Agela Technologies

Bonna-Agela

HPLC Columns & Consumables

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Sample Preparation
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Bonna-Agela Technologies — A Global Supplier for Chromatography Solutions

As Bonna-Agela is poised to enter its new development stage 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.

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, 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 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.

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CONTENTS

HPLC Columns and Consumables

Introduction 001

Featured and New Products 004

Unisol Technology and Column Products 004
Venusil® C18 Plus 015
Venusil® AQ C18 018
Venusil® HILIC 020
Durashell C18-AM 023
Venusil® HLP C18 027
Venusil® XBP Polar – Phenyl 028
Innoval AQ C18 029
Venusil® PAH 031
Venusil® PFP---USP L43 032

HPLC Column by Family 034

Bonshell HPLC Columns 034
Bonshell ASB C18 035
Bonshell C18 035

UHPLC Technology and Columns 038
UHP AQ C18 038
UHP ASB C18 040
UHP Innoval C18 041
UHP HILIC 042

Venusil® ASB Series Columns (C1, C8, C18 and phenyl) 043
Venusil® Family of HPLC Columns 046

Venusil® XBP 048
Venusil® XBP C18 (2) 048
Venusil® XBP C18 052
Venusil® XBP (L) 052

Venusil® SCX 055
Venusil® SAX 055
Venusil® Diol 057

Durashell Technology and Column 058
Durashell C18(L) 059
Durashell C8 060
Durashell NH_2 061

Innoval Series Column 064
Innoval ODS-2 065
Innoval C18 066

Promosil Family of HPLC Columns 068
Promosil C8 069
Promosil Silica 069

Optimix Family of HPLC Columns 070
Optimix C18/C8 070
Optimix C18/Amide 071
Optimix C18/SCX 072

Chiral Columns 074
Venusil® CA 074
Venusil® CO 075
Venusil® CJ 075

HPLC Accessories and Supplies 077
Guard Cartridge Holder 077
Direct-connection Guard Cartridge Holder 077
Direct-connection Guard Cartridge Holder Suit 078
Disposable Syringe for HPLC Filtration 078

Clarinet™ Filtration Products 079
Syringe Filters 079
Membrane Filters 085
Glass Filtration System 086

Vials and Seals 087

HPLC Column Selection Guide 091
Column Selection Parameters 091
Basic Considerations in Choosing HPLC Columns 091
Bonna-Agela HPLC Column Selection Guide 092
USP Column Selection Guide 093

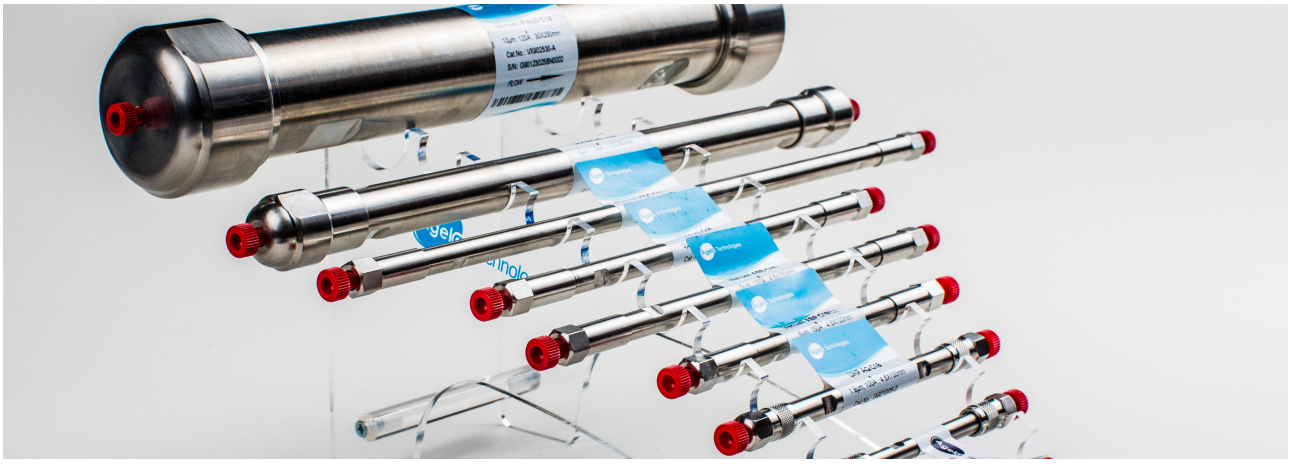
Solutions for Specific Applications 096

Solutions for Highly Water Soluble Compounds 096
HILIC Column Family From Bonna-Agela Technologies 100
Solutions for Low pH and High pH Applications 102
Solutions for LC-MS 103
Solutions for Fast Analysis 105
Solutions for Bio-molecules 106
Solutions for Preparative HPLC 106
Solutions for SFC 107

Applications 108

European and American Pharmacopeia 108
HILIC Applications 117
Antibiotics 122
Synthetic Antimicrobial Agents 126
Anti-virus Medicine 128
Steriod Hormones 129
Medicine for Gastric Ulcer 131
Analysis of Alkaloids 133
Agricultural Chemical 135
Analysis of Amino Acids 136
Applications in LC-MS 137
Others 138

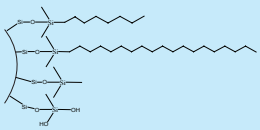
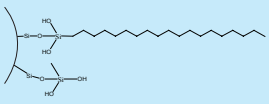
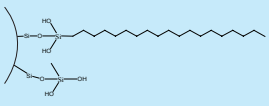
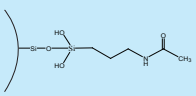
APPENDIX 141



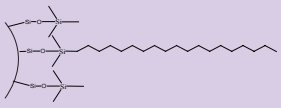
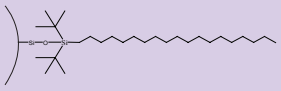
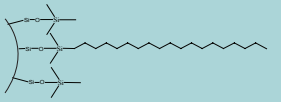
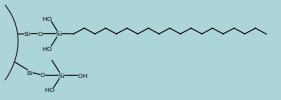
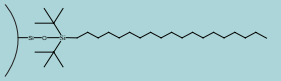
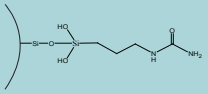
Introduction to Bonna-Agela HPLC Columns

With Challenging demands of scientist working in the field of Pharmaceuticals, Food Safety, Environmental, Forensic & Academics Bonna-Agela offers broad range of stationary phase chemistries to help customer to carry out rapid analysis, LC-MS Analysis, Working through Extreme pH conditions & Extended Temperatures. Bonna-Agela HPLC Columns are manufactured by R&D Scientist with Innovative Approach of playing with different ligands chemistries.

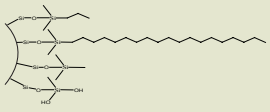
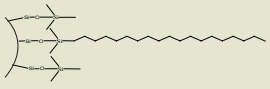
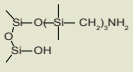
Featured Porduct

Classical Product for Different Polar and Property		
Unisol C18(2)		Unisol C18(2) has excellent balance of hydrophobicity, retention, resolution and contamination tolerance, and provides excellent reproducibility because it is minimal metal content, less affected by the pH of the mobile phase and buffer concentration. Good tolerance of biological matrix.
Unisol C18		A type of true universal reversed phase column for separation of a broad range of molecules such as acidic, basic and neutral organic compounds. Greatly improved peak shape for basic compounds.
Venusil® AQ C18		100% water compatibility; good retention for highly water soluble compounds, elimination of excessive retention for polar compounds in the normal phase mode.
Venusil® HILIC		It has a unique HILIC mechanism for high polar compounds. Also it can be used as either a reversed-phase or normal phase column. Strong retention of polar compounds in HILIC mode. • Unique selectivity and complementary to conventional reversed phase and normal phase; • It can be used in 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.

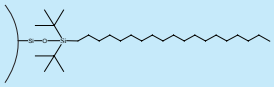
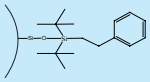
Bonshell Technology and UHPLC for Fast Analysis

Bonshell C18		Core-shell technology; extremely stable, high separation efficiency and shorter analysis time; Compatible with fast and conventional LC with pressure range of 600 bars (9000 psi). Low pressure compared to Sub2u UPLC column.
Bonshell ASB C18		ASB C18 column extended to core shell technology. Extremely stable at high acidic ph conditions. Ideally suited for LC-MS applications.
UHP Innoval C18		1.9 µm particles based on ultra pure silica,double end-capped to ensure an inert stationary phase and ideally suited to UPLC Systems.
UHP AQ C18		Greatly improved peak shape for basic compounds; 100% water compatibility.
UHP ASB C18		Better performance under acid condition; stay stable even at pH 0.8; excellent separation performance for polar compounds, and 100% aqueous compatible.
UHP HILIC		Compatibility with 100% aqueous mobile phase, true HLIC for faster separations for retention of polar compounds which show less retention in RP or NP mode.

Robust Column in Wide Range pH Mobile Phase

Durashell C18-AM		1) Show excellent pH stability pH (1.5-12.0); 2) Double polar end-capped, strong separation performance for polar compounds; 3) Special bonding, strong performance to identify stereoisomeric compounds; 4) Hydrophilic stationary phase, compatible with 100% aqueous mobile phase.
Durashell C18(L)		Show excellent pH stability, pH (1.5-12.0) Minimal silanol activity High loading capacity for basic compounds Good for molecules upto MW range of 5000-6000 Daltons.
Durashell NH_2		Only available Hybrid Phase with amino ligand. Show excellent pH stability, pH (1.5-12.0), improved life time compared to general NH_2 column.

Stable Bonding Phase in Extremely pH Condition

Venusil® ASB C18		Venusil® ASB C18 applies a stable bonding technology to ensure low bleeding of the stationary phase, so provides minimum baseline noise of LC-MS application. Low pH stability: great stability even at pH=0.8; 100% aqueous compatible.
Venusil® ASB C1		Ideally suited for Biomolecules Separation to have early elution and selectivity difference. Low pH stability: Stay stable even at pH=0.8.
Venusil® ASB Phenyl		Low pH stability: Stay stable even at pH=0.8.

Innoval Series Columns

Innoval ODS-2	Innoval series raw silica is manufactured by an aggregation of ultra pure silica sols. This series of column from Bonna-Agela provides excellent reproducibility and high efficiency. 1. Excellent mechanical strength, pressure tolerant (6000psi); 2 .Lower surface area, fast separation speed, more tolerence for dirty sample; 3. Good separation ability for isomers also hydrophilic compounds, compatible with 100% aqueous mobile phase.

Optimix Series

A class of column provides optimized selectivity and balanced retention for hydrophilic and hydrophobic organic compounds with mixed different phases,such as C18/SCX, C18/Amide, C18/C8. It extends the retention for polar molecules while decreasing excessive retention for very hydrophobic compounds.

Featured and New Products

Featured Products

Unisol Technology and Column Products

Bonna-Agela's unique sol-gel process technology generates an uniform surface that produces an universal column applicable to several kinds of HPLC applications.

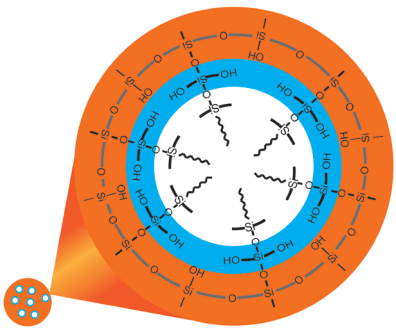
Peak tailing adversely affects chromatographic efficiency and reduces the accuracy and precision of the data. Peak tailing and insufficient retention of polar compounds are among the toughest problems for silica based reversed phase columns. High acidity of the surface silanols, non-uniformity of the surface, and non-uniformity of the bonding process are the three major causes of peak tailing.

Synthetic silica with high purity 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 the formation of micro-crystallization domains on the 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 low acidity and high uniformity, which is further bonded with a 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).

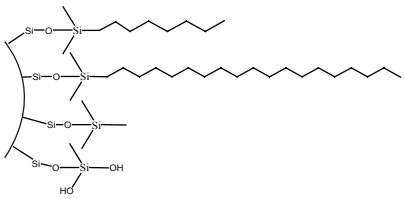
Main Features

- 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 (few 'hot spots')



Unisol C18 (2) Cloumns

Unisol C18 (2) column is an universal reversed phase column through carefully optimizing the pore size, surface and carbon content and the Bonna-Agela's innovative surface modification and unique bonding processes. It has excellent balance retention for hydrophilic and hydrophobic analytes and also balance of separation ability and contamination tolerance. In addition, the Unisol C18 (2) column demonstrates good retention capability for compounds with different polarity. Because the ionized silanols on the stationary surface of Unisol C18(2) are eliminated maximumly, so this column is less affected by the pH of mobile phase and buffer concentration. Finally, it is able to provide excellent reproducibility.



Characteristics:
Unisol C18(2): Metal Impurity<30 ppm; Pore Size: 110 Å; Specific Surface Area: 340 m^2/g;
Available Particle Size: 3 μm, 5 μm or 10 μm; Double end-capped; Carbon Loading: 14%;
pH range is 1.5 to 9.0, and optimized pH is 2.0-6.0, which could ensure a satisfied lifetime.

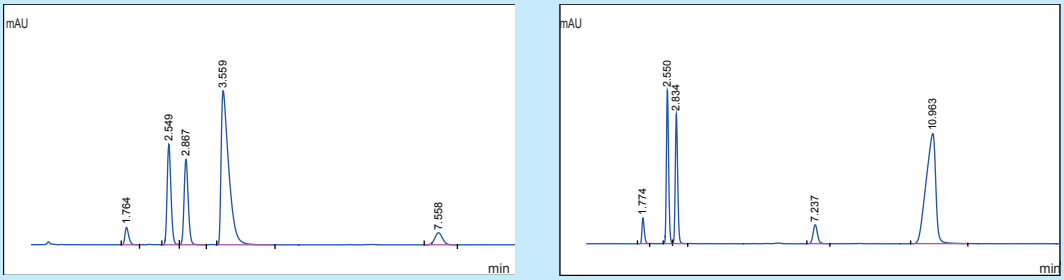
Main Features

- High density of deionized silanol: 100 % water compatible and enhanced retention and separation for polar isomer compounds
- Reduce of ionized silanols and blockage of metal ions: good peak shape for basic compounds
- Reduce of the quantity of ion exchange sites: less affected by the pH mobile phase and buffer concentration.
- Weakened nonspecific adsorption: Good tolerance of biological matrix.

The activity testing of silicon hydroxyl

The Unisol C18 (2) columns provide symmetric peak and good resolution for acidic, neutral and basic compounds at usual pH range. Retention of basic compound is less changed when the pH of mobile phase changes

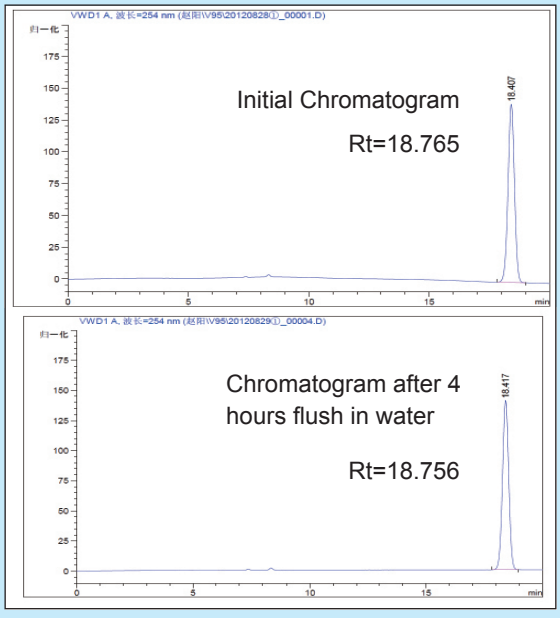
Sample: Uracil, Phenol, dimethylphthalate, naphthalene, amitriptyline
Mobile Phase: Methanol:20mM potassium phosphate buffer (pH2.6/pH5.8) =70: 30
Flow Rate: 1.00 mL/min
Temperature: 30°C
Detector: UV 254 nm



Unisol C18(2), 5 μm, 4.6×250 mm

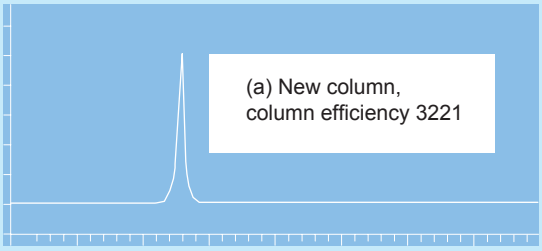
pH=2.6 Rt(amitriptyline)=3.559 min pH=5.8 Rt(amitriptyline)=10.963 min

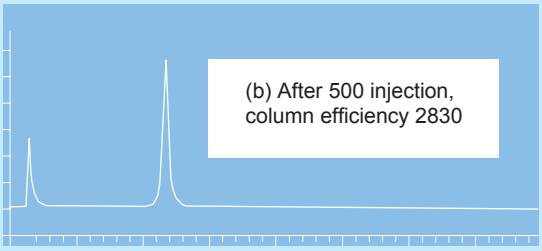
100 % Water Compatible

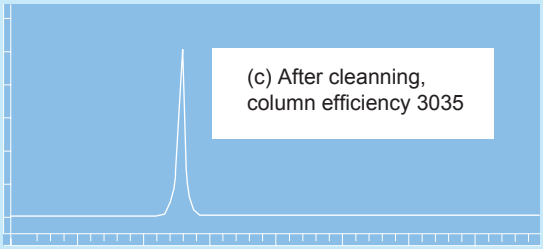


Sample: uridine;
Mobile Phase: water
Flow Rate: 1.00 mL/min 5 minutes after stopping the pump
Temperature: 30°C;
Detector: UV 254 nm

Good Tolerance of Biological Matrix



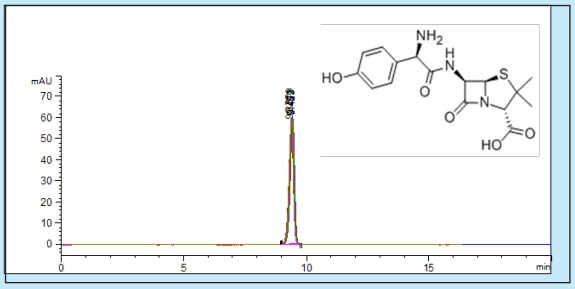




Column: Unisol C18(2), 5 μm, 2.1×50 mm
Sample: uridine in plasma
Mobile Phase: 0.1% formic acid water
Flow Rate: 0.3 mL/min,
Temperature: 30°C
After 500 injections,washing column 30 min with solution (methanol/0.1% formic acid =50:50) at 40°C, then wash column with solution (methanol/water=95:5) at 45°C.

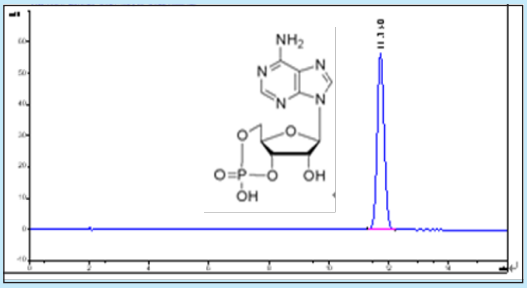
Applications

Amoxicillin



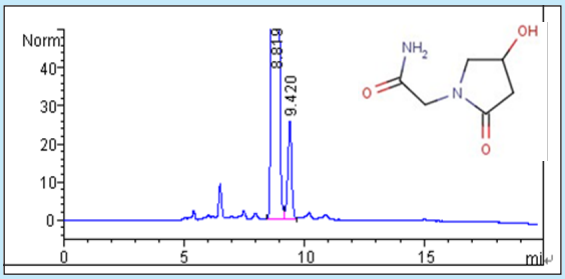
Unisol C18 (2), 5 μm, 4.6×250 mm, 110 Å,
Mobile phase: Acetonitrile:0.05M monopotassium phosphate = 2.5:97.5(KOH pH=5.0)
Flow rate: 1.0 mL/min
Temperature: 30°C
Injection: 20 μL
Detector: UV 254nm

Adenosine Cyclophosphate

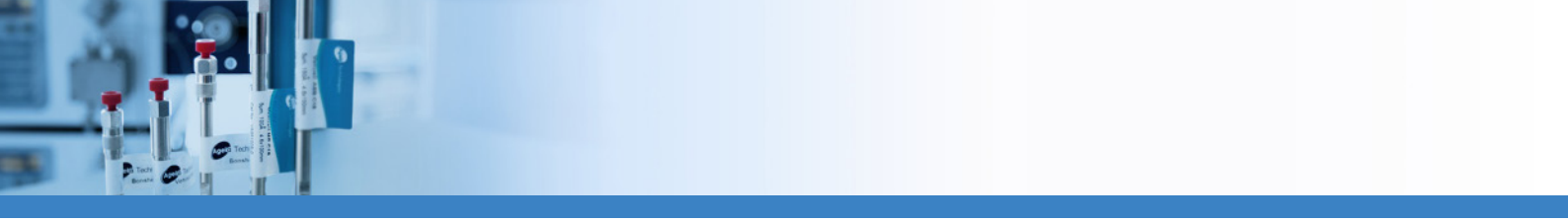


Unisol C18 (2), 5 μm, 4.6×150 mm, 110 Å,
Mobile phase: MeOH: 20 mmol/L monopotassium phosphate =10:90(pH=4.0)
Flow rate: 1.0 mL/min
Temperature: 30°C
Injection: 8 μL
Detector: UV 254nm

Oxiracetam



Unisol C18 (2), 5 μm, 4.6×250 mm, 110 Å,
Mobile phase: MeOH: 0.05 mol/L monopotassium phosphate
Flow rate: 1.0 mL/min
Temperature: 30°C
Injection: 20 μL
Detector: UV 210nm



Unisol Column

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

An unique and universal Unisol C18 HPLC phase made by Bonna-Agela's patented Unisol Technology. This stationary phase demonstrated unprecedented separation performance for compounds with a wide range of properties from hydrophilic to hydrophobic, polar, semi-polar and non-polar compounds. We also offer C8 phase presenting different selections for various applications.

Main Features

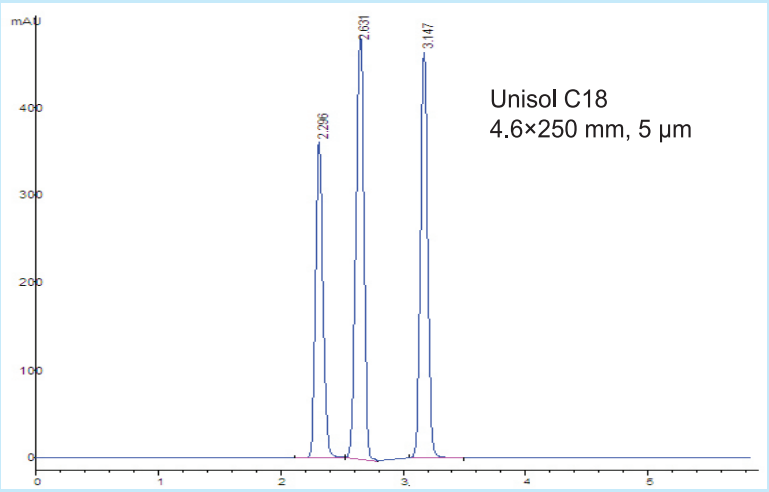
- Great inertness and separation efficiency for basic compounds
- Enhanced retention of hydrophilic compounds
- 100% aqueous compatibility
- Robust and reproducible performance
- Wide pH range (1.5-9.0)
- Low bleeding and high sensitivity for LC-MS

Characteristics

Bonded phase	Particle size(um)	Pore Size(Å)	Carbon loading(%)	Specific surface (m^2/g)	End-capping	pH range*
Unisol C18	2.5, 3, 5, 10	100	18	410	Single	1.5-9.0
Unisol C8	5	100	13	410	Single	1.5-9.0

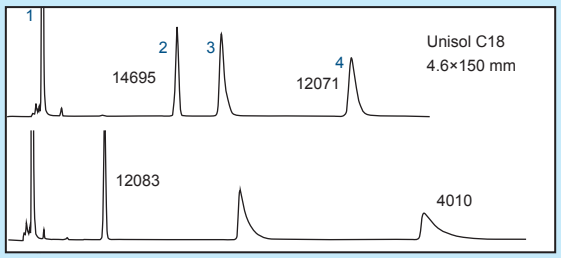
Notes: * Optimum pH range is 2.0 to 6.0; Use the column under optimum pH could ensure a prolonged lifetime.

Good Retention for Polar Compounds



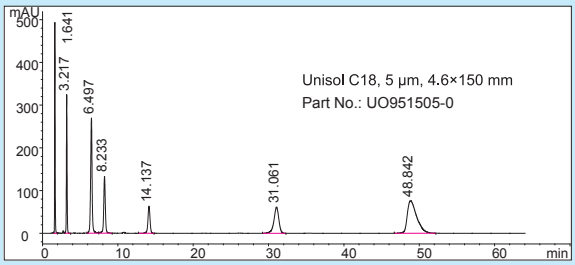
Mobile Phase:
A: Water (Contain 0.01 mM NaH_2PO_4 and 0.01 mM Citric Acid, pH=4.5);
B: ACN; A:B=95:5
Sample: Cytosine, Uracil, Guanine
Temperature: 35°C
Detector: UV 254 nm

Great Inertness and Efficiency for Basic Compounds



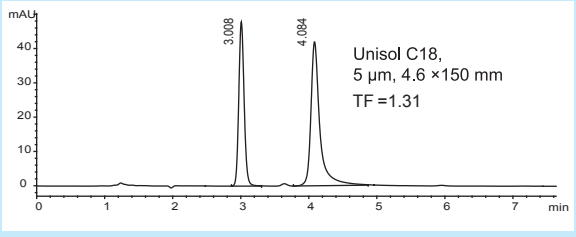
Sample: uracil, toluene, doxepin and amitriptyline
Column: 4.6×150 mm, 5 μm
Mobile Phase: 10 mM sodium phosphate (pH=7.0) in 60% ACN
Temperature: 30°C
Flow Rate: 1 mL/min
The plate numbers in regular font are for toluene, the plate numbers in Italic are for amitriptyline.

Balanced Retention for Hydrophilic and Hydrophobic Compounds



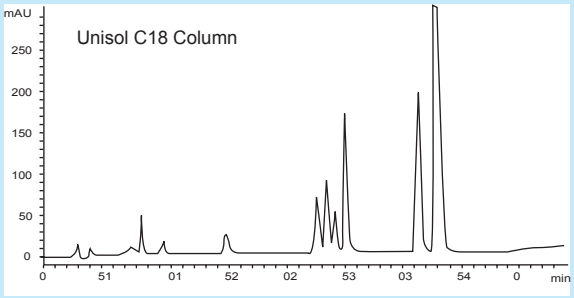
Mobile Phase: 35% 20 mM KH_2PO_4 pH=7.0,
65% Methanol
Temperature: 23°C
Flow Rate: 1 mL/min
Detector: UV 254 nm
Sample: Uracil
Propranolol hydrochloride
Butyl Phthalate
Dimethyl Phthalate
Naphthalene
Acenaphthene
Amitriptyline

Extremely Low Metal Effects



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

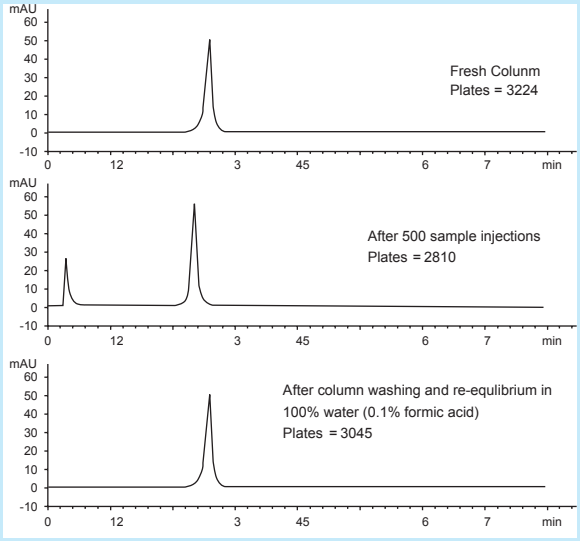
Enable Methods to be Compatible with LC-MS



Analysis of Quaternary Ammonium Alkaloids from Copitidis without a Non-Volatile Ion Pair Reagent on Unisol C18 Column and other Reverse Phase Column

Unisol C18 Column
Mobile Phase: 0.2% TFA in water: Acetonitrile=75:25

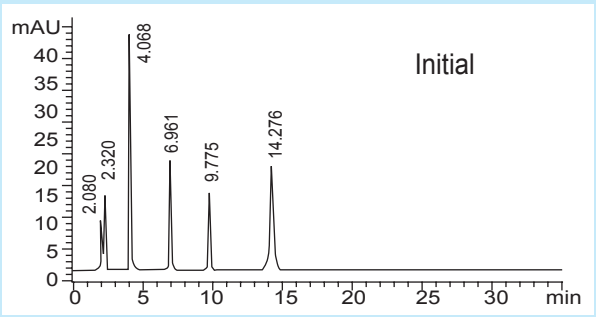
Good Tolerance of Directly Injected Biological Matrix

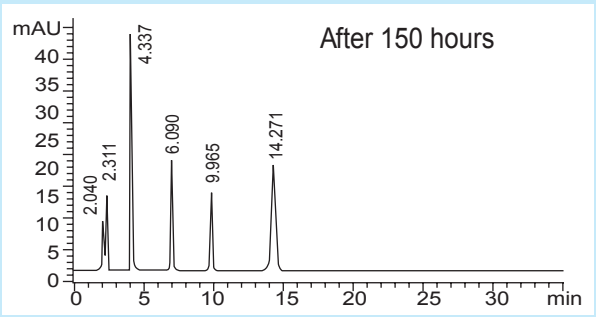


Uridine: uridine in calf blood plasma
(diluted 20 times with 0.1% formic acid)
Column: Unisol C18, 2.1×50 mm, 5 μm
Temperature: 30°C
Flow Rate: 0.3 mL/min
Mobile Phase: 0.1% formic acid solution
(100% aqueous phase)
Injection: 1 μL (not be cleaned up with SPE)
Run Time: 8 min

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

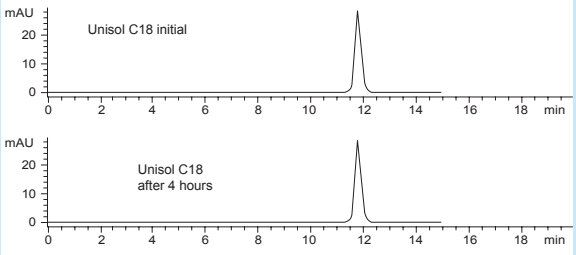
Perfect Peak Symmetry and Good Stability at Mid-pH for Basic Compounds





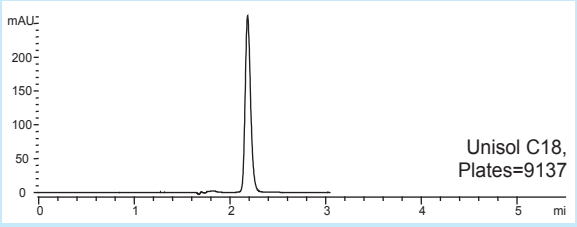
Sample: Uracil, Doxepin, Nortriptyline,
Amitriptyline and Trimipramine
Column: Unisol C18, 4.6×250 mm, 5 μm
Mobile Phase: 0.01M sodium phosphate: ACN
=25:75, pH=7.0
Flow Rate: 1.3 mL/min.
Temperature: 30°C

Compatibility with 100% Aqueous Mobile Phase

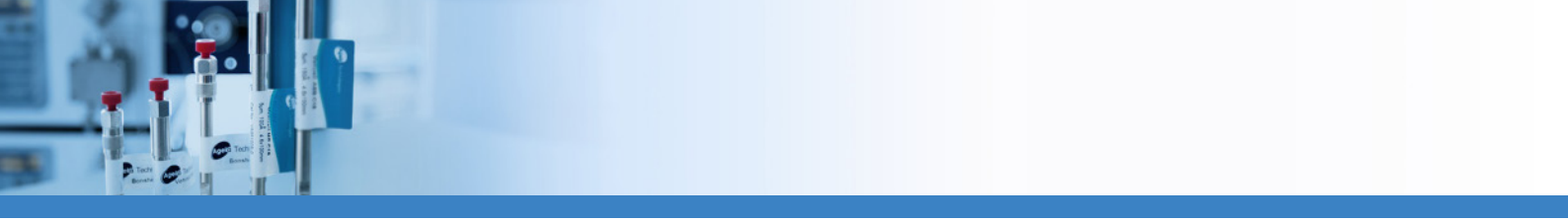


Sample: Uridine
Column: 4.6×150 mm, 5 µm
Mobile Phase: 100% water
Flow Rate: 1 mL/min; the flow was stopped for 5 minutes during the testing period for each column
Temperature: 30°C

Greater Volume Loading Capacity



Large Volume Injection (Injection volume=100 µL)
Sample: 4-methoxybenzenesulfon amide, 10 µg/mL in MeOH/Water (1:1)
Column: 4.6×150 mm, 5 µm
Mobile Phase: MeOH/Water
Flow Rate: 1 mL/min
Temperature: 30°C



Ordering Information

Unisol C18, Unisol C8; Surface Area: 410 m^2/g, Pore Size: 100 Å
Unisol C18(2); Surface Area: 340 m^2/g, Pore Size: 110 Å

Type	Particle(μm)	Dimension(mm)	Unisol C18	Unisol C18 (2)	Unisol C8
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	UO930302-2	
Fast analysis	3	2.1×50	UO930502-0	UO930502-2	
Fast analysis	3	2.1×100	UO931002-0	UO931002-2	
Fast analysis	3	2.1×150	UO931502-0	UO931502-2	
Fast analysis	3	3.0×30	UO930303-0	UO930303-2	
Fast analysis	3	3.0×50	UO930503-0	UO930503-2	
Fast analysis	3	3.0×100	UO931003-0	UO931003-2	
Fast analysis	3	4.6×50	UO930505-0	UO930505-2	
Fast analysis	3	4.6×100	UO931005-0	UO931005-2	
Fast analysis	3	4.6×150	UO931505-0	UO931505-2	
Analytical	5	0.5×50	UO9505005-0		
Analytical	5	2.1×30	UO950302-0	UO950302-2	UO850302-0
Analytical	5	2.1×50	UO950502-0	UO950502-2	UO850502-0
Analytical	5	2.1×100	UO951002-0	UO951002-2	UO851002-0
Analytical	5	2.1×150	UO951502-0	UO951502-2	UO851502-0
Analytical	5	3.0×30	UO950303-0	UO950303-2	UO850303-0
Analytical	5	3.0×50	UO950503-0	UO950503-2	UO850503-0
Analytical	5	3.0×100	UO951003-0	UO951003-2	UO851003-0
Analytical	5	4.6×50	UO950505-0	UO950505-2	UO850505-0
Analytical	5	4.6×100	UO951005-0	UO951005-2	UO851005-0
Analytical	5	4.6×150	UO951505-0	UO951505-2	UO851505-0
Analytical	5	4.6×250	UO952505-0	UO952505-2	UO852505-0
Semi-preparative	5	10×150		UO951510-2	
Semi-preparative	5	10×250		UO952510-2	
Preparative	5	21.2×50		UO950520-2	
Preparative	5	21.2×150		UO951520-2	
Preparative	5	21.2×250		UO952520-2	
Preparative	5	30×100		UO951030-2	
Preparative	5	30×150		UO951530-2	
Preparative	5	30×250		UO952530-2	

Note:
In case of guard cartridge is needed, please choose Agela universal guard column suit as choice. PN: SH-100KT.

Ordering Information

Surface Area: 340 m^2/g, Pore Size: 110 Å

Type	Particle(μm)	Dimension(mm)	Unisol C18 (2)
Semi-preparative	10	10×150	UO901510-2
Semi-preparative	10	10×250	UO902510-2
Preparative	10	21.2×50	UO900520-2
Preparative	10	21.2×150	UO901520-2
Preparative	10	21.2×250	UO902520-2
Preparative	10	30×100	UO901030-2
Preparative	10	30×150	UO901530-2
Preparative	10	30×250	UO902530-2
Preparative	10	50×150	UO901550-2
Preparative	10	50×250	UO902550-2

Note:
In case of guard cartridge is needed, please choose Agela universal guard column suit as choice. PN: SH-100KT.

NEW Products

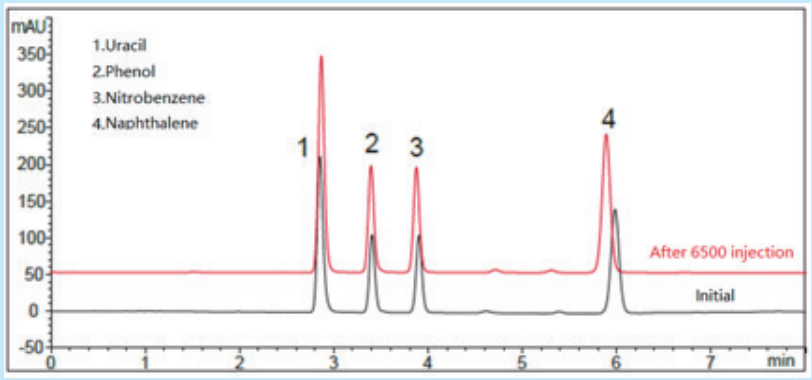
Venusil® C18 Plus

The Venusil® C18 Plus column was engineered to provide enhanced retention for nonpolar and medium polar compounds. This column has a perfect balanced surface area and pore size also the chemical bonding technology, which provide robust performance and universal usage throughout pH 1.5-9.0.

Characteristics

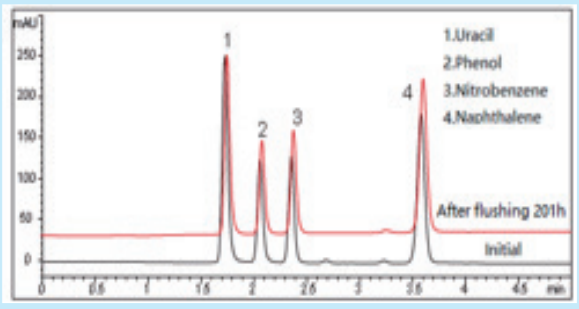
Carbon Loading: 14%,Characteristics: Pore Size: 120 Å; Specific Surface Area: 340 m^2/g; Available Particle Size: 3 μm, 5 μm; Silica purity: >99.999 %; pH=1.5-9.0, optimum pH is range from 2.0 to 6.0 which is recommended for better lifetime.

Anti-Pollution

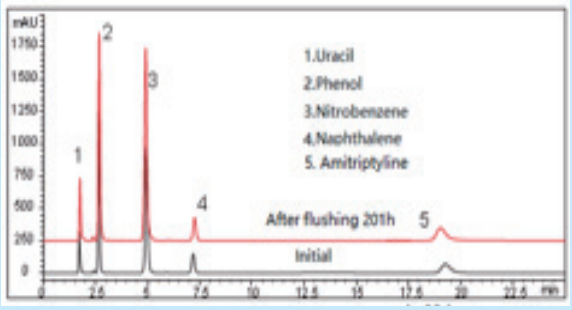


Directly Inject the Plasma sample (1 μL) into the column, after 6500 injections, Venusil® C18 Plus keeps good resolution and peak shape.

Stability in Extreme Mobile Phase

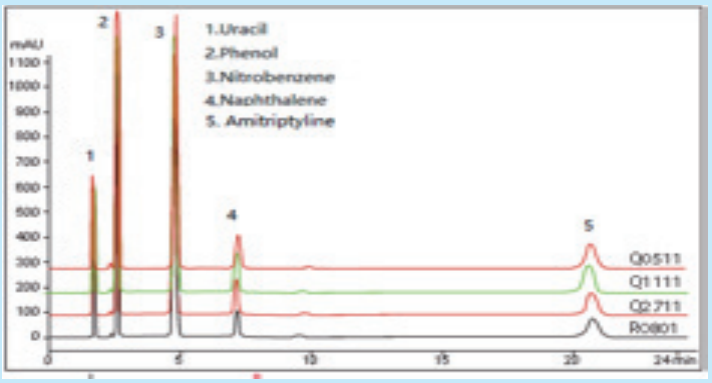


Venusil® C18 Plus, 5 μm, 4.6×150 mm
Flush the column by mobile phase of TFA (pH=1.5) : Methanol=60:40



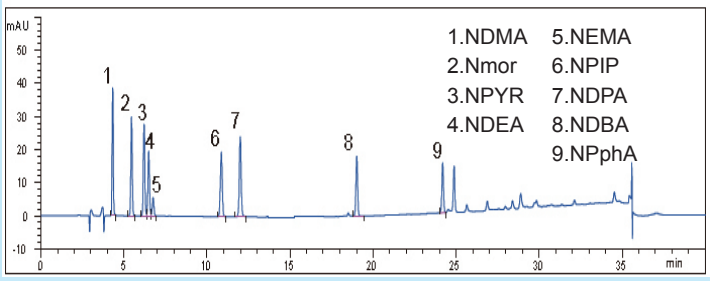
Venusil® C18 Plus, 5 μm, 4.6×150 mm
Flush the column by monopotassium phosphate (pH=8.0) : Methanol=50:50

High Reproducibility



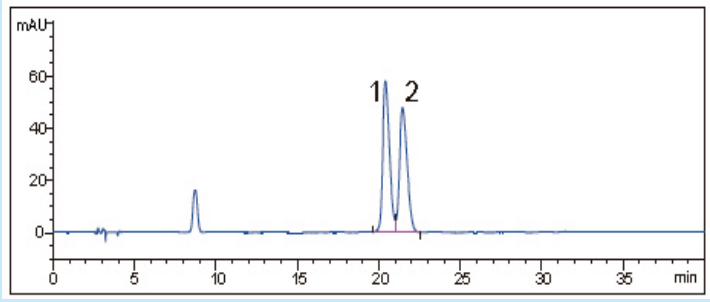
Column: Venusil® C18 Plus
5 μm, 4.6×150 mm
Mobile Phase: 0.02moL/L KH_2PO_4 Solution :
Methanol = 28:72
Detector: UV 254nm
Flow Rate: 1.0mL/min

Analysis of 9 kinds of NDMA



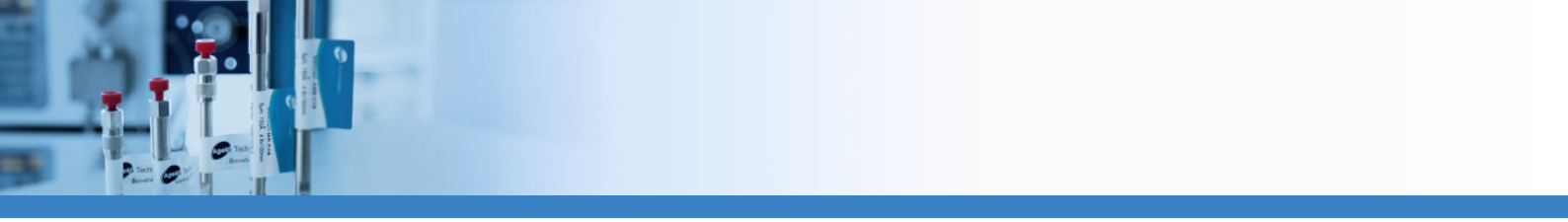
Column: Venusil® C18 Plus
5 μm, 4.6×250 mm
Mobile Phase: Gradient
Detector: UV 240nm
Flow Rate: 1.0mL/min

Separation of GLYCYL-GLUTAMINE MONOHYDRATE



1. GLYCYL-L-GLUTAMINE MONOHYDRATE
2. GLYCYL-D-GLUTAMINE MONOHYDRATE

Column: Venusil® C18 Plus
5 μm, 4.6×250 mm
Mobile Phase: Methanol : Phosphate Buffer
= 15:85
Detector: UV 338 nm
Flow Rate: 1.0 mL/min



Ordering Information

Surface Area: 340 m^2/g, Pore Size: 120 Å

Type	Particle(μm)	Dimension(mm)	Venusil® C18 Plus
Analytical	3	2.1×30	VPS930302-A
Analytical	3	2.1×50	VPS930502-A
Analytical	3	2.1×100	VPS931002-A
Analytical	3	2.1×150	VPS931502-A
Analytical	3	4.6×50	VPS930505-A
Analytical	3	4.6×100	VPS931005-A
Analytical	3	4.6×150	VPS931505-A
Analytical	5	2.1×30	VPS950302-A
Analytical	5	2.1×50	VPS950502-A
Analytical	5	2.1×100	VPS951002-A
Analytical	5	2.1×150	VPS951502-A
Analytical	5	4.6×50	VPS950505-A
Analytical	5	4.6×100	VPS951005-A
Analytical	5	4.6×150	VPS951505-A
Analytical	5	4.6×200	VPS952005-A
Analytical	5	4.6×250	VPS952505-A

Note:
In case of guard cartridge is needed, please choose Agela universal guard column suit as choice. PN: SH-100KT.

