubble point test, maximum operating pressure test, liquid flow rate and hold-up volume, etc.

Hplc certified (uv detector for extractables)

HPLC certification intends to evaluate the UV-detectable extractives of ANPEL&CNW filtration products in methanol and water, to ensure that analytical results will not be compromised by extractable filter materials. Methanol or water is passed through each individual syringe filter or membrane, and a first 2mL eluted sample is collected and subjected to HPLC analysis at 214 nm and 254nm, using a mobile phase of 70:30 (v/v) acetonitrile: water, then compared to a blank of methanol or water.



Bubble point

The bubble point test is to confirm pore size and integrity of the membrane seal. A bubble point is the measure of the amount of air pressure required to force an air bubble through a wetted pore and is in inverse proportion to the size of the hole, the larger the pore, the less pressure required to form the bubble, and it relates to the surface tension of the liquid wetted the membrane. First, the membranes must be completely wetted, PES, Nylon, Hydrophilic PTFE and Hydrophilic PVDF membranes should be wetted with water, while Hydrophobic PTFE and Hydrophobic PVDF membranes should be wetted with absolute ethyl alcohol. Then the air pressure is slowly increased until a steady stream of bubbles is observed downstream of the filter. This pressure is recorded as the bubble point, it is expressed in psi, bar, etc.

■ Bubble point of different materials

Membrane Material	Bubble Point (Mpa)
Nylon	0.3
PES	0.2
PTFE	0.08
PVDF	0.09

Maximum operation pressure

Each batch of syringe filters must undergo maximum operating pressure test to ensure the syringe filter housings will not rupture at the pressure of xxx psi.

Liquid flow rate

Liquid flow-rate tests are performed to ensure that ANPEL&CNW filtration product meets minimum specified flow-rate. Different materials have different flow rate: PES ≥ 27mL/min.

Hold-up volume

The objective of this test is to evaluate the amount of water (for PES, Nylon, Hydrophilic PTFE and Hydrophilic PVDF membranes) or Absolute ethyl alcohol (for Hydrophobic PTFE and Hydrophobic PVDF membranes) remaining in the unit after performing an air flush at a pressure below the bubble point (dead volume) and above the bubble point (hold up volume). The filter unit is weighed dry before the test, then filled with water or Absolute ethyl alcohol using a syringe, ensuring that both the female (inlet) and male (outlet) Luer fittings are filled with fluid. The units are then weighed again. The fluid in the female Luer inlet fitting is expelled using the air from a dry syringe, without exceeding the bubble point, and the units are weighed again. Finally, the units are wetted again using another water or methanol filled syringe, then purged with air from a dry syringe. The air is passed through the filter unit for a few seconds, in order to drive the fluid out of the filter unit and the male Luer outlet fitting. The units are wiped dry, then weighed. The weight of the dry unit is subtracted from weight of the unit after the final flush to obtain the hold-up volume.

Specification: Less than or equal to 100 μL hold up volume

COA MODEL

Certificate of Analysis

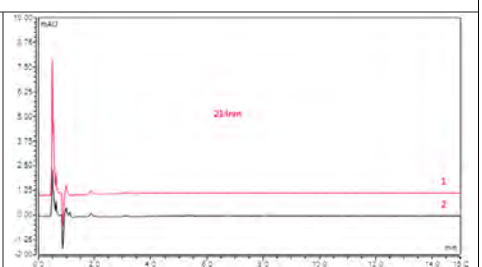
PRECLEANTM 13 mm Syringe Filter, Polyethersulfone (PES) membrane, 0.45 μm, blue
Art Number: 2.CF1101.0001
Lot Number: A0170020

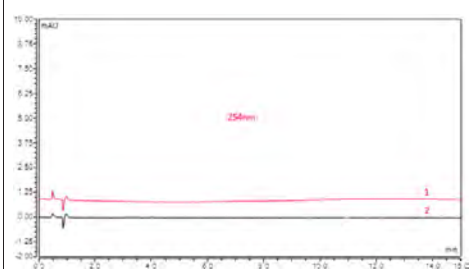
Syringe Filter Characteristics			
Properties	**Results**	**Properties**	**Results**
Membrane material	PES	Pore Size (μm)	0.45
Wettability	Hydrophilic	Filtration Area (cm^2)	0.83
Housing Material	Polypropylene	Filtration Volume (mL)	＜10
Inlet/Outlet	Female luer lock/Male luer silp	Hold-Up Volume (μL)	＜25
Characteristic Test Results			
Thickness (μm)	110	Bubble Point (MPa)/ Test Liquid	0.31/ Pure Water
Maximum Operating Pressure (psi)	＜90	Housing Material Cleanliness Test	Pass

Chromatography Test

HPLC Conditions:
Sample: 2 mL Pure Water filtered
Column: Athena C18, 4.6×150 mm
Flow Rate: 1.5 mL/min
Detector: UV 254 and 214 nm
Mobile Phase: 70:30 (v/v) Acetonitrilel /Water
Temperature: 40.0℃
Injection Volume: 10 μL

Chromatographic Identification
1. Pure Water blank
2. Pure Water filtered





[Expiration Date]: *Use before 2019/6/24*

			2016/11/07
PREPARATION	*REVIEW*	*APPROVAL*	*SIGNATURE DATE*

How to choose a filter

Filter Chemical Compatibility

Different materials have different chemical tolerance, The primary concern when choosing a solvent filter is solvent compatibility with the filter material.

chemical compatibility table

C = Compatible
LC = Limited compatibility
IC = Not compatible
* = Not analyzed

SOLVENT	PTFE	PVDF	PES	CA/CN	RC	PP	GMF	Nylon 6
ACIDS								
Acetic, Glacial	C	C	C	IC	C	C	C	LC
Acetic acid, 90%	C	C	C	*	*	C	C	*
Acetic, 25%	C	C	C	*	C	C	C	C
Acetic acid, 10%	C	C	C	LC	*	C	C	*
Hydrochloric, Concentrated	C	C	C	IC	IC	C	C	IC
Hydrochloric, 25%	C	C	C	*	IC	C	C	IC
Hydrochloric acid, 1N (3.3%)	C	C	C	*	*	C	C	IC
Sulfuric, Concentrated	C	IC	IC	IC	IC	C	C	IC
Sulfuric, 25%	C	IC	IC	IC	IC	C	C	IC
Nitric, Concentrated	C	IC	IC	IC	C	C	LC	IC
Nitric, 25%	C	C	IC	IC	C	C	LC	IC
Phosphoric, 25%	C	*	*	C	LC	C	*	IC
Formic, 25%	C	*	*	LC	C	C	C	IC
Trichloroacetic, 10%	C	*	*	C	C	C	*	IC
Citric acid	C	C	C	C	C	*	C	LC
Hydrofluoric acid	C	C	*	*	IC	LC	IC	IC
Boric Acid	C	C	C	C	C	C	C	LC
ALCOHOLS								
Methanol	C	C	C	IC	C	C	C	C
Ethanol	C	C	C	IC	C	C	C	C
Ethanol, 70%	C	C	C	C	C	C	C	LC
Isopropanol	C	C	C	C	C	C	C	C
n-Propanol	C	C	C	C	C	C	C	C
Amyl Alcohol (Butanol)	C	C	C	LC	C	C	C	C
Benzyl Alcohol	C	C	IC	IC	C	C	IC	LC
Ethylene Glycol	C	C	C	C	C	C	C	C
Propylene Glycol	C	C	C	LC	C	C	C	C
Glycerol	C	C	C	C	C	C	C	C
Isobutyl alcohol	C	C	*	C	C	C	C	C
ALKALIES								
Ammonium Hydroxide, 25%	C	LC	C	C	LC	C	C	C
Sodium Hydroxide, 3N	C	IC	C	IC	LC	C	IC	LC
Sodium hydroxide, 6N (22%)	C	IC	C	IC	IC	C	IC	IC
Potassium hydroxide, 3N (15%)	C	IC	C	IC	*	C	IC	IC
AMINES AND AMIDES								
Dimethyl Formamide	C	IC	IC	IC	LC	C	C	C
Diethylacetamide	C	*	*	IC	C	*	C	LC
Triethanolamine	C	*	*	C	C	*	*	C
Aniline	C	*	*	IC	C	*	*	C
Pyridine	C	IC	IC	IC	C	IC	C	*
Acetonitrile	C	C	LC	IC	C	C	C	C
ESTERS								
Ethyl Acetate/ Methyl Acetate	C	C	IC	IC	C	LC	C	C
Amyl Acetate/Butyl Acetate	C	IC	IC	LC	C	LC	C	C
Propyl Acetate	C	IC	IC	LC	C	LC	*	C
Propylene Glycol Acetate	C	*	IC	IC	C	C	*	*
2-Ethoxyethyl Acetate	C	*	IC	LC	C	*	*	*

SOLVENT	PTFE	PVDF	PES	CA/CN	RC	PP	GMF	Nylon 6
Methyl Cellusolve	C	*	IC	IC	C	C	C	*
Benzyl Benzoate	C	*	IC	C	C	*	*	C
Isopropyl Myristate	C	*	IC	C	C	*	*	C
Tricresyl Phosphate	C	*	IC	C	C	*	*	*
HALOGENATED HYDROCARBONS								
Methylene Chloride	C	C	IC	IC	C	LC	C	LC
Chloroform	C	C	IC	IC	C	LC	C	C
Trichloroethylene	C	C	C	C	C	C	C	C
Chlorobenzene	C	C	LC	C	C	C	C	C
Freon®	C	C	LC	C	C	C	C	C
Carbon Tetrachloride	C	C	IC	LC	C	LC	C	C
Butyl chloride	C	C	*	C	*	IC	C	IC
HYDROCARBONS								
Hexane/Xylene	C	C	IC	C	C	IC	C	C
Toluene/Benzene	C	C	IC	C	C	IC	C	C
Kerosene/Gasoline	C	C	LC	C	C	LC	*	C
Tetralin/Decalin	C	C	*	C	C	*	*	*
Nitrobenzene	C	C	IC	C	C	C	C	LC
Cyclohexane	C	C	IC	C	C	C	C	LC
Trichloroethane	C	C	C	C	C	C	C	C
Trichloroethylene	C	C	IC	C	C	C	C	IC
Perchloro Ethylene	C	C	IC	C	C	C	C	C
	C	C	IC	C	C	IC	C	C
KETONES								
Acetone	C	IC	IC	IC	C	C	C	C
Cyclohexanone	C	IC	IC	IC	C	C	C	C
Methyl Ethyl Ketone	C	LC	IC	IC	C	LC	C	C
Isopropylacetone	C	IC	IC	C	C	*	C	C
Methylisobutyl Ketone	C	LC	IC	*	C	LC	C	*
ORGANIC OXIDES								
Ethyl Ether	C	C	C	C	C	LC	*	C
Dioxane	C	LC	IC	IC	C	C	C	C
Tetrahydrofuran	C	LC	IC	IC	C	C	C	C
Triethanolamine	C	*	*	C	C	*	*	C
Dimethylsulfoxide (DMSO)	C	IC	IC	IC	C	C	C	C
Isopropyl Ether	C	C	C	C	C	C	*	*
MISCELLANEOUS								
Phenol,Aqueous Solution,10%	C	LC	IC	IC	IC	C	C	*
Formaldehyde Aqueous Solution,30%	C	C	C	C	LC	C	C	C
Hydrogen Peroxide,30%	C	*	*	C	C	*	*	C
Silicone Oil/Mineral Oil	C	C	C	C	C	C	C	*

This chart is intended only as a guide. We recommend that you confirm compatibility with the liquid you want to filter by performing a trial filtration run before you start your actual filtration.

This information was developed from technical publications, materials suppliers, laboratory tests, and field evaluations, etc., and is believed to be accurate and reliable. However, because of variability in temperature, concentrations, exposure time, and other factors outside of our control that may affect the use of the unit, we do not provide or imply a warranty with respect to such information. Users should verify chemical compatibility with a specific filter under actual use conditions.

Effective Filtration Area

Increasing the effective filtration area can lengthen the life of a filter.

Optimal Pore Size Rating

When an HPLC column has a packing size of 3 µm or smaller,you should use a 0.2 µm filter because a 0.45 µm filter may let particles through that will plug the column.

Throughput &Flow Rate

Choose suitable product according to different materials and diameter s to meet the required volume capacity and flow rate.

Hold-up Volume

Filtration Volume	Diameter	Hold-up Volume
10mL	13mm	25µL
120mL	25mm	100µL

Surface Tension

Choose suitable membrane material according to the hydrophobic and hydrophilic of solvents, to avoid the filtration resistance is too large.

Extractables

A syringe tip filter extractable may be a membrane or housing formulation component, or a component introduced during the manufacturing or packaging process.There are several mechanisms (solubility, particle displacement,chemical interaction, and diffusion) whereby extractable materials may leach into the sample during sample preparation.The polymeric resins, solvents, pore formers and other chemical components such as housing materials utilized during device manufacturing may potentially extract. Solubility relates to chemical compatibility. As membrane and/or housing components become more soluble with sample fluid components, extractable materials will increase. To determine whether a syringe filter is compatible with the sample fluid, all sample constituents (both major and minor components) require consideration. Because solubility is dependent on temperature, concentration, and exposure time, all of these parameters are significant in determining chemical compatibility.

If the sample volume is enough, a first 3 -5mL flush can be discarded to reduce extractables to an acceptable level.

Adsorption

Unwanted adsorption as well as the presence of possible extractables eluted from the filter during routine pharmaceutical sample analysis can be a serious problem to the results. No single analytical method can provide reliable information on comparative filter properties and the full range of extractables for all filters. We suggest you consider the adsorption when choosing the syringe filters to ensure the HPLC analysis result.

Applications for reference

HPLC, UHPLC, LC/MS	Polyethersulfone,PTFE(Hydrophilic&Hydrophobic)
GC	Nylon, PTFE(Hydrophobic)
ICP-MS	PTFE(Hydrophilic)
CE	Nylon
Organic Solvents	PTFE(Hydrophobic), Nylon
Culture Media	PES, PVDF(Hydrophilic)
Protein Sequencing, Western Blot	PVDF(Hydrophobic)
High Particulate Loaded Samples -Organic Phase	Welded PTFE (Hydrophobic),with prefiltration
High Particulate Loaded Samples -Aqueous Phase	Welded PTFE (Hydrophilic), Welded Nylon

Instructions for use& Cautions

1. Before filling with sample, draw approximately 1 mL air into the syringe. This will minimize fluid retention.
2. Draw your sample into the syringe, then connect the syringe to the syringe filter using a luer connection. Twist gently to ensure a secure seal.

3. Filter syringe contents into a vial. Afterwards, remove the syringe filter, draw air into the syringe, re-attach the syringe filter, and press the plunger to filter the residual sample. This will maximize sample recovery.
4. Use caution with syringes smaller than 10mL, otherwise the pressure they generated may exceed the maximum operating pressure.
5. ANPEL&CNW filtration products are disposable consumables, and not recommended for reuse.

Product Introduction:

Material Features

Polyethersulfone(PES): Hydrophilic membranes, high flow rate and high throughputs, low protein binding, low in extractables, and can be used to remove small particles, bacteria, viruses and fungi from aqueous phase. Normally used with pH range 3-12.

Nylon: Excellent chemical stability and flexibility, durable, hard to tear, can be sterilized in 121°C. Suitable for filtration of aqueous and most organic solvents, such as the water filtration of electronic, microelectronic, semiconductor industry, and also the filtration of culture media, drugs, drinks, and high-purity chemical. Normally used with pH range 3-14.

Hydrophobic Polytetrafluoroethylene (PTFE): Broad solvent chemical compatibility, excellent particle retention, and compatibility with various sterilizing methods. Suitable for both liquid and gas filtration. Normally used with pH range 1-14.

Hydrophobic Polyvinylidene fluoride (PVDF): High mechanical and tensile strength, and have broad chemical and temperature resistance. Not suitable for the filtration of acetone, DMSO, THF, etc. suitable for the filtration of gas, steam and high temperature liquids. Normally used with pH range 2-13.

Hydrophilic Polytetrafluoroethylene (PTFE): Broad chemical resistance, excellent particle retention, and compatibility with various sterilizing methods. Suitable for the filtration of aggressive organic solvents, water solution containing strong acids or alkalis, and mixed solution of both. Normally used with pH range 1-14.

Hydrophilic Polyvinylidene fluoride (PVDF): Low protein binding, and have broad chemical and temperature resistance. The chemical compatibility of the membrane includes aggressive acids and alcohols. We do not recommend using this membrane for the filtration of acetone, DMSO, or bases > 6N. The filtration of dilute protein samples is recommended. Normally used with pH range 2-13.

Filtration products

Description	Packaging	Cat. No.
PRECLEANTM 13 mm Syringe Filter PES membrane, 0.45 µm, blue	100 pcs per PET jar	2.CF1101.0001
PRECLEANTM 13 mm Syringe Filter PES membrane, 0.45 µm, blue	100 pcs per PE bag	2.CF1101.B001
PRECLEANTM 13 mm Syringe Filter PES membrane, 0.22 µm, yellow	100 pcs per PET jar	2.CF1102.0001
PRECLEANTM 13 mm Syringe Filter PES membrane, 0.22 µm, yellow	100 pcs per PE bag	2.CF1102.B001
PRECLEANTM 25 mm Syringe Filter PES membrane, 0.45 µm, blue	100 pcs per PET jar	2.CF1201.0001
PRECLEANTM 25 mm Syringe Filter PES membrane, 0.45 µm, blue	100 pcs per PE bag	2.CF1201.B001
PRECLEANTM 25 mm Syringe Filter PES membrane, 0.20 µm, yellow	100 pcs per PET jar	2.CF1202.0001
PRECLEANTM 25 mm Syringe Filter PES membrane, 0.20 µm, yellow	100 pcs per PE bag	2.CF1202.B001
PRECLEANTM 13 mm Syringe Filter Nylon membrane, 0.45 µm, white	100 pcs per PET jar	2.CF2101.0001
PRECLEANTM 13 mm Syringe Filter Nylon membrane, 0.45 µm, white	100 pcs per PE bag	2.CF2101.B001
PRECLEANTM 13 mm Syringe Filter Nylon membrane, 0.22 µm, green	100 pcs per PET jar	2.CF2102.0001
PRECLEANTM 13 mm Syringe Filter Nylon membrane, 0.22 µm, green	100 pcs per PE bag	2.CF2102.B001
PRECLEANTM 25 mm Syringe Filter Nylon membrane, 0.45 µm, white	100 pcs per PET jar	2.CF2201.0001
PRECLEANTM 25 mm Syringe Filter Nylon membrane, 0.45 µm, white	100 pcs per PE bag	2.CF2201.B001
PRECLEANTM 25 mm Syringe Filter Nylon membrane, 0.20 µm, green	100 pcs per PET jar	2.CF2202.0001
PRECLEANTM 25 mm Syringe Filter Nylon membrane, 0.20 µm, green	100 pcs per PE bag	2.CF2202.B001
PRECLEANTM 13mm Syringe Filter, PTFE membrane, 0.45um, orange	100 pcs per PET jar	2.CF3101.0001
PRECLEANTM 13mm Syringe Filter, PTFE membrane, 0.45um, orange	100 pcs per PE bag	2.CF3101.B001
PRECLEANTM 13mm Syringe Filter, PTFE membrane, 0.22 um, purple	100 pcs per PET jar	2.CF3102.0001
PRECLEANTM 13mm Syringe Filter, PTFE membrane, 0.22 um, purple	100 pcs per PE bag	2.CF3102.B001
PRECLEAN 25mm Syringe Filter, PTFE membrane, 0.45um, orange	100 pcs per PET jar	2.CF3201.0001
PRECLEAN 25mm Syringe Filter, PTFE membrane, 0.45um, orange	100 pcs per PE bag	2.CF3201.B001
PRECLEAN 25mm Syringe Filter, PTFE membrane, 0.2 um, purple	100 pcs per PET jar	2.CF3202.0001
PRECLEAN 25mm Syringe Filter, PTFE membrane, 0.2 um, purple	100 pcs per PE bag	2.CF3202.B001
PRECLEANTM 13mm Syringe Filter PVDF membrane, 0.45 µm, red	100 pcs per PET jar	2.CF4101.0001
PRECLEANTM 13mm Syringe Filter PVDF membrane, 0.45 µm, red	100 pcs per PE bag	2.CF4101.B001
PRECLEANTM 13 mm Syringe Filter PVDF membrane, 0.22 µm, black	100 pcs per PET jar	2.CF4102.0001
PRECLEANTM 13 mm Syringe Filter PVDF membrane, 0.22 µm, black	100 pcs per PE bag	2.CF4102.B001
PRECLEANTM 25 mm Syringe Filter PVDF membrane, 0.45 µm, red	100 pcs per PET jar	2.CF4201.0001
PRECLEANTM 25 mm Syringe Filter PVDF membrane, 0.45 µm, red	100 pcs per PE bag	2.CF4201.B001
PRECLEANTM 25 mm Syringe Filter PVDF membrane, 0.22 µm, black	100 pcs per PET jar	2.CF4202.0001
PRECLEANTM 25 mm Syringe Filter PVDF membrane, 0.22 µm, black	100 pcs per PE bag	2.CF4202.B001
PRECLEANTM 13mm Syringe Filter PP membrane, 0.45 µm, light blue	100 pcs per PET jar	2.CF5101.0001
PRECLEANTM 13mm Syringe Filter PP membrane, 0.45 µm, light blue	100 pcs per PE bag	2.CF5101.B001
PRECLEANTM 13 mm Syringe Filter PP membrane, 0.22 µm, invisible green	100 pcs per PET jar	2.CF5102.0001
PRECLEANTM 13 mm Syringe Filter PP membrane, 0.22 µm, invisible green	100 pcs per PE bag	2.CF5102.B001
PRECLEANTM 25 mm Syringe Filter PP membrane, 0.45 µm, light blue	100 pcs per PET jar	2.CF5201.0001
PRECLEANTM 25 mm Syringe Filter PP membrane, 0.45 µm, light blue	100 pcs per PE bag	2.CF5201.B001
PRECLEANTM 25 mm Syringe Filter PP membrane, 0.22 µm, invisible green	100 pcs per PET jar	2.CF5202.0001
PRECLEANTM 25 mm Syringe Filter PP membrane, 0.22 µm, invisible green	100 pcs per PE bag	2.CF5202.B001
PRECLEANTM 13 mm Syringe Filter, PVDF membrane(Hydrophilic), 0.02 µm, natural	100 pcs per PE bag	2.CF7103.0001
PRECLEANTM 13mm Syringe Filter,with prefiltration layer, PTFE membrane(Hydrophilic), 0.45µm, pink	100 pcs per PET jar	2.CF6101.D001
PRECLEANTM 13mm Syringe Filter, with prefiltration layer, PTFE membrane(Hydrophilic), 0.22 µm, golden	100 pcs per PET jar	2.CF6102.D001
PRECLEANTM 25mm Syringe Filter,with prefiltration layer, PTFE membrane(Hydrophilic), 0.45µm, pink	100 pcs per PET jar	2.CF6201.D001
PRECLEANTM 25mm Syringe Filter,with prefiltration layer, PTFE membrane(Hydrophilic), 0.22µm, golden	100 pcs per PET jar	2.CF6202.D001

Membranes

The green papers between the membranes can avoid franklinism.
High-quality membranes undergo several tests, such as bubble point, back ground, flow rate or volume throughput, to ensure the quality.

Cautions:

1. When using two-layer membrane, the face should be upward and the back should be downward. The film is just a support of membrane. If reversed, the membrane is without support, so it is easy to break, and can't withstand pressure.

2. When filter aqueous solution by organic membranes, before use, the membranes can be wetted by organic solvent such as ethanol first, and then rinsed by clean water.

Description	Packaging	Cat.No.
Polyethersulfone(PES) Membrane,47mm,0.45μm	100 pcs per box	2.CM0111.0001
Polyethersulfone(PES) Membrane,47mm,0.22μm	100 pcs per box	2.CM0112.0001
Nylon Membrane,47mm,0.45μm	100 pcs per box	2.CM0211.0001
Nylon Membrane,47mm,0.22μm	100 pcs per box	2.CM0212.0001
Nylon Membrane,25mm,0.45μm	200 pcs per box	2.CM0221.0001
Nylon Membrane,25mm,0.22μm	200 pcs per box	2.CM0222.0001
Nylon Membrane,13mm,0.45μm	200 pcs per box	2.CM0231.0001
Nylon Membrane,13mm,0.22μm	200 pcsper box	2.CM0232.0001
Hydrophobic Polytetrafluoroethylene(PTFE) Membrane,47mm,0.45μm	50 pcs per box	2.CM0311.0001
Hydrophobic Polytetrafluoroethylene(PTFE) Membrane,47mm,0.22μm	50 pcs per box	2.CM0312.0001
Hydrophobic Polytetrafluoroethylene(PTFE) Membrane,25mm,0.45μm	100 pcs per box	2.CM0321.0001
Hydrophobic Polytetrafluoroethylene(PTFE) Membrane,25mm,0.22μm	100 pcs per box	2.CM0322.0001
Hydrophobic polyvinylidene fluoride(PVDF) Membrane,47mm,0.45μm	50 pcs per box	2.CM0411.0001
Hydrophobic polyvinylidene fluoride(PVDF) Membrane,47mm,0.22μm	50 pcs per box	2.CM0412.0001
Hydrophobic polyvinylidene fluoride(PVDF) Membrane,25mm,0.45μm	100 pcs per box	2.CM0421.0001
Hydrophobic polyvinylidene fluoride(PVDF) Membrane,25mm,0.22μm	100 pcs per box	2.CM0422.0001
Polypropylene(PP) Membrane,47mm,0.45μm	50 pcs per box	2.CM0511.0001
Polypropylene(PP) Membrane,47mm,0.22μm	50 pcs per box	2.CM0512.0001
Hydrophilic Polytetrafluoroethylene(PTFE) Membrane,47mm,0.45μm	50 pcs per box	2.CM0611.0001
Hydrophilic Polytetrafluoroethylene(PTFE) Membrane,47mm,0.22μm	50 pcs per box	2.CM0612.0001
Hydrophilic Polytetrafluoroethylene(PTFE) Membrane,25mm,0.45μm	100 pcs per box	2.CM0621.0001
Hydrophilic Polytetrafluoroethylene(PTFE) Membrane,25mm,0.22μm	100 pcs per box	2.CM0622.0001
Hydrophilic polyvinylidene fluoride(PVDF) Membrane,47mm,0.45μm	50 pcs per box	2.CM0711.0001
Hydrophilic polyvinylidene fluoride(PVDF) Membrane,47mm,0.22μm	50 pcs per box	2.CM0712.0001
Hydrophilic polyvinylidene fluoride(PVDF) Membrane,25mm,0.02μm	100 pcs per box	2.CM0723.0001
Mixed Cellulose Ester(MCE) Membrane,47mm,0.45μm	100 pcs per box	2.CM0811.0001
Mixed Cellulose Ester(MCE) Membrane,47mm,0.22μm	100 pcs per box	2.CM0812.0001
Mixed Cellulose Ester(MCE) Membrane,25mm,0.45μm	200 pcs per box	2.CM0821.0001
Mixed Cellulose Ester(MCE) Membrane,25mm,0.22μm	200 pcs per box	2.CM0822.0001
Mixed Cellulose Ester(MCE) Membrane,13mm,0.22μm	200 pcs per box	2.CM0832.0001

Disposable Syringe

The black rubber seals in conventional medical syringe will produce solute in contact with organic solvents which will pollute samples.
This product is totally made of high quality polypropylene (PP), has good tolerance to organic solvent, avoid polluting samples.
The product itself is an unsterilized medical syringe which can be widely used in HPLC, GC and Sample preparation in elemental analysis.

Description	Packaging	Cat.No.
2mL disposable syringes,Luer slip, centre delivery	100 pcs per box	QBAA-002012
2mL disposable syringes,Luer slip, centre delivery,unassembled	100 pcs per box	QBAA-002012S-100
5mL disposable syringes,Luer slip, eccentric delivery	100 pcs per box	QBAA-002013
5mL disposable syringes,Luer slip, eccentric delivery,unassembled	100 pcs per box	QBAA-002013S-100
10mL disposable syringes,Luer slip, eccentric delivery	50 pcs per box	QBAA-002014-50
10mL disposable syringes,Luer slip, eccentric delivery,unassembled	50 pcs per box	QBAA-002014S-50
20mL disposable syringes,Luer slip, eccentric delivery	25 pcs per box	QBAA-002015-25

New Mobile Phase Filter

CNW new Mobile Phase Filter is designed to solvent rapidfiltration and degassing, suitable for filtering anddegassing of the HPLC mobile phase solvent, Can prolong the service life of instrument and the chromatographic column, improve the detection accuracy; Used in gravimetric analysis, trace analysis, trace analysis, colloid separation and sterile in the laboratory.

Compare to traditional Solvent Filter, the new design solve following questions:

1. Larger filter cup capacity, avoid multiple adding;
2. Removes clamp, avoid potential leaking;
3. Substitute Frosted Seal to Thread fastening, avoid fusion after long time usage.
4. Substitute Quartz sand core to PTFE filter plate, avoid hard cleaning.
5. Substitute Conical flask to GL45 ISO Bottles, avoid solvent transfer after filter.

Description	Packaging	Cat.No.
PTFE Solvent filter assembly,with 1000mL glass reservoir	1 per carton	2.PSF010.0001

HPLC

Column Selection and Handling Precautions

The choice of HPLC columns

The choice of column tubes

The materials of HPLC column tubes include SS316 (stainless steel), PTFE, and PMMA etc., determined by characteristics of mobile phase, pressure degree of column and sample. SS316 is used when mobile phase is organic solvents with pressure between 5 to 30 Mpa. When the mobile phase is 100% water or buffer solution with pressure less than 4 Mpa, PMMA or PTFE is chosen for less impact on activity of biological sample.

Inner diameter

A. 1-2mm ID column, is specific used for micro LC(MLC), such as LC -Mass spectrometry. But for routine analysis, it's not easy to use. Although the solvent consumption is small, the requirement is too rigid. It need the instrument only have a very small dead volume. Besides, this kind of columns is short-life.

B. 4-6mm (3.9, 4.0, 4.6, 5.0, 6.0mm) ID columns are analytical scale and suitable for routine analysis. 4.6mm ID columns are the most usual type. Best flow rate is 1ml/min which general instruments can match with. They have high column efficiency, stable performance, and longer life time.

C. 7.8-10.0mm ID columns are semi-preparative column Chromatographic conditions can be transplanted from analytical column. They can be equipped on normal LC instruments to collect small amount of high purity components to quality and research.

D. 20-100mm ID columns are preparative column, which can prepare a large number of pure components with commercial value. At present, although the price is higher, it is must equipped for the pharmaceutical industry.

The length of the column tube

Length of HPLC columns is between 50 and 500mm. For general analysis 150-250mm is most commonly used. Columns longer than 250mm though have high column efficiency, have much higher pressure. So it is not economic just for better efficiency to increase the column length.

The choice of packing

Particle size

particle size of commonly used packing is 3 - 10um. Small particle size can achieve high column efficiency, but column pressure is also high. Column pressure is an important factor that cannot be ignored. High column pressure may lead to packing collapse and reduce columns' life time. Especially when mobile phase is methanol with larger water content, hydrogen reaction formed between water and methanol makes the viscosity to increase. If high column efficiency is pursued, water-acetonitrile system is recommended.

For preparative column, main pursuit is preparation volume, and separation is secondary. Generally packing with larger size than 10 um is chosen with low cost and low column pressure.

For UHPLC which has higher column efficiency, better separation and shorter separation time, particle size is so small that the pressure is much higher than HPLC. We offer two specifications: 1.8μm and 2.2μm. CNW Athena UHPLC columns can withstand pressures up to 10000psi, and have good reproducibility.

The specifications of packings

Molecular weight smaller than 2000

Aqueous samples	Non-ionic	Reverse phase chromatography	CNW Athena C30,C18,C18-WP, C8
	Ionic	Reverse phase chromatography	CNW Athena C30,C18,C18-WP, C8
		Ion exchange chromatography	CNW Athena SAX,SCX；Transgenomic ICSep AN, ICSep CN
	Amino acids	Reverse phase chromatography	CNW Athena C18
		Ion exchange chromatography	Transgenomic AMINOSep amino acid column
	Organic acids	Ion exclusion chromatography	Transgenomic ICSep organic acid column;Shodex SUGAR SH1821，KC-811
	Monosaccharides, disaccharides, oligosaccharides,	Reverse phase chromatography	CNW Athena NH2
		Ion exclusion chromatography	Shodex SUGAR SH1821
		Inverting chromatography	Transgenomic CARBOSep resin type sugar column
	Peptide	Reverse phase chromatography	CNW Athena C18
Oil-soluble samples	Non-polar	Reversed-phase chromatography	CNW Athena C18
		Normal phase chromatography	CNW Athena NH2, CN, SIL
	Polar	Normal phase chromatography	CNW Athena NH2, CN, SIL
Chiral sample		Chiral chromatography	Regis Whelk-O，RegisPack，RegisCell

Molecular weight higher than 2000

Aqueous samples	Non-ionic	Reversed-phase chromatography	CNW Athena C18-BIO
	Proteins, polypeptides	Gel filtration chromatography (GFC)	Shodex KW-800, SB-800 HQ; CNWGel X series
		Ion-exchange chromatography	Athena SAX, SCX; CNWSep series
		Reversed-phase chromatography	CNW Athena C18-BIO
		Affinity chromatography	Shodex AFpak,
	Nucleic acid	Ion-exchange chromatography	Athena SAX, SCX; CNWSep series
	Polysaccharide	Gel filtration chromatography (GFC)	Shodex KW-800, SB-800 HQ; CNWGel X series
		Ion-exchange chromatography	Athena SAX, SCX; CNWSep series
Oil-soluble samples		Gel filtration chromatography (GFC)	Shodex SB-800 HQ; CNWGel-S Series
		Reversed-phase chromatography	CNW Athena C18-BIO

Precautions for use of columns

Column Equilibration

When preparing to introduce your desired mobile phase into a new column, be aware of the miscibility of the solvents being introduced to the column and the solvent inside the column. If they are not, it is necessary to pump one or more miscible intermediate solvents through the column to avoid high pressure. Equilibrate the column with a minimum of 10 column volumes of mobile phase to be used.

Reversed-phase columns equilibration method

Reversed-phase columns equilibrate in as little as 20 column volumes of mobile phase. If the new eluent being introduced contains buffer sales, it is recommended that the column is flushed with a highly aqueous eluent (such as 90:10 Water: MeCN) before introducing buffer, to avoid precipitation of salts on the column. For extra precaution, introduce new buffered eluents WITHOUT the buffer component for 5-10 column volumes, and then switch to the fully buffered eluent composition. Precipitation of buffer salts on the columns is essentially irreversible and destroys the column. When switching between solvents with vastly different polarities, it may be necessary to first purge the column with a mutually miscible solvent such as Isopropyl Alcohol or Dioxane at a reduced flow rate (approximately 50% of normal). Flushing with a minimum of 5 column volumes is recommended (e.g. 10mL for a 150 x 4.6mm I.D. column).

Normal phase column equilibration method

Normal-phase columns require longer equilibration times (at least 50 column volumes). To ensure good reproducibility and faster equilibration of normal-phase columns, a small, constant percentage of water can be added to the mobile phase.

Column maintenance

Eluent pH: At pH above 8, silica gels begin to dissolve; at acidic pH below 2.0 certain bonded phases (particularly CN) become hydrolyzed and gradual loss of bonded phase can occur. While many customers use the columns outside both sides of the pH spectrum with excellent results and good column lifetime, the best lifetimes are usually obtained at intermediate pH conditions.

Pressure: To maximize column life operate at pressures up to 20 MPa (~ 3000 psi) for standard HPLC phases (UHPLC columns can be used at higher pressures, as indicated on the test chromatogram).

Sample Dissolution: Samples should be dissolved in the eluent or solvent weaker than the eluent, which helps avoid sample precipitation at the column head and inconsistent retention values. Filter sample with 0.45μ membrane to remove particulate matter before injection.

Solvents: Use HPLC or spectroscopy grade solvents that have been filtered through a 0.45μ filter. Filter all buffer solutions before use. Avoid introduction of particulates onto the column at all costs.

Guard Columns: Use a guard column of matching chemistry and particle size between the injector and main column. Guard columns need to be replaced at regular intervals as determined by sample contamination. When system backpressure limit, it is usually an indication that the guard column should be replaced. A sudden appearance of split peaks is also indicative of a need to replace the guard column.

Clean of Columns

Clean of reverse phase silica bonded phase columns

20 column volumes should be used for each wash stage:

95:5 water: ACN(Removal of buffer) → 100% ACN → 50:50 water: ACN

Clean of normal phase silica bonded phase column

20 column volumes should be used for each wash stage:

THF → Chloroform → Methylene Chloride → Hexane

Common Troubleshooting

Problem	Possible cause	Solution
No peaks or very small peaks	Detector off	Check detector
	Broken connections to recorder	Check connections
	No sample/Wrong sample	Check sample. Be sure it is not deteriorated. Check for bubbles in the vials
	Wrong settings on recorder or detector	Check attenuation. Check gain
No Flow	Pump off	Start Pump
	Flow interrupted	Check reservoirs. Check position of the inlet tubing. Check loop for obstruction or air. Check degasing of mobile phase. Check compatibility of the mobile phase components.
	Leak	Check fittings. Check pump for leaks and precipitates. Check pump seals.
	Air trapped in the system	Disconnect column and prime pump. Flush system with 100% methanol or isopropanol. Contact servicing if necessary.
Column end leaks	Loose fitting	Tighten or replace fitting
	White powder at loose fitting	Cut tubing and replace ferrule; disassemble fitting, rinse and reassemble.
Leak at detector	Detector-seal failure	Replace detector seal or gaskets.
Leak at injection valve	Worn or scratched valve rotor	Replace valve rotor
Leak at pump	Pump seal failure	Replace pump seal; check piston for scratches and, if necessary, replace
Changing Retention Times	Buffer retention times	Use buffer with concentration greater than 20 mM.
	Contamination buildup	Flush column occasionally with strong solvent
	Equilibration time insufficient for gradient run or changes in isocratic mobile phase	Pass at least 10 column volumes through the column for gradient regeneration or after solvent changes
	First few injections - active sites	Condition column by injecting concentrated sample
	Inconsistent on-line mobile-phase mixing	Ensure gradient system is delivering a constant composition; compare with manually prepared mobile phase; partially premix mobile phase
	Selective evaporation of mobile-phase component	Cover solvent reservoirs; use less-vigorous helium purging; prepare fresh mobile phase
	Varying column temperature	Thermostat or insulate column; ensure laboratory temperature is constant.
	Active sites on column packing	Use mobil-phase modifier, competing base (basic compounds), or increase buffer strength; use higher coverage column packing.
	Column overloaded with sample	Decrease sample amount or use larger-diameter column.
	Increasing flow rate	Check and reset pump flow rate.
	Loss of bonded stationary phase or base silica	Use mobile-phase pH between pH 2 and pH 8
	Varying column temperature	Thermostat or insulate column; ensure laboratory temperature is constant
Increasing Retention Times	Decreasing flow rate	Check and reset pump flow rate; check for pump cavitation; check for leaking pump seals and other leaks in system
	Changing mobile-phase composition	Cover solvent reservoirs; ensure that gradient system is delivering correct composition.
	Loss of bonded stationary phase	Use mobile-phase pH between pH 2 and pH 8
Slow column equilibration time	Reversed phase ion pairing - long chain ion pairing reagents require longer equilibration time	Use ion-pairing reagent with shorter alkyl chain length
Void Time noise	Air bubbles in mobile phase	Degas or use back pressure restricor on detector
	Positive-negative - difference in refractive index of injection solvent and mobile phase	Normal with many samples; use mobile phase as sample solvent
Drifting baseline	Negative direction (gradient elution) - absorbance of mobile-phase A	Use non-UV absorbing mobile phase solvents; use HPLC grade mobile phase solvents; add UV absorbing compound to mobile phase B.
	Positive direction (gradient elution) - absorbance of mobile phase B	Use higher UV absorbance detector wavelength; use non-UV absorbing mobile phase solvents; use HPLC grade mobile phase solvents; add UV absorbing compound to modile phase A.
	Positive direction - contamination buildup and elution	Flush column with strong solvent; clean up sample; use HPLC grade solvents
	Wavy or undulating - temperature changes in room	Monitor and control changes in room temperature; insulate column or use column oven; cover refractive index detector and keep it out of air currents.
Baseline noise	Continous - detector lamp problem or dirty cell	Replace UV lamp(each should last 2000 h; clean and flush flow cell.
	Gradient or isocratic proportioning - lack of solvent mixing	Use proper mixing device; check proportioning precision by spiking one solvent with UV absorbing compound and mointor UV absorbance detector outputl.
	Gradient or isocratic proportioning - malfunctioning proportioning valvesl	Clean or replace proportioning precision valves; partially remix solventsl.
	Occasional sharp spikes - external electrical interference	Use voltage stabilizer for LC system; use independent electrical circuit.
	Periodic - pump pulses	Service or replace pulse damper; purge air from pump; clean or replace check valves.
	Random - contamination buildup	Flush column with strong solvent; clean up sample; use HPLC grade solvent
	Spikes - bubble in detector	Degas mobile phase; use back pressure restrictor at detector outlet.
	Spikes - column temperature higher than boiling point of solvent	Use lower column temperature.

Problem	Possible cause	Solution
Decreasing Pressure	Insufficient flow from pump	Loosen cap on mobile phase reservior
	Leak in hydralic lines from pump to column	Tighten or replace fittings; tighten rotor in injection valve
	Leaking pump check valve or seals	Replace or clean check valves; replace pump seals.
	Pump cavitation	Degas solvent; check for obstruction in line from solvent reservoir to pump; replace inlet-line frit
Fluctuating pressurre	Bubble in pump	Degas solvent; purge solvent with helium
	Leaking pump check valve or seals	Replace or clean check valves; replace pump seals
High Back Pressure	Column blocked wth irreversibly adorbed sample	Improve sample cleanup; use guard column; reverse-flush column with strong solvent to dissolve blockage
	Column particle size too small (for example 3 micrometers)	Use larger particle size (for example 5 micrometer)
	Microbial growth on column	Use at least 10% organic modifier in mobile phase; use fresh buffer daily; add 0.02% sodium azide to aqueous mobile phase; store column in at least 25% organic solvent without buffer
	Mobile phase viscosity too high	Use lower viscosity solvents or higher temperature
	Plugged frit in in-line filter or guard column	Replace frit or guard column
	Plugged inlet frit	Replace endfitting or frit assembly
	Polymetric columns - solvent change causes swelling of packing	Use correct solvent with column; change to proper solvent compositionl consult manufacturer's solvent-compatibility chartl use a column with a higher percentage of cross-linking
	Salt precipitation (especially in reversed-phase chromatography with high concentration of organic solvent in mobile phase) concentration of organic solvent in mobile phase)	Ensure mobile phase compatibility with buffer concentration; decrease ionic strength and water-organic solvent ratio; premix mobile phase
	When injector disconnected from column - blockage in injector	Clean injector or replace rotor
Increasing Pressure	Blocked flow lines	Systematically disconnect components from detector end to column end to find blockage; replace or clean blocked component
	Particulate buildup at head of column	Filter sample; use .5 micrometer in-line filter; disconnect and backflush column; replace inlet frit
	Water-organic solvent systems - buffer precipitation	Ensure mobile phase compatibility with buffer concentration; decrease ionic strength or water organic solvent ratio
Broad peaks	Analytes eluted early due to sample overload	Dilute sample 1:10 and reinject
	Detector-cell volume too large	Use smallest possible cell volume consistent with sensitivity needs; use detector with no heat exchanger in system
	Injection volume too large	Decrease solvent strength of injection solvent to focus solute; inject smaller volume
	Large extra column volume	Use low- or zero-dead-volume endfittings and connectors; use smallest possible diameter of connecting tubing (<0.10 in. i.d.); connect tubing with matched fittings
	Mobile-phase solvent viscosity too high	Increase column temperature; change to lower viscosity solvent
	Peak dispersion in injector valve	Decrease injector sample loop size; introduce air bubble in front and back of sample in loop
	Poor column efficiency	Use smaller-particle-diameter packing, lower-viscosity mobile phase, higher column temperature, or lower flow rate
	Retention time too long	Use gradient elution or stronger isocratic mobile phase
	Sampling rate of data system too low	Increase sampling frequency.
	Slow detector time constant	Adjust time constant to match peak width
	Some peaks broad - late elution of analytes retained from previous injection	Flush column with strong solvent at end of run; end gradient at higher solvent concentration
Ghost peaks	Contamination	Flush column to remove contaminatint; use HPLC-grade solven
	Elution of analytes retained from previous injection	Flush column with strong solvent at end of run; end gradient at higher solvent concentration
	Ion-pair chromatography - upset equilibrium	Prepare sample in mobile phase; reduce injection volume
	Oxidation of trifluoroacetic acid in peptide mapping	Prepare trifluoroacetic acid solutions fresh daily; use antioxidant
	Reversed-phase chromatography - contaminated water	Check suitability of water by running different amounts through column and measure peak height of interferences as function of enrichment time; clean water by running it through old reversed-phase column; use HPLC-grade water.
	Unknown interferences in sample	Use sample cleanup or prefractionation before injection.
Negative peaks	Refractive index detection - refractive index of solute less than that of mobile phase	Reverse polarity to make peak positive
	UV-absorbance detection - absorbance of solute less than that of mobile phase	Use mobile phase with lower UV absorbance; if recycling solvent, stop recycling when recycled solvent affects detection

Problem	Possible cause	Solution
Peak Doubling	Blocked Frit	Replace or clean frit; install 0.5-um porosity in-line filter between pump and injector to eliminate mobile-phase contaminants or between injector and column to eliminate sample contaminants
	Coelution of interfering compound	Use sample cleanup or prefractionation; adjust selectivity by changing mobile or stationary phase
	Coelution of interfering compound from previous injection	Flush column with strong solvent at end of ran; end gradient at higher solvent concentration
	Column overloaded	Use higher-capacity stationary phase; increase column diameter; decrease sample amount
	Column void or channeling	Replace column, or, if possible, open top endfitting and clean and fill void with glass beads or same column packing; repack column
	Injection solvent too strong	Use weaker injection solvent or stronger mobile phase
	Sample volume too large	Use injection volume equal to one-sixth of column volume when sample prepared in mobile phase for injection
	Unswept injector flow path	Replace injector rotor
Peak Fronting	Channeling in column	Replace or repack column
	Column overloaded	Use higher-capacity stationary phase; increase column diameter; decrease sample amount
Tailing Peaks	Basic solutes - silanol interactions	Use competing base such as triethylamine; use a stronger mobile phase; use base-deactivated silica-based reversed-phase column; use polymeric column
	Beginning of peak doubling	See peak doubling
	Chelating solutes - trace metals in base silica	Use high purity silica-based column with low trace-metal content; add EDTA or chelating compound to mobile phase; use polymeric column
	Silica-based column - degradation at high pH	Use polymeric, sterically protected, or high-coverage reversed-phase column; install silica gel saturator column between pump and injector
	Silica-based column - degradation at high temperature	Reduce temperature to less than 50 ℃
	Silica-based column - silanol interactions	Decrease mobile-phase pH to suppress silanol ionization; increase buffer concentration; derivatize solute to change polar interactions
	Unswept dead volume	Minimize number of connections; ensure injector rotor seal is tight; ensure all compression fittings are correctly seated
	Void formation at head of column	Replace column, or, if possible, open top end fitting and clean and fill in void with glass beads or same column packing; rotate injection valve quickly; use injection valve with pressure bypass; avoid pressure shock
Spikes	Bubbles in mobile phase	Degas mobile phase; use back-pressure restrictor at detector outlet; ensure that all fittings are tight
	Column stored without caps	Store column tightly capped; flush reversed-phase columns with degassed methanol

Correspond of CNW with other brand columns

CNW	Supelco	Kromasil	Agilent	GL
Athena C18-WP	Discovery RP-Amide C16		ZORBAX Rx C18	Inertsil ODS-EP
Athena C18	SUPELCOSIL LC-18 Discovery C18	Kromasil C-18	ZORBAX Eclipse XDB-C18	Inertsil ODS-2
Athena C18-BIO	Discovery BIO Wide Pore C18	Kromasil 300A C-18	ZORBAX 300SB-C18	Inertsil WP300 c18
Athena C8	DISCOVERY C8	Kromasil C-8	ZORBAX Eclipse XDB-C8	Inertsil C8
Athena C4		Kromasil C4		Inertsil C4
Athena Phenyl	SUPELCOSIL LC-DP	Kromasil Phenyl	ZORBAX Eclipse XDBPhenyl	
Athena Silica	SUPELCOSIL LC-Si	Kromasil SIL	ZORBAX Silica	Inertsil Sil
Athena NH2	SUPELCOSIL LC-NH2	Kromasil NH2	ZORBAX NH2	Inertsil NH2
Athena CN	SUPELCOSIL LC-CN	Kromasil CN	ZORBAX Eclipse XDB-CN	Inertsil CN-3

CNW	Merck	Waters	Thermo
Athena C18-WP		SymmetryShield C18	
Athena C18	Puropsher STAR RP-18 endcapped	Symmetry C18	Hypersil ODS C18
Athena C18-BIO	Lichrospher wp 300 RP-18e	Symmetry 300	Hypersil 300A C18
Athena C8	Purospher STAR RP-8 endcapped	Symmetry C8	Hypersil C8
Athena C4		Spherisorb® C4	Hypersil GOLD C4
Athena Phenyl		Spherisorb® Phenyl	Hypersil Phenyl-2
Athena Silica	Lichrospher si 100	Spherisorb® W(Silica)	Hypersil Silica
Athena NH2	Purospher STAR NH2	Spherisorb® NH2	Hypersil NH2
Athena CN	Lichrospher CN	Spherisorb® CN	Hypersil CN (CPS-2)

The USP liquid phase column summary

USP is United States Pharmacopoeia, provides a number of indicators for HPLC column packing:

USP	Packing Description	Recommence HPLC columns
L1	Octadecyl silane chemically bonded to porous silica or ceramic μparticles, 1.5 to 10μm in diameter, or a monolithic rod	CNW Athena C18，C18-WP. C18-BIO
L2	Octadecyl silane chemically bonded to silica gel of a controlled surface porosity that has been bonded to a solid spherical core, 30 to 50μ in diameter	C18 Packing
L3	Porous silica microparticles, 5 to 10μ in diameter	CNW Athena Silica
L4	Silica gel of controlled surface porosity bonded to a solid spherical core, 30 to 50μ in diameter	Silicycle packing
L7	Octyl silane chemically bonded to totally porous microsilica particles, 3 to 10μ in diameter	CNW Athena C8
L8	An essentially monomolecular layer of aminopropyl-silane chemically bonded to totally porous silica gel support, 10μ in diameter	CNW Athena NH2
L9	Irregular or spherical, totally porous silica gel having a chemically bonded, strongly acidic ation-exchange coating, 3 to 10 μm in diameter	CNW Athena SCX
L10	Nitrile groups chemically bonded to porous silica microparticles, 3 to 10μ in diameter	CNW Athena CN，Shodex Silica 5CN
L11	Phenyl groups chemically bonded to porous silica microparticles, 3 to 10μ in diameter	CNW Athena Phenyl，Shodex Silica 5NPE
L12	Strong anion-exchange packing made by chemically bonding a quaternary amine to a solid silica spherical core, 30 to 50 μm in diameter	
L13	Trimethylsilane chemically bonded to porous silica microparticles, 3 to 10μ in diameter	Shodex Silica 5TMS
L14	Silica gel having a chemically bonded, strongly basic quaternary ammonium anion-exchange coating, 5 to 10 μm in diameter.	CNW Athena SAX
L15	Hexyl silane chemically bonded to totally porous silica particles, 3 to 10μ in diameter	Spherisorb S5 C6
L16	Dimethyl silane chemically bonded to totally porous silica particles, 5 to 10 μm in diameter	
L17	Strong cation-exchange resin consisting of sulfonated cross-linked styrene-divinylbenzene copolymer in the hydrogen form, 7 to 11μ in diameter	CNWSep H-L、H-M、H-H
L18	Dimethyl silane chemically bonded to totally porous silica particles, 5 to 10 μm in diameter	
L19	Strong cation-exchange resin consisting of sulfonated cross-linked styrene-divinylbenzene copolymer in the calcium form, 9μ in diameter.	CNWSep Ca-L、Ca-M、Ca-H
L20	Dihydroxypropane groups chemically bonded to porous silica particles, 3 to 10μ in diameter.	Shodex PROTEIN KW-800
L21	A rigid, spherical styrene-divinylbenzene copolymer, 5 to 10μ in diameter.	Transgenomic PRX-1，Shodex GPC KF-800,K-800, KD-800
L22	A cation exchange resin made of porous polystyrene gel with sulfonic acid groups, about 10μ in size	Shodex ICY-521, SUGAR KS-800 series
L23	An ion exchange resin made of porous polymethacrylate or polyacrylate gel with quaternary ammonium groups, about 10μ in size	Shodex IEC QA-825
L24	A semi-rigid hydrophilic gel consisting of vinyl polymers with numerous hydroxyl groups on the matrix surface, 32 to 63 μm in diameter	
L25	Packing having the capacity to separate compounds with a MW range from 100 to 5000 daltons (as determined by polyethylene oxide), applied to neutral, anionic, and cationic water-soluble polymers. A polymethacrylate resin base,crosslinked with poly-hydroxylated ether (surface contained some residual carboxyl functional groups) was found suitable.	Shodex OHpak SB-802 HQ Shodex OHpak SB-802.5 HQ、SB402.5
L26	Butyl silane chemically bonded to totally porous silica particles, 5 to 10μ in diameter	CNW Athena C4
L27	Porous silica particles, 30 to 50μ in diameter	Silicycle packing
L28	A multifunctional support, which consists of a high purity, 100 , spherical silica substrate that has been bonded with anionic (amine) functionality in addition to a conventional reversed phase C8 functionality	
L29	Gamma alumina, reversed phase, low carbon percentage by weight, alumina-based polybutadiene spherical particles, 5 μm diameter with a pore diameter of 80	
L30	Ethyl silane chemically bonded to a totally porous silica particle, 3 to 10 μm in diameter	
L31	A strong anion-exchange resin-quaternary amine bonded on latex particles attached to a core of 8.5 μm macroporous particles having a pore size of 2000 Å and consisting of ethylvinylbenzene cross-linked with 55 % divinyl benzene	
L32	A chiral ligand-exchange packing- L-proline copper complex covalently bonded to irregularly shaped silica particles, 5 to 10 μm in diameter	
L33	Packing having the capacity to separate proteins of 4,000 to 400,000 daltons. It is spherical, silica-based and processed to provide pH stability	Shodex PROTEIN KW-800 series，Shodex KW400 series
L34	Strong cation-exchange resin consisting of sulfonated cross-linked styrene-divinylbenzene copolymer in the lead form, about 9μ in diameter	CNWSep Pb-L、Pb-M、Pb-H
L35	A zirconium-stabilized spherical silica packing with a hydrophilic (diol-type) molecular monolayer bonded phase having a pore size of 150Å.	Agilent Zorbax GF-250
L36	3,5-dinitrobenzoyl derivative of L-phenylglycine covalently bonded to 5 μm aminopropyl silica	
L37	Packing having the capacity to separate proteins by molecular size over a range of 2,000 to 40,000 Da. It is a polymethacrylate gel	Shodex OHpak SB-803 HQ、SB403
L38	Methacrylate-based size-exclusion packing for water-soluble samples	Shodex OHpak SB-802HQ
L39	Hydrophilic polyhydroxymethacrylate gel of totally porous spherical resin	Shodex Ohpak SB-800HQ，Shodex Rspak DM-614
L40	Cellulose tri-3,5-dimethylphenylcarbamate coated porous silica particles, 5μ to 20μ in diameter	Regis Cell ®
L41	Immobilized α1-acid glycoprotein on spherical silica particles	
L42	Octylsilane and octadecylsilane groups chemically bonded to porous silica particles,5 μm in diameter	
L43	Pentafluorophenyl groups chemically bonded to silica particles, 5 to 10 μm in diameter（5-10μm）	Supelco Discovery HSF5
L44	A multifunctional support, which consists of a high purity, 60 , spherical silica substrate that has been bonded with a cationic exchanger, sulfonic acid functionality in addition to a conventional reversed phase C8 functionality.	
L45	Beta cyclodextrin bonded to porous silica particles, 5 to 10 μm in diameter	Shodex ORpak CDBS-453

USP	Packing Description	Recommence HPLC columns
L46	Polystyrene/divinylbenzene substrate agglomerated with quaternary amine functionalized latex beads, 10 µm in diameter.	
L47	High capacity anion-exchange microporous substrate, fully functionalized with a trimethylamine group, 8 µm in diameter.	
L48	Sulfonated, cross-linked polystyrene with an outer layer of submicron, porous,anion-exchange microbeads, 15 µm in diameter.	
L49	A reversed-phase packing made by coating a thin layer of polybutadiene on to spherical porous zirconia particles, 3 to 10 µm in diameter.	Discovery Zr-PBD
L50	Multifunction resin with reversed-phase retention and strong anion-exchange functionalities. The resin consists of ethylvinylbenzene, 55 % cross-linked with divinylbenzene copolymer, 3 to 15 µm in diameter, and a surface area of not less than 350 m^2/g, substrate is coated with quaternary ammonium functionalized latex particles consisting of styrene cross-linked with divinylbenzene.	
L51	Amylose tris-3,5-dimethylphenylcarbamate-coated, porous, spherical, silica particles,5 to 10 µm in diameter.	®
L52	A strong cation exchange resin made of porous silica with sulfopropyl groups, 5 to 10 µm in diameter.	CNW Athena SCX
L53	Weak cation-exchange resin consisting of ethylvinylbenzene, 55 % cross-linked with divinylbenzene copolymer, 3 to 15 µm diameter. Substrate is surface grafted with carboxylic acid and/or phosphoric acid functionalized monomers. Capacity not less than 500 µm in diameter.	
L54	A size exclusion medium made of covalent bonding of dextran to highly cross-linked porous agarose beads, about 13 µm in diameter.	
L55	A strong cation exchange resin made of porous silica coated with polybutadiene-maleic acid copolymer, about 5 µm in diameter.	
L56	Isopropyl silane chemically bonded to totally porous silica particles, 3 to 10 µm in diameter	
L57	A chiral-recognition protein, ovomucoid, chemically bonded to silica particles, about 5 µm in diameter, with a pore size of 120 angstroms.	
L58	Strong cation-exchange resin consisting of sulphonated cross-linked styrene-divinylbenzene copolymer in the sodium form, about 7 to 11µm diameter	CNWSep Na-L、Na-M、Na-H，Transgenomic Coregel 87N
L59	Packing having the capacity to separate proteins by molecular weight over the range of 10 to 500kDa. It is spherical(10µm), silica-based,and processed to provide hydrophilic characteristics and pH stability	Shodex PROTEIN KW-800 series，Shodex KW400 series
L60	Spherical, porous silica gel, 3 to 10 µm in diameter, surface has been covalently modified with palmitamidopropyl groups and endcapped.	CNW Athena C18-WP
L61	Hydroxide-selective, strong anion-exchange resin consisting of a highly cross-linked core of 13 µm microporous particles, pore size less than 10 , and consisting of ethylvinylbenzene cross-linked with 55 % divinylbenzene with a latex coating composed of 85 nm diameter microbeads bonded with alkanol quarternary ammonium ions (6 %).	
L62	C30 silane bonded phase on a fully porous spherical silica, 3 to 15 µm in diameter.	CNW Athena C30
L63	Glycopeptide teicoplanin linked through multiple covalent bonds to a 100 A units spherical silica	
L64	Strongly basic anion exchange resin consisting of 8% crosslinked styrene divinylbenzene copolymer with a quartenary ammonium group in the chloride form, 45 to 180 µm in diameter	
L65	Strongly acidic cation exchange resin consisting of 8% sulfonated crosslinked styrene divinylbenzene copolymer with a sulfonic acid group in the hydrogen form,63 to 250 µm in diameter	
L66	A crown ether coated on a 5 µm particle size silica gel substrate.The active site is (S)-18-crown-6ether	
L67	Porous vinyl alcohol copolymer with a C18 alkyl group attached to the hydroxyl group of the polymer, 2 to 10 µm in diameter	Shodex Asahipak ODP-40 Shodex ET-RP1
L68	Spherical,porous silica,10µm or less in diameter, the surface of which has been covalently modified with alkyl amide groups and not endcapped	
L69	Ethylvinylbenzene/divinylbenzene substrate agglomerated with quaternary amine functionalized 130nm latex beads,about 6.5µm in diameter	
L70	Cellulose tris(phenyl carbamate)coated on 5µm silica	
L71	Arigid, spherical polymetacrylate, 4 to 6 µm in diameter	Shodex RSpak DE-613
L72	(S)-phenylglycine and 3,5-dinitroanaline urea linkage covalently bonded to silica	
L73	A rigid,spherical polydivinylbenzene particle,5 to 10 µm in diameter	
L74	A strong anion-exchange resin consisting of a highly cross-linked core of 7-µm macroporous particles having a 100 Angstroms average pore size and consisting of ethylvinylbenzene cross-linked with 55% divinylbenzene and an anion-exchange layer grafted to the surface,which is functionalized with alkyl quartenary ammonium ions.	
L75	A chiral-recognition protein,bovine serum albumin(BSA),chemically bonded to silica particles,about 7 µm in diameter,with a pore size of 300 Angstroms.	

Pressure unit conversion table

1atm = 1.01325bar

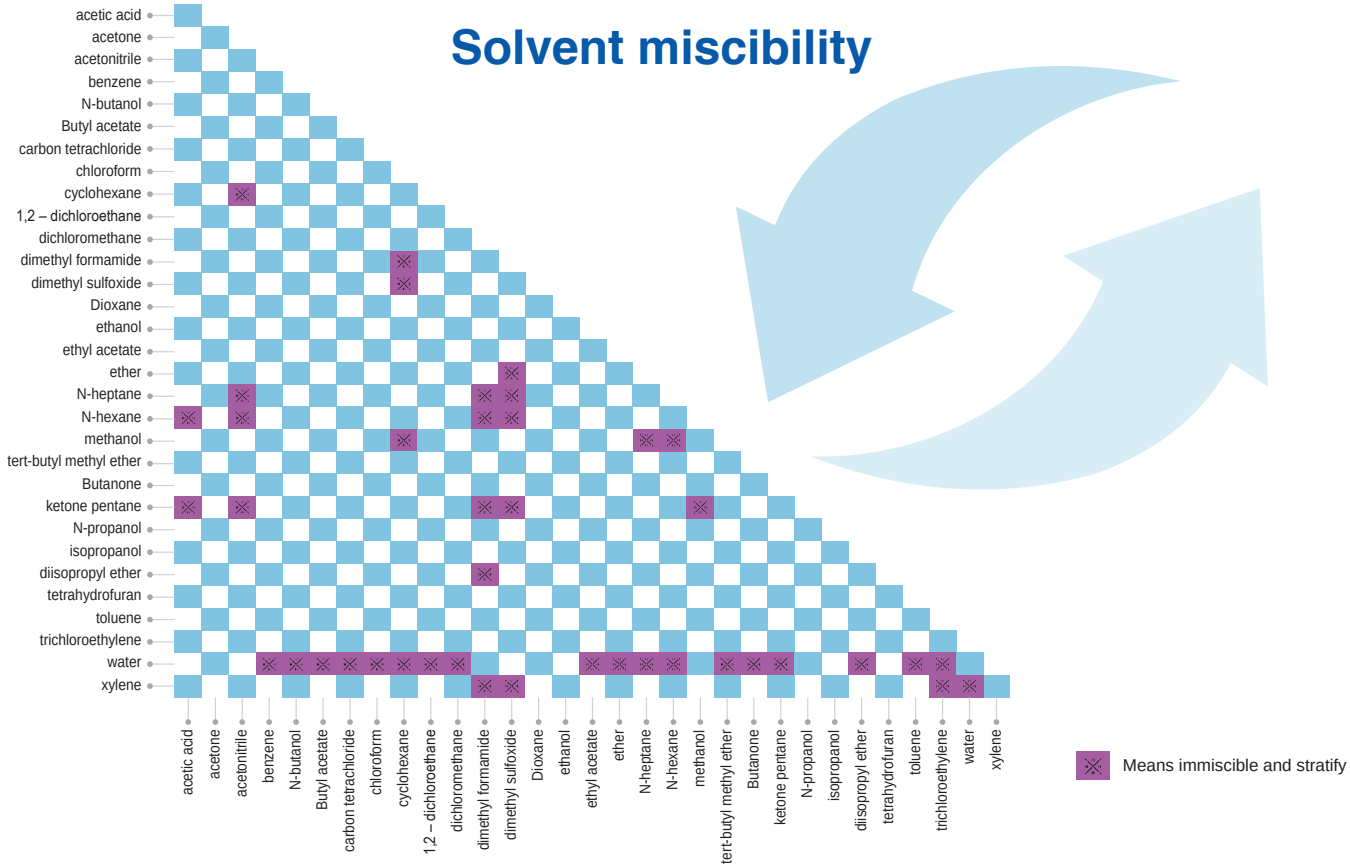
UNIT	Pa	KPa	MPa	bar	kgf/cm^2	mmH_2O	mmHg	p.s.i
Pa	1	10^{-3}	10^{-6}	10^{-5}	10.2×10^{-6}	101.97×10^{-3}	7.5×10^{-3}	0.15×10^{-3}
KPa	10^{3}	1	10^{-3}	10^{-2}	10.2×10^{-3}	101.97	7.5	0.15
MPa	10^{6}	10^{3}	1	10	10.2	101.97×10^{3}	7.5×10^{3}	0.15×10^{3}
bar	10^{5}	10^{2}	10^{-1}	1	1.02	10.2×10^{3}	750.06	14.5
kgf/cm^2	98066.5	98.07	98.07×10^{-3}	0.98	1	10.000	735.56	14.22
mmH_2O	9.806	9.807×10^{-3}	9.807×10^{-6}	98.07×10^{-6}	10^{-4}	1	73.56×10^{-3}	1.42×10^{-3}
mmHg	133.32	133.32×10^{-3}	133.32×10^{-6}	1.33×10^{-3}	1.36×10^{-3}	13.6	1	19.34×10^{-3}
p.s.i	6894.76	6.89	6.89×10^{-3}	68.95×10^{-3}	70.31×10^{-3}	703.07	51.71	1

The nature table of solvents

Solvent ①②	UV wavelength nm ③	Refractive index ④	Boiling point ℃	Viscosity (cp 25 ℃)	Polarity	Solubility ⑤	Dielectric constant 20 ℃
Isooctane (*)	210	1.389	99	0.47	0.1	0.01	1.94
N-heptane (*)	200	1.385	98	0.4	0.2	0.01	1.92
N-hexane (*)	190	1.372	69	0.3	0.1	0.01	1.88
N-pentane (**)	210	1.355	36	0.22	0	0.01	1.84
Cyclohexane	210	1.423	81	0.9	0.1	0.012	2.02
Cyclopentane (*)	210	1.404	49	0.42	0.2	0.004	1.97
Carbon tetrachloride	265	1.457	77	0.9	1.6	0.008	2.24
Toluene	285	1.494	110	0.55	2.4	0.046	2.4
Xylene	290	1.493	138	0.6	2.5	unknown	2.3
Chlorobenzene	unknown	1.521	132	0.75	2.7	unknown	5.6
Benzene	280	1.498	80	0.6	2.7	0.07	2.3
Dichloromethane (**)	245	1.421	40	0.41	3.1	1.6	8.9
N-butanol	210	1.397	118	2.98	3.9	7.81	17.5
N-propanol	210	1.385	97	2.27	4	Miscible	20.3
Tetrahydrofuran(*)	220	1.405	66	0.55	4	Miscible	7.4
Ethyl acetate (*)	256	1.37	77	0.43	4.4	8.7	6.4
Isopropanol	210	1.384	82	2.3	4.3	Miscible	18.3
Chloroform (*)	245	1.443	61	0.53	4.1	0.815	4.8
Acetone (*)	330	1.356	56	0.3	5.4	Miscible	21.4
Ethanol	210	1.359	78	1.08	4.3	Miscible	24.6
Acetic acid	230	1.37	118	1.26	6	Miscible	6.2
Acetonitrile	210	1.341	82	0.34	6.2	Miscible	37.5
Methanol (*)	210	1.326	65	0.54	6.6	Miscible	32.7
Glycol	unknown	1.431	197	19.9	6.9	Miscible	37.7
Water	268	1.338	100	1	10.2	Miscible	80

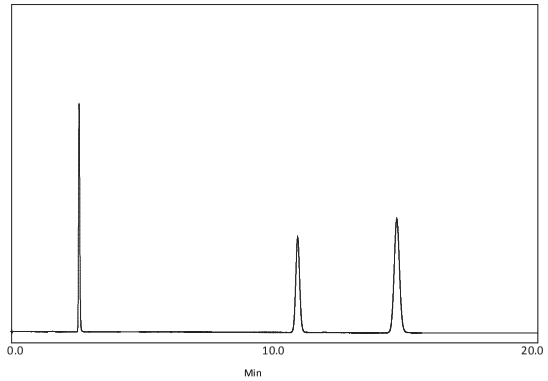
① (*) means a low viscosity (<0.5cp), boiling point appropriate in (> 45 ℃)
② (**) means small viscosity, low boiling point solvent.
③ Means approximate cutoff wavelength,when lower than this value, solvent is opaque.
④ Refractive index when 25 ℃.
⑤ Percentage by weight of water at 20 ℃ when dissolved in a solvent, this value is useful in the liquid - solid chromatography.

Solvent miscibility



Performance Report

Art No:	8.462572.0001	Serial No:	TG220001
Description:	Athena C18-WP, 5μm, 100Å	Batch No:	72L2301
Size:	4.6 x 250mm	Storage:	Acetonitrile



Test Results

Peak	Analyte	Time	Tailing	Efficiency
1	Uracil	2.757	1.127	16302
2	Toluene	11.333	1.039	25108
3	Naphthalene	15.220	1.041	24085

Chromatographic Conditions:

Mobile Phase:	70/30 MeOH/H₂O	Flow Rate:	1.0 mL/min
Injection Volume:	10 μL	Detection:	254 nm
Temperature:	40 °C		

QC Passed: L. Shaw

ANPEL Laboratory Technologies (Shanghai) Inc
Tel:+86(0)21 5489 0099 Fax:+86(0)21 5424 8311 www.anpel.com.cn/cnw

Care and Use of CNW Columns

Please read the following instructions before using this column. The correct use of an HPLC column is extremely important for the life time of a column and therefore for the benefit of your HPLC analysis.

Column Installation

Remove the end plugs of the column and connect the column with the fittings, check direction of the arrow on the column label is the same as the mobile phase flow direction. Please make sure there is no leak under normal operating condition.

Operational Guidelines

Pressure

The maximum operating pressure is 400 bar (6000 psi) for most CNW columns.

Solvents

All common used HPLC solvent can be used. Please use only HPLC grade solvents. Aqueous buffer solutions should be prepared freshly to minimize the bacterial growth and filtered through a 0.45 μm filter before using.

pH stability

The recommended mobile phase pH for common use of Silica-based columns is between 2 and 8. It will ensure maximum column life. The columns packed with Athena C18-WP can be used in pH 1.5-10, Athena C18-BIO in pH 1.5-11, Athena CN and Diol in pH 2.5-8.The recommended pH range for other columns can be found on the catalog.

Temperature

The maximum operating temperature is 60 °C for most silica columns.

Storage

Make sure that all buffers are washed out of the column before flushing with organic solvent like acetonitrile. Buffer salts are mainly insoluble in acetonitrile and can block the column. For short term storage, columns can be stored in the eluent used in last analysis without buffer.

For long term storage, silica based columns should be stored in organic solvent. Unbonded silica columns may be stored in hexane or similar organic solvent. Keep in a cool area and sealed with the end plugs provided.

Column Life

Column life is highly dependent on the sample and conditions, and cannot be generalized. To maximize column life, make sure samples and mobile phases are clean and particle-free.

Warranty

All columns should be tested upon receipt and all deficiencies must be reported to supplier within 14 days from the date of receipt of the column. Column performance warranty is limited to the conditions of the original QC test chromatogram.

Physical and/or chemical damage to the column caused by incorrect use of mobile phase, temperature or pressure voids column warrant.

Application Index

Brief introduction

Currently, HPLC is widely used in the chemical, biological and pharmaceutical field. CNW has launched Cnwsil, Athena and CNWSep series of liquid chromatographic columns in succession. These three series include silica and polymer matrix columns, both analysis and preparative columns, to meet needs of customers in various fields.

Silica-based analytical column

Athena HPLC columns

[Perfect peak shape, strict quality control, long lifetime]

CNW Athena columns base on high-purity silica gel, using unique bonding technique, with excellent peak shape, better selectivity, sensitivity and reproducibility. With low content of matrix metal, the columns show perfect peak shape for all types of analytes. Different types of bonded phases provide more flexibilityfor method development. To ensure excellent column performance and long column life, we comply with strict production process in manufacturing and have a strict quality control for CNW HPLC columns.

