

YMC Chiral Columns



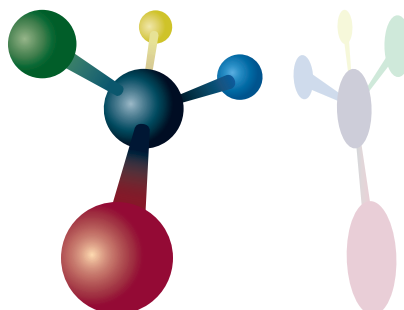
CHIRAL ART
Polysaccharides

YMC CHIRAL
NEA & CD BR

NP/RP/SFC

Coated/
Immobilised

(Semi-)prep

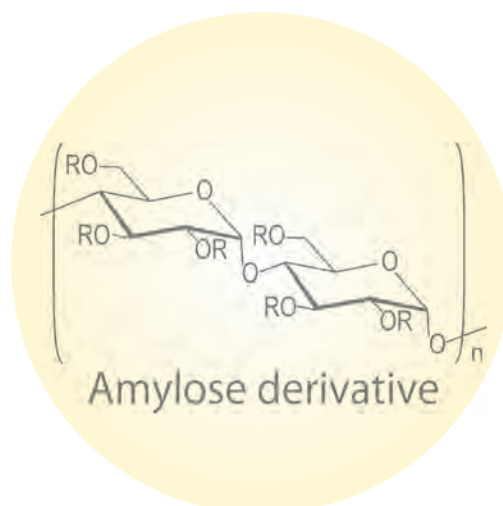


HPLC Columns for Optical Isomer Separation

Chirality has become vitally important in the production of pharmaceuticals, agrochemicals, food and related products due to the different pharmacological or taste/odour effects which the different optical isomers can present. The pharmacological effects can range from no activity through undesirable effects to having potentially life threatening adverse effects. This has led to the development of highly efficient CHIRAL stationary phases (CSP) for analytical and preparative scale separations.

If the CSP is available in two enantiomeric configurations the elution order of enantiomeric pairs can be reversed.

This is particularly useful when the two isomers are not present in equal quantities; a later eluting minor component can often be hidden by the tail of a major peak but on reversal of elution order can be totally resolved from the major component.



Chiral Columns

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Cellulose-SJ

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CHIRAL ART

Immobilised Polysaccharide Derivatives Series

- applicable for normal and reversed phase modes
- unique immobilised chiral selector
- more flexibility due to wide range of usable solvents
- highly robust, also suitable for SFC/SMB
- HPLC columns and preparative grade bulk media with particle sizes of 3, 5, 10 or 20 μm available
- extremely attractive pricing

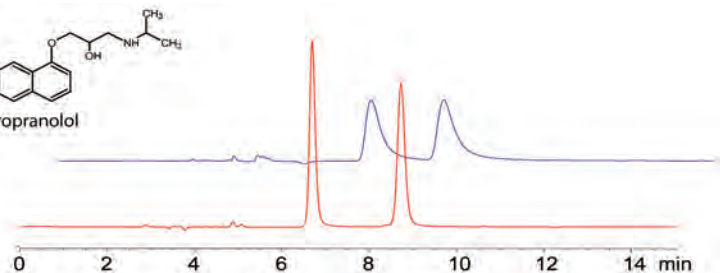
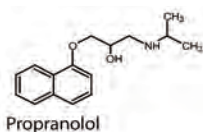
Introduction

CHIRAL ART polysaccharide derivatives are a series of chiral separation columns / packing materials with high stereo-selectivity. They are suitable for separations of a wide range of chiral compounds, cis-trans isomers and geometric isomers. The range of particle sizes and column dimensions available offer outstanding cost effectiveness for analytical to preparative separations.

Immobilised Type

CHIRAL ART immobilised polysaccharide derivatives can be used either in normal phase or in reversed phase modes. They are available in HPLC columns and in preparative grades, in large (multi kg) quantities.

Excellent peak shape



CHIRAL ART polysaccharide derivatives provide excellent peak shapes for ionic and metal coordinating compounds.

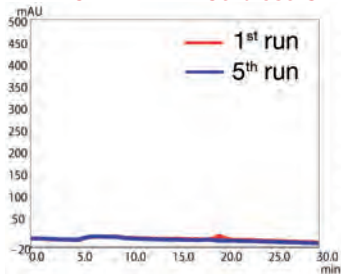
Column: 5 μm , 250 x 4.6 mm ID
 Eluent: *n*-hexane / IPA / DEA (80/20/0.1)
 Flow rate: 1.0 mL/min
 Temperature: 25 $^{\circ}\text{C}$
 Detection: 230 nm
 Injection: 10 μL (0.1 mg/mL)

CHIRALPAK IB

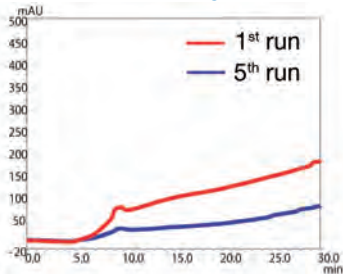
CHIRAL ART Cellulose-SB

Low Column Bleeding

CHIRAL ART Cellulose-SB



CHIRALPAK IB



Gradient test
 Column: 5 μm , 250 x 4.6 mm ID
 Eluent: A) *n*-hexane / B) ethanol
 2-80% B (0-30 min),
 80-2% B (30-30.1 min),
 2% B (30.1-60 min)
 Flow rate: 1.0 mL/min
 Temperature: 25 $^{\circ}\text{C}$
 Detection: UV at 230 nm

CHIRAL ART

Immobilised Polysaccharide Derivatives Series

UNIQUE

	CHIRAL ART Amylose-SA	CHIRAL ART Cellulose-SB	CHIRAL ART Cellulose-SC	CHIRAL ART Cellulose-SJ
Particle size	3, 5, 10, 20 µm			
Chiral selector	Amylose tris (3,5-dimethylphenyl- carbamate)	Cellulose tris (3,5-dimethylphenyl- carbamate)	Cellulose tris (3,5-dichlorophenyl- carbamate)	Cellulose tris (4-methylbenzoat)
USP	L99	—	—	—
Type	Immobilised type			
Separation mode	Normal Phase / Reversed Phase / SFC			
Shipping solvent	<i>n</i> -hexane / 2-propanol (90/10)			
Usable pH-range	2.0 – 9.0			
Temperature	0 – 40°C			
Pressure limit	30 MPa (4,350 psi)			
Recommended flow rate	4.6 mm ID: 0.5 - 1.0 mL/min (Max. flow rate: 3.0 mL/min) 10 mm ID: 2.5 - 5.0 mL/min (Max. flow rate: 15 mL/min)			