Featured Products

Venusil® AQ C18

The Venusil® AQ C18 column is designed for the separation of polar, medium-polar and non-polar compounds from 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.

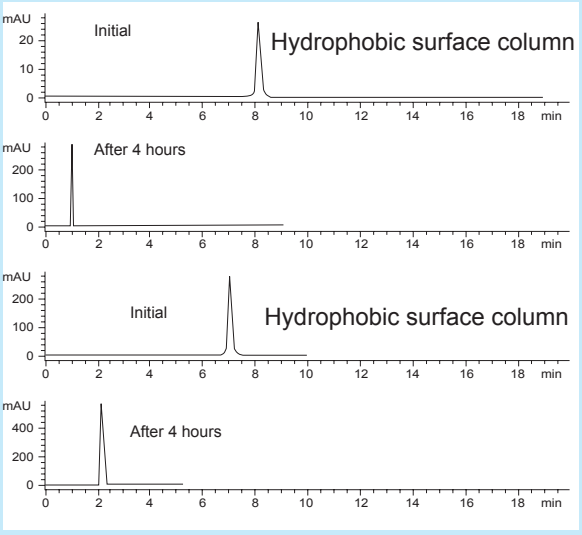
Characteristics

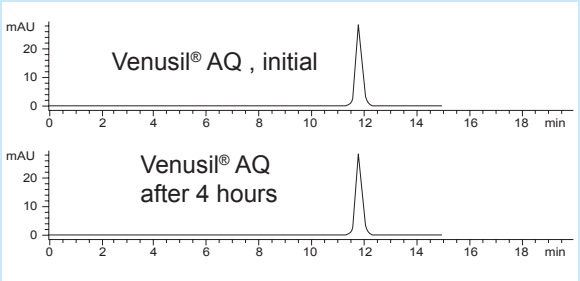
Carbon Loading: 18%,Pore Size: 100 Å; Specific Surface Area: 380 m^2/g; Available Particle Size: 3 μm, 5 μm; Single end-capped; pH=1.5-9.0, optimum pH is range from 2.0 to 6.0 which is recommended for better lifetime.

Main Features

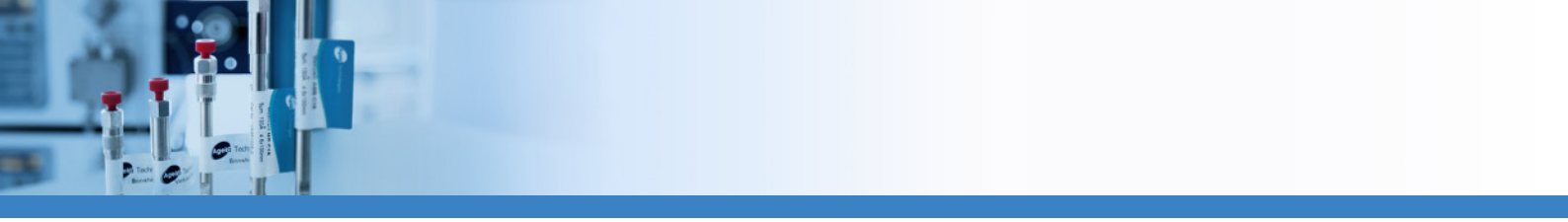
- Inertness: one of the most base-friendly columns, excellent peak symmetry for basic compounds.
- Efficiency: The best column for polar compounds at any pH.
- Large volume injection: maintains very high efficiency even if the injection volume is exceptionally large.
- 100% water compatible: very unique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

Compatibility with 100 % Aqueous Mobile Phase

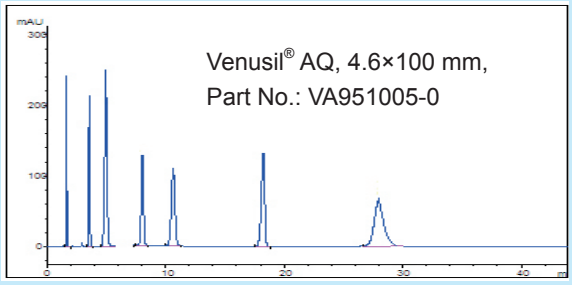




Sample: Uridine
Column: 4.6x150 mm, 5 μm
Mobile Phase: 100 % water
Flow Rate: 1 mL/min; the flow was stopped for 5 minutes during the testing period for each column
Detector: UV 254nm
Temperature: 30°C

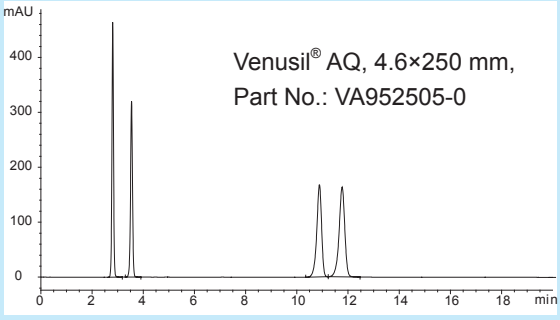


Balanced Retention for Hydrophilic and Hydrophobic Compounds



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
Temperature: 23°C
Sample: uracil,
propranolol hydrochloride,
butyl phthalate,
dimethyl phthalate,
naphthalene,
acenaphthene and amitriptyline

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°C
Detector: UV 275 nm
Sample: Uracil,
Paracetamol,
acetophenone
2-Hydroxybenzoic acid

Ordering Information

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

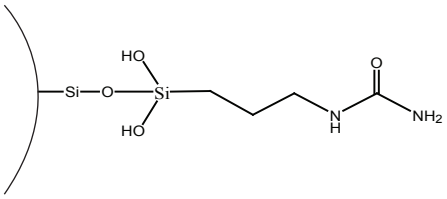
Type	Particle(μm)	Dimension(mm)	Venusil®AQ C18
Fast analysis	3	2.1×30	VA930302-0
Fast analysis	3	2.1×50	VA930502-0
Fast analysis	3	2.1×100	VA931002-0
Fast analysis	3	2.1×150	VA931502-0
Fast analysis	3	4.6×50	VA930505-0
Fast analysis	3	4.6×100	VA931005-0
Fast analysis	3	4.6×150	VA931505-0
Analytical	5	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

Note:
In case of guard cartridge is needed, please choose Agela universal guard column suit as choice. PN: SH-100KT.

Featured Products

Venusil® HILIC

Venusil® HILIC stationary phase is made from ultra pure spherical silica particles bonded with a neutral hydrophilic amide group. It can be used as normal phase, reversed phase or hydrophilic interaction HPLC. The Venusil® HILIC column is a suitable replacement for NH_2 and silica columns that are currently marketed as HILIC. Compared with traditional silica and NH_2 columns, the Venusil® HILIC column has 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. Venusil® HILIC presents unique selectivity for many molecules because of its difference in separation mechanism compare to most of the conventional stationary phases.



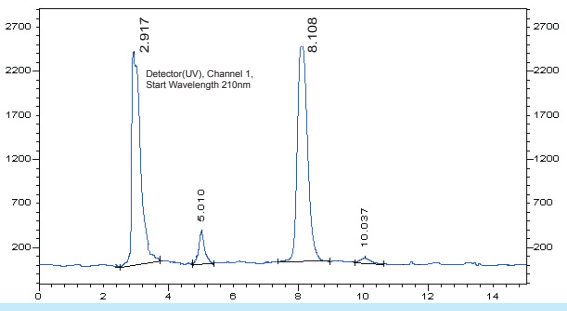
Characteristics

Metal Impurity<30 ppm; No End-capped;
Pore Size 100 Å; Specific Surface Area: 380 m2/g; Carbon Loading 8%;
Available Particle Size: 3 μm, 5 μm and 10 μm;
Compatible pH range is 2.0-8.0, optimum pH ranges from 2.0 to 6.0 which is recommended for better lifetime.

Main features

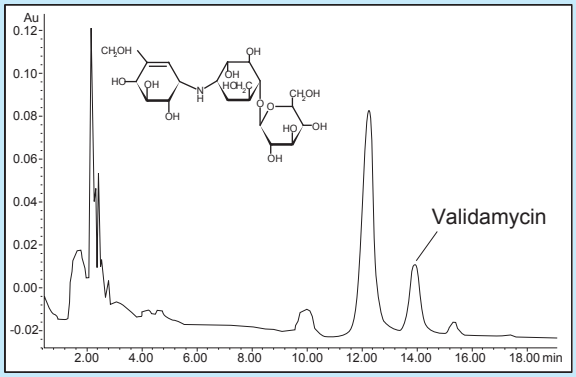
- Strong retention of polar compounds in HILIC mode
- Unique selectivity and complementary to conventional reversed phase and normal phase
- Can be used as reversed phase, normal phase and HILIC phase
- More robust and reproducible performance than silica and amino stationary phase
- 100% aqueous and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

Separation of Shikimic Acid



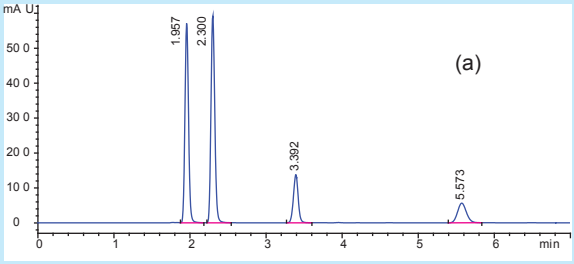
Column: Venusil® HILIC, 5 μm, 4.6 ×150 mm
Part No.: VH951505-0
Mobile Phase: A:1% Fomic Acid in Water; B: Acetonitrile
Gradient: 60% A to 90% A in 20 min
Flow Rate: 1 mL/min
Temperature: 25°C
Detector: UV 210 nm
Sample: Shikimic Acid

Separation of Validamycin



Column: Venusil® HILIC, 4.6×250 mm, 5 µm
Part No.: VH952505-0
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°C
Detector: UV 210 nm
Sample: Validamycin

Water-soluble Vitamins



(a) Venusil® HILIC, 5 µm, 4.6 ×150 mm
Part No.: VH951505-0
Mobile Phase: 0.1% TFA in Water: 0.1% TFA in Acetonitrile=90:10
Flow Rate: 1 mL/min
Temperature: 30°C
Detector: UV 280 nm
Sample: VB1+VB6+VC+VB2

Comparative separations may not be representative of all applications.

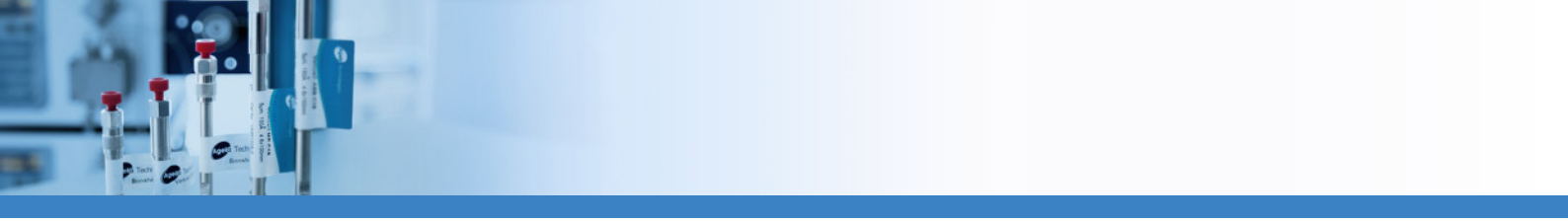
Ordering Information

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

Type	Particle(μm)	Dimension(mm)	Venusil®HILIC
Analytical	3	2.1×30	VH930302-0
Analytical	3	2.1×50	VH930502-0
Analytical	3	2.1×100	VH931002-0
Analytical	3	2.1×150	VH931502-0
Analytical	3	4.6×50	VH930505-0
Analytical	3	4.6×100	VH931005-0
Analytical	3	4.6×150	VH931505-0
G	3	4.6×10,4/pk	VH930105-0
DCG	3	4.6×10,4/pk	VH930105-0S
Analytical	5	2.1×30	VH950302-0
Analytical	5	2.1×50	VH950502-0
Analytical	5	2.1×100	VH951002-0
Analytical	5	2.1×150	VH951502-0
Analytical	5	4.6×50	VH950505-0
Analytical	5	4.6×100	VH951005-0
Analytical	5	4.6×150	VH951505-0
Analytical	5	4.6×250	VH952505-0
G	5	4.6×10,4/pk	VH950105-0
DCG	5	4.6×10,4/pk	VH950105-0S
Semi-preparative	5	10×150	VH951510-0
Semi-preparative	5	10×250	VH952510-0
Preparative	5	20×50	VH950520-0
Preparative	5	21.2×150	VH951520-0
Preparative	5	21.2×250	VH952520-0
Preparative	5	30×100	VH951030-0
Preparative	5	30×150	VH951530-0
Preparative	5	30×250	VH952530-0
G	5	21.2×10	VH950120-0
G	5	10×10	VH950110-0S
Semi-preparative	10	10×150	VH901510-0
Semi-preparative	10	10×250	VH902510-0
Preparative	10	21.2×50	VH900520-0
Preparative	10	21.2×150	VH901520-0
Preparative	10	21.2×250	VH902520-0
Preparative	10	30×100	VH901030-0
Preparative	10	30×150	VH901530-0
Preparative	10	30×250	VH902530-0
Preparative	10	50×150	VH901550-0
Preparative	10	50×250	VH902550-0
G	10	21.2×10	VH900120-0
G	10	10×10	VH900110-0S

G: Guard Cartridge

DCG: Direct-connection Guard Cartridge Holder



NEW Products

Durashell C18-AM

Based on a new generation of silica and bonding technologies, Bonna-Agela technologies has developed new Durashell C18-AM columns. Firstly, silica gel made by inert processing techniques can be kept stable in alkaline mobile phase, significantly improving column lifetime compared with conventional silica; Secondly, the strong ability to identify stereoisomeric compounds, applicable to separation of structurally similar compounds, especially for analysis of a variety of impurities simultaneously in drug.

Main Features

- Excellent stability in extreme pH range (1.5-12.0);
- Double polar end-capped, strong separation ability for polar compounds;
- Special bonding, strong ability to identify stereoisomeric compounds;
- Hydrophilic stationary phase, compatible with 100% aqueous mobile phase.

Characteristics

Bonded phase	Particle size(um)	Pore Size(Å)	Carbon loading(%)	Specific surface (m^2/g)	End-capping	pH range*
C18-AM	5	100	14	380	Double	1.5-12.0
C18(L)	5	150	9	200	Double	1.5-12.0

Notes: * Optimum pH range from 2.0 to 10.0; Use the column under optimum pH could ensure a longer lifetime.

The determination of cefradine content and related substance

Determination of cefradine content

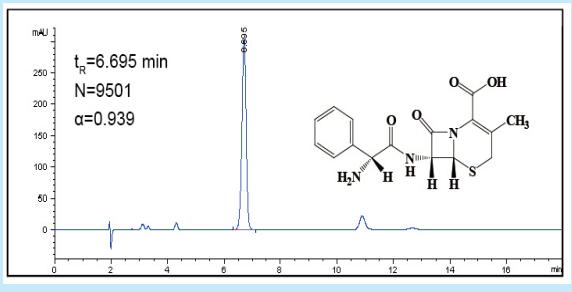


Fig.1 Chromatogram for determination of cefradine content with Durashell C18-AM

Column: Durashell C18-AM,
5 μm, 100 Å, 4.6 × 250 mm;
Mobile Phase: Disodium hydrogen phosphate solution containing 0.027 mol/Loctyl sulfonate (pH adjusted to 8.0 with phosphoric acid) - methanol (75 : 25,v/v);
Detector: UV 206nm;
Temperature: 30°C;
Injection: 10 μL;
Flow rate: 1.0 mL/min.

Inspection of related substance in cefradine

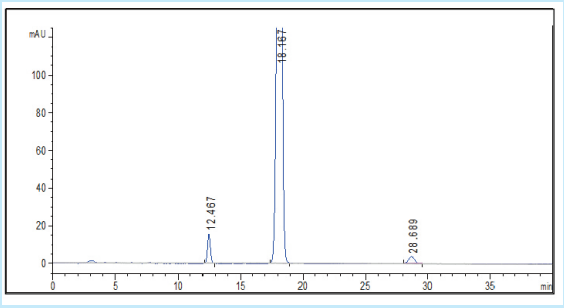


Fig.2 Chromatogram for inspection of related substances in cefradine sample solution with Durashell C18-AM

Column: Durashell C18-AM, 5 μm, 100 Å; 4.6 × 250 mm
Mobile Phase: Water:methanol:3.86% Sodium acetate solution:4% Acetic acid solution (1564:400:30:6);
Detector: UV 254 nm;
Temperature: 30°C;
Injection: 20 μL;
Flow rate: 1.0 mL/min;

Analysis result for cefradine content and the inspection of related substance

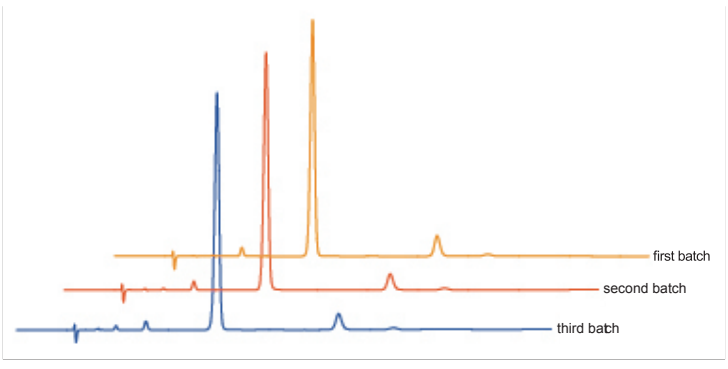
Name	Retention time(min)	Related Retention Time	Separation Degree
Cephalexin	12.467	0.686	
Cefradine	18.167	1.000	10.91
Unknown Impurity	28.689	1.579	13.77

Notes:

1. The retention time of Cefradine is 6.7 mins. Column efficiency is 9501. Tailing factor is 0.939. The resolutions of Cephalexin, Cefradine and Arginine peaks all meet the requirements of Pharmacopoeia;

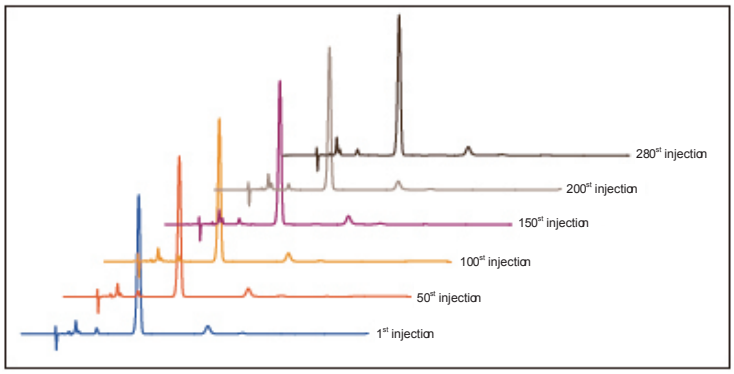
2. During the inspection of related substances, two main impurities were detected , while the resolutions of each chromatographic peak all meet the requirements of Pharmacopoeia.

Good batch reproducibility



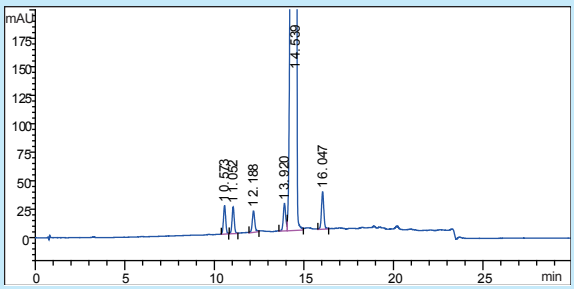
Long lifetime

To inspect the lifetime of Durashell C18-AM, the method of cefradine content determination was applied. The sample spiked with arginine was injected consecutively into Durashell C18-AM which was washed once per 80 injections. At the same time, the changes should be observed in cefradine peak's retention time, column efficiency and peak shape, as well as the resolution of arginine and the 4th unknown impurity, and if any of the changes was significant, then the test should be stopped. In this way, totally 280 injections were processed successfully.



The above figure shows, after 280 injections, there is no significant change in retention time, column efficiency, tailing factor. During the analysis of cefradine, due to the use of higher concentration of ion-pair reagents and buffer solution (total concentration of 54 mM) and alkaline mobile phase (pH 8.0), decline of a lot of other C18 column was observed in peak retention and efficiency and impurity resolution in less than 50 injections. Although a certain C18 alkali tolerant column has good stability in the first 80 injections, decrease was gradually appeared in retention, efficiency and resolution in the more injections, even it was unable to separate impurities near arginine in 4th 80 injections (totally about 240 injection). While Durashell C18-AM showed excellent durability, and still remained a stable retention, good separation and high column efficiency after the 1100 injections.

EP Method-the determination of risperidone content and the inspection of related substance

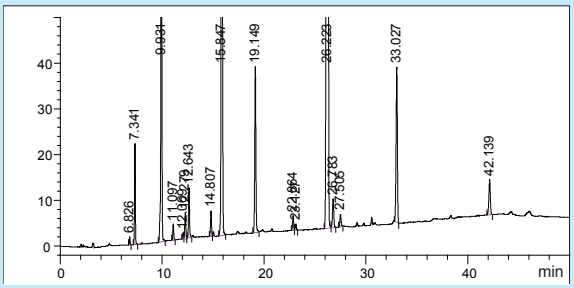


Chromatogram of impurities A, B, C, D, Risperidone, impurity E successively with Durashell C18-AM

Columns: Durashell C18-AM, 5 μm, 100 Å, 4.6×100 mm;
Mobile phase A: 5.0 g Ammonium acetate dissolved in 1000 mL water;
Mobile phase B: Methanol;
Flow rate: 1.5 mL/min;
Detector: UV 260nm;
Temperature: 30°C;
Injection: 10 μL;
Gradient:

Time (min)	A%	B%
0	70	30
2	70	30
17	30	70
22	30	70
22.1	70	30
30	70	30

The separation of the degradation product of lansoprazole according to USP



Chromatogram of degradation products of ansoprazole raw material with Durashell C18-AM

Column: Durashell C18-AM, 5 μm, 100 Å, 4.6×250 mm;
Mobile Fhase A: Water
Mobile Fhase B: Acetonitrile: water: triethylamine (160/40/1), adjusted to pH 7.0 with phosphoric acid
Detector: UV 285nm; Temparature: 30°C;
Flow rate: 1.5 mL/min; Injection: 40 μL;
Gradient:

Time (min)	A%	B%
0	0	10
40	40	80
50	50	80
51	51	10
60	60	10

Detection of azithromycin and relevant matrix compounds(b)

Chromatogram of azithromycin content detection

Column: Durashell C18-AM, 5 μm, 4.6x250 mm;
Mobile Phase A: 0.05 mol/L dipotassium phosphate buffer, and adjust the pH to 8.2 by 20% Phosphoric acid solution;
Mobile Phase B: ACN; A:B=45:55
Detector: UV 210nm;
Flow Rate: 1mL/min
Temperature: 30°C
Injection: 50 μL

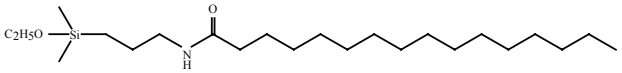
Ordering Information

Type	Particle (μm)	Dimension (mm)	Durashell C18-AM	Durashell C18-AM (L)
Analytical	5	2.1×30	DC950302-AM	DC950302-AML
Analytical	5	2.1×50	DC950502-AM	DC950502-AML
Analytical	5	2.1×100	DC951002-AM	DC951002-AML
Analytical	5	2.1×150	DC951502-AM	DC951502-AML
Analytical	5	4.6×50	DC950505-AM	DC950505-AML
Analytical	5	4.6×100	DC951005-AM	DC951005-AML
Analytical	5	4.6×150	DC951505-AM	DC951505-AML
Analytical	5	4.6×200	DC952005-AM	DC952005-AML
Analytical	5	4.6×250	DC952505-AM	DC952505-AML

Note:
In case of guard cartridge is needed, please choose Agela universal guard column suit as choice. PN: SH-100KT.

NEW Products

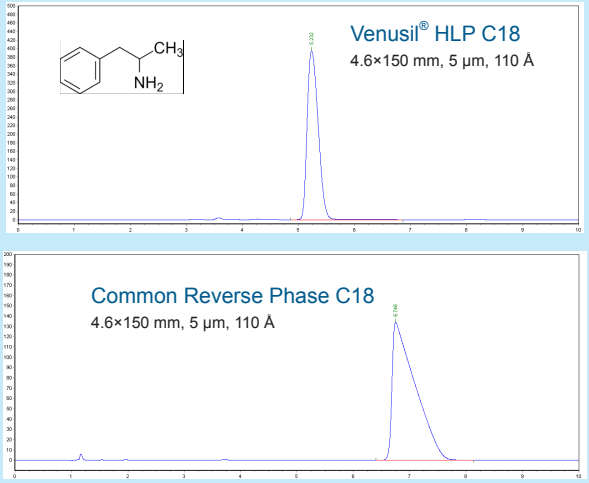
Venusil® HLP C18



Venusil® HLP C18 column is a kind of reversed-phase column based on Bonna-Agela's amide embedded technology. The stationary phase is made from ultra pure spherical silica particles bonded with alkyl chain molecules and embedded amide polar group which literally capped the silica's residual silanols to prevent their interaction with highly basic compounds. This special chemical bonding group changes the retention mechanism, and provides a benefit that there is no need to adjust the pH to restrain the ionization and ensure a good retention of basic compounds. It could be used for multi analytes separation, and also have a more robust chemical bonding and provide better lifetime.

Characteristics

Pore Size: 110 Å; Specific Surface Area: 340 m^2/g; Available Particle Size: 5 μm.
Carbon loading: 15%; No end-capped;
Compatible pH range is 2.0-8.0, optimum pH is range from 2.0 to 6.0 which is recommended for better lifetime.



Sample: 1 mg/mL amphetamine
Mobile Phase: Methanol: 0.02M buffer solution of potassium phosphate(Adjust the pH=2 by 0.1% triethylamine=15:85
Flow Rate: 1 mL/min
Injection Volume: 10 μL
Detector: UV 215nm

Peak of Amphetamine	RT	N	Tf
HLP C18	5.232	3181	1.342
Common C18	6.748	1219	3.519

Ordering Information

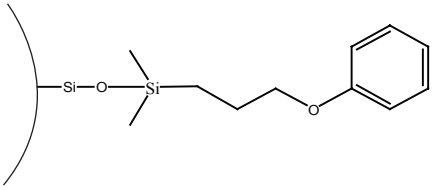
Surface Area: 340 m^2/g, Pore Size: 110 Å

Type	Particle(μm)	Dimension(mm)	Venusil®HLP C18
Analytical	5	4.6×50	VHP950505-0
Analytical	5	4.6×100	VHP951005-0
Analytical	5	4.6×150	VHP951505-0
Analytical	5	4.6×200	VHP952005-0
Analytical	5	4.6×250	VHP952505-0

Note:
In case of guard cartridge is needed, please choose Agela universal guard column suit as choice. PN: SH-100KT.

NEW Products

Venusil® XBP Polar – Phenyl



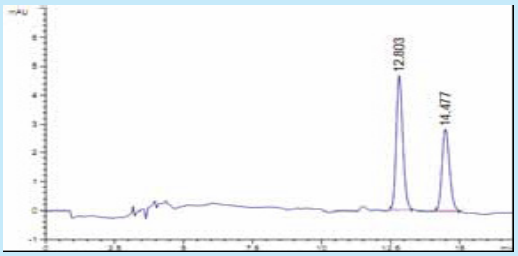
In reversed phase stationary phase carbon chain embedded polar group, raised the strong polarity and the strong basic compound selective. Polar groups blocked silicon alcohol group which greatly improved the peak shape.

Characteristics

Metal Impurity<30 ppm; Pore Size: 110 Å; Specific Surface Area: 340 m^2/g;
Available Particle Size:, 5 μm; Carbon loading: 11%; end-capped;
pH=1.5-9.0, optimum pH is range from 2.0 to 6.0 which is recommended for better lifetime.

Main Features

- An Ether-linked Phenyl Column with Polar Endcapping;
- Different selectivity compared with reversed-phase C18 or C8 column;
- Greater separation between polar and aromatic compounds with only slight differences chemically or structurally.



Sample: Pseudoephedrine hydrochloride Ephedrine hydrochloride 0.1 mg/mL;
Column: 4.6×250 mm; 5 μm;
Mobile phase: 1.16% Solution of ammonium acetate (pH=4.0): MeOH=94:6;
Detector: UV 257nm;
Injection : 20 μL

Ordering Information

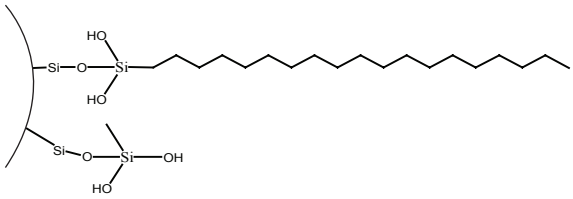
Type	Particle(μm)	Dimension(mm)	Venusil®XBP Polar – Phenyl
Analytical	5	2.1×50	VXP650502-A
Analytical	5	2.1×100	VXP651002-A
Analytical	5	2.1×150	VXP651502-A
Analytical	5	4.6×50	VXP650505-A
Analytical	5	4.6×100	VXP651005-A
Analytical	5	4.6×150	VXP651505-A
Analytical	5	4.6×250	VXP652505-A
G	5	4.6×10, 4/pk	VXP650105-A
DCG	5	4.6×10, 4/pk	VXP650105-AS

G: Guard Cartridge
DCG: Direct-connection Guard Cartridge Holder

NEW Products

Innoval AQ C18

The Innoval AQ C18 is made by Bonna-Agela's 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

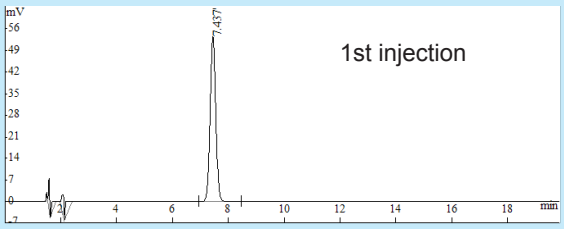
Bonded phase	Particle size(um)	Pore Size(Å)	Carbon loading(%)	Specific surface (m^2/g)	End-capping	pH range*
AQ C18	5	100	15	220	Single	1.5-9.0

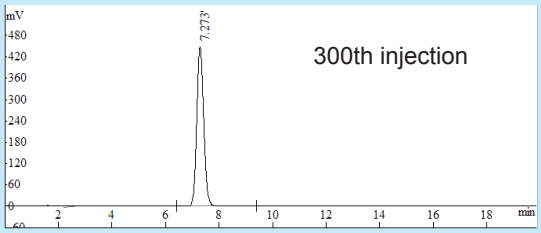
Notes: * Optimum pH range from 2.0 to 6.0; Use the column under optimum pH could ensure a longer lifetime.

Main Features

- Strong separation performance for polar and isomer compounds
- Good pressure tolerance (6000 Psi)
- No dead pores, high stability and prolonged lifetime
- Lower surface area ensures good contamination tolerance
- 100 % aqueous compatibility

Long life-time of Innoval AQ C18 thanks to its highly polar surface





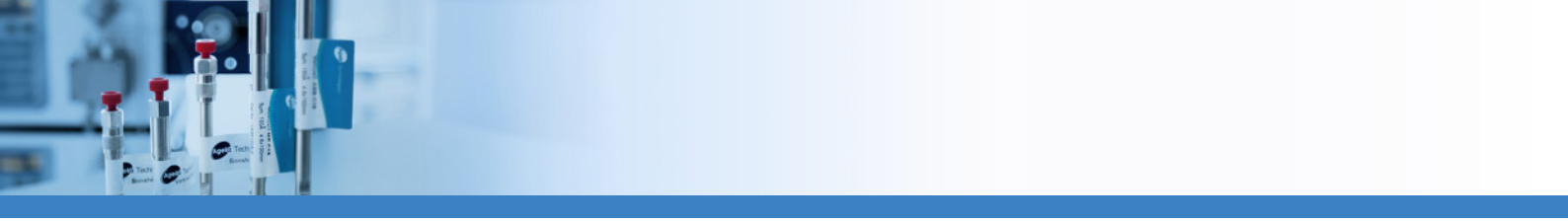
Sample: Cefadroxi
Column: Innoval AQ C18, 5 μm,100 Å, 4.6×150 mm
Mobile phase A: 0.02 mol/L potassium phosphate□Mobile phase B: Methanol□A:B=98:2□
Flow rate: 1.0 mL/min□
Detector: 230 nm□
Temperature: 30°C□
Injection volume: 10 μL

Ordering Information

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

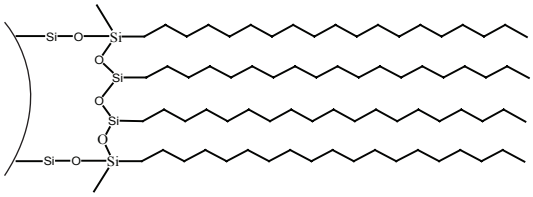
Type	Particle(μm)	Dimension(mm)	Innoval AQ C18
Analytical	5	4.6×50	IA950505-0
Analytical	5	4.6×100	IA951005-0
Analytical	5	4.6×150	IA951505-0
Analytical	5	4.6×250	IA952505-0

Note:
In case of guard cartridge is needed, please choose Agela universal guard column suit as choice. PN: SH-100KT.



NEW Products

Venusil® PAH



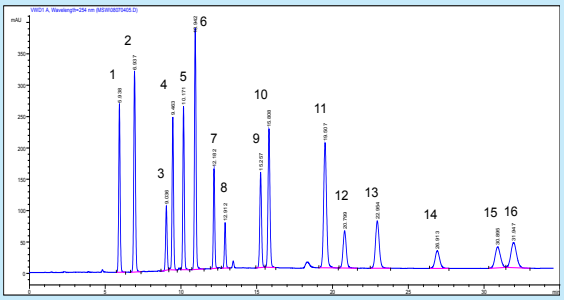
Venusil® PAH column is a polymerically bonded C18 column. It is recommended for the separation of PAHs and steric isomers of the aromatic compounds. PAHs are considered as priority pollutants and the analysis of these potentially carcinogenic compounds in water, soil and food is of major importance.

Characteristics

Metal Impurity<30 ppm; Pore Size: 200 Å; Specific Surface Area: 200 m^2/g; Available Particle Size: 5 μm,
Carbon Loading: 17%; No end-capped; pH range is1.5 to 9.0, optimized pH range from 2.0 to 6.0, which could ensure a satified lifetime.

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:

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

Time(min)	MeOH (%)	H_2O (%)
0	85	15
2	85	15
7	95	5
40	95	5

Ordering Information

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

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

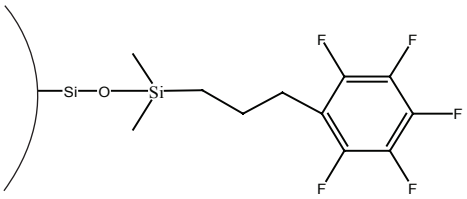
G: Guard Cartridge

DCG: Direct-connection Guard Cartridge Holder

NEW Products

Venusil® PFP---USP L43

Venusil® PFP (Pentafluorophenyl) columns deliver the performance of Venusil® columns by providing excellent peak shape while also offering alternative selectivity of 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 suitable for 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.



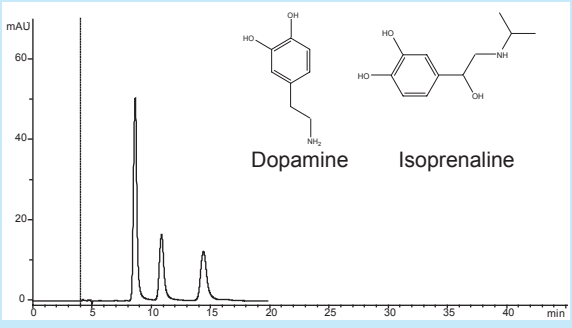
Characteristics

Metal Impurity<30 ppm; Pore Size: 120 Å; Specific Surface Area: 320 m^2/g; Available Particle Size: 5 μm.
No end-capped; pH range is 2.0 to 8.0, optimized pH range from 2.0 to 6.0, which could ensure a satified lifetime.

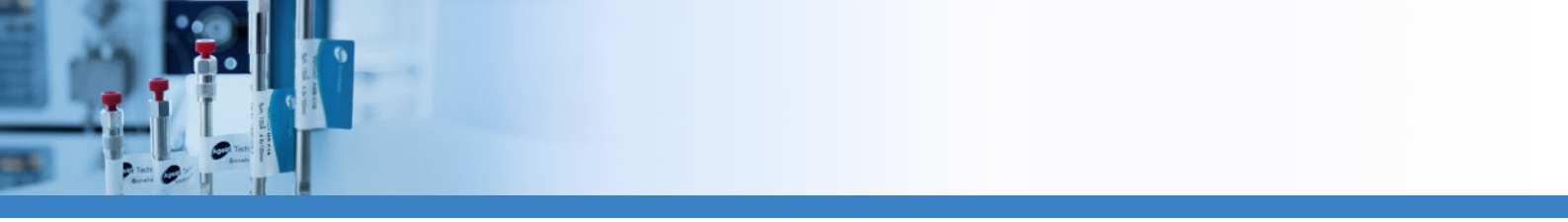
Main Features

- 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



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 (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

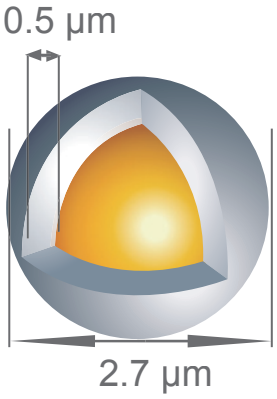
HPLC Column by Family

NEW Products

Bonshell HPLC Columns

------Shell Technology Solutions for Faster Separations

Bonshell Columns are made up of shell particle to carry out faster separations with low back pressures. Bonshell has 0.5 µm porus shell covering solid core inside with diameter of 1.7 µm. With overall particle size of 2.7 µm.



Bonshell Columns are ideal to be used with both UPLC and Conventional HPLC Systems which enables the scientist to easily transfer their existing method from HPLC to UPLC & vice-versa without changing the expensive hardware in HPLC system.

The scalability of Bonshell Columns from conventional analytical dimensions to shorter dimensions and vice-versa makes it more special to use in the HPLC lab and for new method development it is ideal choice of the column which can easily work with both UPLC and HPLC to save the solvent cost, run time of the analysis & most importantly workable pressure range maximum up to 9000 psi making it best choice for the analytical separations in every real sense. The cost of coreshell technology products are lesser than sub 2 µm columns and in API & Formulation Analytical.

However, the lifetime cannot be compared with regular longer length columns. We can conclude in nutshell Bonshell Columns are excellent tool for method development studies and shortening the overall analysis time with any commonly available HPLC System with less cost and optimal pressure with excellent peak shapes & resolution between the compounds.

Main features

- Core-shell technology;
- Stable at operating pressures up to 600 bar (9000 psi);
- High column efficiency as UHPLC column but low back pressure as conventional HPLC column.

Bonshell ASB C18

This C18 column has protective butyl side chains to enhance peak shape and separation of basic compounds under neutral and acidic conditions.

Main features

- Core-shell technology
- Stable at operating pressures up to 600 bar (9000 psi)
- Low pH stability, could be used even at pH=0.8
- Excellent resolution for polar compounds
- Compatibility with 100% aqueous mobile phase

Bonshell C18

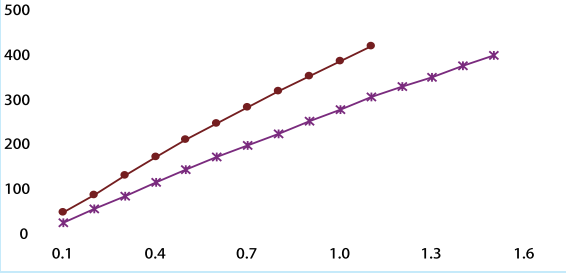
This C18 column offers the hydrophobic retention and methylene selectivity chromatographers expected from a C18 column.

Stationary Phase Characteristics

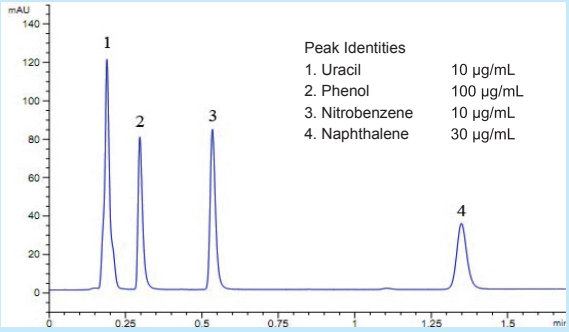
Bonded phase	Particle size(um)	Pore Size(Å)	Carbon loading(%)	Specific surface (m^2/g)	End-capping	pH range*
ASB C18	2.7	90	7	150	No	1.0-7.5
C18	2.7	90	10	150	Double	1.5-9.0

Notes: * Optimum pH range of Bonshell C18 is 2.0-6.0, and for ASB C18 is 1.0-4.0;
Use the column under optimum pH could ensure a better lifetime.

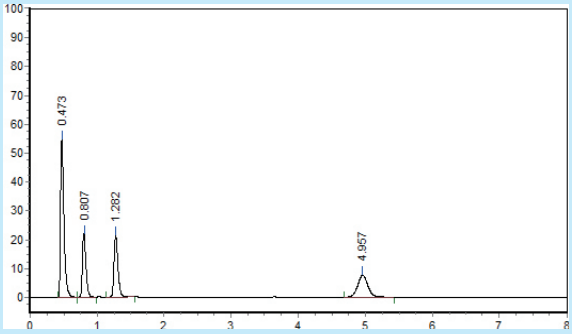
Low Pressure than UHPLC Column



Column: 2.1× 50 mm
Mobile phase: ACN : H_2O=70:30, 25°C
Red curve: 1.9 μm UHPLC column
Purple curve': Bonshell
Compared to the same dimension UHPLC column, Bonshell column has a column pressure 40% lower and the same column efficiency. Also, it enjoys a faster separation.



