

CAPCELL PAK®

by Shiseido Co, Ltd.

- Extended pH range from 1-10 provide longer lifetimes with harsh mobile phases
- Novel bonding reduces residual silanols which cause peak tailing
- Polymer coated “capsule type” silica
- Excellent selectivity for polar compounds

Capcell Pak columns, manufactured by Shiseido Co., Ltd., Japan, distributed worldwide by Phenomenex, are durable, reproducible columns designed to eliminate secondary retention effects that lead to tailing peaks. A two-step synthesis is used: 1) surface coating of the base silica gel using a reinforced silicone polymer by vapor deposition, resulting in a homogenous monolayer, and 2) bonding of alkyl groups to the coated surface to shield any acidic silanols. This process provides excellent peak shape for acidic, basic and chelating compounds. Eight types of Capcell Pak columns are available in sizes ranging from analytical to preparative.

Material Characteristics

Packing Material	Particle Shape/Size (µm)	Pore Size (Å)	Pore Volume (mL/g)	Surface Area (m ² /g)	Carbon Load %	Calculated Bonded Phase Coverage (µmole/m ²)
UG C18	Spher. 3, 5	120	1.0	300	15	1.5
UG C8	Spher. 5	120	1.0	300	10	2.8
UG C1	Spher. 5	120	1.0	300	5	6.9
UG Phenyl	Spher. 5	120	1.0	300	7	2.3
UG CN	Spher. 5	120	1.0	300	5	3.8
UG NH ₂	Spher. 5	80	0.9	400	15	0.9
UG SCX	Spher. 5	80	0.9	400	9	0.6
AG C18	Spher. 5	120	1.0	300	15	2.6
SG C18	Spher. 5	120	1.0	300	14	2.6
AG C8	Spher. 5	120	1.0	300	10	3.9
SG C8	Spher. 5	120	1.0	300	10	3.9
MG C18	Spher. 3, 5	100	0.9	250	15	—
MG-II C18	Spher. 3, 5	100	—	300	15	2.7
ACR C18	Spher. 5	80	0.8	340	18	2.5
AQ C18	Spher. 5	80	0.9	300	11	1.2
DD C8	Spher. 3, 5	80	—	300	11	3.8

Ever since the first Capcell Pak was introduced in 1987 (AG type), the product line has evolved in terms of the quality of the base silica gel as well as polymer coating technology (Table 1). Shiseido's Capcell Pak columns have kept pace with the increasing demands for high throughput, low-level detection and analysis under harsh sample and mobile phase conditions. With qualities such as increased acid and alkaline resistance, improved control over retention and selectivity, chromatographers will find a variety of useful materials from which to select, packed in fast capillaries on up to preparative dimensions.

Table 1 Performance Overview of Capcell Pak Media

Type	Base Silica Gel	Polymer Coating	pH Range	Separation Quality	Retention of Polar Compounds
AG	Conventional grade	Mono-layer	2-10	Good	Fair
SG	High purity (metal content: <5 ppm)	Mono-layer	2-9	Good	Fair
UG	High purity (metal content: <5 ppm)	Homogeneous mono-layer	2-10	Excellent	Fair
MG	High purity (metal content: <5 ppm)	Controlled homogeneous mono-layer	2-10	Excellent (LC-MS)	Strong
MG-II	High purity (metal content: <5 ppm)	Reinforced homogeneous mono-layer	2-10	Excellent (LC-MS)	Excellent
ACR	High purity (metal content: <5 ppm)	Reinforced homogeneous mono-layer	1-10	Excellent (LC-MS)	Fair
DD	High purity (metal content: <5 ppm)	Reinforced homogeneous mono-layer	1.5-10	Excellent (LC-MS)	Excellent
AQ	High purity (metal content: <5 ppm)	Reinforced homogeneous mono-layer	2-9	Excellent (LC-MS)	Excellent

A Choice of 6 Different Capcell Pak C18 Phases

C18 MG and C18 MG-II

C18 MG employs a silica gel with a relatively large surface area to which a controlled amount of C18 phase is introduced. This makes it a well-balanced stationary phase in terms of its retention behavior towards polar and hydrophobic compounds. Especially noteworthy is its ability to separate polar compounds. The new C18 MG-II offers an even higher level of silanol shielding, making it excellent for analysis of basic compounds under neutral conditions - a special advantage to LC/MS users.