Product Line-up

Product name	Particle size	CHIRAL selector	Type	Competitive product
CHIRAL ART Amylose-SA	3 µm	Amylose tris (3,5-dimethylphenylcarbamate)	Immobilised	CHIRALPAK® IA, IA-3
CHIRAL ART Cellulose-SB	5 µm	Cellulose tris (3,5-dimethylphenylcarbamate)		CHIRALPAK® IB, IB-3
CHIRAL ART Cellulose-SC	10 µm	Cellulose tris (3,5-dichlorophenylcarbamate)		CHIRALPAK® IC, IC-3
CHIRAL ART Cellulose-SJ	20 µm	Cellulose tris (4-methylbenzoat)		same chiral selector as CHIRALPAK® OJ (coated)

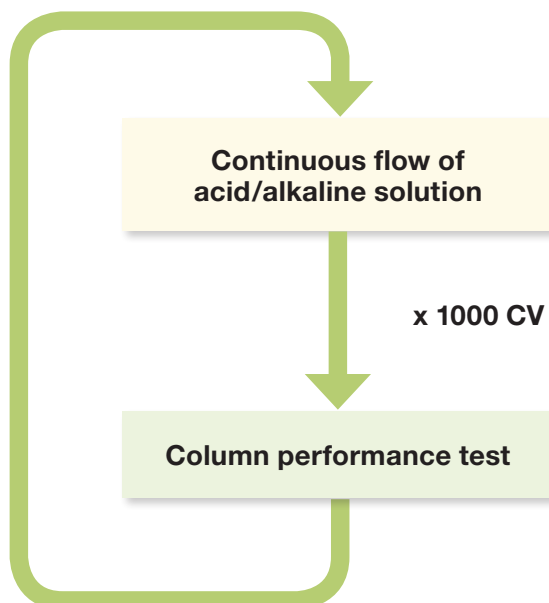
Column Care

The recommended pH range for using CHIRAL ART immobilised polysaccharide columns is 2.0-9.0. Remove acid and buffer salts before storage. Store the column in *n*-hexane/2-propanol = 90/10 (NP) or methanol/water = 50/50 (RP). If columns are affected by undesired contaminants or clogged inlet frits which cause back pressure increases, flush the column (in the reversed direction) with ethanol.

For detailed information please refer to the "Column Care and Use Instructions" which can be downloaded from www.ymc.de/support-documentation.html.

Immobilised Polysaccharides

Wide usable pH range



Continuous flow of acid/alkaline solution

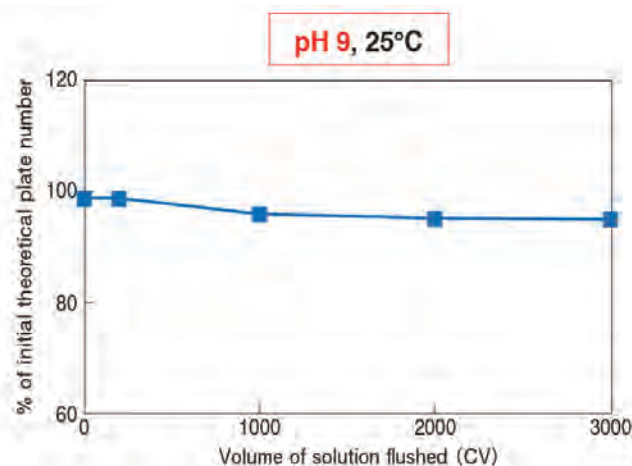
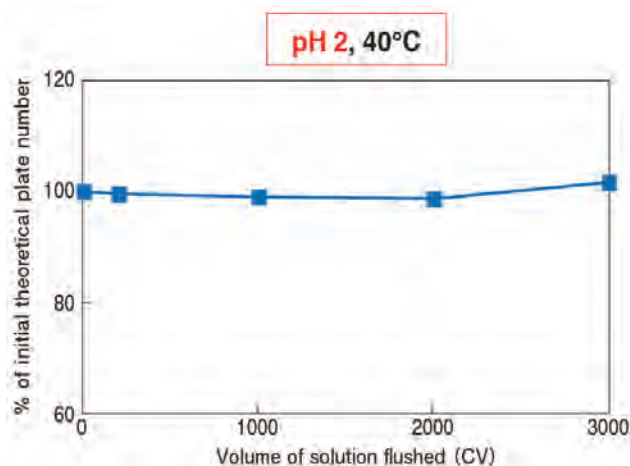
Column: CHIRAL ART Cellulose-SB
 5 μ m, 50 x 4.6 mm ID
 Eluent: buffer/methanol (90/10)
 Flow rate: 1.0 mL/min