2.7 μm Bonshell ASB C18



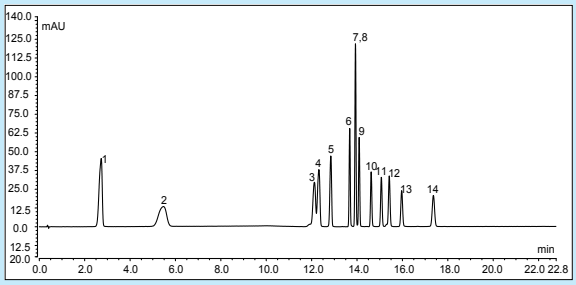
1.9 μm UHPLC C18 column

Column: 2.1×50 mm; Mobile phase: 50% water and 50% ACN
Flow rate: 0.5 mL/min; Temperature: 30°C; Detector: UV 254 nm

	Bonshell ASB C18	1.9 μm Traditional C18
Column efficiency	9600	9100
Pressure	175 bar	275 bar

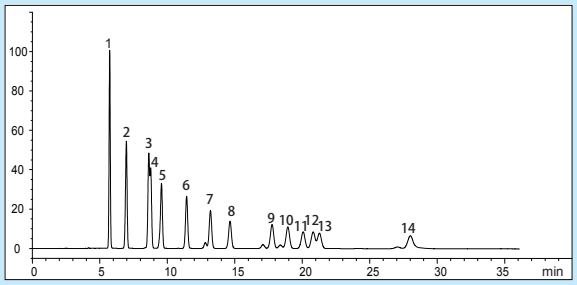
High Efficiency as UHPLC Column

Separation of fourteen 2,4-dinitrophenylhydrazone derivatives formaldehyde, acetaldehyde, acraldehyde, propylaldehyde, crotonaldehyde, butanone, butaldehyde, methacrolein, benzaldehyde, amyl aldehyde, toluyl aldehyde, cyclohexanone, caproaldehyde



Sample: 14 DNPHs
Column: Bonshell C18, 4.6×100 mm, 2.7 μm, 90 Å,
Detection: UV 360 nm
Flow Rate: 1.2 mL/min
Mobile Phase:

Time(min)	ACN (%)	H_2O (%)
0	40	60
5	30	70
9	25	75
13	60	40



Sample: 14 DNPHs
Column: Venusil® XBP C18, 4.6×250 mm, 5 μm
P/N: VX952505-0
Detection: UV 360 nm
Flow Rate: 1 mL/min
Mobile Phase: ACN:Water=60:40

Ordering Information

Type	Particle(μm)	Dimension(mm)	Bonshell ASB C18	Bonshell C18
Analytical	2.7	2.1×30	SS920302-0	SC920302-0
Analytical	2.7	2.1×50	SS920502-0	SC920502-0
Analytical	2.7	2.1×100	SS921002-0	SC921002-0
Analytical	2.7	3.0×30	SS920303-0	SC920303-0
Analytical	2.7	3.0×50	SS920503-0	SC920503-0
Analytical	2.7	3.0×100	SS921003-0	SC921003-0
Analytical	2.7	4.6×50	SS920505-0	SC920505-0
Analytical	2.7	4.6×75	SS920805-0	SC920805-0
Analytical	2.7	4.6×100	SS921005-0	SC921005-0

G: Guard Cartridge
DCG: Direct-connection Guard Cartridge Holder

NEW Products

UHPLC Technology and Columns

Chromatography separation technology has been revolutionized by Ultra-Performance Liquid Chromatography (UHPLC) System. Sub-2 μm particles make UPLC analysis more quickly, and more sensitive than traditional liquid chromatography. Since 2014, Bonna-Agela has launched our UHPLC series columns and provided different kinds of bonding chemistry on several modified silica particles surface.

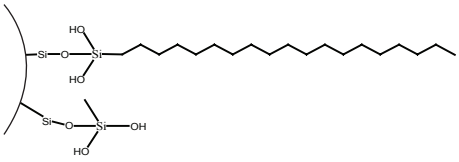
Bonna-Aglea UHPLC columns are packed with 1.9 μm particles based on ultra pure silica prepared by aggregation of silica sols. This kind of silica has narrow size distribution and no dead pores whose pore size is smaller than 2nm.
Bonna-Agela UHPLC family includes UHP AQ C18; UHP ASB C18, UHP Innovol C18 and UHP HILIC.

UHP AQ C18 is based on new spherical silica with high purity, with double layer surface modification technology, which reduces the interactions between polar analytes and silica surface significantly and subsequently symmetry for very basic compounds is maximized. UHP ASB C18 is bonded with unique bulky silanes that sterically protect the siloxane bond. UHP Innoval C18 is end-capped twice to ensure an inert stationary phase.

The UHPLC material is packed in newly designed column housings with extremely low void volume, which tolerate back-pressure up to more than1000 bar or 15000 psi.

UHP AQ C18

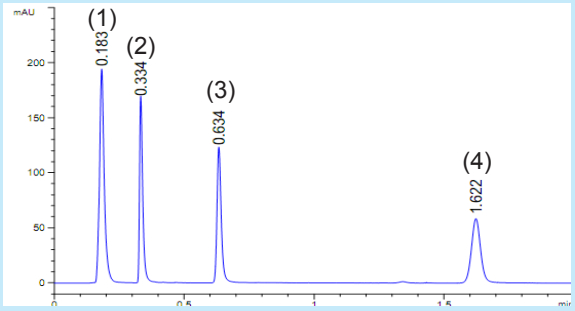
Characteristics



Metal Impurity<30 ppm; Pore Size: 100 Å;
Specific Surface Area: 240 m^2/g; Available Particle Size: 1.9 μm.
Carbon Loading: 8%; Single end-capped;
pH range is 1.5 to 9.0, optimized pH range from 2.0 to 6.0, which could ensure a satisfied lifetime.

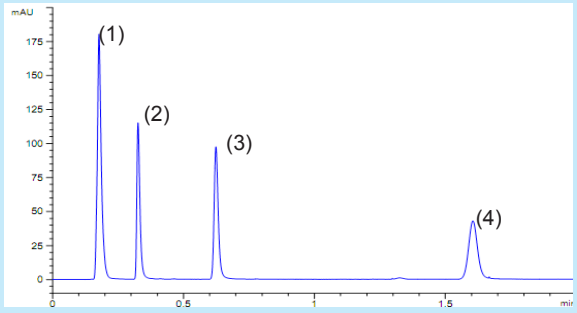
Main Features

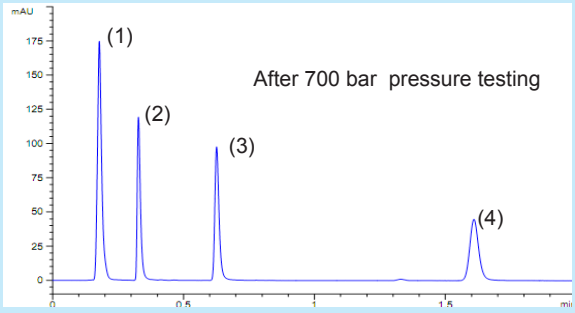
- Greatly improved peak shape for basic compounds;
- 100 % water compatibility;
- Low pH stability: stable at pH as low as 1.5;
- Plate Count: 200000/m;
- Tailing Factor: 0.98-1.25;



Column: UHP AQ C18, 2.1x50 mm, 1.9 µm
Sample: (1) Uracil (2) Phenol (3) Nitrobenzene
(4) Naphthalene
Mobile phase: 50 % Acetonitrile / 50 % Water
Flow Rate: 0.5 mL/min
Pressure: 337 bar
Temperature: 30°C
Detector: UV 254 nm

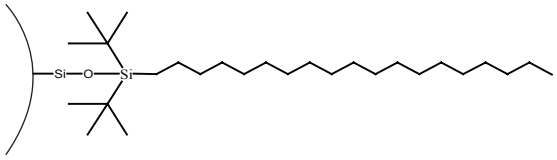
Pressure test





Column: UHP AQ C18, 2.1×50 mm, 1.9 µm
Sample: (1) Uracil (2) Phenol (3) Nitrobenzene (4) Naphthalene
Mobile phase: 50% Acetonitrile / 50% Water; Flow Rate: 0.5 mL/min
Temperature: 30°C; Detector: UV 254 nm

UHP ASB C18



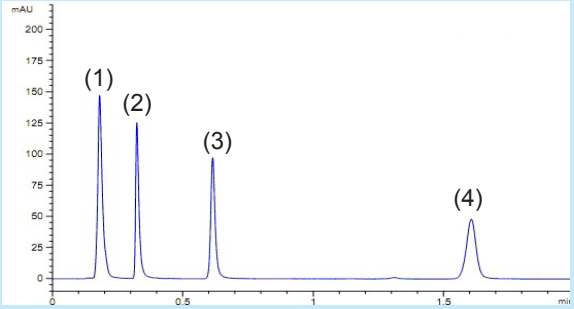
Characteristics

Metal Impurity<30 ppm; Pore Size: 100 Å;
Specific Surface Area 240 m^2/g; Available Particle Size: 1.9 μm.
Carbon Loading: 8%; No end-capped;
pH range is 0.8-7.5, optimized pH range is 1.0-4.0, which could ensure a satisfied lifetime.

Main Features

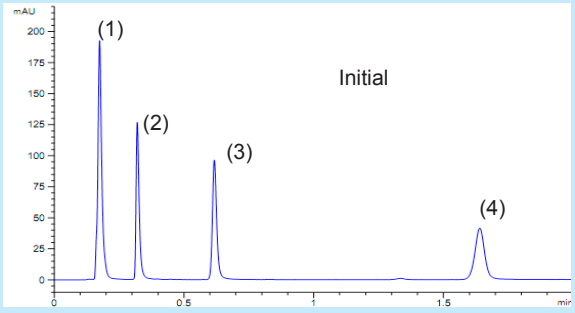
- Better performance under acid condition;
- Low pH stability: great stability even at pH=0.8
- Peak shape and efficiency: Excellent peak symmetry for basic compounds
- Polar C18 phase: Excellent resolution for polar compounds
- 100% aqueous compatible: Much better peak shape, retention and efficiency

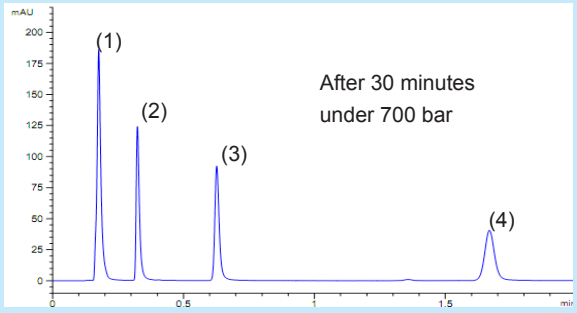
Balanced Retention for Hydrophilic and Hydrophobic Compounds



Column: UHP ASB C18, 2.1×50 mm, 1.9 μm
Sample: (1) Uracil (2) Phenol (3) Nitrobenzene
(4) Naphthalene
Mobile Phase: 50% Water; 50% Acetonitrile
Flow Rate: 0.5 mL/min
Detector: UV 254 nm
Temperature: 30°C

Pressure resistance test

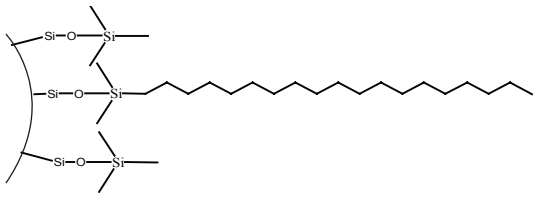




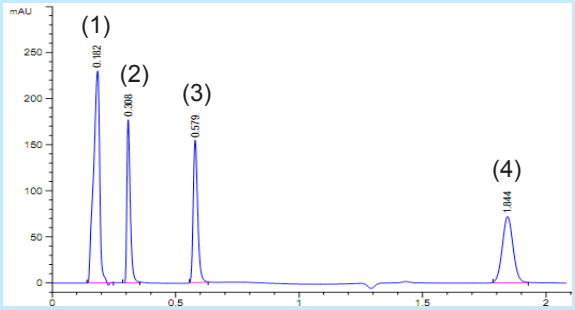
Column: UHP ASB C18, 2.1×50 mm, 1.9 μm
Sample: (1) Uracil (2) Phenol (3) Nitrobenzene (4) Naphthalene
Mobile phase: 50% Acetonitrile / 50% Water; Flow Rate: 0.5 mL/min
Temperature: 30°C ; Detector: UV 254 nm

UHP Innoval C18

Characteristics

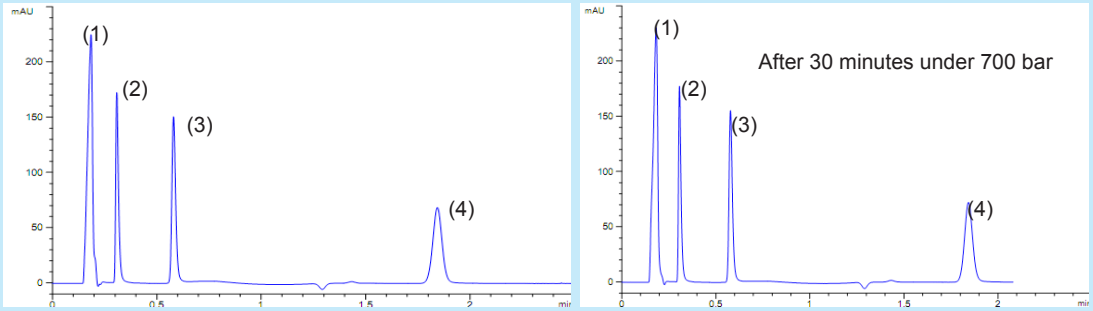


Pore Size: 100 Å; Specific Surface Area: 240 m^2/g;
Available Particle Size: 1.9 μm. Carbon Loading:14 %;
Double end-capped;
pH range is 1.5-9.0, optimized pH is 2.0-6.0, which could ensure a satified lifetime.



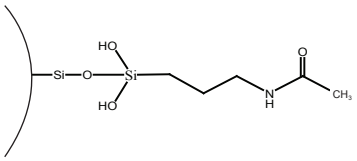
Column: UHP Innoval C18, 2.1 x 50 mm, 1.9 μm
Sample: (1) Uracil (2) Phenol (3) Nitrobenzene
(4) Naphthalene
Mobile phase: 50% Water, 50% ACN
Flow Rate: 0.5 mL/min
Pressure: 287 bar
Temperature: 30°C
Detector: UV 254 nm

Pressure resistance test



Column: UHP Innoval C18, 2.1 x 50 mm, 1.9 μm;
Sample: (1) Uracil (2) Phenol (3) Nitrobenzene (4) Naphthalene;
Mobile phase: 50% Acetonitrile / 50% Water; Flow Rate: 0.5 mL/min
Temperature: 30°C; Detector: UV 254 nm

UHP HILIC



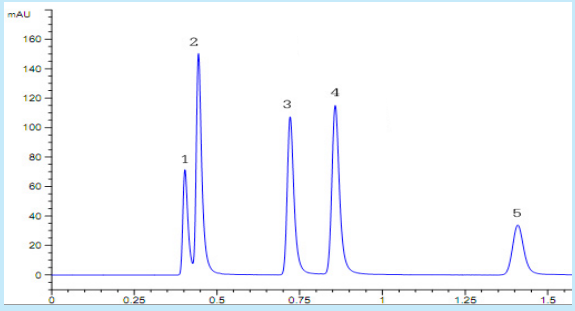
The proprietary nano-surface treatment and bonding process of the packing materials leading to unique performance of the UHP HILIC columns.

Characteristics

Metal Impurity<30 ppm; Pore Size: 100 Å; Specific Surface Area: 240 m^2/g;
Available Particle Size: 1.9 μm. Carbon Loading: 3%; No end-capped;
pH range is 2.0-8.0, optimized pH range is 2.0-6.0, which could ensure a satisfied lifetime.

Main Features

- pH range (2.0-8.0)
- Compatibility with 100% aqueous mobile phase
- Superior retention for polar compounds



Samples: (1) methylbenzene (2) nitrobenzene
(3)o-nitroaniline (4) m-nitroaniline
(5) p-nitroaniline.
Column: UHP HILIC, 2.1 x 50 mm, 1.9 μm;
Mobile Phase: 98.8% chlorobutane;
1% methanol; 0.2% water;
Flow Rate: 0.3 mL/min;
Temperature: 30°C;
Detector: UV 254 nm.

Ordering Information

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

Type	Particle (μm)	Dimension (mm)	UHP AQ C18	UHP ASB C18	UHP Innoval C18	UHP HILIC
UHPLC	1.9	2.1×30	IA920302-0	IS920302-0	IX920302-0	IH920302-0
UHPLC	1.9	2.1×50	IA920502-0	IS920502-0	IX920502-0	IH920502-0
UHPLC	1.9	2.1×100	IA921002-0	IS921002-0	IX921002-0	IH921002-0
UHPLC	1.9	4.6×50	IA920505-0	IS920505-0	IX920505-0	IH920505-0
UHPLC	1.9	4.6×100	IA921005-0	IS921005-0	IX921005-0	IH921005-0

G: Guard Cartridge
DCG: Direct-connection Guard Cartridge Holder

HPLC Column by Family

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

The Venusil® ASB series columns are specially designed for the separation of polar compounds under low (extremely stable at pH=0.8) to medium pH condition. The stationary phase is bonded with unique bulky silanes that sterically protect the siloxane bond. We offer a line of bonding chemistry of C1, C8, C18 or Phenyl groups presenting a broad selection of different polarity for various applications.

Stationary Phase Characteristics

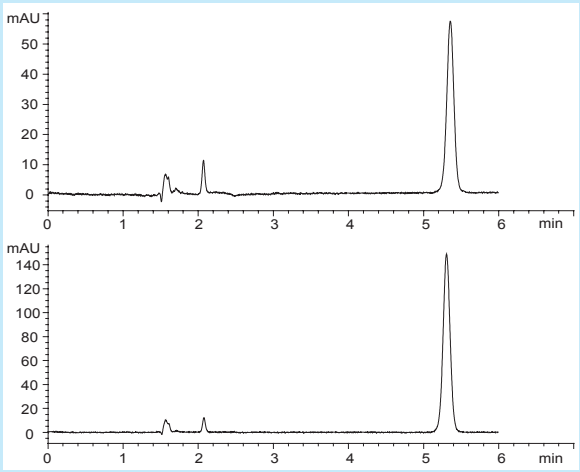
Bonded phase	Particle size(um)	Pore Size(Å)	Carbon loading(%)	Specific surface (m^2/g)	End-capping	pH range*
C18	3,5,10	150	12	200	No	0.8-7.5
C8	3,5	150	7	200	No	1.0-7.5
C1	5	150	3	200	No	1.0-7.5
phenyl	5	150	6	200	No	1.0-7.5
C18(T)	5	150	5	80	No	0.8-7.5

Notes: * Optimum pH range of ASB series is 1.0-4.0; Use the column under optimum pH could ensure a longer lifetime.

Main Features

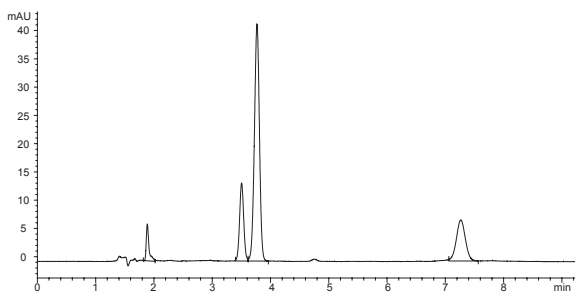
- Low pH stability, could be used even at pH=0.8
- Peak shape and efficiency: Excellent peak symmetry for basic compounds comparing to other non end-capped phase columns
- Excellent separation ability for polar compounds
- 100% aqueous compatible: Much better peak shape, retention and efficiency for polar compounds
- Five different bonded phases provide broad selectivity

The Stability in the Low pH



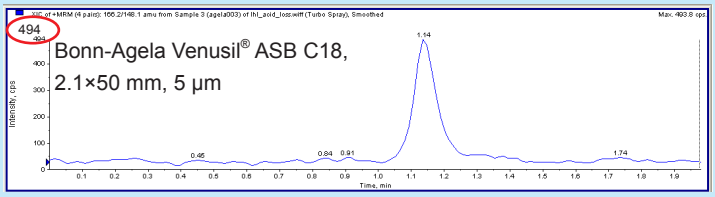
Column: Venusil® ASB C18, 4.6×150 mm, 5 μm
Sample: Naphthol
Aging: 40°C, TFA in 80% methanol (pH=1.0), 400 hours
Mobile Phase: TFA in 80% methanol (pH=1.5)
Flow Rate: 1 mL/min
Injection: 5 μL
Temperature: 30°C

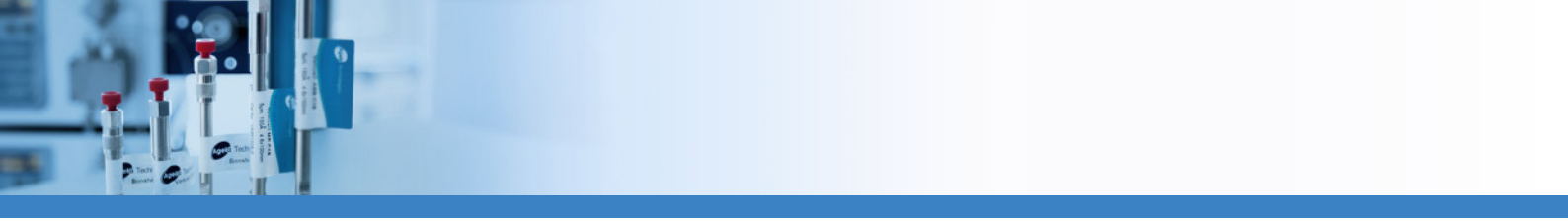
The Separation of Organic Acid



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
Detector: UV 210 nm

Highest LC-MS Sensitivity





Ordering Information

Type	Particle (μm)	Dimension (mm)	Venusil® ASB C18	Venusil® ASB C8
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
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
Analytical	5	2.1×50	VS950502-0	VS850502-0
Analytical	5	2.1×100	VS951002-0	VS851002-0
Analytical	5	2.1×150	VS951502-0	VS851502-0
Analytical	5	4.6×50	VS950505-0	VS850505-0
Analytical	5	4.6×100	VS951005-0	VS851005-0
Analytical	5	4.6×150	VS951505-0	VS851505-0
Analytical	5	4.6×250	VS952505-0	VS852505-0
Semi-preparative	5	10×150	VS951510-0	
Semi-preparative	5	10×250	VS952510-0	
Preparative	5	21.2×50	VS950520-0	
Preparative	5	21.2×150	VS951520-0	
Preparative	5	21.2×250	VS952520-0	
Semi-preparative	10	10×150	VS901510-0	
Semi-preparative	10	10×250	VS902510-0	
Preparative	10	21.2×50	VS900520-0	
Preparative	10	21.2×150	VS901520-0	
Preparative	10	21.2×250	VS902520-0	
Preparative	10	30×100	VS901030-0	
Preparative	10	30×150	VS901530-0	
Preparative	10	30×250	VS902530-0	
Preparative	10	50×150	VS901550-0	
Preparative	10	50×250	VS902550-0	

Note:
In case of guard cartridge is needed, please choose Agela universal guard column suit as choice. PN: SH-100KT.

Type	Particle (μm)	Dimension (mm)	Venusil® ASB Phenyl	Venusil® ASB C1	Venusil® ASB C18(T)
Analytical	5	2.1×30	VS650302-0	VS150302-0	VS950302-T
Analytical	5	2.1×50	VS650502-0	VS150502-0	VS950502-T
Analytical	5	2.1×100	VS651002-0	VS151002-0	VS951002-T
Analytical	5	2.1×150	VS651502-0	VS151502-0	VS951502-T
Analytical	5	4.6×50	VS650505-0	VS150505-0	VS950505-T
Analytical	5	4.6×100	VS651005-0	VS151005-0	VS951005-T
Analytical	5	4.6×150	VS651505-0	VS151505-0	VS951505-T
Analytical	5	4.6×250	VS652505-0	VS152505-0	VS952505-T
G	5	4.6×10, 4/pk	VS650105-0	VS150105-0	VS950105-T
DCG	5	4.6×10, 4/pk	VS650105-0S	VS150105-0S	VS950105-TS

Venusil® ASB C18(T): Surface Area: 80 m^2/g, Pore Size: 300 Å.

G: Guard Cartridge
DCG: Direct-connection Guard Cartridge Holder

Venusil® Family of HPLC Columns

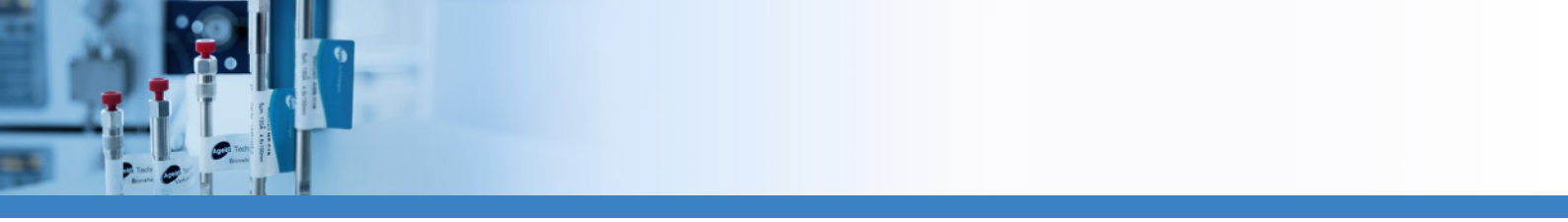
------ A Full Line High Quality Products

Introduction of Venusil® HPLC Columns

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

Best Peak Symmetry and Efficiency

The Venusil® columns generate symmetric peaks with high efficiency over their entire applicable pH range. The pH-independent high performance feature of Venusil® columns allows scientists to establish rugged methods with flexible choice of pH.



Expanding the Capabilities with the Venusil® Family of C18 Columns

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

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:

- High carbon loading and the most hydrophobic column in Agela HPLC family.
- 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 bleeding (high sensitivity for LC-MS) and strong separation power for polar compounds:

- Extremely low pH stability: lowest pH limit can reach 0.8 at 70 □
- Extremely low bleeding 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

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

Bonded phase	Particle size(um)	Pore Size(Å)	Carbon loading(%)	Specific surface (m^2/g)	End-capping	pH range*
C18	3,5,10	100	22	380	Double	1.5-10.0
C18(A)	3,5	120	20	340	Double	1.5-9.0
C18(L)	3,5	150	15	200	Double	1.5-9.0
C18(T)	5	300	8	80	Double	1.5-10.0
C8	3,5,10	100	14	380	Single	1.5-8.5
C8(L)	5	150	8	200	Single	1.5-8.5
C4	5	100	7	380	None	1.5-8.5
C4(T)	5	300	2.4	80	None	1.5-8.5
NH_2	5	100	6	380	None	2.0-8.5
phenyl	5	100	12	380	None	1.5-9.0
CN	5	100	5	380	Single	2.0-9.0
Silica	5	100	/	380	/	1.0-7.0
Silica	5	150	/	200	/	1.0-6.0

Notes: * Optimum pH range of Silica phase is 2.0-5.0; and for other phases are 2.0-6.0.
Use the column under optimum pH could ensure a longer lifetime.

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, 0.010M triethylamine.
- Other Venusil® XBP Columns: A complete line of stationary phases include C8, C4, NH_2, Phenyl, CN, Silica.

Venusil® XBP C18 (2)

Venusil® XBP C18 (2) column's 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 which 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.

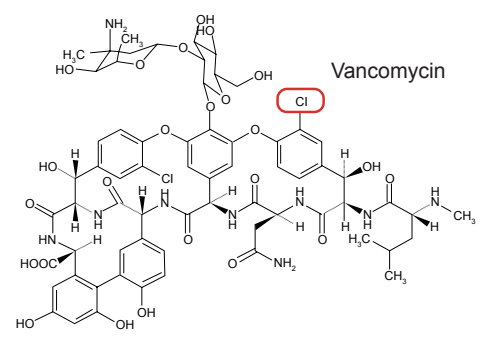
Characteristics

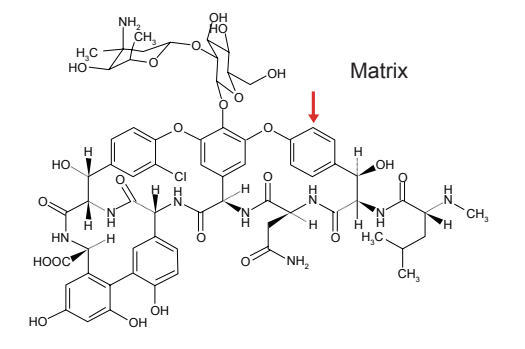
- Particle Size: 3 μm, 5 μm
- Specific Surface: 380 m^2/g
- Pore Size: 100 Å
- Carbon Loading: 18%
- Double End-capping
- pH Range: 1.5-9.0
- Performance: Efficiency>80,000/m (5 μm)
- TF: 0.98-1.12

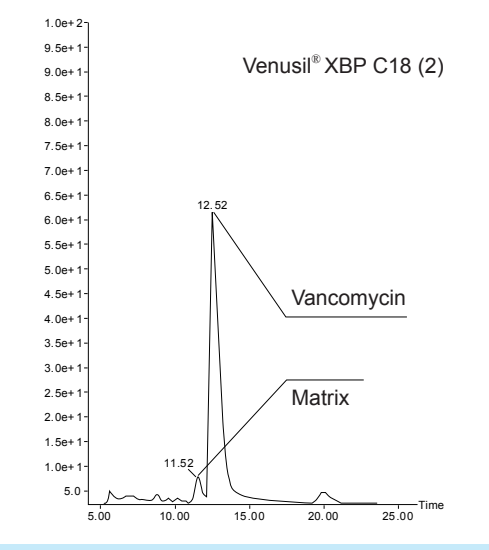
Main Features

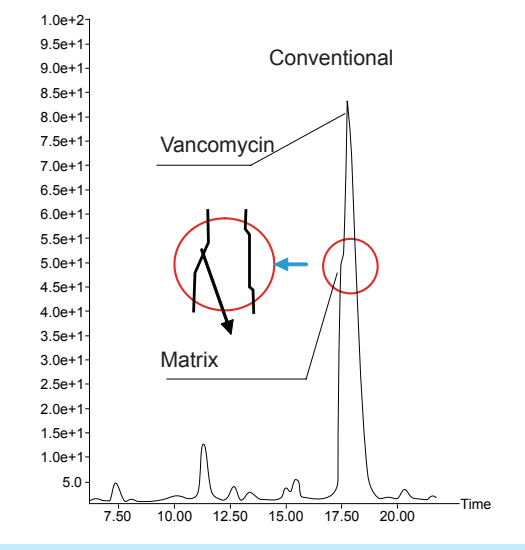
- Balanced hydrophobic adsorption which results in a broader suitability
- Stronger separation power for isomers
- Great column-to-column and batch-to-batch reproducibility
- Perfect symmetry for basic, acidic and neutral compounds

Similar Compounds Separation Applications







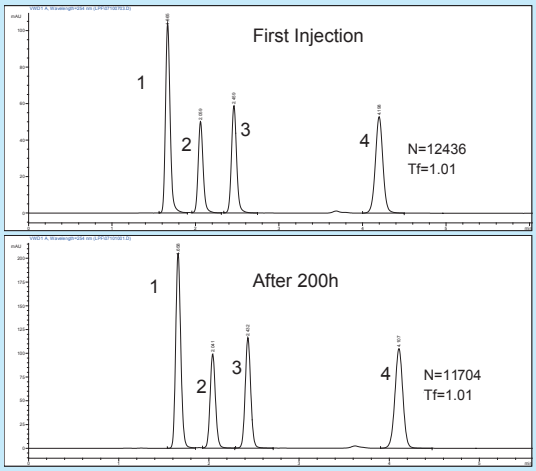


Sample: Vancomycin and Matrix;
Mobile Phase A: Water solution containing 0.7 % triethylamine and 0.3 % ethylic acid;
Mobile Phase B: methanol; Mobile Phase C: tetrahydrofuran; A:B:C=88:10:2;
Flow Rate:1.0 mL/min;
Detector: UV 210 nm

Comparative separations may not be representative of all applications

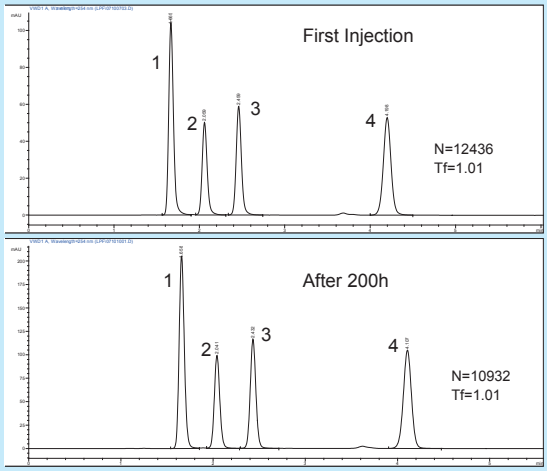
Good Lifetime Under Acid and Basic Mobile Phase Condition

Acid Mobile Phase pH=1.5



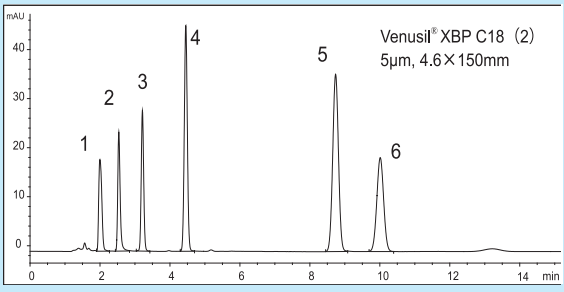
Column: Venusil® XBP C18 (2), 5 μm, 4.6×150 mm
Sample: (1) Uracil (2) phenol (3) nitrobenzene
(4) naphthalene
Mobile Phase: 0.25% TFA(pH 1.5):methanol = 70:30
Flow Rate: 1.0 mL/min; Tempreture: 30°C
Detector: UV 254 nm

Basic Mobile Phase pH=9.0

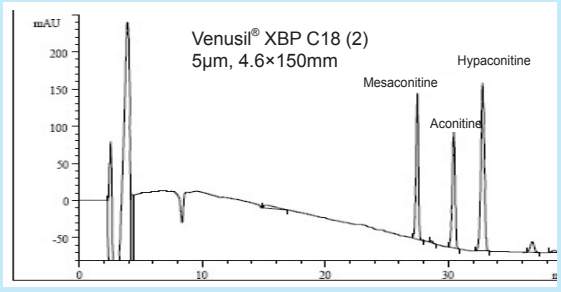


Column: Venusil® XBP C18 (2), 5 μm, 4.6×150 mm
Sample: (1) Uracil (2) phenol (3) nitrobenzene
(4) naphthalene
Mobile Phase: 0.05% ammonium hydroxide (pH 9.0):
methanol:=70:30
Flow rate: 1.0 mL/min; Tempreture: 30°C
Detector: UV 254 nm

Good Peak Symmetry for Acid, Basic Also Neutral Compounds

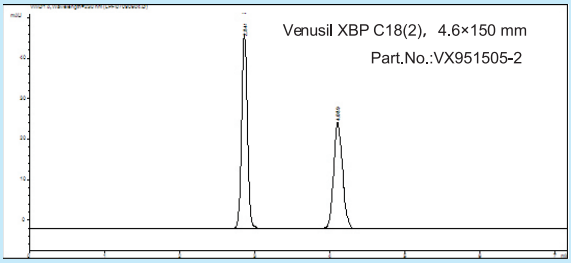


Sample: (1) p-Toluylic acid (2)piperidine (3)phenol
(4)acetophenone (5)N,N- dimethylaniline (6)toluene
Mobile Phase: ethylic acid/ natrium aceticum
solution (pH=5.0): methanol=40:60
Flow Rate: 1.0 mL/min; Tempreture:30°C
Detector: UV 254 nm



Sample: Mesaconitine, Aconitine, Hypaconitine
Mobile Phase: ACN: 2% acetic acid Water solution
(Adjust the pH to 6.5 by
triethylamine)=(15:85)
Flow Rate: 1.0 mL/min; Tempreture: 30°C
Detector: UV 350 nm

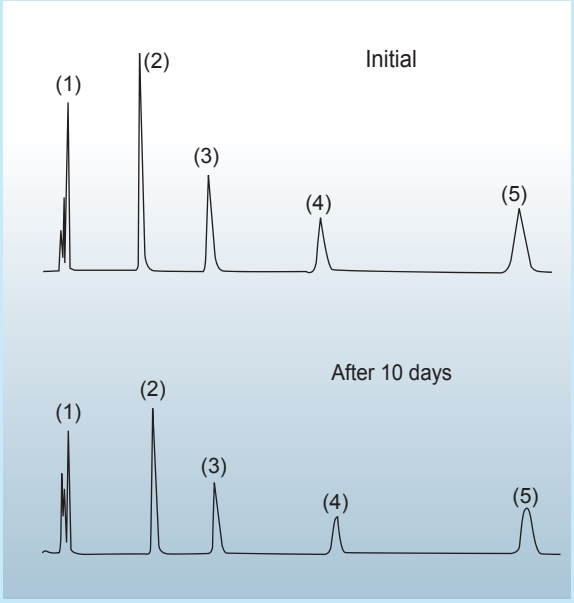
Extremely Low Metal Effects



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

Venusil® XBP C18

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



Sample: (1) Uracil, (2) Doxepin, (3) Nortriptyline, (4) Amitriptyline, (5) Trimipramine
Column: Venusil® XBP C18, 4.6×150 mm, 5 μm
Mobile Phase: 0.01M sodium phosphate:ACN =50:50, pH=7.6
Flow Rate: 1.5 mL/min
Detector: UV 254nm
Temperature: 45°C

Comparative separations may not be representative of all applications.

Venusil® XBP (L)

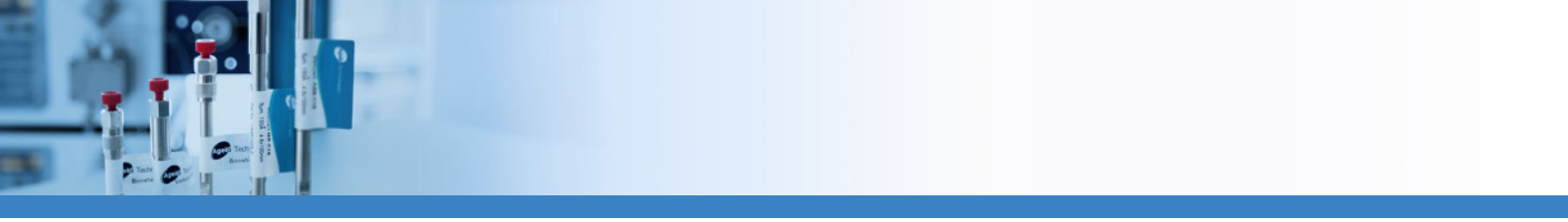
XBP C18(L) has an identical bonded phase as XBP C18. However, XBP C18(L) has relatively low surface area which could shorten the retention time and analysis time.

Characteristics

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

Bonded phase	Particle size(um)	Pore Size(Å)	Carbon loading(%)	Specific surface (m^2/g)	End-capping	pH range*
C18(L)	3,5	150	15	200	Double	1.5-9.0
C8(L)	5	150	8	200	Single	1.5-8.5
Silica(L)	5	150	/	200	No	1.0-6.0

Notes: * Optimum pH range for C18 phase is 2.0-6.0 and for Silica phase is 2.0-5.0; Use the column under optimum pH could ensure a better lifetime.



Ordering Information

Surface Area: 380 m^2/g, Pore Size: 100 Å
Venusil® XBP C18(A): Surface Area: 340 m^2/g, Pore Size: 120 Å

Type	Particle (μm)	Dimension (mm)	Venusil® XBP C18	Venusil® XBP C8	Venusil® XBP C18 (2)	Venusil® XBP C18 (A)
Fast analysis	3	2.1×30	VX930302-0	VX830302-0	VX930302-2	VX930302-A
Fast analysis	3	2.1×50	VX930502-0	VX830502-0	VX930502-2	VX930502-A
Fast analysis	3	2.1×100	VX931002-0	VX831002-0	VX931002-2	VX931002-A
Fast analysis	3	2.1×150	VX931502-0	VX831502-0	VX931502-2	VX931502-A
Fast analysis	3	4.6×50	VX930505-0	VX830505-0	VX930505-2	VX930505-A
Fast analysis	3	4.6×100	VX931005-0	VX831005-0	VX931005-2	VX931005-A
Fast analysis	3	4.6×150	VX931505-0	VX831505-0	VX931505-2	VX931505-A
Analytical	5	2.1×30	VX950302-0	VX850302-0	VX950302-2	VX950302-A
Analytical	5	2.1×50	VX950502-0	VX850502-0	VX950502-2	VX950502-A
Analytical	5	2.1×100	VX951002-0	VX851002-0	VX951002-2	VX951002-A
Analytical	5	2.1×150	VX951502-0	VX851502-0	VX951502-2	VX951502-A
Analytical	5	4.6×50	VX950505-0	VX850505-0	VX950505-2	VX950505-A
Analytical	5	4.6×100	VX951005-0	VX851005-0	VX951005-2	VX951005-A
Analytical	5	4.6×150	VX951505-0	VX851505-0	VX951505-2	VX951505-A
Analytical	5	4.6×200	VX952005-0	VX852005-0	VX952005-2	VX952005-A
Analytical	5	4.6×250	VX952505-0	VX852505-0	VX952505-2	VX952505-A

Note:
In case of guard cartridge is needed, please choose Agela universal guard column suit as choice. PN: SH-100KT.

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 Silica	Venusil® XBP C4
Analytical	5	2.1×30	VN850302-0	VX650302-0	VC950302-0	VSi950302-0	VX450302-0
Analytical	5	2.1×50	VN850502-0	VX650502-0	VC950502-0	VSi950502-0	VX450502-0
Analytical	5	2.1×100	VN851002-0	VX651002-0	VC951002-0	VSi951002-0	VX451002-0
Analytical	5	2.1×150	VN851502-0	VX651502-0	VC951502-0	VSi951502-0	VX451502-0
Analytical	5	4.6×50	VN850505-0	VX650505-0	VC950505-0	VSi950505-0	VX450505-0
Analytical	5	4.6×100	VN851005-0	VX651005-0	VC951005-0	VSi951005-0	VX451005-0
Analytical	5	4.6×150	VN851505-0	VX651505-0	VC951505-0	VSi951505-0	VX451505-0
Analytical	5	4.6×200	VN852005-0	VX652005-0	VC952005-0	VSi952005-0	VX452005-0
Analytical	5	4.6×250	VN852505-0	VX652505-0	VC952505-0	VSi952505-0	VX452505-0
G	5	4.6×10, 4/pk	VN850105-0	VX650105-0	VC950105-0	VSi950105-0	VX450105-0
DCG	5	4.6×10, 4/pk	VN850105-0S	VX650105-0S	VC950105-0S	VSi950105-0S	VX450105-0S

G: Guard Cartridge
DCG: Direct-connection Guard Cartridge Holder

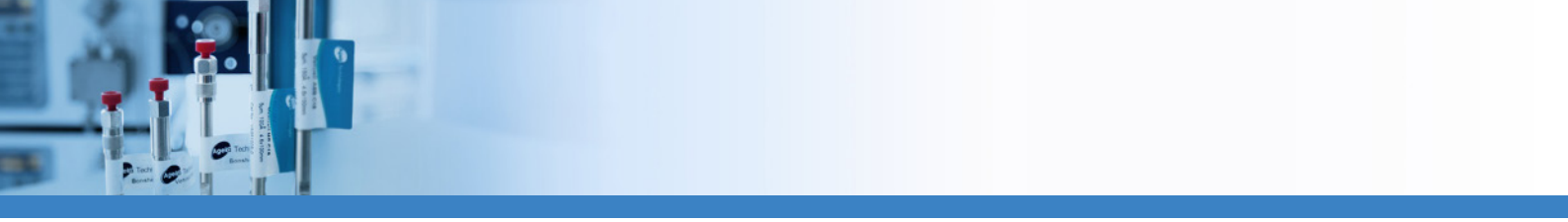
Surface Area: 200 m^2/g, Pore Size: 150 Å

Type	Particle (μm)	Dimension (mm)	Venusil® XBP C18(L)	Venusil® XBP C8(L)	Venusil® XBP Silica(L)
Analytical	3	2.1×30	VX930302-L		
Analytical	3	2.1×50	VX930502-L		
Analytical	3	2.1×100	VX931002-L		
Analytical	3	2.1×150	VX931502-L		
Analytical	3	4.6×50	VX930505-L		
Analytical	3	4.6×100	VX931005-L		
Analytical	3	4.6×150	VX931505-L		
Analytical	3	4.6×250	VX932505-L		
G	3	4.6×10, 4/pk	VX930105-L		
DCG	3	4.6×10, 4/pk	VX930105-LS		
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	4.6×200	VX952005-L	VX852005-L	VSi952005-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

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

Type	Particle (μm)	Dimension (mm)	Venusil® XBP C18	Venusil® XBP C4
Analytical	5	2.1×30	VX950302-T	VX450302-T
Analytical	5	2.1×50	VX950502-T	VX450502-T
Analytical	5	2.1×100	VX951002-T	VX451002-T
Analytical	5	2.1×150	VX951502-T	VX451502-T
Analytical	5	4.6×50	VX950505-T	VX450505-T
Analytical	5	4.6×100	VX951005-T	VX451005-T
Analytical	5	4.6×150	VX951505-T	VX451505-T
Analytical	5	4.6×200	VX952005-T	VX452005-T
Analytical	5	4.6×250	VX952505-T	VX452505-T
G	5	4.6×10, 4/pk	VX950105-T	VX450105-T
DCG	5	4.6×10, 4/pk	VX950105-TS	VX450105-TS

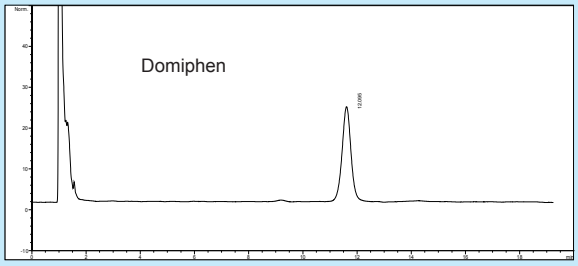
G: Guard Cartridge
DCG: Direct-connection Guard Cartridge Holder



Venusil® SCX

Characteristics

Bonded phase	Particle size(um)	Pore Size(Å)	Carbon loading(%)	Specific surface (m^2/g)	End-capping	pH range*
SCX	3,5	150	6	200	No	2.0-8.0
SCX(T)	5	300	3.5	80	No	2.0-8.0



Column: Venusil® SCX (T), 4.6×150 mm, 5 μm, 300 Å
Tempreture: 30°C
Flow rate: 1.5 mL/min
Mobile phase: methanol:0.05 mol/L natrium aceticum solution=80:20
Injection volume: 50 μL
Detector: UV 274 nm

Venusil® SAX

Characteristics

Bonded phase	Particle size(um)	Pore Size(Å)	Carbon loading(%)	Specific surface (m^2/g)	End-capping	pH range*
SAX	5	100	6	380	No	2.0-8.0

Notes: * Optimum range is 2.0-6.0; Use the column under optimum pH could ensure a longer lifetime.

