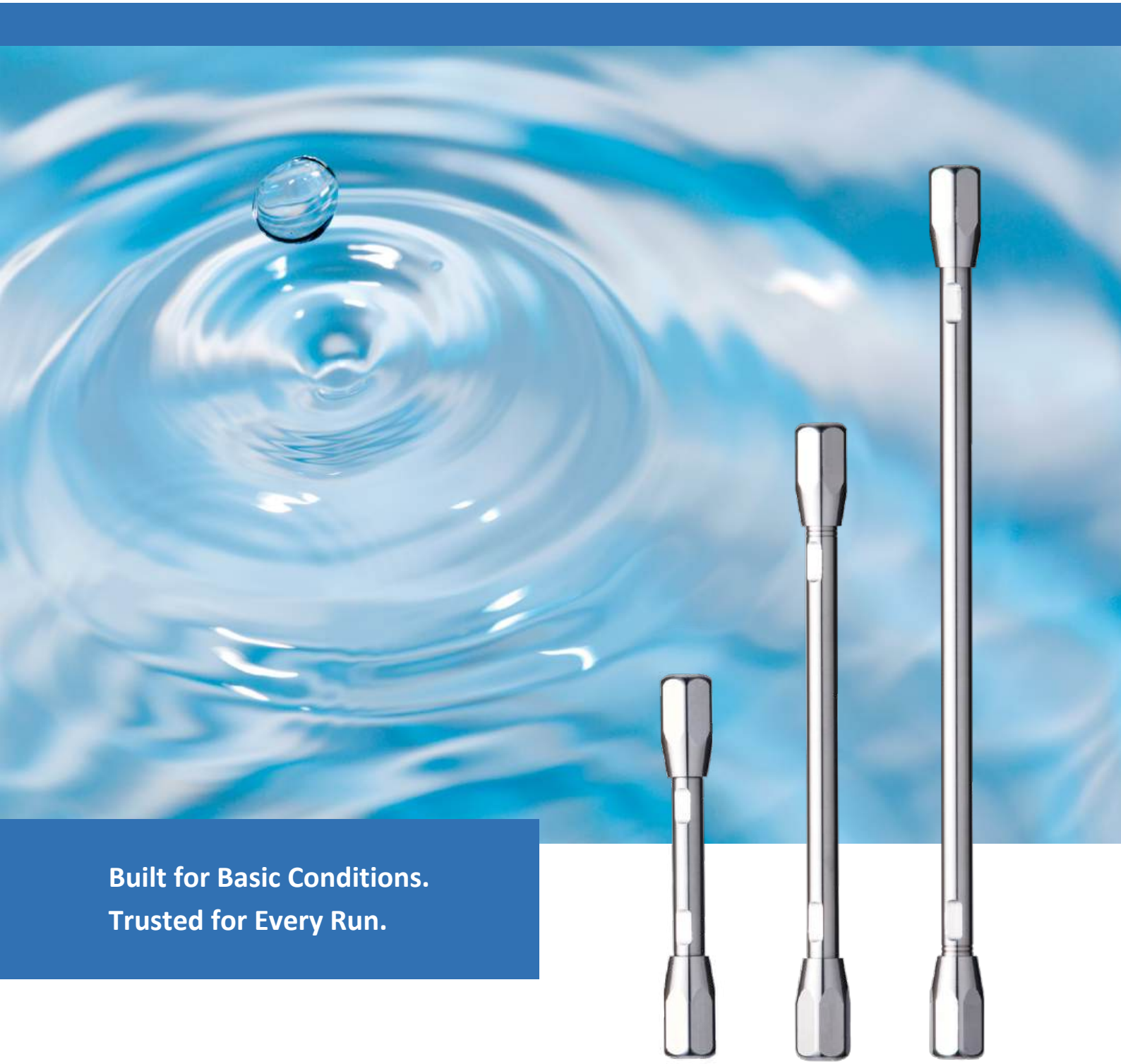
GL Sciences

HPLC, LC/MS Columns

Inertsil Hybrid-C18

High-pH Tolerant HPLC Column for Robust and Reproducible Performance



Built for Basic Conditions.
Trusted for Every Run.