C18 UG120

The moderate hydrophobicity of C18 UG120 is recommended for those who wish to perform their analysis in a relatively short time frame. The nonpolar surface of C18 UG120 is especially suitable for eluting polar compounds rapidly and sharply.

C18 ACR

C18 ACR shows excellent durability to acidic mobile phases. It is recommended to those who are not satisfied with the performance of their columns under harsh acidic conditions. The phase shows similar retention properties to those of UG, but in addition, shows high steric selectivity that is analogous to polymeric phases.

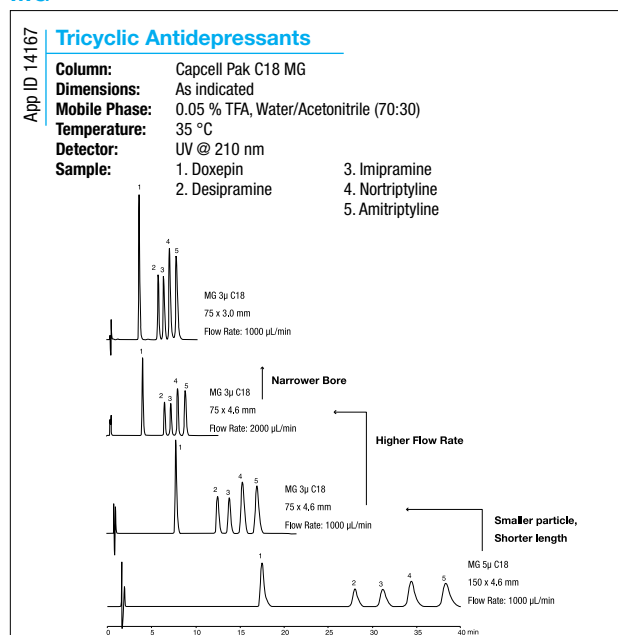
C18 AQ

The C18 AQ phase was developed to retain highly polar compounds, and is useable in 100 % aqueous-based mobile phases.

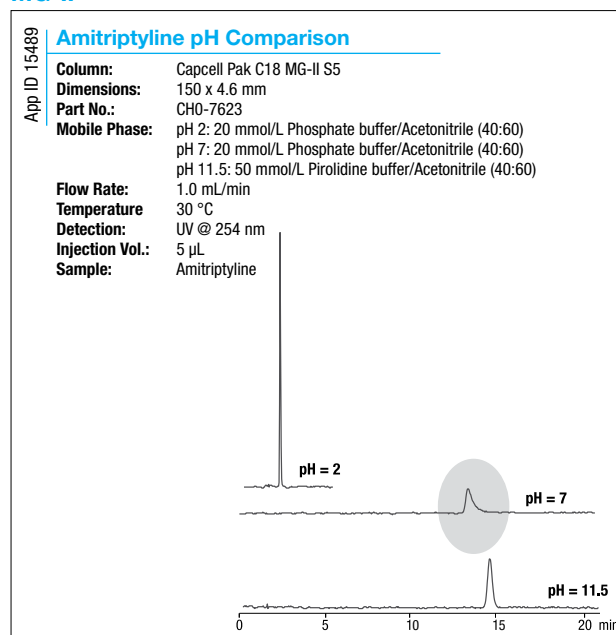
Column Selection By Application

Parameters	Recommended C18 Phase
General-purpose	MG-II, MG
Harsh Acidic Conditions	ACR, DD
Preparative Applications	UG80
Fast Analysis	MG-II, MG S3, UG120
Acid Resistance	ACR > DD > MG-II, MG > AG > UG
Alkaline Resistance	MG-II, MG > ACR > DD > UG > AG
Column Pressure	DD < UG < ACR < AQ < MG-II, MG
Polar Compounds	AQ > DD > MG-II, MG

MG



MG-II



CAPCELL PAK®

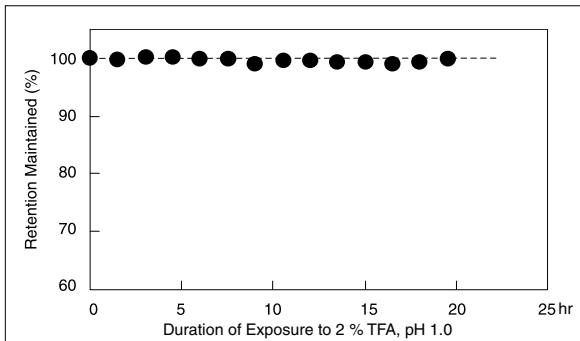
by Shiseido Co, Ltd.