- Suitable for all types of samples
- excellent column reproducibility
- A variety of bonded phases

The packingsinformation:

Packings	Athena C18-WP	Athena C18	Athena C18-BIO	Athena C8	Athena C4	Athena Phenyl	Athena CN	Athena Diol
Particle diameter (μm)	3 and 5	5 and 10	5	3 and 5	5	5	3 and 5	3 and 5
Pore size(Å)	100	120	300	120	300	120	120	120
Pore volume (mL/g)	1.1	1.0	0.9	1.0	0.9	1.0	1.0	1.0
Endcapped	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Specific surface area(m^2/g)	450	300	100	300	100	300	300	300
Metallic impurities (ppm)	<10	<10	<10	<10	<10	<10	<10	<10
Carbon content	17%	17%	8%	10%	3%	11%	7.5%	8.8%
pH range	1.5 - 10	2 - 8	1.5 - 11	2 - 8	2 - 8	2 - 8	2.5 - 8	2.5 - 8
Temperature range (˚C)	20 - 60	20 - 60	20 - 60	20 - 60	20 - 60	20 - 60	20 - 60	20 - 60

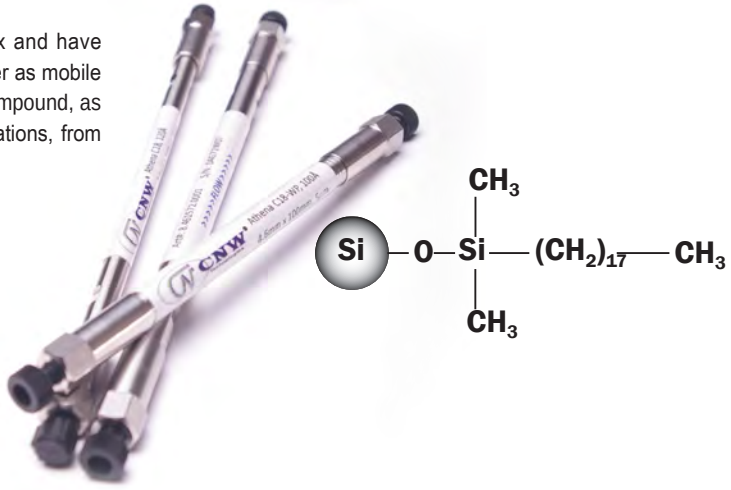
Packings	Athena NH_2	Athena Silica	Athena SAX	Athena SCX	Athena HILIC	Athena HILIC(2)	Athena HILIC(3)	Athena 30
Particle diameter (μm)	3 and 5	3 and 5	3 and 5	3 and 5	3 and 5	3 and 5	5	3 and 5
Pore size(Å)	120	120	120	120	120	120	120	120
Pore volume (mL/g)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Specific surface area(m^2/g)	300	300	300	300	300	300	300	450
Metallic impurities (ppm)	<10	<10	<10	<10	<10	<10	<10	<10
Carbon content	4%	0%	16%	11%	8.6%	8%	16%	20%
pH range	2 - 8	2 - 8	2 - 8	2 - 8	1.5 - 8	1.5 - 8	1.5 - 8	2 - 8
Temperature range (˚C)	20 - 60	20 - 60	20 - 60	20 - 60	20 - 60	20 - 60	20 - 60	20 - 60

Athena C18-WP

[Recommended for Method Development, fit for a variety of mobile phase conditions]

Athena C18-WP use high purity of spherical silica matrix and have excellent stability. Athena C18-WP can use 100% pure water as mobile phase for separation of acidic, neutral and basic organic compound, as well as many drugs and peptides etc. A variety of specifications, from analytical to preparative scale can be provided.

- bonded C18 groups
- pH stability range: 1.5-10
- Suitable for 100% water mobile phase
- Strong retain for polar substances
- Symmetrical peak shape for Alkaline substances
- High specific surface area, suitable for high load



PH stability

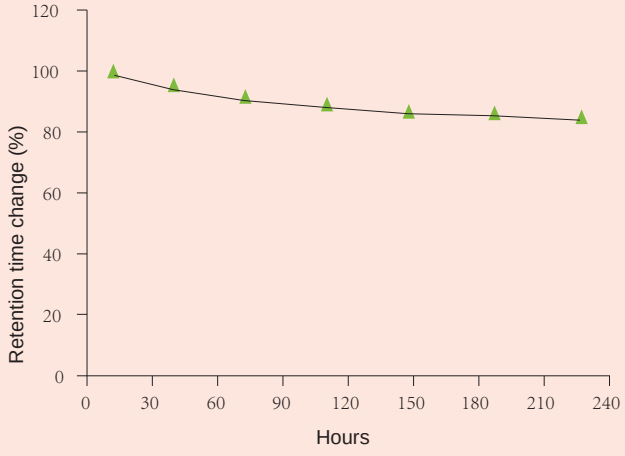
Stability of low pH

In the low pH mobile phase, the main reason for short column life is drop of chemical bonded groupfrom silica gel by hydrolysis. Hydrolysis leads to changing retention timeof the analyte, short lifetime and poor reproducibility.

The following figure shows Athena C18-WP stability under the conditions of pH 1.5 mobile phase.

Low pH tolerance (pH 1.5)

Column	Athena C18-WP, 4.6 x 150 mm, 5μm
Mobile phase	Acetonitrile: 0.1% trifluoroacetic acid (pH 1.5) (50/50)
Flow rate	1.0 mL / min
Detection	UV 254 nm
Column temperature	30 ˚ C
Sample	toluene



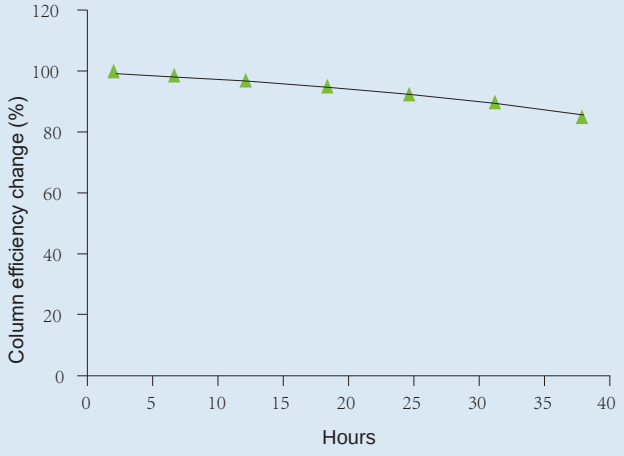
Low pH tolerance (pH 1.5)

Stability of high pH

In the high pH mobile phase, silica matrix is gradually dissolved. Ordinary pH range of silica-based columns is 2-8. When the pH of mobile phase is more than 8,silica gel is dissolved speedily, and column life is very short. Athena C18-WP columns can protect silica matrix to have a longer life in high pH conditions, due to unique bonding and endcapped technology.

High pH tolerance (pH 11.0)

Column	Athena C18-WP, 4.6 x 150 mm, 5μm
Mobile phase	Methanol: 0.5% aqueous ammonia (pH 11.0) (20/80)
Flow rate	1.0 mL / min
Detection	UV 254 nm
Column temperature	30 ˚ C
Sample	Phthalatedipropyl



High pH tolerance (pH 11.0)

100% stability of the aqueous phase

Usually silica-based reversed-phase column can not be used in high proportion of water mobile phase conditions, andorganic phase in the mobile phasemust be maintained more than 5%. This may limit some polar compounds' separation in reversed-phase conditions. The reason is hydrophobic collapse.

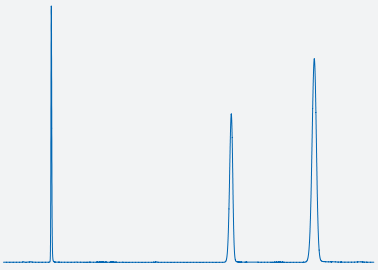
"Hydrophobic collapse" is a phenomenon that reversed-phase column loss the ability of retaining compounds in a mobile phase with a very high water content. Due to the hydrophobic interaction of functional groups, the surface of the stationary phase cannot be wet by the mobile phase and hydrophobic chains fold up.

According to the research, the hydrophobic collapse generally occurs when restarting of the mobile phase after stopping pump. The experiment can verify whether a column is compatible with pure water. Test column efficiency at first, and wash the column with 100% water mobile phaseat 1.0mL/min for 2h. Then slow down the flow rate to zero and stop pump for 1h. Columns are washed with 100% water mobile phase again and tested for column efficiency the second time. Compare the difference of retention before and after stopping pump.

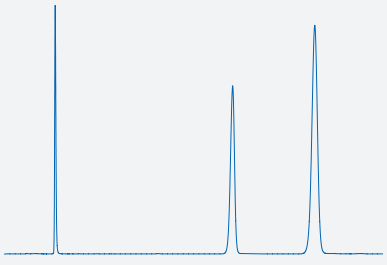
Test condition:

Column	Athena C18-WP, 4.6 x 150 mm, 5μm
Mobile phase	methanol: water (70/30)
Flow rate	1.0 mL / min
Detection	UV 254 nm
Column temperature	30 ° C
Sample	1. Uracil 2. Toluene 3. Naphthalene

(A)



(B)



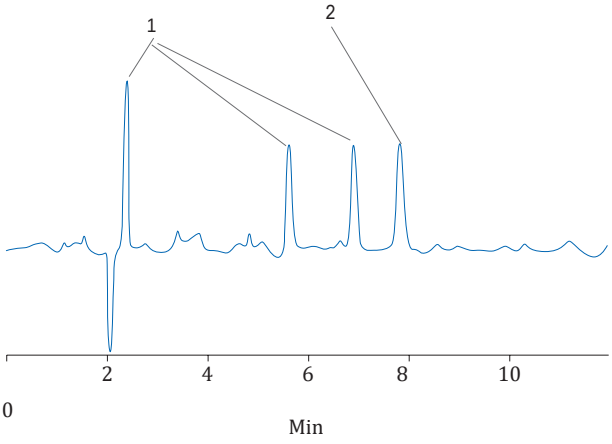
100% water mobile phase compatibility

A before pump stopping

B after pump stopping

Melamine in Milk Powder (according toGB/T22388-2008) No.03215

1. Impurities in Milk
2. Melamine



Column:	Athena C18-WP 4.6 × 150mm, 5μm (LAEQ-461572)
Mobile phase:	10 mM hexane sulfonate +10 mM citric acid buffer solution / acetonitrile (90/10)
Flow rate:	1.0 mL/min
Detection:	240 nm
Column temperature:	40 ˚C

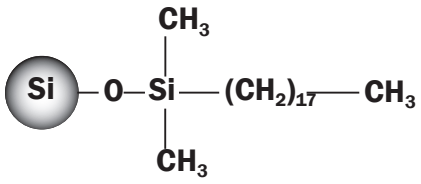
Ordering Information:

Packings	Particle size	diameter × length	Cat. No
Athena C18-WP	3μm	2.1 × 50mm	8.210573.0001
Athena C18-WP	3μm	2.1 × 100mm	8.211073.0001
Athena C18-WP	3μm	2.1 × 150mm	8.211573.0001
Athena C18-WP	3μm	2.1 × 200mm	8.212073.0001
Athena C18-WP	3μm	2.1 × 250mm	8.212573.0001
Athena C18-WP	3μm	4.6 × 50mm	8.460573.0001
Athena C18-WP	3μm	4.6 × 100mm	8.461073.0001
Athena C18-WP	3μm	4.6 × 150mm	8.461573.0001
Athena C18-WP	3μm	4.6 × 200mm	8.462073.0001
Athena C18-WP	3μm	4.6 × 250mm	8.462573.0001
Athena C18-WP	5μm	2.1 × 50mm	8.210572.0001
Athena C18-WP	5μm	2.1 × 100mm	8.211072.0001
Athena C18-WP	5μm	2.1 × 150mm	8.211572.0001
Athena C18-WP	5μm	2.1 × 200mm	8.212072.0001
Athena C18-WP	5μm	2.1 × 250mm	8.212572.0001
Athena C18-WP	5μm	4.6 × 50mm	8.460572.0001
Athena C18-WP	5μm	4.6 × 100mm	8.461072.0001
Athena C18-WP	5μm	4.6 × 150mm	8.461572.0001
Athena C18-WP	5μm	4.6 × 200mm	8.462072.0001
Athena C18-WP	5μm	4.6 × 250mm	8.462572.0001

Athena C18

[Conventional C18 column]

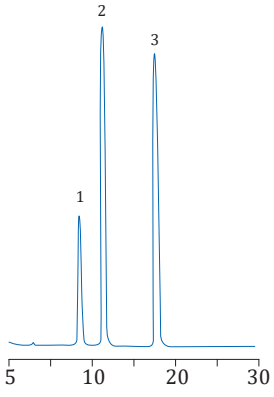
- Bonded C18 groups
- High-purity silica, metal content <10ppm
- Less hydrophobic than C18-WP, with different selectivity
- Economic column



Based on high purity spherical silica, C18 column is good at separating a variety of compounds.It is a typical economic column with high price ratio, as well as long column lifetime. For most analytes, the retention times are shorter than that of C18-WP columns of same specifications.

Tricyclic antidepressants No.03216

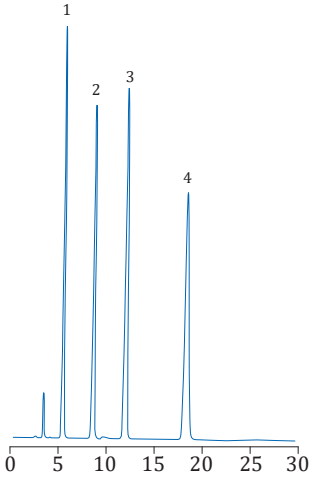
1. Protriptyline
2. Nortriptyline
3. Amitriptyline



Column:	Athena C18 4.6 × 150mm, 5μm (8.461571.0001)
Mobile phase:	methanol / 20 mM K_2HPO_4 buffer (pH 7.0) (80/20)
Flow rate:	1.0 mL/min
Detection:	254 nm
Column temperature:	40 ˚C

Purine alkaloid No.03217

1. Theobromine
2. Theophyline
3. Caffeine
4. Phenol



Column:	Athena C18 4.6 × 150mm, 5μm (LAEQ-461571)
Mobile phase:	methanol / water (25/75)
Flow rate:	1.0 mL/min
Detection:	254 nm
Column temperature:	40 ˚C

Ordering Information:

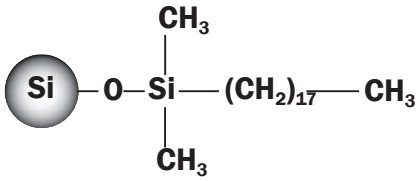
Particle size diameter × length Item No.

Packings	Particle size	diameter × length	Cat. No
Athena C18	5μm	2.1 × 50mm	8.210571.0001
Athena C18	5μm	2.1 × 100mm	8.211071.0001
Athena C18	5μm	2.1 × 150mm	8.211571.0001
Athena C18	5μm	2.1 × 200mm	8.212071.0001
Athena C18	5μm	2.1 × 250mm	8.212571.0001
Athena C18	5μm	4.6 × 50mm	8.460571.0001
Athena C18	5μm	4.6 × 100mm	8.461071.0001
Athena C18	5μm	4.6 × 150mm	8.461571.0001
Athena C18	5μm	4.6 × 200mm	8.462071.0001
Athena C18	5μm	4.6 × 250mm	8.462571.0001
Athena C18	10μm	4.6 × 150mm	8.461574.0001
Athena C18	10μm	4.6 × 250mm	8.462574.0001

Athena C18-BIO

[Applicable to macromolecules]

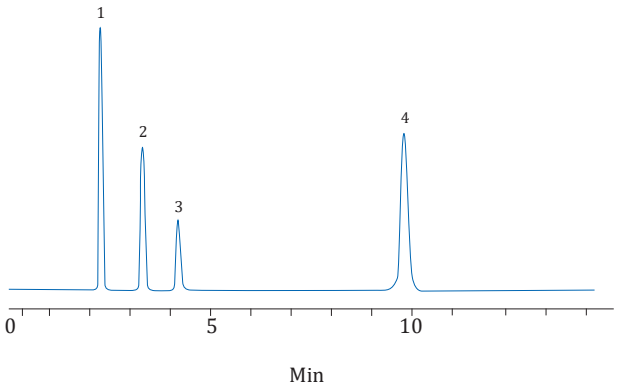
- Bonded C18 groups
- 300Å pore size, fit for macromolecules separation, such as peptides
- High column efficiency and long lifetime
- Stable in the range of pH 1.5-11



300Å pore size, highpurity silica, high density bonding, and completely endcapped, make Athena C18-BIO able to separatelarge moleculars, especially proteins and polypeptides.

Anti-HIV drugs No.03219

1.Thymidine
2.d4T
3.AZT-Glucuronide
4.AZT

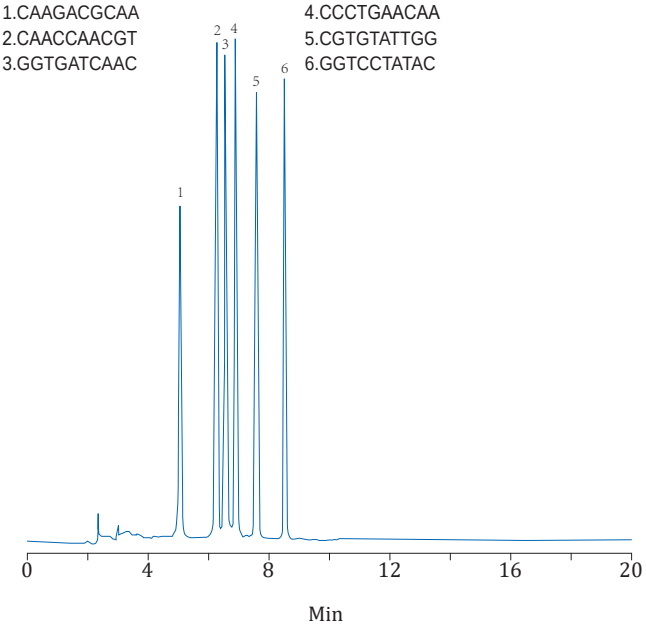


Column:	Athena C18-BIO 4.6 × 150mm, 5μm (8.461578.0001)
Mobile phase:	methanol / 20 mM $NH_4H_2PO_4$ buffer (10/90)
Flow rate:	1.0 mL/min
Detection:	260 nm
Column temperature:	35 ˚C

Applications:

Oligonucleotide No.03218

1.CAAGACGCAA
2.CAACCAACGT
3.GGTGATCAAC
4.CCCTGAACAA
5.CGTGTATTGG
6.GGTCCTATAC



Column:	Athena C18-BIO 4.6 × 150mm, 5μm (LAEQ-461578)
Mobile phase:	A: 50 mM NaH_2PO_4 buffer solution (pH 7.0); B: acetonitrile 0min B: 5%; 20min B: 15%
Flow rate:	1.0 mL/min
Detection:	260 nm
Column temperature:	25 ˚C

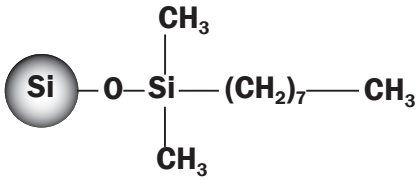
Ordering Information:

Packings	Particle size	diameter × length	Cat. No
Athena C18-BIO	5μm	2.1 × 50mm	8.210578.0001
Athena C18-BIO	5μm	2.1 × 100mm	8.211078.0001
Athena C18-BIO	5μm	2.1 × 150mm	8.211578.0001
Athena C18-BIO	5μm	2.1 × 200mm	8.212078.0001
Athena C18-BIO	5μm	2.1 × 250mm	8.212578.0001
Athena C18-BIO	5μm	4.6 × 50mm	8.460578.0001
Athena C18-BIO	5μm	4.6 × 100mm	8.461078.0001
Athena C18-BIO	5μm	4.6 × 150mm	8.461578.0001
Athena C18-BIO	5μm	4.6 × 200mm	8.462078.0001
Athena C18-BIO	5μm	4.6 × 250mm	8.462578.0001

Athena C8

[High resolution, rapid analysis]

- Bonded C8 group
- Better resolutionthan C18 group for medium polarity subjects, and short retention time for non-polar compunds
- Good peak shapes for acidic, basic, and neutral substances
- Long column life and good repeatability

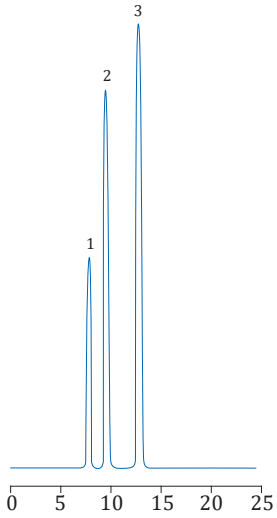


Athena C8 offers less degree of hydrophobic selectivity compared to C18. Athena C8 is a better choice if need to save time and achieve rapid analysis in the same chromatographic condition on octadecyl bonded phase.

Applications:

Tricyclic antidepressants No.03220

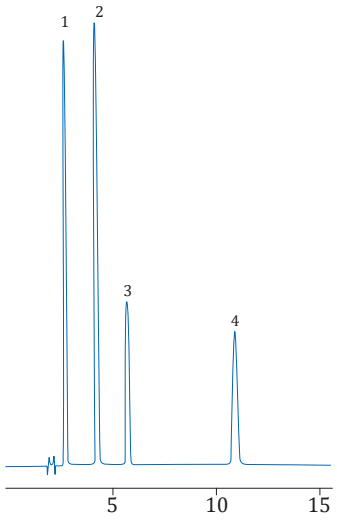
1. Protriptyline
2. Nortriptyline
3. Amitriptyline



Column:	Athena C8 4.6 × 150mm, 5μm (8.461575.0001)
Mobile phase:	methanol /20mM K_2HPO_4 buffer (pH 7.0) （80/20）
Flow rate:	1.0 mL/min
Detection:	254 nm
Column temperature:	40 ˚C

SulfaNo No.03221

1. Sulfonamide
2. Sulfisomidine
3. Sulfadiazine
4. Sulfamethazine



Column:	Athena C8 4.6 x 150mm, 5μm (8.461575.0001)
Mobile phase:	acetonitrile / 0.1% H_3PO_4 buffer (10/90)
Flow rate:	1.0 mL/min
Detection:	254 nm
Column temperature:	40 ˚C

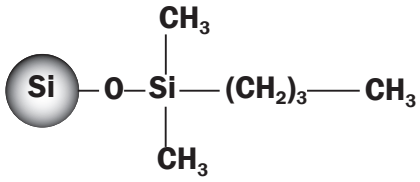
Ordering Information:

Packings	Particle size	diameter × length	Cat. No
Athena C8	3μm	2.1 × 50mm	8.210565.0001
Athena C8	3μm	2.1 × 100mm	8.211065.0001
Athena C8	3μm	2.1 × 150mm	8.211565.0001
Athena C8	3μm	2.1 × 200mm	8.212065.0001
Athena C8	3μm	2.1 × 250mm	8.212565.0001
Athena C8	3μm	4.6 × 50mm	8.460565.0001
Athena C8	3μm	4.6 × 100mm	8.461065.0001
Athena C8	3μm	4.6 × 150mm	8.461565.0001
Athena C8	3μm	4.6 × 200mm	8.462065.0001
Athena C8	3μm	4.6 × 250mm	8.462565.0001
Athena C8	5μm	2.1 × 50mm	8.210575.0001
Athena C8	5μm	2.1 × 100mm	8.211075.0001
Athena C8	5μm	2.1 × 150mm	8.211575.0001
Athena C8	5μm	2.1 × 200mm	8.212075.0001
Athena C8	5μm	2.1 × 250mm	8.212575.0001
Athena C8	5μm	4.6 × 50mm	8.460575.0001
Athena C8	5μm	4.6 × 100mm	8.461075.0001
Athena C8	5μm	4.6 × 150mm	8.461575.0001
Athena C8	5μm	4.6 × 200mm	8.462075.0001
Athena C8	5μm	4.6 × 250mm	8.462575.0001

Athena C4

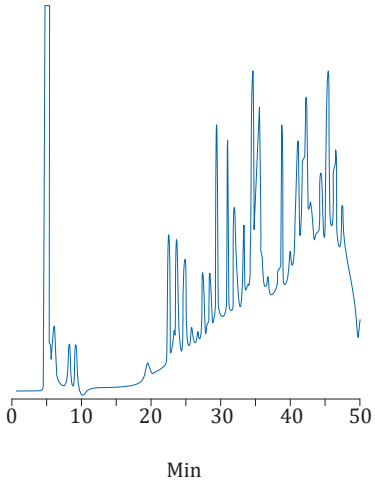
[Low hydrophobic reverse phase, rapid analysis]

- Bonded C4 group
- 300Å pore size, fit for macromolecules separation
- Rapid analysis
- High column efficiency and excellent peak shape



Retention times are shorter than on C8 and C18 phases. 300Å pore size is suitable for analysis of biological samples.

Hydrolysis bovine serum albumin No.03222



Column:	Athena C4 4.6 × 250mm, 5μm (8.462579.0001)
Mobile phase:	A: 0.09% TFA; B: 0.085% TFA + 80% acetonitrile 0min B 5%; 5min B 5%; 35min B 50%; 45min B 100%
Flow rate:	1.0 mL/min
Detection:	214 nm
Column temperature:	25 ˚C

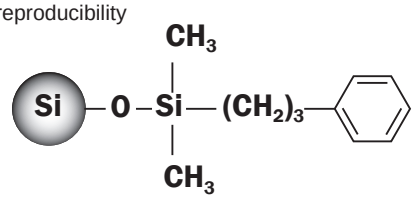
Ordering Information:

Packings	Particle size	diameter × length	Cat. No
Athena C4	5μm	2.1 × 50mm	8.210579.0001
Athena C4	5μm	2.1 × 100mm	8.211079.0001
Athena C4	5μm	2.1 × 150mm	8.211579.0001
Athena C4	5μm	2.1 × 200mm	8.212079.0001
Athena C4	5μm	2.1 × 250mm	8.212579.0001
Athena C4	5μm	4.6 × 50mm	8.460579.0001
Athena C4	5μm	4.6 × 100mm	8.461079.0001
Athena C4	5μm	4.6 × 150mm	8.461579.0001
Athena C4	5μm	4.6 × 200mm	8.462079.0001
Athena C4	5μm	4.6 × 250mm	8.462579.0001

Athena Phenyl

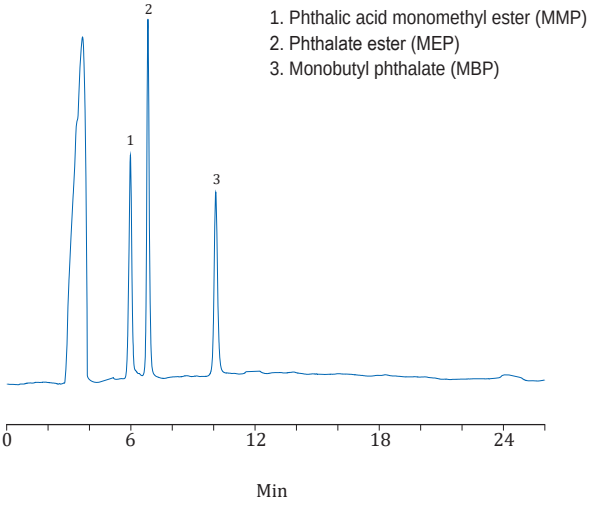
[Analysis for compounds with cyclic structure]

- Bonded phenylpropyl group
- Interactions with π-π of aromatic compound
- Unique selectivity for compounds with cyclic structure
- good reproducibility



Athena Phenyl column bonded phenylpropyl group, with surface coverage is 3.0 μmol/m^2. Athena Phenyl exhibits a unique selectivity for aromatic compounds, due to a possibility for π-π interactions between the phenyl bonded phase and the solute.

O-phthalic monoester acid No.03223



Column:	Athena Phenyl 4.6 × 150mm, 5μm (8.461537.0001)
Mobile phase:	acetonitrile / water / acetic acid(45/55/0.2)
Flow rate:	0.8 mL/min
Detection:	228 nm
Column temperature:	25 ˚C

Ordering Information:

Packings	Particle size	diameter × length	Cat. No
Athena Phenyl	5μm	2.1 × 50mm	8.210537.0001
Athena Phenyl	5μm	2.1 × 100mm	8.211037.0001
Athena Phenyl	5μm	2.1 × 150mm	8.211537.0001
Athena Phenyl	5μm	2.1 × 250mm	8.212537.0001
Athena Phenyl	5μm	4.6 × 50mm	8.460537.0001
Athena Phenyl	5μm	4.6 × 100mm	8.461037.0001
Athena Phenyl	5μm	4.6 × 150mm	8.461537.0001
Athena Phenyl	5μm	4.6 × 250mm	8.462537.0001

Athena Silica

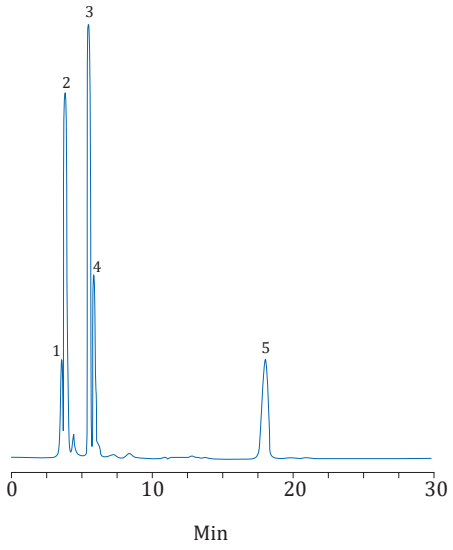
[Non- bonded silica, normal phase]

- Spherical silica, non- bonded
- For non-polar and medium polar organic compounds
- Ultra pure, low metal impurity
- Symmetrical peak shape

None bonded high-purity silica, metal impurity content <10ppm, high mechanical strength. Athena Silica is fit for separation of non-polar and media polar organic compounds to achieve sharp peak shape and high reproducibility for columns.

Fat-soluble vitamins No.03224

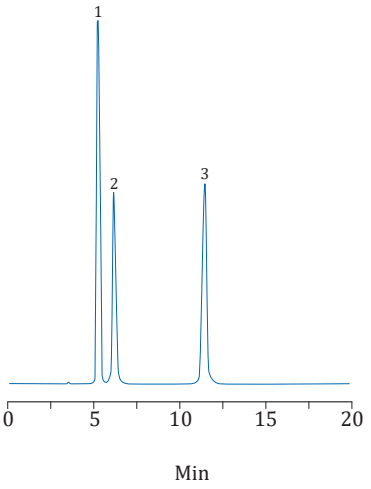
1. Vitamin A palmitate
2. Vitamin K1
3. Vitamin E
4. Vitamin K3
5. Vitamin D



Column:	Athena Silica 4.6 × 150mm, 5μm (8.461576.0001)
Mobile phase:	n-hexane / chloroform (60/40)
Flow rate:	1.0 mL/min
Detection:	254 nm
Column temperature:	25 ˚C

Steroid No.03225

1. Estrone
2. Estradiol
3. Estriol



Column:	Athena Silica 4.6 × 150mm, 5μm (8.461576.0001)
Mobile phase:	n-hexane / ethanol (85/15)
Flow rate:	1.0 mL/min
Detection:	270 nm
Column temperature:	40 ˚C

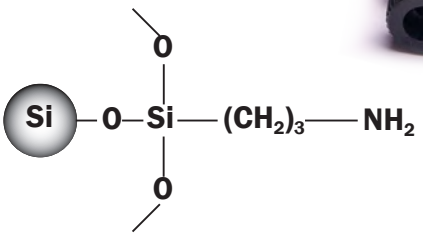
Ordering Information:

Packings	Particle size	diameter × length	Cat. No
Athena Silica	3μm	2.1 × 50mm	8.210566.0001
Athena Silica	3μm	2.1 × 100mm	8.211066.0001
Athena Silica	3μm	2.1 × 150mm	8.211566.0001
Athena Silica	3μm	2.1 × 200mm	8.212066.0001
Athena Silica	3μm	2.1 × 250mm	8.212566.0001
Athena Silica	3μm	4.6 × 50mm	8.460566.0001
Athena Silica	3μm	4.6 × 100mm	8.461066.0001
Athena Silica	3μm	4.6 × 150mm	8.461566.0001
Athena Silica	3μm	4.6 × 200mm	8.462066.0001
Athena Silica	3μm	4.6 × 250mm	8.462566.0001
Athena Silica	5μm	2.1 × 50mm	8.210576.0001
Athena Silica	5μm	2.1 × 100mm	8.211076.0001
Athena Silica	5μm	2.1 × 150mm	8.211576.0001
Athena Silica	5μm	2.1 × 200mm	8.212076.0001
Athena Silica	5μm	2.1 × 250mm	8.212576.0001
Athena Silica	5μm	4.6 × 50mm	8.460576.0001
Athena Silica	5μm	4.6 × 100mm	8.461076.0001
Athena Silica	5μm	4.6 × 150mm	8.461576.0001
Athena Silica	5μm	4.6 × 200mm	8.462076.0001
Athena Silica	5μm	4.6 × 250mm	8.462576.0001

Athena NH_2

[Both Normal and reverse phase mode]

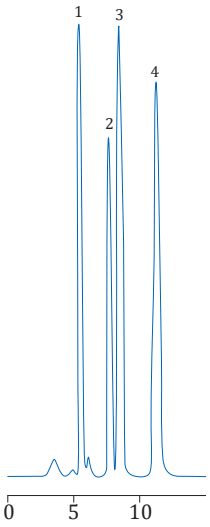
- Bonded aminopropyl group
- Suitable for normal and reverse phase mode
- Separate sugars in reverse mode



Aminopropyl stationary phase serves as a weak anion exchanger and offer polar selectivity under reversed phase and normal phase conditions.

Tocopherol isomers No.03227

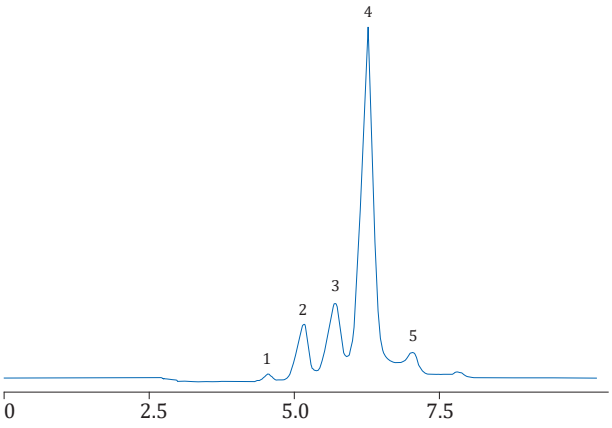
1. α-Tocopherol
2. β-Tocopherol
3. γ-Tocopherol
4. δ-Tocopherol



Column:	Athena NH_2 4.6 x 150mm, 5μm (8.461576.0001)
Mobile phase:	n-hexane / ethyl acetate (70/30)
Flow rate:	1.0 mL/min
Detection:	295 nm
Column temperature:	40 ˚C

Carbonhydrates No.03226

1. Glucose
2. Maltose
3. Maltotriose
4. Maltotetraose
5. Matlopentaos



Column:	Athena NH_2 4.6 x 150mm, 5μm (8.461577.0001)
Mobile phase:	acetonitrile / water (50/50)
Flow rate:	1.0 mL/min
Detection:	RID
Column temperature:	40 ˚C

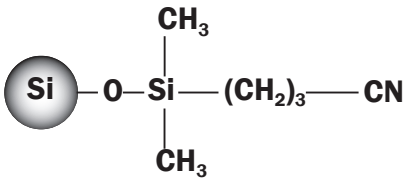
Ordering Information:

Packings	Particle size	diameter × length	Cat. No
Athena NH2	3μm	2.1 × 50mm	8.210567.0001
Athena NH2	3μm	2.1 × 100mm	8.211067.0001
Athena NH2	3μm	2.1 × 150mm	8.211567.0001
Athena NH2	3μm	2.1 × 200mm	8.212067.0001
Athena NH2	3μm	2.1 × 250mm	8.212567.0001
Athena NH2	3μm	4.6 × 50mm	8.460567.0001
Athena NH2	3μm	4.6 × 100mm	8.461067.0001
Athena NH2	3μm	4.6 × 150mm	8.461567.0001
Athena NH2	3μm	4.6 × 200mm	8.462067.0001
Athena NH2	3μm	4.6 × 250mm	8.462567.0001
Athena NH2	5μm	2.1 × 50mm	8.210577.0001
Athena NH2	5μm	2.1 × 100mm	8.211077.0001
Athena NH2	5μm	2.1 × 150mm	8.211577.0001
Athena NH2	5μm	2.1 × 200mm	8.212077.0001
Athena NH2	5μm	2.1 × 250mm	8.212577.0001
Athena NH2	5μm	4.6 × 50mm	8.460577.0001
Athena NH2	5μm	4.6 × 100mm	8.461077.0001
Athena NH2	5μm	4.6 × 150mm	8.461577.0001
Athena NH2	5μm	4.6 × 200mm	8.462077.0001
Athena NH2	5μm	4.6 × 250mm	8.462577.0001

Athena CN

[Can be used for normal or reverse phase separation]

- Bonded cyanopropyl
- Can be used for normal or reverse phase separation
- High column efficiency and good reproducibility



Athena CN is cyanide propyl boned silica column with n-electron interaction and unshared electron pair hydrogen bonding.Can be used for both reverse phase and normal phase mode. When used for reverse mode, having different selectivity from C18 and C8 columns; when used for normal phase mode, retention is lower retention than non-bonded silica gel column.

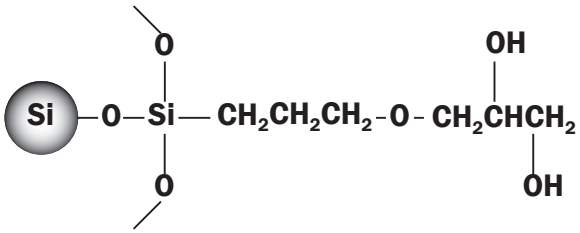
Ordering Information:

Packings	Particle size	diameter × length	Cat. No
Athena CN	3μm	2.1 × 50mm	8.210534.0001
Athena CN	3μm	2.1 × 100mm	8.211034.0001
Athena CN	3μm	2.1 × 150mm	8.211534.0001
Athena CN	3μm	2.1 × 200mm	8.212034.0001
Athena CN	3μm	2.1 × 250mm	8.212534.0001
Athena CN	3μm	4.6 × 50mm	8.460534.0001
Athena CN	3μm	4.6 × 100mm	8.461034.0001
Athena CN	3μm	4.6 × 150mm	8.461534.0001
Athena CN	3μm	4.6 × 200mm	8.462034.0001
Athena CN	3μm	4.6 × 250mm	8.462534.0001
Athena CN	5μm	2.1 × 50mm	8.210533.0001
Athena CN	5μm	2.1 × 100mm	8.211033.0001
Athena CN	5μm	2.1 × 150mm	8.211533.0001
Athena CN	5μm	2.1 × 200mm	8.212033.0001
Athena CN	5μm	2.1 × 250mm	8.212533.0001
Athena CN	5μm	4.6 × 50mm	8.460533.0001
Athena CN	5μm	4.6 × 100mm	8.461033.0001
Athena CN	5μm	4.6 × 150mm	8.461533.0001
Athena CN	5μm	4.6 × 200mm	8.462033.0001
Athena CN	5μm	4.6 × 250mm	8.462533.0001

Athena Diol

[Suitable for normal phase separation]

- Bonded group of 1,2 - dihydroxy-propyl ether propionate
- Normal phase separation
- Good reproducibility



Athena diol bonded 1,2 - dihydroxy-propyl ether propionate group, coverage of 4.0 micromol / m², can interact with polar compounds. Athena diol is able to distinguish compounds from slight difference, also can separate biological molecules based on size exclusion mechanism.

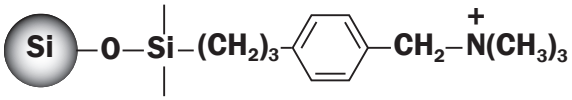
Ordering Information:

Packings	Particle size	diameter × length	Cat. No
Athena Diol	3μm	2.1 × 50mm	8.210536.0001
Athena Diol	3μm	2.1 × 100mm	8.211036.0001
Athena Diol	3μm	2.1 × 150mm	8.211536.0001
Athena Diol	3μm	2.1 × 250mm	8.212536.0001
Athena Diol	3μm	4.6 × 50mm	8.460536.0001
Athena Diol	3μm	4.6 × 100mm	8.461036.0001
Athena Diol	3μm	4.6 × 150mm	8.461536.0001
Athena Diol	3μm	4.6 × 250mm	8.462536.0001
Athena Diol	5μm	2.1 × 50mm	8.210535.0001
Athena Diol	5μm	2.1 × 100mm	8.211035.0001
Athena Diol	5μm	2.1 × 150mm	8.211535.0001
Athena Diol	5μm	2.1 × 250mm	8.212535.0001
Athena Diol	5μm	4.6 × 50mm	8.460535.0001
Athena Diol	5μm	4.6 × 100mm	8.461035.0001
Athena Diol	5μm	4.6 × 150mm	8.461535.0001
Athena Diol	5μm	4.6 × 250mm	8.462535.0001

Athena SAX

[Suitable for analysis of acidic substances]

- Strong anion exchange mode
- Suitable for analysis of acidic substances, including nucleotide and organic acids etc.
- High column efficiency, high batch stability, good columns reproducibility
- To adjust retention time of the analytes by changing buffer concentration of mobile phase
- Stable in high proportion of water mobile phase



Athena SAX column are boned quaternary ammonium strong anion-exchange group in the high-purity silica matrix, having mixed chemical structure of quaternary ammonium and phenyl functional groups. This mixed-mode by strong anion exchange phase and hydrophobic phase is suitable for separation of aromatic or aliphatic carboxylic acids, sulfonic acids, nucleotides and acids etc.

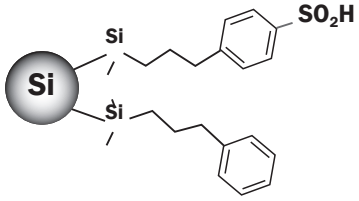
Ordering Information:

Packings	Particle size	diameter × length	Cat. No
Athena SAX	3μm	2.1 × 50mm	8.210520.0001
Athena SAX	3μm	2.1 × 100mm	8.211020.0001
Athena SAX	3μm	2.1 × 150mm	8.211520.0001
Athena SAX	3μm	2.1 × 250mm	8.212520.0001
Athena SAX	3μm	4.6 × 50mm	8.460520.0001
Athena SAX	3μm	4.6 × 100mm	8.461020.0001
Athena SAX	3μm	4.6 × 150mm	8.461520.0001
Athena SAX	3μm	4.6 × 250mm	8.462520.0001
Athena SAX	5μm	2.1 × 50mm	8.210521.0001
Athena SAX	5μm	2.1 × 100mm	8.211021.0001
Athena SAX	5μm	2.1 × 150mm	8.211521.0001
Athena SAX	5μm	2.1 × 250mm	8.212521.0001
Athena SAX	5μm	4.6 × 50mm	8.460521.0001
Athena SAX	5μm	4.6 × 100mm	8.461021.0001
Athena SAX	5μm	4.6 × 150mm	8.461521.0001
Athena SAX	5μm	4.6 × 250mm	8.462521.0001

Athena SCX

[Suitable for analysis of alkaline substances]

- Strong cation exchange mode
- Fit for analysis of alkaline substances, especially amines
- high column efficiency, stable batch, good columns reproducibility



Athena SCX is benzenesulfonic acid boned silica, having mixed chemical structure of sulfonic acid group and phenyl group. Athena SCX is mixed mode of strong cation exchange phase and hydrophobic phase. Not only can be used for separation of cationic / basic and nitrogenous compounds, but also give appropriate reservation for a variety of weak cation, neutral organic compound. Athena SCX is used for separation and determination of amines and polyamine compounds, such as alkaloids, peptides and components in cold medicines.

Ordering Information:

Packings	Particle size	diameter × length	Cat. No
Athena SCX	3μm	2.1 × 50mm	8.210522.0001
Athena SCX	3μm	2.1 × 100mm	8.211022.0001
Athena SCX	3μm	2.1 × 150mm	8.211522.0001
Athena SCX	3μm	2.1 × 250mm	8.212522.0001
Athena SCX	3μm	4.6 × 50mm	8.460522.0001
Athena SCX	3μm	4.6 × 100mm	8.461022.0001
Athena SCX	3μm	4.6 × 150mm	8.461522.0001
Athena SCX	3μm	4.6 × 250mm	8.462522.0001
Athena SCX	5μm	2.1 × 50mm	8.210523.0001
Athena SCX	5μm	2.1 × 100mm	8.211023.0001
Athena SCX	5μm	2.1 × 150mm	8.211523.0001
Athena SCX	5μm	2.1 × 250mm	8.212523.0001
Athena SCX	5μm	4.6 × 50mm	8.460523.0001
Athena SCX	5μm	4.6 × 100mm	8.461023.0001
Athena SCX	5μm	4.6 × 150mm	8.461523.0001
Athena SCX	5μm	4.6 × 250mm	8.462523.0001
Athena SCX(2)	5μm	4.6 × 250mm	8.462545.0001

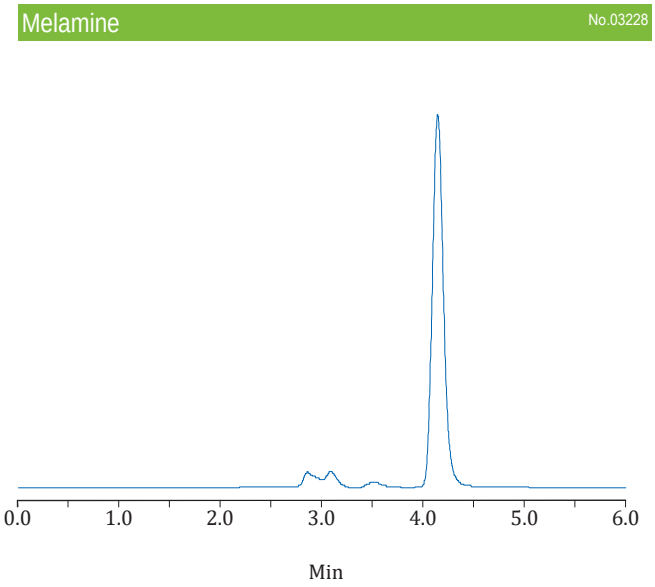
Note: 8.462545 is the original Cnwsil SCX column.

Athena HILIC

[Suitable for analysis of strong polar substances]

Hydrophilic interaction liquid chromatography (HILIC) is a kind of liquid chromatography analytical method for strong polar and strong hydrophilic compounds separation. Sometimes, it is difficult to retain polar compound on reverse-phase column and Ion pair reagent cannot be added to mobile phase in LC / MS analysis. When use normal phase chromatography for analysis, polar and hydrophilic compounds are often difficult to be dissolved in conventional normal phase solvents. This time HILIC will be considered to use for analysis.

In three Athena HILIC stationary phases, Athena HILIC is strong alkaline, Athena HILIC (2) is weak alkaline, Athena HILIC (3) is neutral.



Column:	Athena HILIC (3) 4.6 × 250mm, 5μm (8.462527.0001)
Mobile phase:	acetonitrile / 10 mM ammonium acetate (90/10)
Flow rate:	1.0 mL/min
Detection:	240 nm
Column temperature:	25 ˚C

Difference of reverse phase chromatography, normal phase chromatography and HILIC

	stationary phase	mobile phase	elution order	applications
Reverse phase chromatography	Non-polar, such as C18, C8 etc	Polar, such as methanol, ethanol, water etc.	Polar subject flow quickly, non-polar flow slowly	Medium polar and non-polar substances
Normal phase chromatography	Polar ,such as silica, amino, Cyano etc.	Non-polar, such as N-hexane, acid ethyl ester etc.	non-polar subject flow quickly, polar flow slowly	Medium polar and polar substances
HILIC	Silica bonded hydrophilic stationary phase	Polar, methanol, ethanol, buffer saline etc.	non-polar subject flow quickly, polar flow slowly	Strong polar and strong hydrophilic compounds

Ordering Information:

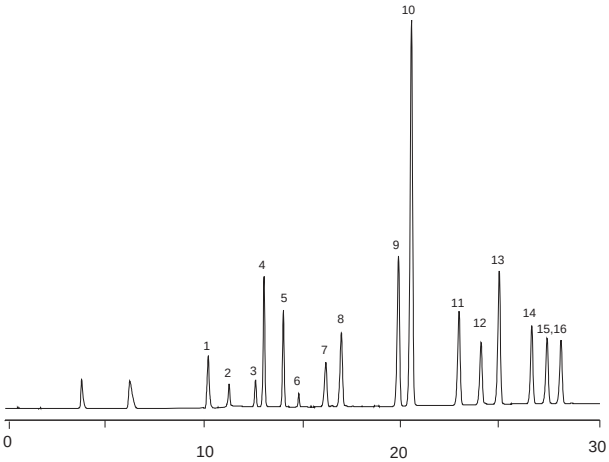
Packings	Particle size	diameter × length	Cat. No
Athena HIILC	3μm	2.1 × 50mm	8.210530.0001
Athena HIILC	3μm	2.1 × 100mm	8.211030.0001
Athena HIILC	3μm	2.1 × 150mm	8.211530.0001
Athena HIILC	3μm	2.1 × 250mm	8.212530.0001
Athena HIILC	3μm	4.6 × 50mm	8.460530.0001
Athena HIILC	3μm	4.6 × 100mm	8.461030.0001
Athena HIILC	3μm	4.6 × 150mm	8.461530.0001
Athena HIILC	3μm	4.6 × 250mm	8.462530.0001
Athena HIILC	5μm	2.1 × 50mm	8.210531.0001
Athena HIILC	5μm	2.1 × 100mm	8.211031.0001
Athena HIILC	5μm	2.1 × 150mm	8.211531.0001
Athena HIILC	5μm	2.1 × 250mm	8.212531.0001
Athena HIILC	5μm	4.6 × 50mm	8.460531.0001
Athena HIILC	5μm	4.6 × 100mm	8.461031.0001
Athena HIILC	5μm	4.6 × 150mm	8.461531.0001
Athena HIILC	5μm	4.6 × 250mm	8.462531.0001
Athena HILIC(2)	3μm	2.1 × 50mm	8.210529.0001
Athena HILIC(2)	3μm	2.1 × 100mm	8.211029.0001
Athena HILIC(2)	3μm	2.1 × 150mm	8.211529.0001
Athena HILIC(2)	3μm	2.1 × 250mm	8.212529.0001
Athena HILIC(2)	3μm	4.6 × 50mm	8.460529.0001
Athena HILIC(2)	3μm	4.6 × 100mm	8.461029.0001
Athena HILIC(2)	3μm	4.6 × 150mm	8.461529.0001
Athena HILIC(2)	3μm	4.6 × 250mm	8.462529.0001
Athena HILIC(2)	5μm	2.1 × 50mm	8.210532.0001
Athena HILIC(2)	5μm	2.1 × 100mm	8.211032.0001
Athena HILIC(2)	5μm	2.1 × 150mm	8.211532.0001
Athena HILIC(2)	5μm	2.1 × 250mm	8.212532.0001
Athena HILIC(2)	5μm	4.6 × 50mm	8.460532.0001
Athena HILIC(2)	5μm	4.6 × 100mm	8.461032.0001
Athena HILIC(2)	5μm	4.6 × 150mm	8.461532.0001
Athena HILIC(2)	5μm	4.6 × 250mm	8.462532.0001
Athena HILIC(3)	5μm	2.1 × 150mm	8.211527.0001
Athena HILIC(3)	5μm	2.1 × 250mm	8.212527.0001
Athena HILIC(3)	5μm	4.6 × 150mm	8.461527.0001
Athena HILIC(3)	5μm	4.6 × 250mm	8.462527.0001

Athena PAHS

CNW Athena PAHs column is designed specifically for analysis of PAHs. Its matrix is made of full porous spherical silica gel with ultra-high purity, which developed by unique bonding process. This ensures specific selectivity for PAHs in terms of usage. And only using acetonitrile-water binary gradient mobile phase can achieve baseline separation of 16 kinds of PAHs substances in 30 minutes.

PAHs(HJ 478-2009) LC-30004

1. Naphthalene
2. Acenaphthylene
3. Acenaphthene
4. Fluorene
5. Phenanthrene
6. Anthracene
7. Fluoranthene
8. Pyrene
9. anthracene
10. Chrysene
11. Benzo(b)fluoranthene
12. Benzo(k)fluoranthene
13. Benzo(a)pyrene
14. Dibenzo(a,h)anthracene
15. Benzo(g,h,i)perylene
16. Indeno(1,2,3-cd)pyrene



Column: Athena PAHs (8.462551.0001)

Mobile phase:

Time(min)	A. water	B. acetonitrile
0 min	60%	40%
25 min	0%	100%
35 min	0%	100%
45 min	60%	40%

Flow rate: 2.0 ml/min

Temperature: 30 ˚C

Detector: 266nm

Ordering Information:

Cat.No.	Description	Specification
8.462551.0001	Athena PAHs	4.6×250mm, 5μm
8.400251.0002	Athena PAHs Guard Cartridge	2pcs/box, 5μm, 4.0×20mm
8.400251.000K	Athena PAHs Guard Cartridge Kit	1Holder and 1 Cartridge 5μm, 4.0×20mm

Athena C30

[suitable for speration of carotenoid]

Athena C30 has unique C30 functional group that is suitable for separation polar substances (such as sugar and nucleic acids) and fat-soluble compounds (such as vitamin E and carotenoids).

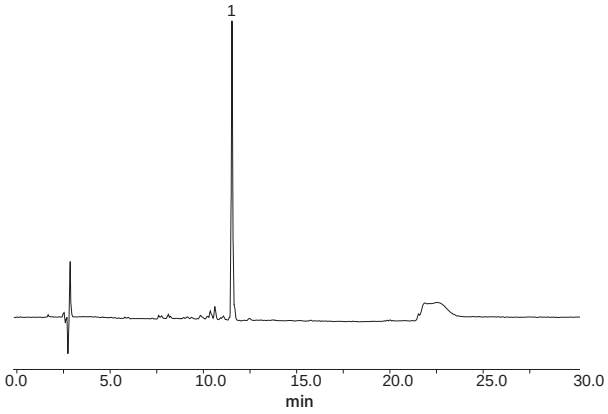
Features:

Unique C30 bonding phase, provides different selectivity

Higer shape selectivity to isomers of similar structures

XanthophyII LC-20099

1. XanthophyII 127-40-2



Column: Athena C30 4.6 × 250mm, 5μm (8.462552.0001)

Mobile phase:

Time(min)	A. Methanol	B. MTBE
0 min	85%	40%
10 min	78%	100%
11 min	10%	100%
15 min	10%	40%

Flow rate: 1.0 ml/min

Temperature: 25 ˚C

Detector: 445nm

Ordering Information:

Cat.No.	Description	Specification
8.462552.0001	Athena C30	4.6 × 250mm, 5μm

CNWSepAX ion exchange column

[Aim at GB5009.11-2014 Chinese food safety standard, detection of inorganic arsenic]

Arsenic is a toxic non-metallic element, which can cause serious damage to human's health, such as skin cancer or other diseases. The research indicates the toxicity of arsenic relates to its chemical form of existence. The form of inorganic arsenic acid salt (As 3+) and arsenate (As 5+) contains high toxicity; the Methyl arsenate (MMA) and Demethylarsinic acid (DMA) on the other hand has lower toxicity; arsenic betaine(AsB), arsenic choline (AsC) and arsenic sugar are often considered non-toxic.

Due to hazardous factor of inorganic arsenic, each country and international organizations have come out various regulations to limit its usage. Based on GB2762-2005 pollutants standard of our country, Inorganic arsenic is also considered to be limited for using around 0.05 ~ 1.5 g/ kg in foods. The Food and Agriculture Organization (FAO), World Health Organization (WHO) have more straight restrictions in Codex Alimentarius Commission (CAC) standard. For inorganic arsenic detection, China has implemented GB5009.11-2014 formally on March,2016 (base on the determination of total inorganic arsenic in food). The liquid phase-atomic fluorescence spectrometry (LC-AFS) and liquid chromatography-inductively coupled plasma mass spectrometry (LC-ICP-MS) are used in such condition.

ANPEL launched CNWSepAX anion exchange column according to the standard, which can realize the perfect separation of four inorganic arsenic list in standard, and effectively detect inorganic arsenic in food.

Cat.No.	Description	Specification
★ 8.4025G7.0001	CNWSep AX HPLC Column	250mm x 4.0mm, 10μm, 100A
★ 8.4005G7.000K	CNWSep AX Guard Cartridge Kit	1 pc holder+ 2 pcs cartridge 5.0×4.0mm, 10μm

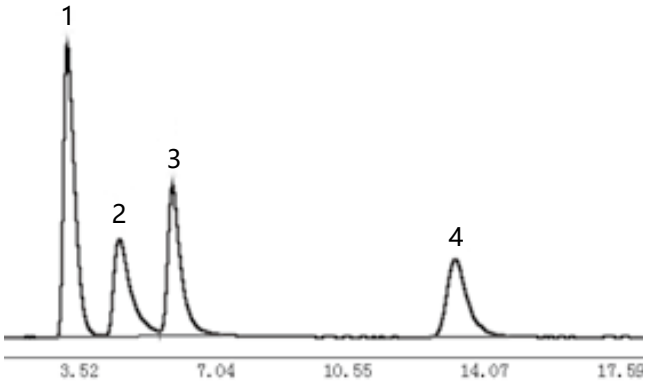
Sample Preparation:

Refer to GB 5009.11-2014

LC-AFS :

HPLC column: CNWSep AX ion-exchange column, 250mm×4.0mm, 10μm
Guard column: CNWSep AX guard column, 5.0×4.0mm, 10μm
Mobile phase: 15mmol/L MAP
Flow rate: 1mL/min
Column temperature: 30℃
Injection: 100ul(100ppb)
Detector: Atomic fluorescence

Chromatogram:



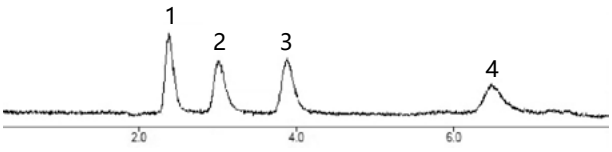
Testing Data:

No.	compound	Retain Time(min)	Resolution	Adding standard (shrimp flesh)	Recovery
1	As(III)	2.632		50ppb	102%
2	DMA	3.971	1.0059		103%
3	MMA	5.339	0.9256		101%
4	As(V)	12.604	4.0549		95%

LC-ICP-MS :

HPLC column: CNWSep AX ion-exchange column, 250mm×4.0mm, 10μm
Guard column: CNWSep AX guard column, 5.0×4.0mm, 10μm
Mobile phase: (Include 10mmol/L Anhydrous sodium acetate, 3mmol/L KNO, 10mmol/L MSP, 0.2mmol/L EDTA buffered solution, using ammonium hydroxide adjust pH to 10): Ethyl Alcohol 99:1
Flow rate: 1mL/min
Column temperature: 30℃
Injection: 50ul(5ppb)
Detector: Atomic fluorescence

Chromatogram:



Testing Data:

No.	Compound	Testing value (mussel)	Standard value	Testing value with standard	Recovery
1	As(III)	12.1	10ppb	21.9	98%
2	DMA	ND		9.7	97%
3	MMA	ND		9.5	95%
4	As(V)	ND		10.1	101%

ND Not detected

CNW guard column

[Longer column life, higher column efficiency]

- Protect analytical column, extend column life
- Easy to use
- Cartridges can be purchased separately, affordable

Why use guard column?

Using CNW guard column can protect analytical column from contamination by sample and solvent residue and extend column life.

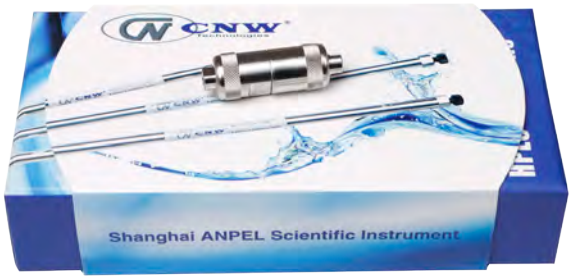
Will use of guard columns affect analysis result?

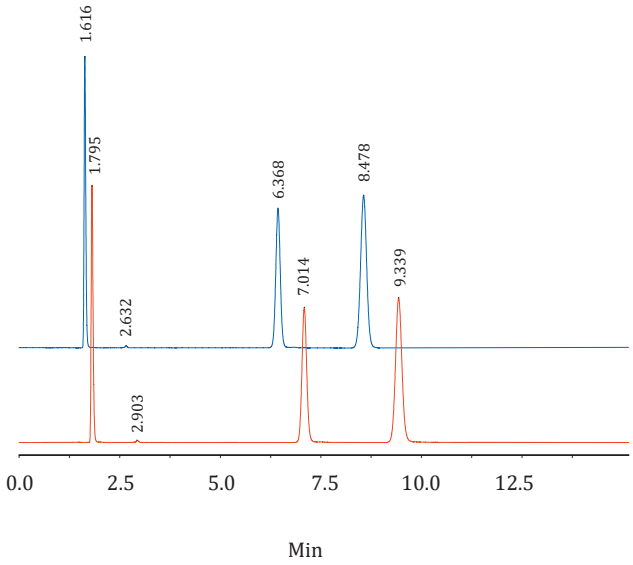
In HPLC system, use of CNW guard column will not affect analysis results. As shown in the figure, resolution and peak shape are not affected by increased guard column. The impact of 4mm ID guard column on pressure is only 50 psi.

When to replace guard column?

Guard column is used to prevent contamination of column, so when the cartridges have been blocked by pollution, change a new one to avoid damage to analytical column.

We advise you replace guard cartridges periodically according to the properties of sample and the frequency of column use. When system pressure increases and peak shape become poor, check especially whether the problem is raised by guard column contamination. If true replace it in time.





HPLC

Ordering Information:

Packings	Particle size	diameter × length	Cat. No
Athena Guard Cartridge Holder A		4.0 × 20mm	8.40020H.0001
Athena C18-WP Guard Cartridge	5μm	4.0 × 20mm	8.400272.0002
Athena C18-WP Guard Cartridge Kit	5μm	4.0 × 20mm	8.400272.000K
Athena C18-WP Guard Cartridge	5μm	2.1 × 20mm	8.210273.0002
Athena C18-WP Guard Cartridge Kit	5μm	2.1 × 20mm	8.210273.000K
Athena C18 Guard Cartridge	5μm	4.0 × 20mm	8.400271.0002
Athena C18 Guard Cartridge Kit	5μm	4.0 × 20mm	8.400271.000K
Athena C8 Guard Cartridge	5μm	4.0 × 20mm	8.400275.0002
Athena C8 Guard Cartridge Kit	5μm	4.0 × 20mm	8.400275.000K
Athena C8 Guard Cartridge	5μm	2.1 × 20mm	8.210265.0002
Athena C8 Guard Cartridge Kit	5μm	2.1 × 20mm	8.210265.000K
Athena C4 Guard Cartridge	5μm	4.0 × 20mm	8.400279.0002
Athena C4 Guard Cartridge Kit	5μm	4.0 × 20mm	8.400279.000K
Athena Silica Guard Cartridge	5μm	4.0 × 20mm	8.400276.0002
Athena Silica Guard Cartridge Kit	5μm	4.0 × 20mm	8.400276.000K
Athena Silica Guard Cartridge	5μm	2.1 × 20mm	8.210266.0002
Athena Silica Guard Cartridge Kit	5μm	2.1 × 20mm	8.210266.000K
Athena NH2 Guard Cartridge	5μm	4.0 × 20mm	8.400277.0002
Athena NH2 Guard Cartridge Kit	5μm	4.0 × 20mm	8.400277.000K
Athena NH2 Guard Cartridge	5μm	2.1 × 20mm	8.210267.0002
Athena NH2 Guard Cartridge Kit	5μm	2.1 × 20mm	8.210267.000K
Athena CN Guard Cartridge	5μm	4.0 × 20mm	8.400233.0002
Athena CN Guard Cartridge Kit	5μm	4.0 × 20mm	8.400233.000K
Athena CN Guard Cartridge	5μm	2.1 × 20mm	8.210234.0002
Athena CN Guard Cartridge Kit	5μm	2.1 × 20mm	8.210234.000K

Description:

1. Guard Cartridge Kit specification: 1 piece cartridge holder+1piece cartridge
2. Guard cartridge specification: 2 pieces / box

Polymer matrix analytical column

CNWSep reverse phase column

[Wider pH range]

CNWSep series have three kinds of reverse phase which structure is phenyl functional group that enables hydrophobic interaction.CNWSep RP and RP3 bonded to porous particles. CNWSep RP is 100Å while CNWSep RP3 is 300Å. CNWSep SP is phenyl bonded to nonporous particles.

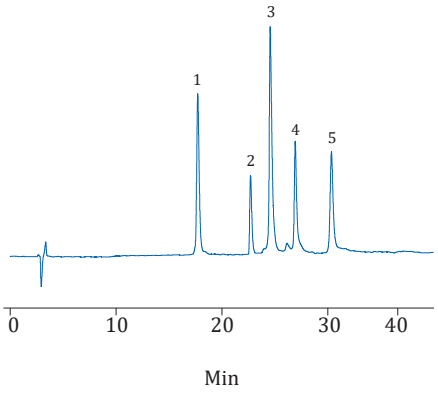
Comparedwith silica based reversed phases, PS/DVB matrix columns have advantages over applications at extreme pH(1-14)with special selectivity andslightly lower separation efficiency.

Ordering Information:

Packings	Particle size	diameter × length	Cat. No
CNWSep RP1	5μm	2.1×50mm	8.2105A1.0001
CNWSep RP1	5μm	2.1×100mm	8.2110A1.0001
CNWSep RP1	5μm	2.1×150mm	8.2115A1.0001
CNWSep RP1	5μm	2.1×250mm	8.2125A1.0001
CNWSep RP1	5μm	4.6×50mm	8.4605A1.0001
CNWSep RP1	5μm	4.6×100mm	8.4610A1.0001
CNWSep RP1	5μm	4.6×150mm	8.4615A1.0001
CNWSep RP1	5μm	4.6×250mm	8.4625A1.0001
CNWSep RP1	5μm	7.8×150mm	8.7815A1.0001
CNWSep RP1	5μm	7.8×250mm	8.7825A1.0001
CNWSep RP1	10μm	2.1×50mm	8.2105A2.0001
CNWSep RP1	10μm	2.1×100mm	8.2110A2.0001
CNWSep RP1	10μm	2.1×150mm	8.2115A2.0001
CNWSep RP1	10μm	2.1×250mm	8.2125A2.0001
CNWSep RP1	10μm	4.6×50mm	8.4605A2.0001
CNWSep RP1	10μm	4.6×100mm	8.4610A2.0001
CNWSep RP1	10μm	4.6×150mm	8.4615A2.0001
CNWSep RP1	10μm	4.6×250mm	8.4625A2.0001
CNWSep RP1	10μm	7.8×150mm	8.7815A2.0001
CNWSep RP1	10μm	7.8×250mm	8.7825A2.0001
CNWSep RP3	5μm	2.1×50mm	8.2105A3.0001
CNWSep RP3	5μm	2.1×100mm	8.2110A3.0001
CNWSep RP3	5μm	2.1×150mm	8.2115A3.0001
CNWSep RP3	5μm	2.1×250mm	8.2125A3.0001
CNWSep RP3	5μm	4.6×50mm	8.4605A3.0001
CNWSep RP3	5μm	4.6×100mm	8.4610A3.0001
CNWSep RP3	5μm	4.6×150mm	8.4615A3.0001
CNWSep RP3	5μm	4.6×250mm	8.4625A3.0001
CNWSep RP3	5μm	7.8×150mm	8.7815A3.0001
CNWSep RP3	5μm	7.8×250mm	8.7825A3.0001
CNWSep RP3	10μm	2.1×50mm	8.2105A4.0001
CNWSep RP3	10μm	2.1×100mm	8.2110A4.0001
CNWSep RP3	10μm	2.1×150mm	8.2115A4.0001

Protein separation No.03229

1. Ribonuclease B
2. Insulin
3. Cytochrome C
4. Lysozyme
5. Bovine serum albumin (BSA)



Column: CNWSep RP3 4.6 × 150mm, 5μm (8.4615A3.0001)
Mobile phase: A: 0.1% TFA aqueous solution
B: 0.1% TFA dissolved in acetonitrile

0min	5min	45min
20%B	20%B	60%B

Flow rate: 1.0 mL/min
Detection: 214 nm
Column temperature: 40 ˚C

Packings	Particle size	diameter × length	Cat. No
CNWSep RP3	10μm	2.1×250mm	8.2125A4.0001
CNWSep RP3	10μm	4.6×50mm	8.4605A4.0001
CNWSep RP3	10μm	4.6×100mm	8.4610A4.0001
CNWSep RP3	10μm	4.6×150mm	8.4615A4.0001
CNWSep RP3	10μm	4.6×250mm	8.4625A4.0001
CNWSep RP3	10μm	7.8×150mm	8.7815A4.0001
CNWSep RP3	10μm	7.8×250mm	8.7825A4.0001
CNWSep SP	3μm	2.1×50mm	8.2105A5.0001
CNWSep SP	3μm	2.1×150mm	8.2115A5.0001
CNWSep SP	3μm	4.6×50mm	8.4605A5.0001
CNWSep SP	3μm	4.6×100mm	8.4610A5.0001
CNWSep SP	3μm	4.6×150mm	8.4615A5.0001
CNWSep SP	3μm	4.6×250mm	8.4625A5.0001
CNWSep SP	5μm	2.1×50mm	8.2105A6.0001
CNWSep SP	5μm	2.1×150mm	8.2115A6.0001
CNWSep SP	5μm	4.6×50mm	8.4605A6.0001
CNWSep SP	5μm	4.6×150mm	8.4615A6.0001
CNWSep SP	5μm	4.6×250mm	8.4625A6.0001
CNWSep SP	5μm	7.8×250mm	8.7825A6.0001
CNWSep SP	10μm	2.1×50mm	8.2105A7.0001
CNWSep SP	10μm	2.1×150mm	8.2115A7.0001
CNWSep SP	10μm	4.6×50mm	8.4605A7.0001
CNWSep SP	10μm	4.6×150mm	8.4615A7.0001
CNWSep SP	10μm	4.6×250mm	8.4625A7.0001
CNWSep SP	10μm	7.8×250mm	8.7825A7.0001

CNWSep sugar column and organic acids column

[Sugars, sugar alcohols and organic acid analysis]

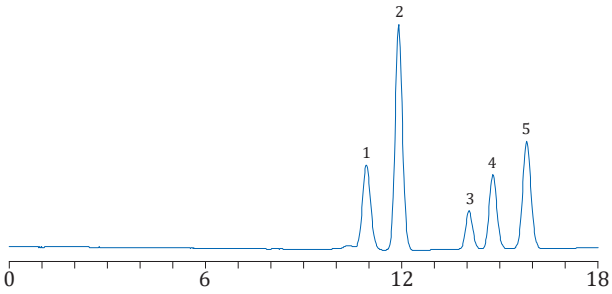
CNWSep sugar column and organic acids column are based on low crosslinked polystyrene / divinylbenzene (PS/DVB) particles with the surface modified with sulfonic acid (-SO3H) for Carbomix H-NP resins, followed by chelating of calcium ions (Ca+2) for synthesis of Carbomix Ca-NP resins. Resin cross-linking degree is an important parameter in the separation. We provide a 5% (-L), 8% (-M) and 10% (-H), three kinds of crosslinking degrees products. And 5um and 10μm particle size products are offered.

CNWSep sugar columns and organic acids columns are more comprehensive and economic, compared with Bio-Rad , Transgenomic and other brands of similar products.