Acidic condition
 Buffer: 0.1% H₃PO₄ (pH 2)
 Temperature: 40 °C

Basic condition
 Buffer: 20 mM NH₄HCO₃-DEA (pH 9)
 Temperature: 25 °C

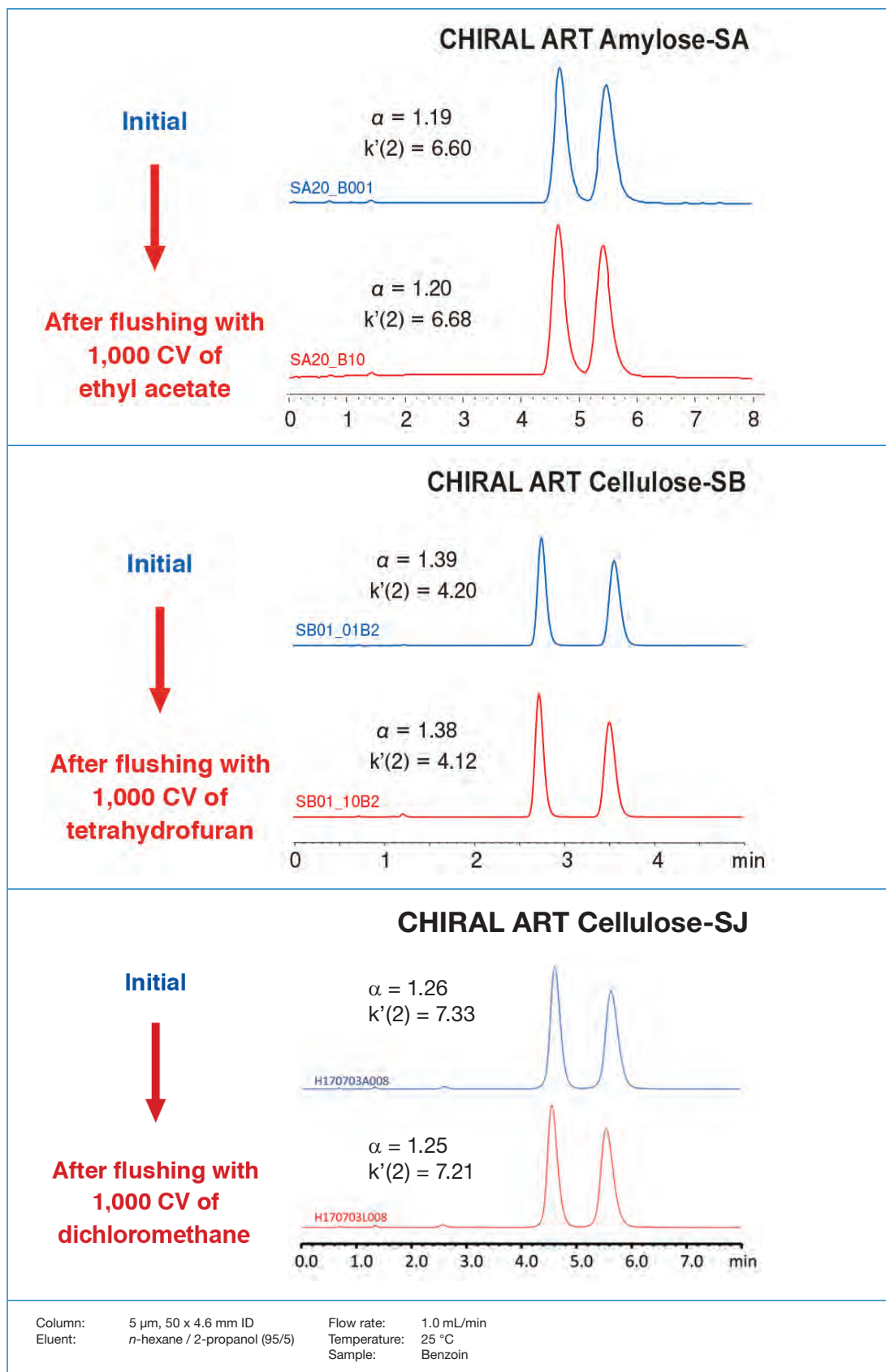
Column performance test

Column: CHIRAL ART Cellulose-SB
 5 μ m, 50 x 4.6 mm ID
 Eluent: acetonitrile/water (30/70)
 Flow rate: 1.0 mL/min
 Temperature: 25 °C
 Detection: UV at 254 nm
 Sample: Benzoin



Immobilised Polysaccharides

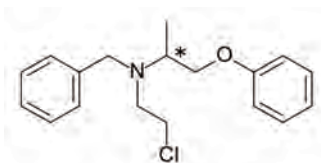
High stability against various solvents



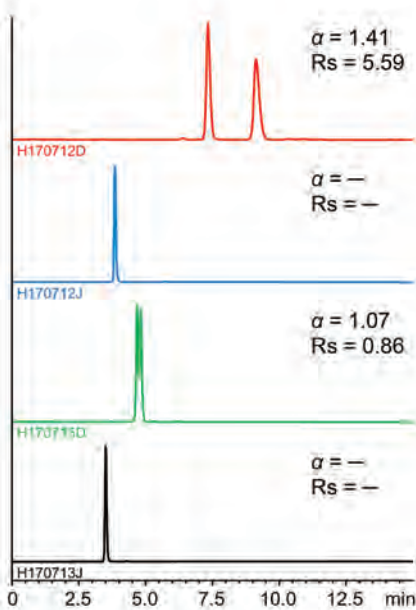
Immobilised Polysaccharides

Unique stereoselectivity complements other CHIRAL ART phases

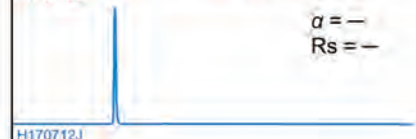
Phenoxybenzamin



CHIRAL ART
Cellulose-SJ



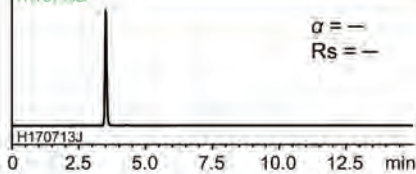
CHIRAL ART
Amylose-SA



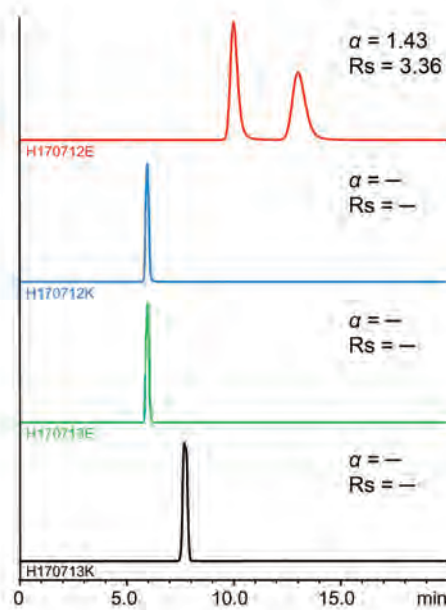
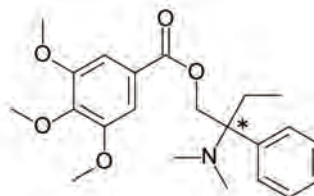
CHIRAL ART
Cellulose-SB



CHIRAL ART
Cellulose-SC



Trimebutine



$\alpha = -$
 $R_s = -$

H170712K

$\alpha = -$
 $R_s = -$

H170713E

$\alpha = -$
 $R_s = -$

H170713K

Phenoxybenzamine

Column: (5 μ m) 250 x 4.6 mm ID
Eluent: *n*-hexane / ethanol / diethylamine (95/5/0.1)
Flow rate: 1.0 mL/min
Temperature: 25 °C
Detection: UV at 270 nm
Injection: 5 μ L (1 mg/mL)

Trimebutine

Column: (5 μ m) 250 x 4.6 mm ID
Eluent: *n*-hexane / ethanol / diethylamine (95/5/0.1)
Flow rate: 1.0 mL/min
Temperature: 25 °C
Detection: UV at 265 nm
Injection: 5 μ L (1 mg/mL)

CHIRAL ART Coated Polysaccharide Derivatives Series

- polysaccharide chiral selectors
- wide application range
- with high stability, also for SFC/SMB
- HPLC columns and preparative grade bulk media with particle sizes of 3, 5, 10 or 20 μm available
- extremely attractive pricing