C18 ACR, Excellent Acid Resistance

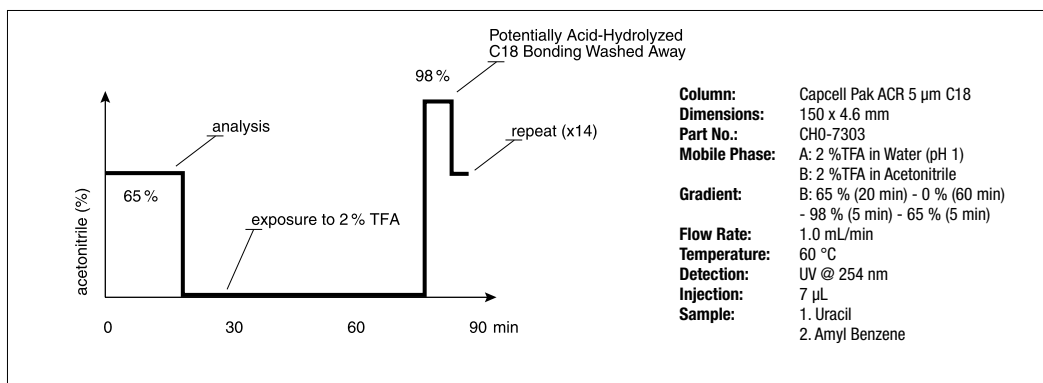
- pH stability 1-10
- Highly inert
- No release of impurities
- Excellent resolution

A modified polymer coating technology led to Capcell Pak C18 ACR. Improved acid resistance was obtained. The ACR column provides excellent performance with improved column life and resolution throughout a wide range of pH (1-10).

Retention Maintained at Low pH



Acid Resistance Test Cycle Conditions



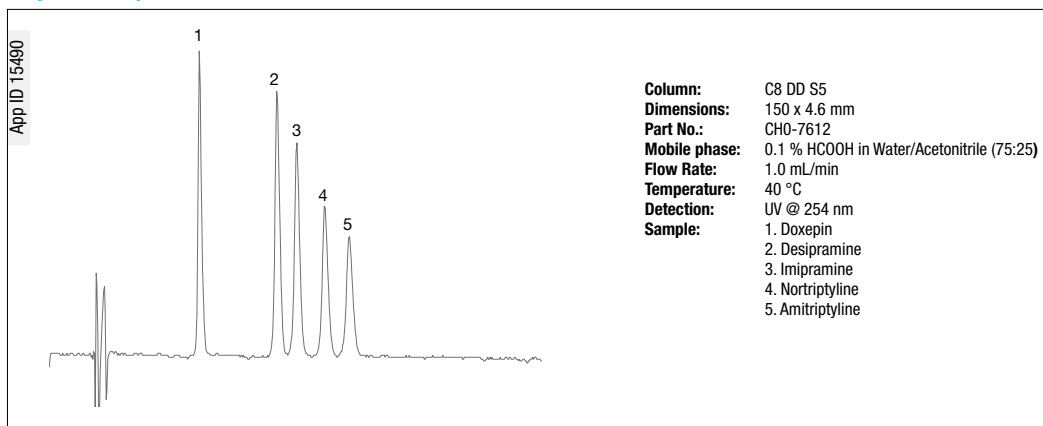
C8 DD

- Good resistance to acid and alkali (pH 1.5-10)
- Great peak shape for basic compounds
- Wide selectivity range for hydrophobic and polar analytes
- Low backpressure and excellent durability

The unique polymer coating and bonding method of the C8 group gives Capcell Pak C8 DD (Double Durability) good acid and alkali resistance. Retention times are decreased for hydrophobic

compounds, while polar compounds are retained. In addition column durability and the balance of surface polarity are improved. The high surface polarity and lower hydrophobicity, compared to C18 columns, make this product a good choice for rapid analysis of mixtures with diverse hydrophobicities.