Packings	Type	Cross-linking degree	PH range	Maximum temperature	Applications
CNWSep H-L	H	5%	1-3	85˚C	fermentation products and fruit juice containing organic acids, sugar and sugar alcohol
CNWSep H-M	H	8%	1-3	85˚C	
CNWSep H-H	H	10%	1-3	85˚C	
CNWSep Ca-L	Ca	5%	5-9	85˚C	monosaccharides, oligosaccharides and sugar alcohols
CNWSep Ca-M	Ca	8%	5-9	85˚C	
CNWSep Ca-H	Ca	10%	5-9	85˚C	
CNWSep Pb-L	Pb	5%	5-9	85˚C	Pentose and hexose in wood products, dairy products containing sucrose, lactose,
CNWSep Pb-M	Type	8%	5-9	85˚C	
CNWSep Pb-H	Pb	10%	5-9	85˚C	
CNWSep K-L	Pb	5%	5-9	85˚C	Sucrose, honey, corn syrup, etc.
CNWSep K-M	K	8%	5-9	85˚C	
CNWSep K-H	K	10%	5-9	85˚C	
CNWSep Na-L	K	5%	5-9	85˚C	Oligosaccharides, samples containing sodium ions
CNWSep Na-M	Na	8%	5-9	85˚C	
CNWSep Na-H	Na	10%	5-9	85˚C	

Sugars No.03230

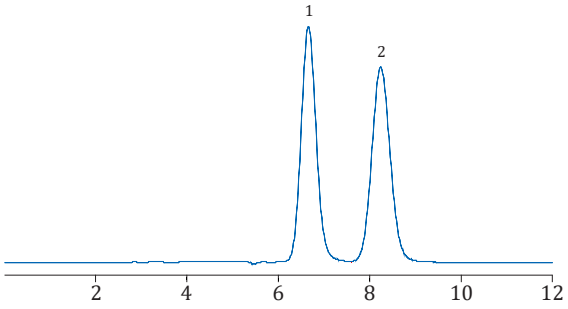
1. Maltotriose
2. Maltose
3. Glucose
4. Mannose
5. Fructose



Column: CNWSep KH 7.8 × 300mm, 5μm (8.7830E5.0001)
Mobile phase: water
Flow rate: 0.4 mL/min
Detection: RID
Column temperature: 85 ˚C

Sorbitol and Mannitol No.03234

1. Mannitol
2. Sorbitol



Column: CNWSep Ca-M 4.6 × 250 mm, 10μm (8.4625C4.0001)
Mobile phase: water
Flow rate: 0.5 mL/min
Detection: RID
Column temperature: 80 ˚C

Sugar column and Organic acid column retention time reference table

	CNWSep H-L	CNWSep H-L	CNWSep H-M	CNWSep H-H	CNWSep Ca-M	CNWSep Ca-H
Particle size	5μm	10μm	10μm	10μm	10μm	10μm
Malic acid	8.66	12.03	9.80	9.24	/	/
Oxalic acid	8.94	7.72	7.44	7.72	/	/
Citric acid	9.63	10.26	8.69	8.35	/	/
Tartaric acid	10.00	10.74	8.94	8.64	/	/
Maleic acid	10.01	9.50	8.53	8.56	/	/
Succinic acid	12.26	14.45	11.54	10.47	/	/
Fumaric acid	13.08	7.37	7.16	7.49	/	/
Lactic acid	13.66	15.41	12.70	11.55	/	/
Formic acid	14.97	16.11	13.51	12.48	/	/
Acetic acid	16.07	17.52	14.64	13.39	/	/
Maltotriose	9.08	8.94	7.70	7.90	8.33	8.57
D-(+)-Cellobiose	9.41	9.79	8.18	8.17	8.81	8.96
(D-(+)-Maltose	9.51	10.01	8.29	8.23	9.02	9.09
D-Lactose	9.60	10.24	8.42	8.29	9.25	9.22
D-Glucose	10.73	11.90	9.68	9.16	10.61	10.32
D-(+)-Mannose	11.13	12.55	10.13	9.48	12.05	11.45
D-(+)-Galactose	11.16	12.54	10.15	9.48	11.77	11.20
D-Fructose	11.24	12.65	10.27	9.58	13.34	12.45
D-Xylose	11.32	12.61	10.24	9.60	11.63	11.19
D-Lyxose	11.62	13.08	10.64	9.87	13.96	13.02
L-(+)-Arabinose	11.89	13.45	10.93	10.08	13.41	12.53
D-(-)-Arabinose	11.90	13.46	10.93	10.08	13.43	12.52
D-(-)-Ribose	12.09	13.73	11.16	10.25	20.70	19.23
D-(+)-Sucrose	/	/	/	/	8.93	9.03
Maltitol	9.72	10.51	8.41	8.29	11.92	11.24
D-Mannitol	11.56	12.99	10.53	9.79	17.34	15.60
Galactitol	11.61	13.13	10.66	9.87	19.44	18.05
D-Sorbitol	11.61	13.12	10.64	9.86	20.22	18.71
Adonitol	12.15	13.59	11.10	10.26	14.73	13.67
Arabinitol	12.33	13.82	11.30	10.41	17.72	16.06
Xylitol	12.46	14.03	11.47	10.53	21.08	18.66
Erythriyol	13.16	14.70	11.94	11.00	15.98	14.47

Column: 7.8 × 300 mm, time unit (min)

7.8 × 300 mm, time unit (min)

5μm: flow rate: 0.5mL/min, column temperature: 80 ° C, detection device: RID

10μm: flow rate: 0.6mL/min, column temperature: 80 ° C, detection device: RID

Ordering Information:

Packings	Particle size	diameter × length	Cat. No
CNWSep H-L	5μm	4.6×250mm	8.4625B1.0001
CNWSep H-L	5μm	4.6×300mm	8.4630B1.0001
CNWSep H-L	5μm	7.8×300mm	8.7830B1.0001
CNWSep H-L	10μm	4.6×250mm	8.4625B2.0001
CNWSep H-L	10μm	4.6×300mm	8.4630B2.0001
CNWSep H-L	10μm	7.8×300mm	8.7830B2.0001
CNWSep H-M	5μm	4.6×250mm	8.4625B3.0001
CNWSep H-M	5μm	4.6×300mm	8.4630B3.0001
CNWSep H-M	5μm	7.8×100mm	8.7810B3.0001
CNWSep H-M	5μm	7.8×300mm	8.7830B3.0001
CNWSep H-M	10μm	4.6×250mm	8.4625B4.0001
CNWSep H-M	10μm	4.6×300mm	8.4630B4.0001
CNWSep H-M	10μm	7.8×150mm	8.7815B4.0001
CNWSep H-M	10μm	7.8×300mm	8.7830B4.0001
CNWSep H-H	5μm	4.6×250mm	8.4625B5.0001
CNWSep H-H	5μm	4.6×300mm	8.4630B5.0001
CNWSep H-H	5μm	7.8×300mm	8.7830B5.0001
CNWSep H-H	10μm	4.6×250mm	8.4625B6.0001
CNWSep H-H	10μm	4.6×300mm	8.4630B6.0001
CNWSep H-H	10μm	7.8×300mm	8.7830B6.0001
CNWSep Ca-L	5μm	4.6×250mm	8.4625C1.0001
CNWSep Ca-L	5μm	4.6×300mm	8.4630C1.0001
CNWSep Ca-L	5μm	7.8×300mm	8.7830C1.0001
CNWSep Ca-L	10μm	4.6×250mm	8.4625C2.0001
CNWSep Ca-L	10μm	4.6×300mm	8.4630C2.0001
CNWSep Ca-L	10μm	7.8×300mm	8.7830C2.0001
CNWSep Ca-M	5μm	4.6×250mm	8.4625C3.0001
CNWSep Ca-M	5μm	4.6×300mm	8.4630C3.0001
CNWSep Ca-M	5μm	7.8×300mm	8.7830C3.0001
CNWSep Ca-M	10μm	4.6×250mm	8.4625C4.0001
CNWSep Ca-M	10μm	4.6×300mm	8.4630C4.0001
CNWSep Ca-M	10μm	7.8×300mm	8.7830C4.0001
CNWSep Ca-H	5μm	4.6×250mm	8.4625C5.0001
CNWSep Ca-H	5μm	4.6×300mm	8.4630C5.0001
CNWSep Ca-H	5μm	7.8×300mm	8.7830C5.0001
CNWSep Ca-H	10μm	4.6×250mm	8.4625C6.0001
CNWSep Ca-H	10μm	4.6×300mm	8.4630C6.0001
CNWSep Ca-H	10μm	7.8×300mm	8.7830C6.0001
CNWSep Pb-L	5μm	4.6×250mm	8.4625D1.0001
CNWSep Pb-L	5μm	4.6×300mm	8.4630D1.0001
CNWSep Pb-L	5μm	7.8×300mm	8.7830D1.0001
CNWSep Pb-L	10μm	4.6×250mm	8.4625D2.0001
CNWSep Pb-L	10μm	4.6×300mm	8.4630D2.0001
CNWSep Pb-L	10μm	7.8×300mm	8.7830D2.0001
CNWSep Pb-M	5μm	4.6×250mm	8.4625D3.0001
CNWSep Pb-M	5μm	4.6×300mm	8.4630D3.0001
CNWSep Pb-M	5μm	7.8×100mm	8.7810D3.0001
CNWSep Pb-M	5μm	7.8×300mm	8.7830D3.0001
CNWSep Pb-M	10μm	4.6×250mm	8.4625D4.0001
CNWSep Pb-M	10μm	4.6×300mm	8.4630D4.0001
CNWSep Pb-M	10μm	7.8×300mm	8.7830D4.0001
CNWSep Pb-H	5μm	4.6×250mm	8.4625D5.0001
CNWSep Pb-H	5μm	4.6×300mm	8.4630D5.0001
CNWSep Pb-H	5μm	7.8×300mm	8.7830D5.0001
CNWSep Pb-H	10μm	4.6×250mm	8.4625D6.0001
CNWSep Pb-H	10μm	4.6×300mm	8.4630D6.0001
CNWSep Pb-H	10μm	7.8×300mm	8.7830D6.0001
CNWSep K-L	5μm	4.6×250mm	8.4625E1.0001
CNWSep K-L	5μm	4.6×300mm	8.4630E1.0001
CNWSep K-L	5μm	7.8×300mm	8.7830E1.0001
CNWSep K-L	10μm	4.6×250mm	8.4625E2.0001
CNWSep K-L	10μm	4.6×300mm	8.4630E2.0001
CNWSep K-L	10μm	7.8×300mm	8.7830E2.0001
CNWSep K-M	5μm	4.6×250mm	8.4625E3.0001
CNWSep K-M	5μm	4.6×300mm	8.4630E3.0001
CNWSep K-M	5μm	7.8×100mm	8.7810E3.0001
CNWSep K-M	5μm	7.8×300mm	8.7830E3.0001
CNWSep K-M	10μm	4.6×250mm	8.4625E4.0001
CNWSep K-M	10μm	4.6×300mm	8.4630E4.0001
CNWSep K-M	10μm	7.8×300mm	8.7830E4.0001
CNWSep K-H	5μm	4.6×250mm	8.4625E5.0001
CNWSep K-H	5μm	4.6×300mm	8.4630E5.0001
CNWSep K-H	5μm	7.8×300mm	8.7830E5.0001
CNWSep K-H	10μm	4.6×250mm	8.4625E6.0001
CNWSep K-H	10μm	4.6×300mm	8.4630E6.0001
CNWSep K-H	10μm	7.8×300mm	8.7830E6.0001
CNWSep Na-L	5μm	4.6×250mm	8.4625F1.0001
CNWSep Na-L	5μm	4.6×300mm	8.4630F1.0001
CNWSep Na-L	5μm	7.8×300mm	8.7830F1.0001
CNWSep Na-L	10μm	4.6×250mm	8.4625F2.0001
CNWSep Na-L	10μm	4.6×300mm	8.4630F2.0001
CNWSep Na-L	10μm	7.8×300mm	8.7830F2.0001
CNWSep Na-M	5μm	4.6×250mm	8.4625F3.0001
CNWSep Na-M	5μm	4.6×300mm	8.4630F3.0001
CNWSep Na-M	5μm	7.8×100mm	8.7810F3.0001
CNWSep Na-M	5μm	7.8×300mm	8.7830F3.0001
CNWSep Na-M	10μm	4.6×250mm	8.4625F4.0001
CNWSep Na-M	10μm	4.6×300mm	8.4630F4.0001
CNWSep Na-M	10μm	7.8×300mm	8.7830F4.0001
CNWSep Na-H	5μm	4.6×250mm	8.4625F5.0001
CNWSep Na-H	5μm	4.6×300mm	8.4630F5.0001
CNWSep Na-H	5μm	7.8×300mm	8.7830F5.0001
CNWSep Na-H	10μm	4.6×250mm	8.4625F6.0001
CNWSep Na-H	10μm	4.6×300mm	8.4630F6.0001
CNWSep Na-H	10μm	7.8×300mm	8.7830F6.0001

CNWSep ion exchange column

[Polymer matrix ion exchange]

CNWSep polymer matrix ion exchange column, which support is composed of a rigid, spherical, highly cross-linked poly(styrene divinylbenzene) (PS/DVB) bead, show high efficiency and high recovery separations for biological molecules.The PS/DVB resin surface is grafted with a highly hydrophilic, neutral polymer thin layer that eliminates non-specific bindings with biological analytes.CNWSep ion-exchange phases are composed of SCX, WCX, SAX,and WAX.

- Suitable for peptides, carbohydrates, polysaccharides, proteins, polynucleotides, etc
- Wide pH range: 2 - 12
- High resolution for slightly differed structures of biological species
- High adsorption capacity
- Excellent resolution and selectivity

Ordering Information:

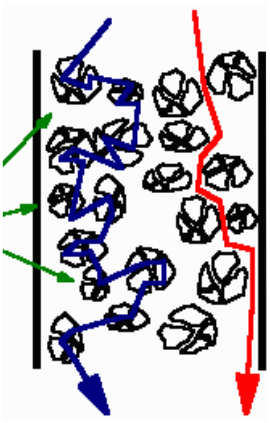
Packings	Particle size	diameter × length	Cat. No
CNWSep SAX	3μm	2.1×50mm	8.2105G1.0001
CNWSep SAX	3μm	2.1×100mm	8.2110G1.0001
CNWSep SAX	3μm	4.6×50mm	8.4605G1.0001
CNWSep SAX	3μm	4.6×100mm	8.4610G1.0001
CNWSep SAX	3μm	4.6×150mm	8.4615G1.0001
CNWSep SAX	5μm	2.1×50mm	8.2105G2.0001
CNWSep SAX	5μm	2.1×100mm	8.2110G2.0001
CNWSep SAX	5μm	2.1×150mm	8.2115G2.0001
CNWSep SAX	5μm	4.6×50mm	8.4605G2.0001
CNWSep SAX	5μm	4.6×100mm	8.4610G2.0001
CNWSep SAX	5μm	4.6×150mm	8.4615G2.0001
CNWSep SAX	5μm	4.6×250mm	8.4625G2.0001
CNWSep SAX	10μm	2.1×50mm	8.2105G3.0001
CNWSep SAX	10μm	2.1×100mm	8.2110G3.0001
CNWSep SAX	10μm	2.1×150mm	8.2115G3.0001
CNWSep SAX	10μm	4.6×50mm	8.4605G3.0001
CNWSep SAX	10μm	4.6×100mm	8.4610G3.0001
CNWSep SAX	10μm	4.6×150mm	8.4615G3.0001
CNWSep SAX	10μm	4.6×250mm	8.4625G3.0001
CNWSep WAX	3μm	2.1×50mm	8.2105G4.0001
CNWSep WAX	3μm	2.1×100mm	8.2110G4.0001
CNWSep WAX	3μm	4.6×50mm	8.4605G4.0001
CNWSep WAX	3μm	4.6×100mm	8.4610G4.0001
CNWSep WAX	3μm	4.6×150mm	8.4615G4.0001
CNWSep WAX	5μm	2.1×50mm	8.2105G5.0001
CNWSep WAX	5μm	2.1×100mm	8.2110G5.0001
CNWSep WAX	5μm	2.1×150mm	8.2115G5.0001
CNWSep WAX	5μm	4.6×50mm	8.4605G5.0001
CNWSep WAX	5μm	4.6×100mm	8.4610G5.0001
CNWSep WAX	5μm	4.6×150mm	8.4615G5.0001
CNWSep WAX	5μm	4.6×250mm	8.4625G5.0001
CNWSep WAX	10μm	2.1×50mm	8.2105G6.0001
CNWSep WAX	10μm	2.1×100mm	8.2110G6.0001
CNWSep WAX	10μm	2.1×150mm	8.2115G6.0001
CNWSep WAX	10μm	4.6×50mm	8.4605G6.0001
CNWSep WAX	10μm	4.6×100mm	8.4610G6.0001
CNWSep WAX	10μm	4.6×150mm	8.4615G6.0001
CNWSep WAX	10μm	4.6×250mm	8.4625G6.0001

Packings	Particle size	diameter × length	Cat. No
CNWSep SCX	3μm	2.1×50mm	8.2105H1.0001
CNWSep SCX	3μm	2.1×100mm	8.2110H1.0001
CNWSep SCX	3μm	4.6×50mm	8.4605H1.0001
CNWSep SCX	3μm	4.6×100mm	8.4610H1.0001
CNWSep SCX	3μm	4.6×150mm	8.4615H1.0001
CNWSep SCX	5μm	2.1×50mm	8.2105H2.0001
CNWSep SCX	5μm	2.1×100mm	8.2110H2.0001
CNWSep SCX	5μm	2.1×150mm	8.2115H2.0001
CNWSep SCX	5μm	4.6×50mm	8.4605H2.0001
CNWSep SCX	5μm	4.6×100mm	8.4610H2.0001
CNWSep SCX	5μm	4.6×150mm	8.4615H2.0001
CNWSep SCX	5μm	4.6×250mm	8.4625H2.0001
CNWSep SCX	10μm	2.1×50mm	8.2105H3.0001
CNWSep SCX	10μm	2.1×100mm	8.2110H3.0001
CNWSep SCX	10μm	2.1×150mm	8.2115H3.0001
CNWSep SCX	10μm	4.6×50mm	8.4605H3.0001
CNWSep SCX	10μm	4.6×100mm	8.4610H3.0001
CNWSep SCX	10μm	4.6×150mm	8.4615H3.0001
CNWSep SCX	10μm	4.6×250mm	8.4625H3.0001
CNWSep WCX	3μm	2.1×50mm	8.2105H4.0001
CNWSep WCX	3μm	2.1×100mm	8.2110H4.0001
CNWSep WCX	3μm	4.6×50mm	8.4605H4.0001
CNWSep WCX	3μm	4.6×100mm	8.4610H4.0001
CNWSep WCX	3μm	4.6×150mm	8.4615H4.0001
CNWSep WCX	5μm	2.1×50mm	8.2105H5.0001
CNWSep WCX	5μm	2.1×100mm	8.2110H5.0001
CNWSep WCX	5μm	2.1×150mm	8.2115H5.0001
CNWSep WCX	5μm	4.6×50mm	8.4605H5.0001
CNWSep WCX	5μm	4.6×100mm	8.4610H5.0001
CNWSep WCX	5μm	4.6×150mm	8.4615H5.0001
CNWSep WCX	5μm	4.6×250mm	8.4625H5.0001
CNWSep WCX	10μm	2.1×50mm	8.2105H6.0001
CNWSep WCX	10μm	2.1×100mm	8.2110H6.0001
CNWSep WCX	10μm	2.1×150mm	8.2115H6.0001
CNWSep WCX	10μm	4.6×50mm	8.4605H6.0001
CNWSep WCX	10μm	4.6×100mm	8.4610H6.0001
CNWSep WCX	10μm	4.6×150mm	8.4615H6.0001
CNWSep WCX	10μm	4.6×250mm	8.4625H6.0001

Size exclusion column (SEC)

Size Exclusion Chromatography (SEC), is a chromatographic method in which molecules in solution are separated by their size, not by molecular weight. It is usually applied to large molecules or macromolecular complexes such as industrial polymers, proteins and nano-particles.

Major brands on the market are TKS, Shodex etc. CNW size exclusion columns have the same excellent performence.



The column used is filled with high-purity silica or polymer containing many pores. Macromolecules which cannot enter the pores flow quickly through the column, while small molecules which can penetrate deep into the pores flow more slowly through the column; other molecules have different retention time arccording to their size.

Compare the calibration curves and select a column that is best suited to the range of molecule weights to be measured. If samples contain molecules larger than the packing material pores, they are excluded and can cause a peak to appear near the exclusion limit.

Size exclusion chromatography can be divided into:

Gel permeation chromatography (GPC) which uses a hydrophobic column packing material and a non-aqueous mobile phase (organic solvent) to measure the molecular weight distribution of synthetic polymers.

Gel filtration chromatography (GFC) which uses a hydrophilic packing material and an aqueous mobile phase to separate, fractionate, or measure the molecular weight distribution of molecules soluble in water, such as polysaccharides and proteins.

CNWGel silica matrix SEC column

CNWGel columns are all silica matrix size exclusion chromatography. X and S series packings, offering both 3μm and 5μm two particle sizes, can meet different separation requirements. Widely used in biological molecules and water-soluble polymers separation, including proteins, nucleic acids, etc. X-Series packing is more universal. Compared to X-Series, S-Series is more suitable for insulin, trypsin etc. hydrophobic protein, as well as monoclonal antibody protein.

CNWGel X series of columns (Universal)

pH range: 2 - 8.5, maximum temperature 80 ℃, salt concentration 20 mM -2.0M, mobile phase is conventional aqueous phase and organic phase solvent.

Filler Model

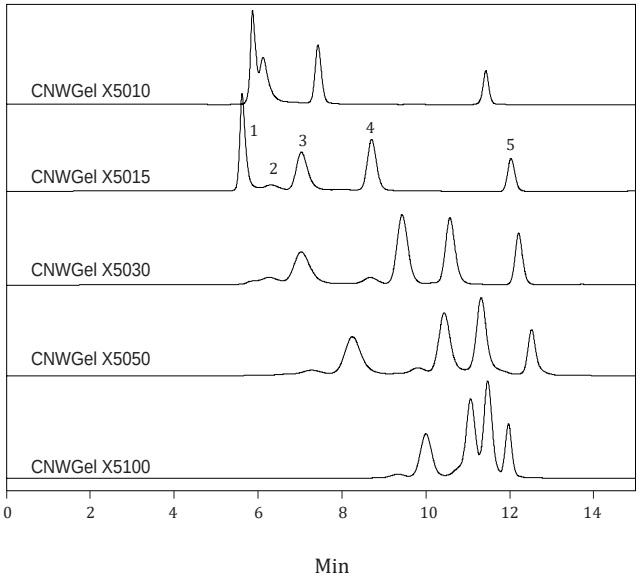
packing model	aperture diameter	Partical size	protein molecular weight	water-soluble
polymer molecular weight	100Å	3μm	100 - 100,000	500 - 10,000
CNWGel X3015	150Å	3μm	500 - 150,000	500 - 25,000
CNWGel X3030	300Å	3μm	5,000 - 1,250,000	1,000 - 100,000
CNWGel X5010	100Å	5μm	100 - 100,000	500 - 10,000
CNWGel X5015	150Å	5μm	500 - 150,000	500 - 25,000
CNWGel X5030	300Å	5μm	5,000 - 1,250,000	1,000 - 100,000
CNWGel X5050	500Å	5μm	15,000 - 5,000,000	2,500 - 500,000
CNWGel X5100	1000Å	5μm	50,000 - 7,500,000	5,000 - 1,500,000
CNWGel X5200	2000Å	5μm	>10,000,000	50,000 - >2,500,000

CNWGel S series columns (S series packing is ideal for separation of insulin, trypsin etc. hydrophobic protein, as well as monoclonal antibody protein)

pH range: 2 - 8.5, maximum temperature 80 ℃, salt concentration 20 mM - 2.0M, mobile phase is conventional aqueous phase and organic phase solvent.

packing model	aperture diameter	Partical size	protein molecular weight
CNWGel S3010	100Å	3μm	100 - 100,000
CNWGel S3015	150Å	3μm	500 - 150,000
CNWGel S3030	300Å	3μm	5,000 - 1,250,000
CNWGel S5015	150Å	5μm	500 - 150,000
CNWGel S5030	300Å	5μm	5,000 - 1,250,000
CNWGel S5050	500Å	5μm	15,000 - 5,000,000

Comparison of different columns for separation of protein samples No.03235



Column: CNWGel X5010 4.6 × 300mm, 5μm (8.4630AD.0001)
CNWGel X5015 4.6 × 300mm, 5μm (8.4630AE.0001)
CNWGel X5030 4.6 × 300mm, 5μm (8.4630AF.0001)
CNWGel X5050 4.6 × 300mm, 5μm (8.4630AG.0001)
CNWGel X5100 4.6 × 300mm, 5μm (8.4630AH.0001)

Mobile phase: 150 mM sodium phosphate buffer (pH 7.0)

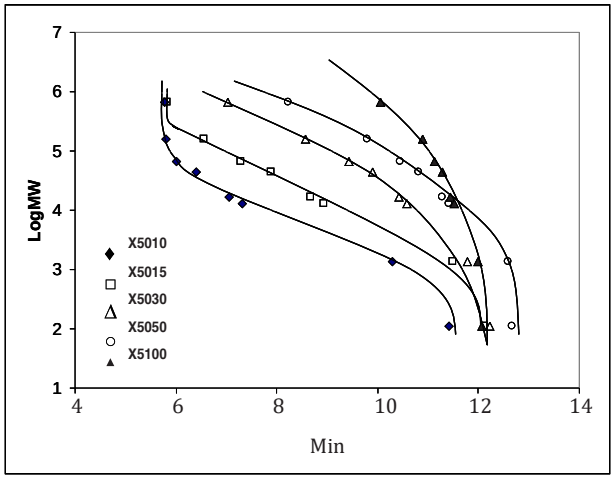
Flow rate: 0.35 mL/min

Detection: 214 nm

Column temperature: 23 ˚C

1.Thyroglobulin (1.0 mg/mL), 670 kD
2.BSA dimer, 132 kD
3.BSA (1.0 mg/mL), 66 kD
4.Ribonuclease A (1.0 mg/mL), 13.7 kD
5.Uracil (2.5 ug/mL), 120 kD.

CNWGel X-Series protein molecular weight calibration curve No.03236



Column: Column: CNWGel X5010 7.8 × 300mm, 5μm (8.7830AD.0001)
CNWGel X5015 7.8 × 300mm, 5μm (8.7830AE.0001)
CNWGel X5030 7.8 × 300mm, 5μm (8.7830AF.0001)
CNWGel X5050 7.8 × 300mm, 5μm (8.7830AG.0001)
CNWGel X5100 7.8 × 300mm, 5μm (8.830AH.0001)

Mobile phase: 150 mM sodium phosphate buffer (pH 7.0)

Flow rate: 0.35 mL/min

Detection: 214 nm

Column temperature: 23 ˚C

1.Thyroglobulin, 670 kD
2.gamma-Globulin, 158kD
3.BSA, 66 kD
4.Ovalbumin, 44 kD
5.Myoglobin, 17.6 kD
6.Ribonuclease A, 13.7 kD
7.B12, 1.35 kD
8.Uracil, 120.

Ordering Information:

Packings	Particle size	diameter × length	Cat. No
X3010	3μm	4.6×50mm	8.4605AA.0001
X3010	3μm	4.6×150mm	8.4615AA.0001
X3010	3μm	4.6×250mm	8.4625AA.0001
X3010	3μm	4.6×300mm	8.4630AA.0001
X3010	3μm	7.8×50mm	8.7805AA.0001
X3010	3μm	7.8×150mm	8.7815AA.0001
X3010	3μm	7.8×250mm	8.7825AA.0001
X3010	3μm	7.8×300mm	8.7830AA.0001
X3015	3μm	4.6×50mm	8.4605AB.0001
X3015	3μm	4.6×150mm	8.4615AB.0001
X3015	3μm	4.6×250mm	8.4625AB.0001
X3015	3μm	4.6×300mm	8.4630AB.0001
X3015	3μm	7.8×50mm	8.7805AB.0001
X3015	3μm	7.8×150mm	8.7815AB.0001
X3015	3μm	7.8×250mm	8.7825AB.0001
X3015	3μm	7.8×300mm	8.7830AB.0001
X3030	3μm	4.6×50mm	8.4605AC.0001

Packings	Particle size	diameter × length	Cat. No
X3030	3μm	4.6×150mm	8.4615AC.0001
X3030	3μm	4.6×250mm	8.4625AC.0001
X3030	3μm	4.6×300mm	8.4630AC.0001
X3030	3μm	7.8×50mm	8.7805AC.0001
X3030	3μm	7.8×150mm	8.7815AC.0001
X3030	3μm	7.8×250mm	8.7825AC.0001
X3030	3μm	7.8×300mm	8.7830AC.0001
X5010	5μm	4.6×50mm	8.4605AD.0001
X5010	5μm	4.6×150mm	8.4615AD.0001
X5010	5μm	4.6×250mm	8.4625AD.0001
X5010	5μm	4.6×300mm	8.4630AD.0001
X5010	5μm	7.8×50mm	8.7805AD.0001
X5010	5μm	7.8×150mm	8.7815AD.0001
X5010	5μm	7.8×250mm	8.7825AD.0001
X5010	5μm	7.8×300mm	8.7830AD.0001
X5015	5μm	4.6×50mm	8.4605AE.0001
X5015	5μm	4.6×150mm	8.4615AE.0001
X5015	5μm	4.6×250mm	8.4625AE.0001
X5015	5μm	4.6×300mm	8.4630AE.0001
X5015	5μm	7.8×50mm	8.7805AE.0001
X5015	5μm	7.8×150mm	8.7815AE.0001
X5015	5μm	7.8×250mm	8.7825AE.0001
X5015	5μm	7.8×300mm	8.7830AE.0001
X5030	5μm	4.6×50mm	8.4605AF.0001
X5030	5μm	4.6×150mm	8.4615AF.0001
X5030	5μm	4.6×250mm	8.4625AF.0001
X5030	5μm	4.6×300mm	8.4630AF.0001
X5030	5μm	7.8×50mm	8.7805AF.0001
X5030	5μm	7.8×150mm	8.7815AF.0001
X5030	5μm	7.8×250mm	8.7825AF.0001
X5030	5μm	7.8×300mm	8.7830AF.0001
X5050	5μm	4.6×50mm	8.4605AF.0001
X5050	5μm	4.6×150mm	8.4615AF.0001
X5050	5μm	4.6×250mm	8.4625AF.0001
X5050	5μm	4.6×300mm	8.4630AF.0001
X5050	5μm	7.8×50mm	8.7805AF.0001
X5050	5μm	7.8×150mm	8.7815AF.0001
X5050	5μm	7.8×250mm	8.7825AF.0001
X5050	5μm	7.8×300mm	8.7830AF.0001
X5100	5μm	4.6×50mm	8.4605AH.0001
X5100	5μm	4.6×150mm	8.4615AH.0001
X5100	5μm	4.6×250mm	8.4625AH.0001
X5100	5μm	4.6×300mm	8.4630AH.0001
X5100	5μm	7.8×50mm	8.7805AH.0001
X5100	5μm	7.8×150mm	8.7815AH.0001
X5100	5μm	7.8×250mm	8.7825AH.0001
X5100	5μm	7.8×300mm	8.7830AH.0001
X5200	5μm	4.6×50mm	8.4605AJ.0001
X5200	5μm	4.6×150mm	8.4615AJ.0001
X5200	5μm	4.6×250mm	8.4625AJ.0001
X5200	5μm	4.6×300mm	8.4630AJ.0001
X5200	5μm	7.8×50mm	8.7805AJ.0001

Packings	Particle size	diameter × length	Cat. No
X5200	5μm	7.8×150mm	8.7815AJ.0001
X5200	5μm	7.8×250mm	8.7825AJ.0001
X5200	5μm	7.8×300mm	8.7830AJ.0001
S3010	3μm	4.6×50mm	8.4605AK.0001
S3010	3μm	4.6×150mm	8.4615AK.0001
S3010	3μm	4.6×250mm	8.4625AK.0001
S3010	3μm	4.6×300mm	8.4630AK.0001
S3010	3μm	7.8×50mm	8.7805AK.0001
S3010	3μm	7.8×150mm	8.7815AK.0001
S3010	3μm	7.8×250mm	8.7825AK.0001
S3010	3μm	7.8×300mm	8.7830AK.0001
S3015	3μm	4.6×50mm	8.4605AL.0001
S3015	3μm	4.6×150mm	8.4615AL.0001
S3015	3μm	4.6×250mm	8.4625AL.0001
S3015	3μm	4.6×300mm	8.4630AL.0001
S3015	3μm	7.8×50mm	8.7805AL.0001
S3015	3μm	7.8×150mm	8.7815AL.0001
S3015	3μm	7.8×250mm	8.7825AL.0001
S3015	3μm	7.8×300mm	8.7830AL.0001
S3030	3μm	4.6×50mm	8.4605AM.0001
S3030	3μm	4.6×150mm	8.4615AM.0001
S3030	3μm	4.6×250mm	8.4625AM.0001
S3030	3μm	4.6×300mm	8.4630AM.0001
S3030	3μm	7.8×50mm	8.7805AM.0001
S3030	3μm	7.8×150mm	8.7815AM.0001
S3030	3μm	7.8×250mm	8.7825AM.0001
S3030	3μm	7.8×300mm	8.7830AM.0001
S5015	5μm	4.6×50mm	8.4605AN.0001
S5015	5μm	4.6×150mm	8.4615AN.0001
S5015	5μm	4.6×250mm	8.4625AN.0001
S5015	5μm	4.6×300mm	8.4630AN.0001
S5015	5μm	7.8×50mm	8.7805AN.0001
S5015	5μm	7.8×150mm	8.7815AN.0001
S5015	5μm	7.8×250mm	8.7825AN.0001
S5015	5μm	7.8×300mm	8.7830AN.0001
S5030	5μm	4.6×50mm	8.4605AO.0001
S5030	5μm	4.6×150mm	8.4615AO.0001
S5030	5μm	4.6×250mm	8.4625AO.0001
S5030	5μm	4.6×300mm	8.4630AO.0001
S5030	5μm	7.8×50mm	8.7805AO.0001
S5030	5μm	7.8×150mm	8.7815AO.0001
S5030	5μm	7.8×250mm	8.7825AO.0001
S5030	5μm	7.8×300mm	8.7830AO.0001
S5050	5μm	4.6×50mm	8.4605AP.0001
S5050	5μm	4.6×150mm	8.4615AP.0001
S5050	5μm	4.6×250mm	8.4625AP.0001
S5050	5μm	4.6×300mm	8.4630AP.0001
S5050	5μm	7.8×50mm	8.7805AP.0001
S5050	5μm	7.8×150mm	8.7815AP.0001
S5050	5μm	7.8×250mm	8.7825AP.0001
S5050	5μm	7.8×300mm	8.7830AP.0001

CruxPoly and ElfPoly polymer matrix SEC column

CruxPoly and ElfPoly series columns are based on highly cross-linked polystyrene / divinylbenzene (PS/DVB) particles with very narrow particle size and pore size distributions. Their uniformpore size distribution offers near linear calibration curves covering wide molecular weight range. Compared to silica gel matrix size exclusion column, polymer matrix is stable to resist wide range of solvents, and have low background noise for light scattering detection. They are uesd to separate .polystyrene, polyacrylate, polysiloxane etc.

CruxPoly series columns

PH range: 1 – 14; maximum temperature: 145 ℃. Mobile phase is organic solvents (THF, DMAC, TCB, NMP etc.).

packing model	aperture diameter	Partical size	Molecular weight exclusion limit
CruxPoly T100	100Å	5μm,10μm	100 - 100,000
CruxPoly T300	300Å	5μm,10μm	500 - 250,000
CruxPoly T500	500Å	5μm,10μm	1,000 - 750,000
CruxPoly T1000	1000Å	5μm,10μm	5,000 - 2,500,000
CruxPoly TMIX	100 - 1000Å	5μm,10μm	5,000 - 2,500,000

ElfPoly series of columns

PH range: 1 – 14; maximum temperature: 250 ℃, mobile phase is organic solvents (THF, DMAC, TCB, NMP etc.).

packing model	aperture diameter	Partical size	Molecular weight exclusion limit
ElfPoly Z300	300Å	5μm	500 - 250,000
ElfPoly Z500	500Å	5μm	1,000 - 750,000
ElfPoly Z1000	1000Å	5μm	5,000 - 2,500,000
ElfPoly Z1000	2000Å	5μm	10,000 - 5,000,000
ElfPoly ZMIX	300 - 2000Å	5μm	10,000 - 5,000,000

Ordering Information:

Packings	Particle size	diameter × length	Cat. No
CruxPoly T100	5μm	4.6×50mm	8.4605BA.0001
CruxPoly T100	5μm	4.6×300mm	8.4630BA.0001
CruxPoly T100	5μm	7.8×50mm	8.7805BA.0001
CruxPoly T100	5μm	7.8×300mm	8.7830BA.0001
CruxPoly T100	10μm	4.6×50mm	8.4605BB.0001
CruxPoly T100	10μm	4.6×300mm	8.4630BB.0001
CruxPoly T100	10μm	7.8×50mm	8.7805BB.0001
CruxPoly T100	10μm	7.8×300mm	8.7830BB.0001
CruxPoly T300	5μm	4.6×50mm	8.4605BC.0001
CruxPoly T300	5μm	4.6×300mm	8.4630BC.0001
CruxPoly T300	5μm	7.8×50mm	8.7805BC.0001
CruxPoly T300	5μm	7.8×300mm	8.7830BC.0001
CruxPoly T300	10μm	4.6×50mm	8.4605BD.0001
CruxPoly T300	10μm	4.6×300mm	8.4630BD.0001
CruxPoly T300	10μm	7.8×50mm	8.7805BD.0001
CruxPoly T300	10μm	7.8×300mm	8.7830BD.0001
CruxPoly T500	5μm	4.6×50mm	8.4605BE.0001
CruxPoly T500	5μm	4.6×300mm	8.4630BE.0001
CruxPoly T500	5μm	7.8×50mm	8.7805BE.0001
CruxPoly T500	5μm	7.8×300mm	8.7830BE.0001
CruxPoly T500	10μm	4.6×50mm	8.4605BF.0001
CruxPoly T500	10μm	4.6×300mm	8.4630BF.0001
CruxPoly T500	10μm	7.8×50mm	8.7805BF.0001
CruxPoly T500	10μm	7.8×300mm	8.7830BF.0001
CruxPoly T1000	5μm	4.6×50mm	8.4605BG.0001
CruxPoly T1000	5μm	4.6×300mm	8.4630BG.0001
CruxPoly T1000	5μm	7.8×50mm	8.7805BG.0001
CruxPoly T1000	5μm	7.8×300mm	8.7830BG.0001
CruxPoly T1000	10μm	4.6×50mm	8.4605BH.0001
CruxPoly T1000	10μm	4.6×300mm	8.4630BH.0001

Packings	Particle size	diameter × length	Cat. No
CruxPoly T1000	10μm	7.8×50mm	8.7805BH.0001
CruxPoly T1000	10μm	7.8×300mm	8.7830BH.0001
CruxPoly TMIX	5μm	4.6×50mm	8.4605BJ.0001
CruxPoly TMIX	5μm	4.6×300mm	8.4630BJ.0001
CruxPoly TMIX	5μm	7.8×50mm	8.7805BJ.0001
CruxPoly TMIX	5μm	7.8×300mm	8.7830BJ.0001
CruxPoly TMIX	10μm	4.6×50mm	8.4605BK.0001
CruxPoly TMIX	10μm	4.6×300mm	8.4630BK.0001
CruxPoly TMIX	10μm	7.8×50mm	8.7805BK.0001
CruxPoly TMIX	10μm	7.8×300mm	8.7830BK.0001
ElfPoly Z300	5μm	4.6×50mm	8.4605CA.0001
ElfPoly Z300	5μm	4.6×300mm	8.4630CA.0001
ElfPoly Z300	5μm	7.8×50mm	8.7805CA.0001
ElfPoly Z300	5μm	7.8×300mm	8.7830CA.0001
ElfPoly Z500	5μm	4.6×50mm	8.4605CB.0001
ElfPoly Z500	5μm	4.6×300mm	8.4630CB.0001
ElfPoly Z500	5μm	7.8×50mm	8.7805CB.0001
ElfPoly Z500	5μm	7.8×300mm	8.7830CB.0001
ElfPoly Z1000	5μm	4.6×50mm	8.4605CD.0001
ElfPoly Z1000	5μm	4.6×300mm	8.4630CD.0001
ElfPoly Z1000	5μm	7.8×50mm	8.7805CD.0001
ElfPoly Z1000	5μm	7.8×300mm	8.7830CD.0001
ElfPoly Z2000	5μm	4.6×50mm	8.4605CE.0001
ElfPoly Z2000	5μm	4.6×300mm	8.4630CE.0001
ElfPoly Z2000	5μm	7.8×50mm	8.7805CE.0001
ElfPoly Z2000	5μm	7.8×300mm	8.7830CE.0001
ElfPoly ZMIX	5μm	4.6×50mm	8.4605CF.0001
ElfPoly ZMIX	5μm	4.6×300mm	8.4630CF.0001
ElfPoly ZMIX	5μm	7.8×50mm	8.7805CF.0001
ElfPoly ZMIX	5μm	7.8×300mm	8.7830CF.0001

Preparative column

CNW preparative columns and semi-preparative columns have a variety of packings, particle size as 5 and 10μm.

Silica gel matrix:

Athena C18
Athena C18-BIO
Athena C8
Athena C4
Athena Phenyl
Athena Silica
Athena CN
Athena NH2
Athena Diol
Athena HILIC
Athena HILIC(2)
Athena HILIC(3)
Athena SAX
Athena SCX

Polymer matrix：

CNWSep RP1
CNWSep RP3
CNWSep SP
CNWSep SAX
CNWSep WAX
CNWSep SCX
CNWSep WCX

Size exclusion chromatography:

CNWGel X5010
CNWGel X5015
CNWGel X5030
CNWGel X5050
CNWGel X5100
CNWGel X5200
CNWGel S5015
CNWGel S5030
CNWGel S5050
CruxPoly T100
CruxPoly T300
CruxPoly T500
CruxPoly T1000
CruxPoly TMIX
ElfPoly Z300
ElfPoly Z500
ElfPoly Z1000
ElfPoly Z2000
ElfPoly ZMIX

Preparative column and semi-preparative column dimensions as:

50mm x 10.0mm
100mm x 10.0mm
150mm x 10.0mm
250mm x 10.0mm
10mm x 21.2mm
50mm x 21.2mm
100mm x 21.2mm
150mm x 21.2mm
250mm x 21.2mm
50mm x 30.0mm
100mm x 30.0mm
150mm x 30.0mm
250mm x 30.0mm
50mm x 50.0mm
150mm x 50.0mm
250mm x 50.0mm

The description and characteristics of preparative and semi-preparative silimlar to analytical column.

Please contact ANPEL salesman or inquire for price and delivery date:

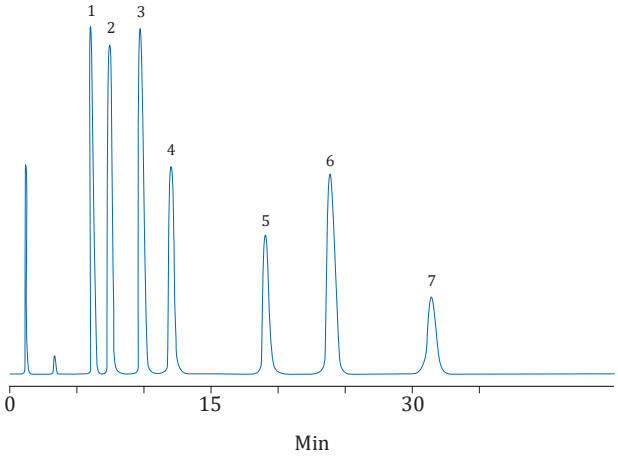
Email：techservice@anpel.com.cn

Applications

Application: Drugs

Tricyclic antidepressants No.1209001

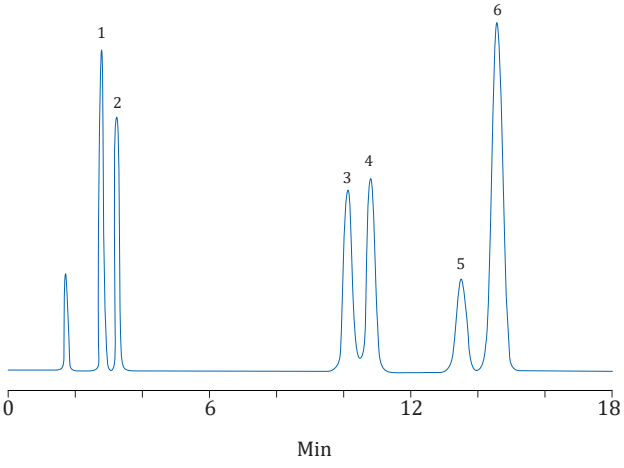
1. Protriptyline
2. Desipramine
3. Nortriptyline
4. Doxepin
5. Imipramine
6. Amitriptyline
7. Trimipramine



Column:	Athena C18-WP 4.6 × 150mm, 5μm (8.461572.0001)
Mobile phase:	methanol / 20 mM KH_2PO_4 - K_2HPO_4 buffer (pH 7.0) (70/30)
Flow rate:	1.2 mL/min
Detection:	240 nm
Column temperature:	30 ˚C

Cough and cold medicine ingredients No.1209003

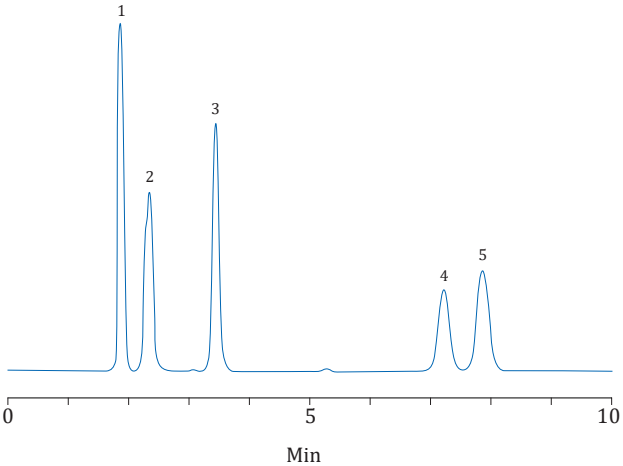
1. Acetaminophen
2. Caffeine
3. Chlorpheniramine Maleate
4. Aspirine
5. Ethenzamide
6. Bucetin



Column:	Athena C18-WP 4.6 × 150mm, 5μm (8.461572.0001)
Mobile phase:	methanol / 50 mM $NH_4H_2PO_4$ - H_3PO_4 buffer (pH 2.5) (20/80)
Flow rate:	1.0 mL/min
Detection:	235 nm
Column temperature:	40 ˚C

Beta-blockers No.1209002

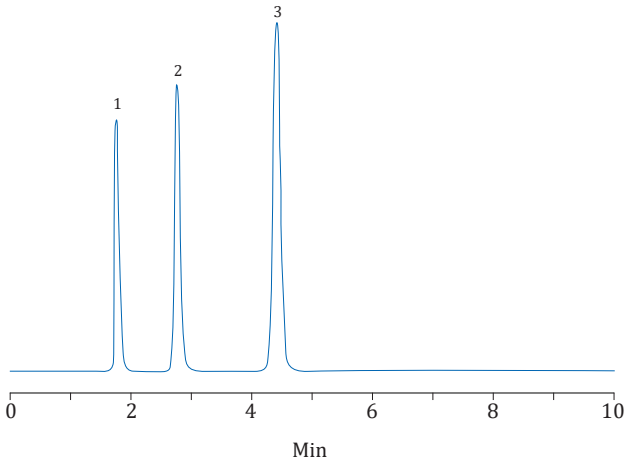
1. Atenolol
2. Nadolol
3. Metoprolol
4. Propranolol
5. Alprenolol



Column:	Athena C18-WP 4.6 × 150mm, 5μm (8.461572.0001)
Mobile phase:	methanol / 20 mM KH_2PO_4 - K_2HPO_4 buffer (pH 7.0) (60/40)
Flow rate:	1.0 mL/min
Detection:	220 nm
Column temperature:	40 ˚C

Procainamide No.1209004

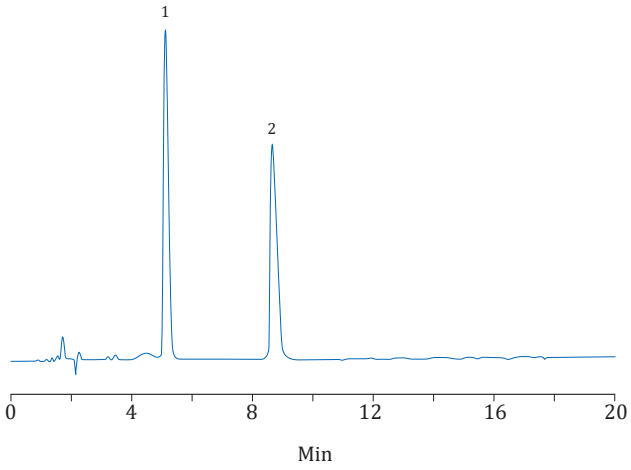
1. Uracil
2. Procainamide
3. N-Acetylprocainamide



Column:	Athena C18-WP 4.6 × 150mm, 5μm (8.461572.0001)
Mobile phase:	methanol / 20 mM KH_2PO_4 - K_2HPO_4 buffer (pH 7.0) (40/60)
Flow rate:	1.0 mL/min
Detection:	254 nm
Column temperature:	40 ˚C

Anticholinergics No.1209005

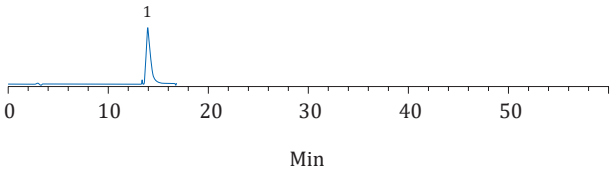
1. Scopolamine Hydrobromide
2. Atropine Sulfate



Column:	Athena C18-WP 4.6 × 150mm, 5μm (8.461572.0001)
Mobile phase:	methanol / 30 mM NaH_2PO_4 buffer (15/85)
Flow rate:	1.0 mL/min
Detection:	254 nm
Column temperature:	40 ˚C

Glycyrrhizin No.1209007

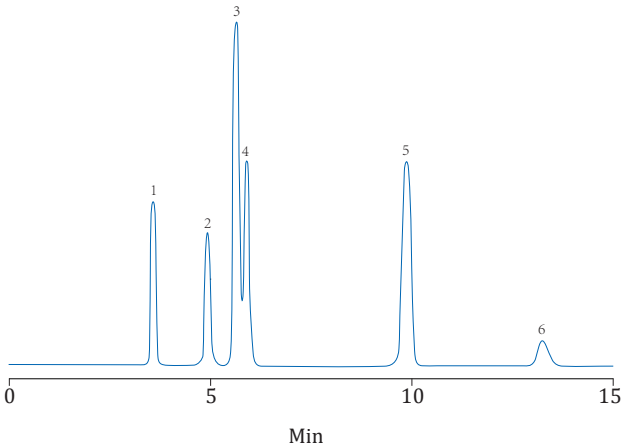
1. Glycyrrhizin



Column:	Athena C18-WP 4.6 * 250mm, 5um (8.462572.0001)
Mobile phase:	acetonitrile / 0.1% acetic acid (38/62)
Flow rate:	1.0mL/min
Detection:	254nm
Column temperature:	30 ˚C

Non-steroidal anti-inflammatory drugs No.1209006

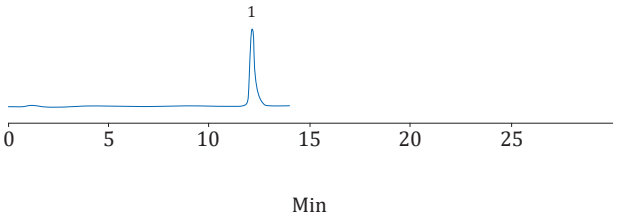
1. Piroxicam
2. Sulindac
3. Ketoprofen
4. Naproxen
5. Flurbiprofen
6. Ibuprofen



Column:	Athena C18-WP 4.6 × 150mm, 5μm (8.461572.0001)
Mobile phase:	acetonitrile / 1% acetic acid buffer solution (65/35)
Flow rate:	1.0 mL/min
Detection:	260 nm
Column temperature:	40 ˚C

Matrine No.1209008

1.Matrine

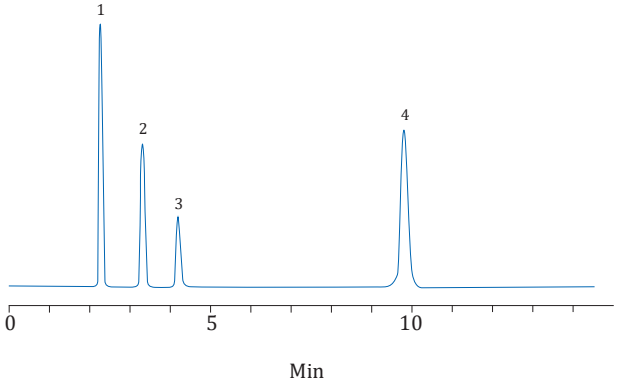


Column:	Athena C18-WP 4.6 * 250mm, 5um (8.462572.0001)
Mobile phase:	acetonitrile / 0.1% phosphoric acid (triethylamine adjusted pH 8.0) = 28/72
Flow rate:	2.0mL/min
Detection:	220nm
Column temperature:	40˚C

Anti-HIV drugs

No.1209009

1.Thymidine
2.d4T
3.AZT-Glucuronide
4.AZT

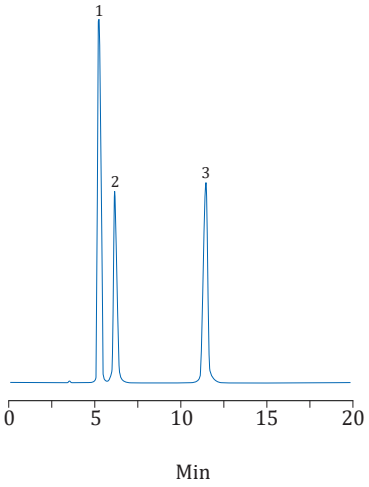


Column:	Athena C18-BIO 4.6 × 150mm, 5μm (8.461578.0001)
Mobile phase:	methanol / 20 mM $NH_4H_2PO_4$ buffer (10/90)
Flow rate:	1.0 mL/min
Detection:	260 nm
Column temperature:	35 ˚C

Steroids -1

No.1209011

1. Estrone
2. Estradiol
3. Estriol

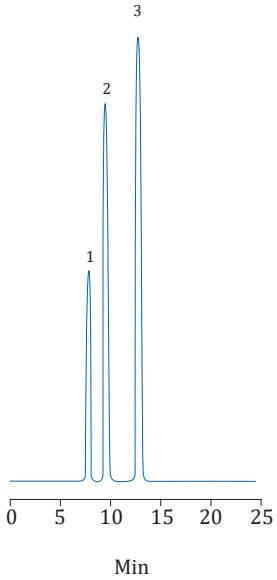


Column:	Athena Silica 4.6 × 150mm, 5μm (8.461576.0001)
Mobile phase:	n-hexane / ethanol (85/15)
Flow rate:	1.0 mL/min
Detection:	270 nm
Column temperature:	40 ˚C

Tricyclic antidepressants

No.1209010

1. Protriptyline
2. Nortriptyline
3. Amitriptyline

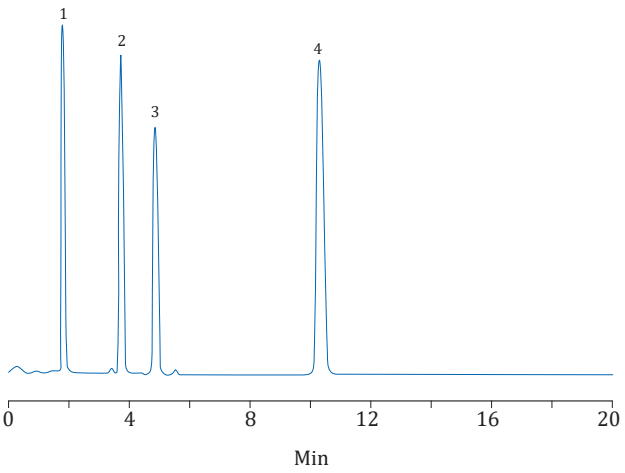


Column:	Athena C8 4.6 x 150mm, 5μm (8.461575.0001)
Mobile phase:	methanol / 20 mM K_2HPO_4 buffer (pH 7.0) (80/20)
Flow rate:	1.0 mL/min
Detection:	254 nm
Column temperature:	40 ˚C

Steroids -2

No.1209012

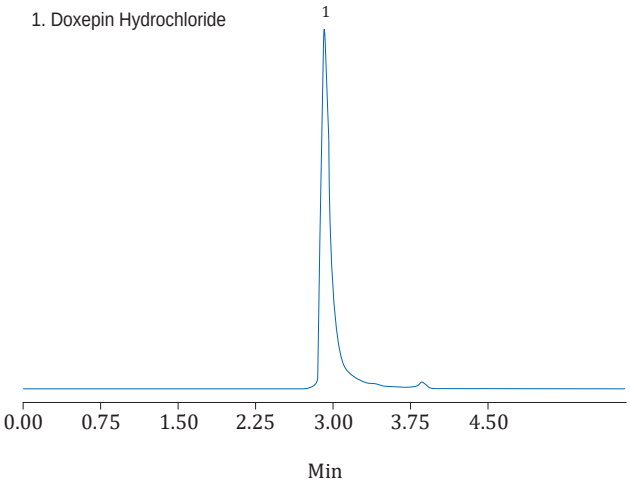
1. Estriol
2. β-Estradiol
3. Estrone
4. Progesterone



Column:	Athena C18-WP 4.6 × 150mm, 5μm (8.461572.0001)
Mobile phase:	acetonitrile / water (60/40)
Flow rate:	1.0 mL/min
Detection:	30 nm
Column temperature:	35 ˚C

Doxepin Hydrochloride No.1209013

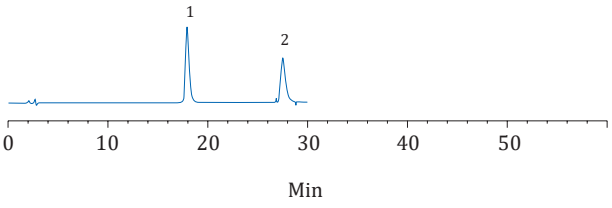
1. Doxepin Hydrochloride



Column:	Athena C18-WP, 5um, 250mm x 4.6mm (8.462572.0001)
Mobile phase:	0.1% triethylamine 0.2 mol / L sodium dihydrogen phosphate: methanol = 65:35 PH = 2.5
Flow rate:	1.0 mL/min
Detection:	254nm
Column temperature:	50°C

Deoxyschizandrin schisandrin B No.1209015

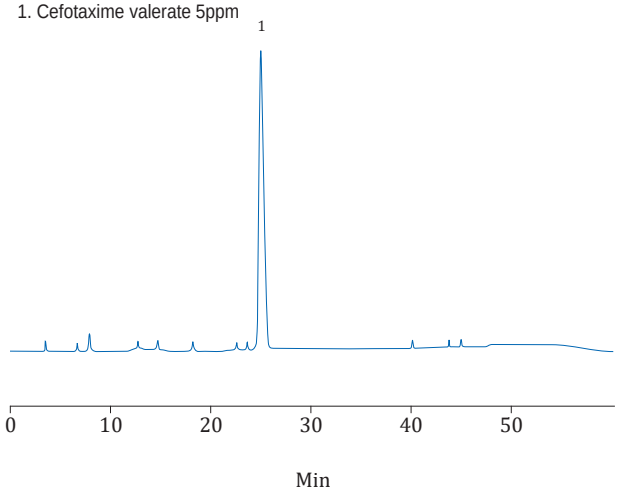
1. Deoxyschizandrin
2. Schisandrin B



Column:	Athena C18-WP 4.6 * 250mm, 5um (8.462572.0001)
Mobile phase:	methanol / water (77/23)
Flow rate:	1.0mL/min
Detection:	254nm
Column temperature:	30 ˚C

Cefotaxime valerate No.1209014

1. Cefotaxime valerate 5ppm



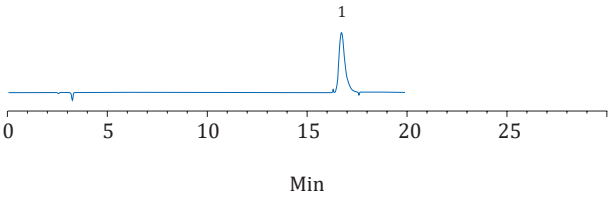
Column:	Athena C18-WP 150mm × 4.6, 5 um (8.461572.0001)
Mobile phase:	

T（min）	Sodium dihydrogen phosphate(pH = 6.25)	methanol
0-7	86	14
7-9	86-82	14-18
9-16	82	18
16-45	82-60	18-40
45-50	60	40
50-55	60-86	40-14
55-60	86	14

Flow rate:	1.0mL/min
Detection:	235nm
Column temperature:	30°C

Calcium pantothenate No.1209016

1. Calcium pantothenate

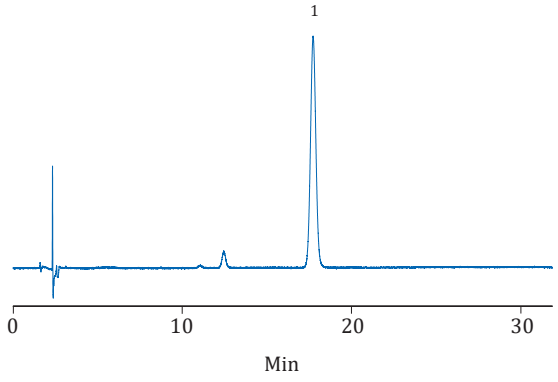


Column:	Athena C18-WP 4.6 * 250mm, 5um (8.462572.0001)
Mobile phase:	acetonitrile / 20 mM potassium phosphate dibasic = 5/95
Flow rate:	1.0mL/min
Detection:	200nm
Column temperature:	30 ˚C

Cefuroxime Sodium

No.1209017

1. Cefuroxime Sodium

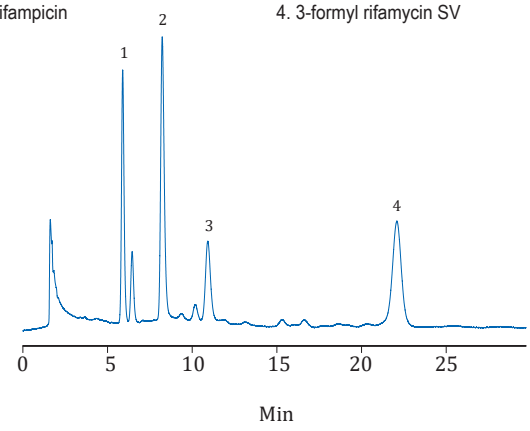


Column:	Athena C18 4.6 × 250mm, 5μm (8.462571.0001)
Mobile phase:	sodium acetate - acetic acid buffer solution (pH3.4) / acetonitrile = 10/1
Flow rate:	1.5 mL/min
Detection:	254 nm
Column temperature:	25 ˚C

Rifampicin and related substances

No.1209019

1. rifampicin quinone
2. rifampicin
3. N-oxidation of rifampicin
4. 3-formyl rifamycin SV

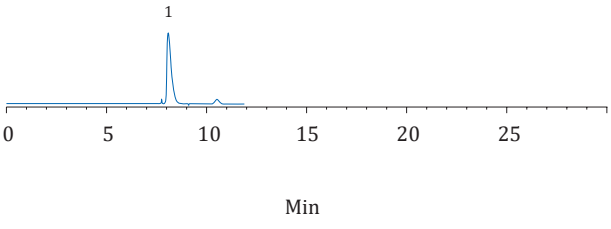


Column:	Athena C8 4.6 × 150mm, 5μm (8.461575.0001)
Mobile phase:	methanol / acetonitrile / 0.075mM potassium dihydrogen phosphate / 1M citric acid (30/30/36/4)
Flow rate:	1.0 mL/min
Detection:	254 nm
Column temperature:	25 ˚C

Taurine

No.1209018

1. taurine

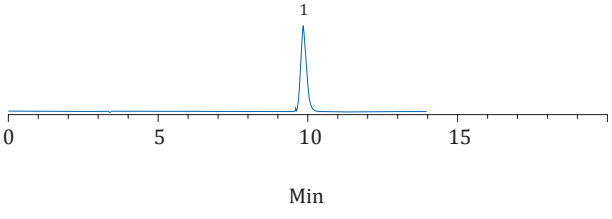


Column:	Athena C18-WP 4.6 * 250mm, 5um (8.462572.0001)
Mobile phase:	methanol / 50mM sodium acetate (37/63)
Flow rate:	1.0mL/min
Detection:	360nm
Column temperature:	30 ˚C

Melatonin

No.1209020

1. melatonin

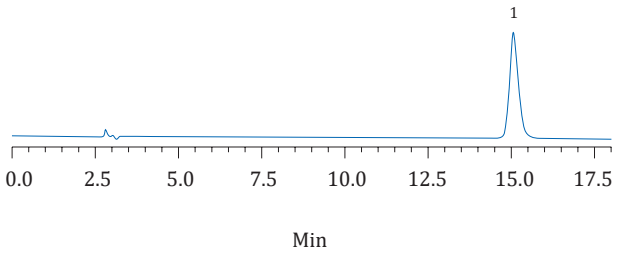


Column:	Athena C18-WP 4.6 * 250mm, 5um (8.462572.0001)
Mobile phase:	methanol / water +50 mM TFA (45/55)
Flow rate:	1mL/min
Detection:	222nm
Column temperature:	30 ˚C

Day ephedra

No.1209021

1. day ephedra

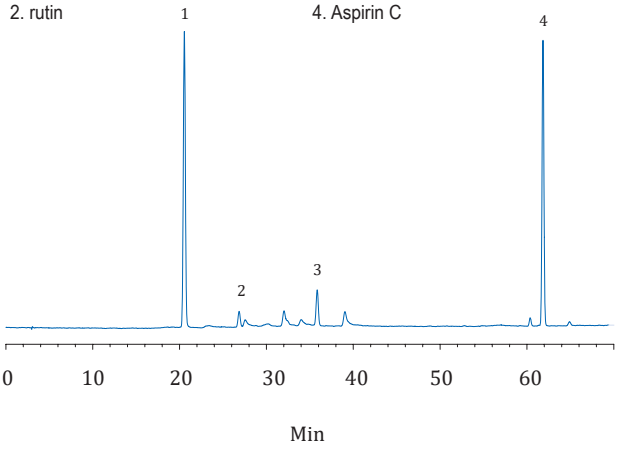


Column:	Athena C18-WP 4.6 * 250mm, 5um (8.462572.0001)
Mobile phase:	acetonitrile / water / 0.1% phosphoric acid (1/2/97)
Flow rate:	1.0mL/min
Detection:	222nm
Column temperature:	25˚C

Aspirin C in propolis

No.1209023

1. p-coumaric acid
2. rutin
3. cinnamic acid
4. Aspirin C

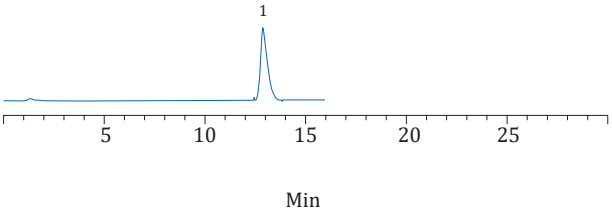


Column:	Athena C18-WP 4.6 * 250mm, 5um (8.462572.0001)
Mobile Phase:	A: methanol B: water (formic acid adjusted PH = 2.7) 0min 20%A 70min 95%A 75min 80%A
Flow rate:	1mL/min
Detection:	310nm
Column temperature:	40 ˚C

Berberine

No.1209022

1. berberine

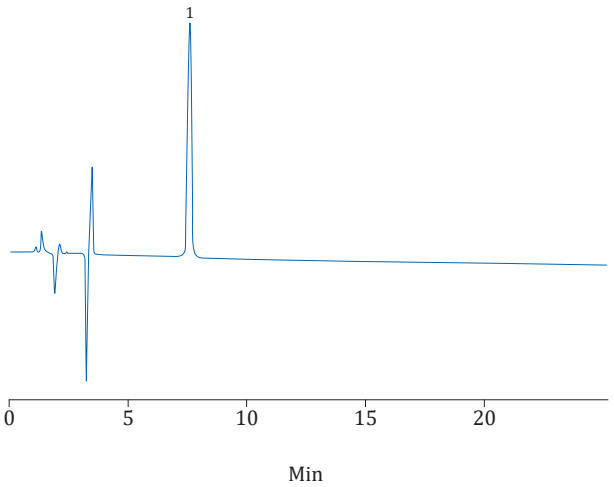


Column:	Athena C18-WP 4.6 * 250mm, 5um (8.462572.0001)
Mobile phase:	12.5mM sodium dodecyl / 12.5mM potassium dihydrogen phosphate / acetonitrile (25/25/50)
Flow rate:	1.0mL/min
Detection:	345nm
Column temperature:	25 ˚C

Nicotinamide

No.1209024

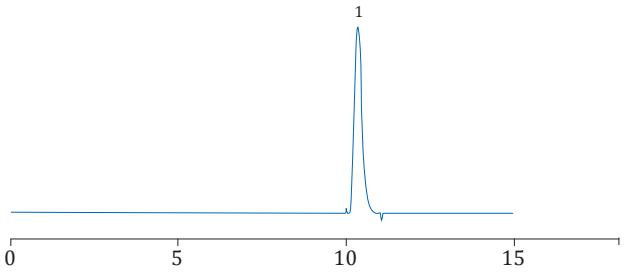
1. Nicotinamide



Column:	Athena C18-wp, 5 µm, 150 mm × 4.6 mm, (8.461572.0001)
Mobile phase:	methanol 70 mL, isopropanol, 20 mL, heptane sulfonate 1 g, was dissolved with 910 mL of water and after mixing using perchloric acid to adjust to pH 2.1 ± 0.1, filtered through 0.45 µm membrane
Flow rate:	1.0 mL/min
Detection:	261 nm
Column temperature:	25 ˚C

VitB6 No.1209025

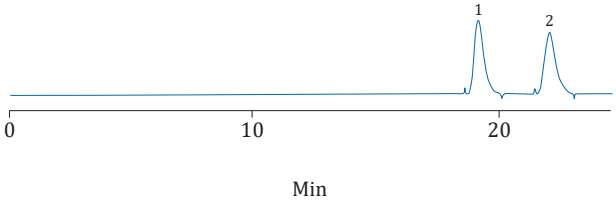
1. VitB6



Column:	Athena C18-WP 4.6 * 250mm, 5um (8.462572.0001)
Mobile phase:	methanol / 0.04% pentane sulfonate (use acetic acid to adjust ph3.0) = 15/85
Flow rate:	1mL/min
Detection:	291nm
Column temperature:	30˚C

Psoralen No.1209027

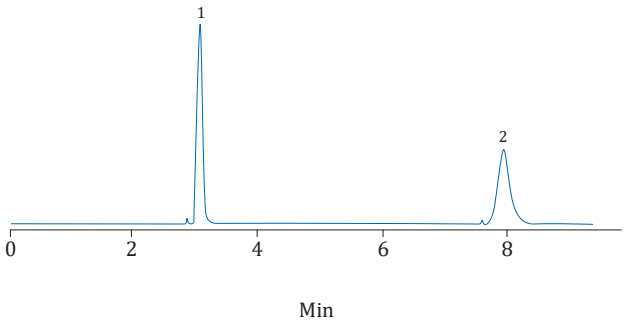
1. psoralen
1. isopsoralen



Column:	Athena C18-WP 4.6 * 250mm, 5um (8.462572.0001)
Mobile phase:	methanol / water = 40/60
Flow rate:	1mL/min
Detection:	246nm
Column temperature:	30˚C

Coenzyme Q No.1209026

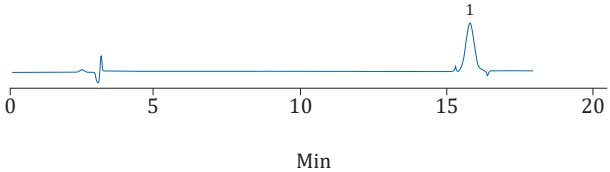
1. Coenzyme Q9
2. Coenzyme Q10



Column:	Athena C18-WP 4.6 * 250mm, 5um (8.462572.0001)
Mobile phase:	methanol / ethanol = 50/50
Flow rate:	1mL/min
Detection:	275nm
Column temperature:	30˚C

Loganin No.1209028

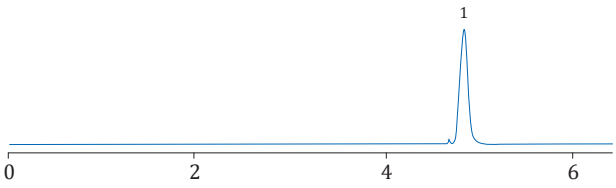
1. Loganin



Column:	Athena C18-WP 4.6 * 250mm, 5um (8.462572.0001)
Mobile phase:	methanol / acetonitrile / 0.1% phosphoric acid = 5/9/86
Flow rate:	1mL/min
Detection:	236nm
Column temperature:	30˚C

Paeonol No.1209029

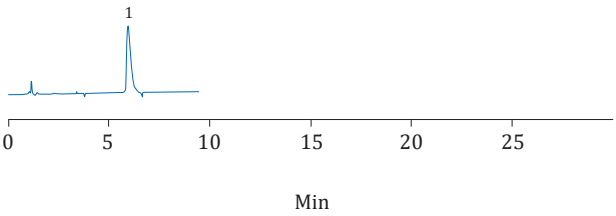
1. Paeonol



Column:	Athena C18-WP 4.6 * 250mm, 5um (8.462572.0001)
Mobile phase:	methanol / water = 70/30
Flow rate:	1.0mL/min
Detection:	274nm
Column temperature:	30˚C

Clarithromycin No.1209031

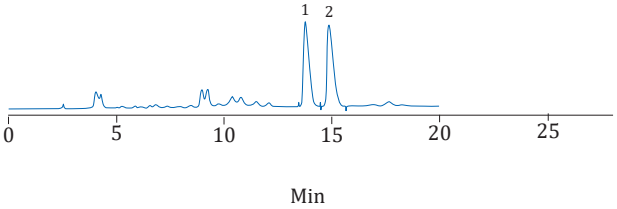
1. Clarithromycin



Column:	Athena C18-WP 4.6 * 250mm, 5um (8.462572.0001)
Mobile phase:	acetonitrile / phosphate buffer (ph5.5) = 40/60
Flow rate:	1.0mL/min
Detection:	210nm
Column temperature:	30˚C