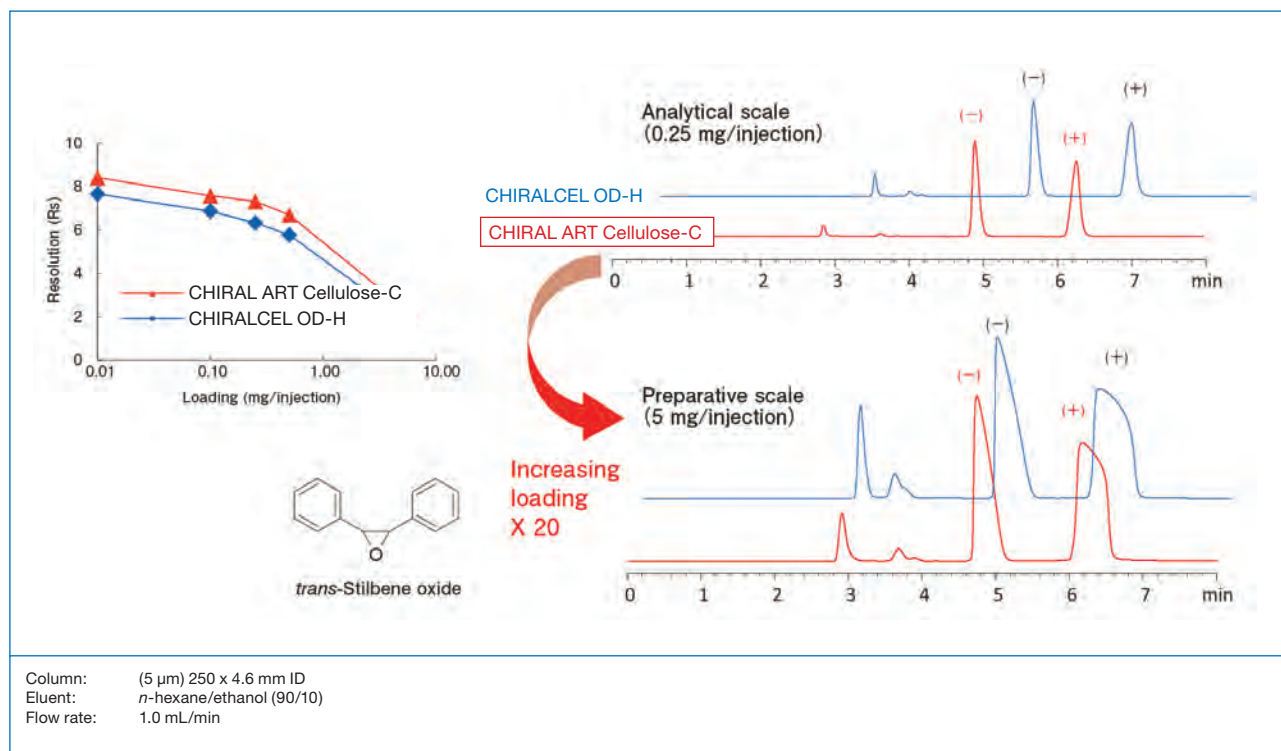
Introduction

A family of coated chiral polysaccharide phases has been developed by YMC, designed to supply superior products which are competitively priced compared to established vendors. In addition – and typical of YMC – fully scalable preparative grades are available in large quantities.

Mobile phase and sample solvent

The silica packing material is coated with the polysaccharide derivative. Therefore trace quantities of a solvent which might potentially dissolve the polysaccharide derivative (e.g. THF, acetone, ethyl acetate, chloroform, dichloromethane, DMSO, DMF, etc.) should be eliminated. These solvents must be avoided in the mobile phase and the sample solvent.

Effective for Preparative Separation of Enantiomers



CHIRAL ART

Coated Polysaccharide Derivatives Series

CHIRAL ART
Amylose-C Neo for
Extended Resolution
& Loadability

	CHIRAL ART Amylose-C/Amylose-C Neo	CHIRAL ART Cellulose-C
Particle size	3, 5, 10, 20 μm	
Chiral selector	Amylose tris (3,5-dimethyl-phenylcarbamate)	Cellulose tris (3,5-dimethyl-phenylcarbamate)
USP	L51	L40
Type	Coated type	
Separation mode	Normal Phase / SFC	
Shipping solvent	n-hexane / 2-propanol (90/10)	
Temp. range	0–40°C	
Pressure limit	30 MPa (4,350 psi)	
Recommended flow rate	4.6 mm ID: 0.5 - 1.0 mL/min (Max. flow rate: 3.0 mL/min) 10 mm ID: 2.5 - 5.0 mL/min (Max. flow rate: 15 mL/min)	

Product Line-up

Product name	Particle size	Chiral selector	Type	Competitive product
CHIRAL ART Amylose-C/Amylose-C Neo	3 μm 5 μm	Amylose tris (3,5-dimethylphenylcarbamate)	Coated	CHIRALPAK® AD, AD-H, AD-3
CHIRAL ART Cellulose-C	10 μm 20 μm	Cellulose tris (3,5-dimethylphenylcarbamate)		CHIRALCEL® OD, OD-H, OD-3

