Agela Technologies

HPLC Columns, Media,and Accessories

- UHPLC Columns
- Optimix™ Mix-phase HPLC Columns
- Durashell™ Columns
- Unisol™ Columns
- Venusil™ Columns
- Bulk Media

Bonna-Agela Technologies

Best Value
Guaranteed Product Quality
Innovation to Benefit Customers

HPLC Columns

Venusil™ & Promosil™ HPLC Columns

Venusil™ AA Kit

SPE Columns

Cleanert™ SPE Cartridges

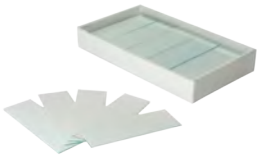
Cleanert™ IC
Pre-treatment Cartridges

Cleanert™ 96 Wellplates

Flash Chromatography Products

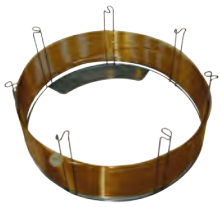
Flash Purification Columns

CHEETAH™ Flash Purification System



TLC Plates

Consumables Products



GC Columns

Clarinert™ Syringe Filters

Vials, Caps and Septa

Bonna-Agela Technologies — A Global Supplier for Chromatography Solutions

2012 Message From Bonna-Agela Technologies

As Bonna-Agela 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 2011, we had tremendous accomplishments: We cataloged over one thousand different products. Our manufacturing and R&D operation were certified in compliance with ISO 9001 and passed many quality audits by customers and distributors, including VWR International. As a global wide company, we not only have our own international sales force but have also formed a marketing alliance with VWR. This will allow us to reach higher goals and to provide our customers with even better quality products and faster service in the new year.

Our 2012 mission statement and commitment:

- Provide products with our innovative technologies at the best performance 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:

Bonna-Agela Technologies US
2038A Telegraph Rd.
Wilmington, DE 19808, USA
Tel: (302) 438 8798
Fax: (302) 636 9339
E-mail: info@bonnaagela.com

Bonna-Agela India
G#212, 2nd Floor, Sector-63, Noida, Uttar Pradesh
Tel: 0120-4225466-71
Fax: 0120-4225465

Bonna-Agela China
179 South Street, Teda West Zone, Tianjin 300462, China
Tel: +86(22)25321032/7023
Fax: +86(22)25321033

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 and 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 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.

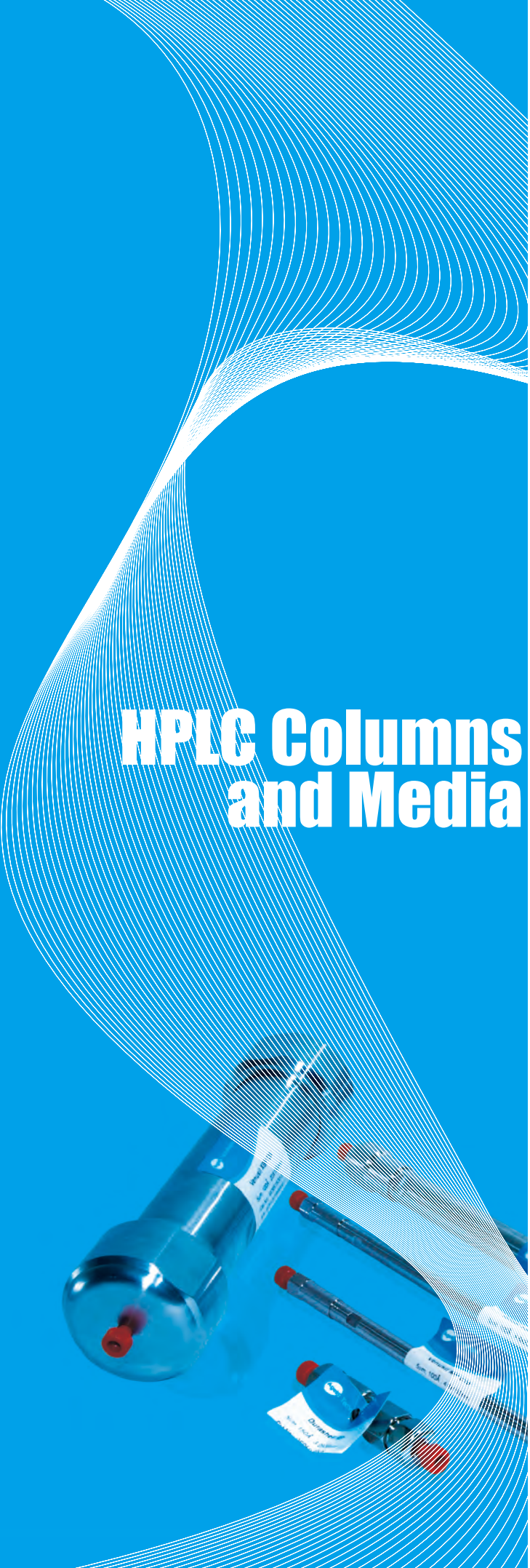
Shipping Policy
The standard shipping method is 2-day FedEx within the United States and Canada. We will try to accommodate requests for other shipping methods if they are available. All shipping and handling charges will be billed separately. Should you receive damaged goods, it is imperative that you 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



HPLC Columns and Media

INTRODUCTION

Bonna-Agela HPLC columns cover a broad spectrum of chemistry to meet nowadays challenging needs of rapid HPLC, LC-MS, extreme pH conditions as well as conventional applications in pharmaceutical, environmental monitoring, and food industries. Our HPLC columns are manufactured with innovative technologies in both media bonding and column packing for unique selectivity and unsurpassed reproducibility. Bonna-Agela HPLC columns are classified into five catogories:

1. **Unisol C18** - A type of true universal reversed phase column for separation of a broad spectrum of molecules such as acidic, basic and neutral compounds. It has a superior performance to other branded C18 phases in almost every aspects.

2. **Unisol Amide** - It has a unique mechanism to separate molecules of different polarities. It can be used as either a reversed-phase or normal phase column. It outperforms any other columns on the market in the HILIC category. It is a top option to separate very polar compounds for optimized retention.

3. **Optimix Series** – A class of columns provides optimized selectivity and balanced retention for hydrophilic and hydrophobic compounds. It extends the retention for polar molecules while decreasing excessive retention for very hydrophobic compounds.

4. **Durashell Series** - A class of columns that can be used in different pH conditions. It has a wide pH range from 1.0 to 12.0.

5. **Venusil ASB Series** – This class of columns is tailored for acidic (pH=0.8) operation and demanding LC-MS applications.

Bonna-Aglea also carries a line accessories such as ultra-low volume guard columns, fittings, column selectors and thermostat chambers, etc. Moreover, Bonna-Agela HPLC column products and are backed by industry leading customer support.

HPLC COLUMNS BY FAMILY

NEW Products!

UHPLC Technology and Columns

In recent ultra-performance HPLC (UHPLC), sub-2μm particles are utilized to achieve higher efficiency and resolution resulting in improved sensitivity. Due to the limit of back-pressure, conventional HPLC systems are not sufficient to drive the column packed with such small particles. However, Bonna-Aglea UHPLC columns packed with 2 μm and 2.5 μm particles of narrow size distribution minimize system back-pressure, and allow application in conventional HPLC systems with comparable performance to UHPLC.

The UHPLC packing material manufactured by Bonna-Agela is based on a new high purity spherical silica. A proprietary technology of surface modification and bonding process renders outstanding properties of the stationary phase with uniform surface and consistent chemistry on the spherical silica. As a result of this technology, interactions between polar analytes and silica surface are reduced significantly and subsequently symmetry for very basic compounds is maximized. A series of unique columns was developed to meeting the demanding requirements for analysis of highly polar compounds. Lot-to-lot reproducibility is guaranteed by a stable bonding or end-capping process.

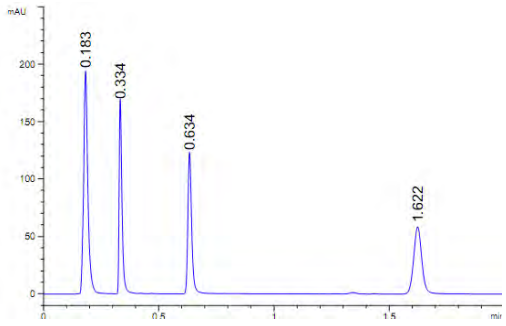
The UHPLC material is packed in newly designed column housings of extremely low void volume, which tolerate back-pressure up to 1000 bar or 15000 psi.

UHP AQ C18

Characteristics: Metal Impurity<30 ppm; Pore Size: 100 Å; Specific Surface Area: 240 m^2/g; Available Particle Size: 2 μm and 2.5 μm.

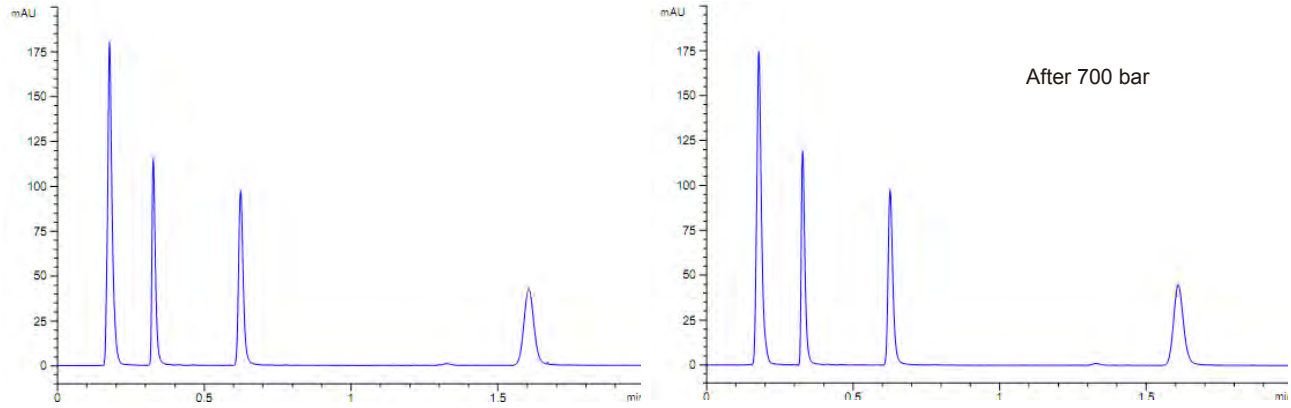
Main Features:

- Greatly improved peak shape for basic compounds;
- 100% water compatibility;
- Low pH stability: stable at as low as pH=1.5;
- Plate Count: 200000/m (2 μm);
- Tailing Factor: 0.98-1.25;



Column: UHP AQ C18, 2.1x50 mm, 2 μm
Sample: Uracil (1) Phenol (2) Nitrobenzene (3) and Naphthalene (4) in mobile phase; 1.0 μL
Mobile phase: 50 % Acetonitrile / 50 % Water
Flow Rate: 0.5 mL/min
Pressure: 337 bar
Temperature: 30 ℃
Detector: UV 254 nm

Pressure test



Column: UHP AQ C18, 2.1x50 mm, 2 μm
Sample: Uracil (1) Phenol (2) Nitrobenzene (3) and Naphthalene (4) in mobile phase
Mobile phase: 50% Acetonitrile / 50% Water
Flow Rate: 0.5 mL/min
Temperature: 30 ℃
Detector: UV 254 nm

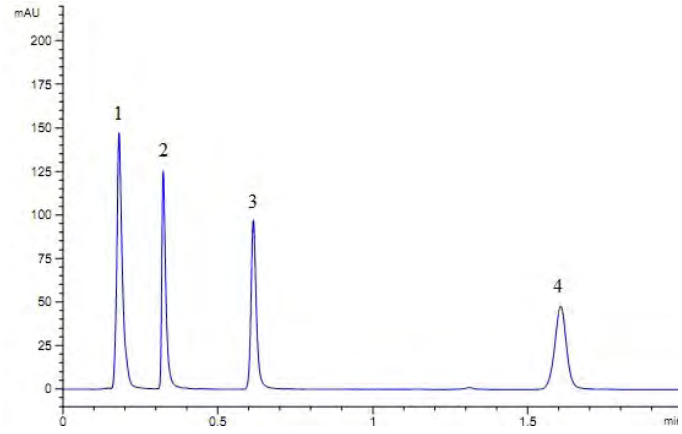
UHP ASB C18

Characteristics: Metal Impurity<30 ppm; Pore Size: 100 Å; Specific Surface Area 240 m^2/g; Available Particle Size: 2 μm and 2.5 μm.

Main Features:

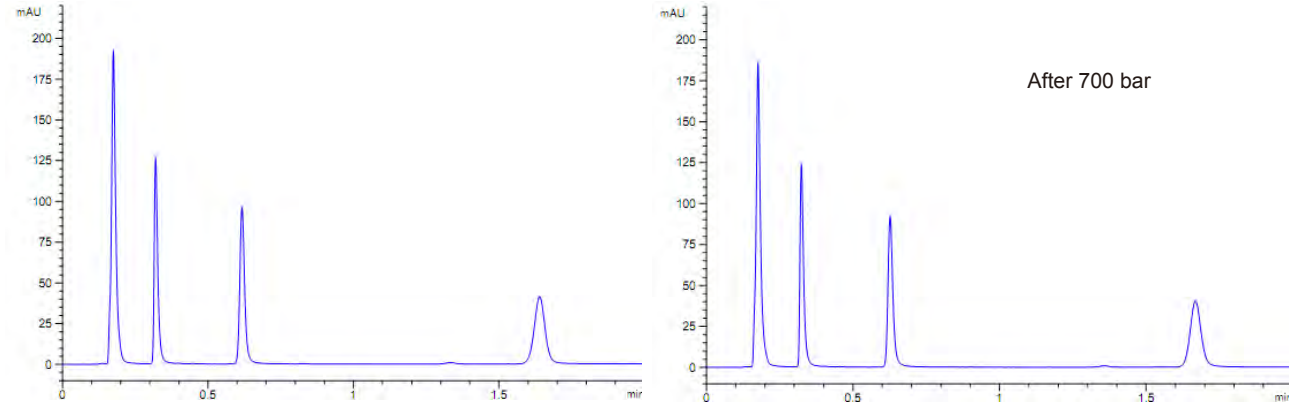
- Balanced retention with high efficiency and resolution
- 100% water compatibility
- Low pH application: as low as 0.8

Balanced Retention for Hydrophilic and Hydrophobic Compounds



Column: UHP ASB C18, 2.1×50mm, 2 μm
Sample: Uracil (1) Phenol (2) Nitrobenzene (3) and Naphthalene (4) in mobile phase; 2 μL
Mobile Phase: 50% Water; 50% Acetonitrile
Flow Rate: 0.5 mL/min
Detector: UV 254 nm
Temperature: 30℃

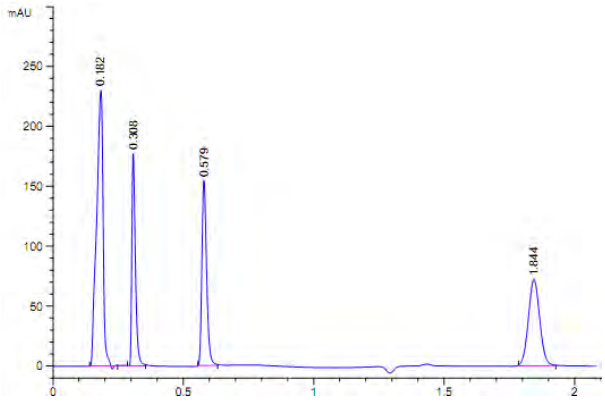
Pressure test



Column: UHP ASB C18, 2.1 x 50 mm, 2 μm
Sample: Uracil (1) Phenol (2) Nitrobenzene (3) Naphthalene (4) in mobile phase
Mobile phase: 50% Acetonitrile / 50% Water
Flow Rate: 0.5 mL/min
Temperature: 30 ℃
Detector: UV 254 nm

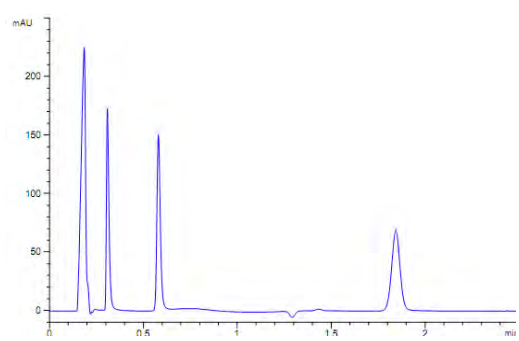
UHP Innoval C18

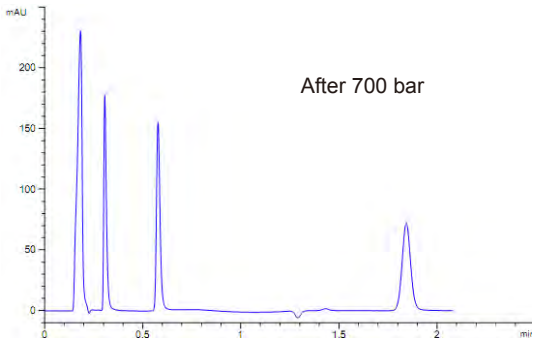
Characteristics: Metal Impurity<30 ppm; Pore Size: 100 Å; Specific Surface Area: 240 m^2/g; Available Particle Size: 2 μm and 2.5 μm.



Sample: Uracil (1) Phenol (2) Nitrobenzene (3) and Naphthalene (4) in mobile phase; 1 μL .
Mobile phase: 50% Water, 50% ACN
Flow Rate: 0.5 mL/min
Pressure: 287 bar
Temperature: 30℃
Detector: UV 254 nm

Pressure test





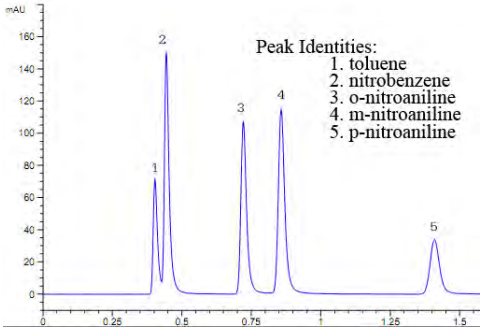
Column: UHP Innoval C18, 2.1 x 50 mm, 2 μm
Sample: Uracil (1) Phenol (2) Nitrobenzene (3) Naphthalene (4) in mobile phase
Mobile phase: 50% Acetonitrile / 50% Water
Flow Rate: 0.5 mL/min
Temperature: 30 ℃
Detector: UV 254 nm

UHP HILIC

The proprietary nano-surface treatment and bonding process of the packing materials led to unique performance of the UHP HILIC columns.
Characteristics: Metal Impurity<30 ppm; Pore Size: 100 Å; Specific Surface Area: 240 m^2/g; Available Particle Size: 2 μm and 2.5 μm.

Main Features:

- Stable to operating pressures
- Wide pH range (2.0-8.0)
- Compatibility with 100% aqueous mobile phase
- Superior retention for polar compounds



Test Conditions
Column: UHP HILIC, 2.1 x 50 mm, 2 μm
Mobile phase: 98.8% chlorobutane; 1% methanol; 0.2% water
Flow rate: 0.3 mL/min
Temperature: 30 ℃
Detector: UV 254 nm

Ordering Information

Surface Area: 240 m^2/g, Pore Size: 100 Å.

Type	Particle size (μm)	Dimension (mm)	UHP AQ C18	UHP ASB C18	UHP Innoval C18	UHP HILIC
UHPLC	2	2.1×30	IA920302-0	IS920302-0	IX920302-0	IH920302-0
UHPLC	2	2.1×50	IA920502-0	IS920502-0	IX920502-0	IH920502-0
UHPLC	2	2.1×100	IA921002-0	IS921002-0	IX921002-0	IH921002-0
UHPLC	2	4.6×50	IA920505-0	IS920505-0	IX920505-0	IH920505-0
UHPLC	2	4.6×100	IA921005-0	IS921005-0	IX921005-0	IH921005-0
UHPLC	2.5	2.1×30	IA920302-A	IS920302-A	IX920302-A	IH920302-A
UHPLC	2.5	2.1×50	IA920502-A	IS920502-A	IX920502-A	IH920502-A
UHPLC	2.5	2.1×100	IA921002-A	IS921002-A	IX921002-A	IH921002-A
UHPLC	2.5	4.6×50	IA920505-A	IS920505-A	IX920505-A	IH920505-A
UHPLC	2.5	4.6×100	IA921005-A	IS921005-A	IX921005-A	IH921005-A

Durashell Columns (C18, C8, Phenyl and NH_2)

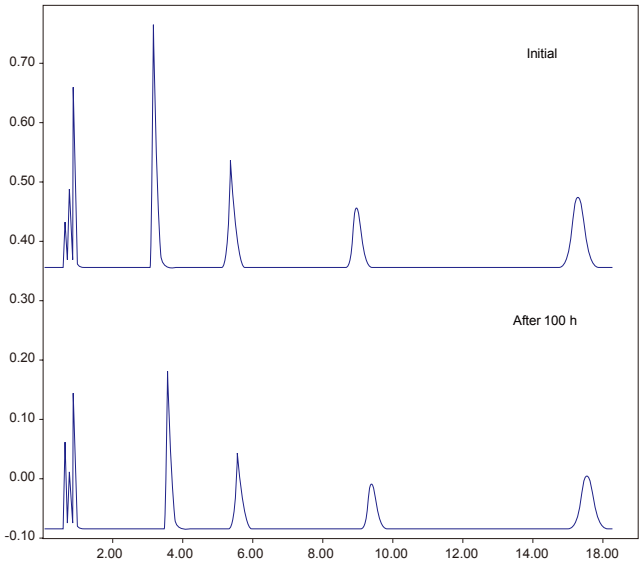
Bonna-Agela' s Durashell column has a pH range of 1.5-12.0. Different from the current marketed products that also can be used at high pH, Durashell' s stationary phase is made with a dendrimer technology followed by molecular modifications. Bonna-Agela's technology produces a strong hydrophobic protection 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 analytes, and yet maintains great interfacial kinetics for high efficiency. A line of stationary phases includes C18, C8, Phenyl and NH_2.

Characteristics: Metal Impurity<30 ppm; Pore Size: 100 Å; Specific Surface Area: 380 m^2/g; Available Particle Size: 5 and 10 um.

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; 4.6x150 mm
Mobile Phase: 50% ACN/50% 0.05M Ammonia (pH=9.0)
Flow Rate: 1.5 mL/min
Sample: doxepin, nortriptyline, amitriptyline and trimipramine
Temperature: 35℃

Durashell (C18) vs Phenomenex Gemini-NX C18

Column: Bonna-Agela Durashell (C18) , 5um, 100Å, 4.6x100 mm
Phenomenex Gemini-NX C18, 5 um, 110Å, 4.6x100 mm

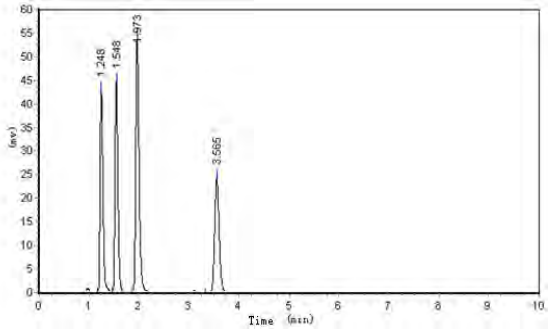
Column efficiency test:

Test method:

Mobile phase: MeOH: H_2O=85:15
Flow rate: 0.8 mL/min
Sample: Uracil, Phenol, Nitrobenzene, Naphthalene
Injection: 1 μL
Detector: UV 254 nm
Temperature: 30℃

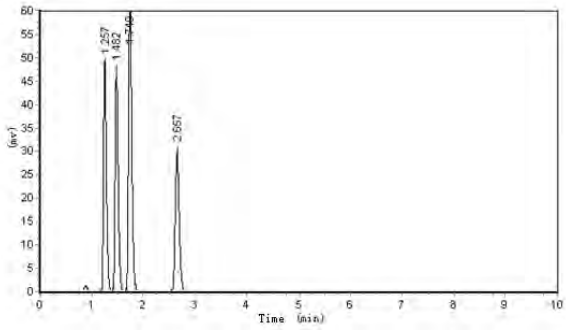
Test Result:

Bonna-Agela Durashell



The four peaks are uracil, phenol, nitrobenzene and naphthalene successively.
According to Naphthalene's peak, N=7281, TF=1.11, Rt=3.565.

Phenomenex Gemini



The four peaks are uracil, phenol, nitrobenzene and naphthalene successively.
According to Naphthalene' s peak, N=5205, TF=1.239, Rt=2.657.

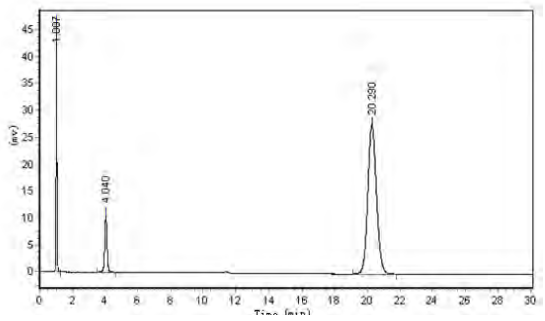
Test of basic compounds under basic condition:

Test method:

Mobile phase: MeOH: 0.1% Ammonia =70: 30
Flow rate: 1.0 mL/min
Injection: 2 μL
Detection wavelength: 254 nm
Temperature: 30℃
Sample: 6 mg Uracil, 426 mg Propranolol Hydrochloride and 79 mg Amitriptyline dissolved in 100 mL mobile phase

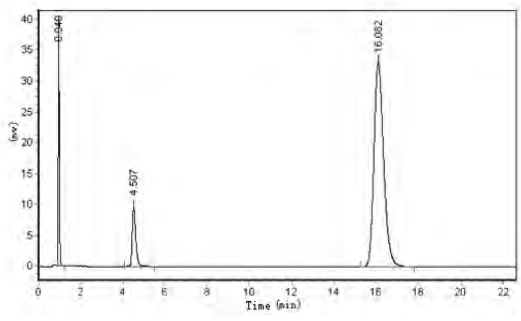
Test result:

Bonna-Agela Durashell



The last peak Amitriptyline: Tf=1.108

Phenomenex Gemini



The last peak Amitriptyline: Tf=1.241

Peak No.	Compound	Retention time	N	Tf	Asymmetry
3	Amitriptyline	20.290	7061.023	1.108	1.217

Peak No.	Compound	Retention time	N	Tf	Asymmetry
3	Amitriptyline	16.082	5926.937	1.241	1.397

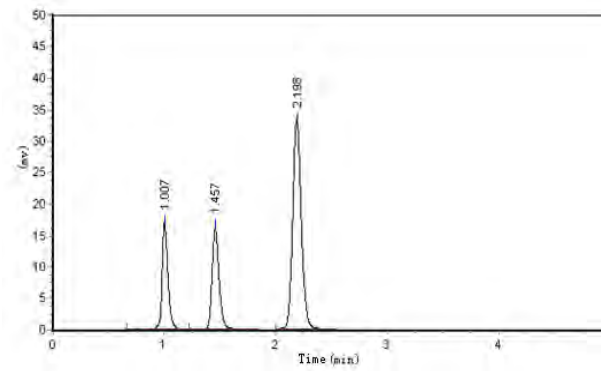
Test of basic compounds under acid condition:

Test method:

Mobile phase: MeOH: 1%Acetic acid (pH=3.72 adjusted with Triethylamine) =70: 30
Flow rate: 1.0 mL/min
Injection: 2 μL
Detector: UV 254 nm
Temperature: 30 ℃
Sample: 3 mg Uracil, 285 mg Propranolol Hydrochloride and 13 mg Amitriptyline dissolved in 100 mL mobile phase

Test result:

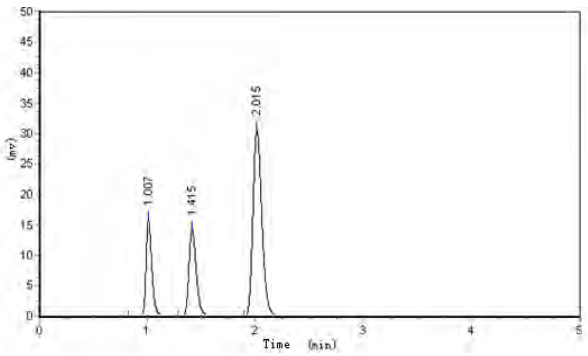
Bonna-Agela Durashell



The last peak Amitriptyline : Tf=1.122

Peak No.	Compound	Retention time	N	Tf	Asymmetry
3	Amitriptyline	2.198	3706	1.122	1.238

Phenomenex Gemini



The last peak Amitriptyline : Tf=1.229

Peak No.	Compound	Retention time	N	Tf	Asymmetry
3	Amitriptyline	2.015	2777	1.229	1.372

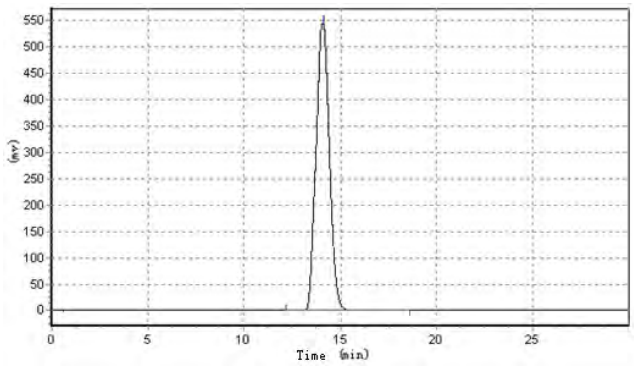
The maximum volume of sample loading onto Durashell and Gemini

Test method:

Mobile phase: MeOH: 0.1% Ammonia =70: 30
Flow rate: 1.5 mL/min
Injection: 10 μL
Detector: UV 254 nm
Temperature: 30 ℃
Sample: Amitriptyline dissolved in mobile phase

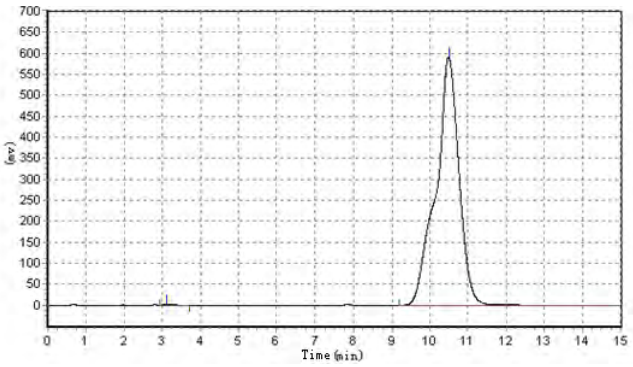
Test result:

Durashell
Load 10 μL 6.0 mg/mL Amitriptyline



Peak No.	Compound	Retention time	N	Tf	Asymmetry
1	Amitriptyline	14.132	2226	1.091	1.105

Gemini
Load 10 μL 6.0 mg/mL Amitriptyline



Peak No.	Compound	Retention time	N	Tf	Asymmetry
1	Amitriptyline	10.498	1959	0.883	0.722

Result and discussion:

Column efficiency test:
Compared to Gemini-NX C18, Durashell C18 has a higher efficiency and better peak shape.

Column	Retention time/min	N	Tf
Durashell	3.565	7282	1.11
Gemini	2.567	5206	1.239

Test of basic compounds under basic condition:

Compared to Gemini-NX C18, Durashell C18 has a stronger retention and a better peak shape.

Column	Retention time(Amitriptyline)/min	Tf
Durashell	20.29	1.108
Gemini	16.082	1.241

Test of basic compounds under acid condition:

Compared to Gemini-NX C18, Durashell C18 has a better peak shape.

Column	Amitriptyline (min.)	Tf
Durashell	2.198	1.122
Gemini	2.015	1.229

The maximum volume of sample loading onto Durashell and Gemini:

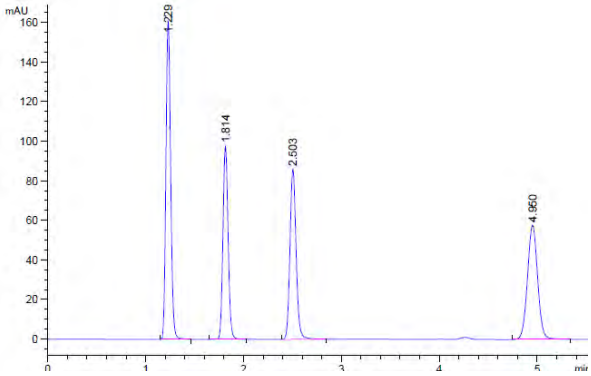
The maximum amount of sample loading onto Durashell C18 is 0.06 mg while that of Gemini-NX C18 is 0.05 mg.

Sample amount (mg)		0.06
Durashell	Rt (min.)	14.132
	Tf	1.091
Gemini	Rt (min.)	10.498
	Tf	0.883

Durashell C8

Characteristics: Metal Impurity<30ppm; Pore Size: 100 Å; Specific Surface Area: 380 m^2/g; Available Particle Size: 3 μm and 5 μm.

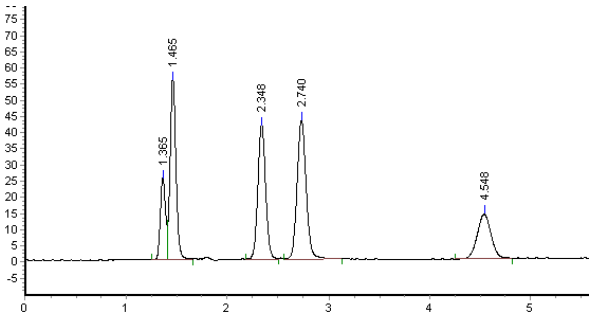
Sample: Uracil (1) Phenol (2) Nitrobenzene (3) and Naphthalene (4) in mobile phase; 2 μL.
Column: Durashell C8, 4.6x 100 mm, 3 μm
Mobile phase: 30% Water, 70% MeOH
Flow Rate: 1.0 mL/min
Temperature: 30 ℃
Detector: UV 254 nm



Durashell NH_2

Characteristics: Metal Impurity<30ppm; Pore Size: 100 Å; Specific Surface Area: 380 m^2/g; Available Particle Size: 3 μm and 5 μm.