Cefixime No.1209030

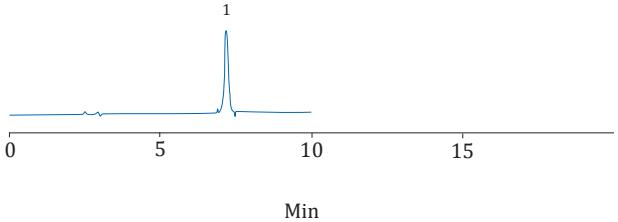
1. E isomer
2. cefixime



Column:	Athena C18-WP 4.6 * 250mm, 5um (8.462572.0001)
Mobile phase:	tetrabutylammonium hydroxide (ph7.0) / acetonitrile = 72:28
Flow rate:	1.0mL/min
Detection:	254nm
Column temperature:	30˚C

Paeoniflorin No.1209032

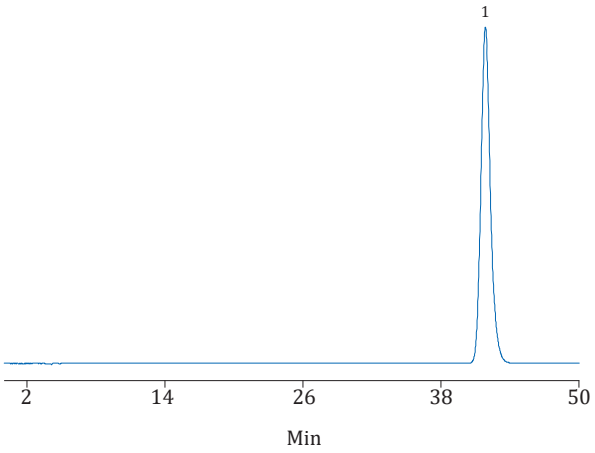
1. Paeoniflorin



Column:	Athena C18-WP 4.6 * 250mm, 5um (8.462572.0001)
Mobile phase:	acetonitrile / 0.04% phosphoric acid = 15/85
Flow rate:	1.0mL/min
Detection:	230nm
Column temperature:	30˚C

Carbamazepine No.1209033

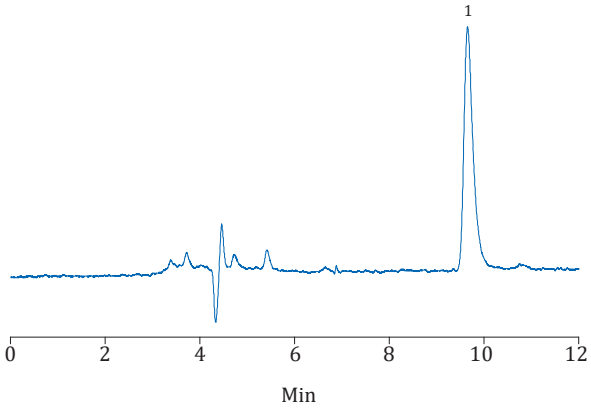
1. Carbamazepine



Column:	Athena CN 4.6 × 250mm, 5μm (8.462533.0001)
Mobile phase:	methanol / water / trifluoroacetic acid (12/85/3)
Flow rate:	1.0 mL/min
Detection:	230 nm
Column temperature:	25 ˚C

Domiphen bromide No.1209035

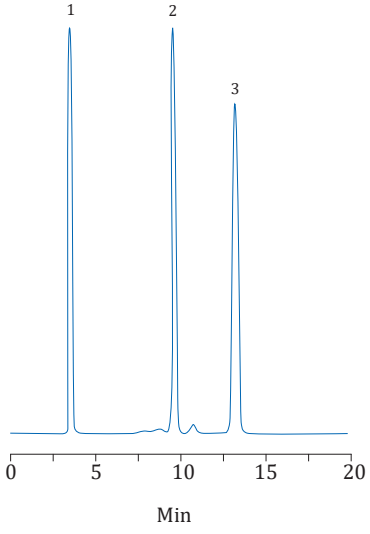
1. Domiphen bromide



Column:	Athena SCX 4.6 × 250mm, 5μm (8.462523.0001)
Mobile phase:	methanol / 50mM ammonium acetate (80/20)
Flow rate:	0.7 mL/min
Detection:	274 nm
Column temperature:	25 ˚C

Acetylacetone No.1209034

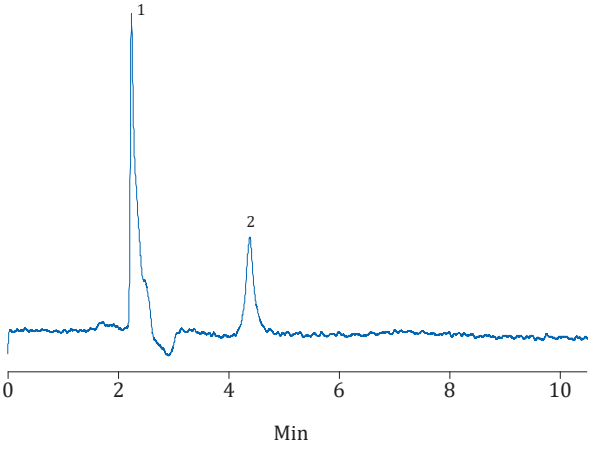
1. Acetylacetone
2. 1-Nitronaphthalene
3. Naphthalene



Column:	Athena C18 4.6 × 150mm, 5μm (8.461571.0001)
Mobile phase:	30mM Na_3PO_4 buffer (Use H_3PO_4 to adjust pH2.5)
Flow rate:	1.0 mL/min
Detection:	254 nm
Column temperature:	40 ˚C

Methotrexate No.1209036

1. Methanol
2. Methotrexate



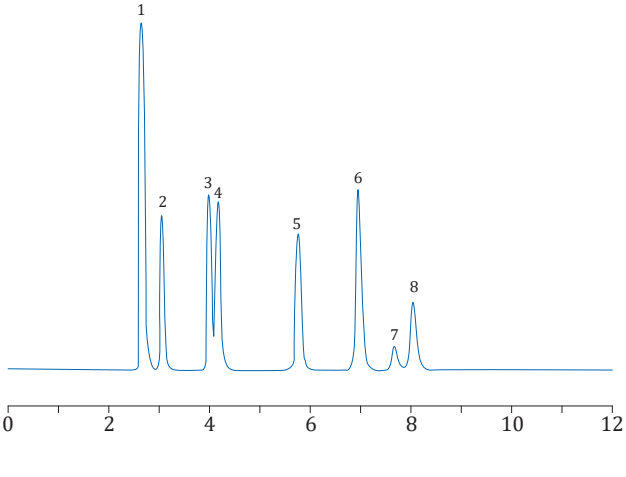
Column:	Athena HILIC 4.6 × 150mm, 5μm (8.461531.0001)
Mobile phase:	acetonitrile / 10mM ammonium acetate (90/10)
Flow rate:	1.0 mL/min
Detection:	306 nm
Column temperature:	25 ˚C

Application: Foods

Water-soluble vitamins

No.1209037

1. Vitamin C
2. Vitamin B13
3. Nicotinic acid
4. Nicotinamide
5. Pyridoxal
6. Pyridoxine
7. Calcium pantothenate
8. Thiamin

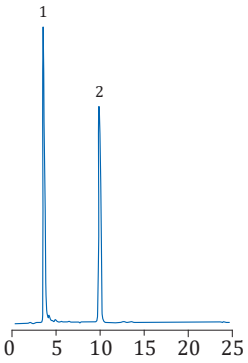


Column:	Athena C18-WP 4.6 × 250mm, 5μm (8.462572.0001)
Mobile phase:	acetonitrile / 20mM H_3PO_4 +5 mM pentane sulfonate buffer (8/92)
Flow rate:	1.0 mL/min
Detection:	210 nm
Column temperature:	40 ˚C

Vitamin B

No.1209039

1. Thiamin HCl
2. Riboflavin

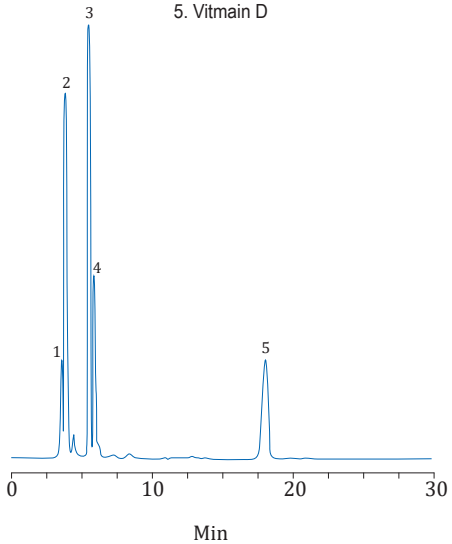


Column:	Athena C18 4.6 × 150mm, 5μm (8.461571.0001)
Mobile phase:	acetonitrile / 10mM Na_3PO_4 buffer (adjust to pH 5.0) = 15/85
Flow rate:	1.0 mL/min
Detection:	254 nm
Column temperature:	40 ˚C

Fat-soluble vitamins

No.1209038

1. VA palmitate
2. Vitamin K1
3. Vitamin E
4. Vitamin K3
5. Vitmain D

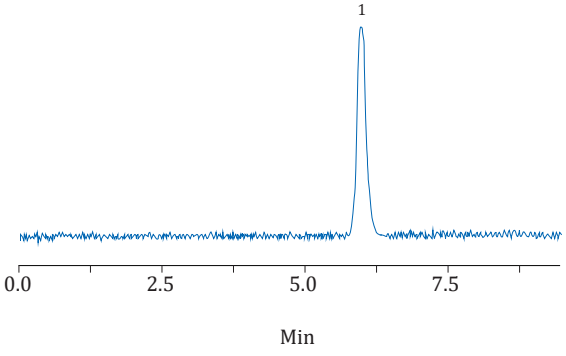


Column:	Athena Silica 4.6 × 150mm, 5μm (8.461576.0001)
Mobile phase:	hexane / chloroform (60/40)
Flow rate:	1.0 mL/min
Detection:	254 nm
Column temperature:	25 ˚C

Citrus red No. 2 in juice

No.1209040

1. Citrus red No. 2

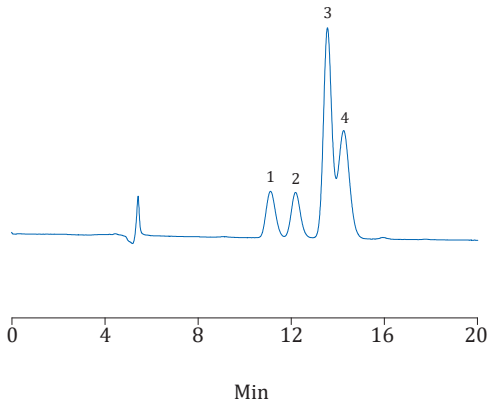


Column:	Athena C18-WP 4.6 × 150mm, 5μm (8.461572.0001)
Mobile phase:	acetonitrile / water (80/20)
Flow rate:	1.0 mL/min
Detection:	500 nm
Column temperature:	35 ˚C

Carbohydrate -1

No.1209041

1. Glucose
2. L-xylose
3. Fructose
4. Lyxose

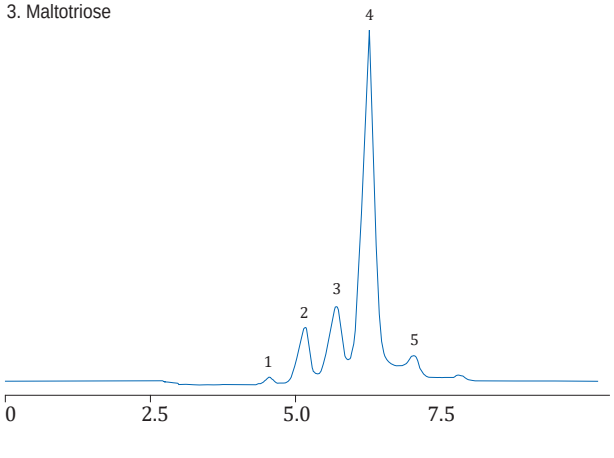


Column:	CNWSep Ca-H 7.8 × 300mm, 5μm (8.7830C3.0001)
Mobile phase:	water
Flow rate:	0.6 mL/min
Detection:	192 nm
Column temperature:	85 ˚C

Carbohydrate -3

No.1209043

1. Glucose
2. Maltose
3. Maltotriose
4. Maltotetraose
5. Matlopentaos

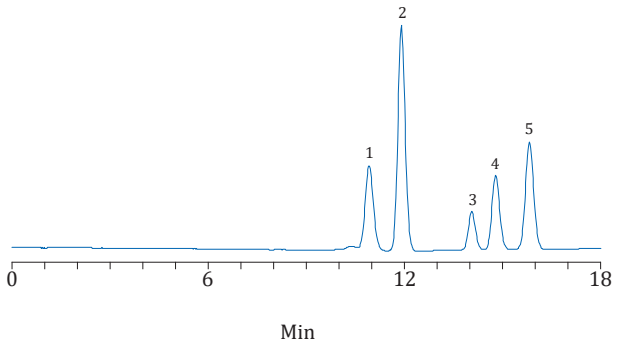


Column:	Athena NH_2 4.6 × 150mm, 5μm (8.461577.0001)
Mobile phase:	acetonitrile / water (50/50)
Flow rate:	1.0 mL/min
Detection:	RID
Column temperature:	40 ˚C

Carbohydrate -2

No.1209042

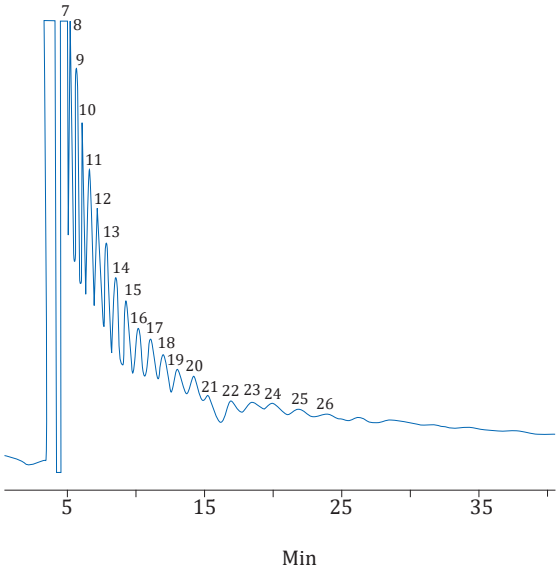
1. Maltotriose
2. Maltose
3. Glucose
4. Mannose
5. Fructose



Column:	CNWSep Ca-H 7.8 × 300mm, 5μm (8.7830C3.0001)
Mobile phase:	water
Flow rate:	0.6 mL / min
Detection:	192 nm
Column temperature:	85 ˚C

Isomaltooligosaccharide

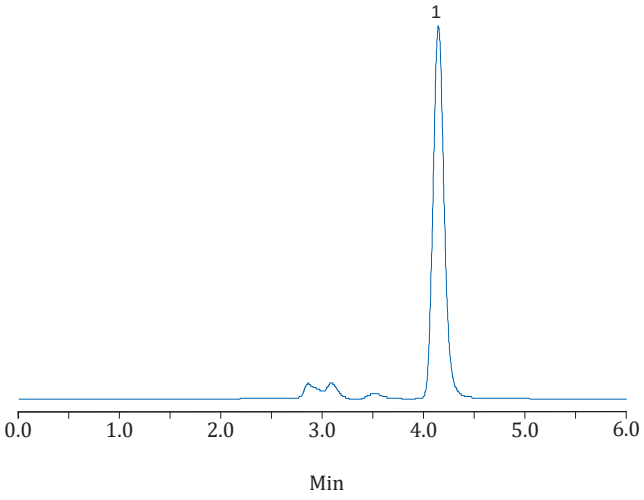
No.1209044



Column:	Athena C4 4.6 × 150mm, 5μm (8.461579.0001)
Mobile phase:	methanol / water (2.5/97.5)
Flow rate:	1.0 mL/min
Detection:	RID
Column temperature:	40 ˚C

Melamine No.1209045

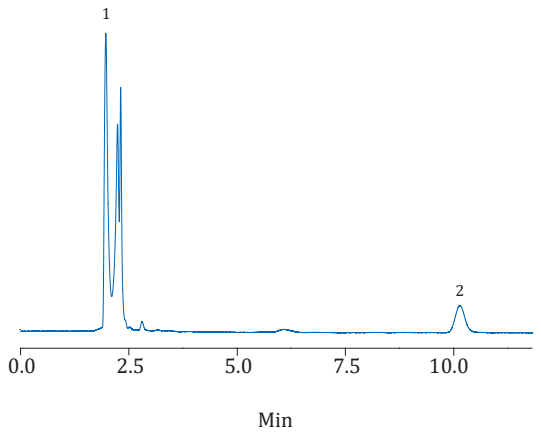
1. Melamine



Column:	Athena HILIC (3) 4.6 × 250mm, 5μm (8.462527.0001)
Mobile phase:	acetonitrile / 10mM ammonium acetate (90/10)
Flow rate:	1.0 mL/min
Detection:	240 nm
Column temperature:	25 ˚C

Melamine in raw milk (according to GB / T 22400-2008) No.1209047

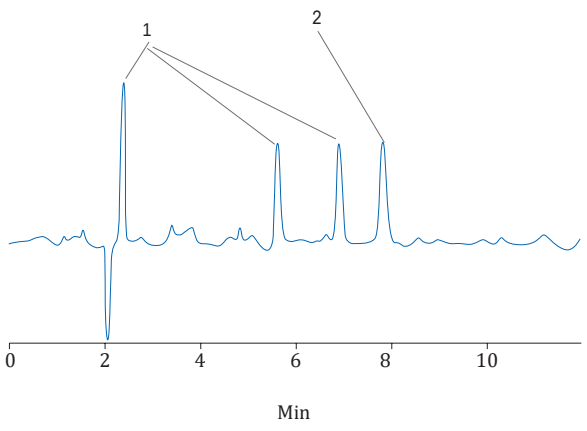
1. Impurity
2. Melamine



Column:	Cnwsil SCX 4.6 × 250mm, 5μm (8.462545.0001)
Mobile phase:	acetonitrile / 50mM KH_2PO_4 buffer (pH 3.0) (30/70)
Flow rate:	1.5 mL/min
Detection:	240 nm
Column temperature:	25 ˚C

Melamine in Milk Powder No.1209046

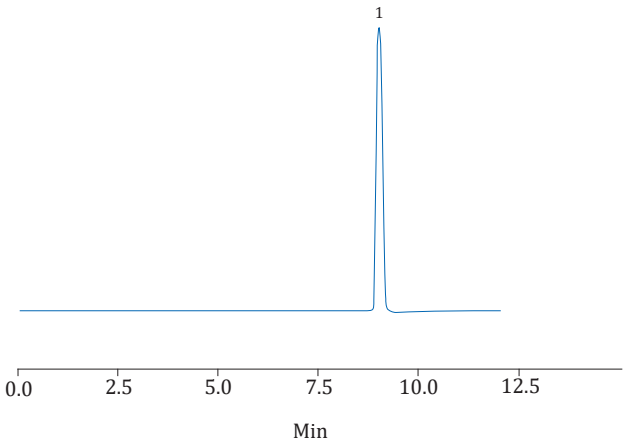
1. Milk impurities
2. Melamine



Column:	Athena C18-WP 4.6 × 150mm, 5μm (8.461572.0001)
Mobile phase:	10mM citrate buffer +10 mM sodium hexane solution / acetonitrile (90/10)
Flow rate:	1.0 mL/min
Detection:	240 nm
Column temperature:	40 ˚C

Furosine No.1209048

1. Furosine

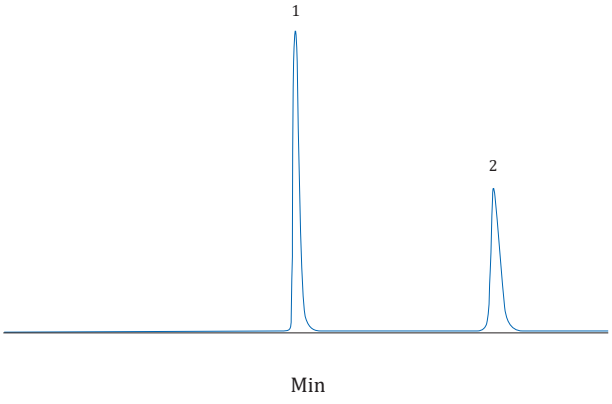


Column:	CNW Athena C18-WP 4.6 * 250mm, 5um (8.462572.0001)
Mobile phase:	A = 0.1% TFA aqueous solution; B = 0.1% TFA acetonitrile
Gradient:	0min： 1%B，25min： 21%B
Flow rate:	1mL/min
Detection:	280nm
Column temperature:	room temperature

Vanillin and ethyl vanillin

No.1209049

1. Vanillin
2. Ethyl vanillin

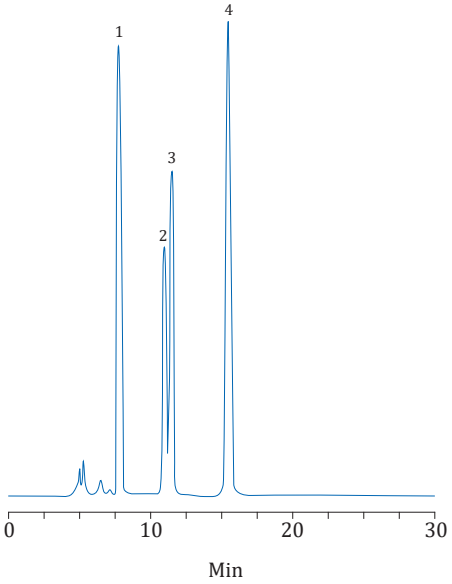


Column:	Athena C18-WP 4.6 * 250mm, 5um (8.462572.0001)
Mobile phase:	acetonitrile / 0.02M sodium dihydrogen phosphate (PH4.0) = 30/70
Flow rate:	1.0mL/min
Detection:	276nm
Column temperature:	30˚C

Tocopherol isomers

No.1209051

1. α-Tocopherol
2. β-Tocopherol
3. γ-Tocopherol
4. δ-Tocopherol

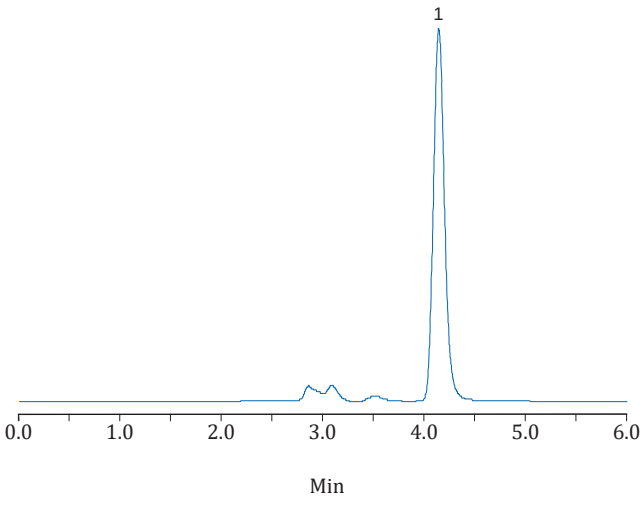


Column:	Athena Silica 4.6 × 150mm, 5μm (8.461576.0001)
Mobile phase:	hexane / ethanol (99/1)
Flow rate:	0.7 mL/min
Detection:	280 nm
Column temperature:	40 ˚C

Tocopherol isomers

No.1209050

1.Tocopherol isomers

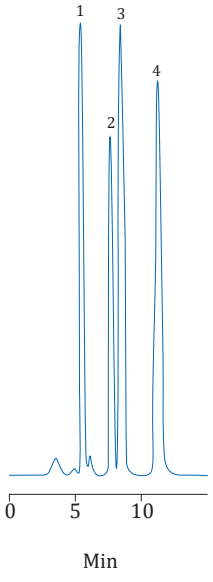


Column:	Athena HILIC (3) 4.6 × 250mm, 5μm (8.462527.0001)
Mobile phase:	acetonitrile / 10mM ammonium acetate (90/10)
Flow rate:	1.0 mL/min
Detection:	240 nm
Column temperature:	25 ˚C

Tocopherol

No.1209052

1. α-Tocopherol
2. β-Tocopherol
3. γ-Tocopherol
4. δ-Tocopherol

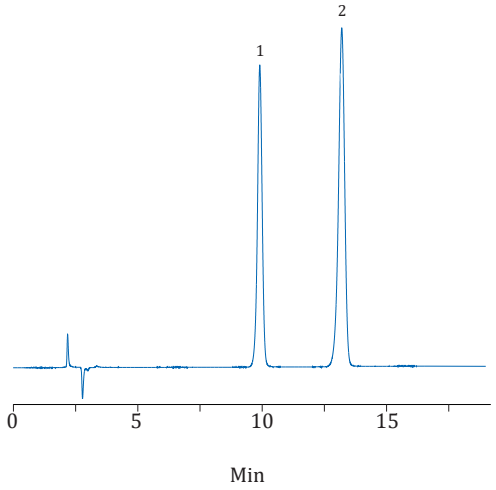


Column:	Athena NH_2 4.6 × 150mm, 5μm (8.461576.0001)
Mobile phase:	hexane / ethyl acetate (70/30)
Flow rate:	1.0 mL/min
Detection:	295 nm
Column temperature:	40 ˚C

Benzoic acid, sorbic acid

No.1209053

1. Bezoic Acid
2. Sorbic acid

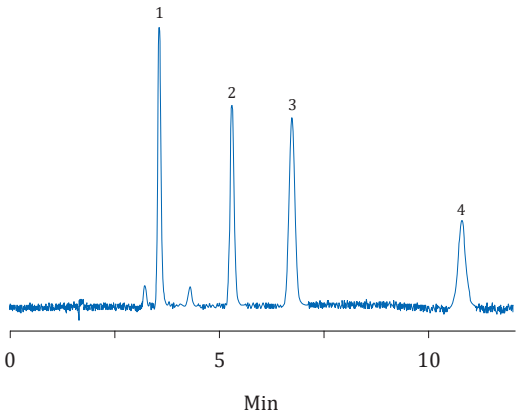


Column:	Athena C18-WP 250mm * 4.6,5 um (8.462572.0001)
Mobile phase:	20mM ammonium acetate / methanol (90/10)
Flow rate:	1.0 mL/min
Detection:	230 nm
Column temperature:	25 ˚C

Sudan in chili sauce

No.1209055

1. Sudan I
2. Sudan II
3. Sudan III
4. Sudan IV

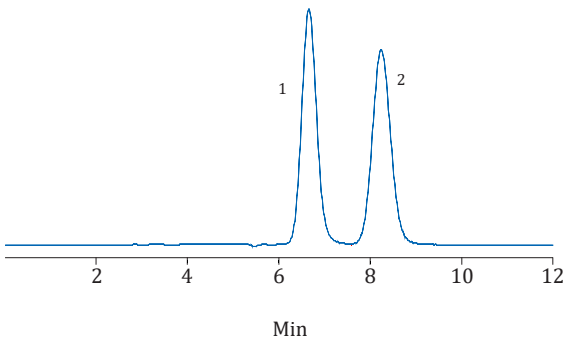


Column:	Athena C18-WP 4.6 × 150mm, 5μm (8.461572.0001)
Mobile phase:	acetonitrile / water (95/5)
Flow rate:	1.0 mL/min
Detection:	500 nm
Column temperature:	35 ˚C

Sorbitol and mannitol

No.1209054

1. Mannitol
2. Sorbitol

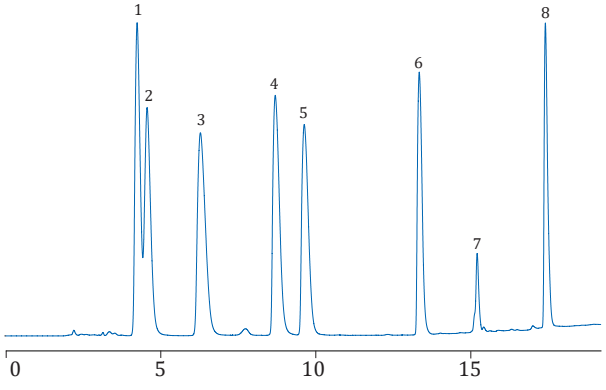


Column:	CNWSep Ca-M 4.6 × 250mm, 10μm (8.4625C4.0001)
Mobile phase:	water
Flow rate:	0.5 mL/min
Detection:	RID
Column temperature:	80 ˚C

Synthetic colorants

No.1209056

1. New Red
2. Tartrazine
3. Amaranth
4. Indigotine
5. Ponceau 4RC
6. Sunset Yellow
7. Brilliant Blue FCF
8. Erythrosin B disodium salt

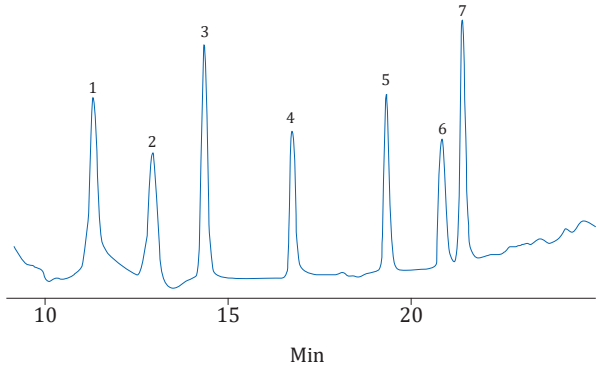


Column:	Athena C18-WP 4.6 × 250mm, 5μm (8.462572.0001)
Mobile Phase:	A: methanol; B: 20mM ammonium acetate (pH 4.0) 0min B: 80%; 5min B: 65%; 12min B: 2%
Flow rate:	1.0 mL/min
Detection:	254 nm
Column temperature:	25 ˚C

Applications: Pesticide

Carbamate pesticide in pepper No.1209057

1. Aldicarb-sulfoxide
2. Aldicarb-sulfone
3. Methomyl
4. Carbofuran-3-hydroxy
5. Aldicarb
6. Carbofuran
7. Carbaryl



Column: Athena C18-WP (4.6 × 250mm, 5μm (8.462572.0001)

Mobile phase:

t(min)	% water	% methanol	Flow rate (mL / min)
0	85	15	0.5
2	75	25	0.5
8	75	25	0.5
9	60	40	0.8
10	55	45	0.8
19	20	80	0.8
25	20	80	0.8
26	85	15	0.5

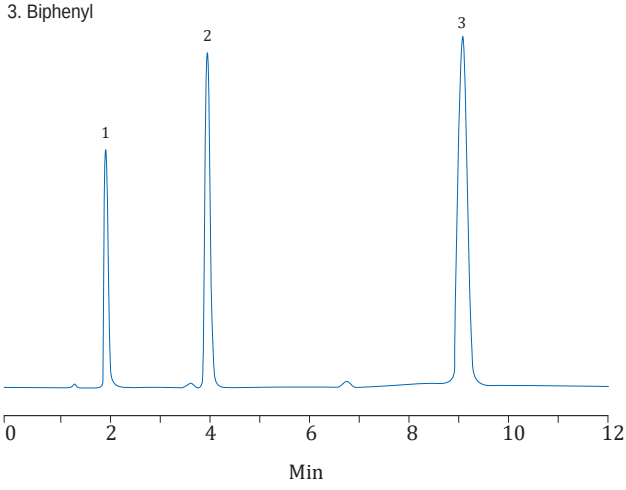
Detection: Fluorescence detector, λex 330nm, λem 465nm

Column derivatization: 50mM NaOH solution and OPA reagent, flow rate 0.3mL/min; hydrolysis temperature 100C, derivative, room temperature

Column temperature: 42 ˚C

Fungicides No.1209058

1. Thiabendazole
2. o-Phenylphenol
3. Biphenyl



Column: Athena C18-WP 4.6 × 150mm, 5μm(8.461572.0001)

Mobile phase: acetonitrile / 30mM $NH_4H_2PO_4$ buffer (65/35)

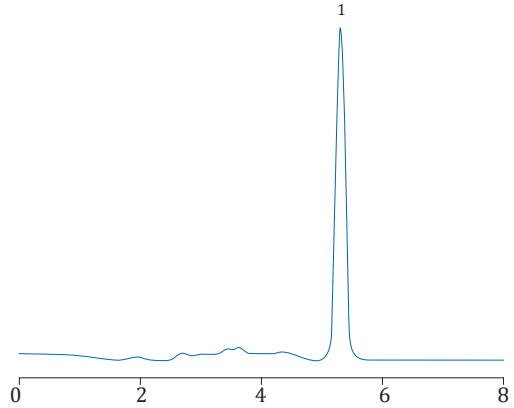
Flow rate: 1.0 mL/min

Detection: 254 nm

Column temperature: 40 ˚C

Glyphosate No.1209059

1. Glyphosate



Column: Athena SAX 4.6 × 150mm, 5μm (8.461521.0001)

Mobile phase: methanol / 10mM KH_2PO_4 (pH 2.0) (15/85)

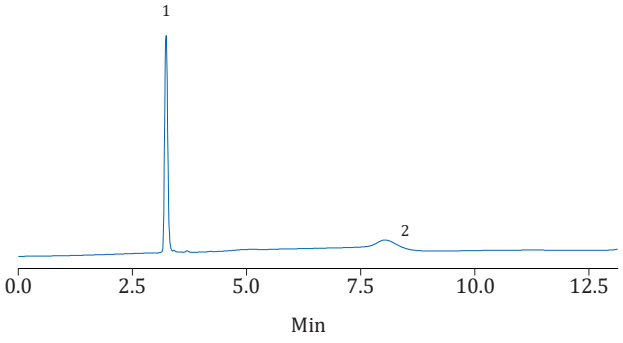
Flow rate: 1.0 mL/min

Detection: 195 nm

Column temperature: 25 ˚C

Clethodim No.1209060

1. Clethodim
2. Impurity



Column: Athena Silica 4.6 * 250mm 5um (8.462576.0001)

Mobile phase: dichloromethane: cyclohexane (70:30, containing 0.5% acetic acid)

Flow rate: 1.0 mL/min

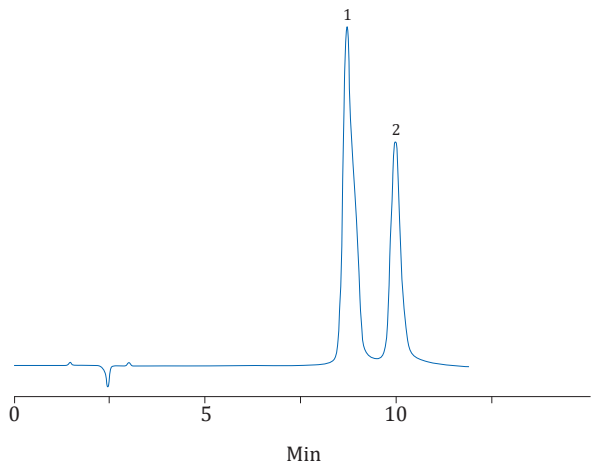
Detection: 280nm

Column temperature: 25 ˚C

Application: veterinary drug residues

Quinolones No.1209061

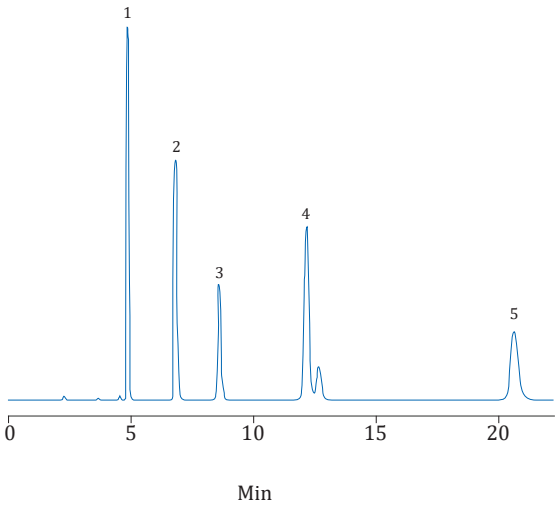
1. Norfloxacin
2. Ciprofloxacin



Column:	Athena C18-WP 4.6 × 150mm, 5μm (8.461572.0001)
Mobile phase:	25mM phosphate buffer / acetonitrile (85/15)
Flow rate:	1.0 mL/min
Detection:	254 nm
Column temperature:	25 ˚C

Sulfa drugs in feed No.1209063

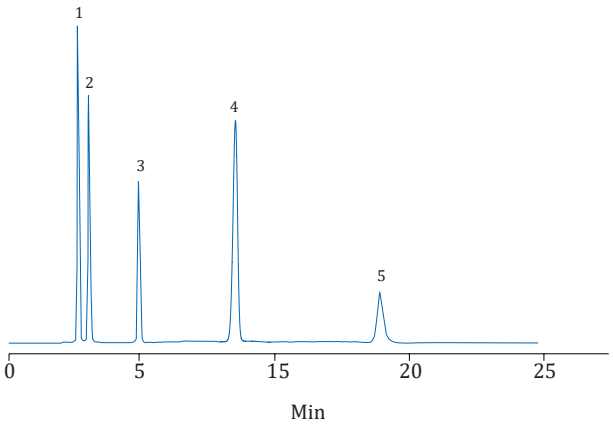
1. Sulfadiazine
2. Sulfamethazine
3. Sulfamonomethoxine
4. Sulfamethoxazole
5. Sulfachinoxalin



Column:	Athena C18-WP 4.6 × 150mm, 5μm (8.461572.0001)
Mobile phase:	acetonitrile / water / acetic acid (25/75/0.3)
Flow rate:	1.0 mL/min
Detection:	270 nm
Column temperature:	25 ˚C

Sulfa No.1209062

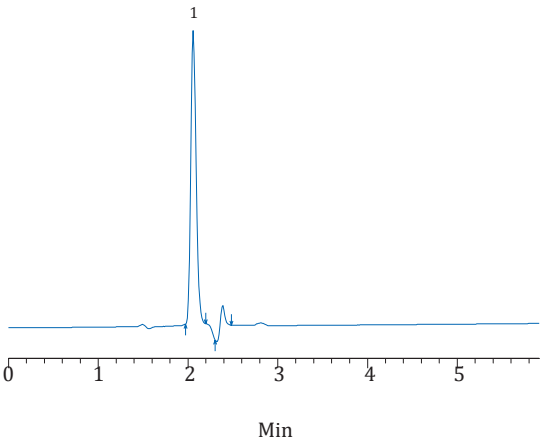
1. Sulfanilamide
2. Sulfisomidine
3. Sulfadiazine
4. Sulfamethazine
5. Sulfamonomethoxine



Column:	Athena C18-WP 4.6 × 150mm, 5μm (8.461572.0001)
Mobile phase:	acetonitrile / 10mM H_3PO_4 buffer (15/85)
Flow rate:	1.0 mL/min
Detection:	254 nm
Column temperature:	40 ˚C

Clenbuterol No.1209064

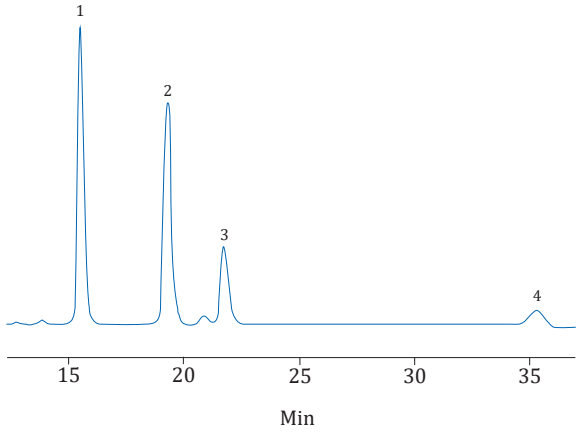
1. Clenbuterol



Column:	Athena C18-WP 250mm * 4.6,5 um (8.462572.0001)
Mobile phase:	water / acetonitrile (20/80)
Flow rate:	1.0 mL/min
Detection:	240 nm
Column temperature:	25 ˚C

Fluoroquinolones No.1209065

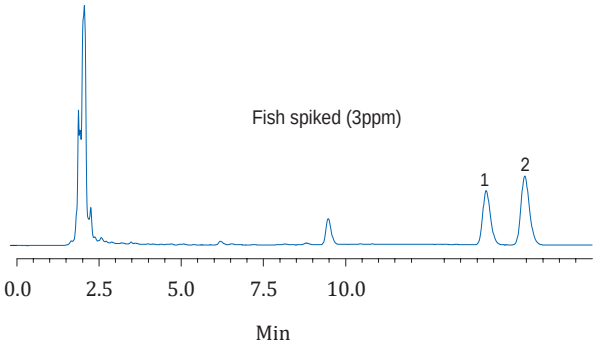
1. Ciprofloxacin
2. Danofloxacin
3 enrofloxacin
4 Sarafloxacin



Column:	Athena C18-WP, 5um, 4.6 * 250mm (8.462572.0001)
Mobile phase:	acetonitrile +0.05 moL / L phosphoric acid / triethylamine (18 +82)
Flow rate:	0.8mL/min
Detection:	280nm
Column temperature:	35˚C

Malachite green and crystal violet aquatic No.1209067

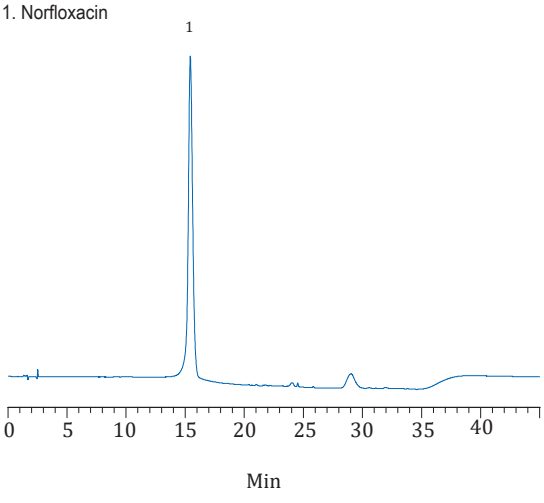
1. malachite green
2. crystal violet



Column:	Athena C18-WP，5um，4.6*250mm (8.462572.0001)
Mobile phase:	acetonitrile +0.125 moL / L ammonium acetate pH = 4.5 (80 +20)
Flow rate:	1.3mL/min
Detection:	265nm
Column temperature:	35˚C

Norfloxacin No.1209066

1. Norfloxacin

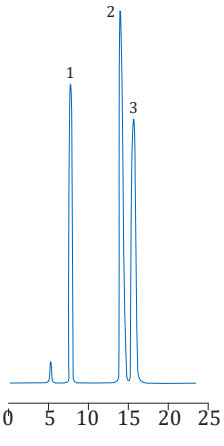


Column:	Athena C18-WP 150mm * 4.6,5 um (8.461572.0001)
Mobile phase:	0.025mol / L phosphoric acid solution (triethylamine adjusted to pH 3.0) / acetonitrile (87/13)
Flow rate:	1.0 mL/min
Detection:	278 nm
Column temperature:	40 ˚C

Applications: Environment

Nitroaniline No.1209068

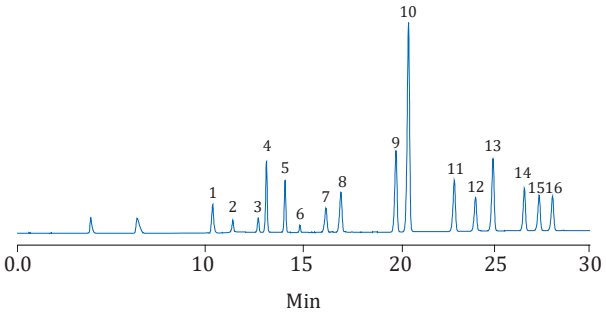
1. o-nitroaniline
2. m-nitroaniline
3. p-nitroaniline



Column:	Athena Silica 4.6 × 150mm, 5μm (8.461576.0001)
Mobile phase:	hexane / chloroform (40/60)
Flow rate:	0.7 mL/min
Detection:	254 nm
Column temperature:	25 ˚C

Polycyclic aromatic hydrocarbons (PAHs) No.1209069

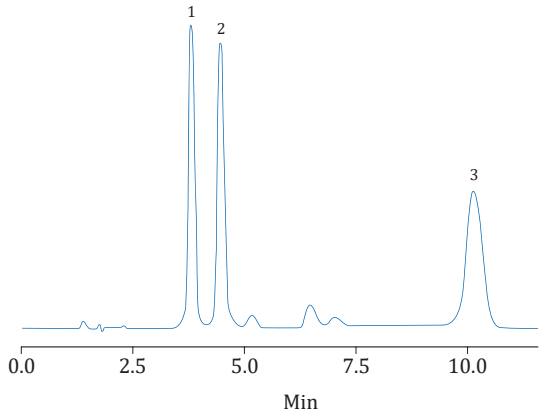
1. Naphthalene
2. Acenaphthylene
3. Acenaphthene
4. Fluorene
5. Phenanthrene
6. Anthracene
7. Fluoranthene
8. Pyrene
9. Benzo(a)anthracene
10. Chrysene
11. Benzo(b)fluoranthene
12. Benzo(k)fluoranthene
13. Benzo(a)pyrene
14. Dibenzo(a,h)anthracene
15. Benzo(g,h,i)perylene
16. Indeno(1,2,3-cd)pyrene



Column:	Athena PAHs 4.6 × 250mm, 5μm
Column Temperature:	30 ˚C
Mobile phase:	gradient A：water B:acetonitrile 0min:40%B;25min 100%B;35min 100%B;45min 40%B
Flow rate:	2.0ml/min
Detection:	266 nm
Inj volume:	5ul (10ppm)

Tetracyclines

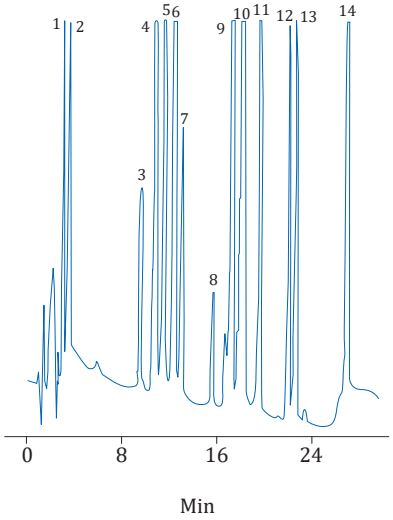
1. Oxytetracycline
2. Tetracycline
3. Chlortetracycline



Column:	Athena C18-WP (4.6 × 250mm, 5μm (8.462572.0001)
Mobile phase:	acetonitrile / methanol / 10mM oxalic acid solution (15/15/70)
Flow rate:	1.0 mL/min
Detection:	355 nm
Column temperature:	25 ˚C

Watery nonvolatile pesticides No.1209071

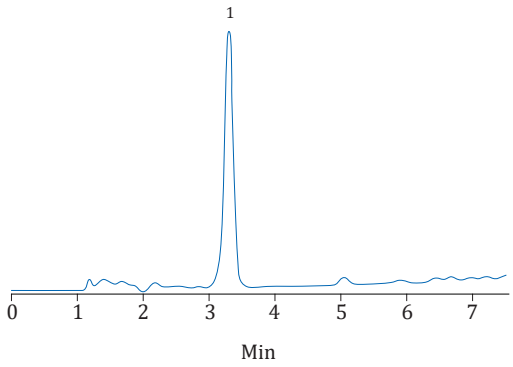
1. Oxamyl
2. Methomyl
3. Aldicarb
4. Simazine
5. Monuron
6. Cyanazine
7. Metribuzin
8. Carbofuran
9. Atrazine
10. Carbaryl
10. Fluometuron
11. Diuron
12. Propham
13. Propachlor
14. Linuron



Column:	Athena C18-WP 4.6 × 250mm, 5μm (8.462572.0001)
Mobile phase:	A: water / acetonitrile (90/10); B: acetonitrile 0min B: 20%; 5min B: 20%; 30min B: 70%
Flow rate:	1.5 mL / min
Detection:	220 nm
Column temperature:	25 ˚C

Bisphenol A No.1209072

1. Bishphenol A



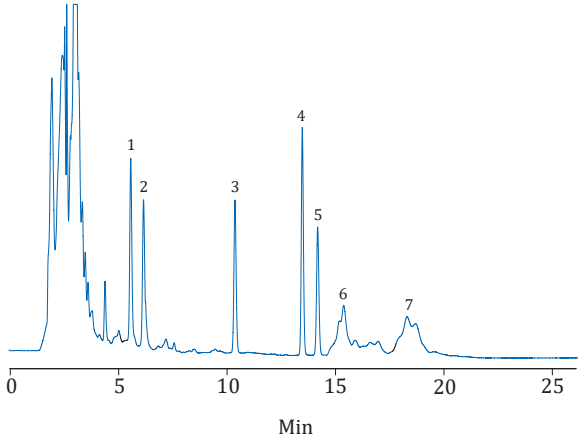
Column:	Athena C18-WP 4.6 × 150mm, 5μm (8.461572.0001)
Mobile phase:	A: Acetonitrile; B: Water 0min B: 40%; 7min B: 5%
Flow rate:	1.0 mL / min
Detection:	216 nm
Column temperature:	35 ˚C

Applications: Industrial parts

Leather's phthalates

No.1209073

1. BBP
2. DBP
3. DNHP
4. DEHP
5. DNOP
6. DINP
7. DIDP

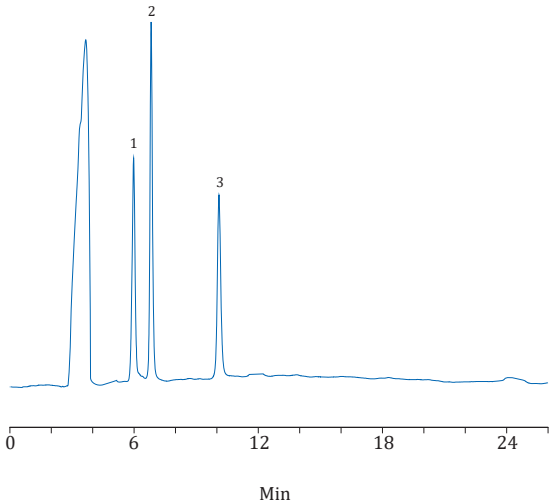


Column:	Athena C18-WP 4.6 × 250mm, 5μm (8.462572.0001)			
Mobile phase:	t(min)	acetonitrile	water	flow rate(mL/min)
	0	90	10	1.0
	6.5	100	0	1.5
	7.5	100	0	1.5
Detection:	228 nm			
Column temperature:	25 ˚C			

Phthalate monoester

No.1209075

1. MMP
2. MEP
3. MBP

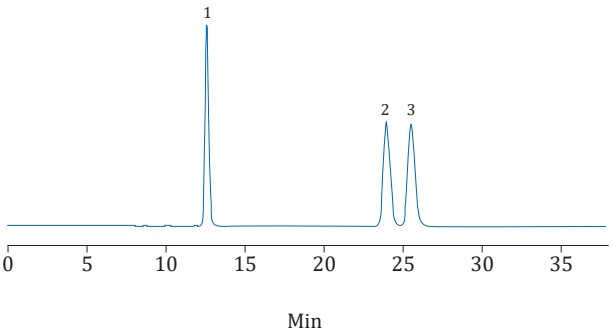


Column:	Athena Phenyl 4.6 × 150mm, 5μm (8.461537.0001)
Mobile phase:	acetonitrile / water / acetic acid (45/55/0.2)
Flow rate:	0.8 mL / min
Detection:	228 nm
Column temperature:	25 ˚C

Parabens in cosmetics

No.1209074

1. Iso-propyl paraben
2. Iso-butyl paraben
3. Iso-butylparaben

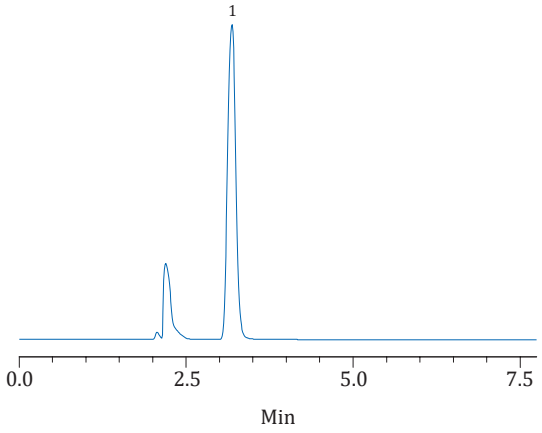


Column:	CNW Athena C18 (8.462571.0001)
Mobile phase:	methanol / 20mM aqueous ammonium acetate = 58/42
Flow rate:	1.0mL/min
Detection:	254nm
Column temperature:	room temperature

Bromopyrene-C8

No.1209076

1. Bromopyrene



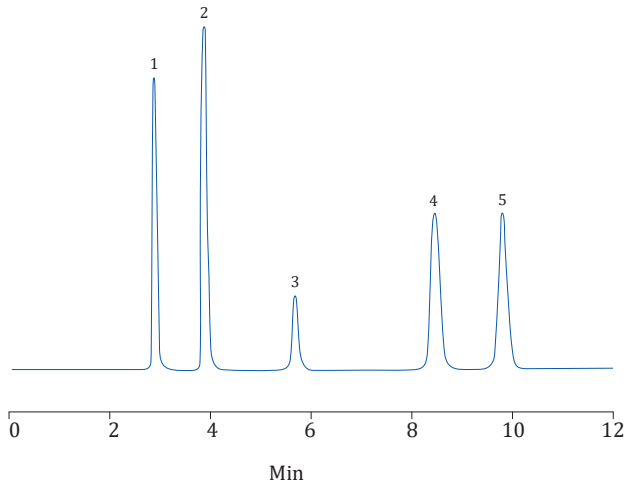
Column:	Athena C8 4.6 × 150mm, 5um (8.461575.0001)
Mobile phase:	100% methanol
Flow rate:	1.0 mL / min
Detection:	254 nm
Column temperature:	25 ˚C

Applications: Biochemistry

Nucleoside -1

No.1209077

1. Cytosine
2. Uracil
3. Cytidine
4. Uridine
5. Thymine

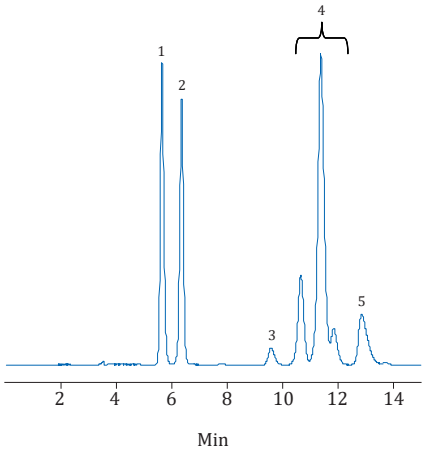


Column:	Athena C18-WP 4.6 × 250mm, 5μm (8.462572.0001)
Mobile phase:	100% water
Flow rate:	1.0 mL / min
Detection:	254 nm
Column temperature:	40 ˚C

Nucleoside

No.1209079

1. Uridine
2. Cytidine
3. Guanosin
4. Inosine and impurities
5. Adenosine

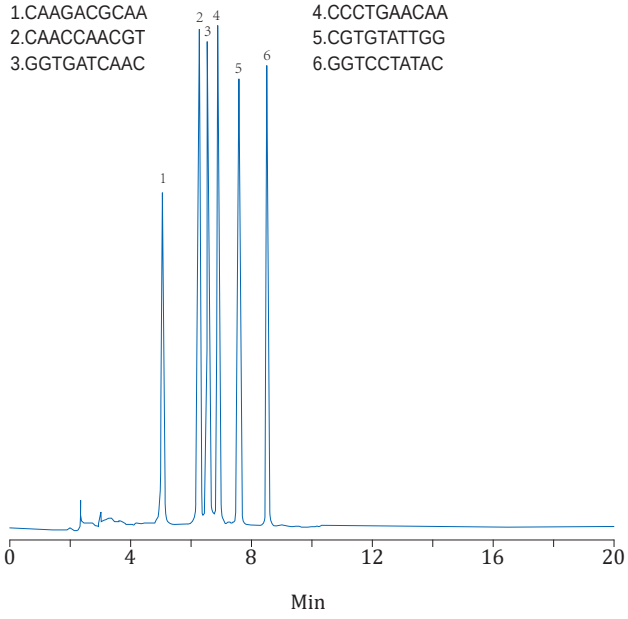


Column:	Athena SCX 4.6 × 150mm, 5μm (8.461523.0001)
Mobile phase:	50mM sodium phosphate buffer (pH 2.5)
Flow rate:	0.5 mL / min
Detection:	280 nm
Column temperature:	25 ˚C

Oligonucleotide

No.1209078

1.CAAGACGCAA
2.CAACCAACGT
3.GGTGATCAAC
4.CCCTGAACAA
5.CGTGTATTGG
6.GGTCCTATAC

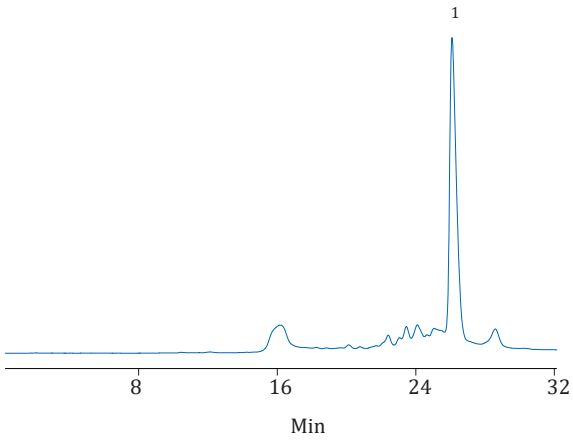


Column:	Athena C18-BIO 4.6 × 150mm, 5μm (8.461578.0001)
Mobile phase:	A: 50mM NaH_2PO_4 buffer solution (pH 7.0); B: Acetonitrile 0min B: 5%; 20min B: 15%
Flow rate:	1.0 mL / min
Detection:	260 nm
Column temperature:	25 ˚C

DNA

No.1209080

DNA sample size of about 200bp

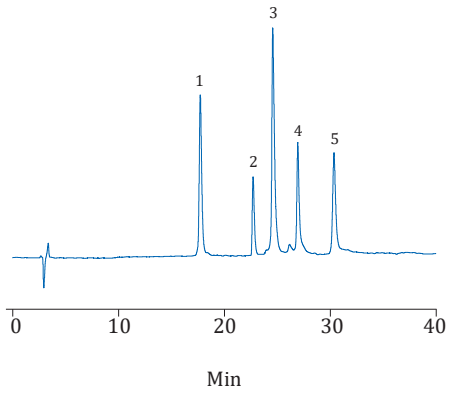


Column:	CNWSep RP3 4.6 × 150mm, 5μm (8.4615P3.0001)
Mobile phase:	A: 0.1% TEAA (pH 7.0); B: ACN 0min-30min B: 0% -12%; 30min-50min B: 12% -30%
Flow rate:	1.0 mL/min
Detection:	260 nm
Column temperature:	25 ˚C

Protein separation

No.1209081

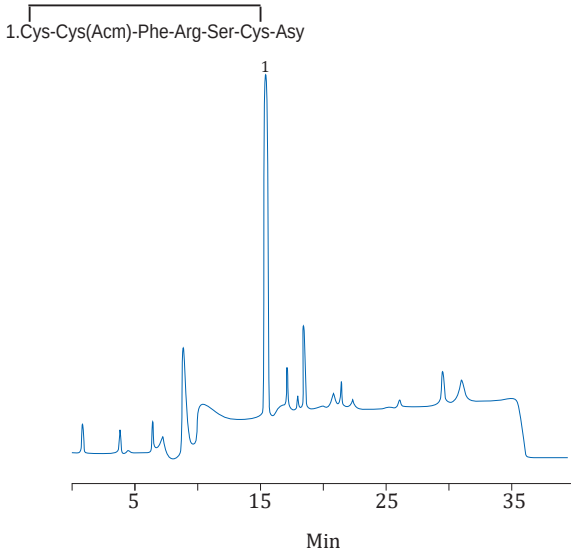
1. Ribonuclease B
2. Insulin
3. Cytochrome C
4. Lysozyme
5. BSA



Column:	CNWSep RP3 4.6 × 150mm, 5μm (8.4615A3.0001)
Mobile phase:	A: 0.1% TFA aqueous solution B: 0.1% TFA in acetonitrile 0min 20%B 5min 20%B 45min 60%B
Flow rate:	1.0 mL/min
Detection:	214 nm
Column temperature:	40 ˚C

Synthetic peptide

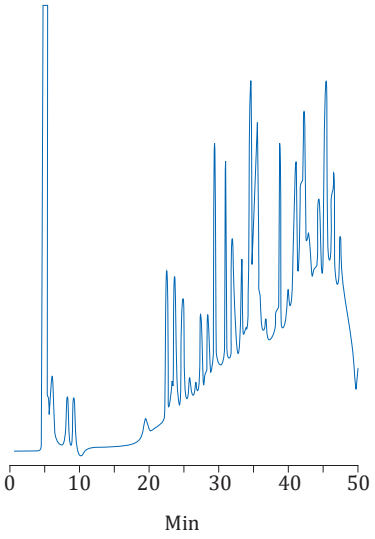
No.1209083



Column:	Athena C18 4.6 × 150mm, 5μm (8.461571.0001)
Mobile Phase:	A: 10mM TFA; B: 10mM +60% acetonitrile 0min to 30min proportion of mobile phase B gradient from 0% to 100%
Flow rate:	1.0 mL/min
Detection:	214 nm
Column temperature:	25 ˚C

Hydrolysis of bovine serum albumin

No.1209082

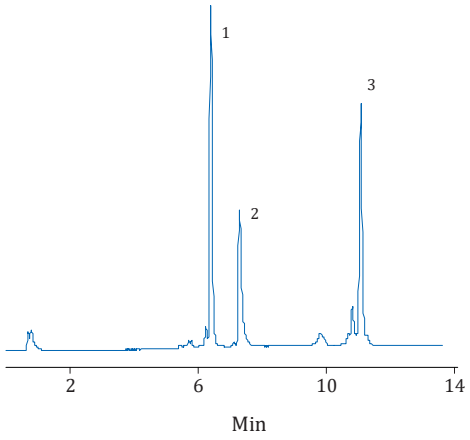


Column:	Athena C4 4.6 × 250mm, 5μm (8.462579.0001)
Mobile phase:	A: 0.09%TFA; B: 0.085% TFA +80% acetonitrile 0min B 5%; 5min B 5%; 35min B 50%; 45min B 100%
Flow rate:	1.0 mL/min
Detection:	214 nm
Column temperature:	25 ˚C

Protein sample

No.1209084

1. Cytochrome
2. Ribonuclease A
3. Lysozyme



Column:	CNWSep SAX 4.6 × 50mm, 3μm (8.4605G1.0001)
Mobile phase:	A: 10 mM phosphate buffer (pH 6.0); B: A + 1.0 M NaCl 0-15min, B: 0% -70%
Flow rate:	0.5 mL/min
Detection:	280 nm
Column temperature:	25 ˚C

GC

USP method

USP CODE	DESCRIPTION	RECOMMENDED CNW PHASE
G1	Dimethylpolysiloxane oil.	OV-101
G2	Dimethylpolysiloxane gum.	OV-1 CD-1
G3	50% Phenyl-50% methylpolysiloxane.	OV-17 CD-50
G4	Diethylene glycol succinate polyester.	DEGS
G5	3-Cyanopropylpolysiloxane.	Silar-10 CP
G6	Trifluoropropylmethylpolysiloxane.	CD-210OV-210
G7	50% 3-Cyanopropyl-50% phenylmethylsilicone.	Silar-5 CP
G8	80% Bis(3-cyanopropyl)-20% 3-cyanoproplyphenylpolysiloxane	
G9	Methylvinylpolysiloxane.	UC W982
G10	Polyamide	
G11	Bis(2-ethylhexyl)sebacate polyester.	
G12	Phenyldiethanolamine succinate polyester.	
G13	Sorbitol.	Sorbitol
G14	Polyethylene glycol (av. mol. wt. of 950 to 1050).	Carbowax 1000
G15	Polyethylene glycol (av. mol. wt. of 3000 to 3700).	Carbowax 4000
G16	Polyethylene glycol compound (av. mol. wt. about 15,000).A high molecular weight compound of polyethylene glycol with a diepoxide linker. Available commercially as Polyethylene Glycol Compound 20M, or as Carbowax 20M,from suppliers of chromatographic reagents.	Carbowax 20M,CD-WAX
G17	75% Phenyl-25% methylpolysiloxane.	OV-25
G18	Polyalkylene glycol.	UCON® LB 550XUCONLB 1800XBoth are acceptable/USP
G19	25% Phenyl-25% cyanopropyl-50% methylsilicone.	CD-225OV-225
G20	Polyethylene glycol (av. mol. wt. of 380 to 420).	Carbowax 400
G21	Neopentyl glycol succinate.	
G22	Bis(2-ethylhexyl) phthalate.	Bis(2-ethylhexyl)phthalate
G23	Polyethylene glycol adipate.	Ethylene glycol adipate (EGA), Polyethylene glycoladipate (EGA)
G24	Diisodecyl phthalate.	Diisodecyl phthalate
G25	Polyethylene glycol compound TPA. A high molecular weight compound of a polyethylene glycol and a diepoxide that is esterified with terephthalic acid. Available commercially as Carbowax 20M-TPA from suppliers of chromatographic reagents.	Carbowax 20M-TPA,FFAP,CD-ACIDWAX
G26	25% 2-cyanoethyl-75% methylpolysiloxane	XE®-60
G27	5% Phenyl-95% methylpolysiloxane.	SE-52,CD-5
G28	25% Phenyl-75% methylpolysiloxane.	
G29	3,3’-Thiodipropionitrile.	
G30	Tetraethylene glycol dimethyl ether.	
G31	Nonylphenoxypoly(ethyleneoxy)ethanol (av. ethyleneoxy chain length is 30); Nonoxynol 30.	Lgepal® CO-880
G32	20% Phenylmethyl-80% dimethylpolysiloxane.	OV-7
G33	20% Carborane-80% methylsilicone.	Dexsil® 300
G34	Diethylene glycol succinate polyester stabilized with phosphoric acid.	DEGS-PS
G35	A high molecular weight compound of polyethyleneglycol and a diepoxide that is esterified withnitroterephthalic acid.	CD-ACIDWAX
G36	1% Vinyl-5% phenylmethylpolysiloxane.	SE-54
G37	Polyimide.	Polyl-110
G38	Phase G1 containing a small percentage of a tailing inhibitor	Carbowax 1500
G40	Ethylene glycol adipate.	
G41	Phenylmethyldimethylsiloxane (10% phenyl- substituted）	OV-3
G42	35% Phenyl-65% dimethylpolysiloxane (percentagesrefer to molar substitution).substituted).	CD-35
G43	6% cyanopropylphenyl-94% dimethylpolysiloxane (percentages refer to molar substitution).	CD-1301OV-1301OVI-G43
G44	2% low molecular weight petrolatum hydrocarbon grease and 1% solution of potassium hydroxide.	2%Apiezon® L/1%KOH
G45	Divinylbenzene-ethylene glycol-dimethylacrylate.	HayeSep NPorapak NHayeSep A
G46	14% Cyanopropylphenyl-86% methylpolysiloxane.	CD-1701
G47	Polyethylene glycol (av. mol. wt. of about 8000).	Carbowax 6000
G48	Highly polar, partially cross-linked cyanopolysiloxane.	
Å = angstrom; μ m = micron		
USP CODE	Generic Description Supports for Gas Chromatography	RECOMMENDED CNW PHASE
S1	Siliceous earth for gas chromatography. Unless otherwise specified, it has been flux-calcined by mixing diatomite with Na2CO3,flux and calcining above 900℃,then washed with water and acid and/or base (as needed) to neutrality and silanized by treating with an agent such as dimethyldichlorosilane to mask surface silanol groups. Alternative treatments, as defined below, are required where the letter indicated appears as a suffix in the designation (e.g.,S1C).	Chromosorb® W AWChromosorb W HP

USP CODE	DESCRIPTION	RECOMMENDED CNW PHASE
S1A	Siliceous earth from gas chromatography has been flux-calcined by mixing diatomite with Na2CO3,flux and calcining above 900°C.The siliceous earth is acid-washed, then waterwashed until neutral, but not base-washed. The siliceous earth may be silanized by treating with an agent such as dimethyldichlorosilane to mask surface silanol groups.	
S1B	The siliceous earth as described above is both acid and base washed.	
S1C	A support prepared from crushed firebrick and calcined or burned with a clay binder above 900 degs. With subsequent acid-wash . It may be silanized. Note:S1C was updated 4-1-98	Chromosorb P AWChromosorb P AW-DMCS
S1NS	The siliceous earth is untreated	Chromosorb W-NAW
S2	Styrene-divinylbenzene copolymer having a nominal surface area of less than 50m2/gand an average pore diameter of 0.3 to 0.4um	Chromosorb 101
S3	Copolymer of ethylvinylbenzene and divinylbenzene having a nominal surface area of 500-600m2/g and an average pore diameter of 0.0075um	HayeSep QPorapak Q
S4	Styrene-divinylbenzene copolymer with aromatic-O and -N groups, having a nominal surface area of 400 to 600 m2/g and an average pore diameter of 0.0076um.	HayeSep RPorapak R
S5	40/60 mesh high molecular weight tetrafluoroethylene polymer	Chromosorb T
S6	Styrene-divinylbenzene copolymer having a nominal surface area of 250 to 350 m2/g and an average pore diameter of 0.0091um	Chromosorb 102
S7	Graphitized carbon having a nominal surface area of 12 m2/g	Carboteck C
S8	Copolymer of 4-vinyl-pyridine and styrene-divinylbenzene.	HayeSep SPorapak S
S9	Porous polymer based on 2,6-diphenyl-p-phenylene oxide	Tenax® TA
S10	Highly polar cross-linked copolymer of acrylonitrile and divinylbenzene	HayeSep C
S11	Graphitized carbon having a nominal surface area of 100 m2/g modifiedwith small amounts of petrolatum and polyethylene glycol	
S12	Graphitized carbon having a nominal surface area of 100 m2/g	Carboteck B
Unless otherwise specified, mesh sizes of 80 to 100 or, alternatively, 100 to 120, are intended. Å=angstorm µm = micron 1\Some methods designate silanized or non-silanized		

Capillary column

About Capillary column

The basic capillary column composed of two parts: the tubing and the stationary phase in general there are two kinds of tubings - quartz (Tube coated with polyimide) and stainless steel.

A variety of stationary phase. Most of the polymer molecular weight, good thermal stability, The polymer is a liquid or gel. This type of stationary phase and the most commonly used which called polysiloxane (sometimes known as silicone), and polyethylene glycol. There is another commonly used stationary phase is small porous particles - the polymer and the zeolite (for example: alumina, molecular sieves).

Column selection is based on five primary factors: sample, stationary phase type, column ID and stationary phase film thickness (which are interrelated), and column length.

How to select Stationary Phase

1. If no information or ideas about which stationary phase to use is available, start with a CD-1 or CD-5.

2. Low-bleed ("ms") columns are usually more inert and have higher temperature limits. Ultra Inert 1ms, 5ms and 35ms columns provide the lowest column bleed and highest column inertness for a wide range of analytes, including active compounds and trace level samples.

3. Use the least polar stationary phase that provides satisfactory resolution and analysis times.Non-polar stationary phases have superior lifetimes compared to polar phases.

4. Use a stationary phase with a polarity similar to that of the solutes. This approach works more times than not; however, the best stationary phase is not always found using this technique.

5. If poorly separated solutes possess different dipoles or hydrogen bonding strengths, change to a stationary phase with a different amount (not necessarily more) of the dipole or hydrogen bonding interaction. Other co-elutions may occur upon changing the stationary phase, thus the new stationary phase may not provide better overall resolution.

6. If possible, avoid using a stationary phase that contains a functionality that generates a large response with a selective detector. For example, cyanopropyl containing stationary phases exhibit a disproportionately large baseline rise (due to column bleed) with NPDs.

7. A CD-1 or CD-5, CD-1701, CD-50, and CD-WAX cover the widest range of selectivities with the smallest number of columns.

8. PLOT columns are used for the analysis of gaseous samples at above ambient column temperatures.

How to select Column Diameter

1.1. Use 0.15, 0.18 or 0.25 mm id columns when higher column efficiencies are needed. 0.15 and 0.18 mm id columns are especially well suited for GC/MS systems with low pumping capacities.Smaller diameter columns have the lowest capacities and require the highest head pressures.

2. Use 0.32 mm id columns when higher sample capacity is needed. They often provide better resolution of earlier eluting solutes for splitless injections or large injection volumes (> 2 µL) than 0.25 mm id columns.

3. Use 0.45 mm id columns when only a Megabore direct injector is available and higher column efficiency is desired. Well suited for high carrier gas flow rate situations, such as with purge &trap, headspace samplers, and valve injection applications.

4. Use 0.53 mm id columns when only a Megabore direct injector is available. Well suited for high carrier gas flow rate situations, such as with purge & trap and headspace samplers. 0.53 mm id columns have the highest sample capacities at constant df.

How to select Column Length

1. Start with 25-30 meter columns when the best length is unknown.

2. 10-15 meter columns are well suited for samples containing very well separated solutes or very few solutes. Shorter lengths are used for very small diameter columns to reduce head pressures.

3. 50-60 meter columns should be used when resolution is not possible by other means (smaller diameter, different stationary phase, change in column temperature). Best suited for complex samples containing a large number of solutes. Long columns have long analysis times and higher cost.

How to select Film Thickness

1. For 0.18-0.32 mm id columns, a film thickness of 0.18-0.25 µm is average or standard (i.e.,not thin or thick) and used for most analyses.

2. For 0.45-0.53 mm id columns, a film thickness of 0.8-1.5 µm is average or standard (i.e., not thin or thick) and used for most analyses.