CHIRALPAK and CHIRALCEL are registered trademarks of Daicel Corporation

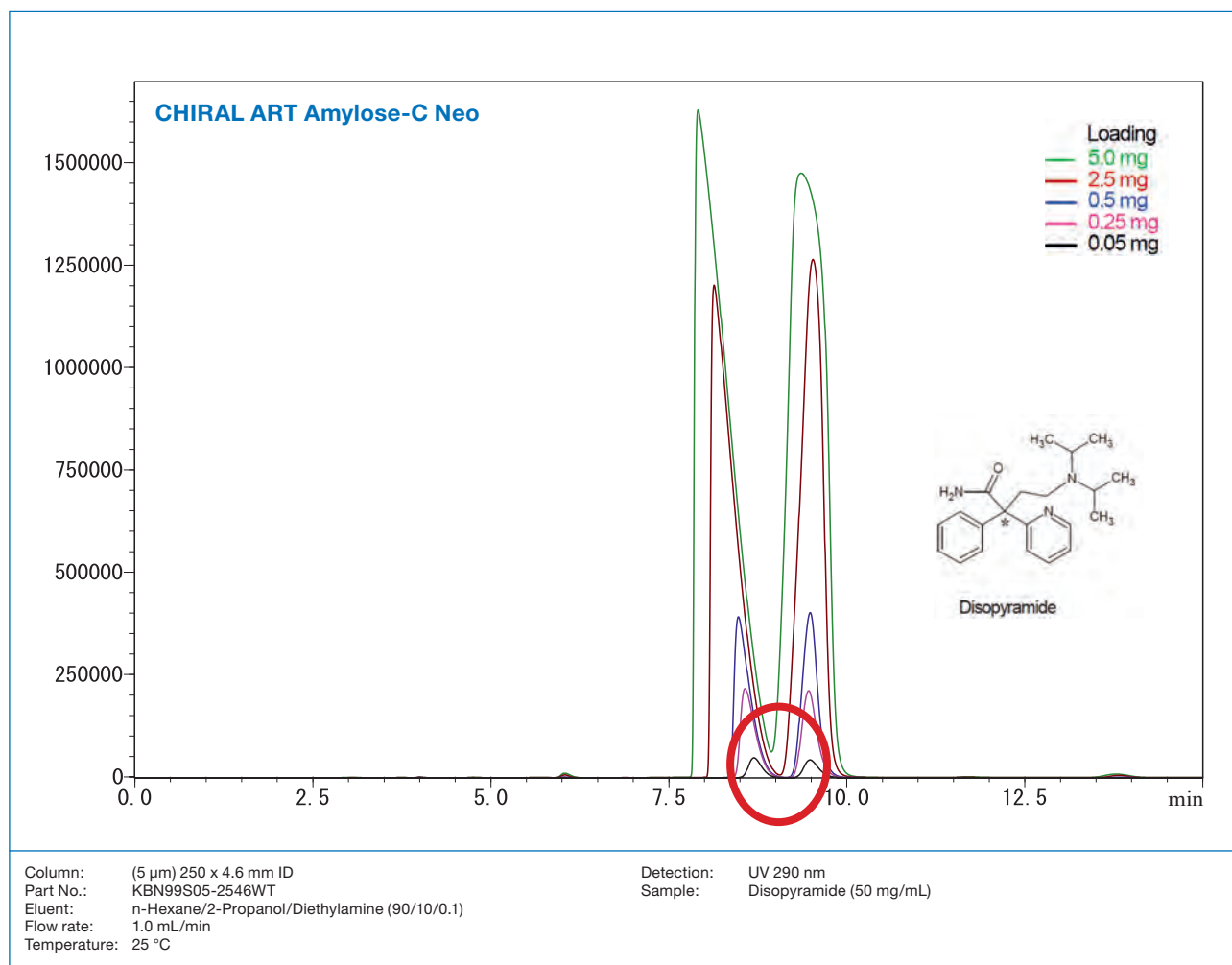
CHIRAL ART Amylose-C Neo

CHIRAL ART Amylose-C Neo is an upgraded phase and offers increased resolution, compared to that of CHIRAL ART Amylose-C, for both HPLC and SFC separations.

This chiral phase also offers increased performance when it comes to purification under high loading as well as overall purification efficiency and productivity.

CHIRAL ART Coated Polysaccharide Derivatives Series

Excellent peak shapes at high loading: CHIRAL ART Amylose-C Neo



Column Care

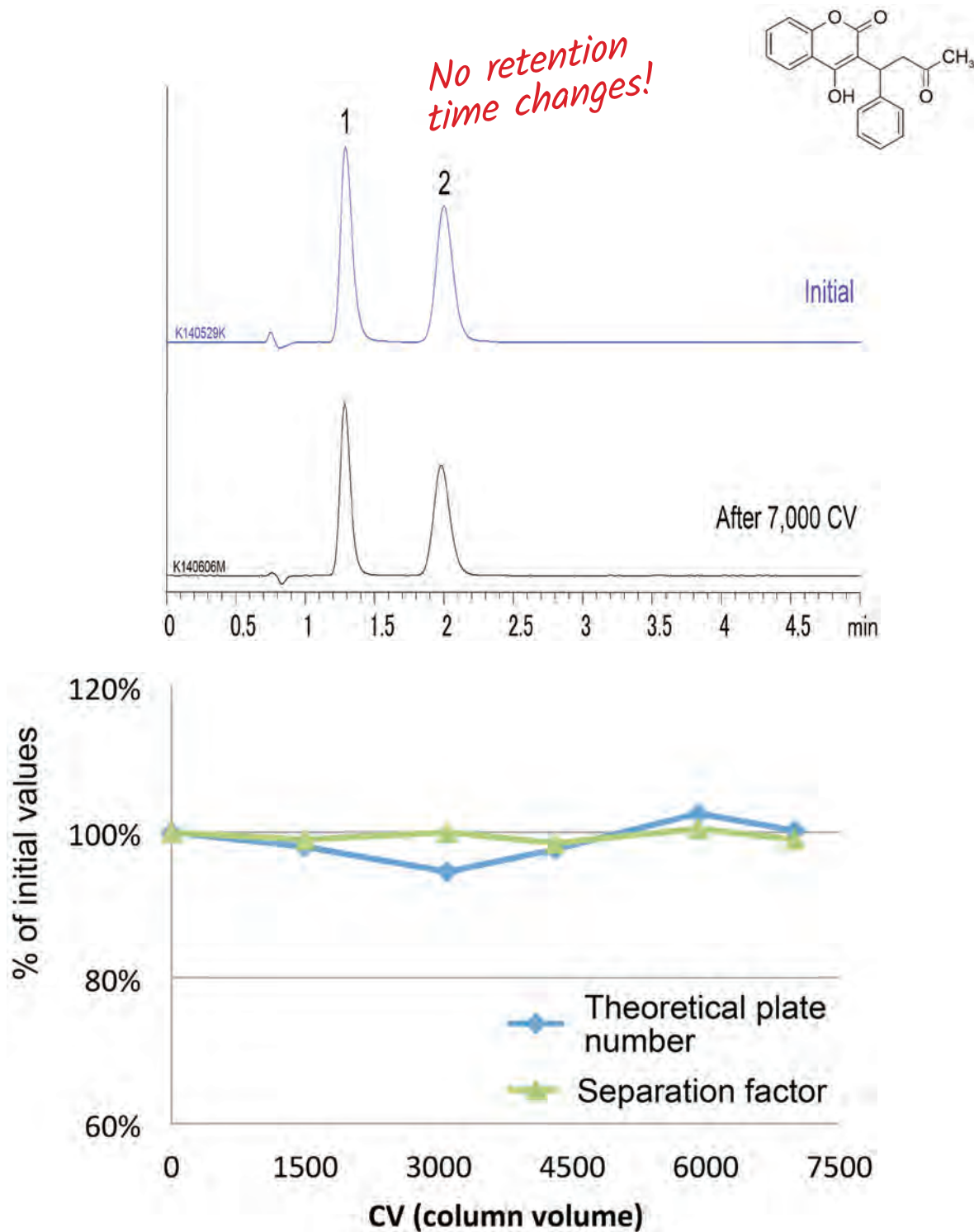
The recommended pH range for using CHIRAL ART coated polysaccharide columns is 3.5-6.5. Store the column in *n*-hexane/2-propanol = 90/10. If columns are affected by undesired contaminants or clogged inlet frits which cause back pressure increases, flush the column with ethanol.