Ordering Information

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

Type	Particle (μm)	Dimension (mm)	Venusil® SCX
Analytical	3	2.1×30	VSC930302-0
Analytical	3	2.1×50	VSC930502-0
Analytical	3	2.1×100	VSC931002-0
Analytical	3	2.1×150	VSC931502-0
Analytical	3	4.6×50	VSC930505-0
Analytical	3	4.6×100	VSC931005-0
Analytical	3	4.6×150	VSC931505-0
G	3	4.6×10, 4/pk	VSC930105-0
DCG	3	4.6×10, 4/pk	VSC930105-0S
Analytical	5	4.6×50	VSC950505-0
Analytical	5	4.6×100	VSC951005-0
Analytical	5	4.6×150	VSC951505-0
Analytical	5	4.6×200	VSC952005-0
Analytical	5	4.6×250	VSC952505-0
G	5	4.6×10, 4/pk	VSC950105-0
DCG	5	4.6×10, 4/pk	VSC950105-0S

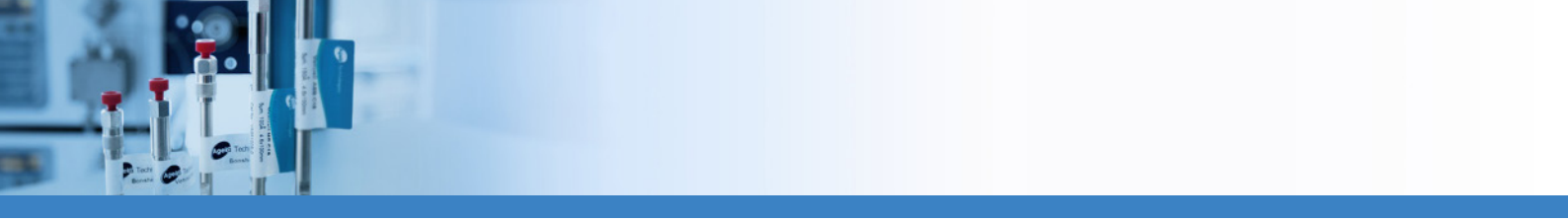
Surface Area: 80 m^2/g, Pore Size: 300 Å

Type	Particle (μm)	Dimension (mm)	Venusil® SCX(T)
Analytical	5	4.6×50	VSC950505-T
Analytical	5	4.6×100	VSC951005-T
Analytical	5	4.6×150	VSC951505-T
Analytical	5	4.6×200	VSC952005-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

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

Type	Particle (μm)	Dimension (mm)	Venusil® SAX
Analytical	5	4.6×50	VSA950505-0
Analytical	5	4.6×100	VSA951005-0
Analytical	5	4.6×150	VSA951505-0
Analytical	5	4.6×200	VSA952005-0
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

G: Guard Cartridge
DCG: Direct-connection Guard Cartridge Holder



Venusil® Diol

Venusil® Diol column is based on ultra high purity silica gel matrix. Dihydroxypropane groups chemically bonded to porous silica particle. Because the glycol base is less hydrophilic than pure silica silanol, it has a different selectivity from silica column. It can be widely used for polarity of natural products, herbicides and metabolites, low sugar and lipid analysis.

Characteristics

Metal Impurity<30 ppm; Pore Size: 100 Å; Specific Surface Area: 380 m^2/g; Available Particle Size: 5 μm.
No end-capped; pH range is 2.0-8.0, optimized pH range is 2.0-6.0, which could ensure a satisfied lifetime.

Ordering Information

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

Type	Particle(μm)	Dimension(mm)	Venusil® Diol
Analytical	5	2.1×50	VD950502-0
Analytical	5	2.1×100	VD951002-0
Analytical	5	2.1×150	VD951502-0
Analytical	5	4.6×50	VD950505-0
Analytical	5	4.6×100	VD951005-0
Analytical	5	4.6×150	VD951505-0
Analytical	5	4.6×250	VD952505-0
G	5	4.6×10, 4/pk	VD950105-0
DCG	5	4.6×10, 4/pk	VD950105-0S

G: Guard Cartridge
DCG: Direct-connection Guard Cartridge Holder

Durashell Technology and Column

Bonna-Agela's Durashell series columns could be used under a wide pH range from 1.5 to 12.0. Durashell series columns have a hybrid technology stationary phase surface, followed by molecular modifications.

The patented hybrid technology provides a strong hydrophobic protective layer on the silica surface, allowing the columns to be used at extremely high and low pH. It also reduces excessive hydrophobic interactions between the stationary phase and the analytes by reducing the bonding density, and yet maintains great interfacial kinetics for high efficiency. The stationary phases include C18(L), RP, C8 and NH_2.

Durashell C18(L) gives a good performance by decreasing the surface area to achieve the balance of the separation ability and the lifetime.

Durashell RP column is the first-generation product designed for applications in a wide pH range from 1.5 to 11.0. A strong hydrophobic protective layer can be covered on the silica gel surface, which effectively prevents the destruction of the alkaline solution onto the silica. By using multi-functional bonding techniques, it shows better separation performance meanwhile.

Characteristics

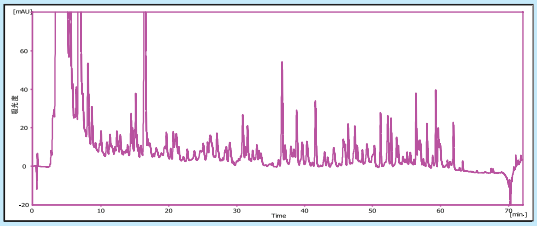
Bonded phase	Particle size(um)	Pore Size(Å)	Carbon loading(%)	Specific surface (m^2/g)	End-capping	pH range*
C18(L)	3,5,10	150	14	200	Double	1.5-12.0
RP	5	150	15	200	Double	1.5-12.0
C8	5	100	14	380	Single	1.5-12.0
NH_2	5	100	9	380	No	2.0-10.0

Notes: * Optimum pH range for NH2 is 2.0-8.0, and for other phases are 2.0-10.0.
Use the column under optimum pH could ensure a longer lifetime.

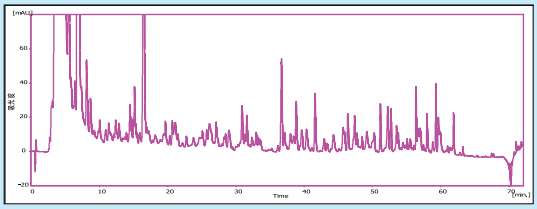
Main Features

- Excellent pH stability (pH 1.5-12.0)
- Minimal silanol activity
- High loading capacity for basic compounds for preparative requirement

Durashell C18(L)



First injection

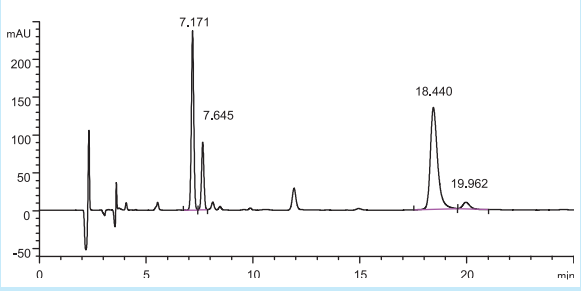


After 1000 injections

Column: Durashell C18(L), 4.6x250 mm, 5 μm, 150 Å
Mobile Phase: A: 2% ACN (pH=10.0) B: 98% ACN (pH=10.0)
Flow Rate: 0.7 mL/min
Sample: BSA peptide fragment
Temperature: 45°C

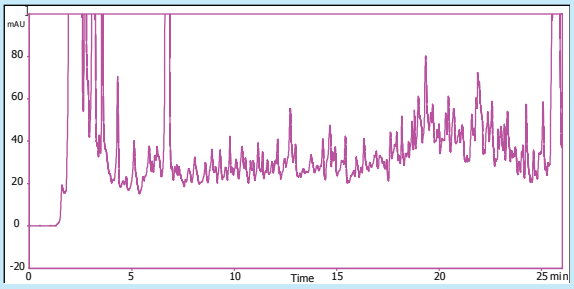
Time(min)	A (%)	B (%)
0	95	5
5	92	8
40	82	18
62	68	32
64	5	95
68	5	95
72	95	5

Analysis of VB6, dihydralazine sulfate and VB1 in Reserpine Tablets



Column: Durashell C18(L), 5 μm, 150 Å, 4.6×250 mm
Buffer Solution: 0.11% sodium hexanesulfonate and 0.02% sodium Heptanesulfonate (acetic acid pH=3.5)
Mobile Phase: Buffer solution: methanol: ACN=80:10:10
Temperature: 30°C;
Flow Rate: 1.0 mL/min;
Injection: 20 μL;
Detector: UV 210 nm

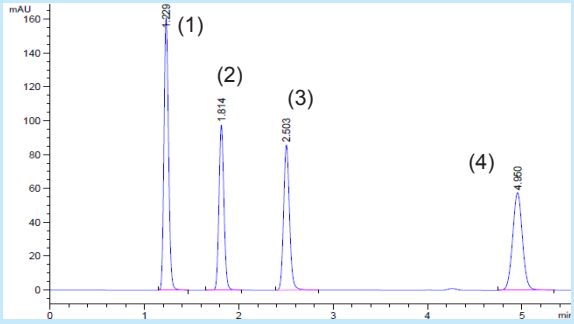
Analysis of Rat liver protein extracts of enzyme peptides



Sample: 200 μg Rat liver protein extract enzyme peptides
Column: Durashell C18 (L), 5 μm, 150 Å ,4.6×250 mm
Mobile Phase: A: 2% ACN (pH=10.0)
B: 98% ACN (pH=10.0)
Flow Rate: 1.5 mL/min; Temperature: 60°C
Detector: UV 214 nm

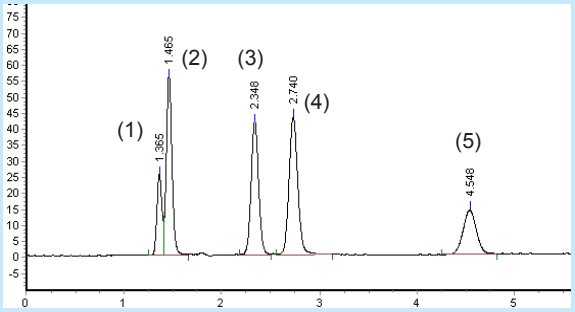
Time(min)	A (%)	B (%)
0	95	5
2	92	8
13	82	18
22	68	32
23	5	95
24	5	95
36	95	5

Durashell C8



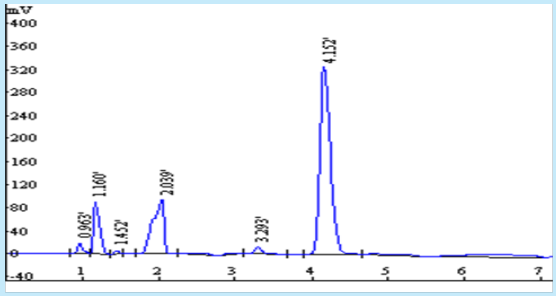
Sample: (1) Uracil (2) Phenol (3) Nitrobenzene
(4) Naphthalene
Column: Durashell C8, 4.6×100 mm, 3 μm
Mobile phase: 30% Water, 70% MeOH
Flow Rate: 1.0 mL/min
Temperature: 30°C
Detector: UV 254 nm

Durashell NH_2



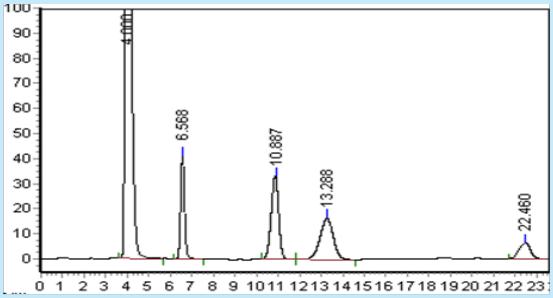
Sample: (1) methylbenzene (2) nitrobenzene
(3)o-nitroaniline (4) m-nitroaniline
(5) p-nitroaniline.
Column: Durashell NH_2, 4.6×50 mm, 3 μm
Mobile phase: 98.8% chlorobutane; 1% methanol;
0.2% water
Flow Rate: 0.5 mL/min
Temperature: 30°C
Detector: UV 254 nm

Glucosamine Hydrochloride Tablets



HPLC Column: Durashell NH_2,
5 μm, 100 Å, 4.6×150 mm
Buffer Solution: Dissolve 3.5 g dipotassium hydrogen phosphate with 500 mL water, and add 0.25 mL ammonia, dilution to 1000 mL with water
Mobile Phase: Buffer solution: ACN=30:70
Temperature: 30°C;
Flow Rate: 1.5 mL/min
Injection: 10 μL;
Detector: UV 195 nm

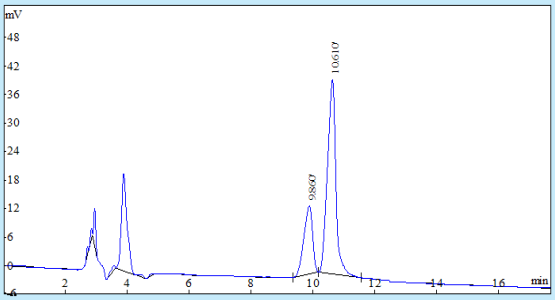
Glycerin, Fructose, Glucose and Cane sugar



2- Glycerin 3- Fructose 4- Glucose 5- Cane sugar

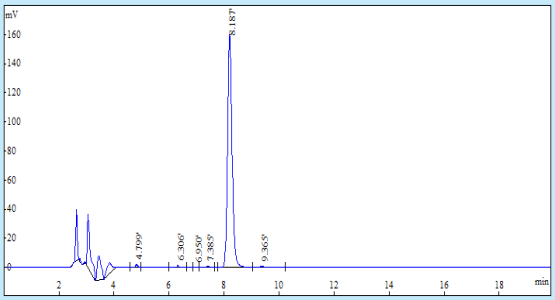
HPLC Column: Durashell NH_2,
5 μm, 100 Å, 4.6×250 mm
Mobile Phase: Water:ACN =23:77
Flow Rate: 1.0 mL/min
Temperature: 30°C
Injection: 10 μL
Detector: Refractive index detector

Glucose and Sorbitol



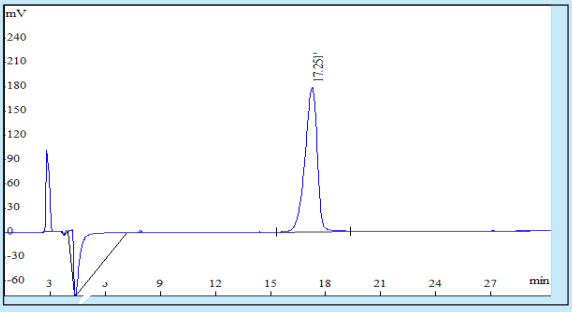
HPLC Column: Durashell NH_2,
5 μm, 100 Å, 4.6×250 mm
Mobile Phase: Water:ACN =15:85
Flow Rate: 1.0 mL/min
Temperature: 30°C
Injection: 20 μL
Detector: UV 195 nm

4-Hydroxy-D-phenylglycine

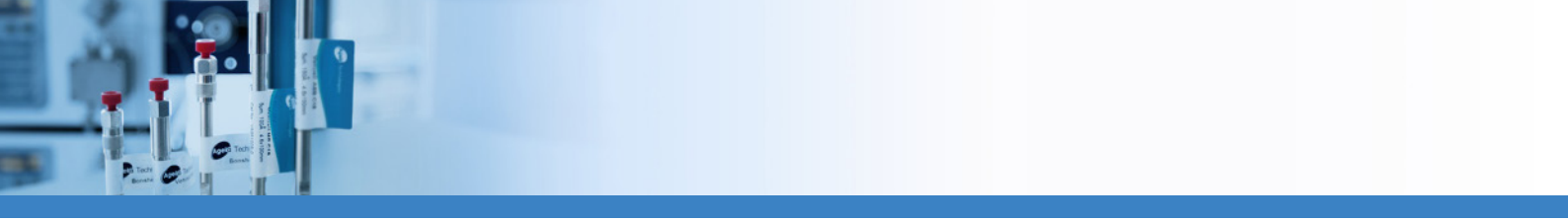


HPLC Column: Durashell NH_2,
5 μm, 100 Å, 4.6×250 mm
Mobile Phase: ACN: 0.05 mol/L sodium acetate
(acetic acid pH=3.0) =75:25
Flow Rate:1.0 mL/min
Temperature: 30°C
Injection: 20 μL
Detector: UV 254 nm

Sialic acid



HPLC Column: Durashell NH_2,
5 μm, 100Å, 4.6×250 mm
Mobile Phase: ACN: 0.02 mol/L ammonium
acetate(acetic acid pH=5.6) =60:40
Flow Rate: 1.0 mL/min
Temperature: 30°C
Injection: 20 μL
Detector: UV 254 nm



Ordering Information

Durashell RP and Durashell C18(L): Surface Area: 200 m^2/g, Pore Size: 150 Å
Durashell NH_2 and C8: Surface Area: 380 m^2/g, Pore Size: 100 Å

Type	Particle (μm)	Dimension (mm)	Durashell C18 (L)	Durashell RP	Durashell NH_2	Durashell C8
Fast analysis	3	2.1×30	DC930302-L			
Fast analysis	3	2.1×50	DC930502-L			
Fast analysis	3	2.1×100	DC931002-L			
Fast analysis	3	2.1×150	DC931502-L			
G	3	2.1×10, 4/pk	DC930102-L			
DCG	3	2.1×10, 4/pk	DC930102-LS			
Fast analysis	3	4.6×50	DC930505-L			
Fast analysis	3	4.6×100	DC931005-L			
Fast analysis	3	4.6×150	DC931505-L			
Analytical	5	2.1×30	DC950302-L	DS950302-0	DN850302-0	DC850302-0
Analytical	5	2.1×50	DC950502-L	DS950502-0	DN850502-0	DC850502-0
Analytical	5	2.1×100	DC951002-L	DS951002-0	DN851002-0	DC851002-0
Analytical	5	2.1×150	DC951502-L	DS951502-0	DN851502-0	DC851502-0
Analytical	5	4.6×50	DC950505-L	DS950505-0	DN850505-0	DC850505-0
Analytical	5	4.6×100	DC951005-L	DS951005-0	DN851005-0	DC851005-0
Analytical	5	4.6×150	DC951505-L	DS951505-0	DN851505-0	DC851505-0
Analytical	5	4.6×200	DC952005-L	DS952005-0	DN852005-0	DC852005-0
Analytical	5	4.6×250	DC952505-L	DS952505-0	DN852505-0	DC852505-0
G	5	4.6×10, 4/pk	DC950105-L	DS950105-0	DN850105-0	DC850105-0
DCG	5	4.6×10, 4/pk	DC950105-LS	DS950105-0S	DN850105-0S	DC850105-0S
Semi-preparative	5	10×150	DC951510-L			
Semi-preparative	5	10×250	DC952510-L			
Preparative	5	21.2×50	DC950520-L			
Preparative	5	21.2×150	DC951520-L			
Preparative	5	21.2×250	DC952520-L			
G	5	10×10	DC950110-LS			
G	5	21.2×10	DC950120-L			
Preparative	5	30×100	DC951030-L			
Preparative	5	30×150	DC951530-L			
Preparative	5	30×250	DC952530-L			
Semi-preparative	10	10×150	DC901510-L			
Semi-preparative	10	10×250	DC902510-L			
Preparative	10	21.2×50	DC900520-L			
Preparative	10	21.2×150	DC901520-L			
Preparative	10	21.2×250	DC902520-L			
G	10	10×10	DC900110-LS			
G	10	21.2×10	DC900120-L			
Preparative	10	30×100	DC901030-L			
Preparative	10	30×150	DC901530-L			
Preparative	10	30×250	DC902530-L			
Preparative	10	50×150	DC901550-L			
Preparative	10	50×250	DC902550-L			

G: Guard Cartridge
DCG: Direct-connection Guard Cartridge Holder

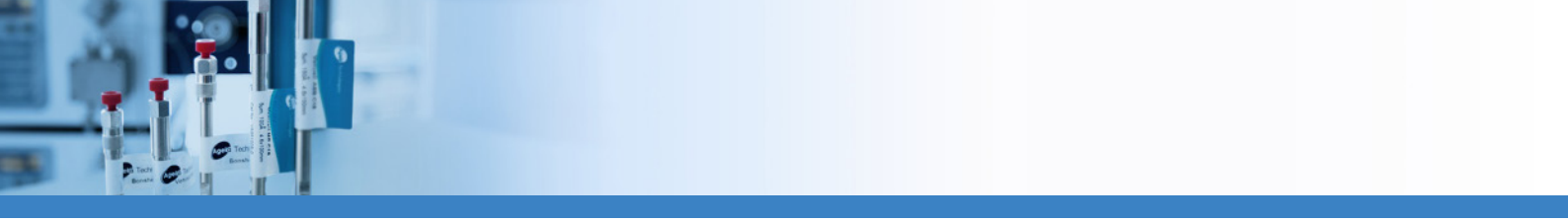
Innoval Series Column

The Innoval silica is made by aggregation technic, which makes the material have a much higher mechanical strength than normal silica made by sol-gel technic. Also caused by this special technic, Innoval silica also has less micro pore which is the main cause for contamination, which is a best cost-effective choice for analysis and preparation requirement. The Innoval column series includes C18, AQ C18 and Silica phases, show excellent reproducibility and high efficiency, providing customer with several kinds of selectivity.

Characteristics

Bonded phase	Particle size(um)	Pore Size(Å)	Carbon loading(%)	Specific surface (m^2/g)	End-capping	pH range*
C18(ODS-2)	5,10	100	14	220	Double	1.5-9.0
C18	5	100	14	220	Double	1.5-9.0
AQ C18	5	100	15	220	Single	1.5-9.0
C8	5,10	100	8	220	Single	1.5-8.5
NH_2	5	100	3.5	220	No	2.0-8.5
Silica	5,10	100	/	220	No	1.0-7.0
C18(XD C18)	5	80	10	180	Double	2.0-9.0

Notes: * Optimum pH range for C18 is 2.0-6.0 and for Silica is 2.0-5.0; Use the column under optimum pH could ensure a longer lifetime.



Innoval ODS-2

Innoval ODS-2 has excellent mechanical strength, which could be used under pressure up to 6000psi. Its low surface area, provide fast separation speed, also more tolerance ability for dirty sample. Innoval ODS-2 could provide good separation ability for hydrophilic compounds, compatible with 100% aqueous mobile phase.

Characteristics

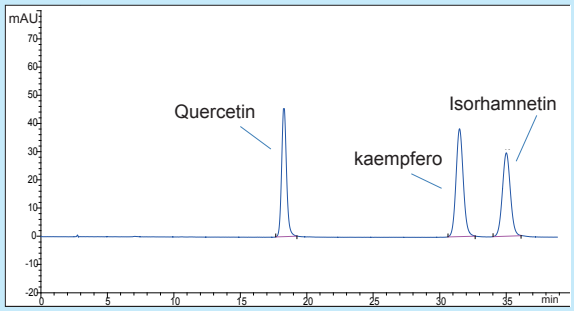
Bonded phase	Particle size(um)	Pore Size(Å)	Carbon loading(%)	Specific surface (m^2/g)	End-capping	pH range
C18	5,7,10	100	14	220	Double	1.5-9.0

Notes: * Optimum pH range is 2.0-6.0; Use the column under optimum pH could ensure a longer lifetime.

Main Features

- Excellent mechanical strength, pressure tolerant (6000psi);
- Lower surface area, fast separation speed, anti-pollution;
- Uniform pore size, no dead pore, long lifetime;
- Symmetrical peak shape and equilibrated separation for acidic, alkaline and neutral compounds;
- Good separation ability for isomers;
- Hydrophilic, compatible with 100% aqueous mobile phase.

Determination of the extract from Ginkgo leaf



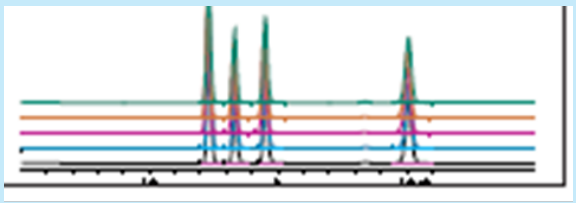
Peak tailing of Quercetin: 1.157;
Theoretical plate number: 13253

Column: Innoval ODS-2 (4.6×250 mm, 5 μm, 100 Å)
Mobile Phase: A: B=50: 50
A: 0.4% Phosphate
B: methanol;
Flow rate: 1.0 mL/min
Temperature: 30°C
Detector: UV 360 nm
Injection: 10 μL

	Innoval ODS-2
Quercetin	1
Kaempferol	1.72
Isorhamnetin	2

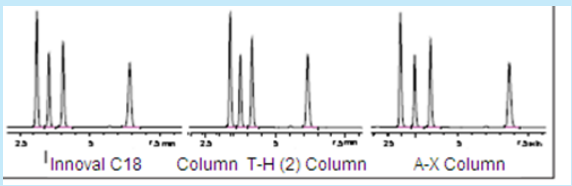
Innoval C18

Batch-to-Batch Reproducibility



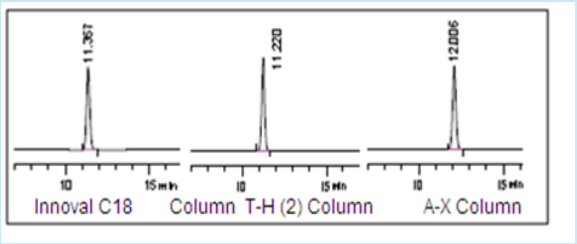
Column: Innoval C18, 5 μm, 4.6×250 mm
Sample: uracil, phenol, nitrobenzene, naphthalene
Mobile Phase: acetonitrile/water= 85/15
Flow Rate: 0.8 mL/min
Detection: UV, 254 nm
Temperature: 25°C

Column efficiency test



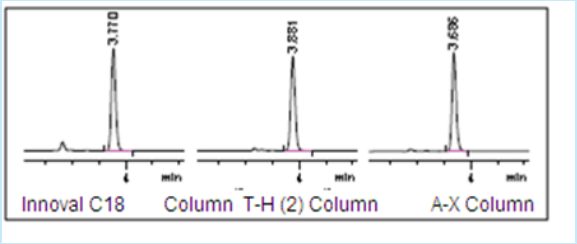
Metal sensitivity testing
Column: Innoval C18, 5 μm, 4.6×150 mm
Sample: 2,7-dihydroxynaphthalene and
2,3-dihydroxynaphthalene mixed standard
Mobile Phase: Methanol /water= 65/35;
Flow Rate: 1.0 mL/min
Detector: UV 230 nm
Temperature: 35°C
Sample Loading: 1 μL

The content of ferulic acid (acid samples)

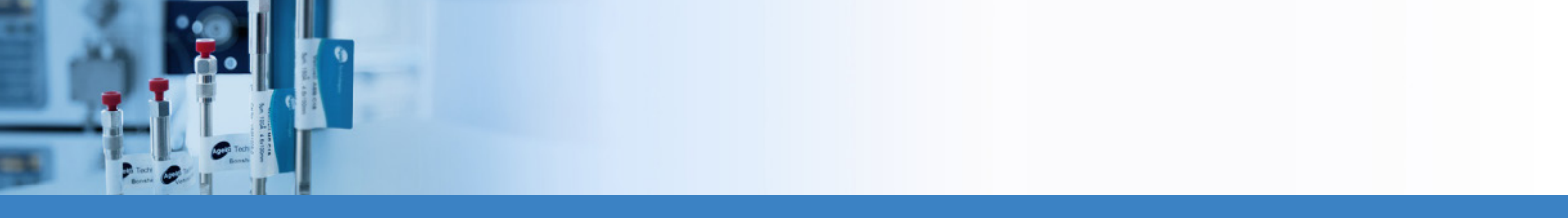


Column: Innoval C18, 5 μm, 4.6×250 mm
Flow Phase: ACN/0.085% phosphoric acid:17/83
Flow Rate: 1.0 mL/min
Detector: UV 316 nm
Temperature: 25°C

The content of fluconazole (alkaline samples)



Column: Innoval C18, 5 μm, 4.6×250 mm
Flow Phase: MeOH/phosphas (pH 7.1):45/55
Flow Rate: 1.0 mL/min
Detector: UV 261 nm
Temperature: 30°C



Ordering Information

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

Type	Particle (μm)	Dimension (mm)	Innoval Silica	Innoval C8	Innoval ODS-2
Analytical	5	4.6×50	ISi950505-0	IX850505-0	IX950505-2
Analytical	5	4.6×100	ISi951005-0	IX851005-0	IX951005-2
Analytical	5	4.6×150	ISi951505-0	IX851505-0	IX951505-2
Analytical	5	4.6×250	ISi952505-0	IX852505-0	IX952505-2
Semi-preparative	5	10×150	ISi951510-0	IX851510-0	IX951510-2
Semi-preparative	5	10×250	ISi952510-0	IX852510-0	IX952510-2
Preparative	5	21.2×50	ISi950520-0	IX850520-0	IX950520-2
Preparative	5	21.2×150	ISi951520-0	IX851520-0	IX951520-2
Preparative	5	21.2×250	ISi952520-0	IX852520-0	IX952520-2
Preparative	5	30×100	ISi951030-0	IX851030-0	IX951030-2
Preparative	5	30×150	ISi951530-0	IX851530-0	IX951530-2
Preparative	5	30×250	ISi952530-0	IX852530-0	IX952530-2
Analytical	10	4.6×150	ISi901505-0	IX801505-0	IX901505-2
Analytical	10	4.6×250	ISi902505-0	IX802505-0	IX902505-2
Preparative	10	10×150	ISi901510-0	IX801510-0	IX901510-2
Preparative	10	10×250	ISi902510-0	IX802510-0	IX902510-2
Preparative	10	21.2×50	ISi900520-0	IX800520-0	IX900520-2
Preparative	10	21.2×150	ISi901520-0	IX801520-0	IX901520-2
Preparative	10	21.2×250	ISi902520-0	IX802520-0	IX902520-2
Preparative	10	30×150	ISi901530-0	IX801530-0	IX901530-2
Preparative	10	30×250	ISi902530-0	IX802530-0	IX902530-2
Preparative	10	50×150	ISi901550-0	IX801550-0	IX901550-2
Preparative	10	50×250	ISi902550-0	IX802550-0	IX902550-2

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

Type	Particle(μm)	Dimension(mm)	Innoval AQ C18	Innoval C18	Innoval NH_2
Analytical	5	4.6×50	IA950505-0	IX950505-0	IN850505-0
Analytical	5	4.6×100	IA951005-0	IX951005-0	IN851005-0
Analytical	5	4.6×150	IA951505-0	IX951505-0	IN851505-0
Analytical	5	4.6×250	IA952505-0	IX952505-0	IN852505-0

Note:
In case of guard cartridge is needed, please choose Agela universal guard column suit as choice. PN: SH-100KT.

Surface Area: 180 m^2/g, Pore Size: 80 Å

Type	Particle(μm)	Dimension(mm)	Innoval Neo XD C18
Analytical	5	4.6×50	IXD950505-0
Analytical	5	4.6×100	IXD951005-0
Analytical	5	4.6×150	IXD951505-0
Analytical	5	4.6×250	IXD952505-0

G: Guard Cartridge
DCG: Direct-connection Guard Cartridge Holder

Promosil Family of HPLC Columns

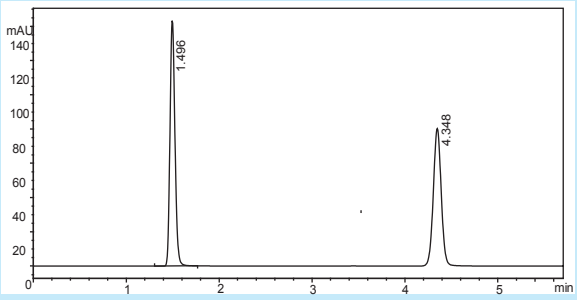
Using the silica of high pure and high mechanical strength, the Promosil C18 series columns are made with high pure monosilane through Bonna-Agela Technologies' well controlled bonding process. They have high surface bonding coverage and are completely capped. The carbon content is as much as 18%. They 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

Bonded phase	Particle size(um)	Pore Size(Å)	Carbon loading(%)	Specific surface (m^2/g)	End-capping	pH range*
C18	5	100	18	320	Double	1.5-9.0
C8	5	100	10	320	Double	2.0-8.0
NH_2	5	100	4	320	No	2.0-8.0
Silica	5	100	/	320	No	1.0-6.0

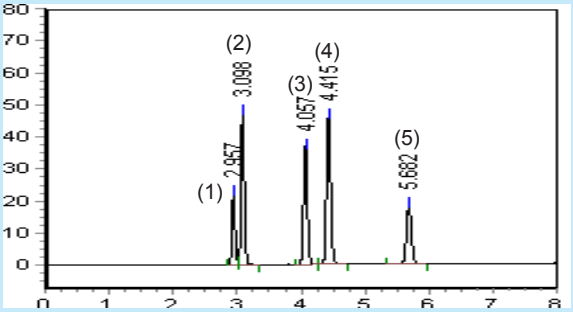
Notes: * Optimum pH range for Silica phase is 2.0-5.0; for other phases are 2.0-6.0.
Use the column under optimum pH could ensure a longer lifetime.

Hydrophobicity Test



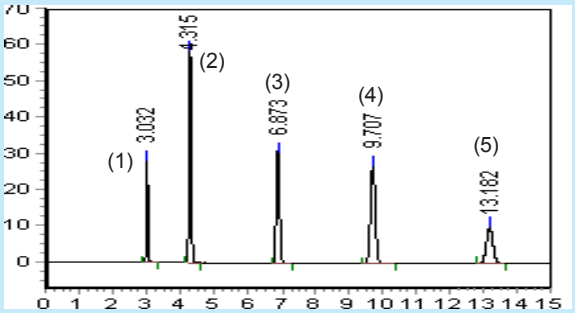
Column: Promosil C18, 4.6×150 mm, 5 µm
Sample: Uracil, Toluene
Mobile Phase: MeOH: 25mM KH_2PO_4/K_2HPO_4 (pH=6.0)=80:20
Detector: UV 254 nm
Flow Rate: 1 mL/min

Promosil C8



Column: Promosil C8, 4.6×250 mm
Sample: (1) Uracil (2) Phenol (3) Nitrobenzene
(4) Naphthalene (5) Amitriptyline.
Mobile phase: 15% Water, 85% Methanol
Flow Rate: 1.0 mL/min
Temperature: 30°C
Detector: UV 254 nm

Promosil Silica



Column: Promosil Silica, 4.6×250 mm
Sample: (1) methylbenzene (2) nitrobenzene
(3) o-nitroaniline (4) m-nitroaniline
(5) p-nitroaniline.
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

Type	Particle (µm)	Dimension (mm)	Promosil C18	Promosil C8	Promosil NH_2	Promosil Silica
Analytical	5	2.1×30	PM950302-0	PM850302-0	PM750302-0	PM050302-0
Analytical	5	2.1×50	PM950502-0	PM850502-0	PM750502-0	PM050502-0
Analytical	5	2.1×100	PM951002-0	PM851002-0	PM751002-0	PM051002-0
Analytical	5	2.1×150	PM951502-0	PM851502-0	PM751502-0	PM051502-0
Analytical	5	4.6×50	PM950505-0	PM850505-0	PM750505-0	PM050505-0
Analytical	5	4.6×100	PM951005-0	PM851005-0	PM751005-0	PM051005-0
Analytical	5	4.6×150	PM951505-0	PM851505-0	PM751505-0	PM051505-0
Analytical	5	4.6×250	PM952505-0	PM852505-0	PM752505-0	PM052505-0
G	5	4.6×10, 4/pk	PM950105-0			
DCG	5	4.6×10, 4/pk	PM950105-0S			

G: Guard Cartridge
DCG: Direct-connection Guard Cartridge Holder

Optimix Family of HPLC Columns

Conventional silica based HPLC stationary phases are usually bonded with mono-type alkyl chain molecules, e.g., C18, C8, etc. Recent studies 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 overcame 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

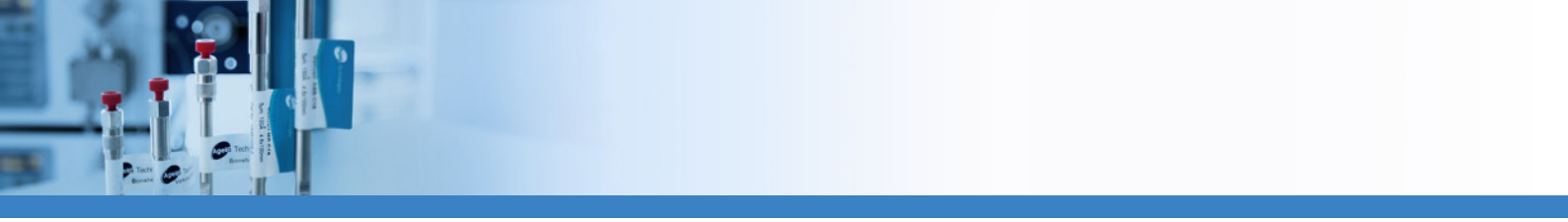
Improved performance from a mixed-phase C18/C8 (1:1) column compared to mono-chain C18 or C8 columns

Characteristics

Pore Size:100 Å; Available Particle Size: 5 μm; pH=1.5-9.0; pH range of 2.0-6.0 is recommended for better lifetime.

Features

- Alternative selectivity;
- Improved selectivity for stereo isomers, better differentiation of molecular 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.



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.

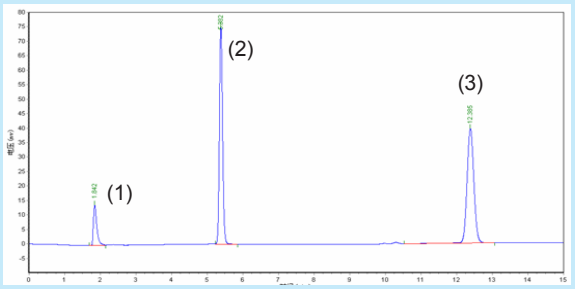
Characteristics

Pore Size:100 Å; Available Particle Size: 5 μm;
pH range is 2.0-8.0, optimum pH range of 2.0-6.0 is recommended for better lifetime.

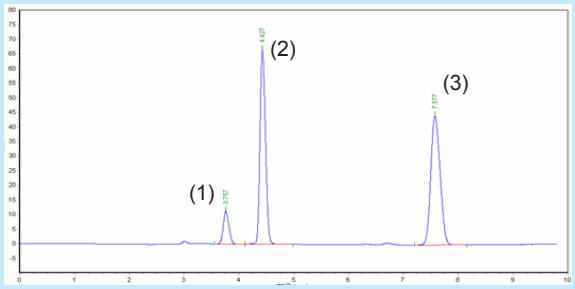
Features

- 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/C8



Optimix C18 / Amide=1/1

Sample: (1) Glucose, (2) Nitrobenzene, (3) Naphthalene
Column: 4.6×250 mm, 5 μm, 100 Å
Mobile Phase: ACN:Water=70:30
Flow: 1.0 mL/min; Detector: UV 195nm
Injection: 10 μL

Optimix C18/SCX

Characteristics

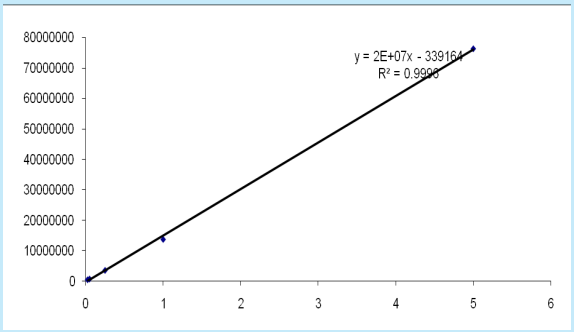
Pore Size:100 Å; Available Particle Size: 5 μm;
pH=2.0-8.0, optimum pH range of 2.0-6.0 is recommended for better lifetime

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

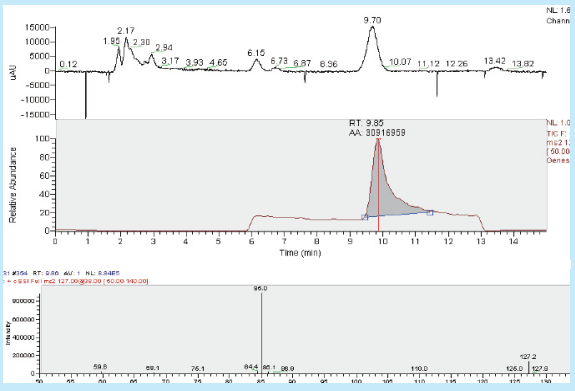
Application in Melamine Detection

Standard Curve

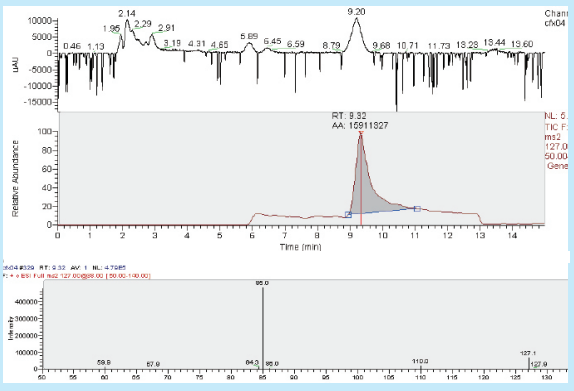


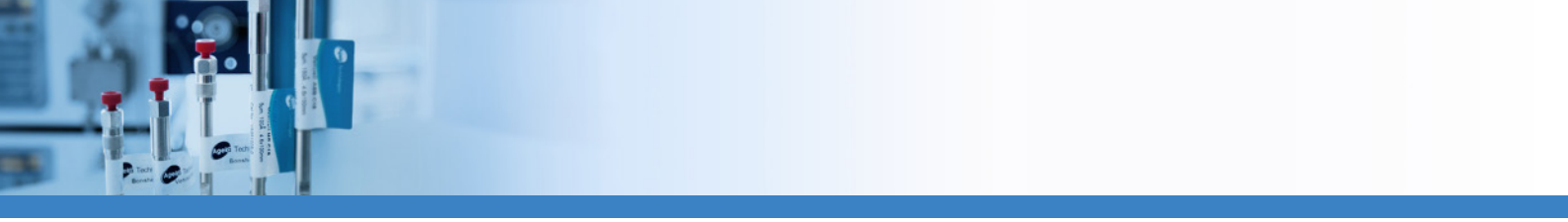
HPLC Conditions :
Column: Venusil® AS-T(SCX/C18), 2.1×150 mm, 5 μm
Mobile Phase: Buffer (10mM ammonium acetate pH=3.0): acetonitrile (50: 50)
Detector: UV 240 nm
Flow Rate: 0.2 mL/min, Injection: 10 μL
Mass Conditions:
ESI, 5KV, Capillary 300°C, 15V, 35 arb, Positive Ion, range (m/z) 50~140

Melamine Standard



Milk Sample





Ordering Information

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

Type	Particle (μm)	Dimension (mm)	Optimix C18/C8	Optimix C18/Amide	Optimix C18/SCX
Analytical	5	2.1×30	OP950302-OC	OP950302-AM	OP950302-SC
Analytical	5	2.1×50	OP950502-OC	OP950502-AM	OP950502-SC
Analytical	5	2.1×100	OP951002-OC	OP951002-AM	OP951002-SC
Analytical	5	2.1×150	OP951502-OC	OP951502-AM	OP951502-SC
Analytical	5	4.6×50	OP950505-OC	OP950505-AM	OP950505-SC
Analytical	5	4.6×100	OP951005-OC	OP951005-AM	OP951005-SC
Analytical	5	4.6×150	OP951505-OC	OP951505-AM	OP951505-SC
Analytical	5	4.6×200	OP952005-OC	OP952005-AM	OP952005-SC
Analytical	5	4.6×250	OP952505-OC	OP952505-AM	OP952505-SC
G	5	4.6×10, 4/pk	OP950105-OC	OP950105-AM	OP950105-SC
DCG	5	4.6×10, 4/pk	OP950105-OCS	OP950105-AMS	OP950105-SCS

G: Guard Cartridge
DCG: Direct-connection Guard Cartridge Holder

Chiral Columns

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.