3. Thick film columns are used to retain and resolve volatile solutes (e.g., light solvents, gases). Thick columns are more inert and have higher capacities. Thick film columns exhibit higher column bleed and decreased upper temperature limits.

4. Thin film columns are used to minimize the retention of high boiling, high molecular weight solutes (e.g., steroids, triglycerides). Thin film columns are less inert, have lower capacities and exhibit lower column bleed.

Install and condition capillary column

- Precolumn Installation Check List

1. Replace oxygen, moisture, and hydrocarbon traps as needed.

2. Clean the injection port, replace critical injection port seals, replace injection port liners, and change septa as needed.

3. Check detector seals, and replace as necessary. Clean or replace detector jets as necessary.

4. Carefully inspect the column for damage or breakage.

5. Check your GC manufacturer’ s gas pressure requirements and verify gas cylinder delivery pressures to ensure that an adequate supply of carrier, makeup, and fuel gases are available. Minimum recommended carrier gas purity percentages are: Helium 99.995% and Hydrogen 99.995%, with H20 < 1ppm and O2 < 0.5ppm.

6. Gather the necessary installation tools: You will need a column cutter, column nuts, column nut wrench, ferrules, a magnifying loupe, and typewriter correction fluid.

- Install column

1. Uncoil approximately 0.5 m of tubing (1 coil ~ 0.5 m) from the column basket at both ends of the column for injector and detector installation. Avoid using sharp bends in the tubing.

2. Mount the column in the oven. Use a handling bracket if available.

3. Install the column nut and Graphite/Vespel or Graphite ferrule at each column end; pull the nut and ferrule down the tubing approximately 15 cm.

4. Score (scratch) the column. Use a light touch to score the column about 4 to 5 cm from each end.

5. Make a clean break. Grasp the column between the thumb and forefinger as close to the score point as possible. Gently pull and bend the column. The column should part easily. If the column does not break easily, do not force it. Score the column again in a different place (farther from the end than before) and try again for a clean break.

6. Use a magnifying loupe to inspect the cut. Make sure the cut is square across the tubing with no polyimide or "glass" fragments at the end of the tube.

7. Install the column in the inlet. Check the GC manufacturer’ s instrument manual for the correct insertion distance in the injection port type being used. Slide the column nut and ferrule to the proper distance and then mark the correct distance on the column with typewriter correction fluid just behind the column nut. Allow the fluid to dry. Insert the column into the injector.Finger tighten the column nut until it starts to grab the column, and then tighten the nut an additional 1/4 to 1/2 turn, so that the column cannot be pulled from the fitting when gentle pressure is applied. Verify that the correct column insertion distance has been maintained by looking at the typewriter correction fluid mark.

8. Turn on the carrier gas and establish the proper flow rate. Set head pressure, split flow, and septum purge flow to appropriate levels. If fusing a split/splitless inlet, check that the purge (split) valve is "on" (open).

9. Confirm carrier gas flow through the column. Immerse the end of the column in a vial of solvent and check for bubbles.

10. Install the column into the detector. Check the instrument manufacturers manual for the proper insertion distance.

11. Check for leaks. This is very important. Do not heat the column without thoroughly checking for leaks.

12. Establish proper injector and detector temperatures.

13. Establish proper makeup and detector gas flows. Ignite or turn "on" the detector.

14. Purge the column for a minimum of 10 min at ambient temperature. Add the appropriate additional purge time following inlet or trap maintenance.

15. Inject non-retained substance to check for proper injector installation. Examples: butane or methane (FID), headspace vapors from Acetonitrile (NPD), headspace vapors from methylene chloride (ECD), air (TCD), argon (mass spectrometer). Proper installation is indicated by a symmetrical non-retained peak. If tailing is observed, reinstall the column into the inlet.

- Conditioning and Testing the Column

1. Set oven temperature 20 °C above the maximum temperature of the analysis or at the maximum temperature of the column (whichever is lower) for 2 hours. If after 10 min at the upper temperature the background does not begin to fall, immediately cool the column and check for leaks.

2. If you are using Vespel or Graphite/Vespel ferrules, recheck column nut tightness after the conditioning process.

3. Confirm final proper average linear velocity by injecting a non-retained substance again.

Column Storage

Capillary columns should be stored in their original box when removed from the GC. Place a GC septa over the ends to prevent debris from entering the tubing. Upon reinstallation of column, the column end need to be trimmed by 2-4 cm to ensure that a small piece of septa is not lodged in the column.

If a column is left in a heated GC, there should always be carrier gas flow. The carrier gas flow can be turned off only if the oven, injector, detector and transfer lines are turned off (i.e., not heated).

Without carrier gas flow, damage to the heated portion of the column occurs.

Causes of Column Performance Degradation

Column Breakage

Fused silica columns break wherever there is a weak point in the polymide coating. The polymide coating protects the fragile but flexible fused silica tubing. The continuous heating and cooling of the oven, vibrations caused by the oven fan, and being wound on a circular cage all place stress on the tubing. Eventually breakage occurs at a weak point. Weak spots are created where the polymide coating is scratched or abraded. This usually occurs when a sharp point or edge is dragged over the tubing. Column hangers and tags, metal edges in the GC oven, column cutters, and miscellaneous items on the lab bench are just some of the common sources of sharp edges or points.

It is rare for a column to spontaneously break. Column manufacturing practices tend to expose any weak tubing and eliminate it from use in finished columns. Larger diameter columns are more prone to breakage. This means that greater care and prevention against breakage must be taken with 0.45-0.53 mm id tubing than with 0.18-0.32 mm id tubing.

A broken column is not always fatal. If a broken column was maintained at a high temperature either continuously or with multiple temperature program runs, damage to the column is very likely. The back half of the broken column has been exposed to oxygen at elevated temperatures which rapidly damages the stationary phase.The front half is fine since carrier gas flowed through this length of column.If a broken column has not been heated or only exposed to high temperatures or oxygen for a very short time, the back half has probably not suffered any significant damage. A union can be installed to repair a broken column. Any suitable union will work to rejoin the column. Problems with dead volume (peak tailing) may occur with improperly installed unions.

Thermal Damage

Exceeding a column’ s upper temperature limit results in accelerated degradation of the stationary phase and tubing surface. This results in the premature onset of excessive column bleed, peak tailing for active compounds and/or loss of efficiency (resolution). Fortunately, thermal damage is a slower process, thus prolonged times above the temperature limit are required before significant damage occurs. Thermal damage is greatly accelerated in the presence of oxygen. Overheating a column with a leak or high oxygen levels in the carrier gas results in rapid and permanent column damage.

Setting the GC's maximum oven temperature at or only a few degrees above the columns temperature limit is the best method to prevent thermal damage. This prevents the accidental over heating of the column. If a column is thermally damaged, it may still be functional. Remove the column from the detector. Heat the column for 8-16 hours at its isothermal temperature limit. Remove 10-15 cm from the detector end of the column. Reinstall the column and condition as usual. The column usually does not return to its original performance; however, it is often still functional. The life of the column will be reduced after thermal damage.

Oxygen Damage

Oxygen is an enemy to most capillary GC columns. While no column damage occurs at or near ambient temperatures, severe damage occurs as the column temperature increases. In general, the temperature and oxygen concentration at which significant damage occurs is lower for polar stationary phases. It is constant exposure to oxygen that is the problem. Momentary exposure such as an injection of air or a very short duration septum nut removal is not a problem.

A leak in the carrier gas flow path (e.g., gas lines, fittings, injector) is the most common source of oxygen exposure. As the column is heated, very rapid degradation of the stationary phase occurs. This results in the premature onset of excessive column bleed, peak tailing for active compounds and/or loss of efficiency (resolution). These are the same symptoms as for thermal damage.

Unfortunately, by the time oxygen damage is discovered, significant column damage has already occurred. In less severe cases, the column may still be functional but at a reduced performance level.

In more severe cases, the column is irreversibly damaged. Maintaining an oxygen and leak-free system is the best prevention against oxygen damage. Good GC system maintenance includes periodic leak checks of the gas lines and regulators, regular septa changes, using high quality carrier gases, installing and changing oxygen traps, and changing gas cylinders before they are completely empty.

Chemical Damage

There are relatively few compounds that damage stationary phases. Introducing nonvolatile compounds (e.g., salts) in a column often degrades performance, but damage to the stationary phase does not occur. These residues can often be removed and performance returned by solvent rinsing the column.

Inorganic or mineral bases and acids are the primary compounds to avoid introducing into a column. The acids include hydrochloric (HCl), sulfuric (H2S04), nitric (HNO3), phosphoric (H3PO4), and chromic (CrO3). The bases include potassium hydroxide (KOH), sodium hydroxide (NaOH), and ammonium hydroxide (NH4OH). Most of these acids and bases are not very volatile and accumulate at the front of the column. If allowed to remain, the acids or bases damage the stationary phase. This results in the premature onset of excessive column bleed, peak tailing for active compounds and/or loss of efficiency (resolution). The symptoms are very similar to thermal and oxygen damage. Hydrochloric acid and ammonium hydroxide are the least harmful of the group. Both tend

to follow any water that is present in the sample. If the water is not or only poorly retained by the column, the residence time of the HCl and NH4OH in the column is short. This tends to eliminate or minimize any damage by these compounds. Thus, if HCl or NH4OH are present in a sample, using conditions or a column with no water retention will render these compounds relatively harmless to the column. The only organic compounds that have been reported to damage stationary phases are perfluoroacids. Examples include trifluoroacetic, pentafluoropropanoic, and heptafluorobutyric acid. They need to be present at high levels (e.g., 1% or higher). Most of the problems are experienced with splitless or Megabore direct injections where large volumes of the sample are deposited at the front of the column.

Since chemical damage is usually limited to the front of the column, trimming or cutting 0.5-1 meter from the front of the column often eliminates any chromatographic problems. In more severe cases, five or more meters may need to be removed. The use of a guard column or retention gap will minimize the amount of column damage; however, frequent trimming of the guard column may be necessary. The acid or base often damages the surface of the deactivated fused silica tubing which leads to peak shape problems for active compounds.

Column Contamination

Column contamination is one of the most common problems encountered in capillary GC. Unfortunately, it mimics a very wide variety of problems and is often misdiagnosed as another problem. A contaminated column is usually not damaged, but it may be rendered useless.There are two basic types of contaminants: nonvolatile and semivolatile. Nonvolatile contaminants or residues do not elute and accumulate in the column. The column becomes coated with these residues which interfere with the proper partitioning of solutes in and out of the stationary phase. Also, the residues may interact with active solutes resulting in peak adsorption problems (evident as peak tailing or loss of peak size). Active solutes are those containing a hydroxyl (-OH) or amine (-NH) group, and some thiols (-SH) and aldehydes. Semivolatile contaminants or residues accumulate in the column, but eventually elute. Hours to days may elapse before they completely leave the column. Like nonvolatile residues, they may cause peak shape and size problems, and, in addition, are usually responsible for many baseline problems (instability, wander, drift, ghost peaks, etc.).

Contaminants originate from a number of sources, with injected samples being the most common.

Extracted samples are among the worst types. Biological fluids and tissues, soils, waste and ground water, and similar types of matrices contain high amounts of semivolatile and nonvolatile materials.

Even with careful and thorough extraction procedures, small amounts of these materials are present in the injected sample. Several to hundreds of injections may be necessary before the accumulated residues cause problems. Injection techniques such as on-column, splitless, and Megabore direct place a large amount of sample into the column, thus column contamination is more common with these injection techniques.

Occasionally, contaminants originate from materials in gas lines and traps, ferrule and septa particles, or anything coming in contact with the sample (vials, solvents, syringes, pipettes, etc.). These types of contaminants are probably responsible when a contamination problem suddenly develops and similar samples in previous months or years did not cause any problems. Minimizing the amount of semivolatile and nonvolatile sample residues is the best method to reduce contamination problems. Unfortunately, the presence and identity of potential contaminants are often unknown. Rigorous and thorough sample cleanup is the best protection against contamination problems. The use of a guard column or retention gap often reduces the severity or delays the onset of column contamination induced problems. If a column becomes contaminated, it is best to solvent rinse the column to remove the contaminants. Maintaining a contaminated column at high temperatures for long periods of time (often called baking-out a column) is not recommended. Baking-out a column may convert some of the contaminating residues into insoluble materials that cannot be solvent rinsed from the column. If this occurs, the column cannot be salvaged in most cases. Sometimes the column can be cut in half and the back half may still be useable. Baking-out a column should be limited to 1-2 hours at the isothermal temperature limit of the column.

General capillary column corresponding

CNW	SUPELCO	AGILENT/J&W	ALLTECH	VARIAN CHROMPACK	MACHERY-NAGEL	QUADREX	RESTEK	SGE	USP Code	PACKED COLUMN EQUIVALENT
--	SPB-Octyl	--	--	CP-Sil 2CB	--	--	--	--	--	Squalane
CD-1	Equity-1/ SPB-1	HP-1, DB-1, HP-Utra 1	AT-1, EC-1	CP-Sil 5CB	Optima 1, Permabond SE-30	007-1	RTX-1	BP-1	G1, G2, G9	SE-30, SP-2100
CD-5	Equity-5/ SPB-5	HP-5, HP-Ultra 2, DB-5, DB-5.625, HP-PAS5	AT-5, EC-5	CP-Sil 8CB	Optima 5, Permabond SE-52	007-2	RTX-5, XTI-5	BP-5	G27, G36	SE-54, SE-52, OV-73
--	SPB-20	--	AT-20, EC-20	--	--	007-20	RTX-20	--	G28, G32	OV-7
CD-1701	Equity 1701/ S PB-1701	DB-1701/DB-1701P	AT-1701	CP-Sil 19CB	Optima 1701	007-1701	RTX-1701	BP-10	G46	OV-1701
CD-35	SPB-35	HP-35/DB-35	AT-35	--	--	007-11	RTX-35	--	G42	OV-11
CD-50	SPB-2250	HP-50+, HP-17, DB-17	AT-50	CP-Sil 24CB	Optima 17	007-17	RTX-50	--	G3	OV-17
--	SPB-17	HP-50+, HP-17, DB-17	AT-50	CP-Sil 24CB	Optima 17	007-17	RTX-50	--	G3	OV-17, SP-2250
--	SPB-50	HP-50+, HP-17, DB-17	AT-50	CP-Sil 24CB	--	--	RTX-50	--	G3	OV-17, SP-2250
--	PAG	--	--	--	--	--	--	--	G3	OV-17, SP-2250
CD-WAX	SUPELCOWAX 10	HP-Wax,HP-INNO Wax/DB-WAX, DB-WAXetr	AT-Wax, EC-WAX, AT-Aquawax	CP-Wax 52CB	Permabond CW 20M	007-CW	RTX-WAX, Stabilwax	BP-20	G16	Carbowax 20M

CNW	SUPELCO	AGILENT/J&W	ALLTECH	VARIAN CHROMPACK	MACHERY-NAGEL	QUADREX	RESTEK	SGE	USP Code	PACKED COLUMN EQUIVALENT
--	SPB-1000/ NUKOL	HP-FFAP, DB-FFAP	AT-1000, EC-1000, AT-Aquawax -DA	CP-Wax 58(FFAP) CB, CP-FFAP CB	Permabond FFAP	007-FFAP	Stabilwax-DA	BP-21	G25, G35	OV-351, SP-1000
CD-225	SPB-225	HP-225, DB-225	AT-225	CP-Sil 43CB	Optima 225	007-225	RTX-225	BP-225	G7, G19	
--	SPB-2330	DB-23, HP-88	AT-Silar	CP-Sil 84	--	007-23	RTX-2330	--	G8	SP-2330
--	SPB-2380	--	--	--	--	--	RTX-2330	--	G48	--
--	SPB-2340	--	--	CP-Sil 88	--	--	--	--	G5	SP-2340

Special purpose capillary column corresponding

CNW	SUPELCO	AGILENT/ J&W	ALLTECH	VARIAN CHROMPACK	MACHERY-NAGEL	QUADREX	RESTEK	SGE
CD-1MS	Equity-1/MDN 1	HP-1MS	--	CP-Sil 1CB MS, UF-1 MS	Optima 1MS	--	--	BPX5
CD-5MS	SLB-5ms	DB-5MS	--	CP-Sil 8CB MS	Optima 5MS	--	RTX-5Sil MS	BPX5
CD-5	Equity-5	DB-5, DB-5.625, HP-5, HP-PAS5 HP-Ultra2	AT-5, EC-5	CP-Sil 8CB	Optima 5	007-2	RTX-5, XTI-5	BP5
CD-624	SPB-624	DB-624, DB-VRX	AT-624	CP-Select 624 CB	Optima 624	007-624	RTX-624	BP624
CD-VOCOL	VOCOL	HP-VOC, DB-502.2	AT-502.2	--	--	--	RTX-502.2, RTX-Volatiles	--
--	SP-2331	DB-Dioxin	--	--	--	--	RTX-Dioxin	--
CD-608	SPB-608	DB-608	AT-Pesticides	--	--	007-608	--	--
CD-1701	Equity 1701	DB-1701/DB-1701P	AT-1701	CP-Sil 19CB	Optima 1701	--	RTX-1701	BP-10
CD-WAX	Omegawax	DB-WAX, DB-WAXetr, HP-INNOWAX	AT-FAME	CP-Wax 52CB	Permabond	--	FAMEWAX	BP20
CD-2560	SP-2560	HP-88	--	CP-Sil 88	--	--	RT-2560	--
--	Carbowax Amine	CAM	AT-CAM	CP-Wax For Volatile Amines and Diamines	FS-CW 20 M-AM	--	Stabilwax-DB	--
--	Carboxen-1006 PLOT	GS-Carbon PLOT	Carbograph VOC	CP-CarboBOND				
--	Carboxen-1010 PLOT	GS-Carbon PLOT	Carbograph VOC	CP-CaboPLOT P7				
CD-Molesieve	Mol Sieve 5A PLOT	HP-PLOT MoleSieve	AT-Mole Sieve	CP-MoleSieve 5A			RT-Msieve 5A	
--	Petrocol 2887/ Petrocol EX2887	DB-2887	AT-2887	CP-SimDist		007-1-10V-1.0F	RTX-2887	
--	Petrocol DH	DB-Petro, HP-PONA	AT-Petro	CP-Sil PONA CB	Permabond	007-1-10V-1.0F	RTX1-PONA	BP-1 PONA
--	Petrocol DH 150							
--	Petrocol DH 50.2	HP-PONA				007-1-50-0.5F		BP-1 PONA
--	PTA-5			CP-SIL 8 CB For Ami nes	Optima-5 Amine		RTX-5 Amine	
--	SPB-1 Sulfur	DB-1, HP-1	AT-Sulfur	CP-Sil 5 CB For Sulfur				
CD-PLOT Q	Supel-Q PLOT	HP-PLOT Q	AT-Q	CP-PoraPLOT Q			RT-Q PLOT	
CD-Al2O3 /KCl	Alumina chloride PLOT	GS-Alumina “KCl”,HP-PLOT Al2O3 “KCl”		CP-Al2O3 PLOT KCl				
--	Alumina sulfate PLOT	HP-PLOT Al2O3 “S”		CP-Al2O3 PLOT Na2SO4				
--	SPB-1000/NUKOL	HP-FFAP, DB-FFAP	AT-1000, EC-1000, AT-Aquawax-DA	CP-Wax 58CB,(FFAP) CB, CP-FFAP CB	Permabond FFAP		Stabilwax-DA	BP-21
CD-1301	OVI-G43	DB-1301, HP-Fast Residual Solvent Column	AT-1301		Optima 1301	007-624	RTX-1301, RTX-G43	
CD-624	SPB-624	HP-624、HP-VOC		CP-624		007-624	RTX-624	

Capillary column

CD Serials

High performance capillary columns

As a result of our efforts in research and development and the continuous improvements in our manufacturing techniques we present CD – a series of high performance capillary columns for gas chromatography.

CD capillary columns provide:

• high thermal stability • reduced column bleed • more inert columns

Capillary column	polar	stationary phase
CD-1	non polar	100% poly(dimethylsiloxane)
CD-5	low polar	Poly(5% diphenyl/95% dimethylsiloxane)
CD-35	intermediate polarity	Poly(35%diphenyl/65dimethylsiloxane)
CD-50		Poly (50%diphenyl/50dimethylsiloxane)
CD-1301		6% cyanopropyl-phenyl – 94% dimethylpolysiloxane
CD-1701		14% cyanopropyl-phenyl – 86% dimethylpolysiloxane
CD-225	high polarity	Poly(50% cyanopropylphenyl/50% dimethylsiloxane)
CD-210		50% tri_luoropropyl-methylpolysiloxane
CD-WAX		polyethylene glycol 20M
CD-1MS	non polar	100% poly(dimethylsiloxane)
CD-5MS	low polar	Poly(5% diphenyl/95% dimethylsiloxane)
CD-35MS	intermediate polarity	Poly(35%diphenyl/65dimethylsiloxane)
CD-2560		fames, designed to separate geometric-positional (cis/trans) isomers of fatty acid methyl esters
CD-VOCOL		volatile organic compounds (VOCs) analysis, YC/T207-2006
CD-5HT		For PCB, PBDE, max temp 400C
CD-ACIDWAX		free acid, diol
CD-BASEWAX		amine, alkalinity
CD-624		solvent residual for pharmaceutical
CD-VOC		volatile organic compounds (VOCs) analysis
CD-MoleSieve		permenent gas
CD-PLOT Q		take place of Porapak Q packed column
CD-PLOT U		mtake place of Porapak N packed column

General Purpose Columns

CD-1

Phase: bonded, poly(dimethylsiloxane)

Nonpolar methylsilicone columns that separate sample components according to boiling point. This bonded poly-mer matches the polarity of its nonbonded predecessors. This column meets USP G1,G2,G9 requirements.

Similar phases: OV-1, DB-1, SE-30, HP-1, Ultra-1,SPB-1, CP-SIL 5 CB, Rtx-1, 007-1, BP1, MDN-1, AT-1, OV- 101

Temp. Limits: -60°C to 320°C

ID(mm)	Length(m)	Df(um)	Cat. No.
0.25	15	0.25	1.120311.0001
0.25	30	0.25	1.120312.0001
0.25	30	0.5	1.120313.0001
0.25	30	1	1.120314.0001
0.25	60	0.25	1.120315.0001
0.25	60	1	1.120316.0001
0.25	100	0.25	1.120317.0001
0.32	15	0.25	1.120318.0001
0.32	30	0.25	1.120319.0001
0.32	30	0.5	1.120320.0001
0.32	30	1	1.120321.0001
0.32	30	3	1.120322.0001
0.32	30	5	1.120323.0001
0.32	60	0.25	1.120324.0001
0.32	60	0.5	1.120325.0001
0.32	60	1	1.120326.0001
0.32	60	3	1.120327.0001
0.53	15	0.5	1.120329.0001
0.53	15	1	1.120330.0001
0.53	15	1.5	1.120331.0001
0.53	15	3	1.120332.0001
0.53	30	0.5	1.120333.0001

CD-5

Phase: bonded, Poly(5% diphenyl/95% dimethylsiloxane)

The low phenyl content, 5%, improves thermal stability of the phase, while still providing essentially a boiling point elution order, and a slight increase in selectivity, especially for aromatic compounds. This column meets USP G27 and G36 requirements.

Similar phases: SE-54, SE-52, DB-5, HP-5, AT-5, , ZB-5 Ultra-2,SPB-5, CP-SIL 8, Rtx-5, 007-5, BP5, MDN-5

Temp. Limits: -60°C to 320°C

ID(mm)	Length(m)	Df(um)	Cat. No.
0.25	15	0.25	1.521510.0001
0.25	30	0.25	1.521511.0001
0.25	30	0.5	1.521512.0001
0.25	30	1	1.521513.0001
0.25	60	0.25	1.521514.0001
0.25	60	1	1.521515.0001
0.25	100	0.25	1.521516.0001
0.32	15	0.25	1.521517.0001
0.32	30	0.25	1.521518.0001
0.32	30	0.5	1.521519.0001
0.32	30	1	1.521520.0001
0.32	30	3	1.521521.0001
0.32	30	5	1.521522.0001
0.32	60	0.25	1.521523.0001
0.32	60	0.5	1.521524.0001
0.32	60	1	1.521525.0001
0.32	60	3	1.521526.0001

ID(mm)	Length(m)	Df(um)	Cat. No.
0.53	15	0.5	1.521528.0001
0.53	15	1	1.521529.0001
0.53	15	1.5	1.521530.0001
0.53	15	3	1.521531.0001
0.53	30	0.5	1.521532.0001
0.53	30	1	1.521533.0001
0.53	30	1.5	1.521534.0001
0.53	30	3	1.521535.0001
0.53	30	5	1.521536.0001
0.53	50	0.5	1.521537.0001
0.53	50	2.65	1.521538.0001
0.53	50	5	1.521539.0001
0.53	60	0.5	1.521540.0001
0.53	60	1	1.521541.0001
0.53	60	1.5	1.521542.0001
0.53	60	3	1.521543.0001
0.53	60	5	1.521544.0001

CD-35

Phase: bonded, Poly(35% diphenyl/65%dimethylsiloxane)

CD-35 columns have intermediate polarity as a result of a greater phenyl content (35%). These columns are useful for analyses of polar compounds, because these compounds are retained longer, relative to nonpolar compounds. This column meets USP G42 requirements.

Similar phases: DB-35, Rtx-35, SPB-35, AT-35

Temp. Limits: 0°C to 300°C

ID(mm)	Length(m)	Df(um)	Cat. No.
0.25	15	0.25	1.355341.0001
0.25	30	0.25	1.355342.0001
0.25	30	0.5	1.355343.0001
0.25	30	1	1.355344.0001
0.25	60	0.25	1.355345.0001
0.25	60	1	1.355346.0001
0.32	15	0.25	1.355348.0001
0.32	30	0.25	1.355349.0001
0.32	30	0.5	1.355350.0001
0.32	30	1	1.355351.0001
0.32	60	0.25	1.355354.0001
0.32	60	0.5	1.355355.0001
0.32	60	1	1.355356.0001
0.53	15	0.5	1.355359.0001
0.53	15	1	1.355360.0001
0.53	15	1.5	1.355361.0001
0.53	30	0.5	1.355363.0001
0.53	30	1	1.355364.0001
0.53	30	1.5	1.355365.0001
0.53	50	0.5	1.355368.0001
0.53	60	0.5	1.355371.0001
0.53	60	1	1.355372.0001
0.53	60	1.5	1.355373.0001

CD-50

Phase: bonded, Poly (50% diphenyl/50% dimethylsiloxane)

The highest phenyl content of the common phenyl containing phases, and hence the highest polarizability. Useful for analyses of polar materials and to provide confirmational information. This column meets USP G3 requirements.

Similar phases: OV-17, DB-17, HP-50+, HP-17, SPB-50, SP-2250, Rtx-50, CP-SIL 24 CB, 007-17, ZB-50

Temp. Limits: 30°C to 310°C

ID(mm)	Length(m)	Df(um)	Cat. No.
0.25	15	0.25	1.501221.0001
0.25	30	0.25	1.501222.0001
0.25	30	0.5	1.501223.0001
0.25	30	1	1.501224.0001
0.25	60	0.25	1.501225.0001
0.25	60	1	1.501226.0001
0.32	15	0.25	1.501228.0001
0.32	30	0.25	1.501229.0001
0.32	30	0.5	1.501230.0001
0.32	30	1	1.501231.0001
0.32	60	0.25	1.501234.0001
0.32	60	0.5	1.501235.0001
0.32	60	1	1.501236.0001
0.53	15	0.5	1.501239.0001
0.53	15	1	1.501240.0001
0.53	30	0.5	1.501243.0001
0.53	30	1	1.501244.0001
0.53	50	0.5	1.501248.0001
0.53	60	0.5	1.501251.0001
0.53	60	1	1.501252.0001

CD-1301

Phase: bonded, 6% cyanopropyl-phenyl – 94% dimethylpolysiloxane

The medium polar of the phases. Ideal for pesticide analyses.This column meets USP G43 requirements.

Similar phases: HP-1301,DB-1301,SPB-1301,Rtx-1301,CP-1301,007-1301

Temp. Limits: -20°C to 280°C

ID(mm)	Length(m)	Df(um)	Cat. No.
0.25	15	0.25	1.130121.0001
0.25	30	0.25	1.130122.0001
0.25	30	0.5	1.130123.0001
0.25	30	1	1.130124.0001
0.25	60	0.25	1.130125.0001
0.25	60	1	1.130126.0001
0.25	100	0.25	1.130127.0001
0.32	15	0.25	1.130128.0001
0.32	30	0.25	1.130129.0001
0.32	30	0.5	1.130130.0001
0.32	30	1	1.130131.0001
0.32	30	3	1.130132.0001
0.32	30	5	1.130133.0001
0.32	60	0.25	1.130134.0001
0.32	60	0.5	1.130135.0001
0.32	60	1	1.130136.0001
0.53	15	0.5	1.130139.0001
0.53	15	1	1.130140.0001
0.53	15	1.5	1.130141.0001
0.53	15	3	1.130142.0001
0.53	30	0.5	1.130143.0001
0.53	30	1	1.130144.0001
0.53	30	1.5	1.130145.0001
0.53	30	3	1.130146.0001
0.53	50	0.5	1.130148.0001
0.53	50	2.65	1.130149.0001
0.53	50	5	1.130150.0001
0.53	60	0.5	1.130151.0001
0.53	60	1	1.130152.0001
0.53	60	1.5	1.130153.0001
0.53	60	3	1.130154.0001

CD-1701

Phase: bonded, 14% cyanopropyl-phenyl – 86% dimethylpolysiloxane

Intermediate polarity CD-1701 columns have a mixed functionality which

provides unique elution order characteristics , relative to the phenyl-containing silicone phases. This column meets USP G46 requirements.。
Similar phases: OV-1701, DB-1701, CP-SIL 19 CB, HP-1701, Rtx-1701, SPB-1701, 007-1701, BP10, ZB-1701
Temp. Limits: 20°C to 280°C

ID(mm)	Length(m)	Df(um)	Cat. No.
0.25	15	0.25	1.170171.0001
0.25	30	0.25	1.170172.0001
0.25	30	0.5	1.170173.0001
0.25	30	1	1.170174.0001
0.25	60	0.25	1.170175.0001
0.25	60	1	1.170176.0001
0.32	15	0.25	1.170178.0001
0.32	30	0.25	1.170179.0001
0.32	30	0.5	1.170180.0001
0.32	30	1	1.170181.0001
0.32	60	0.25	1.170184.0001
0.32	60	0.5	1.170185.0001
0.32	60	1	1.170186.0001
0.53	15	0.5	1.170189.0001
0.53	15	1	1.170190.0001
0.53	15	1.5	1.170191.0001
0.53	30	0.5	1.170193.0001
0.53	30	1	1.170194.0001
0.53	30	1.5	1.170195.0001
0.53	50	0.5	1.170198.0001
0.53	60	0.5	1.170201.0001
0.53	60	1	1.170202.0001
0.53	60	1.5	1.170203.0001

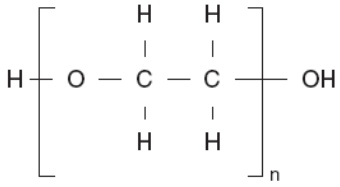
CD-225

Phase: bonded, Poly(50% cyanopropylphenyl/50% dimethylsiloxane)

This bonded,crosslinked poly(50% cyanopropylphenyl 50% dimethylsiloxane phase is excellent for separating cis and trans FAMEs. CD-225 columns have intermediate to high polarity. This column meets USP G7requirements
Similar phases: DB-225,HP-225,OV-225,Rtx-225,CP-SIL 43,007-225, BP225
Temp. Limits: 40°C to 240°C

ID(mm)	Length(m)	Df(um)	Cat. No.
0.25	15	0.25	1.225101.0001
0.25	30	0.25	1.225102.0001
0.25	30	0.5	1.225103.0001
0.25	30	1	1.225104.0001
0.25	60	0.25	1.225105.0001
0.25	60	1	1.225106.0001
0.32	15	0.25	1.225108.0001
0.32	30	0.25	1.225109.0001
0.32	30	0.5	1.225110.0001
0.32	30	1	1.225111.0001
0.32	60	0.25	1.225114.0001
0.32	60	0.5	1.225115.0001
0.32	60	1	1.225116.0001
0.53	15	0.5	1.225119.0001
0.53	15	1	1.225120.0001
0.53	30	0.5	1.225123.0001
0.53	30	1	1.225124.0001
0.53	50	0.5	1.225128.0001
0.53	60	0.5	1.225131.0001
0.53	60	1	1.225132.0001
0.53	60	1.5	1.225133.0001
0.53	60	3	1.225134.0001
0.53	60	5	1.225135.0001

CD-WAX



Phase: bonded, polyethylene glycol 20M
This polar PEG-type phase is the bonded with much higher thermal stability. Because this phase offers higher polarity than any of the phenylsilicone phases, it is widely
used for separation and purity analyses of many polar compounds, including alcohols, aromatics, and other solvents, flavors, fragrances, and FAMEs. This column meets USP G16 requirements.
Similar phases: DB-Wax, Supelcowax, HP-Wax, Rtx-Wax, HP-INNOWAX, CP-Wax 52 CB, Stabilwax,007-CW, BP20, AT-Wax, ZB-Wax
Temp. Limits: 20°C to 240/250°C

ID(mm)	Length(m)	Df(um)	Cat. No.
0.25	15	0.25	1.103220.0001
0.25	30	0.25	1.103221.0001
0.25	30	0.5	1.103222.0001
0.25	30	1	1.103223.0001
0.25	60	0.25	1.103224.0001
0.25	60	1	1.103225.0001
0.32	15	0.25	1.103227.0001
0.32	30	0.25	1.103228.0001
0.32	30	0.5	1.103229.0001
0.32	30	1	1.103230.0001
0.32	60	0.25	1.103233.0001
0.32	60	0.5	1.103234.0001
0.32	60	1	1.103235.0001
0.53	15	0.5	1.103238.0001
0.53	15	1	1.103239.0001
0.53	15	1.5	1.103240.0001
0.53	30	0.5	1.103242.0001
0.53	30	1	1.103243.0001
0.53	30	1.5	1.103244.0001
0.53	50	0.5	1.103247.0001
0.53	60	0.5	1.103250.0001
0.53	60	1	1.103251.0001
0.53	60	1.5	1.103252.0001

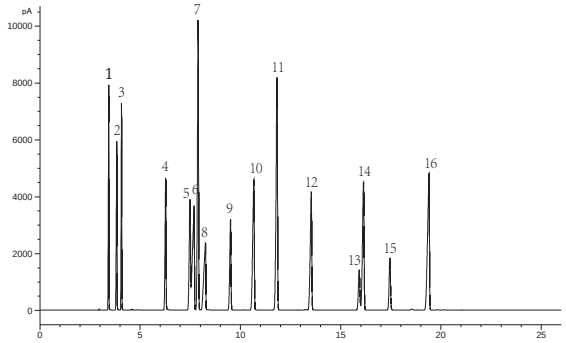
Special Purpose Columns

CD-VOCOL

ID(mm)	Length(m)	Df(um)	Cat. No.
0.32	60	1.8	1.302524.0001

VOC in packing of cigarette

1. Ethanol
2. 2-Propanol
3. Acetone
4. acetic ether
5. Iso-propyl acetate
6. N- Butanol
7. Benzene
8. 1-Methoxy-2-propanol
9. Acetic acid-n-propyl ester
10. 4-methyl- Pentanol
11. Toluene
12. n-Butyl acetate
13. Ethylbenzene
14. Xylene
15. Xylene
16. cyclohexanone



Column: CD-VOCOL, 60m×0.32mm×1.8um(1.302524.0001)
Inject: 150°C
Oven: 40°C（2min） at 4min/°C to 180°C（15min）
Det: 250°C

CD-2560

Specially prepared and tested columns, designed to separate geometric-positional (cis/trans) isomers of fatty acid methyl esters. Recommended for separating FAMEs in hydrogenated vegetable oil samples.

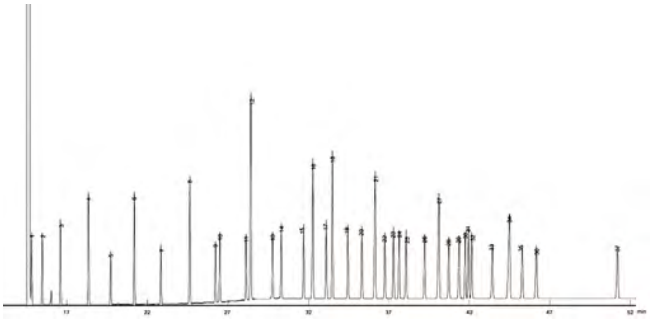
Phase: nonbonded; biscyanopropyl polysiloxane

Temp. Limits: subambient to 250°C

ID(mm)	Length(m)	Df(um)	Cat. No.
0.25	100	0.2	1.232421.0001

37 Fames

1. (C4:0) Butyric Acid Methyl Ester
2. (C6:0) Caproic Acid Methyl Ester
3. (C8:0) Caprylic Acid Methyl Ester
4. (C10:0) Capric Acid Methyl Ester
5. (C11:0) Undecanoic Acid Methyl Ester
6. (C12:0) Lauric Acid Methyl Ester
7. (C13:0) Tridecanoic Acid Methyl Ester
8. (C14:0) Myristic Acid Methyl Ester
9. (C14:1) Myristoleic Acid MethylEster
10. (C15:0) Pentadecanoic Acid
11. (C15:1) cis-10-Pentadecenoic Acid
12. (C16:0) Palmitic Acid Methyl Ester
13. (C16:1) Palmitoleic Acid Methyl Ester
14. (C17:0) Heptadecanoic Acid
15. (C17:1) cis-10-Heptadecenoic Acid Methyl Ester
16. (C18:0) Stearic Acid Methyl Ester
17. (C18:1n9t) Elaidic Acid Methyl Ester
18. (C18:1n9c) Oleic Acid Methyl Ester
19. (C18:2n6t) Linolelaidic Acid Methyl Ester
20. (C18:2n6c) Linoleic Acid Methyl Ester
21. (C20:0) Arachidic Acid Methyl Ester
22. (C18:3n6) γ-Linolenic Acid Methyl Ester
23. (C20:1n9) cis-11-Eicosenoic Acid Methyl Ester
24. (C18:3n3) α-Linolenic Acid Methyl Ester
25. (C21:0) Heneicosanoic Acid Methyl Ester
26. (C20:2) cis-11,14-Eicosadienoic Acid Methyl Ester
27. (C22:0) Behenic Acid Methyl Ester
28. (C20:3n6) cis-8,11,14-Eicosatrienoic Acid Methyl Ester
29. (C22:1n9) Erucic Acid Methyl Ester
30. (C20:3n3) cis-11,14,17-Eicosatrienoic Acid Methyl Ester
31. (C20:4n6) Arachidonic Acid Methyl Ester
32. (C23:0) Tricosanoic Acid Methyl Ester
33. (C22:2n6) cis-13,16-Docosadienoic Acid Methyl Ester
34. (C24:0) Lignoceric Acid Methyl Ester
35. (C20:5n3) cis-5,8,11,14,17-Eicosapentaenoic Acid Methyl Ester
36. (C24:1n9) Nervonic Acid Methyl Ester
37. (C22:6n3) cis-4,7,10,13,16,19-Docosahexaenoic Acid Methyl Ester



Column: CD-2560,100m×0.25mm×0.20um(1.232421.0001)
Inject: 250°C,split :30：1, 1ul
Oven: 140°C（5min） to 240°C at 4°C /min
Det: FID,260°C

CD-624

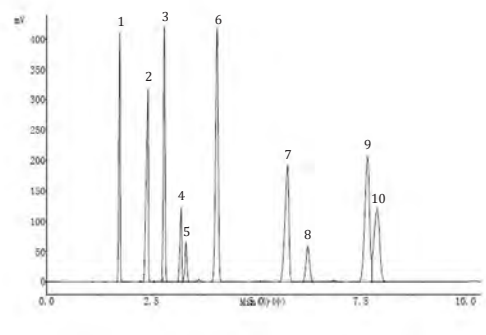
Specially tested for separation, efficiency, and baseline bleed; designed for purge-and-trap analyses of volatile halogenated,nonhalogenated, and aromatic contaminants from air, drinking water, wastewater, and soil This column meets USP G43 requirements.

Similar phases: HP-624, HP-VOC, DB-624, CP-624DB-VRX, SPB-624, RTX-624, RTX-Volatiles, BP624007-624, VOCOL

Temp. Limits: 20 °C-260 °C

Solvent

1. Methanol
2. Ethanol
3. Acetone
4. Acetonitrile
5. Dichlormethan
6. N-HEXAN
7. Acetic ether
8. Trichlormethan
9. Benzene
10. ISO-OCTANE



Column: CD-624,30m×0.32mm×1.8um(1.624516.0001)
Inject: 200°C,split 1：10, 0.04ul
Oven: 40°C,10min
Det: FID,240°C

ID(mm)	Length(m)	Df(um)	Cat. No.
0.25	30	1.4	1.624514.0001
0.25	60	1.4	1.624515.0001
0.32	30	1.8	1.624516.0001
0.32	60	1.8	1.624518.0001
0.53	30	3	1.624520.0001
0.53	60	3	1.624521.0001

CD-5HT

(5%-Phenyl)-methylpolysiloxane

Specially processed for extended temperature limit of 400 °C High temperature, polyimide-coated, fused silica tubing, for PCB ,PBDE

ID(mm)	Length(m)	Df(um)	Cat. No.
0.25	15	0.1	1.621512.0001
0.25	30	0.1	1.621511.0001

ID(mm)	Length(m)	Df(um)	Cat. No.
0.32	15	0.1	1.621513.0001
0.32	30	0.1	1.621510.0001

CD-1MS

Phase: bonded, poly(dimethylsiloxane)

The nonpolar methylsilicone columns have the phase with lowest bleeding. Ideal for GC/MS and ECD applications and general analyses at trace level.
Similar phases: DB-1ms,HP-1ms,RTX-1ms,CP-Sil 5 CB
Temp. Limits: -60°C-340/360°C

ID(mm)	Length(m)	Df(um)	Cat. No.
0.25	15	0.25	1.154631.0001
0.25	30	0.25	1.154632.0001
0.25	30	0.5	1.154633.0001
0.25	60	0.25	1.154635.0001
0.25	60	1	1.154636.0001
0.25	100	0.25	1.154637.0001
0.32	15	0.25	1.154638.0001
0.32	30	0.25	1.154639.0001
0.32	30	0.5	1.154640.0001
0.32	30	1	1.154641.0001
0.32	60	0.25	1.154644.0001
0.32	60	0.5	1.154645.0001
0.32	60	1	1.154646.0001
0.53	15	0.5	1.154649.0001
0.53	15	1	1.154650.0001
0.53	30	0.5	1.154653.0001
0.53	30	1	1.154654.0001
0.53	50	0.5	1.154658.0001
0.53	60	0.5	1.154661.0001
0.53	60	1	1.154662.0001

CD-5MS

Phase: bonded, Poly(5% diphenyl/95% dimethylsiloxane)

The low polar methylsilicone columns have the phase with lowest bleeding. Ideal for GC/MS and ECD applications and general analyses at trace level.
Similar phases: DB-5ms,HP-5ms,RTX-5ms,CP-Sil 8CBms
Temp. Limits: -60°C -340/360°C

ID(mm)	Length(m)	Df(um)	Cat. No.
0.25	15	0.25	1.554420.0001
0.25	30	0.25	1.554421.0001
0.25	30	0.5	1.554422.0001
0.25	60	0.25	1.554424.0001
0.25	60	1	1.554425.0001
0.25	100	0.25	1.554426.0001
0.32	15	0.25	1.554427.0001
0.32	30	0.25	1.554428.0001
0.32	30	0.5	1.554429.0001
0.32	30	1	1.554430.0001
0.32	60	0.25	1.554433.0001
0.32	60	0.5	1.554434.0001
0.32	60	1	1.554435.0001
0.53	15	0.5	1.554438.0001
0.53	15	1	1.554439.0001
0.53	30	0.5	1.554442.0001
0.53	30	1	1.554443.0001
0.53	30	1.5	1.554444.0001
0.53	50	0.5	1.554447.0001
0.53	60	0.5	1.554450.0001
0.53	60	1	1.554451.0001

CD-35MS

Phase: bonded, Poly(35% diphenyl/65% dimethylsiloxane)

The low polar methylsilicone columns have the phase with lowest bleeding. Ideal for GC/MS and ECD applications and general analyses at trace level.
Similar phases: DB-35ms, MDN-35
Temp. Limits: -60°C -340/360°C

ID(mm)	Length(m)	Df(um)	Cat. No.
0.25	15	0.25	1.355411.0001
0.25	30	0.25	1.355412.0001
0.25	30	0.5	1.355413.0001
0.25	60	0.25	1.355415.0001
0.25	60	1	1.355416.0001
0.25	100	0.25	1.355417.0001
0.32	15	0.25	1.355418.0001
0.32	30	0.25	1.355419.0001
0.32	30	0.5	1.355420.0001
0.32	30	1	1.355421.0001
0.32	60	0.25	1.355424.0001
0.32	60	0.5	1.355425.0001
0.32	60	1	1.355426.0001
0.53	15	0.5	1.355429.0001
0.53	15	1	1.355430.0001
0.53	30	0.5	1.355433.0001
0.53	30	1	1.355434.0001
0.53	50	0.5	1.355438.0001
0.53	60	0.5	1.355441.0001
0.53	60	1	1.355442.0001

CD-ACIDWAX

Phase: bonded, polyethylene glycol 2-nitroterephthalate

This bonded PEG-type phase, incorporating acidic functional groups, displays an acidic character and is useful for analyses of volatile acidic compounds. This column meets USP G35 requirements.
Similar phases:DB-FFAP,HP-FFAP,CP-SIL 58 CB,007-FFAP,CP-FFAP CB,Nukol
Temp. Limits: 40°C to 230°C

ID(mm)	Length(m)	Df(um)	Cat. No.
0.25	15	0.25	1.448134.0001
0.25	30	0.25	1.448135.0001
0.25	30	0.5	1.448136.0001
0.25	30	1	1.448137.0001
0.25	60	0.25	1.448138.0001
0.25	60	1	1.448139.0001
0.32	15	0.25	1.448141.0001
0.32	30	0.25	1.448142.0001
0.32	30	0.5	1.448143.0001
0.32	30	1	1.448144.0001

ID(mm)	Length(m)	Df(um)	Cat. No.
0.32	60	0.25	1.448147.0001
0.32	60	0.5	1.448148.0001
0.32	60	1	1.448149.0001
0.53	15	0.5	1.448152.0001
0.53	15	1	1.448153.0001
0.53	15	1.5	1.448154.0001
0.53	15	3	1.448155.0001
0.53	30	0.5	1.448156.0001
0.53	30	1	1.448157.0001
0.53	30	1.5	1.448158.0001
0.53	50	0.5	1.448161.0001
0.53	60	0.5	1.448164.0001
0.53	60	1	1.448165.0001
0.53	60	1.5	1.448166.0001

CD-BASEWAX

Phase: bonded, base-deactivated polyethylene glycol

Specially prepared, base-deactivated polyethylene glycol columns designed for analyses of amines and other basic analytes.

Similar phases: RTX Amine, PTA-5

Temp. Limits: -60 °C -240 °C

ID(mm)	Length(m)	Df(um)	Cat. No.
0.25	15	0.25	1.548168.0001
0.25	30	0.25	1.548169.0001
0.25	30	0.5	1.548170.0001
0.25	30	1	1.548171.0001
0.25	60	0.25	1.548172.0001
0.25	60	1	1.548173.0001
0.32	15	0.25	1.548175.0001
0.32	30	0.25	1.548176.0001
0.32	30	0.5	1.548177.0001
0.32	30	1	1.548178.0001
0.32	60	0.25	1.548181.0001
0.32	60	0.5	1.548182.0001
0.32	60	1	1.548183.0001
0.53	15	0.5	1.548186.0001
0.53	15	1	1.548187.0001
0.53	15	1.5	1.548188.0001
0.53	30	0.5	1.548190.0001
0.53	30	1	1.548191.0001
0.53	30	1.5	1.548192.0001
0.53	50	0.5	1.548195.0001
0.53	60	0.5	1.548198.0001
0.53	60	1	1.548199.0001
0.53	60	1.5	1.548200.0001

CD-PONA

Phase: bonded, poly(dimethylsiloxane)

Highly reproducible column displaying more than 400,000 theoretical plates, designed for detailed analyses of petroleum products; used for PNA, PONA and PIANO type analyses.

Similar phases: HP-PONA, Petrocol DH

Temp. Limits: -60 °C -240 °C

ID(mm)	Length(m)	Df(um)	Cat. No.
0.2	50	0.5	1.096125.0001
0.25	100	0.5	1.096155.0001

CD-2887

Phase: bonded, poly(dimethylsiloxane)

Developed and tested to meet or exceed column performance requirements for simulated distillation of petroleum fractions having boiling points up to 1000°F, according to ASTM Test Method D2887.

Similar phases: DB-2887,Petrocol EX2887

Temp. Limits: -60 °C -280 °C

ID(mm)	Length(m)	Df(um)	Cat. No.
0.53	5	1	1.288710.0001
0.53	5	3	1.288711.0001
0.53	10	0.1	1.288712.0001
0.53	10	0.5	1.288713.0001
0.53	10	1	1.288714.0001
0.53	10	3	1.288715.0001

CD-608

Specially tested with 18 chlorinated pesticides at low concentration with an electron capture detector (ECD). These columns meet the criteria for minimum breakdown of 4,4'-DDT and endrin for EPA Methods 508, 608, 8080, 8081, and SW-Pesticides.

Similar phases: DB-608, HP-608,SPB-608, 007-608

Temp. Limits: 40 °C-300 °C

ID(mm)	Length(m)	Df(um)	Cat. No.
0.25	30	0.25	1.608025.0001
0.32	30	0.5	1.608026.0001
0.53	30	1.0	1.608027.0001

CD-VOC

These intermediate polarity columns, designed for volatile organic compounds (VOCs) analysis, ensure greater retention and resolution of the more volatile compounds. Used for US EPA volatiles methods, including 502.2, 524.2, 624, 8240, 8260, and 8021.

Similar phases: VOCOL, DB-VRX, HP-VOC, Rtx-Volatiles

Temp. Limits: 60 °C-280 °C

ID(mm)	Length(m)	Df(um)	Cat. No.
0.25	30	1	1.302510.0001
0.25	60	1	1.302511.0001
0.32	30	1	1.302512.0001
0.32	30	1.8	1.302513.0001
0.32	60	1	1.302514.0001
0.32	60	1.8	1.302515.0001
0.53	30	1.5	1.302518.0001
0.53	30	3	1.302519.0001
0.53	60	1.5	1.302520.0001
0.53	60	3	1.302521.0001

CD-MoleSieve

The Mol Sieve 5A PLOT columns separate permanent gases. Oxygen, nitrogen, carbon monoxide and methane can be separated in less than 5 minutes. More difficult separations, such as argon from oxygen, can be achieved by using subambient temperatures.

Similar phases: HP-PLOT, Mol Sieve 5A PLOT

Temp. Limits: -60 °C-300 °C

ID(mm)	Length(m)	Df(um)	Cat. No.
0.32	15	10	1.232429.0001
0.32	30	10	1.232430.0001
0.32	50	10	1.232431.0001
0.53	15	20	1.232432.0001
0.53	30	20	1.232433.0001
0.53	50	20	1.232434.0001

CD-PLOT Q

The CD-PLOT Q columns effectively resolves carbon dioxide and C1-C4 hydrocarbons at above ambient temperatures. It also is suitable for analyses of other gases, such as sulfur gases, and alcohols, ketones, aldehydes, and many polar compounds. Gasoline and other petroleum fractions can be analyzed as well. These columns exhibit very little bleed, even at the maximum temperature. Relative to packed columns (HayeSep Q and Porapak Q), CD-PLOT Q columns offer better resolution in less time.

Similar phases: HP-PLOT Q,CP PoraPLOT Q, Rt-QPLOT, SupelQ PLOT

Temp. Limits: -60 °C-250 °C

ID(mm)	Length(m)	Df(um)	Cat. No.
0.32	15	10	1.232436.0001
0.32	30	10	1.232437.0001
0.32	50	10	1.232438.0001
0.53	15	20	1.232439.0001
0.53	30	20	1.232440.0001
0.53	50	20	1.232441.0001

CD-AL2O3/KCl

These chloride deactivated alumina PLOT columns allow for the separation of C1-C8 hydrocarbons. It is also used in the ASTM methods. The Alumina Chloride PLOT is less polar than other Alumina PLOT.

Similar phases: HP-PLOT Al2O3 KCl,CP-Al2O3/KCl PLOT, Rt-Alμmina PLOT

Temp. Limits: -60 °C-200 °C

ID(mm)	Length(m)	Df(um)	Cat. No.
0.32	15	10	1.232422.0001
0.32	30	10	1.232423.0001
0.32	50	10	1.232424.0001
0.53	15	20	1.232425.0001
0.53	30	20	1.232426.0001
0.53	50	20	1.232427.0001

CD-AL2O3/Na2SO4

These sulfate deactivated alumina PLOT columns are highly dependable columns for fast and efficient hydrocarbon and petrochemical analysis. The selectivity of the sulfate deactivated alumina version allows for the separation of C1-C8 hydrocarbons. This column also provides elution of acetylene after n-butane. The Alumina Sulfate PLOT column is more polar than the Alumina Chloride PLOT.

Similar phases: HP-PLOT Al2O3 S,GS-Alμmina, Alumina Sulfate PLOT

Temp. Limits: -60 °C-190 °C

Description	Packing	Cat. No.	Solvent	Temp(°C) Min/Max
Apiezon L	25g	1.091100.0025	C	20/100

ID(mm)	Length(m)	Df(um)	Cat. No.
0.53	50	20	1.232420.0001

GC Packed column

Introduction of Packed column

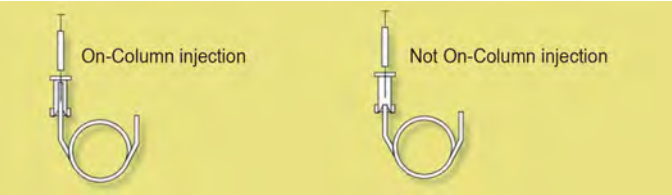
GC packed column is chromatography column that packed with solid phase. Its main components include empty column and packing in it. Commonly used column are stainless steel column and glass column with ID 2-5mm, length 0.5-10m. The packing can be porous granular adsorbent or a thin layer of fixed liquid film that applied evenly on the surface of inert carrier particles. The packed column is sample to prepare, has many kinds of optional stationary phase and supports. Therefore, it has wide selectivity and is conducive to solving the problem of separation and analysis of various components. Its disadvantage is that the column permeability is small, and mass transfer resistance is large, the column cannot be too long, so the separation efficiency is low.

Ordering Instroductions

Due to the different column shapes for different brand gas chromatography instruments and the same model machine for different type testing, ordering needs supply detail information.

Stainless steel packed column of common imported machine has OD 1/8", with Not On-Column injection. But on domestic machine, the stainless steel column's OD is 3mm or 4mm, and injection method is On-Column injection.

The difference between On-Column injection and Not On-Column injection refer to following table.



Commonly used Glass packed column graph

Shapes of glass packed column (no fittings, all 1/4" OD)

Machine model	Glass column shape
Agilent/HP 5880, 5890, 5987, 6890 Configuration A 9" span all detectors except TCD	
Agilent/HP 5880, 5890, 5987, 6890 Configuration B TCD only	
Shimadzu GC-4BM, 4CM,4MG, GC-6A,6AM,GC-7AG,7A, 9A	
Shimadzu GC RIA, GC-8A8IF	
Shimadzu 14A, 15A, 16A	

X the length associated with injection segment

Y the length of connection with detector

S the length of the span from the sample to the detection end

ANPEL Packed column

Packed column in stock (stainless steel column, length 6ft, OD1/8", ID2.1mm)

Description	Agilent Item	Cat.No.
10% OV-1 on 80-100 Chromosorb W HP	19001A-A11	GBAA-90001-20
5% OV-1 on 100-120 Chromosorb W HP	19001A-A52	GBAA-90002-20
3% OV-1 on 100-120 Chromosorb W HP		GBAA-90003-20
10% OV-17 on 80-100 Chromosorb W HP	19001A-B11	GBAA-90004-20
5% OV-17 on 80-100 Chromosorb W HP	19001A-B51	GBAA-90005-20
3% OV-17 on 80-100 Chromosorb W HP		GBAA-90006-20
10% OV-101 on 80-100 Chromosorb W HP	19001A-D11	GBAA-90007-20
10% OV-101on 100-120 Chromosorb W HP	19001A-D12	GBAA-90008-20
3% OV-210 on 80-100Chromosorb W HP		GBAA-90009-20
3% OV-210 on 80-100Chromosorb W AW DMCS		GBAA-90010-20
10% OV-225 on 100-120Chromosorb W HP	19001A-F12	GBAA-90011-20
3% OV-275 on 100-120Chromosorb W HP		GBAA-90012-20

ANPEL Empty column

Description	Brand	Packing	Cat.No.
Steel column 1/8"	import, customize	m	GBAA-00100
Steel column 1/4"	import, customize	m	GBAA-00200
1m Steel column	Shimadzu	pc	GBAK-48705-10
2m Steel column	Shimadzu	pc	GBAK-48705-20
3m Steel column	Shimadzu	pc	GBAK-48705-30
1m glass column (Shimadzu GC14)	ANPEL	pc	GBAA-00010-10
1.5m glass column (Shimadzu GC14)	ANPEL	pc	GBAA-00010-15
2m glass column (Shimadzu GC14)	ANPEL	pc	GBAA-00010-20
3m glass column (Shimadzu GC14)	ANPEL	pc	GBAA-00010-30
1m glass column (Shimadzu GC8A)	ANPEL	pc	GBAA-00020-10
1.5m glass column (Shimadzu GC8A)	ANPEL	pc	GBAA-00020-15
2m glass column (Shimadzu GC8A)	ANPEL	pc	GBAA-00020-20
3m glass column (Shimadzu GC8A)	ANPEL	pc	GBAA-00020-30
1m glass column (Shimadzu GC17A)	ANPEL	pc	GBAA-00030-10
1.5m glass column (Shimadzu GC17A)	ANPEL	pc	GBAA-00030-15
2m glass column (Shimadzu GC17A)	ANPEL	pc	GBAA-00030-20
3m glass column (Shimadzu GC17A)	ANPEL	pc	GBAA-00030-30
1m glass column (Agilent FID)	ANPEL	pc	GBAA-00050-10
1.5m glass column (Agilent FID)	ANPEL	pc	GBAA-00050-15
2m glass column (Agilent FID)	ANPEL	pc	GBAA-00050-20
2.5m glass column (Agilent FID)	ANPEL	pc	GBAA-00050-25
3m glass column (Agilent FID)	ANPEL	pc	GBAA-00050-30
2m glass column (Wenling9790FID)	ANPEL	pc	GBAA-00060-20

Packed column customize table:

Packed column customize information table			
Stationary phase(1)		Coating rate:	%
Stationary phase(2)		Coating rate:	%
Support:		(like Chromosorb WAW DMCS)	
Mesh:			
Column material:	(1)stainless steel, (2)glass, (3) copper		
Column size:			
Length:		Inner diameter:	Outer diameter:
Instrument model:			
Injection method:		Detector type:	
Other requirement:			

Stationary phase

The specification of stationary phase

1.Little volatile, have a lower vapor pressure under the operating temperature, in order to avoid wastage
2.Good thermal stability, decomposition and polymerization reaction does not occur under the operating temperature, and liquid-like State, maintaining the original characteristics
3.Sample some ability to dissolve in order to avoid the component being tested is bleed
4.with good selectivity, has higher separation capability for the groups which has similar nature
5.Good chemical stability, high inertness with test groups and the supports

How to select stationary phase

1, use low polar phase for low polar groups
2, use high polar phase for high polar groups
3, use high polar phase for both low and high polar groups mixed
4, use hydrogen bonded phase for hydrogen bonded groups
5, use mixed phase for mixed and special groups

Description	Packing	Cat. No.	Solvent	Temp(°C) Min/Max
Apiezon L	25g	1.091100.0025	C	20/100
Bentone 34	50g	1.010033.0050	TC	20/200
Bis(2-Butoxyethyl) phthalate	20g	1.010043.0020	M	20/175
Butane 14 diol Succinate	25g	1.010049.0025	C	
Carbowax 400	50g	1.010051.0050	C	20/100
Carbowax 550	50g	1.010053.0050	C	20/110
Carbowax 600	50g	1.010055.0050	C	20/120
Carbowax 750	50g	1.010057.0050	C	25/130
Carbowax 1000	50g	1.010059.0050	M	40/150
Carbowax 1500	50g	1.010061.0050	C	40/200
Carbowax 1540	50g	1.010063.0050	C	40/200
Carbowax 4000	50g	1.010065.0050	C	60/200
Carbowax 6000	50g	1.010067.0050	C	60/2000
Carbowax 20M	50g	1.010069.0050	C	60/250
Carbowax 20M	50g	1.110069.0050	C	60/225
Carbowax 20M-TPA	50g	1.010071.0050	C	60/250
Citroflex A-4	50g	1.010081.0050	A	-25/180
Citroflex 4	50g	1.010083.0050	M	-15/150
Cyanoethylsucrose	50g	1.010085.0050	A	20/125
DC-200 (350 cstk)	50g	1.001010.0050	CT	0/200
DC-11	50g	1.001011.0050	CT	0/300
DC-200 (12500 cstk)	50g	1.001012.0050	CT	0/250
DC-410	50g	1.001013.0050		

Description	Packing	Cat. No.	Solvent	Temp(°C) Min/Max
DC-401	50g	1.001014.0050		
DC-550	50g	1.001015.0050	AT	20/250
DC-710	50g	1.001018.0050	A	5/250
DC-HIVAC Grease	50g	1.001019.0050		
DC QF-1	50g	1.001021.0050	A	0/250
DC FS-1265	50g	1.001022.0050	A	
Dibutyl Phthalate	50g	1.010099.0050	M	-20/100
Didecyl Phthalate	25g	1.010101.0025	A	20/150
Diethylene Glycol Adipate (DEGA)	25g	1.010103.0025	A	20/190
Diethylene Glycol Succinate (DEGS) GC Grade	25g	1.010105.0025	A	20/200
Di(2-Ethylhexyl) sebacate	50g	1.010109.0050	A	-20/125
Diglycerol	10g	1.010111.0010	M	20/120
Diisodecyl Adipate	50g	1.010113.0050	M	-20/125
Diisodecyl Phthalate	50g	1.010115.0050	A	-20/150
Dilauryl Phthalate	10g	1.010121.0010	M	20/150
Dimethylformamide UN2265 Flammable Liquid	50g	1.010127.0050	M	-20/20
Dimethyl Sufoxide	50g	1.010131.0050	A	20/30
Dinonyl Phthalate	50g	1.010133.0050	A	20/150
EPON 1001	50g	1.010141.0050	C	65/200
Ethylene Glycol Phthalate (EGP)	25g	1.010149.0025	C	
Ethylene Glycol Succinate (EGS)	25g	1.010155.0025	C	100/200
FFAP	25g	1.010156.0025	C	0/275
Formamide	50g	1.010159.0050	M	20/50
Glycerol	50g	1.010161.0050	M	20/100
Halocarbon Oil 14-25	50g	1.010163.0050	C	20/150
Hallcomid M-18 OL	50g	1.010166.0050	MC	8/150
Hexamethylphosphoramide (HMPA)	50g	1.010171.0050	M	20/35
HI-EFF-1BP	25g	1.010407.0025	C	20/200
Igepal CO-630	50g	1.010175.0050	M	100/200
Igepal CO-880	50g	1.010179.0050	C	100/200
Igepal CO-990	50g	1.010181.0050	C	100/220
BB-Iminodipropionitrile	25g	1.010183.0025	M	-/1100
KEL-F Oil #3	25g	1.010187.0025	A	0/50
KEL-F Oil #10	50g	1.010189.0050	A	20/100
Lexan	25g	1.010201.0025	C	220/270
Mannitol	25g	1.010203.0025		170/200
Neopentyl Glycol Adipate (NPGA)	25g	1.010205.0025	C	50/225
NUJOL	50g	1.010211.0050	T	0/100
OV-1(dimethyl gum)	10g	1.001041.0010	T	100/350
OV-3(phenyl methyl dimethyl 10% phenyl)	25g	1.001042.0025	A	20/350
OV-7(phenyl methyl dimethyl 20% phenyl)	25g	1.001043.0025	A	20/350
OV-11(phenyl methyl dimethyl 35% phenyl)	25g	1.001044.0025	A	0/350
OV-17(phenyl methyl 50% phenyl) 25g	25g	1.001045.0025	A	20/350
OV-22(phenyl methyl diphenyl 65% phenyl)	10g	1.001046.0010	A	20/350
OV-25(phenyl methyl diphenyl 75% phenyl)	10g	1.001047.0010	A	20/350
OV-61(diphenyl 33% phenyl)	10g	1.001048.0010	A	20/350
OV-73(5.5% diphenyl)	10g	1.001049.0010	T	20/350
OV-101(dimethyl fluid)	20g	1.001050.0020	T	20/350
OV-105(cyanopropylmethyl)	10g	1.001051.0010	A	20/350
OV-202(trifluoropropyl fluid)	10g	1.001052.0010	C	0/275
OV-210(trifluoropropyl fluid)	25g	1.001053.0025	C	20/275
OV-225(cyanopropylmethyl-phenylmethyl)	10g	1.001054.0010	A	20/250
OV-275(dicyanoallyl)	5g	1.001055.0005	A	20/275
OV-330(silicone – Carbowax)	5g	1.001056.0005	A	20/275

Description	Packing	Cat. No.	Solvent	Temp(°C) Min/Max
OV-351(polyglycol-nitroterephthalic)	10g	1.001058.0010	C	50/250
OV-1701 (Dimethylphenyl cyano substitute)	3g	1.001059.0003	A	20/325
OV-235	5g	1.001090.0005	C	50/275
OV-245	5g	1.001091.0005	A	50/275
OV-255	5g	1.001092.0005	A	50/275
OV-1 Vinyl Modified	5g	1.006001.0005		
OV-17 Vinyl	3g	1.006017.0003		
OV-20 Vinyl Modified	3g	1.006020.0003		
OV-35 Vinyl Modified	3g	1.006035.0003		
OV-215 Vinyl Modified	10g	1.001057.0010		
OV-225 Vinyl Modified	3g	1.006225.0003		
OV-275 Vinyl Modified	3g	1.006275.0003		
OV-1701 Vinyl Modified	3g	1.061701.0003		
OV-101-OH Modified	5g	1.066001.0005		
OV-17-OH Modified	3g	1.6017OH.0003		
OV-31-OH Modified	3g	1.603106.0003		
OV-61-OH Modified	3g	1.606106.0003		
OV-1701-OH Modified	3g	1.617006.0003		
OV-225-OH Modified	3g	1.6225OH.0003		
OV-240-OH Modified	3g	1.624006.0003		
Phenyldiethanolamine	25g	1.010225.0025	A	0/150
Polyphenyl Ether 5-ring	25g	1.010233.0025	C	20/200
Polyphenyl Ether 6-ring	5g	1.010235.0005	C	0/250
Polypropylene Glycol	50g	1.010237.0050	M	0/150
Polyvinylpyrrolidinone (PVP)	50g	1.010241.0050	M	20/200
Propylene Glycol	50g	1.010243.0050	C	0/50
Reoplex 400	50g	1.010247.0050	A	20/220
SE-30((methyl silicone)	50g	1.001023.0050	C	50/300
SE-30 ((methyl siliconeGC Grade)	10g	1.001024.0010	C	50/350
SE-52(methyl silicone)	50g	1.001025.0050	C	50/300
SE-54((methyl silicone: 5% phenyl 1% vinyl silicone)	50g	1.001026.0050	C	100/300
SF-96(methyl silicone)	50g	1.001027.0050	C	20/250
Span 80 (Sorbitane Monooleate)	25g	1.010323.0025	T	20/150
Squalane	50g	1.010325.0050	T	20/150
Squalene	50g	1.010327.0050	T	20/150
Sucrose Acetate Isobutyrate (SAIB)	25g	1.010329.0025	C	30/200
Tergitol NPX	50g	1.010335.0050	C	10/175
THEED	25g	1.010347.0025	M	20/125
Tricresyl Phosphate [UN2574]	50g	1.010353.0050	M	20/125
Triethanolamine	50g	1.010355.0050	M	25/75
123-Tris(2-cyanoethoxy) propane (TCEP)	50g	1.010359.0050	M	29/150
Triton X-100	50g	1.010363.0050	A	20/190
Triton X-305	50g	1.010365.0050	A	20/250
Tween 80	50g	1.010367.0050	M	20/160
UCC L-45	50g	1.001032.0050		/300°C
UCC W-98	50g	1.001033.0050		/250°C
UCON LB-550-X	50g	1.010373.0050	M	20/200
UCON 50-HB-280-X	50g	1.010381.0050	M	20/200
UCON 50-HB-200	50g	1.010383.0050	A	20/200
UCON 50-HB-5100	50g	1.010385.0050	M	20/200

Solvent Code: A=Acetone C=Chloroform E=Ethyl Acetate T=Toluene M=Methano

Supports

The support plays a critical role in several ways in the performance of the column. First, it governs the efficiency of the column (narrowness of peaks). The structure of the support, and the manner in which it is coated, both contribute to the efficiency. Secondly, the wrong choice of support can interact with the sample to cause the chromatographic peaks to tail, i.e., they can be highly asymmetrical and consequently difficult or impossible to measure. Ideally, the support should not interact with the sample but, in practice, this does occur. By careful selection of the support and conditions, one can minimize this problem.

1 A large surface area
2 High chemical inertness
3 High thermal stability
4 Uniform particles
5 High mechanical strength

HayeSep

HayeSep® polymers are thoroughly cleaned and preconditioned for twelve hours under oxygen free nitrogen before packing.These handling techniques produce polymers which are consistently the same, with no shrinkage and minimum bleed. Columns packed with HayeSep require minimum conditioning.

Description	Packing	Art.	Max Temp(°C)
HayeSep A			
60-80 mesh	75cc	1.007105.0075	165
80-100 mesh	75cc	1.071051.0075	165
100-120 mesh	75cc	1.071052.0075	165
HayeSep B			
60-80 mesh	75cc	1.071023.0075	190
80-100 mesh	75cc	1.071024.0075	190
HayeSep C			
60-80 mesh	75cc	1.071025.0075	250
80-100 mesh	75cc	1.071026.0075	250
100-120 mesh	75cc	1.071027.0075	250
HayeSep D			
60-80 mesh	75cc	1.007103.0075	290
80-100 mesh	75cc	1.007100.0075	290
100-120 mesh	75cc	1.071030.0075	290
HayeSep DB			
60-80 mesh	75cc	1.007104.0075	290
80-100 mesh	75cc	1.007102.0075	290
100-120 mesh	75cc	1.007101.0075	290
HayeSep N			
60-80 mesh	75cc	1.007106.0075	165
80-100 mesh	75cc	1.007107.0075	165
100-120 mesh	75cc	1.007108.0075	165
HayeSep P			
60-80 mesh	75cc	1.007109.0075	250
80-100 mesh	75cc	1.071010.0075	250
HayeSep Q			
60-80 mesh	75cc	1.071012.0075	275
80-100 mesh	75cc	1.071013.0075	275
100-120 mesh	75cc	1.071014.0075	275
HayeSep R			
60-80 mesh	75cc	1.071015.0075	250
80-100 mesh	75cc	1.071016.0075	250
100-120 mesh	75cc	1.071017.0075	250
HayeSep S			
60-80 mesh	75cc	1.071018.0075	250
80-100 mesh	75cc	1.071019.0075	250
HayeSep T			
60-80 mesh	75cc	1.071020.0075	165
80-100 mesh	75cc	1.071021.0075	165
100-120 mesh	75cc	1.071022.0075	165

HayeSep® Specifications

Description	Polymer Composition	Polar(1=lowest 9=highest)	Surface Area (m^2/g)	Density(g/cc)
HayeSep A	DVB/EGDM (high purity)	7	526	0.356
HayeSep B	DVB /PEI.	8	608	0.330
HayeSep C	DVB /ACN	6	442	0.322
HayeSep D	DVB/(highpurity)	1	795	0.3311
HayeSep DB	DVB/(highpurity)	1	795	0.3311
HayeSep N	DVB /EGDM	9	405	0.355
HayeSep P	DVB /Styrene	3	165	0.420
HayeSep Q	DVB	2	582	0.351
HayeSep R	DVB /NV2P	5	344	0.324
HayeSep S	DVB /4VP	4	583	0.334
HayeSep T	EGDM	10	250	0.381

DVB	Divinylbenzene	ACN	Acrylonitrile
EGDM	Ethyleneglycoldimethacrylate	NV2P	N-Vinyl-2-pyrrolidinone
PEI	Polyethyleneimine	4VP	4-Vinyl-pyridine

Porapak

Porapak® GC packings are cross-linked polymers which can be used directly in GC columns without a stationary phase coating. Acetone washing of Porapak improves performance.