Tricyclic Antidepressants



CAPCELL PAK®

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ORDERING INFORMATION

AG Series

Part No.	Mfr. No.	Dimensions (mm)	Unit	Price
C18 AG 120 Å 5 µm				
CHO-3976	12503	150 x 4.6	ea	
CHO-3977	12504	250 x 4.6	ea	
C18 AG 120 Å Guard Cartridge				
CHO-3894	12410	10 x 4.0	2/pk	

SG Series

Part No.	Mfr. No.	Dimensions (mm)	Unit	Price
C18 SG 120 Å 5 µm				
CHO-3941	12512	150 x 4.6	ea	
CHO-3942	12513	250 x 4.6	ea	
C18 SG 120 Å Guard Cartridge				
CHO-3893	12411	10 x 4.0	2/pk	
C8 SG 120 Å 5 µm				
CHO-3936	21513	150 x 4.6	ea	
CHO-3937	21514	250 x 4.6	ea	
CN SG 120 Å 5 µm				
CHO-3952	33513	150 x 4.6	ea	
CHO-3953	33514	250 x 4.6	ea	
NH₂ SG 80 Å 5 µm				
CHO-3946	34513	150 x 4.6	ea	
CHO-3947	34514	250 x 4.6	ea	
Phenyl SG 300 Å 5 µm				
CHO-3965	31523	150 x 4.6	ea	
CHO-3966	31524	250 x 4.6	ea	
C1 SG 300 Å 5 µm				
CHO-3968	32523	150 x 4.6	ea	
CHO-3969	32524	250 x 4.6	ea	
C8 SG 300 Å 5 µm				
CHO-3955	21523	150 x 4.6	ea	
CHO-3956	21524	250 x 4.6	ea	
C18 SG 300 Å 5 µm				
CHO-3960	12522	150 x 4.6	ea	
CHO-3961	12523	250 x 4.6	ea	

Preparative sizes also available for all AG and SG phases.

MF Series

Part No.	Mfr. No.	Dimensions (mm)	Unit	Price
MF C8 80 Å 5 µm				
CHO-3884	60521	50 x 4.6	ea	
CHO-3885	60522	100 x 4.6	ea	
CHO-3886	60523	150 x 4.6	ea	
MF Ph-1 80 Å 5 µm				
CHO-3887	60501	50 x 4.6	ea	
CHO-3888	60502	100 x 4.6	ea	
CHO-3889	60503	150 x 4.6	ea	
MF Ph-1 80 Å 5 µm Guard Cartridges				
CHO-3896	12437	10 x 2.0	5/pk	
CHO-3897	12436	10 x 2.0	2/pk	
CHO-3898	12417	10 x 4.0	5/pk	
CHO-3899	12416	10 x 4.0	2/pk	
CHO-3901	12440	20 x 4.0	2/pk	

Cartridge Holders

Part No.	Mfr. No.	Description	Unit	Price
CHO-3902	EF4010	Holder for 10 mm cartridges	ea	
CHO-3903	EF4020	Holder for 20 mm cartridges	ea	

UG Series

Part No.	Mfr. No.	Dimensions (mm)	Unit	Price
C8 UG 120 Å 5 µm				
CHO-3827	70001	35 x 2.0	ea	
CHO-3828	70003	150 x 2.0	ea	
CHO-3831	71503	150 x 4.6	ea	
CHO-3832	71504	250 x 4.6	ea	
Phenyl UG 120 Å 5 µm				
CHO-3840	73503	150 x 4.6	ea	
CHO-3841	73504	250 x 4.6	ea	
CN UG 120 Å 5 µm				
CHO-3854	71001	35 x 2.0	ea	
CHO-3857	64501	35 x 4.6	ea	
CHO-3858	64503	150 x 4.6	ea	
CHO-3859	64504	250 x 4.6	ea	
C18 UG 120 Å 3 µm				
CHO-4831	69790	50 x 2.0	ea	
CHO-4832	69791	75 x 2.0	ea	
CHO-4833	69792	100 x 2.0	ea	
CHO-3878	61526	50 x 4.6	ea	
CHO-3880	61530	100 x 4.6	ea	
CHO-3881	61533	150 x 4.6	ea	
C18 UG 120 Å 5 µm				
CHO-3806	70701	35 x 1.0	ea	
CHO-3807	70703	150 x 1.0	ea	
CHO-3812	70501	35 x 2.0	ea	
CHO-3813	70503	150 x 2.0	ea	
CHO-3814	70504	250 x 2.0	ea	
CHO-3815	61501	35 x 4.6	ea	
CHO-3816	61503	150 x 4.6	ea	
CHO-3817	61504	250 x 4.6	ea	
CHO-3819	61514	250 x 10	ea	
CHO-3820	61521	35 x 20	ea	
CHO-3821	61524	250 x 20	ea	
CHO-3822	61532	50 x 30	ea	
CHO-3823	61534	250 x 30	ea	
C18 UG 120 Å Guard Cartridge				
CHO-3895	12412	10 x 4.0	2/pk	
C1 UG 120 Å 5 µm				
CHO-3850	63504	250 x 4.6	ea	
NH₂ UG 80 Å 5 µm				
CHO-3864	75003	150 x 2.0	ea	
CHO-3867	62503	150 x 4.6	ea	
CHO-3868	62504	250 x 4.6	ea	
SCX UG 80 Å 5 µm				
CHO-3882	77003	150 x 4.6	ea	
CHO-3883	77004	250 x 4.6	ea	
C18 UG 300 Å 5 µm				
CHO-3875	70801	35 x 2.0	ea	