Sample: toluene, nitrobenzene, *o*-nitroaniline, *m*-nitroaniline and *p*-nitroaniline in mobile phase; 1μL.
Column: Durashell NH_2, 4.6 x 50 mm, 3 μm
Mobile phase: 98.8% chlorobutane; 1% methanol; 0.2% water
Flow Rate: 0.5 mL/min
Temperature: 30 ℃
Detector: UV 254 nm



Ordering Information

Surface Area: 380 m^2/g, Pore Size: 100 Å
Durashell RP: Surface Area: 200 m^2/g, Pore Size: 150 Å

Type	Particle size (μm)	Dimension (mm)	Durashell C18	Durashell Phenyl	Durashell NH_2	Durashell C8	Durashell RP
Fast analysis	3	2.1×30	DC930302-0	DC630302-0	DN830302-0	DC830302-0	DS930302-0
Fast analysis	3	2.1×50	DC930502-0	DC630502-0	DN830502-0	DC830502-0	DS930502-0
Fast analysis	3	2.1×100	DC931002-0	DC631002-0	DN831002-0	DC831002-0	DS931002-0
Fast analysis	3	2.1×150	DC931502-0	DC631502-0	DN831502-0	DC831502-0	DS931502-0
G	3	2.1×10, 4/pk	DC930102-0	DC630102-0	DN830102-0	DC830102-0	DS930102-0
DCG	3	2.1×10, 4/pk	DC930102-0S	DC630102-0S	DN830102-0S	DC830102-0S	DS930102-0S
Fast analysis	3	4.6×50	DC930505-0	DC630505-0	DN830505-0	DC830505-0	DS930505-0
Fast analysis	3	4.6×100	DC931005-0	DC631005-0	DN831005-0	DC831005-0	DS931005-0
Fast analysis	3	4.6×150	DC931505-0	DC631505-0	DN831505-0	DC831505-0	DS931505-0
Analytical	5	2.1×30	DC950302-0	DC650302-0	DN850302-0	DC850302-0	DS950302-0
Analytical	5	2.1×50	DC950502-0	DC650502-0	DN850502-0	DC850502-0	DS950502-0
Analytical	5	2.1×100	DC951002-0	DC651002-0	DN851002-0	DC851002-0	DS951002-0
Analytical	5	2.1×150	DC951502-0	DC651502-0	DN851502-0	DC851502-0	DS951502-0
Analytical	5	4.6×50	DC950505-0	DC650505-0	DN850505-0	DC850505-0	DS950505-0
Analytical	5	4.6×100	DC951005-0	DC651005-0	DN851005-0	DC851005-0	DS951005-0
Analytical	5	4.6×150	DC951505-0	DC651505-0	DN851505-0	DC851505-0	DS951505-0
Analytical	5	4.6×200	DC952005-0	DC652005-0	DN852005-0	DC852005-0	DS952005-0
Analytical	5	4.6×250	DC952505-0	DC652505-0	DN852505-0	DC852505-0	DS952505-0
G	5	4.6×10, 4/pk	DC950105-0	DC650105-0	DN850105-0	DC850105-0	DS950105-0
DCG	5	4.6×10, 4/pk	DC950105-0S	DC650105-0S	DN850105-0S	DC850105-0S	DS950105-0S
Semi-preparative	5	10×150	DC951510-0	DC651510-0	DN851510-0	DC851510-0	DS951510-0
Semi-preparative	5	10×250	DC952510-0	DC652510-0	DN852510-0	DC852510-0	DS952510-0
Preparative	5	21.2×50	DC950520-0	DC650520-0	DN850520-0	DC850520-0	DS950520-0
Preparative	5	21.2×150	DC951520-0	DC651520-0	DN851520-0	DC851520-0	DS951520-0
Preparative	5	21.2×250	DC952520-0	DC652520-0	DN852520-0	DC852520-0	DS952520-0
G	5	10×10	DC950110-0S	DC650110-0S	DN850110-0S	DC850110-0S	DS950110-0S
G	5	21.2×10	DC950120-0	DC650120-0	DN850120-0	DC850120-0	DS950120-0
Preparative	5	30×100	DC951030-0	DC651030-0	DN851030-0	DC851030-0	DS951030-0
Preparative	5	30×150	DC951530-0	DC651530-0	DN851530-0	DC851530-0	DS951530-0
Preparative	5	30×250	DC952530-0	DC652530-0	DN852530-0	DC852530-0	DS952530-0
Semi-preparative	10	10×150	DC901510-0	DC601510-0	DN801510-0	DC801510-0	DS901510-0
Semi-preparative	10	10×250	DC902510-0	DC602510-0	DN802510-0	DC802510-0	DS902510-0
Preparative	10	21.2×50	DC900520-0	DC600520-0	DN800520-0	DC800520-0	DS900520-0
Preparative	10	21.2×150	DC901520-0	DC601520-0	DN801520-0	DC801520-0	DS901520-0
Preparative	10	21.2×250	DC902520-0	DC602520-0	DN802520-0	DC802520-0	DS902520-0
G	10	10×10	DC900110-0S	DC600110-0S	DN800110-0S	DC800110-0S	DS900110-0S
G	10	21.2×10	DC900120-0	DC600120-0	DN800120-0	DC800120-0	DS900120-0
Preparative	10	30×100	DC901030-0	DC601030-0	DN801030-0	DC801030-0	DS901030-0
Preparative	10	30×150	DC901530-0	DC601530-0	DN801530-0	DC801530-0	DS901530-0
Preparative	10	30×250	DC902530-0	DC602530-0	DN802530-0	DC802530-0	DS902530-0
Preparative	10	50×150	DC901550-0	DC601550-0	DN801550-0	DC801550-0	DS901550-0
Preparative	10	50×250	DC902550-0	DC602550-0	DN802550-0	DC802550-0	DS902550-0

G: Guard Cartridge
DCG: Direct-connection Guard Cartridge

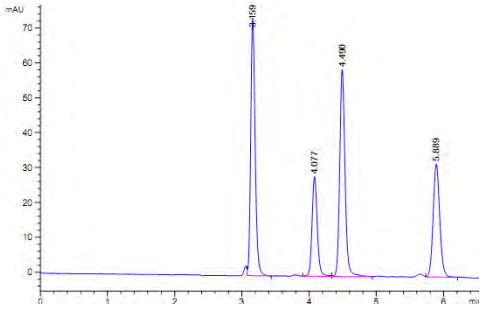
Venusil HLP

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

Characteristics: Metal Impurity<30 ppm; Pore Size: 100 Å; Specific Surface Area: 380 m^2/g; Available Particle Size: 5 μm

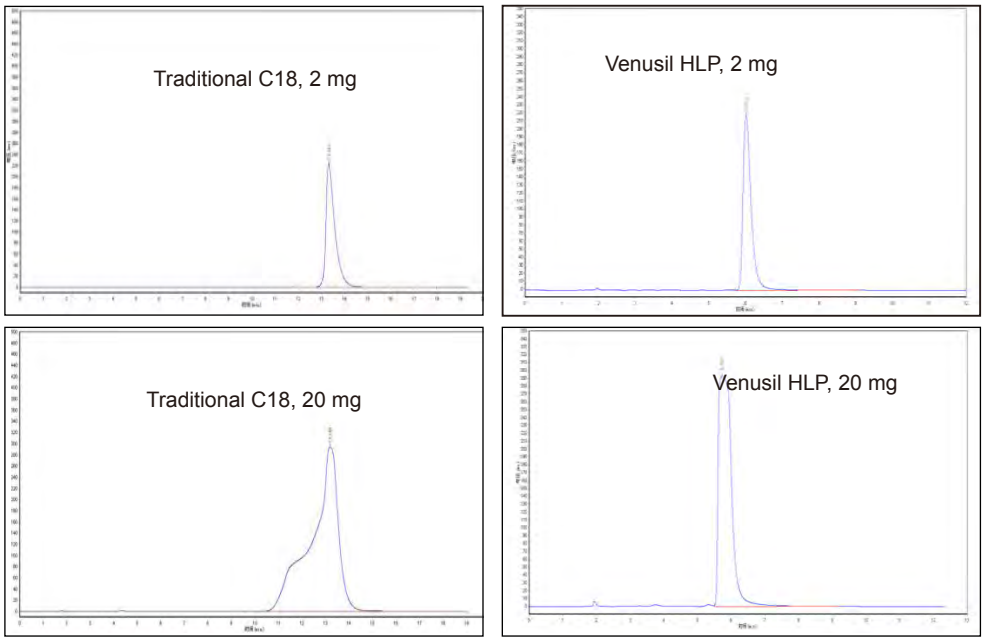
Main Features:

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



Column: Venusil HLP, 4.6 x 250 mm, 5 μm, 100 Å,
Sample Uracil (1) Phenol (2) Nitrobenzene (3) and Naphthalene (4) in mobile phase; 2 μL .
Mobile phase: 20% Water 80% Methanol
Flow Rate: 1.0 mL/min
Temperature: 30℃
Detector: UV 254 nm

High Loading Capacity



Column: Traditional C18, 21.2×150 mm, 5 μm, 100 Å
Venusil HLP, 21.2×150 mm, 5 μm, 100 Å
Sample: Amitriptyline
Mobile Phase: MeOH:0.1% Formic acid=80:20
Flow Rate: 20 mL/min
UV Detector: UV 254 nm
Temperature: Ambient

Ordering Information

Surface Area: 380 m^2/g, Pore Size: 100 Å

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

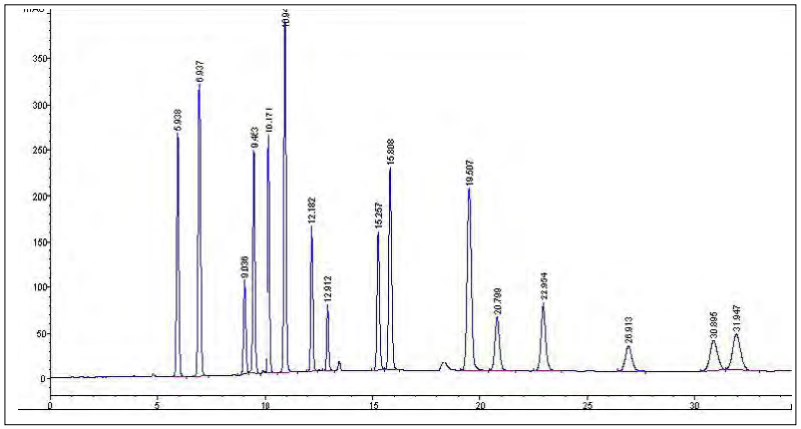
Venusil PAH

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 as priority pollutants and the analysis of these potentially carcinogenic compounds in water, soil and food is of major importance.

Characteristics: Metal Impurity<30 ppm; Pore Size: 200 Å; Specific Surface Area: 200 m^2/g; Available Particle Size: 5 μm

Main Features:

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



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

Time (min)	MeOH (%)	H_2O (%)
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. Benzoanthrancene; 10. Chrysene; 11. Benzo[b]fluorathene; 12. Benzo[k]fluorathene; 13. Benzo[a]Pyrene; 14. Benzo[g,h,i]Pyrene; 15. Dibenz(a,h)anthracene; 16. Indeno [1,2,3,-cd] pyrene

Ordering Information

Surface Area: 200 m^2/g, Pore Size: 200 Å

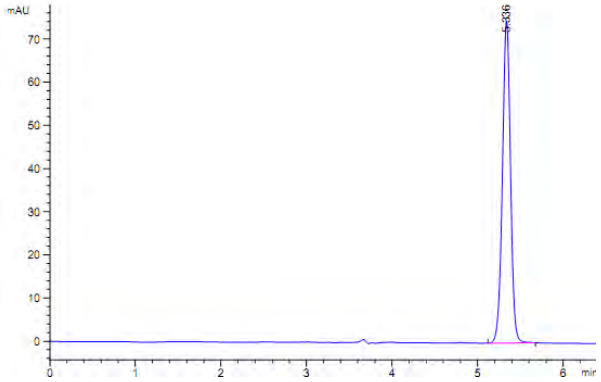
Type	Particle size (μm)	Dimension (mm)	Venusil PAH
Analytical	5	4.6×250	VP952505-L
G	5	4.6×10, 4/pk	VP950105-L

Venusil XBP COOH

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

Characteristics: Metal Impurity<30 ppm; Pore Size 100 Å; Specific Surface Area: 380 m^2/g; Available Particle Size: 5 μm

Sample: Melamine in ACN; 10μL.
Column: Venusil XBP COOH, 4.6 x 250 mm, 5 μm
Mobile phase: ACN / 50mmol KH_2PO_4 (pH4.28) = 30 / 70
Flow Rate: 1.0 mL/min
Temperature: 30 ℃
Detector: UV 240 nm



Ordering Information

Surface Area: 380 m^2/g, Pore Size: 100 Å

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: Direct-connection Guard Cartridge

Venusil PFP---USPL43

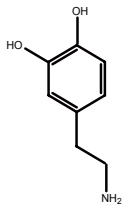
Venusil PFP (Pentafluorophenyl) columns deliver the performance of Venusil columns by providing excellent peak shape while also offering alternative selectivity in reversed phase chromatography compared to alkyl chain phases. Venusil PFP columns help to extend the range of selectivities of reversed phase 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<30 ppm; Pore Size: 120 Å; Specific Surface Area: 320 m^2/g; Available Particle Size: 5 μm.

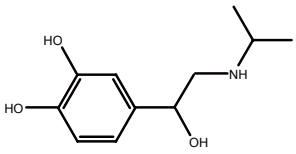
Main Features:

- 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

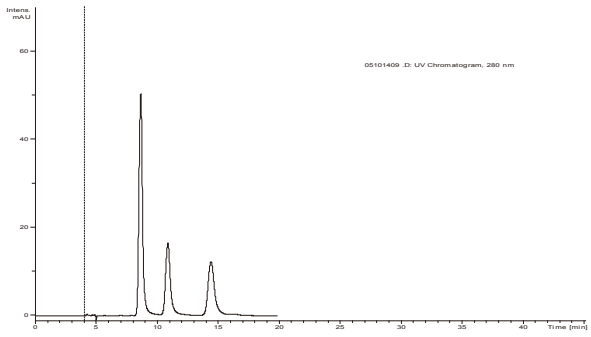
Dopamine and Its Metabolin



Dopamine



Isoprenaline



Sample: Dopamine, isoprenaline and soprenaline
Column: Venusil PFP, 4.6×250 mm, 5 μm
Part No.: VF952505-0
Mobile Phase: MeOH: CH_3COOH /CH_3COONH_4 Buffer (pH 4.5) =15:85
Detector: UV 280 nm
Flow Rate: 0.8 mL/min

Ordering Information

Surface Area: 320 m^2/g, Pore Size: 120 Å

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	VF952005-0
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 Cartridge
DCG: Direct-connection Guard Cartridge Holder

Chiral Columns

Polysaccharides Based Column

Normal phase chiral columns from Bonna-Agela Technologies are based on modified celluloses and starches. This type of chiral columns represents the most effective means of analyzing chiral compounds and obtaining pure enantiomers, i.e., e.e. purity >99% enantiomeric excess.

Main Festures:

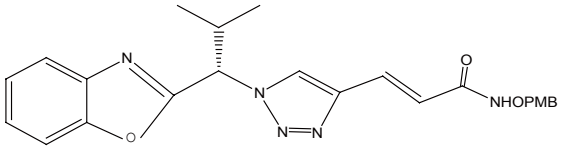
- Hydrogen bonding, π-π and the "embedded" composite integrated mechanism
- Venusil CA and CO columns are applicable to separate 80% chiral compounds
- Wide selectivity and high loading capacity

Venusil CA

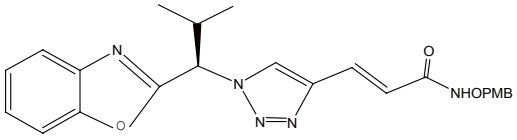
Amylose - (3,5-dimethylphenyl carbamate)

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

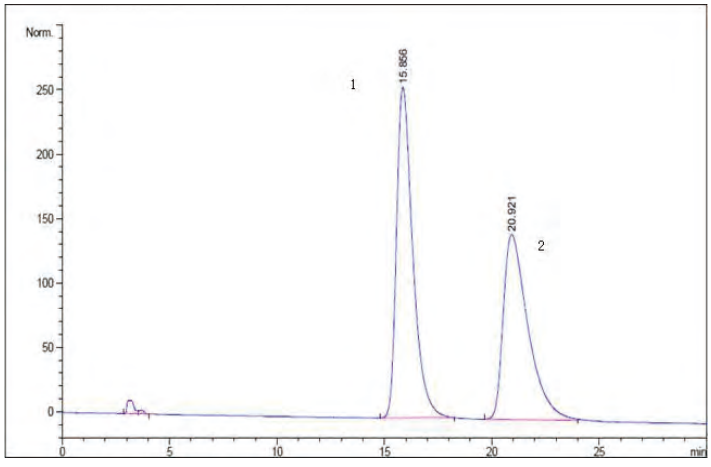
Example:



L-val PMB



D-val PMB



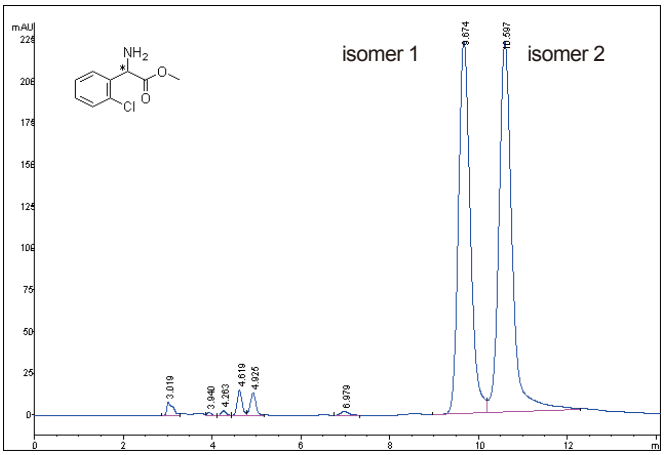
1, L-Val PMB; 2, D-Val PMB
Column: Venusil CA, 4.6×250 mm, 5 μm, 1000 Å
Mobile Phase: Hexane: Isopropanol=80:20
Detection: 254 nm
Flow Rate: 1.0 mL/min
Temperature: 25 ℃

Venusil CO

Coating Materials: Cellulose - (3,5 - dimethylphenyl carbamate)

Applications: a phase suitable for the separation of beta-blockers and steroids, such as DHA, chlorine heart acyl amines, flavanones, metoprolol, etc

Example:



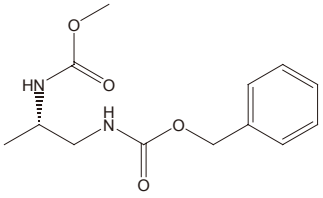
Column: Venusil CO, 4.6×250 mm, 5 μm, 1000 Å
Mobile Phase: Hexane:Isopropanol=98:2
Flow Rate: 1.0 mL/min
Detection: 220 nm
Temperature: 25 ℃

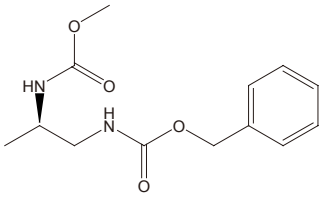
Venusil CJ

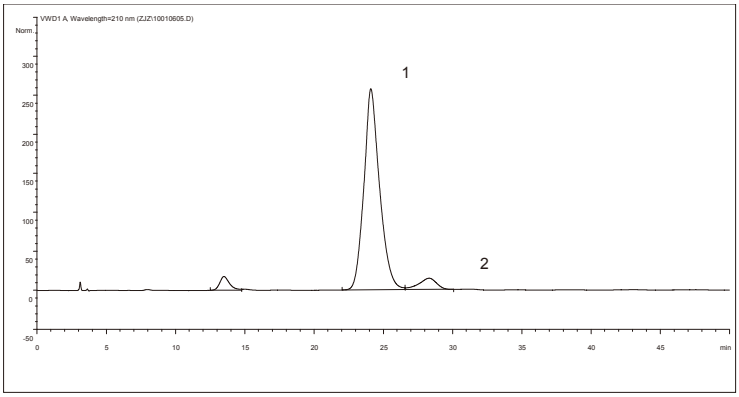
Coating Materials: Cellulose - [4 - methyl benzoate]

Applications: the Venusil CJ column is used for the separation of carbonyl, amido, aryl, nitro, cyano ,sulfonyl, hydroxyl, amine and carboxylic acid compounds.

Example:







Column: Venusil CJ, 4.6×250 mm, 5 μm,1000 Å
Mobile Phase: Hexane:Isopropanol=93:7
Flow Rate: 1.0 mL/min
Detection: 210 nm
Temperature: 30℃

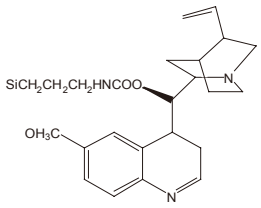
Chemical Bonded Column

Chiral Amide-1

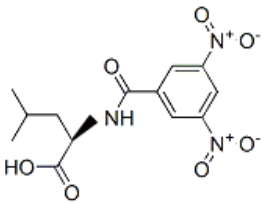
Chiral Amide-1 is packed with 5 μm, 300 Å silica bonded with a chiral compound whose structure is demonstrated as below:

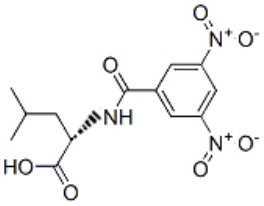
Main Features:

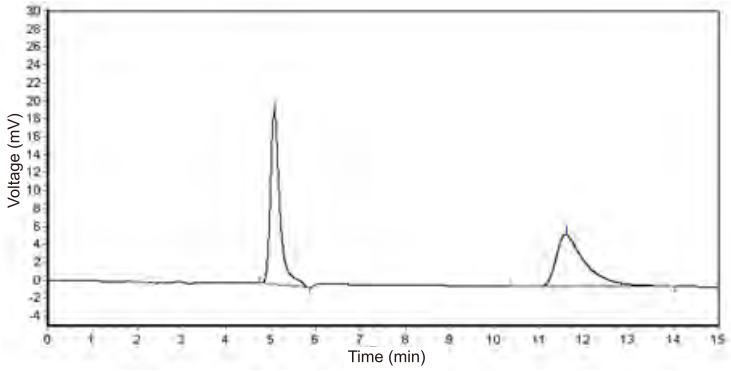
- Can be used as reversed phase or normal phase
- Unique selectivity and high resolution
- More stable and longer column lifetime



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







Column: Chiral Amide-1, 5 μm, 300 Å, 4.6×150 mm
Mobile Phase: Methonal/10 mM KH_2PO_4 (pH=6.86) +0.5 mM Tetrabutyl ammonium hydroxide=30/70
Flow Rate: 1.0 mL/min
Detection: UV 254 nm
Injection: 5 μL

Ordering Information

Type	Particle size (μm)	Dimension (mm)	Venusil CA	Venusil CO	Venusil CJ	Chiral Amide-1
Analytical	5	4.6×150	VCA951505-0	VCO951505-0	VCJ951505-0	AM951505-1
Analytical	5	4.6×250	VCA952505-0	VCO952505-0	VCJ952505-0	AM952505-1
Preparative	5	21.2×250	VCA952520-0	VCO952520-0	VCJ952520-0	AM952520-1
Preparative	5	30×250	VCA952530-0	VCO952530-0	VCJ952530-0	AM952530-1

Innoval Columns

Innoval columns are packed with high purity silica particles that is prepared by the ultra pure aggregation of silica sols. This class of columns from Bonna-Agela shows excellent reproducibility and high efficiency. A variety of function groups is bonded to the packing for broad applications.

Characteristics: Metal Impurity<30ppm; Pore Size: 100 Å; Specific Surface Area: 220 m^2/g; Available Particle Size: 5 μm. pH range:15~9

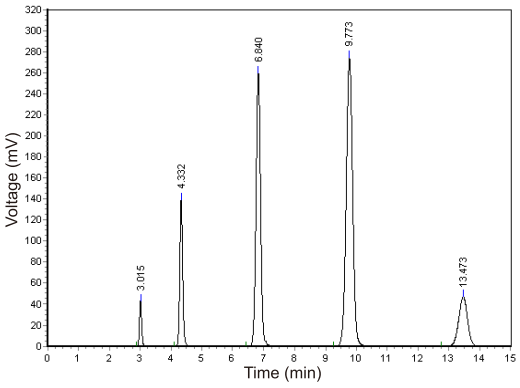
Main Features:

- Spherical silica manufactured via controlled aggregation
- No nanopores/dead pores
- Optimized surface

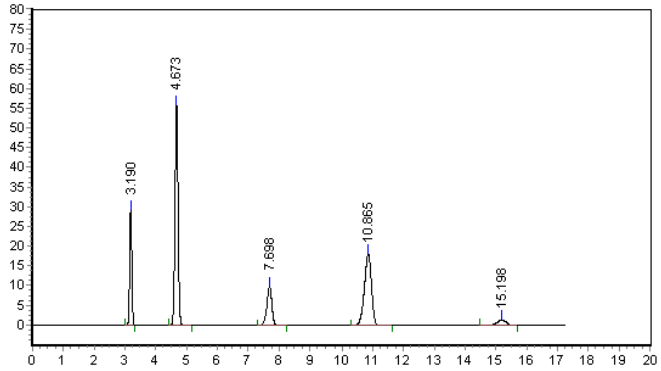
Benefit

- Higher pressure tolerance
- High stability and extended lifetime
- Excellent dispersion and high recovery
- Contamination tolerance

Balance Retention for Hydrophilic and Hydrophobic Compounds



Innoval Silica

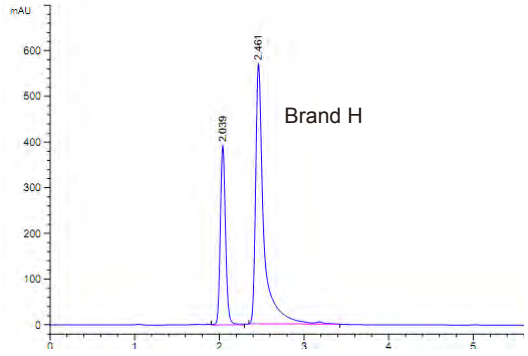


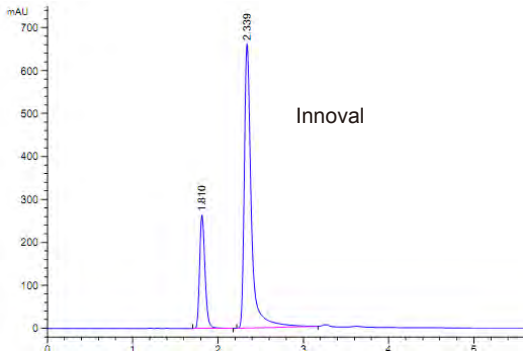
Venusil XBP Silica

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

Metal sensitivity testing

Sample: 2,7-dihydroxynaphthalene and 2,3-dihydroxynaphthalene mixed standard
Mobile Phase: Methanol /water= 65/35;
Flow Rate: 1.0 mL/min
Detector: UV 230nm
Temperature: 35℃
Sample Loading: 1μL





The test show that Innoval has a lower metal content than Brand H

Compounds	Column	RT(min)	TF
2,7-dihydroxynaphthalene	Brand H	2.039	1.146
	Innoval	1.810	1.263
2,3-dihydroxynaphthalene	Brand H	2.461	2.259
	Innoval	2.339	1.713

Ordering Information

Surface Area: 220 m^2/g, Pore Size: 100 Å

Type	Particle size (μm)	Dimension (mm)	Innoval Silica	Innoval C18
Analytical	5	4.6×150	ISi 951505-0	IX951505-0
Analytical	5	4.6×250	ISi 952505-0	IX952505-0
Semi-preparative	5	10×150	ISi 951510-0	IX951510-0
Semi-preparative	5	10×250	ISi 952510-0	IX952510-0
Preparative	5	21.2×50	ISi 950520-0	IX950520-0
Preparative	5	21.2×150	ISi 951520-0	IX951520-0
Preparative	5	21.2×250	ISi 952520-0	IX952520-0
Preparative	5	30×100	ISi 951030-0	IX951030-0
Preparative	5	30×150	ISi 951530-0	IX951530-0
Preparative	5	30×250	ISi 952530-0	IX952530-0

Featured Products!

Unisol Technology and Column Products

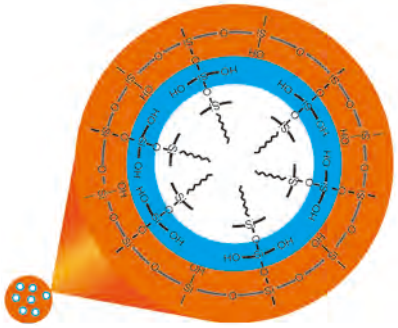
Bonna-Agela's unique sol-gel process technology generates a uniform surface that produces a universal column applicable to many HPLC applications. Peak tailing adversely affects chromatographic efficiency and reduces the resulting accuracy and precision of the data. Peak tailing and insufficient retention of polar compounds are among the toughest problems for silica based reversed phase columns. High acidity of the surface silanols, non-uniformity of the surface, and non-uniformity of the bonding process are the three major causes of peak tailing.

High purity synthetic silica is typically obtained by hydrolyzing silicic acid esters followed by high temperature sinteration. The sintered silica is further leached with dilute acid to enrich silanol on the surface. The process does not generate a uniform, silanol covered surface. It will create some isolated silanol groups with very strong acidity or some "un-leached islands" during the leaching process. Furthermore, the high temperature procedure may cause formation of micro-crystallization domains on the amorphous silica, further contributing to the nonuniformity of the surface.

Unisol process technology is specifically designed to solve these problems. In our patented Unisol process, gas phase tetramethoxy silane is adsorbed evenly on the silica surface. It is subsequently hydrolyzed by a controlled amount of moisture. A fresh layer of silanols is then formed by a mild heating process. This process produces a surface with lower acidity and high uniformity, which is further bonded with a high purity C18 silane, and then di-functional end-capped. The overall process yields an excellent HPLC stationary phase with a very smooth surface that is friendly to basic compounds (minimal ionic interactions) and polar compounds (provides significantly increased retention).

Main Features:

- Greatly improved peak shape for basic compounds
- 100% water compatibility
- Significantly increased retention for highly water soluble compounds and balanced hydrophobicity in the reverse phase mode
- Elimination of excessive retention for polar compounds in the normal phase mode ("hot spots")



Unisol C18

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

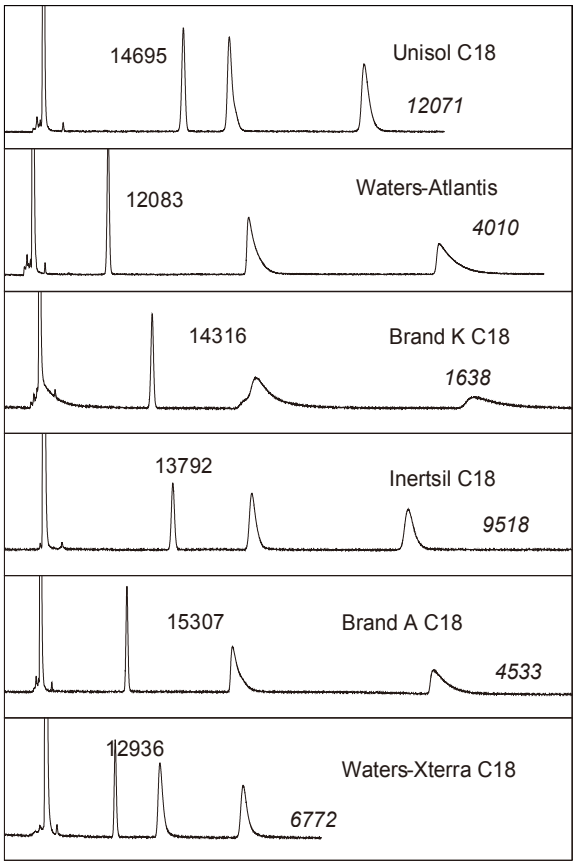
A unique and universal C18 HPLC phase made by our patented Unisol Technology. This packing demonstrated unprecedented separation performance for compounds with a wide range of properties from hydrophilic to hydrophobic: polar, semi-polar and non-polar compounds.

Characteristics: Metal Impurity<30 ppm; Pore Size: 100 Å; Specific Surface Area: 410 m^2/g; Single end-capping; Available Particle Size: 2.5 µm, 3 µm, 5 µm or 10 µm

Main Features:

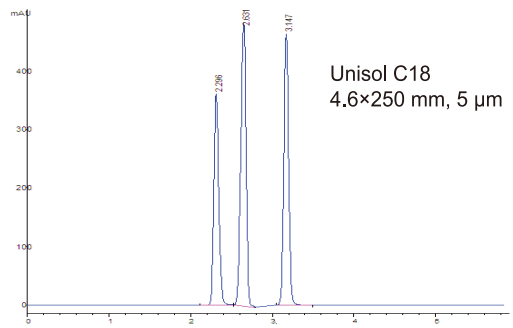
- One of the most universal reversed phase columns
- Great inertness and efficiency for basic compounds
- Enhanced retention of hydrophilic compounds
- 100% aqueous compatibility
- Robust and reproducible performance
- Wide pH range (1.5-9.0)
- Low bleed and high sensitivity for LC-MS

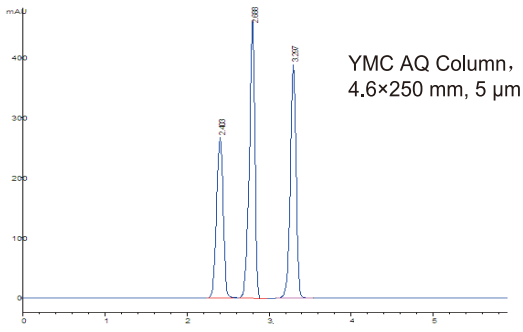
Great Inertness and Efficiency for Basic Compounds



Sample: uracil, toluene, doxepin and amitriptyline
Column: 4.6x150 mm, 5 μm
Mobile Phase: 10 mM sodium phosphate (pH=7.0) in 60% ACN
Temperature: 30℃
Flow Rate: 1 mL/min
The plate numbers in regular font are for toluene, the plate numbers in Italic are for amitriptyline.

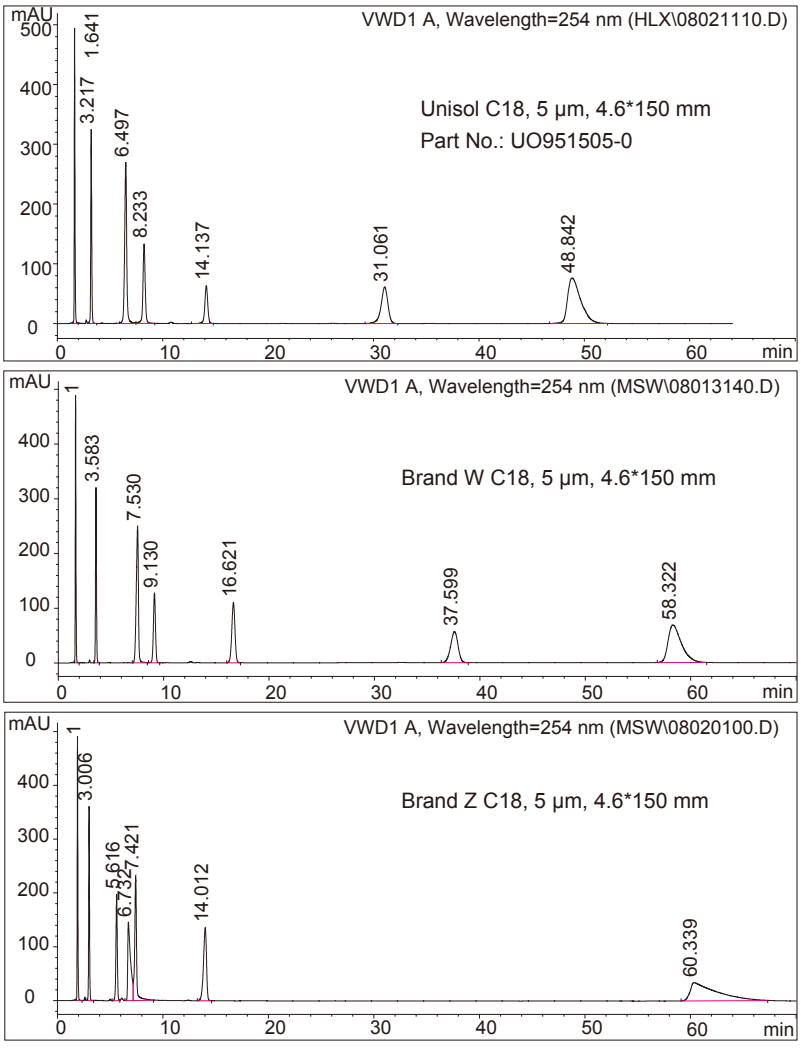
Good Retention for Polar Compounds





Mobile Phase: A: Water (Contain 0.01 mM NaH_2PO_4 and 0.01 mM Citric Acid, pH=4.5);
B: ACN; A:B=95:5
Sample: Cytosine, Uracil, Guanine
Temperature: 35℃
Detector: UV 254 nm

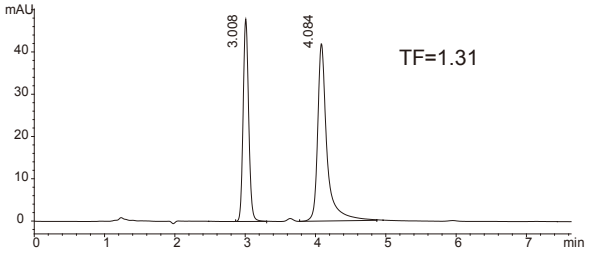
Balanced Retention for Hydrophilic and Hydrophobic Compounds



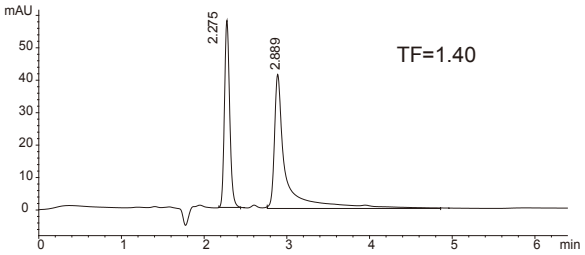
Mobile Phase: 35% 20mM KH_2PO_4 pH=7.0, 65% Methanol
Temperature: 23℃
Flow Rate: 1 mL/min
Detector: UV 254 nm
Sample: Uracil
Propranolol hydrochloride
Butyl Phthalate
Dimethyl Phthalate
Naphthalene
Acenaphthene
Amitriptyline

Extremely Low Metal Effects

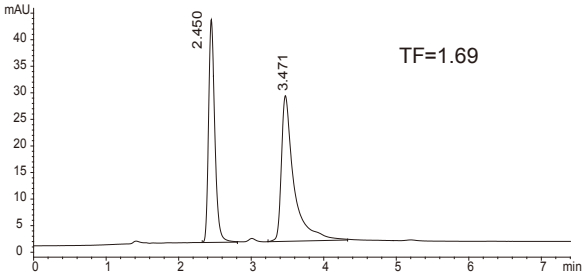
Unisol C18, 5 μm, 4.6 ×150 mm



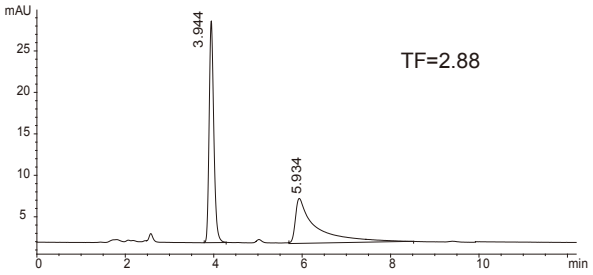
Brand W, AQ Column, 5 μm, 4.6 ×150 mm



Brand H, C18 Column, 5 μm, 4.6 ×150 mm

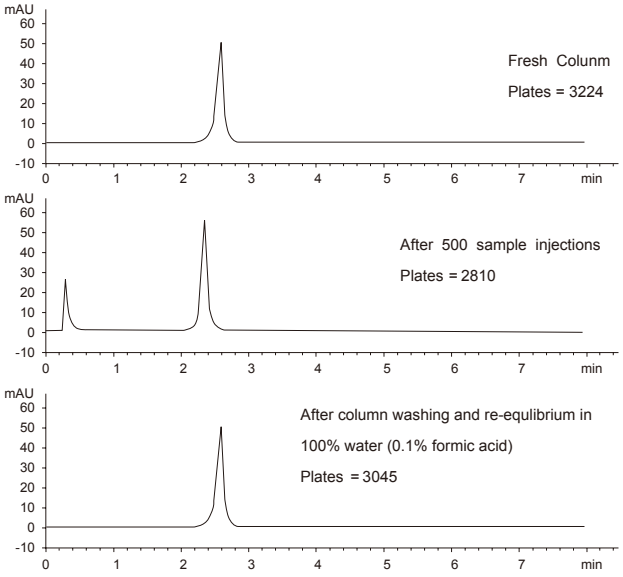


Brand Z,C18 Column, 5 μm, 4.6 ×150 mm



Mobile Phase: A:Water; B:Methanol; A:B=65:35
Flow Rate: 1 mL/min
Temperature: 25℃
Detector: UV 230 nm
Sample: 2,7-Dihydroxynaphthalene, 2,3-Dihydroxynaphthalene

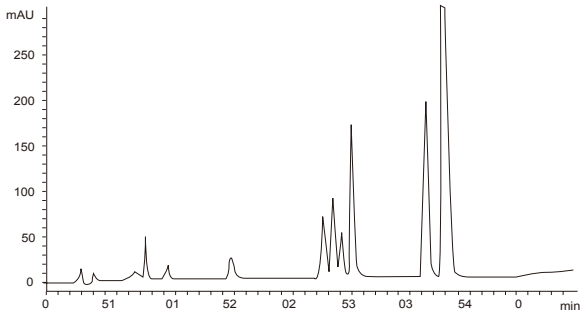
Good Tolerance of Directly Injected Biological Matrix



Uridine: uridine in calf blood plasma (diluted 20 times with 0.1% formic acid)
Injection: 1μl (not be cleaned up with SPE)
Column: Unisol C18, 2.1×50 mm, 5 μm
Temperature: 30℃
Flow Rate: 0.3 mL/min
Mobile Phase: 0.1 % formic acid solution (100% aqueous phase)
Run Time: 8 min

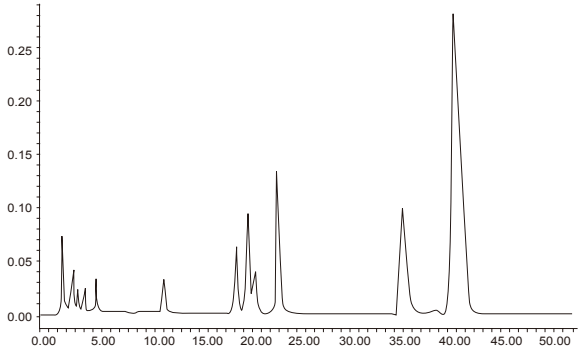
After 500 injection, wash with methanol/0.1% formic acid solution=50/50 for 30 mins,column temperature 40℃
rinse with 95 % MeOH for 30 mins, column temperature 45℃ .

