



HPLC Columns, Media, and Accessories

Bonna-Agela Technologies 2011



HPLC Columns



Guard Cartridge (Holder)



Best Value
Guaranteed Product Quality
Innovation to Benefit Customers

HPLC Columns



Venusil™ & Promosil™ HPLC



Venusil™ AA

SPE Columns



Cleanert™ SPE Cartridges



Cleanert™ IC
Pre-treatment Cartridges



Cleanert™ 96 Wellplates

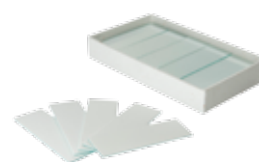
Flash Chromatography Products



Flash Purification Columns

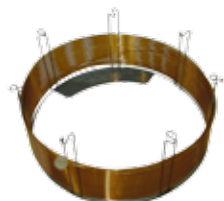


CHEETAH™ Flash Purification System



TCL Plates

Consumables Products



GC Columns



Clarinet™ Syringe Filters



Vials, Caps, Septa

Bonna-Agela Technologies — A Global Supplier for Chromatography Solutions

2011 Message From Bonna-Agela Technologies

As Bonna-Agela technologies is poised to enter its fifth year with confidence and pride in its innovative separation, purification, and sample preparation products, we would like to thank our many loyal customers for your continuous support and trust. With your support and our effort in delivering the highest quality products to you, our company has grown remarkably. This has allowed us to expand our research and development effort, and thus introduce more innovative products to better service your application needs.

In 2010, we had tremendous accomplishments: We cataloged over one thousand different products. Our manufacturing and R&D operation was certified in compliance with ISO 9001 and passed many quality audits by customers and distributors, including VWR. As a global wide company, we not only have our own international sales force but have also formed a marketing alliance with VWR international. This will allow us to reach higher goals for 2008 and to provide our customers with even better quality products and faster service.

Our 2011 mission statement and commitment:

- Provide products with our INNOVATIVE technologies at the best PERFOR
- MANCE to COST ratio.
- Deliver products with guaranteed quality.
- Provide global support with quick responses

How to Place Orders

Our office is open from 9:00 am to 6:00 pm Eastern Standard Time, Monday through Friday.

To place an order or receive a quote, you may choose from the following contacts:

Mail Address: Bonna-Agela Technologies Inc.
2038A Telegraph Road, Wilmington, DE 19808, USA
Phone: (302) 438-8798
Fax: (302) 636-9339
Email: info@agela.com
On-line: www.agela.com

Please include the following information with your order or request: Account number (if you have one), purchase order number, contact name, organization name, shipping and billing address, telephone number, fax number or email address, product number, brief description and quantity, method of payment, preferred method of delivery. A written confirmation will be sent to you by email or fax. We accept business checks, wire transfers, and major credit cards as methods of payment.

Checks:

Please make checks payable to:
Bonna-Agela Technologies Inc. and send to:
Bonna-Agela Technologies Inc.
2038A Telegraph Road, Wilmington, DE 19808, USA

Wire Transfer:

Please contact us by phone, fax or email for account information.

Credit Cards:

Please include the card type and number, expiration date, and card holder name. Due to security concerns, please do not email the information. Please call or send a fax to provide your credit card information.

Terms and Conditions

PLEASE READ THESE TERMS BEFORE ORDERING. IF YOU HAVE ANY QUESTIONS, PLEASE DO NOT HESITATE TO CONTACT US AND OUR STAFF WILL BE GLAD TO ASSIST YOU.

Acceptance and Availability

All orders placed are subject to the agreement of Bonna-Agela Technologies Inc. The catalogue does not constitute an engagement of the company to sell all listed products. You are guaranteed to be notified at the time of ordering if the ordered items are in back-order or discontinued.

Price and Payment

The prices are in effect at the time of printing. Bonna-Agela Technologies reserves the right to change the prices without notice, though we do our best to provide our customers with advance notice. The prices quoted at the time of ordering will be guaranteed. The general payment term is net 30 days, F.O.B., Newark, Delaware, USA. However we reserve the right to ask for prepayment if customers' account information is not satisfactory. A 1.5% per month service charge will be added to delinquent accounts. If a purchase order is less than \$1000.00, a \$50.00 extra charge will be added to the invoice.

Changes

Bonna-Agela Technologies reserves the right to change product specifications, quantities, designs or prices without prior notice and without liability for such changes.

Shipping Policy

The standard shipping method is 2 day FedEx within the United States and Canada. We will try to accommodate requests for other shipping methods if they are available. All shipping and handling charges will be billed separately. Should you receive damaged goods, it is imperative that you notify us immediately and save all packing materials for inspection by the carrier.

Application

All products in this catalog should be used for laboratory or manufacturing use only. They are not intended for direct medicinal or food use. Bonna-Agela Technologies assumes no liability for any misuse of the products.

Returns

Bonna-Agela Technologies tries to accommodate all requests for returns of unused goods. However, return of some items may be restricted by the original manufacturers. Please contact us for return authorization before returning any items. A restocking charge may be applied to certain products.

Warranty

All Bonna-Agela Technologies products are warranted to be free of defects in materials and workmanship. They are not warranted for any other particular purpose. Bonna-Agela Technologies shall not under any circumstance be liable for any incidental, consequential or compensatory damage in conjunction with its products. The maximum liability shall not exceed the invoice price of the product.



HPLC Columns and Media

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Introduction

As one of the emerging leaders in chromatography technology, Bonna-Agela Technologies proudly presents five series of the featured HPLC columns developed using our latest cutting-edge technologies. These products exhibit superior performance and are designed to meet the ever-increasing demands of our customers.

1. **Unisol C18** - A type of column that is a true universal reverse phase column for the separation of acidic, basic, and neutral molecules. It has superior performance to any conventional C18 phases in almost every aspect.
2. **Unisol Amide** - A unique phase that is very different from other stationary phases in its separation mechanism. It can be used as a RP or a NP column. It has superior performance than any of the other HILIC columns on the market. It has superior retention for polar compounds when operated as a HILIC column.
3. **Optimix columns** – A class of columns that provide optimized selectivity and performance for HPLC separations. It has balanced hydrophilicity and hydrophobicity: extended retention for polar compounds; non-excessive retention for strong hydrophobic compounds.
4. **Durashell columns** - A class of columns that can be used in a wide pH range of 1.0-12.0.
5. **Venusil ASB columns** – A class of columns that are excellent for low pH=0.8 and LC-MS applications..

HPLC Columns by Family

NEW Products!

UHPLC Technology and Column Products

Compared to conventional HPLC applications using 3-5 μ m particle sizes, ultra fast separations with superior efficiency are made possible through the use of sub-2 μ m particles on UHPLC systems, with significant improvements in sensitivity and resolution as well. Bonna-Agela UHPLC columns packed with 2 μ m and 2.5 μ m particles feature a very narrow particle size distribution to minimize column back pressures to values in reach of conventional HPLC systems.

The UHPLC packings are manufactured from the new highest purity spherical silica particles. The outstanding properties of the stationary phase are results of subjecting high quality silica to Bonna-Agela's innovative surface modification and unique bonding processes. Our proprietary nanosurface modification generates a very smooth and even surface. This reduces the interaction between the silica surface and polar compounds, resulting in symmetric peak shape even for very basic compounds. Based on this technology, a series of unique columns were developed to meet the tough requirements for the analysis of highly polar compounds. Lot-to-lot reproducibility is ensured by a stable bonding/end-capping process.

The UHPLC stationary phase is packed in our new UHPLC hardware, specially designed for ultra high-performance applications which demand pressure resistance up to 1000 bar (15000 psi) and extremely low dead volumes.

UHP-AQ-C18

The uniform, spherical particles have a nominal surface area of 340m²/g, with a controlled pore size of 120Å.

Characteristics: Metal Impurity<10ppm; Pore Size 120Å; Specific: Surface Area 340m²/g; Available Particle Size: 2 μ m and 2.5 μ m

Main Features:

- Greatly improved peak shape for basic compounds
- 100% water compatibility
- Low pH stability: stable at as low as pH=1.5
- Performance: 200,000/m (2µm)
- TF: 0.98-1.12
- Pressure resistance: 1000 bar (15000 psi)

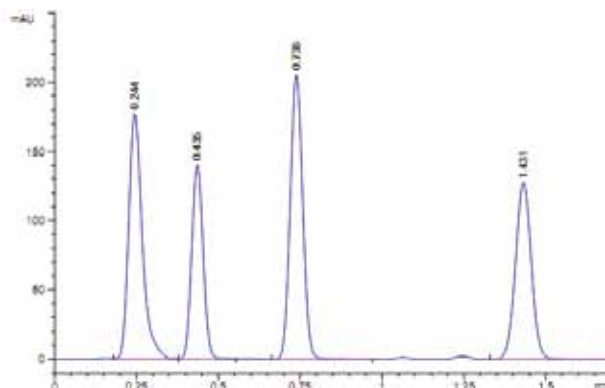
UHP ASB C18

Characteristics: Metal Impurity<10ppm; Pore Size 120Å; Specific: Surface Area 340m²/g; Available Particle Size: 2µm and 2.5µm

Main Features:

- Extremely polar reverse phase
- 100% water compatibility
- Extremely low pH stability: as low as at pH=0.8

Balanced Retention for Hydrophilic and Hydrophobic Compounds



Column: UHP ASB C18,4.6×50mm,2µm
 Sample: Uracil (1) Phenol(2) Nitrobenzene(3) and Naphthalene(4) in mobile phase; 2µL
 Mobile Phase: 50% Water; 50% Acetonitrile
 Flow Rate: 0.5mL/min
 Detector: UV 254nm
 Temperature: 30 C

Ordering Information

Surface Area: 380m²/g, Pore Size: 100Å

Durashell RP: Surface Area:200m²/g, Pore Size: 150Å

Type	Particle size (µm)	Dimension (mm)	UHP AQ C18	UHP ASB C18
UHPLC	2	2.1×30	UO920302-1A	VS920302-1A
UHPLC	2	2.1×50	UO920502-1A	VS920502-1A
UHPLC	2	2.1×100	UO921002-1A	VS921002-1A
UHPLC	2	4.6×50	UO920505-1A	VS920505-1A
UHPLC	2	4.6×100	UO921005-1A	VS921005-1A
UHPLC	2.5	2.1×30	UO920302-A	VS920302-A
UHPLC	2.5	2.1×50	UO920502-A	VS920502-A
UHPLC	2.5	2.1×100	UO921002-A	VS921002-A
UHPLC	2.5	4.6×50	UO920505-A	VS920505-A
UHPLC	2.5	4.6×100	UO921005-A	VS921005-A



Durashell Columns(C18, C8, Phenyl, NH₂)

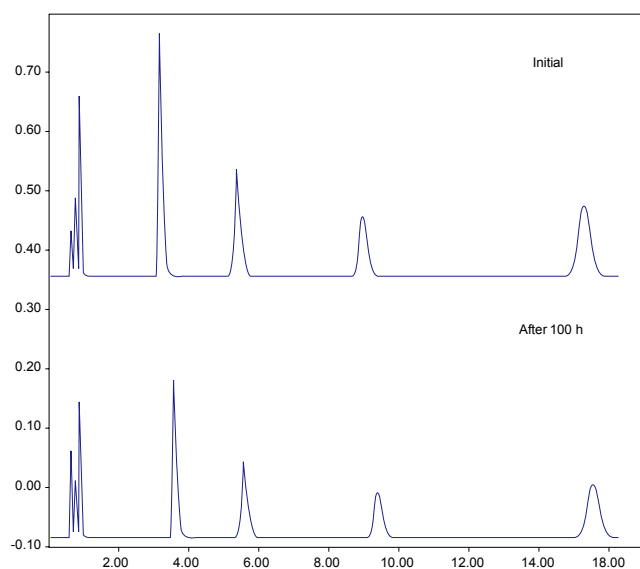
Bonna-Agela's Durashell column has a pH range of 1.5-12.0. Different from the current marketed products that also can be used at high pH, Durashell's stationary phase is made with a dendrimer technology followed by molecular modifications. Bonna-Agela's technology produces a strong hydrophobic protection layer over the silica surface allowing the columns to be used at extremely high and low pH. This technology also reduces excessive hydrophobic interactions between the stationary phase and the compounds, and yet maintains great interfacial kinetics for high efficiency. A line of stationary phases include C18, C8, Phenyl and NH₂.

Characteristics: Metal Impurity < 30ppm; Pore Size 100Å; Specific Surface Area 200m²/g; Available Particle Size: 5µm, 10µm

Main Features:

- Wide pH range (1.5-12.0)
- Minimal silanol activity
- Better efficiency than many other high pH compatible columns
- High loading capacity for basic compounds for preparative applications

High pH Stability



Column: Durashell C18; 4.6x150mm
Mobile Phase: 50% ACN/50% 0.05M Ammonia (pH=9.0)
Flow Rate: 1.5mL/min
Sample: doxepin, nortriptyline, amitriptyline, trimipramine
Temperature: 35 C

Ordering Information

Surface Area: 380m²/g, Pore Size: 100Å

Durashell RP: Surface Area:200m²/g, Pore Size: 150Å

Type	Particle size (µm)	Dimension (mm)	Durashell C18	Durashell NH ₂	Durashell C8	Durashell RP
Fast analysis	3	2.1×30	DC930302-0	DN830302-0	DC830302-0	DS930302-0
Fast analysis	3	2.1×50	DC930502-0	DN830502-0	DC830502-0	DS930502-0
Fast analysis	3	2.1×100	DC931002-0	DN831002-0	DC831002-0	DS931002-0
Fast analysis	3	2.1×150	DC931502-0	DN831502-0	DC831502-0	DS931502-0
G	3	2.1×10,4/pk	DC930102-0	DN830102-0	DC830102-0	DS930102-0
DCG	3	2.1×10,4/pk	DC930102-0S	DN830102-0S	DC830102-0S	DS930102-0S
Fast analysis	3	4.6×50	DC930505-0	DN830505-0	DC830505-0	DS930505-0
Fast analysis	3	4.6×100	DC931005-0	DN831005-0	DC831005-0	DS931005-0
Fast analysis	3	4.6×150	DC931505-0	DN831505-0	DC831505-0	DS931505-0
Analytical	5	2.1×30	DC950302-0	DN850302-0	DC850302-0	DS950302-0
Analytical	5	2.1×50	DC950502-0	DN850502-0	DC850502-0	DS950502-0
Analytical	5	2.1×100	DC951002-0	DN851002-0	DC851002-0	DS951002-0
Analytical	5	2.1×150	DC951502-0	DN851502-0	DC851502-0	DS951502-0
Analytical	5	4.6×50	DC950505-0	DN850505-0	DC850505-0	DS950505-0
Analytical	5	4.6×100	DC951005-0	DN851005-0	DC851005-0	DS951005-0
Analytical	5	4.6×150	DC951505-0	DN851505-0	DC851505-0	DS951505-0
Analytical	5	4.6×200	DC952005-0	DN852005-0	DC852005-0	DS952005-0
Analytical	5	4.6×250	DC952505-0	DN852505-0	DC852505-0	DS952505-0
G	5	4.6×10,4/pk	DC950105-0	DN850105-0	DC850105-0	DS950105-0
DCG	5	4.6×10,4/pk	DC950105-0S	DN850105-0S	DC850105-0S	DS950105-0S
Semi-preparative	5	10×150	DC951510-0	DN851510-0	DC851510-0	DS951510-0
Semi-preparative	5	10×250	DC952510-0	DN852510-0	DC852510-0	DS952510-0
Preparative	5	21.2×50	DC950520-0	DN850520-0	DC850520-0	DS950520-0
Preparative	5	21.2×150	DC951520-0	DN851520-0	DC851520-0	DS951520-0
Preparative	5	21.2×250	DC952520-0	DN852520-0	DC852520-0	DS952520-0
G	5	10×10	DC950110-0S	DN850110-0S	DC850110-0S	DS950110-0S
G	5	21.2×10	DC950120-0	DN850120-0	DC850120-0	DS950120-0
Preparative	5	30×100	DC951030-0	DN851030-0	DC851030-0	DS951030-0
Preparative	5	30×150	DC951530-0	DN851530-0	DC851530-0	DS951530-0
Preparative	5	30×250	DC952530-0	DN852530-0	DC852530-0	DS952530-0
Semi-preparative	10	10×150	DC901510-0	DN801510-0	DC801510-0	DS901510-0
Semi-preparative	10	10×250	DC902510-0	DN802510-0	DC802510-0	DS902510-0
Preparative	10	21.2×50	DC900520-0	DN800520-0	DC800520-0	DS900520-0
Preparative	10	21.2×150	DC901520-0	DN801520-0	DC801520-0	DS901520-0
Preparative	10	21.2×250	DC902520-0	DN802520-0	DC802520-0	DS902520-0
G	10	10×10	DC900110-0S	DN800110-0S	DC800110-0S	DS900110-0S
G	10	21.2×10	DC900120-0	DN800120-0	DC800120-0	DS900120-0
Preparative	10	30×100	DC901030-0	DN801030-0	DC801030-0	DS901030-0
Preparative	10	30×150	DC901530-0	DN801530-0	DC801530-0	DS901530-0
Preparative	10	30×250	DC902530-0	DN802530-0	DC802530-0	DS902530-0
Preparative	10	50×150	DC901550-0	DN801550-0	DC801550-0	DS901550-0
Preparative	10	50×250	DC902550-0	DN802550-0	DC802550-0	DS902550-0

G: Guard Carriage

DCG: DC Guard Carriage*(Direct-connection Guard Cartridge Holder)



Venusil HLP

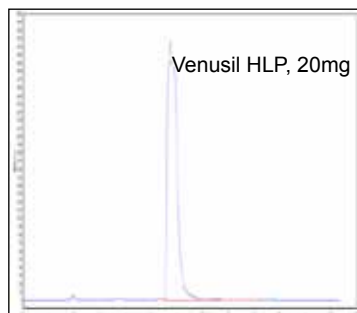
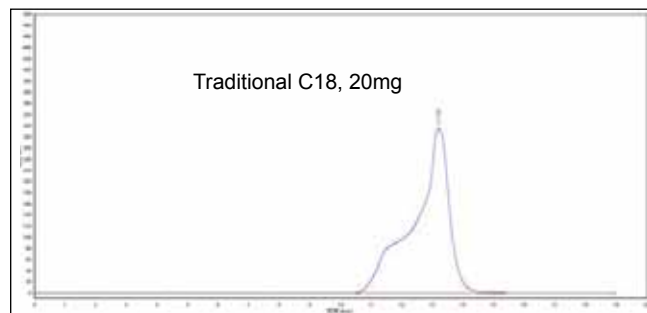
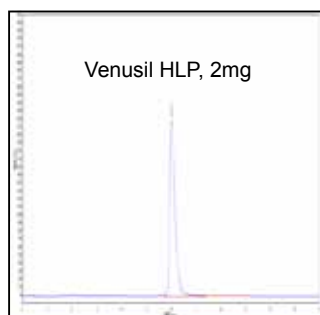
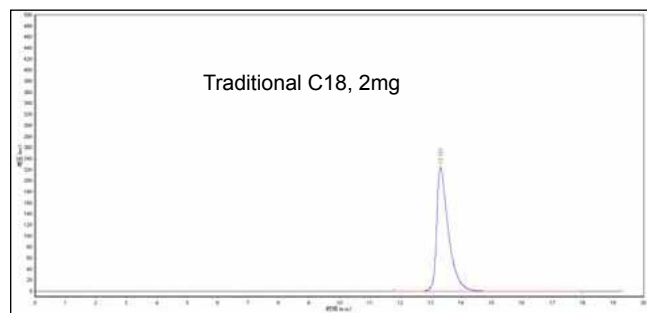
Venusil HLP columns are reversed-phase columns based on Bonna-Agela' Amide technology. The stationary phase is made from high purity spherical silica particles bonded with alkyl chain molecules embedded amide polar group that literally capped the silica's residual silanols from highly basic analytes. It can be used to replace Waters Symmetry Shield RP18 and Agilent Bonus RP.

Characteristics: Metal Impurity<10ppm; Pore Size 100Å; Specific: Surface Area 380m²/g; Available Particle Size: 5µm

Main Features:

- Greatly improved peak shape for basic compounds
- Enhanced retention and separation for polar compounds and steric isomers .
- High loading capacity for polar compounds for preparative applications

High Loading Capacity



Column: Traditional C18, 5µm, 100Å, 20×150mm;

Venusil HLP, 5µm, 100Å, 20×150mm

Sample: Amitriptyline

Mobile Phase: MeOH:0.1% Formic acid=80:20

Flow Rate: 20mL / min

UV Detection: 254nm

Temp: ambient

Ordering Information

Surface Area: 380m²/g, Pore Size: 100Å

Type	Particle size (µm)	Dimension (mm)	Venusil HLP
Analytical	5	4.6×50	VHL950505-0
Analytical	5	4.6×100	VHL951005-0
Analytical	5	4.6×150	VHL951505-0
Analytical	5	4.6×200	VHL952005-0
Analytical	5	4.6×250	VHL952505-0
G	5	4.6×10,4/pk	VHL950105-0
DCG	5	4.6×10,4/pk	VHL950105-0S

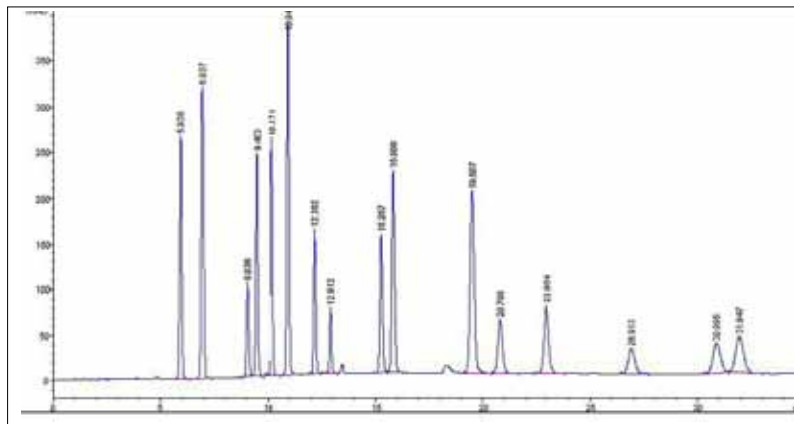
Venusil PAH

Venusil PAH column is a polymerically bonded C18 column. It is recommended for the separation of PAHs and steric isomers of the aromatic compounds. PAHs are considered priority pollutants and the analysis of these potentially carcinogenic compounds in water, soil and food is of major importance.

Characteristics: Metal Impurity<10ppm; Pore Size 200Å; Specific Surface Area 200m²/g; Available Particle Size: 5µm, 3µm

Main Features:

- High resolution separation of PAHs
- Robust and reproducible performance
- Good for applications requiring the separation of geometric isomers



Sample: 16 PAHs (MeOH:methylene chloride=1:1)
 Column: Venusil PAH, 5µm, 200Å, 4.6×250mm
 Detection: UV 254nm
 Flow Rate: 1.2mL/min
 Mobile Phase:

Time (min)	MeOH (%)	H ₂ O (%)
0	85	15
2	85	15
7	95	5
40	95	5

- 1.Naphthalen; 2.Acenaphene; 3.Acenaphthylene; 4.Fluorene; 5.Anthracene; 6.Phenanthrene; 7.Fluoranthene; 8.Pyrene;
 9.Benzoanthracene; 10.Chrysene; 11.Benzo[b]fluorathene; 12.Benzo[k]fluorathene; 13. Benzo[a]Pyrene; 14. Benzo[ghi]Pyrene;
 15.Dibenz(a,h)anthracene; 16.Indeno[1,2,3,-cd]pyrene

Ordering Information

Surface Area: 200m²/g, Pore Size: 200Å

Type	Particle size (µm)	Dimension (mm)	Venusil PAH
Analytical	5	4.6×250	VP952505-L
G	5	4.6×10,4/pk	VP950105-L



Venusil XBP COOH

Venusil XBP COOH columns are made of the high purity spherical silica particle, bonded with carboxylic acid functional group. They can be used for the separation of basic, water-soluble compounds and bio-molecules.

Characteristics: Metal Impurity < 10ppm; Pore Size 100Å; Specific Surface Area 380m²/g; Available Particle Size: 5µm

Ordering Information

Surface Area: 380m²/g, Pore Size: 100Å

Type	Particle size (µm)	Dimension (mm)	Venusil XBP COOH
Analytical	5	2.1×30	VO950302-0
Analytical	5	2.1×50	VO950502-0
Analytical	5	2.1×100	VO951002-0
Analytical	5	2.1×150	VO951502-0
Analytical	5	4.6×50	VO950505-0
Analytical	5	4.6×100	VO951005-0
Analytical	5	4.6×150	VO951505-0
Analytical	5	4.6×250	VO952505-0
G	5	4.6×10,4pk	VO950105-0
DCG	5	4.6×10,4pk	VO950105-0S

G: Guard Cartridge

DCG: DC Guard Cartridge*(Direct-connection Guard Cartridge Holder)

Venusil PFP---USPL43

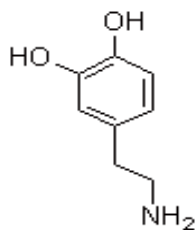
Venusil PFP (perfluorophenyl) columns build on the performance of Venusil columns by providing excellent peak shapes while also offering alternative selectivity in reversed phase chromatography compared to alkyl chain phases. Venusil PFP columns help to extend the range of selectivities that are provided in reversed phase chromatography. This phase will increase retention and resolution, and is particularly suited to separation of halogenated species as well as compounds containing hydroxyl, carboxyl, nitro or other polar groups. The additional mechanisms of the PFP phase, such as steric selectivity of the analyte species and dipole interactions, offer alternative selectivity.

Characteristics: Metal Impurity < 10ppm; Pore Size 120Å; Specific Surface Area 320m²/g; Available Particle Size: 5µm.

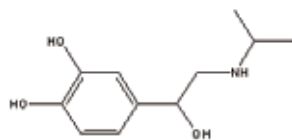
Main Features:

- Extra retention for halogenated species
- Unique selectivity for compounds containing benzyl, nitrobenzol and conjugate system
- Excellent peak shape and sensitivity for positional isomers and polar analytes
- Analysis of complex taxane samples

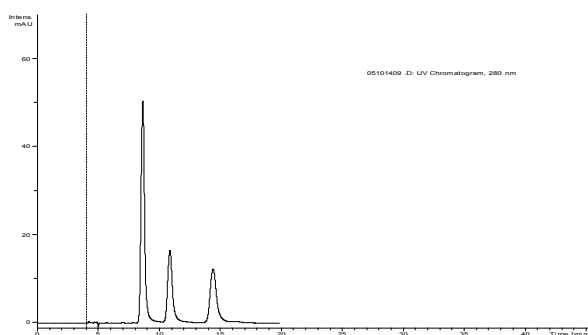
Dopamine and Its Metabolin



Dopamine



Isoprenaline



Sample: Dopamine Isoprenaline Soprenaline
 Column: Venusil PFP 4.6×250mm 5µm
 Part No.: VF952505-0
 Mobile Phase: MeOH: CH₃COOH /CH₃COONH₄
 Buffer (pH 4.5) =15:85
 Detection: UV 280nm
 Flow Rate: 0.8mL/min

Ordering Information

Surface Area: 380m²/g, Pore Size: 100Å

Type	Particle size (µm)	Dimension (mm)	Venusil PFP
Analytical	5	4.6×50	VF950505-0
Analytical	5	4.6×100	VF951005-0
Analytical	5	4.6×150	VF951505-0
Analytical	5	4.6×200	VF252005-0
Analytical	5	4.6×250	VF952505-0
G	5	4.6×10,4/pk	VF950105-0
DCG	5	4.6×10,4/pk	VF950105-0S

G: Guard Carriage

DCG: DC Guard Carriage*(Direct-connection Guard Cartridge Holder)



Chiral columns

Normal Phase Column

Normal phase chiral columns of Bonna-Agela Technologies are based on modificational celluloses and starches. This kind of chiral columns represent the most effective means of analyzing chiral compounds and obtaining pure enantiomers, i.e., to levels of >99% enantiomeric excess.

Main Features:

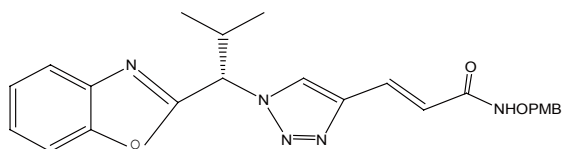
- Hydrogen bonding, π - π and the "embedded" composite integrated mechanism
- Chiral AD-H and OD-H columns are available for 80% chiral compounds
- Wide selectivity and high loading capacity

Chiral AD H

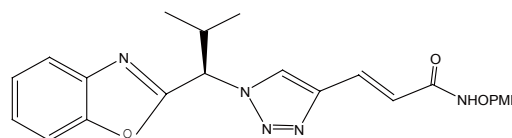
Overlayered Radical: Amylose - (3,5-dimethylphenyl carbamate)

Separation Scale: Amide, Aromatic, carbonyl-group, nitro-group, sulfonyl-group, cyano-group, hydroxide radical, amine and carboxylic acid compounds

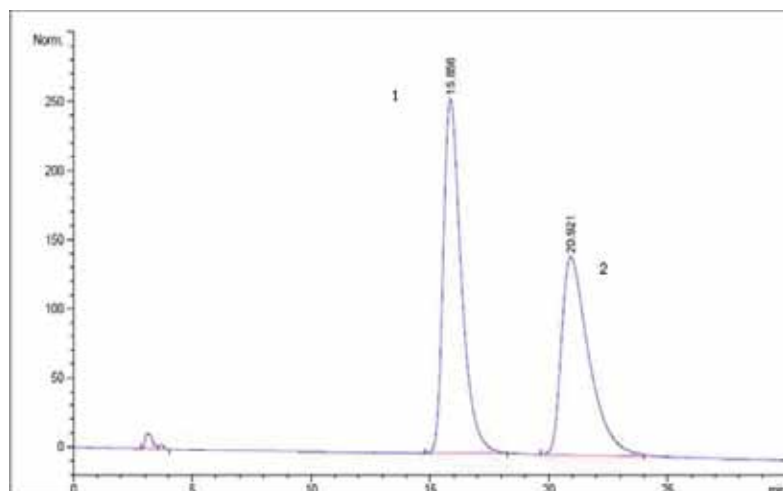
Example:



L-val PMB



D-val PMB



1: L-val PMB; 2: D-val PM

Column: Chiral AD H, 4.6×250mm, 5 μ m, 1000Å

Mobile Phase: Hexane:isopropanol=80:20

Detection: 254nm

Flow Rate: 1.0mL/min

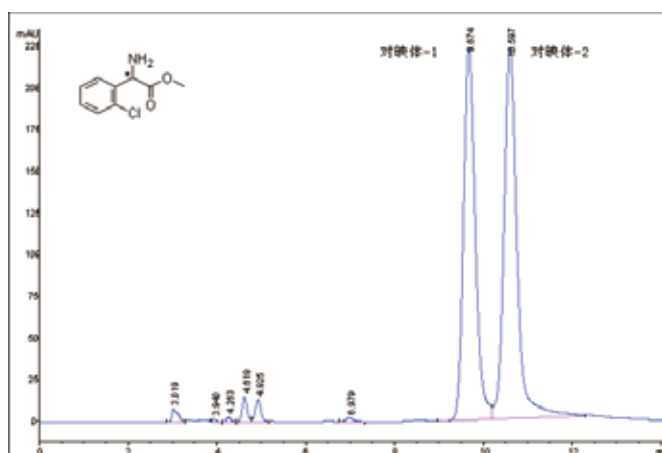
Temperature: 25°C

Chrial OD H

Overlayered Radical: Cellulose - (3,5 - dimethylphenyl carbamate)

Separation Scale: a phase suitable for the separation of β -blocker class and steroids, such as DHA, chlorine heart acyl amines, flavanones, metoprolol, etc

Example:



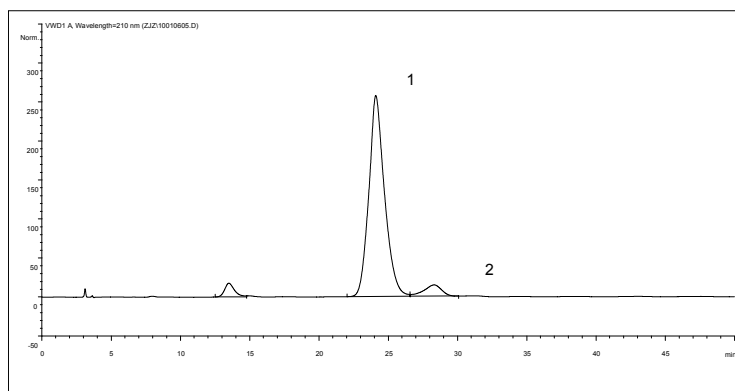
Column: Chrial OD H, 4.6×250mm,5 μ m,1000Å
Mobile Phase: Hexane:Isopropanol=98:2
Flow Rate: 1.0mL/min
Detection: 220nm
Temperature: 25°C

Chrial OJ H

Overlayered Radical: Cellulose - [4 - methyl benzoate]

Separation Scale: the Chrial OJ H column is used for the separation of carbonyl, amido, aryl, nitro, cyano, sulfonyl, hydroxyl, amine and carboxylic acid compounds.