Description	Packing	Art.	Max Temp(°C)
Po rapak P			
50-80 mesh	20g	1.027053.0020	250
80-100 mesh	20g	1.027054.0020	250
100-120 mesh	20g	1.027055.0020	250
Porapak PS			
50-80 mesh	20g	1.027083.0020	250
80-100 mesh	20g	1.027084.0020	250
100-120 mesh	20g	1.027085.0020	250
Porapak Q			
50-80 mesh	26g	1.027059.0026	250
80-100 mesh	26g	1.027060.0026	250
100-120 mesh	26g	1.027061.0026	250
Porapak QS			
50-80 mesh	26g	1.027089.0026	250
80-100 mesh	26g	1.027090.0026	250
100-120 mesh	26g	1.027091.0026	250
Porapak R			
50-80 mesh	24g	1.027065.0024	250
80-100 mesh	24g	1.027066.0024	250
100-120 mesh	24g	1.027067.0024	250
Porapak S			
50-80 mesh	26g	1.027071.0026	250

Description	Packing	Art.	Max Temp(°C)
80-100 mesh	26g	1.027072.0026	250
100-120 mesh	26g	1.027073.0026	250
Porapak N			
50-80 mesh	28g	1.027047.0028	190
80-100 mesh	28g	1.027048.0028	190
100-120 mesh	28g	1.027049.0028	190
Porapak T			
50-80 mesh	31g	1.027077.0031	190
80-100 mesh	31g	1.027078.0031	190
100-120 mesh	31g	1.027079.0031	190

Porapak® Specifications

Description	Polymer Composition	Polar	Surface Area (m^2/g)	Density(g/cc)
Porapak P	DVB /Styrene	Non-Polar	100-200	0.26
Porapak PS	Silanized version of Porapak P.	Non-Polar	100-200	0.26
Porapak Q	DVB / Ethylvinylbenzene	Slightly nonpolar to moderate	500-600	0.34
Porapak QS	Silanized version of Porapak S	Slightly nonpolar to moderate	500-600	0.34
Porapak R	DVB/Vinyl pyrrolidinone	Moderate polar	450-600	0.32
Porapak S	DVB/Vinyl pyridine	Moderate polar	300-450	0.35
Porapak N	DVB/Vinyl pyrrolidinone	Polar	250-350	0.41
Porapak T	Ethyleneglycold imethacrylate.	High polar	225-350	0.39

Zeolite Molecular Sieves

Molecular Sieve 5A and Molecular Sieve 13X are commonly used for separations of H2, O2, N2, CH4, and CO, argon, neon, and other rare gases. Also used as trapping materials, in particular, for removing water vapor from gas streams. When three-foot columns of the molecular sieves are compared, elution of H2, O2, N2, and CH4, is approximately equal, but elution of CO takes twice as long on Molecular Sieve 5A.

Description	Packing	Art.	Max Temp(°C)
Molecular Sieve 4A			
45-60 mesh	50g	1.243112.0050	400
60-80 mesh	50g	1.243113.0050	400
80-100 mesh	50g	1.243114.0050	400
100-120 mesh	50g	1.243115.0050	400
Molecular Sieve 5A			
45-60 mesh	50g	1.243119.0050	400
60-80 mesh	50g	1.243120.0050	400
80-100 mesh	50g	1.243117.0050	400
100-120 mesh	50g	1.243116.0050	400
Molecular Sieve 13X			
45-60 mesh	50g	1.243123.0050	400
60-80 mesh	50g	1.243121.0050	400
80-100 mesh	50g	1.243124.0050	400
100-120 mesh	50g	1.243122.0050	400

Tenax

Tenax® - TA Polymers

Tenax® -TA is a porous polymer that is based on 2,6-Diphenylp-phenylene Oxide. It has replaced Tenax®-GC. Tenax –TA can be used as a packing and as a trapping material. Both the EPA and NIOSH specify the use of Tenax in their standard methods. Tenax is particularly useful for the analysis of high boiling compounds such as alcohols, polyethylene glycols, diols, phenols, monoamines and diamines, ethanolamines, aldehydes, ketones, and chlorinated aromatics.

Tenax®-GR contains 30% graphitized carbon as an integral part of the material. This is not an admixture; the graphitized carbon is co-precipitated with the Tenax polymer. The resulting material gives higher breakthrough volumes for most materials, yet is less water retentive than Tenax -TA. When using this material for packing GC columns, better peak symmetry is observed. Surface area is 24.1m^2/g.

Description	Packing	Art.	Max Temp(°C)
Tenax TA			
Tenax TA 20/35	10g	1.000919.0010	350
Tenax TA 35/60	10g	1.000920.0010	350
Tenax TA 60/80	10g	1.000921.0010	350
Tenax TA 80/100	10g	1.000922.0010	350
Tenax GR			
Tenax GR 20/35	10g	1.000933.0010	350
Tenax GR 35/60	10g	1.000934.0010	350
Tenax GR 60/80	10g	1.000944.0010	350
Tenax GR 80/100	10g	1.000945.0010	350

Graphitized Carbon Blacks (GCB)

Nonporous, nonspeci_ic, highly inert graphitic carbon adsorbents/solid supports which separate compounds according to the size and shape of the molecule (e.g., polarizability). Addition of a liquid phase allows unique separations, based on analyte interactions with both the carbon surface and the liquid phase (i.e., gas-liquid-solid chromatography, or GLSC)

Carboteck B - USP code [S12]. Surface area: ~100m^2/g.

Carboteck C - USP code [S7]. Surface area: ~ 10m^2/g. Separation mechanism equivalent to that of Carboteck B, but a larger molecular size range typically is chosen.

Carboteck F- Surface area: ~ 5m^2/g. Can reduce separation times by 50%, compared to Carboteck C.

Carboteck X - A unique graphitized carbon black with porosity (absent in most GCBs). The 240m^2/g surface area provides greater adsorption strength, relative to other GCBs, making Carboteck X a unique bridge between GCBs and carbon molecular sieves. Density: 0.41g/mL.

Carbotecp B- Surface area: 100m^2/g; available in 20/40 mesh. Traps many airborne C4-C8 compounds.

Carbotecp C - Surface area: 10m2/g; available in 20/40 mesh. Traps many airborne C8 and heavier compounds.

Carboteck

Description	Packing	Art.	Max Temp(°C)
Carboteck B 60-80 mesh	10g	1.072010.0010	>500
Carboteck BHT 60-80 mesh	10g	1.072011.0010	225
Carboteck B 80-100 mesh	10g	1.072012.0010	>500
Carboteck B80-120 mesh	10g	1.072013.0010	>500
Carboteck C 60-80 mesh	10g	1.072014.0010	>500
Carboteck C 80-100 mesh	10g	1.072015.0010	>500
Carboteck F 60-80 mesh	10g	1.072016.0010	>500
Carboteck X 60-80 mesh	10g	1.072017.0010	>500

Carbotecp

Description	Packing	Art.	Max Temp(°C)
Carbotecp B 20-40 mesh	10g	1.072018.0010	350
Carbotecp B 40-60 mesh	10g	1.072019.0010	350
Carbotecp C 20-40 mesh	10g	1.072020.0010	350
Carbotecp C 40-60 mesh	10g	1.072021.0010	350
Carbotecp F 20-40 mesh	10g	1.072022.0010	350
Carbotecp F 40-60 mesh	10g	1.072023.0010	350
Carbotecp X 20-40 mesh	10g	1.072024.0010	350
Carbotecp X 40-60 mesh	10g	1.072025.0010	350

Packings

Description	Packing	Art.	Max Temp(°C)
60/80 Carboteck B/1% SP-1000	15g	1.072026.0015	225
80/120 Carboteck B DA 4% Carbowax 20M	15g	1.072027.0015	200
80/120 Carboteck B AW/6.6% Carbowax 20M	15g	1.072028.0015	225
80/120 Carboteck BAW/5% Carbowax 20M	15g	1.072029.0015	225
60/80 Carboteck B/4% Carbowax 20M + 0.8% KOH	15g	1.072030.0015	220
80/100 Carboteck C/0.1% SP-1000	15g	1.072031.0015	225
60/80 Carboteck C/0.2% Carbowax 1500	15g	1.072032.0015	175
80/100 Carboteck C/0.2% Carbowax 1500	15g	1.072033.0015	175

Carbon Molecular Sieves

For excellent kinetics and thermodynamics, designed for analyses of permanent gases and light hydrocarbons.
Surface area: 1100 m^2/g (+/- 10%)
Pore volume (total): 0.37 cc/g
Average pore width (approx): 1.3 nm
Hydrophobic
Excellent thermal stability (up to 400°C)

Description	Packing	Art.	Max Temp(°C)
Carb Adsorbent 80-100mesh	10g	1.072037.0010	400

Chromosorb® Diatomite Supports

Chromsorb® P is a calcined diatomite. It is orange-pink in color and relatively hard. Chromosorb P generates high column efficiencies for hydrocarbons. Its surface is more adsorptive than the other Chromosorb diatomite grades due to high surface area.
Chromosrob® W is the most popular grade used for GC work. It is flux-calcined diatomite, is white in color and friable compared to other diatomite grades. It is of utmost importance to take care in handling this material during coating and packing procedures in order to achieve maximum performance. It is relatively nonadsorptive separating polar compounds.
Chromosorb® G is developed for the GC analysis of polar compounds. It has a low surface area and good handling characteristics. It is non-friable compared to other diatomite packings and will not generate fines during coating or packing procedures.
Chromosorb® 750 is the latest addition to the diatomite series. It is flux-calcined and has better handling characteristics than Chromosorb W. It is prepared from high purity diatomite crude with exhaustive acid-washing and effective silane treatment.Its high degree of chemical inertness makes Chromosorb 750 an ideal packing for bio-medical and pesticide analysis.

Description	Qty	Art.
Chromosorb P NAW		
60-80 mesh	100g	1.573015.0100
80-100 mesh	100g	1.573016.0100
100-120 mesh	100g	1.573017.0100
Chromosorb P AW		
60-80 mesh	100g	1.573018.0100
80-100 mesh	100g	1.573019.0100
100-120 mesh	100g	1.573020.0100
Chromosorb P AW-DMCS		
60-80 mesh	100g	1.573021.0100
80-100 mesh	100g	1.573022.0100
100-120 mesh	100g	1.573023.0100
Chromosorb G NAW		
60-80 mesh	100g	1.573024.0100
80-100 mesh	100g	1.573025.0100
100-120 mesh	100g	1.573026.0100
Chromosorb G AW		
60-80 mesh	100g	1.573027.0100
80-100 mesh	100g	1.573028.0100
100-120 mesh	100g	1.573029.0100
Chromosorb G AW-DMCS		
60-80 mesh	100g	1.573030.0100
80-100 mesh	100g	1.573031.0100
100-120 mesh	100g	1.573032.0100
Chromosorb G HP		
60-80 mesh	100g	1.573033.0100
80-100 mesh	100g	1.573034.0100
100-120 mesh	100g	1.573035.0100
Chromosorb W AW		
60-80 mesh	100g	1.573036.0100
80-100 mesh	100g	1.573037.0100
100-120 mesh	100g	1.573038.0100
Chromosorb W AW-DMCS		
60-80 mesh	100g	1.573039.0100
80-100 mesh	100g	1.573211.0100
100-120 mesh	100g	1.573212.0100
Chromosorb W HP		
60-80 mesh	100g	1.573213.0100
80-100 mesh	100g	1.573214.0100
100-120 mesh	100g	1.573215.0100
Chromosorb 750		
60-80 mesh	100g	1.573012.0100
80-100 mesh	100g	1.573013.0100
100-120 mesh	100g	1.573014.0100

Chromosorb® Specifications

Chromosorb Series	color	Surface Area(m^2/g)	Packed Density(g/cc)	Recommended Liquid Phase Load
Chromosorb G	Oyster white	0.5-0.8	0.58	5%
Chromosorb P	Orange-Pink	4..0-8.0	0.47	30%
Chromosorb W	White	1.0	0.24	15%
Chromosorb 750	Off-white	0.5-1.0	0.37-0.42	12%

Chromosorb® Treatment Specifications

NAW Untreated (non-acid washed)
AW Acid washed
DMCS Dimethyldichlorosilane (silanized)
HP High performance QC,ed (acid washed, silanized, flux-calcined)

Century Series Chromosorb

Century Series Chromosorb porous polymers have a rigid structure and distinct pore size. They are packed into columns in the normal manner and do not require a liquid coating.

Chromosorb® 101 For free fatty acids, glycols, alcohols, alkanes, esters, ketones, hydrocarbons, ethers

Chromosorb® 102 For alcohols, light and permanent gases, oxygenated compounds, or as an adsorbent to trap organics in air or water.

Chromosorb® 103 For basic compounds such as alcohols, amides, amines, arsines, hydrazines, ketones, NH3, phosphines, or as an adsorbent to trap acidic compounds in air.

Chromosorb® 105 For formaldehyde, various classes of organic compounds (boiling point approx. 200°C), to separate acetylene from other small hydrocarbons, or as an adsorbent for trapping organics in air or water.

Chromosorb® 106 For gases, C2-C5 alcohols, low boiling compounds; an adsorbent for organics in air or water.

Chromosorb® 107 Formaldehyde, sulfur gases, efficient for moderately polar compounds. Adsorbent to trap vinyl acetate from air

Chromosorb® 108 Gases, alcohols, aldehydes, ketones, glycols,etc. Retention characteristics differ from other Century Series Chromosorb

Chromosorb® T Sulfur gases, halogens, mercaptans, hydrazines, water No tailing problems with polar compounds. Highly inert surface.

Description	Qty	Art.	Max Temp(°C)
Chromosorb 101			
60-80 mesh	50g	1.710442.0050	275/325
80-100 mesh	50g	1.710443.0050	275/325
100-120 mesh	50g	1.710444.0050	275/325
Chromosorb 102			
60-80 mesh	50g	1.710445.0050	250/300
80-100 mesh	50g	1.710446.0050	250/300
100-120 mesh	50g	1.710447.0050	250/300
Chromosorb 103			
60-80 mesh	50g	1.710448.0050	275/300
80-100 mesh	50g	1.710449.0050	275/300
100-120 mesh	50g	1.710450.0050	275/300
Chromosorb 105			
60-80 mesh	50g	1.710451.0050	250/275
80-100 mesh	50g	1.710452.0050	250/275
100-120 mesh	50g	1.710453.0050	250/275
Chromosorb 106			
60-80 mesh	50g	1.710454.0050	225/250
80-100 mesh	50g	1.710455.0050	225/250
100-120 mesh	50g	1.710456.0050	225/250
Chromosorb 107			
60-80 mesh	50g	1.710457.0050	225/250
80-100 mesh	50g	1.710458.0050	225/250
100-120 mesh	50g	1.710459.0050	225/250
Chromosorb 108			
60-80 mesh	50g	1.710460.0050	225/250
80-100 mesh	50g	1.710461.0050	225/250
100-120 mesh	50g	1.710462.0050	225/250
Chromosorb T			
30-60 mesh	100g	1.710463.0100	250/250
40-60 mesh	100g	1.710464.0100	250/250

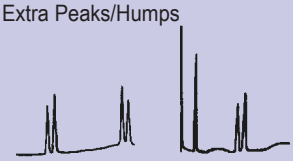
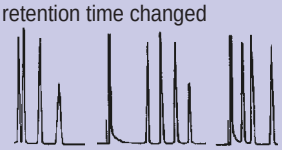
Chromosorb® Specifications

Chromosorb Series	Polymer Composition	Polar	Surface Area(m^2/g)	Density (g/cc)
Chromosorb 101	DVB/Styrene	Non-Polar	less than 50	0.30
Chromosorb 102	DVB/Styrene	SlightlyPolar	300 - 400	0.29
Chromosorb 103	Cross-linked Polystyrene	Non-Polar	15-25	0.32
Chromosorb 105	Polyaromatic	Mod. Polar	600-700	0.34
Chromosorb 106	Cross-linked Polystyrene	Non-Polar	700-800	0.28
Chromosorb 107	Cross-linked Acrylic Ester	Polar	400-500	0.30
Chromosorb 108	Cross-linked Acrylic	Polar	100-200	0.30
Chromosorb T	Tetrafluorethylene TFE Fluorocarbon	Non-Polar	7-8	0.42

Septa

Inlet septa are a key component of sample introduction. Septa maintain the leak-free seal and exclude air from the inlet. They come in many different sizes and are made from different types of materials specific to inlet type and analysis needs.

where Inject septa used	why replace the septa	To avoid problems
Septa separate the internal GC from outside, when GC syringe inject the samples, the septa keep the GC system no leak and pressure constantly	• Leaks • Decomposition • Sample loss • Reduced column or split vent flow • Ghost peaks • Column degradation	• Use within the recommended temperature range • Change regularly • Use septum purge when available • Use autoinjectors • Regularly inspect needle tips for wear

Problem	Reason	how to avoid
Extra Peaks/Humps 	Extra Peaks/Humps	Turn off injector heater. If extra peaks disappear, use septum specified for higher temperature or analyze at lower inlet temperature.
baseline changed after the biggest peak 	Large leak at septum during injection and for a short time thereafter (common with large diameter needles)	Replace septum and use smaller diameter needles.
retention time changed 	Carrier gas leaks at septum or column connection	Check for leaks. Replace septum or tighten connections if necessary

Our green septa is made from premium 100% silicone rubber with a guide hole that helps guide the syringe needle to the same point with every injection. All of the septa are conditioned for low bleed.

- Ultra Low Bleed
- True long life, high temp performance
- Suitable to an injector port temp of 350°C
- 50 durometer hardness

Description	Packing	Art.	Max Temp(°C)
9	50	1.442271.0050	350
9.5	50	1.442272.0050	350
10	50	1.442272.0050	350
11	50	1.442076.0050	350
11.5	50	1.442077.0050	350
12.5	50	1.442078.0050	350
17	50	1.442079.0050	350
Shimadzu plug	50	1.442495.0050	350

Ferrule

Using the wrong ferrule or a worn-out ferrule to seal your column connection can result in inconsistent and unreliable chromatography. An improper ferrule can cause leaks, which allow air and other contaminants to enter the instrument through the column seal, causing major interference with column and detector performance.

where ferrule used	why replace the ferrule	To avoid problems
ferrule used for avoid the leak on the connection between column and GC inlet. Ferrule has different ID fit for the different column, also different material of the ferrule has the different temp	ferrule leaks • oxygen leak to GC system,baseline changed • oxygen damange the column • Sample degradation • Sample bleed • The signal / noise ratio increases • retention time changed	• Don't overtighten–finger tighten the column nut, then use wrench to tighten • Maintain cleanliness • Bake out ferrules prior to use (Vespel and Vespel/Graphite only) • Avoid contamination, such as fingerprint oils • Inspect used ferrules with magnifier for cracks, chips, or other damage before reusing them • Change ferrules when new columns or injector/detector parts are installed

Ferrule type	upper temp. Limit	usages	Advantages	Limitations
Graphite (100%)	450℃	-General purpose for capillary columns -Suitable for FID and NPD -Recommended for high temperature and cool on-column applications	-Easy-to-use stable seal -Higher temperature limit -Can be removed easily	-Not for MS or oxygen-sensitive detectors -Soft, easily deformed or destroyed -Possible system contamination
Vespel /Graphite (85%/15%)	400℃	-General purpose for capillary columns -Recommended for MS and oxygen-sensitive detectors -Most reliable leak-free connection	-Mechanically robust -Long lifetime	-Not reusable -Flows at elevated temperature -Must re-tighten frequently
Vespel (100%)	350℃	-Isothermal operation -Can be reused or removed easily -Excellent sealing material when making metal or glass connections	-Mechanically robust -Long lifetime -Can be reused or removed easily	-Leaks aftertem perature cycle -Flows at elevated temperature -Must re-tighten frequently

Graphite Ferrules

These 99.95% pure graphite ferrules can be used at temperatures up to 450°C without producing bleed or decomposition products. The one-piece design requires no back ferrules. Graphite ferrules are very soft and conform well to the column on compression. These ferrules can be reused as long as care is taken not to overtighten them.

Vespel /Graphite Ferrules

Composites of Vespel and graphite combine the advantages of the two materials. They are less likely to adhere to the column than Vespel but are more durable than graphite. Ferrules are easy to reuse and stable at temperatures to 400°C.

Vespel Ferrules

Vespel ferrules do not cold _low, are easily reusable, and withstand temperature up to 350°C. At high temperatures, Vespel may adhere to glass or metal.

PTFE Ferrules

PTFE ferrules are completely inert and an economical choice. They have an upper temperature limit of 250°C. PTFE ferrules conform well to the shape of the column upon compression and can be reused if handled carefully.

Ferrule Type	Use for
0.4mm Hole:	Capillaries with i.d. of 0.10-0.25mm
0.5mm Hole:	Capillaries with i.d. of 0.28-0.35mm
0.8mm Hole:	Capillaries with i.d. of 0.45-0.53mm
NO-HOLE:	As plugs, or drill for special needs
2-HOLE:	Connecting two pieces of capillary tubing or columns to the same end_ fitting

Maximum Operating	Temperature
100% Graphite	450°C
85% Vespel / 15% Graphite	450°C
60% Vespel / 40% Graphite	450°C
100% Vespel	450°C
100% Teflon	450°C

Short ferrule

100%Graphite

Ferrule ID	Column ID	Packing	Art.
1/16	0.4	10	1.690403.0010
1/16	0.5	10	1.690505.0010
1/16	0.8	10	1.690802.0010
1/16	1.0	10	1.691006.0010

60% Vespel / 40%Graphite

Ferrule ID	Column ID	Packing	Art.
1/16	0.4	10	1.691203.0010
1/16	0.5	10	1.691204.0010
1/16	0.8	10	1.691205.0010
1/16	1.0	10	1.691206.0010

85% Vespel / 15%Graphite

Ferrule ID	Column ID	Packing	Art.
1/16	0.4	10	1.690407.0010
1/16	0.5	10	1.690508.0010
1/16	0.8	10	1.690809.0010
1/16	1.0	10	1.691010.0010

100% Vespel

Ferrule ID	Column ID	Packing	Art.
1/16	0.4	10	1.690421.0010
1/16	0.5	10	1.690522.0010
1/16	0.8	10	1.690823.0010
1/16	1.0	10	1.691024.0010

Long ferrule

100%Graphite

Ferrule ID	Column ID	Packing	Art.
1/16	0.4	10	1.690425.0010
1/16	0.5	10	1.690526.0010
1/16	0.8	10	1.690827.0010
1/16	1.0	10	1.691028.0010
1/16	1.2	10	1.691219.0010

100% Vespel

Ferrule ID	Column ID	Packing	Art.
1/16	0.4	10	1.690430.0010
1/16	0.5	10	1.690531.0010
1/16	0.8	10	1.690832.0010
1/16	1.0	10	1.691033.0010
1/16	1.2	10	1.691221.0010

85% Vespel / 15%Graphite

Ferrule ID	Column ID	Packing	Art.
1/16	0.4	10	1.690410.0010
1/16	0.5	10	1.690511.0010
1/16	0.8	10	1.690812.0010
1/16	1.0	10	1.691029.0010
1/16	1.2	10	1.691220.0010

100% PTFE

Ferrule ID	Column ID	Packing	Art.
1/16	0.4	10	1.691222.0010
1/16	0.5	10	1.691223.0010
1/16	0.8	10	1.691224.0010
1/16	1.0	10	1.691225.0010
1/16	1.2	10	1.691226.0010

60% Vespel / 40%Graphite

Ferrule ID	Column ID	Packing	Art.	Ferrule ID	Column ID	Packing	Art.
1/16	0.4	10	1.691214.0010	1/16	1.0	10	1.691217.0010
1/16	0.5	10	1.691215.0010	1/16	1.2	10	1.691218.0010
1/16	0.8	10	1.691216.0010				

Packed column ferrule

100%Graphite

Ferrule ID	Column ID	Packing	Art.
1/16	1/16	10	1.691227.0010
1/8	1/8	10	1.691228.0010
3/16	3/16	10	1.691229.0010
1/4	1/4	10	1.691230.0010
3/8	3/8	10	1.691231.0010
1/2	1/2	10	1.691232.0010

100% Vespel

Ferrule ID	Column ID	Packing	Art.
1/16	1/16	10	1.691239.0010
1/8	1/8	10	1.691240.0010
1/4	1/4	10	1.691241.0010

85% Vespel / 15%Graphite

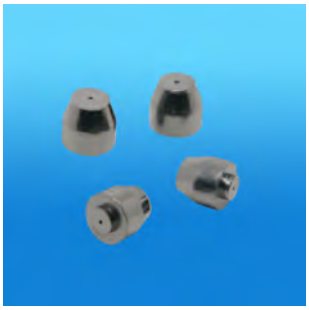
Ferrule ID	Column ID	Packing	Art.
1/16	1/16	10	1.691233.0010
1/8	1/8	10	1.691234.0010
1/4	1/4	10	1.691235.0010

100% PTFE

Ferrule ID	Column ID	Packing	Art.
1/16	1/16	10	1.691242.0010
1/8	1/8	10	1.691243.0010
3/16	3/16	10	1.691244.0010
1/4	1/4	10	1.691245.0010
3/8	3/8	10	1.691246.0010
1/2	1/2		1.691247.0010

60% Vespel / 40%Graphite

Ferrule ID	Column ID	Packing	Art.
1/16	1/16	10	1.691236.0010
1/8	1/8	10	1.691237.0010
1/4	1/4	10	1.691238.0010



Reducing ferrule

100%Graphite

Ferrule ID	Column ID	Packing	Art.
1/8	0.4mm	10	1.691248.0010
1/8	0.5mm	10	1.691249.0010
1/8	0.8mm	10	1.691250.0010
1/8	1.0mm	10	1.691251.0010
1/8	1/16 inch	10	1.691252.0010
1/4	1/16 inch	10	1.691253.0010
1/4	1/8 inch	10	1.691254.0010

100% Vespel

Ferrule ID	Column ID	Packing	Art.
1/8	0.4mm	10	1.691262.0010
1/8	0.5mm	10	1.691263.0010
1/8	0.8mm	10	1.691264.0010
1/8	1.0mm	10	1.691265.0010
1/8	1/16 inch	10	1.691266.0010
1/4	1/16 inch	10	1.691267.0010
1/4	1/8 inch	10	1.691268.0010

85% Vespel / 15%Graphite

Ferrule ID	Column ID	Packing	Art.
1/8	0.4mm	10	1.691255.0010
1/8	0.5mm	10	1.691256.0010
1/8	0.8mm	10	1.691257.0010
1/8	1.0mm	10	1.691258.0010
1/8	1/16 inch	10	1.691259.0010
1/4	1/16 inch	10	1.691260.0010
1/4	1/8 inch	10	1.691261.0010

100% PTFE

Ferrule ID	Column ID	Packing	Art.
1/8	0.4mm	10	1.691269.0010
1/8	0.5mm	10	1.691270.0010
1/8	0.8mm	10	1.691271.0010
1/8	1.0mm	10	1.691272.0010
1/8	1/16 inch	10	1.691273.0010
1/4	1/16 inch	10	1.691274.0010
1/4	1/8 inch	10	1.691275.0010

Double hole ferrule

100% Graphite

Ferrule ID	Column ID	Packing	Art.
1/16	0.4	10	1.691276.0010
1/16	0.5	10	1.691277.0010
1/8	0.5	10	1.691278.0010
1/8	0.8	10	1.691279.0010

100%Vespel

Ferrule ID	Column ID	Packing	Art.
1/16	0.4	10	1.691284.0010
1/16	0.5	10	1.691285.0010
1/8	0.5	10	1.691286.0010
1/8	0.8	10	1.691287.0010

85% Vespel / 15%Graphite

Ferrule ID	Column ID	Packing	Art.
1/16	0.4	10	1.691280.0010
1/16	0.5	10	1.691281.0010
1/8	0.5	10	1.691282.0010
1/8	0.8	10	1.691283.0010

100% PTFE

Ferrule ID	Column ID	Packing	Art.
1/16	0.4	10	1.691288.0010
1/16	0.5	10	1.691289.0010
1/8	0.5	10	1.691290.0010
1/8	0.8	10	1.691291.0010

No hole ferrule

100%Graphite

Ferrule ID	Column ID	Packing	Art.
1/16	-	10	1.691292.0010
1/8	-	10	1.691293.0010
1/4	-	10	1.691294.0010

100%Vespel

Ferrule ID	Column ID	Packing	Art.
1/16	-	10	1.691298.0010
1/8	-	10	1.691299.0010
1/4	-	10	1.691300.0010

85% Vespel / 15%Graphite

Ferrule ID	Column ID	Packing	Art.
1/16	-	10	1.691295.0010
1/8	-	10	1.691296.0010
1/4	-	10	1.691297.0010

100% PTFE

Ferrule ID	Column ID	Packing	Art.
1/16	-	10	1.691301.0010
1/8	-	10	1.691302.0010
1/4	-	10	1.691303.0010

Tubing

Inner surface treated and cleaned – excellent for GC use.

Copper tubing

Meets ASTM B-280

O.D.(in.)	I.D.(in.)	Length(ft)	Art.
1/8	0.065	15	1.603312.0015
1/4	0.19	15	1.603323.0015
1/2	0.436	15	1.603301.0015

Stainless steel tubing

1.028189.0015 and 1.028188.0015 are Type 316 stainless.
1.051341.0015 is Type 304 stainless.

O.D.(in.)	I.D.(in.)	Length(ft)	Art.
1/16	0.01	15	1.028189.0015
1/8	0.065	15	1.028188.0015
1/4	0.19	15	1.051341.0015

Ni 200 tubing

O.D.(in.)	I.D.(in.)	Length(ft)	Art.
1/8	0.085	50	1.028190.0050
1/4	0.210	50	1.028191.0050

Aluminum tubing

O.D.(in.)	I.D.(in.)	Length(ft)	Art.
1/8	0.065	50	1.028192.0050
1/4	0.190	50	1.028193.0050

PTFE tubing

Max Temp(°C):260

O.D.(in.)	I.D.(in.)	Length(ft)	Art.
1/8	0.065	25	1.028194.0025
1/4	0.188	25	1.028195.0025

FEP tubing

Max Temp (°C):200

O.D.(in.)	I.D.(in.)	Length(ft)	Art.
1/8	0.085	50	1.028196.0050

Tubing Cutters

Description	Packing	Art.
MINI TUBE CUTTERS, For 1/8" to 5/8" tubing	1	1.001050.0001
Cutting wheel for 1.001050.0001	1	1.032633.0001
Heavy Duty Tuing Cutter, For 1/8" to 5/8" tubing	1	1.001000.0001
Cutting wheel for 1.001000.0001	1	1.075015.0001
TUBE CUTTERS, For 1/16" tubing	1	1.003920.0001
Cutting wheel for 1.003920.0001	1	1.003930.0001

Glass wool and quartz wool

We offer four different kinds of glass and quartz wool, for nearly all chromatographic needs. These are specially recommended for use in injection liners, and end plugs in packed columns.

- Untreated
- Silane Treated silanized treated for general use
- Pesticide Grade.
- Phosphoric Acid Treated - recommended for analysis of acidic compounds such as free acids, phenols and glycols.

Description	Packing	Art.	Max Temp(°C)
Glass Wool			
Untreated	50g	1.003362.0050	400
DMCS Treated	50g	1.003352.0050	500
Phosphoric acid Treated	50g	1.003382.0050	500
Pestcide grade Treated	50g	1.003372.0010	400
Quartz Wool			
Untreated	10g	1.002403.0010	750
	50g	1.002403.0050	750
DMCS Treated	5g	1.002416.0005	350
Phosphoric acid Treated	5g	1.002417.0005	250

Fused Silica Connectors

Excellent for repairing broken columns, or for connecting guard columns

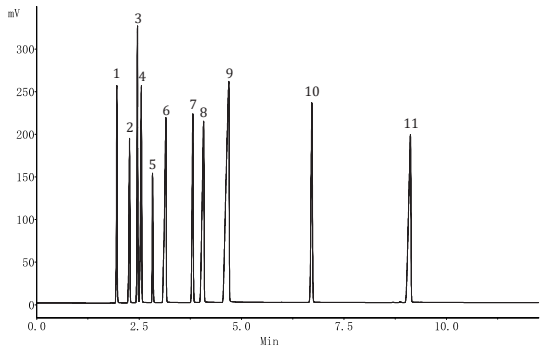
Description	Packing	Art.
Universal Union	1	1.072632.0001
Universal Union	5	1.072632.0005
Universal Union	25	1.072632.0025
Universal Union, deactived	1	1.072635.0001
Universal Union, deactived	5	1.072635.0005
Universal Union, deactived	25	1.072635.0025

Description	Packing	Art.
Y connector	1	1.072633.0001
Y connector	5	1.072633.0005
connector, deactived	1	1.072634.0001
connector, deactived	5	1.072634.0005
Polyimide Sealing Resin	5g	1.072636.0005

GC Application

Solvent

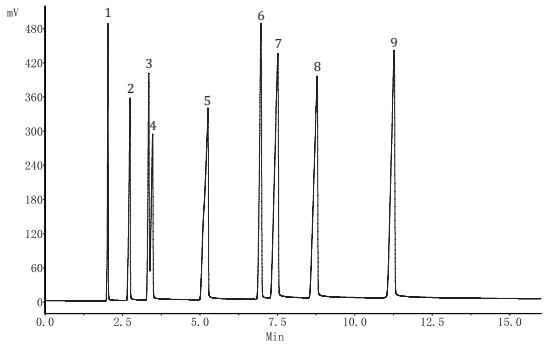
1.Methanol
2.Ethanol
3.Acetone
4.isopropyl alcohol
5.Dichloromethane
6.Propanol
7.acetic ether
8.isobutyl alcohol
9.butyl alcohol
10.Toluene
11.Cyclohexanone



Column : CD-1,30m×0.32mm×1.0um (1.120321.0001)
Inject: 220˚C,0.2ul
Column Pressure: 0.8kg/cm^2
Oven: 30˚C(0min)—10˚C/min—140˚C(5min)
Det: FID,240˚C

Alcohol

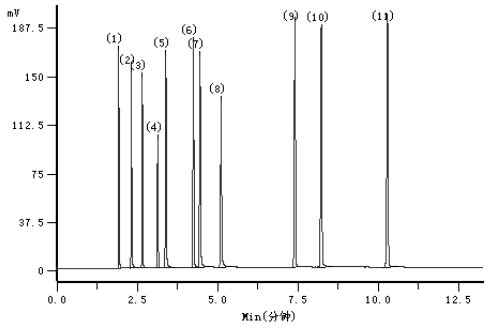
1.Methanol
2.Ethanol
3.Acetone
4.isopropyl alcohol
5.Propanol
6.acetic ether
7.isobutyl alcohol
8.butyl alcohol
9.2-methyl -1- butyl alcohol



Column: CD-5,30m×0.32mm×1.0um (1.521520.0001)
Inject: 200˚C,0.2ul
Pressure: 0.8kg/cm^2
Oven: 25˚C(4min) at 8˚C/min to 80˚C(5min)
Det: FID,200˚C

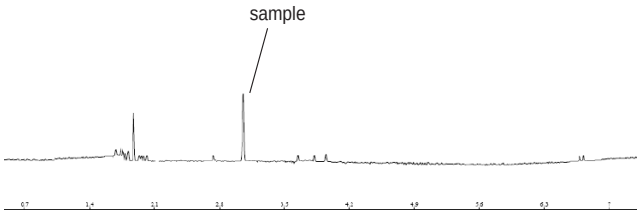
Solvent

1.Methanol
2.Ethanol
3.Acetone / isopropyl alcohol
4.Dichloromethanel
5.Propanol
6.acetic ether
7.isobutyl alcohol
8.butyl alcohol
9.Toluene
10.BUTYL ACETATE
11.Cyclohexanone



Column : CD-5,30m×0.32mm×1.0um (1.521520.0001)
inject: 200˚C,0.1ul
Pressure: 0.8kg/cm^2
Oven: 30˚C (0min)—10˚C /min—140˚C (5min)
Det: FID,200˚C

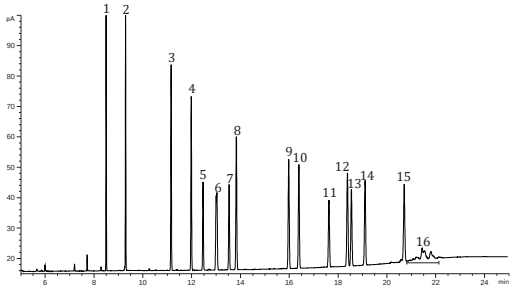
GB/T 5413.23-2010 I2 in infant milk powder



Column: CD-1301,30m×0.25mm×0.25um(1.130122.0001)
Inject: 260˚C,1ul
Split:: 1:1
Oven: 50˚C(9min) at 30˚C/min 220˚C(3min)

Phthalate

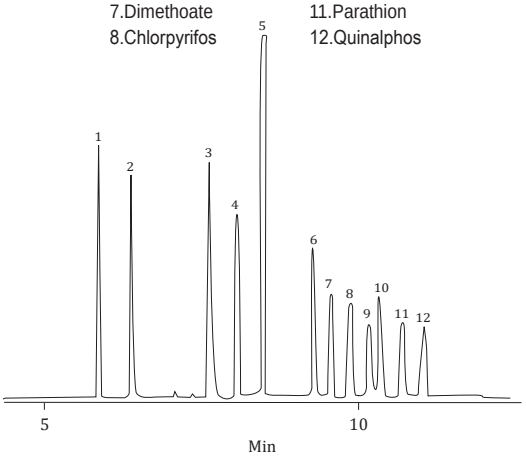
1.DMP
2.DEP
3.DIBP
4.DBP
5.DMEP
6.BMPP
7.DEEP
8.DPP
9.DHXP
10.BBP
11.DBEP
12.DCHP
13.DEHP
14.Diphenyl phthalate
15.DNOP
16.DNP



Column : CD-5,30m×0.25mm×0.25um (1.521511.0001)
Inject: 250˚C,10ppm,1ul,splitless
Carrier gas: He
Oven : 60˚C（1min）-20˚C/min-220˚C(1min)-5˚C/min-280˚C(4 min)
Det: FID,300˚C

Organophosphorus Pesticides

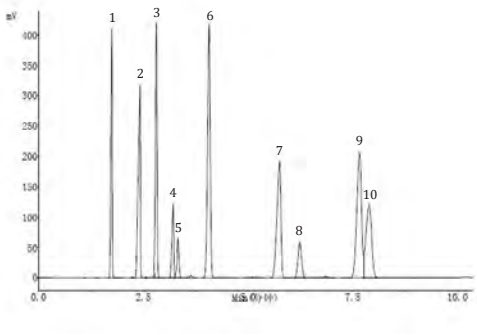
1.Dichlorvos
2.Methamidophos
3.acephate
4.Phorate
5.Omethoate
6.Chlorpyriphos-methyl
7.Dimethoate
8.Chlorpyrifos
9.Malathion
10.Fenitrothion
11.Parathion
12.Quinalphos



Column: CD-1701 (P/N:1.170172.0001) 30m x0.25mm x 0.25um
Temp.: 40 °C (5min),10°C/min to 280 °C,hold
Carrier gas: He
Injection: 250°C
Det.: FPD,280°C

Solvent

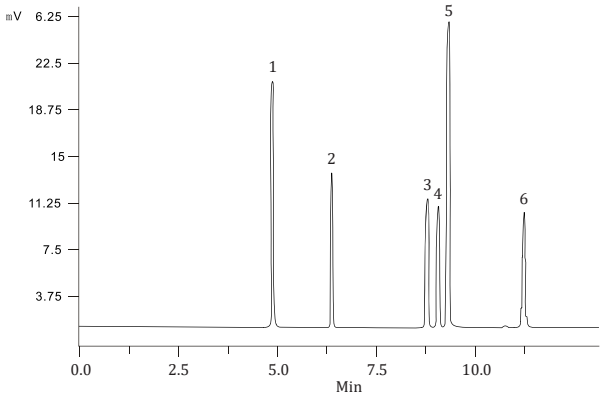
1.Methanol
2.Ethanol
3.Acetone
4.Acetonitrile
5.Dichlormethan
6.N-HEXAN
7.acetic ether
8.Trichlormethan
9.Benzene
10.ISO-OCTANE



Column: CD-624, 30m×0.32mm×1.8um(1.624516.0001)
Inject: 200˚C,split 1：10, 0.04ul
Oven: 40˚C,10min
Det: FID,240˚C

Aromatics

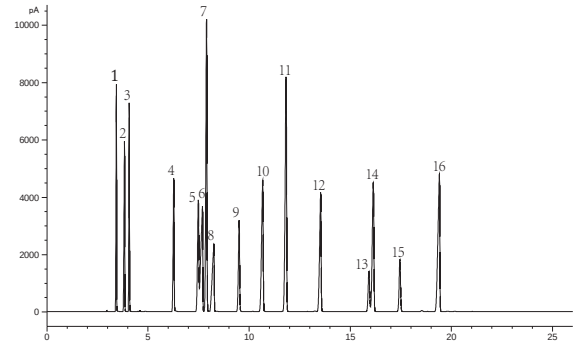
1.Benzene
2.Toluene
3.Ethylbenzene
4.p-Xylene
5.m-Xylene
6.o-Xylene



Column: CD-WAX (P/N:1.103221.0001) 30m x0.25mm x 0.25um
Temp.: 80 °C
Carrier gas: He
Injection: 240°C
Det.: 300°C,FID

VOC in packing of cigarette

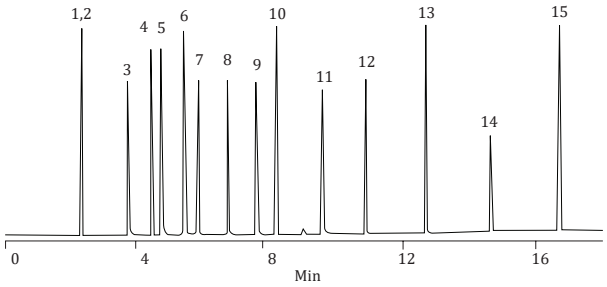
1. Ethanol
2. 2-Propanol
3. Acetone
4. acetic ether
5.Iso-propyl acetate
6.N- Butanol
7.Benzene
8.1-Methoxy-2-propanol
9.Acetic acid-n-propyl ester
10.4-methyl- Pentanol
11.Toluene
12.n-Butyl acetate
13.Ethylbenzene
14.Xylene
15.Xylene
16.cyclohexanone



Column: CD-VOCOL,60m×0.32mm×1.8um(1.302524.0001)
Inject: 150˚C
Oven: 40˚C(2min)at 4min/˚C to 180˚C (15min)
Det: 250˚C

Fatty acids (C1-C14)

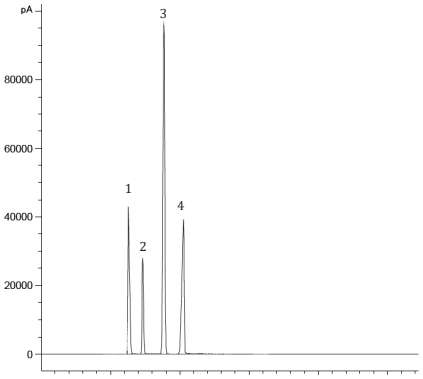
1.Acetone
2.formic acid
3.Acetic acid
4.Propionic acid
5.Isobutyric acid
6.Butyric acid
7.Isovaleric acid
8.Valeric Acid
9. 4-Methylvaleric acid
10.Hexanoic acid
11.Heptanoic acid
12.Octanoic acid
13.Decanoic acid
14.Lauric acid
15.Tetradecanoic acid



Column: CD-ACIDWAX (P/N:1.448135.0001) 30m x0.25mm x0.25um
Temp.: 150 °C (4min),10°C/min to 230 °C(10 min)
Carrier gas: He,at 40cm/se
Injection: 240°C,split 1:50
Det.: 250°C,FID

Alcohol in blood

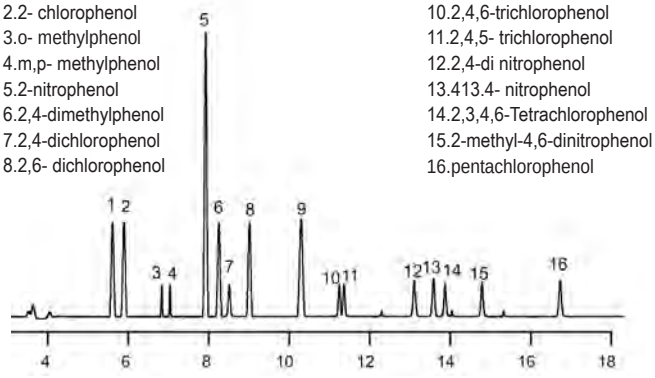
1. Methanol
2. Ethanol
3. tert-butanol
4. 2-Propanol



Column : CD-624,30m×0.32mm×1.8um(1.624516.0001)
Inject: 0.4ul,2ml/min
split: 30:1
Oven: 80˚C

Phenol

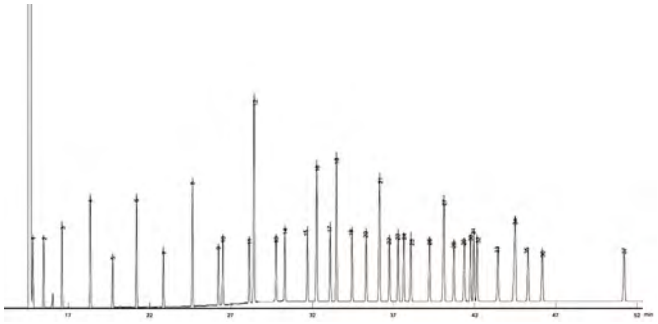
1.Phenol
2.2- chlorophenol
3.o- methylphenol
4.m,p- methylphenol
5.2-nitrophenol
6.2,4-dimethylphenol
7.2,4-dichlorophenol
8.2,6- dichlorophenol
9.4-chloro-3- methylphenol
10.2,4,6-trichlorophenol
11.2,4,5- trichlorophenol
12.2,4-di nitrophenol
13.413.4- nitrophenol
14.2,3,4,6-Tetrachlorophenol
15.2-methyl-4,6-dinitrophenol
16.pentachlorophenol



Column : CD-1MS,30m×0.25mm×0.25um
Inject: 300˚C
Oven: 60˚C（1min）to 230˚C at 10˚C/min
Det: MSD

37 Fames

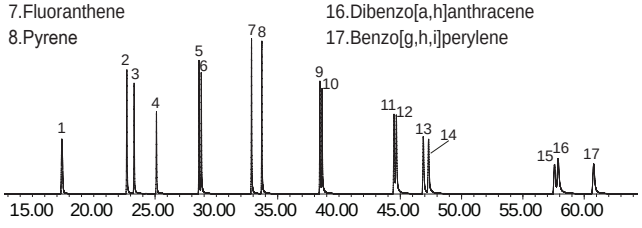
1. (C4:0) Butyric Acid Methyl Ester
2. (C6:0) Caproic Acid Methyl Ester
3. (C8:0) Caprylic Acid Methyl Ester
4. (C10:0) Capric Acid Methyl Ester
5. (C11:0) Undecanoic Acid Methyl Ester
6. (C12:0) Lauric Acid Methyl Ester
7. (C13:0) Tridecanoic Acid Methyl Ester
8. (C14:0) Myristic Acid Methyl Ester
9. (C14:1) Myristoleic Acid MethylEster
10. (C15:0) Pentadecanoic Acid
11. (C15:1) cis-10-Pentadecenoic Acid
12. (C16:0) Palmitic Acid Methyl Ester
13. (C16:1) Palmitoleic Acid Methyl Ester
14. (C17:0) Heptadecanoic Acid
15. (C17:1) cis-10-Heptadecenoic Acid Methyl Ester
16. (C18:0) Stearic Acid Methyl Ester
17. (C18:1n9t) Elaidic Acid Methyl Ester
18. (C18:1n9c) Oleic Acid Methyl Ester
19. (C18:2n6t) Linolelaidic Acid Methyl Ester
20. (C18:2n6c) Linoleic Acid Methyl Ester
21. (C20:0) Arachidic Acid Methyl Ester
22. (C18:3n6) γ-Linolenic Acid Methyl Ester
23. (C20:1n9) cis-11-Eicosenoic Acid Methyl Ester
24. (C18:3n3) α-Linolenic Acid Methyl Ester
25. (C21:0) Heneicosanoic Acid Methyl Ester
26. (C20:2) cis-11,14-Eicosadienoic Acid Methyl Ester
27. (C22:0) Behenic Acid Methyl Ester
28. (C20:3n6) cis-8,11,14-Eicosatrienoic Acid Methyl Ester
29. (C22:1n9) Erucic Acid Methyl Ester
30. (C20:3n3) cis-11,14,17-Eicosatrienoic Acid Methyl Ester
31. (C20:4n6) Arachidonic Acid Methyl Ester
32. (C23:0) Tricosanoic Acid Methyl Ester
33. (C22:2n6) cis-13,16-Docosadienoic Acid Methyl Ester
34. (C24:0) Lignoceric Acid Methyl Ester
35. (C20:5n3) cis-5,8,11,14,17-Eicosapentaenoic Acid Methyl Ester
36. (C24:1n9) Nervonic Acid Methyl Ester
37. (C22:6n3) cis-4,7,10,13,16,19-Docosahexaenoic Acid Methyl Ester



Column: CD-2560, 100m×0.25mm×0.20um(1.232421.0001)
Inject : 250˚C,split：30:1, 1ul
Oven: 140˚C(5min) to 240˚C at4˚C/min
Det: FID,260˚C

PAH in drinking water

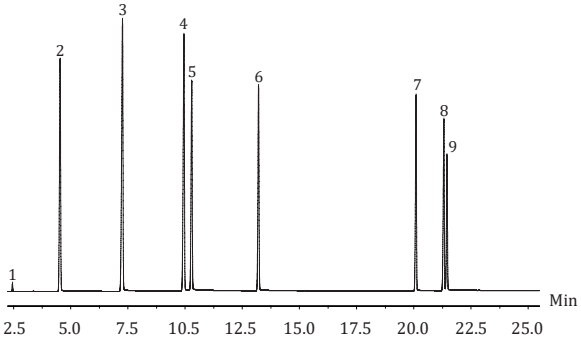
1.Naphthalene
2.Acenaphthylene
3.Acenaphthene
4.Fluorene
5.Phenanthrene
6.Anthracene
7.Fluoranthene
8.Pyrene
9.Benzo[a]anthracene
10.Chrysene
11.Benzo[b]fluoranthene
12.Benzo[k]fluoranthene
13.Benzo[a]pyrene
15.Indeno[1,2,3-cd]pyrene
16.Dibenzo[a,h]anthracene
17.Benzo[g,h,i]perylene



Column: CD-5MS,60m×0.25mm×0.25um
Inject: splitless(10min),280˚C,1.0ul
Oven: 100˚C(1min),6˚C/min to 300˚C(30min)
Det: MSD,280˚C

Ester

1.Unknown
2.Methyl acetate
3.ethyl acetate
4.Ethyl acrylate
5.Propanoic acid ethyl ester
6.-Butyl acetate
7.Methyl benzoate
8. Benzyl acetate
9.Ethyl benzoate

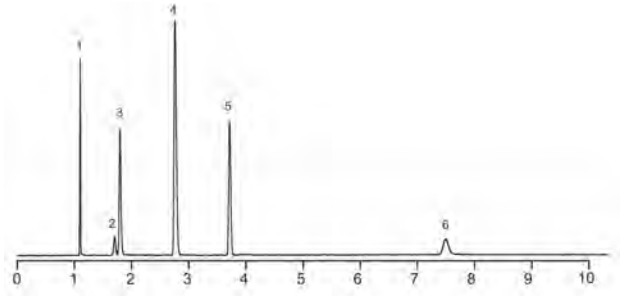


Column: CD-624,30m×0.32mm×1.8um(1.624516.0001)
inject: 250˚C split 1：30,0.2ul
Pressure: 0.8kg/cm^2
Oven: 40˚C（5min）—10˚C/min —240˚C（3min）
Det: FID,300˚C

GC

permanent gas

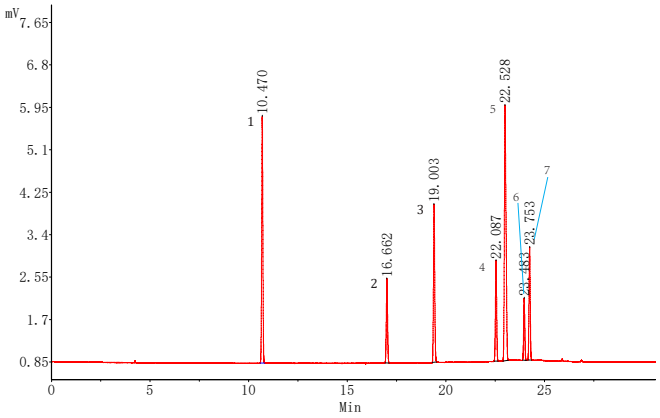
1.He
2. Ar
3.O2
4.N2
5.CH4
6.CO



Column: CD-Molesieve,30m×0.53mm×20um
Inject: 70˚C
Oven: 50˚C
Det: TCD,150˚C

TVOC in Vehicles

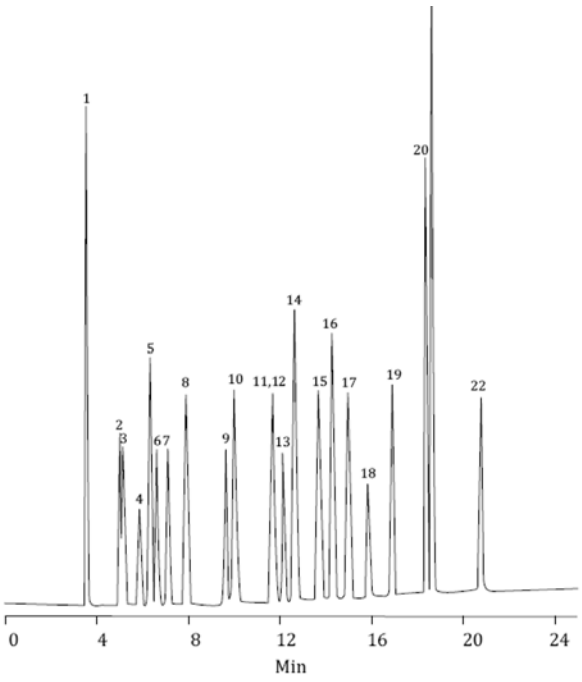
1.Benzene
2.Toluene
3.Butyl acetate
4.Ethylbenzene
5.m-Xylene/p-Xylene
6.Styrene
7.o-Xylene



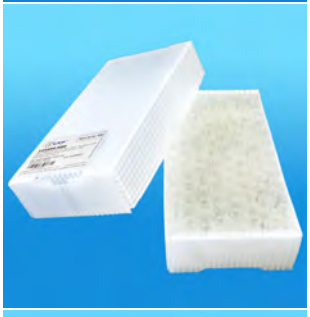
Column: CD-1,60m×0.32mm×1.0μm
Inject: 280℃
Oven: 50℃（10min）to 250℃（3min） at 5℃/min
Det: FID,250℃

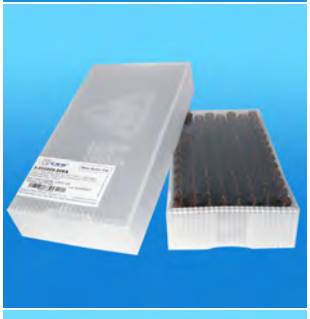
Solvent residue

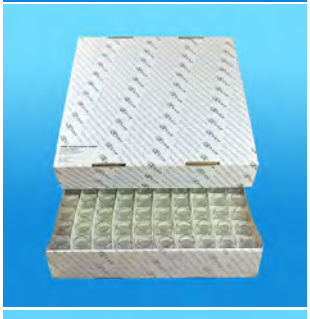
1. methanol
2. ethanol
3. ether
4. acetone
5. isopropanol
6. acetonitrile
7. dichloromethane
8. isobutanol
9. n-hexane
10. n-propyl alcohol
11. butanone
12. acetic ether
13. butylene oxide
14. chloroform
15. cyclohexane
16. benzene
17. n-heptane
18. methyl chloroform
19. 1,4-Dioxane
20. pyridine
21. methylbenzene
22. N,N-dimethyl formamide

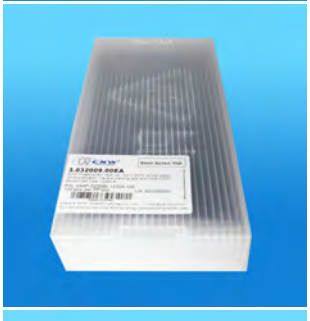


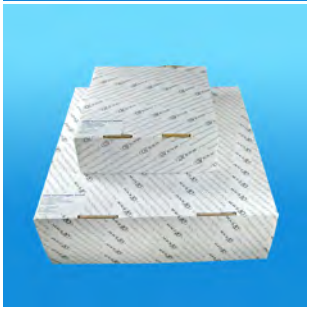
Column: CD-624 (P/N:1.624520.0001) 30m x0.53mm x 3.00um
Inject: 240℃,split 1:30
Oven: 35 ℃ (10min),10℃/min to 150 ℃(5 min)
Det: 260℃,FID











VIAL

A VIAL IS A VIAL, OR IS IT?

Autosampler vials may seem insignificant when compared to the sophisticated analytical instrumentation most laboratories use, but the incorrect vial, cap or septa can contribute to problems that can decrease productivity and reproducibility.

Potential Problems Caused by Using Incorrect Vial/Cap/Septum:

- Loss of analyte due to evaporation
- Presence of extra peaks in the chromatogram due to solvent/septum interaction
- Mechanical damage to autosampler
- Sample degradation
- Irreproducible injection volumes

WHAT TO CONSIDER WHEN SELECTING AN AUTOSAMPLER VIAL

Autosampler Compatibility

Not all autosamplers are alike. Some utilize robotic arms to pick up a sample vial; Some use tray rotation while others move the sampling needle to the respective vial coordinates. The dimensions of autosampler vials vary. Most autosamplers are equipped with trays that use 12x32mm vial configurations, but some like the Waters Wisp require a 15x45mm configuration. Consult your autosampler's operating manual or manufacturer to determine the vial dimensions required.

Sample Volume

The amount of sample available for analysis is important in choosing the appropriate vial. If only a limited volume of sample is available, you will have to choose among using an insert for your regular autosampler vial, a microvial or a high recovery vial.

Note: Most 12x32 mm autosampler vials hold between 1.5mL to 2.0mL of liquid, depending on where the manufacture measures the vial full. The dimensions for 12x32mm vials are standard among manufacturers, but the length of the neck and width/shape of the vial shoulder may vary. 12x32mm microvials have the same outer dimensions but the inside of the vial may be tapered to reduce volume or contain a fused insert. 12x32mm high recovery vials will have an internal conical bottom that allows for maximum sample recovery.

Sample Compatibility

The analyte and solvent compatibility should be considered in choosing vials and accessories. For example, amber glass is frequently used for light sensitive samples while deactivated glass or plastic vials are used for compounds that are sensitive to glass or stick to the glass itself. Volatile samples require closures that reduce the risk of analyte loss due to evaporation.

Linear Coefficient of Expansion

Refers to the fractional change in the length of glass per degree of change in temperature, in short, the ability of the glass to tolerate rapid thermal changes. The lower the coefficient of expansion, the better the glass can handle temperature change without fracturing.

Classifications for laboratory glass based on its resistance to attack from water were established by the United States Pharmacopoeia, USP.

USP Type 1, Class A, 33 Borosilicate Glass is the most inert and chemically resistant glass widely used in laboratories especially for chromatography applications. Type I glass is composed primarily of silicone and oxygen, with trace amounts of boron and sodium. It has the lowest leaching characteristics and a linear coefficient of expansion of 33.

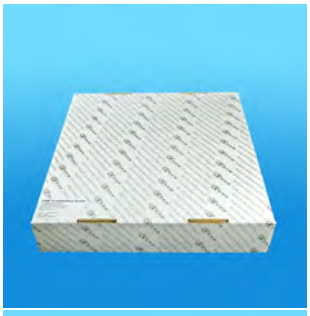
USP Type 1, Class B, 51 Borosilicate Glass which is composed of silicone and oxygen, trace amounts of boron, sodium and other element is more alkaline than Class A glass but still adequate for laboratory use. All amber borosilicate glass is made of Class B unless otherwise specified and has an expansion coefficient of 51.

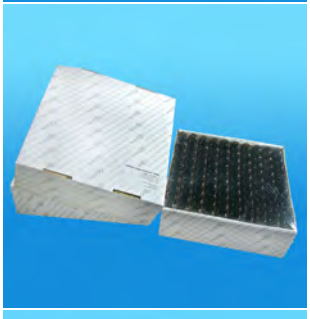
Silanized or Deactivated glass is Borosilicate Glass is borosilicate glass that has undergone further deactivation by treating the surface of the glass with an organosilane. The surface becomes more hydrophobic and inert making the vial suitable for use with pH sensitive compounds, trace analyses and applications requiring long term sample storage.

USP Types II, III and NP Glass are manufactured from soda lime which has less chemical resistance than borosilicate.

Polypropylene is a rigid and translucent material, which also comes in a variety of colours and has good chemical resistance for short term storage of most common laboratory chemicals. Resistance decreases over time when using aromatic and halogenated hydrocarbons. Polypropylene vials are often used for ion chromatography because of the extremely low metal content and excellent cleanability with dilute acid followed by deionized water rinse. Polypropylene vials limit the exposure to hazardous materials since they can be incinerated while sealed.

Polymethylpentene (TPX) is a rigid transparent material, which has a relatively high melting point with a temperature range of 0°-170°C. TPX vials can be used as alternative to opaque polypropylene vials because





they provide maximum clarity. Their chemical resistance is similar to that of polypropylene vials. TPX vials should be used for applications where visual clarity is required or repetitive exposure to higher temperatures such as autoclaving. TPX vials tend to be more brittle at room temperature.

Type of Vial Finish and Closures

Autosampler vials are available in a variety of neck finishes and opening diameters. Large mouth or wide ID vials have approximately a 40% wider mouth opening than standard ones. The large opening reduces the risk of bent autosampler needles during sampling.

Screw thread vials and caps provide low evaporation, reusability, less hand injury during manipulation than crimp seals and require no special tools. All screw threads vials and caps are differentiated by their thread finish as defined by the Glass Packaging Institute, GPI. For screw thread vials, a two part number is assigned. For example, 8-425 neck finish represents a vial with a diameter of 8 mm across the outside of the threads and a thread style of 425. Screw thread vials and caps are more expensive than crimp seals.

Caps for screw thread vials are available with either an open hole for autosampler use and standard addition or with a solid top for sample storage. One piece polypropylene cap and membrane are also available. These pierceable screw thread caps are designed for one time use and reduce sample preparation time as there is no cap and seal to assemble.

Crimp top vials require lacquered aluminum crimp seals which are relatively inexpensive and, when properly assembled, provide the best seal for long term storage. Crimp seals are not reusable.

A crimping tool is required to seal caps and a decrimper or decapper is required to remove the seals. Several types of hand crimpers are available including the adjustable precision crimpers that Chromatographic Specialties offers. Adjustable hand crimpers feature an adjustable stop on the handle to provide consistent seal tightness every time. Adjusting the hex screw inside the steel crimper jaws will also alter the amount of crimp. Achieving a good crimp is crucial because overcrimping can cause septum coring, bent needles and create a larger hole in the Teflon septum layer than a properly crimped seal. Undercrimping can result in loosing seals and sample evaporation.

Hand decrimpers quickly and safely remove seals with just a single squeeze of the handle. Decappers are similar in design to pliers and provide an inexpensive alternative to decrimpers. Decrimpers should be used for applications involving hazardous samples because there is less chance of spillage.

Snap seal vials are less prone to breakage during decapping because more glass is used in the neck of the vial. The snap seal neck finish is compatible with either crimp and/or snap seals and no special tools are required to remove the cap. These vials are recommended for short term sample storage and non-volatile samples because the seal is not as secure as a crimp or screw thread seal.

Shell Vials are an economical alternative to screw thread vials for Water’ s HPLC autosamplers or any other autosampler that doesn't use a robotic arm to move the vials. Most shells vials are sold with a polyethylene cap which has a starburst design for easy needle penetration.

SEPTA SELECTION GUIDE

Optimise performance and results by choosing the right septum for your application:

PTFE:
- Excellent resealing capabilities – highly recommended for multiple injections and sample storage
- Autoclavable and excellent resistance to coring
- PTFE chemical resistance until pierced then the septa will have the compatibility of silicone
- Temperature range -40°C to 200°C"

PTFE/Silicone:
- Excellent resealing capabilities – highly recommended for multiple injections and sample storage
- Autoclavable and excellent resistance to coring
- PTFE chemical resistance until pierced then the septa will have the compatibility of silicone
- Temperature range -40°C to 200°C"

PTFE/Silicone/PTFE:
- Recommended for multiple injections due to above average resealing capabilities
- Autoclavable and excellent resistance to coring
- Recommended for demanding applications such as internal standards, trace analysis or applications where there will be a long time between injections
- Temperature range -40°C to 200°C"

PTFE/Red Rubber:
- The most economical septa used in routine analysis
- Easy to pierce with moderate resealability
- PTFE chemical resistance until pierced then the septa will have the compatibility of rubber
- Not recommended when retaining samples for further analysis or for multiple injections
- Temperature range -40°C to 110°C"

Pre-slit PTFE/Silicone:
- Reduces the possibility of coring with blunt tipped needles or for applications using a thin gauge needle
- Used to prevent vacuum from forming inside the vial
- Temperature range -40°C to 200°C"

Moulded Polypropylene:
- Only suitable for single injection use – not recommended for sample storage before or after injection
- Not resealable
- Temperature range 0°C to 130°C"

The characteristics of CNW vials and septa

The characteristics of CNW glass vials:

- All products made from borosilicate TYPE I glass tubing, the key indicators just like ID, OD, mouse size, thread specification conform to international standard.
- The thread specification is very accurately, ensure autosampler can grasp the vials accurate and easy.
- The product manufacture and packed in cleaning room, all the packing material made from special materials, ensure non-pollution.
- The brand and marking spot we used ceramic printing process, ensure non-heavy etals like Pb, Cr etc. meet European RoHs standard. And the printing difficult to be fall of, ensure keep identity for a long time.

The characteristics of CNW Septa:

- All septa made from high-purity PTFE and high quality silicone rubber or ultrapure silicone, ensure the product nontoxicity.
- The products used the new tech to avoid the adhesive, this made the septa soft then before, ensure to provide better protection for the needle of the autosampler.
- The products made in the cleaning room, the customer can be use the product directly not through cleaning operation.
- We offer the COA for each lot of the septa, this will help customer know which will caused the problem when they use this lot products, save times for the customers and avoid the problem

CNW vials Identify figure and specific

8-425 stand open screw neck 2mL vials
Compatible Shimadzu instrument

size: 32×11.6mm

9mm screw neck 2mL vials
Fully compatible Agilent instrument

size: 32×11.6mm

9mm screw neck 1.5mL hign recovery vials
Compatible Agilent instrument

size: 32×11.6mm

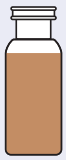
10-425 screw neck 2mL vials

size: 32×11.6mm

13-425 screw neck 4mL vials
Compatible Waters wisp 48

size: 45×14.7mm

11mm Crimp neck 2mL vials

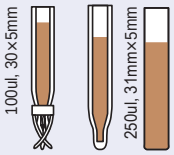


size: 32×11.6mm

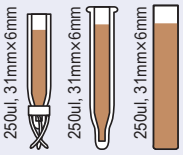
11mm crimp neck 1.5mL high recovery vials
Compatible Agilent instrument

size: 32×11.6mm

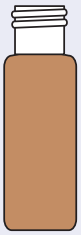
Insert
Suitable for 8-425 standard open screw neck vials



Insert
Suitable for 9mm and 10-425 screw neck vials.
Suitable for 11mm crimp neck vials.

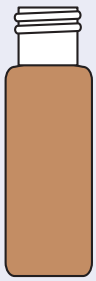


15-425 screw neck 8mL vials



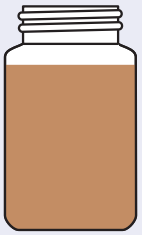
size: 61×16.6mm

18-400 screw neck 15mL vials



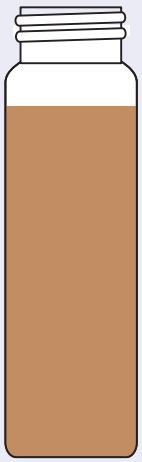
size: 71×20.6mm

24-400 screw neck 20mL EPA/VOC vials



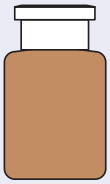
size: 57×27.5mm

24-400 screw neck 40mL EPA/VOC vials



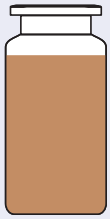
size: 95×27.5mm

20mm crimp neck 6mL Headspace vials



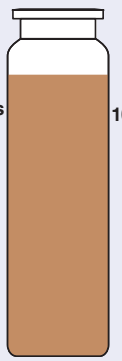
size: 38.2×22mm

20mm crimp neck 10mL Headspace vials



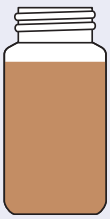
size: 46×22.5mm

20mm crimp neck 20mL Headspace vials



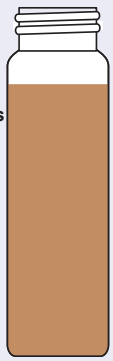
size: 75.5×22.5mm

18mm screw neck 10mL Headspace vials



size: 46×22.5mm

18mm screw neck 20mL Headspace vials



size: 75.5×22.5mm

Screw thread vials

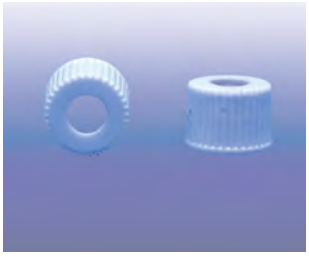
8-425 screw thread vials, caps and septa

- 8-425 screw thread vials are the original smaller opening autosampler vials.
- They are designed to work in a variety of autosamplers requiring narrow neck vials, you can use them on below brand instrument: Beckman, CTC, Gilson, Knauer, Shimadzu, Spark, Varian, VWR(Merck)/Hitachi, etc.

8-425 screw thread vials

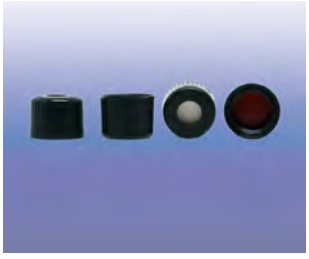
Description	Packaging	Cat. No.
8-425 Thread screw neck vial, 32x11.6mm, amber glass, white graduation line and marking spot and CNW LOGO, Borosilicate Type I Class A	100pcs. per PP box,50 boxes per Carton	3.032008.00E0
8-425 Thread screw neck vial, 32x11.6mm, amber glass, white graduation line and marking spot and CNW LOGO, Borosilicate Type I Class B	100pcs. per PP box,50 boxes per Carton	3.032008.00EA

Vials with other print and glass type are on require.



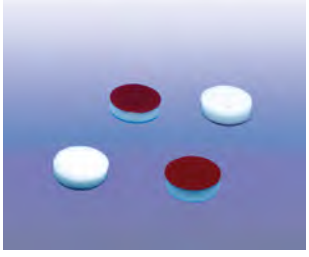
8-425 screw cap

Description	Packaging	Cat. No.
8-425 Screw thread cap, made from PP, black, centre hole	100pcs. per PE bag	3.005310.0800
8-425 Screw thread cap, made from PP, black, closed	100pcs. per PE bag	3.005320.0800
8-425 Screw thread cap, made from PP, white, centre hole	100pcs. per PE bag	3.W05310.0800
8-425 Screw thread cap, made from PP, white, closed	100pcs. per PE bag	3.W05320.0800



8-425 preassembled cap

Description	Packaging	Cat. No.
Preassembled cap and septa for 8-425 thread screw, PP cap, black, centre hole, Red rubber/White PTFE, 0.060" thick	100pcs. per PE bag	3.005394.0800
Preassembled cap and septa for 8-425 thread screw, PP cap, black, centre hole, White silicone/Red PTFE, 0.060" thick	100pcs. per PE bag	3.005395.0800
Preassembled cap and septa for 8-425 thread screw, PP cap, black, centre hole, Red PTFE/White silicone/Red PTFE, 0.040" thick	100pcs. per PE bag	3.005396.0800
Preassembled cap and septa for 8-425 thread screw, PP cap, black, centre hole, White silicone/Red PTFE, 0.075" thick, slitted	100pcs. per PE bag	3.005397.0800
Preassembled cap and septa for 8-425 thread screw, PP cap, black, closed, F217 with PTFE Cire	100pcs. per PE bag	3.005360.0800
Preassembled cap and septa for 8-425 thread screw, PP cap, black, closed, White sillcone/Red PTFE	100pcs. per PE bag	3.CS5360.0800



Septa for 8-425 screw cap

Description	Packaging	Cat. No.
Septa for 8-425 screw thread cap, white PTFE only, 0.010" thick	100pcs. per PE bag	3.601010.0800
Septa for 8-425 screw thread cap, White PTFE/red Rubber , 0.060" thick	100pcs. per PE bag	3.606040.0800
Septa for 8-425 screw thread cap, White silicone/Red PTFE, 0.060" thick	100pcs. per PE bag	3.606050.0800
Septa for 8-425 screw thread cap, White silicone/Red PTFE, 0.075" thick	100pcs. per PE bag	3.607550.0800
Septa for 8-425 screw thread cap, White silicone/ Red PTFE, 0.075" thick, slitted	100pcs. per PE bag	3.607570.0800

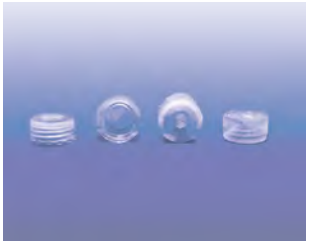
9mm screw thread vials, caps and septa

- 9mm screw thread vials and closure is dimensionally equivalent to 11mm crimp neck vials. This means that they can be used in any autosampler that uses 11mm crimp neck vials.
- Large open mouse help reduce the damage for the autosampler needles, this design also can ask customer use economic glass insert, to reduce their cost
- relative to 11mm crimp neck vials, 9mm screw thread vials can easily used by hand without tools
- This size can be used on almost all the new austosamplers. Especially used on Agilent, HTA, Shimadzu, thermo, Varian and Waters etc.