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.

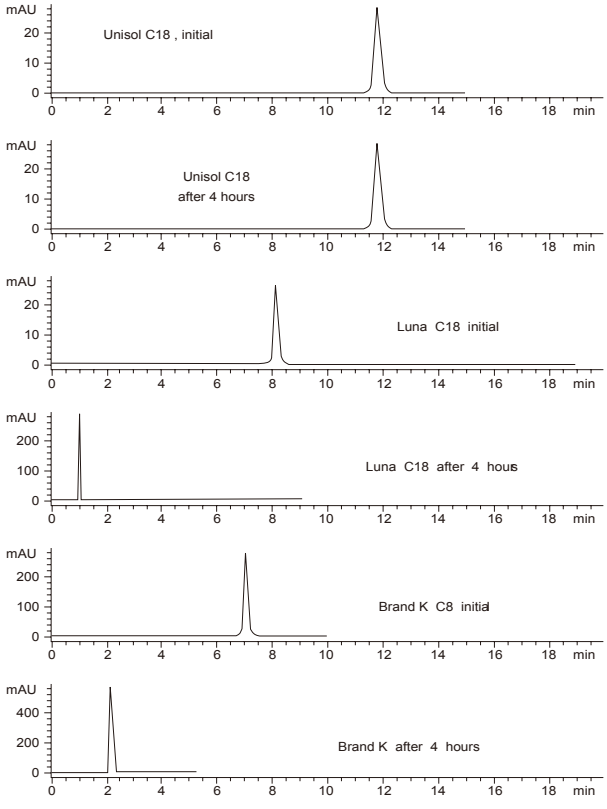
Mobile Phase: ACN:0.05 mol/L KH_2PO_4 Aq.
(40:60, Contain 0.015 mol/L SDS)



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

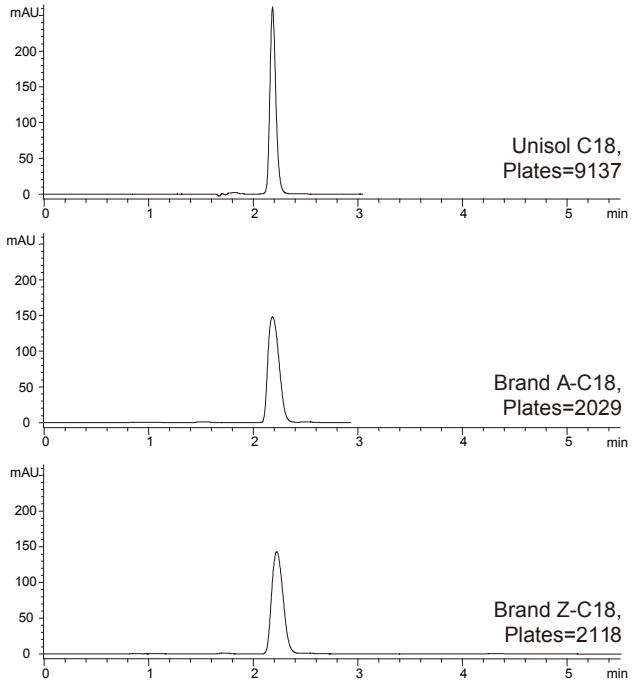
Mobile Phase: 0.2 % TFA in water: Acetonitrile=75:25

Compatibility with 100% Aqueous Mobile Phase



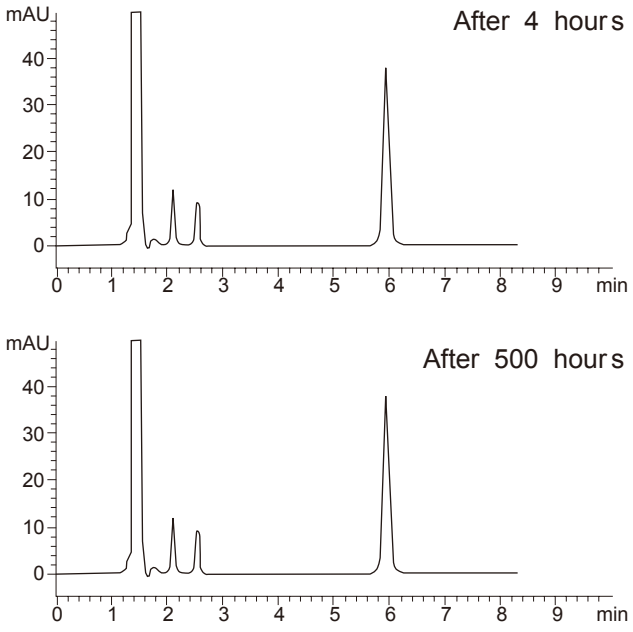
Sample: Uridine
Column: 4.6x150 mm, 5 μm
Mobile Phase: 100% water
Flow Rate: 1mL/min; the flow was stopped for 5 minutes during the testing period for each column
Temperature: 30℃

Greater Volume Loading Capacity Than Other Brands



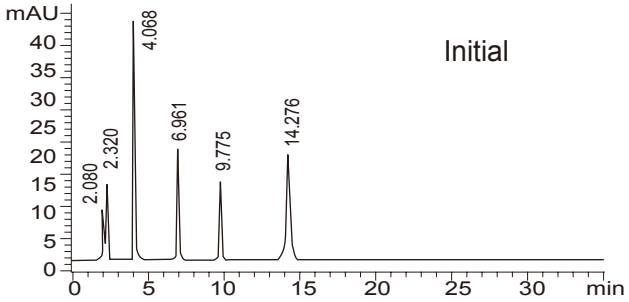
Large Volume Injection (Injection volume=100μL)
Sample: 4-methoxybenzenesulfon amide,
10μg/mL in MeOH/Water (1:1)
Column: 4.6x150 mm, 5 μm
Mobile Phase: MeOH/Water
Flow Rate: 1 mL/min
Temperature: 30℃

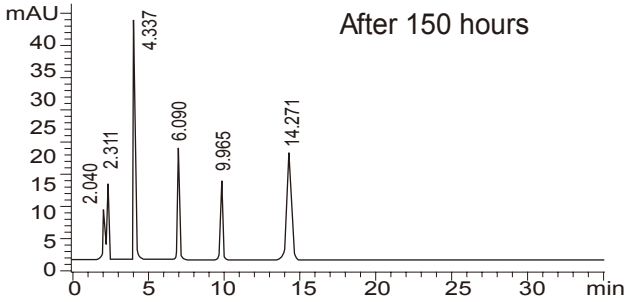
Stability of Unisol C18 at pH=1.5



Sample: Uracil, Doxepin, Amitriptyline and Toluene.
Column: Unisol C18, 4.6x150 mm, 5 μm
Mobile Phase: TFA (0.25%, pH=1.5) in 60 % acetonitrile
Flow Rate: 1 mL/ min
Temperature: 40℃

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





Sample: Uracil, Doxepin, Nortriptyline, Amitriptyline and Trimipramine
Column: Unisol C18, 4.6×250 mm, 5 μm
Mobile Phase: 0.01M sodium phosphate: ACN=25:75, pH=7.0
Flow Rate: 1.3 mL/min.
Temperature: 30℃

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, reversed phase, or hydrophilic interaction HPLC. The Unisol Amide (NP) column is a good replacement for NH_2 and silica columns that are currently marketed as HILIC. Compared with traditional silica and NH_2 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. Unisol Amide presents unique selectivity for many molecules because of its difference in separation mechanism from most of the conventional stationary phases.

Characteristics: Metal Impurity<30 ppm; Pore Size 100 Å; Specific Surface Area: 410 m^2/g; Carbon Loading 8 %; Single End-capping; Available Particle Size: 3 μm, 5 μm and 10 μm

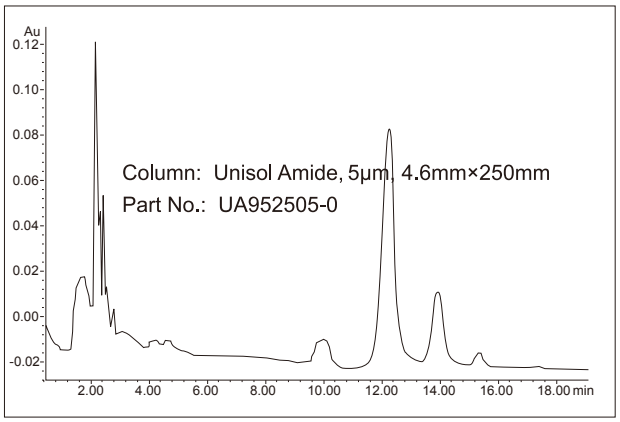
Main features:

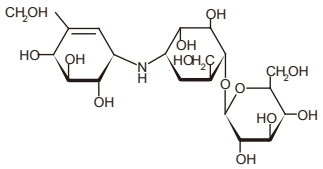
- Strong retention of polar compounds in HILIC mode
- Unique selectivity and complementary to conventional reversed phase
- Can be used as reversed phase, normal phase and HILIC phase
- More robust and reproducible performance than silica and amino stationary phase
- 100% aqueous and 100% organic solvents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

Application:

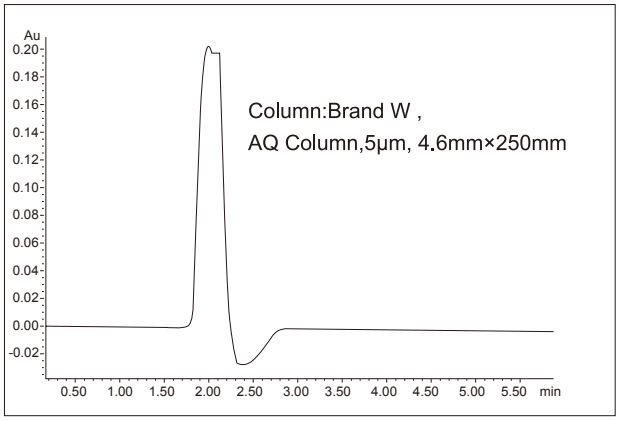
- Oligonucleotide
- Carbohydrates
- Amino acids and small molecules
- Other high polar molecules

Separation of Validamycin



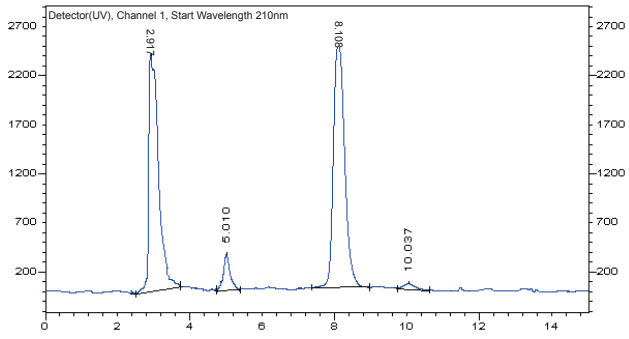


Mobile Phase: A: 0.1% TFA in Water; B: Acetonitrile
Gradient: 40 % A to 85 % A in 30 min
Flow Rate: 1 mL/min
Temperature: 25℃
Detector: UV 210 nm
Sample: Validamycin



Mobile Phase: A:0.005M NaH_2PO_4 (pH=7.0);
B:MeOH; A:B=98:2
Flow Rate: 1 mL/min
Temperature: 25℃
Detector: UV 210 nm
Sample: Validamycin

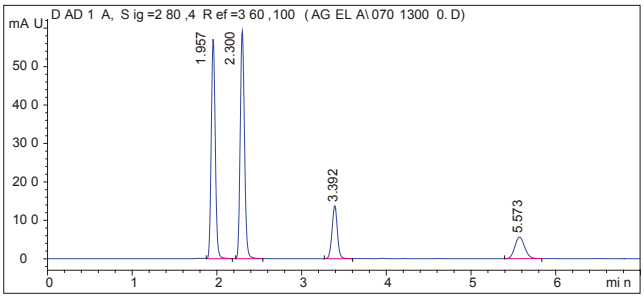
Separation of Shikimic Acid



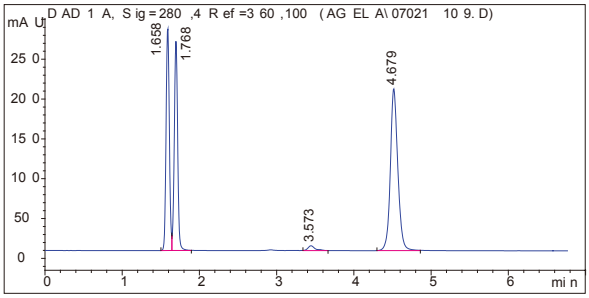
Column: Unisol Amide, 5 μm, 4.6 ×150 mm
Part No.: UA951505-0
Mobile Phase: A:1% Fomic Acid in Water; B: Acetonitrile
Gradient: 60 % A to 90 % A in 20 min
Flow Rate: 1 mL/min
Temperature: 25℃
Detector: UV 210 nm
Sample: Shikimic Acid

Water-soluble Vitamins

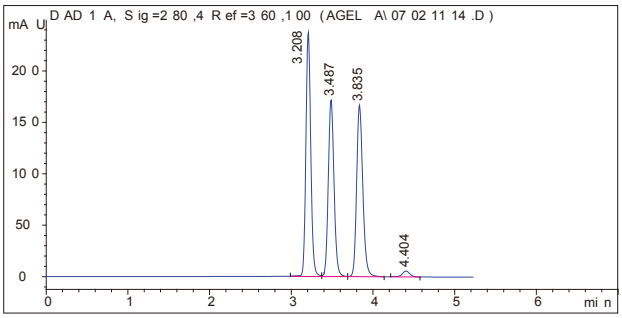
Unisol Amide, 5 μm, 4.6 ×150 mm
Part No.: UA951505-0



Brand W, NH_2 Column, 5 μm, 4.6 ×150 mm



Brand W Silica Column, 5 μm, 4.6 × 150 mm



Mobile Phase: 0.1% TFA in Water: 0.1 % TFA in Acetonitrile =90:10
Flow Rate: 1 mL/min
Temperature: 30℃
Detector: UV 280 nm
Sample: VB1+VB6+VC+VB2

Ordering Information

Surface Area: 410 m^2/g, Pore Size: 100 Å

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

Surface Area: 410 m^2/g, Pore Size: 100 Å

Type	Particle Size(μm)	Dimension (mm)	Unisol C18	Unisol Amide(HILIC)
Analytical	5	2.1×30	UO950302-0	VH950302-0
Analytical	5	2.1×50	UO950502-0	VH950502-0
Analytical	5	2.1×100	UO951002-0	VH951002-0
Analytical	5	2.1×150	UO951502-0	VH951502-0
Analytical	5	3.0×30	UO950303-0	VH950303-0
Analytical	5	3.0×50	UO950503-0	VH950503-0
Analytical	5	3.0×100	UO951003-0	VH951003-0
Analytical	5	4.6×50	UO950505-0	VH950505-0
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 Cartridge
DCG: Direct-connection Guard Cartridge

Venusil ASB Series Columns (C1, C3, C8, C18 and phenyl)

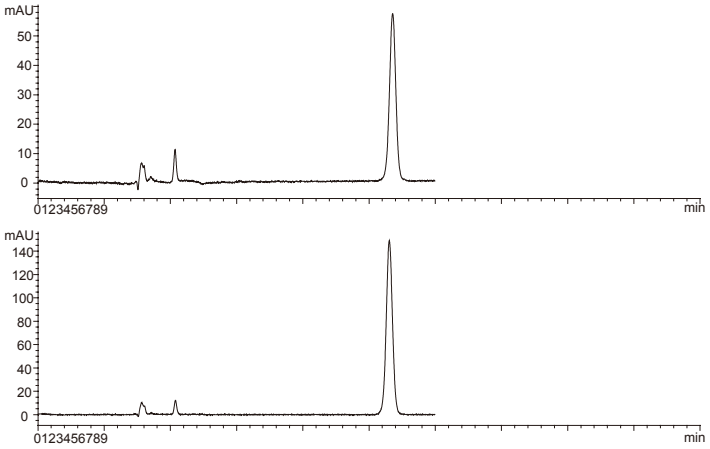
The Venusil ASB series columns are specially designed for the separation of polar compounds from low (extremely stable at pH=1.0) to medium pH. The stationary phase is bonded with unique bulky silanes that sterically protect the siloxane bond. We offer a line of bonding chemistry of C1, C3, C8, C18 or Phenyl groups presenting a broad selection of different polarity for various applications. This column can be used to replace Zorbax SB.

Characteristics: Metal Impurity<30 ppm; Pore Size: 150 Å; Specific Surface Area: 200 m^2/g; Available Particle Size: 3 μm, 5 μm, 10 μm.

Main features:

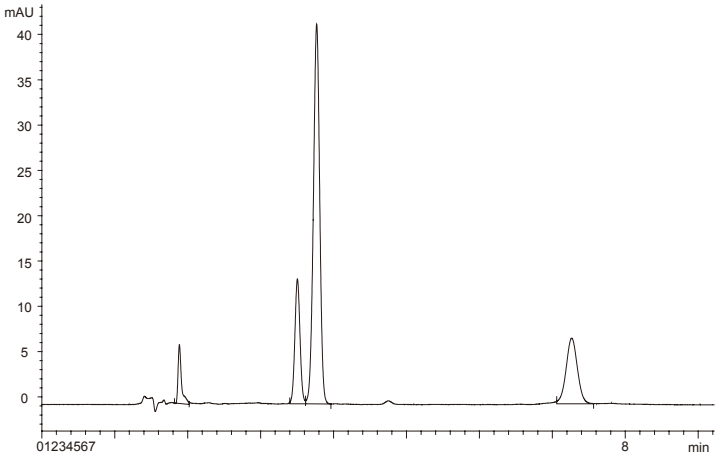
- Low pH stability: great stability even at pH=1.0
- Peak shape and efficiency: Excellent peak symmetry for basic compounds comparing to other brand polar phase columns
- Polar C18 phase: Very strong separation power for polar compounds
- 100% aqueous compatible: Much better peak shape, retention and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

The Stability in the Low pH



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

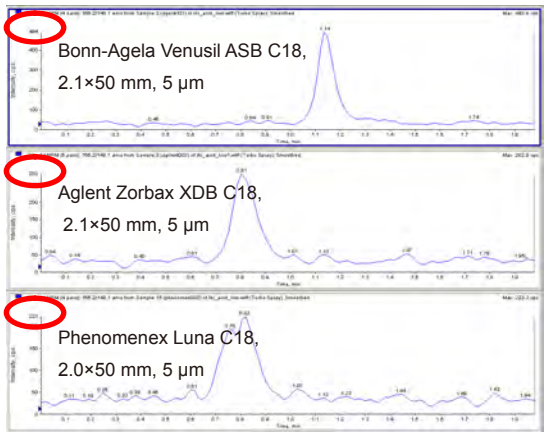
The Separation of Organic Acid



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

Highest LC-MS Sensitivity

2-3 times higher than many popular brands *(low bleed, inert surface and high efficiency)*



Ordering Information

Surface Area: 200 m^2/g, Pore Size: 150 Å

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			

Type	Particle (μm)	Dimension (mm)	Venusil ASB C18	Venusil ASB C8	Venusil ASB Phenyl	Venusil ASB C3	Venusil ASB C1
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: Direct-connection Guard Cartridge

Surface Area: 80 m^2/g, Pore Size: 300 Å

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
Analytica	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: Direct-connection Guard Cartridge

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 have revealed that synergistic effects can be obtained when the bonded surface consists of C18 mixed with a shorter chain such as C8, amide or nitro-phenyl, etc. These new products offer different selectivity, coordinating 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.

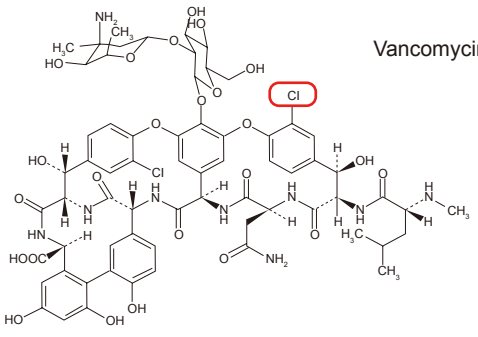
Optimix C18/C8:

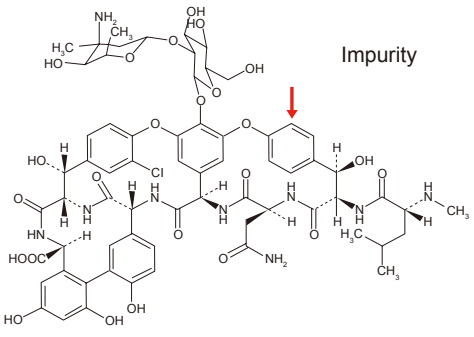
Improved performance from a mixed-phase C18/C8 (1:1) column compared to mono-chain C18 or C8 columns
Characteristics: Metal Impurity<30 ppm; Pore Size:100 Å; Double End-cap; Available Particle Size: 5 μm

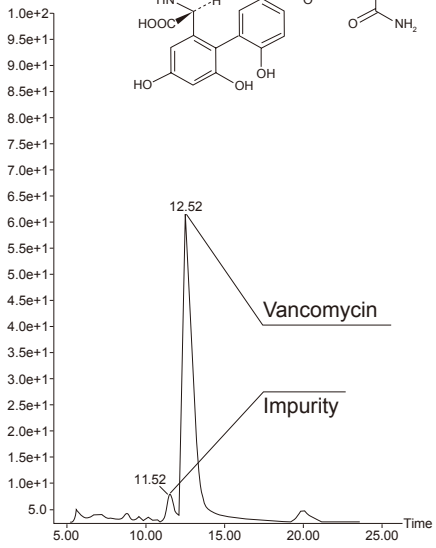
Main Features:

- 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.

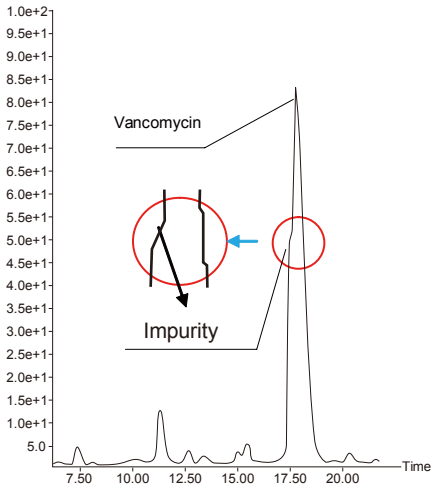
Analysis of Vancomycin and Its Impurity







Column: Optimix C18 /C8, 4.6×250 mm, 5 μm
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: 1 mL/min
Temperature: 25℃
Detection: UV 210 nm
Sample: Vancomycin+Impurity



Column: Brand W C18 Column, 4.6×250 mm, 5 μm
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

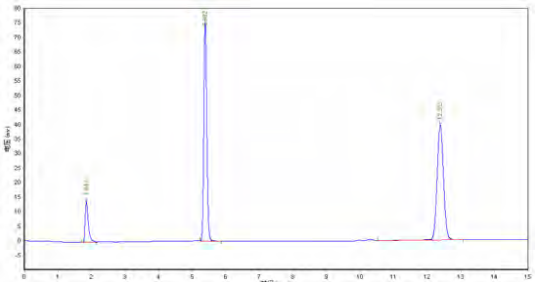
Optimix C18/Amide

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<30 ppm; Pore Size:100 Å; Single End-capping; Available Particle Size: 3 μm, 5 μm

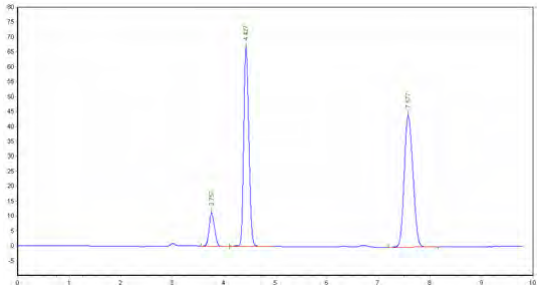
Features:

- Unique selectivity
- Balanced retention for extremely polar and non-polar compounds
- Greater retention for polar compounds due to coordinating 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



Optimix C18



Optimix C18 / Amide=1/1

HPLC conditions:
Column：4.6 x 250 mm, 5 μm, 100 Å
Mobile Phase：
ACN：Water=70 ： 30
Flow：1.0 mL/min
Wavelength：195 nm
Injection：10 μL
Sample：Glucose, Nitrobenzene and Naphthalene

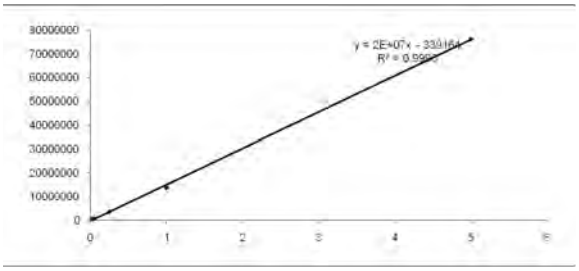
Optimix SCX/C18

Main Features:

- Mix-phase of SCX and C18
- Balanced retention for polar (basic) and non-polar; very useful for analysis of multi-components
- Unique selectivity
- LC-MS compatible due to reduced ion strength

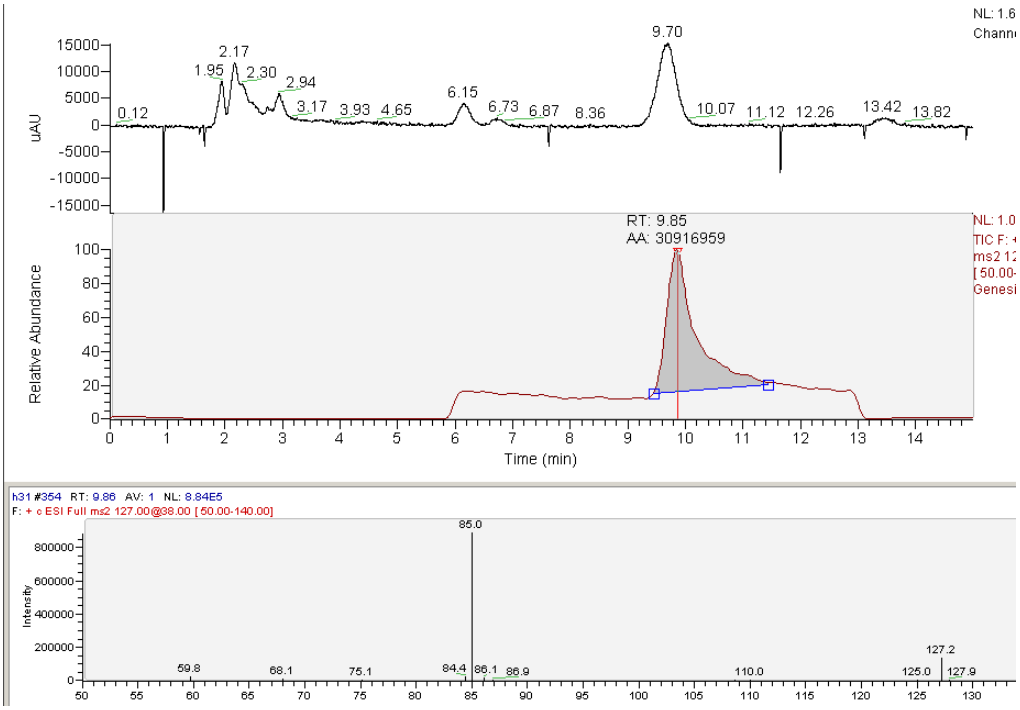
Application in Melamine Detection

Standard Curve



HPLC Conditions :
Column: Venusil AS-T(SCX/C18), 2.1x150 mm, 5 μm
Mobile Phase: Buffer (10mM ammonium acetate pH=3.0): acetonitrile (50: 50)
Detector: UV 240 nm
Flow Rate: 0.2 mL/min, Injection: 10 μL
Mass Conditions:
ESI, 5KV, Capillary 300℃ , 15V, 35 arb, Positive Ion, range (m/z) 50~140

Melamine Standard



Milk Sample

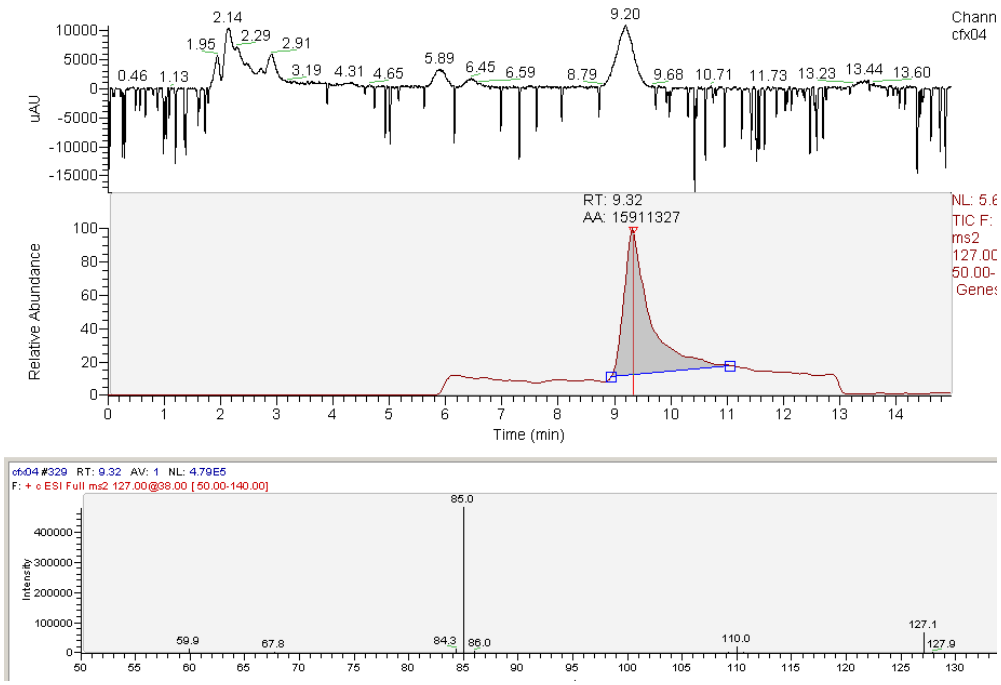
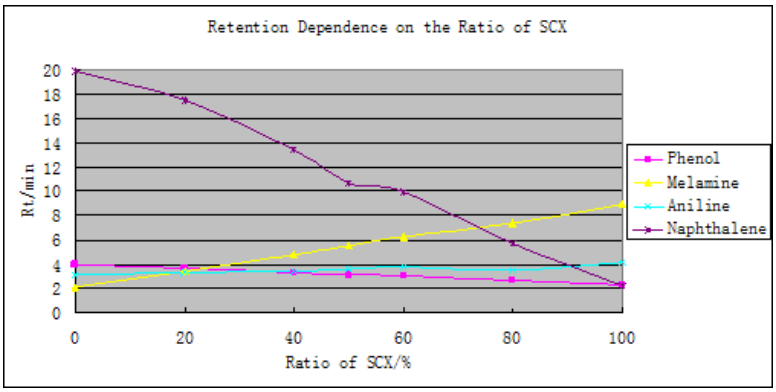


Fig.1 The relation of retention time and the ratio of SCX in column

Optimix SCX/C8



An investigation was taken to show how Optimix technology works. SCX (5 μm, 300 Å) and ASB C8 (5 μm, 300 Å) packing materials were mixed at different ratios and packed in columns separately. Then phenol, melamine, aniline and naphthalene were analyzed on these columns by the following:

Here is an application of Optimix technology to separate herbicides.

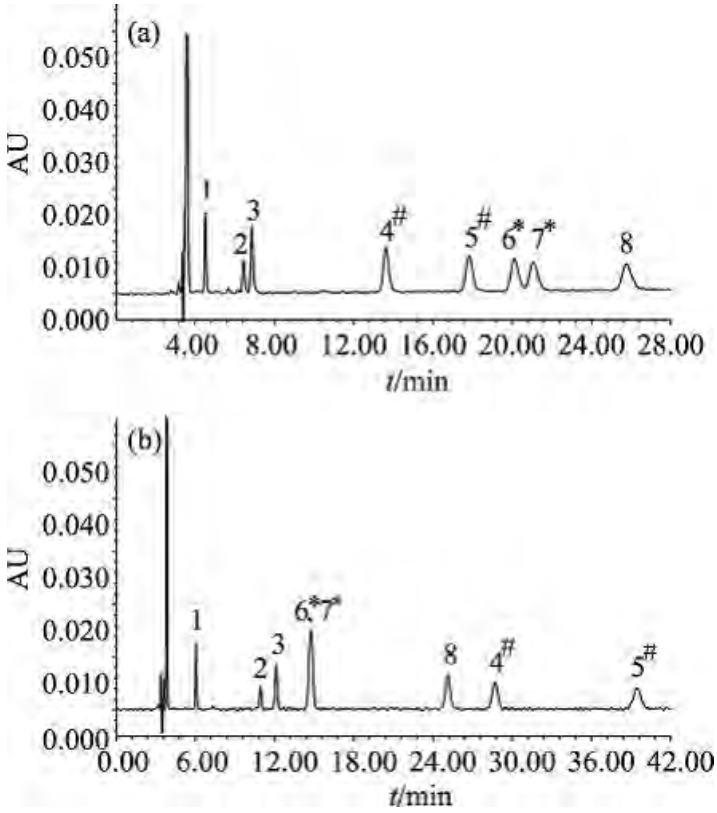


Fig.2 Chromatograms of herbicides performed on Optimix SCX/C8 (a) and Venusil ASB C8 (b) columns

Column: Optimix SCX/C8 (250 x 4. 6 mm, 5 μm, 300 Å, SCX: C8=3:2), Venusil ASB C8 (250 × 4. 6 mm, 5 μm, 300 Å);
Mobile phase: 0. 01 mol /L sodium acetate (pH4. 2): CAN = 75: 25(V /V) ;
Flow Rate: 1 mL /min;
Injection: 20 μL;
Detector: UV230 nm;
Temperature: 25℃

1 — Atrazine Desethyl; 2 — Metribuzin; 3 — Cyanazine;
4 — Propazine; 5 — Terbuthylazine; 6 — Desmetryn;
7 — Simetryn; 8 — Ametryn;
— isomers: Propazine and Terbuthylazine,
* — isomers: Desmetryn and Simetryn

Surface Area: 380 m^2/g, Pore Size: 100 Å

Type	Dimension (mm)	Particle size (μm)	Optimix C18/C8 (1:1)	Optimix C18/amide (1:1)	Optimix C18/phenyl (1:1)
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, 4/pk	5	OP950105-OC	OP950105-AM	OP950105-PH
DCG	4.6×10, 4/pk	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, 4/pk	3		OP930102-AM	
DCG	2.1×10, 4/pk	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: Direct-connection Guard Cartridge

Standard Products!

Venusil Family of HPLC Columns -- A 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 was 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 380 m^2/g, 200 m^2/g or 80 m^2/g, with a controlled pore size of 100 Å, 150 Å or 300 Å, 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.
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 4.6×150 mm, 5 µm	Zorbax XDB-C18 4.6×150 mm, 5 µm	Venusil XBP C18 (2) 4.6×150 mm, 5 µm
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%	18%

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 have 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 requirement.

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 manufacturing to offer high column-to-column reproducibility
- Non-excessive retention for hydrophobic peaks (less peak broadening of later eluted compounds compared to other columns)

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 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: 1.5~9.0
- Applicable to a wide range of sample types: plasma, urine, drug formulation and food extraction
- Available in a range of column diameters suitable for LC-MS, conventional analytical, and preparative scale

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 lowest limit can reach 0.8 at 70℃
- Extremely low bleed offering high sensitivity for LC-MS under acidic conditions
- Compatible with 100% aqueous to 100% organic mobile phases
- Non-endcapped but with low surface acidity/activity compared to other non-endcapped stationary phases

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 uniform 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.