For detailed information please refer to the "Column Care and Use Instructions" which can be downloaded from www.ymc.de/support-documentation.html.

Coated Polysaccharides

Enhanced stability using TFA

Stability evaluation with Warfarin

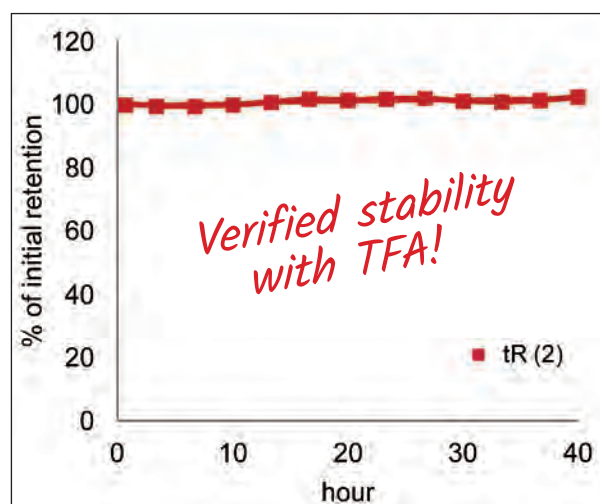
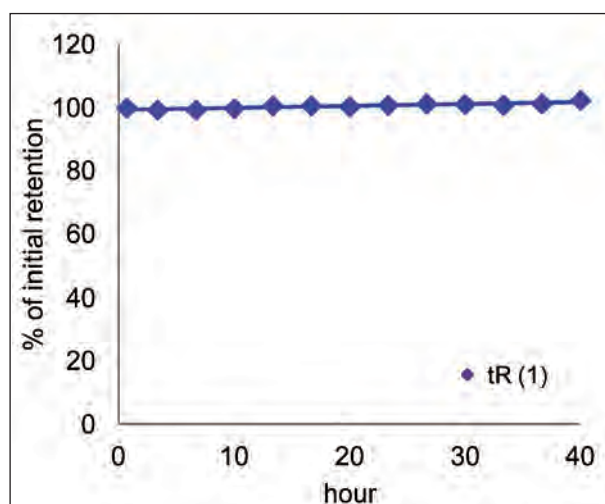
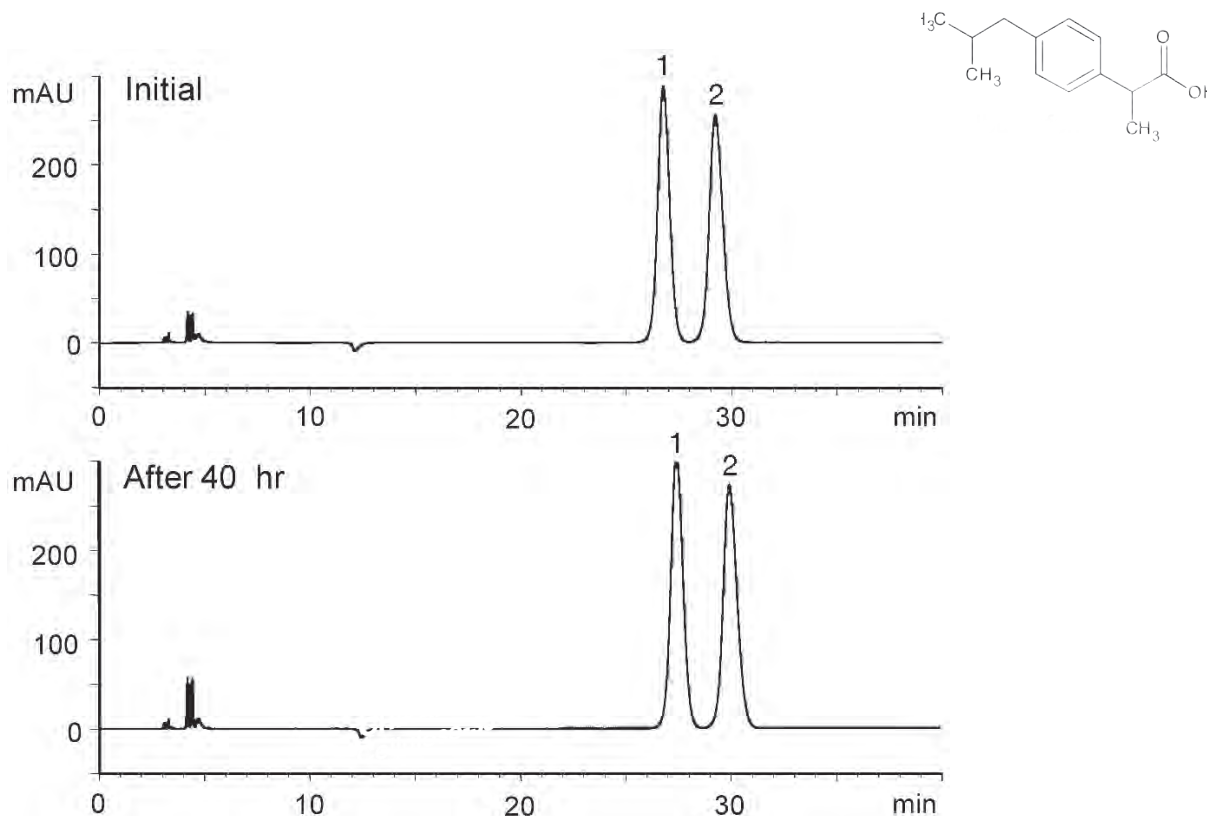


Column: CHIRAL ART Amylose-C (5 μ m) 50 x 3.0 mm ID
Part No.: KAN99S05-0503WT
Eluent: *n*-hexane / ethanol / TFA (70/30/0.1)
Flow rate: 0.425 mL/min
Temperature: 25 $^{\circ}$ C
Detection: UV at 254 nm