Introduction & Key Features

Inertsil Hybrid-C18 is a silica-based reversed-phase column engineered with hybrid organic-inorganic bonding technology, enabling exceptional chemical stability across a broad pH range of 1–12.

- pH range 1–12 for both acidic and basic conditions
- Excellent batch-to-batch reproducibility
- Compatible with LC/MS, LC/MS/MS and high-pressure LC systems
- High durability and long lifetime, even under basic pH
- USP L1 classification (C18)

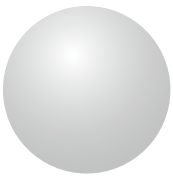
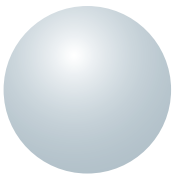
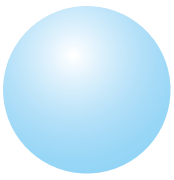
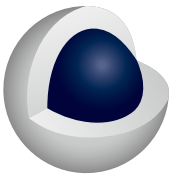
Specification

Base Material	: High-pH Stable Hybrid Silica
Particle Size	: 1.7 µm / 3.5 µm / 5 µm
Pore Size	: 165 Å (16.5 nm)
Pore Volume	: 1.00 mL/g
Surface Area	: 185 m^2/g
Carbon Load	: 15%
End-capped	: Yes
USP Code	: L1
Max Temp	: 80°C (pH 1 - 10), 60°C (pH 1 - 12)
pH Range	: 1 – 12
Max Pressure	1.7 µm: 18,000 psi (124 MPa) — PEEK hardware: 14,500 psi (100 MPa) 3.5 µm: 7,200 psi (50 MPa) 5 µm: 6,000 psi (40 MPa)

A Legacy of Quality

Since the launch of Inertsil ODS-3 in 1994, we have consistently manufactured HPLC columns in-house—from the synthesis of base silica to final packing. This fully integrated production process is the foundation of our ability to deliver high-quality, highly reliable columns with unmatched consistency.

Inertsil Hybrid-C18 was newly developed to meet the evolving needs of users, offering exceptional durability under high-pH mobile phase conditions. This column expands application flexibility while maintaining the trusted performance of the Inertsil series.

Classic Silica	High-Purity Silica	ES Silica	Core-Shell	Hybrid Silica
				
Inertsil ODS Inertsil ODS-2	Inertsil ODS-3 Inertsil C8-3 Inertsil Ph-3 Inertsil ODS-4 Inertsil ODS-HL	InertSustain	InertCore	Inertsil Hybrid-C18

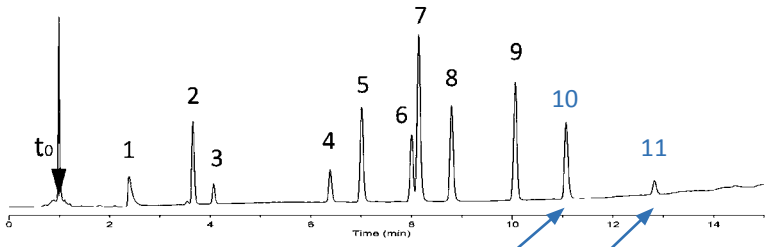
One Column, Infinite Possibilities

Impact of Mobile Phase pH on Selectivity

These chromatograms demonstrate how changes in mobile phase pH influence the selectivity and resolution of analytes.
Inertsil Hybrid-C18 of hybrid silica gel allows stable performance across this wide pH range without loss of efficiency and reproducibility.