Example:



Column: Chiral OJ H, 4.6×250mm,5 μ m,1000Å
Mobile Phase: Hexane:Isopropanol=93:7
Flow Rate: 1.0mL/min
Detection: 210nm
Temperature: 30°C



Chemical Bonded column

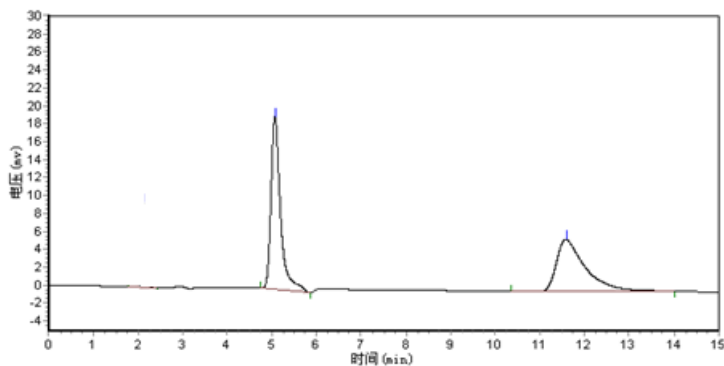
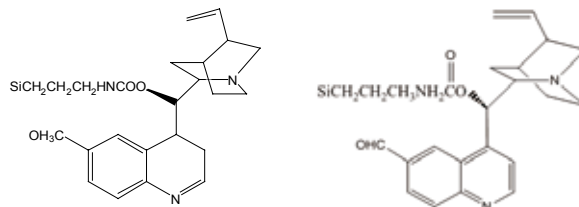
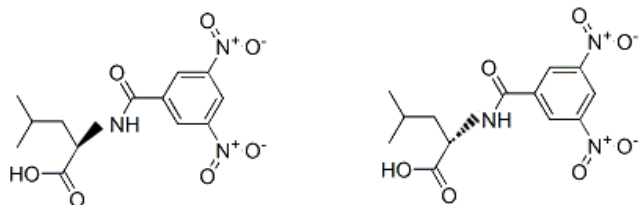
Chrial Amide-1

Chiral Amide-1 is packed with 5 μ m, 300Å silica bonding with a chiral compound whose structure is demonstrated as below:

Consider this column as the first option to separate amide chrial compounds:

- Can be used as reverse phase and normal phase
- Unique selectivity and high separation
- More stable and longer column lifetime

Example: N-(3,5-Dinitrobenzoyl)-DL-leucine



Column: Venusil Chiral Amide-1, 5 μ m, 300Å, 4.6 \times 150mm
 Mobile Phase: Methonal/10mM KH₂PO₄(pH=6.86)+0.5mM
 Tetrabutyl ammonium hydroxide=30/70
 Flow Rate: 1.0mL/min
 Detection: UV254nm
 Injection: 5 μ L

Ordering Information

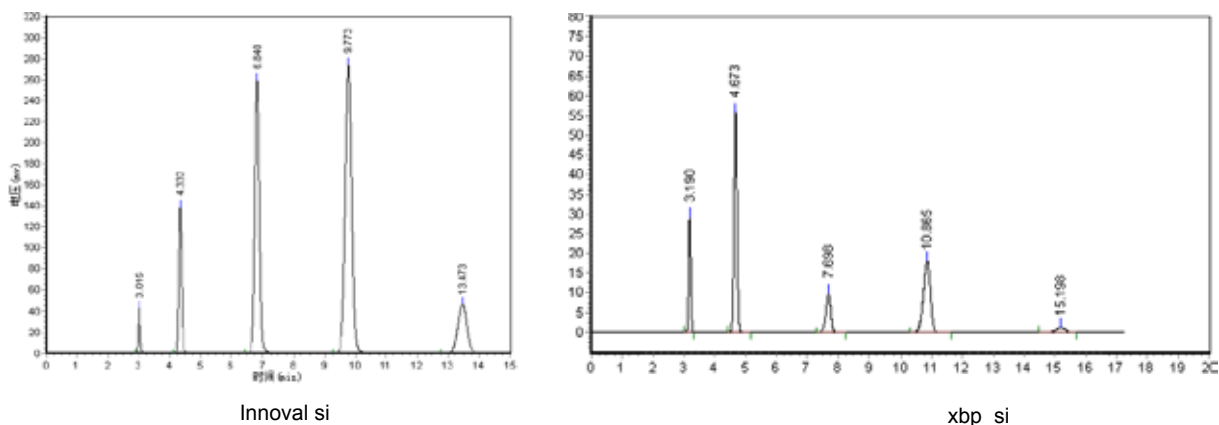
Type	Particle size (μ m)	Dimension (mm)	Chrial AD-H	Chrial OD-H	Chrial OJ-H	Chrial Amide-1
Analytical	5	4.6 \times 150	AD951505-0	OD951505-0	OJ951505-0	AM951505-1
Analytical	5	4.6 \times 250	AD952505-0	OD952505-0	OJ952505-0	AM952505-1
Preparative	5	20 \times 250	AD952520-0	OD952520-0	OJ952520-0	AM952520-1
Preparative	5	30 \times 250	AD952530-0	OD952530-0	OJ952530-0	AM952530-1

Innoval Columns

Innoval column is made of the purity silica particle that is prepared by the ultra pure aggregation of silica sols. A advantage of sorbents is easily and reproducibly packed into efficient columns. A desirable property of silica supports is that the surface can be chemically modified with a large variety of bonded phases having different functionalities. Innoval column has the best performance to cost value.

Characteristics: Pore Size 100Å; Available Particle Size:6µm, Specific: Surface Area 240m²/g

Balance Retention for Hydrophilic and Hydrophobic Compounds



Sample: toluene, nitrobenzene, o-nitroaniline, m-nitroaniline, p-nitroaniline
 Mobile Phase: Isooctane:ethanol:water=85:15:0.3
 Flow Rate: 1.00mL/min
 Temperature: room temperature
 Detector: UV 254nm

Ordering Information

Surface Area: 380m²/g, Pore Size: 100Å

Type	Particle size (µm)	Dimension (mm)	Innoval Silica	Innoval C18
Analytical	6	4.6×150	ISi 961505-0	IX961505-0
Analytical	6	4.6×250	ISi 962505-0	IX962505-0
Semi-preparative	6	10×150	ISi 961510-0	IX961510-0
Semi-preparative	6	10×250	ISi 962510-0	IX962510-0
Preparative	6	21.2×50	ISi 960520-0	IX960520-0
Preparative	6	21.2×150	ISi 961520-0	IX961520-0
Preparative	6	21.2×250	ISi 962520-0	IX962520-0
Preparative	6	30×100	ISi 961030-0	IX961030-0
Preparative	6	30×150	ISi 961530-0	IX961530-0
Preparative	6	30×250	ISi 962530-0	IX962530-0



Featured Products!

Unisol C18

A Slightly Polar, 100% Water Compatible and Universal Reverse Phase

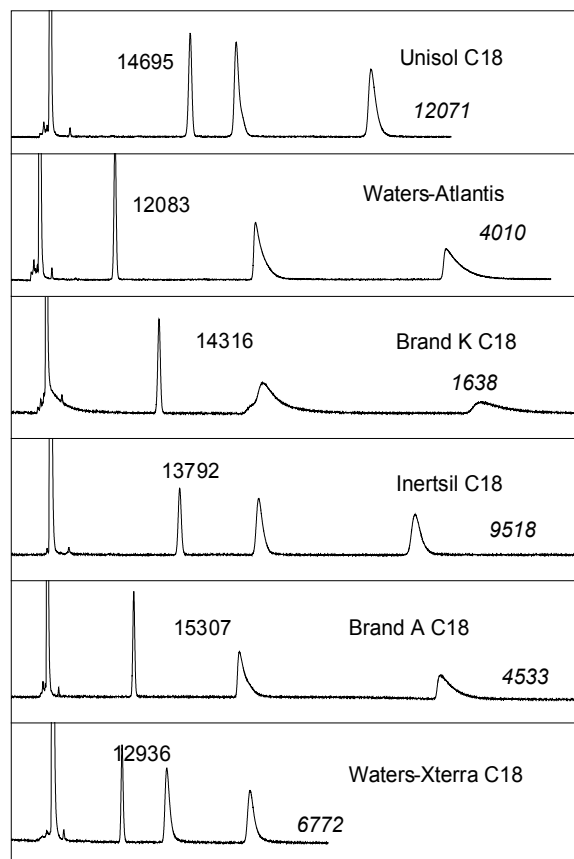
A unique and universal C18 HPLC phase made by our patented Unisol Technology. Unprecedented separation performance for compounds with a wide range of properties from hydrophilic to hydrophobic: polar, semi-polar and non-polar compounds.

Characteristics: Metal Impurity <10ppm; Pore Size 100Å; Specific Surface Area 410m²/g; Carbon Loading 17%; Single end-cap; Available Particle Size: 2.5µm, 3µm, 5µm, 10µm

Consider this column as the first option for your HPLC method development

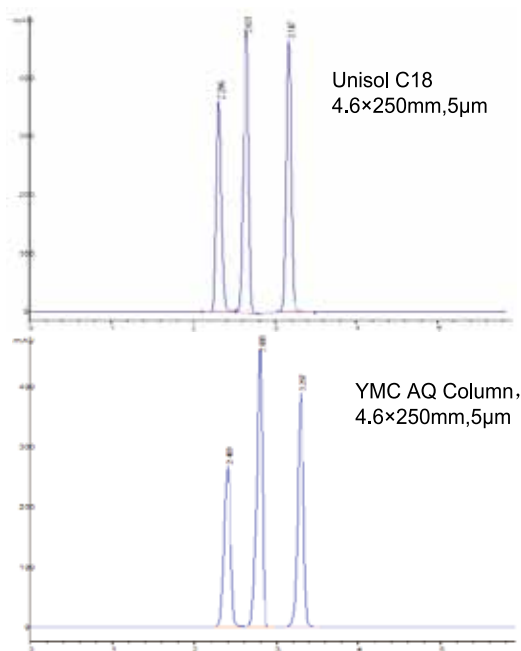
- One of the most universal reverse phase columns
- Great inertness and efficiency for basic compounds
- Enhanced retention of hydrophilic compounds
- 100% aqueous compatibility
- Robust and reproducible performance
- Wide pH range (1.5-9.0)
- Low bleed and high sensitivity for LC-MS

Great Inertness and Efficiency for Basic Compounds



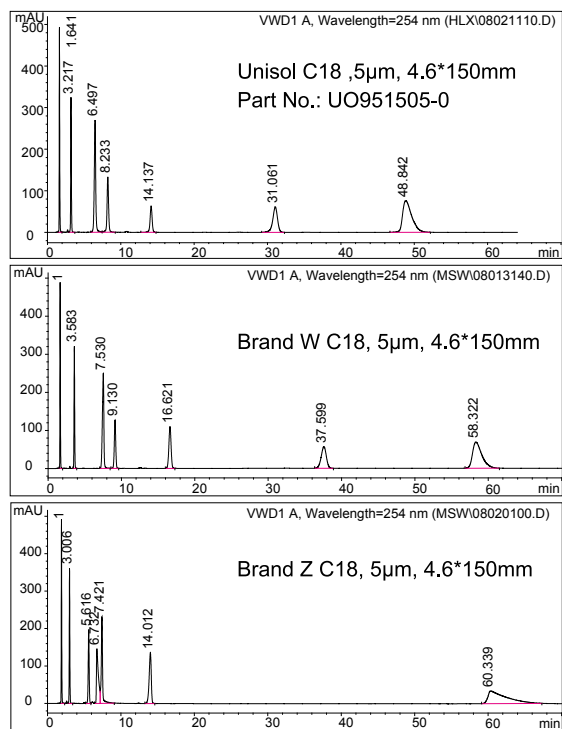
Sample: uracil, toluene, doxepin, amitriptyline;
Column: 4.6x150mm, 5µm;
Mobile Phase: 10mM sodium phosphate (pH=7.0) in 60% ACN;
Temperature: 30 C ;
Flow Rate: 1mL/min;
The plate numbers in regular font are for toluene, the plate numbers in italic are for amitriptyline.

Good Retention for Polar Compounds



Mobile Phase: A: Water (Contain 0.01mM NaH₂PO₄ and 0.01mM Citric Acid, pH=4.5);
B: ACN; A:B=95:5
Sample: Cytosine, Uracil, Guanine
Temperature: 35 °C
Detection: 254nm

Balanced Retention for Hydrophilic and Hydrophobic Compounds

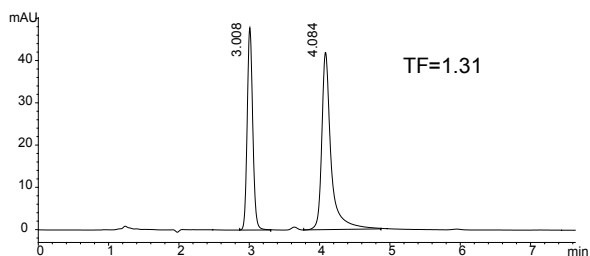


Mobile Phase: 35% 20mM KH₂PO₄ pH=7.0, 65% Methanol
Temperature: 23 °C
Flow: 1mL/min
Detection: UV 254nm
Sample: Uracil
Propranolol hydrochloride
Butyl Phthalate
Dimethyl Phthalate
Naphthalene
Acenaphthene
Amitriptyline

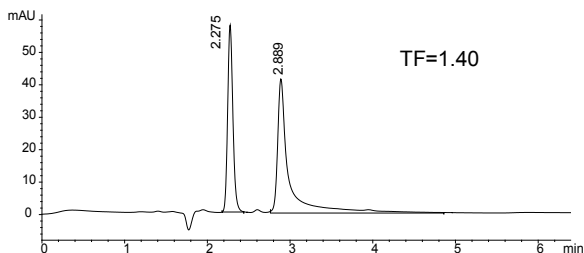


Extremely Low Metal Effects

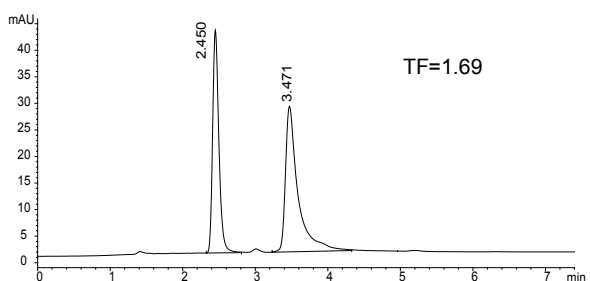
Unisol C18 5 μ m, 4.6mm \times 150mm



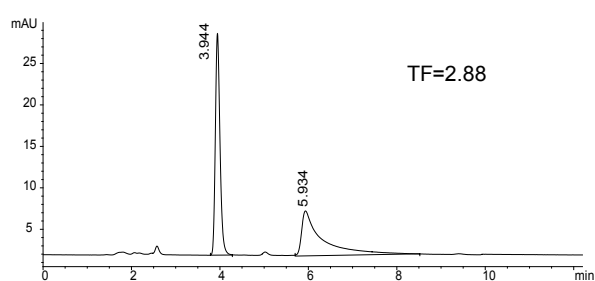
Brand W, AQ Column 5 μ m, 4.6mm \times 150mm



Brand H, C18 Column 5 μ m, 4.6mm \times 150mm



Brand Z, C18 Column 5 μ m, 4.6mm \times 150mm



Mobile Phase: A:Water; B:Methanol; A:B=65:35

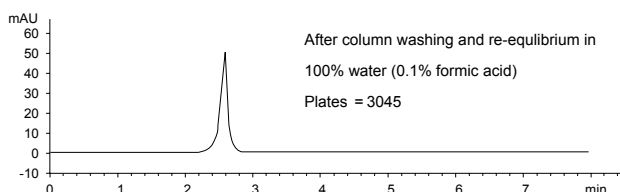
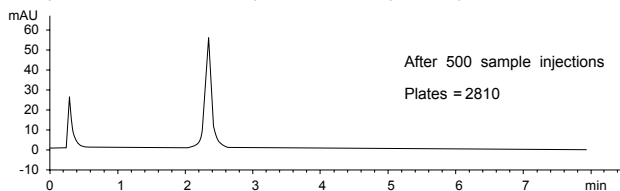
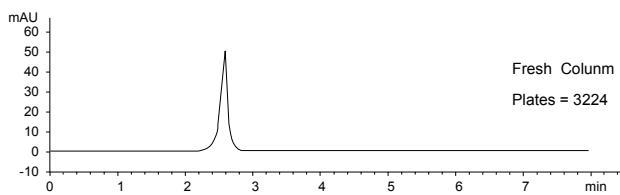
Flow Rate: 1mL/min

Temperature: 25 C

Detection: UV 230nm

Sample: 2,3-Dihydroxynaphthalene+2,7-Dihydroxynaphthalene

Good Tolerance of Directly Injected Biological Matrix



Sample: uridine in calf blood plasma (diluted 20 times with 0.1% formic acid)

Injection: 1 μ l (not be cleaned up with SPE)

Column: Unisol C18 2.1 \times 50mm, 5 μ m

Temperature: 30 C

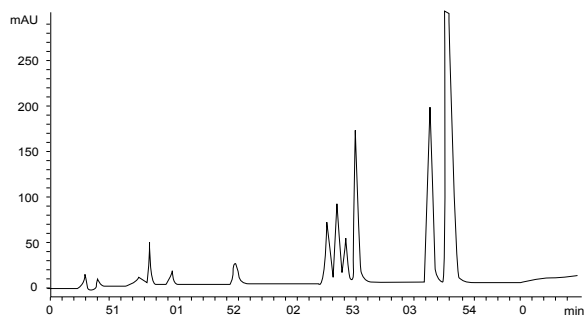
Flow Rate: 0.3mL/min

Mobile Phase: 0.1% formic acid solution (100% aqueous phase)

Run Time: 8min

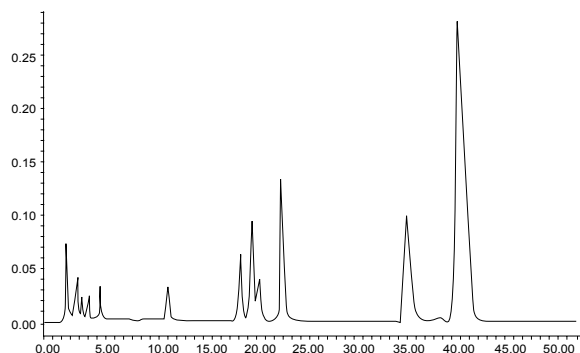
After 500 injection, wash with methanol/0.1% formic acid solution=50/50 for 30mins, column temperature 40 C ; rinse with 95% MeOH for 30mins, column temperature 45 C .

Enable Methods to be Compatible with LC-MS



Analysis of Quaternary Ammonium Alkaloids from Copitidis with a Non-Volatile **Ion Pair Reagent** Using Brand Z C18 Column.

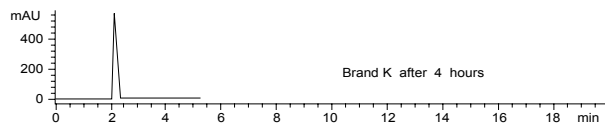
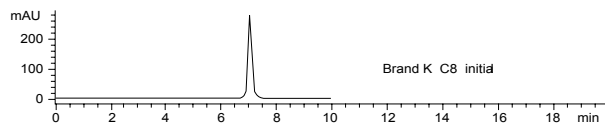
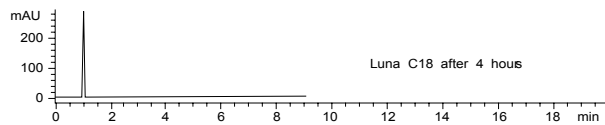
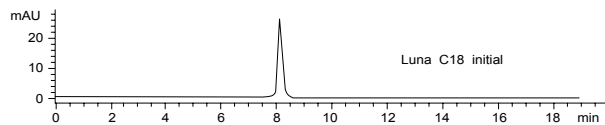
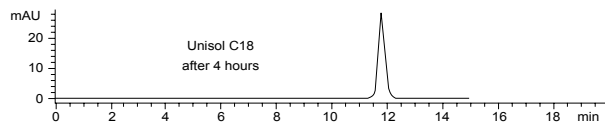
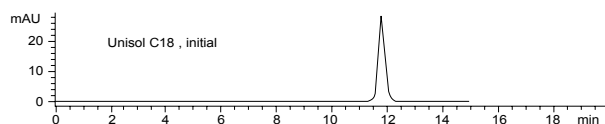
Mobile Phase: ACN:0.05 mol/L KH_2PO_4 Aq.
(40:60, Contain 0.015 mol/L SDS)



Analysis of Quaternary Ammonium Alkaloids from Copitidis without a Non-Volatile Ion Pair Reagent Using Unisol C18 Column .

Mobile Phase: Water+0.2% TFA:acetonitrile=75:25

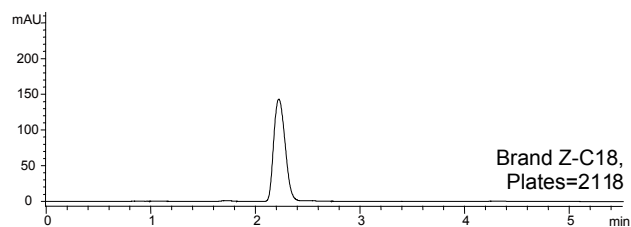
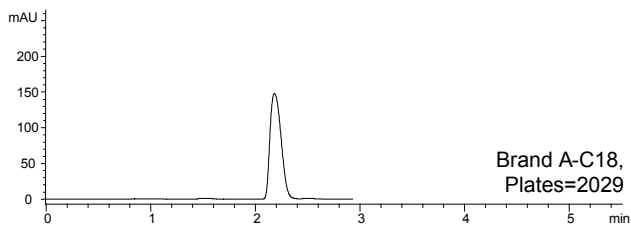
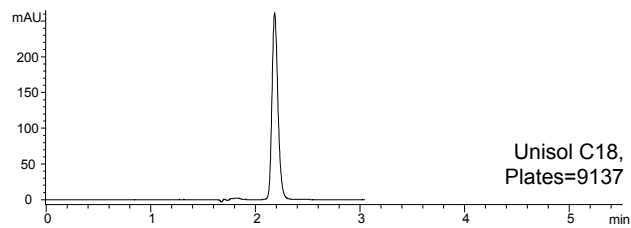
Compatibility with 100% Aqueous Mobile Phase



Sample: Uridine
Column: 4.6x150mm,5 μm
Mobile Phase: 100% water
Flow Rate: 1mL/min; the flow was stopped for 5 minutes during the testing period for each column
Temperature: 30 $^{\circ}\text{C}$



Greater Volume Loading Capacity Than Other Brands

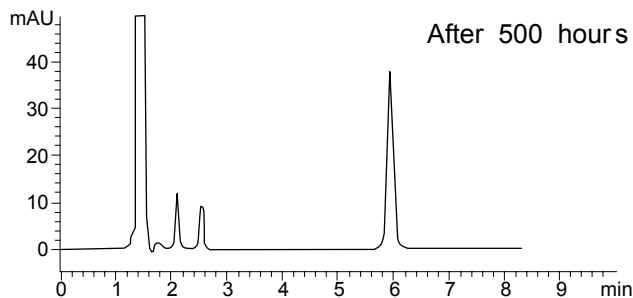
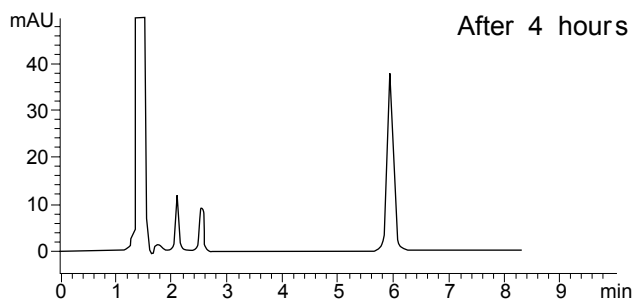


Large Volume Injection (Injection volume=100 μ L)
Sample: 4-methoxybenzenesulfon amide,
10 μ g/mL in MeOH/Water (1:1)
Column: 4.6x150mm,5 μ m
Mobile Phase: MeOH/Water
Flow Rate: 1mL/min
Temperature: 30 C

017

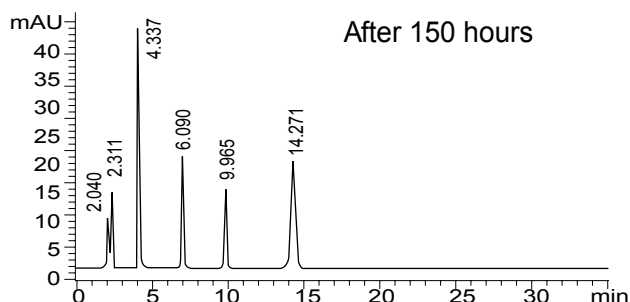
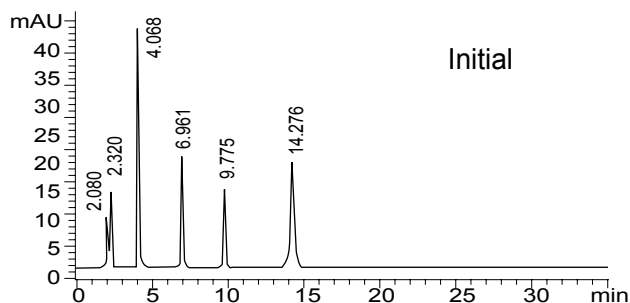
HPLC Columns

Stability of Unisol C18 at pH=1.5



Sample: Uracil, Doxepin, Amitriptyline, Toluene.
Column: Unisol C18, 4.6x150mm, 5 μ m
Mobile Phase: TFA (0.25%, pH=1.5) in 60% acetonitrile
Flow Rate: 1mL/min.;
Temperature: 40 C

Perfect Peak Symmetry and Good Stability at Mid-pH for Basic Compounds



Sample: Uracil, Doxepin, Nortriptyline, Amitriptyline, Trimipramine
Column: Unisol C18, 4.6x250mm, 5µm
Mobile Phase: 0.01M sodium phosphate:ACN=25:75, pH=7.0
Flow Rate: 1.3mL/min.
Temperature: 30 °C

Unisol Amide (HILIC)

Unisol Amide stationary phase is made from high purity spherical silica particles bonded with a neutral hydrophilic amide group. It can be used for normal phase, reverse phase, or hydrophilic interaction HPLC. The Unisol Amide (NP) column is a good replacement for NH₂ and Silica columns that are currently marketed as HILIC. Compared with traditional silica and NH₂ columns, the Unisol Amide columns have better reproducibility and column lifetime. It is especially useful for the separation of strong hydrophilic compounds, whether they are acidic, basic or neutral. It is compatible with aqueous mobile phases in the pH range of 2.0-8.0. It has selectivity very different from most of conventional stationary phases.

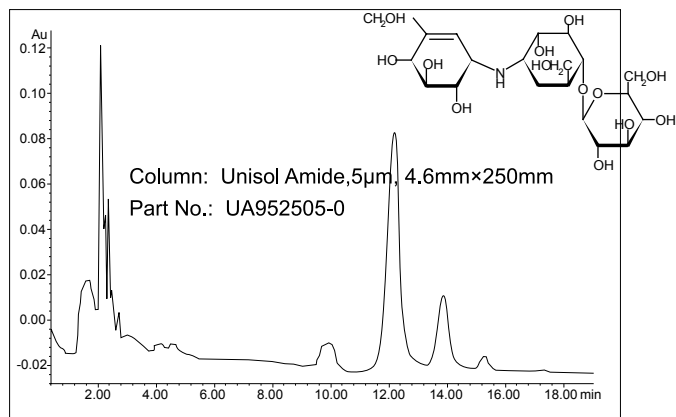
Characteristics: Metal Impurity < 10ppm; Pore Size 100Å; Specific: Surface Area 410m²/g; Carbon Loading 6%; Single End-cap; Available Particle Size: 3µm, 5µm, 10µm

Main features:

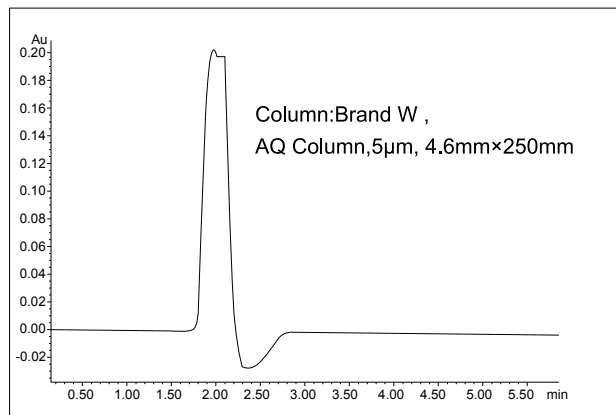
- Strong retention of polar compounds in HILIC mode
- Very unique selectivity and good complementary to the conventional reverse phase
- Can be used as reverse phase, normal phase and HILIC phase
- More robust and reproducible performance than silica and amino stationary phase
- 100% aqueous and 100% organic solvents compatible
- pH range (2.0-8.0)



Separation of Validamycin

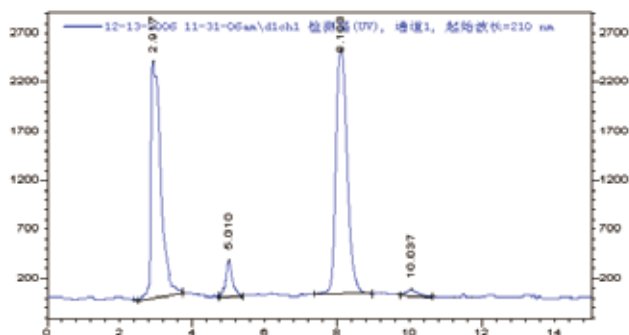


Mobile Phase: A: 0.1% TFA in Water; B: Acetonitrile
Gradient: 40% A to 85% A in 30 min
Flow Rate: 1mL/min
Temperature: 25 C
Detection: UV 210nm
Sample: Validamycin



Mobile Phase: A: 0.005M NaH₂PO₄ (pH=7.0);
B: MeOH; A:B=98:2
Flow Rate: 1mL/min
Temperature: 25 C
Detection: UV 210nm
Sample: Validamycin

Separation of Shikimic Acid

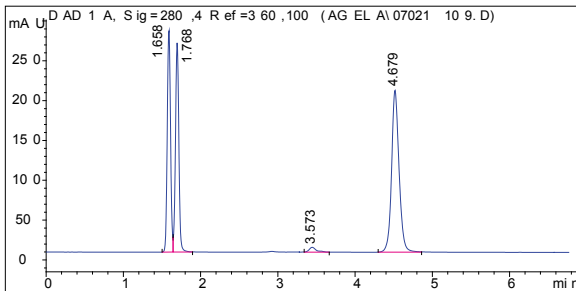
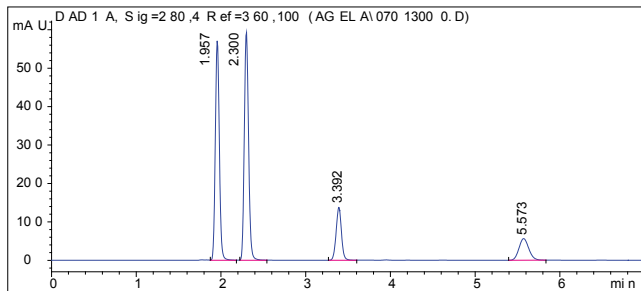


Column: Unisol Amide, 5 μ m, 4.6mm \times 150mm
Part No.: UA951505-0
Mobile Phase: A: 1% Fomic Acid in Water; B: Acetonitrile
Gradient: 60% A to 90% A in 20 min
Flow Rate: 1mL/min
Temperature: 25 C
Detection: UV 210nm
Sample: Shikimic Acid

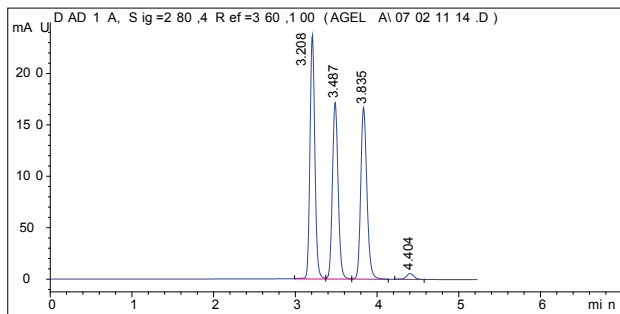
Water-soluble Vitamins

Unisol Amide, 5µm, 4.6mm×150mm
 Part No.: UA951505-0

Brand W, NH₂ Column, 5µm, 4.6×150mm



Brand W Silica Column, 5µm, 4.6×150mm



Mobile Phase: A:0.1% TFA in Water; B:0.1% TFA in Acetonitrile
 A:B=90:10
 Flow Rate: 1mL/min
 Temperature: 30 °C
 Detection: UV 280nm
 Sample: VB1+VB6+VC+VB2

Ordering Information

Surface Area: 410m²/g, Pore Size: 100Å

Type	Particle Size(µm)	Dimension (mm)	Unisol C18	Unisol Amide(HILIC)
Fast analysis	2.5	2.1×30	UO920302-0	
Fast analysis	2.5	2.1×50	UO920502-0	
Fast analysis	2.5	2.1×100	UO921002-0	
Fast analysis	2.5	3.0×30	UO920303-0	
Fast analysis	2.5	3.0×50	UO920503-0	
Fast analysis	2.5	3.0×100	UO921003-0	
Fast analysis	2.5	4.6×50	UO920505-0	
Fast analysis	2.5	4.6×100	UO921005-0	
Fast analysis	3	2.1×30	UO930302-0	VH930302-0
Fast analysis	3	2.1×50	UO930502-0	VH930502-0
Fast analysis	3	2.1×100	UO931002-0	VH931002-0
Fast analysis	3	2.1×150	UO931502-0	VH931502-0
G	3	2.1×10,4/pk	UO930102-0	VH930102-0
DCG	3	2.1×10,4/pk	UO930102-0S	VH930102-0S
Fast analysis	3	3.0×30	UO930303-0	VH930303-0
Fast analysis	3	3.0×50	UO930503-0	VH930503-0
Fast analysis	3	3.0×100	UO931003-0	VH931003-0
Fast analysis	3	4.6×50	UO930505-0	VH930505-0
Fast analysis	3	4.6×100	UO931005-0	VH931005-0
Fast analysis	3	4.6×150	UO931505-0	VH931505-0



Bonna-Agela Technologies

BETTER SOLUTION FOR CHROMATOGRAPHY

Surface Area: 410m²/g, Pore Size: 100Å

Type	Particle Size(μm)	Dimension (mm)	Unisol C18	Unisol Amide(HILIC)
Analytical	5	2.1×30	UO950302-0	
Analytical	5	2.1×50	UO950502-0	
Analytical	5	2.1×100	UO951002-0	
Analytical	5	2.1×150	UO951502-0	
Analytical	5	3.0×30	UO950303-0	
Analytical	5	3.0×50	UO950503-0	
Analytical	5	3.0×100	UO951003-0	
Analytical	5	4.6×50	UO950505-0	
Analytical	5	4.6×100	UO951005-0	VH951005-0
Analytical	5	4.6×150	UO951505-0	VH951505-0
Analytical	5	4.6×250	UO952505-0	VH952505-0
G	5	4.6×10,4/pk	UO950105-0	VH950105-0
DCG	5	4.6×10,4/pk	UO950105-0S	VH950105-0S
Semi-preparative	5	10×150	UO951510-0	VH951510-0
Semi-preparative	5	10×250	UO952510-0	VH952510-0
Preparative	5	21.2×50	UO950520-0	VH950520-0
Preparative	5	21.2×150	UO951520-0	VH951520-0
Preparative	5	21.2×250	UO952520-0	VH952520-0
G	5	10×10	UO950110-0S	VH950110-0S
G	5	21.2×10	UO950120-0	VH950120-0
Preparative	5	30×100	UO951030-0	VH951030-0
Preparative	5	30×150	UO951530-0	VH951530-0
Preparative	5	30×250	UO952530-0	VH952530-0
Semi-preparative	10	10×150	UO901510-0	VH901510-0
Semi-preparative	10	10×250	UO902510-0	VH902510-0
Preparative	10	21.2×50	UO900520-0	VH900520-0
Preparative	10	21.2×150	UO901520-0	VH901520-0
Preparative	10	21.2×250	UO902520-0	VH902520-0
G	10	10×10	UO900110-0S	VH900110-0S
G	10	21.2×10	UO900120-0	VH900120-0
Preparative	10	30×100	UO901030-0	VH901030-0
Preparative	10	30×150	UO901530-0	VH901530-0
Preparative	10	30×250	UO902530-0	VH902530-0
Preparative	10	50×150	UO901550-0	VH901550-0
Preparative	10	50×250	UO902550-0	VH902550-0

G: Guard Carriage

DCG: DC Guard Carriage*(Direct-connection Guard Cartridge Holder)

New Venusil ASB Series Columns (C3, C1 and Phenyl)

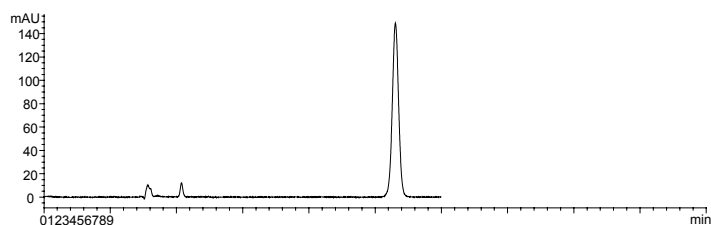
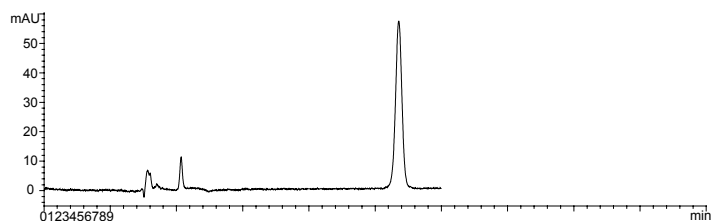
The Venusil ASB series columns are specially designed for the separation of polar compounds from low (extremely stable at pH=1.0) to medium pH. The stationary phase is made using bulky, unique silanes that sterically protect the siloxane bond and thus has the highest polarity among all Venusil family columns. A line of stationary phases include C18, C8, C3, C1 and Phenyl. This column can be used to replace Zorbax SB.