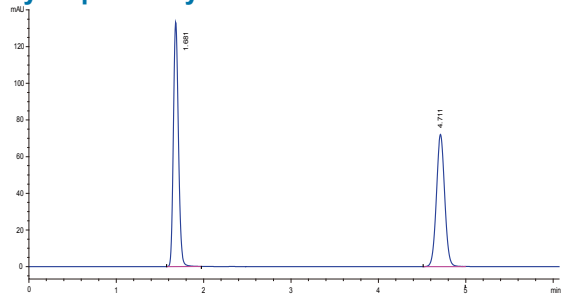
Characteristics:

- Metal Impuriy<30 ppm
- Particle Size: 5 μm, 3 μm,10 μm
- Specific Surface: 380 m^2/g
- Pore Size: 100 Å
- Carbon Loading: 18 %
- Double End-capping
- pH Range: 1.5-9.0
- Performance: Efficiency ＞ 80,000/m (5 μm)
- TF: 0.98-1.12

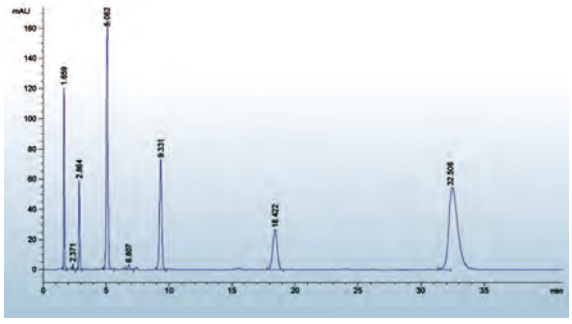
Main Features:

- 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

Hydrophobicity Test



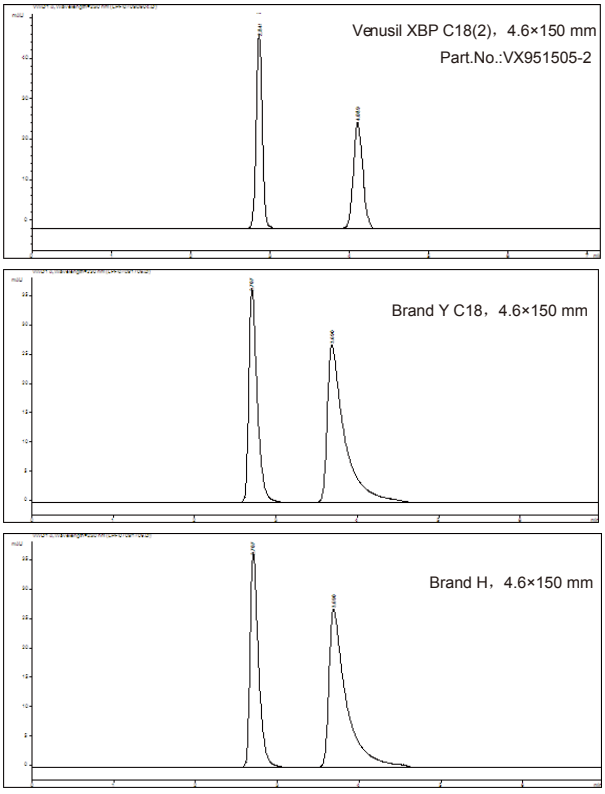
Column: Venusil XBP C18 (2), 4.6×150 mm, 5 μm
Sample: Uracil, Toluene
Mobile Phase: MeOH: 25 mM KH_2PO_4/K_2HPO_4 (pH=6.0)=80:20
Detector: UV 254 nm
Flow Rate: 1 mL/min



Column: Venusil XBP C18 (2), 4.6×150 mm, 5 μm
Sample: Amitriptyline
Mobile Phase: NaH_2PO_4/Na_2HPO_4 (20 mM, pH=6.9):
MeOH=29:71
Detector: UV 254 nm
Flow Rate: 1 mL/min

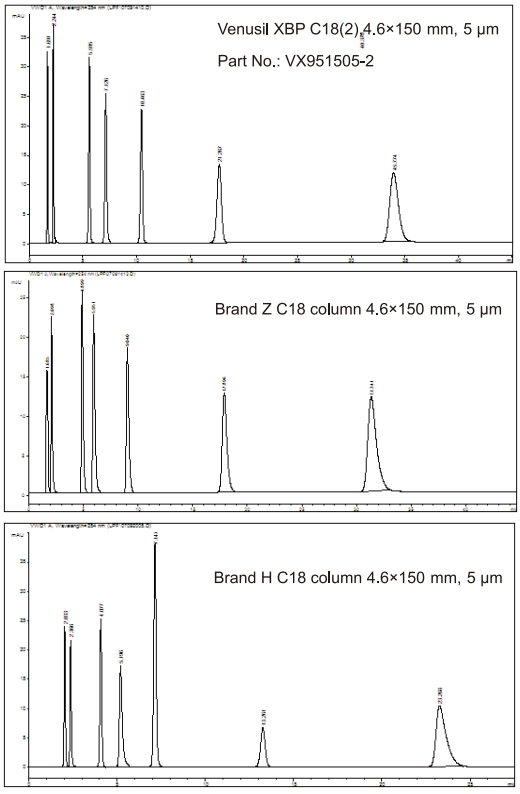
Amitriptyline is a strong basic antidepressant. It is recognized as a compound difficult to obtain good peak shape;
But the XBP C18(2) column performed outstandingly and gave a great peak symmetry (TF=1.12).

Extremely Low Metal Effects



Mobile Phase: Water:Methanol=65:35
Flow Rate: 1 mL/min
Temperature: 35℃
Detection: UV 230 nm
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: 1 mL/min
Temperature: 30℃
Detection: UV 254 nm
Sample: p-Methyl benzoic acid, Pyridine, Phenol,
Acetophenone, Amino-dimethyl benzene and Toluene

Ordering Information

Surface Area: 380 m^2/g; Pore Size: 100 Å

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 Cartridge
DCG: Direct-connection Guard Cartridge

Venusil XBP Series Columns

Venusil XBP C18 columns have the maximum bonding density and therefore provide highest hydrophobicity or 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.

Characteristics:

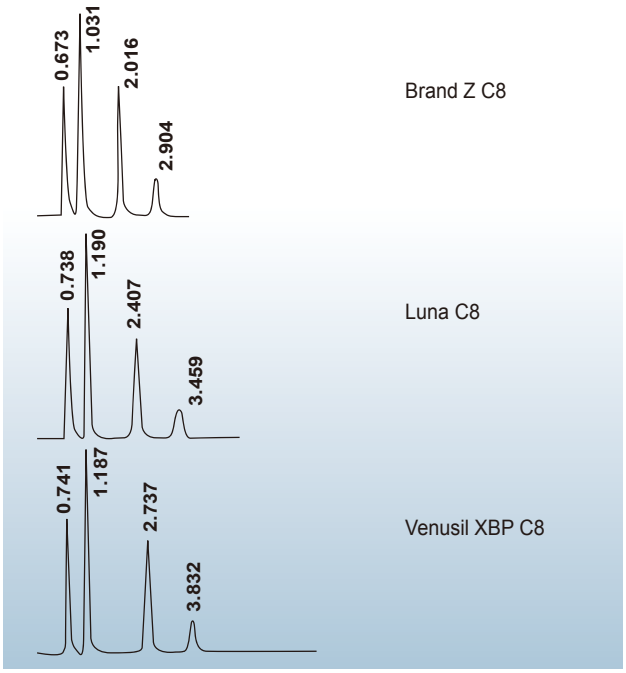
Pore size: 100 Å, 300 Å; Specific surface: 380 m^2/g, 80 m^2/g; Purity>99.999%;

Main Features:

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

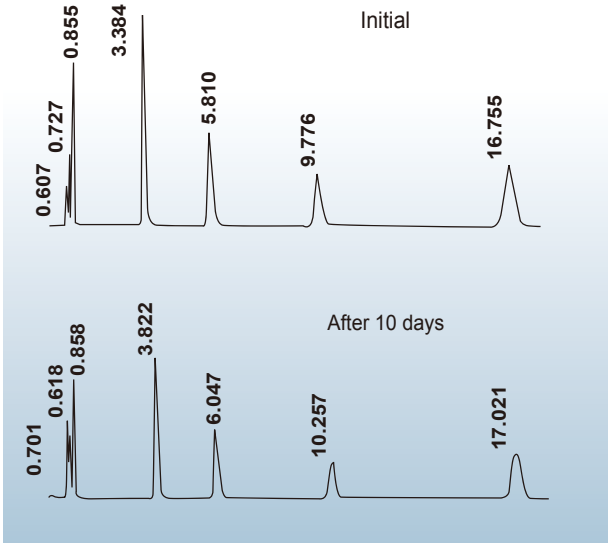
Other Venusil XBP Columns: A complete line of stationary phases include C8, C4, C1, NH_2, Phenyl, CN, Silica, SCX, SAX;

Quality of Column Packing



Sample: uracil, phenol,chloronitrobenzene, toluene(in methanol/water=50/50)
Column: 2.1x50 mm, 5 μm
Mobile Phase: methanol:water=65:35
Flow Rate: 0.20 mL/min
Temperature: 30℃

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



Sample: Uracil, Doxepin, Nortriptyline, Amitriptyline, Trimipramine
Column: Venusil XBP-C18, 4.6x150 mm, 5 μm
Mobile Phase: 0.01M sodium phosphate:ACN=50:50, pH=7.6
Flow Rate: 1.5 mL/min
Temperature: 45℃

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: 380 m^2/g, Pore Size: 100 Å

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: Direct-connection Guard Cartridge

Surface Area: 380 m^2/g, Pore Size: 100 Å

Type	Particle (μm)	Dimension (mm)	Venusil XBP NH_2	Venusil XBP Phenyl	Venusil XBP CN	Venusil XBP
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: 80 m^2/g, Pore Size: 300 Å

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: 80 m^2/g, Pore Size: 300 Å

Type	Particle (μm)	Dimension (mm)	Venusil XBP NH_2	Venusil XBP Phenyl	Venusil XBP CN	Venusil XBP
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 Cartridge
DCG: Direct-connection Guard Cartridge

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

Surface Area: 200 m^2/g, Pore Size: 150 Å

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 Cartridge
DCG: Direct-connection Guard Cartridge

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	1.5-9	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	1.5-10	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	1.5-9	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	1.5-9	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	0.8-7.5	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℃ .

Venusil AQ C18 Columns

The Venusil AQ C18 column is designed for the separation of polar, medium-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.

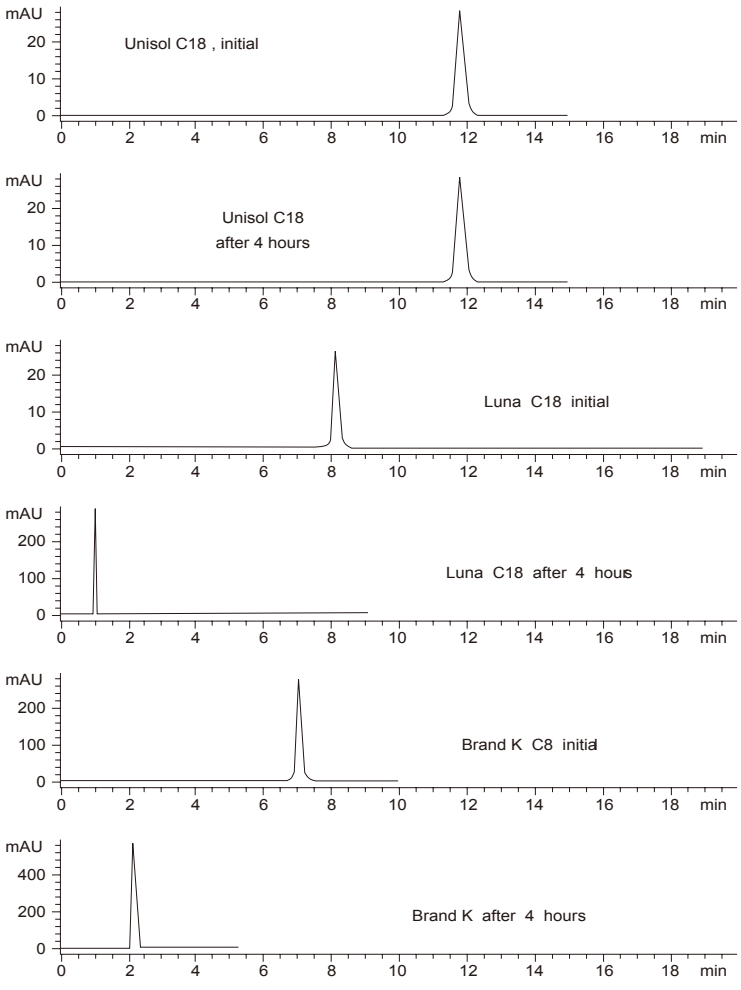
Characteristics:

Pore size:100 Å; Specific surface: 380 m^2/g; Purity>99.999 %;

Main Features:

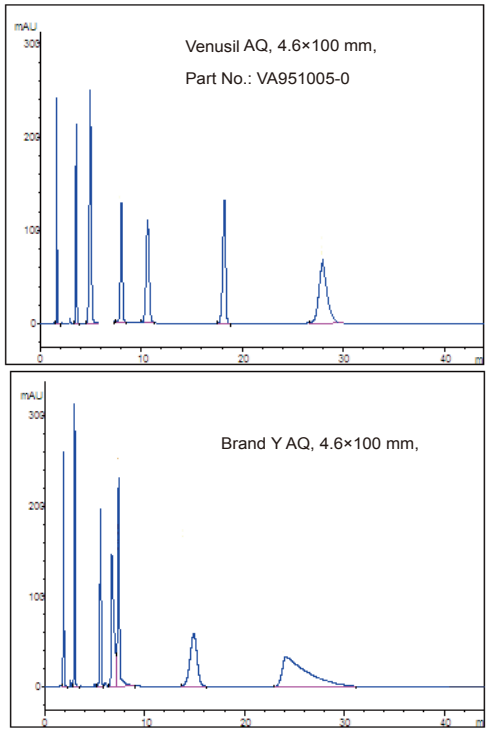
- Inertness: one of most base-friendly columns, excellent peak symmetry for basic compounds.
- Efficiency: The best column for polar compounds at any pH.
- Large volume injection: maintains very high efficiency even if the injection volume is exceptionally large.
- 100% water compatible: very unique for a universal C18 column; much better peak shape, retention, and efficiency than other brand AQ columns.
- 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



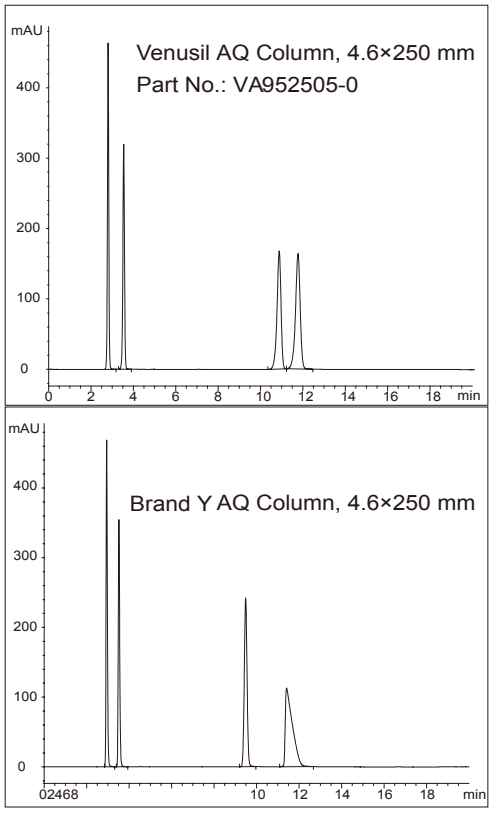
Sample: Uridine
Column: 4.6x150 mm, 5 µm
Mobile Phase: 100% water
Flow Rate: 1mL/min; the flow was stopped for 5 minutes during the testing period for each column
Temperature: 30℃

Balanced Retention for Hydrophilic and Hydrophobic Compounds



Mobile Phase: 20.0 mM KH_2PO_4/K_2HPO_4 (pH=7.0) :
Methanol = 35:65
Flow Rate: 1 mL/min
Detector: UV 254 nm
Sample: uracil, propranolol hydrochloride, butyl phthalate, dimethyl phthalate, naphthalene, acenaphthene and amitriptyline
Temperature: 23℃

Great Peak Shape for All Type of Compounds



Mobile Phase: 1 % Acetic Acid (pH=2.57): MeOH=50 : 50
Flow Rate: 1 mL/min
Temperature: 30 ℃
Detector: UV 275 nm
Sample: Uracil, Paracetamol, acetophenone and 2-Hydroxybenzoic acid

Ordering Information

Surface Area: 380 m^2/g, Pore Size: 100 Å

Type	Particle (μm)	Dimension (mm)	Venusil AQ C18
Fast analysis	3	2.1×30	VA930302-0
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 Cartridge
DCG: Direct-connection Guard Cartridge

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: 200 m^2/g, Pore Size: 150 Å

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 Aera: 80 m^2/g, Pore Size: 300 Å

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: Direct-connection Guard Cartridge

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: 380 m^2/g, Pore Size: 100 Å

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 Aera: 80 m^2/g, Pore Size: 300 Å

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: Direct-connection Guard Cartridge

Promosil Family of HPLC Columns

Columns	Particle Size (Å)	C %	Metal Content	End-capped?	End-capping Type	pH
Promosil C18	5, 10	18	<100 ppm	Yes	Double End-capped	1.5-9.0
Promosil C8	5, 10	10	<100 ppm	Yes	Double End-capped	2.0-8.0
Promosil NH_2	5, 10	4	<100 ppm	No		2.0-8.0
Promosil CN	5, 10	5	<100 ppm	Yes	Single End-capped	2.0-8.0
Promosil Silica	5, 10	/	<100 ppm	No		1.0-6.0

Promosil C18

Using the silica of high-purity and high mechanical strength, the Promosil C18 series columns are made with high-purity monosilane through Bonna-Agela Technologies' well controlled bonding process. They have high surface bonding coverage and are 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 to contamination and long life-time. They are the best choice of high performance-to-cost value.

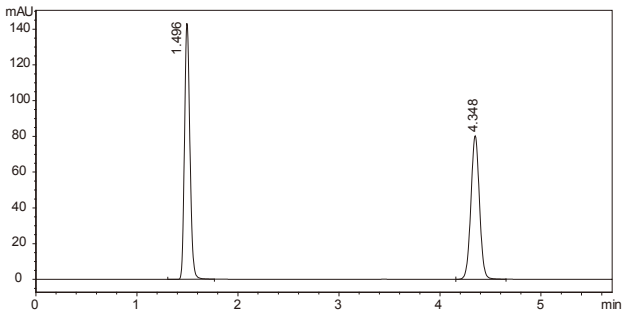
Characteristics:

- High-purity silica, Metal Impurity<10 ppm
- Average Particle Size: 5 μm
- Specific Surface: 320 m^2/g
- Pore Size: 100 Å
- Carbon Loading: 18 %
- pH Range: 1.5-9.0
- Plate Count: >80,000/m
- Tailing Factor: 0.98-1.20

Main Features:

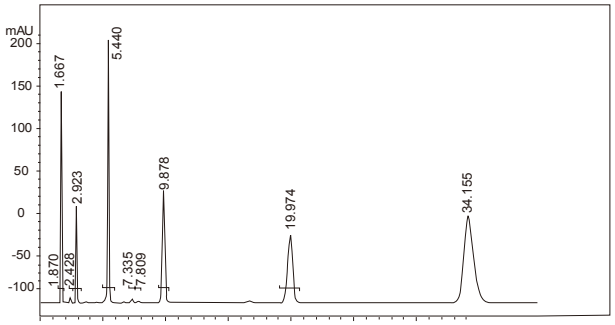
- Double End-cap, Good Inertness
- Good Stability and Reproducibility
- Excellent Performance-to-cost Value

Hydrophobicity Test



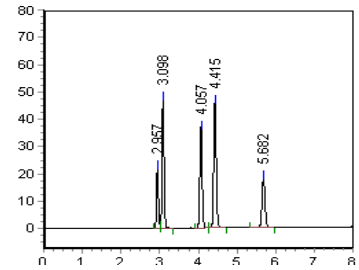
Column: Promosil C18, 4.6×150 mm, 5 μm
Sample: Uracil, Toluene
Mobile Phase: MeOH:25mM KH_2PO_4/K_2HPO_4 (pH=6.0)=80:20
Detector: UV 254 nm
Flow Rate: 1 mL/min

Hydrophobicity Test



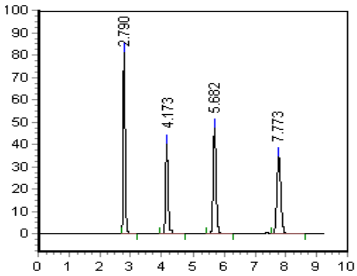
Column: Promosil C18, 4.6×150 mm, 5 μm
Sample: Amitriptyline
Mobile Phase: NaH_2PO_4/Na_2HPO_4 (20 mM, pH=6.9):MeOH=32:68
Detector: UV 254 nm
Flow Rate: 1 mL/min

Promosil C8



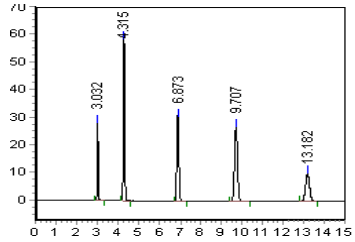
Column: Promosil C8, 4.6 x 250 mm
Sample: Uracil (1) Phenol (2) Nitrobenzene (3) and Naphthalene (4) in mobile phase 1μL .
Mobile phase: 15% Water 85% Methanol
Flow Rate: 1.0 mL/min
Temperature: 30 ℃
Detector: UV 254 nm

Promosil CN



Column: Promosil CN, 4.6 x 250 mm
Sample: Uracil (1) Phenol (2) Nitrobenzene (3) and Naphthalene (4) in mobile phase 1μL.
Mobile phase: 45% Water, 55% Methanol
Flow Rate: 1.0 mL/min
Temperature: 30 ℃
Detector: UV 254 nm

Promosil Silica



Column: Promosil Silica, 4.6 x 250 mm
Sample: toluene, nitrobenzene, o-nitroaniline, m-nitroaniline and p-nitroaniline in mobile phase 1μL.
Mobile phase: Isooctane:ethanol:water = 85:15:0.3
Flow Rate: 1.00 mL/min
Temperature: Room temperature
Detector: UV 254 nm

Ordering Information

Surface Area: 320 m^2/g, Pore Size: 100 Å

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 Cartridge DCG: Direct-connection Guard Cartridge

Other Manufacturers' Brands

Bonna-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: Zorbax, 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 reversed 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 0.8-7.5. 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 chose to adjust mobile phase ratio, mobile phase pH (very effective for ionizable compounds), or chose 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.

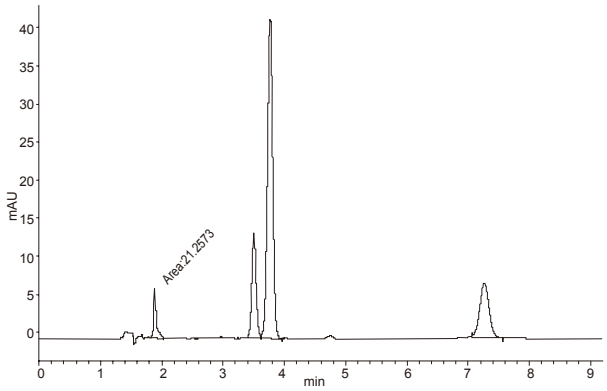
For basic compounds, you may start with a AQ C18 column. For compounds with pKa>9, another alternative is to use a Unisol Amide column in place of the AQ C18 column and operate at a low to medium pH (2.0-7.0). Figure 3 shows that even with a 100% aqueous mobile phase, validamycin (basic and highly water soluable) 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 reversed phase columns and offer much higher retentivity .

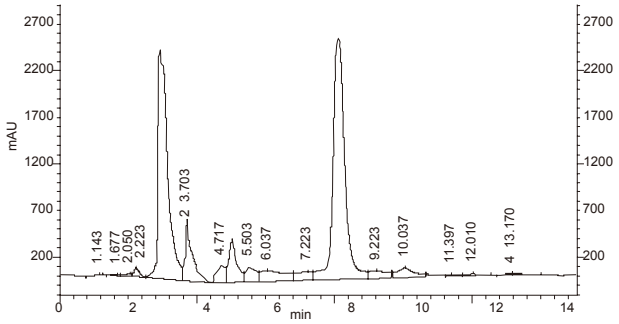
The multiple selection of columns and this comprehensive method development scheme for the separation of highly water-soluble compounds will allow you to develop HPLC methods at ease.

Figure 1. HPLC Separation of Organic Acids



Sample: Vitamin C, malonic acid, lactic acid, citric acid.
Column: Venusil AQ C18, 4.6x150 mm, 5 μm
Mobile Phase: 20 mmol phosphate buffer, pH=2.0
Detector: UV 210 nm
Flow Rate: 1.0 mL/min
Temperature: 30℃

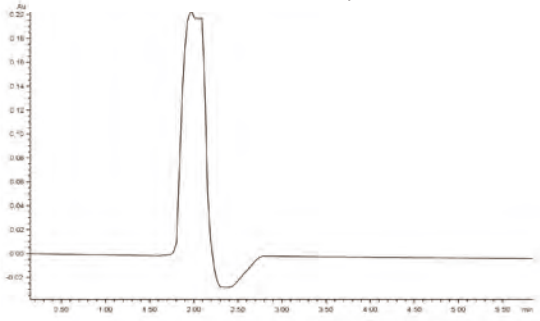
Figure 2. HPLC Analysis of Shikimic Acid (3,4,5-Trihydroxy-1-cyclohexene-1-carboxylic Acid)



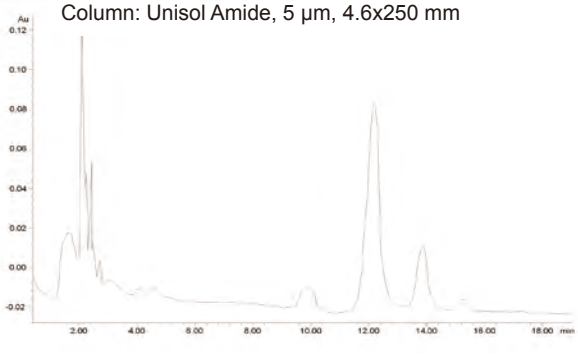
Column: Unisol Amide (HILIC), 4.6x250 mm, 5 μm
Mobile Phase: ACN/1% formic acid 90-60% in 20 min
Detector: UV 210 nm
Flow Rate: 1.0 mL/min
Temperature: 30℃

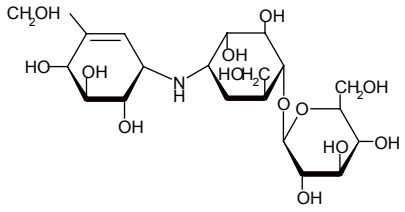
Figure 3. HPLC Analysis of Validamycin Raw Products

Column: Brand W, AQ Column, 5 μm, 4.6x250 mm



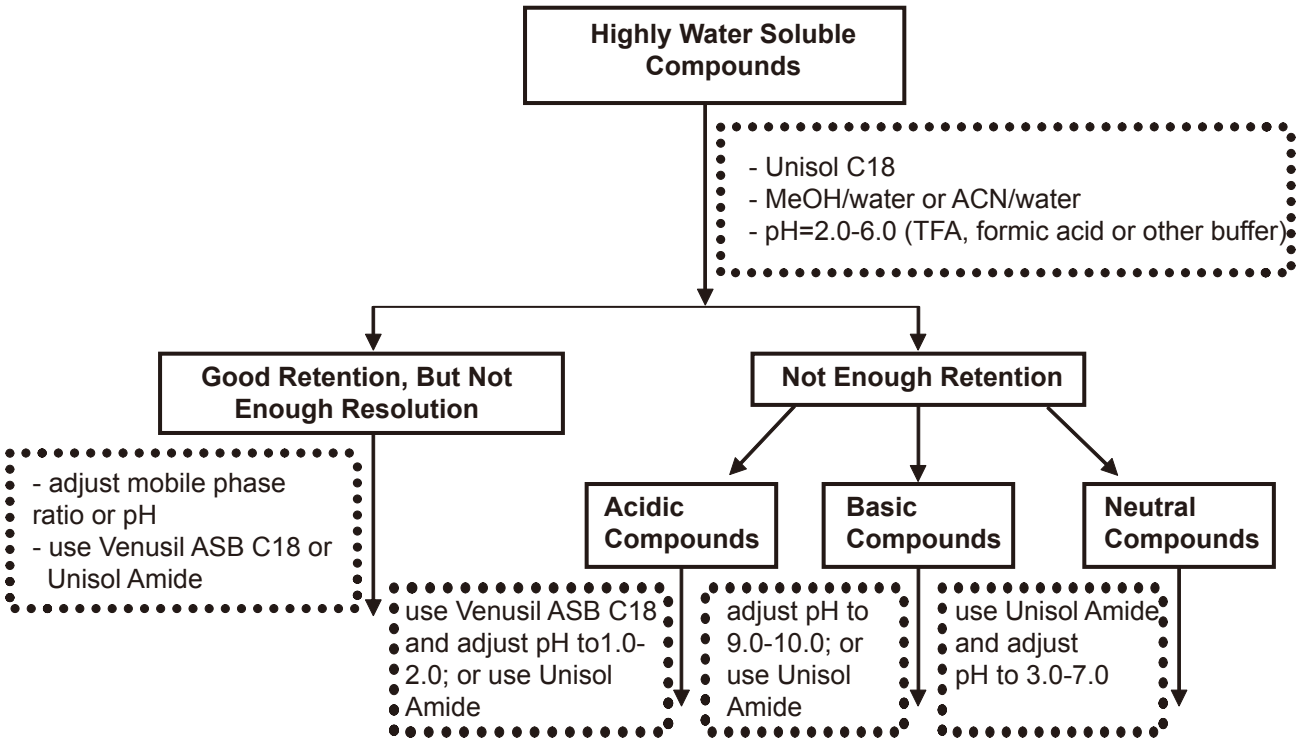
Column: Unisol Amide, 5 μm, 4.6x250 mm





Validamycin

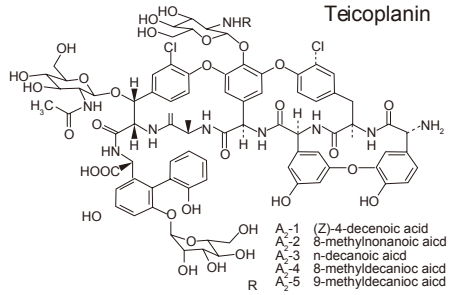
Mobile Phase: A:0.1% TFA in Water
B:Acetonitrile
Gradient: 40% A to 85% A in 30 min
Flow Rate: 1 mL/min
Temperature: 25℃
Detector: UV 210 nm
Sample: Validamycin

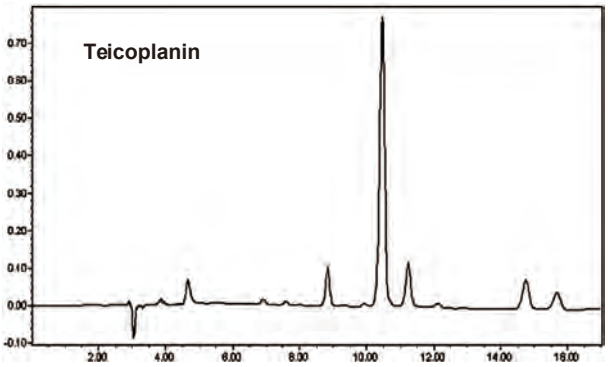


Other Stationary Phases from Bonna-Agela Technologies for Hydrophilic Compounds Separation:

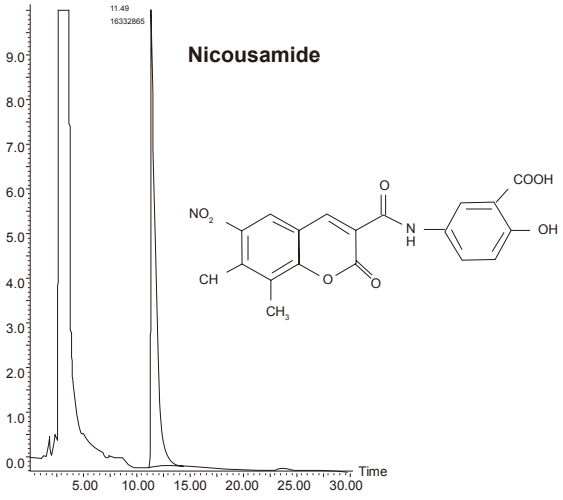
Unisol C18
Venusil XBP Silica (HILIC II)
Venusil XBP NH_2 (HILIC III)

Unisol C18





Column: Unisol C18, 4.6×150 mm
Mobile Phase: A:NH_4AC Buffer (Adjust pH=6.0)
B:ACN
Gradient: 10 % B to 60 % B in 20 min.
Flow Rate: 1.0 mL/min
Sample: Teicoplanin+Impurity
Temperature: 35℃



Column: Unisol C18, 4.6×150 mm (UO951505-0)
Mobile Phase: Water:ACN:THF (50:50:1, 0.1%H_3PO_4)
Flow Rate: 1 mL/min
Sample: Nicousamide
Detector: UV 254 nm

HILIC Column Family From Bonna-Agela Technologies

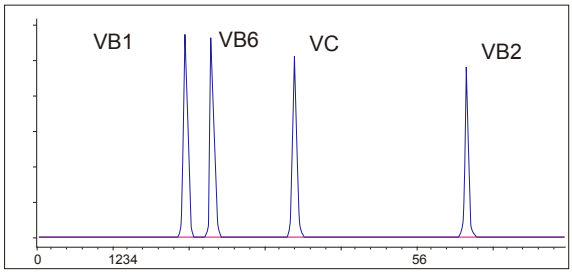
Unisol Amide (Bonna-Agela HILIC)
Venusil XBP Silica (Bonna-Agela HILIC II)
Venusil XBP NH_2 (Bonna-Agela HILIC III)

Comparison:

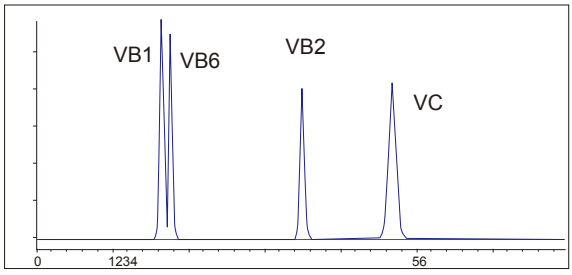
- Selectivity
  XBP silica is slightly acidic (pH=5.6); while Unisol Amide is slightly basic (pH=7.0-9.0), and XBP NH_2 is more basic (pH=9.2).
  XBP silica has stronger retention of basic compounds, while Unisol Amide and XBP NH_2 have better retention of acidic compounds.
  Unisol Amide has a balanced 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

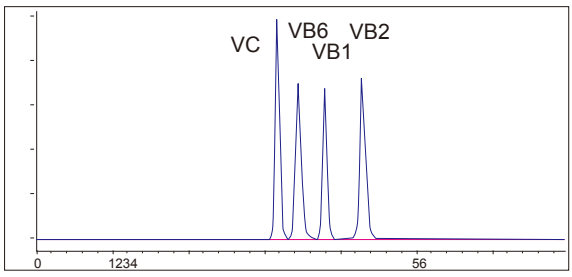
- Selectivity comparison on 3 columns
- Stability comparison of Unisol Amide and XBP silica



Unisol Amide Column,
4.6 ×150 mm, 5 µm



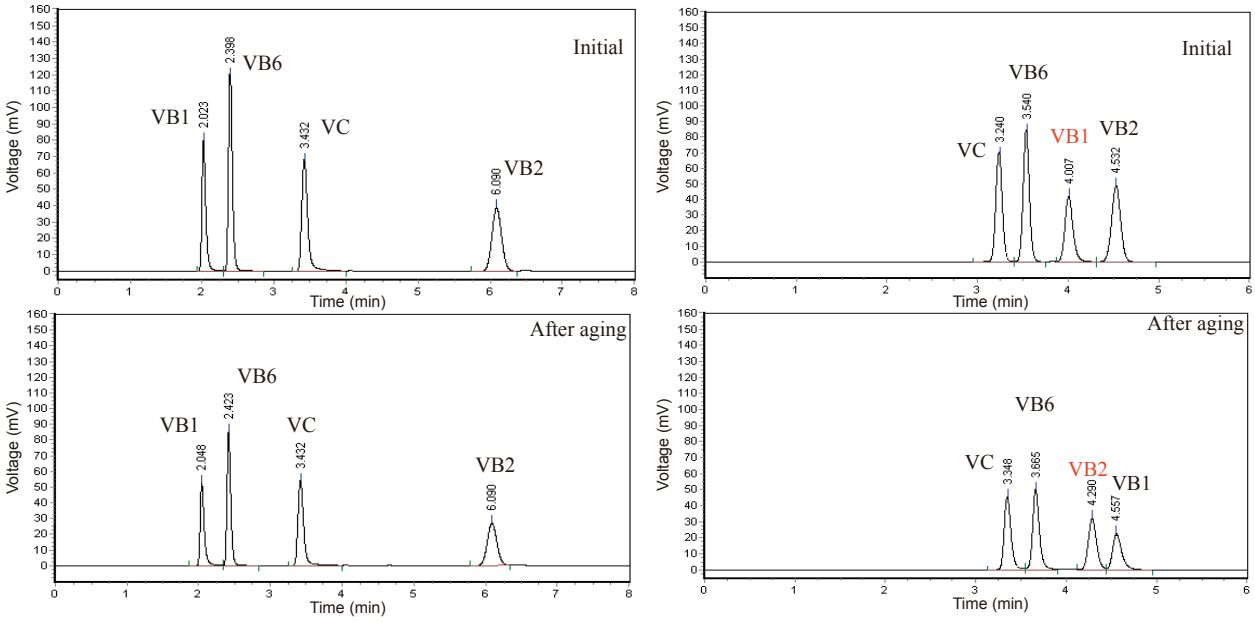
XBP NH_2 Column,
4.6×150 mm, 5 µm



XBP Silica Column,
4.6×150 mm, 5 µm

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

Stability Comparison of Unisol Amide and Venusil XBP Silica



Unisol Amide, 4.6×150 mm, 5 μm

Brand W Silica, 4.6×150 mm, 5 μm

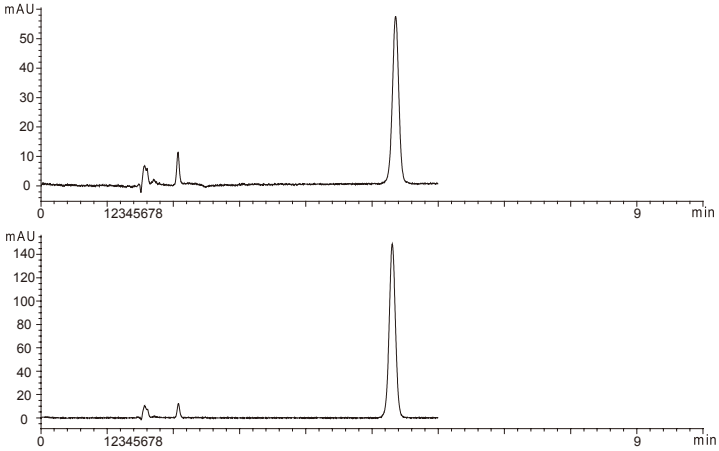
Samples:VB1, VB6, VC and VB2
Aging Conditions:
MeOH: 20 mM NaH_2PO_4 (pH=7.0)=40:60; 1.0 mL/min; Temperature: 40℃
HPLC Conditions:
Mobile Phase: 0.1%TFA:ACN=90:10;
Detector: UV 280 nm; Flow Rate: 1.0 mL/min; Temperature: 30℃ ; Injection: 2 μL