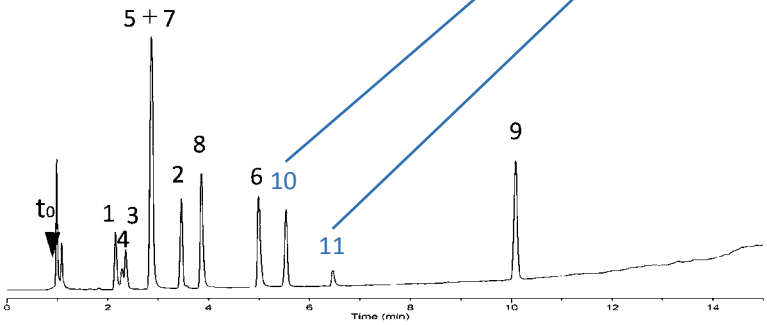
pH 9.8

10 mM $HCOONH_4$
50 mM NH_3



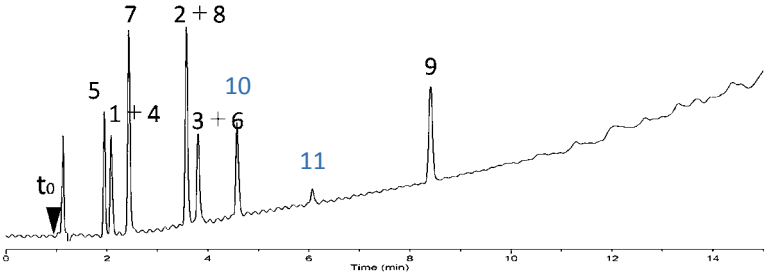
pH 6.5

10 mM $HCOONH_4$



pH 4.8

10 mM $HCOONH_4$
0.1% HCOOH



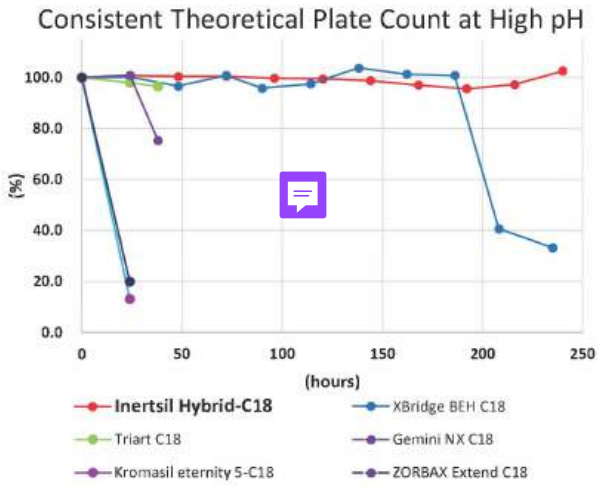
- **Basic compounds (pKa ≈ 9)** show stronger retention at high pH due to reduced ionization.
- **Acidic compounds (e.g., COOH)** retain better at low pH where ionization is suppressed.
- **Understanding pKa** enables control over separation behavior.

No.	Compound
1	Epinastine
2	Cetirizine
3	Fexofenadine
4	Chlorpheniramine
5	Ketotifen
6	Hydroxyzine
7	Triprolidine
8	Azelastine
9	Loratadine
10	Homochlorcyclizine
11	Clemastine

Alkali-Resistant Hybrid Silica Technology

Superior Durability Under High pH Conditions (pH 11.5)

With its advanced hybrid silica technology, Inertsil Hybrid-C18 delivers exceptional resistance to alkaline mobile phase condition.
Even under high-pH mobile phase conditions that typically cause dissolution of conventional packings, the column maintains its structural integrity.
This unique robustness prevents loss of theoretical plates, guaranteeing reliable peak resolution, reproducible separations, and extended column lifetime.