Characteristics: Metal Impurity < 10ppm; Pore Size 150Å; Specific Surface Area 200m²/g; Available Particle Size: 3µm, 5µm, 10µm.

Main features:

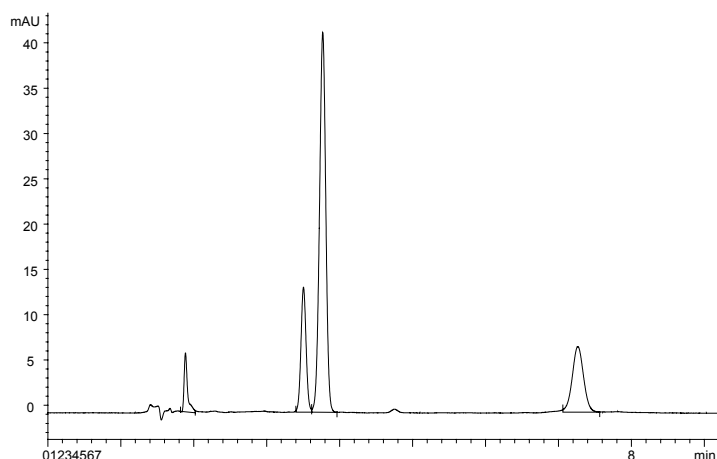
- Low pH stability: great stability even at pH=1.0
- Peak shape and efficiency: Excellent peak symmetry for basic compounds comparing to other brand polar phase columns
- Polar C18 phase: Very strong separation power for polar compounds
- 100% aqueous compatible: Much better peak shape, retention, and efficiency
- Five different bonded phases provide broad selectivity

The Stability in the Low pH



Column: Venusil ASB C18, 5µm, 4.6×150mm
Sample: Naphthol
Aging: 40 C, TFA in 80% methanol (pH=1.0), 400 hours
Mobile Phase: TFA in 80% methanol (pH=1.5)
Flow Rate: 1mL/min
Injection: 5µL
Temperature: 30 C

The separation of Organic Acid



Column: Venusil ASB C18, 5µm, 4.6×150mm
Sample: Vc, malonic acid, lactic acid, citric acid
Mobile Phase: 20mM Phosphate buffer saline (PBS), pH=2.0
Flow Rate: 1mL/min
Injection: 5µL
Detection: UV 210nm



Ordering Information

Surface Area: 200m²/g, Pore Size: 150Å

Type	Particle (µm)	Dimension (mm)	Venusil ASB C18	Venusil ASB C8	Venusil ASB Phenyl	Venusil ASB C3	Venusil ASB C1
Analytical	3	2.1×30	VS930302-0	VS830302-0			
Analytical	3	2.1×50	VS930502-0	VS830502-0			
Analytical	3	2.1×100	VS931002-0	VS831002-0			
Analytical	3	2.1×150	VS931502-0	VS831502-0			
G	3	2.1×10,4/pk	VS930102-0	VS830102-0			
DCG	3	2.1×10,4/pk	VS930102-0S	VS830102-0S			
Analytical	3	4.6×50	VS930505-0	VS830505-0			
Analytical	3	4.6×100	VS931005-0	VS831005-0			
Analytical	3	4.6×150	VS931505-0	VS831505-0			
Analytical	5	2.1×30	VS950302-0	VS850302-0	VS650302-0	VS350302-0	VS150302-0
Analytical	5	2.1×50	VS950502-0	VS850502-0	VS650502-0	VS350502-0	VS150502-0
Analytical	5	2.1×100	VS951002-0	VS851002-0	VS651002-0	VS351002-0	VS151002-0
Analytical	5	2.1×150	VS951502-0	VS851502-0	VS651502-0	VS351502-0	VS151502-0
Analytical	5	4.6×50	VS950505-0	VS850505-0	VS650505-0	VS350505-0	VS150505-0
Analytical	5	4.6×100	VS951005-0	VS851005-0	VS651005-0	VS351005-0	VS151005-0
Analytical	5	4.6×150	VS951505-0	VS851505-0	VS651505-0	VS351505-0	VS151505-0
Analytical	5	4.6×250	VS952505-0	VS852505-0	VS652505-0	VS352505-0	VS152505-0
G	5	4.6×10,4/pk	VS950105-0	VS850105-0	VS650105-0	VS350105-0	VS150105-0
DCG	5	4.6×10,4/pk	VS950105-0S	VS850105-0S	VS650105-0S	VS350105-0S	VS150105-0S
Semi-preparative	5	10×150	VS951510-0	VS851510-0			
Semi-preparative	5	10×250	VS952510-0	VS852510-0			
Preparative	5	21.2×50	VS950520-0	VS850520-0			
Preparative	5	21.2×150	VS951520-0	VS851520-0			
Preparative	5	21.2×250	VS952520-0	VS852520-0			
G	5	10×10	VS950110-0S	VS850110-0S			
G	5	21.2×10	VS950120-0	VS850120-0			
Semi-preparative	10	10×150	VS901510-0	VS801510-0			
Semi-preparative	10	10×250	VS902510-0	VS802510-0			
Preparative	10	21.2×50	VS900520-0	VS800520-0			
Preparative	10	21.2×150	VS901520-0	VS801520-0			
Preparative	10	21.2×250	VS902520-0	VS802520-0			
G	10	10×10	VS900110-0S	VS800110-0S			
G	10	21.2×10	VS900120-0	VS800120-0			
Preparative	10	30×100	VS901030-0	VS801030-0			
Preparative	10	30×150	VS901530-0	VS801530-0			
Preparative	10	30×250	VS902530-0	VS802530-0			
Preparative	10	50×150	VS901550-0	VS801550-0			
Preparative	10	50×250	VS902550-0	VS802550-0			

G: Guard Cartridge

DCG: DC Guard Cartridge*(Direct-connection Guard Cartridge Holder)

Surface Area: 45m²/g, Pore Size: 300Å

Type	Particle (µm)	Dimension (mm)	Venusil ASB C18	Venusil ASB C8
Analytical	5	2.1×30	VS950302-T	VS850302-T
Analytical	5	2.1×50	VS950502-T	VS850502-T
Analytical	5	2.1×100	VS951002-T	VS851002-T
Analytical	5	2.1×150	VS951502-T	VS851502-T
Analytical	5	4.6×50	VS950505-T	VS850505-T
Analytical	5	4.6×100	VS951005-T	VS851005-T
Analytical	5	4.6×150	VS951505-T	VS851505-T
Analytical	5	4.6×250	VS952505-T	VS852505-T
G	5	4.6×10,4/pk	VS950105-T	VS850105-T
DCG	5	4.6×10,4/pk	VS950105-TS	VS850105-TS

G: Guard Cartridge

DCG: DC Guard Cartridge*(Direct-connection Guard Cartridge Holder)

Optimix Family of HPLC Columns

Conventional silica based HPLC stationary phases are usually bonded with mono-type alkyl chain molecules, e.g., C18, C8, etc. Recent studies revealed that synergistic effects can be obtained when the bonded surface consists of mixed phases of C18 and a shorter chain (C8, amide, nitro-phenyl, etc). These new products offer different selectivity, coordinated multi-functionality, as well as a spacer effect (C18/C8).

It is difficult to produce a uniformly bonded C18 surface on silica due to steric hindrance of the bulky C18 chain. This problem can be easily overcome when the surface is bonded with mixed chain lengths, C18 and a shorter silane. As a result, there are many advantages: improved surface uniformity, better penetration of molecules during partitioning due to less steric hindrance, and different selectivity compared to a mono-chain type stationary phase.

As one of the leaders in separation technologies, Bonna-Agela Technologies has innovatively developed a family of non-ionic, mixed-phase HPLC/SFC columns.

Consider these columns as options for your HPLC method development

Optimix C18/C8:

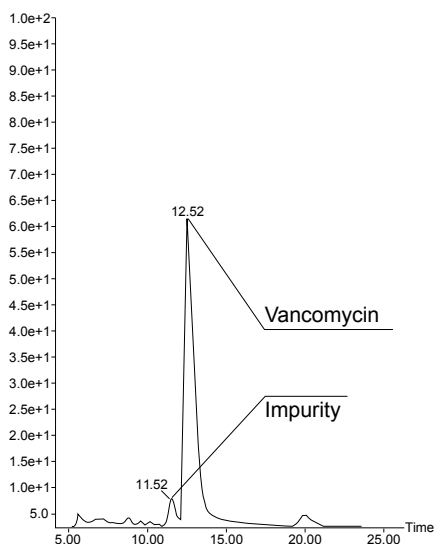
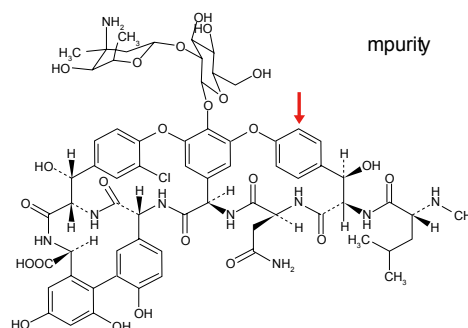
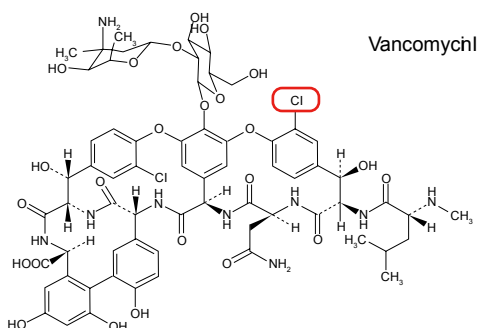
Improved performance from a mixed-phase C18/C8 column compared to mono-chain C18 or C8 columns

- Alternative selectivity
- Improved selectivity for stereo isomers, better differentiation of shapes
- Better peak shape due to uniformity of the bonding.
- Balanced hydrophilicity and hydrophobicity: extended retention for polar compounds; non-excessive retention for strong hydrophobic compounds

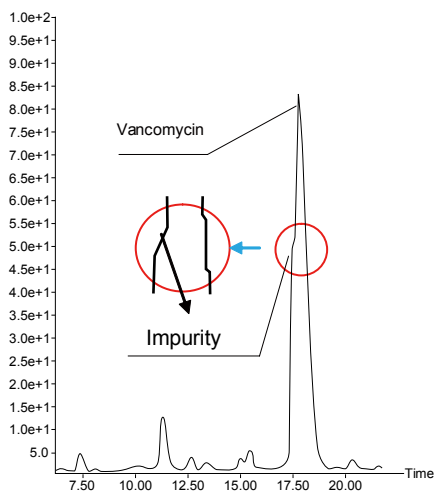
Characteristics: Metal Impurity<10ppm; Pore Size:100Å; Carbon Loading:16%; Double End-cap; Available Particle Size: 5µm



Analysis of Vancomycin and Its Impurity



Column: Optimix C18 /C8,5 μ m 4.6 \times 250mm,
 Part No.: OP952505-OC
 Mobile Phase: A: 0.7% TEA and 3% Acetic Acid in Water
 B: Methanol; C: THF ; A:B:C(88:10:2)
 Flow Rate: 1mL/min
 Temperature: 25 $^{\circ}$ C
 Detection: UV 210nm
 Sample: Vancomycin+Impurity



Column: Brand W C18 Column,5 μ m,4.6 \times 250mm,
 Mobile Phase: USP 24
 A: 0.2% TEA (pH3.2)-Acetonitrile-THF(92:7:1)
 B: 0.2% TEA (pH3.2)-Acetonitrile-THF(70:29:1)
 Gradient: USP 24

Time(min)	0	12	20	22	23	30
B%	0	0	100	100	0	0

Optimix C18/Amide

A mixed-phase of C18 and propionic amide provides unique selectivity which allows extremely polar and non-polar compounds to be analyzed in a single run under isocratic conditions.

Characteristics: Metal Impurity < 10ppm; Pore Size: 100Å; Carbon Loading : 11%; Single End-cap;
Available Particle Size: 3µm, 5µm

Performance Features:

- Unique selectivity
- Balanced retention for extremely polar and non-polar compounds
- Greater retention for polar compounds due to coordinated effects of C18 and amide
- Minimal tailing for basic compounds compared to any other type of columns, due to suppression of silanol effects by the amide group.

Bring extremely polar and non-polar analytes closer to shorten the analysis time under isocratic conditions

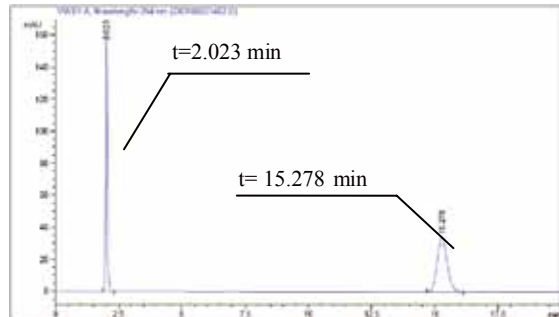
Mobile Phase: A:Water, B:Methanol

Sample: Uracil, Toluene

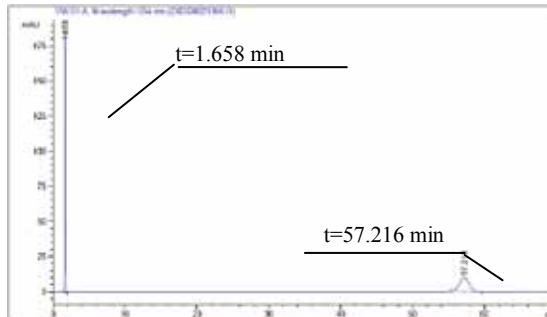
Flow Rate: 1mL/min

Detection: UV=254nm

t_0 =1.52min



Column: Optimix C18/amide, 5µm, 4.6×150mm
Mobile Phase: A:B=50:5



Column: C18, 5µm, 4.6×150mm
Mobile Phase: A:B=60:40



Standard Products!

Venusil Family of HPLC Columns

Full Line of High Quality Products

Introduction of Venusil HPLC Columns

Venusil HPLC columns are manufactured from the highest purity spherical silica particles on the market. The outstanding properties of the HPLC phases are results of subjecting high quality silica to Bonna-Agela's innovative surface modification and unique bonding processes. Our proprietary nanosurface modification generates a very smooth and even surface. This reduces the interaction between the silica surface and polar compounds, resulting in symmetric peak shape even for very basic compounds. Based on this technology, a series of unique columns were developed to meet the tough requirements for the analysis of highly polar compounds. Lot-to-lot reproducibility is ensured by a stable bonding/end-capping process. The uniform, spherical particles have a nominal surface area of 380m²/g, 200m²/g or 45m²/g, with a controlled pore size of 100Å, 150Å or 300Å, respectively. All columns are packed using a consistent slurry packing process to achieve uniform and stable beds for maximum column efficiency, lifetime and column-to-column reproducibility.

Unprecedented Experience in Chromatography

You will experience unprecedented performance using Venusil columns for your HPLC separations

Best Peak Symmetry and Efficiency

The Venusil columns generate symmetric peaks with high efficiency over their entire applicable pH range, outperforming competitors columns.

The pH-independent high performance feature of Venusil columns allows scientists to establish rugged methods with flexible choice of pH.

Tightest Specification

All our columns have tighter specification (see the table) than other brand-name columns. This ensures that all columns have great performance and identical selectivity.

Comparison of Specifications

	Waters Symmetry-C18 4.6×150mm,5µm	Zorbax XDB-C18 4.6×150mm,5µm	Venusil XBP C18 (2) 4.6×150mm,5µm
Spec. on efficiency	N/A	8000	12000
Spec. on tailing factor(toluene)	N/A	0.98-1.25	0.98-1.12
Spec. on tailing factor-amitriptyline	1.8	N/A(typically 1.5-2.0)	1.4
Spec. on selectivity(amitriptyline/acenaphthene)	+/- 10%	N/A	+/- 7%
pH range	2.0-8.0	2.0-9.0	1.5-9.0
Specific Surface	300	180	380
Carbon%	16%	12%	19%

Characteristics of Venusil Columns

Benefit to the Columns' users

Perfect peak symmetry, independent of pH and mobile phase	Highest flexibility for any application, better sensitivity, greater confidence on HPLC results
Broad pH range (1.0-10.5)	Flexibility for method development
Compatible with 100% aqueous mobile phase	Maximum versatility
Highest surface coverage	Tolerance of large volume and mass injection
A wide variety of chemistries	Broad selection of polarity and maximum versatility
Minimum buffer concentration needed	Better sensitivity for LC/MS, extended column lifetime
Tightest specification	Better reproducibility, greater confidence on the HPLC results
Excellent column efficiency	Better and faster separation
Great column lifetime	Lower cost; greater convenience

Expanding the Capabilities with the Venusil Family of C18 Columns

Bonna-Agela Technologies has developed a series of high quality C18 stationary phases to meet a wide range of application needs. These columns contain an ultra pure silica subjected to our patented surface deactivation process. By altering the column chemistry, we are able to tune the surface properties of the silica particles and alter selectivity to meet a variety of application needs.

Many of our columns have very unique properties to address some special needs. Here are some examples:

Venusil XBP C18 (2): a phase designed for balanced adsorption to avoid excessive retention of hydrophobic compounds:

- Great peak symmetry for all types of compounds
- Improved separation of stereo isomers
- Extremely narrow specification during manufacture to offer high column-to-column reproducibility
- Non-excessive retention for hydrophobic peaks (less peak broadening of later eluting compounds compared to other columns)

Venusil ASB C18: a phase designed for low pH, low bleed (high sensitivity for LC-MS) and strong separation power for polar compounds:

- Extremely low pH stability: pH limit =0.8 at 70 °C
- Extremely low bleed offering high sensitivity for LC-MS under acidic conditions
- Compatible with 100% aqueous to 100% organic mobile phases
- Non-encapped but with low surface acidity/activity compared to other non-encapped stationary phases

Venusil AQ C18: a phase designed for polar and semi-polar compounds, to be compatible with 100% water :

- Compatible with 100% aqueous to 100% organic mobile phases
- Applicable to a variety of analytes: from very polar to non-polar
- Operates over a wide pH range: 1.0~9.0
- Applicable to a wide range of sample types: plasma, urine, drug formulation, food extraction
- Available in a range of column diameters suitable for LC-MS, conventional analytical, and preparative scale

Venusil XBP C18: a phase designed for maximum hydrophobicity and high pH tolerance:

- The highest carbon loading and the most hydrophobic column on the market.
- High pH tolerance
- Not suggested for samples containing highly hydrophobic compounds

Venusil XBP C18 (L): a phase designed for larger molecules and highly hydrophobic compounds:

- Larger pore size and lower surface area
- Accelerated elution for highly hydrophobic compounds
- Easier column clean-up for samples containing hydrophobic impurities or samples extracted by non-polar solvents
- Better choice for molecules >500 Dalton



Venusil XBP C18 (2) Series Columns

Venusil XBP C18 (2) column packing material is made with ultra pure silica. The silica surface is processed with Bonna-Agela's patented surface deactivation technology, followed by a unique bonding process that can reduce the carbon content while maintaining a high bonding coverage. The Venusil XBP C18 column does not have excessive retention for highly hydrophobic compounds, and it is great for the separation of acidic, basic, and neutral compounds. Moreover, this column also has superb resolution power for isomers. The perfect peak symmetry offered by this RP column makes it a great first-choice for HPLC method development.

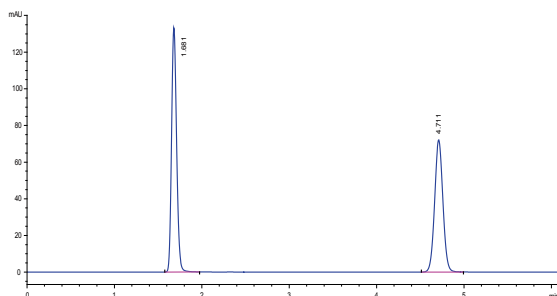
Universal, Highly Inert C18 Columns

- Balanced hydrophobic adsorption which results in a broader suitability
- Stronger separation power for isomers
- Great column-to-column and batch-to-batch reproducibility
- Perfect symmetry for basic, acidic and neutral compounds

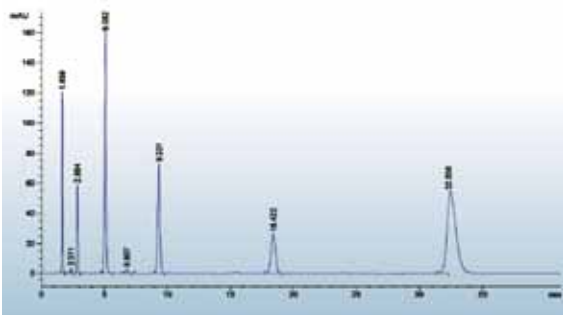
Technical Parameters

- Metal Impurity < 10ppm
- Particle Size: 5 μ m, 3 μ m, 10 μ m
- Specific Surface: 380m²/g
- Pore Size: 100Å
- Carbon Loading: 19%
- Double End-cap
- pH Range: 1.5-9.0
- Performance: Efficiency > 80,000/m (5 μ m)
- TF: 0.98-1.12

Hydrophobicity Test



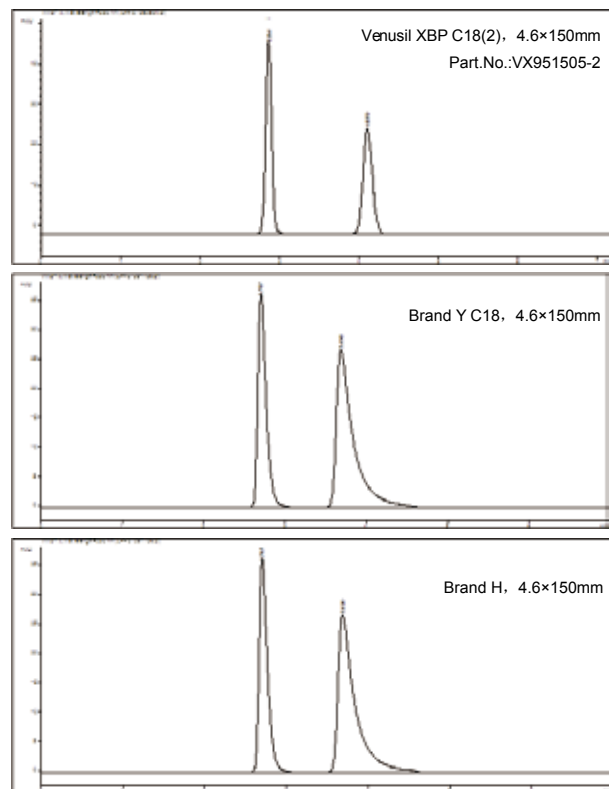
Column: Venusil XBP C18 (2), 4.6×150mm, 5 μ m
Sample: Uracil, Toluene
Mobile Phase: MeOH:25mM KH₂PO₄/K₂HPO₄ (pH=6.0)=80:20
Detection: UV 254nm
Flow Rate: 1mL/min



Column: Venusil XBP C18 (2), 4.6×150mm, 5 μ m
Sample: Amitriptyline
Mobile Phase: NaH₂PO₄/Na₂HPO₄ (20mM, pH=6.9):
MeOH=29:71
Detection: UV 254nm
Flow Rate: 1mL/min

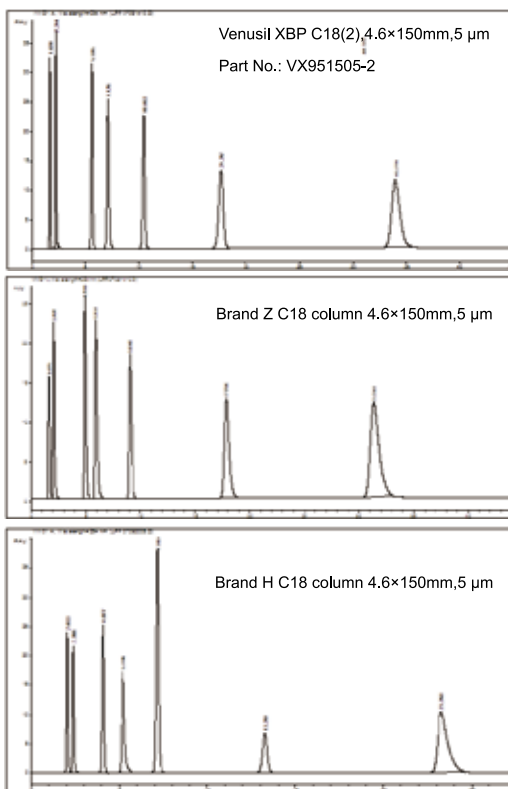
Amitriptyline is a strong basic antidepressant. It is recognized as a compound difficult to obtain good peak shape; But the XBP C18(2) column performed outstandingly and gave a great peak symmetry (TF=1.12).

Extremely Low Metal Effects



Mobile Phase: Water:Methanol=65:35
 Flow Rate: 1mL/min
 Temperature: 35 °C
 Detection: UV 230nm
 Sample: 2,3-Dihydroxynaphthalene
 + 2,7-Dihydroxynaphthalene

Selectivity of Basic Compounds



Mobile Phase: MeOH: Acetic Acid/ sodium acetate aq.
 (pH=5.0) = 60:40
 Flow Rate: 1mL/min
 Temperature: 30 °C
 Detection: UV 254nm
 Sample: p-Methyl benzoic acid, Pyridine, Phenol,
 Acetophenone, Amino-dimethyl benzene, Toluene

Ordering Information

Surface Area: 380m²/g; Pore Size: 100Å

Type	Particle size(μm)	Dimension(mm)	Venusil XBP C18 (2)
Analytical	5	2.1×30	VX950302-2
Analytical	5	2.1×50	VX950502-2
Analytical	5	2.1×100	VX951002-2
Analytical	5	2.1×150	VX951502-2
Analytical	5	4.6×50	VX950505-2
Analytical	5	4.6×100	VX951005-2
Analytical	5	4.6×150	VX951505-2
Analytical	5	4.6×250	VX952505-2
G	5	4.6×10 4/pk	VX950105-2
DCG	5	4.6×10 4/pk	VX950105-2S

G: Guard Carriage

DCG: DC Guard Carriage*(Direct-connection Guard Cartridge Holder)



Venusil XBP Series Columns

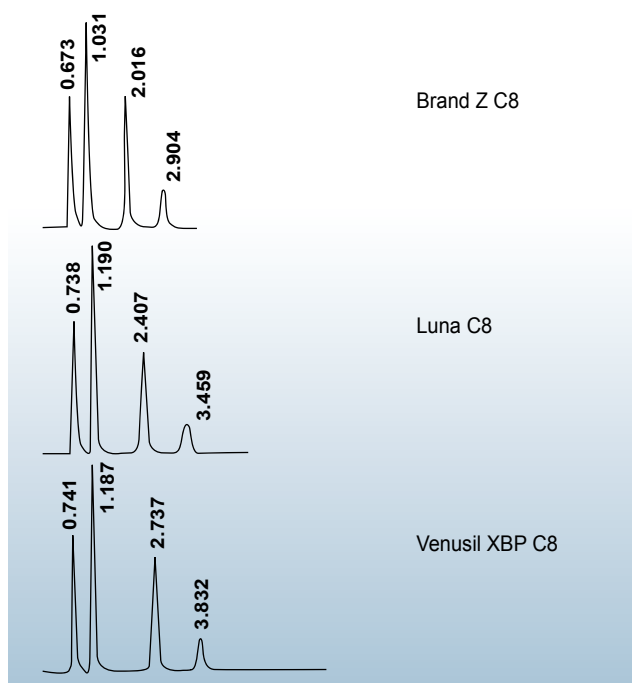
Venusil XBP C18 columns have the maximum bonding density therefore the highest hydrophobicity (the lowest polarity). This allows for the least interaction between the analytes and the silanol groups. Venusil XBP columns have extraordinary column stability at high pHs.

Pore size: 100Å,300Å; Specific surface:380m²/g, 45m²/g; Purity>99.999%;

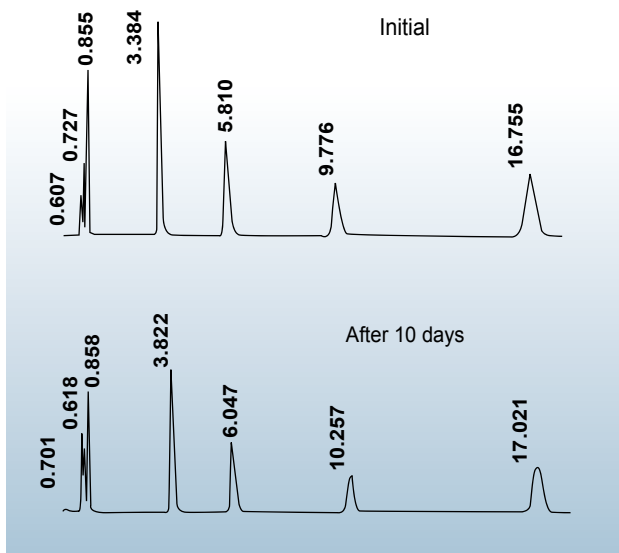
- 1) Inertness: one of most base-friendly columns.
- 2) Efficiency: excellent at any applicable pH.
- 3) Large volume injection: maintain very high efficiency with very large injection volumes.
- 4) Broad pH range (1.5~10.0): low pH, 0.2% TFA; high pH, 0.010 M triethylamine.

Other Venusil XBP Columns: A complete line of stationary phases include C8,C4,C1,NH₂,Phenyl,CN,Silica,SCX,SAX;

Quality of Column Packing



Perfect Peak Symmetry and Great Lifetime of the Column for Basic Compounds at Mid-pH



Sample: uracil, phenol, chloronitrobenzene, toluene (in methanol/water=50/50)

Column: 2.1x50mm, 5µm

Mobile Phase: methanol:water=65:35

Flow Rate: 0.20mL/min

Temperature: 30 °C

Sample: Uracil, Doxepin, Nortriptyline, Amitriptyline, Trimipramine

Column: Venusil XBP-C18, 4.6x150mm, 5µm

Mobile Phase: 0.01M sodium phosphate:ACN=50:50, pH=7.6

Flow Rate: 1.5mL/min

Temperature: 45 °C

Comparison of Venusil C8 Phases

	Plates (Toluene)	Tailing Factor
Brand Z-C8	3805	1.12
Luna C8	2546	1.15
Venusil XBP-C8	4012	1.03

Ordering Information

Surface Area: 380m²/g, Pore Size: 100Å

Type	Particle(μm)	Dimension(mm)	Venusil XBP C18	Venusil XBP C8	Venusil XBP C4	Venusil XBP C1
Fast analysis	3	2.1×30	VX930302-0	VX830302-0		
Fast analysis	3	2.1×50	VX930502-0	VX830502-0		
Fast analysis	3	2.1×100	VX931002-0	VX831002-0		
Fast analysis	3	2.1×150	VX931502-0	VX831502-0		
G	3	2.1×10,4/pk	VX930102-0	VX830102-0		
DCG	3	2.1×10,4/pk	VX930102-0S	VX830102-0S		
Fast analysis	3	4.6×50	VX930505-0	VX830505-0		
Fast analysis	3	4.6×100	VX931005-0	VX831005-0		
Fast analysis	3	4.6×150	VX931505-0	VX831505-0		
Analytical	5	2.1×30	VX950302-0	VX850302-0	VX450302-0	VX150302-0
Analytical	5	2.1×50	VX950502-0	VX850502-0	VX450502-0	VX150502-0
Analytical	5	2.1×100	VX951002-0	VX851002-0	VX451002-0	VX151002-0
Analytical	5	2.1×150	VX951502-0	VX851502-0	VX451502-0	VX151502-0
Analytical	5	4.6×50	VX950505-0	VX850505-0	VX450505-0	VX150505-0
Analytical	5	4.6×100	VX951005-0	VX851005-0	VX451005-0	VX151005-0
Analytical	5	4.6×150	VX951505-0	VX851505-0	VX451505-0	VX151505-0
Analytical	5	4.6×200	VX952005-0	VX852005-0	VX452005-0	VX152005-0
Analytical	5	4.6×250	VX952505-0	VX852505-0	VX452505-0	VX152505-0
G	5	4.6×10,4/pk	VX950105-0	VX850105-0	VX450105-0	VX150105-0
DCG	5	4.6×10,4/pk	VX950105-0S	VX850105-0S	VX450105-0S	VX150105-0S
Semi-preparative	5	10×150	VX951510-0	VX851510-0		
Semi-preparative	5	10×250	VX952510-0	VX852510-0		
Preparative	5	21.2×50	VX950520-0	VX850520-0		
Preparative	5	21.2×150	VX951520-0	VX851520-0		
Preparative	5	21.2×250	VX952520-0	VX852520-0		
G	5	10×10	VX950110-0S	VX850110-0S		
G	5	21.2×10	VX950120-0	VX850120-0		
Preparative	5	30×100	VX951030-0	VX851030-0		
Preparative	5	30×150	VX951530-0	VX851530-0		
Preparative	5	30×250	VX952530-0	VX852530-0		
Semi-preparative	10	10×150	VX901510-0	VX801510-0		
Semi-preparative	10	10×250	VX902510-0	VX802510-0		
Preparative	10	21.2×50	VX900520-0	VX800520-0		
Preparative	10	21.2×150	VX901520-0	VX801520-0		
Preparative	10	21.2×250	VX902520-0	VX802520-0		
G	10	10×10	VX900110-0S	VX800110-0S		
G	10	21.2×10	VX900120-0	VX800120-0		
Preparative	10	30×100	VX901030-0	VX801030-0		
Preparative	10	30×150	VX901530-0	VX801530-0		
Preparative	10	30×250	VX902530-0	VX802530-0		
Preparative	10	50×150	VX901550-0	VX801550-0		
Preparative	10	50×250	VX902550-0	VX802550-0		

G: Guard Cartridge

DCG: DC Guard Cartridge*(Direct-connection Guard Cartridge Holder)



Bonna-Agela Technologies

BETTER SOLUTION FOR CHROMATOGRAPHY

Surface Area: 380m²/g, Pore Size: 100Å

Type	Particle (µm)	Dimension (mm)	Venusil XBP NH ₂	Venusil XBP Phenyl	Venusil XBP CN	Venusil Silica
Analytical	5	2.1×30	VN850302-0	VX650302-0	VC950302-0	VSi950302-0
Analytical	5	2.1×50	VN850502-0	VX650502-0	VC950502-0	VSi950502-0
Analytical	5	2.1×100	VN851002-0	VX651002-0	VC951002-0	VSi951002-0
Analytical	5	2.1×150	VN851502-0	VX651502-0	VC951502-0	VSi951502-0
Analytical	5	4.6×50	VN850505-0	VX650505-0	VC950505-0	VSi950505-0
Analytical	5	4.6×100	VN851005-0	VX651005-0	VC951005-0	VSi951005-0
Analytical	5	4.6×150	VN851505-0	VX651505-0	VC951505-0	VSi951505-0
Analytical	5	4.6×200	VN852005-0	VX652005-0	VC952005-0	VSi952005-0
Analytical	5	4.6×250	VN852505-0	VX652505-0	VC952505-0	VSi952505-0
G	5	4.6×10,4/pk	VN850105-0	VX650105-0	VC950105-0	VSi950105-0
DCG	5	4.6×10,4/pk	VN850105-0S	VX650105-0S	VC950105-0S	VSi950105-0S

Surface Area: 45m²/g, Pore Size: 300Å

Type	Particle (µm)	Dimension (mm)	Venusil XBP C18	Venusil XBP C8	Venusil XBP C4	Venusil XBP C1
Analytical	5	2.1×30	VX950302-T	VX850302-T	VX450302-T	VX150302-T
Analytical	5	2.1×50	VX950502-T	VX850502-T	VX450502-T	VX150502-T
Analytical	5	2.1×100	VX951002-T	VX851002-T	VX451002-T	VX151002-T
Analytical	5	2.1×150	VX951502-T	VX851502-T	VX451502-T	VX151502-T
Analytical	5	4.6×50	VX950505-T	VX850505-T	VX450505-T	VX150505-T
Analytical	5	4.6×100	VX951005-T	VX851005-T	VX451005-T	VX151005-T
Analytical	5	4.6×150	VX951505-T	VX851505-T	VX451505-T	VX151505-T
Analytical	5	4.6×200	VX952005-T	VX852005-T	VX452005-T	VX152005-T
Analytical	5	4.6×250	VX952505-T	VX852505-T	VX452505-T	VX152505-T
G	5	4.6×10 4/pk	VX950105-T	VX850105-T	VX450105-T	VX150105-T
DCG	5	4.6×10 4/pk	VX950105-TS	VX850105-TS	VX450105-TS	VX150105-TS
Semi-preparative	5	10×150	VX951510-T	VX851510-T		
Semi-preparative	5	10×250	VX952510-T	VX852510-T		
Preparative	5	21.2×50	VX950520-T	VX850520-T		
Preparative	5	21.2×150	VX951520-T	VX851520-T		
Preparative	5	21.2×250	VX952520-T	VX852520-T		
G	5	10×10	VX950110-TS	VX850110-TS		
G	5	21.2×10	VX950120-T	VX850120-T		

Surface Area: 45m²/g, Pore Size: 300Å

Type	Particle (µm)	Dimension (mm)	Venusil XBP NH ₂	Venusil XBP Phenyl	Venusil XBP CN	Venusil Silica
Analytical	5	2.1×30	VN850302-T	VX650302-T	VC950302-T	VSi950302-T
Analytical	5	2.1×50	VN850502-T	VX650502-T	VC950502-T	VSi950502-T
Analytical	5	2.1×100	VN851002-T	VX651002-T	VC951002-T	VSi951002-T
Analytical	5	2.1×150	VN851502-T	VX651502-T	VC951502-T	VSi951502-T
Analytical	5	4.6×50	VN850505-T	VX650505-T	VC950505-T	VSi950505-T
Analytical	5	4.6×100	VN851005-T	VX651005-T	VC951005-T	VSi951005-T
Analytical	5	4.6×150	VN851505-T	VX651505-T	VC951505-T	VSi951505-T
Analytical	5	4.6×200	VN852005-T	VX652005-T	VC952005-T	VSi952005-T
Analytical	5	4.6×250	VN852505-T	VX652505-T	VC952505-T	VSi952505-T
G	5	4.6×10 4/pk	VN850105-T	VX650105-T	VC950105-T	VSi950105-T
DCG	5	4.6×10 4/pk	VN850105-TS	VX650105-TS	VC950105-TS	VSi950105-TS

G: Guard Carriage

DCG: DC Guard Carriage*(Direct-connection Guard Cartridge Holder)

Venusil XBP(L) Series Columns

XBP C18(L) has an identical bonded phase as XBP C18. However, XBP C18(L) has relatively low surface area which allows compounds to have shorter retention times. These columns are an excellent alternative to Hypersil BDS C18, Hypersil BDS C8; Zorbax XDB C18, Zorbax XDB C8 which comparatively could have too much retention.