Coated Polysaccharides

Enhanced stability using TFA

Repeated analysis of Ibuprofen

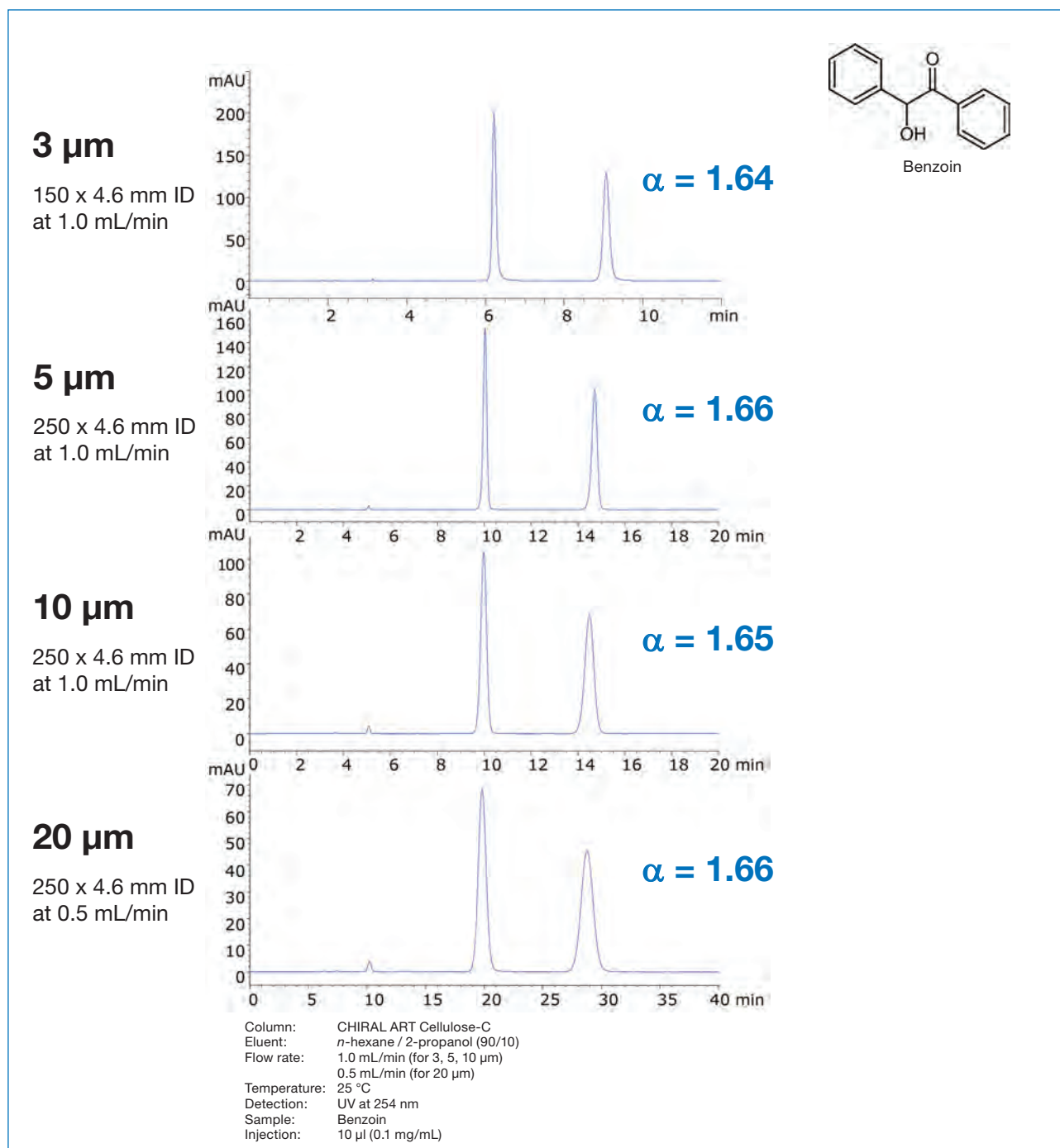


Column: CHIRAL ART Amylose-C (5 μ m) 250 x 4.6 mm ID
 Part No.: KAN99S05-2546WT
 Eluent: *n*-hexane / 2-propanol / TFA (99/1/0.1)
 Flow rate: 1.0 mL/min
 Temperature: 25 $^{\circ}$ C
 Detection: UV at 220 nm
 Injection: 10 μ L (1 mg/mL)

TFA can be challenging for coated amylose phases with regards to stability and lifetime. CHIRAL ART Amylose-C however shows long-term stability using mobile phases containing TFA. The retention behaviour and column efficiency remain completely unaffected.

Coated Polysaccharides

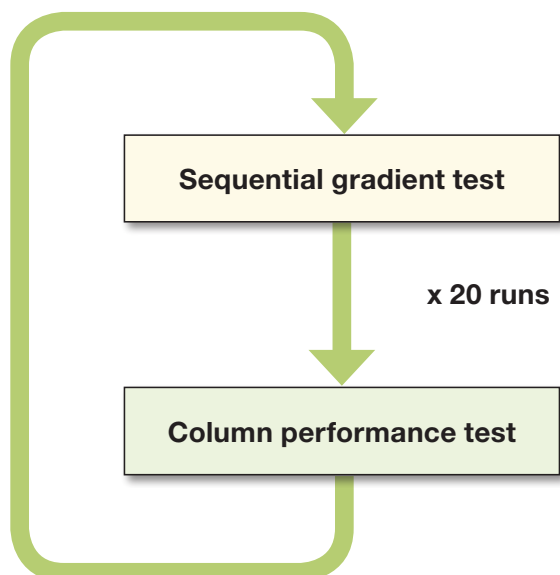
Full scalability from 3 to 20 μm



CHIRAL ART shows identical selectivity and excellent peak shapes for materials with particle sizes from 3 μm to 20 μm . It allows predictable scale up from analytical LC to semi-preparative or preparative LC, and vice versa. Screening and method development can be done on small particle sizes and the results can easily be transferred to larger particle sizes.