Ordering Information (Continued)

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ORDERING INFORMATION (CONTINUED)

MG Series				
Part No.	Mfr. No.	Dimensions (mm)	Unit	Price
C18 MG 100 Å 3 µm				
CHO-7137	90841	35 x 1.0	ea	
CHO-7138	90842	50 x 1.0	ea	
CHO-7139	90846	75 x 1.0	ea	
CHO-7140	90821	35 x 2.0	ea	
CHO-7141	90822	50 x 2.0	ea	
CHO-7142	90826	75 x 2.0	ea	
CHO-7145	90816	75 x 3.0	ea	
CHO-7146	90801	35 x 4.6	ea	
CHO-7147	90802	50 x 4.6	ea	
CHO-7148	90806	75 x 4.6	ea	
CHO-7150	90853	50 x 10	ea	
CHO-7151	90862	35 x 20	ea	
CHO-7152	90863	50 x 20	ea	
C18 MG 100 Å 3 µm Capillary Columns				
CHO-7295	90923	150 x 0.3	ea	
CHO-7296	90933	150 x 0.5	ea	
C18 MG 100 Å 3 µm Guard Cartridges				
CHO-7159	12301	10 x 2.0	2/pk	
CHO-7161	12305	10 x 4.0	2/pk	
C18 MG 100 Å 5 µm				
CHO-5839	90301	35 x 2.0	ea	
CHO-5840	90303	150 x 2.0	ea	
CHO-5841	90304	250 x 2.0	ea	
CHO-5837	90203	150 x 3.0	ea	
CHO-5838	90204	250 x 3.0	ea	
CHO-5833	90101	35 x 4.6	ea	
CHO-5834	90103	150 x 4.6	ea	
CHO-5835	90104	250 x 4.6	ea	
CHO-7153	90602	50 x 10	ea	
CHO-7154	90604	250 x 10	ea	
CHO-7155	90702	50 x 20	ea	
CHO-7156	90704	250 x 20	ea	
C18 MG 100 Å 5 µm Capillary Columns				
CHO-7297	90903	150 x 0.3	2/pk	
CHO-7298	90913	150 x 0.5	2/pk	
C18 MG 100 Å 5 µm Guard Cartridges				
CHO-7157	12497	10 x 2.0	2/pk	
CHO-7158	12496	10 x 4.0	2/pk	

MG-II Series				
Part No.	Mfr. No.	Dimensions (mm)	Unit	Price
C18 MG-II 100 Å 5 µm - Silanol Shielding (pH 2-10)				
CHO-7622	92528	35 x 4.6	ea	
CHO-7623	92532	150 x 4.6	ea	
CHO-7624	92533	250 x 4.6	ea	
CHO-7625	92516	35 x 2.0	ea	
CHO-7626	92520	150 x 2.0	ea	
CHO-7627	92521	250 x 2.0	ea	
CHO-7628	92503	35 x 1.0	ea	
CHO-7629	92507	150 x 1.0	ea	
CHO-7630	92508	250 x 1.0	ea	
C18 MG-II 100 Å 5 µm - Silanol Shielding (pH 2-10) Guard Cartridges				
CHO-7631	12200	10 x 4.0	2/pk	
CHO-7632	12199	10 x 2.0	2/pk	