Solutions for Low pH and High pH Applications

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

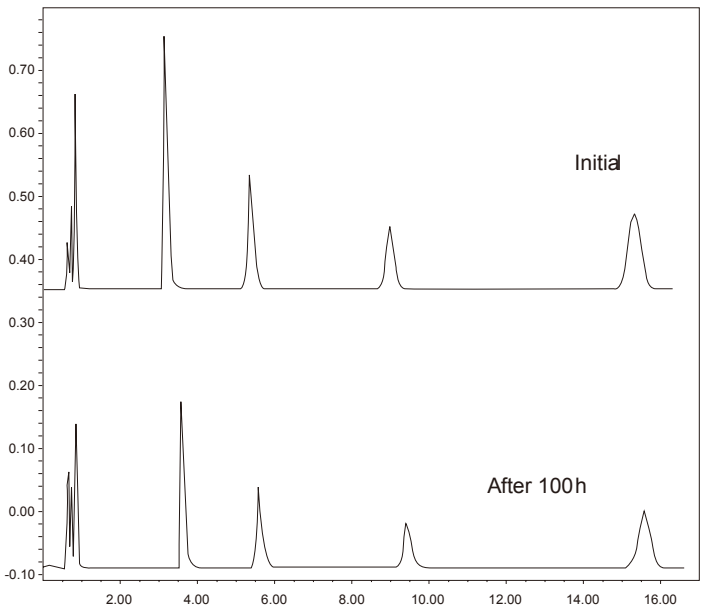
- Venusil ASB C18 (pH:0.8-7.5);
- Venusil ASB C8 (pH:1.0-7.5);
- Durashell C18 (pH:1.5-12.0)

Low pH Stability of ASB C18



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

High pH Stability of Durashell C18



Column: Durashell C18, 4.6×150 mm, 5 μm
Flow Rate: 1.5 mL/min, ACN:0.05 M Ammonia (pH=9.0)=50:50
Sample: Doxepin, nortriptyline, amitriptyline, trimipramine
Temperature: 35℃

Solutions for LC-MS

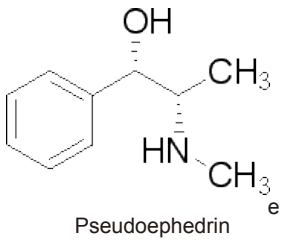
Bonna-Agela Technologies provide columns that can meet the needs of LC-MS applications. The most popular LC-MS columns from Bonna-Agela include:

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

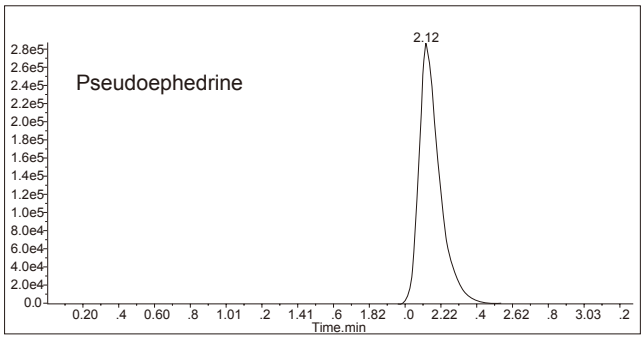
Benefits:

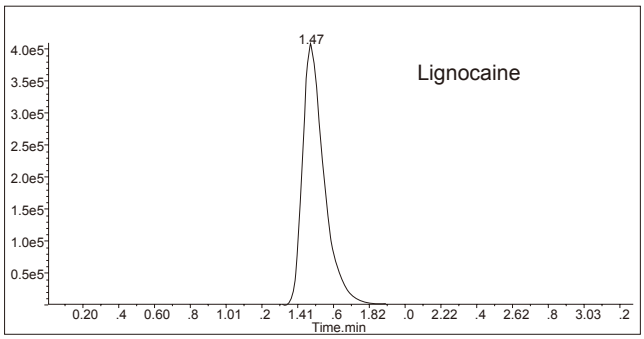
- Low bleed and symmetric peak shape→Sensitivity.
- High retention for polar compounds→Sensitivity, versatility, and low ion suppression for bioanalytical analysis.
- Compatible with 100% water to 100% organic solvents→Simplified method development effort.
- Stability→Long column life means a reduced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

Pseudoephedrine in Plasma



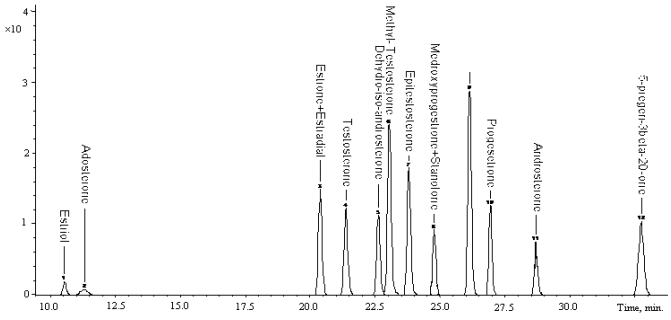
Pseudoephedrin e





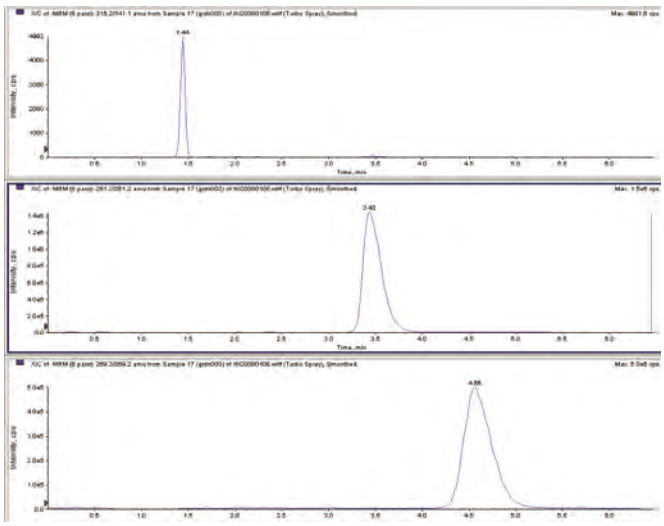
Mass System: API Qtrap 3200, Applied Biosystem
Mass Condition: Positive Ion Mode, MRM
HPLC Column: Venusil ASB C18, 2.1×50 mm, 5 μm
Sample: Sample prepared by SPE (Cleanert PCX 60 mg/3 mL)
Mobile Phase: A:1% Formic Acid in Water;
B:Methanol;
Gradient: 20%B to 95%B in 2 min, hold for 0.5 min, then switch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

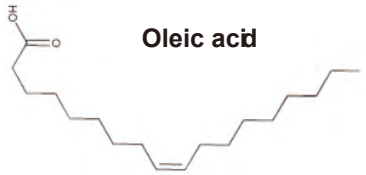
Analysis of 14 Kinds of Hormone



Mass System: Agilent 1100 Series LC/MSD Trap
HPLC Column: Venusil XBP C18, 2.1×150 mm, 5 μm
Sample: Estriol, Adosterone, Estrone+Estradial, Testosterone, Dehydro-iso-androsterone Methyl-Testosterone, Epitestosterone, Medroxyprogestrone+Stanolone, Progesetrone, 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: 0.8 mL/min
Temperature: 25℃

Oleic Acid in Plasma

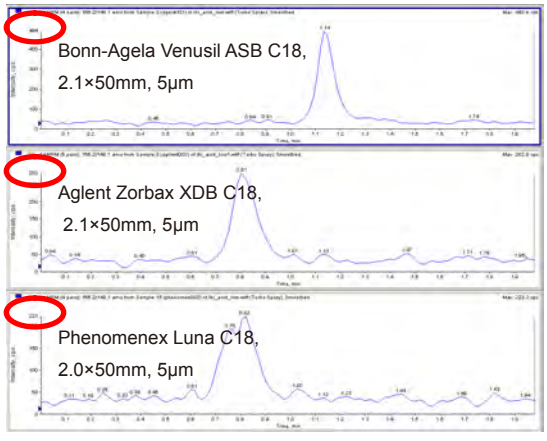




Mass System: API Qtrap 3200, Applied Biosystem
Mass Condition: Negative Ion Mode, MRM
HPLC Column: Venusil ASB C18, 2.1×50 mm, 5 μm
Sample: Sample prepared by SPE (Cleanert PEP 60 mg/3mL)
Mobile Phase: A:13 mmol/L ammonium acetate aq.,
B:Acetonitrile
Gradient: 5%B to 95%B in 2 min, hold for 2 min,
switch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

Highest LC-MS Sensitivity

2-3 times higher than many popular brands *(low bleed, inert surface and high efficiency)*

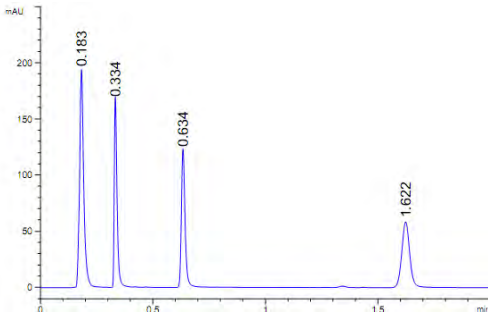


Solutions for Fast Analysis

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

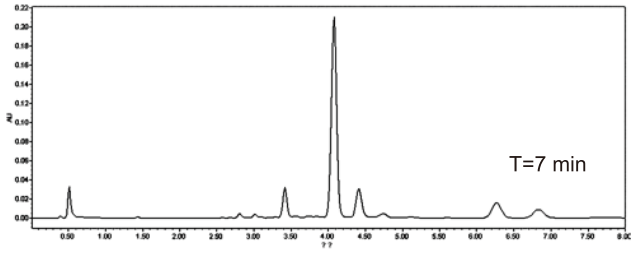
Small particle size or fused-core technology

- UHP AQ C18
- UHP ASB C18
- UHP Innoval C18
- UHP HILIC

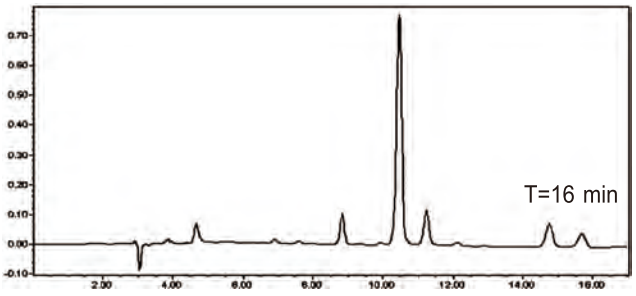


Column: UHP AQ C18, 2.1×50 mm, 2 μm
Sample: Uracil (1) Phenol (2) Nitrobenzene (3) and Naphthalene (4) in mobile phase; 1.0 μL
Mobile phase: 50 % Acetonitrile / 50 % Water
Flow Rate: 0.5 mL/min
Pressure: 337 bar
Temperature: 30 ℃
Detector: UV 254 nm

Unique retention mechanism : Optimix C18/Amide



Mobile Phase: A:NH_4AC Buffer (Adjust pH=6.0)
B:ACN
HPLC Column: Halo C18, 4.6 × 50 mm, 2.7 μm
Gradient: 5%B to 45%B in10 min.
Flow Rate: 1.0 mL/min
Sample: Teicoplanin+Impurity
Temperature: 35℃



Mobile Phase: A:NH_4AC Buffer (Adjust pH=6.0)
B:ACN
HPLC Column: Conventional C18, 4.6 ×150 mm, 5 μm
Gradient: 10%B to 60%B in 20 min.
Flow Rate: 1.0 mL/min
Sample: Teicoplanin+Impurity
Temperature: 35℃

Solutions for Bio-molecules

Bonna-Agela Technologies offers a broad line of HPLC columns for Bio-molecules, including reversed 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; 100 Å or 150 Å
2. Large peptide and proteins: C8, C4, 300 Å; ion-exchange; HILIC; size exclusion
3. Mono- and oligo-saccharides: ion-exchange; NH_2; 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 type of stationary phase" for ordering or call our technical staff for helps in selecting the columns you need.

Solutions for Preparative HPLC
(Refer to Purification Section for More Information)

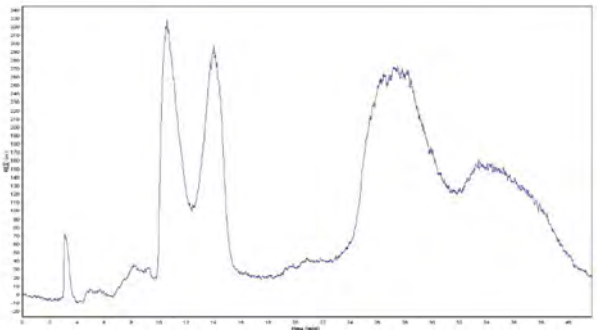
Bonna-Agela Technologies offer a full line of preparative HPLC columns to meet a variety of application needs.

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

Preparation of Polysaccharide

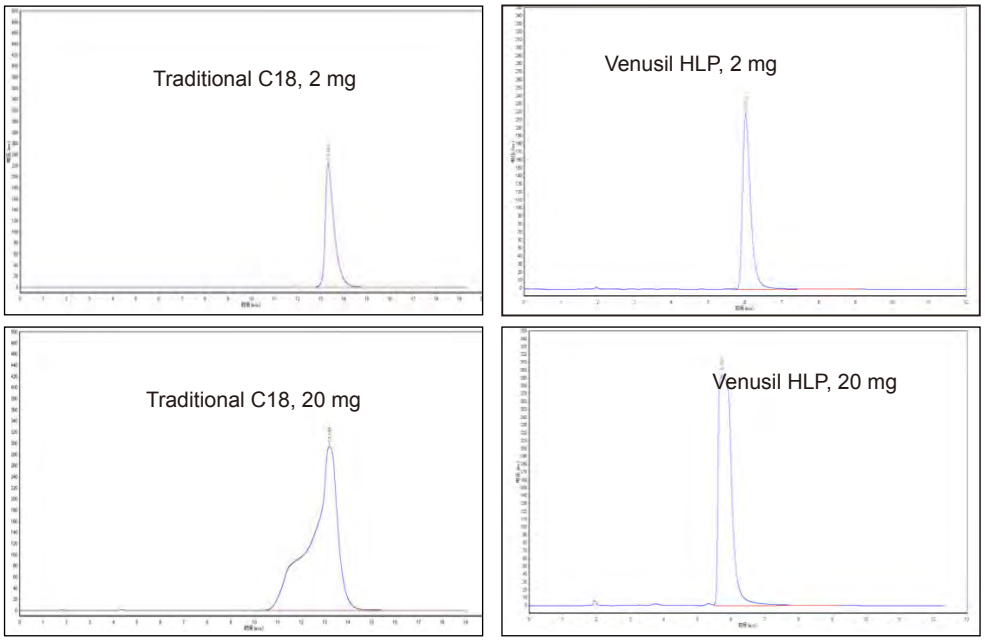


Sample Polysaccharide
Column: Unisol Amide 5 μm 100 Å, 10×250 mm
Mobile phase: A (acetonitrile): B (water) = 80:20
Flow Rate: 5 mL/min
Sample Loading: 200 uL
ELSD: 0.3mpa, 80 ℃

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

Venusil HLP: Bonded with alkyl chain molecules and embedded amide polar group that literally capped the silica's residual silanols from interacting with highly basic analytes.

High Loading Capacity



Column: Traditional C18, 5 μm, 100 Å, 21.2×150 mm
Venusil HLP, 5 μm,100 Å, 21.2×150 mm
Sample: Amitriptyline
Mobile Phase: MeOH:0.1% Formic acid=80:20
Flow Rate: 20 mL/min
UV Detector: UV 254 nm
Temperature: Ambient

Solutions for SFC

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

- Unisol Amide
- Venusil XBP NH_2
- 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 high efficiency and extended lifetime.

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

ORDERING INFORMATION BY THE TYPE OF STATIONARY PHASES

Reversed Phase Columns

Reversed Phase Columns for Small Molecules

Analytical Columns, Particle Size: 5 µm

Dimension (mm)	Promosil C18	Promosil C8	Promosil CN	Venusil XBP Phenyl	Venusil XBP C4	Venusil XBP C1	Venusil XBP CN
	General C18, 100 Å, 320 m^2/g; C%=18	General C8, 100 Å, 320 m^2/g; C%=10	100 Å, 320 m^2/g, C%=5	100 Å, 380 m^2/g, C%=12	100 Å, 380 m^2/g, C%=7	100 Å, 380 m^2/g; C%= 3	100 Å, 380 m^2/g, C%=5
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 PFP	Venusil PAH
	100 Å, 380 m^2/g, C%=18	150 Å, 200 m^2/g; C%=15	5 µm, 100 Å, 240 m^2/g; C%=15	100 Å, 380 m^2/g; C%=15	120 Å, 320 m^2/g;	200 Å, 200 m^2/g; C%=17
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	IX950505-0			
4.6×50	VX950505-2	VX950505-L	IX951005-0	VHL950505-0	VF950505-0	
4.6×100	VX951005-2	VX951005-L	IX951505-0	VHL951005-0	VF951005-0	
4.6×150	VX951505-2	VX951505-L	IX952005-0	VHL951505-0	VF951505-0	
4.6×200	VX952005-2	VX952005-L	IX952505-0	VHL952005-0	VF952005-0	
4.6×250	VX952505-2	VX952505-L	IX950105-0	VHL952505-0	VF952505-0	VP952505-L
G 4.6×10, 4/pk	VX950105-2	VX950105-L	IX950105-0S	VHL950105-0	VF950105-0	VP950105-L
DCG 4.6×10, 4/pk	VX950105-2S	VX950105-LS		VHL950105-0S	VF950105-0S	VP950105-LS

G: Guard Cartridge
DCG: Direct-connection Guard Cartridge

Dimension (mm)	Particle Size (μm)	Venusil ASB C18	Venusil AQ C18	Unisol C18	Durashell RP	Durashell C18	Venusil XBP C18	Venusil XBP C8
		150 Å, 200 m^2/g, C%=12	100 Å, 380 m^2/g, C%=18	100 Å, 410 m^2/g, C%=18	150 Å, 100 m^2/g, C%=15	100 Å, 380 m^2/g, C%=21	100 Å, 380 m^2/g, C%=22	100 Å, 380 m^2/g; C%= 14
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
3.0x30	3	VS930303-0	VA930303-0	UO930303-0	DS930303-0	DC930303-0	VX930303-0	VX830303-0
3.0x50	3	VS930503-0	VA930503-0	UO930503-0	DS930503-0	DC930503-0	VX930503-0	VX830503-0
3.0x100	3	VS931003-0	VA931003-0	UO931003-0	DS931003-0	DC931003-0	VX931003-0	VX831003-0
3.0x150	3	VS931503-0	VA931503-0	UO931503-0	DS931503-0	DC931503-0	VX931503-0	VX831503-0
4.6×50	3	VS930505-0	VA930505-0	UO930505-0	DS930505-0	DC930502-0	VX930505-0	VX830502-0
4.6×100	3	VS931005-0	VA930505-0	UO931005-0	DS931005-0	DC931002-0	VX931005-0	VX831002-0
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
3.0x30	5	VS950303-0	VA950303-0	UO950303-0	DS950303-0	DC950303-0	VX950303-0	VX850303-0
3.0x50	5	VS950503-0	VA950503-0	UO950503-0	DS950503-0	DC950503-0	VX950503-0	VX850503-0
3.0x100	5	VS951003-0	VA951003-0	UO951003-0	DS951003-0	DC951003-0	VX951003-0	VX851003-0
3.0x150	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 Cartridge
DCG: Direct-connection Guard Cartridge

Dimension (mm)	Particle Size (μm)	Venusil ASB C8	Venusil ASB C3	Venusil ASB C1	Durashell C8
		150 Å, 200 m^2/g, C%=7	150 Å, 200 m^2/g, C%=4	150 Å, 200 m^2/g, C%=2	100 Å, 380 m^2/g, C%=14
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
3.0x30	3	VS830303-0	VS330303-0	VS130303-0	DC830303-0
3.0x50	3	VS830503-0	VS330503-0	VS130503-0	DC830503-0
3.0x100	3	VS831003-0	VS331003-0	VS131003-0	DC831003-0
3.0x150	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
3.0x30	5	VS850303-0	VS350303-0	VS150303-0	DC850303-0
3.0x50	5	VS850503-0	VS350503-0	VS150503-0	DC850503-0
3.0x100	5	VS851003-0	VS351003-0	VS151003-0	DC851003-0
3.0x150	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

Reversed Phase Columns for Large Molecules

Particle Size: 5 μm; Surface Area: 80 m^2/g; Pore Size: 300 Å;

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	3.0x30	VX650303-T	VX450303-T	VX150303-T	VC950303-T
Analytical	3.0x50	VX650503-T	VX450503-T	VX150503-T	VC950503-T
Analytical	3.0x100	VX651003-T	VX451003-T	VX151003-T	VC951003-T
Analytical	3.0x150	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 Cartridge

DCG: Direct-connection Guard Cartridge

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: 5 μm; Surface Area: 80 m^2/g; Pore Size: 300 Å;

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	3.0x30	VS950303-T	VS850303-T	VX950303-T	VX850303-T
Analytical	3.0x50	VS950503-T	VS850503-T	VX950503-T	VX850503-T
Analytical	3.0x100	VS951003-T	VS851003-T	VX951003-T	VX851003-T
Analytical	3.0x150	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 Cartridge
DCG: Direct-connection Guard Cartridge

Normal Phase Columns

Normal Phase Columns for Small Molecules

Particle Size: 5 μm

Type	Particle Size(μm)	Dimension (mm)	Unisol Amide (HILIC)	Venusil XBP Silica (HILIC II)	Venusil XBP NH_2 (HILIC III)	Venusil XBP CN	Durashell NH_2	Venusil XBP Diol
			100 Å, 410 m^2/g,	100 Å, 380 m^2/g,	100 Å, 380 m^2/g;	100 Å, 380 m^2/g,	100 Å, 380 m^2/g,	100 Å, 380 m^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 Cartridge
DCG: Direct-connection Guard Cartridge

High Purity; Surface Aera: 320 m^2/g; Pore Size: 100 Å;

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	3.0x30	PM050303-0	PM550303-0	PM750303-0
Analytical	5	3.0x50	PM050503-0	PM550503-0	PM750503-0
Analytical	5	3.0x100	PM051003-0	PM551003-0	PM751003-0
Analytical	5	3.0x150	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: Direct-connection Guard Cartridge

Normal Phase Columns for Large Molecules

Ultra Pure Silica; Surface Area: 80 m^2/g; Pore Size: 300 Å

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	3.0x30	VN850303-T	VD950303-T	VC950303-T	VH950303-T	VSi950303-T
Analytical	5	3.0x50	VN850503-T	VD950503-T	VC950503-T	VH950503-T	VSi950503-T
Analytical	5	3.0x100	VN851003-T	VD951003-T	VC951003-T	VH951003-T	VSi951003-T
Analytical	5	3.0x150	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

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: Direct-connection Guard Cartridge

Surface Aera: 80 m^2/g, Pore Size: 300 Å

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: 380 m^2/g, Pore Size: 100 Å

Type	Dimension (mm)	Particle size (μm)	Optimix C18/C8 (1:1)	Optimix C18/amide (1:1)	Optimix C18/phenyl (1:1)
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, 4/pk	5	OP950105-OC	OP950105-AM	OP950105-PH
DCG	4.6×10, 4/pk	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, 4/pk	3		OP930102-AM	
DCG	2.1×10, 4/pk	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: Direct-connection Guard Cartridge

Type	Dimension (mm)	Particle size (μm)	Optimix C18/SCX (1:1)	Optimix C18/SAX (1:1)	Optimix C18/Nitrophenyl (1:1)
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, 4/pk	3	OP930102-SC		
DCG	2.1×10, 4/pk	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, 4/pk	5	OP950105-SC	OP950105-SA	OP950105-NP
DCG	4.6×10, 4/pk	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 100 Å,	ultra pure, high porosity; bonded 300 Å,	ultra pure, high porosity; bonded with amide 100 Å,	ultra pure, high porosity; bonded with amide 300 Å,
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: 5 μm; Pore Size: 1000 Å

Type	Dimension (mm)	Venusil CA	Venusil CO	Venusil CJ
Analytical	4.6×150	VCA951505-0	VCO951505-0	VCJ951505-0
Analytical	4.6×250	VCA952505-0	VCO952505-0	VCJ952505-0
G	4.6×10, 4/pk	VCA950105-0	VCO950105-0	VCJ950105-0
DCG	4.6×10, 4/pk	VCA950105-0S	VCO950105-0S	VCJ950105-0S
Preparative	21.2×250	VCA952520-0	VCO952520-0	VCJ952520-0
G	10×10	VCA950110-0S	VCO950110-0S	VCJ950110-0S
G	21.2×10	VCA950120-0	VCO950120-0	VCJ950120-0

G: Guard Cartridge
DCG: Direct-connection Guard Cartridge

Particle size: 5 µm; Pore Size: 300 Å

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	AM952520-1
G	10×10	AM950110-1S
G	21.2×10	AM950120-1

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-150

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

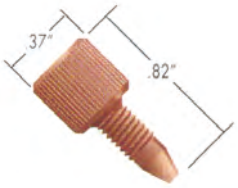
Direct-connection Guard Cartridge Holder

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

HPLC ACCESSORIES AND SUPPLIES

HPLC Fitting and Tubing

Cat.No.	Material	Tubing Size/Nut Threads
AF-120	PEEK	1/16", 10-32
PM1960	PEEK	1/16"OD, 0.010 " (0.25mm) ID, 1 m
PM1945R	PEEK	1/16"OD, 0.005" (125um) ID, 1 m
BX-0400	Stainless Steel	1/16"OD, 0.04" ID, 20 cm
BX-0300	Stainless Steel	1/16"OD, 0.03" ID, 20 cm
BX-0200	Stainless Steel	1/16"OD, 0.02" ID, 20 cm
BX-0100	Stainless Steel	1/16"OD, 0.01" ID, 20 cm
BX-0070	Stainless Steel	1/16"OD, 0.007" ID, 20 cm
FF-1600	Teflon pipe	ID 1.6 mm
FF2400	Teflon pipe	ID 2.4 mm



Cat.No.: AF-120

Automatic Column Selector

- Connect up to 6 HPLC columns
- Controllable by both panel keys and computer
- Easy key operation for setting method and sequence
- Compact design and easy access to columns
- Compatible with any HPLC


Cat.No.: LC-08

HPLC Column Heater

Technical specification

Cat.No.	CC-100
Dimensions (H×W×D)	510 mm×110 mm×65 mm
Operating Temperature	Above 5 ℃ ~ 60 ℃
Temperature Accuracy	±0.1℃
Compatible Column Quantity and Length	2×300 mm
Power	220 V/50 Hz/1 A
Weight	4 Kg


Cat.No.: CC-100

UV Lamps

Bonna-Agela Technologies offers UV lamps of the same or better quality as a low cost replacement for many of those manufactured by original HPLC manufacturers, such as Shimadzu.

Shimadzu

Original Instrument Part Number	Bonna-Agela Lamps Part Number
SPD-10A, 2000 h	SHL001
LC2010, 2000 h	SHL002
SPD-20A, 2000 h	SHL003
UV AA	SUV001

Pipettes and Accessories

Mechanical Pipette (Fixed Volume)

Cat No.	Volume (µL)
A722001	5
A722004	10
A722010	20
A722015	25
A722020	50
A722025	100

Cat No.	Volume (µL)
A722030	200
A722035	250
A722040	500
A722045	1000
A722050	2000
A722055	5000

Mechanical Pipette (Adjustable Volume)

Single Channel Pipette

Cat No.	Volume (µL)	Increment (µL)
A720005	0.1-2.5	0.05
A720000	0.5-10	0.1
A720020	5-50	0.5
A720080	2-20	0.5
A720050	10-100	1

Cat No.	Volume (µL)	Increment (µL)
A720070	20-200	1
A720030	50-200	1
A720060	100-1000	5
A720040	200-1000	5
A720110	1000-5000	50

8-Channel Pipette

Cat No.	Volume (µL)	Increment (µL)
A720210	0.5-10	0.1
A720220	5-50	0.5
A720240	50-300	5

12-Channel Pipette

Cat No.	Volume (µL)	Increment (µL)
A720310	0.5-10	0.1
A720320	5-50	0.5
A720340	50-300	5

Pipette Tips

Cat No.	Qty
AD781348	FT10µL
AD781349	FT10µL
AD780006	FT300µL
AD780007	FT300µL

Cat No.	Qty
AD780019	FT1000µL
AD780020	FT1000µL
AD780046	FT1200µL

HPLC COLUMN SELECTION GUIDE

Column Selection Parameters

Stationary Phases

- Reversed 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 reversed phase; polysaccharides(amino), ion-exchange chromatography, some preparative needs.
- Bi-mode [Cyano, Venusil HILIC]: can be used in both reversed and normal phase modes, alternative selectivity to hydrocarbon-based reversed phases, inert and better reproducibility than silica columns.

Particle Size

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

Particle Size

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

Column Length

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

Column Diameter

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

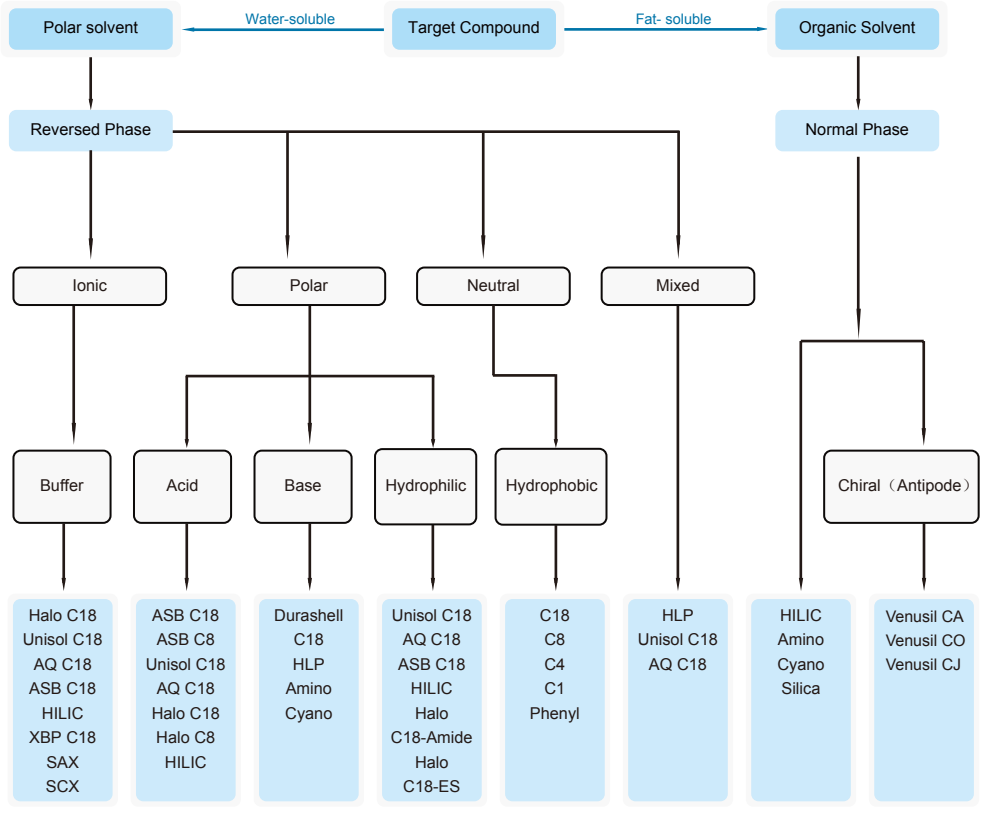
Sample

- Analyte mass/concentration: high mass load, larger diameter column (>10 mm 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 μm, 5 μm; 4.6x100 mm, 4.6x150 mm, 4.6x250 mm
- High throughput analysis: 3 μm, 5 μm; 2.1x30 mm, 2.1x50 mm, 4.6x50 mm.
- LC-MS application: 3 μm, 5 μm; 1.0x30 mm, 1.0x50 mm, 2.1x30 mm, 2.1x50 mm, 2.1x100 mm.
- Micro HPLC: 3 μm, 5 μm; 0.5x30 mm, 0.5x50 mm, 0.5x100 mm.
- Preparative HPLC: 5 μm, 10 μm; 21.2x50 mm, 21.2x150 mm, 21.2x250 mm, 30x150 mm, 30x250 mm, 50x250 mm.

Bonna-Agela HPLC Column Selection Guide



Comparison of Technical Properties for C18 Phases

Stationary Phase	Particle (µm)	Pore (Å)	Surface (m^2/g)	Carbon load(%)	End Capping	High purity Silica
Unisol C18	5	100	380	17	double	yes
Venusil XBP C18	5	100	380	22	double	yes
Venusil AQ C18	5	100	380	18	yes	yes
Venusil XBP C18(2)	5	100	380	19	yes	yes
Venusil XBP C18(L)	5	150	200	14	double	yes
Venusil ASB C18	5	150	200	10	no	yes
Promosil C18	5	100	320	18	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 5 C18(2)	5	100	400	17.5	yes	yes

Cross-reference for Bonna-Agela HPLC Columns

	Unisol C18	HLP	HILIC	Halo C18	Durashell C18	Venusil ASB C18	Venusil XBP C18(2)	Venusil XBP C18	Venusil XBP(L) C18	Venusil XBP NH_2	Venusil XBP CN	Venusil XBP Silica	Promosil C18	Promosil Silica	Promosil NH_2	Promosil CN	Venusil PAH	Venusil XBP C18 300Å	Venusil SCX	Venusil SAX
Waters																				
ACQUITY C18				■																
Symmetry C18									■											
Sunfire C18	■						■													
Atlantis-(d)C18	■																			
Atlantis T3		■																		
Atlantis-HILIC			■																	
Xterra				■	■															
Spherisorb ODS-2									■				■							
Spherisorb CN											■					■				
Spherisorb Si												■		■						
Resolve C18						■														
Phenomenex																				
Luna-C18（2）	■						■													
Luna C18								■												
Luna NH_2										■										
Luna CN											■									
Luna silica												■								
Luna SCX																			■	
Luna HILIC												■								
Germini					■															
Jupiter 300-C18																		■		
Agilent																				
SB-C18						■														
Bonus-RP		■																		
XDB-C18	■								■											
SB-Aq																				
Extend					■															
300SB-C18																				
Rx-SIL												■								
SAX																				■
Supelco																				
Discovery-C18									■											
Asentics-C18								■												
GL Science																				
Insertsil ODS-3	■																			
Varian																				
Pursuit C18									■											
Pursuit XRs C18	■						■	■												
Omnispher-C18																				
Microsorb C18													■							
Microsorb BDS													■							
ChromSpher C18													■							
ChromSpher Poly C18																	■			
ChromSpher Si														■						
ChromSpherPAH																	■			
YMC																				
YMC ODS-AQ	■																			
Grace																				
Alltima C18									■											
Alltima C18 Hiload	■							■												
Alltima C18 AQ	■																			
Prevail C18																				
Prevail OA(organic acid)	■					■														
Alltima C18													■							
LiChrospher RP C18 Endcapped													■							
LiChrospher RP C18						■														

■ : Equivalent ■ : Replacement

USP Column Selection Guide

L01 Octadecyl silane (ODS or C18) chemically bonded to porous silica or ceramic particles,1.5~10 μm 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, 30~50 μm in diameter.

Brand	Particle(μm)	Figure
C18 bulk media	50	Irregular

L03 Porous silica particles, 1.5~10 μm 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, 30~50 μm in diameter.

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

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

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

L07 Octyl silane (C8) chemically bonded to porous silica particles,1.5~10 μm 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 (NH_2) chemically bonded to totally porous silica gel support, 3~10 μm in diameter.

Brand	Particle(μm)	Figure
Venusil XBP NH_2	3, 5	sphere
Promosil NH_2	5	sphere

L09 3~10 μm 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, 3~10 μm in diameter.

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

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

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

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

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

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

L14 Silica gel, 5~10 μm 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, 3~10 μm in diameter.

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

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

L18 Amino (NH_2) and Cyano (CN) groups chemically bonded to porous silica particles, 3~10 μm in diameter.

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

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

Brand	Particle(μm)	Figure
Venusil Diol	5	sphere

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

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

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

L24 A semi-rigid hydrophilic gel consisting of viny l polymers with numerous hydroxyl groups on the matrix surface, 32~63 μm 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, 5~10 μm in diameter.

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

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

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

L28 A multifunctional support which consists of a high purity, 100 Å, spherical silica ssubstrate 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, 5 μm in diameter with a pore diameter of 80 Å.

L30 Ethyl silane chemically bonded to a totally porous silica particle, 5~10 μm 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 2000 Å and consisting of ethylvinylbenzene cross- linked with 55 % divinyl benzene.

L32 A chiral-ligand exchange packing-L proline/copper complex covalently bonded to an irregularly shaped silica particles, 5~10 μm 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 stabitlity.