XBP C18(L) have relatively larger pore size (150Å) and are suitable for the separation of large molecules.

Surface Area: 200m²/g, Pore Size: 150Å

Type	Particle (µm)	Dimension (mm)	Venusil XBP C18(L)	Venusil XBP C8(L)	Venusil XBP Silica(L)
Analytical	5	2.1×30	VX950302-L	VX850302-L	VSi950302-L
Analytical	5	2.1×50	VX950502-L	VX850502-L	VSi950502-L
Analytical	5	2.1×100	VX951002-L	VX851002-L	VSi951002-L
Analytical	5	2.1×150	VX951502-L	VX851502-L	VSi951502-L
Analytical	5	4.6×50	VX950505-L	VX850505-L	VSi950505-L
Analytical	5	4.6×100	VX951005-L	VX851005-L	VSi951005-L
Analytical	5	4.6×150	VX951505-L	VX851505-L	VSi951505-L
Analytical	5	4.6×250	VX952505-L	VX852505-L	VSi952505-L
G	5	4.6×10, 4/pk	VX950105-L	VX850105-L	VSi950105-L
DCG	5	4.6×10, 4/pk	VX950105-LS	VX850105-LS	VSi950105-LS

G: Guard Carriage

DCG: DC Guard Carriage*(Direct-connection Guard Cartridge Holder)

Stationary Phase	Specific Surface Area (m ² /g)	Pore Size (Å)	Carbon Loading	Particle Size Available (µm)	pH Range	Characteristics
Venusil XBP C18(2)	380	100	18%	3, 5, 10	1.5	Balanced adsorption to avoid excessive retention; a wider range of suitability; perfect peak symmetry for acidic, basic and neutral compounds; greater separation power for isomers.
Venusil XBP C18	380	100	22%	3, 5, 10	1.5	The most hydrophobic adsorption; better high pH tolerance; not suggested for samples which contain highly hydrophobic compounds.
Venusil XBP C18(L)	200	150	15%	3, 5, 10	1.5	Larger pore size and lower surface area; a better choice for the analysis of large molecule and strong hydrophobic compounds.
Venusil AQ C18	380	100	18%	3, 5, 10	1.5	Slightly polar C18 and enhanced retention for polar compounds; 100% water compatible; good peak shape for acidic, basic and neutral compounds.
Venusil ASB C18	200	150	12%	3, 5, 10	0.8	Polar C18; extremely low bleed at low pH; great for LC-MS and peptide separation; stable at pH as low as 0.8 at 70 °C.



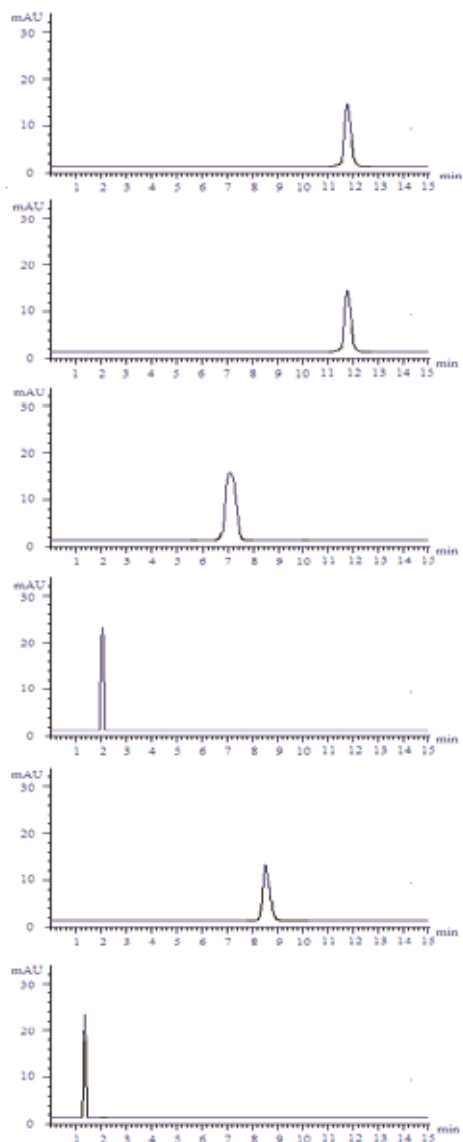
Venusil AQ C18 Columns

The Venusil AQ C18 column is designed for the separation of polar, semi-polar and non-polar compounds at low to medium pH. This column is more polar than XBP C18, but less polar than ASB C18. With a special surface treatment, Venusil AQ C18 is made to be compatible with 100% aqueous mobile phases, and it can be used to replace Waters Symmetry, Inertsil C18, Zorbax SB, Atlantis dC18, and other AQ columns. This column has a pH range of 1.5-9.0.

Pore size: 100Å; Specific surface: 380m²/g; Purity > 99.999%;

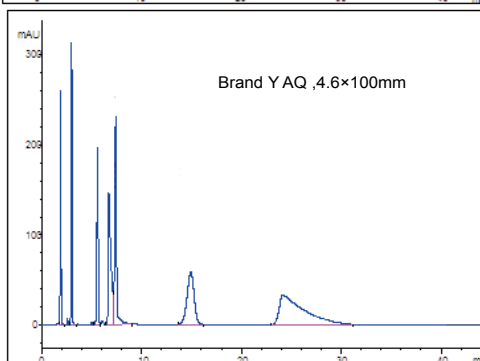
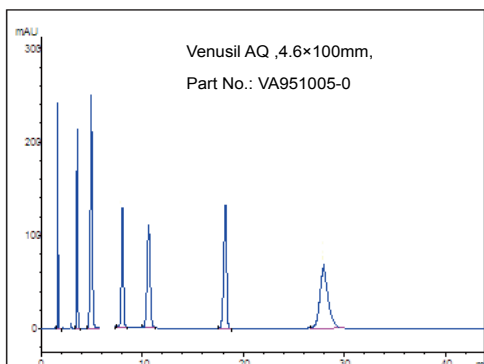
- 1) Inertness: one of most base-friendly columns, excellent peak symmetry of basic compounds.
- 2) Efficiency: The best column for polar compounds at any pH.
- 3) Large volume injection: maintains very high efficiency even if the injection volume is exceptionally large.
- 4) 100% water compatible: very unique for a universal C18 column; much better peak shape, retention, and efficiency than other brand AQ columns.
- 5) Low pH stability (pH=1.5): better stability than most of the popular brand columns (including other brand AQ columns) on the market.

Compatibility with 100% Aqueous Mobile Phase



Sample: Ranitidine
Column: 4.6×150mm, 5µm
Mobile Phase: 100% Water
Flow Rate: 1mL/min; the flow was stopped for 5 minutes during the testing period for each column.
Temperature: 30 °C

Balanced Retention for Hydrophilic and Hydrophobic Compounds



Mobile Phase: 35% v/v 20.0mM KH_2PO_4 / K_2HPO_4
at pH=7.0 / 65% Methanol at 23 °C

Flow Rate: 1mL/min

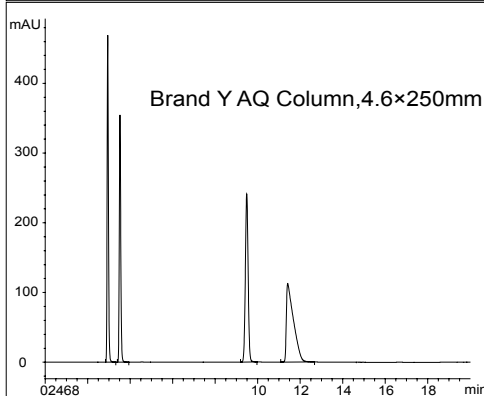
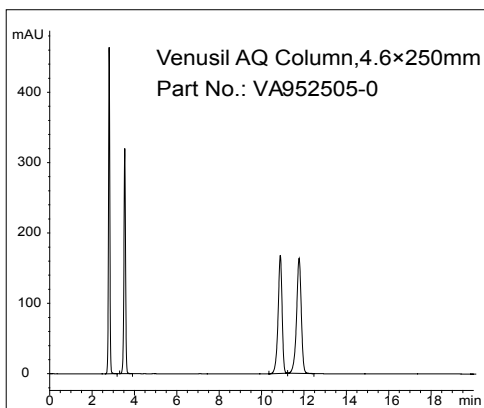
Detection: UV 254nm

Sample: Uracil Propranolol hydrochloride

Butyl, Phthalate Dimethyl Phthalate

Naphthalene, Acenaphthene Amitriptyline

Great Peak Shape for All Type of Compounds



Mobile Phase: 1% Acetic Acid (pH=2.57):MeOH=50:50

Flow Rate: 1mL/min

Temperature: 30 °C

Detection: 275nm

Sample: Uracil, Paracetamol, acetophenone and

2-Hydroxybenzoic acid



Ordering Information

Surface Area: 380m²/g, Pore Size: 100Å

Type	Particle (µm)	Dimension (mm)	Venusil AQ-C18
Fast analysis	3	2.1×30	VA930302-3
Fast analysis	3	2.1×50	VA930502-0
Fast analysis	3	2.1×100	VA931002-0
Fast analysis	3	2.1×150	VA931502-0
G	3	2.1×10,4/pk	VA930102-0
DCG	3	2.1×10,4/pk	VA930102-0S
Fast analysis	3	4.6×50	VA930505-0
Fast analysis	3	4.6×100	VA931005-0
Fast analysis	3	4.6×150	VA931505-0
Analytical	5	2.1×30	VA950302-0
Analytical	5	2.1×50	VA950502-0
Analytical	5	2.1×100	VA951002-0
Analytical	5	2.1×150	VA951502-0
Analytical	5	4.6×50	VA950505-0
Analytical	5	4.6×100	VA951005-0
Analytical	5	4.6×150	VA951505-0
Analytical	5	4.6×250	VA952505-0
G	5	4.6×10,4/pk	VA950105-0
DCG	5	4.6×10,4/pk	VA950105-0S
Semi-preparative	5	10×150	VA951510-0
Semi-preparative	5	10×250	VA952510-0
Preparative	5	21.2×50	VA950520-0
Preparative	5	21.2×150	VA951520-0
Preparative	5	21.2×250	VA952520-0
G	5	10×10	VA950110-0S
G	5	21.2×10	VA950120-0
Preparative	5	30×100	VA951030-0
Preparative	5	30×150	VA951530-0
Preparative	5	30×250	VA952530-0
Semi-preparative	10	10×150	VA901510-0
Semi-preparative	10	10×250	VA902510-0
Preparative	10	21.2×50	VA900520-0
Preparative	10	21.2×150	VA901520-0
Preparative	10	21.2×250	VA902520-0
G	10	10×10	VA900110-0S
G	10	21.2×10	VA900120-0
Preparative	10	30×100	VA901030-0
Preparative	10	30×150	VA901530-0
Preparative	10	30×250	VA902530-0
Preparative	10	50×150	VA901550-0
Preparative	10	50×250	VA902550-0

G: Guard Carriage

DCG: DC Guard Carriage*(Direct-connection Guard Cartridge Holder)

Venusil SCX Columns

SCX Column: made of spherical silica particles of the highest purity (>99.999%), bonded with aromatic sulfonic acid group. They can be used for the separation of basic, water-soluble compounds and bio-molecules.

Ordering Information

Surface Area: 200m²/g, Pore Size: 150Å

Type	Particle (µm)	Dimension (mm)	Venusil SCX
Analytical	5	4.6×100	VSc951005-0
Analytical	5	4.6×150	VSc951505-0
Analytical	5	4.6×250	VSc952505-0
G	5	4.6×10,4/pk	VSc950105-0
DCG	5	4.6×10,4/pk	VSc950105-0S

Surface Area: 50m²/g, Pore Size: 300Å

Type	Particle (µm)	Dimension (mm)	Venusil SCX
Analytical	5	4.6×100	VSc951005-T
Analytical	5	4.6×150	VSc951505-T
Analytical	5	4.6×250	VSc952505-T
G	5	4.6×10,4/pk	VSc950105-T
DCG	5	4.6×10,4/pk	VSc950105-TS

G: Guard Cartridge

DCG: DC Guard Cartridge*(Direct-connection Guard Cartridge Holder)



Venusil SAX Columns

SAX Column: the stationary phase is made with high purity spherical silica particles and bonded with quaternary amine groups. The column can be used for the separation of acidic, water-soluble compounds and bio-molecules.

Ordering Information

Surface Area: 380m²/g, Pore Size: 100Å

Type	Particle (µm)	Dimension (mm)	Venusil SAX
Analytical	5	4.6×100	VSa951005-0
Analytical	5	4.6×150	VSa951505-0
Analytical	5	4.6×250	VSa952505-0
G	5	4.6×10,4/pk	VSa950105-0
DCG	5	4.6×10,4/pk	VSa950105-0S

Surface Area: 45m²/g, Pore Size: 300Å

Type	Particle (µm)	Dimension (mm)	Venusil SAX
Analytical	5	4.6×100	VSa951005-T
Analytical	5	4.6×150	VSa951505-T
Analytical	5	4.6×250	VSa952505-T
G	5	4.6×10,4/pk	VSa950105-T
DCG	5	4.6×10,4/pk	VSa950105-TS

G: Guard Cartridge

DCG: DC Guard Cartridge*(Direct-connection Guard Cartridge Holder)

Promosil Family of HPLC Columns

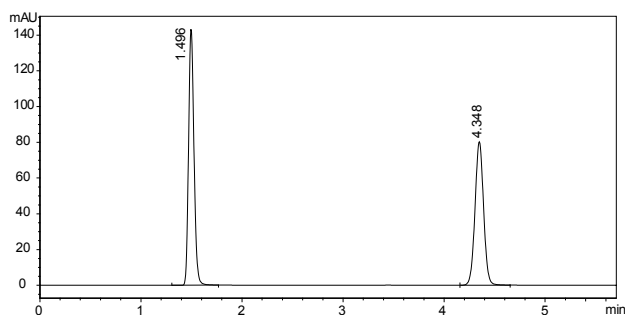
Using the silica of high-purity and high mechanical strength, the Promosil C18s are made with high-purity monosilane through Bonna-Agela Technologies' well controlled bonding process. They have high surface bonding coverage and completely capped. The carbon content is as much as 18%. They are stable at pH range 1.5-9.0 showing good peak shape for acidic and basic compounds. They have excellent tolerance of contamination and long life-time. They are the best choice of high performance-to-cost value.

- Double End-cap, Good Inertness
- Good Stability and Reproducibility
- Excellent Performance-to-cost Value

Technical Parameters:

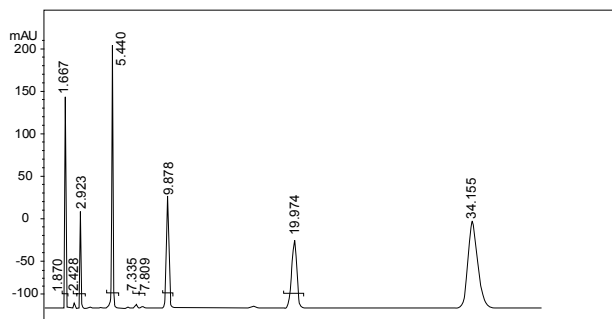
- High-purity silica, Metal Impurity < 10ppm
- Average Particle Size: 5 μ m
- Specific Surface: 320m²/g
- Pore Size: 100Å
- Carbon Loading: 18%
- pH Range: 1.5-9.0
- Efficiency: >80,000/m
- TF: 0.98-1.20

Hydrophobicity Test



Column: Promosil C18, 4.6×150mm, 5 μ m
Sample: Uracil, Toluene
Mobile Phase: MeOH:25mM KH₂PO₄/K₂HPO₄ (pH=6.0)=80:20
Detection: UV 254nm
Flow Rate: 1mL/min

Hydrophobicity Test



Column: Promosil C18, 4.6×150mm, 5 μ m
Sample: Amitriptyline
Mobile Phase: NaH₂PO₄/Na₂HPO₄ (20mM, pH=6.9):MeOH=32:68
Detection: UV 254nm
Flow Rate: 1mL/min



Ordering Information

Surface Area: 320m²/g, Pore Size: 100Å

Dimension (mm)	Particle (µm)	Promosil C18	Promosil C8	Promosil NH ₂	Promosil CN	Promosil Silica
2.1×30	5	PM950302-0	PM850302-0	PM750302-0	PM550302-0	PM050302-0
2.1×50	5	PM950502-0	PM850502-0	PM750502-0	PM550502-0	PM050502-0
2.1×100	5	PM951002-0	PM851002-0	PM751002-0	PM551002-0	PM051002-0
2.1×150	5	PM951502-0	PM851502-0	PM751502-0	PM551502-0	PM051502-0
4.6×50	5	PM950505-0	PM850505-0	PM750505-0	PM550505-0	PM050505-0
4.6×100	5	PM951005-0	PM851005-0	PM751005-0	PM551005-0	PM051005-0
4.6×150	5	PM951505-0	PM851505-0	PM751505-0	PM551505-0	PM051505-0
4.6×250	5	PM952505-0	PM852505-0	PM752505-0	PM552505-0	PM052505-0
G 4.6×10,4/pk	5	PM950105-0	PM850105-0	PM750105-0	PM550105-0	PM050105-0
DCG 4.6×10,4/pk	5	PM950105-0S	PM850105-0S	PM750105-0S	PM550105-0S	PM050105-0S

G: Guard Carriage

DCG: DC Guard Carriage*(Direct-connection Guard Cartridge Holder)

Other Manufacturers' Brands

Agela Technologies may also supply a number of major brand name HPLC columns made by other manufacturers, as listed below. Please contact us for availability and price information..

These brands are: Zobax, Kromasil, Hypersil, ES-Industry, Shodex, Jordi

Selected Solutions for Popular Applications

Solutions for Highly Water Soluble Compounds

Venusil AQ C18
Venusil ASB C18
Unisol Amide

It is known that highly water-soluble compounds often have difficulties in HPLC analysis, such as lack of retention, bad peak shape and inconsistent results. A large scientific effort has been made in developing HPLC stationary phases that can provide solutions to these problems. However, no single stationary phase may resolve all these difficulties. Bonna-Agela Technologies has developed a series of stationary phases along with development schemes to help chemists systematically develop methods for the analysis of highly water-soluble compounds. Some application examples are included as a guide to your column selection.

Venusil AQ C18 is a slightly-polar C18 column, and it is our most versatile high aqueous reverse phase column. Venusil AQ C18 has a broad pH suitability (1.5-9.0) and thus can be your first option for most of your HPLC applications. Venusil ASB-C18 has pH range of 0.8-7.0. The column stationary phase is non-end capped polar C18 and good for low pH conditions. Unisol Amide (HILIC) has a pH range of 2.0-8.0. Unisol Amide column stationary phase is modified with strong hydrophilic and neutral functionalities, it has hydrophilic interaction with the compounds. Unisol Amide provides the strongest retention to hydrophilic compounds among these three types of columns.

In general, your method development may start with a Venusil AQ C18 column and a mobile phase containing a mixture of methanol or acetonitrile with an aqueous acidic buffer solution (pH=2.0-5.0). This approach may be applicable to the HPLC analysis of more than 50% of small molecules (<2000 daltons). If required, you can minimize the percentage of the stronger organic mobile phase to increase retention by using up to 100% aqueous acidic buffer mobile phase. In the cases that you achieve adequate retention, but not enough resolution for the compounds of your interest, you may choose to adjust mobile phase ratio, mobile phase pH (very effective for ionizable compounds), or choose to replace the column with a Venusil ASB C18 or Unisol Amide for an alternative selectivity. Figure 1 shows an HPLC separation of four organic acids using Venusil AQ C18 column in 100% aqueous mobile phase at pH=2.0.

In the cases that you cannot achieve adequate retention after analysis in 100% aqueous mobile phase using the Venusil AQ C18, you have the following options depending on the type of compounds. For acidic compounds, you may try ASB C18 columns and lower the pH to further reduce the solubility of the compounds in water. For such low pH applications, TFA is the preferred acidic modifier. TFA may give you the highest retention of both acidic and basic compounds than other organic or inorganic acidic modifiers. If necessary, you may also try a Unisol Amide column in HILIC mode for even higher retention and/or different selectivity. When using a Unisol Amide column, it will behave like a NP column. More polar compounds will elute later than less polar compounds. Figure 2 shows a good separation of highly water-soluble shikimic acid and related substances using a Unisol Amide column. The retention of these compounds was not adequate for analysis on either an AQ C18 or an ASB C18 column.

For basic compounds, you may start with a AQ C18 column. For compounds with $pK_a > 9$, another alternative is to use a Unisol Amide column in place of the AQ C18 column and operate at a low to medium pH (2.0-7.0). Figure 3 shows that even with a 100% aqueous mobile phase, validamycin (basic and highly water soluble) still has poor retention on a AQ C18 column. However, a Unisol Amide column operating at pH=2.0 in the hydrophilic interaction mode resulted in a suitable validamycin separation.

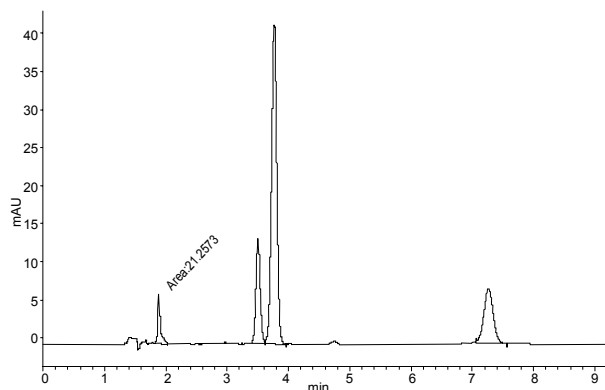
For neutral compounds, changing pH will have a limited effect on retention. If a suitable method cannot be developed using an AQ C18 column, an ASB C18 or Unisol Amide column may be required.

Usually during method development, the desired retention is achieved first, then the mobile phase pH and ratio is further adjusted to get the desired resolution. When the desired retention or resolution cannot be obtained for highly water soluble compounds using a AQ C18 or ASB C18 column, a Unisol Amide column will be a good alternative. Unisol Amide columns offer completely different selectivity from reverse phase columns and offer much higher retention.

The multiple selection of columns and this comprehensive method development scheme for the separation of highly water-soluble compounds will allow you to develop HPLC methods at ease.

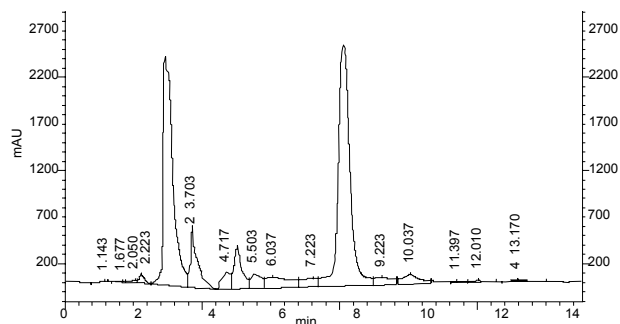


Figure 1. HPLC Separation of Organic Acids



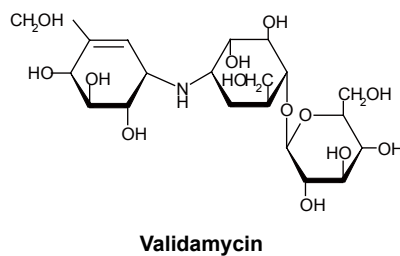
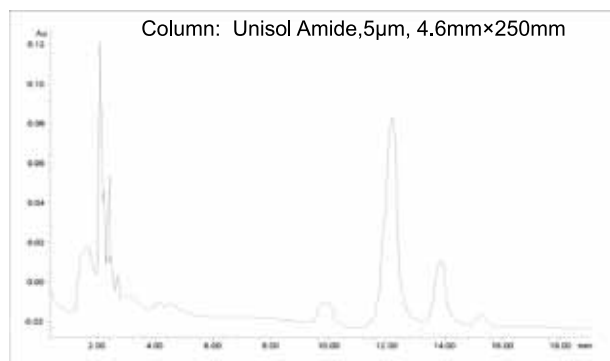
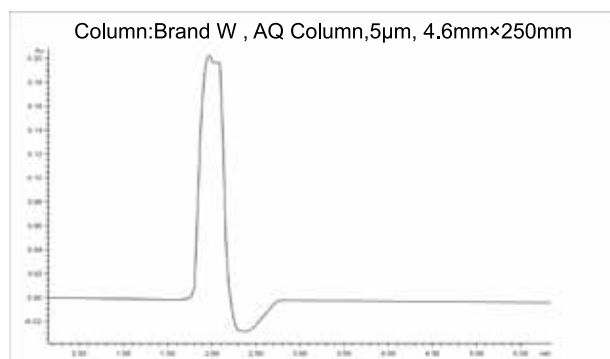
Sample: Vitamin C, malonic acid, lactic acid, citric acid.
Column: Venusil AQ C18, 4.6x150mm, 5µm
Mobile Phase: 20mmol phosphate buffer, pH=2.0
Detection: UV 210nm
Flow Rate: 1.0mL/min
Temperature: 30°C

Figure 2. HPLC Analysis of Shikimic Acid (3,4,5-Trihydroxy-1-cyclohexene-1-carboxylic Acid)

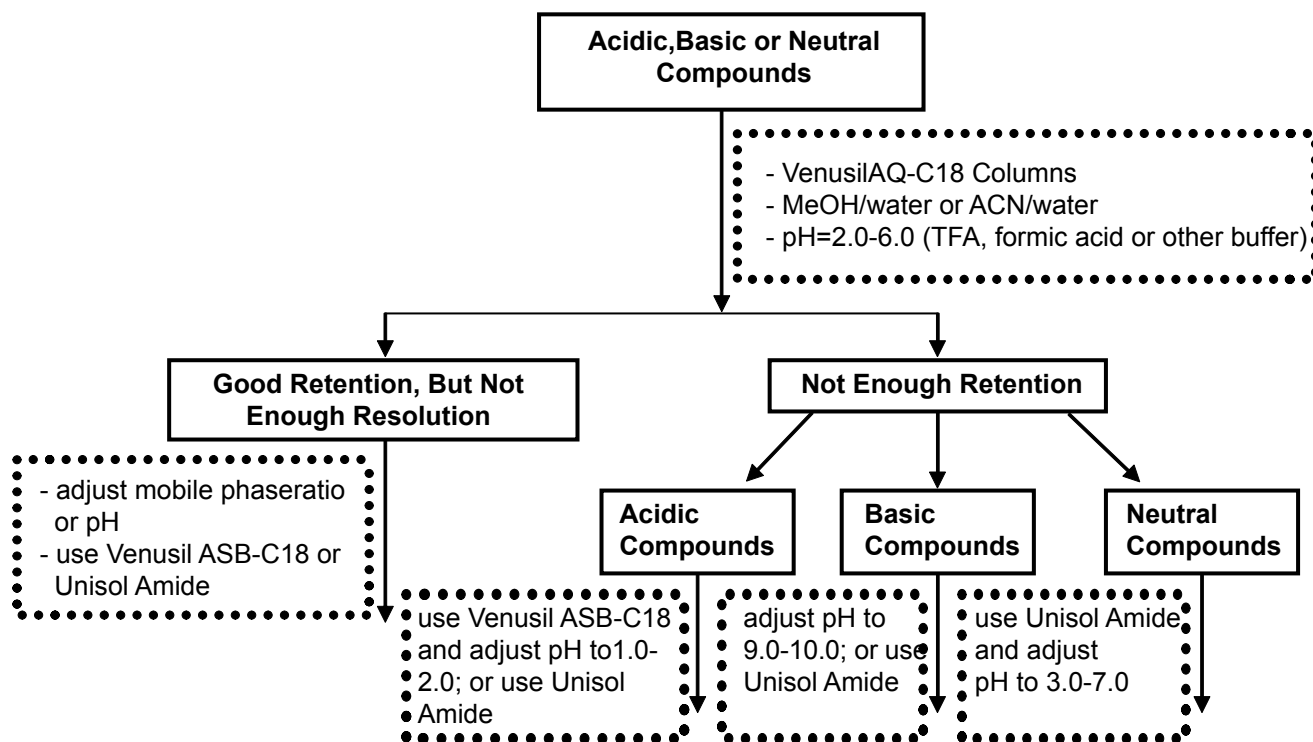


Column: Unisol Amide (HILIC), 4.6x250mm, 5µm
Mobile Phase: ACN/1% formic acid 90-60% in 20min
Detection: UV 210nm
Flow Rate: 1.0mL/min
Temperature: 30°C

Figure 3. HPLC Analysis of Validamycin Raw Products



Mobile Phase: A: 0.1% TFA in Water
B: Acetonitrile
Gradient: 40% A to 85% A in 30min
Flow Rate: 1mL/min
Temperature: 25°C
Detection: UV 210nm
Sample: Validamycin

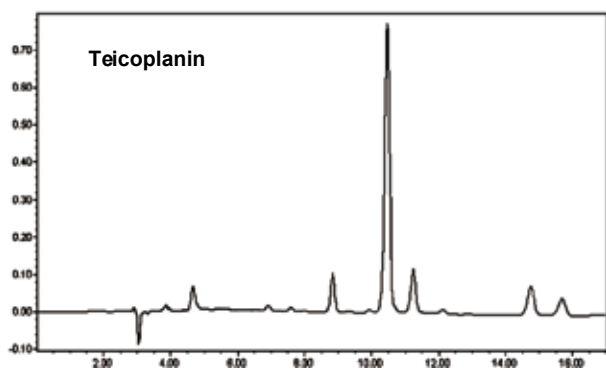
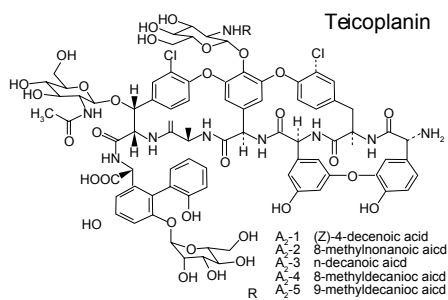


Other Stationary Phases from Bonna-Agela Technologies for Hydrophilic Compounds Separation:

- Unisol C18
- Venusil XBP-Silica (HILIC II)
- Venusil XBP-NH₂ (HILIC III)



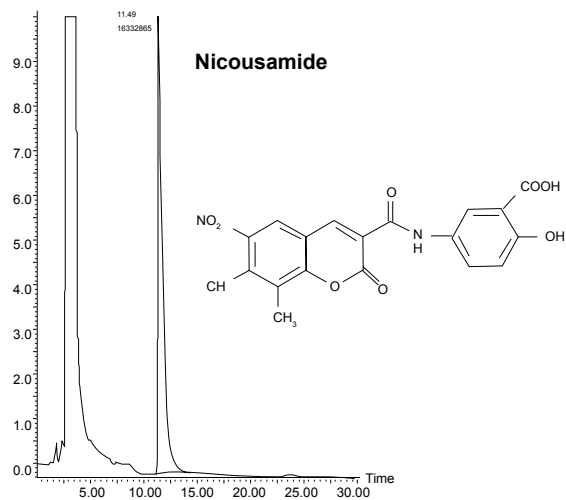
Unisol C18



Column: Unisol C18, 4.6×150mm
Mobile Phase: A: NH₄AC Buffer (Adjust pH=6.0)
B: ACN
Gradient: 10% B to 60% B in 20min.
Flow Rate: 1.0mL/min
Sample: Teicoplanin+Impurity
Temperature: 35°C

045

HPLC Columns



Column: Unisol C18, 4.6×150mm (UO951505-0)
Mobile Phase: Water:ACN:THF (50:50:1, 0.1% H₃PO₄)
Flow Rate: 1mL/min
Sample: Nicousamide
Detection: UV 254nm

HILIC Column Family From Bonna-Agela Technologies

Unisol Amide (Bonna-Agela HILIC)

Venusil XBP-Silica (Bonna-Agela HILIC II)

Venusil XBP-NH₂ (Bonna-Agela HILIC III)

Comparison:

- Selectivity

XBP-silica is slightly acidic (pH=5.6); while Unisol Amide is slightly basic (pH=7.0-9.0), and XBP NH₂ is more basic (pH=9.2).