9mm screw thread vials

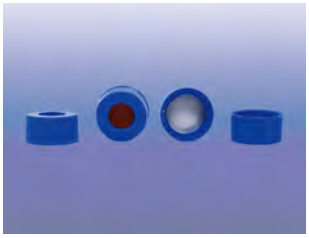
Description	Packaging	Cat. No.
9mm Thread screw neck vial, 32x11.6mm, clear glass, white graduation line and marking spot and CNW LOGO, Borosilicate Type I Class A	100pcs. per PP box,50 boxes per Carton	3.032009.00E0
9mm Thread screw neck vial, 32x11.6mm, amber glass, white graduation line and marking spot and CNW LOGO, Borosilicate Type I Class B	100pcs. per PP box,50 boxes per Carton	3.032009.00EA
9mm Thread screw neck vial, 32x11.6mm, clear glass, white graduation line and marking spot and CNW LOGO, Borosilicate Type I Class A, The inner diameter of the bottle mouth greater than 6.15mm	100pcs. per PP box,50 boxes per Carton	3.L32009.00E0
9mm Thread screw neck vial, 32x11.6mm, amber glass, white graduation line and marking spot and CNW LOGO, Borosilicate Type I Class B, The inner diameter of the bottle mouth greater than 6.15mm	100pcs. per PP box,50 boxes per Carton	3.L32009.00EA
9mm Thread screw neck vial, 32x11.6mm, amber glass, white graduation line and marking spot, Borosilicate Type I Class B	100pcs. per PP box,50 boxes per Carton	3.032009.00MA
9mm Thread screw neck vial, 32x11.6mm, clear glass, Borosilicate type 70	100pcs. per PP box,50 boxes per Carton	3.032009.7000
9mm Thread screw neck vial, 32x11.6mm, amber glass, Borosilicate type 70	100pcs. per PP box,50 boxes per Carton	3.032009.700A
9mm Thread screw neck vial, 32x11.6mm, clear glass, white graduation line and marking spot, Borosilicate type 70	100pcs. per PP box,50 boxes per Carton	3.032009.70M0
9mm Thread screw neck vial, 32x11.6mm, amber glass, white graduation line and marking spot, Borosilicate type 70	100pcs. per PP box,50 boxes per Carton	3.032009.70MA
9mm Thread screw neck vial, 1.5mL, 32x11.6mm, clear glass, total recovery, Borosilicate type I class A	100pcs. per PP box,50 boxes per Carton	3.031309.0000

Vials with other print and glass type are on require.



9mm screw cap

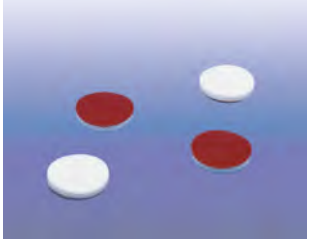
Description	Packaging	Cat. No.
9mm Screw thread cap(Royal), made from PP, blue, centre hole	100pcs. per PE bag	3.B05310.09FR
9mm Screw thread cap(Royal), made from PP, green, centre hole	100pcs. per PE bag	3.G05310.09FR
Preassembled cap and septa for 9mm thread screw, design for MS, no bleed, septa no required	100pcs. per PE bag	3.005330.09FR



9mm preassembled cap

Description	Packaging	Cat. No.
Preassembled cap and septa for 9mm thread screw, PP cap, blue, centre hole, White PTFE/red Rubber, 0.040" thick	100pcs. per PE bag	3.B05394.0900
Preassembled cap and septa for 9mm thread screw, PP cap, blue, centre hole, White silicone/Red PTFE, 0.040" thick	100pcs. per PE bag	3.B05395.0900
Preassembled cap and septa for 9mm thread screw, PP cap(Royal), blue, centre hole, White silicone/Red PTFE, 0.040" thick, slitted	100pcs. per PE bag	3.B05397.0900
Preassembled cap and septa for 9mm thread screw, PP cap(Royal), blue, centre hole, White PTFE/red Rubber, 0.040" thick, BONDED	100pcs. per PE bag	3.B05394.09FR
Preassembled cap and septa for 9mm thread screw, PP cap(Royal), blue, centre hole, White silicone/Red PTFE, 0.040" thick, BONDED	100pcs. per PE bag	3.B05395.09FR
Preassembled cap and septa for 9mm thread screw, PP cap(Royal), blue, centre hole, Red PTFE/White silicone/Red PTFE, 0.040" thick	100pcs. per PE bag	3.B05396.09FR
Preassembled cap and septa for 9mm thread screw, PP cap(Royal), blue, centre hole, White silicone/ Red PTFE, 0.040" thick, slitted, BONDED	100pcs. per PE bag	3.B05397.09FR
Preassembled cap and septa for 9mm thread screw, PP cap, black, closed, F217 with PTFE line	100pcs. per PE bag	3.005360.0900

Other colours caps with preassembled septa are on require.



Septa for 9mm screw cap

Description	Packaging	Cat. No.
Septa for 9mm Royal screw thread cap, white PTFE only, 0.010" thick	100pcs. per PE bag	3.601010.09FR
Septa for 9mm Royal screw thread cap, White PTFE/red Rubber , 0.040" thick	100pcs. per PE bag	3.604040.09FR

Description	Packaging	Cat. No.
Septa for 9mm Royal screw thread cap, White silicone/Red PTFE, 0.040" thick	100pcs. per PE bag	3.604050.09FR
Septa for 9mm Royal screw thread cap, Red PTFE/ White Silicone/Red PTFE, 0.040" thick	100pcs. per PE bag	3.604060.09FR
Septa for 9mm Royal screw thread cap, White silicone/Red PTFE, 0.040" thick, slitted	100pcs. per PE bag	3.604070.09FR
Septa for 9mm popular screw thread cap, White PTFE/red Rubber , 0.040" thick	100pcs. per PE bag	3.604040.0900
Septa for 9mm popular screw thread cap, White silicone/Red PTFE, 0.040" thick	100pcs. per PE bag	3.604050.0900
Septa for 9mm popular screw thread cap, Red PTFE/ White Silicone/Red PTFE, 0.040" thick	100pcs. per PE bag	3.604060.0900
Septa for 9mm popular screw thread cap, White silicone/Red PTFE, 0.040" thick, slitted	100pcs. per PE bag	3.604070.0900

10-425 screw thread vials, caps and septa

- 10-425 screw thread vials feature a wider opening than other screw thread vials. This increased target area makes samples preparation easier. It also reduces the chances of bent or broken needles during sampling.
- You can use them on below brand instrument: Jasco, Perkin Elmer, Shimadzu, Varian, Waters, etc.

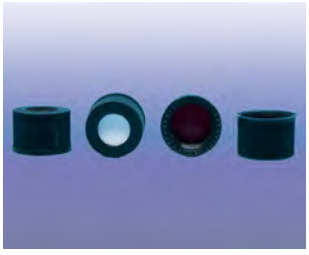
10-425 screw thread vials

Description	Packaging	Cat. No.
10-425 Thread screw neck vial, 32x11.6mm, clear glass, white graduation line and marking spotand CNW LOGO, Borosilicate Type I Class A	100pcs. per PPbox,50 boxes per Carton	3.032010.00E0
10-425 Thread screw neck vial, 32x11.6mm, amber glass, white graduation line and marking spot and CNW LOGO, Borosilicate Type I Class B	100pcs. per PPbox,50 boxes per Carton	3.032010.00EA
10-425 Thread screw neck vial, 32x11.6mm, clear glass, white graduation line and marking spot, Borosilicate Type I Class A	100pcs. per PPbox,50 boxes per Carton	3.032010.00M0

Vials with other print and glass type are on require.

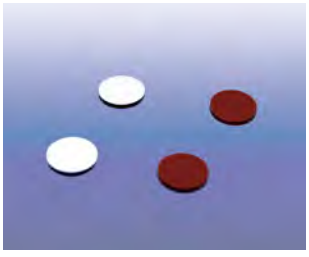
10-425 screw cap

Description	Packaging	Cat. No.
10-425 Screw thread cap, made from PP, black, centre hole	100pcs. per PE bag	3.005310.1000
10-425 Screw thread cap, made from PP, black, closed	100pcs. per PE bag	3.005320.1000



10-425 preassembled cap

Description	Packaging	Cat. No.
Preassembled cap and septa for 10-425 thread screw, PP cap, black, centre hole, Red rubber/White PTFE, 0.060" thick	100pcs. per PE bag	3.005394.1000
Preassembled cap and septa for 10-425 thread screw, PP cap, black, centre hole, Red PTFE/White silicone, 0.060" thick	100pcs. per PE bag	3.005395.1000
Preassembled cap and septa for 10-425 thread screw, PP cap, black, centre hole, White silicone/Red PTFE, 0.040" thick, slitted	100pcs. per PE bag	3.005397.1000
Preassembled cap and septa for 10-425 thread screw, PP cap, black, closed, White sillcone/Red PTFE	100pcs. per PE bag	3.CS5360.1000



Septa for 10-425 screw cap

Description	Packaging	Cat. No.
Septa for 10-425 screw thread cap, white PTFE only, 0.010" thick	100pcs. per PE bag	3.601010.1000
Septa for 10-425 screw thread cap, White PTFE/red Rubber , 0.060" thick	100pcs. per PE bag	3.606040.1000
Septa for 10-425 screw thread cap, Red PTFE/ White silicone, 0.060" thick	100pcs. per PE bag	3.606050.1000
Septa for 10-425 screw thread cap, White silicone/ Red PTFE, 0.060" thick, slitted	100pcs. per PE bag	3.606070.1000
Septa for 10-425 screw thread cap, White silicone/Red PTFE, 0.075" thick	100pcs. per PE bag	3.607550.1000

13-425 screw thread vials, caps and septa

- Precise screw seal consistent security
- Can be used for cleaning, storage waste or sample
- You can use them on below brand instrument: Dionex, Shimadzu, Spark, Varian, VWR(MERCK)/ HITACHI, WATERS(Wisp 48 position carousel), etc.

13-425 screw thread vials

Description	Packaging	Cat. No.
13-425 Thread screw neck vial, 45x14.7mm, clear glass, white graduation line and marking spotand CNW LOGO, Borosilicate Type I Class A	100pcs. per PP box, 30 boxes per Carton	3.034013.00E0
13-425 Thread screw neck vial, 45x14.7mm, amber glass, white graduation line and marking spot and CNW LOGO, Borosilicate Type I Class B	100pcs. per PP box, 30 boxes per Carton	3.034013.00EA

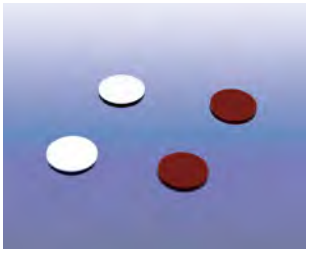
Vials with other print and glass type are on require.

13-425 screw cap

Description	Packaging	Cat. No.
13-425 Screw thread cap, made from PP, black, centre hole	100pcs. per PE bag	3.005310.1300
13-425 Screw thread cap, made from PP, black, closed	100pcs. per PE bag	3.005320.1300

13-425 preassembled cap

Description	Packaging	Cat. No.
Preassembled cap and septa for 13-425 thread screw, PP cap, black, centre hole, Red rubber/White PTFE, 0.050" thick	100pcs. per PE bag	3.005394.1300
Preassembled cap and septa for 13-425 thread screw, PP cap, black, centre hole, White silicone/Red PTFE, 0.060" thick	100pcs. per PE bag	3.005395.1300
Preassembled cap and septa for 13-425 thread screw, PP cap, black, closed, White sillcone/Red PTFE	100pcs. per PE bag	3.CS5360.1300
Preassembled cap and septa for 13-425 thread screw, PP cap, black, closed, F217 line	100pcs. per PE bag	3.005361.1300
Preassembled cap and septa for 13-425 thread screw, PP cap, white, closed, F217 line	100pcs. per PE bag	3.W05361.1300



Septa for 13-425 screw cap

Description	Packaging	Cat. No.
Septa for 13-425 screw thread cap, white PTFE only, 0.010" thick	100pcs. per PE bag	3.601010.1300
Septa for 13-425 screw thread cap, White PTFE/red Rubber , 0.050" thick	100pcs. per PE bag	3.605040.1300
Septa for 13-425 screw thread cap, White silicone/Red PTFE, 0.060" thick	100pcs. per PE bag	3.606050.1300
Septa for 13-425 screw thread cap, White silicone/Red PTFE, 0.075" thick	100pcs. per PE bag	3.607550.1300

Crimp neck vials

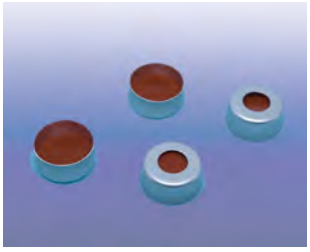
11mm large open crimp neck vials, caps and septa

- Crimp neck vials provide the tightest seal, reducing the chance of sample evaporation.
- The 12 x 32 mm crimp neck vials and 11mm aluminum crimp caps are enconomical and easy to use with crimp tools.
- You can use them on below brand instrument: Agilent, Carlo Erba, CTC, Dani, Fisons, Gerstel, Jasco, Perkin Elmer, Shimdzu, Spark, Thermo, Varian, etc.

11mm crimp neck vials

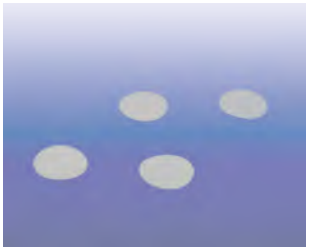
Description	Packaging	Cat. No.
11mm Crimp neck vial, 32x11.6mm, clear glass, white graduation line and marking spot and CNW LOGO, Borosilicate Type I Class A	100pcs. per PP box,50 boxes per Carton	3.L32011.00E0
11mm Crimp neck vial, 32x11.6mm, amber glass, white graduation line and marking spot and CNW LOGO, Borosilicate Type I Class B	100pcs. per PP box,50 boxes per Carton	3.L32011.00EA
11mm Crimp neck vial, 32x11.6mm, clear glass, white graduation line and marking spot, Borosilicate type 70	100pcs. per PP box,50 boxes per Carton	3.L32011.7HM0
11mm Crimp neck vial, 32x11.6mm, clear glass, white graduation line and marking spot and CNW logo, Borosilicate type 70	100pcs. per PP box,50 boxes per Carton	3.L32011.70EA

Vials with other print and glass type are on require.



11mm preassembled crimp cap

Description	Packaging	Cat. No.
Preassembled cap and septa for 11mm Crimp neck, Aluminum cap, clear, centre hole, Clear PTFE/Orange Silicone, 0.040" thick	100pcs. per PE bag	3.005140.1100
Preassembled cap and septa for 11mm Crimp neck, Aluminum cap, clear, centre hole, Clear PTFE/Orange Silicone, 0.040" thick	500pcs. per PET jar	3.005140.1100.G
Preassembled cap and septa for 11mm Crimp neck, magnetic cap, Silver, centre hole, Clear PTFE/Orange Silicone, 0.040" thick	100pcs. per PE bag	3.005140.11MS
Preassembled cap and septa for 11mm Crimp neck, Aluminum cap, Blue, centre hole, Natural Rubber red-orange/Butyl red/TEF transparent, 0.040" thick	100pcs. per PE bag	3.B05140.1100
Preassembled cap and septa for 11mm Crimp neck, Aluminum cap, Green, centre hole, Natural Rubber red-orange/Butyl red/TEF transparent, 0.040" thick	100pcs. per PE bag	3.G05140.1100
Preassembled cap and septa for 11mm Crimp neck, Aluminum cap, Red, centre hole, Natural Rubber red-orange/Butyl red/TEF transparent, 0.040" thick	100pcs. per PE bag	3.R05140.1100
Preassembled cap and septa for 11mm Crimp neck, Aluminum cap, black, centre hole, White silicone/Red PTFE, 0.040" thick	100pcs. per PE bag	3.SW5150.1100
Preassembled cap and septa for 11mm Crimp neck, Aluminum cap, clear, centre hole, Red Butyl/Transparent PTFE, 0.040" thick	100pcs. per PE bag	3.X05140.1100
Preassembled cap and septa for 8-425 thread screw, PP cap, black, centre hole, Red PTFE/White silicone/Red PTFE, 0.040" thick	500pcs. per PET jar	3.X05140.1100.G



Septa for 11mm crimp cap

Description	Packaging	Cat. No.
Septa for 11mm crimp cap, white PTFE only, 0.010" thick	100pcs. per PE bag	3.601010.1100

Snap neck vials

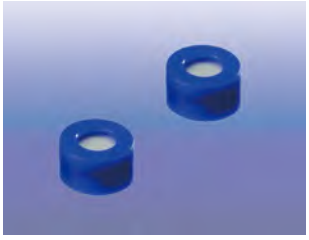
11 mm Snap neck vials, caps and septa

- 11 mm snap neck vials provide a secure seal that minimizes evaporation, even with volatile samples.
- 11 mm snap caps are often more convenient than crimp caps as they can be easily applied and remove by hand.
- An audible click ensures a secure seal has been formed and that cap is correctly aligned.
- 11 mm snap vials can be closed with either snap caps or crimp caps.
- You can use them on below brand instrument: Agilent, CTC, Dani, Dionex, Jasco, Shimdzu, Spark, Thermo, Varian, VWR(Merck)/Hitachi, Waters, etc.

11mm snap neck vials

Description	Packaging	Cat. No.
11mm Snap neck vial, 32x11.6mm, clear glass, white graduation line and marking spot and CNWLOGO, Borosilicate Type I Class A	100pcs. per PP box,50 boxes per Carton	3.S32011.00E0
11mm Snap neck vial, 32x11.6mm, amber glass, white graduation line and marking spot and CNWLOGO, Borosilicate Type I Class B	100pcs. per PP box,50 boxes per Carton	3.S32011.00EA

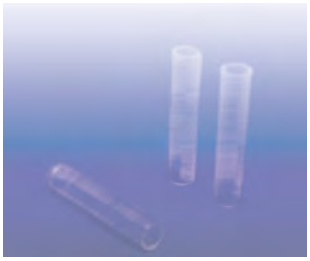
Vials with other print and glass type are on require.



11mm preassembled crimp cap

Description	Packaging	Cat. No.
Preassembled cap and septa for 11mm Snap neck, pp cap, clear, centre hole, Clear PTFE/Orange Silicone rubber, 0.040" thick	100pcs. per PE bag	3.005540.1100
Preassembled cap and septa for 11mm Snap neck, pp cap, clear, centre hole, Red Butyl/Transparent PTFE, 0.040" thick	100pcs. per PE bag	3.X05540.1100

Shell vials



- Shell vials feature thicker walls for safer sample handling.
- All the shell vials are supplied with polyethylene plug closures.
- You can use them on below brand instrument: Alcott, Gilson, Shimadzu, Waters(WISP 48 and 96 style autosamplers), etc.

1ml shell vials and plug

Description	Packaging	Cat. No.
1ml shell vial, 40x8.2mm, clear glass, Borosilicate Type I Class A	100pcs. per PP box	3.004100.0800
1ml shell vial, 40x8.2mm, amber glass, Borosilicate Type I Class B	100pcs. per PP box	3.004100.080A
8mm transparent PE-plug for shell vial	100pcs. per PP box	3.SB5400.0800

2ml shell vials and plug

Description	Packaging	Cat. No.
2ml shell vial, 31.5x11.6mm, clear glass, Borosilicate Type I Class A	100pcs. per PP box	3.004100.1200
2ml shell vial, 31.5x11.6mm, amber glass, Borosilicate Type I Class B	100pcs. per PP box	3.004100.120A
12mm transparent PE-plug for shell vial	100pcs. per PP box	3.SB5400.1200

4ml shell vials and plug

Description	Packaging	Cat. No.
4ml shell vial, 44.6x14.65mm, clear glass, Borosilicate Type I Class A	100pcs. per PP box	3.004100.1500
4ml shell vial, 44.6x14.65mm, amber glass, Borosilicate Type I Class B	100pcs. per PP box	3.004100.150A
15mm transparent PE-plug for shell vial	100pcs. per PP box	3.SB5400.1500

Conical bottom vials

Conical bottom vials can be supplier small remained reagent when the sampling not need use insert.

8-425 screw thread neck conical bottom vials

Description	Packaging	Cat. No.
8-425 Thread screw neck Micro vial, 1.1ml, 32x11.6mm, clear glass, conical bottom, Borosilicate Type I Class A	100pcs. per PP box, 50 boxes per Carton	3.031108.0000

11 mm crimp neck conical bottom vials

Description	Packaging	Cat. No.
11mm Crimp neck micro vial, 1.1ml, 32x11.6mm, clear glass, conical bottom, Borosilicate Type I Class A	100pcs. per PP box, 50 boxes per Carton	3.031111.0000

High recovery vials

1.5mL vials with 30uL reservoir are for sample concentration and injection without transferring to microvolume inserts.

9 mm screw thread neck high recovery vials

Description	Packaging	Cat. No.
9mm Thread screw neck vial, 1.5mL, 32x11.6mm, clear glass, high recovery, Borosilicate Type I Class A	100pcs. per PP box, 50 boxes per Carton	3.031509.0000
9mm Thread screw neck vial, 1.5mL, 32x11.6mm, amber glass, high recovery, Borosilicate Type I Class B	100pcs. per PP box, 50 boxes per Carton	3.031509.000A

11 mm crimp neck high recovery vials

Description	Packaging	Cat. No.
11mm Crimp neck vial, 32x11.6mm, clear glass, high recovery, Borosilicate Type I Class A	100pcs. per PP box, 50 boxes per Carton	3.031511.0000
11mm Crimp neck vial, 32x11.6mm, amber glass, high recovery, Borosilicate Type I Class B	100pcs. per PP box, 50 boxes per Carton	3.031511.000A

Total Recovery vials

- Volume 1.4mL, 5μL needle-liked groove on the bottom
- Sample injection without transfering to microvolume inserts, low residual quantity remaining
- Effectively reducing dead volume
- Low volume of sample with advantage of hight (The ploy-spring inserts has same dead volume compare with total recovery vials, but with low volume sample (nearly 5uL) total recovery vials has sample’s hight clearly superior than ploy-spring’s one.)
- Good usage of centrifugation and concentration

Description	Packaging	Cat. No.
9mm Thread screw neck vial, 1.5mL, 32x11.6mm, clear glass, total recovery, Borosilicate Type I Class A	100pcs. per PP box	3.031309.0000

Silanized vials

- For polar compounds, volatile compounds and the compounds can interaction with OH, we can use silanized vials to get the best recovery;
- Silanized vials are especially suitable for analysis flow matter: phenolic compound, protein, antibody, amine, metabolite, herbicide and insecticide etc.

9 mm Silanized screw thread neck vials

Description	Packaging	Cat. No.
9mm Thread screw neck vial, 32x11.6mm, clear glass, white graduation line and marking spot and CNW LOGO, Borosilicate Type I Class A, Silanized	100pcs. per PP box, 50 boxes per Carton	3.032009.0ZE0
9mm Thread screw neck vial, 32x11.6mm, amber glass, white graduation line and marking spot and CNW LOGO, Borosilicate Type I Class A, Silanized	100pcs. per PP box, 50 boxes per Carton	3.032009.0ZEA

11 mm Silanized crimp neck vials

Description	Packaging	Cat. No.
11mm Crimp neck vial, 32x11.6mm, clear glass, white graduation line and marking spot and CNW LOGO, Silanized	100pcs. per PP box, 50 boxes per Carton	3.L32011.0ZE0
11mm Crimp neck vial, 32x11.6mm, amber glass, white graduation line and marking spot and CNW LOGO, Silanized	100pcs. per PP box, 50 boxes per Carton	3.L32011.0ZEA

Polypropylene vials

- Polypropylene material with high resistance for most of chemical regents. Also without heavy metal ion, this material is very suitable for ion chromatography, atomic absorption and CE+CE/MS customers.
- The adsorption capacity for the internal surface of polypropylene vials is much lower, so when used in HPLC analysis. it's better for protein and amino acid analysis.

9mm screw thread neck plastic vials

Description	Packaging	Cat. No.
9mm Thread screw neck vial, 32x11.6mm, transparent PP, with graduation line, slightly concave shaped bottom	100pcs. per PE bag	3.P32009.0000
9mm Thread screw neck vial, 32x11.6mm, amber PP, with graduation line, slightly concave shaped bottom	100pcs. per PE bag	3.P32009.000A
0.3ml PP Short Thread Micro-Vial, 32 x 11.6mm, transparent	100pcs. per PE bag	3.P30309.0000
0.3ml PP Short Thread Micro-Vial, 32 x 11.6mm, amber	100pcs. per PE bag	3.P30309.000A

Limited Volume insert

- The insert is to reduce the amount of solvent and small volume injection of an economic program;
- The insert with polymer spring can ensure the insert perpendicular in the vials, to maintain alignment injection direction. Polymer spring also play a role of buffer, so you can suck out all the samples. If the autosampler settings are correct, these insert virtually no dead volume, syringe needle can be inserted into the bottom of the insert without injured.
- Conical bottom insert do not need springs, its most economical choice for micro sampling.
- Flat-bottomed insert economic alternatives for finite volume vials.
- Appropriate choice of insert can optimize the performance of the instrument and experimental results

1ml shell vials and plug

Description	Packaging	MEMO	Cat. No.
Insert for small open vial, 31x5mm, clear glass, plastic spring not required, Economic, Borosilicate Type I Class A	100pcs. per PE bag	Suitable for 8-425 screw neck vials	3.000401.050E
Insert for small open vial, 30x5mm, clear glass, preassembled plastic spring, Borosilicate Type I Class A	100pcs. per PE bag		3.000401.05BS
Insert for small open vial, 31x5mm, clear glass, flat bottom, heavy wall, Borosilicate Type I Class A	100pcs. per PE bag		3.004025.0500
Insert for small open vial, 31x5mm, clear glass, flat bottom, mean wall, Borosilicate Type I Class A	100pcs. per PE bag	Suitable for 8-425 screw neck vials	3.004025.050G
Insert for small open vial, 29x5mm, transparent plastic, preassembled plastic spring	100pcs. per PE bag		3.P00401.05BS
Insert for large open vial, 31x6mm, clear glass, flat bottom, heavy wall, Borosilicate Type I Class A	100pcs. per PE bag	Suitable for 9mm screw thread vials with large open mouth 10-425 screw thread vials 11mm crimp neck vials with large open mouth 11mm snap neck vials with large open mouth	3.004025.0600
Insert for large open vial, 31x6mm, clear glass, plastic spring not required, Economic, Borosilicate Type I Class A	100pcs. per PE bag		3.004025.060E
Insert for large open vial, 29x5.7mm, clear glass, preassembled plastic spring, Borosilicate Type I Class A	100pcs. per PE bag	Suitable for 9mm screw thread vials with standard open mouth 11mm crimp neck vials with standard open mouth 11mm snap neck vials with standard open mouth	3.004025.06BS
Insert for large open vial, 31x6mm, transparent plastic, preassembled plastic spring	100pcs. per PE bag		3.P04025.06BS

Headspace vials

20mm crimp neck headspace vials, caps and septa

Because of the headspace testing have a standard internal pressure, to ensure that the headspace vials does not burst due the testing, all of our headspace vial wall thickness in 1.2mm.

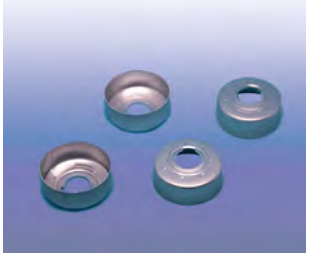
- CNW headspace vials using double inclined jaw design, make the septa having a lager contact area with the vials, to ensure the best sealing effect.
- Flat bottom and round bottom to be choiced by customer, rounded-bottom vials can be work with higher pressure.In addition, the rounded-bottom vials more easy to put into the heated module during the magnetic moving.
- Uniform wall thickness, and good thermal shock resistance.
- Magnetic metal cap and two-color aluminum cap can be used for CTC Combi PAL Series injector, the middle of the two-color aluminum cap made from iron to ensure that can be sucked up, surrounded by aluminum, no need to hard crimp.
- 20mm crimp neck 6ml headspace vails for Metrohm.

20mm crimp neck headspace vials

Description	Packaging	Cat. No.
20mm crimp neck headspace vial, 6ml, 38.2x22mm, clear glass, flat bottom, white marking spot and CNW LOGO, Borosilicate Type I Class A, for Varian	100pcs. per Carton,10 Cartons per Case	3.036020.0E00

Description	Packaging	Cat. No.
20mm crimp neck headspace vial, 6ml, 38.2x22mm, clear glass, rounded bottom, white marking spot and CNW LOGO, Borosilicate Type I Class A, for PE	100pcs. per Carton,10 Cartons per Case	3.036020.0EA0
20mm crimp neck headspace vial, 10ml, 46x22.5mm, clear glass, flat bottom, Borosilicate Type I Class A, for Carlo Erba/Dani/Fisons/Agilent	100pcs. per Carton,10 Cartons per Case	3.310020.0000
20mm crimp neck headspace vial, 10ml, 46x22.5mm, clear glass, rounded bottom, Borosilicate Type I Class A, for CTC/Varian	100pcs. per Carton,10 Cartons per Case	3.310020.00A0
20mm crimp neck headspace vial, 10ml, 46x22.5mm, clear glass, flat bottom, white marking spot and CNW LOGO, Borosilicate Type I Class A, for Carlo Erba/Dani/Fisons/Agilent	100pcs. per Carton,10 Cartons per Case	3.310020.0E00
20mm crimp neck headspace vial, 10ml, 46x22.5mm, clear glass, rounded bottom, white marking spot and CNW LOGO, Borosilicate Type I Class A, for CTC/Varian	100pcs. per Carton,10 Cartons per Case	3.310020.0EA0
20mm crimp neck headspace vial, 10ml, 46x22.5mm, amber glass, rounded bottom, white marking spot and CNW LOGO, Borosilicate Type I Class B, for CTC/Varian	100pcs. per Carton,10 Cartons per Case	3.310020.0EAA
20mm crimp neck headspace vial, 20ml, 75.5x22.5mm, clear glass, flat bottom, white marking spot and CNW LOGO, Borosilicate Type I Class A, for Carlo Erba/Dani/Fisons/Agilent	100pcs. per Carton,10 Cartons per Case	3.320020.0E00
20mm crimp neck headspace vial, 20ml, 75.5x22.5mm, clear glass, rounded bottom, white marking spot and CNW LOGO, Borosilicate Type I Class A, for PE/Tekmar	100pcs. per Carton,10 Cartons per Case	3.320020.0EA0
20mm crimp neck headspace vial, 20ml, 75.5x22.5mm, amber glass, rounded bottom, white marking spot and CNW LOGO, Borosilicate Type I Class B, for PE/Tekmar	100pcs. per Carton,10 Cartons per Case	3.320020.0EAA
20mm crimp neck headspace vial, 50ml, 101x31mm, clear glass, flat bottom, white marking spot and CNW LOGO, Borosilicate Type I Class A	100pcs. per Carton, 4 Cartons per Case	3.350020.0E00
20mm crimp neck headspace vial, 100ml, 94.5x51.6mm, clear glass, flat bottom, 3rd hydrol. Class	88pcs. Shrink-wrapped	3.100020.0000

Vials with other print and glass type are on require.



20mm crimp neck caps

Description	Packaging	Cat. No.
Aluminum cap for 20mm crimp neck vial, without septa, centre hole	100pcs. per PE bag	3.005100.2000
Aluminum cap with iron top for 20mm crimp neck vial, without septa, silver, centre hole	100pcs. per PE bag	3.005100.20MN
Safty aluminum cap for 20mm crimp neck vial, without septa	100pcs. per PE bag	3.005100.20SS

20mm crimp neck preassembled caps

Description	Packaging	Cat. No.
Preassembled cap and septa for 20mm crimp neck headspace vial, Aluminum cap, clear, centre hole, butyl/PTFE, 0.125" thick	100pcs. per PET jar	3.F05140.2000
Preassembled cap and septa for 20mm crimp neck headspace vial, Aluminum cap with iron top, silver, centre hole, butyl/PTFE, 0.125" thick	100pcs. per PET jar	3.F05140.20MN
Preassembled cap and septa for 20mm crimp neck headspace vial, Aluminum cap, clear, centre hole, White silicone/white PTFE, 0.125" thick	100pcs. per PET jar	3.T05150.2000
Preassembled cap and septa for 20mm crimp neck headspace vial, Aluminum cap, clear, centre hole, Translucent Blue silicone/white PTFE, 0.125" thick	100pcs. per PET jar	3.TB5150.2000
Preassembled cap and septa for 20mm crimp neck headspace vial, Aluminum cap with iron top, silver, centre hole, Translucent Blue silicone/white PTFE, 0.125" thick	100pcs. per PET jar	3.TB5150.20MN
Preassembled cap and septa for 20mm crimp neck headspace vial, Safty aluminum cap, clear, centre hole, Translucent Blue silicone/white PTFE, 0.125" thick	100pcs. per PET jar	3.TB5150.20SS
Preassembled cap and septa for 20mm crimp neck headspace vial, Aluminum cap, clear, centre hole, Clear silicone/white PTFE, 0.125" thick	100pcs. per PET jar	3.005150.2000

20mm crimp neck septa

Description	Packaging	Cat. No.
Septa for 20mm crimp neck headspace vial, Butyl Injection Stopper, grey	100pcs. per PE bag	3.600004.2000
Septa for 20mm crimp neck headspace vial, moulded, Butyl/PTFE, 0.120" thick	100pcs. per PE bag	3.610040.200G
Septa for 20mm crimp neck headspace vial, Translucent Blue silicone/Nature PTFE, 0.125" thick	100pcs. per PE bag	3.610050.20TB
Septa for 20mm crimp neck headspace vial, Clear silicone/Nature PTFE, 0.125" thick	100pcs. per PE bag	3.610050.2200

20mm crimp neck SPME vials, caps and septa

- The thicker crimp neck is 3.2mm, the customer can use thin septa to of 1.5mm to ensure the SPME fiber can puncture easily.
- The aluminum cap with iron top, the magnetic injector can get the caps, and customer not need hard cover.
- Design for CTC Combi PAL(headspace module) and Shimadzu AOC-5000(headspace module), etc.

20mm crimp neck SPME vials

Description	Packaging	Cat. No.
20mm crimp neck SPME vial, 20ml, 46x22.5mm, clear glass, rounded bottom, white marking spot and CNW LOGO, Borosilicate Type I Class A	100pcs. per Carton,10 Cartons per Case	3.310020.SEA0
20mm crimp neck SPME vial, 20ml, 75.5x22.5mm, clear glass, rounded bottom, white marking spot and CNW LOGO, Borosilicate Type I Class A	100pcs. per Carton,10 Cartons per Case	3.320020.SEA0

20mm SPME neck preassembled caps

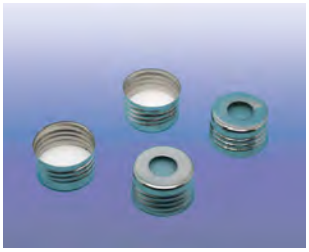
Description	Packaging	Cat. No.
Preassembled cap and septa for 20mm crimp neck SPME vial, Aluminum cap with iron top , silver, centre hole, White silicone/Blue PTFE, 0.06"thick	100pcs. per PET jar	3.05150B.20MN

18mm precision thread headspace vials, caps and septas.

- Easy for use, crimp tools is not needed, customer can screw and unscrew the cap only by hand.
- Avoid the risk for mis-crimp, ensure the repeatability of the analysis.
- Very good airtight performance.
- Use thin septa to ensure puncture easily and safety.
- Can be seal the samples on the spot, not need bring back the samples to laboratory and refill to the autosampler vials.

18mm precision thread headspace vials

Description	Packaging	Cat. No.
18mm precision Thread vial, 10ml, 46x22.5mm, clear glass, rounded bottom, white marking spot and CNW LOGO, Borosilicate Type I Class A	100pcs. per Carton,10 Cartons per Case	3.310018.0EM0
18mm precision Thread vial, 10ml, 46x22.5mm, amber glass, rounded bottom, white marking spot and CNW LOGO, Borosilicate Type I Class B	100pcs. per Carton,10 Cartons per Case	3.310018.0EMA
18mm precision Thread vial, 20ml, 75.5x22.5mm, clear glass, rounded bottom, white marking spot and CNW LOGO, Borosilicate Type I Class A	100pcs. per Carton,10 Cartons per Case	3.320018.0EM0
18mm precision Thread vial, 20ml, 75.5x22.5mm, amber glass, rounded bottom, white marking spot and CNW LOGO, Borosilicate Type I Class B	100pcs. per Carton,10 Cartons per Case	3.320018.0EMA



18mm precision thread headspace neck preassembled caps

Description	Packaging	Cat. No.
Preassembled cap and septa for 18mm precision Thread vial, magnetic cap, clear, centre hole, butyl/PTFE, 0.060" thick	100pcs. per PE bag	3.F05394.18M0
Preassembled cap and septa for 18mm precision Thread vial, magnetic cap, clear, centre hole, Translucent Blue silicone/white PTFE, 0.050" thick	100pcs. per PE bag	3.TB5395.18M0
Preassembled cap and septa for 18mm precision Thread vial, magnetic cap, clear, centre hole, White silicone/Blue PTFE, 0.060" thick	100pcs. per PE bag	3.B05395.18M0

18mm precision thread headspace neck septa

Description	Packaging	Cat. No.
Setpa for 18mm magnetic screw thread cap, Butyl/PTFE, 0.060" thick	100pcs. per PE bag	3.606050.180M
Setpa for 18mm magnetic screw thread cap, Translucent Blue silicone/white PTFE, 0.050" thick	100pcs. per PE bag	3.606050.18TB

Crimping Tools and Decapping tools

- Coating out of the handle, ensure the tools can prevent hull corrosion;
- The head of the tools made from Special alloy materials ensure the long life;
- The handle part use frosted design ensure easy clench;
- Can be adjust the screw nut on the handle to ensure the best sealing performance;
- Crimping tools can use hexagon spanner to adjust the crimp neck height;
- Decapper easy to use, avoid the samples spilling and the glass parts broken;

Crimping tools

Description	Packaging	Cat. No.
Crimper for 8mm Aluminum caps	1 pc. Per box	3.009300.0800
Crimper for 11mm Aluminum caps	1 pc. Per box	3.009300.1100
Crimper for 13mm Aluminum caps	1 pc. Per box	3.009300.1300
Crimper for 20mm Aluminum caps	1 pc. Per box	3.009300.2000

Decapping tools

Description	Packaging	Cat. No.
Decapper for 8mm Aluminum caps	1 pc. Per box	3.009320.0800
Decapper for 11mm Aluminum caps	1 pc. Per box	3.009320.1100
Decapper for 13mm Aluminum caps	1 pc. Per box	3.009320.1300
Decapper for 20mm Aluminum caps	1 pc. Per box	3.009320.2000

Standard screw thread neck vials

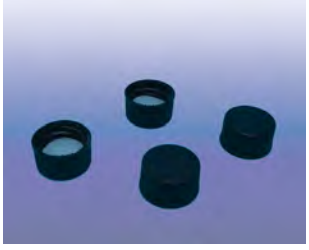
These large volume vials is best choice for laboratory to storage the samples.

15-425 standard screw thread neck 8mL vials

15-425 screw thread neck vials

Description	Packaging	Cat. No.
15-425 Thread screw neck vial, 8ml, 61x16.6mm, clear glass, white marking spot and CNW LOGO, Borosilicate Type I Class A	100pcs. per Carton,8 Cartons per Case	3.038015.00E0
15-425 Thread screw neck vial, 8ml, 61x16.6mm, amber glass, white marking spot and CNW LOGO, Borosilicate Type I Class B	100pcs. per Carton,8 Cartons per Case	3.038015.00EA

Vials with other print and glass type are on require.



15-425 screw thread neck preassembled caps

Description	Packaging	Cat. No.
Preassembled cap and septa for 15-425 thread screw, PP cap, black, closed, F217 line	100pcs. per PE bag	3.005361.1500
Preassembled cap and septa for 15-425 thread screw, PP cap, white, closed, F217 line	100pcs. per PE bag	3.W05361.1500

15-425 screw thread neck caps

Description	Packaging	Cat. No.
15-425 Screw thread cap, made from PP, black, centre hole	100pcs. per PE bag	3.005310.1500

Description	Packaging	Cat. No.
15-425 Screw thread cap, made from PP, black, closed	100pcs. per PE bag	3.005320.1500

15-425 screw thread neck septas

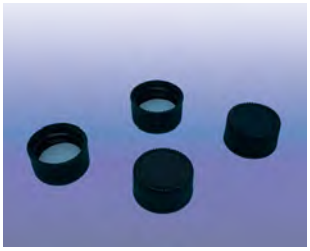
Description	Packaging	Cat. No.
Septa for 15-425 screw thread cap, white PTFE only, 0.010" thick	100pcs. per PE bag	3.601010.1500
Septa for 15-425 screw thread cap, Clear silicone/White PTFE, 0.060" thick	100pcs. per PE bag	3.606050.150G
Septa for 15-425 screw thread cap, Clear silicone/ White PTFE, 0.060" thick, ultra low bleed	100pcs. per PE bag	3.606050.15LB

18-400 standard screw thread neck 15mL vials

18-400 screw thread neck vials

Description	Packaging	Cat. No.
18-400 Thread screw neck vial, 15ml, 71x20.6mm, clear glass, white marking spot and CNW LOGO, Borosilicate Type I Class A	100pcs. per Carton,10 Cartons per Case	3.316018.00E0
18-400 Thread screw neck vial, 15ml, 71x20.6mm, amber glass, white marking spot and CNW LOGO, Borosilicate Type I Class B	100pcs. per Carton,10 Cartons per Case	3.316018.00EA

Vials with other print and glass type are on require.

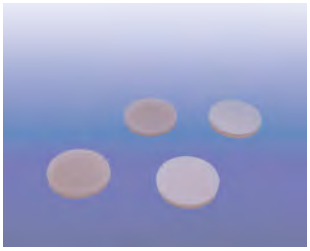


18-400 screw thread neck preassembled caps

Description	Packaging	Cat. No.
Preassembled cap and septa for 18-400 thread screw, PP cap, black, closed, F217 line	100pcs. per PE bag	3.005361.1800

18-400 screw thread neck caps

Description	Packaging	Cat. No.
18-400 Screw thread cap, made from PP, black, centre hole	100pcs. per PE bag	3.005310.1800
18-400 Screw thread cap, made from PP, black, closed	100pcs. per PE bag	3.005320.1800



18-400 screw thread neck septas

Description	Packaging	Cat. No.
Septa for 18-400screw thread cap, white PTFE only, 0.010" thick	100pcs. per PE bag	3.601010.1800
Septa for 18-400 screw thread cap, Red Butyl/Grey PTFE, 0.060" thick	100pcs. per PE bag	3.606040.180F
Septa for 18-400 screw thread cap, Clear silicone/ White PTFE, 0.060" thick, ultra low bleed	100pcs. per PE bag	3.606050.18LB
Septa for 18-400 screw thread cap, Clear silicone/White PTFE, 0.100" thick	100pcs. per PE bag	3.610050.180L

24-400 standard screw thread neck 20mL, 40mL, 60mL EPA/VOA vials

- You can use them on below brand instrument:Agilent, Dionex, Shimadzu, Tekmar, Thermo Scientific, Varian.
- Broad range of EPA vials in clear and amber glass
- Volumes of 20mL, 20mL, 40mL and 60mL available

24-400 screw thread neck vials

Description	Packaging	Cat. No.
24-400 Thread screw neck EPA vial, 20ml, 57x27.5mm, clear glass, white marking spot and CNW LOGO, Borosilicate Type I Class A	100pcs. per Carton, 8 Cartons per Case	3.320024.00E0
24-400 Thread screw neck EPA vial, 20ml, 57x27.5mm, amber glass, white marking spot and CNW LOGO, Borosilicate Type I Class B	100pcs. per Carton, 8 Cartons per Case	3.320024.00EA
24-400 Thread screw neck EPA vial, 20ml, 57x27.5mm, clear glass, Borosilicate type 70	100pcs. per Carton, 8 Cartons per Case	3.320024.7000
24-400 Thread screw neck EPA vial, 20ml, 57x27.5mm, amber glass, Borosilicate type 70	100pcs. per Carton, 8 Cartons per Case	3.320024.700A
24-400 Thread screw neck EPA vial, 40ml, 95x27.5mm, clear glass, white marking spot and CNW LOGO, Borosilicate Type I Class A	100pcs. per Carton, 4 Cartons per Case	3.340024.00E0
24-400 Thread screw neck EPA vial, 40ml, 95x27.5mm, amber glass, white marking spot and CNW LOGO, Borosilicate Type I Class B	100pcs. per Carton, 4 Cartons per Case	3.340024.00EA
24-400 Thread screw neck EPA vial, 40ml, 95x27.5mm, clear glass, Borosilicate type 70	100pcs. per Carton, 4 Cartons per Case	3.340024.7000

Description	Packaging	Cat. No.
24-400 Thread screw neck EPA vial, 40ml, 95x27.5mm, amber glass, Borosilicate type 70	100pcs. per Carton, 4 Cartons per Case	3.340024.700A
24-400 Thread screw neck EPA vial, 60ml, 140x27.5mm, clear glass, white marking spot and CNW LOGO,Borosilicate Type I Class A	100pcs. per Carton, 4 Cartons per Case	3.360024.00E0
24-400 Thread screw neck EPA vial, 60ml, 140x27.5mm, amber glass, white marking spot and CNW LOGO, Borosilicate Type I Class B	100pcs. per Carton, 4 Cartons per Case	3.360024.00EA

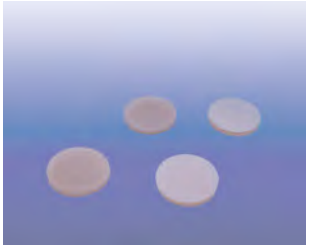
Vials with other print and glass type are on require.

24-400 screw thread neck preassembled caps

Description	Packaging	Cat. No.
Preassembled cap and septa for 24-400 thread screw, PP cap, black, centre hole, Clear silicone/White PTFE, 0.100" thick	100pcs. per PE bag	3.005350.2400
Preassembled cap and septa for 24-400 thread screw, PP cap, black, closed, Clear silicone/White PTFE, 0.100" thick	100pcs. per PE bag	3.005360.2400
Preassembled cap and septa for 24-400 thread screw, PP cap, black, closed, Red Butyl/Grey PTFE, 0.060" thick	100pcs. per PE bag	3.0F5360.2400
Preassembled cap and septa for 24-400 thread screw, PP cap, white, centre hole, Clear silicone/White PTFE, 0.100" thick	100pcs. per PE bag	3.W05350.2400
Preassembled cap and septa for 24-400 thread screw, PP cap, white, closed, Clear silicone/White PTFE, 0.100" thick	100pcs. per PE bag	3.W05360.2400
Preassembled cap and septa for 24-400 thread screw, PP cap, white, closed, Red Butyl/Grey PTFE, 0.060" thick	100pcs. per PE bag	3.WF5360.2400
Preassembled cap and septa for 24-400 thread screw, PP cap, black, closed, F217 line	100pcs. per PE bag	3.005361.2400
Preassembled cap and septa for 24-400 thread screw, PP cap, white, closed, F217 line	100pcs. per PE bag	3.W05361.2400

24-400 screw thread neck caps

Description	Packaging	Cat. No.
24-400 Screw thread cap, made from PP, black, centre hole	100pcs. per PE bag	3.005310.2400
24-400 Screw thread cap, made from PP, black, closed	100pcs. per PE bag	3.005320.2400
24-400 Screw thread cap, made from PP, white, centre hole	100pcs. per PE bag	3.W05310.2400
24-400 Screw thread cap, made from PP, white, closed	100pcs. per PE bag	3.W05320.2400



24-400 screw thread neck septum

Description	Packaging	Cat. No.
Septa for 24-400 screw thread cap, white PTFE only, 0.010" thick	100pcs. per PE bag	3.601010.2400
Septa for 24-400 screw thread cap, Red Butyl/Grey PTFE, 0.060" thick	100pcs. per PE bag	3.606040.240F
Septa for 24-400 screw thread cap, Clear silicone/White PTFE, 0.100" thick	100pcs. per PE bag	3.610050.240L
Septa for 24-400 screw thread cap, Clear silicone/ White PTFE, 0.100" thick, ultra low bleed	100pcs. per PE bag	3.610050.24LB

Sampling Bottles

- These large volume sample bottles are so related to environmental samples. According to customer's requirements, we provide the corresponding product.
- Large open mouth bottles are designed for storing the soil, sediments and sludge samples.
- Narrow open mouth bottles are suitable for storing liquid samples.
- All the sampling bottles with cap and the inner liner.
- Brown sample bottles are is suitable for storing light-sensitive samples.

Straight bottle

Suitable for storing the soil, sediments and sludge samples.

Description	Packaging	Cat. No.
30mL flint glass jar, screw finish 38/R3, 38/R3 mm black screw cap, material phenolic moulding poeder, mounted waxed KKPVDC-liner	48pcs. Per Carton	3.P14801.0300

Description	Packaging	Cat. No.
60mL flint glass jar, screw finish 51/R3, 51/R3 mm black screw cap, material phenolic moulding poeder, mounted waxed KKPVDC-liner	48pcs. Per Carton	3.P14801.0600
120mL flint glass jar, screw finish 58/R3, 58/R3 mm black screw cap, material phenolic moulding poeder, mounted waxed KKPVDC-liner	12pcs. Per Carton	3.P14801.1200

large open mouth bottle

Suitable for storing the soil, sediments and sludge samples.

Description	Packaging	Cat. No.
Weithalsglaeser, Material:Glas Hydrolytische Klasse III, weiB, 30mL, DIN 32, Verschluesse fuer braune und weiBe Weithalsglaeser, schwarz, PP, LKD, DIN32	48pcs. Per Carton	3.P14802.0300
Weithalsglaeser, Material:Glas Hydrolytische Klasse III, braun, 30mL, DIN 32, Verschluesse fuer braune und weiBe Weithalsglaeser, schwarz, PP, LKD, DIN32	48pcs. Per Carton	3.P14802.030A
Weithalsglaeser, Material:Glas Hydrolytische Klasse III, weiB, 50mL, DIN 32, Verschluesse fuer braune und weiBe Weithalsglaeser, schwarz, PP, LKD, DIN32	24pcs. Per Carton	3.P14802.0500
Weithalsglaeser, Material:Glas Hydrolytische Klasse III, braun, 50mL, DIN 32, Verschluesse fuer braune und weiBe Weithalsglaeser, schwarz, PP, LKD, DIN32	48pcs. Per Carton	3.P14802.050A
Weithalsglaeser, Material:Glas Hydrolytische Klasse III, weiB, 125mL, DIN 40, Verschluesse fuer braune und weiBe Weithalsglaeser, schwarz, PP, LKD, DIN40	12pcs. Per Carton	3.P14802.1250
Weithalsglaeser, Material:Glas Hydrolytische Klasse III, braun, 125mL, DIN 40, Verschluesse fuer braune und weiBe Weithalsglaeser, schwarz, PP, LKD, DIN40	12pcs. Per Carton	3.P14802.125A
Weithalsglaeser, Material:Glas Hydrolytische Klasse III, weiB, 250mL, DIN 55, Verschluesse fuer braune und weiBe Weithalsglaeser, schwarz, PP, LKD, DIN55	12pcs. Per Carton	3.P14802.2500
Weithalsglaeser, Material:Glas Hydrolytische Klasse III, braun, 250mL, DIN 55, Verschluesse fuer braune und weiBe Weithalsglaeser, schwarz, PP, LKD, DIN55	12pcs. Per Carton	3.P14802.250A
Weithalsglaeser, Material:Glas Hydrolytische Klasse III, weiB, 500mL, DIN 55, Verschluesse fuer braune und weiBe Weithalsglaeser, schwarz, PP, LKD, DIN55	6pcs. Per Carton	3.P14802.5000
Weithalsglaeser, Material:Glas Hydrolytische Klasse III, braun, 500mL, DIN 55, Verschluesse fuer braune und weiBe Weithalsglaeser, schwarz, PP, LKD, DIN55	6pcs. Per Carton	3.P14802.500A
50mL white wide mouth glass jar, neck DIN 40, DIN 40 black PPN-caps, with white 2 mm PE-foam inlays	24pcs. Per Carton	3.P14803.0500
50mL amber wide mouth glass jar, neck DIN 40, DIN 40 black PPN-caps, with white 2 mm PE-foam inlays	24pcs. Per Carton	3.P14803.050A

Boston bottle

- Suitable for storing liquid samples.
- Suitable for storing light-sensitive samples.
- With a polypropylene cap and 0.015” PTFE liner.

Description	Packaging	Cat. No.
Boston Flauml;schchen, Material:Glas Hydrolytische Klasse III, braun, 30mL, neck 20-400, mit wei szlig;em Schraubverschluss, F217-Inlay，slash;33x78mm	24pcs. Per Carton	3.T12252.030A
Boston bottle, Material:Glas Hydrolytische Klasse III, braun, 60mL, neck 20-400, mit wei szlig;em Schraubverschluss, F217-Inlay，39x94mm	24pcs. Per Carton	3.T12252.060A
Boston Flauml;schchen, Material:Glas Hydrolytische Klasse III, braun, 120mL, neck 22-400, mit wei szlig;em Schraubverschluss, F217-Inlay，slash;48x133mm	12pcs. Per Carton	3.T12252.120A

Description	Packaging	Cat. No.
Boston Fläschchen, Material:Glas Hydrolytische Klasse III, braun, 240mL, neck 28-400, mit weißem Schraubverschluss, F217-Inlay，Ø60x138mm	12pcs. Per Carton	3.T12252.240A
Boston Flauml;schchen, Material:Glas Hydrolytische Klasse III, braun, 480mL, neck 28-400, mit wei szlig;em Schraubverschluss, F217-Inlay，slash;75x169mm	6pcs. Per Carton	3.T12252.480A

Vials Rack

Description	Packaging	Cat. No.
Vails Rack for 12mm, 2mL vials, made from PP, white.	1 pcs. Per Carton	3.GSCM01.W001
Vails Rack for 12mm, 2mL vials, made from PP, blue.	1 pcs. Per Carton	3.GSCM01.B001
Vails Rack for 12mm, 2mL vials, made from PP, red.	1 pcs. Per Carton	3.GSCM01.R001
Vails Rack for 12mm, 2mL vials, made from PP, white.	5 pcs. Per Carton	3.GSCM01.W005
Vails Rack for 12mm, 2mL vials, made from PP, blue.	5 pcs. Per Carton	3.GSCM01.B005
Vails Rack for 12mm, 2mL vials, made from PP, red.	5 pcs. Per Carton	3.GSCM01.R005

Other colours products are on require.

Glass magnet

- Glass magnet is made from ploy urethane, which have good adsorptivity. So this product can adhere to the table surface and the samples without other assistant,
- This product is skidproof, flame resistant, antibacterial, easy to use, easy to transfer.
- This products solved the problem that sample vials are too small to operate, avoid losing or sloping when hand sampling in chromatogram laboratory.

Description	Packaging	Cat. No.
Glass magnet, blue, 160x90mm	1 pcs. Per PE bag	VHAP-1690-1
Glass magnet, black, 160x90mm	1 pcs. Per PE bag	VHAP-1690B-1
Glass magnet, pink, 160x90mm	1 pcs. Per PE bag	VHAP-1690P-1
Glass magnet, red, 160x90mm	1 pcs. Per PE bag	VHAP-1690R-1
Glass magnet, white, 160x90mm	1 pcs. Per PE bag	VHAP-1690W-1
Glass magnet, blue, 160x90mm	5 pcs. Per Carton	VHAP-1690
GGlass magnet, black, 160x90mm	5 pcs. Per Carton	VHAP-1690B
Glass magnet, pink, 160x90mm	5 pcs. Per Carton	VHAP-1690P
Glass magnet, red, 160x90mm	5 pcs. Per Carton	VHAP-1690R

Colored Labelling Tape

- It can be attached to glass, plastic, metal, paper products, and rubber products.
- Strong tolerance (acid resistance, water resistance, oil resistance); Wide scope of heat-resistant (it can be used in 121 ℃ hot and humid sterilization, and used for - 20 ℃ storage);
- Can be easily removed or transferred paste on another place, with no back glue residue;
- Can be marked by pencils, ballpoint pens, neutral pens and so on; and can be used for color labeling.

Description	Packaging	Cat. No.
Coloured Labelling Tape Rainbow(red/orange/ yellow/green/blue/pink/white)	3/4 Inch X 500 Inch,7 rolls per. pk	QBAA-1913
Coloured Labelling Tape cutter	1 pcs. per bag	QBAA-2010

Correspond of CNW and La-pha-pack vials

For the following Liquid Chromatography Autosampler :

AS3000

AS3500

Finnigan/Carlo Erba/Fisons A200LC

Carlo Erba/Fison AS100

Carlo Erba/Fison AS300

9mm thread screw neck vial

Cat. No.（CNW）	Cat. No.（LPP）	Description
3.032009.0000	11 09 0500	9mm Thread screw neck vial, 32x11.6mm, clear glass, Borosilicate Type I Class A
3.032009.00E0	11 09 0519	9mm Thread screw neck vial, 32x11.6mm, clear glass, white graduation line and marking spot and LOGO, Borosilicate Type I Class A
3.032009.00EA	11 09 0520	9mm Thread screw neck vial, 32x11.6mm, amber glass, white graduation line and marking spot and LOGO, Borosilicate Type I Class B
3.032009.0Z00	11 09 1241	9mm Thread screw neck vial, 32x11.6mm, clear glass, silanzied
3.032009.0ZEA	11 09 1242	9mm Thread screw neck vial, 32x11.6mm, amber glass, white graduation line and marking spot and CNW LOGO, Borosilicate Type I Class A, Silanized
3.P32009.0000	11 19 1205	9mm Thread screw neck vial, 32x11.6mm, clear PP, with graduation line, slightly concave shaped bottom
3.P32009.000A	11 19 1516	9mm Thread screw neck vial, 32x11.6mm, amber PP, with graduation line, slightly concave shaped bottom
3.P30309.0000	11 19 0932	0.3ml PP Short Thread Micro-Vial, 32 x 11.6mm, transparent
3.031509.0000	11 09 0620	9mm Thread screw neck vial, 1.5mL, 32x11.6mm, clear glass, high recovery, Borosilicate Type I Class A

9mm thread screw neck seals

Cat. No.（CNW）	Cat. No.（LPP）	Description
3.B05394.0900	09 15 1819	Preassembled cap and septa for 9mm thread screw, PP cap, blue, centre hole, White PTFE/red Rubber, 0.040" thick
3.B05395.0900	09 15 0838	Preassembled cap and septa for 9mm thread screw, PP cap, blue, centre hole, White silicone/Red PTFE, 0.040" thick
3.B05397.0900	09 15 0869	Preassembled cap and septa for 9mm thread screw, PP cap, blue, centre hole, White silicone/Red PTFE, 0.040" thick, slitted
3.B05395.09FR	09 04 1533	Preassembled cap and septa for 9mm thread screw, PP cap(Royal), blue, centre hole, White silicone/Red PTFE, 0.040" thick, BONDED
3.B05396.09FR	09 15 0868	Preassembled cap and septa for 9mm thread screw, PP cap(Royal), blue, centre hole, Red PTFE/White silicone/Red PTFE, 0.040" thick
3.B05397.09FR	09 04 1534	Preassembled cap and septa for 9mm thread screw, PP cap(Royal), blue, centre hole, White silicone/Red PTFE, 0.040 thick, slitted, BONDED

9mm thread screw neck vials kits

Cat. No.（CNW）	Cat. No.（LPP）	Description
3.032009.0000 + 3.B05395.0900	11 24 1050	9mm Thread screw neck vial, 32x11.6mm, clear glass, Borosilicate Type I Class A + Preassembled cap and septa for 9mm thread screw, PP cap, blue, centre hole, White silicone/Red PTFE, 0.040" thick
3.032009.0000 + 3.B05397.0900	11 24 1051	9mm Thread screw neck vial, 32x11.6mm, clear glass, Borosilicate Type I Class A + Preassembled cap and septa for 9mm thread screw, PP cap, blue, centre hole, White silicone/Red PTFE, 0.040" thick, slitted
3.032009.0000 + 3.B05396.09FR	11 24 1052	9mm Thread screw neck vial, 32x11.6mm, clear glass, Borosilicate Type I Class A + Preassembled cap and septa for 9mm thread screw, PP cap(Royal), blue, centre hole, Red PTFE/White silicone/Red PTFE, 0.040" thick
3.032009.0000 + 3.B05397.09FR	11 24 1622	9mm Thread screw neck vial, 32x11.6mm, clear glass, Borosilicate Type I Class A + Preassembled cap and septa for 9mm thread screw, PP cap(Royal), blue, centre hole, White silicone/Red PTFE, 0.040 thick, slitted, BONDED
3.032009.00E0 + 3.B05395.0900	11 24 1143	9mm Thread screw neck vial, 32x11.6mm, clear glass, white graduation line and marking spot and LOGO, Borosilicate Type I Class A + Preassembled cap and septa for 9mm thread screw, PP cap, blue, centre hole, White silicone/Red PTFE, 0.040" thick
3.032009.00E0 + 3.B05397.0900	11 24 1238	9mm Thread screw neck vial, 32x11.6mm, clear glass, white graduation line and marking spot and LOGO, Borosilicate Type I Class A + Preassembled cap and septa for 9mm thread screw, PP cap, blue, centre hole, White silicone/Red PTFE, 0.040" thick, slitted
3.032009.00E0 + 3.B05396.09FR	11 24 1446	9mm Thread screw neck vial, 32x11.6mm, clear glass, white graduation line and marking spot and LOGO, Borosilicate Type I Class A + Preassembled cap and septa for 9mm thread screw, PP cap(Royal), blue, centre hole, Red PTFE/White silicone/Red PTFE, 0.040" thick
3.032009.00E0 + 3.B05397.09FR	11 24 1860	9mm Thread screw neck vial, 32x11.6mm, clear glass, white graduation line and marking spot and LOGO, Borosilicate Type I Class A + Preassembled cap and septa for 9mm thread screw, PP cap(Royal), blue, centre hole, White silicone/Red PTFE, 0.040 thick, slitted, BONDED
3.032009.00EA + 3.B05395.0900	11 24 1324	9mm Thread screw neck vial, 32x11.6mm, amber glass, white graduation line and marking spot and LOGO, Borosilicate Type I Class B + Preassembled cap and septa for 9mm thread screw, PP cap, blue, centre hole, White silicone/Red PTFE, 0.040" thick
3.032009.00EA + 3.B05397.0900	11 24 1573	9mm Thread screw neck vial, 32x11.6mm, amber glass, white graduation line and marking spot and LOGO, Borosilicate Type I Class B + Preassembled cap and septa for 9mm thread screw, PP cap, blue, centre hole, White silicone/Red PTFE, 0.040" thick, slitted
3.032009.00EA + 3.B05396.09FR	11 24 1447	9mm Thread screw neck vial, 32x11.6mm, amber glass, white graduation line and marking spot and LOGO, Borosilicate Type I Class B + Preassembled cap and septa for 9mm thread screw, PP cap(Royal), blue, centre hole, Red PTFE/White silicone/Red PTFE, 0.040" thick
3.032009.00EA + 3.B05397.09FR	11 24 1696	9mm Thread screw neck vial, 32x11.6mm, amber glass, white graduation line and marking spot and LOGO, Borosilicate Type I Class B + Preassembled cap and septa for 9mm thread screw, PP cap(Royal), blue, centre hole, White silicone/Red PTFE, 0.040 thick, slitted, BONDED

9mm thread screw neck vials kits

Cat. No.（CNW）	Cat. No.（LPP）	Description
3.031509.0000 + 3.B05397.0900	11 24 1129	9mm Thread screw neck vial, 1.5mL, 32x11.6mm, clear glass, high recovery, Borosilicate Type I Class A + Preassembled cap and septa for 9mm thread screw, PP cap, blue, centre hole, White silicone/Red PTFE, 0.040" thick, slitted
3.031509.0000 + 3.B05395.09FR	11 24 1862	9mm Thread screw neck vial, 1.5mL, 32x11.6mm, clear glass, high recovery, Borosilicate Type I Class A + Preassembled cap and septa for 9mm thread screw, PP cap(Royal), blue, centre hole, White silicone/Red PTFE, 0.040" thick, BONDED
3.P30309.0000 + 3.B05397.0900	11 24 1130	0.3ml PP Short Thread Micro-Vial, 32 x 11.6mm, transparent + Preassembled cap and septa for 9mm thread screw, PP cap, blue, centre hole, White silicone/Red PTFE, 0.040" thick, slitted
3.P30309.0000 + 3.B05397.09FR	11 24 1643	0.3ml PP Short Thread Micro-Vial, 32 x 11.6mm, transparent + Preassembled cap and septa for 9mm thread screw, PP cap(Royal), blue, centre hole, White silicone/Red PTFE, 0.040 thick, slitted, BONDED
3.P30309.0000 + 3.B05395.0900	11 24 1476	0.3ml PP Short Thread Micro-Vial, 32 x 11.6mm, transparent + Preassembled cap and septa for 9mm thread screw, PP cap, blue, centre hole, White silicone/Red PTFE, 0.040" thick
3.P30309.0000 + 3.B05396.09FR	11 24 1593	0.3ml PP Short Thread Micro-Vial, 32 x 11.6mm, transparent + Preassembled cap and septa for 9mm thread screw, PP cap(Royal), blue, centre hole, Red PTFE/White silicone/Red PTFE, 0.040" thick

11mm Crimp neck vial

Cat. No.（CNW）	Cat. No.（LPP）	Description
3.L32011.0000	11 09 0356	11mm Crimp neck vial, 32x11.6mm, clear lass, Borosilicate Type I Class A
3.L32011.00E0	11 09 0476	11mm Crimp neck vial, 32x11.6mm, clear glass, white graduation line and marking spot and CNW LOGO, Borosilicate Type I Class A
3.L32011.00EA	11 09 0477	11mm Crimp neck vial, 32x11.6mm, amber glass, white graduation line and marking spot and CNW LOGO, Borosilicate Type I Class B
3.031511.0000	11 09 0619	11mm Crimp neck vial, 32x11.6mm, clear glass, high recovery, Borosilicate Type I Class A
3.031111.0000	11 09 0415	11mm Crimp neck micro vial, 1.1ml, 32x11.6mm, clear glass, conical bottom, Borosilicate Type I Class A

11mm Crimp neck vial

Cat. No.（CNW）	Cat. No.（LPP）	Description
3.031511.0000	11 09 0619	11mm Crimp neck vial, 32x11.6mm, clear glass, high recovery, Borosilicate Type I Class A
3.031111.0000	11 09 0415	11mm Crimp neck micro vial, 1.1ml, 32x11.6mm, clear glass, conical bottom, Borosilicate Type I Class A

11mm Crimp neck vial seals

Cat. No.（CNW）	Cat. No.（LPP）	Description
3.005140.1100	11 03 0247	Preassembled cap and septa for 11mm Crimp neck, Aluminum cap, clear, centre hole, Clear PTFE/Orange Silicone, 0.040" thick
3.X05140.1100	11 03 0209	Preassembled cap and septa for 11mm Crimp neck, Aluminum cap, clear, centre hole, Red Butyl/Transparent PTFE, 0.040" thick
3.B05140.1100	11 03 1986	Preassembled cap and septa for 11mm Crimp neck, Aluminum cap, blue, centre hole, Butyl red/TEF transparent, 0.040" thick
3.G05140.1100	11 03 1984	Preassembled cap and septa for 11mm Crimp neck, Aluminum cap, green, centre hole, Butyl red/TEF transparent, 0.040" thick
3.R05140.1100	11 03 1985	Preassembled cap and septa for 11mm Crimp neck, Aluminum cap, Red, centre hole, Butyl red/TEF transparent, 0.040" thick
3.BL5140.1100	11 03 0303	Preassembled cap and septa for 11mm Crimp neck, Aluminum cap, Blue, centre hole, Natural Rubber red-orange/Butyl red/TEF transparent, 0.040" thick
3.GL5140.1100	11 03 0301	Preassembled cap and septa for 11mm Crimp neck, Aluminum cap, green, centre hole, Natural Rubber red-orange/Butyl red/TEF transparent, 0.040" thick
3.RL5140.1100	11 03 0302	Preassembled cap and septa for 11mm Crimp neck, Aluminum cap, Red, centre hole, Natural Rubber red-orange/Butyl red/TEF transparent, 0.040" thick

11mm Snap neck vial

Cat. No.（CNW）	Cat. No.（LPP）	Description
3.S32011.0000	11 09 0627	11mm Snap neck vial, 32x11.6mm, clear glass, Borosilicate Type I Class A
3.S32011.00E0	11 09 0644	11mm Snap neck vial, 32x11.6mm, clear glass, white graduation line and marking spot and CNW LOGO, Borosilicate Type I Class A
3.S32011.00EA	11 09 0645	11mm Snap neck vial, 32x11.6mm, amber glass, white graduation line and marking spot and CNW LOGO, Borosilicate Type I Class B

11mm Snap neck vial seals

Cat. No.（CNW）	Cat. No.（LPP）	Description
3.005540.1100	11 15 1852 11 15 0637	Preassembled cap and septa for 11mm snap neck, pp cap, clear, centre hole, Clear PTFE/Orange Silicone rubber, 0.040" thick
3.B05540.1100	11 15 1856 11 15 1267	Preassembled cap and septa for 11mm snap neck, pp cap, blue, centre hole, Clear PTFE/Orange Silicone rubber, 0.040" thick
3.R05540.1100	11 15 1323	Preassembled cap and septa for 11mm snap neck, pp cap, red, centre hole, Clear PTFE/Orange Silicone rubber, 0.040" thick
3.X05540.1100	11 15 1850 11 15 0635	Preassembled cap and septa for 11mm snap neck, pp cap, clear, centre hole, Red Butyl/Transparent PTFE, 0.040" thick

10-425 thread screw neck vial

Cat. No.（CNW）	Cat. No.（LPP）	Description
3.032010.0000	10 09 0743	10-425 Thread screw neck vial, 32x11.6mm, clear glass, Borosilicate Type I Class A
3.032010.00E0	10 09 1196	10-425 Thread screw neck vial, 32x11.6mm, clear glass, white graduation line and marking spot and CNW LOGO, Borosilicate Type I Class A
3.032010.00EA	10 09 1197	10-425 Thread screw neck vial, 32x11.6mm, amber glass, white graduation line and marking spot and CNW LOGO, Borosilicate Type I Class B

10-425 thread screw neck vial seals

Cat. No.（CNW）	Cat. No.（LPP）	Description
3.005394.1000	10 15 1256	Preassembled cap and septa for 10-425 thread screw, PP cap, black, centre hole, Red rubber/White PTFE, 0.060" thick
3.005395.1000	10 15 1257	Preassembled cap and septa for 10-425 thread screw, PP cap, black, centre hole, White silicone/Red PTFE, 0.060" thick

Insert (for 9mm thread screw neck vials,10-425 thread screw neck vials,11mm Crimp neck vials,11 Snap neck vials)

Cat. No.（CNW）	Cat. No.（LPP）	Description
3.004025.06BS	06 09 0865	Insert for large open vial, 29x5.7mm, clear glass, preassembled plastic spring, Borosilicate Type I Class A
3.004025.Z6BS	06 09 1343	Insert for large open vial, 29x5.7mm, clear glass, preassembled plastic spring, silanized
3.004025.060E	06 09 0357 06 09 0669	Insert for large open vial, 31x6mm, clear glass, plastic spring not required, Economic, Borosilicate Type I Class A
3.004025.Z60E	06 09 1240	Insert for large open vial, 31x6mm, clear glass, plastic spring not required, Economic, Borosilicate Type I Class A， silanized
3.004025.0600	06 09 0866	Insert for large open vial, 31x6mm, clear glass, flat bottom, heavy wall, Borosilicate Type I Class A

8-425 thread screw neck vial

Cat. No.（CNW）	Cat. No.（LPP）	Description
3.032008.0000	11 09 0210	8-425 Thread screw neck vial, 32x11.6mm, clear glass,Borosilicate Type I Class A
3.032008.000A	11 09 0259	8-425 Thread screw neck vial, 32x11.6mm, amber glass, Borosilicate Type I Class B
3.032008.00E0	11 09 0419	8-425 Thread screw neck vial, 32x11.6mm, clear glass, white graduation line and marking spot and CNW LOGO, Borosilicate Type I Class A
3.032008.00EA	11 09 0382	8-425 Thread screw neck vial, 32x11.6mm, amber glass, white graduation line and marking spot and CNW LOGO, Borosilicate Type I Class B
3.031108.0000	11 09 0417	8-425 Thread screw neck Micro vial, 1.1ml, 32x11.6mm, clear glass, conical bottom, Borosilicate Type I Class A