Mobile phase for durability testing

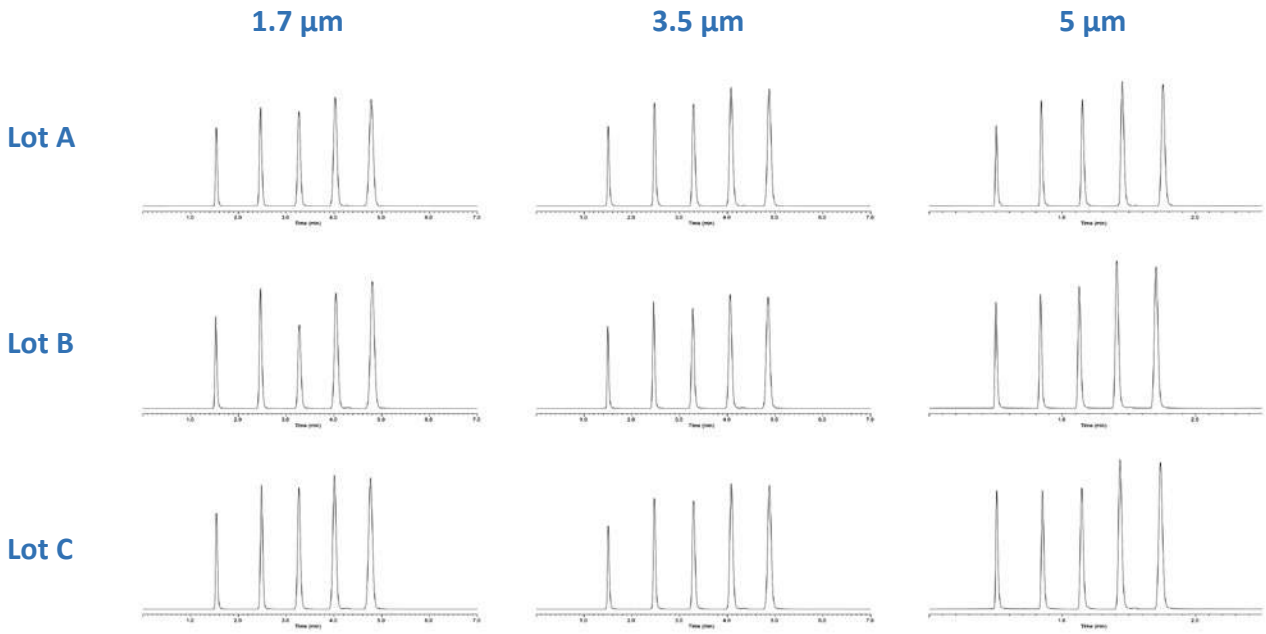
Column : 5 µm, 150 x 2.1 mm I.D.
Eluent : A) 50 mM Phosphate Buffer (pH 11.5) in H_2O
B) CH_3CN
A/B = 90/10, v/v
Flow Rate : 0.2 mL/min
Col. Temp. : 40 °C

Mobile phase for analysis

Eluent : A) H_2O
B) CH_3CN
A/B = 35/65, v/v
Flow Rate : 0.2 mL/min
Col. Temp. : 40 °C
Detection : 254 nm
Sample : Naphthalene

Excellent batch-to-batch reproducibility

Comparison of three different production lots of Inertsil Hybrid-C18 show virtually identical retention and peak shape, demonstrating outstanding lot-to-lot consistency. This high reproducibility ensures method robustness and eliminates the need for revalidation when switching lots.



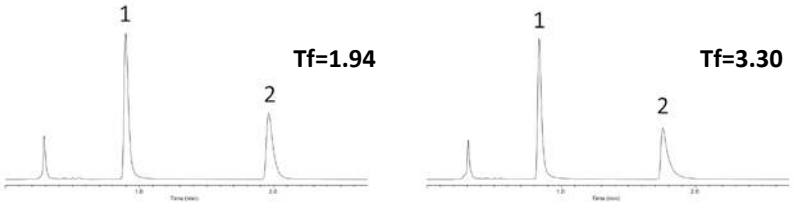
Superior Performance Across Challenging Analytes with Inertsil Hybrid-C18

Inertsil Hybrid-C18 demonstrates excellent peak shape for basic compounds, acidic compounds, and metal-coordinating compounds, outperforming competitor columns.This high-level performance is achieved through our proprietary hybrid silica technology, which offers superior resistance to peak tailing and adsorption issues under a wide range of pH conditions.