ACR Series				
Part No.	Mfr. No.	Dimensions (mm)	Unit	Price
C18 ACR 80 Å 5 µm - Acid Resistance (pH 1-10)				
CHO-7302	91101	35 x 4.6	ea	
CHO-7303	91103	150 x 4.6	ea	
CHO-7304	91104	250 x 4.6	ea	
CHO-7305	91301	35 x 2.0	ea	
CHO-7306	91303	150 x 2.0	ea	
CHO-7307	91304	250 x 2.0	ea	
CHO-7308	91501	35 x 1.0	ea	
CHO-7309	91503	150 x 1.0	ea	
CHO-7310	91504	250 x 1.0	ea	
C18 ACR 80 Å 5 µm - Acid Resistance (pH 1-10) Capillary Columns				
CHO-7311	91913	150 x 0.3	ea	
CHO-7312	91933	150 x 0.5	ea	
C18 ACR 80 Å 5 µm - Acid Resistance (pH 1-10) Guard Cartridges				
CHO-7299	12150	10 x 1.0	2/pk	
CHO-7300	12152	10 x 2.0	2/pk	
CHO-7301	12155	10 x 4.0	2/pk	

AQ Series				
Part No.	Mfr. No.	Dimensions (mm)	Unit	Price
C18 AQ 5 µm				
CHO-7380	92040	35 x 4.6	ea	
CHO-7381	92044	150 x 4.6	ea	
CHO-7382	92045	250 x 4.6	ea	
CHO-7383	92010	35 x 2.0	ea	
CHO-7384	92014	150 x 2.0	ea	
CHO-7385	92015	250 x 2.0	ea	
CHO-7386	92000	35 x 1.0	ea	
CHO-7387	92004	150 x 1.0	ea	
CHO-7388	92005	250 x 1.0	ea	
C18 AQ 5 µm Capillary Columns				
CHO-7389	92604	150 x 0.5	ea	
CHO-7390	92504	150 x 0.3	ea	
C18 AQ 5 µm Guard Cartridges				
CHO-7391	12170	10 x 2.0	2/pk	
CHO-7392	12180	10 x 4.0	2/pk	

DD Series				
Part No.	Mfr. No.	Dimensions (mm)	Unit	Price
C8 DD 80 Å 5 µm - Double Durability (pH 1.5-10)				
CHO-7611	90980	35 x 4.6	ea	
CHO-7612	90984	150 x 4.6	ea	
CHO-7613	90985	250 x 4.6	ea	
CHO-7614	90960	35 x 2.0	ea	
CHO-7615	90964	150 x 2.0	ea	
CHO-7616	90965	250 x 2.0	ea	
CHO-7617	90940	35 x 1.0	ea	
CHO-7618	90944	150 x 1.0	ea	
CHO-7619	90945	250 x 1.0	ea	
C8 DD 80 Å 5 µm - Double Durability (pH 1.5-10) Guard Cartridges				
CHO-7620	12350	10 x 4.0	2/pk	
CHO-7621	12090	10 x 2.0	2/pk	

Cartridge Holders				
Part No.	Mfr. No.	Description	Unit	Price
CHO-3902	EF4010	Holder for 10 mm cartridges	ea	
CHO-3903	EF4020	Holder for 20 mm cartridges	ea	

CERAMOSPHER® AND CHIRAL CD-PH

by Shiseido Co, Ltd.

CERAMOSPHER® CHIRAL COLUMNS

- High-efficiency, pressure-stable ceramic-based materials
- Choice of normal or aqueous mobile phase conditions
- Enantioselectivity for acidic, basic and neutral chiral compounds
- High loadability combined with long column lifetimes

Based on 5 µm 40 Å spherical sodium magnesium silicate particles, Ceramospher phases RU-1 and RU-2 are novel materials for chiral HPLC separations. Enantiomer resolution is accomplished on an ion-exchange adduct of the base clay material in combination with an optically-active metal complex (based on ruthenium).