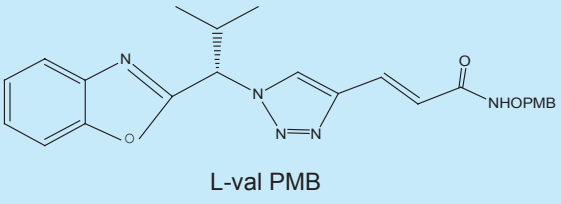
Main Festures

- 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

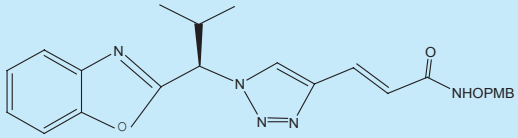
Venusil® CA

Coating Materials: Amylose - (3,5-dimethylphenyl carbamate)
Applications: Amide, Aromatic, carbonyl-group, nitro-group, sulfonyl-group, cyano-group, hydroxide radical, amine and carboxylic acid compounds

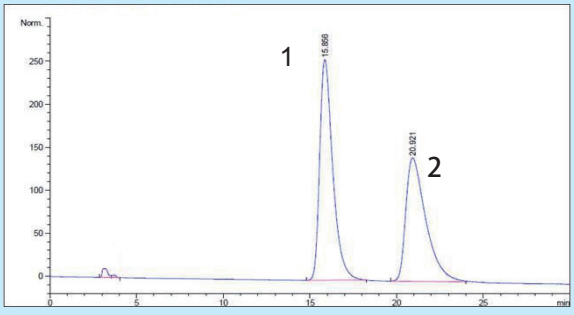
Example



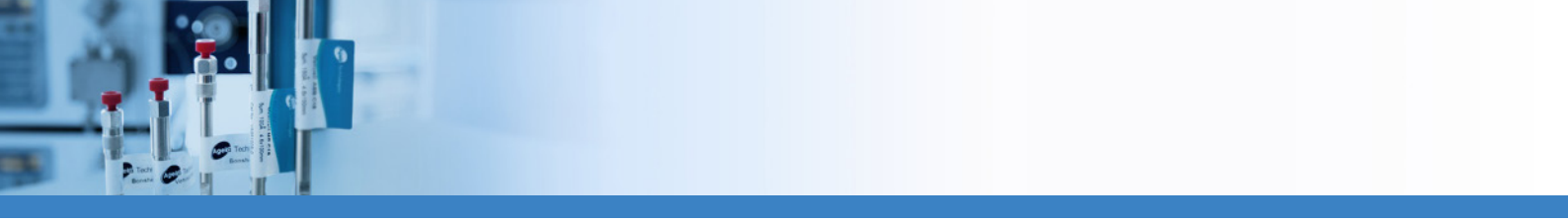
L-val PMB



D-val PMB



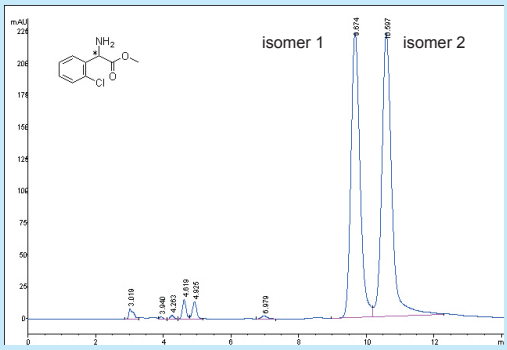
1, L-Val PMB; 2, D-Val PMB
Column: Venusil® CA, 4.6×250 mm, 5 μm, 1000 Å
Mobile Phase: Hexane: Isopropanol=80:20
Detector: UV 254nm
Flow Rate: 1.0 mL/min
Temperature: 25°C



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

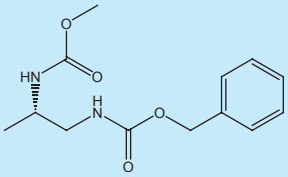


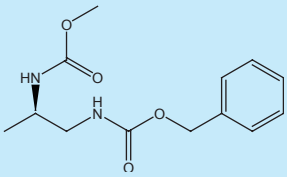
Column: Venusil® CO, 4.6×250 mm, 5 μm, 1000 Å
Mobile Phase: Hexane:Isopropanol=98:2
Flow Rate: 1.0 mL/min
Detector: UV 220nm
Temperature: 25°C

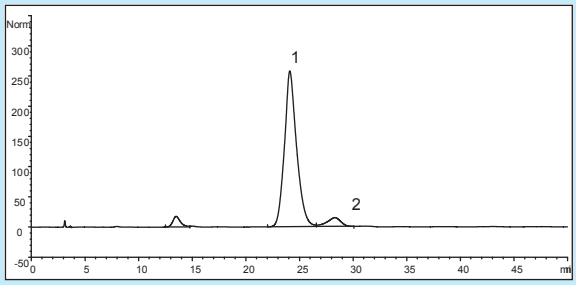
Venusil® CJ

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





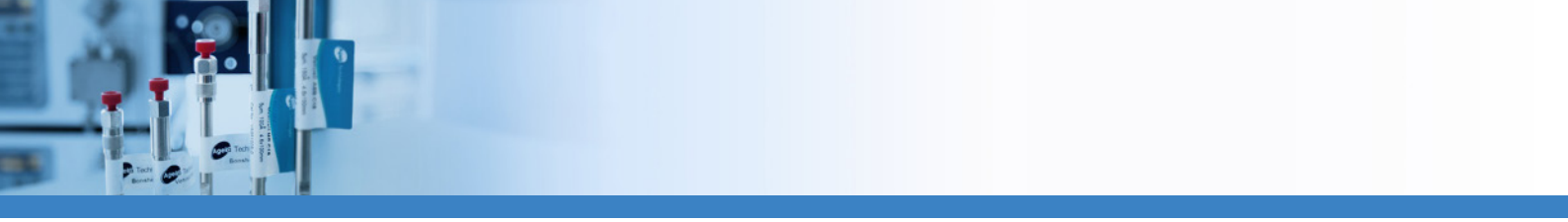


Column: Venusil® CJ, 4.6×250 mm, 5 μm,1000 Å
Mobile Phase: Hexane:Isopropanol=93:7
Flow Rate: 1.0 mL/min
Detector: UV 210nm
Temperature: 30°C

Ordering Information

Type	Particle (μm)	Dimension (mm)	Venusil® CA	Venusil® CO	Venusil® CJ
Analytical	5	4.6×150	VCA951505-0	VCO951505-0	VCJ951505-0
Analytical	5	4.6×250	VCA952505-0	VCO952505-0	VCJ952505-0
G	5	4.6×10	VCA950105-0	VCO950105-0	VCJ950105-0
DCG	5	4.6×10	VCA950105-0S	VCO950105-0S	VCJ950105-0S

G: Guard Cartridge
DCG: Direct-connection Guard Cartridge Holder



HPLC Accessories and Supplies

Guard Cartridge Holder

Guard Cartridge Holder provides convenient, economic and effective protection, to prolong HPLC lifetime and ensure the reproducibility of the analysis results. With the use of HPLC, high performance liquid chromatography column will decline in separation efficiency and increase in column pressure. The main reason is due to the pollution of small amount of packing at inlet section, and the column bed of HPLC has not been damaged. The use of guard cartridge holder is equivalent to add additional packing in front of columns and thus protect the whole HPLC column.

Non Direct-connection Guard Cartridge Holder

Non Direct-connection Guard Cartridge Holder connects with column through a section of the pipeline and the joint, the traditional design is compatible with all the HPLC columns.

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

The direct-connection guard cartridge holder is easier to use than ever, and can be reused for multiple times. It directly connects with the column inlet, and no need to connect with other pipeline, achieve excellent chromatographic performance with minimum dead volume.

Advantages

- Direct-connection design does not require additional connectors;
- Quick and easy installation of manpower;
- Simple and convenient.

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

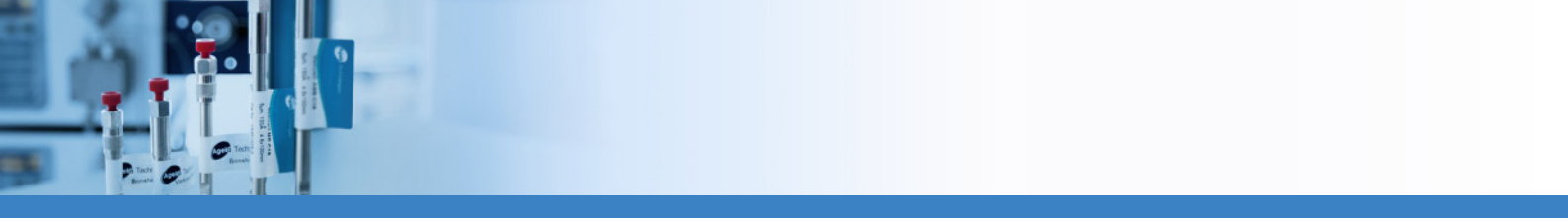
Direct-connection Guard Cartridge Holder

Type	Dimension (mm)	P/N
Analytical	One direct-connection guard cartridge holder and compatible guard cartridge cores included 4.6×10 mm,C18, 2/pk	SH-100KT
Analytical	Guard cartridge cores 4.6×10 mm,C18, 2/pk	DC952505-LS

Disposable Syringe for HPLC Filtration

- High Quality
- Low Cost
- No Needle design for chromatography usage

Products	Description	Specification	Package	Cat. No.(100/pk)
Syringe	-	5 mL	10	ZSQ-5 ML
Syringe	Two-Piece Syringe	2 mL	10	LZSQ-2 ML



Clarinet™ Filtration Products

■ High Quality	– Bonna-Agela is an ISO 9001 certified manufacturer; all of our products are guaranteed to meet our published specifications.
■ Cost saving	– Reduce substantially the customers cost without compromising quality.
■ Comprehensive	– Comprehensive product lines;including some unique products
■ Reliable partnership	– Global OEM manufacturing partner
Important Features	– All filters's housing is made of high purity polypropylene – Female luer-lock inlets on all filters secure the fit to syringes – All filters are designed for use in both direction – All filters are autoclavable – All products are certified

- Syringe Filters
- Membrane Filters
- 96-Well Filtration Plates and Collection Plates
- Glass Filtration System
- Disposable filtration funnels with 10μm frits

Syringe Filters

Type of Filters

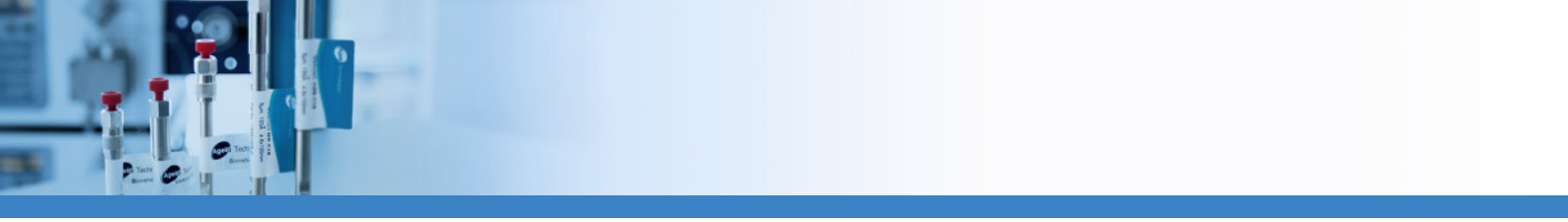
- Single Layer Filters: Single membrane, commonly used, highly cost-effective; newly developed Φ33mm Syringe Filters, with pore sizes of 0.22 μm and 0.45 μm are in stock.
- Double Layer Filters: A prefilter before the main membrane, which would avoid the damage to the soft main membrane from larger particles and clogging of the main membrane by colloidal particles, is good for the overall lifetime, process volume, and efficiency.
- Sterilized Filters: Filter the sample with biological activity or aseptic requirements; generally used as a fast, convenient, reliable sterilization and filtration tool in the lab. We supply many kinds of syringe filters, which can be used for filtration of 1 mL to 300 mL sample solutions.

Specifications

Type	Diameter (mm)	Pore size (μm)	Pressure rating (bar)	Bubble Point rating(bar)	Water speed (mL/min/cm^2)	Air speed (L/min/cm^2)	Filtration /Hold-up Volume	Effective filter area(cm^2)
MCM	13	0.22	7	3.52	18	-	10mL/<25μL	0.65
		0.45	7	2.20	60	-		0.65
	25	0.22	5	3.52	18	-	100mL/<100μL	3.90
		0.45	5	2.20	60	-		3.90
Nylon	13	0.22	7	2.80	25	-	10mL/<25μL	0.65
		0.45	7	2.50	75	-		0.65
	25	0.22	5	2.80	25	-	100mL/<100μL	3.90
		0.45	5	2.50	75	-		3.90
PVDF	13	0.22	7	1.20	15	16	10mL/<25μL	0.65
		0.45	7	0.56	35	20		0.65
	25	0.22	5	1.20	15	16	100mL/<100μL	3.90
		0.45	5	0.56	35	20		3.90
PTFE	13	0.22	7	1.00	24	5	10mL/<25μL	0.65
		0.45	7	0.63	60	8		0.65
	25	0.22	5	1.00	24	5	100mL/<100μL	3.90
		0.45	5	0.63	60	8		3.90
PES	13	0.22	7	-	-	-	10mL/<25μL	0.65
		0.45	7	-	-	-		0.65
	25	0.22	5	-	-	-	100mL/<100μL	3.90
		0.45	5	-	-	-		3.90
Reg. Cellulose	13	0.22	7	-	-	-	10mL/<25μL	0.65
		0.45	7	-	-	-		0.65
	25	0.22	5	-	-	-	100mL/<100μL	3.90
		0.45	5	-	-	-		3.90

Selection Guide

Material Type	Characteristics
MCM (Hydrophilic)	Remove the particle from aqueous; Can be high temperature sterilized. Low protein-binding.
Nylon	Good flexibility and chemical compatibility (avoid strong acid and strong organic solution).
PTFE (Hydrophobic)	Broad chemical compatibility (compatible to any common solvents). Low protein-binding; Can be high temp sterilized repeatedly; Low extractable; For use with high aqueous solution, pre-wet the filter membrane with MeOH, then rinse with DI water before fitering samples.
PVDF (Hydrophilic, Hydrophobic)	Low extractable; Low protein-binding; Broad chemical compatibility (avoid strong basic solution); Hydrophobic : for use with organic solution; Hydrophilic: can be used with high aqueous solution without pre-wet steps.
PES (Hydrophilic)	Broad chemical compatibility; Apply to high-throughput, high efficient filtration; Low protein-binding.
Reg. Cellulose (Not used with Organic solvent)	Low protein-binding; Better strength than MCM.



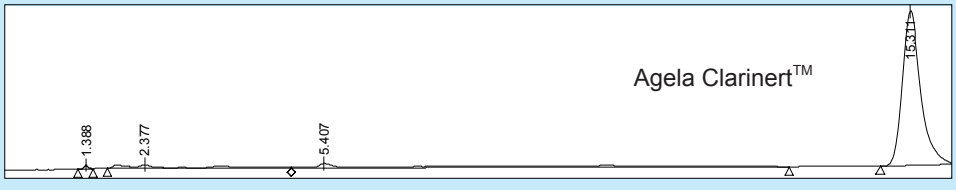
Chemical Compatibility

The introduction of extra impurities (extractables) is undesired; we should minimize the extractables during sample preparation. Extractables are often the result of inappropriate choice of materials, improper operation of the device during the manufacturing process, or downstream particle shedding. Particular attention should be paid to potential impurities from the membrane and housing material. The membranes used in Bonna-Agela's Clarinert Filters are extensively tested to determine their compatibility with various HPLC solvents.

Material	MCM	Nylon	PTEE	Material	MCM	Nylon	PTEE
1-hexanol	R	R	R	glycol	R	R	R
CH_3COOH,10%	LR	-	R	formic acid, 25%	LR	-	R
acetone	NR	R	R	n-hexane	R	R	R
acetonitrile	NR	R	NR	HCl,25%	NR	NR	R
fatty hydrocarbon	R	R	R	isopropanol	R	R	R
ammonia,1M	R	R	R	methanol	R	LR	R
aromatic hydrocarbons	R	N/A	R	nitrous acid,25%	LR	NR	R
benzene	R	R	R	pentane	R	R	R
boric acid	R	LR	R	phosphoric acid,25%	R	LR	R
tetrachloromethane	LR	NR	R	phosphoric acid,45%	LR	LR	R
carboxylic acid	R	NR	R	KOH,1M	NR	NR	R
chloroacetic acid	NR	NR	R	mineral salt in water	R	R	R
chloroform	NR	R	LR	NaOH,1M	LR	NR	R
cyclohexane	LR	R	R	cellon	LR	LR	R
cyclohexanol	R	R	R	tetrahydrofuran	NR	R	LR
aether	LR	R	LR	toluene	R	R	R
DMF	NR	R	R	acetocaustin,10%	NR	LR	R
DMSO	NR	N/A	R	methyl chloroform	LR	LR	R
alcohol=<98%	R	R	R	chlorylene	LR	LR	R
ethyl acetate	NR	R	R	xylene	R	R	R
chloroethylene	LR	R	R				

Remarks: R(Resistant), LR(Limited Resistant), NR (Not Resistant)

Excellent filtration performance



Instrument: Waters 600e Pump, 717 Auto-sampling, 2487UV
Detector Column: Venusil® ASB C18, 4.6×250mm, 5μm;
Mobile Phase: Water: ACN= 22:78;
Wave Length: 251nm

Ordering Information

Mixed cellulose(acetate and nitrate) syringe filters

Membrane Type	Pore Size	Qty	Cat.No.
13mm	0.22μm	200	AS011320
	0.45μm	200	AS011345
25mm	0.22μm	100	AS012520
	0.45μm	100	AS012545
33mm	0.22μm	100	AS013320
	0.45μm	100	AS013345
13mm with glass prefilter	0.22μm	200	AS011320-G
	0.45μm	200	AS011345-G
25mm with glass prefilter	0.22μm	100	AS012520-G
	0.45μm	100	AS012545-G
33mm with glass prefilter	0.22μm	100	AS013320-G
	0.45μm	100	AS013345-G

Nylon syringe filters

Membrane Type	Pore Size	Qty	Cat.No.
13mm	0.22μm	200	AS021320
	0.45μm	200	AS021345
25mm	0.22μm	100	AS022520
	0.45μm	100	AS022545
33mm	0.22μm	100	AS023320
	0.45μm	100	AS023345
13mm with glass prefilter	0.22μm	200	AS021320-G
	0.45μm	200	AS021345-G
25mm with glass prefilter	0.22μm	100	AS022520-G
	0.45μm	100	AS022545-G
33mm with glass prefilter	0.22μm	100	AS023320-G
	0.45μm	100	AS023345-G

Hydrophobic PVDF syringe filters

Membrane Type	Pore Size	Qty	Cat.No.
13mm	0.22μm	200	AS031320
	0.45μm	200	AS031345
25mm	0.22μm	100	AS032520
	0.45μm	100	AS032545
33mm	0.22μm	100	AS033320
	0.45μm	100	AS033345
13mm with PP prefilter	0.22μm	200	AS031320-P
	0.45μm	200	AS031345-P
25mm with PP prefilter	0.22μm	100	AS032520-P
	0.45μm	100	AS032545-P
33mm with PP prefilter	0.22μm	100	AS033320-P
	0.45μm	100	AS033345-P

Hydrophobic PTFE syringe filters

Membrane Type	Pore Size	Qty	Cat.No.
13mm	0.22μm	200	AS041320
	0.45μm	200	AS041345
	1μm	200	AS041301
25mm	0.22μm	100	AS042520
	0.45μm	100	AS042545
	1μm	100	AS042501
	5μm	100	AS042505
33mm	0.22μm	100	AS043320
	0.45μm	100	AS043345
	1μm	100	AS043301
13mm with PP prefilter	0.22μm	200	AS041320-P
	0.45μm	200	AS041345-P
25mm with PP prefilter	0.22μm	100	AS042520-P
	0.45μm	100	AS042545-P
	1μm	100	AS042501-P
	5μm	100	AS042505-P
33mm with PP prefilter	0.22μm	100	AS043320-P
	0.45μm	100	AS043345-P

Polyethersulfone (PES) syringe filters

Membrane Type	Pore Size	Qty	Cat.No.
13mm	0.22μm	200	AS051320
	0.45μm	200	AS051345
25mm	0.22μm	100	AS052520
	0.45μm	100	AS052545
33mm	0.22μm	100	AS053320
	0.45μm	100	AS053345
13mm with glass prefilter	0.22μm	200	AS051320-G
	0.45μm	200	AS051345-G
25mm with glass prefilter	0.22μm	100	AS052520-G
	0.45μm	100	AS052545-G
33mm with glass prefilter	0.22μm	100	AS053320-G
	0.45μm	100	AS053345-G

Regenerated cellulose (RC) syringe filters

Membrane Type	Pore Size	Qty	Cat.No.
13mm	0.22μm	200	AS061320
	0.45μm	200	AS061345
25mm	0.22μm	100	AS062520
	0.45μm	100	AS062545
33mm	0.22μm	100	AS063320
	0.45μm	100	AS063345
13mm with glass prefilter	0.22μm	200	AS061320-G
	0.45μm	200	AS061345-G
25mm with glass prefilter	0.22μm	100	AS062520-G
	0.45μm	100	AS062545-G
33mm with glass prefilter	0.22μm	100	AS063320-G
	0.45μm	100	AS063345-G

Hydrophilic PVDF syringe filters

Membrane Type	Pore Size	Qty	Cat.No.
13mm	0.22μm	200	AS071320
	0.45μm	200	AS071345
25mm	0.22μm	100	AS072520
	0.45μm	100	AS072545
33mm	0.22μm	100	AS073320
	0.45μm	100	AS073345
13mm with glass prefilter	0.22μm	200	AS071320-G
	0.45μm	200	AS071345-G
25mm with glass prefilter	0.22μm	100	AS072520-G
	0.45μm	100	AS072545-G
33mm with glass prefilter	0.22μm	100	AS073320-G
	0.45μm	100	AS073345-G

Sterilized Syringe Filters

Mixed cellulose(acetate and nitrate) syringe filters

Membrane Type	Pore Size	Qty	Cat.No.
13mm	0.22μm	96	AS911320
	0.45μm	96	AS911345
25mm	0.22μm	100	AS912520
	0.45μm	100	AS912545

Nylon syringe filters

Membrane Type	Pore Size	Qty	Cat.No.
13mm	0.22μm	96	AS921320
	0.45μm	96	AS921345
25mm	0.22μm	100	AS922520
	0.45μm	100	AS922545

Hydrophobic PVDF syringe filters

Membrane Type	Pore Size	Qty	Cat.No.
13mm	0.22μm	96	AS931320
	0.45μm	96	AS931345
25mm	0.22μm	100	AS932520
	0.45μm	100	AS932545

Hydrophobic PTFE syringe filters

Membrane Type	Pore Size	Qty	Cat.No.
13mm	0.22μm	96	AS941320
	0.45μm	96	AS941345
25mm	0.22μm	100	AS942520
	0.45μm	100	AS942545

Polyethersulfone (PES) syringe filters

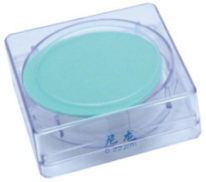
Membrane Type	Pore Size	Qty	Cat.No.
13mm	0.22μm	96	AS951320
	0.45μm	96	AS951345
25mm	0.22μm	100	AS952520
	0.45μm	100	AS952545

Regenerated cellulose (RC) syringe filters

Membrane Type	Pore Size	Qty	Cat.No.
13mm	0.22μm	96	AS961320
	0.45μm	96	AS961345
25mm	0.22μm	100	AS962520
	0.45μm	100	AS962545

Membrane Filters

Ordering Information



Mixed cellulose(acetate and nitrate)

Membrane Type	Pore Size	Qty	Cat.No.
13mm	0.22μm	200	AM011320
	0.45μm	200	AM011345
25mm	0.22μm	200	AM012520
	0.45μm	200	AM012545
50mm	0.22μm	100	AM015020
	0.45μm	100	AM015045

Nylon

Membrane Type	Pore Size	Qty	Cat.No.
13mm	0.22μm	200	AM021320
	0.45μm	200	AM021345
25mm	0.22μm	200	AM022520
	0.45μm	200	AM022545
50mm	0.22μm	100	AM025020
	0.45μm	100	AM025045

Hydrophobic PVDF

Membrane Type	Pore Size	Qty	Cat.No.
13mm	0.22μm	200	AM031320
	0.45μm	200	AM031345
25mm	0.22μm	200	AM032520
	0.45μm	200	AM032545
50mm	0.22μm	100	AM035020
	0.45μm	100	AM035045

Hydrophobic PTFE

Membrane Type	Pore Size	Qty	Cat.No.
13mm	0.22μm	200	AM041320
	0.45μm	200	AM041345
25mm	0.22μm	200	AM042520
	0.45μm	200	AM042545
50mm	0.22μm	100	AM045020
	0.45μm	100	AM045045

Polyethersulfone (PES)

Membrane Type	Pore Size	Qty	Cat.No.
13mm	0.22μm	200	AM051320
	0.45μm	200	AM051345
25mm	0.22μm	200	AM052520
	0.45μm	200	AM052545
50mm	0.22μm	100	AM055020
	0.45μm	100	AM055045

Regenerated cellulose (RC)

Membrane Type	Pore Size	Qty	Cat.No.
13mm	0.22μm	200	AM061320
	0.45μm	200	AM061345
25mm	0.22μm	200	AM062520
	0.45μm	200	AM062545
50mm	0.22μm	100	AM065020
	0.45μm	100	AM065045

Glass Filtration System

The system includes a borosilicate glass funnel, a sintered borosilicate glass membrane core on the neck, aluminum clamp, and borosilicate glass filter flask. It can be used with or without a membrane filter depending on the application requirement to filtrate organic or aqueous solution. It is also used for liquid degassing.

Funnel volumes: 300 mL, 500 mL
Pore size of the glass membrane core: 10 µm
Flask volumes: 1000 mL, 2000 mL

Ordering Information

Funnel Volume (mL)	Flask Volume (mL)	Qty	Cat.No.
300	1000	ea	AM3100
500	2000	ea	AM5200

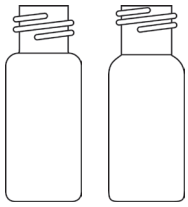
Vials and Seals

Bonna-Agela Technologies Inc. offers a number of high quality vials and seals. All of them can meet the high standard of the chromatographic applications.

Vials and Seals

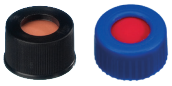
Description	Thread	Color	Cat. No.(100/pk)
1mL shell vial, 8mm PE-Plug	Shell	Clear	AV0100-6

2 mL 12x32 mm Screw Neck Vials and Seals



8-425 Short thread

Description	Thread	Color	Cat. No.(100/pk)
Screw neck vials	Std 8-425	Clear	AV1000-6
Screw neck vials	Std 8-425	Amber	AV1010-0
Screw neck vials, graduated	Std 8-425	Clear	AV1001-6
Screw neck vials, graduated	Std 8-425	Amber	AV1011-0
Black screw cap, centre hole; Red silicone/white PTFE septa	Std 8-425		AV2000-0



8-425 Short thread

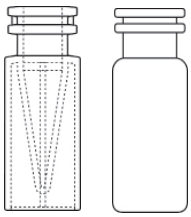
Description	Thread	Color	Cat. No.(100/pk)
300 µL PP Micro-vial	short 9 mm	Transparent	AV1103-P
300 µL PP Micro-vial	short 9 mm	Amber	AV1113-P
Screw neck vial	short 9 mm	Clear	AV1100-6
Screw neck vial	short 9 mm	Amber	AV1110-0
Screw neck vial, graduated	short 9 mm	Clear	AV1101-6
Screw neck vial, graduated	short 9 mm	Amber	AV1111-0
Screw neck cap, center hole; red silicone/ white PTFE septa	short 9 mm	Blue	AV2100-A
Screw neck cap, center hole; red silicone/ white PTFE septa,slitted	short 9 mm	Blue	AV2200-0
Screw neck cap, closed top; red silicone/ white PTFE septa	short 9 mm	Blue	AV2300-0

Inserts for 2 mL Short Thread Screw Vials

Description	Thread	Color	Cat. No.(100/pk)
Insert, flat bottom, 31x6 mm, for 9 mm vials	300 µL	Clear	AV1130-6
Insert, with assembled plastic spring, 29*6 mm	250 µL	Clear	AV1131-6

ND11 12x32mm Snap Ring Vials and Seals

Description	Thread	Color	Cat. No.(100/pk)
PP snap ring Micro-vial	300 µL	Transparent	AV0003-P
PP snap ring Micro-vial	300 µL	Amber	AV0013-P
Snap ring vial	2 mL	Clear	AV3000-6
Snap ring vial	2 mL	Amber	AV3101-0
Snap ring vial, graduated	2 mL	Clear	AV3001-6
Snap ring vial, graduated	2 mL	Amber	AV3011-0
PE snap ring cap, centre hole; white silicone/blue PTFE septa, slitted	11 mm	Transparent	AV4100-0
PEsnap ring cap, centre hole; red silicone/ white PTFE septa	11 mm	Blue	AV4201-0



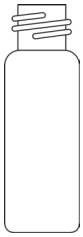
8-425 Short thread

ND11 2 mL 12x32mm Crimp Neck Vials and Seals

Description	Thread	Color	Cat. No.(100/pk)
PP snap ring Micro-vial	Wide mouth	Clear	AV5001-6
PP snap ring Micro-vial	Wide mouth	Amber	AV5200-0
Snap ring vial	Wide mouth	Clear	AV5111-6
Snap ring vial	Wide mouth	Amber	AV5300-0
Aluminium cap, center hole; red silicone/white PTFE septa	11 mm	Clear	AV6110-0
Manual Crimper	11 mm	lacquered	AVC011-0

4 mL Screw Neck Vials and Seals

Description	Thread	Color	Cat. No.(100/pk)
Screw neck vials	4 mL	Clear	AV7000-6
Screw neck vials, graduated	4 mL	Clear	AV7001-6
Screw neck vials	4 mL	Amber	AV7010-0
Screw neck vials, graduated	4 mL	Amber	AV7011-0
Screw caps close top; Nature PTFE/Nature silicone septa	13 mm	Black	AV7400-0
Screw caps center hole; Red PTFE/ White silicone septa	13 mm	Black	AV7410-0



12 mL Screw Neck Vials and Seals

Description	Thread	Color	Cat. No.(100/pk)
Screw neck vial, clear glass	12 mL	Clear	AV7500-6
Screw neck vial, amber glass	12 mL	Amber	AV7510-7

Sample Storage Screw Neck Vials and Seals

Description	Thread	Color	Cat. No.(100/pk)
Screw neck vials,57×27.5mm	20 mL	Clear	AV7100-7
Screw neck vials,57×27.5mm	20 mL	Amber	AV7110-7
Screw neck vial,70×27.5 mm	25 mL	Clear	AV7600-7
Screw neck vials,95×27.5mm	40 mL	Clear	AV7220-7
Screw neck vials,95×27.5mm	40 mL	Amber	AV7230-7
Screw neck vials,140×27.5mm	60 mL	Clear	AV7320-7
Screw neck vials,140×27.5mm	60 mL	Amber	AV7330-7
Screw caps, centre hole; nature PTFE/ nature silicone septa,	¢ 22×3 mm	white	AV7910-0
Screw caps, closed top; nature PTFE/ nature silicone septa,	¢ 22×1.5 mm	white	AV7920-0

Headspace Vials and Seals

Description	Thread	Color	Cat. No.(100/pk)
Crimp neck headspace vials,23×75.5mm, rounded bottom(PE)	20mL	Clear	AV8000-7
Crimp neck headspace vials,22.5×75.5mm, long neck, rounded bottom	20mL	Clear	AV8100-7
Crimp neck headspace vials,22.5×75.5mm, long neck, flat bottom	20mL	Clear	AV8110-7
Aluminium cap, centre hole; nature silicone/ PTFE septa	20 mm×3 mm	Clear	AV8800-0
Manual Crimper	20 mm	Amber	AVC020-0

Description	Thread	Color	Cat. No.(100/pk)
Precision thread vials, rounded bottom 46×22.5 mm	10 mL	Clear	AV8500-0
Precision thread vials, rounded bottom 77.5×22.5 mm	20 mL	Clear	AV8600-0
Screw cap, centre hole; White silicone/Blue PTFE septa	18 mm×1.5 mm	Silver	AV8900-0

2 mL Vial Rack (Cat. No AR0002-1)

Material	Description	Cat. No.
PP	ID 12mm, 50 well, Blue	AR0002-1

Crimper for HS Crimp Vials

- Easy hands on
- Chemical Resistance Surface
- Crimping Pressure Adjustable by a Screw In the Handle

Product	Description	Cat. No.(100/pk)
Crimper	for 20 mm crimp vials	AVC020-0
Crimper	for 11 mm crimp vials	AVC011-0

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

- 3 µm: fast analysis, high throughput analytical applications, micro/nano HPLC
- 5 µm: analytical and semi-preparative separation
- 10 µm: 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 Venusil® HILIC; 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, Amide column.
- **pH**: pH<2, ASB C18; pH>9, Durashell series; pH=2.0-9.0, most of other 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.

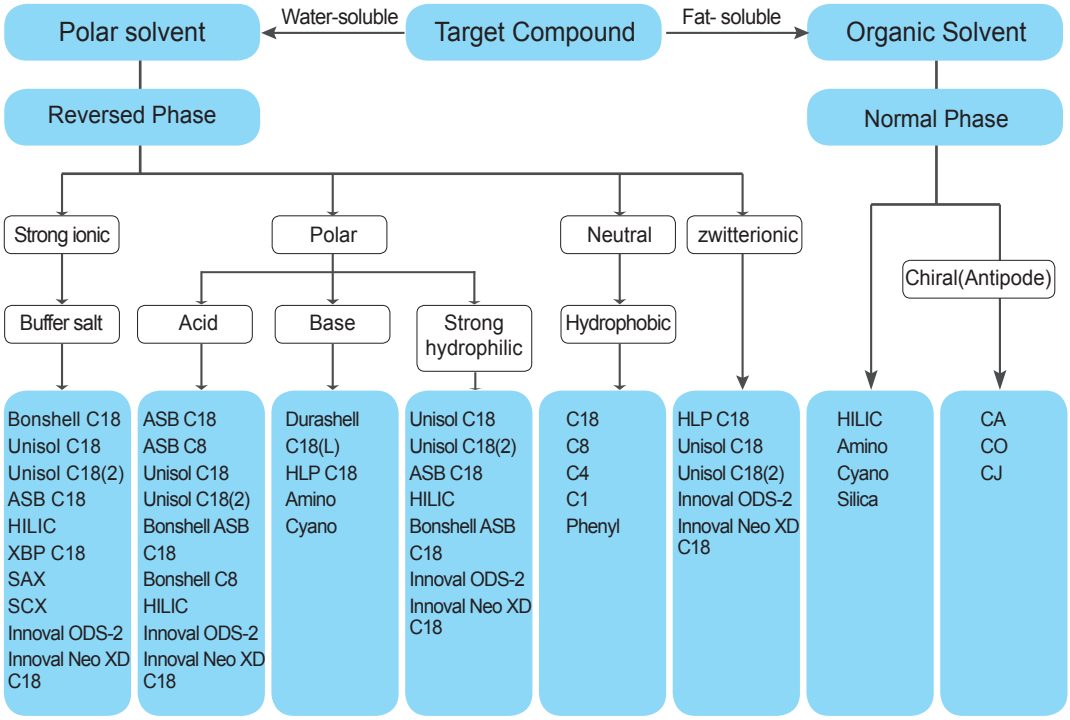
Sample

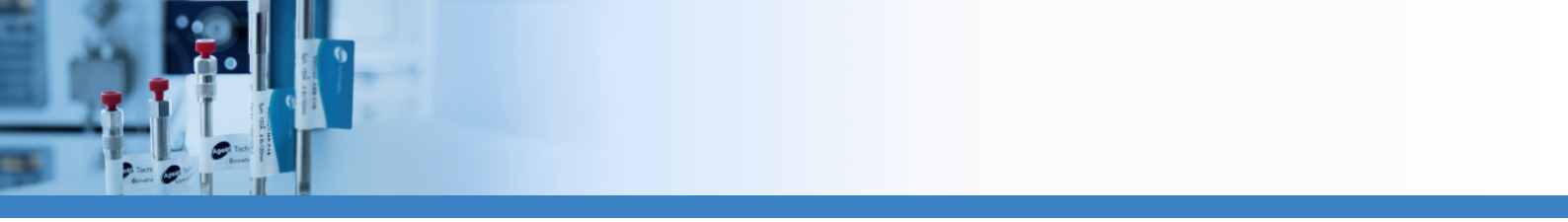
- Analyte mass/concentration: high mass load, larger diameter column (>10 mm for preparative).
- Sample volume: small volume, small diameter; large volume, large diameter and length.
- Sample complexity: simple separation, short column; complex separation, long column.

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





USP Column Selection Guide

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

Series Name	Particle(μm)	Figure
Unisol C18	3,5,10	sphere
Unisol C18(2)	3,5,10	sphere
Venusil® ASB C18	3,5,10	sphere
Venusil® XBP C18	3,5,10	sphere
Venusil® XBP C18(2)	3,5	sphere
Venusil® XBP C18(L)	3,5	sphere
Durashell C18(L)	3,5,10	sphere
Promosil® C18	5	sphere
Bonashell C18	2.7	core-shell
Innoval C18	5	sphere
Innoval Neo XD C18	5	sphere

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.

Series Name	Particle(μm)	Figure
C18 bulk media	50	Irregular

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

Series Name	Particle(μm)	Figure
Venusil® XBP Silica	5	sphere
Venusil® XBP Silica(L)	5	sphere
Promosil Silica	5	sphere
Innoval Silica	5	sphere

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

Series Name	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.

Series Name	Particle(μm)	Figure
Venusil® ASB C8	3, 5	sphere
Venusil® XBP C8	3, 5,10	sphere
Venusil® XBP C8(L)	5	sphere

L08 An essentially monomolecular layer of amino-propylsilane (NH_2) chemically bonded to totally porous silica gel support, 3~10 μm in diameter.

Series Name	Particle(μm)	Figure
Venusil® XBP NH_2	5	sphere
Promosil NH_2	5	sphere
Drushell NH_2	5	shpere

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

Series Name	Particle(μm)	Figure
Venusil® SCX	5	sphere

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

Series Name	Particle(μm)	Figure
Venusil® XBP CN	5	sphere

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

Series Name	Particle(μm)	Figure
Venusil® XBP Phenyl	5	sphere
Venusil® ASB Phenyl	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.

Series Name	Particle(μm)	Figure
Venusil® ASB C1	5	sphere

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

Series Name	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.

Series Name	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 polyhy-droxylated 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.

Series Name	Particle(µm)	Figure
Venusil® XBP C4	5	sphere

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

Series Name	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.

Series Name	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.

Series Name	Particle(µm)	Figure
Optimix C18/C8	5	sphere

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

Series Name	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.

Series Name	Particle(µm)	Figure
Venusil® CA	5	Irregular

L52 A strong cation exchange resin made of porous silica with sulfopropyl groups, 5 to 10 µ in diameter

L53 Weak cation-exchange resin consisting of ethylvinylbenzene, 55% cross-linked with divinylbenzene copolymer, 3 to 15 µm in diameter. Substrate is surface grafted with carboxylic acid and /or phosphoric acid functionalized monomers. Capacity not less than 500 µEq/column.

L54 A size exclusion medium made of covalent bonding of dextran to highly cross-linked porous agarose beads, about 13 µm in diameter

L55 A strong cation exchange resin made of porous silica coated with polybutadiene-maleic acid copolymer, about 5 µ in diameter

L56 Propyl silane chemically bonded to totally porous silica particles, 3 to 10 µm in diameter

L57 A chiral-recognition protein, ovomucoid, chemically bonded to silica particles, about 5 µm in diameter, having a pore size of 120 angstrons

L58 Strong cation-exchange resin consisting of sulfonated cross-linked styrene-divinylbenzene copolymer in the sodium form, about 6 to 30 µm in diameter
Packing having the capacity to separate proteins by

L59 molecular weight over the range of 5 to 7000 kDa. It is spherical (5 - 10 µm), silica-based, and processed to provide hydrophilic characteristics and pH stability
Spherical, porous silica gel, 10 µm or less in diameter,

L60 the surface of which has been covalently modified with alkyl amide groups and endcapped
A hydroxide selective strong anion-exchange resin

L61 consisting of a highly cross-linked core of 13 µm microporous particles having a pore size less than 10 Angstrom units and consisting of ethylvinylbenzene cross-linked with 55% divinylbenzene with a latex coating composed of 85 nm diameter microbeads bonded with alkanol quartenary ammonium ions (6%)

L62 C30 silane bonded phase on a fully porous spherical silica, 3 to 15 µm in diameter

Series Name	Particle(µm)	Figure
Venusil® XBP C30	5	sphere

Solutions for Specific Applications

Solutions for Highly Water Soluble Compounds

Unisol C18(2), Venusil® ASB C18, Venusil® HILIC

It is known that highly water-soluble compounds always 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 to 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.