Basic Compounds

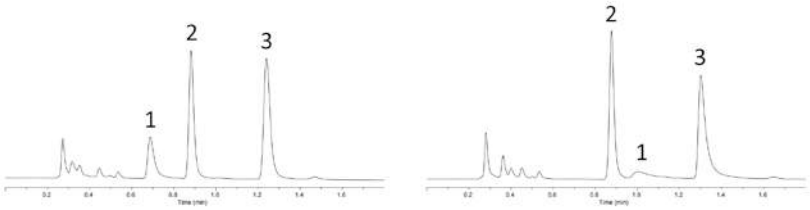
Conditions
Column : Inertsil Hybrid-C18, 1.7 µm, 50 x 2.1 mm I.D.
Eluent : A) 25 mM Phosphate Buffer (pH7.0) in H_2O
B) CH_3CN
A/B = 70/30, v/v
Flow Rate : 1.7 µm, 2.1 × 50 mm, 0.4mL/min
Col. Temp. : 40 °C
Detection : UV 230 nm
Analytes : 1. Berberine
2. Dextromethorphan

Inertsil Hybrid-C18 | **Brand A**



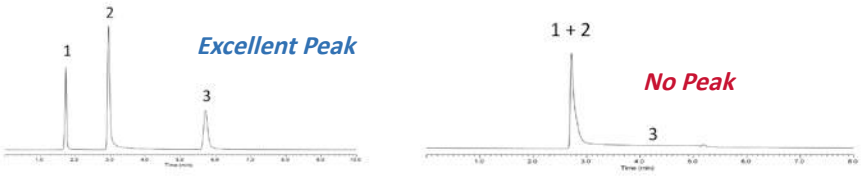
Acid Compounds

Conditions
Column : Inertsil Hybrid-C18, 1.7 µm, 50 x 2.1 mm I.D.
Eluent : A) CH_3CN
B) 0.1% H_3PO_4 in H_2O
A/B = 25/75, v/v
Flow Rate : 1.7 µm, 2.1 × 50mm : 0.4mL/min
Col. Temp. : 40 °C
Detection : UV 254 nm
Analytes : 1. Blue FCF
2. Phenol
3. Salicylic acid



Metal-coordinating Compounds

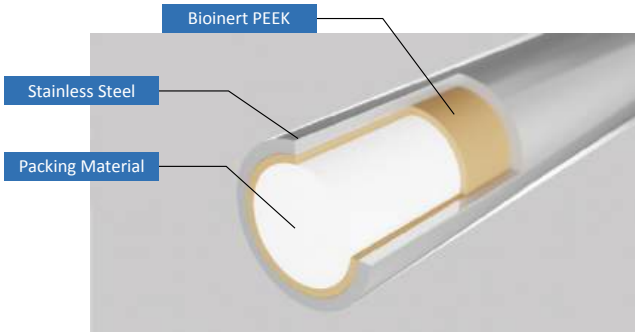
Conditions
Column : Inertsil Hybrid-C18, 1.7 µm, 50 x 2.1 mm I.D.
Eluent : A) CH_3CN, B) 0.1 % formic acid
A/B = 60/40, v/v
Flow Rate : 0.2 mL/min
Col. Temp. : 40 °C
Detection : UV 310 nm
Inj. Vol. : 1 µL
Analytes : 1. 8-Quinolinol
2. Hinokitiol
3. Piroctone Olamine



Column Hardware Lineup

Wide Range of Dimensions and Hardware Options

Hardware is available in two choices: stainless steel (SS) and biocompatible PEEK, making it suitable for everything from routine analyses to LC/MS, LC/MS/MS, and sensitive biological applications.

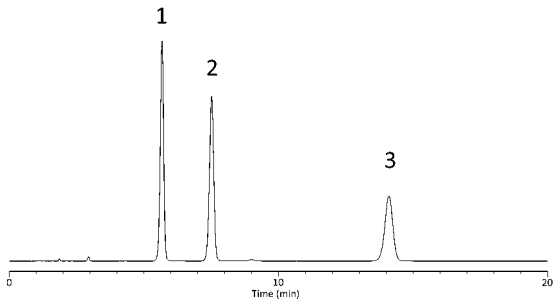


Customized Dimensions Available on Request

In addition to our standard lineup, custom column dimensions and configurations can be made to order, including preparative-scale dimensions and specialty hardware options.