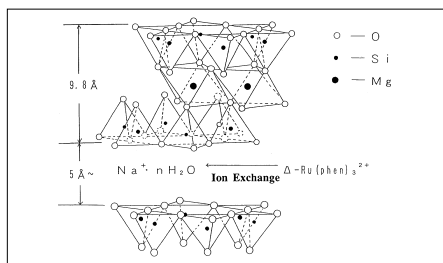
Ceramospher Phases

RU-1. Used for normal phase separations of a wide variety of chiral compounds, typical mobile phases include: 1 % isopropanol-amine or dimethylamine in alcohol (methanol or ethanol) for basic compounds, and 1 % acetic acid in alcohol for acidic compounds. Retention can be controlled by adding small percentages of hexane to these eluents.

RU-2. Treating the base material with a hydrophobic agent imparts excellent stability under aqueous conditions. Water is typically combined with methanol or acetonitrile in the mobile phase. When the content of water in the eluent is 30 % or higher, the retention mechanism appears to be based on typical reversed phase partitioning; when water makes up 5 % or less of the eluent, separations appear to be based on normal phase partitioning. Because of the long lifetime expected, this material is well suited for preparative use.



Call Phenomenex for a complete listing of Ceramospher chiral applications.



ORDERING INFORMATION

Ceramospher and Chiral CD-Ph Chiral Columns			
Part No.	Mfr. No.	Dimensions (mm)	Price
RU-1			
CHO-3904	50503	150 x 4.6	
CHO-3905	50504	250 x 4.6	
RU-2			
CHO-3906	50603	150 x 4.6	
CHO-3907	50604	250 x 4.6	
Chiral CD-Ph			
CHO-5862	80054	250 x 4.6	

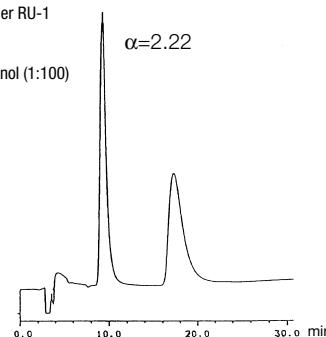
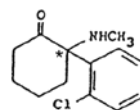
CHIRAL CD-PH COLUMNS

Made of precisely classified high-purity silica, this versatile chiral stationary phase is modified with phenylcarbamated β-cyclodextrin.

- Suitable for separation of basic, neutral, and amphoteric optical isomers
- Usable with both aqueous and non-aqueous mobile phases
- High durability
- High sample loadability

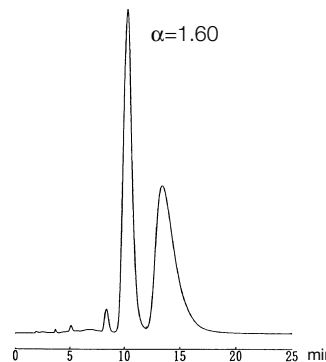
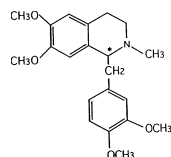
Ketamine

Column: Shiseido Ceramospher RU-1
Dimensions: 250 x 4.6 mm x 2
Part No.: CHO-3905
Mobile Phase: Triethylamine/Methanol (1:100)
Flow Rate: 1.0 mL/min
Temperature: 50 °C
Detection: UV @ 254 nm



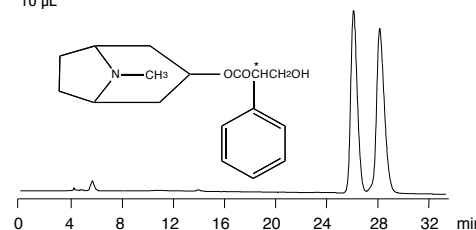
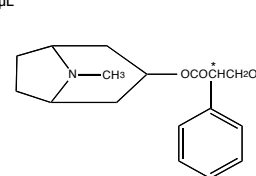
Laudanosine

Column: Shiseido Ceramospher RU-2
Dimensions: 250 x 4.6 mm
Part No.: CHO-3907
Mobile Phase: Diethylamine/Water/Acetonitrile (0.1:10:90)
Flow Rate: 0.5 mL/min
Temperature: 50 °C
Detection: UV @ 254 nm



Atropine

Column: Shiseido Chiral CD-Ph
Dimensions: 250 x 4.6 mm
Part No.: CHO-5862
Mobile Phase: 0.5 mol/L NaClO₄/CH₃CN (70:30)
Flow Rate: 0.5 mL/min
Temperature: 25 °C
Detection: UV @ 220 nm
Injection Vol.: 10 µL



See p. 108 for additional Chiral Stationary Phases.