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

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

L36 3,5-dinitrobenzoyl derivative of L-phenylglycine covalently bonded to a 5 μm 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, 5~20 µm in diameter.

Brand	Particle(µm)	Figure
Venusil CO	5	sphere

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

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

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

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

Brand	Particle(µm)	Figure
Venusil PFP	5	sphere

L44 A multifunctional support, which consists of a high purity, 60 Å, spherical silica substrate that has been bonded with a cationic exchanger, sulfonic acid functionality in addition to a reversed- phase C8 functionality.

L45 Beta cyclodextrin bonded to porous silica particles, 5~10 µm in diameter.

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

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

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

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

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 350 m^2/g, substrate is coated with quaternary ammonium functionalized latex particles consisting of styrene cross-linked with divinylbenzene.

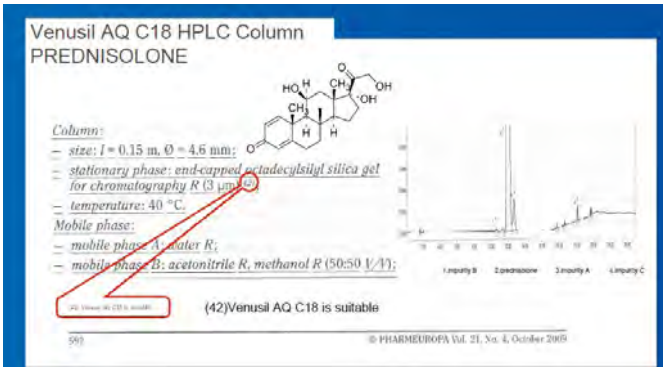
L51 Amylose tris-3,5-dimethylphenyl carbamate-coated, porous, spherical, silica particles, 5 to 10 µm in diameter.

Brand	Particle(µm)	Figure
Venusil CA	5	Irregular

APPLICATIONS

1.European and American Pharmacopeia

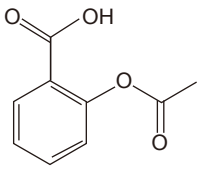
1.1 Venusil AQ C18 HPLC Column Recommended in European Pharmacopoeia



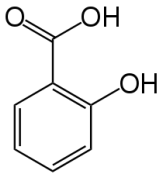
1.2 Acetylsalicylic acid and its related compounds

European Pharmacopoeia 7.0, 2523-2524
Requirements: Resolution factor (R) between target and its impurity is > 6.

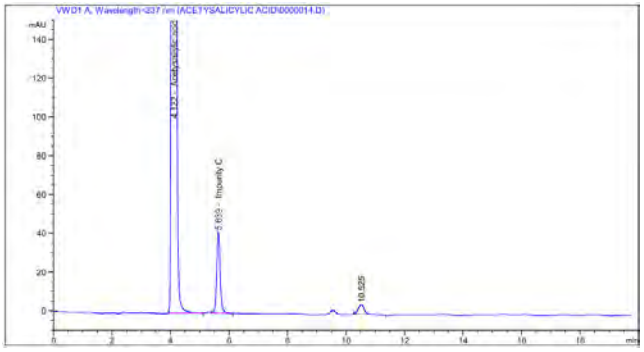
Acetylsalicylic acid



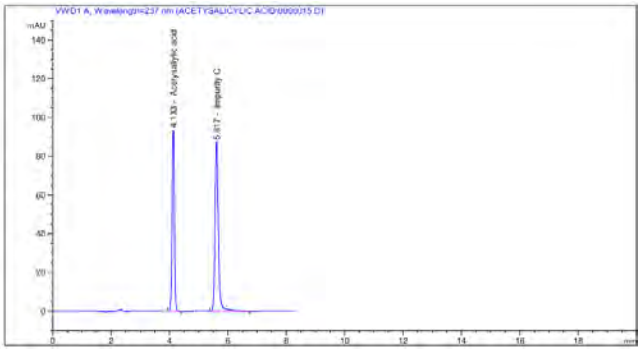
Impurity Salicylic acid



Column: Innoval C18, 4.6 x 250 mm, 5 µm
Mobile phase: phosphate - acetonitrile - water (2:400:600).
Detection wavelength: 237 nm,
column temperature: 35 ℃ ,
Flow rate: 1mL/min, injection volume 10 µL.



Sample profile of acetylsalicylic acid

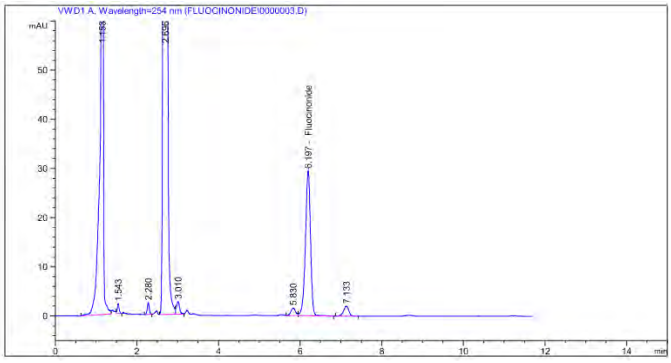


Chromatogram of system suitability test

1.3 Assay test of Fluocinonide Cream

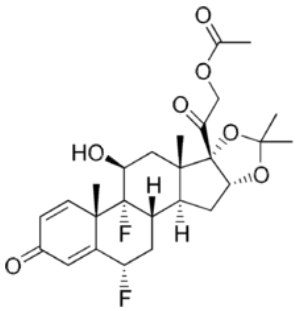
USP34-NF 29, 2862

Requirements: Plate counts should be no less than 4500 for fluocinonide



Sample profile of fluocinonide cream

Fluocinonide



Column: Venusil ASB C18, 4.6 x 250 mm, 5 μm

Mobile phase: water: acetonitrile (50:50),

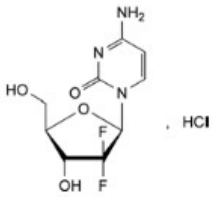
Detection wavelength: 254 nm, column temperature: 35 ℃ , flow rate: 2 mL/min,

Injection volume: 20 μL.

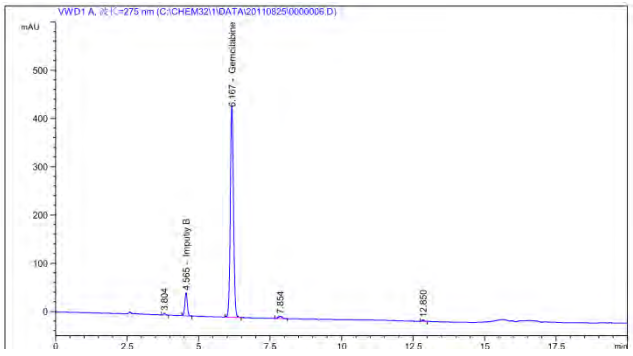
1.4 The gemcitabine hydrochloride and its related compounds

European Pharmacopoeia 7.0, 2088-2089

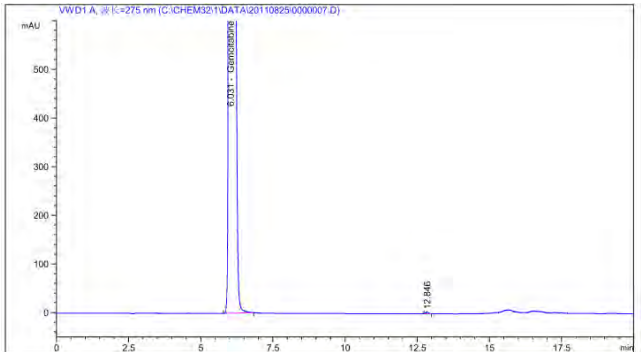
Requirements: Resolution factor (R) should be > 8 for the compound and its impurity



gemcitabine hydrochloride



Chromatogram of system suitability test



Sample profile of gemcitabine hydrochloride

Column: Venusil ASB C8, 4.6 x 250 mm

Detector: UV= 275 nm,

Column temperature: 30 ℃ ,

Flow rate: 1.2 mL/min,

Injection volume: 20 μL

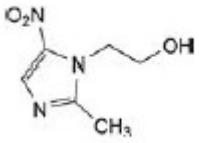
Mobile Phase A: 0.1mol/L NaH_2PO_4 (adjust pH to 2.5 with H_3PO_4)

Mobile Phase B: methanol

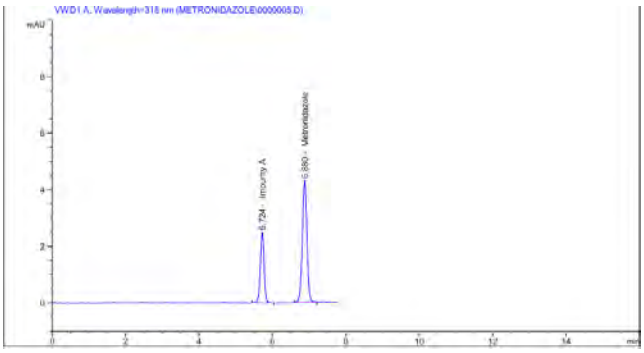
Time (min)	Mobile Phase A (%)	Mobile Phase B (%)
0-8	97	3
8-13	97 → 50	3 → 50
13-20	50	50

1.5 The metronidazole and its related compounds

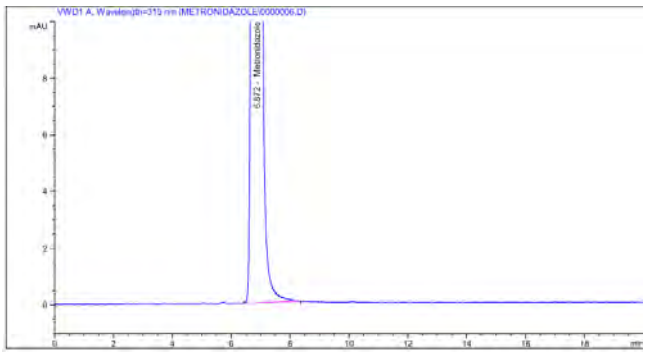
European Pharmacopoeia 7.0, 2500
Requirements: Resolution factor (R) for metronidazole and its impurity should be > 2.0.



metronidazole hydrochloride



Chromatogram of system suitability test

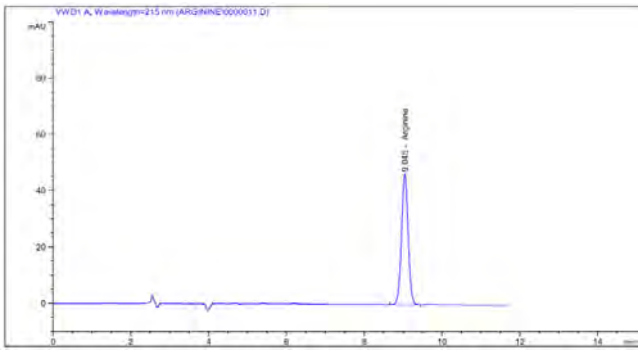


Sample profile of metronidazole hydrochloride

Column: Venusil AQ C18, 4.6 x 250 mm, 5 μm
Mobile phase: 0.01mol/L of KH_2PO_4 solution: methanol (70:30)
Detection wavelength: 315 nm,
column temperature: 30 ℃ ,
Flow rate: 1ml/min, injection volume 10 μL

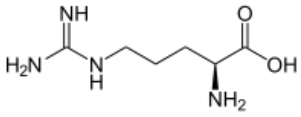
1.6 Arginine

USP34-NF 29, 1079
Requirements: Plate counts for Arginine should be > 1500.



Profile of system suitability test

Arginine

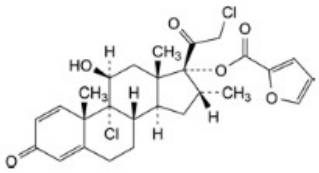


Column: Promosil C8, 4.6 x 250 mm
Mobile phase: acetonitrile -0.5 mg/ml octane sodium phosphate buffer (5:95)
Phosphate buffer prepare: 6.9 mg/mL NaH_2PO_4 (pH =3.5)
Detection wavelength: 215 nm, column temperature: 35 ℃ ,
Flow rate: 0.8ml/min, Injection volume: 10 μl

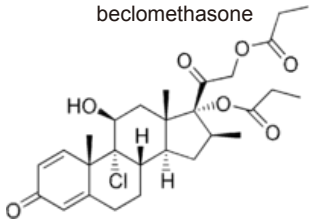
1.7 Mometasone furoate and its related compounds

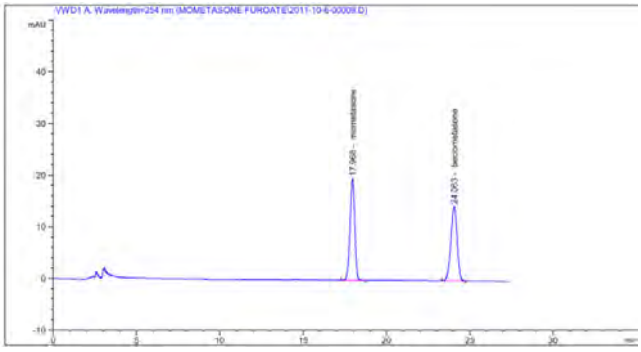
European Pharmacopoeia 7.0, 2523-2524
Requirements: Resolution factor (R) for mometasone and beclomethasone should be > 6.

mometasone furoate

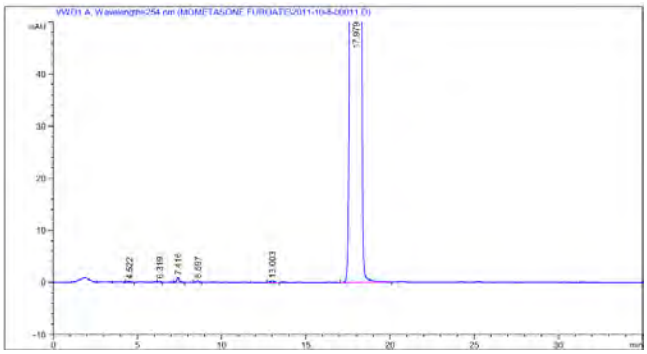


beclomethasone





Profile of system suitability test

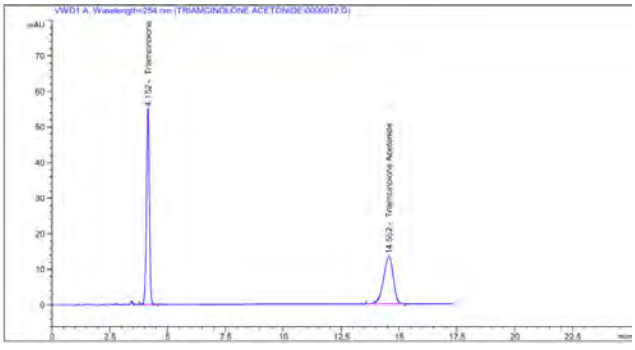


Sample profile

Column: Venusil XBP (L) C18, 4.6 x 250 mm, 5 µm
Detection wavelength: 254 nm,
column temperature: 35 ℃ ,
Flow rate: 1 mL/min,
Injection volume: 20 µL

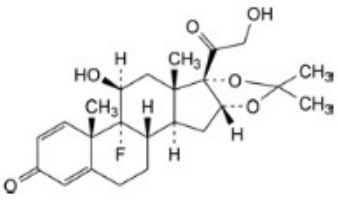
1.8 Triamcinolone acetonide and its related compounds

European Pharmacopoeia 7.0, 3128-3129
Requirements: Resolution factor (R) between triamcinolone acetonide and triamcinolone is > 15; Retention of triamcinolone acetonide is around 17 minutes; and for triamcinolone, retention time is ~ 5 minutes.

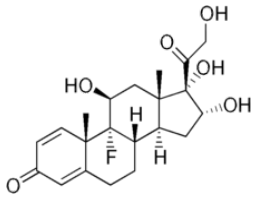


Chromatogram of system suitability test

Triamcinolone acetonide



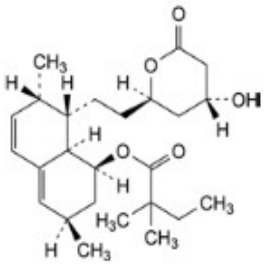
Triamcinolone



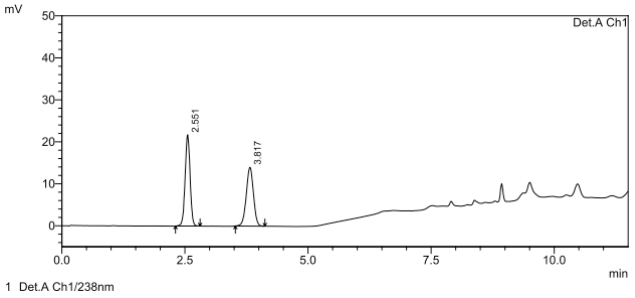
Column: Innoval C18, 4.6 x 250 mm, 5 µm
Mobile phase: methanol: water (525:475)
Detection wavelength: 254 nm, column temperature: 35 ℃ ,
Flow rate: 1.5 mL/ min, Injection volume: 20 µL

1. 9 Simvastatin and its related compounds

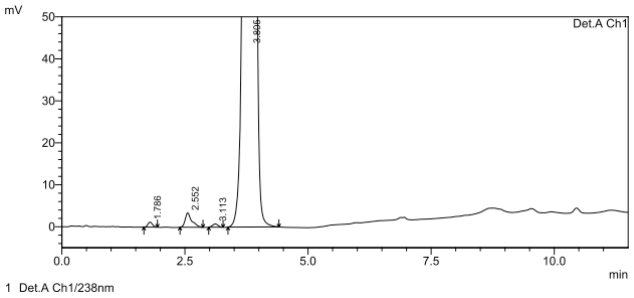
European Pharmacopoeia 7.0, 2906-2907
Requirements: Resolution factor (R) for simvastatin and its impurity should be > 4.



Simvastatin



Profile of system suitability test for simvastatin



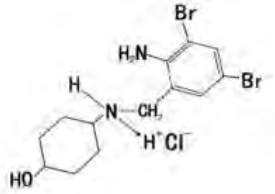
Chromatographic profile of simvastatin sample

Column: Venusil AQ C18, 4.6 x 33 mm, 3 μm
Mobile phase A: 0.1% phosphoric acid: acetonitrile (50:50)
Mobile phase B: 0.1% phosphoric acid in acetonitrile
Detection wavelength: 238nm,
column temperature: 30 ℃ , Flow Rate: 3.0ml/min, Sample Loading: 5μL

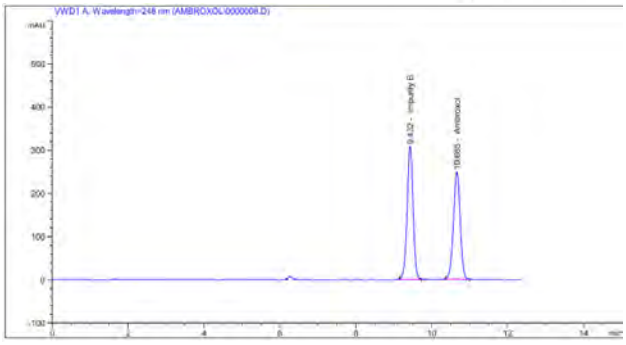
Time（min）	Mobile phase A (%)	Mobile phase B (%)
0-4.5	100	0
4.5-4.6	100 → 95	0 → 5
4.6-8.0	95 → 25	5 → 75
8.0-11.5	25	75

1.10 Ambroxol Hydrochloride

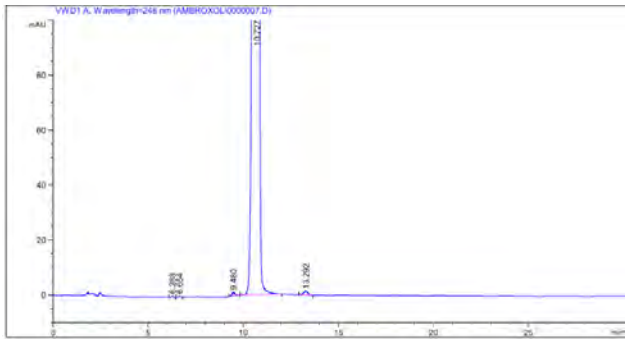
European Pharmacopoeia 7.0, 1365-1366
Requirements: Resolution factor (R) for ambroxol hydrochloride and its impurity should be > 4.



Ambroxol Hydrochloride



Chromatogram of system suitability test

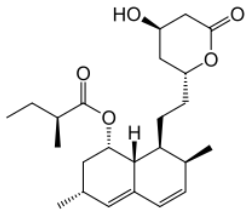


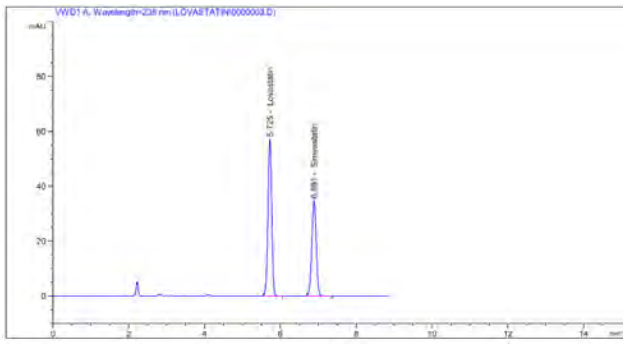
Chromatographic profile of ambroxol hydrochloride sample

Column: Venusil XBP C18, 4.6 x 250mm, 5μm
Mobile phase: phosphate buffer (Add1.32 g NH_4PO_4 in 900mL water, adjust the pH to 7.0, bring the volume to 1000mL) : acetonitrile (50:50).
Detector: UV 248 nm
Column Temperature: 30℃
Flow Rate: 1 mL/min
Sample Loading: 20μl

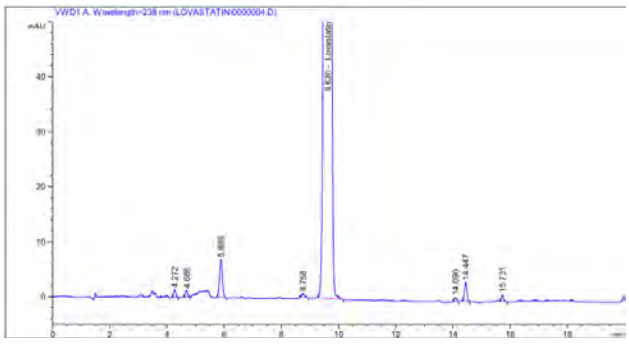
1.11 Lovastatin

European Pharmacopoeia 7.0, 2384-2385
Requirements: Resolution factor (R) for lovastatin and simvastatin should be > 5.





System suitability test



Profile of lovastatin and simvastatin sample

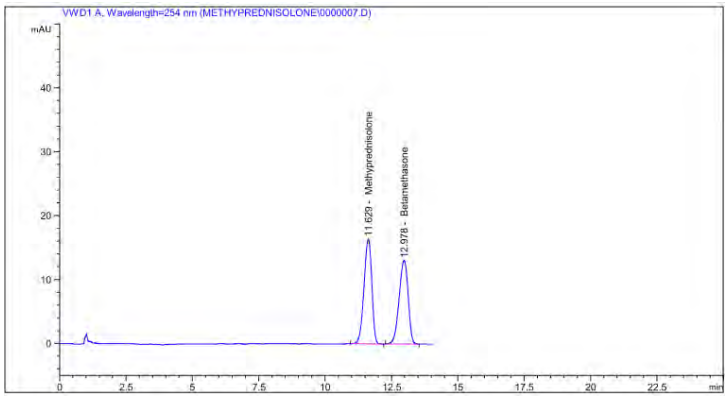
Column: Venusil ASB C8, 4.6 x 250 mm
Mobile Phase A: 0.1% H_3PO_4 aq.,B: Acetonitrile

Time (min)	Mobile Phase A (%)	Mobile Phase B (%)
0-7	40	60
7-9	40 → 35	60 → 65
9-15	35 → 10	65 → 90
15-20	10	90

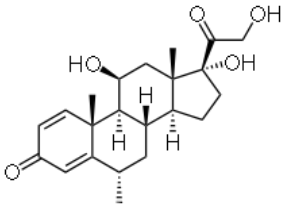
Detector: UV 238 nm
Column Temperature: 35 ℃
Flow Rate: 1.5 mL/min
Sample Loading: 10 μl

1.12 Methylprednisolone

European Pharmacopoeia 7.0, 2481-2482
Requirements: Resolution factor (R) between methylprednisolone and betamethasonum is > 1.5; Retention of methylprednisolone isaround 11.5 minutes; and for betamethasonum, retention time is ~ 12.5 minutes.



Profile of system suitability test



Column: Innoval C18 x 250 mm, 5 μm
Mobile Phase A: water- acetonitrile (75: 25), mobile phase B: acetonitrile

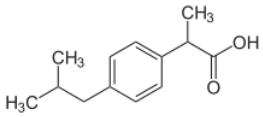
Time (min)	Mobile Phase A (%)	Mobile Phase B (%)
0-15	100	0
15-40	40 → 35	60 → 65

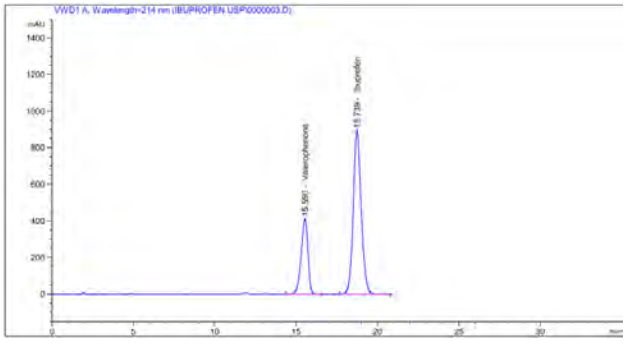
Detector: UV 254 nm
Column Temperature: 45 ℃
Flow Rate: 2.5 mL/min
Sample Loading: 20 μl

1.13 Ibuprofen

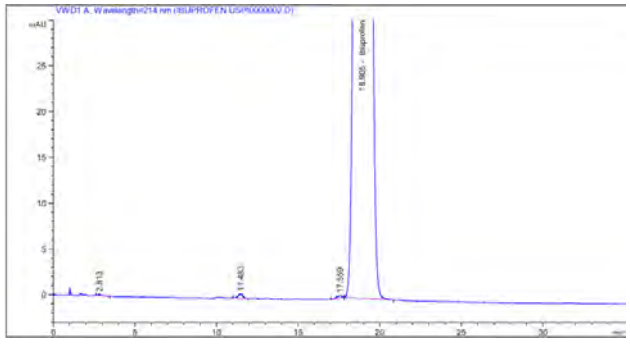
USP34-NF29, 3099
Requirements: Resolution factor (R) for ibuprofen and valerophenone should be > 2.

Ibuprofen





Chromatogram of system suitability test

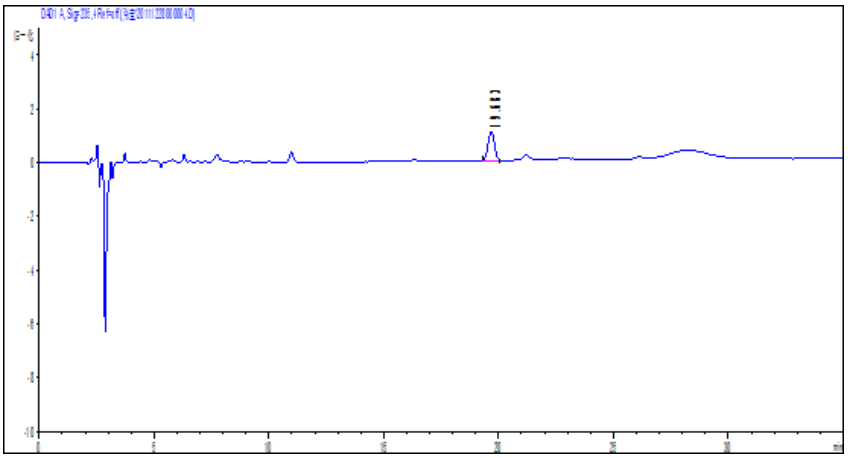


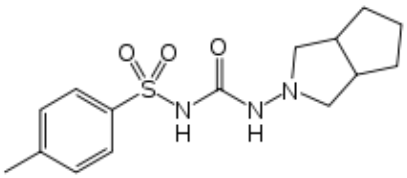
Chromatogram of ibuprofen sample

Column: Venusil ASB C18, 4.6 x 150 mm, 5 μm
Mobile Phase: Water (adjust pH to 2.5 with H_3PO_4)-Acetonitrile (1340:680 ≈ 66: 34)
Detector: UV 214 nm
Column Temperature: 35℃
Flow Rate: 2 mL/min
Sample Loading: 5 μl

1.14 Gliclazide

European Pharmacopoeia 7.0, 2096
Requirements: Retention of gliclazide is around 6 minutes

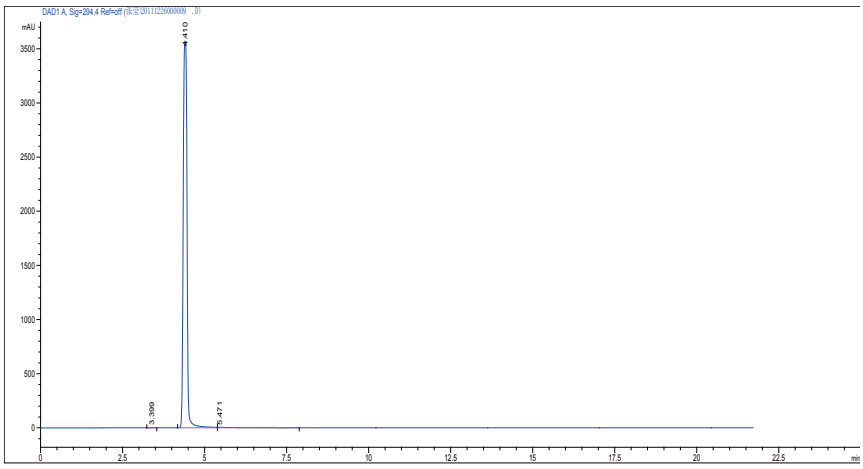


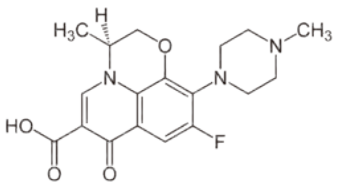


Profile of gliclazide sample

Column : Venusil XBP C8, 4.6 x 250 mm
Mobile phase: triethylamine: trifluoroacetic acid: acetonitrile: water = 1:0.1:45:55
Detector: UV 235 nm
Column Temperature: 35 ℃
Flow Rate: 0.9 mL/min
Sample Loading: 20 μl

1.15 Levofloxacin





Profile of levofloxacin sample

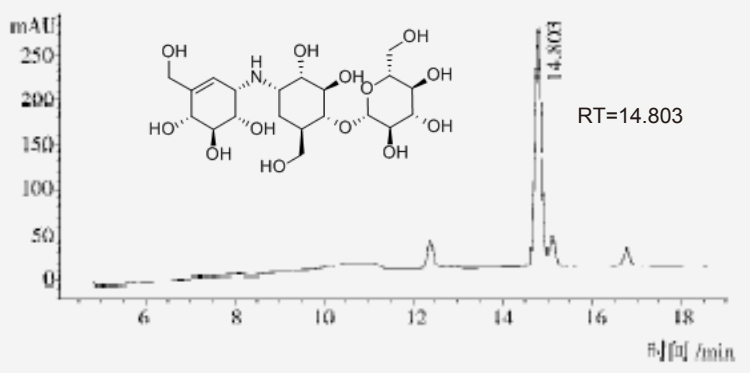
Column : Venusil XBP C18 L, 4.6×250 mm
Buffer salts: NH4COOH 4g and $NaClO_4$ 7g dissolved in 1 L water, add 2 mL triethylamin, adjust pH to 6.6 with H_3PO_4
Solvent: Acetonitrile: buffer salts = 20:80
Mobile Phase A: Acetonitrile: buffer salts = 2:98
Mobile Phase B: Acetonitrile : water = 90:10

Time (min)	Mobile Phase A (%)	Mobile Phase B (%)
0	90	10
2	90	10
15	85	15
35	70	30
40	60	40
45	50	50
46	90	10
55	90	10

Detector: UV 294 nm
Column Temperature: 30 ℃
Flow Rate: 1.0 mL/min
Sample Loading: 10 µl

2. HILIC Applications

2.1 Validamycin A

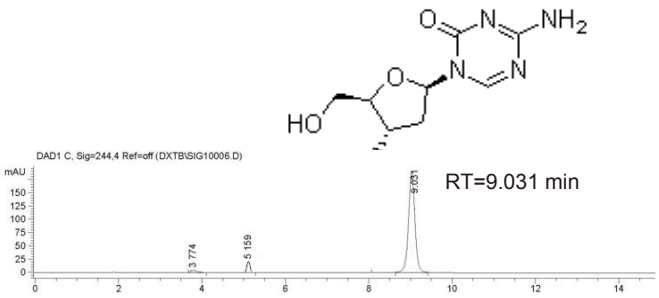


Column: Unisol Amide,
4.6 × 250 mm, 5 μm, 100 Å
Mobile Phase A: Water,
B: Acetonitrile
Flow Rate: 1.0 mL/min

Time (min)	B%
0	40
30	85

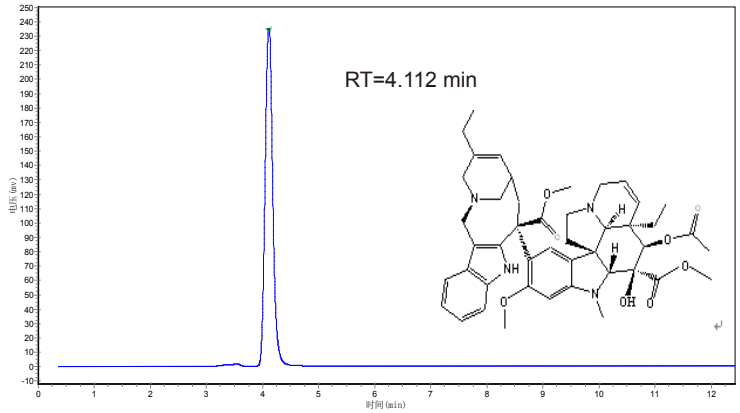
Detection: UV, 210nm
Temperature: 30 ℃
Sample Loading: 10 mL

2.2 Decitabine



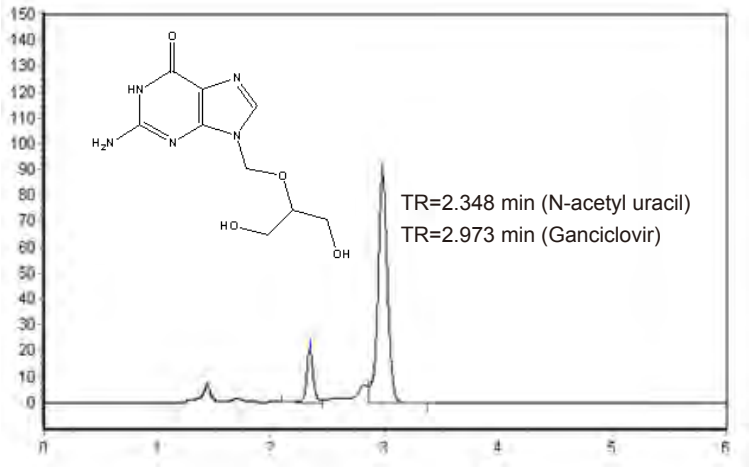
Column: Unisol Amide
4.6 × 150 mm, 5 μm, 100 Å
Mobile Phase:
Acetonitrile: Water=96:4
Flow Rate: 1.0 mL/min
Detector: UV, 244 nm
Temperature:30℃
Sample Loading:10 μL

2.3 Vinorelbine



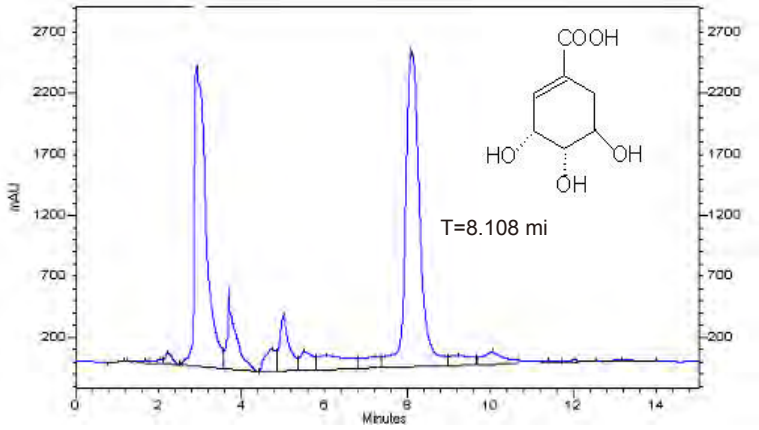
Column: Unisol Amide
4.6×250 mm, 5 μm, 100 Å
Mobile Phase:
5mmoL Ammonium acetate (pH = 7.4):
methanol =20:80
Flow Rate: 1.0 mL/min
Detector: UV, 267 nm
Column Temperature: 30℃
Sample Loading: 10 μL

2.4 Ganciclovir



Column: Unisol Amide
4.6×150 mm, 5 μm, 100 Å
Mobile Phase: 10 mmol NaH_2PO_4 (pH7.0)
: Acetonitrile=35:65
Flow Rate:1.0 mL/min
Detector: UV, 254 nm
Column Temperature: 23℃
Sample Loading: 10 μL

2.5 Shikimic Acid

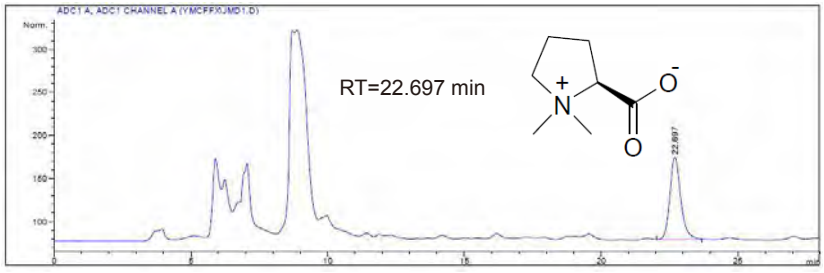


Columns: Unisol Amide
4.6×250 mm, 5 μm, 100 Å
Mobile Phase A: 1% Formic acid,
B: acetonitrile
Flow Rate: 1.0 mL/min
Detector: UV, 210 nm
Column Temperature: 20℃
Sample Loading: 10 μL

Time (min)	B%
0	60
20	90

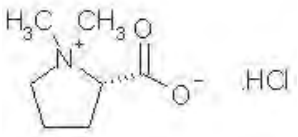
2.6 Stachydrine hydrochloride (in Motherwort)

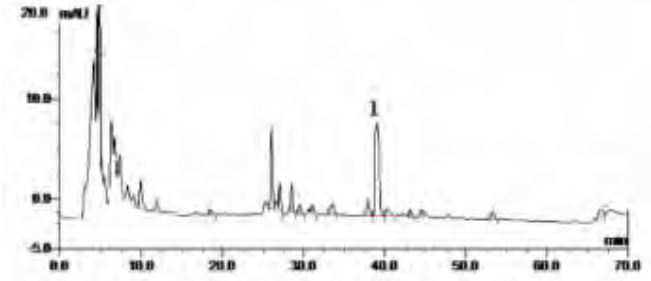
The method has adopted in Chinese Pharmacopoeia



Columns: Unisol Amide
4.6×250 mm, 5 μm, 100 Å
Mobile Phase:
Acetonitrile: 0.2% acetic acid solution (80:20)
Flow Rate: 0.5 mL/min
Detector: ELSD
Column Temperature: 20℃
Sample Loading: 20 μL

2.7 Stachydrine hydrochloride

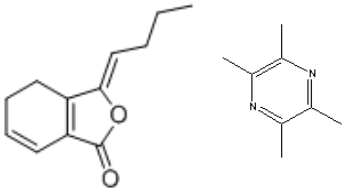


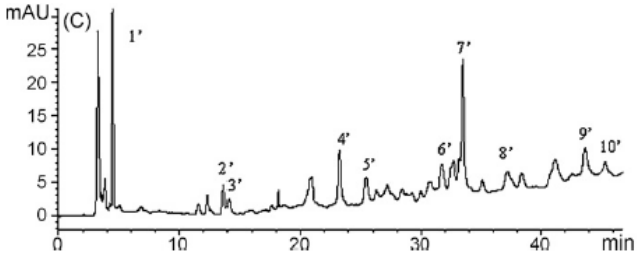


Columns: Unisol Amide
4.6×250 mm, 5 μm, 100 Å
Mobile phase: methanol: acetic acid = 0.2 % (82:18)
Flow Rate:1.0 mL/min
Detector: ELSD
Column Temperature: 30℃ TR=38.759
Sample Loading: 5 μL

KUANG yan, LI Zhi-hao, ZHENG fang, Determination of Stachydrine Hydrochloride in Chanhou Zhuyu Tablets by HPLC-ELSD, GUIDING JOURNAL OF TRADITIONAL CHINESE MEDICINE AND PHARMACOLOGY. 2010, 16(12), 89~91.