Application

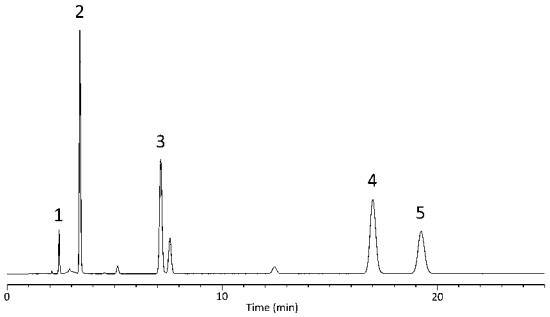
Guanine-based antiviral agent



Conditions

Column	: 5 µm, 150 x 2.1 mm I.D.
Eluent	: 10 mM $HCOONH_4$ in H_2O
Flow Rate	: 0.3 mL/min
Col. Temp.	: 40 °C
Detection	: UV 254 nm
Inj. Vol.	: 1 µL
Analytes	: 1. Ganciclovir 2. Aciclovir 3. Penciclovir (100 mg/L each)

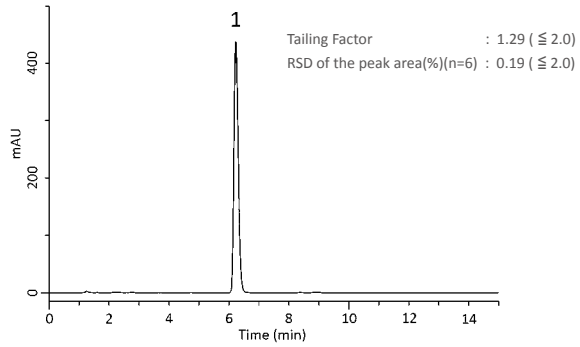
Nucleoside-based antiviral drug



Conditions

Column	: 3.5 µm, 150 x 2.1 mm I.D.
Eluent	: 10 mM $HCOONH_4$ in H_2O
Flow Rate	: 0.3 mL/min
Col. Temp.	: 40 °C
Detection	: UV 240 nm
Inj. Vol.	: 1 µL
Analytes	: 1. Ribavirin 2. Cytarabine 3. Gemcitabine 4. Lamivudine 5. Vidarabine (100 mg/L each)

Azithromycin Tablet of Assay under USP condition

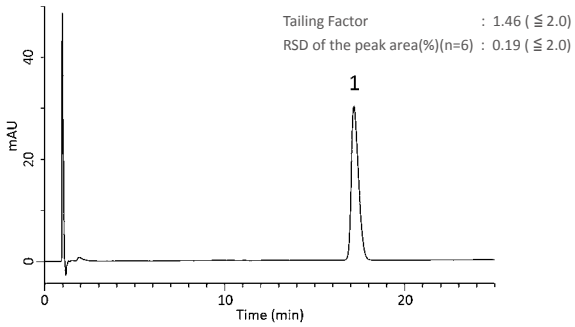


Conditions

Column	: 5 µm, 250 x 4.6 mm I.D.
Eluent	: CH_3CN/Buffer* = 65/35, v/v
Flow Rate	: 2.0 mL/min
Col. Temp.	: 50 °C
Detection	: UV 210 nm
Inj. Vol.	: 100 µL
Analyte	: Reference Standard in Eluent 1. Azithromycin dihydrate 1 mg/mL

*Dissolve 4.6 g of monobasic potassium phosphate anhydrous in 900 mL of water. Adjust with 1 N sodium hydroxide to a pH of 7.5, and dilute with water to 1 L.

Azithromycin Tablet of Dissolution under USP condition

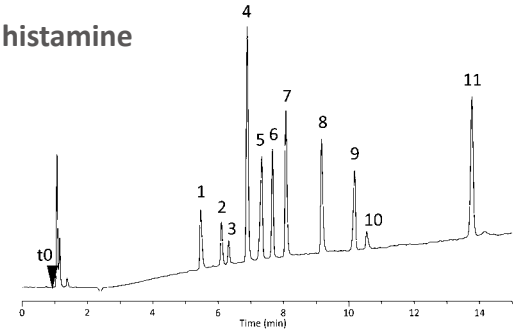


Conditions

Column	: 5 µm, 150 x 4.6 mm I.D.
Eluent	: CH_3CN/CH_3OH/Solution*= 9/3/8, v/v/v
Flow Rate	: 1.5 mL/min
Col. Temp.	: 50 °C
Detection	: UV 210 nm
Inj. Vol.	: 50 µL
Sample	: Reference Standard 1. Azithromycin dihydrate 0.25 mg/mL

*4.4 mg/mL of dibasic potassium phosphate and 0.5 mg/mL of sodium 1-octanesulfonate; adjusted with phosphoric acid to a p of 8.20 ± 0.05.