XBP-silica has stronger retention of basic compounds, while Unisol Amide and XBP NH₂ have better retention of acidic compounds.

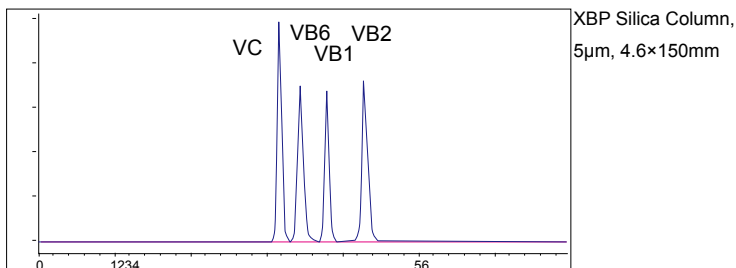
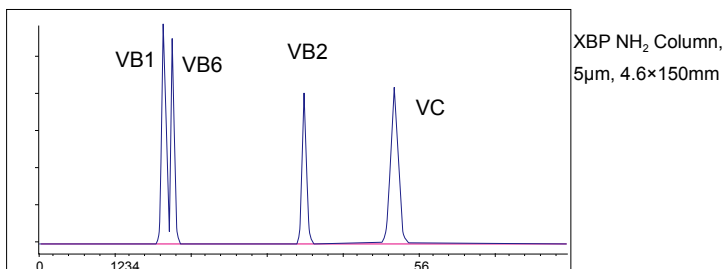
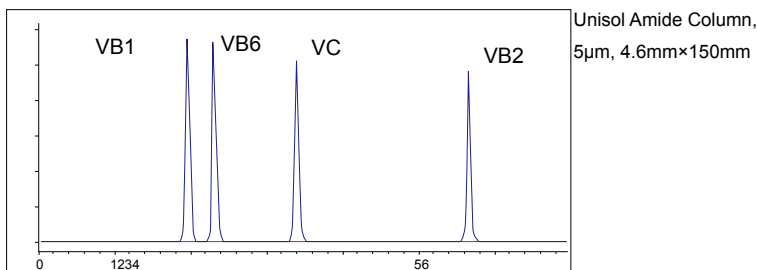
Unisol Amide has a balanced retention power for neutral, acidic and basic compounds, and thus the highest versatility.

- Reproducibility and Lifetime

Unisol Amide has the best reproducibility and lifetime because of a bonded and close-to-neutral protection layer.

Water-soluble Vitamins

- Selectivity comparison on 3 columns
- Stability comparison of Unisol Amide and XBP silica



Mobile Phase: A:0.1% TFA in Water;
B:0.1% TFA in Acetonitrile; A:B=90:10

Flow Rate: 1mL/min

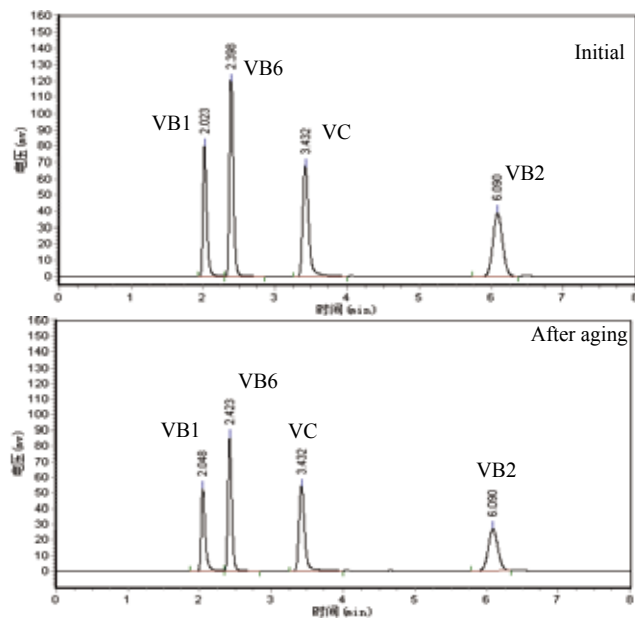
Temperature: 30°C

Detection: UV 280nm

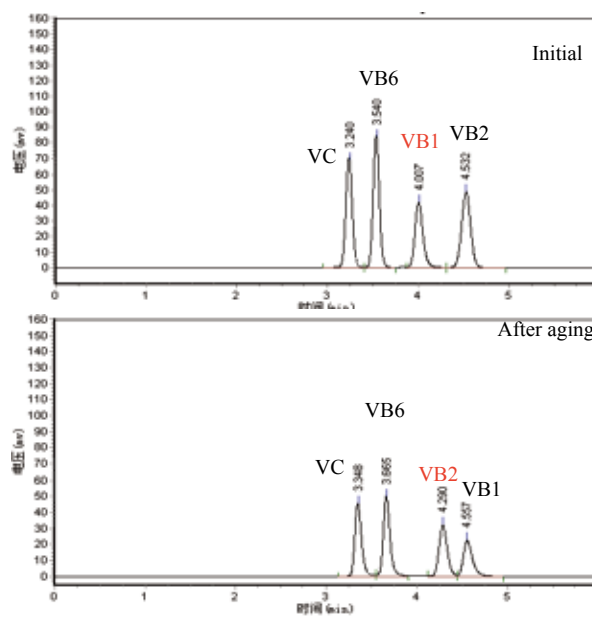
Sample: VB1+VB6+VC+VB2



Stability Comparison of Unisol Amide and Venusil XBP Silica



Unisol Amide, 4.6×150mm, 5μm



Brabd W Silica, 4.6×150mm, 5μm

Samples: VB1, VB6, VC, VB2

Aging Conditions:

MeOH: 20mM NaH₂PO₄ (pH=7.0)=40:60; 1.0mL/min; Temperature: 40℃

HPLC Conditions:

Mobile Phase: 0.1%TFA:ACN=90:10;

Detection: 280nm; Flow Rate: 1.0mL/min; Temperature: 30℃ ; Injection: 2μL

Solutions for Low pH and High pH Applications

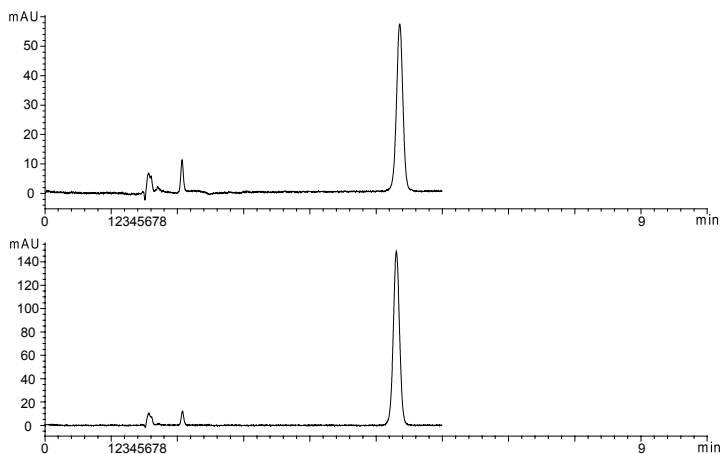
Bonna-Agela Technologies offers a family of stationary phases for applications to be run at extremely low or extremely high pH. These columns extend the capability of regular reverse phase HPLC columns with a typical pH range of 2.0-8.0, and provide more options for your applications and method development needs.

Venusil ASB C18 (pH:0.8-7.5);

Venusil ASB C8 (pH:1.0-7.5);

Durashell C18 (pH:1.5-12.0)

Low pH Stability of ASB C18



Column: Venusil ASB C18, 4.6×150mm, 5µm

Sample: Naphthol

Aging: 40°C, TFA in 80% methanol (pH=1.0), 400 hours

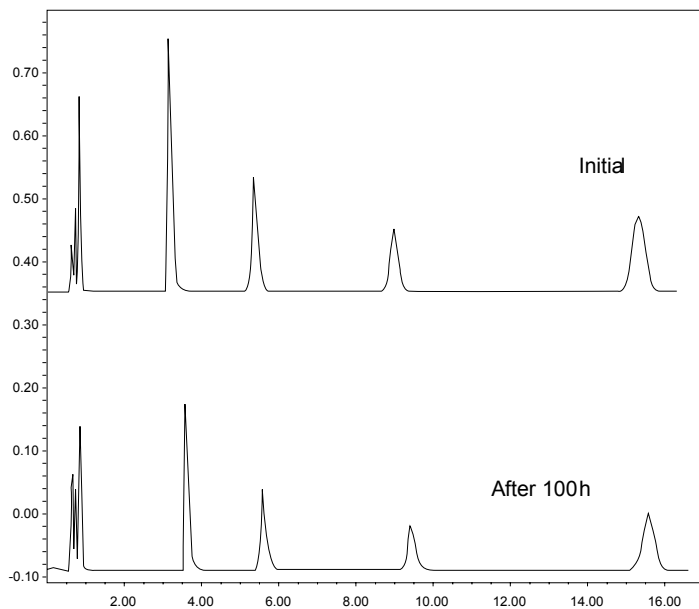
Mobile Phase: TFA in 80% methanol (pH=1.5)

Flow Rate: 1.0mL/min

Injection: 5µL

Temperature: 30°C

High pH Stability of Durashell C18



Column: Durashell C18, 4.6×150mm, 5µm

Flow Rate: 1.5mL/min, ACN:0.05M Ammonia
(pH=9.0)=50:50

Sample: Doxepin, nortriptyline, amitriptyline, trimipramine

Temperature: 35°C



Solutions for LC-MS

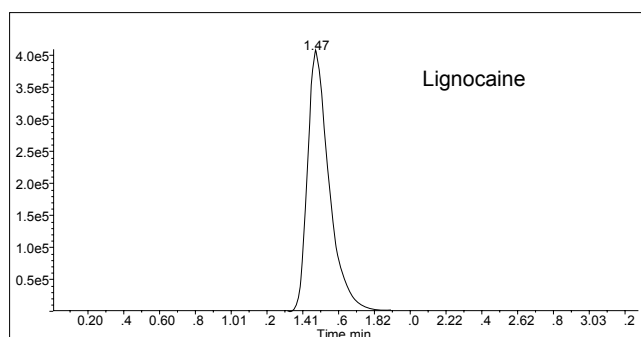
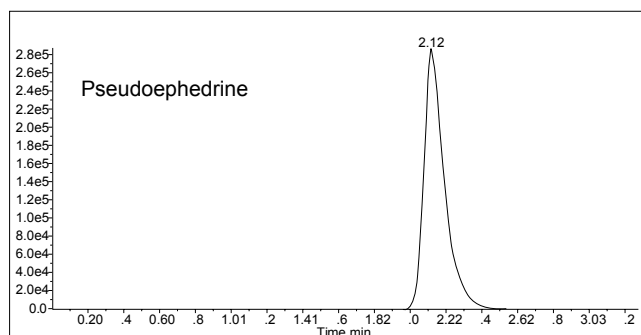
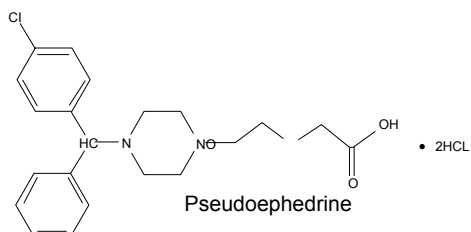
Bonna-Agela Technologies provides columns that can meet the needs of LC-MS applications. The most popular LC-MS columns from Bonna-Agela include:

- Unisol C18 (versatile).
- Venusil ASB C18 and ASB C8 (extremely low bleed and long lifetime at low pH).
- Unisol Amide (for extremely polar compounds).

Benefits:

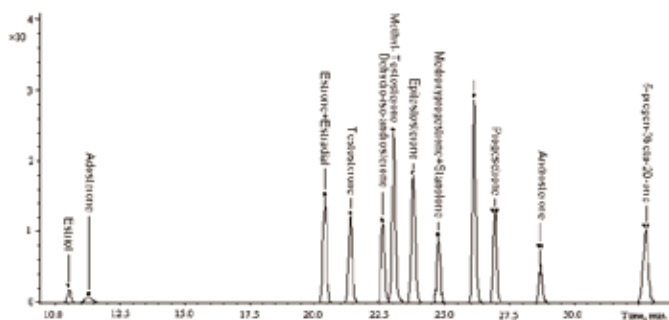
- Low bleed and symmetric peak shape→Sensitivity.
- High retention for polar compounds→Sensitivity, versatility, and low ion suppression for bioanalytical analysis.
- Compatible with 100% water to 100% organic solvents→Simplified method development effort.
- Stability→Long column life means a reduced cost for customers.

Pseudoephedrine in Plasma



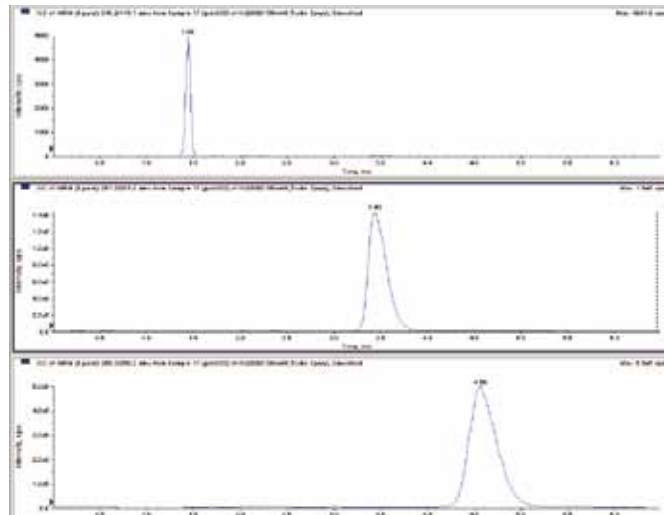
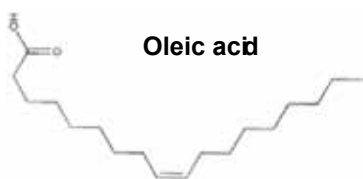
Mass System: API Qtrap 3200, Applied Biosystem
Mass Condition: Positive Ion Mode, MRM
HPLC Column: Venusil ASB C18, 2.1×50mm, 5µm
Sample: Sample prepared by SPE (Cleanert PCX 60mg/3mL)
Mobile Phase: A: 1% Formic Acid in Water;
B: Methanol;
Gradient: 20%B to 95%B in 2 min, hold for 0.5 min, then
switch to A:B (20:80)
Flow Rate: 0.5mL/min
Temperature: 25 °C

Analysis of 14 Kinds of Hormone



Mass System: Agilent 1100 Series LC/MSD Trap
 HPLC Column: Venusil XBP C18, 2.1×150mm, 5µm
 Sample: Estriol, Adosterone, Estrone+Estradiol, Testosterone, Dehydro-iso-androsterone Methyl-Testosterone, Epitestosterone, Medroxyprogesterone+Stanoalone, Progesetron, Androsterone, 5-pregen-3beta-20-one
 Mobile Phase: A:Water; B:MeOH
 Gradient: 40%B to 80%B in 24 min, then hold for 12 min.
 Flow Rate: 0.8mL/min
 Temperature: 25 C

Oleic Acid in Plasma



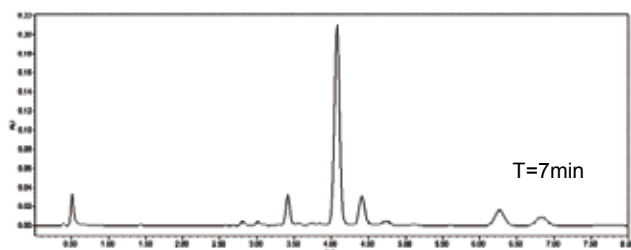
Mass System: API Qtrap 3200, Applied Biosystem
 Mass Condition: Negative Ion Mode, MRM
 HPLC Column: Venusil ASB C18, 2.1×50mm, 5µm
 Sample: Sample prepared by SPE (Cleanert PEP 60mg/3mL)
 Mobile Phase: A:13mmol/L ammonium acetate aq., B:Acetonitrile
 Gradient: 5%B to 95%B in 2min, hold for 2min, switch to A:B (95:5) then hold for 2 min.
 Flow Rate: 0.8mL/min
 Temperature: 25 C



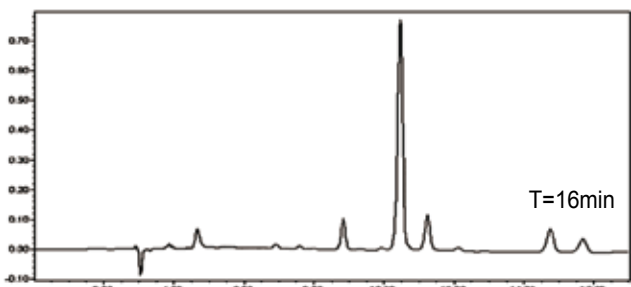
Solutions for Fast Analysis

Bonna-Agela Technologies provides two approaches for fast HPLC analyses with shorter run times and higher column efficiencies.

- Small particle size or fused-core technology: Venusil AQ C18 (2.5 μ m), HALO (2.7 μ m)
- Unique retention mechanism : Optimix C18/Amide



Mobile Phase: A: NH₄AC Buffer (Adjust pH=6.0)
B: ACN
HPLC Column: HALO C18, 4.6mm \times 50mm, 2.7 μ m
Gradient: 5%B to 45%B in 10 min.
Flow Rate: 1.0mL/min
Sample: Teicoplanin+Impurity
Temperature: 35 C



Mobile Phase: A: NH₄AC Buffer (Adjust pH=6.0)
B: ACN
HPLC Column: Conventional C18, 4.6mm \times 150mm, 5 μ m
Gradient: 10%B to 60%B in 20min.
Flow Rate: 1.0mL/min
Sample: Teicoplanin+Impurity
Temperature: 35 C

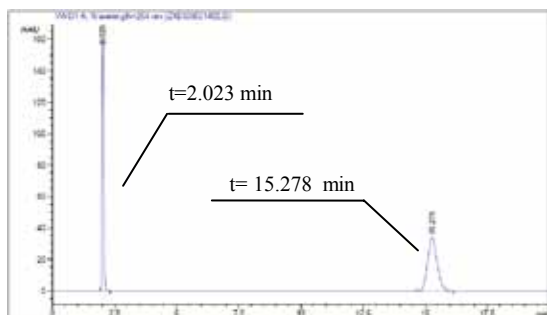
051

HPLC Columns

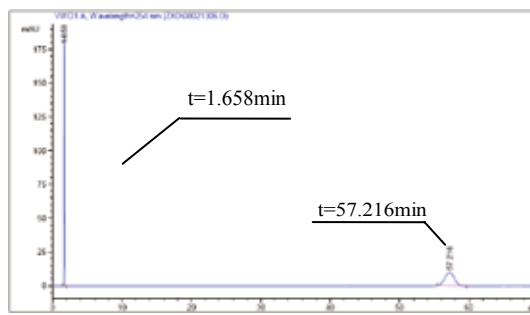
Separation by Optimix C18/Amide

Mobile Phase: A: Water; B: Methanol
Sample: Uracil, Toluene
Flow Rate: 1mL/min
Detection: UV 254nm
t₀=1.52 min
Temperature: 35 C

Bring extremely polar and non-polar analytes closer to shorten the analysis time under isocratic conditions



Column: Optimix C18/amide, 4.6 \times 150mm, 5 μ m
Mobile Phase: A:B=50:50



Column: C18, 4.6 \times 150mm, 5 μ m
Mobile Phase: A:B=60:40

Solutions for Bio-molecules

Bonna-Agela Technologies offers a broad line of HPLC columns for Bio-molecules, including reverse phase, normal phase, ion-exchange, HILIC and size exclusion columns. All column packing materials are made of ultra pure silica, bonded with pure silanes to ensure the surface inertness.

General guide for the column selection:

1. Small peptide: C18, C8, C4; 100Å or 150Å
2. Large peptide and proteins: C8, C4, 300Å; ion-exchange; HILIC; size exclusion
3. Mono- and oligo-saccharides: ion-exchange; NH₂; HILIC
4. Polysaccharides: ion-exchange; size exclusion
5. Oligo-nuclei: ion-exchange; reverse phase
6. Nuclei acids: ion-exchange; size exclusion

See the section of “ordering information by the type of stationary phase” for ordering or call our technical staff for helps in selecting the columns you need.

Solutions for Preparative HPLC (See Purification Section for More Information)

Bonna-Agela Technologies offers a full line of preparative HPLC columns to meet a variety of application needs.

Our preparative columns feature:

1. Great scalability
2. Excellent bed stability
3. High loading capacity
4. Broad solvent compatibility from 100% aqueous to 100% organic solvents (Unisol C18, Unisol Amide and Venusil ASB C18)
5. Broad pH range (1.0-12.0) from Durashell
6. Unique selectivity from Unisol Amide and Venusil ASB C18

Unisol-Amide: an unique phase from Bonna-Agela Technologies that offers a good alternative selectivity to reverse phase columns and an excellent solution for purifying highly polar compounds.

Durashell: a high pH tolerance enable the use of high pH mobile phase, which results in great improvement of peak shape and loadability of basic compounds.

Solutions for SFC

Bonna-Agela Technologies offers a broad line of normal phase columns of different selectivity for SFC applications, including:

Unisol Amide

Venusil XBP NH₂

Venusil XBP Silica

Venusil XBP CN

Venusil XBP Nitrophenyl

They are all made of high purity silica materials and are packed using our robust and reproducible process to ensure the high efficiency and the extended lifetime.

See the section of “Ordering Information by the Type of Stationary Phase” for ordering or call our technical staff for helps.



Ordering Information by the Type of Stationary Phases

Reverse Phase Columns

Reverse Phase Columns for Small Molecules

Analytical Columns, Particle Size: 5µm

Dimension (mm)	Promosil C18	Promosil C8	Promosil CN	Venusil XBP Phenyl	Venusil XBP C4	Venusil XBP C1	Venusil XBP CN
	General C18, 100Å,320m ² /g; C%=18	General C8, 100Å,320m ² /g; C%=10	100Å,320m ² /g; C%=5	100Å,380m ² /g; C%=12	100Å,380m ² /g; C%=7	100Å,380m ² /g; C%= 3	100Å,380m ² /g; C%=5
2.1×20	PM950202-0	PM850202-0	PM550202-0	VX650202-0	VX450202-0	VX150202-0	VC950202-0
2.1×30	PM950302-0	PM850302-0	PM550302-0	VX650302-0	VX450302-0	VX150302-0	VC950302-0
2.1×50	PM950502-0	PM850502-0	PM550502-0	VX650502-0	VX450502-0	VX150502-0	VC950502-0
2.1×100	PM951002-0	PM851002-0	PM551002-0	VX651002-0	VX451002-0	VX151002-0	VC951002-0
2.1×150	PM951505-0	PM851505-0	PM551505-0	VX651502-0	VX451502-0	VX151502-0	VC951502-0
3.0x30	PM950303-0	PM850303-0	PM550303-0	VX650303-0	VX450303-0	VX150303-0	VC950303-0
3.0x50	PM950503-0	PM850503-0	PM550503-0	VX650503-0	VX450503-0	VX150503-0	VC950503-0
3.0x100	PM951003-0	PM851003-0	PM551003-0	VX651003-0	VX451003-0	VX151003-0	VC951003-0
3.0x150	PM951503-0	PM851503-0	PM551503-0	VX651503-0	VX451503-0	VX151503-0	VC951503-0
4.6×50	PM950505-0	PM850505-0	PM550505-0	VX650505-0	VX450505-0	VX150505-0	VC950505-0
4.6×100	PM951005-0	PM851005-0	PM551005-0	VX651005-0	VX451005-0	VX151005-0	VC951005-0
4.6×150	PM951505-0	PM851505-0	PM551505-0	VX651505-0	VX451505-0	VX151505-0	VC951505-0
4.6×200	PM952005-0	PM852005-0	PM552005-0	VX652005-0	VX452005-0	VX152005-0	VC952005-0
4.6×250	PM952505-0	PM852505-0	PM552505-0	VX652505-0	VX452505-0	VX152505-0	VC952505-0
G 4.6×10,4/pk	PM950105-0	PM850105-0	PM550105-0	VX650105-0	VX450105-0	VX150105-0	VC950105-0
DCG 4.6×10,4/pk	PM950105-0S	PM850105-0S	PM550105-0S	VX650105-0S	VX450105-0S	VX150105-0S	VC950105-0S

Dimension (mm)	Venusil XBP C18 (2)	Venusil XBP C18 (L)	Innoval C18	Venusil HLP	Venusil PEP	Venusil PAH
	100Å,380m ² /g; C%=18	150Å,200m ² /g; C%=15	6µm,100Å, 240m ² /g; C%=15	100Å,380m ² /g; C%=15	120Å,320m ² /g;	200Å,200m ² /g;
2.1×30	VX950302-2	VX950302-L				
2.1×50	VX950502-2	VX950502-L				
2.1×100	VX951002-2	VX951002-L				
2.1×150	VX951502-2	VX951502-L				
3.0x30	VX950303-2	VX950303-L				
3.0x50	VX950503-2	VX950503-L				
3.0x100	VX951003-2	VX951003-L				
3.0x150	VX951503-2	VX951503-L				
4.6×50	VX950505-2	VX950505-L	IX960505-0	VHL950505-0	VF950505-0	
4.6×100	VX951005-2	VX951005-L	IX961005-0	VHL951005-0	VF951005-0	
4.6×150	VX951505-2	VX951505-L	IX961505-0	VHL951505-0	VF951505-0	
4.6×200	VX952005-2	VX952005-L	IX962005-0	VHL952005-0	VF952005-0	
4.6×250	VX952505-2	VX952505-L	IX962505-0	VHL952505-0	VF952505-0	VP952505-L
G 4.6×10,4/pk	VX950105-2	VX950105-L	IX960105-0	VHL950105-0	VF950105-0	VP950105-L
DCG 4.6×10,4/pk	VX950105-2S	VX950105-LS	IX960105-0S	VHL950105-0S	VF950105-0S	VP950105-LS

G: Guard Carriage

DCG: DC Guard Carriage*(Direct-connection Guard Cartridge Holder)

Dimension (mm)	Particle Size (µm)	Venustil ASB C18	Venustil AQ C18	Unisol C18	Durashell RP	Durashell C18	Venustil XBP C18	Venustil XBP C8
		150Å,200m ² /g, C%=12	100Å,380m ² /g, C%=18	100Å,410m ² /g, C%=18	150Å,100m ² /g, C%=15	100Å,380m ² /g, C%=21	100Å,380m ² /g, C%=22	100Å,380m ² /g, C%=14
2.1×20	3	VS930202-0	VA930202-0	UO930202-0	DS930202-0	DC930202-0	VX930202-0	VX830202-0
2.1×30	3	VS930302-0	VA930302-0	UO930302-0	DS930302-0	DC930302-0	VX930302-0	VX830302-0
2.1×50	3	VS930502-0	VA930502-0	UO930502-0	DS930502-0	DC930502-0	VX930502-0	VX830502-0
2.1×100	3	VS931002-0	VA931002-0	UO931002-0	DS931002-0	DC931002-0	VX931002-0	VX831002-0
2.1×150	3	VS931502-0	VA931502-0	UO931502-0	DS931502-0	DC931502-0	VX931502-0	VX831502-0
G 2.1×10,4/pk	3	VS930102-0	VA930102-0	UO930102-0	DS930102-0	DC930102-0	VX930102-0	VX830102-0
DCG 2.1×10,4/pk	3	VS930102-0S	VA930102-0S	UO930102-0S	DS930102-0S	DC930102-0S	VX930102-0S	VX830102-0S
3.0×30	3	VS930303-0	VA930303-0	UO930303-0	DS930303-0	DC930303-0	VX930303-0	VX830303-0
3.0×50	3	VS930503-0	VA930503-0	UO930503-0	DS930503-0	DC930503-0	VX930503-0	VX830503-0
3.0×100	3	VS931003-0	VA931003-0	UO931003-0	DS931003-0	DC931003-0	VX931003-0	VX831003-0
3.0×150	3	VS931503-0	VA931503-0	UO931503-0	DS931503-0	DC931503-0	VX931503-0	VX831503-0
G 3.0×10	3	VS930103-0	VA930103-0	UO930103-0	DS930103-0	DC930103-0	VX930103-0	VX830103-0
4.6×50	3	VS930505-0	VA930505-0	UO930505-0	DS930505-0	DC930505-0	VX930505-0	VX830505-0
4.6×100	3	VS931005-0	VA931005-0	UO931005-0	DS931005-0	DC931005-0	VX931005-0	VX831005-0
4.6×150	3	VS931505-0	VA931505-0	UO931505-0	DS931505-0	DC931505-0	VX931505-0	VX831505-0
2.1×30	5	VS950302-0	VA950302-0	UO950302-0	DS950302-0	DC950302-0	VX950302-0	VX850302-0
2.1×50	5	VS950502-0	VA950502-0	UO950502-0	DS950502-0	DC950502-0	VX950502-0	VX850502-0
2.1×100	5	VS951002-0	VA951002-0	UO951002-0	DS951002-0	DC951002-0	VX951002-0	VX851002-0
2.1×150	5	VS951502-0	VA951502-0	UO951502-0	DS951502-0	DC951502-0	VX951502-0	VX851502-0
3.0×30	5	VS950303-0	VA950303-0	UO950303-0	DS950303-0	DC950303-0	VX950303-0	VX850303-0
3.0×50	5	VS950503-0	VA950503-0	UO950503-0	DS950503-0	DC950503-0	VX950503-0	VX850503-0
3.0×100	5	VS951003-0	VA951003-0	UO951003-0	DS951003-0	DC951003-0	VX951003-0	VX851003-0
3.0×150	5	VS951503-0	VA951503-0	UO951503-0	DS951503-0	DC951503-0	VX951503-0	VX851503-0
4.6×50	5	VS950505-0	VA950505-0	UO950505-0	DS950505-0	DC950505-0	VX950505-0	VX850505-0
4.6×100	5	VS951005-0	VA951005-0	UO951005-0	DS951005-0	DC951005-0	VX951005-0	VX851005-0
4.6×150	5	VS951505-0	VA951505-0	UO951505-0	DS951505-0	DC951505-0	VX951505-0	VX851505-0
4.6×200	5	VS952005-0	VA952005-0	UO952005-1	DS952005-0	DC952005-0	VX952005-0	VX852005-0
4.6×250	5	VS952505-0	VA952505-0	UO952505-0	DS952505-0	DC952505-0	VX952505-0	VX852505-0
G 4.6×10,4/pk	5	VS950105-0	VA950105-0	UO950105-0	DS950105-0	DC950105-0	VX950105-0	VX850105-0
DCG 4.6×10,4/pk	5	VS950105-0S	VA950105-0S	UO950105-0S	DS950105-0S	DC950105-0S	VX950105-0S	VX850105-0S
10×150	5	VS951510-0	VA951510-0	UO951510-0	DS951510-0	DC951510-0	VX951510-0	VX851510-0
10×250	5	VS952510-0	VA952510-0	UO952510-0	DS952510-0	DC952510-0	VX952510-0	VX852510-0
21.2×50	5	VS950520-0	VA950520-0	UO950520-0	DS950520-0	DC950520-0	VX950520-0	VX850520-0
21.2×150	5	VS951520-0	VA951520-0	UO951520-0	DS951520-0	DC951520-0	VX951520-0	VX851520-0
21.2×250	5	VS952520-0	VA952520-0	UO952520-0	DS952520-0	DC952520-0	VX952520-0	VX852520-0
G 10×10	5	VS950110-0S	VA950110-0S	UO950110-0S	DS950110-0S	DC950110-0S	VX950110-0S	VX850110-0S
G 21.2×10	5	VS950120-0	VA950120-0	UO950120-0	DS950120-0	DC950120-0	VX950120-0	VX850120-0
30×100	5	VS951030-0	VA951030-0	UO951030-0	DS951030-0	DC951030-0	VX951030-0	VX851030-0
30×150	5	VS951530-0	VA951530-0	UO951530-0	DS951530-0	DC951530-0	VX951530-0	VX851530-0
30×250	5	VS952530-0	VA952530-0	UO952530-0	DS952530-0	DC952530-0	VX952530-0	VX852530-0
10×150	10	VS901510-0	VA901510-0	UO901510-0	DS901510-0	DC901510-0	VX901510-0	VX801510-0
10×250	10	VS902510-0	VA902510-0	UO902510-0	DS902510-0	DC902510-0	VX902510-0	VX802510-0
21.2×50	10	VS900520-0	VA900520-0	UO900520-0	DS900520-0	DC900520-0	VX900520-0	VX800520-0
21.2×150	10	VS901520-0	VA901520-0	UO901520-0	DS901520-0	DC901520-0	VX901520-0	VX801520-0
21.2×250	10	VS902520-0	VA902520-0	UO902520-0	DS902520-0	DC902520-0	VX902520-0	VX802520-0
G 10×10	10	VS900110-0S	VA900110-0S	UO900110-0S	DS900110-0S	DC900110-0S	VX900110-0S	VX800110-0S
G 21.2×10	10	VS900120-0	VA900120-0	UO900120-0	DS900120-0	DC900120-0	VX900120-0	VX800120-0
30×100	10	VS901030-0	VA901030-0	UO901030-0	DS901030-0	DC901030-0	VX901030-0	VX801030-0
30×150	10	VS901530-0	VA901530-0	UO901530-0	DS901530-0	DC901530-0	VX901530-0	VX801530-0
30×250	10	VS902530-0	VA902530-0	UO902530-0	DS902530-0	DC902530-0	VX902530-0	VX802530-0
50×150	10	VS901550-0	VA901550-0	UO901550-0	DS901550-0	DC901550-0	VX901550-0	VX801550-0
50×250	10	VS902550-0	VA902550-0	UO902550-0	DS902550-0	DC902550-0	VX902550-0	VX802550-0

G: Guard Carriage

DCG: DC Guard Carriage*(Direct-connection Guard Cartridge Holder)