2.8 Ligusticum wallichii

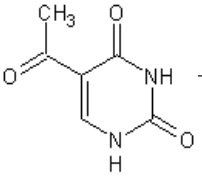


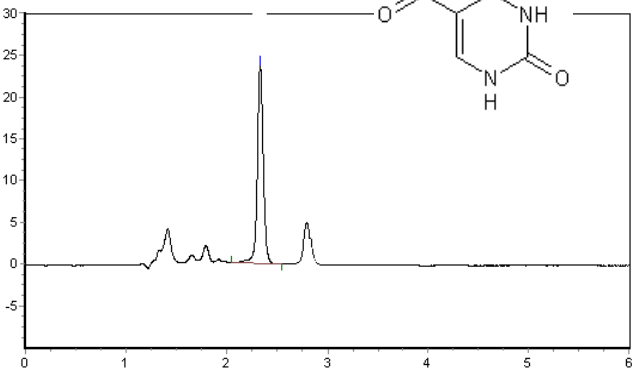


Column: Unisol Amide
4.6×250 mm, 5 μm, 100 Å
Mobile Phase:
Methanol: 0.2% acetic acid = 82: 18）
Flow Rate: 1.0 mL/min
Detector: ELSD
Column Temperature: 30℃
Sample Loading: 5 μL

Yu Jin, Tu Liang, Qing Fu, Yuan-Sheng Xiao, Jia-Tao Feng, Yan-Xiong Ke, Xin-Miao Liang, Fingerprint analysis of ligusticum chuanxiong using hydrophilic interaction chromatography and reversed-phase liquid chromatography.Journal of Chromatography A,2008,1216(2009):2136~2141

2.9 Uracil

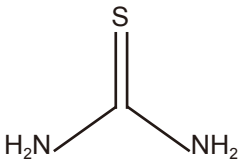


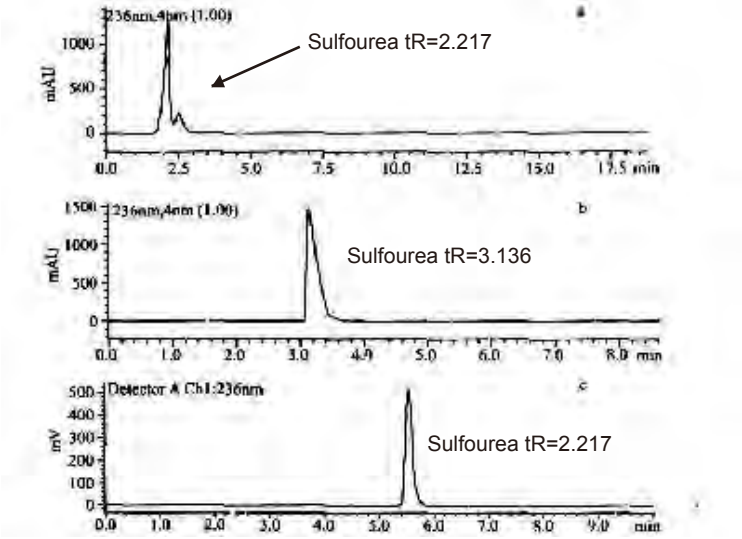


Column: Unisol Amide
4.6×150 mm, 5 μm, 100 Å
Mobile Phase:
10 mmol NaH_2PO_4 (pH7.0): ACN =35:65
Flow Rate: 1.0 mL/min
Detector: UV, 254 nm
Column Temperature: 23℃
Sample Loading: 10 μL

TR=2.340 (N- Acetyl uracil)
TR=2.811(uracil)

2.10 Sulfocarbamide

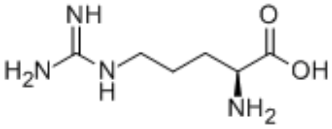


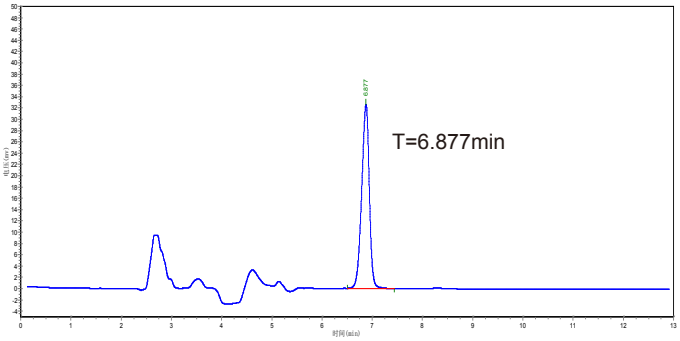


Column: Unisol Amide
4.6×250 mm, 5 μm, 100 Å
Mobile Phase: Acetonitrile: Water =97:3
Flow Rate: 1.0 mL/min
Detector: UV, 236 nm
Column Temperature: 23℃
Sample Loading: 10 μL

Fig.a
Column: Brand W C18
Mobile Phase : A /B= water: ACN =90 /10
Fig. b
Column: Brand W C18
Mobile Phase: 0.1% formic acid in water
Fig. c
Column: Unisol Amide
Mobile Phase: A/B = water : ACN = 3 /97

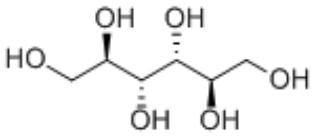
2.11 Arginine

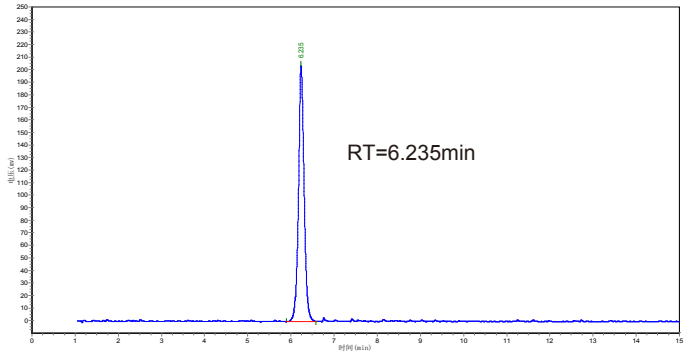




Column: Unisol Amide
4.6×250 mm, 5 μm, 100 Å
Mobile Phase:
0.05 mol KaH_2PO_4: ACN =40:60
Flow Rate: 1.0 mL/min
Detector: UV, 220 nm
Column Temperature: 30℃
Sample Loading: 10 μL

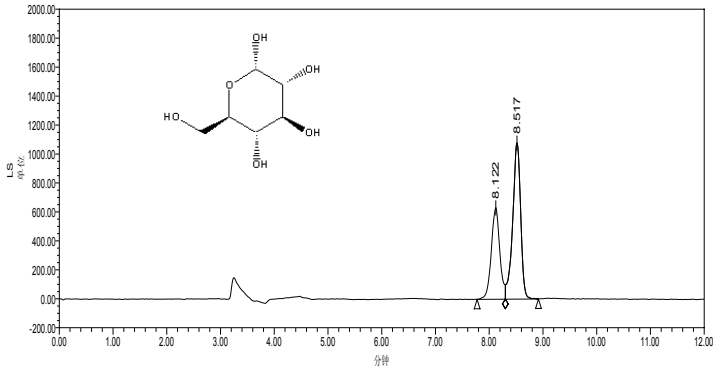
2.12 Mannitol





Column: Unisol Amide
4.6×250 mm, 5 μm, 100 Å
Mobile Phase: water
Flow Rate: 0.5 mL/min
Detector: ELSD
Column Temperature: 40℃
Sample Loading: 2 μL

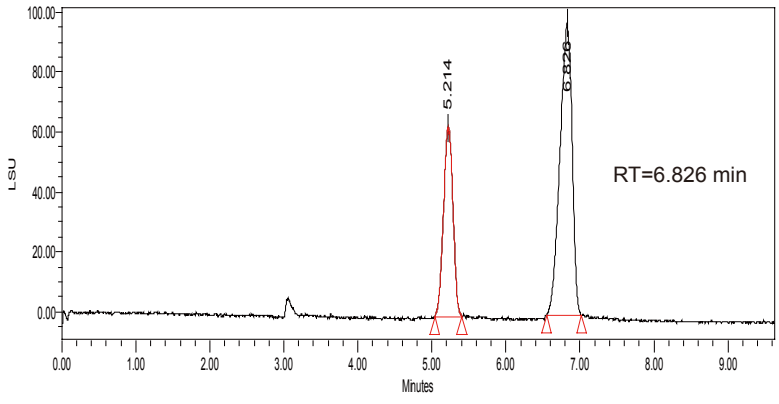
2.13 Glucose

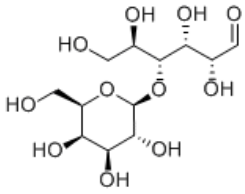


Column: Unisol Amide
4.6×250 mm, 5 μm, 100 Å
Mobile Phase:
ACN: water =80: 20
Flow Rate: 1.0 mL/min
Detector: ELSD
Column Temperature: 30℃
Sample Loading: 10 μL

RT=8.122 min (α-D Glucose)
RT=8.511 min (β-D- Glucose)

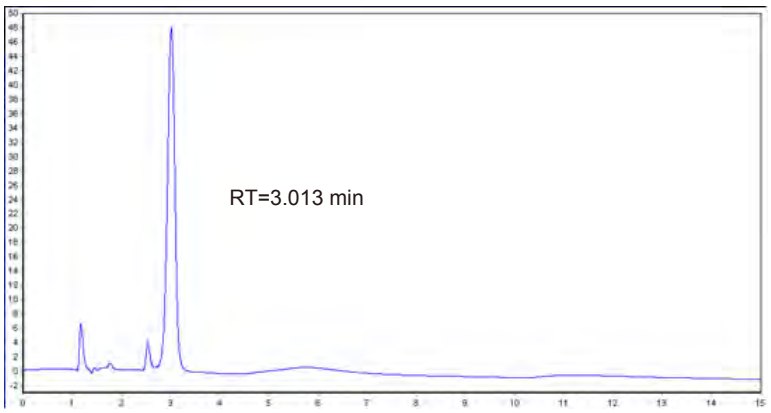
2.14 Lactose

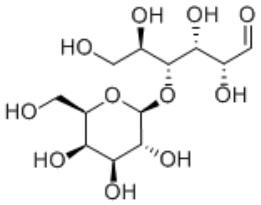




Column: Unisol Amide
4.6×250 mm, 5 μm, 100 Å
Mobile Phase:
ACN: water =75: 25
Flow Rate: 1.0 mL/min
Detector: ELSD
Column Temperature: 60℃
Sample Loading: 20 μL

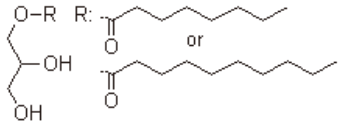
2.15 Acarbose

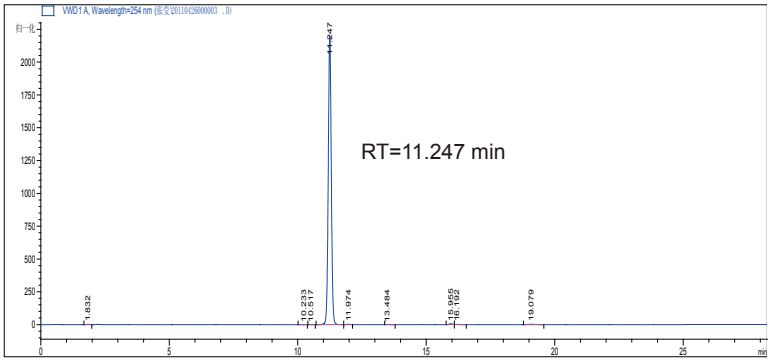




Column: Unisol Amide
4.6×150 mm, 5 μm, 100 Å
Mobile Phase:
ACN : KH_2PO_4(4.4 mmol/L)
-Na_2HPO_4 (2.0 mmol/L) = 70 : 30
Flow Rate: 1.5 mL/min
Detection: 210 nm
Column Temperature: 35℃
Sample Loading: 20 μL

2.16 Simple lipids

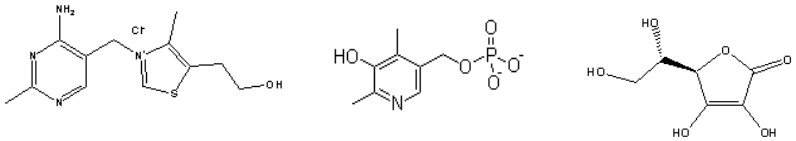


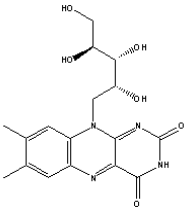


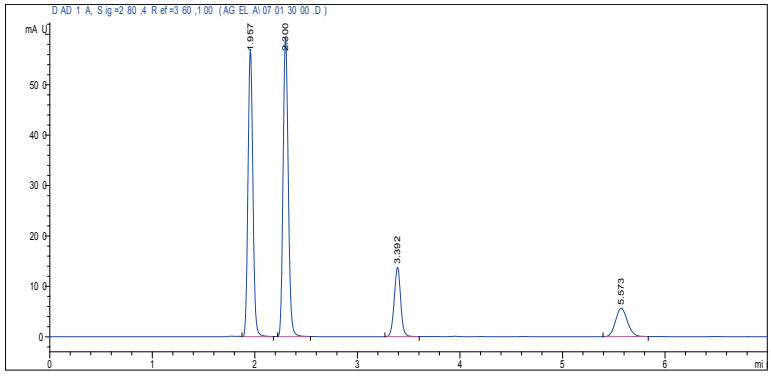
Column: Unisol Amide
4.6×150 mm, 5 μm, 100 Å
Mobile Phase
A: CAN, B: 10 mmol/L NH_4OAc
Flow Rate: 1.0 mL/min
Detector: UV, 254 nm
Column Temperature: 25℃
Sample Loading: 10 μL

Time (min)	B%
5	4
16	20
28	4

2.17 Water-soluble vitamins



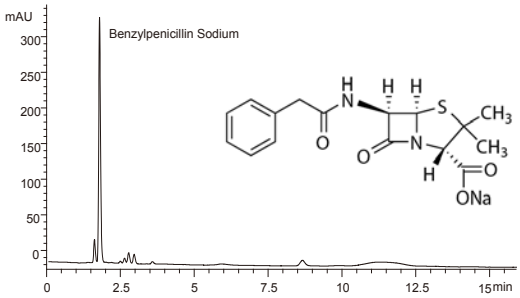




Column: Unisol Amide,
4.6×150 mm, 5 μm, 100 Å
Moblie Phase:
0.1%TFA in water: 0.1%
TFA in ACN =90:10
Flow Rate: 1.0 mL/min
Detector: UV, 280 nm ,
Column Temperature: 30℃
Sample Loading: 10 μL
RT=3.392 (VC), RT=5.573 min (VB2)
RT=1.957 min (VB1) RT=2.300 min (VB6)

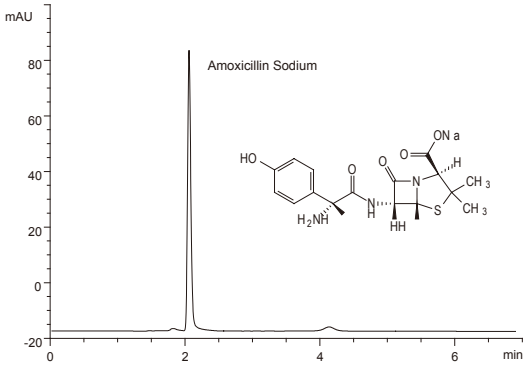
3. Antibiotics

3.1 Benzylpenicillin Sodium



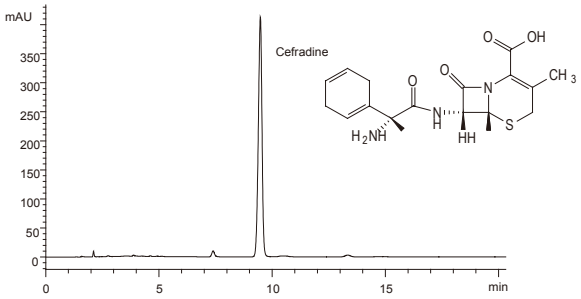
Column: Unisol C18, 4.6×150 mm, 5 μm
Part No.: UO951505-0
Mobile Phase: 0.1 mol/L potassium dihydrogen phosphate buffer (pH=2.5):ACN=70:30
Detector: UV 225 nm
Flow Rate: 1 mL/min
Injection: 4 μL

3.2 Amoxicillin Sodium



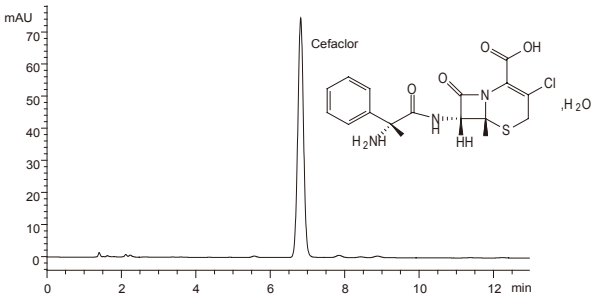
Column: Unisol C18, 4.6×150 mm, 5 μm
Part No.: UO951505-0
Mobile Phase: Phosphate buffer (0.05 mol/L, pH=5.0):ACN=97.5:2.5
Detector: UV 254 nm
Flow Rate: 1 mL/min
Injection: 5 μL

3.3 Cefradine



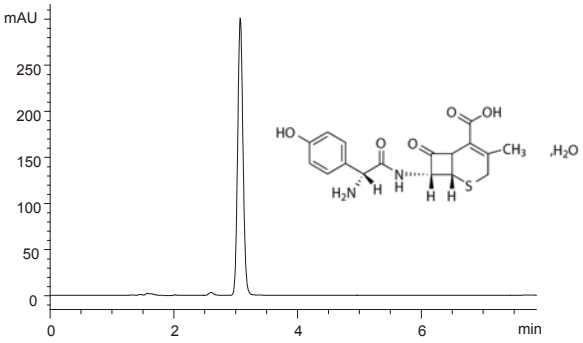
Column: Unisol C18, 4.6×150 mm, 5 μm
Part No.: UO951505-0
Mobile Phase: Water:MeOH:3.86% sodiumacetate solution /4%acetic acid solution=742:240:15:3
Detector: UV 254 nm
Flow Rate: 1 mL/min
Injection: 2 μL

3.4 Cefaclor



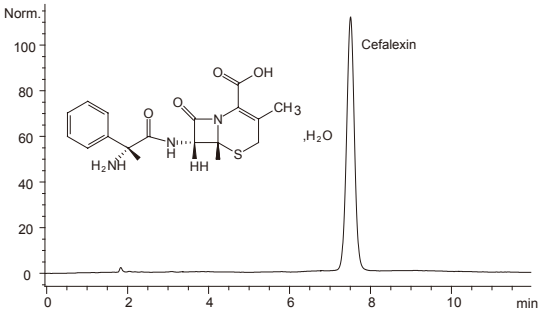
Column: Unisol C18, 4.6×150 mm, 5 μm
Part No.: UO951505-0
Mobile Phase: 0.05 mM phosphate
buffer (pH=3.4):ACN=92:8
Detector: UV 254 nm
Flow Rate: 1 mL/min
Injection: 5 μL

3.5 Cefadroxil



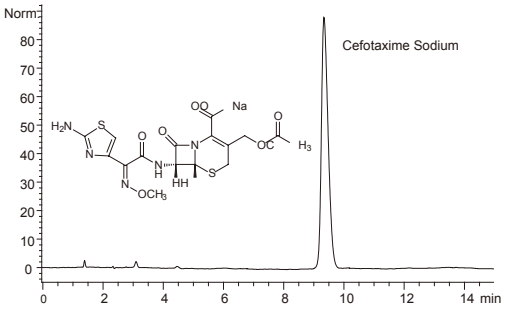
Column: Unisol C18, 4.6×150 mm, 5 μm
Part No.: UO951505-0
Mobile Phase: 0.05 mM phosphate
buffer (pH=5.5):ACN=96:4
Detector: UV 230 nm
Flow Rate: 1 mL/min
Injection: 2 μL

3.6 Cefalexin



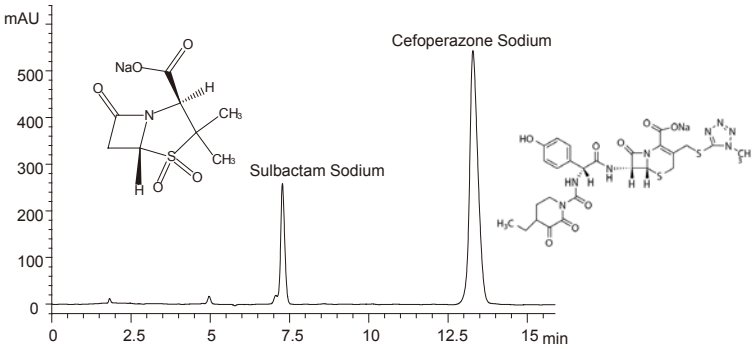
Column: Unisol C18, 4.6×150 mm, 5 μm
Part No.: UO951505-0
Mobile Phase: Water:MeOH: 3.86 %
sodium acetate solution/4 %
acetic acid solution=742:240:15:3
Detector: UV 254 nm
Flow Rate: 1 mL/min
Injection: 2 μL

3.7 Cefotaxime Sodium



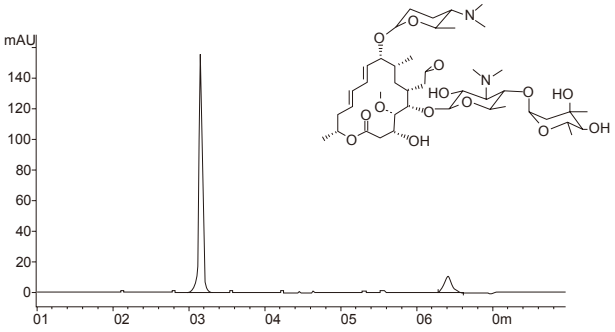
Column: Unisol C18, 4.6×150 mm, 5 μm
Part No.: UO951505-0
Mobile Phase: phosphate buffer
(0.4 mMKH_2PO_4+8 mM K_2HPO_4)/MeOH=89:11
Detector: UV 254 nm
Flow Rate: 1 mL/min
Injection: 2 μL

3.8 Sulbactam Sodium + Cefoperazone Sodium



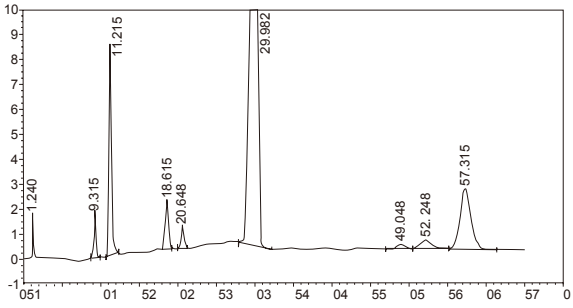
Column: Venusil XBP C18, 4.6×250 mm, 5 μm
Part No.: VX952505-0
Mobile Phase: 0.005 mol/L TABOH (adjust pH=5.0 with H_3PO_4):ACN=70:30
Detector: UV 220 nm
Flow Rate: 1 mL/min
Injection: 2 μL

3.9 Acetylspiramycin



Column: Unisol C18, 4.6×250 mm, 5 μm
Part No.: UO952505-0
Mobile Phase: ACN:NaClO4/H_3PO_4 (pH=2.2)=30:70
Temperature: 30℃
Flow Rate: 0.8 mL/min
Injection: 20 μL

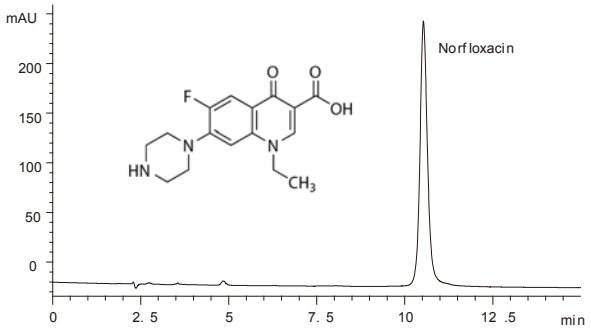
3.10 Meleumycin



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

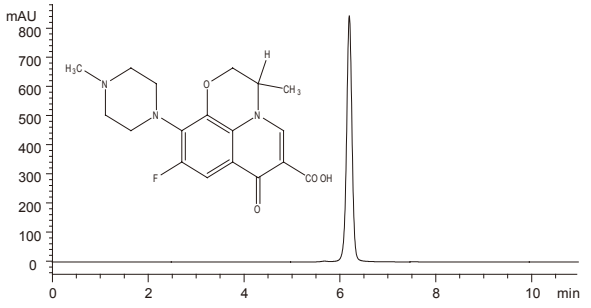
4.Synthetic Antimicrobial Agents

4.1 Norfloxacin



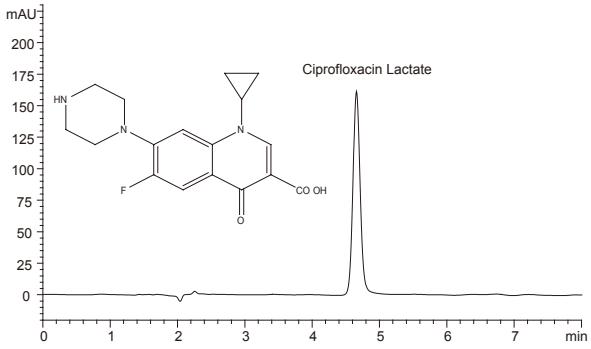
Column: Venusil XBP C18, 4.6×250 mm, 5 μm
Part No.: VX952505-0
Mobile Phase: H_3PO_4 (0.025 mol/L, adjust to pH=3.0 with TEA):ACN=87:13
Detector: UV 278 nm
Flow Rate: 1 mL/min
Injection: 20 μL

4.2 Ofloxacin



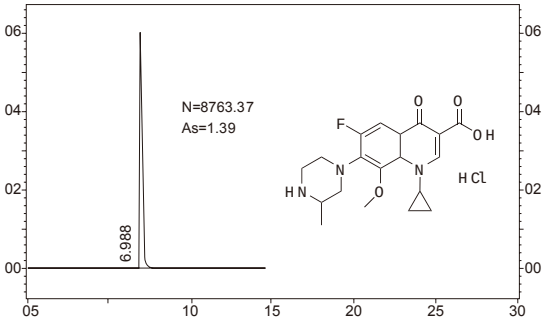
Column: Venusil XBP C18, 4.6×250 mm, 5 μm
Part No.: VX952505-0
Mobile Phase: $NH_4AC/KClO_4$ (40 mM, pH=2.0):ACN=85:15
Detector: UV 294 nm
Flow Rate: 1 mL/min
Injection: 4 μL

4.3 Ciprofloxacin Lactate



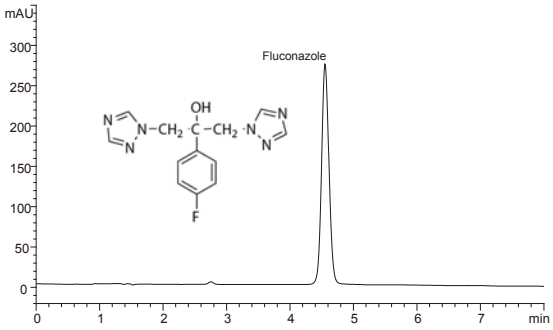
Column: Venusil XBP C18, 4.6×150 mm, 5 μm
Part No.: VX951505-0
Mobile Phase: Citric acid buffer (0.05 mol/L, adjust to pH=3.5 with TFA):ACN=82:28
Detector: UV 277 nm
Flow Rate: 1 mL/min
Injection: 10 μL

4.4 Gatifloxacin hydrochloride



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

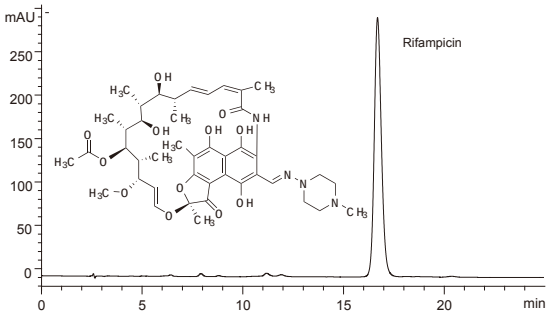
4.5 Fluconazole



Column: Venusil XBP C18, 4.6×150 mm, 5 μm
Part No.: VX951505-0
Mobile Phase: KH_2PO_4 buffer (adjust to pH=7.0 with NaOH):MeOH=55:45
Detector: UV 260 nm
Flow Rate: 1 mL/min
Injection: 10 μL

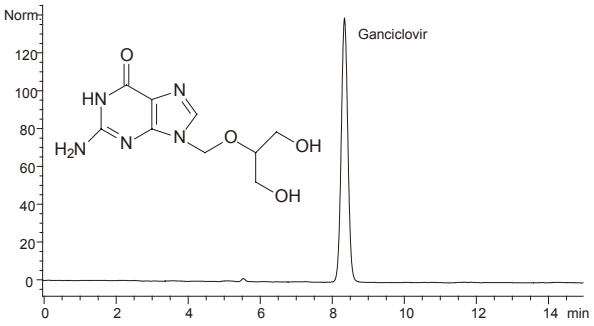
5. Anti-virus Medicine

5.1 Rifampicin



Column: Venusil XBP C8, 4.6×250 mm, 5 μm
Part No.: VX852505-0
Mobile Phase: MeOH/ACN/KH_2PO_4 0.075mol/L/citric acid 1 mol/L=30:30:36:4
Detector: UV 254 nm
Flow Rate: 1 mL/min
Injection: 2 μL

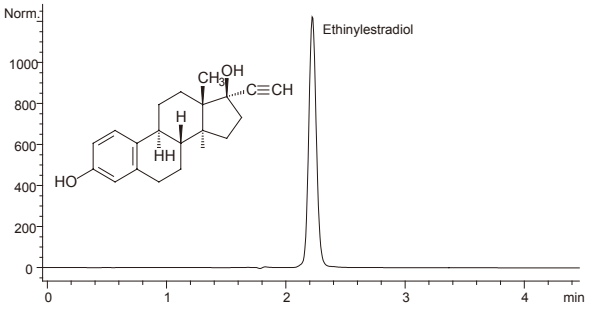
5.2 Ganciclovir



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

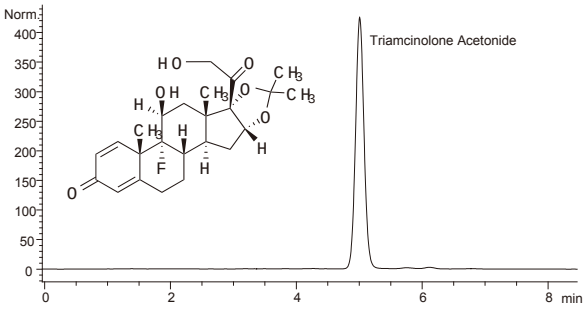
6. Steriod Hormones

6.1 Ethinylestradiol



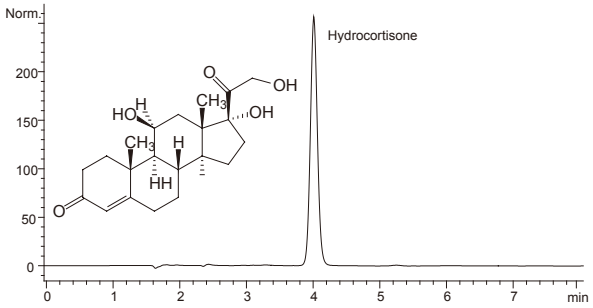
Column: Unisol C18, 4.6×150 mm, 5 μm
Part No.: UO951505-0
Mobile Phase: MeOH:Water=70:30
Detector: UV 281 nm
Flow Rate: 1 mL/min
Injection: 2 μL

6.2 Triamcinolone Acetonide



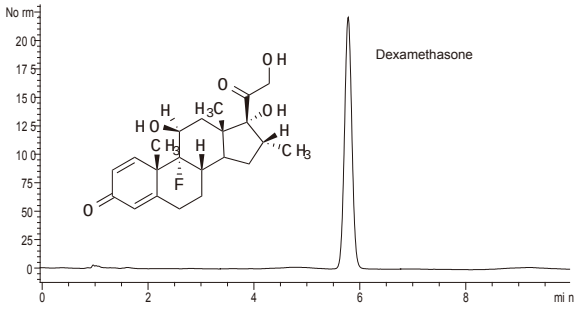
Column: Unisol C18, 4.6×150 mm, 5 μm
Part No.: UO951505-0
Mobile Phase: MeOH:Water=21:19
Detector: UV 240 nm
Flow Rate: 1 mL/min
Injection: 2 μL

6.3 Hydrocortisone



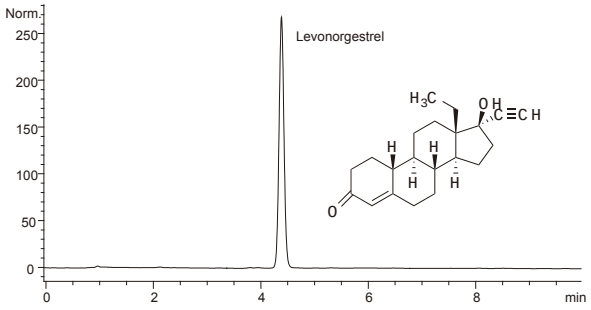
Column: Unisol C18, 4.6×150 mm, 5 μm
Part No.: UO951505-0
Mobile Phase: MeOH:Water=70:30
Detector: UV 240 nm
Flow Rate: 1 mL/min
Injection: 10 μL

6.4 Dexamethasone

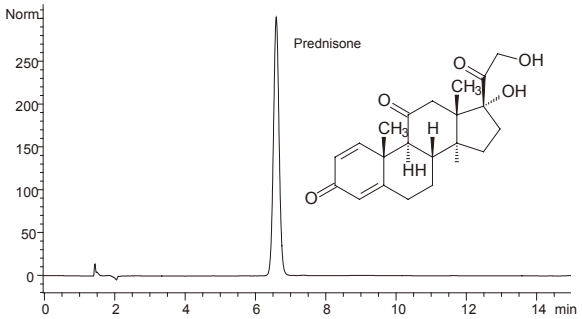


Column: Venusil XBP C18, 4.6×150 mm, 5 μm
Part No.: VX951505-0
Mobile Phase: Citric acid buffer (0.05 mol/L, adjust to pH=3.5 with TFA):ACN=82:28
Detector: UV 277 nm
Flow Rate: 1 mL/min
Injection: 10 μL