8-425 thread screw neck seals

Cat. No.（CNW）	Cat. No.（LPP）	Description
3.005394.0800	08 15 1965	Preassembled cap and septa for 8-425 thread screw, PP cap, black, centre hole, Red rubber/White PTFE, 0.060" thick
3.005395.0800	08 15 0293	Preassembled cap and septa for 8-425 thread screw, PP cap, black, centre hole, White silcone/Red PTFE, 0.060" thick

8-425 thread screw neck vial kits

Cat. No.（CNW）	Cat. No.（LPP）	Description
3.032008.0000 + 3.005395.0800	11 23 1046	8-425 Thread screw neck vial, 32x11.6mm, clear glass,Borosilicate Type I Class A + Preassembled cap and septa for 8-425 thread screw, PP cap, black, centre hole, White silcone/Red PTFE, 0.060" thick
3.032008.000A + 3.005395.0800	11 23 1098	8-425 Thread screw neck vial, 32x11.6mm, amber glass, Borosilicate Type I Class B + Preassembled cap and septa for 8-425 thread screw, PP cap, black, centre hole, White silcone/Red PTFE, 0.060" thick
3.032008.00E0 + 3.005395.0800	11 23 1280	8-425 Thread screw neck vial, 32x11.6mm, clear glass, white graduation line and marking spot and CNW LOGO, Borosilicate Type I Class A + Preassembled cap and septa for 8-425 thread screw, PP cap, black, centre hole, White silcone/Red PTFE, 0.060" thick
3.032008.00EA + 3.005395.0800	11 23 1100	8-425 Thread screw neck vial, 32x11.6mm, amber glass, white graduation line and marking spot and CNW LOGO, Borosilicate Type I Class B + Preassembled cap and septa for 8-425 thread screw, PP cap, black, centre hole, White silcone/Red PTFE, 0.060" thick
3.032008.0000 + 3.005310.0800 + 3.607570.0800	11 23 1047	8-425 Thread screw neck vial, 32x11.6mm, clear glass,Borosilicate Type I Class A + 8-425 Screw thread cap, made from PP, black, centre hole + Septa for 8-425 screw thread cap, Red PTFE/WhiteSilicone, 0.075" thick, slitted
3.032008.000A + 3.005310.0800 + 3.607570.0800	11 23 1144	8-425 Thread screw neck vial, 32x11.6mm, amber glass, Borosilicate Type I Class B + 8-425 Screw thread cap, made from PP, black, centre hole + Septa for 8-425 screw thread cap, Red PTFE/WhiteSilicone, 0.075" thick, slitted
3.032008.0000 + 3.005310.0800 + 3.601010.0800	11 23 1085	8-425 Thread screw neck vial, 32x11.6mm, clear glass,Borosilicate Type I Class A + 8-425 Screw thread cap, made from PP, black, centre hole + Septa for 8-425 screw thread cap, white PTFE only, 0.010" thick

Insert (for 8-425 thread screw neck vials)

Cat. No.（CNW）	Cat. No.（LPP）	Description
3.000401.05BS	05 09 0968	Insert for small open vial, 30x5mm, clear glass, preassembled plastic spring, Borosilicate Type I Class A
3.000401.050E	05 09 0129	Insert for small open vial, 31x5mm, clear glass, plastic spring not required, Economic, Borosilicate Type I Class A
3.004025.0500	05 09 1674	Insert for small open vial, 31x5mm, clear glass, flat bottom, heavy wall, Borosilicate Type I Class A

20mm Crimp neck vial (Just for AS3000)

Cat. No.（CNW）	Cat. No.（LPP）	Description
3.310020.0E00	20 09 0795	20mm crimp neck headspace vial, 10ml, 46x22.5mm, clear glass, flat bottom, white marking spot and CNW LOGO, Borosilicate Type I Class A

20mm Crimp neck vial seals (Just for AS3000)

According to the following seals for Head Space Gas Chromatography :

20mm Crimp neck vial seals

For the following Gas Chromatography Autosampler :

AS2000

Finnigan/Carlo Erba/Fisons A200S

Carlo Erba/Fison AS800, 42 vial tray

Carlo Erba/Fison AS800, 60 vial tray

According to the following vials for the Liquid Chromatography Autosampler :

11mm crimp neck vial，seals，kits

8-425 thread screw neck vial，seals，kits

20mm Crimp neck vial (Just for AS2000 30V.T)

Cat. No.（CNW）	Cat. No.（LPP）	Description
3.310020.0E00	20 09 0795	20mm crimp neck headspace vial, 10ml, 46x22.5mm, clear glass, flat bottom, white marking spot and CNW LOGO, Borosilicate Type I Class A

20mm Crimp neck vial seals (Just for AS2000 30V.T)

According to the following seals for Head Space Gas Chromatography :

20mm Crimp neck vial seals

For the following Head Space Gas Chromatography :

HS2000

Carlo Erba/Fisons HS250

Carlo Erba/Fisons HS500

Carlo Erba/Fisons HS800

Carlo Erba/Fisons HS850

20mm Crimp neck vial

Cat. No.（CNW）	Cat. No.（LPP）	Description
3.310020.0E00	20 09 0795	20mm crimp neck headspace vial, 10ml, 46x22.5mm, clear glass, flat bottom, white marking spot and CNW LOGO, Borosilicate Type I Class A（for HS2000,HS850）
3.320020.0E00	20 09 0796	20mm crimp neck headspace vial, 20ml, 75.5x22.5mm, clear glass, flat bottom, white marking spot and CNW LOGO, Borosilicate Type I Class A（for HS2000,HS850）
3.310020.0EA0	20 09 1405	20mm crimp neck headspace vial, 10ml, 46x22.5mm, clear glass, rounded bottom, white marking spot and CNW LOGO, Borosilicate Type I Class A（for HS250, HS500, HS800）

20mm Crimp neck vial seals

Cat. No.（CNW）	Cat. No.（LPP）	Description
3.F05140.2000	20 03 0059	Preassembled cap and septa for 20mm crimp neck headspace vial, Aluminum cap, clear, centre hole, butyl/PTFE, 0.125" thick
3.005150.2000	20 03 0901	Preassembled cap and septa for 20mm crimp neck headspace vial, Aluminum cap, clear, centre hole, Clear silicone/White PTFE, 0.125" thick
3.TB5150.2000	20 04 0142	Preassembled cap and septa for 20mm crimp neck headspace vial, Aluminum cap, clear, centre hole, Translucent Blue silicone/white PTFE, 0.125" thick
3.TB5150.20IY	20 03 0975	Preassembled cap and septa for 20mm crimp neck headspace vial, Iron cap, yellow, centre hole, Translucent Blue silicone/white PTFE, 0.125" thick
3.TB5150.20MR	20 03 1536	Preassembled cap and septa for 20mm crimp neck headspace vial, Magnetic cap, red, centre hole,translucent silicone/PTFE, 0.120" thick
3.TB5150.20SS	20 03 0163	Preassembled cap and septa for 20mm crimp neck headspace vial, Safty aluminum cap, clear, centre hole, Translucent Blue silicone/white PTFE, 0.125" thick
3.005100.2000 + 3.600004.2000	20 10 0290 (septa)	Aluminum cap for 20mm crimp neck vial, without septa + Septa for 20mm crimp neck headspace vial, Butyl Injection Stopper, grey

For the following Autosampler:

In Kombination mit

Combi PAL

20mm Crimp neck vial

Cat. No.（CNW）	Cat. No.（LPP）	Description
3.310020.0EA0	20 09 1405	20mm crimp neck headspace vial, 10ml, 46x22.5mm, clear glass, rounded bottom, white marking spot and CNW LOGO, Borosilicate Type I Class A
3.320020.0EA0	20 09 0873	20mm crimp neck headspace vial, 20ml, 75.5x22.5mm, clear glass, rounded bottom, white marking spot and CNW LOGO, Borosilicate Type I Class A

20mm Crimp neck vial seals

According to the following seals for Head Space Gas Chromatography :

20mm Crimp neck vial seals

18mm screw neck vial

Cat. No.（CNW）	Cat. No.（LPP）	Description
3.310018.0EM0	18 09 1306	18mm precision Thread vial, 10ml, 46x22.5mm, clear glass, rounded bottom, white marking spot and CNW LOGO, Borosilicate Type I Class A
3.310018.0EMA	18 09 1310	18mm precision Thread vial, 10ml, 46x22.5mm, amber glass, rounded bottom, white marking spot and CNW LOGO, Borosilicate Type I Class B
3.320018.0EM0	18 09 1307	18mm precision Thread vial, 20ml, 75.5x22.5mm, clear glass, rounded bottom, white marking spot and CNW LOGO, Borosilicate Type I Class A
3.320018.0EMA	18 09 1311	18mm precision Thread vial, 20ml, 75.5x22.5mm, amber glass, rounded bottom, white marking spot and CNW LOGO, Borosilicate Type I Class B

18mm screw neck vial seals

Cat. No.（CNW）	Cat. No.（LPP）	Description
3.F05394.18M0	18 03 1416	Preassembled cap and septa for 18mm precision Thread vial, magnetic cap, clear, centre hole, butyl/PTFE, 0.060" thick
3.B05395.18M0	18 03 1414	Preassembled cap and septa for 18mm precision Thread vial, magnetic cap, clear, centre hole, White silicone/Blue PTFE, 0.060" thick
3.TB5395.18M0	18 03 1309	Preassembled cap and septa for 18mm precision Thread vial, magnetic cap, clear, centre hole, Translucent Blue silicone/white PTFE, 0.050" thick

Correspond of CNW and national vials

For the following Liquid Chromatography Autosampler :

AS3000

AS3500

Finnigan/Carlo Erba/Fisons A200LC

Carlo Erba/Fison AS100

Carlo Erba/Fison AS300

9mm thread screw neck vial

Cat. No.（CNW）	Cat. No.（National）	Description
3.032009.0000	C4000-1	9mm Thread screw neck vial, 32x11.6mm, clear glass, Borosilicate Type I Class A
3.032009.00E0	C4000-1W	9mm Thread screw neck vial, 32x11.6mm, clear glass, white graduation line and marking spot and LOGO, Borosilicate Type I Class A
3.032009.00EA	C4000-2W	9mm Thread screw neck vial, 32x11.6mm, amber glass, white graduation line and marking spot and LOGO, Borosilicate Type I Class B
3.032009.0Z00	C4000-S1	9mm Thread screw neck vial, 32x11.6mm, clear glass, silanzied
3.032009.0ZE0	C4000-S1W	9mm Thread screw neck vial, 32x11.6mm, clear glass, white graduation line and marking spot and CNW LOGO, Borosilicate Type I Class A, Silanized
3.032009.0ZEA	C4000-S2W	9mm Thread screw neck vial, 32x11.6mm, amber glass, white graduation line and marking spot and CNW LOGO, Borosilicate Type I Class A, Silanized
3.P32009.000A	C4000-12	9mm Thread screw neck vial, 32x11.6mm, amber PP, with graduation line, slightly concave shaped bottom
3.P30309.0000	C4000-11	0.3ml PP Short Thread Micro-Vial, 32 x 11.6mm, transparent
3.031509.0000	C4000-9	9mm Thread screw neck vial, 1.5mL, 32x11.6mm, clear glass, high recovery, Borosilicate Type I Class A
3.031509.000A	C4000-9A	9mm Thread screw neck vial, 1.5mL, 32x11.6mm, amber glass, high recovery, Borosilicate Type I Class B

9mm thread screw neck seals

Cat. No.（CNW）	Cat. No.（National）	Description
3.B05394.0900	C4000-51B	Preassembled cap and septa for 9mm thread screw, PP cap, blue, centre hole, White PTFE/red Rubber, 0.040" thick
3.B05395.0900	C4000-54B	Preassembled cap and septa for 9mm thread screw, PP cap, blue, centre hole, White silicone/Red PTFE, 0.040" thick
3.B05397.0900	C4000-55B	Preassembled cap and septa for 9mm thread screw, PP cap, blue, centre hole, White silicone/Red PTFE, 0.040" thick, slitted
3.B05395.09FR	C4000-64B(black cap)	Preassembled cap and septa for 9mm thread screw, PP cap(Royal), blue, centre hole, White silicone/Red PTFE, 0.040" thick, BONDED
3.B05396.09FR	C4000-53B	Preassembled cap and septa for 9mm thread screw, PP cap(Royal), blue, centre hole, Red PTFE/White silicone/Red PTFE, 0.040" thick
3.B05397.09FR	C4000-75C(grey cap)	Preassembled cap and septa for 9mm thread screw, PP cap(Royal), blue, centre hole, White silicone/Red PTFE, 0.040 thick, slitted, BONDED

9mm thread screw neck vials kits

Cat. No.（CNW）	Cat. No.（National）	Description
3.032009.00E0 + 3.B05394.0900	C4000-80W	9mm Thread screw neck vial, 32x11.6mm, clear glass, white graduation line and marking spot and LOGO, Borosilicate Type I Class A + Preassembled cap and septa for 9mm thread screw, PP cap, blue, centre hole, White PTFE/red Rubber, 0.040" thick
3.032009.0000 + 3.B05396.09FR	C4000-86	9mm Thread screw neck vial, 32x11.6mm, clear glass, Borosilicate Type I Class A + Preassembled cap and septa for 9mm thread screw, PP cap(Royal), blue, centre hole, Red PTFE/White silicone/Red PTFE, 0.040" thick
3.032009.00E0 + 3.B05396.09FR	C4000-86W	9mm Thread screw neck vial, 32x11.6mm, clear glass, white graduation line and marking spot and LOGO, Borosilicate Type I Class A + Preassembled cap and septa for 9mm thread screw, PP cap(Royal), blue, centre hole, Red PTFE/White silicone/Red PTFE, 0.040" thick
3.032009.0000 + 3.B05397.0900	C4000-95	9mm Thread screw neck vial, 32x11.6mm, clear glass, Borosilicate Type I Class A + Preassembled cap and septa for 9mm thread screw, PP cap, blue, centre hole, White silicone/Red PTFE, 0.040" thick, slitted
3.032009.00E0 + 3.B05397.0900	C4000-95W	9mm Thread screw neck vial, 32x11.6mm, clear glass, white graduation line and marking spot and LOGO, Borosilicate Type I Class A + Preassembled cap and septa for 9mm thread screw, PP cap, blue, centre hole, White silicone/Red PTFE, 0.040" thick, slitted
3.032009.00E0 + 3.B05395.09FR	C4000-78W(black cap)	9mm Thread screw neck vial, 32x11.6mm, clear glass, white graduation line and marking spot and LOGO, Borosilicate Type I Class A + Preassembled cap and septa for 9mm thread screw, PP cap(Royal), blue, centre hole, White silicone/Red PTFE, 0.040" thick, BONDED
3.032009.0000 + 3.B05397.09FR	C4000-93P(pink cap)	9mm Thread screw neck vial, 32x11.6mm, clear glass, Borosilicate Type I Class A + Preassembled cap and septa for 9mm thread screw, PP cap(Royal), blue, centre hole, White silicone/Red PTFE, 0.040 thick, slitted, BONDED
3.032009.00EA + 3.B05394.0900	C4000-82W	9mm Thread screw neck vial, 32x11.6mm, amber glass, white graduation line and marking spot and LOGO, Borosilicate Type I Class B + Preassembled cap and septa for 9mm thread screw, PP cap, blue, centre hole, White PTFE/red Rubber, 0.040" thick
3.032009.00EA + 3.B05396.09FR	C4000-88W	9mm Thread screw neck vial, 32x11.6mm, amber glass, white graduation line and marking spot and LOGO, Borosilicate Type I Class B + Preassembled cap and septa for 9mm thread screw, PP cap(Royal), blue, centre hole, Red PTFE/White silicone/Red PTFE, 0.040" thick
3.032009.00EA + 3.B05395.0900	C4000-94W	9mm Thread screw neck vial, 32x11.6mm, amber glass, white graduation line and marking spot and LOGO, Borosilicate Type I Class B + Preassembled cap and septa for 9mm thread screw, PP cap, blue, centre hole, Whitesilicone/Red PTFE, 0.040" thick
3.P30309.0000 + 3.B05395.0900	C4000-87	0.3ml PP Short Thread Micro-Vial, 32 x 11.6mm, transparent + Preassembled cap and septa for 9mm thread screw, PP cap, blue, centre hole, Whitesilicone/Red PTFE, 0.040" thick
3.P30309.0000 + 3.B05397.0900	C4000-97	0.3ml PP Short Thread Micro-Vial, 32 x 11.6mm, transparent + Preassembled cap and septa for 9mm thread screw, PP cap, blue, centre hole, White silicone/Red PTFE, 0.040" thick, slitted

Correspond of CNW and National vials

11mm Crimp neck vial

Cat. No.（CNW）	Cat. No.（National）	Description
3.L32011.0000	C4011-1	11mm Crimp neck vial, 32x11.6mm, clear lass, Borosilicate Type I Class A
3.L32011.00E0	C4011-1W	11mm Crimp neck vial, 32x11.6mm, clear glass, white graduation line and marking spot and CNW LOGO, Borosilicate Type I Class A
3.L32011.000A	C4011-2	11mm Crimp neck vial, 32x11.6mm, amber glass, Borosilicate Type I Class B
3.L32011.00EA	C4011-2W	11mm Crimp neck vial, 32x11.6mm, amber glass, white graduation line and marking spot and CNW LOGO, Borosilicate Type I Class B
3.L32011.0ZE0	C4011-S1W	11mm Crimp neck vial, 32x11.6mm, clear glass, white graduation line and marking spot and CNW LOGO, Silanized
3.L32011.0ZEA	C4011-S2W	11mm Crimp neck vial, 32x11.6mm, amber glass, white graduation line and marking spot and CNW LOGO, Silanized
3.031511.0000	C4011-9	11mm Crimp neck vial, 32x11.6mm, clear glass, high recovery, Borosilicate Type I Class A

11mm Crimp neck vial seals

Cat. No.（CNW）	Cat. No.（National）	Description
3.005140.1100	C4011-4A	Preassembled cap and septa for 11mm Crimp neck, Aluminum cap, clear, centre hole, Clear PTFE/Orange Silicone, 0.040" thick
3.X05140.1100	C4011-7A	Preassembled cap and septa for 11mm Crimp neck, Aluminum cap, clear, centre hole, Red Butyl/Transparent PTFE, 0.040" thick
3.B/G/R/X-05140.1100	C4011-7K	Preassembled cap and septa for 11mm Crimp neck, Aluminum cap, blue/green/red, centre hole, Butyl red/TEF transparent, 0.040" thick

11mm Crimp neck vial kits

Cat. No.（CNW）	Cat. No.（National）	Description
3.L32011.0000 + 3.X05140.1100	C4011-89W	11mm Crimp neck vial, 32x11.6mm, clear lass, Borosilicate Type I Class A + Preassembled cap and septa for 11mm Crimp neck, Aluminum cap, clear, centre hole, Red Butyl/Transparent PTFE, 0.040" thick

11mm Snap neck vial

Cat. No.（CNW）	Cat. No.（National）	Description
3.S32011.0000	C4011-5	11mm Snap neck vial, 32x11.6mm, clear glass, Borosilicate Type I Class A
3.S32011.00E0	C4011-5W	11mm Snap neck vial, 32x11.6mm, clear glass, white graduation line and marking spot and CNW LOGO, Borosilicate Type I Class A
3.S32011.00EA	C4011-6W	11mm Snap neck vial, 32x11.6mm, amber glass, white graduation line and marking spot and CNW LOGO, Borosilicate Type I Class B

11mm Snap neck vial seals

Cat. No.（CNW）	Cat. No.（National）	Description
3.005540.1100	C4011-54	Preassembled cap and septa for 11mm snap neck, pp cap, clear, centre hole, Clear PTFE/Orange Silicone rubber, 0.040" thick
3.B05540.1100	C4011-54B	Preassembled cap and septa for 11mm snap neck, pp cap, blue, centre hole, Clear PTFE/Orange Silicone rubber, 0.040" thick
3.R05540.1100	C4011-54R	Preassembled cap and septa for 11mm snap neck, pp cap, red, centre hole, Clear PTFE/Orange Silicone rubber, 0.040" thick
3.X05540.1100	C4011-51	Preassembled cap and septa for 11mm snap neck, pp cap, clear, centre hole, Red Butyl/Transparent PTFE, 0.040" thick

11mm Snap neck vial kits

Cat. No.（CNW）	Cat. No.（National）	Description
3.S32011.0000 + 3.X05540.1100	C4011-72	11mm Snap neck vial, 32x11.6mm, clear glass, Borosilicate Type I Class A + Preassembled cap and septa for 11mm snap neck, pp cap, clear, centre hole, Red Butyl/Transparent PTFE, 0.040" thick
3.S32011.00EA + 3.X05540.1100	C4011-72AW	11mm Snap neck vial, 32x11.6mm, amber glass, white graduation line and marking spot and CNW LOGO, Borosilicate Type I Class B + Preassembled cap and septa for 11mm snap neck, pp cap, clear, centre hole, Red Butyl/Transparent PTFE, 0.040" thick
3.S32011.0000 + 3.005540.1100	C4011-73	11mm Snap neck vial, 32x11.6mm, clear glass, Borosilicate Type I Class A + Preassembled cap and septa for 11mm snap neck, pp cap, clear, centre hole, Clear PTFE/Orange Silicone rubber, 0.040" thick
3.S32011.00E0 + 3.005540.1100	C4011-73W	11mm Snap neck vial, 32x11.6mm, amber glass, white graduation line and marking spot and CNW LOGO, Borosilicate Type I Class B + Preassembled cap and septa for 11mm snap neck, pp cap, clear, centre hole, Clear PTFE/Orange Silicone rubber, 0.040" thick

10-425 thread screw neck vial

Cat. No.（CNW）	Cat. No.（National）	Description
3.032010.0000	C4010-1	10-425 Thread screw neck vial, 32x11.6mm, clear glass, Borosilicate Type I Class A
3.032010.000A	C4010-2	10-425 Thread screw neck vial, 32x11.6mm, amber glass, Borosilicate Type I Class B
3.032010.00E0	C4010-1W	10-425 Thread screw neck vial, 32x11.6mm, clear glass, white graduation line and marking spot and CNW LOGO, Borosilicate Type I Class A
3.032010.00EA	C4010-2W	10-425 Thread screw neck vial, 32x11.6mm, amber glass, white graduation line and marking spot and CNW LOGO, Borosilicate Type I Class B

10-425 thread screw neck vial seals

Cat. No.（CNW）	Cat. No.（National）	Description
3.005394.1000	C4010-30A	Preassembled cap and septa for 10-425 thread screw, PP cap, black, centre hole, Red rubber/White PTFE, 0.060" thick
3.005395.1000	C4010-60A	Preassembled cap and septa for 10-425 thread screw, PP cap, black, centre hole, White silicone/Red PTFE, 0.060" thick

10-425 thread screw neck vial kits

Cat. No.（CNW）	Cat. No.（National）	Description
3.032010.0000 + 3.005395.1000	C4010-88	10-425 Thread screw neck vial, 32x11.6mm, clear glass, Borosilicate Type I Class A + Preassembled cap and septa for 10-425 thread screw, PP cap, black, centre hole, White silicone/Red PTFE, 0.060" thick
3.032010.00E0 + 3.005395.1000	C4010-88W	10-425 Thread screw neck vial, 32x11.6mm, clear glass, white graduation line and marking spot and CNW LOGO, Borosilicate Type I Class A + Preassembled cap and septa for 10-425 thread screw, PP cap, black, centre hole, White silicone/Red PTFE, 0.060" thick
3.032010.00EA + 3.005395.1000	C4010-88AW	10-425 Thread screw neck vial, 32x11.6mm, amber glass, white graduation line and marking spot and CNW LOGO, Borosilicate Type I Class B + Preassembled cap and septa for 10-425 thread screw, PP cap, black, centre hole, White silicone/Red PTFE, 0.060" thick

Insert (for 9mm thread screw neck vials,10-425 thread screw neck vials,11mm Crimp neck vials,11 Snap neck vials)

Cat. No.（CNW）	Cat. No.（National）	Description
3.004025.06BS	C4010-630	Insert for large open vial, 29x5.7mm, clear glass, preassembled plastic spring, Borosilicate Type I Class A
3.004025.Z6BS	C4010-S630	Insert for large open vial, 29x5.7mm, clear glass, preassembled plastic spring, silanized
3.P04025.06BS	C4010-630P	Insert for large open vial, 31x6mm, transparent plastic, preassembled plastic spring
3.004025.060E	C4010-629L	Insert for large open vial, 31x6mm, clear glass, plastic spring not required, Economic, Borosilicate Type I Class A
3.004025.0600	C4010-631	Insert for large open vial, 31x6mm, clear glass, flat bottom, heavy wall, Borosilicate Type I Class A
3.004025.Z600	C4010-S631	Insert for large open vial, 31x6mm, clear glass, flat bottom , silanized

8-425 thread screw neck vial

Cat. No.（CNW）	Cat. No.（National）	Description
3.032008.0000	C4013-1 C4013-1500(1000/pk)	8-425 Thread screw neck vial, 32x11.6mm, clear glass,Borosilicate Type I Class A
3.032008.000A	C4013-2	8-425 Thread screw neck vial, 32x11.6mm, amber glass, Borosilicate Type I Class B
3.032008.00E0	C4013-1W	8-425 Thread screw neck vial, 32x11.6mm, clear glass, white graduation line and marking spot and CNW LOGO, Borosilicate Type I Class A
3.032008.00EA	C4013-2W	8-425 Thread screw neck vial, 32x11.6mm, amber glass, white graduation line and marking spot and CNW LOGO, Borosilicate Type I Class B

8-425 thread screw neck seals

Cat. No.（CNW）	Cat. No.（National）	Description
3.005394.0800	C4013-30A	Preassembled cap and septa for 8-425 thread screw, PP cap, black, centre hole, Red rubber/White PTFE, 0.060" thick
3.005395.0800	C4013-60A	Preassembled cap and septa for 8-425 thread screw, PP cap, black, centre hole, White silcone/Red PTFE, 0.060" thick

8-425 thread screw neck vial kits

Cat. No.（CNW）	Cat. No.（National）	Description
3.032008.0000 + 3.005395.0800	C4013-15	8-425 Thread screw neck vial, 32x11.6mm, clear glass,Borosilicate Type I Class A + Preassembled cap and septa for 8-425 thread screw, PP cap, black, centre hole, White silcone/Red PTFE, 0.060" thick
3.032008.000A + 3.005395.0800	C4013-17	8-425 Thread screw neck vial, 32x11.6mm, amber glass, Borosilicate Type I Class B + Preassembled cap and septa for 8-425 thread screw, PP cap, black, centre hole, White silcone/Red PTFE, 0.060" thick

Insert (for 8-425 thread screw neck vials)

Cat. No.（CNW）	Cat. No.（National）	Description
3.000401.05BS	C4012-530	Insert for small open vial, 30x5mm, clear glass, preassembled plastic spring, Borosilicate Type I Class A
3.P00401.05BS	C4012-530P	Insert for small open vial, 29x5mm, transparent plastic, preassembled plastic spring
3.000401.050E	C4012-529	Insert for small open vial, 31x5mm, clear glass, plastic spring not required, Economic, Borosilicate Type I Class A
3.004025.0500	C4012-465	Insert for small open vial, 31x5mm, clear glass, flat bottom, heavy wall, Borosilicate Type I Class A

20mm Crimp neck vial （Just for AS3000）

Cat. No.（CNW）	Cat. No.（National）	Description
3.310020.0E00	C4020-10	20mm crimp neck headspace vial, 10ml, 46x22.5mm, clear glass, flat bottom, white marking spot and CNW LOGO, Borosilicate Type I Class A

20mm Crimp neck vial seals （Just for AS3000）

According to the following seals for Head Space Gas Chromatography :

20mm Crimp neck vial seals

For the following Gas Chromatography Autosampler :

AS2000

Finnigan/Carlo Erba/Fisons A200S

Carlo Erba/Fison AS800, 42 vial tray

Carlo Erba/Fison AS800, 60 vial tray

According to the following vials for the Liquid Chromatography Autosampler :

11mm crimp neck vial，seals，kits

8-425 thread screw neck vial，seals，kits

20mm Crimp neck vial (Just for AS2000 30V.T)

Cat. No.（CNW）	Cat. No.（National）	Description
3.310020.0E00	C4020-10	20mm crimp neck headspace vial, 10ml, 46x22.5mm, clear glass, flat bottom, white marking spot and CNW LOGO, Borosilicate Type I Class A

20mm Crimp neck vial seals (Just for AS2000 30V.T)

According to the following seals for Head Space Gas Chromatography :

20mm Crimp neck vial seals

Correspond of CNW and National vials

For the following Head Space Gas Chromatography :

HS2000

Carlo Erba/Fisons HS250

Carlo Erba/Fisons HS500

Carlo Erba/Fisons HS800

Carlo Erba/Fisons HS850

20mm Crimp neck vial

Cat. No.（CNW）	Cat. No.（National）	Description
3.310020.0E00	C4020-10	20mm crimp neck headspace vial, 10ml, 46x22.5mm, clear glass, flat bottom, white marking spot and CNW LOGO, Borosilicate Type I Class A（for HS2000,HS850）
3.320020.0E00	C4020-20	20mm crimp neck headspace vial, 20ml, 75.5x22.5mm, clear glass, flat bottom, white marking spot and CNW LOGO, Borosilicate Type I Class A（for HS2000,HS850）

20mm Crimp neck vial

Cat. No.（CNW）	Cat. No.（National）	Description
3.310020.0EA0	C4020-210	20mm crimp neck headspace vial, 10ml, 46x22.5mm, clear glass, rounded bottom, white marking spot and CNW LOGO, Borosilicate Type I Class A（for HS250, HS500, HS800）

20mm Crimp neck vial seals

Cat. No.（CNW）	Cat. No.（National）	Description
3.F05140.2000	C4020-39A	Preassembled cap and septa for 20mm crimp neck headspace vial, Aluminum cap, clear, centre hole, butyl/PTFE, 0.125" thick
3.005150.2000	C4020-32A	Preassembled cap and septa for 20mm crimp neck headspace vial, Aluminum cap, clear, centre hole, Clear silicone/White PTFE, 0.125" thick
3.TB5150.20IY	C4020-42A	Preassembled cap and septa for 20mm crimp neck headspace vial, Iron cap, yellow, centre hole, Translucent Blue silicone/white PTFE, 0.125" thick
3.TB5150.20SS	C4020-42AP	Preassembled cap and septa for 20mm crimp neck headspace vial, Safty aluminum cap, clear, centre hole, Translucent Blue silicone/white PTFE, 0.125" thick
3.005100.2000 + 3.600004.2000	C4020-3A + C4020-30	Aluminum cap for 20mm crimp neck vial, without septa + Septa for 20mm crimp neck headspace vial, Butyl Injection Stopper, grey

For the following Autosampler:

In Kombination mit

Combi PAL

20mm Crimp neck vial

Cat. No.（CNW）	Cat. No.（National）	Description
3.310020.0EA0	C4020-210	20mm crimp neck headspace vial, 10ml, 46x22.5mm, clear glass, rounded bottom, white marking spot and CNW LOGO, Borosilicate Type I Class A
3.320020.0EA0	C4020-2	20mm crimp neck headspace vial, 20ml, 75.5x22.5mm, clear glass, rounded bottom, white marking spot and CNW LOGO, Borosilicate Type I Class A

20mm Crimp neck vial seals

According to the following seals for Head Space Gas Chromatography:

20mm Crimp neck vial seals

18mm screw neck vial

Cat. No.（CNW）	Cat. No.（National）	Description
3.310018.0EM0	C4020-180	18mm precision Thread vial, 10ml, 46x22.5mm, clear glass, rounded bottom, white marking spot and CNW LOGO, Borosilicate Type I Class A
3.320018.0EM0	C4020-18	18mm precision Thread vial, 20ml, 75.5x22.5mm, clear glass, rounded bottom, white marking spot and CNW LOGO, Borosilicate Type I Class A

18mm screw neck vial seals

Cat. No.（CNW）	Cat. No.（National）	Description
3.B05395.18M0	C4020-46	Preassembled cap and septa for 18mm precision Thread vial, magnetic cap, clear, centre hole, White silicone/Blue PTFE, 0.060" thick
3.TB5395.18M0	C4020-48	Preassembled cap and septa for 18mm precision Thread vial, magnetic cap, clear, centre hole, Translucent Blue silicone/white PTFE, 0.050" thick

Correspond of CNW with Waters vials

For the following Liquid Chromatography :

Waters Alliance

Alliance 2690/2695

Alliance 2790/2795

ACQUITY UPLC™

Waters Alliance HT System

9mm thread screw neck vial

CNW Cat.	Waters Cat.	Description
3.032009.00E0	186000273	9mm Thread screw neck vial, 32x11.6mm, clear glass, white graduation line and marking spot and LOGO, Borosilicate Type I Class A
3.032009.00EA	186000848	9mm Thread screw neck vial, 32x11.6mm, amber glass, white graduation line and marking spot and LOGO, Borosilicate Type I Class B
3.032009.0ZE0	186000273DV	9mm Thread screw neck vial, 32x11.6mm, clear glass, white graduation line and marking spot and CNW LOGO, Borosilicate Type I Class A, Silanized
3.032009.0ZEA	186000848DV	9mm Thread screw neck vial, 32x11.6mm, amber glass, white graduation line and marking spot and CNW LOGO, Borosilicate Type I Class A, Silanized
3.P30309.0000	186002626	0.3ml PP Short Thread Micro-Vial, 32 x 11.6mm, transparent
3.031509.0000	186002802	9mm Thread screw neck vial, 1.5mL, 32x11.6mm, clear glass, high recovery, Borosilicate Type I Class A（for Alliance 2790/2795 ACQUITY UPLC™）

9mm thread screw neck seals

CNW Cat.	Waters Cat.	Description
3.005330.09FR	186004169	Preassembled cap and septa for 9mm thread screw, design for MS, no bleed, septa no required
3.B05395.09FR	186000274	Preassembled cap and septa for 9mm thread screw, PP cap(Royal), blue, centre hole, White silicone/Red PTFE, 0.040" thick, BONDED
3.R05395.09FR	186002129	Preassembled cap and septa for 9mm thread screw, PP cap(Royal), red, centre hole, White silicone/Red PTFE, 0.040" thick, BONDED
3.G05395.09FR	186002130	Preassembled cap and septa for 9mm thread screw, PP cap(Royal), green, centre hole, White silicone/Red PTFE, 0.040" thick, BONDED
3.B05397.09FR	186000305	Preassembled cap and septa for 9mm thread screw, PP cap(Royal), blue, centre hole, White silicone/Red PTFE, 0.040 thick, slitted, BONDED
3.R05397.09FR	186002128	Preassembled cap and septa for 9mm thread screw, PP cap(Royal), red, centre hole, White silicone/Red PTFE, 0.040 thick, slitted, BONDED

9mm thread screw neck vials kits

CNW Cat.	Waters Cat.	Description
3.032009.0ZE0 + 3.B05397.09FR	186000307DV	9mm Thread screw neck vial, 32x11.6mm, clear glass, white graduation line and marking spot and CNW LOGO, Borosilicate Type I Class A, Silanized + Preassembled cap and septa for 9mm thread screw, PP cap(Royal), blue, centre hole, White silicone/Red PTFE, 0.040 thick, slitted, BONDED
3.032009.0ZEA + 3.B05397.09FR	186000847DV	9mm Thread screw neck vial, 32x11.6mm, amber glass, white graduation line and marking spot and CNW LOGO, Borosilicate Type I Class A, Silanized + Preassembled cap and septa for 9mm thread screw, PP cap(Royal), blue, centre hole, White silicone/Red PTFE, 0.040 thick, slitted, BONDED
3.P30309.0000 + 3.B05395.09FR	186002640	0.3ml PP Short Thread Micro-Vial, 32 x 11.6mm, transparent + Preassembled cap and septa for 9mm thread screw, PP cap(Royal), blue, centre hole, White silicone/Red PTFE, 0.040" thick, BONDED
3.P30309.0000 + 3.B05397.09FR	186002639	0.3ml PP Short Thread Micro-Vial, 32 x 11.6mm, transparent + Preassembled cap and septa for 9mm thread screw, PP cap(Royal), blue, centre hole, White silicone/Red PTFE, 0.040 thick, slitted, BONDED
3.P30309.0000 + 3.005330.09FR	186004112	0.3ml PP Short Thread Micro-Vial, 32 x 11.6mm, transparent + Preassembled cap and septa for 9mm thread screw, design for MS, no bleed, septa no required

11mm Crimp neck vial

CNW Cat.	Waters Cat.	Description
3.L32011.00E0	WAT094222	11mm Crimp neck vial, 32x11.6mm, clear glass, white graduation line and marking spot and CNW LOGO, Borosilicate Type I Class A
3.L32011.00EA	WAT094223	11mm Crimp neck vial, 32x11.6mm, amber glass, white graduation line and marking spot and CNW LOGO, Borosilicate Type I Class B
3.L32011.0ZE0	WAT094222DV	11mm Crimp neck vial, 32x11.6mm, clear glass, white graduation line and marking spot and CNW LOGO, Silanized
3.L32011.0ZEA	WAT094223DV	11mm Crimp neck vial, 32x11.6mm, amber glass, white graduation line and marking spot and CNW LOGO, Silanized

11mm Crimp neck vial

CNW Cat.	Waters Cat.	Description
3.005140.1100	PSL404219	Preassembled cap and septa for 11mm Crimp neck, Aluminum cap, clear, centre hole, Clear PTFE/Orange Silicone, 0.040" thick

11mm Snap neck vial

CNW Cat.	Waters Cat.	Description
3.S32011.00E0	WAT094219	11mm Snap neck vial, 32x11.6mm, clear glass, white graduation line and marking spot and CNW LOGO, Borosilicate Type I Class A
3.S32011.00EA	WAT094220	11mm Snap neck vial, 32x11.6mm, amber glass, white graduation line and marking spot and CNW LOGO, Borosilicate Type I Class B

Correspond of CNW and Waters vials

11mm Snap neck vial seals

CNW Cat.	Waters Cat.	Description
3.B05540.1100	186000303	Preassembled cap and septa for 11mm snap neck, pp cap, blue centre hole, Clear PTFE/Orange Silicone rubber, 0.040" thick
3.R05540.1100	186002650	Preassembled cap and septa for 11mm snap neck, pp cap, red centre hole, Clear PTFE/Orange Silicone rubber, 0.040" thick

10-425 thread screw neck vial

CNW Cat.	Waters Cat.	Description
3.032010.00E0	WAT063300	10-425 Thread screw neck vial, 32x11.6mm, clear glass, white graduation line and marking spot and CNW LOGO, Borosilicate Type I Class A

10-425 thread screw neck vial seals

CNW Cat.	Waters Cat.	Description
3.005395.1000	WAT058875(cap) + WAT058874(septa)	Preassembled cap and septa for 10-425 thread screw, PP cap, black, centre hole, White silicone/Red PTFE, 0.060" thick

Insert (for 9mm thread screw neck vials,10-425 thread screw neck vials,11mm Crimp neck vials,11 Snap neck vials)

CNW Cat.	Waters Cat.	Description
3.004025.06BS	WAT094170	Insert for large open vial, 29x5.7mm, clear glass, preassembled plastic spring, Borosilicate Type I Class A
3.004025.Z6BS	WAT094170DV	Insert for large open vial, 29x5.7mm, clear glass, preassembled plastic spring, silanized

For the following Liquid Chromatography :

Waters WISP (96 position)

1ml shell vials

CNW Cat.	Waters Cat.	Description
3.004100.0800 + 3.SB5400.0800	WAT025054C	1ml shell vial, 40x8.2mm, clear glass, Borosilicate Type I Class A + 8mm ransparent PE-plug for shell vial
3.004100.080A + 3.SB5400.0800	WAT025053C	1ml shell vial, 40x8.2mm, amber glass, Borosilicate Type I Class B + 8mm transparent PE-plug for shell vial

For the following Liquid Chromatography :

Waters WISP (48 position)

4ml shell vials

CNW Cat.	Waters Cat.	Description
3.004100.1500 + 3.SB5405.1500	WAT025051	4ml shell vial, 44.6x14.65mm, clear glass, Borosilicate Type I Class A + 15mm transparent PE-plug for shell vial
3.004100.150A + 3.SB5405.1500	WAT025050	4ml shell vial, 44.6x14.65mm, amber glass, Borosilicate Type I Class B + 15mm transparent PE-plug for shell vial

For the following Liquid Chromatography :

Waters WISP

GPC 2000

Waters 717

13-425 thread screw neck vial

CNW Cat.	Waters Cat.	Description
3.034013.00E0	186000840	13-425 Thread screw neck vial, 45x14.7mm, clear glass, white graduation line and marking spot and CNW LOGO, Borosilicate Type I Class A
3.034013.00EA	186001135	13-425 Thread screw neck vial, 45x14.7mm, amber glass, white graduation line and marking spot and CNW LOGO,Borosilicate Type I Class B

13-425 thread screw neck vial seals

CNW Cat.	Waters Cat.	Description
3.005395.1300	186000841	Preassembled cap and septa for 13-425 thread screw, PP cap, black, centre hole, White silicone/Red PTFE, 0.060" thick
3.005310.1300 + 3.601010.1300	WAT072711(144/pk) + WAT072714(144/pk)/ WAT073005(1440/pk)	13-425 Screw thread cap, made from PP, black, centre hole + Septa for 13-425 screw thread cap, white PTFE only, 0.010" thick

13-425 thread screw neck vials kits

CNW Cat.	Waters Cat.	Description
3.034013.00E0 + 3.005395.1300	186000838C	13-425 Thread screw neck vial, 45x14.7mm, clear glass, white graduation line and marking spot and CNW LOGO, Borosilicate Type I Class A + Preassembled cap and septa for 13-425 thread screw, PP cap, black, centre hole, White silicone/Red PTFE, 0.060" thick
3.034013.00EA + 3.005395.1300	186001133C	13-425 Thread screw neck vial, 45x14.7mm, amber glass, white graduation line and marking spot and CNW LOGO,Borosilicate Type I Class B + Preassembled cap and septa for 13-425 thread screw, PP cap, black, centre hole, White silicone/Red PTFE, 0.060" thick

Labware

Pipette Tips

- Precision in any detail guarantees highest quality.
- Made of high quality polypropylene
- Firm fit on pipettor cones
- Optimum handling due to straight shape
- Special ionization process guarantees dust free tip production
- Excellent transparency due to optimum surface quality
- Minimum fluid retention due to controlled raw material quality
- Excellent volumetric accuracy due to precisely molded tip orifices
- Most practical tip volumes
- Autoclavable

Description	Packaging	Cat. No.
Pipette tips, Nature, 0.5-20ul, Universal design, Ultra Micro Tips	1000pcs. per PE bag	7.250017.01K0
Pipette tips, Nature, 0.5-20ul, Universal design, Ultra Micro Tips	96pcs. per PP box	7.251317.2096
Pipette tips, Yellow, 1-200ul, Universal design, Ultra Micro Tips	1000pcs. per PE bag	7.210060.01k0
Pipette tips, Yellow, 1-200ul, Universal design, Ultra Micro Tips	96pcs. per PP box	7.211360.2096
Pipette tips, Nature, 1-300ul, Universal design, Ultra Micro Tips	1000pcs. per PE bag	7.230065.01K0
Pipette tips, Nature, 1-300ul, Universal design, Ultra Micro Tips	96pcs. per PP box	7.231365.2096
Pipette tips, Blue, 100-1000ul, Universal design, Ultra Micro Tips	1000pcs. per PE bag	7.210061.01K0
Pipette tips, Blue, 100-1000ul, Universal design, Ultra Micro Tips	96pcs. per PP box	7.210061.2096
Pipette tips, Nature, 1-5mL, Design for Biohit/ Eppendorf/Labmate/Socorex/Witeg	300pcs. per PE bag	7.240065.0300
Pipette tips, Nature, 1-5mL, Design for CappAero/Gilson	250pcs. per PE bag	7.240063.0250
Pipette tips, Nature, 1-5mL, Design for Brand/Finnpipette	500pcs. per PE bag	7.240062.4500
Pipette tips, Nature, 2-10mL, Design for Finnpipette/Gilson/Socorex	100pcs. per PE bag	7.240064.0100

Centrifuge Tubes

- These centrifuge tubes with conical bottom are available in two sizes of 15mL and 50mL.
- Tubes are made of ultra-clear polypropylene assures the good transparency, chemical resistibility.
- Tubes are provided with printed graduations and a large white writing area for sample identification.
- The flat caps are also available for sample identification.
- Rack-packed tubes are packaged on racks.
- Autoclavable at 121 ℃, and freezable to -80 ℃
- For 15mL centrifuge tubes,there're molded graduation on the top tip with interval 0.25mL

Description	Packaging	Cat. No.
Centrifuge tubes 15mL, conical,17*120mm, non-sterile	25 pcs. Per PE bag, 20 bags Per carton	7.330000.6500
Centrifuge tubes 50mL, conical, 30*115mm, non-sterile	25 pcs. Per PE bag, 20 bags Per carton	7.330000.2500
Centrifuge tubes 50mL, conical, 30*115mm, non-sterile, with blue caps	25 pcs. Per PE bag, 20 bags Per carton	7.33000B.2500
Centrifuge tubes 15mL, conical, 17*120mm, non-sterile, with blue caps	25 pcs. Per PE bag, 20 bags Per carton	7.33000B.6500
Centrifuge tubes 50mL, conical, 30*115mm, non-sterile, with rack	25 pcs. Per PE bag, 20 bags Per carton	7.33R000.2500
Centrifuge tubes 15mL, conical, 17*120mm, non-sterile, with rack	50 pcs. Per PE bag, 10 bags Per carton	7.33R000.6500
Free-standing centrifuge tubes 50mL, conical, 30*115mm, non-sterile	20 pcs. Per PE bag, 25 bags Per carton	7.330000.4500
Centrifuge tubes 50ml, conical, 30*115mm, sterilized	25 pcs. Per PE bag, 20 bags Per carton	7.33S000.2500
Centrifuge tubes 15ml, conical,17*120mm, sterilized	25 pcs. Per PE bag, 20 bags Per carton	7.33S000.6500

Tube Racks

Snap- Together Conical Tube Rack Holds both 15mL and 50mL tubes

- Easy-to-assemble polypropylene racks snap together securely
- Designed for stable use in water baths.
- Features alphanumeric grid reference aids for tube identification.
- Shipped flat.
- Wells for 15mL tubes and 50mL tubes

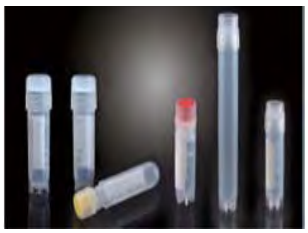
Description	Packaging	Cat. No.
Snap-together conical tube rack,PP,non sterilized	1pcs. per bag	7.371001.6001

4-Way Micro Tube Rack, Link Together Multipel Racks

- Heavy-duty polypropylene racks feature a unique system of tabs and slots, which facilitate easy connection and sturdy fit.
- Each rack can hold four 50mL conical tube, twelve 15mL conical tubes, thirty-two 1.5mL micro tubes, or thirty-two 0.5mL tubes.
- Autoclavable.
- Assorted pack includes on each of blue, green,rose, yellow, and orange.
- Rack measures 174 x 95 x 52 mm.

Description	Packaging	Cat. No.
4-Way micro tube rack,blue,non sterilized	1pcs. per bag	7.372001.4001
4-Way micro tube rack,red,non sterilized	1pcs. per bag	7.372001.2001

Other colours products are on require.



Cryo vials

- Made from special polypropylene for storing biological material or cells at temperature as low as -196℃
- An exclusive silicon washer inside the cap features a positive seal at any temperature
- Thick wall makes vials almost unbreakable
- Large white marking area and graduations in 0.2mL increasements

Description	Packaging	Cat. No.
Cryo vials,external thread with silicon seal,self-standing,1.2mL	100pcs. per PE bag	7.511011.2100
Cryo vials,external thread with silicon seal,self-standing,2mL	100pcs. per PE bag	7.511012.2100
Cryo vials,external thread with silicon seal,self-standing,5mL	100pcs. per PE bag	7.511015.0100

Storage Box

- Polypropylene box fit for standard freezer racks.
- Store 1.5 to 2.0 mL micro tubes under easy-open, friction-fit lid.
- Locating tubes is easy with molded grid lines and a molded reference point on the lid.
- High wall design.

Description	Packaging	Cat. No.
Compacked microtube storage box, PP,81 positon,natural,non sterilized	1pcs. per bag	7.512001.0001
Compacked microtube storage box, PP,81 positon,blue,non sterilized	1pcs. per bag	7.512001.4001
Compacked microtube storage box, PP,100 positon,natural,non sterilized	1pcs. per bag	7.512011.0001
Compacked microtube storage box, PP,100 positon,blue,non sterilized	1pcs. per bag	7.512011.4001

Other colours products are on require.

Plastic Pasteur pipette

- Plastic Pasteur pipette manufactured from a special non-toxic low-density polyethylene.
- Ideal for transferring and dispensing liquids safely in all types of laboratories, eliminating the risk of cross contamination.
- Offer excellent transparency with uniform wall thickness and precise graduations ensuring consistent results.

Description	Packaging	Cat. No.
3mL plastic Pasteur pipette，150mm length,non sterilized	500 pcs. per box	7.260011.1500
1mL plastic Pasteur pipette，150mm length,non sterilized	500 pcs. per box	7.260017.1500

Culture Tube and Test Tube

- Our test tubes and culture tubes are manufactured from tubing that has uniform wall thickness and exacting diameters.
- Rims are fire polished and smooth; tube bottoms are perfectly formed.
- Whether plain top, screw-capped, glass stoppered or flared rim, these test tubes will always perform in your lab.

Test Tube

Description	Packaging	Cat. No.
Test tube, AR glass, 6mL, O.D. 12mm x L 75mm,wall thickness 0.6mm	250pcs. per PP box	3.015012.0000
Test tube, AR glass, 15mL, O.D. 16mm x L 100mm,wall thickness 0.7mm	250pcs. per PP box	3.112016.0000
Test tube, AR glass, 20mL, O.D. 20mm x L 150mm,wall thickness 0.8mm	250pcs. per PP box	3.130020.0000

Culture Tubes

Description	Packaging	Cat. No.
Culture Tubes, Reusable, 13 x 100mm, 8mL	100pcs. Per Carton	3.038013.CT00
Culture Tubes, Reusable, 16 x 100mm, 12mL	100pcs. Per Carton	3.312016.CT00
Culture Tubes, Reusable, 16 x 125mm, 16mL	100pcs. Per Carton	3.316016.CT00
Culture Tubes, Reusable, 16 x 150mm, 20mL	100pcs. Per Carton	3.320016.CT00
Culture Tubes, Reusable, 20 x 125mm, 25mL	100pcs. Per Carton	3.325020.CT00
Culture Tubes, Reusable, 20 x 150mm, 30mL	100pcs. Per Carton	3.330020.CT00
Culture Tubes, Reusable, 25 x 150mm, 50mL	100pcs. Per Carton	3.350025.CT00
Culture Tubes, Reusable, 25 x 200mm, 70mL	100pcs. Per Carton	3.370025.CT00

Screw Cap With PTFE-Faced Rubber-Lined Caps for Culture Tubes

Description	Packaging	Cat. No.
Phenolic Cap with PTFE-Faced Rubber Liner, 13-415	100pcs. Per PE bag	3.005360.CT13
Phenolic Cap with PTFE-Faced Rubber Liner, 15-415	100pcs. Per PE bag	3.005360.CT15
Phenolic Cap with PTFE-Faced Rubber Liner, 18-415	100pcs. Per PE bag	3.005360.CT18
Phenolic Cap with PTFE-Faced Rubber Liner, 24-410	50pcs. Per PE bag	3.005360.CT24

TFM Vessel

- Digestion vessel made from TFM or PFA. More corrosion resistance than PTFE. Maximum use temperature is 260 ℃, extreme up to 300 ℃. High temperature and pressure deformation resistance, Recoverability is better.
- More permeability resistance than PTFE. Long use life. Reducing the polluting and memory effect for high smoothness tube shell. high seal performance and low surface roughness based on special and high quality process. Low dissolution of metal and dis-conglutinate the sample that mostly used for trace analysis & ultratrace analysis and microanalysis.

TFM vessels adapt to CEM

Description	Packaging	Cat. No.
Xpress TFM Vessels Replacement 55ml	1pcs. per pack	9.C40055.0001
Xpress TFM Replacement 55ml,Vessels only	1pcs. per pack	9.C40055.V001
XPRESS VENT PLUG	1pcs. per pack	9.C40055.P001
Cap of Xpress TFM Replacement 55ml	1pcs. per pack	9.C40055.C001
Xpress TFM Vessels Replacement 110ml	1pcs. per pack	9.C24110.0001
TEasyPrep TFM Vessels Replacement 100ml	1pcs. per pack	9.C12100.V001
EasyPrep TFM Vessels Cap Replacement 100ml	1pcs. per pack	9.C12100.C001

TFM vessels adapt to Milestone

Description	Packaging	Cat. No.
ETHOS TFM Threaded vessel,55ml	1pcs. per pack	9.M41055.0001
41 high throughput rotor complete with 41 TFM vessels	1pcs. per pack	9.M41001.0001
ETHOS UP TFM Threaded vessel,80ml	1pcs. per pack	9.M44080.0001
ETHOS UP TFM Threaded vessel,100ml	1pcs. per pack	9.M44100.0001
ETHOS UP TFM vessel,100ml	1pcs. per pack	9.M15100.0001
ETHOS TFM vessel, 100ml	1pcs. per pack	9.M10100.0001
ETHOS TFM vessel, 100ml	1pcs. per pack	9.M12100.0001

Laboratory Instrument

Nitrogen Evaporators

DC series Nitrogen Evaporators

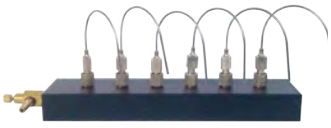
The DC series Nitrogen Evaporators include 12 positions, 24 positions and ordinary 6 positions products. Design for sample preparing in the laboratory, especially for analysis of pesticide residues in animal and plant, fruit, tobacco etc. Environmental analysis just like water quality analysis, sewage water analysis etc. And also used in the food and beverage, quality control of pharmaceutical and drug, biochemical analysis etc. The products are simplicity of operator, can be processing multiple samples at one time. The gas flow rate and flux can be controlled, and customer can use multiple kind of sample container.

The DC series Nitrogen Evaporators design with compact and reasonable structure, Composed of circular gas distribution system, the sample holder with spring, center support device and stainless steel base; the sample contain with the ID number on each position; the gas through the rotor flowmeter arrived the gas distribution system, the flexible silicone tube guide the gas into needle valve which can be free lift, after that, the gas through the stainless steel needle or glass needle arrived the surface of samples. During this operater, customer can choice water bath or aluminum sand bath, also can adjust the altitude of the needle, to ensure the evaporation efficiency.

Product features:

- Circular design, Rotate freely, Operate simply, Reasonable structure;
- Sample holder with ID number, Free lift, with stainless steel spring ring clamp;
- Circular of the gas distribution system, Gas guide needle can be lift freely, with precision regulating valve;
- Suitable for sample contain: OD 10-29mm test tube, centrifuge tube, erlenmeyer flask etc. sample volume 1-50ml;
- Use 100mm stainless steel needle or glass needle;
- Circular water bath, heating gently, temperature control precisely, room temperature + 5℃ - 90℃(advise 40℃ - 70℃);
- the main part made from stainless steel, offer good corrosion preventive; all the key part made from inter material with specially processing (Stainless steel, PTFE, Nickel chrome brass, anodized aluminum, high purity silicon tube and borosilicate glass) to ensure will not cause secondary pollution of the samples;
- Precision needle valves can be easily control the gas rate on each position;

RT series Nitrogen Evaporators



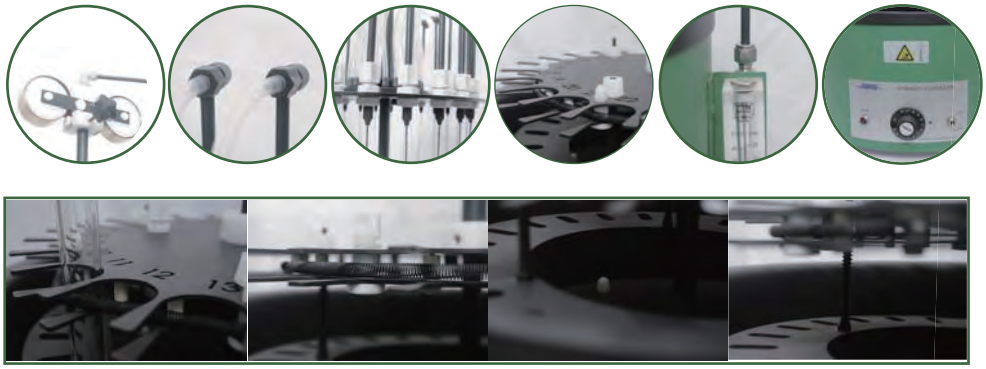
To reduce the damage of corrosive vapours to the instrument in process of nitrogen blowing,we provide anti-corrosion type(RT series) Nitrogen Evaporators by improving current Nitrogen Evaporators; RT series Nitrogen Evaporators use high-tech PTFE coating on stainless steel surface for protection, making parts to improve chemical corrosion resistance, extending equipment service life; 90% of stainless steel surface are sprayed high-tech PTFE coating, use nylon parts in the places which are inconveniently sprayed coating, improving chemical corrosion resistance entirely.

Cat. No.	EFAA-DC12	EFAA-DC24	EFAA-DC12-DA	EFAA-DC-J6	EFAA-DC12-RT	EFAA-DC24-RT
Description	12 positions Nitrogen Evaporators with water bath	24 positions Nitrogen Evaporators with water bath	12 positions Nitrogen Evaporators with Aluminum Sand bath	Simply 6 positions Nitrogen Evaporators Instrument	12 positions RT series Nitrogen Evaporators with water bath	24 positions RT series Nitrogen Evaporators with water bath
Instrument Dimensions	Φ210mmx780mm	Φ380mmx900mm	Φ210mmx780mm	185mmx38mmx120mm	Φ210mmx780mm	Φ420X410X900mm
Diameter of the container	10-30mm	10-30mm	10-30mm	Directly used on the small capacity test tube or vials	10-30mm	10-30mm
Gas flow rate	2-16 L/min	2-16 L/min	2-16 L/min		2-16 L/min	2-16 L/min
Heating device Cat. No.	EFAA-DC12H			N/A	DC-12H-RT	DC-24H-RT
Heating device Dimensions	Φ370MMX200MM	Φ410MMX220MM	Φ265MMX200MM		Φ300MMX200MM	Φ410MMX220MM
Heating device Maximum power	500W	1000W	650W		500W	1000W
Temperature control range	RT+5 ~ 90℃	RT+5 ~ 90℃	RT+5 ~ 80℃		RT+5 ~ 90℃	RT+5 ~ 90℃

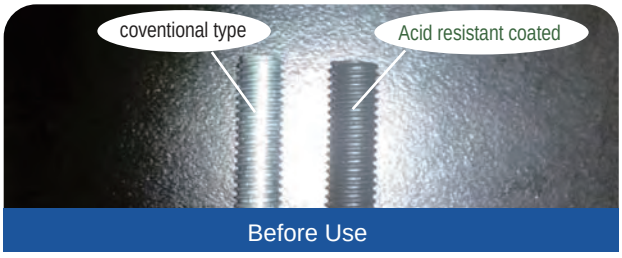
Temperature control accuracy	+/- 2℃	+/- 2℃	+/- 2℃		+/- 2℃	+/- 2℃
Heating device material	stainless steel	stainless steel	stainless steel		stainless steel coated with PTFE	stainless steel coated with PTFE

Anti-corrosion coated Nitrogen Evaporator

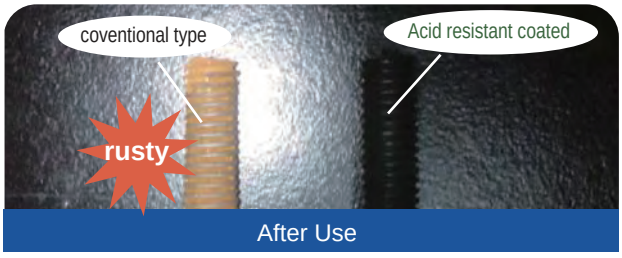
To reduce the damage of corrosive vapours to the instrument in process of nitrogen blowing,we provide anticorrosion type(RT series) Nitrogen Evaporators by improving current Nitrogen vaporators; RT series Nitrogen Evaporators use high-tech PTFE coating on stainless steel surface for protection, making parts to improve chemical corrosion resistance, extending equipment service life; 90% of stainless steel surface are sprayed hightech PTFE coating, use nylon parts in the places which are inconveniently sprayed coating, improving chemical corrosion resistance entirely.



Acidic conditions before and after use



Before Use



After Use

Typical Parameter

External skin	PTFE
Sample number	12 positions, 24 positions
OD of the container	Φ 10-29mm
Gas flow rate	0.1~1m³/h(2~16L/min)
Input gas pressure	less than 0.2Mpa
Maximum power	500W, 1000W
Power voltage	220V, 50Hz
Temp. control range	RT+5~90 ℃
Temp. control accuracy	±2 ℃

Product Features

1. Machine coated **anti-corrosion** materials **resistant** acid, alkali and organic solvents.
2. **New** semiconductor ceramic heating material.
3. **Higher** heat efficiency.
4. **Long** service life.
5. **Protection** against dry heating features.

Cat.No	Description
EFAA-DC24-RT	24 positions RT series Nitrogen Evaporators with water bath
EFAA-DC12-RT	12 positions RT series Nitrogen Evaporators with water bath

ANPEL series Gas Generator

This is economic gas generator for laboratory use, compared with the traditional gas cylinders, Security has been greatly improved. So, use it to instead of the gas cylinders is a very good choice. The products with lower requirement of the working environment, easy for install and use, one standard current source enough for instrument working, provide 1/8 inch pipeline ensure easily connect with other instruments,

Hydrogen gas generator using potassium hydroxide aqueous solution as the electrolyte, during the instrument running potassium hydrate not consumed, only electrolyze water, so after the instrument running, customer only need replenishment of distilled water regularly into the electrolytic cell. Because of the high pH alkali liquor will Inhibition of microorganism growth, so customer do not need worry about the growth of microorganism pollution.

Hydrogen gas generator

This instrument consists of Electrolysis system, Pressure control system, Purification system and Display system.

Our new LGH-T series hydrogen gas generator, increased Acousto-optic alarm system, When the liquid level is too lower, the instrument will alarm sound, the liquid level windows will flashing red. Warm the customer to replenish distilled water. When the liquid level below the limit value, instrument will auto-stop, this moment customer need power off the instrument and replenish distilled water, then re-open the instrument. This will help customer avoid damaging the expensive Electrolytic tank.

Our instrument use two-stage pressure control and protect system, increased visible alkali liquor return protection system,timely reminde customer handle the return alkali liquor, to guarantee the safety of instrument.

The pipe in the instrument through special processing, ensure the lower background.

Characteristics of the instrument：

1. Small size, Light weight, instead of gas cylinders, without transporting;
2. Operate easly, high degree of automation. Only need pulse-onthe switch, routine attention only need supplement distilled water;
3. The gas flow path system equipped with pressure overload protection function and alkali liquor return protection system;
4. Output flow stability, with LED digital display, automatic flow control, intuitive and convenient;
5. service long life, allowed to continue working, gas purity does not reduce;
6. whole unit offer one year warrantly, Electrolytic tank warranty for two years;

Description	Output pressure	Gas purity	Power	Gas flow rate	Instrument Dimensions	Instrument Weight	Cat. No.
Hydrogen gas generator LGH-300T	0.3MPa	>99.995%	150W	0-300ml/min	400X230X370 (LxWxH)mm	15kg	ECAA-LGH-300T
Hydrogen gas generator LGH-500T	0.3MPa	>99.995%	250W	0-300ml/min	400X230X370 (LxWxH)mm	15kg	ECAA-LGH-500T

Air generator(oil free)

Our oil free air generator consists of air pump, Pressure stabilizing system, Pressure control system, Purification system and Display system.

LGA series air generator, suitable for all types gas chromatograph and other instrument need air source in the laboratory. Our air generator use oil free air pump as air source, it is the ideal air source for laboratory.

Characteristics of the instrument:

1. Small size, Light weight, instead of gas cylinders, without transporting;
2. Operate easly, high degree of automation. Only need pulse-on the switch, customer can get constant pressure and constant flow air;
3. The gas flow path system equipped with two-stage pressure overload protection system, two-stage pressure stabilize system, automatic drainage system, dust filtration system, three times purification system;
4. Small vibrate, low noise, output pressure stability, output flow stability;
5. service long life, allowed to continue working, stable performance;
6. whole unit offer one year warrantly,

Description	Output pressure	Pressure stability	Power	Gas flow rate	Instrument Dimensions	Instrument Weight	Cat. No.
Air generator LGA-5000W	0.4MPa	<0.003MPa	180W	5000ml/min	335×335×680 (L×W×H)	26kg	ECAA-LGA-5000W

Hydrogen and air generator

LGB series hydrogen and air generator is a product in order to satisfied market demand, on the basis of LGH series hydrogen gas generator and LGA series air generator, advantage of LGH series and LGA series feature, can get hydrogen or air separate or get two gas coinstantaneous, It is the ideal air source for laboratory.

Characteristics of the instrument:

1. Small size, Light weight, instead of gas cylinders, without transporting;
2. Operate easly, high degree of automation. Only need pulse-on the switch, customer can get constant pressure and constant flow air;
3. The gas flow path system equipped with two-stage pressure overload protection system, two-stage pressure stabilizing system, automatic drainage system, dust filtration system, three times purification system;
4. Small vibrate, low noise, output pressure stability, output flow stability;
5. service long life, allowed to continue working, stable performance;
6. whole unit offer one year warrantly,

Description	Output pressure	Gas flow rate	Instrument Dimensions	Instrument Weight	Cat. No.
Hydrogen and air generator LGB-0300W	Hydrogen: 0.3 MPa Air:0.4 MPa	Hydrogen: 0-300ml/min Air: 5000ml/min	400×400×700 (L×W×H)	40kg	ECAA-LGB-0300W
Hydrogen and air generator LGB-0500W	Hydrogen: 0.3 MPa Air:0.4 MPa	Hydrogen: 0-500ml/min Air: 5000ml/min	400×400×700 (L×W×H)	40kg	ECAA-LGB-0500W

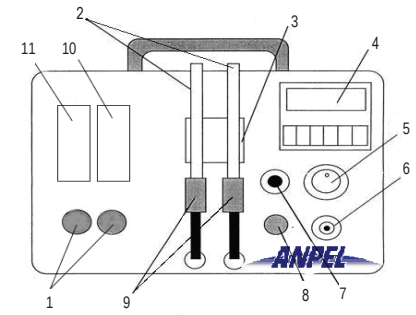
CYY-II portable dual-channel gas sampler

The gas sampler is based on portable tank sampling theory, can be used with a variety of thermal desorption tubes，solvent desorption tubes and related equipments, common indoor and outdoor air samples are collected such as TVOC, benzene, aldehydes and ketones.

The device is small, light weight, easy to carry, built-in high capacity rechargeable battery and there are seven modes of custom timer design to meet various needs of customers. Customers can set different modes and time according to sampling.

Characteristics of the instrument

- Adjustable dual-channel flow sampling system can be imultaneously sampling of two same or different organics;
- Built-in high capacity rechargeable battery, If fully charged, generally can keep supplying for more than 10 hours;
- Detachable tube bracket is easy to change tubes, supporting1/4 inch or 6mm diameter tube;
- Outside cover increase anti-misoperation lock;
- Seven modes of timer to meet various needs of customers;
- Low battery indicator to remind recharging, prevent the sampling interrupt to avoid causing sampling failure.



1. flow regulating valve
2. sampling tube
3. sampling tube rack
4. digital timer
5. power switch
6. charging holes
7. sampling switch
8. low battery indicator light
9. sampling tube quick connector
10. 1#flow indication
11. 2#flow indication

Setting method

- Press MODE button, display up/down, press 1~4 any keys can choose the sampling time,counting (u)/counting down (d),choice: d, (factory setting: d mode);
- Press MODE button, display OUTMODE, press 1~4 any keys to cycle indicate a, A1, A2, b, e, these five working modes, select: E working modes (factory setting is E mode);
- Press DISPLAY key to exit setting;
- According to the displaying time 1~4 key, set sampling time, continuously press key 3 is 8,other three keys is 0, until indicate 8h00m;
- Press Start Sampling key to begin sampling by countdown;
- If need to stop sampling, can directly press RESET key of digital display timer panel, also can turn off on/off key to stop sampling;
- Open the on/off key again, press Start Sampling key, sampler will work according to the last setting.
- Flow control: adjust the Channel 1/Channel 2,can change sampling tube’s vacuum degree,clockwise is aimed to reduce the sampling flow until close, when using only 1 sampling channel, please close other channel;
- Above are frequently used settings, if need other special settings, please refer to manual.

Separatory Funnel Shaker

* Two kinds of shock mode: Vertical oscillation, Tilt oscillation
* Oscillation frequency is continuously variable
  Vertical oscillation: 10 to 300 beats / min
  Tilt oscillation: 10 to 250 beats / min
* DC motor, ensure long-term stable oscillation frequency
* Separating funnel fixture is easy to install or remove

Typical applications of liquid-liquid extraction:

1. Environmental Analysis extraction operation prior to treatment
2. Extraction of food, oil natural product
3. Pesticide residue extraction
4. Extraction of harmful substances in the soil
5. Extraction of Water Pollutants

Technical Parameters

Product	Separatory Funnel Shaker
Shock mode	Vertical or Tilt oscillation（70°~90°）
Oscillation frequency	Vertical oscillation: 10 to 300 beats/min
	Tilt oscillation: 10 to 250 beats/min
Amplitude	40mm
Display	Digital
Timing Range	99hour 59min
Max. funnel	1L
Max. Load	5Kg per side
Fixture	Not include, Require additional purchase
Power supply	AC220V ± 10%； 50Hz ± 5%　AC110V on require
Max. Power (KW)	0.8
Dimensions (mm)	600× 470× 490（L× W× H)
Weight (kg)	43

It is recommended to use a high-quality, flawless separatory funnel. Do not use a separatory funnel cap with a handle. Use the same number of separatory funnels and liquid weights on both sides of the shaker to allow the instrument to balance left and right.

Specifications	The maximum number of installations per side
50-100mL	5
200mL	Pear shape 5, spherical 3
300mL	3
500mL	3
1L	3

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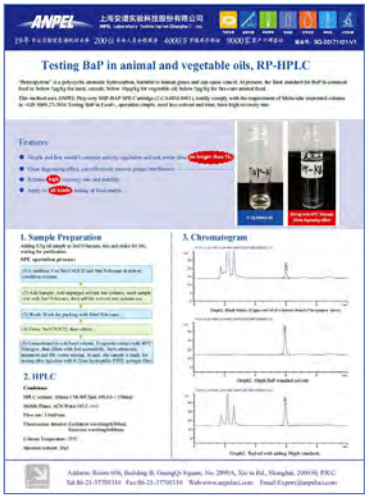

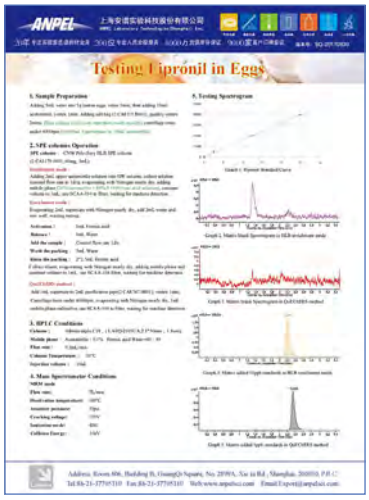

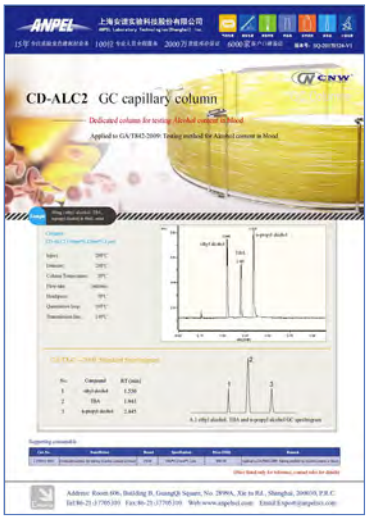

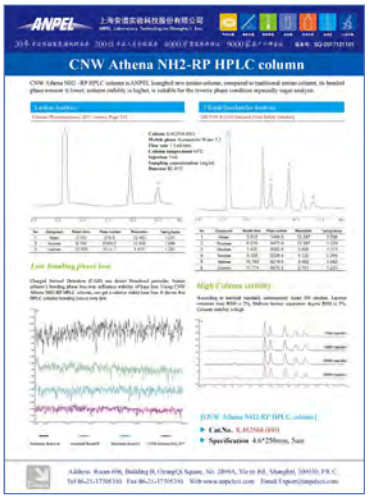

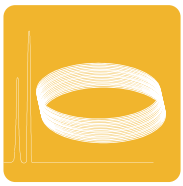
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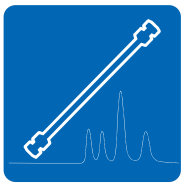
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