Dimension (mm)	Particle Size (µm)	Venusil ASB C8 150Å,200m ² /g, C%=7	Venusil ASB C3 150Å,200m ² /g, C%=4	Venusil ASB C1 150Å,200m ² /g, C%=2	Durashell C8 100Å,380m ² /g, C%=13
2.1×30	3	VS830302-0	VS330302-0	VS130302-0	DC830302-0
2.1×50	3	VS830502-0	VS330502-0	VS130502-0	DC830502-0
2.1×100	3	VS831002-0	VS331002-0	VS131002-0	DC831002-0
2.1×150	3	VS831502-0	VS331502-0	VS131502-0	DC831502-0
G 2.1×10,4/pk	3	VS830102-0	VS330102-0	VS130102-0	DC830102-0
DCG 2.1×10,4/pk	3	VS830102-0S	VS330102-0S	VS130102-0S	DC830102-0S
3.0×30	3	VS830303-0	VS330303-0	VS130303-0	DC830303-0
3.0×50	3	VS830503-0	VS330503-0	VS130503-0	DC830503-0
3.0×100	3	VS831003-0	VS331003-0	VS131003-0	DC831003-0
3.0×150	3	VS831503-0	VS331503-0	VS131503-0	DC831503-0
4.6×50	3	VS830505-0	VS330505-0	VS130505-0	DC830505-0
4.6×100	3	VS831005-0	VS331005-0	VS131005-0	DC831005-0
4.6×150	3	VS831505-0	VS331505-0	VS131505-0	DC831505-0
2.1×30	5	VS850302-0	VS350302-0	VS150302-0	DC850302-0
2.1×50	5	VS850502-0	VS350502-0	VS150502-0	DC850502-0
2.1×100	5	VS851002-0	VS351002-0	VS151002-0	DC851002-0
2.1×150	5	VS851502-0	VS351502-0	VS151502-0	DC851502-0
3.0×30	5	VS850303-0	VS350303-0	VS150303-0	DC850303-0
3.0×50	5	VS850503-0	VS350503-0	VS150503-0	DC850503-0
3.0×100	5	VS851003-0	VS351003-0	VS151003-0	DC851003-0
3.0×150	5	VS851503-0	VS351503-0	VS151503-0	DC851503-0
4.6×50	5	VS850505-0	VS350505-0	VS150505-0	DC850505-0
4.6×100	5	VS851005-0	VS351005-0	VS151005-0	DC851005-0
4.6×150	5	VS851505-0	VS351505-0	VS151505-0	DC851505-0
4.6×200	5	VS852005-0	VS352005-0	VS152005-0	DC852005-1
4.6×250	5	VS852505-0	VS352505-0	VS152505-0	DC852505-0
G 4.6×10,4/pk	5	VS850105-0	VS350105-0	VS150105-0	DC850105-0
DCG 4.6×10,4/pk	5	VS850105-0S	VS350105-0S	VS150105-0S	DC850105-0S

Reverse Phase Columns for Large Molecules

Particle Size: 5µm; Surface Area: 45m²/g; Pore Size: 300Å;

Column Type	Dimension (mm)	Venusil XBP Phenyl	Venusil XBP C4	Venusil XBP C1	Venusil XBP CN
Analytical	2.1×30	VX650302-T	VX450302-T	VX150302-T	VC950302-T
Analytical	2.1×50	VX650502-T	VX450502-T	VX150502-T	VC950502-T
Analytical	2.1×100	VX651002-T	VX451002-T	VX151002-T	VC951002-T
Analytical	2.1×150	VX651502-T	VX451502-T	VX151502-T	VC951502-T
Analytical	3.0×30	VX650303-T	VX450303-T	VX150303-T	VC950303-T
Analytical	3.0×50	VX650503-T	VX450503-T	VX150503-T	VC950503-T
Analytical	3.0×100	VX651003-T	VX451003-T	VX151003-T	VC951003-T
Analytical	3.0×150	VX651503-T	VX451503-T	VX151503-T	VC951503-T
Analytical	4.6×50	VX650505-T	VX450505-T	VX150505-T	VC950505-T
Analytical	4.6×100	VX651005-T	VX451005-T	VX151005-T	VC951005-T
Analytical	4.6×150	VX651505-T	VX451505-T	VX151505-T	VC951505-T
Analytical	4.6×200	VX652005-T	VX452005-T	VX152005-T	VC952005-T
Analytical	4.6×250	VX652505-T	VX452505-T	VX152505-T	VC952505-T
G	4.6×10,4/pk	VX650105-T	VX450105-T	VX150105-T	VC950105-T
DCG	4.6×10,4/pk	VX650105-TS	VX450105-TS	VX150105-TS	VC950105-TS

G: Guard Carriage

DCG: DC Guard Carriage*(Direct-connection Guard Cartridge Holder)

Column Type	Dimension (mm)	Venusil XBP Phenyl	Venusil XBP C4	Venusil XBP C1	Venusil XBP CN
Preparative	10×150	VX651510-T	VX451510-T	VX151510-T	VC951510-T
Preparative	10×250	VX652510-T	VX452510-T	VX152510-T	VC952510-T
Preparative	21.2×50	VX650520-T	VX450520-T	VX150520-T	VC950520-T
Preparative	21.2×150	VX651520-T	VX451520-T	VX151520-T	VC951520-T
Preparative	21.2×250	VX652520-T	VX452520-T	VX152520-T	VC952520-T
G	10×10	VX650110-TS	VX450110-TS	VX150110-TS	VC950110-TS
G	21.2×10	VX650120-T	VX450120-T	VX150120-T	VC950120-T

Particle Size: 5µm; Surface Area: 45m²/g; Pore Size: 300Å;

Column Type	Dimension (mm)	Venusil ASB C18	Venusil ASB C8	Venusil XBP C18	Venusil XBP C8
		extreme low pH tolerance (0.8-7.5), low bleed	C8 for low pH and low bleed	highest hydrophobicity	General RP
Analytical	2.1×30	VS950302-T	VS850302-T	VX950302-T	VX850302-T
Analytical	2.1×50	VS950502-T	VS850502-T	VX950502-T	VX850502-T
Analytical	2.1×100	VS951002-T	VS851002-T	VX951002-T	VX851002-T
Analytical	2.1×150	VS951502-T	VS851502-T	VX951502-T	VX851502-T
Analytical	3.0×30	VS950303-T	VS850303-T	VX950303-T	VX850303-T
Analytical	3.0×50	VS950503-T	VS850503-T	VX950503-T	VX850503-T
Analytical	3.0×100	VS951003-T	VS851003-T	VX951003-T	VX851003-T
Analytical	3.0×150	VS951503-T	VS851503-T	VX951503-T	VX851503-T
Analytical	4.6×50	VS950505-T	VS850505-T	VX950505-T	VX850505-T
Analytical	4.6×100	VS951005-T	VS851005-T	VX951005-T	VX851005-T
Analytical	4.6×150	VS951505-T	VS851505-T	VX951505-T	VX851505-T
Analytical	4.6×200	VS952005-T	VS852005-T	VX952005-T	VX852005-T
Analytical	4.6×250	VS952505-T	VS852505-T	VX952505-T	VX852505-T
G	4.6×10,4/pk	VS950105-T	VS850105-T	VX950105-T	VX850105-T
DCG	4.6×10,4/pk	VS950105-TS	VS850105-TS	VX950105-TS	VX850105-T
Preparative	10×150	VS951510-T	VS851510-T	VX951510-T	VX851510-T
Preparative	10×250	VS952510-T	VS852510-T	VX952510-T	VX852510-T
Preparative	21.2×50	VS950520-T	VS850520-T	VX950520-T	VX850520-T
Preparative	21.2×150	VS951520-T	VS851520-T	VX951520-T	VX851520-T
Preparative	21.2×250	VS952520-T	VS852520-T	VX952520-T	VX852520-T
G	10×10	VS950110-TS	VS850110-TS	VX950110-TS	VX850110-TS
G	21.2×10	VS950120-T	VS850120-T	VX950120-T	VX850120-T

G: Guard Carriage

DCG: DC Guard Carriage*(Direct-connection Guard Cartridge Holder)



Normal Phase Columns

Normal Phase Columns for Small Molecules

Particle Size: 5µm

Type	Particle Size(µm)	Dimension (mm)	Unisol Amide (HILIC) 100Å, 410m ² /g;	Venusil Silica (HILIC II) 100Å, 380m ² /g;	Venusil XBP NH ₂ (HILIC III) 100Å, 380m ² /g;	Venusil XBP CN 100Å, 380m ² /g;	Durashell NH ₂ 300Å, 45m ² /g;	Venusil XBP Diol 100Å, 380m ² /g;
Analytical	5	2.1×30	VH950302-0	VSi950302-0	VN850302-0	VC950302-0	DN850302-0	VD950302-0
Analytical	5	2.1×50	VH950502-0	VSi950502-0	VN850502-0	VC950502-0	DN850502-0	VD950502-0
Analytical	5	2.1×100	VH951002-0	VSi951002-0	VN851002-0	VC951002-0	DN851002-0	VD951002-0
Analytical	5	2.1×150	VH951502-0	VSi951502-0	VN851502-0	VC951502-0	DN851502-0	VD951502-0
Analytical	5	3.0x30	VH950303-0	VSi950303-0	VN850303-0	VC950303-0	DN850303-0	VD950303-0
Analytical	5	3.0x50	VH950503-0	VSi950503-0	VN850503-0	VC950503-0	DN850503-0	VD950503-0
Analytical	5	3.0x100	VH951003-0	VSi951003-0	VN851003-0	VC951003-0	DN851003-0	VD951003-0
Analytical	5	3.0x150	VH951503-0	VSi951503-0	VN851503-0	VC951503-0	DN851503-0	VD951503-0
Analytical	5	4.6×50	VH950505-0	VSi950505-0	VN850505-0	VC950505-0	DN850505-0	VD950505-0
Analytical	5	4.6×100	VH951005-0	VSi951005-0	VN851005-0	VC951005-0	DN851005-0	VD951005-0
Analytical	5	4.6×150	VH951505-0	VSi951505-0	VN851505-0	VC951505-0	DN851505-0	VD951505-0
Analytical	5	4.6×200	VH952005-0	VSi952005-0	VN852005-0	VC952005-0	DN852005-0	VD952005-0
Analytical	5	4.6×250	VH952505-0	VSi952505-0	VN852505-0	VC952505-0	DN852505-0	VD952505-0
G	5	4.6×10,4/pk	VH950105-0	VSi950105-0	VN850105-0	VC950105-0	DN850105-0	VD950105-0
DCG	5	4.6×10,4/pk	VH950105-0S	VSi950105-0S	VN850105-0S	VC950105-0S	DN850105-0S	VD950105-0S
Semi-preparative	5	10×150	VH951510-0	VSi951510-0	VN851510-0	VC951510-0	DN851510-0	
Semi-preparative	5	10×250	VH952510-0	VSi952510-0	VN852510-0	VC952510-0	DN852510-0	
Preparative	5	21.2×50	VH950520-0	VSi950520-0	VN850520-0	VC950520-0	DN850520-0	
Preparative	5	21.2×150	VH951520-0	VSi951520-0	VN851520-0	VC951520-0	DN851520-0	
Preparative	5	21.2×250	VH952520-0	VSi952520-0	VN852520-0	VC952520-0	DN852520-0	
G	5	10×10	VH950110-0S	VSi950110-0S	VN850110-0S	VC950110-0S	DN850110-0S	
G	5	21.2×10	VH950120-0	VSi950120-0	VN850120-0	VC950120-0	DN850120-0	
Preparative	5	30×100	VH951030-0	VSi951030-0	VN851030-0	VC951030-0	DN851030-0	
Preparative	5	30×150	VH951530-0	VSi951530-0	VN851530-0	VC951530-0	DN851530-0	
Preparative	5	30×250	VH952530-0	VSi952530-0	VN852530-0	VC952530-0	DN852530-0	
Semi-preparative	10	10×150	VH901510-0	VSi901510-0	VN801510-0	VC901510-0		
Semi-preparative	10	10×250	VH902510-0	VSi902510-0	VN802510-0	VC902510-0		
Preparative	10	21.2×50	VH900520-0	VSi900520-0	VN800520-0	VC900520-0		
Preparative	10	21.2×150	VH901520-0	VSi901520-0	VN801520-0	VC901520-0		
Preparative	10	21.2×250	VH902520-0	VSi902520-0	VN802520-0	VC902520-0		
G	10	10×10	VH900110-0S	VSi900110-0S	VN800110-0S	VC900110-0S		
G	10	21.2×10	VH900120-0	VSi900120-0	VN800120-0	VC900120-0		
Preparative	10	30×100	VH901030-0	VSi901030-0	VN801030-0	VC901030-0		
Preparative	10	30×150	VH901530-0	VSi901530-0	VN801530-0	VC901530-0		
Preparative	10	30×250	VH902530-0	VSi902530-0	VN802530-0	VC902530-0		
Preparative	10	50×150	VH901550-0	VSi901550-0	VN801550-0	VC901550-0		
Preparative	10	50×250	VH902550-0	VSi902550-0	VN802550-0	VC902550-0		

G: Guard Carriage

DCG: DC Guard Carriage*(Direct-connection Guard Cartridge Holder)

High Purity; Surface Area: 320m²/g; Pore Size: 100Å;

Type	Particle Size (µm)	Dimension (mm)	Promosil Silica	Promosil CN	Promosil NH ₂
Analytical	5	2.1×30	PM050302-0	PM550302-0	PM750302-0
Analytical	5	2.1×50	PM050502-0	PM550502-0	PM750502-0
Analytical	5	2.1×100	PM051002-0	PM551002-0	PM751002-0
Analytical	5	2.1×150	PM051502-0	PM551502-0	PM751505-0
Analytical	5	3.0×30	PM050303-0	PM550303-0	PM750303-0
Analytical	5	3.0×50	PM050503-0	PM550503-0	PM750503-0
Analytical	5	3.0×100	PM051003-0	PM551003-0	PM751003-0
Analytical	5	3.0×150	PM051503-0	PM551503-0	PM751503-0
Analytical	5	4.6×50	PM050505-0	PM550505-0	PM750505-0
Analytical	5	4.6×100	PM051005-0	PM551005-0	PM751005-0
Analytical	5	4.6×150	PM051505-0	PM551505-0	PM751505-0
Analytical	5	4.6×200	PM052005-0	PM552005-0	PM752005-0
Analytical	5	4.6×250	PM052505-0	PM552505-0	PM752505-0
G	5	4.6×10,4/pk	PM050105-0	PM550105-0	PM750105-0
DCG	5	4.6×10,4/pk	PM050105-0S	PM550105-0S	PM750105-0S
Semi-preparative	5	10×150	PM051510-0		
Semi-preparative	5	10×250	PM052510-0		
Preparative	5	21.2×50	PM050520-0		
Preparative	5	21.2×150	PM051520-0		
Preparative	5	21.2×250	PM052520-0		
G	5	10×10	PM050110-0S		
G	5	21.2×10	PM050120-0		
Preparative	5	30×100	PM051030-0		
Preparative	5	30×150	PM051530-0		
Preparative	5	30×250	PM052530-0		

G: Guard Cartridge

DCG: DC Guard Cartridge*(Direct-connection Guard Cartridge Holder)



Normal Phase Columns for Large Molecules

Ultra Pure Silica; Surface Area:45m²/g; Pore Size:300Å

Type	Particle Size(μm)	Dimension (mm)	Venusil XBP NH ₂	Venusil XBP Diol	Venusil XBP CN	Unisol Amide (HILIC)	Venusil XBP Silica
Analytical	5	2.1×30	VN850302-T	VD950302-T	VC950302-T	VH950302-T	VSi950302-T
Analytical	5	2.1×50	VN850502-T	VD950502-T	VC950502-T	VH950502-T	VSi950502-T
Analytical	5	2.1×100	VN851002-T	VD951002-T	VC951002-T	VH951002-T	VSi951002-T
Analytical	5	2.1×150	VN851502-T	VD951502-T	VC951502-T	VH951502-T	VSi951502-T
Analytical	5	3.0×30	VN850303-T	VD950303-T	VC950303-T	VH950303-T	VSi950303-T
Analytical	5	3.0×50	VN850503-T	VD950503-T	VC950503-T	VH950503-T	VSi950503-T
Analytical	5	3.0×100	VN851003-T	VD951003-T	VC951003-T	VH951003-T	VSi951003-T
Analytical	5	3.0×150	VN851503-T	VD951503-T	VC951503-T	VH951503-T	VSi951503-T
Analytical	5	4.6×50	VN850505-T	VD950505-T	VC950505-T	VH950505-T	VSi950505-T
Analytical	5	4.6×100	VN851005-T	VD951005-T	VC951005-T	VH951005-T	VSi951005-T
Analytical	5	4.6×150	VN851505-T	VD951505-T	VC951505-T	VH951505-T	VSi951505-T
Analytical	5	4.6×200	VN852005-T	VD952005-T	VC952005-T	VH952005-T	VSi952005-T
Analytical	5	4.6×250	VN852505-T	VD952505-T	VC952505-T	VH952505-T	VSi952505-T
G	5	4.6×10,4/pk	VN850105-T	VD950105-T	VC950105-T	VH950105-T	VSi950105-T
G	5	4.6×10,4/pk	VN850105-TS	VD950105-TS	VC950105-TS	VH950105-TS	VSi950105-TS
Semi-preparative	5	10×150	VN851510-T		VC951510-T		VSi951510-T
Semi-preparative	5	10×250	VN852510-T		VC952510-T		VSi952510-T
Preparative	5	21.2×50	VN850520-T		VC950520-T		VSi950520-T
Preparative	5	21.2×150	VN851520-T		VC951520-T		VSi951520-T
Preparative	5	21.2×250	VN852520-T		VC952520-T		VSi952520-T
G	5	10×10	VN850110-TS		VC950110-TS		VSi950110-TS
G	5	21.2×10	VN850120-T		VC950120-T		VSi950120-T
Preparative	5	30×100	VN851030-T		VC951030-T		VSi951030-T
Preparative	5	30×150	VN851530-T		VC951530-T		VSi951530-T
Preparative	5	30×250	VN852530-T		VC952530-T		VSi952530-T

Ion-exchange Columns

Surface Area: 200m²/g, Pore Size: 150Å

Type	Particle Size (μm)	Dimension (mm)	Venusil SAX	Venusil SCX
			100Å, 380m ² /g	150Å, 200m ² /g
Analytical	5	4.6×100	VSa951005-0	VSc951005-0
Analytical	5	4.6×150	VSa951505-0	VSc951505-0
Analytical	5	4.6×250	VSa952505-0	VSc952505-0
G	5	4.6×10,4/pk	VSa950105-0	VSc950105-0
DCG	5	4.6×10,4/pk	VSa950105-0S	VSc950105-0S

G: Guard Cartridge

DCG: DC Guard Cartridge*(Direct-connection Guard Cartridge Holder)

Surface Area: 80m²/g, Pore Size: 300Å

Type	Particle Size (µm)	Dimension (mm)	Venusil SAX	Venusil SCX
Analytical	5	4.6×100	VSa951005-T	VSc951005-T
Analytical	5	4.6×150	VSa951505-T	VSc951505-T
Analytical	5	4.6×250	VSa952505-T	VSc952505-T
G	5	4.6×10,4/pk	VSa950105-T	VSc950105-T
DCG	5	4.6×10,4/pk	VSa950105-TS	VSc950105-TS

Mixed Phase Columns

Surface Area: 410m²/g, Pore Size: 100Å

Type	Dimension (mm)	Particle size(µm)	Optimix C18/C8	Optimix C18/amide	Optimix C18/phenyl
Analytical	2.1×30	5	OP950302-OC	OP950302-AM	OP950302-PH
Analytical	2.1×50	5	OP950502-OC	OP950502-AM	OP950502-PH
Analytical	2.1×100	5	OP951002-OC	OP951002-AM	OP951002-PH
Analytical	2.1×150	5	OP951502-OC	OP951502-AM	OP951502-PH
Analytical	4.6×50	5	OP950505-OC	OP950505-AM	OP950505-PH
Analytical	4.6×100	5	OP951005-OC	OP951005-AM	OP951005-PH
Analytical	4.6×150	5	OP951505-OC	OP951505-AM	OP951505-PH
Analytical	4.6×200	5	OP952005-OC	OP952005-AM	OP952005-PH
Analytical	4.6×250	5	OP952505-OC	OP952505-AM	OP952505-PH
G	4.6×10	5	OP950105-OC	OP950105-AM	OP950105-PH
DCG	4.6×10	5	OP950105-OCS	OP950105-AMS	OP950105-PHS
Fast analysis	2.1×30	3		OP930302-AM	
Fast analysis	2.1×50	3		OP930502-AM	
Fast analysis	2.1×100	3		OP931002-AM	
Fast analysis	2.1×150	3		OP931502-AM	
G	2.1×10	3		OP930102-AM	
DCG	2.1×10	3		OP930102-AMS	
Fast analysis	4.6×50	3		OP930505-AM	
Fast analysis	4.6×100	3		OP931005-AM	
Fast analysis	4.6×150	3		OP931505-AM	

G: Guard Cartridge

DCG: DC Guard Cartridge*(Direct-connection Guard Cartridge Holder)



Type	Dimension (mm)	Particle size(μm)	Optimix C18/SCX	Optimix C18/SAX	Optimix C18/Nitrophenyl
Fast analysis	2.1×30	3	OP930302-SC		
Fast analysis	2.1×50	3	OP930502-SC		
Fast analysis	2.1×100	3	OP931002-SC		
Fast analysis	2.1×150	3	OP931502-SC		
G	2.1×10	3	OP930102-SC		
DCG	2.1×10	3	OP930102-SCS		
Fast analysis	4.6×50	3	OP930505-SC		
Fast analysis	4.6×100	3	OP931005-SC		
Fast analysis	4.6×150	3	OP931505-SC		
Analytical	2.1×30	5	OP950302-SC	OP950302-SA	OP950302-NP
Analytical	2.1×50	5	OP950502-SC	OP950502-SA	OP950502-NP
Analytical	2.1×100	5	OP951002-SC	OP951002-SA	OP951002-NP
Analytical	2.1×150	5	OP951502-SC	OP951502-SA	OP951502-NP
Analytical	4.6×50	5	OP950505-SC	OP950505-SA	OP950505-NP
Analytical	4.6×100	5	OP951005-SC	OP951005-SA	OP951005-NP
Analytical	4.6×150	5	OP951505-SC	OP951505-SA	OP951505-NP
Analytical	4.6×200	5	OP952005-SC	OP952005-SA	OP952005-NP
Analytical	4.6×250	5	OP952505-SC	OP952505-SA	OP952505-NP
G	4.6×10	5	OP950105-SC	OP950105-SA	OP950105-NP
DCG	4.6×10	5	OP950105-SCS	OP950105-SAS	OP950105-NPS

Size Exclusion Columns (Silica Based)

Type	Dimension (mm)	Particle Size (μm)	GF	GF 300	GF amide	GFamide-300
			ultra pure,high porosity; bonded 120Å,	ultra pure,high porosity; bonded 300Å,	ultra pure,high porosity; bonded with amide 120Å,	ultra pure,high porosity; bonded with amide 300Å,
Analytical	4.6x150	5	GF151505-0	GF351505-0	GF151505-A	GF351505-A
Analytical	4.6x250	5	GF152505-0	GF352505-0	GF152505-A	GF352505-A
Analytical	4.6x150	10	GF101505-0	GF301505-0	GF101505-A	GF301505-A
Analytical	4.6x250	10	GF102505-0	GF302505-0	GF102505-A	GF302505-A
Semi-prep.	10x150	5	GF151510-0	GF351510-0	GF151510-A	GF351510-A
Semi-prep.	10x250	5	GF152510-0	GF352510-0	GF152510-A	GF352510-A
Semi-prep.	10x150	10	GF101510-0	GF301510-0	GF101510-A	GF301510-A
Semi-prep.	10x250	10	GF102510-0	GF302510-0	GF102510-A	GF302510-A

Chiral Columns

Particle size: 5μm; Pore Size: 1000Å

Type	Dimension(mm)	Chiral AD-H	Chiral OD-H	Chiral OJ-H
Analytical	4.6×150	AD951505-0	OD951505-0	OJ951505-0
Analytical	4.6×250	AD952505-0	OD952505-0	OJ952505-0
G	4.6×10,4/pk	AD950105-0	OD950105-0	OJ950105-0
DCG	4.6×10,4/pk	AD950105-0S	OD950105-0S	OJ950105-0S
Preparative	21.2×250	AD902520-0	OD902520-0	OJ902520-0
G	10×10	AD900110-0S	OD900110-0S	OJ900110-0S
G	21.2×10	AD900120-0	OD900120-0	OJ900120-0

G: Guard Cartridge

DCG: DC Guard Cartridge*(Direct-connection Guard Cartridge Holder)

Particle size: 5µm; Pore Size: 300Å

Type	Dimension(mm)	Chiral Amide-1
Analytical	4.6×150	AM951505-1
Analytical	4.6×250	AM952505-1
G	4.6×10,4/pk	AM950105-1
DCG	4.6×10,4/pk	AM950105-1S
Preparative	21.2×250	AM902520-1
G	10×10	AM900110-1S
G	21.2×10	AM900120-1

Polymer Phase Columns

RPC-Analytical Prepacked Columns

Matrix	Dimension (mm)	Particle Size (µm)
AKF-RP-M-154607	4.6×150	7
AKF-RP-M-154610	4.6×150	10
AKF-RP-M-154620	4.6×150	20
AKF-RP-H-254605	4.6×250	5
AKF-RP-H-254607	4.6×250	7
AKF-RP-H-254610	4.6×250	10
AKF-RP-H-254620	4.6×250	20

RPC-Preparative Prepacked Columns

Matrix	Dimension (mm)	Particle Size (µm)
AKF-RP-M-052007	20×50	5
AKF-RP-M-102007	20×100	5
AKF-RP-M-251007	10×250	7
AKF-RP-M-252007	20×250	7
AKF-RP-M-151010	10×150	10
AKF-RP-M-152010	20×150	10
AKF-RP-H-151010	10×150	10
AKF-RP-H-152010	20×150	10
AKF-RP-M-251010	10×250	10
AKF-RP-M-252010	20×250	10
AKF-RP-H-251010	10×250	10
AKF-RP-H-252010	20×250	10
AKF-RP-H-152020	20×150	20
AKF-RP-H-252020	20×250	20
AKF-RP-H-105020	50×100	20
AKF-RP-H-255020	50×250	20
AKF-RP-H-2510020	100×250	20

G: Guard Carriage

DCG: DC Guard Carriage*(Direct-connection Guard Cartridge Holder)



Hydrophobic Interaction Chromatography Columns

Matrix	Dimension (mm)	Particle Size (µm)
AKF-PHEMM-154607	4.6×150	7
AKF-PHEMM-154610	4.6×150	10
AKF-PHEMM-154620	4.6×150	20
AKF-PHEMH-254607	4.6×250	7
AKF-PHEMH-254610	4.6×250	10
AKF-PHEMH-254620	4.6×250	20
AKF-PHEMH-036410	6.4×30	10
AKF-C4-MM-154607	4.6×150	7
AKF-C4-MM-154610	4.6×150	10
AKF-C4-MM-154620	4.6×150	20
AKF-C4-MH-254607	4.6×250	7
AKF-C4-MH-254610	4.6×250	10
AKF-C4-MH-254620	4.6×250	20
AKF-C4-MH-036410	6.4×30	10
AKF-C8-MM-154607	4.6×150	7
AKF-C8-MM-154610	4.6×150	10
AKF-C8-MM-154620	4.6×150	20
AKF-C8-MH-254607	4.6×250	7
AKF-C8-MH-254610	4.6×250	10
AKF-C8-MH-254620	4.6×250	20
AKF-C8-MH-036410	6.4×30	10
AKF-ETHMM-154607	4.6×150	7
AKF-ETHMM-154610	4.6×150	10
AKF-ETHMM-154620	4.6×150	20
AKF-ETHMH-254607	4.6×250	7
AKF-ETHMH-254610	4.6×250	10
AKF-ETHMH-254620	4.6×250	20
AKF-ETHMH-036410	6.4×30	10

Ion Exchange Chromatography Columns (Strong Cation)

Matrix	Dimension (mm)	Particle Size (µm)
AKF-CISLM-050207	2.0×50	5
AKF-CISLM-150207	2.0×150	5
AKF-CISLM-154607	4.6×150	7
AKF-CISLM-154610	4.6×150	10
AKF-CISLM-154620	4.6×150	20
AKF-CISLH-154607	4.6×150	7
AKF-CISLH-154610	4.6×150	10
AKF-CISLH-154620	4.6×150	20
AKF-CISLM-254610	4.6×250	10
AKF-CISLH-254610	4.6×250	10
AKF-CISLH-251010	10×250	10
AKF-CISLH-101010	10×100	10

Ion Exchange Chromatography Columns (Weak Cation)

Matrix	Dimension (mm)	Particle Size (µm)
AKF-CLV-050207	2.0×50	5
AKF-CLV-150207	2.0×150	5
AKF-CLV-154607	4.6×150	7
AKF-CLV-154610	4.6×150	10
AKF-CLV-154620	4.6×150	20
AKF-CHV-154607	4.6×150	7
AKF-CHV-154610	4.6×150	10
AKF-CHV-154620	4.6×150	20
AKF-CLV-254610	4.6×250	10
AKF-CHV-254610	4.6×250	10
AKF-CHV-251010	10×250	10
AKF-CHV-101010	10×100	10

Ion Exchange Chromatography Columns (Strong Anion)


Matrix	Dimension (mm)	Particle Size (µm)
AKF-QLV-050207	2.0×50	5
AKF-QLV-150207	2.0×150	5
AKF-QLV-154607	4.6×150	7
AKF-QLV-154610	4.6×150	10
AKF-QLV-154620	4.6×150	20
AKF-QHV-154607	4.6×150	7
AKF-QHV-154610	4.6×150	10
AKF-QHV-154620	4.6×150	20
AKF-QLV-254610	4.6×250	10
AKF-QHV-254610	4.6×250	10
AKF-QHV-251010	10×250	10
AKF-QHV-101010	10×100	10

Ion Exchange Chromatography Columns (Weak Anion)


Matrix	Dimension (mm)	Particle Size (µm)
AKF-DEAL-050207	2.0×50	5
AKF-DEAL-150207	2.0×150	5
AKF-DEAL-154607	4.6×150	7
AKF-DEAL-154610	4.6×150	10
AKF-DEAL-154620	4.6×150	20
AKF-DEAH-154607	4.6×150	7
AKF-DEAH-154610	4.6×150	10
AKF-DEAH-154620	4.6×150	20
AKF-DEAL-254610	4.6×250	10
AKF-DEAH-254610	4.6×250	10
AKF-DEAH-251010	10×250	10
AKF-DEAH-101010	10×100	10




Guard Cartridge Holder

Type	Dimension(mm)	P/N	
Analytical	4.6	CH-100	
Analytical	2.1	CH-50	

Type	Dimension(mm)	P/N	
Preparative	10	SH-100	

Type	Dimension(mm)	P/N	
Preparative	20	CH-200	

Direct-connection Guard Cartridge Holder

Type	Dimension(mm)	P/N	
Analytical	4.6	SH-100	
Analytical	2.1	SH-50	

HPLC Column Selection Guide

Column Selection Parameters

Stationary Phases

- Reverse Phase [C18 (Unisol, XBP, AQ, ASB), C8 (XBP, ASB), C4, Phenyl]: most HPLC analytical and preparative separations; use shorter chain if the retention is too high on C18 columns; use shorter chain (C8, C4) for proteins and larger peptides.
- Normal Phase [Silica, Amino, SAX, SCX]: for those not applicable on reverse phase; polysaccharides(amino), ion-exchange chromatography, some preparative needs.
- Bi-mode [Cyano, Venusil HILIC]: can be used in both reverse and normal phase modes, alternative selectivity to hydrocarbon-based reverse phases, inert and better reproducibility than silica columns.

Particle Size

- 3 μ m: fast analysis, high throughput analytical applications, micro/nano HPLC
- 5 μ m: analytical and semi-preparative separation
- 10 μ m: preparative separation

Particle Size

- Narrow pore (100-150Å): MW<3000
- Large pore (300-500Å): 3000<MW<50000
- Mega pore (1000Å): MW>50000

Column Length

- Short (30mm, 50mm): high throughput analysis and purification, pre-separation
- Regular (100mm, 150mm, 250mm): more complex sample, larger injection volume

Column Diameter

- Capillary (0.5mm, 1.0mm): LC-MS, micro-HPLC, very small sample volume
- Analytical (2.1mm, 4.6mm, 10mm): standard HPLC, analytical and mini-prep
- Preparative (21.2mm, 30mm, 50mm): preparative HPLC

Basic Considerations in Choosing HPLC Columns

Analyte

- **Molecular Weight** – small molecule (<3000), narrow pore; medium molecule(3000- 50000), large pore; large molecule(>50000), mega pore.
- **Solubility in aqueous solutions** – very hydrophilic, use AQ C18, ASB C18 or Unisol Amide; very hydrophobic, use shorter chain phases (C8, C4, Phenyl, CN); in between, use AQ C18, ASB C18, XBP C18 or Phenyl.
- **Difference between the compounds to be separated** – by polarity, use AQ C18, ASB C18, cyano, HILIC; by shape or regio-isomer, use XBP C18, phenyl.

Mobile Phase

- **Solution solvent:** 97-100% aqueous solution, AQ C18 or ASB C18; normal phase mode with aqueous mobile phase.
- **pH:** pH<2, ASB C18; pH>9, XBP C18, Durashell; pH= 2.0-9.0, most phases; (check the pH range for each column before use!)
- **Salt concentration:** high salt concentration>0.1 M (should be avoided if possible), XBP C18(2), SCX, SAX.

Sample

- Analyte mass/concentration: high mass load, larger diameter column (>10mm for preparative).
- Sample volume: small volume, small diameter; large volume, large diameter and length.
- Sample complexity: simple separation, short column; complex separation, long column.

Instrument and Application

- Traditional HPLC analysis: 3 μ m, 5 μ m; 4.6x100mm, 4.6x150mm, 4.6x250mm
- High throughput analysis: 3 μ m, 5 μ m; 2.1x30mm, 2.1x50mm, 4.6x50mm.
- LC-MS application: 3 μ m, 5 μ m; 1.0x30mm, 1.0x50mm, 2.1x30mm, 2.1x50mm, 2.1x100mm.
- Micro HPLC: 3 μ m, 5 μ m; 0.5x30mm, 0.5x50mm, 0.5x100mm.
- Preparative HPLC: 5 μ m, 10 μ m; 21.2x50mm, 21.2x150mm, 21.2x250mm, 30x150mm, 30x250mm, 50x250mm.



Cross-reference for Bonna-Agela Venusil Series Columns

	XBP C18	XBP C18 (2)	XBP C8	XBP(L) C18	XBP(L) C8	ASB C18	ASB C8	AQ C18	HILIC
Agilent									
SB C18						R			
SB C8							R		
XDB C18				R					
XDB C8					R				
SB Aq								R	
Waters									
Sunfire C18	R	R							
Sunfire C8				R					
Atlantis C18 (AQ)								R	
Atlantis HILIC									R
Phenomenex									
Luna C18	E								
Luna C8				E					
Luna C18 (2)		E							
Supelco									
Discovery C18				E					
Discovery C8					E				
Asentics C18	E								
Asentics C8				E					
GL Science									
Insertsil ODS-3								E	

E: Similar selectivity and superior performance

R: A better replacement

Comparison of Particle Characteristics of Typical HPLC Stationary Phases

Stationary	Phase	Particle(μm)	Pore(A)	Surface(m ² /g)	C%	End Capping	High Purity Silica
Venusil XBP C18 (2)		5	100	380	19	double	yes
Venusil XBP C18		5	100	380	22	double	yes
Venusil AQ C18		5	100	380	18	yes	yes
Venusil ASB C18		5	150	200	11	no	yes
Venusil XBP C18(L)		5	150	200	14	double	yes
ZORBAX SB C18		5	80	180	10	no	yes
ZORBAX XDB C18		5	80	180	12	yes	yes
Waters SunFire C18		5	100	340	16	yes	yes
Waters Symmetry C18		5	100	335	19	yes	yes
Waters XTerra MS C18		5	125	—	15.5	yes	—
Hypersil BDS C18		5	130	170	11	yes	no
Hypersil ODS		5	120	170	10	yes	no
Inertsil ODS		5	100	350	14	yes	no
Inertsil ODS3		5	100	450	15	yes	yes
Kromasil C18		5	100	340	19	yes	special
Supelco Discovery C18		5	180	200	12	yes	yes
Luna C18(2)		5	100	400	17.5	yes	yes

USP Column Selection Guide

L01 Octadecyl silane (ODS or C18) chemically bonded to porous silica or ceramic particles, 1.5~10µm in diameter.