6.5 Levonorgestrel

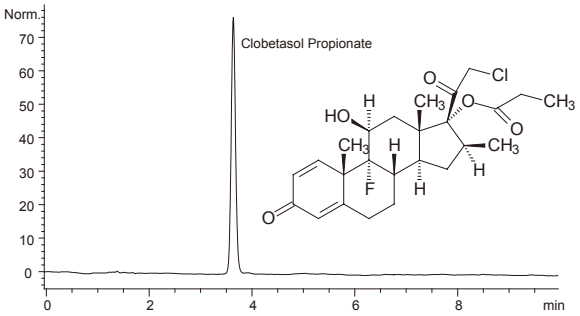


Column: Unisol C18, 4.6×150 mm, 5 μm
Part No.: UO951505-0
Mobile Phase: Water:ACN=30:70
Detector: UV 240 nm
Flow Rate: 1 mL/min
Injection: 2 μL



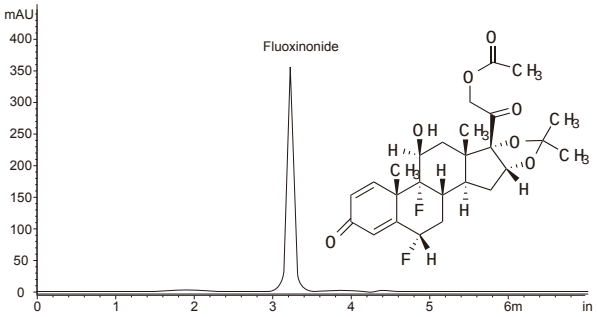
Column: Unisol C18, 4.6×150 mm, 5 μm
Part No.: UO951505-0
Mobile Phase: Water:THF:MeOH=668:250:62
Detector: UV 254 nm
Flow Rate: 1 mL/min
Injection: 2 μL

6.6 Clobetasol Propionate



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

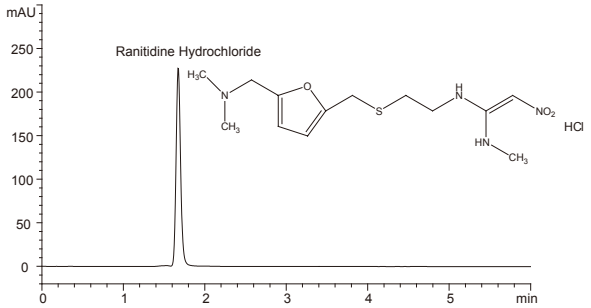
6.7 Fluocinonide



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

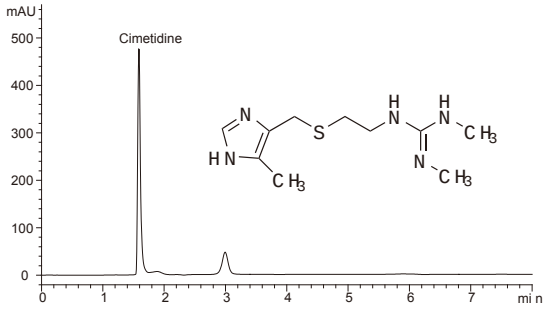
7. Medicine for Gastric Ulcer

7.1 Ranitidine Hydrochloride



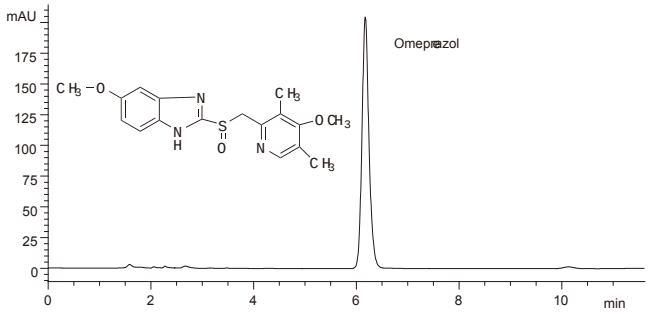
Column: Venusil XBP C18, 4.6×150 mm, 5 μm
Part No.: VX951505-0
Mobile Phase: MeOH:0.77% Ammonium acetate aq.= 285:115
Detector: UV 320 nm
Flow Rate: 1 mL/min
Injection: 10 μL

7.2 Cimetidine



Column: Venusil XBP C18, 4.6×150 mm, 5 μm
Part No.: VX951505-0
Mobile Phase: MeOH:Water:H_3PO_4:TFA =200:800:0.3:0.2
Detector: UV 220 nm
Flow Rate: 1 mL/min
Injection: 10 μL

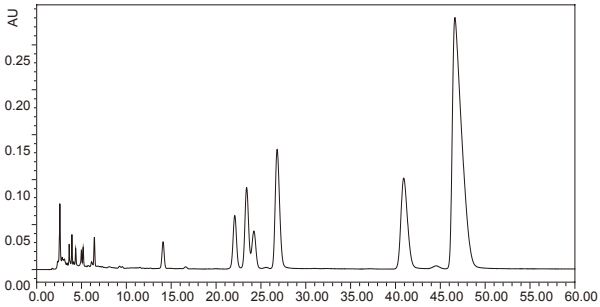
7.3 Omeprazole



Column: Venusil XBP C8, 4.6×250 mm, 5 μm
Part No.: VX852505-0
Mobile Phase: NaH_2PO_4 Buffer (0.01 mol/L, adjust to pH7.6 with H_3PO_4): ACN=60:40
Detector: UV 302 nm
Flow Rate: 1 mL/min
Injection: 4 μL

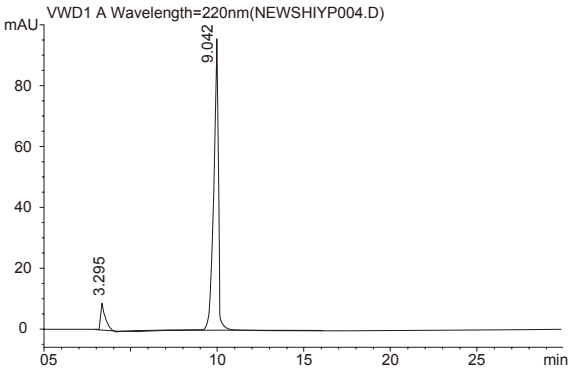
8. Analysis of Alkaloids

8.1 Quaternary Ammonium Alkaloids from Coptidis



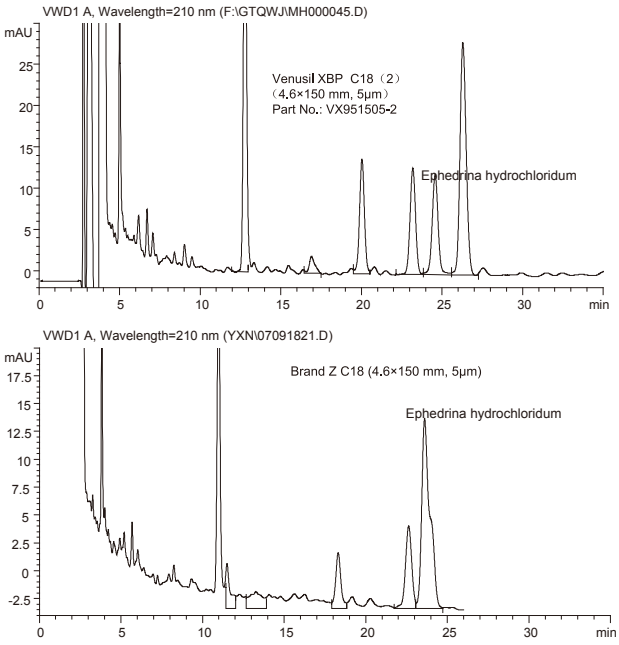
Column: Unisol C18, 4.6×250 mm, 5 μm
Part No.: UO952505-0
Mobile Phase: Water(0.3%TEA):ACN=75:25
Detector: UV254 nm
Flow Rate: 1 mL/min
Temperature: 25℃

8.2 Matrine



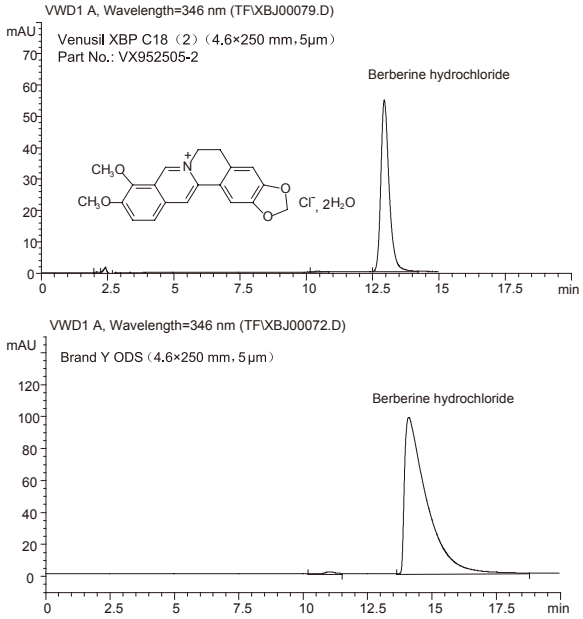
Column: Venusil XBP NH_2, 4.6×250 mm, 5 μm
Part No.: VN852505-0
Mobile Phase: ACN:Ethanol:3 % H_3PO_4 aq.=80:10:10
Detector: UV 220 nm
Flow Rate: 1 mL/min
Injection: 20 μL

8.3 Ephedrine from Coptidis



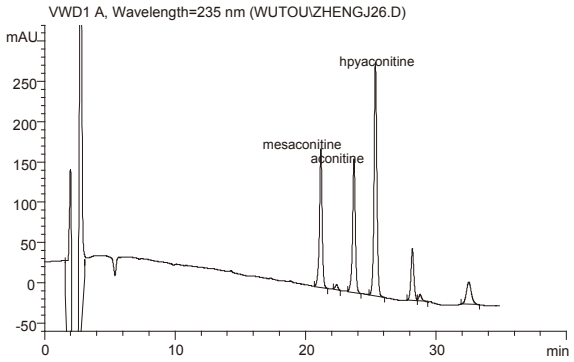
Mobile Phase: ACN:SDS/H_3PO_4=40:60
Detector: UV 210 nm
Flow Rate: 1 mL/min

8.4 Berberine Hydrochloride From Phellodendron



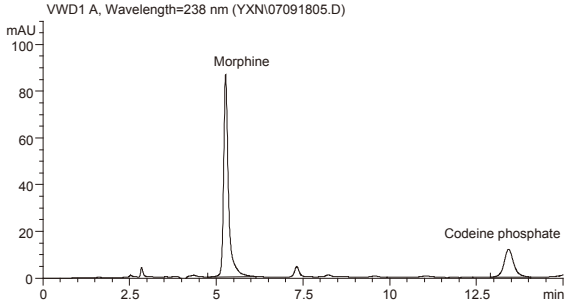
Mobile Phase: ACN:1%TFA=35:65
Detector: UV 346 nm
Flow Rate: 1 mL/min

8.5 Aconitine, Mesaconitine and Hypaconitin



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

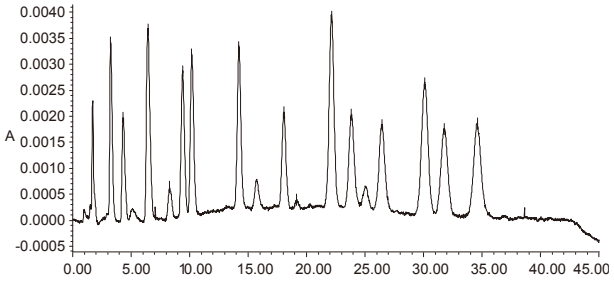
8.6 Berberine from Phellodendron



Column: Venusil XBP C18(2), 4.6×250 mm, 5 μm
Part No.: VX952505-2
Mobile Phase: MeOH: CH_3COONa aq. (0.03mol/L, adjust pH to 3.5 with Acetic acid)=15:85
Detector: UV 238 nm
Flow Rate: 1 mL/min

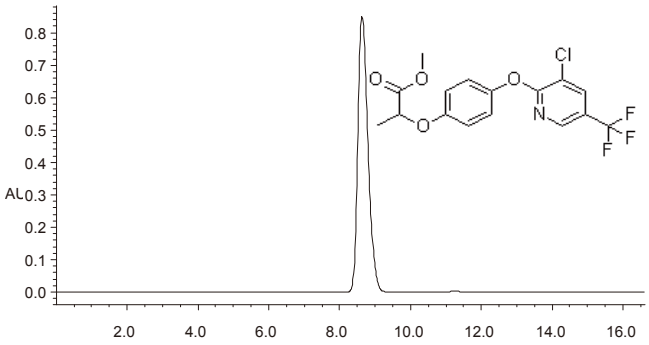
9. Agricultural Chemical

9.1 Analysis of 14 Herbicides



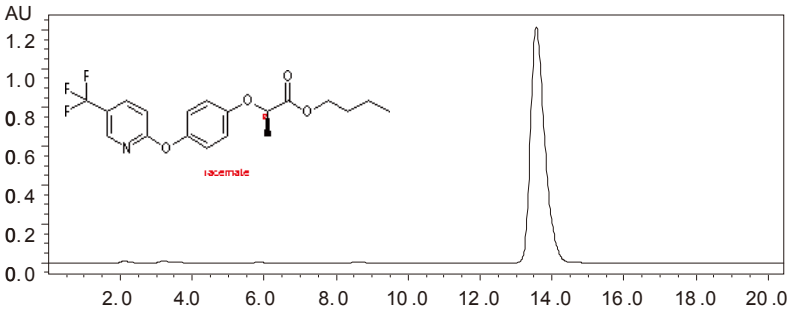
Sample: dazomet Cymoxanil Triadimefon Tebuconazole
Thiophanate-Methyl hexaconazole flutriafol
Iprodione Metalaxyl Procymidone carboxin
Prochlora Diethofencar Triadimenol
1,2,3,6-tetrahydro-N-(trichloromethylthio)phthalimide
Column: Venusil XBP C18, 4.6×150 mm, 5 μm
Part No.: VX951505-0
Mobile Phase: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

9.2 Haloxyfop-P-methyl



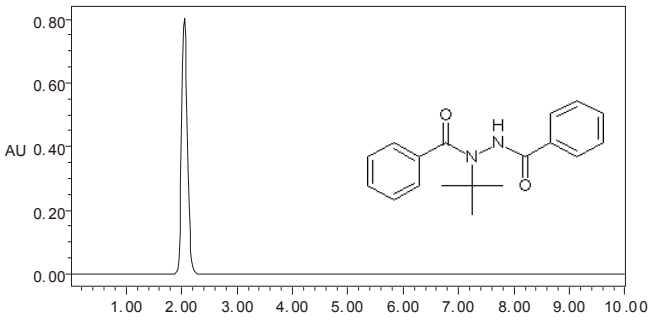
Column: Venusil XBP C18, 4.6×150 mm, 5 μm
Part No.: VX951505-0
Mobile Phase: ACN:Water=70:30
Detector: UV 225 nm
Flow Rate: 1 mL/min
Injection: 5 μL
Temperature: 25℃

9.3 Fluazifop-p-butyl



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

9.4 1,2-Dibenzoyl-1-tert-butylhydrazine



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

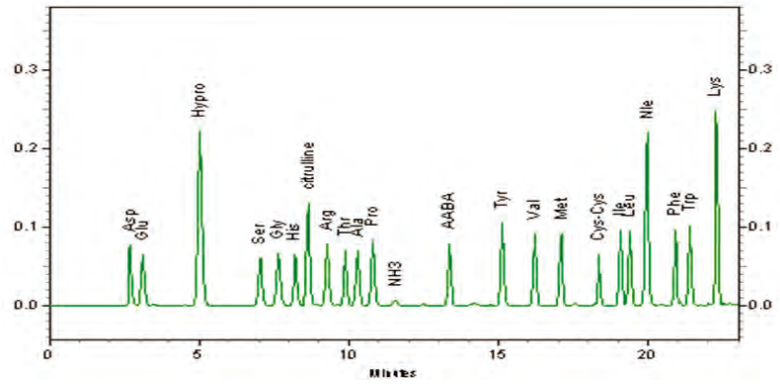
10. Analysis of Amino Acids

Column: Venusil AA, 4.6×250 mm, 5 μm
Part No.: AA952505-0
Mobile Phase: A: 0.1 mol/L CH_3COONa (Adjust pH=6.5 with Acetic Acid):Acetonitrile (93:7)
B:Water: Acetonitrile (4:1)
Gradient:

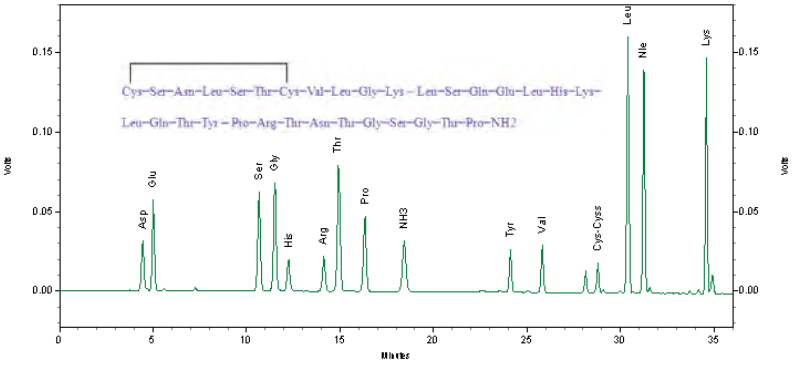
Time(min)	0	11	13.9	14	29	29.1	37	37.1	45
%B	0	7	12	15	34	100	100	0	0

Flow Rate: 1 mL/min
Detector: UV 254 nm
Temperature: 40℃
Sample: PTC-AA (derivatization of amino acids with PITC)

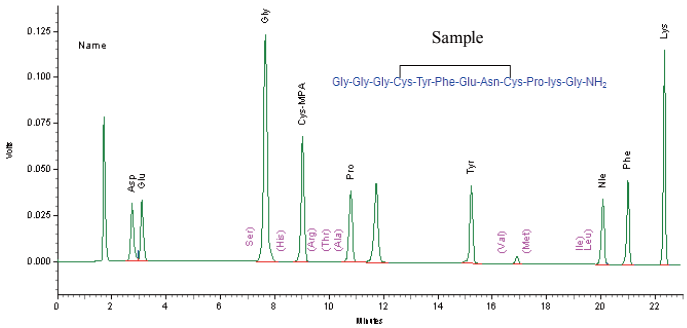
10.1 Standards of Amino Acids

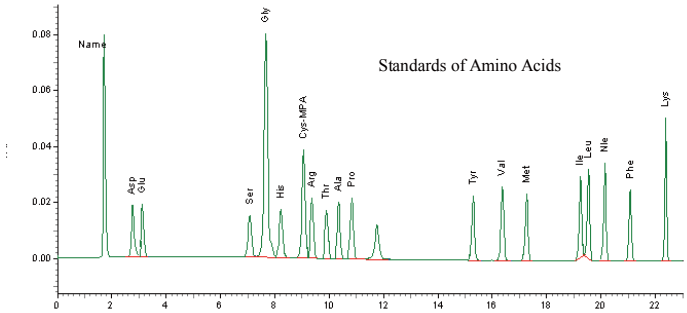


10.2 Amino Acids from Salmon Calcitonin



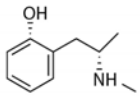
10.3 Amino Acid from Terlipressin



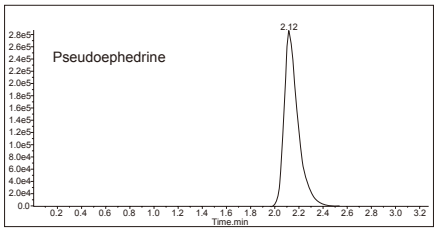


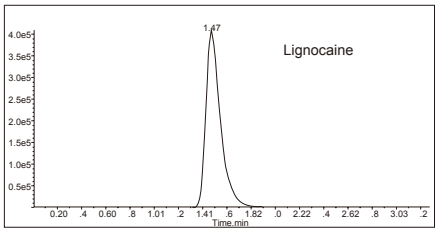
11. Applications in LC-MS

11.1 Pseudoephedrine in Plasma



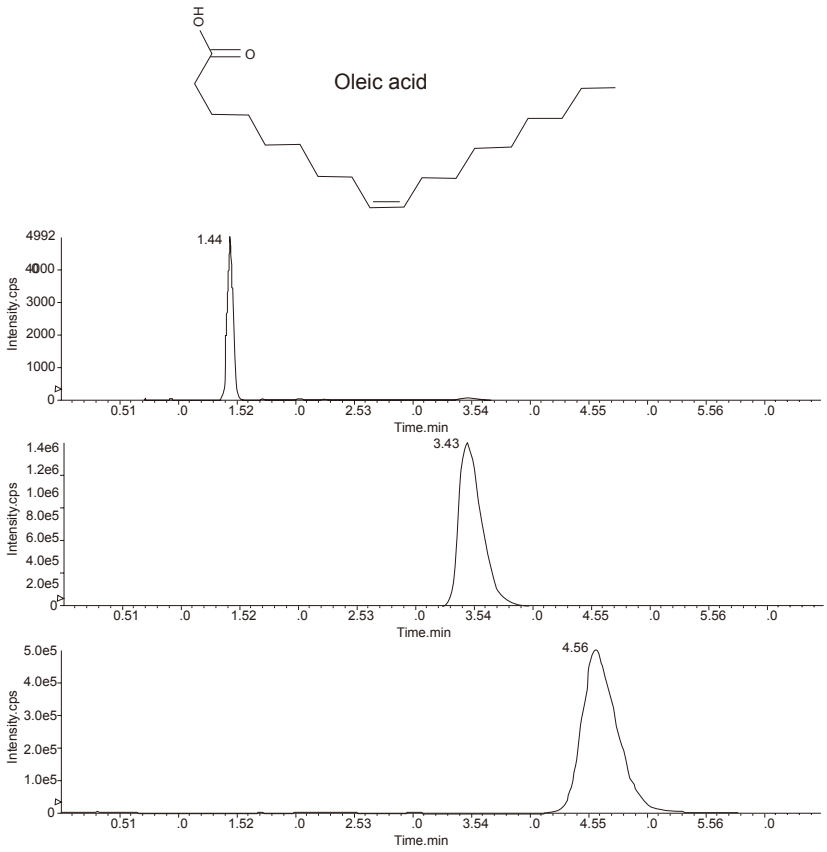
Pseudoephedrine





Mass System: API Qtrap 3200 Applied Biosystem
Mass Condition: Cation Detector Mode, MRM
HPLC Column: Venusil ASB C18, 2.1 mm×50 mm; 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: 0.5 mL/min
Temperature: 25℃

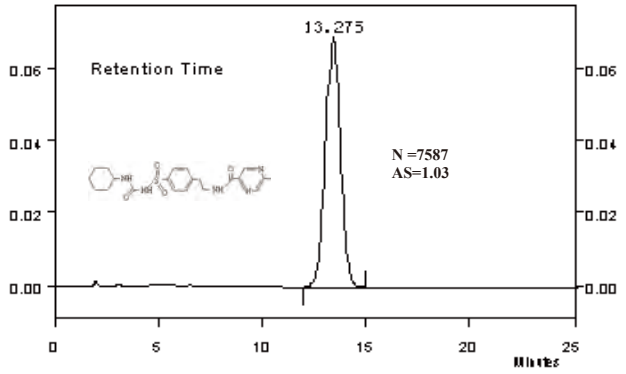
11.2 Oleic Acid in Plasma



Mass System: API Qtrap 3200 Applied Biosystem
Mass Condition: Anion Detector Mode, MRM
HPLC Column: Venusil ASB C18, 2.1mm×50 mm; Part No.: VS950502-0
Sample: Prepared sample by SPE (Cleanert PEP)
Mobile Phase: A:13 mmol/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℃

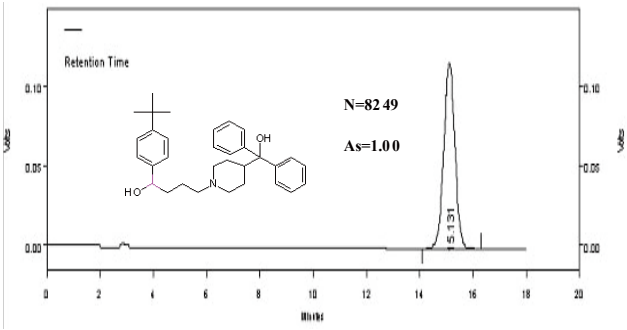
12. Others

12.1 Glipizide



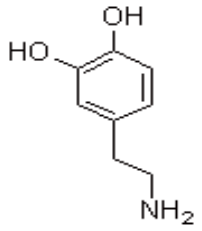
Column: Unisol C18, 4.6×150 mm, 5 μm
Part No.: UO951505-0
Mobile Phase: Phosphate Buffer 0.1 mol/L,
pH 6.0:MeOH=55:45
Flow Rate: 1 mL/min
Injection: 20 μL

12.2 Terfenadine

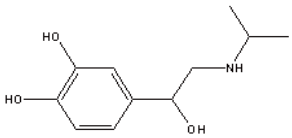


Column: Unisol C18, 4.6×150 mm, 5 μm
Part No.: UO951505-0
Mobile Phase: MeOH:H_3PO_4/Triethylamine
(0.1mol/L)=80:20
Detector: UV 254 nm
Flow Rate: 1 mL/min
Injection: 10 μL

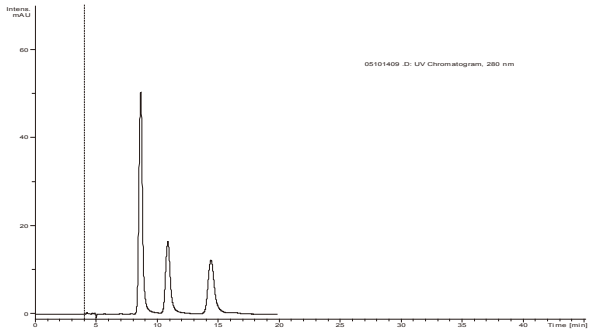
12.3 Dopamine and Its Metabolin



Dopamine

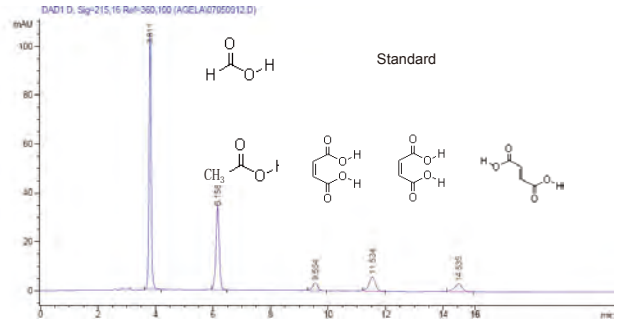


Isoprenaline



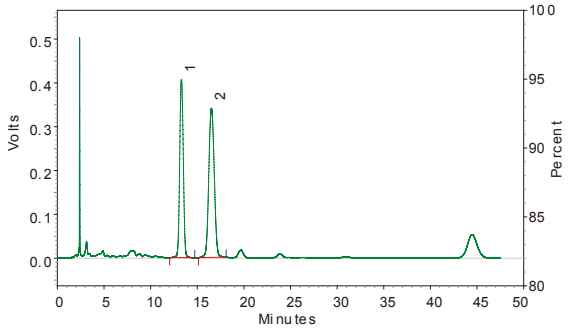
Sample: Dopamine, Isoprenaline, Soprenaline
Column: Venusil PFP, 4.6×250 mm, 5 μm
Part No.: VF952505-0
Mobile Phase: MeOH:CH_3COOH/CH_3COONH_4
Buffer(pH 4.5)=15:85
Detector: UV 280 nm
Flow Rate: 0.8 mL/min

12.4 Organic Acids



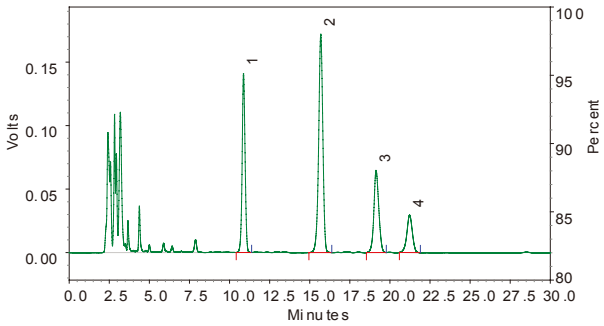
Sample: Formic acid, acetic acid, maleic acid, succinic acid, fumaric acid
Column: Unisol C18, 4.6×250 mm, 5 μm
Part No.: UO952505-0
Mobile Phase: 0.02M NH_4AC Aq.:MeOH=95:5
Detector: UV 215 nm
Flow Rate: 1 mL/min
Injection: 10 μL
Temperature: 20℃

12.5 Catechins in Leaves



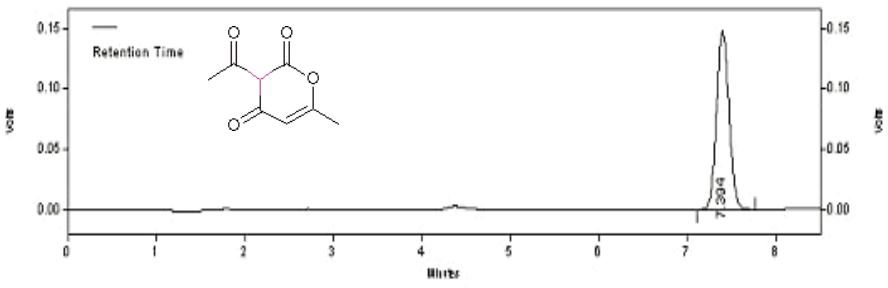
Sample: Extract of leaves
Column: Unisol C18, 4.6×250 mm, 5 μm
Part No.: UO952505-0
Mobile Phase: 0.02%H_3PO_4:MeOH=81:19
Detector: UV 278 nm
Flow Rate: 1 mL/min
Temperature: 40℃

12.6 Saccharin Sodium in Milk Powder



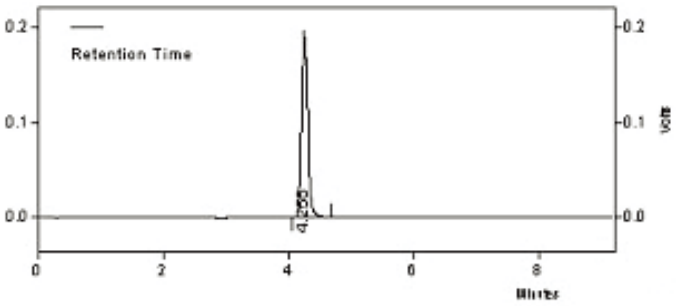
Sample: Benzoic acid, 2,4-Hexadienoic acid, Sodium saccharine, milk powder
Column: Unisol C18, 4.6×250 mm, 5 μm
Part No: UO952505-0
Mobile Phase: MeOH:CH_3COONH_4(0.02 M)=5:95
Detector: UV 230 nm
Flow Rate: 1 mL/min
Temperature: 30℃

12.7 DHA in the Health Food



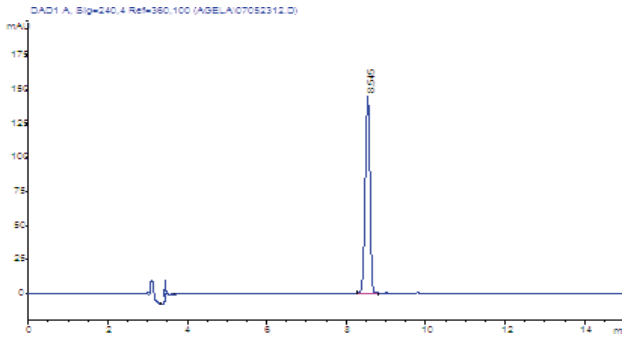
Column: Unisol C18, 4.6×250 mm, 5 μm
Part No.: UO952505-0
Mobile Phase: MeOH:Water=80:20
Detector: UV 254 nm
Flow Rate: 1 mL/min
Injection: 10 μL

12.8 Tartrazine in Food



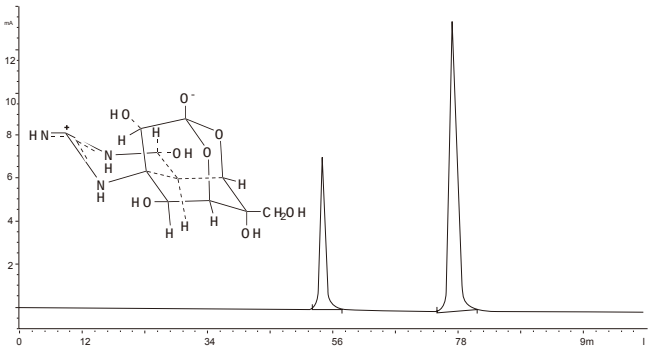
Column:Unisol C18, 4.6×250 mm, 5 μm
Part No.: UO952505-0
Mobile Phase: A: Ammonium acetate buffer pH 4.0; B:MeOH
Gradient: 35%B to 50%B in 5 min.
Detector: UV 254 nm
Flow Rate: 1 mL/min
Injection: 10 μL

12.9 Melamine in Feed



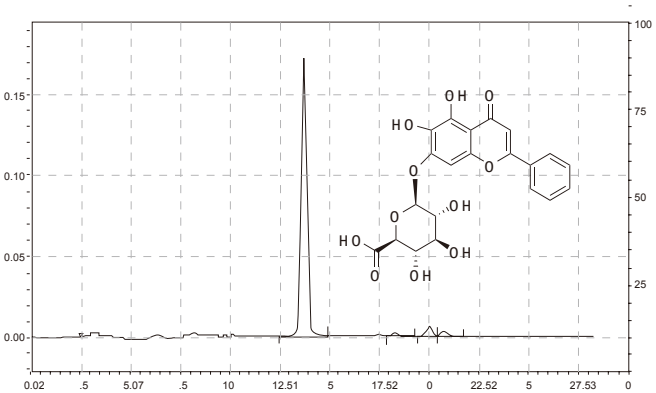
Column: Venusil ASB C18, 4.6×250 mm, 5 μm
Part No.: VS952505-0
Mobile Phase:10 mM Citric acid+10 mM Perfluorooctane sulfonate (pH=3.0):ACN=85:15
Detector: UV 240 nm
Flow Rate: 1 mL/min
Injection: 10 μL
Temperature: 40℃

12.10 Tetrodotoxin(TTX)



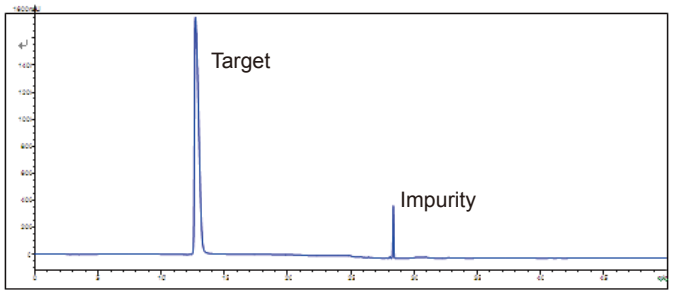
Column: Venusil ASB C18, 4.6×250 mm, 5 μm
Part No.: VS952505-0
Mobile Phase: 0.02% H_3PO_4:MeOH=40:60
Detector: UV 200 nm
Flow Rate: 0.5 mL/min
Temperature: 25℃

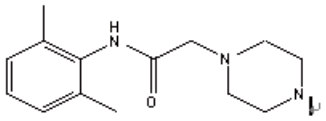
12.11 Baicalin



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

12.12 2 - piperazine-N-(2,6-dimethylphenyl) acetamide

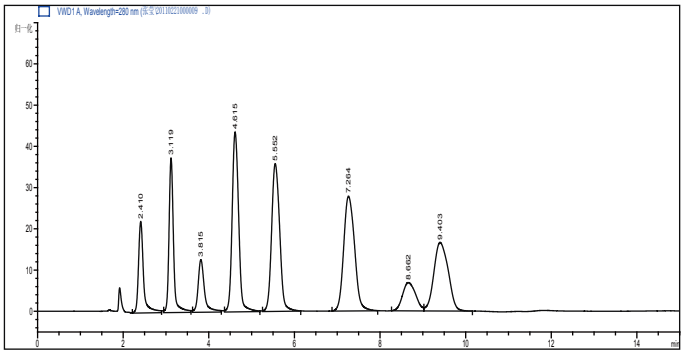




Time(min)	A (%)	B (%)
0	90	10
15	90	10
25	40	60
40	40	60

Conditions:
Column: Durashell-C18, 4.6×250 mm, 5 μm, 100 Å
Mobile phase: A: Phosphate buffer (pH=7.0)
B: Acetonitrile
Flow rate: 1.0 mL/min
Detector: UV220 nm
Temperature: 30℃
Injection: 5 μL

12.13 Dyes

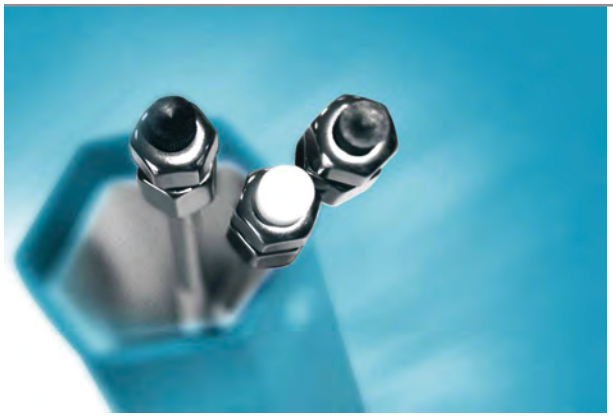


1: p- Phenylenediamine; 2: 4-Aminophenol;
3: methylbenzene 2,5Phenylenediamine;
4: Hydroquinone; 5: m-Aminophenol; 6: o-Phenylenediamine;
7:1, 4 Phenylenediamine; 8: p- methylaminophenol.

Conditions:
Column: Durashell-C18, 4.6×150 mm, 5 μm, 100 Å
Mobile phase: 10% TEOA (pH=7.7) : Acetonitrile = 95:5
Flow rate: 1.0 mL/min
Detector: UV280 nm
Temperature: 20℃
Injection: 2 μL

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:

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

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 and NH_2)	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 and 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, NH_2 and DIOL)	Rinse with 10 column vol umes 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, NH_2 and 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

Agela Technologies

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