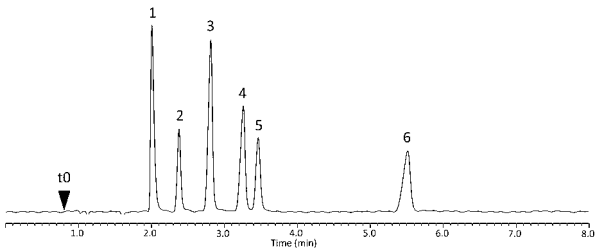
Antihistamine



Conditions

Column	: 3.5 µm, 150 x 2.1 mm I.D.
Eluent	: A) 10 mM $HCOONH_4$ in H_2O B) CH_3CN A/B = 80/20 - 15 min - 20/80 - 0.1 min - 80/20, v/v
Flow Rate	: 0.3 mL/min
Col. Temp.	: 40 °C
Detection	: UV 240 nm
Inj. Vol.	: 2 µL
Analytes	: 1. Epinastine 2. Chlorpheniramine 3. Fexofenadine 4. Triprolidine 5. Ketotifen 7. Azelastine 8. Hydroxyzine 9. Homochlorcyclizine 10. Clemastine 11. Loratadine (50 mg/L each)

Antidepressant



Conditions

Column	: 3.5 µm, 150 x 2.1 mm I.D.
Eluent	: A) 10 mM $HCOONH_4$ in H_2O B) CH_3CN A/B=50/50, v/v
Flow Rate	: 0.3 mL/min
Col. Temp.	: 40 °C
Detection	: UV 230 nm
Inj. Vol.	: 1 µL
Analytes	: 1. Nortriptyline 2. Imipramine 3. Amitriptyline 4. Sertraline 5. Clomipramine 6. Mianserine (100 mg/L each)

Ordering Information

Inertsil Hybrid-C18 SS Hardware

Particle Size	Length/ID (mm)	2.1	3.0	4.6
1.7 µm	30	5020-76052	5020-76057	–
	50	5020-76053	5020-76058	–
	75	5020-76054	5020-76059	–
	100	5020-76055	5020-76060	–
	150	5020-76056	5020-76061	–
3.5 µm	30	5020-76026	5020-76032	5020-76038
	50	5020-76027	5020-76033	5020-76039
	75	5020-76028	5020-76034	5020-76040
	100	5020-76029	5020-76035	5020-76041
	150	5020-76030	5020-76036	5020-76042
	250	5020-76031	5020-76037	5020-76043
5 µm	30	5020-76000	5020-76006	5020-76012
	50	5020-76001	5020-76007	5020-76013
	75	5020-76002	5020-76008	5020-76014
	100	5020-76003	5020-76009	5020-76015
	150	5020-76004	5020-76010	5020-76016
	250	5020-76005	5020-76011	5020-76017

Inertsil Hybrid-C18 PEEK Hardware

Particle Size	Length/ID (mm)	2.1	4.6
1.7 µm	50	5020-76062	–
	100	5020-76063	–
	150	5020-76064	–
3.5 µm	50	5020-76044	5020-76048
	100	5020-76045	5020-76049
	150	5020-76046	5020-76050
	250	5020-76047	5020-76051
5 µm	50	5020-76018	5020-76022
	100	5020-76019	5020-76023
	150	5020-76020	5020-76024
	250	5020-76021	5020-76025

NeoGuard, Guard Column Cartridge and Holder

Particle Size	2.1 x 5 mm (3/pk)	3.0 x 5 mm (3/pk)	4.6 x 5 mm (3/pk)	Holder
1.7 µm	5020-76072	5020-76071	–	5020-76073
3.5 µm	5020-76070	5020-76069	5020-76068	
5 µm	5020-76067	5020-76066	5020-76065	

Replacement Cartridge

Holder

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