Brand	Particle(µm)	Figure
Unisol C18	3,5,10	sphere
Venusil ASB C18	3,5,10	sphere
Venusil XBP C18	3,5,10	sphere
Venusil XBP C18 (2)	5	sphere
Venusil XBP C18 (L)	5	sphere
Durashell C18	3,5,10	sphere
Promosil C18	5	sphere
Halo C18	2.7	

L02 Octadecyl silane (ODS or C18) chemically bonded to silica gel of a controlled surface porosity bonded to a solid spherical core, 30~50µm in diameter.

Brand	Particle(µm)	Figure
C18 bulk media	50	Irregular

L03 Porous silica particles, 1.5~10µm in diameter.

Brand	Particle(µm)	Figure
Venusil XBP Silica	3, 5, 10	sphere
Venusil XBP Silica(L)	5	sphere
Promosil Silica	5	sphere

L04 Silica gel of a controlled surface porosity bonded to a solid spherical core, 30~50µm in diameter.

Brand	Particle(µm)	Figure
Bulk media(Silica)	30~50	Irregular

L05 Alumina of controlled surface porosity bonded to a solid spherical core, 30~50µm in diameter.

L06 Strong cation exchanger packing-sulfonated fluorocarbon polymer coated on a solid spherical core, 30~50µm in diameter.

L07 Octyl silane (C8) chemically bonded to porous silica particles, 1.5~10µm in diameter.

Brand	Particle(µm)	Figure
Venusil ASB C8	3, 5, 10	sphere
Venusil XBP C8	3, 5, 10	sphere
Venusil XBP C8(L)	5	sphere
Halo C8	2.7	sphere

L08 An essentially monomolecular layer of amino-propylsilane (NH₂) chemically bonded to totally porous silica gel support, 3~10µm in diameter.

Brand	Particle(µm)	Figure
Venusil XBP NH ₂	3, 5	sphere
Promosil NH ₂	5	sphere

L09 3~10µm irregular, totally porous silica gel having a chemically bonded strongly acidic cation exchanger coating (SCX).

Brand	Particle(µm)	Figure
Venusil SCX	5	sphere

L10 Nitrile groups (CN) chemically bonded to porous silica particles, 3~10µm in diameter.

Brand	Particle(µm)	Figure
Venusil XBP CN	3, 5	sphere

L11 Phenyl groups chemically bonded to porous silica particles, 1.5~10µm in diameter.

Brand	Particle(µm)	Figure
Venusil XBP Phenyl	3, 5	sphere

L12 A strong anion exchanger packing made by chemically bonding a quaternary amine to a solid silica spherical core, 30~50µm in diameter.

L13 Trimethylsilane (C1) chemically bonded to porous silica particles, 3~10µm in diameter.

Brand	Particle(µm)	Figure
Venusil XBP C1	3, 5	sphere

L14 Silica gel, 5~10µm in diameter having a chemically bonded, strongly basic quaternary ammonium anion exchanger (SAX) coating.

Brand	Particle(µm)	Figure
Venusil SAX	5	sphere

L15 Hexylsilane (C6) chemically bonded to a totally porous silica particle, 3~10µm in diameter.

L16 Dimethylsilane (C2) chemically bonded to a totally porous silica particles, 5~10µm in diameter.



L17 Strong cation exchange resin consisting of sulfonated, cross-linked styrene divinylbenzene copolymer in the hydrogen form, 7~11µm in diameter.

Brand	Particle(µm)	Figure
AKF CISLH	7	sphere

L18 Amino (NH₂) and Cyano (CN) groups chemically bonded to porous silica particles, 3~10µm in diameter.

L19 Strong cation exchange resin consisting of sulfonated, cross-linked styrene divinyl benzene copolymer in the calcium form, about 9µm in diameter.

Brand	Particle(µm)	Figure
AKF CISLM	7	sphere

L20 Dihydroxypropane groups chemically bonded to porous silica particles, 3~10µm in diameter.

Brand	Particle(µm)	Figure
Venusil Diol	5	sphere

L21 A rigid, spherical styrene-divinylbenzene copolymer, 5~10µm in diameter.

Brand	Particle(µm)	Figure
AKF RP	5, 7	sphere

L22 A cation-exchange resin made of porous polystyrene with sulfonic acid groups, 5~10µm in diameter.

Brand	Particle(µm)	Figure
AKF CISLH	7	sphere

L23 An anion exchange resin made of porous polymethacrylate or polyacrylate gel with quaternary ammonium groups, about 10µm in diameter.

L24 A semi-rigid hydrophilic gel consisting of vinyl polymers with numerous hydroxyl groups on the matrix surface, 32~63µm in diameter.

L25 Packing having the capacity to separate compounds with a molecular weight range from 100 to 5000 (as determined by polyethylene oxide), applied to neutral, anionic and cationic water-soluble polymers. A polymethacrylate resin base, cross-linked with polyhydroxylated ether surface contained some residual carboxyl groups was found suitable.

L26 Butyl silane (C4) chemically bonded to porous silica particles, 5~10µm in diameter.

Brand	Particle(µm)	Figure
Venusil XBP C4	3, 5	sphere

L27 Porous silica particles, 30~50µm in diameter.

Brand	Particle(µm)	Figure
Bulk media(Silica)	50	Irregular

L28 A multifunctional support which consists of a high purity, 100Å, spherical silica substrate that has been bonded with anionic functionality in addition to a conventional reversed-phase C8 functionality.

L29 Gamma alumina, reversed-phase, low carbon percentage by weight alumina-based polybutadiene spherical particale, 5µm in diameter with a pore diameter of 80Å.

L30 Ethyl silane chemically bonded to a totally porous silica particle, 5~10µm in diameter.

L31 A strong anion-exchange resin-quaternary amine bonded on latex particles attached to a core of 8.5µm macroporous particles having a pore size of 2000Å and consisting of ethylvinylbenzene cross-linked with 55% divinyl benzene.

L32 A chiral-ligand exchange packing-L prolinecopper complex covalently bonded to an irregularly shaped silica particles, 5~10µm in diameter.

L33 Packing having the capacity to separate proteins of 4000 to 40000 daltons. It is spherical, silica-based and processed to provide pH stability.

L34 Strong cation-exchange resin consisting of sulfonated cross-linked styrene-divinylbenzene copolymer in the lead form, about 9µm in diameter.

L35 Zirconium-stabilized spherical silica packing with a hydrophilic (diol-type) molecular mono layer bonded phase having a pore size of 150Å.

L36 3,5-dinitrobenzoyl derivative of L-phenylglycine covalently bonded to a 5µm aminopropyl silica.

L37 Packing having the capacity to separate proteins by molecular size over a range of 2000~40000 daltons. It is a polymethacrylate gel.

L38 A methacrylate-based size-exclusion packing for water soluble samples.

L39 A hydrophilic- polyhydroxy methacrylate gel of totally porous spherical resin.

L40 Cellulose tris 3,5-dimethylphenyl carbamate coated porous silica particles, 5~20µm in diameter.

Brand	Particle(µm)	Figure
Chiral OD-H	5	sphere

L41 Immobilized α1-acid glycoprotein on spherical silica particles, 5µm in diameter.

L42 Octylsilane and octadecylsilane groups chemically bonded to porous silica particles, 5µm in diameter.

Brand	Particle(µm)	Figure
Optimix C18/C8	3, 5	sphere

L43 Pentafluorophenyl groups chemically bonded to silica particles, 5~10µm in diameter.

Brand	Particle(µm)	Figure
Venusil PFP	5	sphere

L44 A multifunctional support, which consists of a high purity, 60Å, 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, 5~10µm in diameter.

L46 Polystyrene/divinylbenzene substrate agglomerated with quaternary amine functionalized latex beads, 10µm in diameter.

Brand	Particle(µm)	Figure
AKF QLV	5, 7	sphere

L47 High capacity anion-exchange microporous substrate, fully functionalized with a trimethylamine group, 8µm in diameter.

L48 Sulfonated, cross-linked polystyrene with an outer layer of submicron, porous, anion-exchange microbeads, 15µm in diameter.

L49 A reversed-phase packing made by coating a thin layer of polybutadiene on to spherical porous zirconia particles, 3 to 10µm in diameter.

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 15µm in diameter, and a surface area of not less than 350m²/g, substrate is coated with quaternary ammonium functionalized latex particles consisting of styrene cross-linked with divinylbenzene.

L51 Amylose tris-3,5-dimethylphenyl carbamate-coated, porous, spherical, silica particles, 5 to 10µm in diameter.

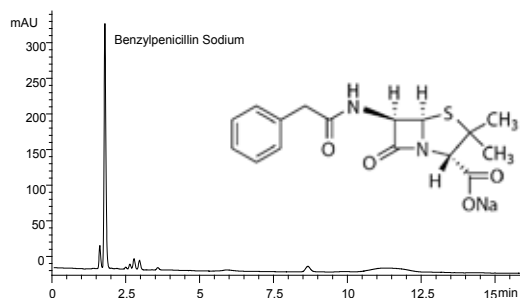
Brand	Particle(µm)	Figure
Chiral AD-H	5	Irregular



Applications

1. Antibiotics

1.1 Benzylpenicillin Sodium



Column: Unisol C18, 4.6×150mm, 5μm

Part No.: UO951505-0

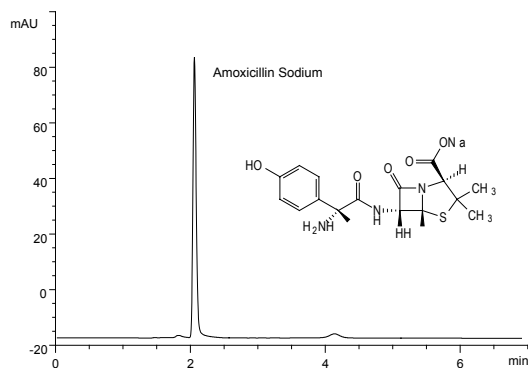
Mobile Phase: 0.1mol/L potassium dihydrogen phosphate buffer
(pH=2.5):ACN=70:30

Detection: UV 225nm

Flow Rate: 1mL/min

Injection: 4μL

1.2 Amoxicillin Sodium



Column: Unisol C18, 4.6×150mm, 5μm

Part No.: UO951505-0

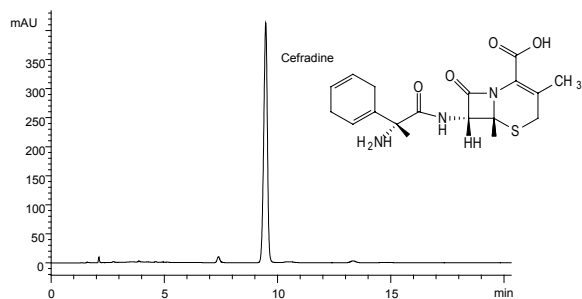
Mobile Phase: Phosphate buffer
(0.05mol/L, pH=5.0):ACN=97.5:2.5

Detection: UV 254nm

Flow Rate: 1mL/min

Injection: 5μL

1.3 Cefradine



Column: Unisol C18, 4.6×150mm, 5μm

Part No.: UO951505-0

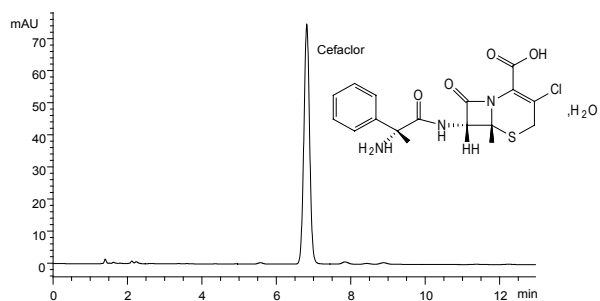
Mobile Phase: Water:MeOH:3.86% sodiumacetate solution
/4% acetic acid solution=742:240:15:3

Detection: UV 254nm

Flow Rate: 1mL/min

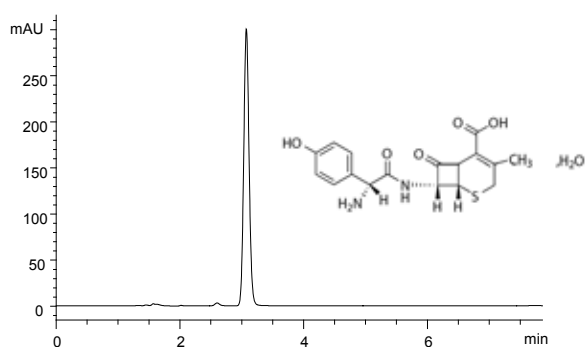
Injection: 2μL

1.4 Cefaclor



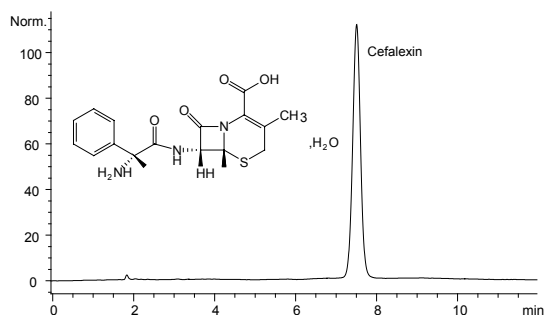
Column: Unisol C18,4.6×150mm,5µm
Part No.: UO951505-0
Mobile Phase: 0.05mol/L phosphate
buffer(pH=3.4):ACN=92:8
Detection: UV 254nm
Flow Rate: 1mL/min
Injection: 5µL

1.5 Cefadroxil



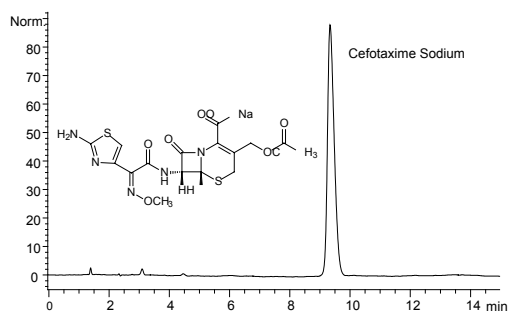
Column: Unisol C18,4.6×150mm,5µm
Part No.: UO951505-0
Mobile Phase: 0.05mol/L phosphate
buffer(pH=5.5):ACN=96:4
Detection: UV 230nm
Flow Rate: 1mL/min
Injection: 2µL

1.6 Cefalexin



Column: Unisol C18,4.6×150mm,5µm
Part No.: UO951505-0
Mobile Phase: Water:MeOH:3.86%
sodium acetate solution/4%
acetic acid solution=742:240:15:3
Detection: UV 254nm
Flow Rate: 1mL/min
Injection: 2µL

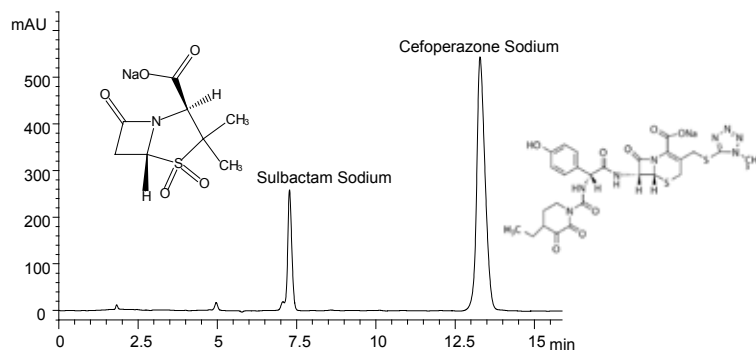
1.7 Cefotaxime Sodium



Column: Unisol C18,4.6×150mm,5µm
Part No.: UO951505-0
Mobile Phase: phosphate buffer
(0.4mMKH₂PO₄+8mM K₂HPO₄)/MeOH=89:11
Detection: UV 254nm
Flow Rate: 1mL/min
Injection: 2µL

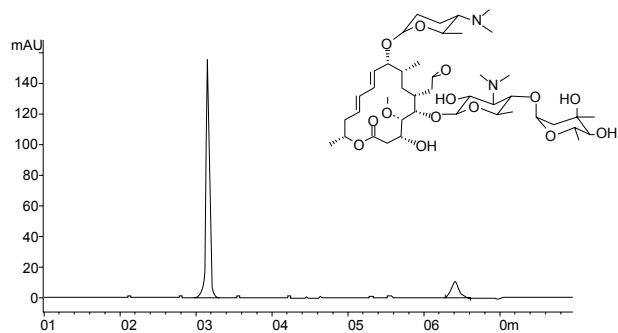


1.8 Sulbactam Sodium + Cefoperazone Sodium



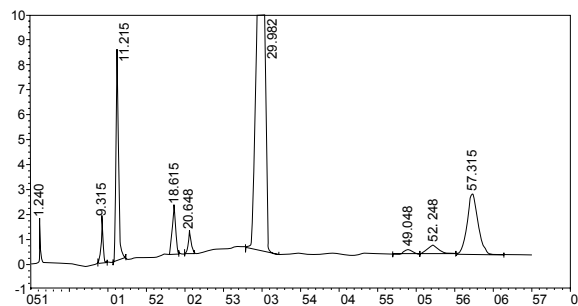
Column: Venusil XBP C18, 4.6×250mm, 5μm
Part No.: VX952505-0
Mobile Phase: 0.005 mol/L TABOH (adjust pH=5.0 with H₃PO₄):ACN=70:30
Detection: UV 220nm
Flow Rate: 1mL/min
Injection: 2μL

1.9 Acetylspiramycin



Column: Unisol C18, 4.6×250mm, 5μm
Part No.: UO952505-0
Mobile Phase: ACN:NaClO₄/H₃PO₄(pH=2.2)=30:70
Temperature: 30°C
Flow Rate: 0.8mL/min
Injection: 20μL

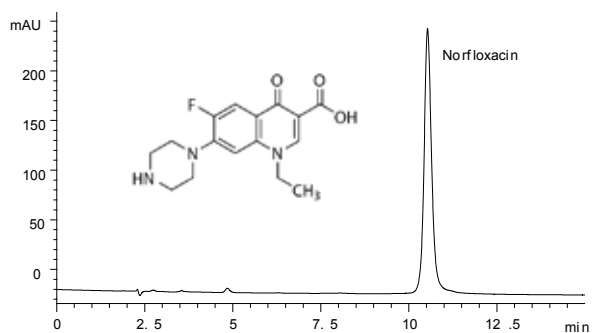
1.10 Meleumycin



Column: Venusil XBP C8, 4.6×150mm, 5μm
Part No.: VX851505-0
Mobile Phase: ammonium formate (0.2mol/L, adjust to pH=7.3 with TEA):ACN=62:38
Detection: UV 232nm
Flow Rate: 1mL/min
Temperature: 30°C

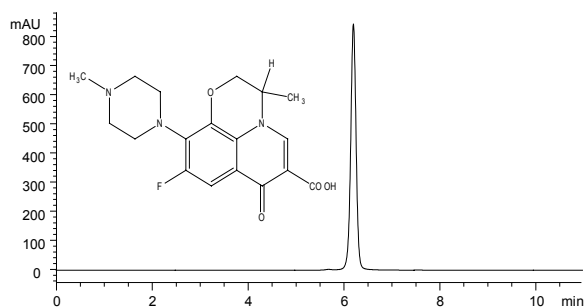
2.Synthetic Antimicrobial Agents

2.1 Norfloxacin



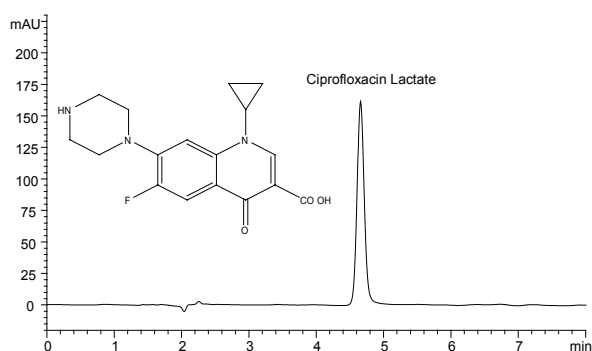
Column: Venusil XBP C18, 4.6×250mm,5μm
Part No.: VX952505-0
Mobile Phase: H₃PO₄ (0.025mol/L, adjust to pH=3.0 with TEA):ACN=87:13
Detection: UV 278nm
Flow Rate: 1mL/min
Injection: 20μL

2.2 Ofloxacin



Column: Venusil XBP C18, 4.6×250mm,5μm
Part No.: VX952505-0
Mobile Phase: NH₄AC/ KClO₄(40mM,pH=2.0):ACN=85:15
Detection: UV 294nm
Flow Rate: 1mL/min
Injection: 4μL

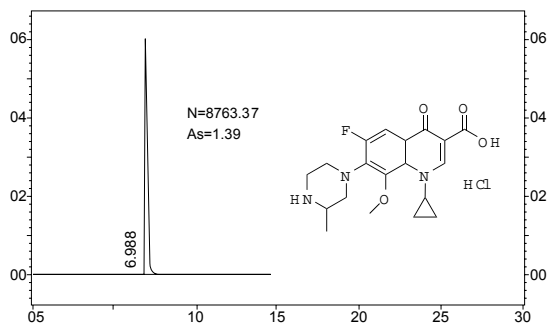
2.3 Ciprofloxacin Lactate



Column: Venusil XBP C18,4.6×150mm,5μm
Part No.: VX951505-0
Mobile Phase: citric acid buffer (0.05mol/L, adjust to pH=3.5 with TFA):ACN=82:28
Detection: UV 277nm
Flow Rate: 1mL/min
Injection: 10μL

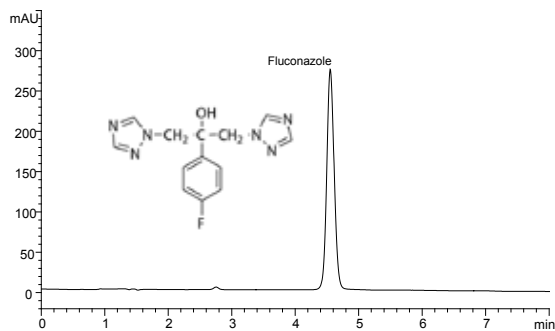


2.4 Gatifloxacin hydrochloride



Column: Venusil XBP C18(L), 4.6×150mm, 5μm
Part No.: VX951505-L
Mobile Phase: 1%TEA(pH=4.5):ACN=87:13
Detection: UV 325nm
Flow Rate: 1.5mL/min
Injection: 10μL
Temperature: 40 °C

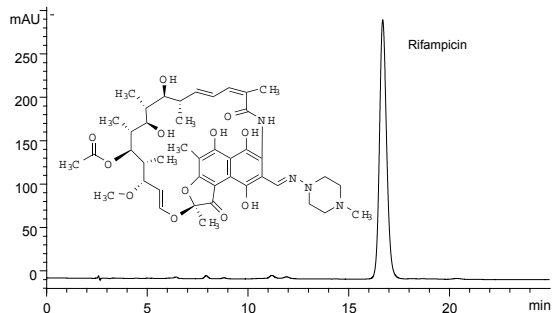
2.5 Fluconazole



Column: Venusil XBP C18, 4.6×150mm, 5μm
Part No.: VX951505-0
Mobile Phase: KH₂PO₄ buffer(adjust to pH=7.0
with NaOH):MeOH=55:45
Detection: UV 260nm
Flow Rate: 1mL/min
Injection: 10μL

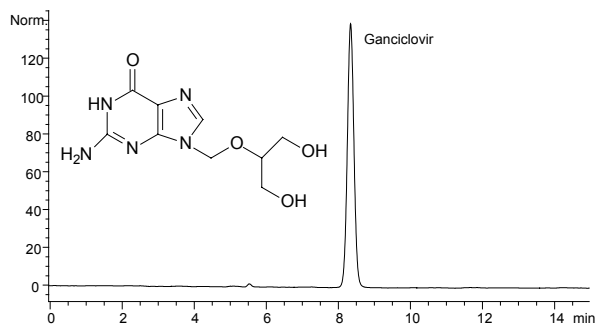
3. Anti-virus Medicine

3.1 Rifampicin



Column: Venusil XBP C8, 4.6×250mm, 5μm
Part No.: VX852505-0
Mobile Phase: MeOH/ACN/KH₂PO₄ 0.075mol/L/citric acid
1mol/L=30:30:36:4
Detection: UV 254nm
Flow Rate: 1mL/min
Injection: 2μL

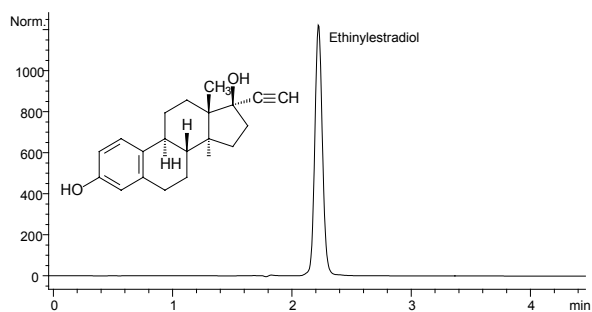
3.2 Ganciclovir



Column: Unisol C18,4.6×150mm,5µm
Part No.: UO951505-0
Mobile Phase: Water:MeOH=95:5
Detection: UV 252nm
Flow Rate: 1mL/min
Injection: 2µL

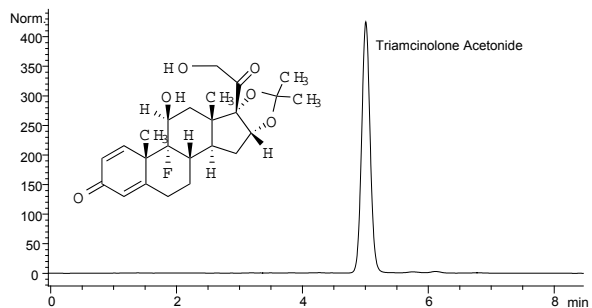
4. Steroid Hormones

4.1 Ethinylestradiol



Column: Unisol C18,4.6×150mm,5µm
Part No.: UO951505-0
Mobile Phase: MeOH:Water=70:30
Detection: UV 281nm
Flow Rate: 1mL/min
Injection: 2µL

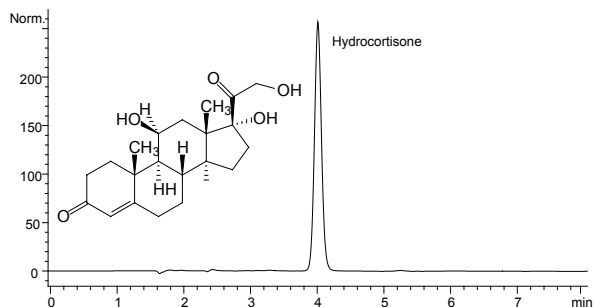
4.2 Triamcinolone Acetonide



Column: Unisol C18,4.6×150mm,5µm
Part No.: UO951505-0
Mobile Phase: MeOH:Water=21:19
Detection: UV 240nm
Flow Rate: 1mL/min
Injection: 2µL

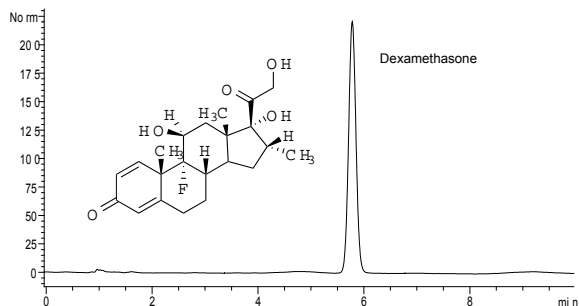


4.3 Hydrocortisone



Column: Unisol C18,4.6×150mm,5µm
Part No.: UO951505-0
Mobile Phase: MeOH:Water=70:30
Detection: UV 240nm
Flow Rate: 1mL/min
Injection: 10µL

4.4 Dexamethasone

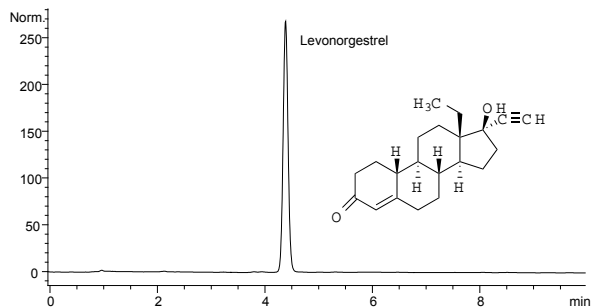


Column: Venusil XBP C18,4.6×150mm,5µm
Part No.: VX951505-0
Mobile Phase: citric acid buffer (0.05mol/L, adjust to pH=3.5 with TFA):ACN=82:28
Detection: UV 277nm
Flow Rate: 1mL/min
Injection: 10µL

077

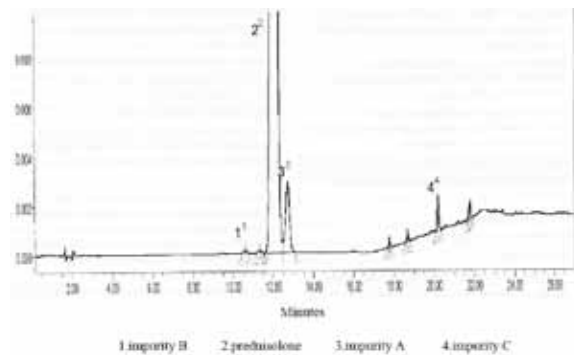
HPLC Columns

4.5 Levonorgestrel

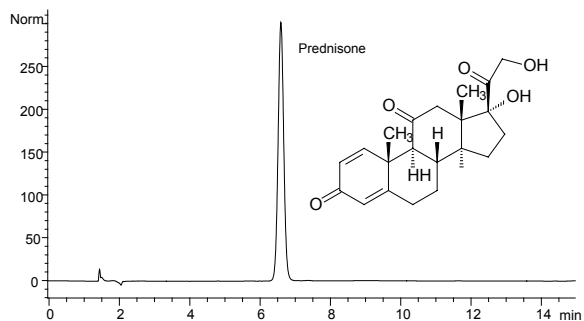


Column: Unisol C18,4.6×150mm,5µm
Part No.: UO951505-0
Mobile Phase: Water:ACN=30:70
Detection: UV 240nm
Flow Rate: 1mL/min
Injection: 2µL

4.6 Prednisone

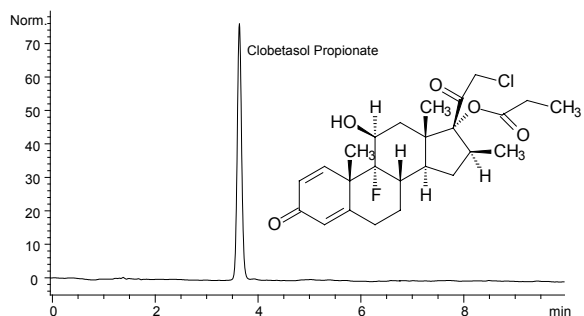


Column: Unisol C18,4.6×150mm,5µm
Part No.: UO951505-0
Mobile Phase: Water:THF:MeOH=668:250:62
Detection: UV 254nm
Flow Rate: 1mL/min
Injection: 2µL



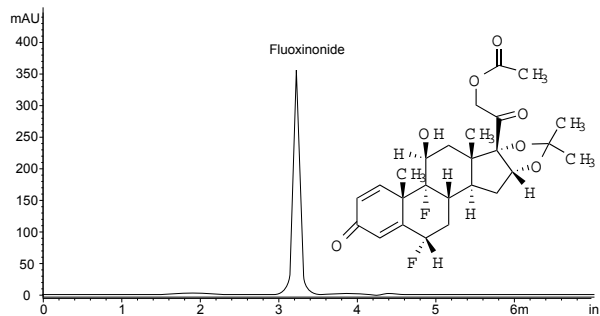
Column: Unisil C18,4.6×150mm,5µm
Part No.: UO951505-0
Mobile Phase: Water:THF:MeOH=668:250:62
Detection: UV 254nm
Flow Rate: 1mL/min
Injection: 2µL

4.7 Clobetasol Propionate



Column: Unisil C18,4.6×150mm,5µm
Part No.: UO951505-0
Mobile Phase: phosphate buffer 0.05mol/L,pH=2.5/ACN
/MeOH=425:475:100
Detection: UV 240nm
Flow Rate: 1mL/min
Injection: 2µL

4.8 Fluocinonide

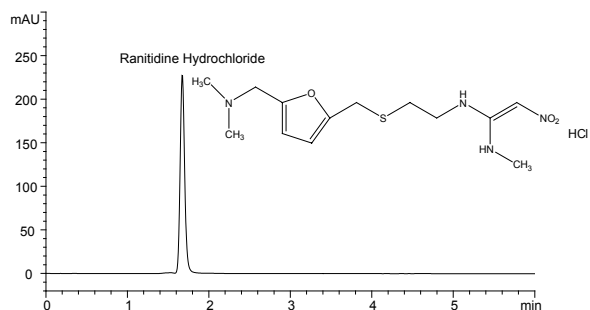


Column: Venusil XBP C18,4.6×150mm,5µm
Part No.: VX951505-0
Mobile Phase: MeOH:ACN:Water=60:10:30
Detection: UV 240nm
Flow Rate: 1mL/min
Injection: 10µL



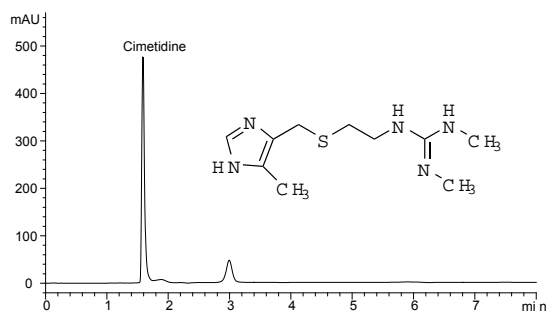
5 Medicine for Gastric Ulcer

5.1 Ranitidine Hydrochloride



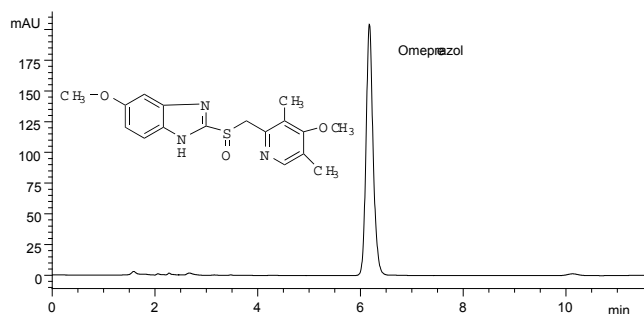
Column: Venusil XBP C18,4.6×150mm,5µm
Part No.: VX951505-0
Mobile Phase: MeOH:0.77% Ammonium acetate aq.
285:115
Detection: UV 320nm
Flow Rate: 1mL/min
Injection: 10µL