Unisol C18(2) is a slightly-polar C18 column, and it is our most versatile high aqueous reversed phase column. Unisol C18(2) 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 suits for pH range of 0.8-7.5. The column's stationary phase is non-end capped polar C18 and good for low pH conditions. Venusil® HILIC has a pH range of 2.0-8.0. Venusil® HILIC column's stationary phase is modified with strong hydrophilic and neutral functionalities, and it provides hydrophilic interaction with the analytes. Venusil® HILIC provides the strongest retention of hydrophilic compounds among these three types of columns.

In general, your method development may start with a Unisol C18(2) column and a mobile phase containing a mixture of methanol or acetonitrile with an aqueous acidic buffer solution (pH=2.0-5.0). This approach may be applicable to the HPLC analysis of more than 50% of small molecules (<2000 daltons). If required, you can minimize the percentage of the stronger organic mobile phase to increase retention by using up to 100 % aqueous acidic buffer mobile phase. In the cases that you achieve adequate retention, but not enough resolution for the compounds of your interest, you may choose to adjust mobile phase ratio, mobile phase pH (very effective for ionizable compounds), or choose to replace the column with a Venusil® ASB C18 or Venusil® HILIC for an alternative selectivity. Figure 1 shows an HPLC separation of four organic acids using Unisol C18(2) 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 Unisol C18(2), 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 Venusil® HILIC column in HILIC mode for even higher retention and/or different selectivity. When using a Venusil® HILIC 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 Venusil® HILIC column. The retention of these compounds was not adequate for analysis on either an Unisol C18(2) or an ASB C18 column.

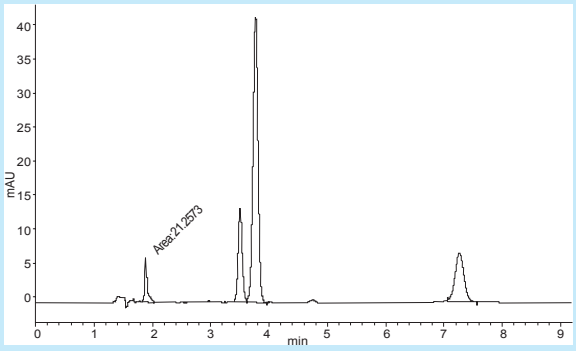
For basic compounds, you may start with an Unisol C18(2) column. For compounds with pKa>9, another alternative is to use a Venusil® HILIC column in place of the Unisol C18(2) column and operate at pH (2.0-7.0). Figure 3 shows that even with a 100% aqueous mobile phase, validamycin (basic and highly water soluable) still has poor retention on an Unisol C18(2) column. However, a Venusil® HILIC column operating at pH=2.0 in the hydrophilic interaction mode resulted in a suitable separation.

For neutral compounds, changing pH will have a limited effect on retention. If a suitable method cannot be developed using an Unisol C18(2) column, an ASB C18 or Venusil® HILIC 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 an Unisol C18(2) or ASB C18 column, a Venusil® HILIC column will be a good alternative. Venusil® HILIC columns offer completely different selectivity from reversed phase columns and offer much higher retentivity .

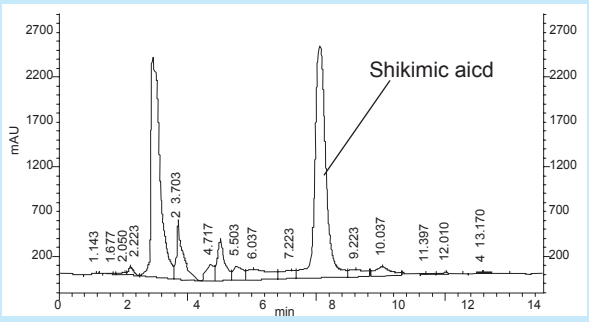
The multiple selection of columns and this comprehensive method development scheme for the separation of highly water-soluble compounds will allow you to develop HPLC methods at ease.

HPLC Separation of Organic Acids



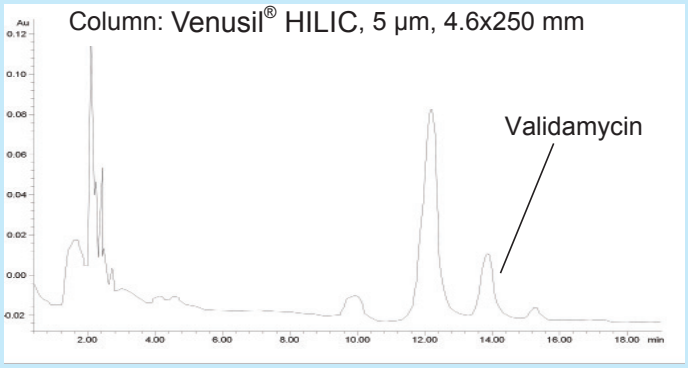
Sample: Vitamin C, malonic acid, lactic acid, citric acid.
Column: Venusil® AQ C18, 4.6x150 mm, 5 μm
Mobile Phase: 20 mmol phosphate buffer, pH=2.0
Detector: UV 210 nm
Flow Rate: 1.0 mL/min
Temperature: 30°C

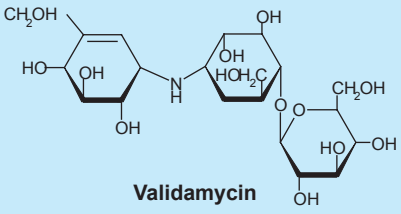
HPLC Analysis of Shikimic Acid (3,4,5-Trihydroxy-1-cyclohexene-1-carboxylic Acid)



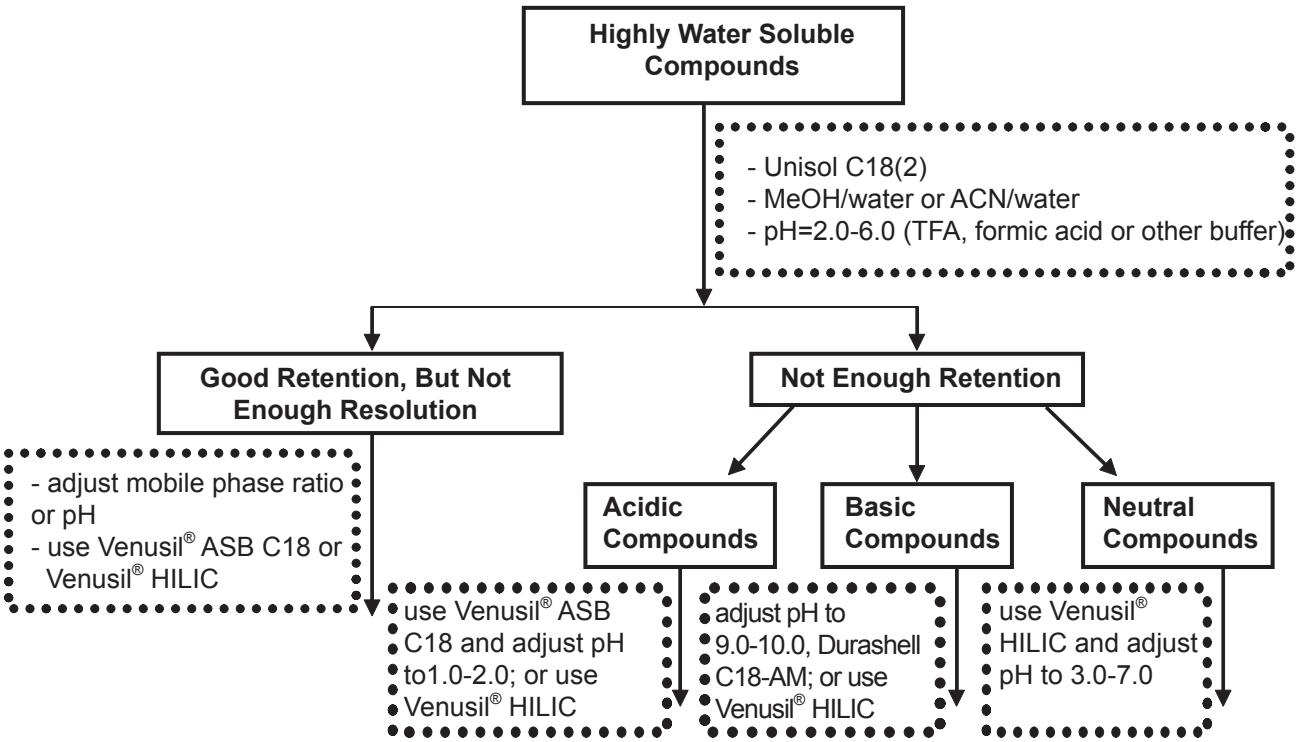
Column: Venusil® HILIC, 4.6x250 mm, 5 μm
Mobile Phase: ACN/1% formic acid 90-60% in 20 min
Detector: UV 210 nm
Flow Rate: 1.0 mL/min
Temperature: 30°C

HPLC Analysis of Validamycin Raw Products



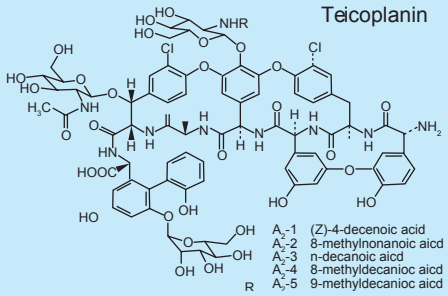


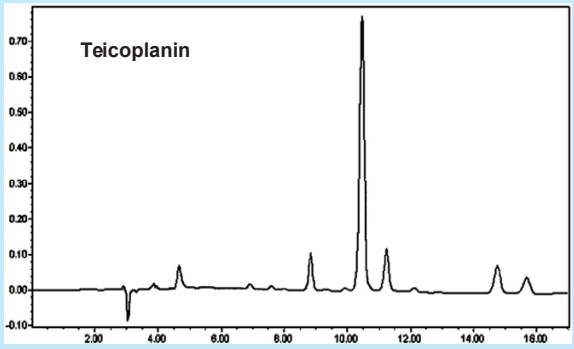
Mobile Phase: A:0.1% TFA in Water
B:Acetonitrile
Gradient: 40% A to 85% A in 30 min
Flow Rate: 1 mL/min
Temperature: 25°C
Detector: UV 210 nm
Sample: Validamycin


Highly Water Soluble Compounds
- Unisol C18(2)
- MeOH/water or ACN/water
- pH=2.0-6.0 (TFA, formic acid or other buffer)
Good Retention, But Not Enough Resolution
- adjust mobile phase ratio or pH
- use Venusil® ASB C18 or Venusil® HILIC
Not Enough Retention
Acidic Compounds
use Venusil® ASB C18 and adjust pH to1.0-2.0; or use Venusil® HILIC
Basic Compounds
adjust pH to 9.0-10.0, Durashell C18-AM; or use Venusil® HILIC
Neutral Compounds
use Venusil® HILIC and adjust pH to 3.0-7.0

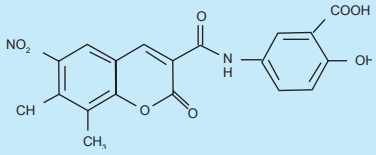
Other Stationary Phases from Bonna-Agela Technologies for Hydrophilic Compounds Separation:

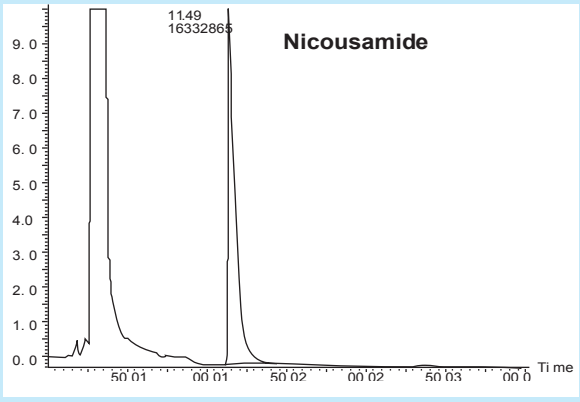
Unisol C18





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
Detector: UV 254nm
Temperature: 35°C





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

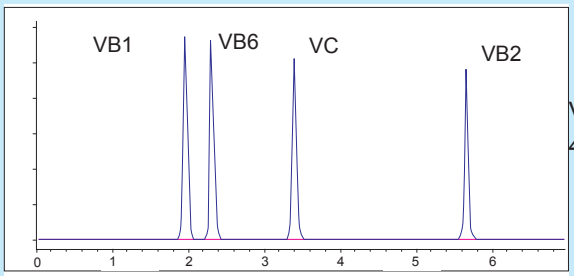
Venusil® HILIC (Bonna-Agela HILIC)
Venusil® XBP Silica (Bonna-Agela HILIC II)
Venusil® XBP NH_2 (Bonna-Agela HILIC III)

Comparison

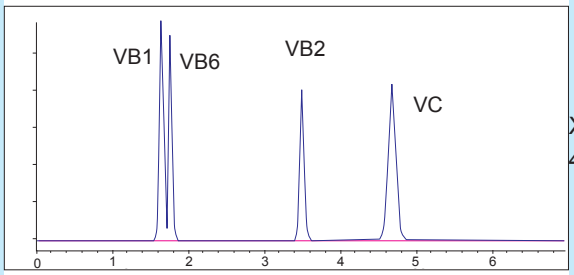
- Selectivity
  XBP silica is slightly acidic (pH=5.6); while Venusil® HILIC is slightly basic (pH=7.0-9.0), and XBP NH_2 is more basic (pH=9.2). XBP silica has stronger retention of basic compounds, while Venusil® HILIC and XBP NH_2 have better retention of acidic compounds.
  Venusil® HILIC has a balanced retention power for neutral, acidic and basic compounds, and thus the highest versatility.
- Reproducibility and Lifetime
  Venusil® HILIC has the best reproducibility and lifetime because of a bonded and close-to-neutral protection layer.

Water-soluble Vitamins

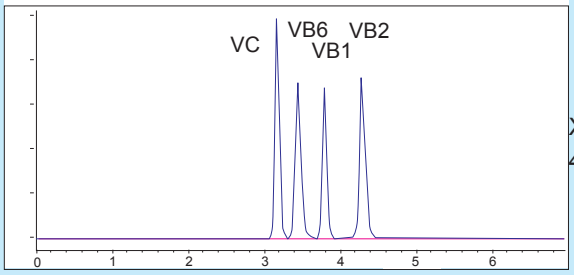
- Selectivity comparison on 3 columns



Venusil® HILIC Column,
4.6 ×150 mm, 5 µm

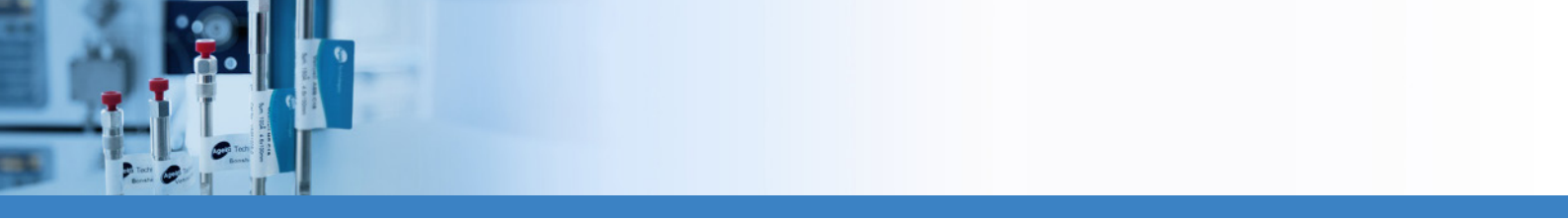


XBP NH_2 Column,
4.6×150 mm, 5 µm

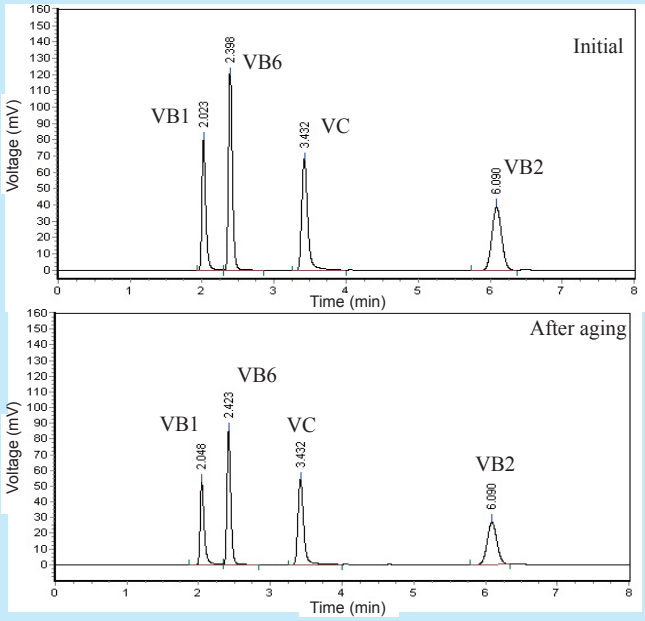


XBP Silica Column,
4.6×150 mm, 5 µm

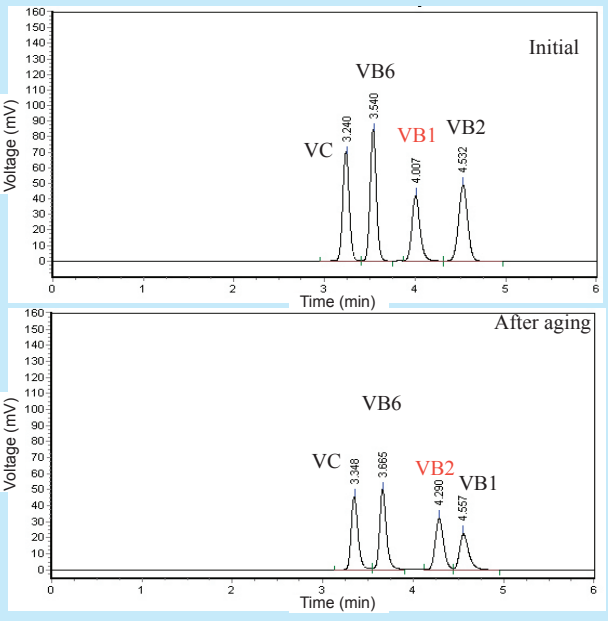
Mobile Phase: A:0.1% TFA in Water;
B:0.1% TFA in Acetonitrile;
A:B=90:10
Flow Rate: 1 mL/min
Temperature: 30°C
Detector: UV 280 nm
Sample: VB1+VB6+VC+VB2



Stability Comparison of Venusil® HILIC and Venusil® XBP Silica



Venusil® HILIC, 4.6×150 mm, 5 μm



Venusil® XBP 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°C

HPLC Conditions:

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

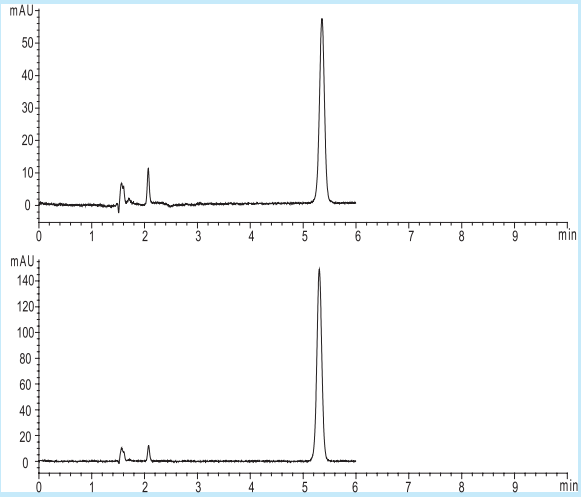
Detector: UV 280 nm; Flow Rate: 1.0 mL/min; Temperature: 30°C; Injection: 2 μL

Solutions for Low pH and High pH Applications

Bonna-Agela Technologies offers a family of stationary phases for applications at extremely low or extremely high pH. These columns extend the capability of reversed phase HPLC columns to a typical pH range of 0.8-12.0, and provide more options for your applications and method development needs.

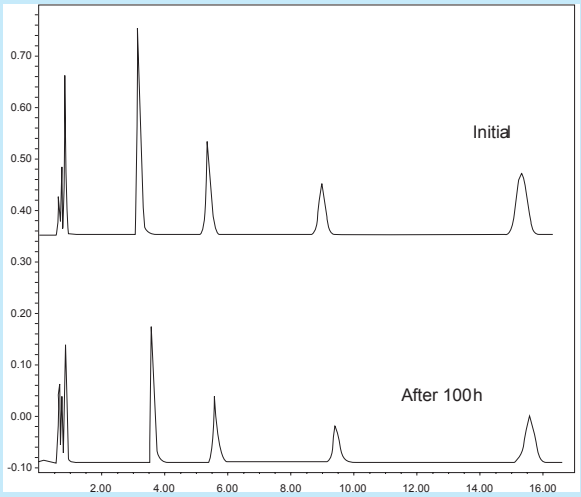
- Venusil® ASB C18 (pH:0.8-7.5);
- Venusil® ASB C8 (pH:1.0-7.5);
- Durashell C18(L) (pH:1.5-12.0)

Low pH Stability of Venusil® ASB C18

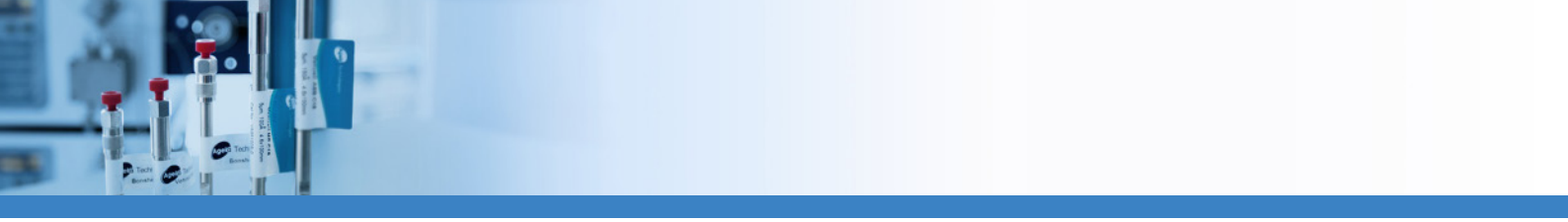


Sample: Naphthol
Column: Venusil® ASB C18, 4.6×150 mm, 5 µm
Aging: 40°C, TFA in 80% methanol (pH=1.0), 400 hours
Mobile Phase: TFA in 80% methanol (pH=1.5)
Flow Rate: 1.0 mL/min
Injection: 5 µL
Temperature: 30°C

High pH Stability of Durashell C18(L)



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



Solutions for LC-MS

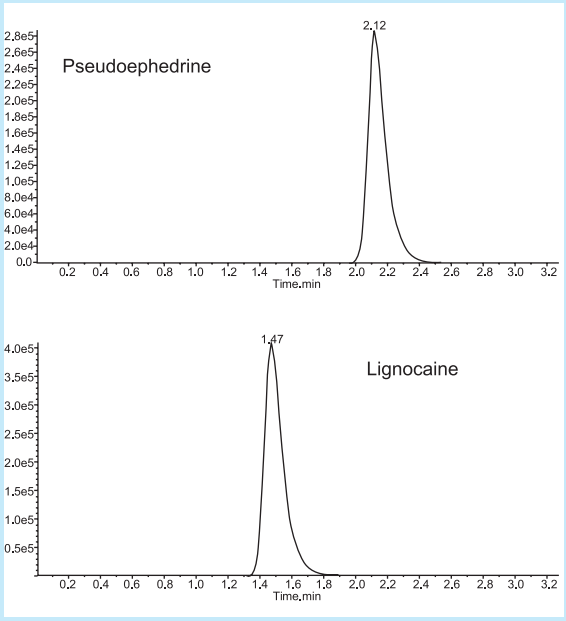
Bonna-Agela Technologies provides columns that can meet the needs of LC-MS applications. The most popular LC-MS columns from Bonna-Agela include:

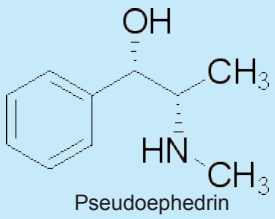
- Unisol C18(2) (versatile).
- Venusil® ASB C18 and ASB C8 (extremely low bleeding and long lifetime at low pH).
- Venusil® HILIC (for extremely polar compounds).

Benefits

- Low bleeding 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

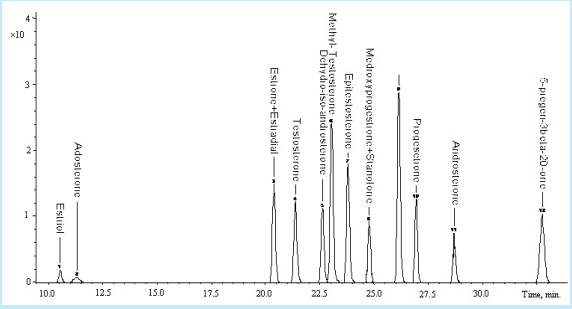




Pseudoephedrin

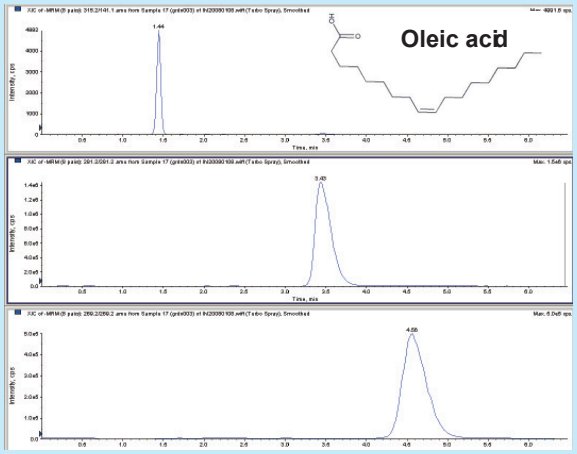
HPLC Column: Venusil® ASB C18, 2.1×50 mm, 5 μm
Sample: Sample prepared by SPE
(Cleanert® PCX 60 mg/3 mL)
Mobile Phase: A:1% Formic Acid in Water;
B:Methanol;
Gradient: 20% B to 95% B in 2 min, hold for 0.5 min, then switch to A:B (20:80)
Flow Rate: 0.5 mL/min
Temperature: 25°C

Analysis of 14 Kinds of Hormone



HPLC Column: Venusil® XBP C18, 2.1×150 mm, 5 μm
Sample: Estriol, Adosterone, Estrone+Estradial, Testosterone, Dehydro-iso-androsterone Methyl-Testosterone, Epitestosterone, Med roxyprogestrone+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°C

Oleic Acid in Plasma



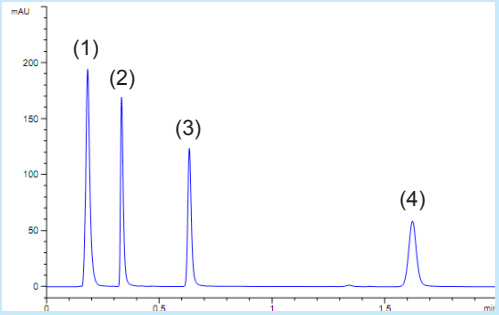
HPLC Column: Venusil® ASB C18, 2.1×50 mm, 5 μm
Sample: Sample prepared by SPE (Cleanert® PEP 60 mg/3mL)
Mobile Phase: A:13 mmol/L ammonium acetate aq., B:Acetonitrile
Gradient: 5% B to 95% B in 2 min, hold for 2 min, switch to A:B (95:5) then hold for 2 min.
Flow Rate: 0.8 mL/min
Temperature: 25°C

Solutions for Fast Analysis

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

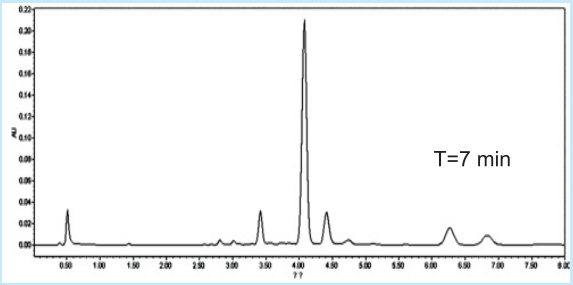
Small particle size or fused-core technology

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

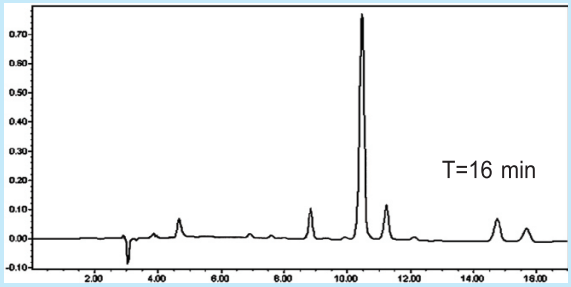


Column: UHP AQ C18, 2.1×50 mm, 2 μm
Sample: Uracil (1) Phenol (2) Nitrobenzene (3) and Naphthalene (4) in mobile phase; 1.0 μL
Mobile phase: 50% Acetonitrile / 50% Water
Flow Rate: 0.5 mL/min
Pressure: 337 bar
Temperature: 30°C
Detector: UV 254 nm

Comparison of the analysis for Teicoplanin and impurity on Bonshell C18 and conventional C18 column



Mobile Phase: A: NH_4AC Buffer (Adjust pH=6.0)
B: ACN
HPLC Column: Bonshell 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
Detector: UV 254nm
Temperature: 35°C



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
Detector: UV 254nm
Temperature: 35°C

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 columns' 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

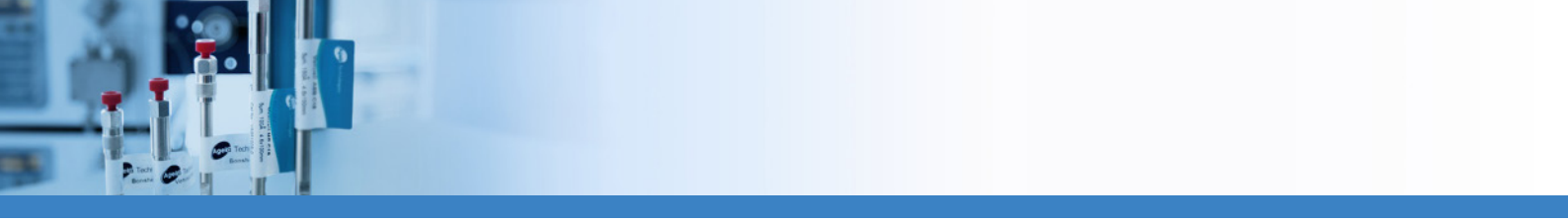
See the section of "ordering information by type of stationary phase" for ordering or call our technical staff for helps in selecting the columns you need.

Solutions for Preparative HPLC

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

Our preparative columns feature

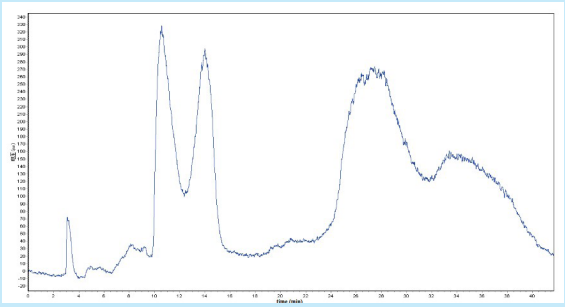
1. Great scalability
2. Excellent bed stability
3. High loading capacity
4. Broad solvent compatibility from 100% aqueous to 100% organic solvents
   (Unisol C18, Venusil HILIC and Venusil ASB C18)
5. Broad pH range (1.0-12.0) of Durashell series
6. Unique selectivity of Venusil HILIC and Venusil ASB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



Venusil® HILIC

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: Venusil® HILIC 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: 0.3 mpa, 80°C

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

Solutions for SFC

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

- Venusil® HILIC
- Venusil® XBP NH_2
- Venusil® XBP Silica
- Venusil® XBP CN
- Venusil® XBP Nitrophenyl

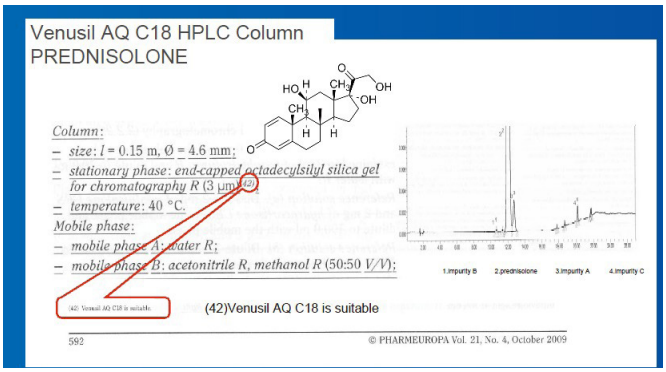
They are all made of high pure silica materials and are packed using our robust and reproducible process to ensure high efficiency and prolonged lifetime.

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

Applications

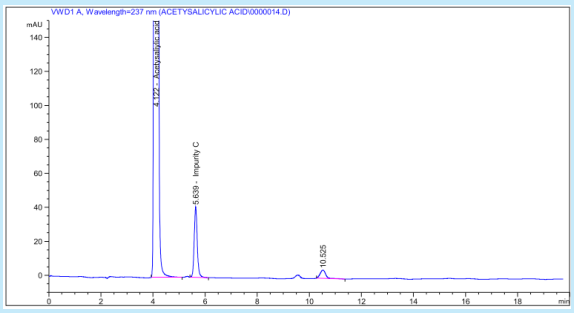
European and American Pharmacopeia

1.1. Venusil® AQ C18 HPLC Column Recommended in European Pharmacopoeia

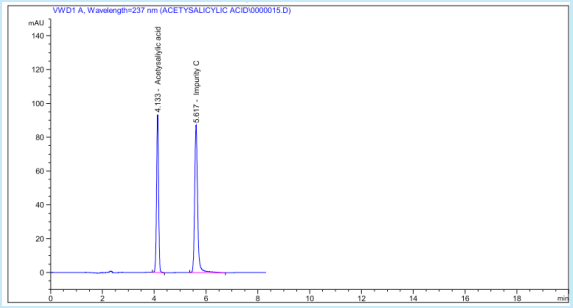


1.2. Acetylsalicylic acid and its related compounds

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

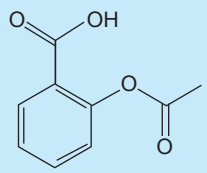


Sample profile of acetylsalicylic acid

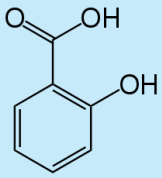


Chromatogram of system suitability test

Acetylsalicylic acid



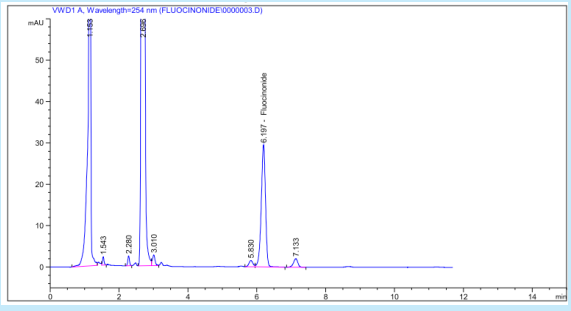
Impurity Salicylic acid



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

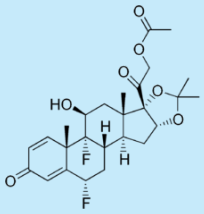
1.3. Assay test of Fluocinonide Cream

USP34-NF 29, 2862
Requirements: Plate counts should be no less than 4500 for fluocinonide



Sample profile of fluocinonide cream

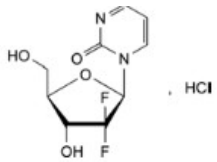
Fluocinonide



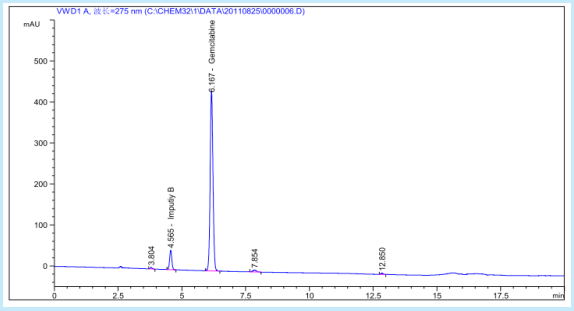
Column: Venusil® ASB C18
4.6×250 mm, 5 μm
Mobile phase: water: acetonitrile (50:50),
Detector: UV 254 nm;
Column temperature: 35°C,
Flow rate: 2 mL/min,
Injection volume: 20 μL.

1.4. The gemcitabine hydrochloride and its related compounds

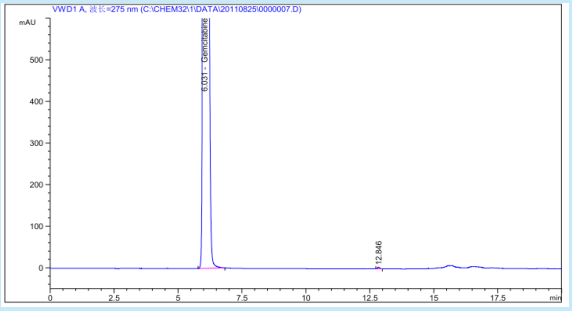
European Pharmacopoeia 7.0, 2088-2089
Requirements: Resolution factor (R) should be > 8 for the compound and its impurity



gemcitabine hydrochloride



Chromatogram of system suitability test



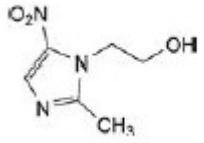
Sample profile of gemcitabine hydrochloride

Column: Venusil® ASB C8, 4.6 x 250 mm
Detector: UV 275 nm,
Column temperature: 30°C,
Flow rate: 1.2 mL/min,
Injection volume: 20 μL
Mobile Phase A: 0.1 mol/L NaH_2PO_4 (adjust pH to 2.5 with H_3PO_4)
Mobile Phase B: methanol

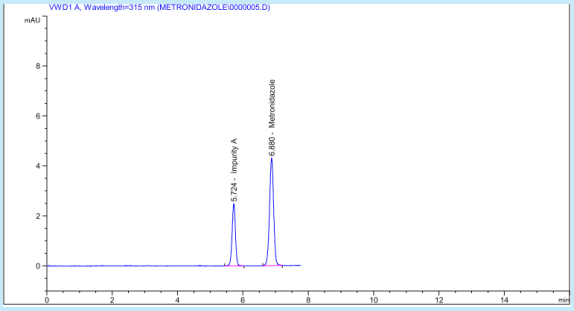
Time (min)	Mobile Phase A (%)	Mobile Phase B (%)
0-8	97	3
8-13	97→50	3→50
13-20	50	50

1.5. The metronidazole and its related compounds

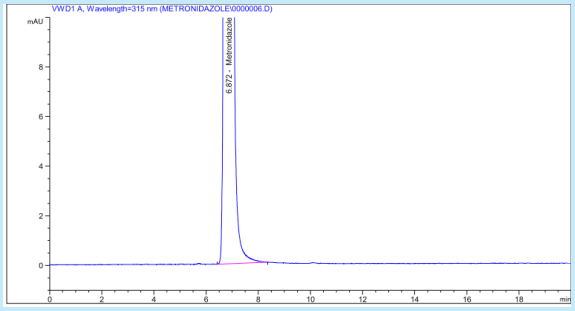
European Pharmacopoeia 7.0, 2500
Requirements: Resolution factor (R) for metronidazole and its impurity should be > 2.0.



metronidazole hydrochloride



Chromatogram of system suitability test

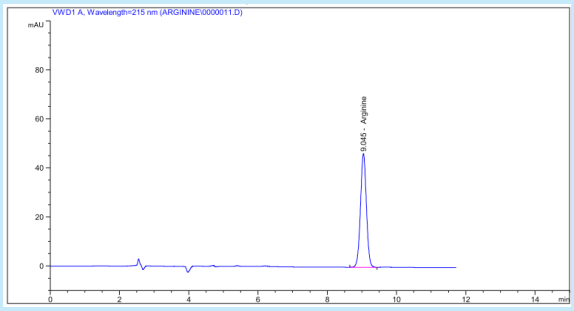


Sample profile of metronidazole hydrochloride

Column: Venusil® AQ C18, 4.6 x 250 mm, 5 µm;
Mobile phase: 0.01 mol/L of KH_2PO_4 solution: methanol (70:30);
Detector: UV 315 nm; Column temperature: 30°C;
Flow rate: 1 mL/min; injection volume 10 µL.

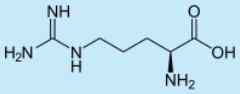
1.6. Arginine

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



Chromatographic profile of system suitability test

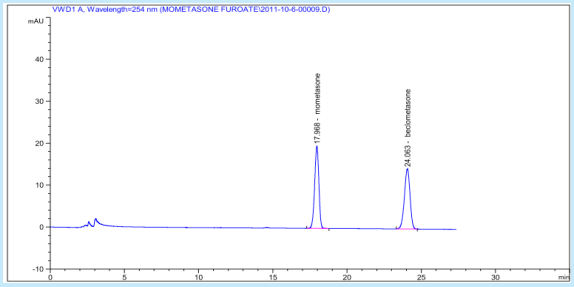
Arginine



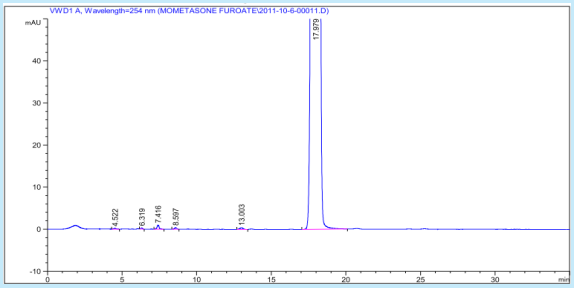
Column: Promosil C8, 4.6×250 mm;
Mobile Phase: acetonitrile -0.5 mg/mL
octane sodium phosphate buffer (5:95);
Phosphate Buffer Prepare: 6.9 mg/mL NaH_2PO_4 (pH=3.5);
Detector: UV 215 nm; Temperature: 35°C;
Flow Rate: 0.8 mL/min; Injection: 10 µL

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.

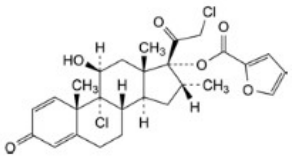


Profile of system suitability test

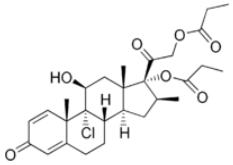


Sample profile

mometasone furoate



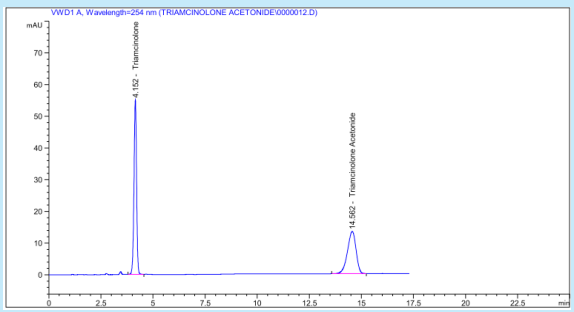
beclomethasone



Column: Venusil® XBP (L) C18, 4.6×250 mm, 5 µm
Detector: UV 254 nm
Column temperature: 35°C
Flow rate: 1 mL/min
Injection volume: 20 µL

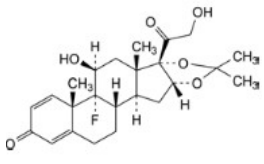
1.8. Triamcinolone acetonide and its related compounds

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.

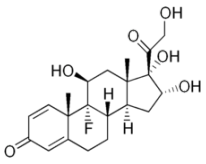


Chromatogram of system suitability test

Triamcinolone acetonide



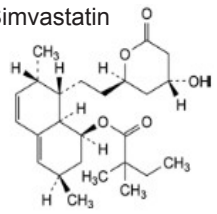
Triamcinolone



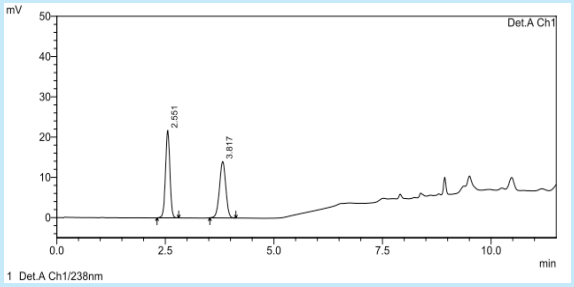
Column: Innoval C18, 4.6×250 mm, 5 µm;
Mobile Phase: methanol: water (525:475);
Detector: UV 254 nm; Temperature: 35°C;
Flow Rate: 1.5 mL/ min; Injection: 20 µL.

1.9. Simvastatin and its related compounds

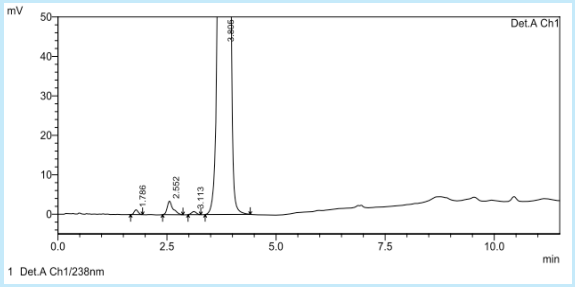
Simvastatin



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



Chromatographic profile of system suitability test for simvastatin



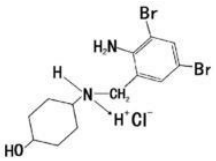
Chromatographic profile of simvastatin sample

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;
Detector: UV 238nm; Temperature: 30°C;
Flow Rate: 3.0 mL/min; Loading: 5 μL.

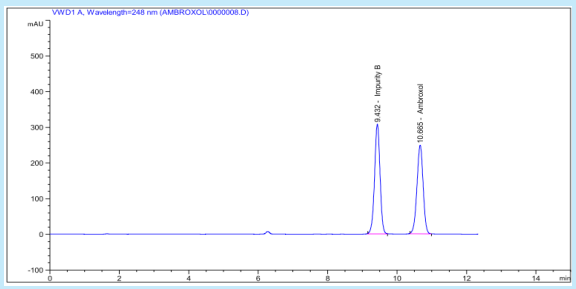
Time (min)	Mobile Phase A (%)	Mobile Phase B (%)
0-4.5	100	0
4.5-4.6	100→95	0→5
4.6-8.0	95→25	5→75
8.0-11.5	25	75

1.10. Ambroxol Hydrochloride

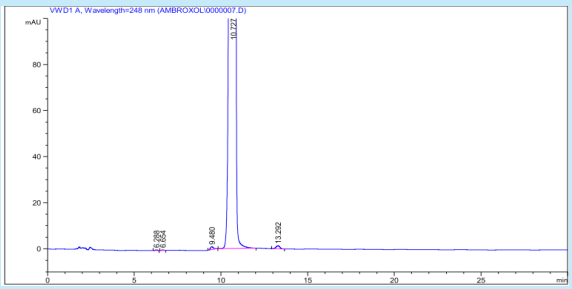
Ambroxol Hydrochloride



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



Chromatogram of system suitability test

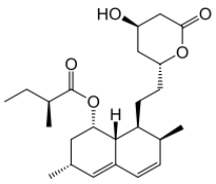


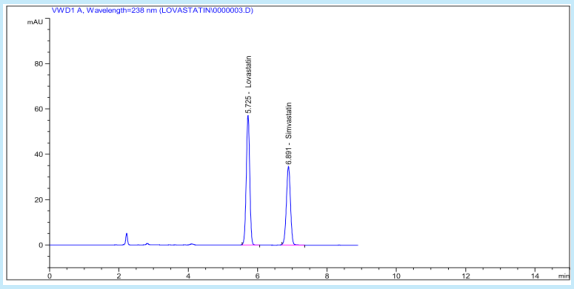
Chromatographic profile of ambroxol hydrochloride sample

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

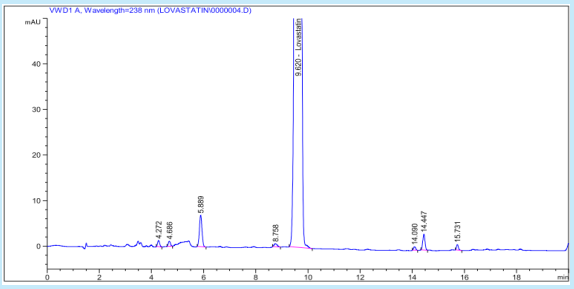
1.11. Lovastatin

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





System suitability test



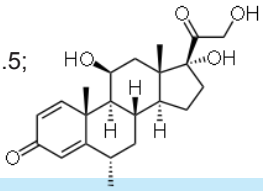
Profile of lovastatin and simvastatin sample

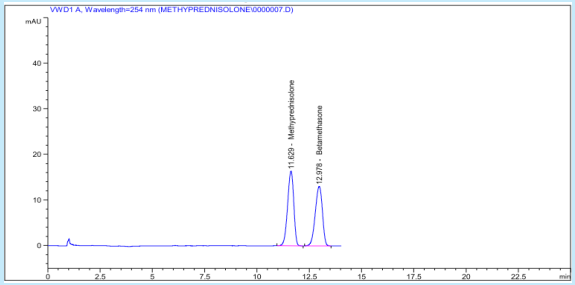
Column: Venusil® ASB C8, 4.6×250 mm
Mobile Phase A: 0.1% H_3PO_4 aq.,B: Acetonitrile
Detector: UV 238 nm
Temperature: 35°C
Flow Rate: 1.5 mL/min
Sample Loading: 10 μL

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

1.12. Methylprednisolone

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





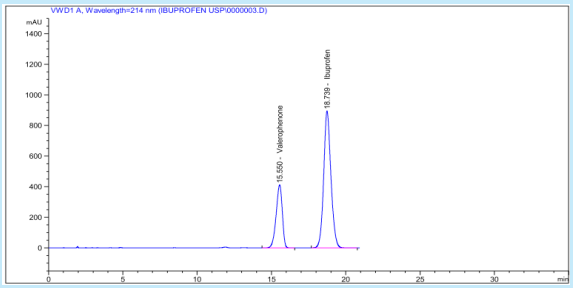
Profile of system suitability test

Column: Innoval C18×250 mm, 5 μm
Mobile Phase A: water- acetonitrile (75: 25)
Mobile Phase B: acetonitrile
Detector: UV 254 nm
Column Temperature: 45°C
Flow Rate: 2.5 mL/min
Sample Loading: 20 μL

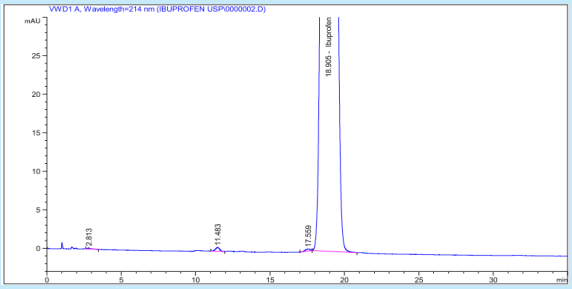
Time (min)	Mobile Phase A (%)	Mobile Phase B (%)
0-15	100	0
15-40	40→35	60→65

1.13. Ibuprofen

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

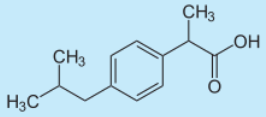


Chromatogram of system suitability test



Chromatogram of ibuprofen sample

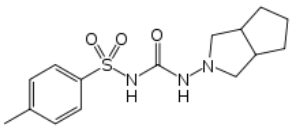
Ibuprofen

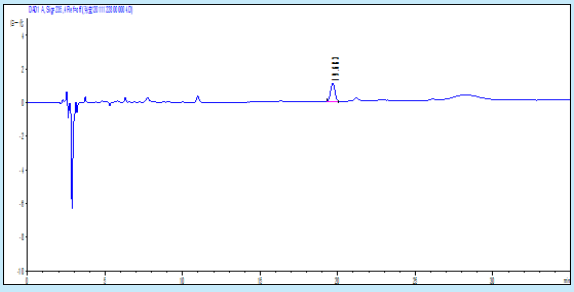


Column: Venusil® ASB C18, 4.6 x 150 mm, 5 µm
Mobile Phase: Water (adjust pH to 2.5 with H_3PO_4)
-Acetonitrile (1340: 680≈66: 34)
Detector: UV 214 nm
Column Temperature: 35°C
Flow Rate: 2 mL/min
Sample Loading: 5 µL

1.14. Gliclazide

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

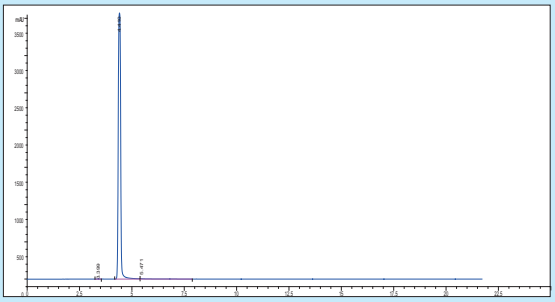




Profile of gliclazide sample

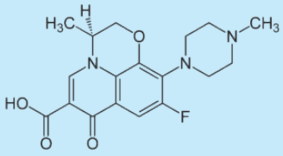
Column : Venusil® XBP C8, 4.6 x 250 mm
Mobile Phase: triethylamine: trifluoroacetic acid:
acetonitrile: water = 1:0.1:45:55
Detector: UV 235 nm
Temperature: 35°C
Flow Rate: 0.9 mL/min
Sample Loading: 20 µL

1.15. Levofloxacin



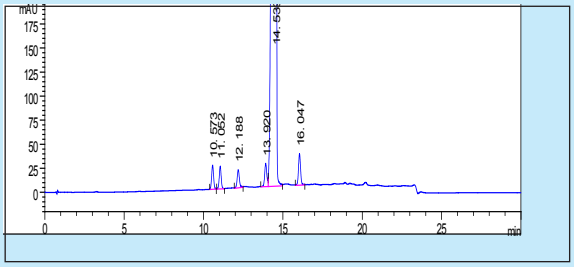
Profile of levofloxacin sample

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



Column : Venusil® XBP C18 (L), 4.6×250 mm
Buffer Salts: NH_4COOH 4 g and $NaClO_4$ 7 g 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
Detector: UV 294 nm
Column Temperature: 30°C
Flow Rate: 1.0 mL/min
Sample Loading: 10 μL

1.16. Analysis of Risperidone



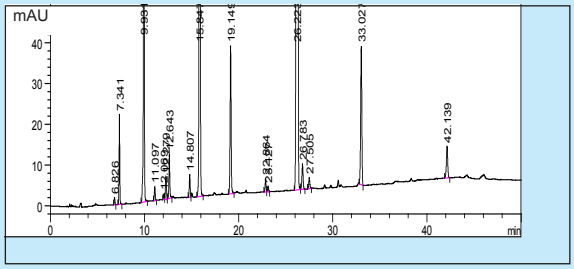
Chromatogram of sytem suitability test of Risperidone

Note: Peaks are in order of impurities A, B, C, D, Risperidone, impurity E successively.

Column: Durashell C18-AM (5 μm, 100 Å, 4.6×100 mm) ;
Mobile Phase A: 5.0 g Ammonium acetate dissolved in 1000 mL water;
Mobile Phase B: Methanol;
Flow rate: 1.5 mL/min; Detector: UV 260nm;
Temperature: 30°C; Injection: 10 μL;
Gradient:

Time (min)	Mobile Phase A (%)	Mobile Phase B (%)
0	70	30
2	70	30
17	30	70
22	30	70
22.1	70	30
30	70	30

1.17. Separation of lansoprazole Degradation Product According to USP



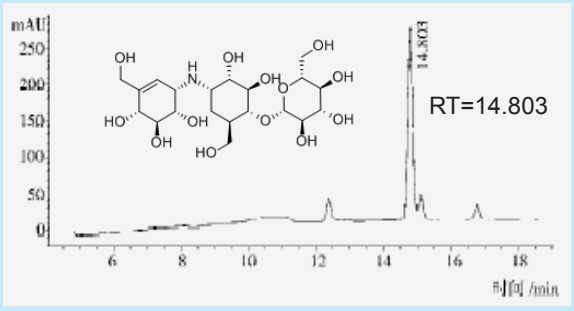
Chromatogram of ansoprazole raw material degradation products with Durashell C18-AM

Column: Durashell C18-AM (5 μm,100 Å; 4.6×250 mm);
Detector: UV 285 nm; Temperature: 30°C;
Flow rate: 1.5 mL/min; Injection: 40 μL;
Mobile phase A: Water
Mobile phase B: Acetonitrile:water:triethylamine (160/40/1,v/v), adjusted to pH 7.0 with phosphoric acid
Gradient:

Time (min)	Mobile Phase A (%)	Mobile Phase B (%)
0	90	10
40	20	80
50	20	80
51	90	10
60	90	10

HILIC Applications

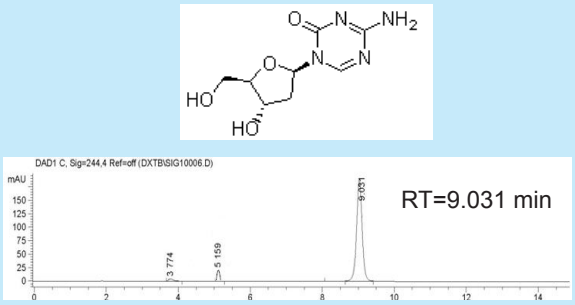
2.1 Validamycin A



Column: Venusil® HILIC, 4.6×250 mm, 5 μm, 100 Å
Mobile Phase A: Water, B: Acetonitrile
Flow Rate: 1.0 mL/min
Detector: UV 210 nm
Temperature: 30°C
Sample Loading: 10 μL

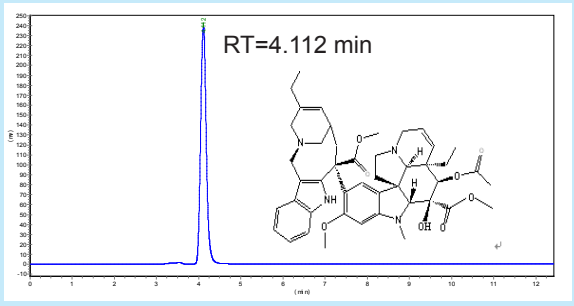
Time (min)	B (%)
0	40
30	85

2.2 Decitabine



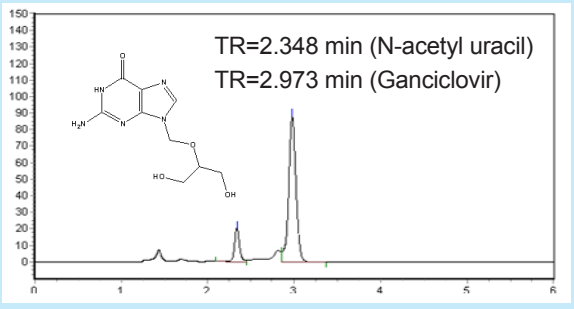
Column: Venusil® HILIC, 4.6×150 mm, 5 μm, 100 Å
Mobile Phase: Acetonitrile: Water=96:4
Flow Rate: 1.0 mL/min
Detector: UV 244 nm
Temperature:30°C
Sample Loading:10 μL

2.3 Vinorelbine



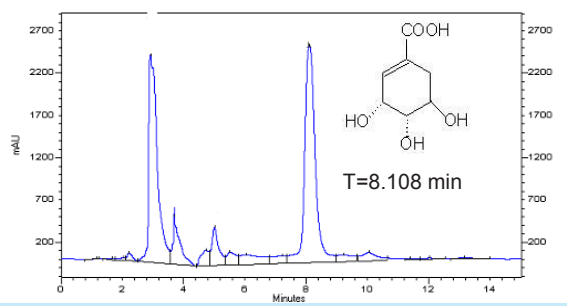
Column: Venusil® HILIC, 4.6×250 mm, 5 μm, 100 Å
Mobile Phase: 5 mmoL Ammonium acetate (pH = 7.4):
methanol =20:80
Flow Rate: 1.0 mL/min
Detector: UV 267 nm
Temperature: 30°C
Sample Loading: 10 μL

2.4 Ganciclovir



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

2.5 Shikimic Acid

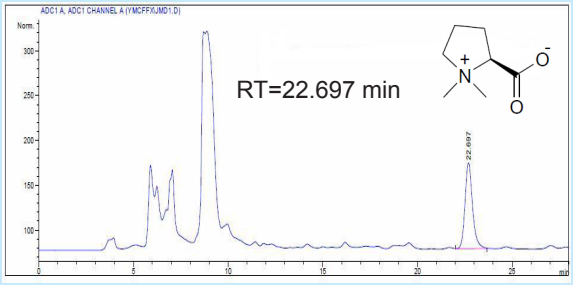


Columns: Venusil® HILIC, 4.6×250 mm, 5 μm, 100 Å
Mobile Phase: A:1% Formic acid, B: acetonitrile
Flow Rate: 1.0 mL/min
Detector: UV 210 nm
Temperature: 20°C
Sample Loading: 10 μL

Time (min)	B (%)
0	60
20	90

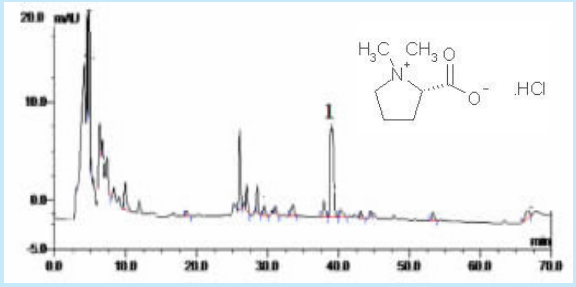
2.6 Stachydrine hydrochloride (in Motherwort)

The method has adopted in Chinese Pharmacopoeia



Columns: Venusil® HILIC, 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
Temperature: 20°C
Sample Loading: 20 μL

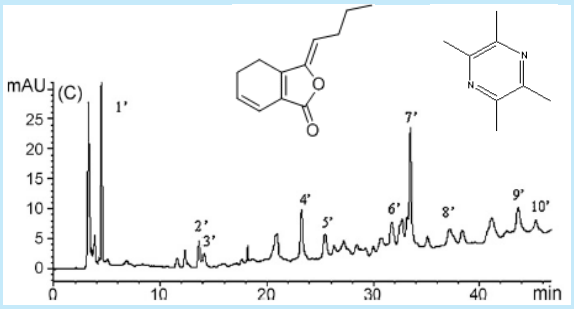
2.7 Stachydrine hydrochloride



Columns: Venusil® HILIC, 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°C; TR=38.759 min
Sample Loading: 5 μL

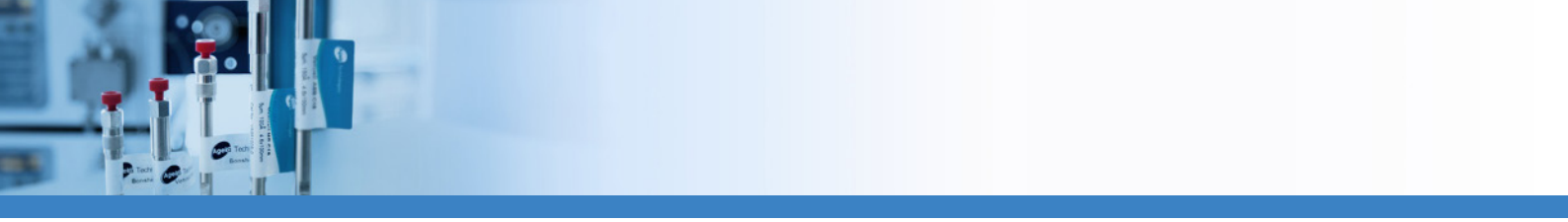
KUANG yan, LI Zhi-hao, ZHENG fang, Determination of Stachydrine Hydrochloride in Chanhou Zhuyu Tablets by HPLC-ELSD, GUIDING JOURNAL OF TRADITIONAL CHINESE MEDICINE AND PHARMACOLOGY. 2010, 16(12), 89~91.

2.8 Ligusticum wallichii

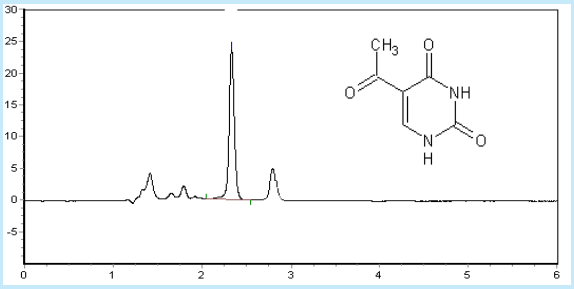


Column: Venusil® HILIC, 4.6×250 mm, 5 μm, 100 Å
Mobile Phase: Methanol: 0.2% acetic acid = 82: 18
Flow Rate: 1.0 mL/min; Detector: ELSD
Column Temperature: 30°C; Sample Loading: 5 μL

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



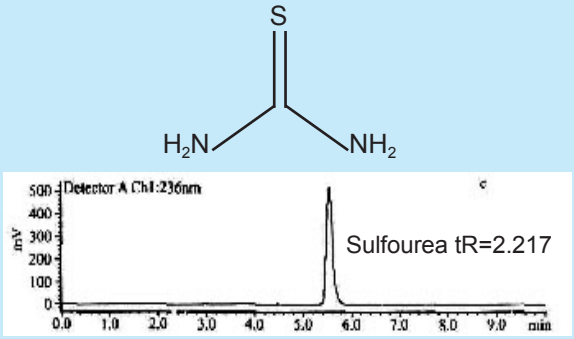
2.9 Uracil



Column: Venusil® HILIC, 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°C; Sample Loading: 10 μL

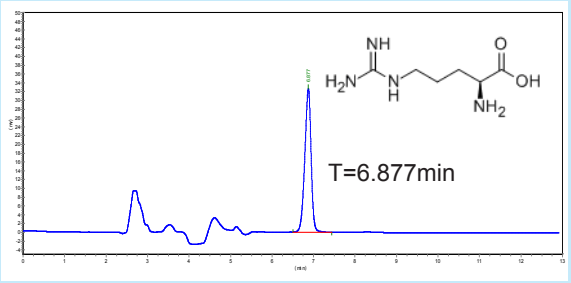
TR=2.340 (N- Acetyl uracil)
TR=2.811(uracil)

2.10 Sulfocarbamide



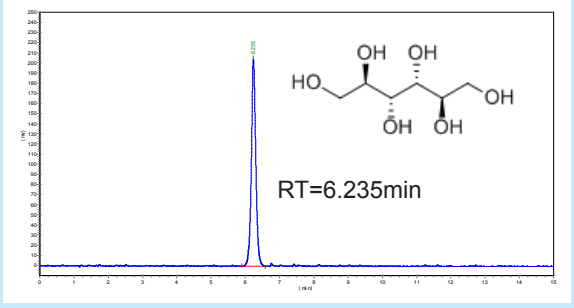
Column: Venusil® HILIC, 4.6×250 mm, 5 μm, 100 Å
Mobile Phase: Acetonitrile: Water =97:3
Flow Rate: 1.0 mL/min
Detector: UV 236 nm
Column Temperature: 23°C
Sample Loading: 10 μL

2.11 Arginine



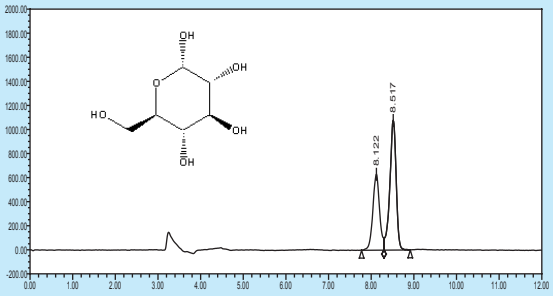
Column: Venusil® HILIC, 4.6×250 mm, 5 μm, 100 Å
Mobile Phase: 0.05 mol KaH_2PO_4: ACN =40:60
Flow Rate: 1.0 mL/min
Detector: UV 220 nm
Column Temperature: 30°C
Sample Loading: 10 μL

2.12 Mannitol



Column: Venusil® HILIC, 4.6×250 mm, 5 μm, 100 Å
Mobile Phase: water
Flow Rate: 0.5 mL/min
Detector: ELSD
Column Temperature: 40°C
Sample Loading: 2 μL

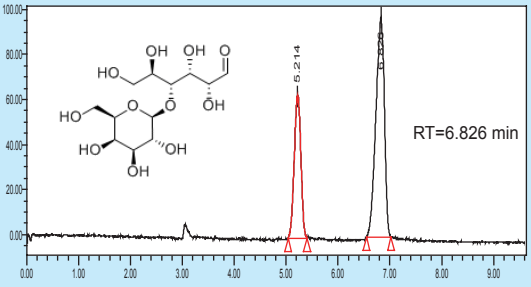
2.13 Glucose



Column: Venusil® HILIC, 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°C; Sample Loading: 10 μL

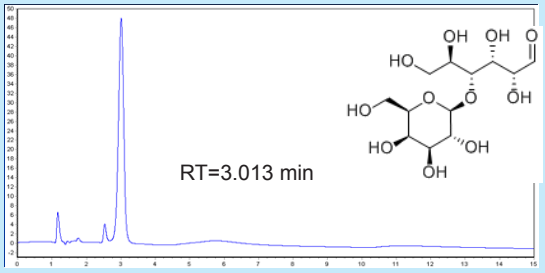
RT=8.122 min (α-D Glucose)
RT=8.511 min (β-D- Glucose)

2.14 Lactose



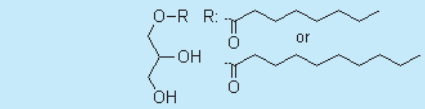
Column: Venusil® HILIC, 4.6×250 mm, 5 μm, 100 Å
Mobile Phase: ACN: water =75:25
Flow Rate: 1.0 mL/min
Detector: ELSD
Column Temperature: 60°C
Sample Loading: 20 μL

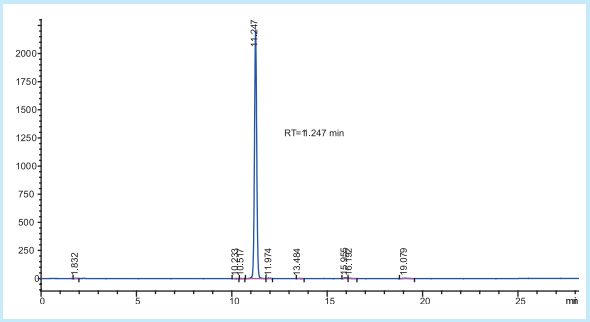
2.15 Acarbose



Column: Venusil® HILIC, 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
Detector: UV 210nm
Column Temperature: 35°C
Sample Loading: 20 μL

2.16 Simple lipids

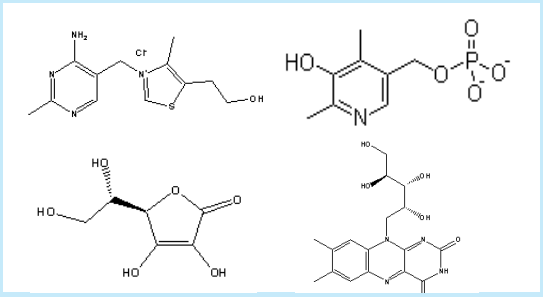


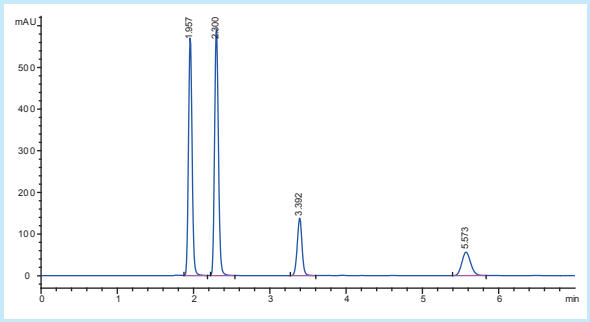


Column: Venusil® HILIC, 4.6×150 mm, 5 μm, 100 Å
Mobile Phase: A: CAN, B: 10 mmol/L NH_4OAc
Flow Rate: 1.0 mL/min
Detector: UV 254 nm
Column Temperature: 25°C
Sample Loading: 10 μL

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

2.17 Water-soluble vitamins



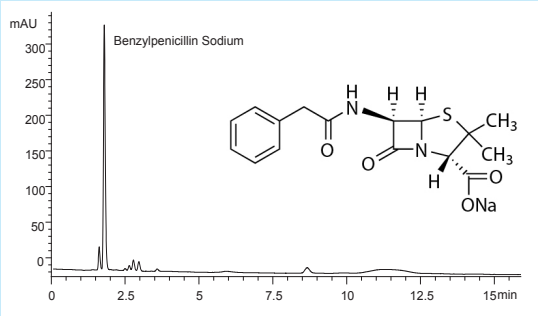


Column: Venusil® HILIC, 4.6×150 mm, 5 μm, 100 Å
Moblie Phase: 0.1%TFA in water: 0.1%TFA in ACN =90:10
Flow Rate: 1.0 mL/min; Detector: UV 280 nm,
Column Temperature: 30°C; Sample Loading: 10 μL

RT=3.392 min (VC), RT=5.573 min (VB2)
RT=1.957 min (VB1) RT=2.300 min (VB6)

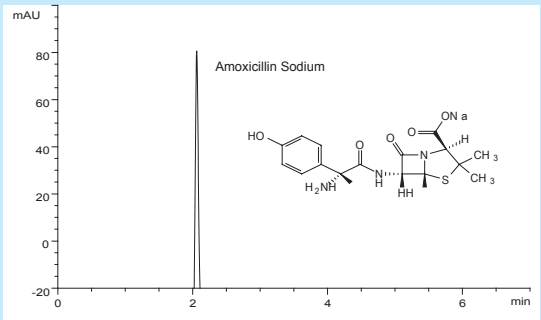
Antibiotics

3.1 Benzylpenicillin Sodium



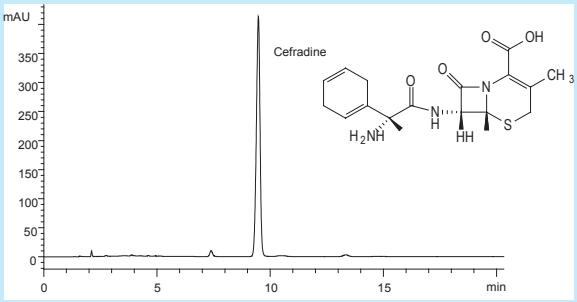
Column: Unisol C18, 4.6×150 mm, 5 μm
Part No.: UO951505-0
Mobile Phase: 0.1 mol/L potassium dihydrogen phosphate buffer (pH=2.5):ACN =70:30
Detector: UV 225 nm
Flow Rate: 1 mL/min
Injection: 4 μL

3.2 Amoxicillin Sodium



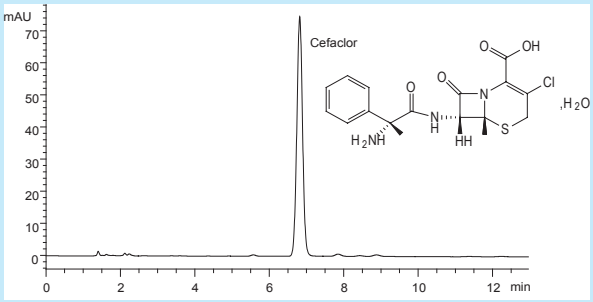
Column: Unisol C18, 4.6×150 mm, 5 μm
Part No.: UO951505-0
Mobile Phase: Phosphate buffer (0.05 mol/L, pH=5.0): ACN=97.5:2.5
Detector: UV 254 nm
Flow Rate: 1 mL/min
Injection: 5 μL

3.3 Cefradine



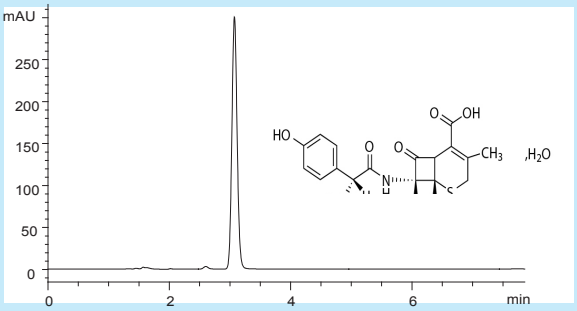
Column: Unisol C18, 4.6×150 mm, 5 μm
Part No.: UO951505-0
Mobile Phase: Water:MeOH:3.86% sodiumacetate solution/4%acetic acid solution=742:240:15:3
Detector: UV 254 nm
Flow Rate: 1 mL/min
Injection: 2 μL

3.4 Cefaclor



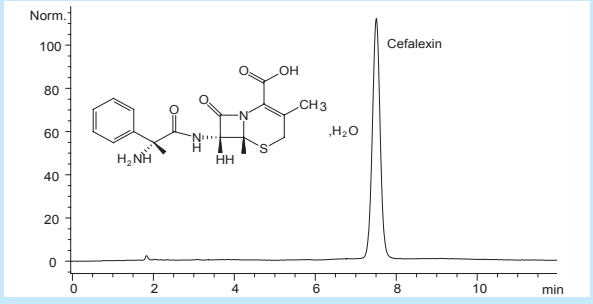
Column: Unisol C18, 4.6×150 mm, 5 μm
Part No.: UO951505-0
Mobile Phase: 0.05 mM phosphate buffer (pH=3.4):ACN=92:8
Detector: UV 254 nm
Flow Rate: 1 mL/min
Injection: 5 μL

3.5 Cefadroxil



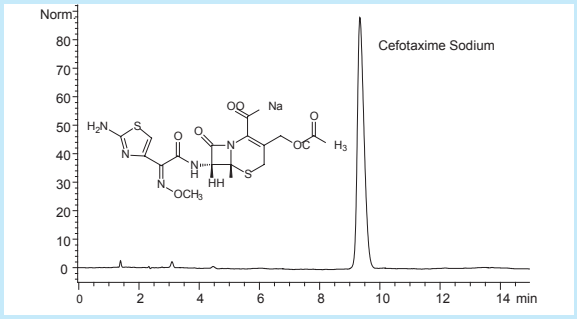
Column: Unisol C18, 4.6×150 mm, 5 μm
Part No.: UO951505-0
Mobile Phase: 0.05 mM phosphate buffer (pH=5.5):ACN=96:4
Detector: UV 230 nm
Flow Rate: 1 mL/min
Injection: 2 μL

3.6 Cefalexin



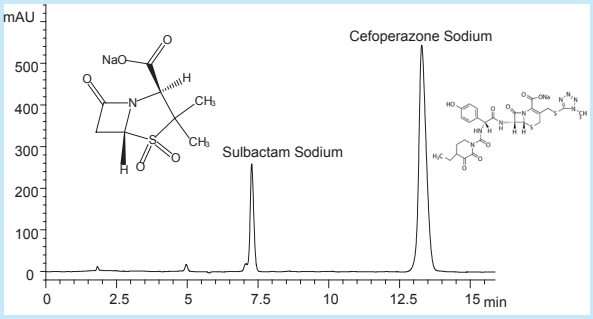
Column: Unisol C18, 4.6×150 mm, 5 μm
Part No.: UO951505-0
Mobile Phase: Water:MeOH: 3.86% sodium acetate solution/4% acetic acid solution=742:240:15:3
Detector: UV 254 nm
Flow Rate: 1 mL/min
Injection: 2 μL

3.7 Cefotaxime Sodium



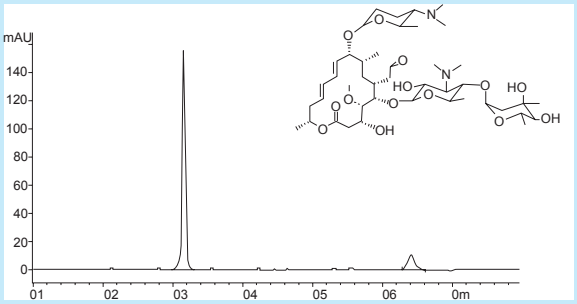
Column: Unisol C18, 4.6×150 mm, 5 μm
Part No.: UO951505-0
Mobile Phase: phosphate buffer (0.4 mMKH_2PO_4+8 mM K_2HPO_4) /MeOH=89:11
Detector: UV 254 nm
Flow Rate: 1 mL/min
Injection: 2 μL

3.8 Sulbactam Sodium + Cefoperazone Sodium



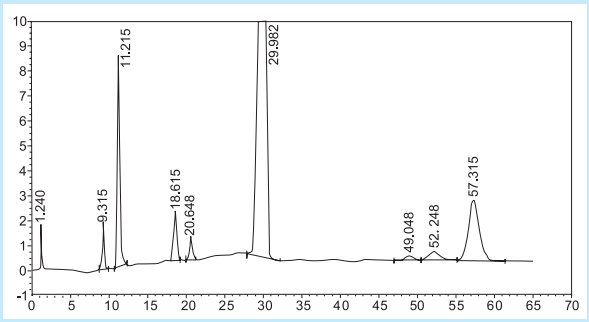
Column: Venusil® XBP C18, 4.6×250 mm, 5 μm
Part No.: VX952505-0
Mobile Phase: 0.005 mol/L TABOH (adjust pH=5.0 with H_3PO_4): ACN=70:30
Detector: UV 220 nm
Flow Rate: 1 mL/min
Injection: 2 μL

3.9 Acetylspiramycin



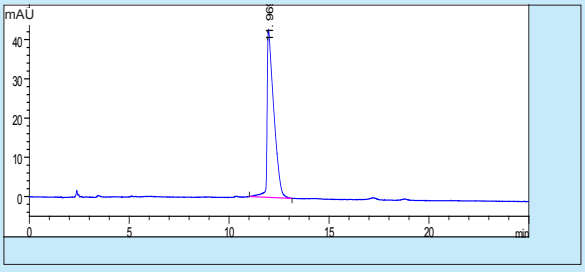
Column: Unisol C18, 4.6×250 mm, 5 μm
Part No.: UO952505-0
Mobile Phase: ACN:$NaClO_4$/H_3PO_4 (pH=2.2)=30:70
Temperature: 30°C
Flow Rate: 0.8 mL/min
Detector: UV 232nm
Injection: 20 μL

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°C

3.11 Inspection of karats Amphotericin and Its Related Substance



Chromatogram of Flumorph sample of karats amphotericin and its related substance

Column: Innoval ODS-2 (5 μm, 100 Å, 4.6×250 mm);
Buffer solution: 9.11 g potassium dihydrogen phosphate dissolved in 1000 mL water, add to pH 5.5 with 2.0 mL triethylamine and a certain amount of phosphoric acid;
Mobile phase: buffer solution: acetonitrile = 600:400;
Flow rate: 1.0 mL/min;
Temperature: 45°C;
Detector: UV 210nm;
Injection: 20 μL;
Sample: 1.0 mg/mL (dissolved in mobile phase).

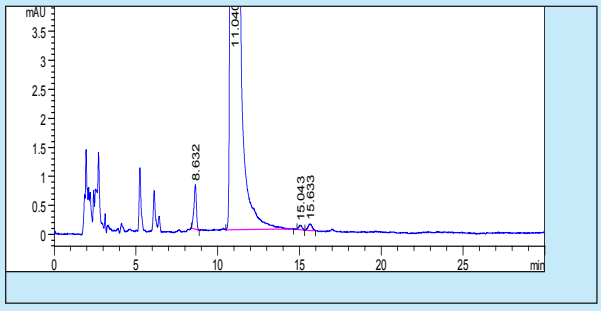
3.12 Inspection of Ambroxol Hydrochloride Tablet

Sample Preparation

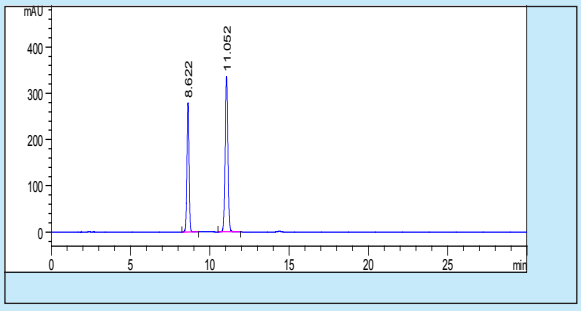
1 piece of ambroxol hydrochloride tablet was dissolved in mobile phase and diluted to the concentration of 1.0 mg/mL of ambroxol hydrochloride. Then the solution was filtered and collected as the test solution.

About 5.0 mg of ambroxol hydrochloride reference substance was dissolved with 0.2 mL methanol and was added with 40 μL of formaldehyde water solution (1→100). After shaking gently, the mixed solution was placed in water bath at 60□ for 5 min, then dried by nitrogen blow. The residue was dissolved with 5.0 mL of water and then diluted with 20 mL of mobile phase to get the ambroxol hydrochloride system suitability test solution.

Chromatographic conditions



Chromatogram of related substance test of ambroxol hydrochloride tablets

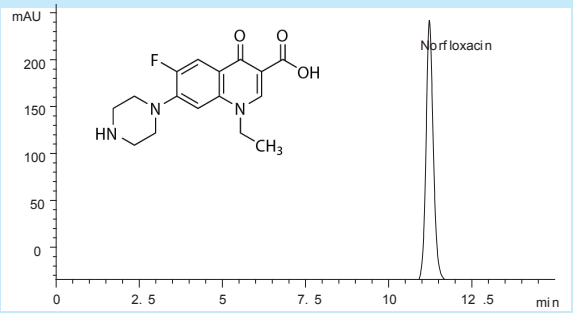


Chromatogram of system suitability test of ambroxol hydrochloride tablets

Column: Innoval ODS-2 (5 μm, 100 Å, 4.6×250 mm);
Mobile Phase: 0.01 mol/L diammonium phosphate solution:acetonitrile = 1:1;
Temperature: 30°C; Detector: UV 248nm;
Flow rate: 1.0 mL/min; Injection: 20 μL.