5.2 Cimetidine



Column: Venusil XBP C18,4.6×150mm,5µm
Part No.: VX951505-0
Mobile Phase: MeOH:Water:H₃PO₄:TFA
=200:800:0.3:0.2
Detection: UV 220nm
Flow Rate: 1mL/min
Injection: 10µL

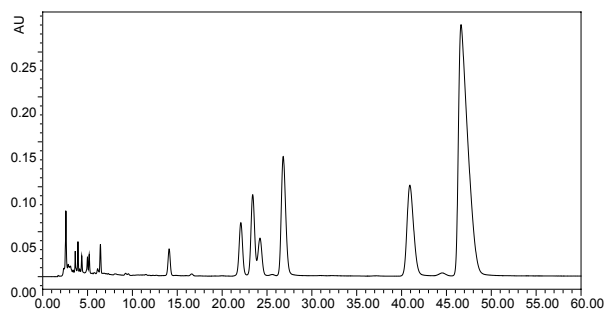
5.3 Omeprazole



Column: Venusil XBP C8,4.6×250mm,5µm
Part No.: VX852505-0
Mobile Phase: NaH₂PO₄ Buffer (0.01 mol/L, adjust to
pH7.6with H₃PO₄): ACN=60:40
Detection: UV 302nm
Flow Rate: 1mL/min
Injection: 4µL

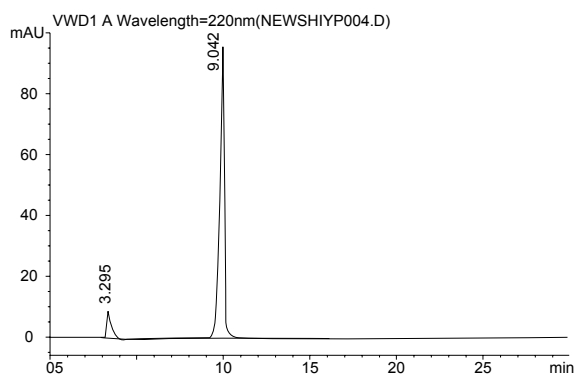
6. Analysis of Alkaloids

6.1 Quaternary Ammonium Alkaloids from Coptidis



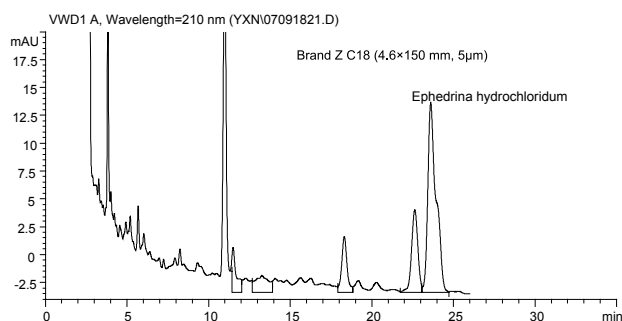
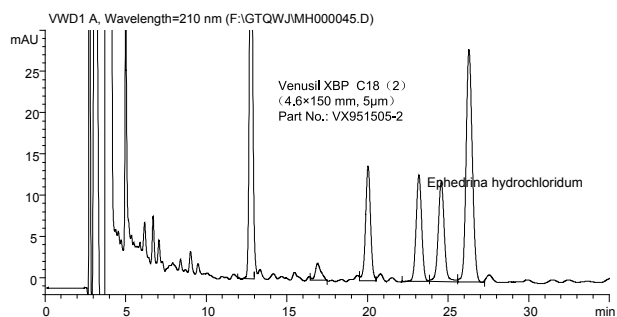
Column: Unisol C18, 4.6×250mm, 5µm
Part No.: UO952505-0
Mobile Phase: water(0.3%TEA):ACN=75:25
Detection: UV254nm
Flow Rate: 1mL/min
Temperature: 25 °C

6.2 Matrine



Column: Venusil XBP NH₂, 4.6×250mm, 5µm
Part No.: VN852505-0
Mobile Phase: ACN:Ethanol:3% H₃PO₄ aq.=80:10:10
Detection: UV 220nm
Flow Rate: 1mL/min
Injection: 20µL

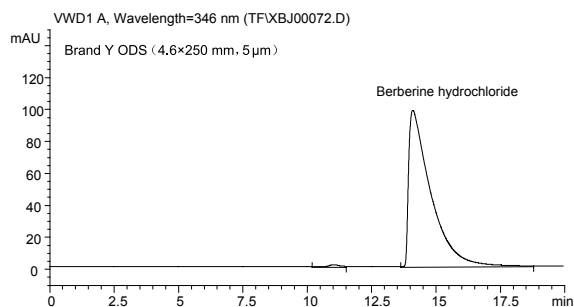
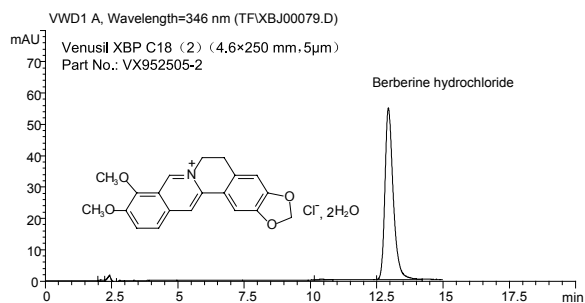
6.3 Ephedrine from Coptidis



Mobile Phase: ACN:SDS/H₃PO₄=40:60
Detection: UV 210nm
Flow Rate: 1mL/min

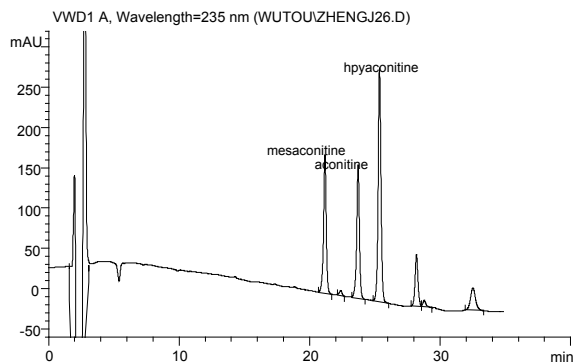


6.4 Berberine Hydrochloride From Phellodendron



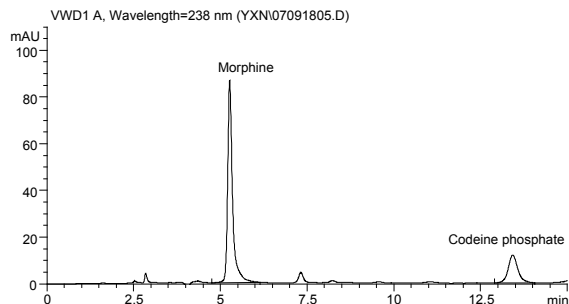
Mobile Phase: ACN:1%TFA=35:65
Detection: UV 346nm
Flow Rate: 1mL/min

6.5 Aconitine、Mesaconitine、Hypaconitine



Column: Promosil C18,4.6×250mm,5μm
Part No.: PM952505-0
Mobile Phase: ACN: 2% Acetate Buffer adjust pH=6.5
with TEA=15:85
Detection: UV 235nm
Flow Rate: 1mL/min

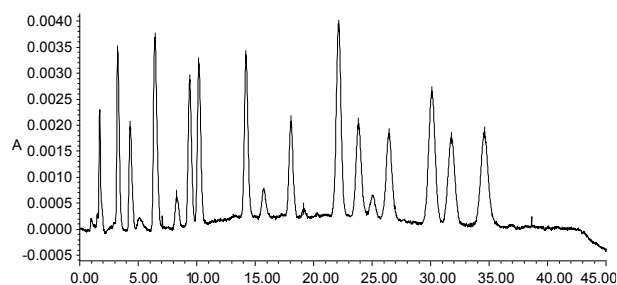
6.4 Berberine from Phellodendron



Column: Venusil XBP C18(2),4.6×250mm,5μm
Part No.: VX952505-2
Mobile Phase: MeOH: CH₃COONa aq. (0.03mol/L,
adjust pH to 3.5 with Acetic acid)=15:85
Detection: UV 238nm
Flow Rate: 1mL/min

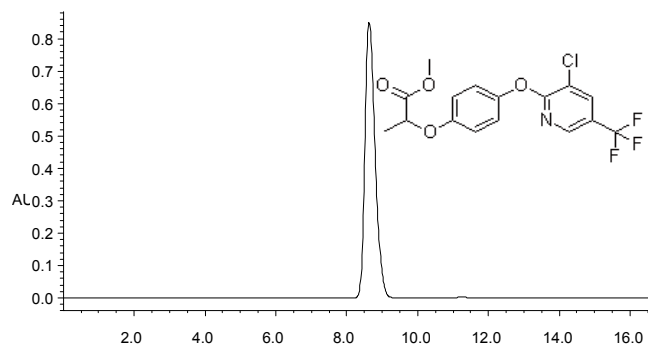
7. Agricultural Chemical

7.1 Analysis of 14 Kinds Herbicides



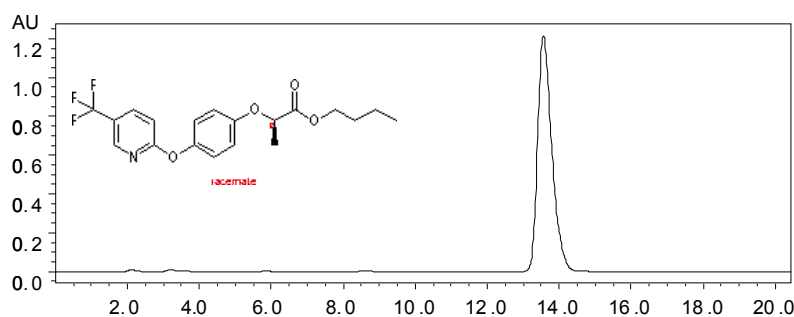
Sample: dazomet Cymoxanil Triadimefon Tebuconazole
Thiophanate-Methyl hexaconazole flutriafol
Iprodione Metalaxyl Procymidone carboxin
Prochlora Diethofencar Triadimenol
1,2,3,6-tetrahydro-N-(trichloromethylthio)phthalimide
Column: Venusil XBP C18,4.6×150mm,5µm
Part No.: VX951505-0
Mobile Phase: A: Ammonium acetate buffer; B:ACN
Gradient: 40%B to 45%B in 8 min, hold for 40min.
Detection: UV 225nm Flow Rate: 1mL/min
Injection: 20µL Temperature: 25°C

7.2 Haloxyfop-P-methyl



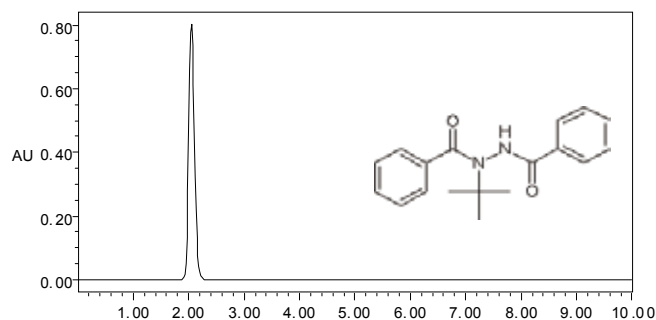
Column: Venusil XBP C18,4.6×150mm,5µm
Part No.: VX951505-0
Mobile Phase: ACN:Water=70:30
Detection: UV 225nm
Flow Rate: 1mL/min
Injection: 5µL
Temperature: 25°C

7.3 Fluazifop-p-butyl



Column: Venusil XBP C18,4.6×150mm,5µm
Part No.: VX951505-0
Mobile Phase: ACN:Water=70:30
Detection: UV 225nm
Flow Rate: 1mL/min
Injection: 5µL
Temperature: 25°C

7.4 1,2-Dibenzoyl-1-tert-butylhydrazine



Column: Venusil XBP C18,4.6×150mm,5µm
Part No.: VX951505-0
Mobile Phase: Water:MeOH=25:75
Detection: UV 254nm
Flow Rate: 1mL/min
Injection: 10µL
Temperature: 25°C



8. Analysis of Amino Acid

Column: Venusil AA, 4.6×250mm, 5µm

Part No.: AA952505-0

Mobile Phase: A: 0.1mol/L CH₃COONa(Adjust pH=6.5 with Acetic Acid):Acetonitrile (93:7)

B:Water: Acetonitrile (4:1)

Gradient:

Time(min)	0	11	13.9	14	29	29.1	37	37.1	45
%B	0	7	12	15	34	100	100	0	0

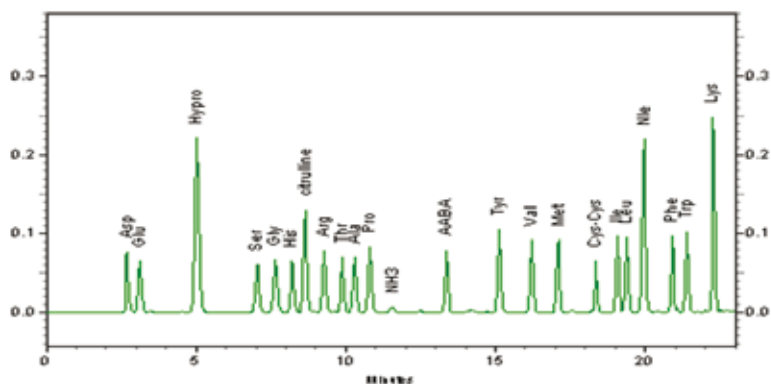
Flow Rate: 1mL/min

Detection: UV 254nm

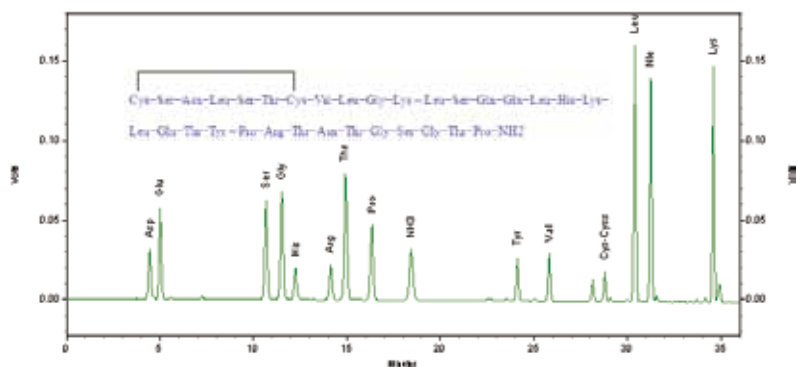
Temperature: 40 C

Sample: PTC-AA (derivatization of amino acids with PITC)

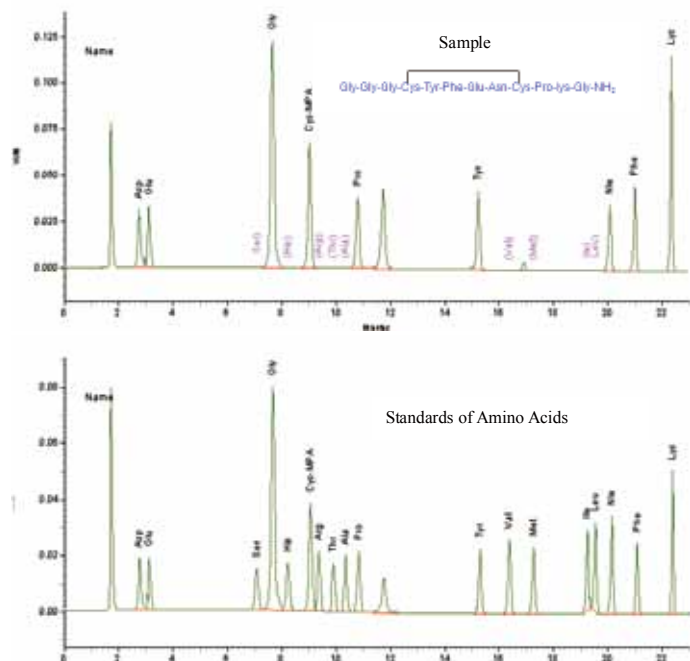
8.1 Standards of Amino Acids



8.2 Amino Acid from Salmon Calcitonin

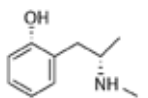


8.3 Amino Acid from Terlipressin

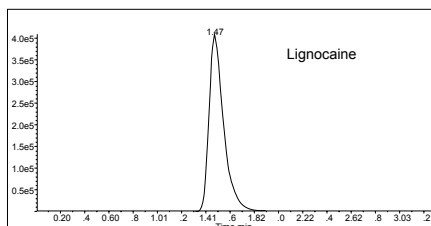
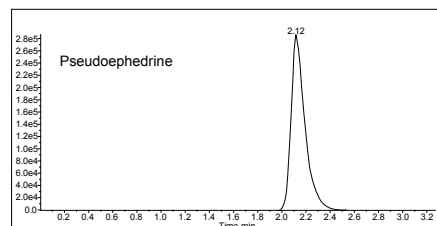


9. Applications in LC-MS

9.1 Pseudoephedrine in Plasma



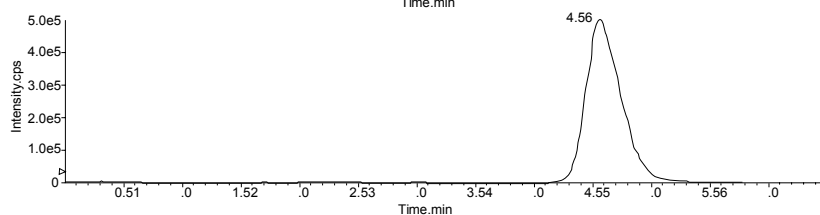
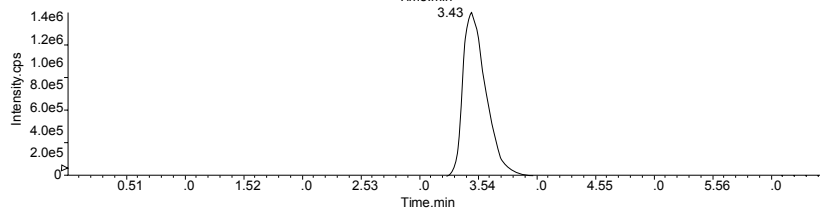
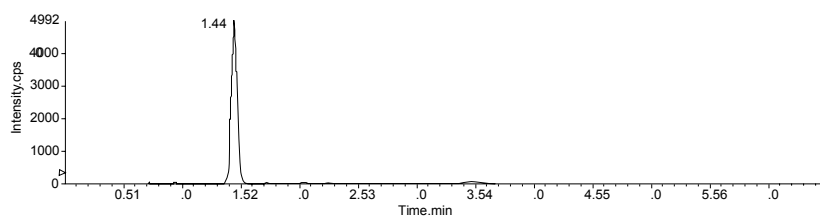
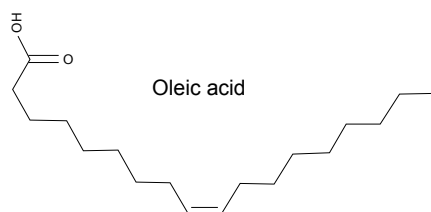
Pseudoephedrine



Mass System: API Qtrap 3200 Applied Biosystem
 Mass Condition: Cation Detector Mode,MRM
 HPLC Column: Venusil ASB C18, 2.1mm×50mm; Part No.:VS950502-0;
 Sample: Prepared sample by SPE(Cleanert PCX)
 Mobile Phase: A:1% Formic Acid in Water; B:Methanol
 Gradient: 20%B to 95%B in 2 min, hold for 0.5 min, then switch to A:B(20:80)
 Flow Rate: 0.5mL/min
 Temperature: 25 C



9.2 Oleic Acid in Plasma



Mass System: API Qtrap 3200 Applied Biosystem

Mass Condition: Anion Detector Mode, MRM

HPLC Column: Venusil ASB C18, 2.1mm×50mm; Part No.: VS950502-0

Sample: Prepared sample by SPE(Cleanert PEP)

Mobile Phase: A:13mmol/L ammonium acetate aq.; B:Acetonitrile

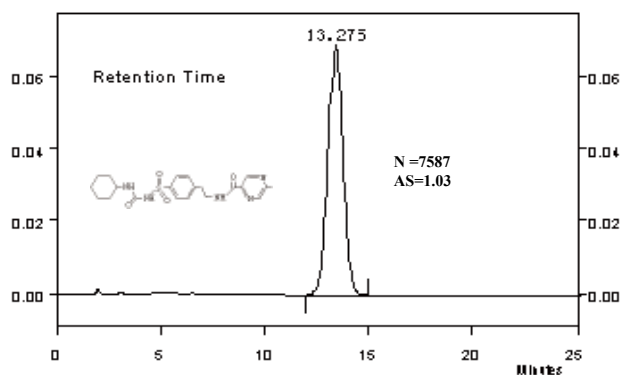
Gradient: 5%B to 95%B in 2 min, hold for 2 min., switch to A:B(95:5) then hold for 2 min.

Flow Rate: 0.8 mL/min

Temperature: 25°C

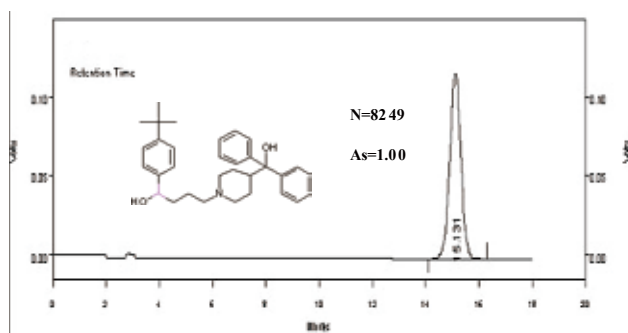
10.others

10.1 Glipizide



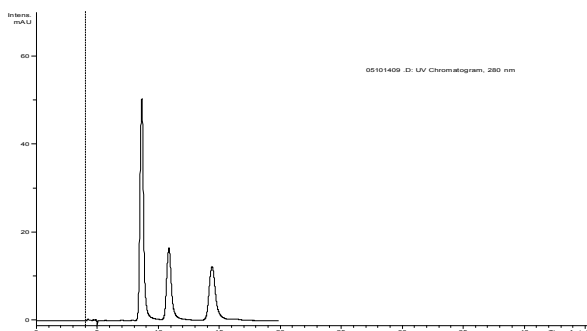
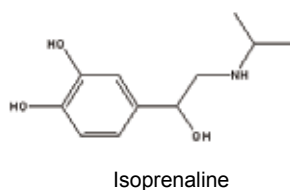
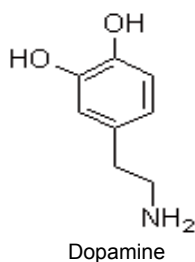
Column: Unisol C18,4.6×150mm,5µm
Part No.: UO951505-0
Mobile Phase: phosphate Buffer 0.1 mol/L,
pH 6.0 :MeOH=55:45
Flow Rate: 1mL/min
Injection: 20µL

10.2 Terfenadine



Column: Unisol C18,4.6×150mm,5µm
Part No.: UO951505-0
Mobile Phase: MeOH:H₃PO₄/Triethylamine
(0.1mol/L)=80:20
Detection: UV 254nm
Flow Rate: 1mL/min
Injection: 10µL

10.3 Dopamine and Its Metabolite

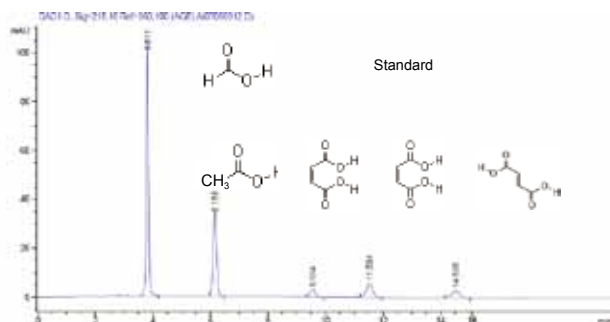


Sample: Dopamine Isoprenaline Soprorenaline
Column: Venusil PFP,4.6×250mm,5µm
Part No.: VF952505-0
Mobile Phase: MeOH:CH₃COOH/CH₃COONH₄
Buffer(pH 4.5)=15:85
Detection: UV 280nm
Flow Rate: 0.8mL/min



10.4 Organic Acids

Determination of organic acids in Fermentation Broth



Sample: Formic acid, acetic acid, maleic acid,
succinic acid, fumaric acid

Column: Unisol C18, 4.6×250mm, 5μm

Part No.: UO952505-0

Mobile Phase: 0.02M NH₄AC Aq.:MeOH=95:5

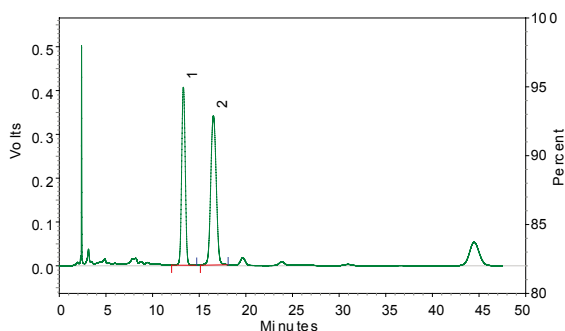
Detection: UV 215nm

Flow Rate: 1mL/min

Injection: 10μL

Temperature: 20 °C

10.5 Catechins in Tea



Sample: Extract of tea

Column: Unisol C18, 4.6×250mm, 5μm

Part No.: UO952505-0

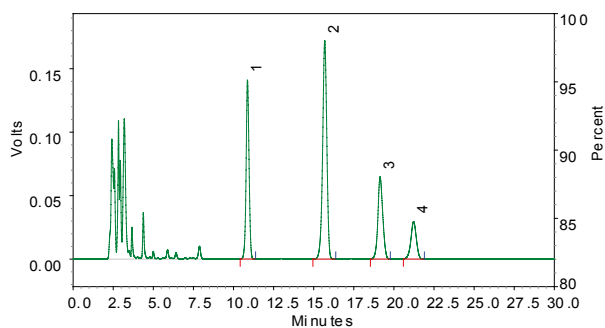
Mobile Phase: 0.02% H₃PO₄:MeOH=81:19

Detection: UV 278nm

Flow Rate: 1mL/min

Temperature: 40 °C

10.6 Saccharin Sodium in Milk Powder



Sample: Benzoic acid, 2,4-Hexadienoic acid, Sodium
saccharine, milk powder

Column: Venusil Unisol C18, 4.6×250mm, 5μm

Part No: UO952505-0

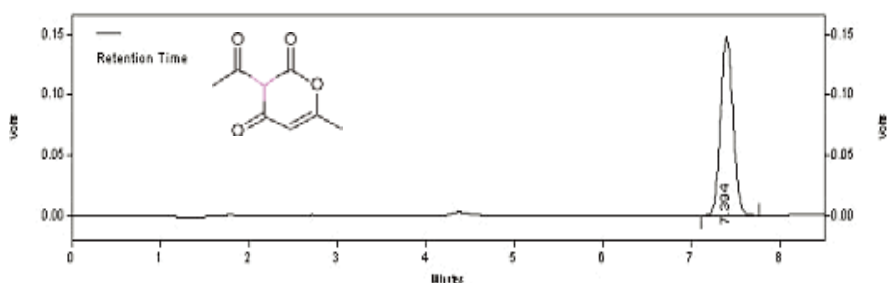
Mobile Phase: MeOH:CH₃COONH₄(0.02 M)=5:95

Detection: UV 230nm

Flow Rate: 1mL/min

Temperature: 30 °C

10.7 DHA in the Health Food



Column: Unisol C18, 4.6×250mm, 5μm

Part No.: UO952505-0

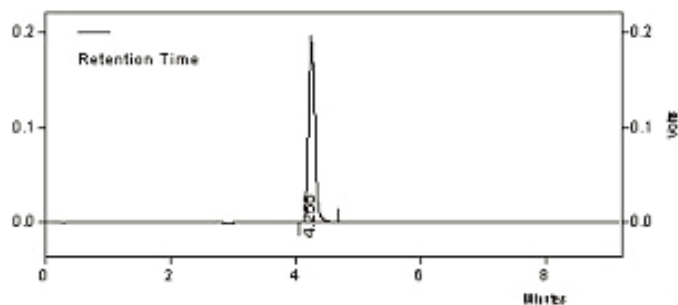
Mobile Phase: MeOH:Water=80:20

Detection: UV 254nm

Flow Rate: 1mL/min

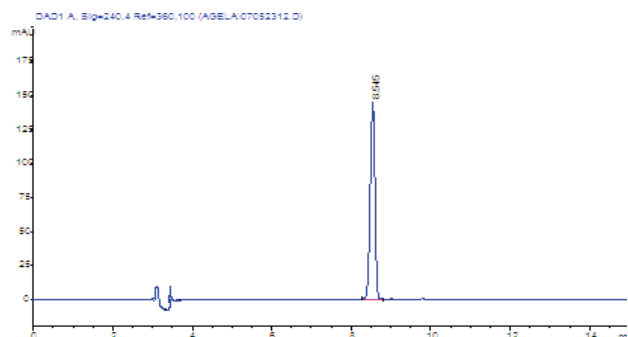
Injection: 10μL

10.8 Tartrazine in Food



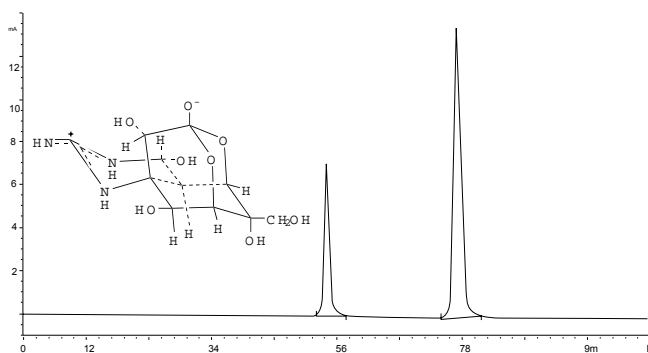
Column: Unisol C18, 4.6×250mm, 5µm
Part No.: UO952505-0
Mobile Phase: A: Ammonium acetate buffer pH 4.0; B: MeOH
Gradient: 35%B to 50%B in 5 min.
Detection: UV 254nm
Flow Rate: 1mL/min
Injection: 10µL

10.9 Melamine in Feed



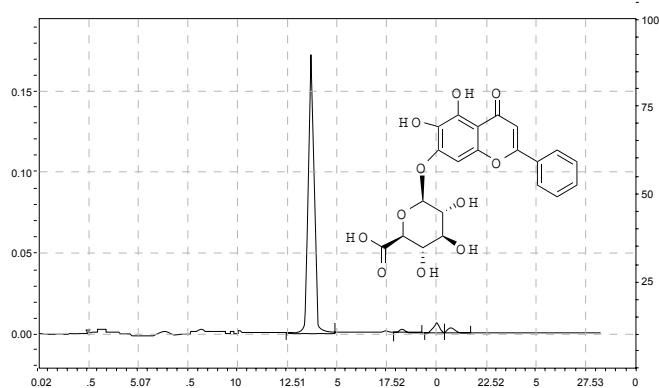
Column: Venusil ASB C18, 4.6×250mm, 5µm
Part No.: VS952505-0
Mobile Phase: 10mM Citric acid+10mM Perfluorooctane sulfonate (pH=3.0):ACN=85:15
Detection: UV 240nm
Flow Rate: 1mL/min
Injection: 10µL
Temperature: 40°C

10.10 Tetrodotoxin(TTX)



Column: Venusil ASB C18, 4.6×250mm, 5µm
Part No.: VS952505-0
Mobile Phase: 0.02% H₃PO₄:MeOH=40:60
Detection: UV 200nm
Flow Rate: 0.5mL/min
Temperature: 25°C

10.11 Baicalin



Column: Venusil ASB C18, 4.6×150mm, 5µm
Part No.: VS951505-0
Mobile Phase: MeOH:1% acetic acid=50:50
Detection: UV 274nm
Flow Rate: 1mL/min
Injection: 5µL



APPENDIX

Column Cleaning Procedures



Due to interactions between the stationary phase and sample components, HPLC columns may occasionally require cleaning or regeneration. The following conditions apply to silica-based columns. Flow rates should be 1/5-1/2 of the typical flow rate.

To estimate the column volume, use the following equation:

$$V = \pi r^2 / L$$

V = column volume in mL

r = column radius in cm

L = column length in cm

UNBONDED SILICA COLUMNS (SILICA)

Rinse with 10 column volumes each of: Hexane, Methylene Chloride, Isopropanol, Methylene Chloride. Mobile phase: Flush column with 30mL 2.5% 2,2-dimethoxy-propane and 2.5% glacial acetic acid in hexane

REVERSED PHASE COLUMNS (C18, C8, C4, C2, C1, PHENYL, CN, NH₂)

Rinse with 10 column volumes of: 95% Water/5% Acetonitrile (for buffer removal) followed by 95% Acetonitrile/5% Water mobile phase

REVERSED PHASE PROTEIN/PEPTIDE COLUMNS (C18, C8, C5, C4, PHENYL)

Rinse with 20 column volumes of mobile phase with buffer removed run gradient (2x):
 A) 0.1% Aqueous TFA in Water
 B) 0.1% TFA in Acetonitrile/Isopropanol (1:2) 25% B to 100% B for 30 minutes
 Equilibrate with 10 column volumes of mobile phase.

BONDED NORMAL PHASE COLUMNS (CN, NH₂, DIOL)

Rinse with 10 column volumes each of: Chloroform, Isopropanol, Methylene chloride, mobile phase. Exception: Recommended for cleaning Amino when used in reversed phase mode:
 1. Wash with at least 30 column volumes of Sodium Hydroxide (pH=11.0)
 2. Flush with at least 30 column volumes of Water (HPLC grade)
 3. Re-equilibrate to Mobile phase conditions.

GFC/SEC COLUMNS FOR PROTEINS

(300X7.8mm size columns) Rinse with 5 column volumes of:
 0.1M Phosphate buffer pH=3.0. For strongly retained proteins: Run 100% Water to 100% Acetonitrile to 100% Water over 60 minutes or wash with 5 column volumes of SDS or 6M Guanidine Thiocyanate or 10% DMSO

ION-EXCHANGE COLUMNS (SAX, SCX, NH₂, DEAE)

Rinse with 10 column volumes of:
 500mM Phosphate buffer pH=7.0 10% Acetic acid (Aq)
 5 Column Volumes of Water
 10 Column Volumes of Phosphate buffer pH=7.0
 5 Column Volumes of Water
 10 Column Volumes of Methanol
 10 Column Volumes of Water
 For protein removal
 Follow the above procedure with this exception: Substitute 10 column volumes of Methanol with 10 column volumes of 5M Urea or 5M Guanidine Thiocyanate

The Methods of Maintaining Good Column Lifetime and Performance

- Inject only well-prepared (filtration, liquid/liquid extraction, SPE) clean samples
- Minimize pressure surge; avoid mechanical and thermo shock
- Use guard columns or on-line filtration
- Flush columns frequently using an appropriate program
- Remove unstable and strongly retained components of no-interest from samples
- Use low pH (1.0-6.0) mobile phase if possible
- Use organic buffer when operating at medium to high pH (6.0-10.0)
- Avoid elevated temperature unless it is necessary
- Add 200 ppm sodium azide in aqueous mobile phase to suppress the growth of the bacteria
- Wash out all buffer salts and store the columns in high organic solution for overnight or long time storage



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