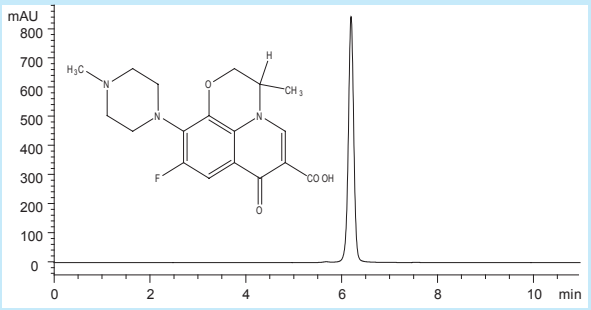
Synthetic Antimicrobial Agents

4.1 Norfloxacin



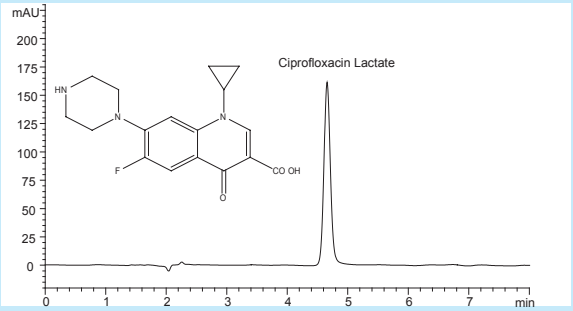
Column: Venusil® XBP C18, 4.6×250 mm, 5 μm
Part No.: VX952505-0
Mobile Phase: H_3PO_4 (0.025 mol/L, adjust to pH=3.0 with TEA):ACN=87:13
Detector: UV 278 nm
Flow Rate: 1 mL/min
Injection: 20 μL

4.2 Ofloxacin



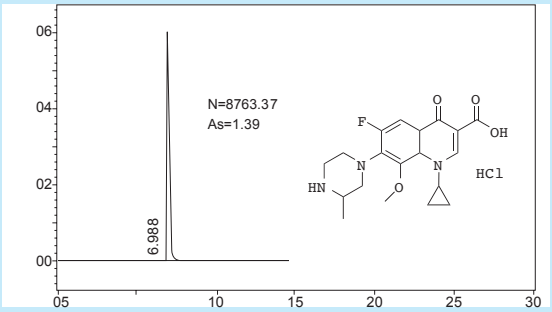
Column: Venusil® XBP C18, 4.6×250 mm, 5 μm
Part No.: VX952505-0
Mobile Phase: $NH_4AC/KClO_4$ (40 mM, pH=2.0): ACN =85:15
Detector: UV 294 nm
Flow Rate: 1 mL/min
Injection: 4 μL

4.3 Ciprofloxacin Lactate



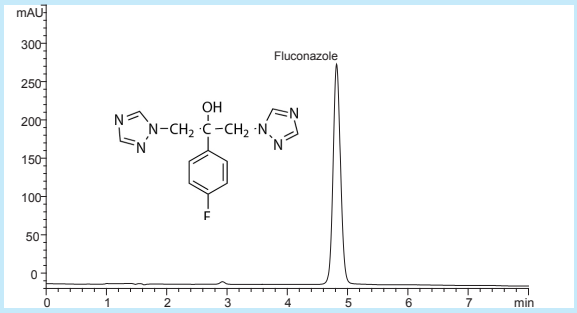
Column: Venusil® XBP C18, 4.6×150 mm, 5 μm
Part No.: VX951505-0
Mobile Phase: Citric acid buffer (0.05 mol/L, adjust to pH=3.5 with TFA):ACN=82:28
Detector: UV 277 nm
Flow Rate: 1 mL/min
Injection: 10 μL

4.4 Gatifloxacin hydrochloride



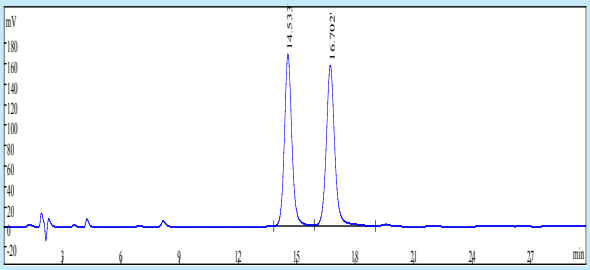
Column: Venusil® XBP C18(L), 4.6×150 mm, 5 μm
Part No: VX951505-L
Mobile Phase: 1% TEA(pH=4.5):ACN=87:13
Detector: UV 325 nm
Flow Rate: 1.5 mL/min
Injection: 10 μL
Temperature: 40°C

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

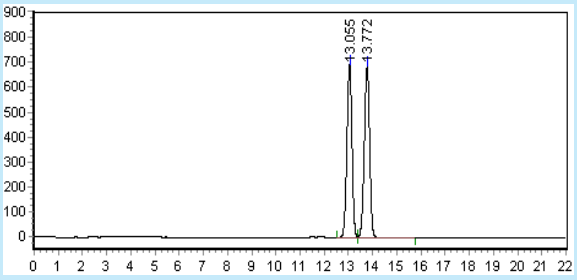
4.6 Separation of Flumorph Isomer



Chromatogram of flumorph isomers

Column: Venusil® XBP C18(L), 5 μm, 4.6×250 mm;
Mobile Phase: ACN: water =(35/65, v/v);
Flow Rate: 1 mL/min;
Detector: UV 254nm;
Temperature: 30°C;
Injection: 5 μL;

4.7 Separation of Flumorph Isomer

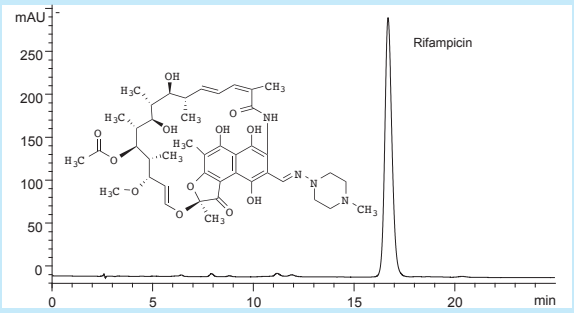


Chromatogram of flumorph isomer with Innoval ODS(2)

Column: Innoval ODS-2 (5 μm, 100 Å, 4.6×250 mm)
Mobile Phase: Acetonitrile: water = 40:60, v/v;
Detector: UV 254nm;
Flow rate: 1.0 mL/min;
Injection: 10 μL;
Sample: 0.33 mg/ml(dissolved in mobile phase)
Temperature: 30°C

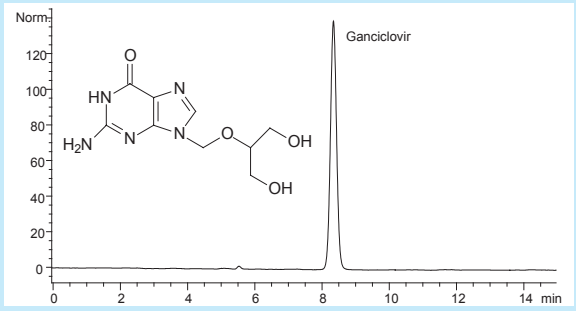
Anti-virus Medicine

5.1 Rifampicin



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

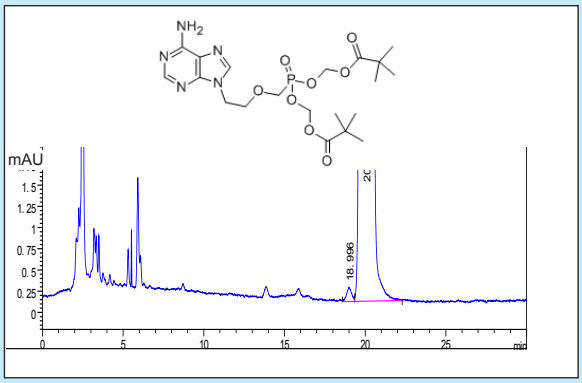
5.2 Ganciclovir



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

5.3 Inspection of Adefovir Dipivoxil and Its Related Substance

Adefovir dipivoxil; Molecular weight 501.47; Formula: $C_{20}H_{32}N_5O_8P$;



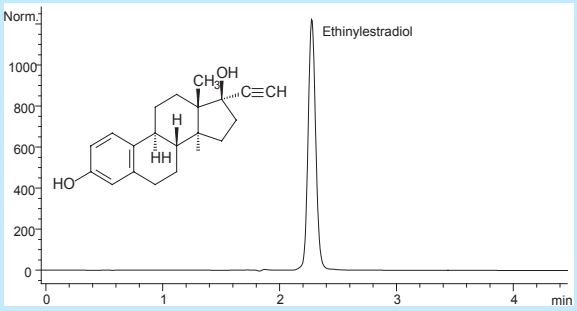
Chromatogram of system suitability test of Adefovir dipivoxil

Column: Durashell C18-AM, 5 μm, 100 Å, 4.6x250 mm;
Buffer solution: 0.15 mol/L dipotassium hydrogen phosphate solution, adjusted to pH 6.0 with phosphoric acid;
Mobile phase: Acetonitrille: buffer solution =33:67,v/v;
Detector: UV 261 nm;
Temperature: 30°C;
Flow rate: 1.0 mL/min;
Injection: 20 μL.

Peak No	Compound	Retention Time(min)	Tailing Factor	N	Reference
1	Unknown Impurity	18.996	0.94	16371	Figure 1
2	Adefovir dipivoxil	20.055	1.04	20508	Figure 1

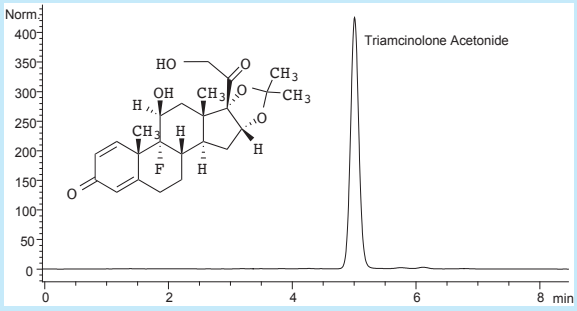
Steriod Hormones

6.1 Ethinylestradiol



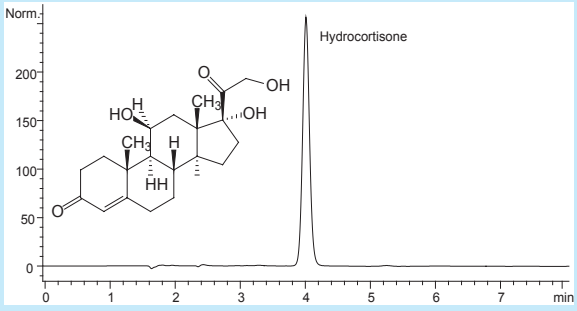
Column: Unisol C18, 4.6×150 mm, 5 μm
Part No.: UO951505-0
Mobile Phase: MeOH:Water=70:30
Detector: UV 281 nm
Flow Rate: 1 mL/min
Injection: 2 μL

6.2 Triamcinolone Acetonide



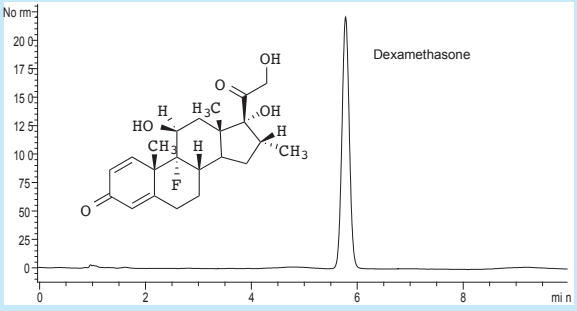
Column: Unisol C18, 4.6×150 mm, 5 μm
Part No.: UO951505-0
Mobile Phase: MeOH:Water=21:19
Detector: UV 240 nm
Flow Rate: 1 mL/min
Injection: 2 μL

6.3 Hydrocortisone



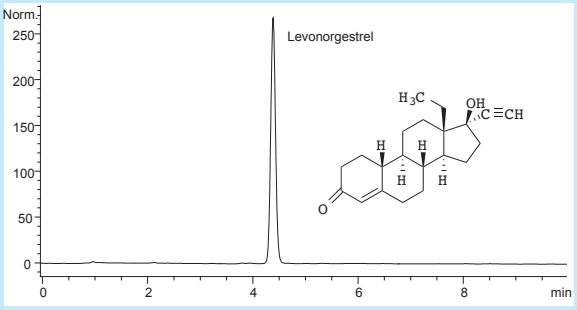
Column: Unisol C18, 4.6×150 mm, 5 μm
Part No.: UO951505-0
Mobile Phase: MeOH:Water=70:30
Detector: UV 240 nm
Flow Rate: 1 mL/min
Injection: 10 μL

6.4 Dexamethasone

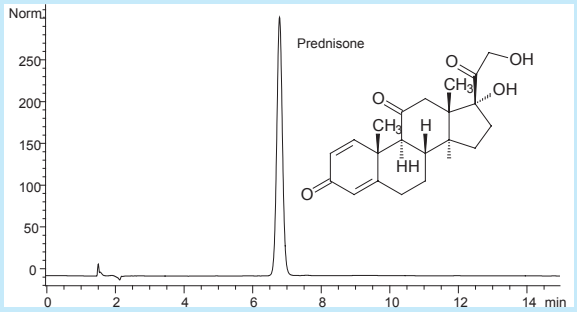


Column: Venusil® XBP C18, 4.6×150 mm, 5 μm
Part No.: VX951505-0
Mobile Phase: Citric acid buffer (0.05 mol/L, adjust to pH=3.5 with TFA):ACN=82:28
Detector: UV 277 nm
Flow Rate: 1 mL/min
Injection: 10 μL

6.5 Levonorgestrel

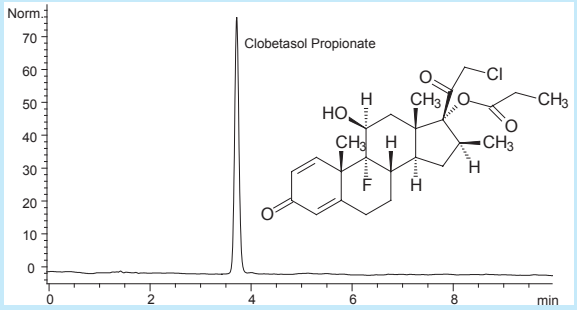


Column: Unisol C18, 4.6×150 mm, 5 μm
Part No.: UO951505-0
Mobile Phase: Water:ACN=30:70
Detector: UV 240 nm
Flow Rate: 1 mL/min
Injection: 2 μL



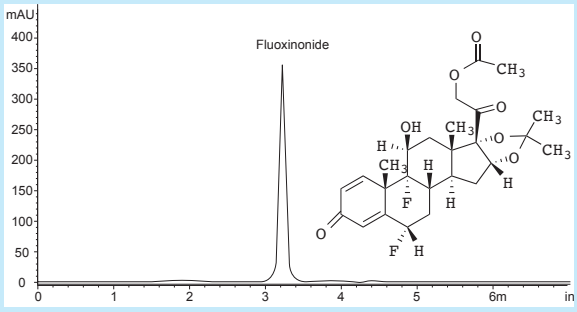
Column: Unisol C18, 4.6×150 mm, 5 μm
Part No.: UO951505-0
Mobile Phase: Water:THF:MeOH=668:250:62
Detector: UV 254 nm
Flow Rate: 1 mL/min
Injection: 2 μL

6.6 Clobetasol Propionate

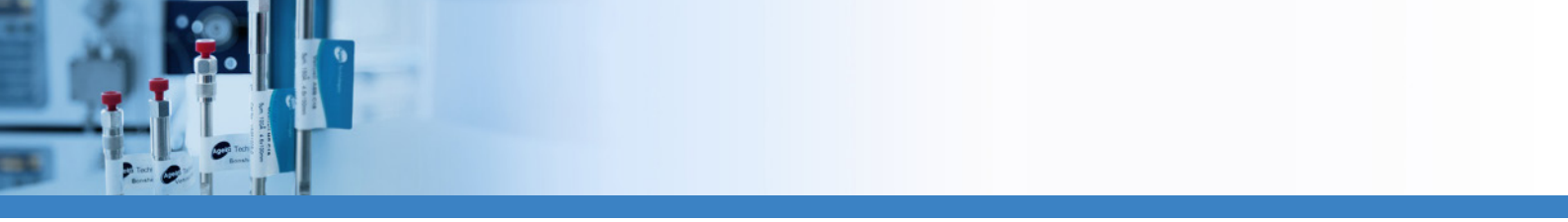


Column: Unisol C18, 4.6×150 mm, 5 μm
Part No.: UO951505-0
Mobile Phase: Phosphate buffer 0.05 mol/L,
pH=2.5/ACN/MeOH=425:475:100
Detector: UV 240 nm
Flow Rate: 1 mL/min
Injection: 2 μL

6.7 Fluocinonide

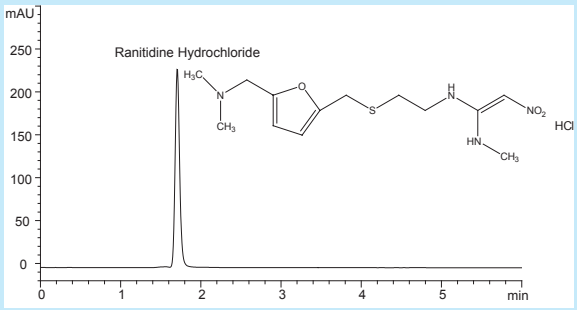


Column: Venusil® XBP C18, 4.6×150 mm, 5 μm
Part No.: VX951505-0
Mobile Phase: MeOH:ACN:Water=60:10:30
Detector: UV 240 nm
Flow Rate: 1 mL/min
Injection: 10 μL



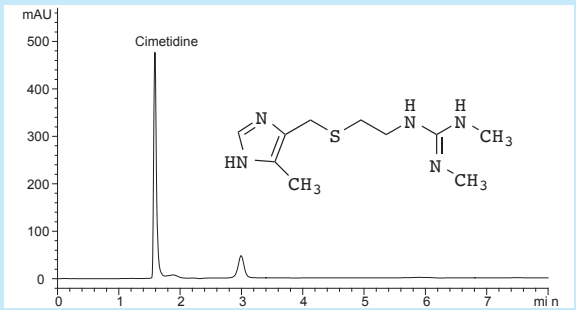
Medicine for Gastric Ulcer

7.1 Ranitidine Hydrochloride



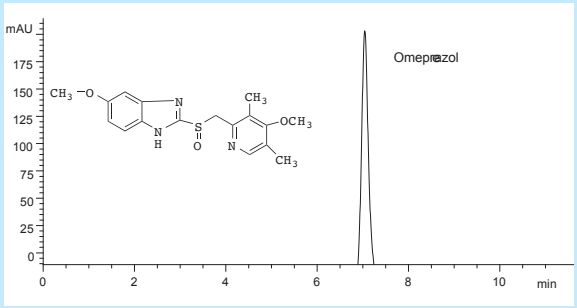
Column: Venusil® XBP C18, 4.6×150 mm, 5 μm
Part No.: VX951505-0
Mobile Phase: MeOH:0.77% Ammonium acetate aq.= 285:115
Detector: UV 320 nm
Flow Rate: 1 mL/min
Injection: 10 μL

7.2 Cimetidine



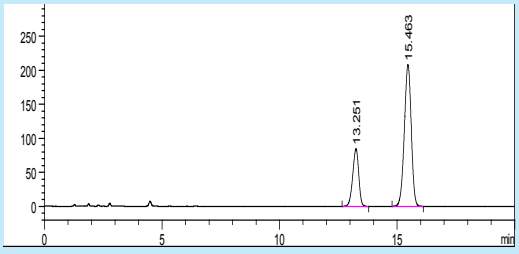
Column: Venusil® XBP C18, 4.6×150 mm, 5 μm
Part No.: VX951505-0
Mobile Phase: MeOH:Water:H_3PO_4:TFA =200:800:0.3:0.2
Detector: UV 220 nm
Flow Rate: 1 mL/min
Injection: 10 μL

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

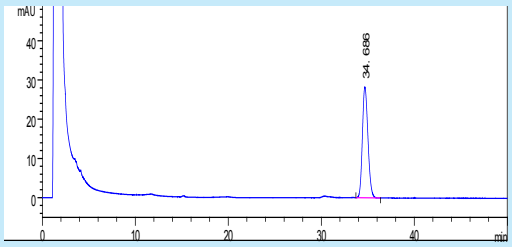
7.4 Separation of Omeprazole and Omeprazole Sulfonamide Compounds



Chromatogram of Omeprazole and Omeprazole sulfonamide compounds
(peaks are in order of omeprazole sulfonamide compounds and omeprazole successively)

Column: Durashell C18-AM (5 μm,100 Å, 4.6x150 mm);
Mobile Phase: Phosphate buffer solution:acetonitrile =(74/26, v/v);
Flow rate: 1.0 mL/min; Detector: UV 280nm;
Temperature: 25°C; Injection: 20 μL.

7.5 Determination of Vitamin E in Compound Amino Acid and Vitamin Capsules

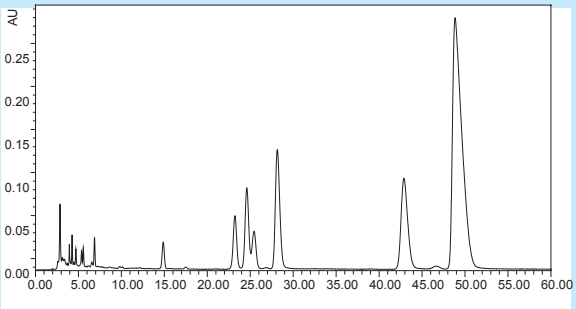


Chromatogram of vitamin E in compound amino acid and vitamin capsules

Column: Durashell C18-AM (5μm, 100Å, 4.6*250mm);
Mobile Phase: methanol: acetonitrile: isopropanol: 2% of acetic acid in water= 40: 30: 20: 10,v/v;
FlowRate: 1.5 mL/min;
Temperature: 40°C;
Injection: 20 μL;
Detector: UV 265nm;

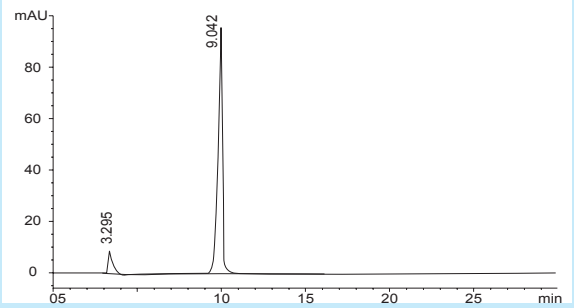
Analysis of Alkaloids

8.1 Quaternary Ammonium Alkaloids from Coptidis



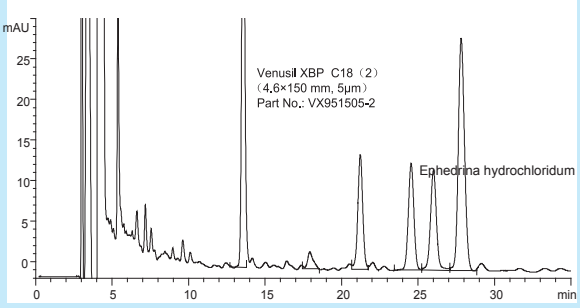
Column: Unisol C18, 4.6×250 mm, 5 μm
Part No.: UO952505-0
Mobile Phase: Water(0.3% TEA): ACN=75:25
Detector: UV 254 nm
Flow Rate: 1 mL/min
Temperature: 25°C

8.2 Matrine



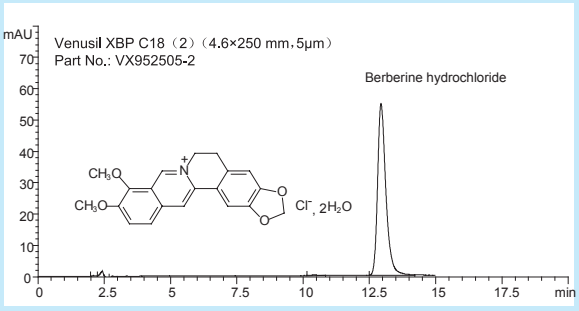
Column: Venusil® XBP NH_2, 4.6×250 mm, 5 μm
Part No.: VN852505-0
Mobile Phase: ACN:Ethanol:3% H_3PO_4 aq.=80:10:10
Detector: UV 220 nm
Flow Rate: 1 mL/min
Injection: 20 μL

8.3 Ephedrine from Coptidis



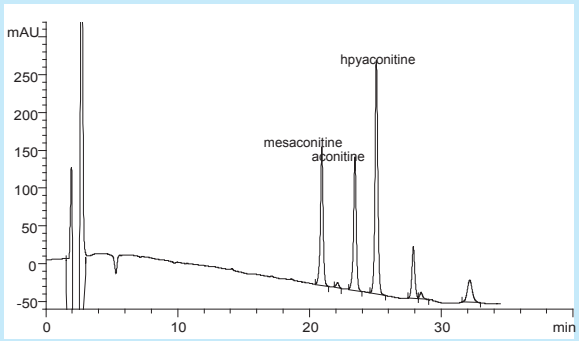
Mobile Phase: ACN:SDS/H_3PO_4=40:60
Detector: UV 210 nm
Flow Rate: 1 mL/min

8.4 Berberine Hydrochloride From Phellodendron



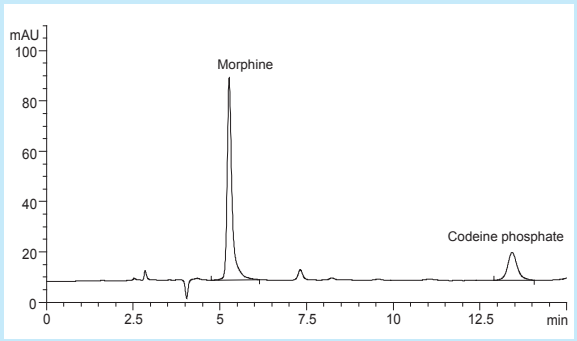
Mobile Phase: ACN:1% TFA=35:65
Detector: UV 346 nm
Flow Rate: 1 mL/min

8.5 Aconitine, Mesaconitine and Hypaconitin



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

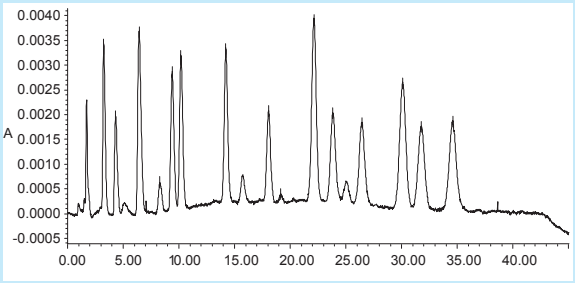
8.6 Berberine from Phellodendron



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

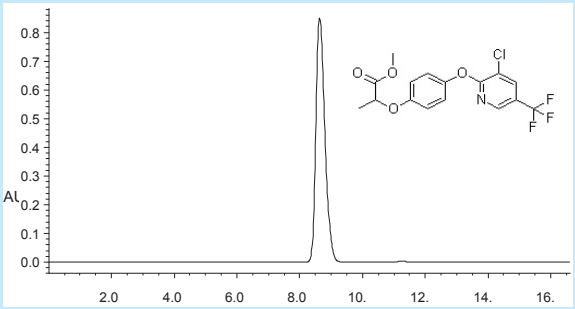
Agricultural Chemical

9.1 Analysis of 14 Herbicides



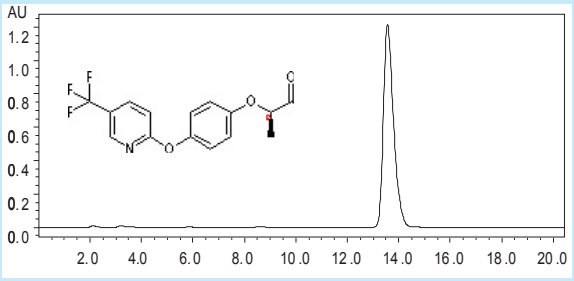
Sample: dazomet Cymoxanil Triadimefon Tebuconazole
Thiophanate-Methyl hexaconazole flutriafol
Iprodione Metalaxyl Procymidone carboxin
Prochlora Diethofencar Triadimenol
1,2,3,6-tetrahydro-N-(trichloromethylthio)phthalimide
Column: Venusil® XBP C18, 4.6×150 mm, 5 µm
Part No.: VX951505-0
Mobile Phase: 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°C

9.2 Haloxyfop-P-methyl



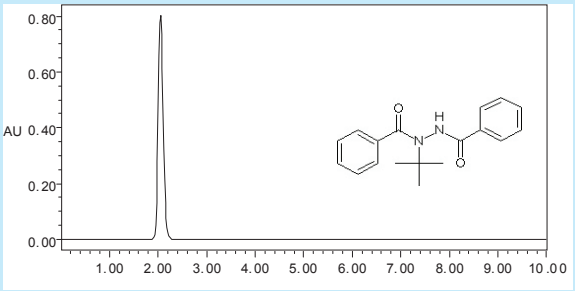
Column: Venusil® XBP C18, 4.6×150 mm, 5 µm
Part No.: VX951505-0
Mobile Phase: ACN:Water=70:30
Detector: UV 225 nm
Flow Rate: 1 mL/min
Injection: 5 µL
Temperature: 25°C

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°C

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°C

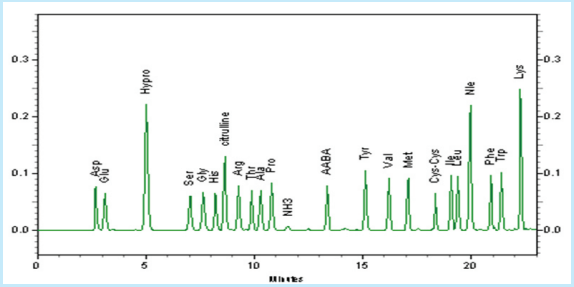
Analysis of Amino Acids

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:

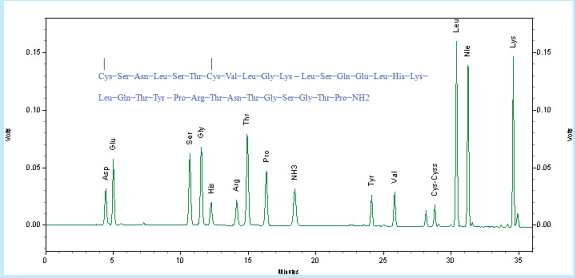
Time(min)	0	11	13.9	14	29	29.1	37	37.1	45
%B	0	7	12	15	34	100	100	0	0

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

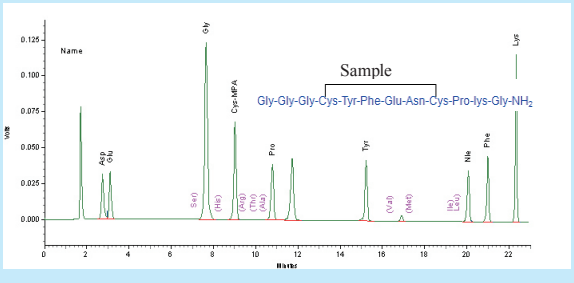
10.1 Standards of Amino Acids

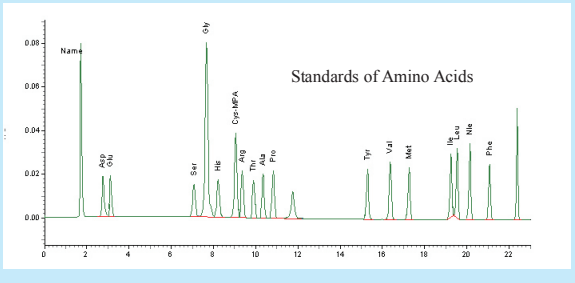


10.2 Amino Acids from Salmon Calcitonin



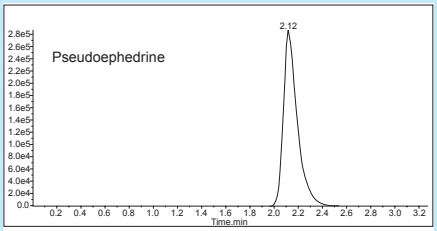
10.3 Amino Acid from Terlipressin

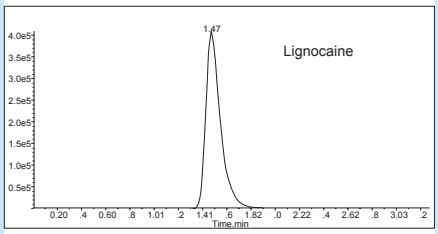


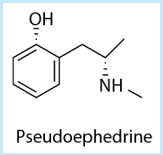


Applications in LC-MS

11.1 Pseudoephedrine for Plasma

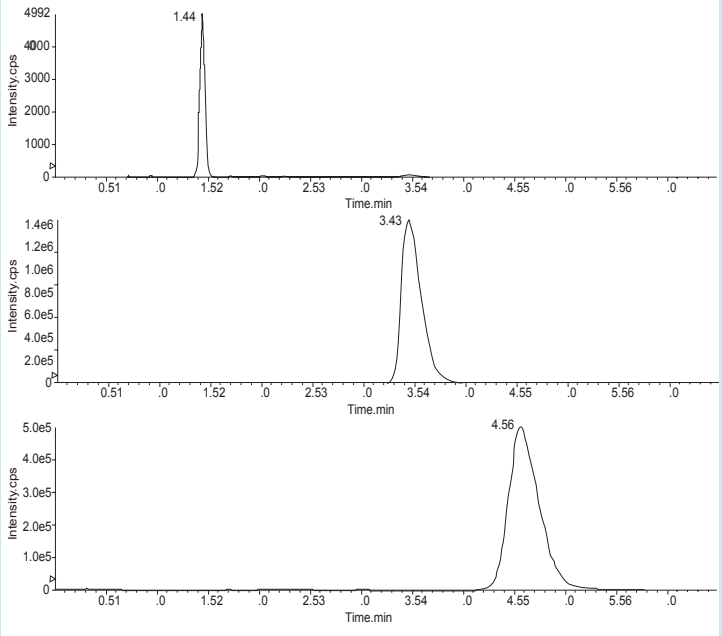


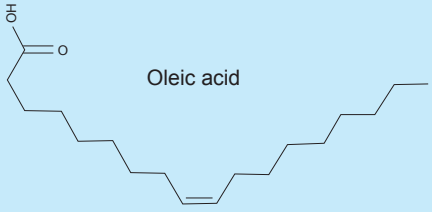




HPLC Column: Venusil® ASB C18, 2.1 mm×50 mm; Part No.:VS950502-0;
Sample: Prepared sample by SPE(Cleanert® PCX)
Mobile Phase: A:1% Formic Acid in Water; B:Methanol
Gradient: 20% B to 95% B in 2 min, hold for 0.5 min, then switch to A:B (20:80)
Flow Rate: 0.5 mL/min
Temperature: 25°C

11.2 Oleic Acid in Plasma

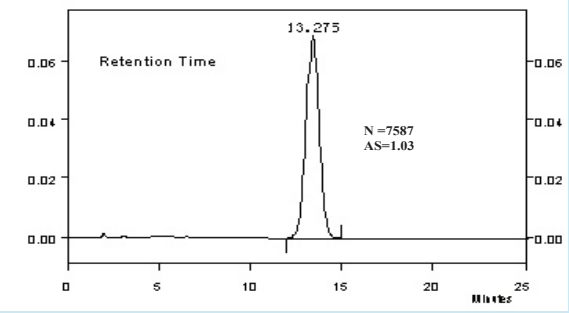




HPLC Column: Venusil® ASB C18, 2.1mm×50 mm; Part No.: VS950502-0
Sample: Prepared sample by SPE (Cleanert® PEP)
Mobile Phase: A:13 mmol/L ammonium acetate aq.; B:Acetonitrile
Gradient: 5% B to 95% B in 2 min, hold for 2 min, switch to A:B(95:5) then hold for 2 min.
Flow Rate: 0.8 mL/min
Temperature: 25°C

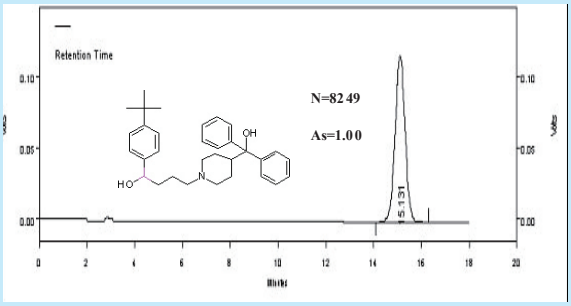
Others

12.1 Glipizide



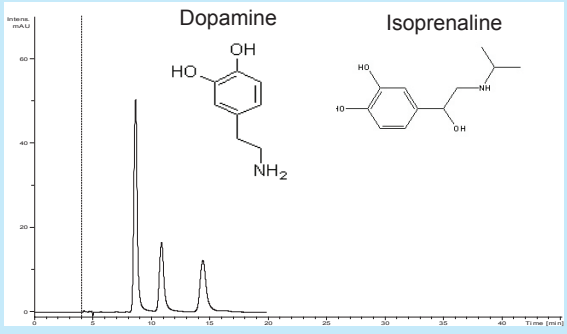
Column: Unisol C18, 4.6×150 mm, 5 μm
Part No.: UO951505-0
Mobile Phase: Phosphate Buffer 0.1 mol/L,
pH 6.0:MeOH=55:45
Flow Rate: 1 mL/min
Injection: 20 μL

12.2 Terfenadine



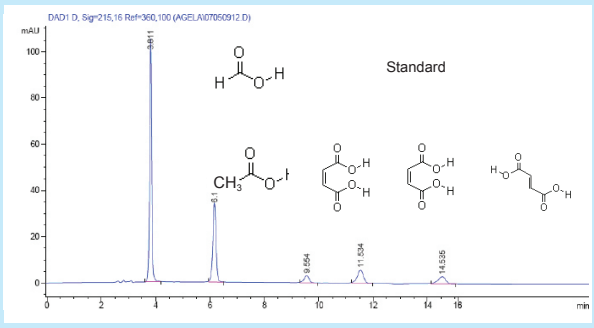
Column: Unisol C18, 4.6×150 mm, 5 μm
Part No.: UO951505-0
Mobile Phase: MeOH:H_3PO_4/Triethylamine
(0.1mol/L)=80:20
Detector: UV 254 nm
Flow Rate: 1 mL/min
Injection: 10 μL

12.3 Dopamine and Its Metabolin



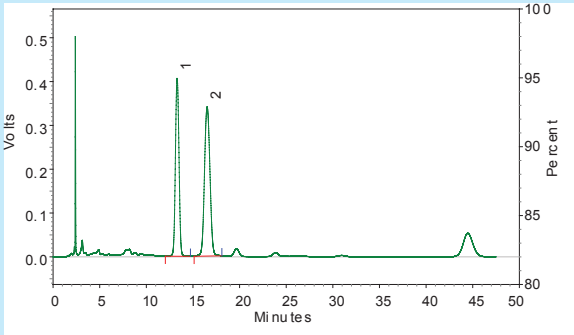
Sample: Dopamine, Isoprenaline, Soprenaline
Column: Venusil® PFP, 4.6×250 mm, 5 μm
Part No.: VF952505-0
Mobile Phase: MeOH:CH_3COOH/CH_3COONH_4
Buffer(pH 4.5)=15:85
Detector: UV 280 nm
Flow Rate: 0.8 mL/min

12.4 Organic Acids



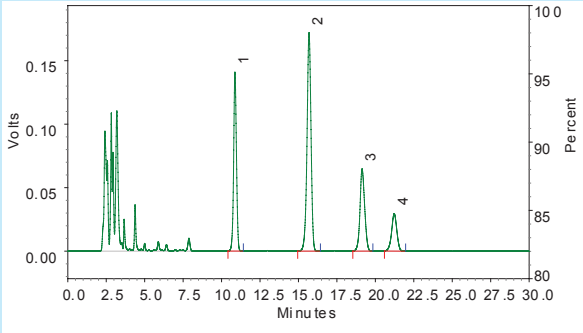
Sample: Formic acid, acetic acid, maleic acid,
succinic acid, fumaric acid
Column: Unisol C18, 4.6×250 mm, 5 μm
Part No.: UO952505-0
Mobile Phase: 0.02M NH_4AC Aq.:MeOH=95:5
Detector: UV 215 nm
Flow Rate: 1 mL/min
Injection: 10 μL
Temperature: 20°C

12.5 Catechins in Leaves



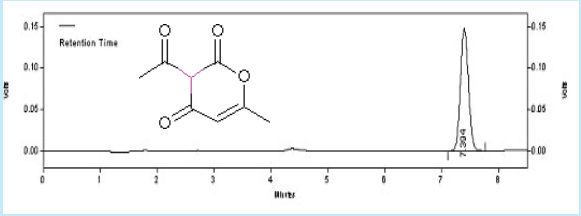
Sample: Extract of leaves
Column: Unisol C18, 4.6×250 mm, 5 μm
Part No.: UO952505-0
Mobile Phase: 0.02% H_3PO_4:MeOH=81:19
Detector: UV 278 nm
Flow Rate: 1 mL/min
Temperature: 40°C

12.6 Saccharin Sodium in Milk Powder



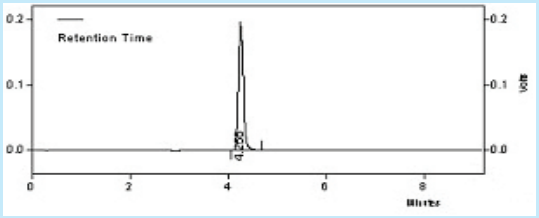
Sample: Benzoic acid, 2,4-Hexadienoic acid, Sodium saccharine, milk powder
Column: Unisol C18, 4.6×250 mm, 5 μm
Part No: UO952505-0
Mobile Phase: MeOH:CH_3COONH_4(0.02 M)=5:95
Detector: UV 230 nm
Flow Rate: 1 mL/min
Temperature: 30°C

12.7 DHA in the Health Food



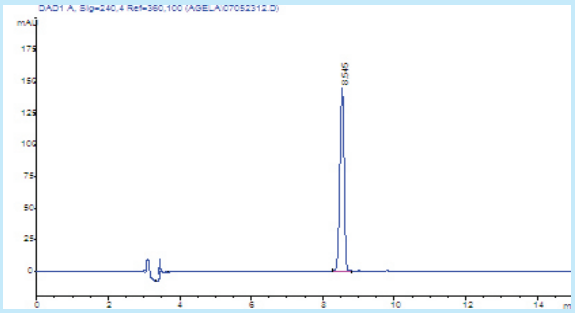
Column: Unisol C18, 4.6×250 mm, 5 μm
Part No.: UO952505-0
Mobile Phase: MeOH:Water=80:20
Detector: UV 254 nm
Flow Rate: 1 mL/min
Injection: 10 μL

12.8 Tartrazine in Food



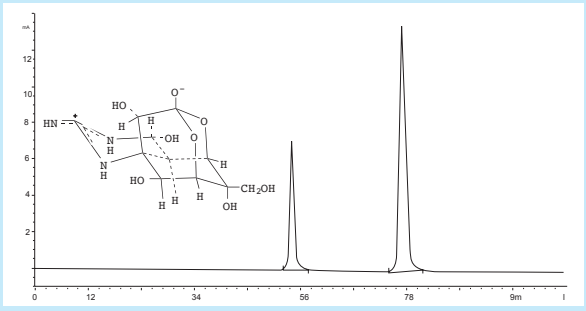
Column:Unisol C18, 4.6×250 mm, 5 μm
Part No.: UO952505-0
Mobile Phase: A: Ammonium acetate buffer pH 4.0; B:MeOH
Gradient:35%B to 50%B in 5 min.
Detector: UV 254 nm
Flow Rate: 1 mL/min
Injection: 10 μL

12.9 Melamine in Feed



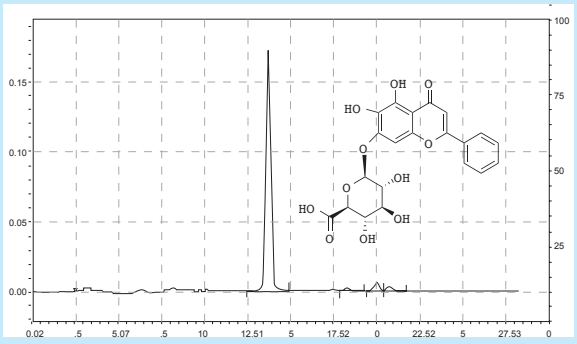
Column: Venusil® ASB C18, 4.6×250 mm, 5 μm
Part No.: VS952505-0
Mobile Phase:10 mM Citric acid+10 mM Perfluorooctane sulfonate (pH=3.0):ACN=85:15
Detector: UV 240 nm
Flow Rate: 1 mL/min
Injection: 10 μL
Temperature: 40°C

12.10 Tetrodotoxin(TTX)



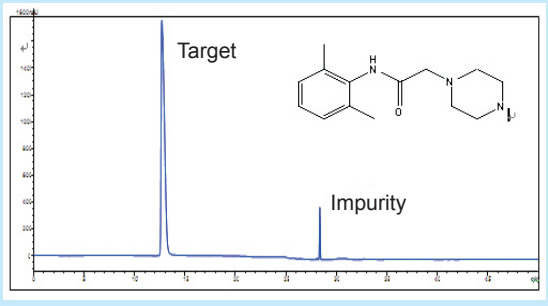
Column: Venusil® ASB C18, 4.6×250 mm, 5 μm
Part No.: VS952505-0
Mobile Phase: 0.02% H_3PO_4: MeOH=40:60
Detector: UV 200 nm
Flow Rate: 0.5 mL/min
Temperature: 25°C

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



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°C
Injection: 5 μL

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

APPENDIX

Procedures for Column Regeneration

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 30 mL 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 (NH_2 and DIOL)	Rinse with 10 column volumes each of: Chloroform, Isopropanol, Methylene chloride, mobile phase. Exception: Recommended for cleaning Amino when used in reversed phase mode: 1. Flush with at least 30 column volumes of Water (HPLC grade) 2. 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: 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

Methods of Maintaining Good Column Lifetime and Performance

- Only load 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 with highly aqueous solution, such as 5% methanol in water, and store the columns in high organic solution for overnight or long time storage

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