Coated Polysaccharides

Extended packing stability



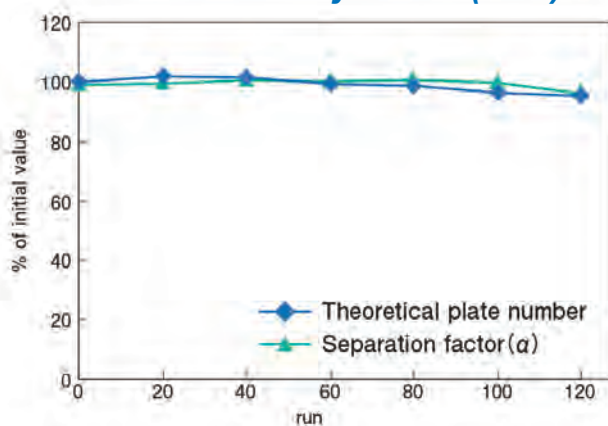
Sequential gradient test

Column: 5 μ m, 250 x 4.6 mm ID
 Eluent: A) *n*-hexane, B) ethanol
 0-100% B (0-15 min)
Flow rate: 3.0 mL/min
Pressure: 10-30 MPa/run
 Temperature: 37 °C

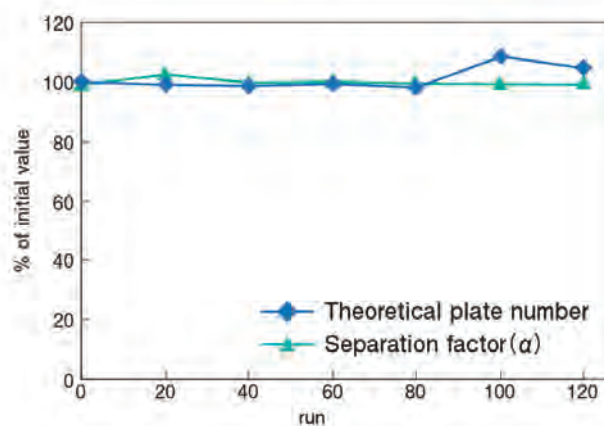
Column performance test

Column: 5 μ m, 250 x 4.6 mm ID
 Eluent: *n*-hexane/ethanol (90/10)
 Flow rate: 1.0 mL/min
 Temperature: 37 °C
 Detection: UV at 230 nm
 Sample: *trans*-Stilbene oxide

CHIRAL ART Amylose-C (Neo)



CHIRAL ART Cellulose-C

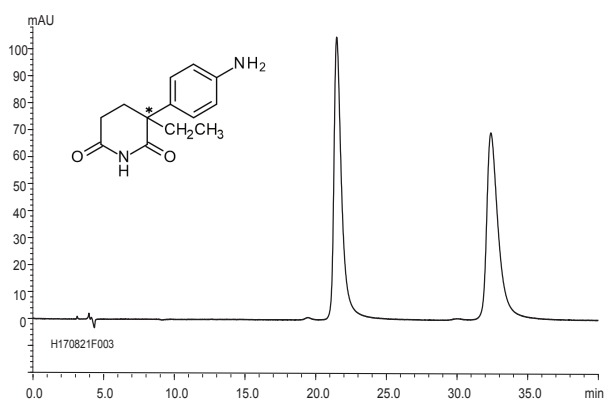


Applications

Pharmaceuticals (APIs)

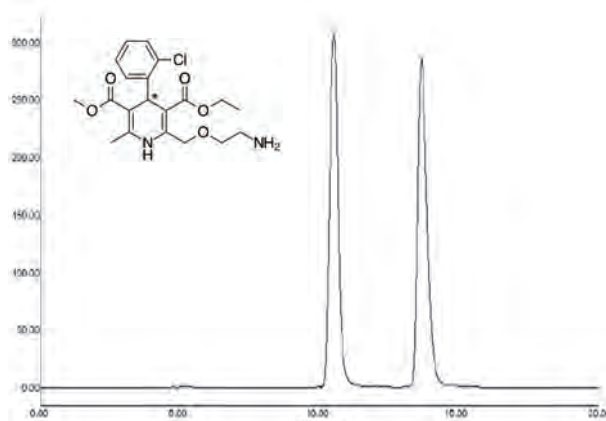
Using **CHIRAL ART**
Cellulose-SJ

Aminogluthethimide



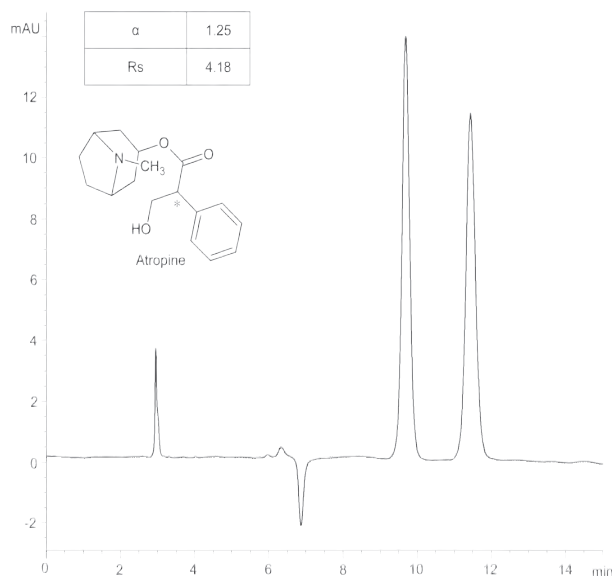
Column: CHIRAL ART Cellulose-SJ (5 μ m) 250 X 4.6 mm ID
Part No.: KSJ99S05-2546WT
Eluent: *n*-hexane / ethyl acetate / diethylamine (70/30/0.1)
Flow rate: 1.0 mL/min
Temperature: 25 °C

Amlodipine



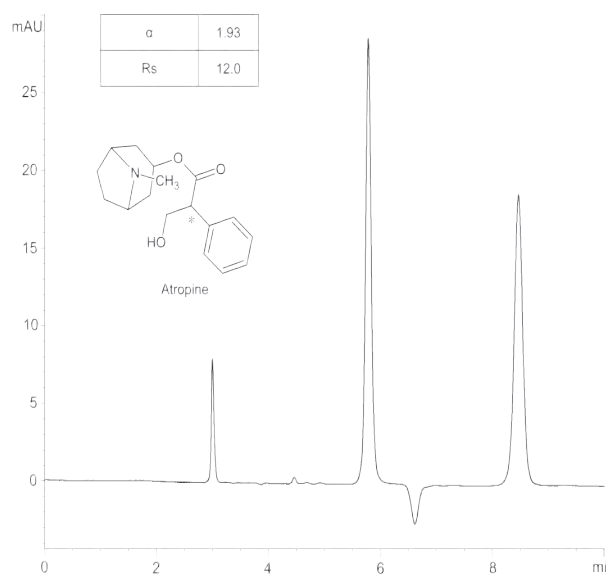
Column: CHIRAL ART Cellulose-SC (5 μ m) 250 x 4.6 mm ID
Part No.: KSC99S05-2546WT
Eluent: dichloromethane / acetonitrile / *n*-butylamine (90/10/0.1)
Flow rate: 0.7 mL/min
Temperature: 25 °C
Detection: UV at 360 nm
Injection: 20 μ L (0.5 mg/mL)

Atropine



Column: CHIRAL ART Amylose-C (5 μ m) 250 x 4.6 mm ID
Part No.: KAN99S05-2546WT
Eluent: *n*-hexane / ethanol / ethanolamine (87/13/0.1)
Flow: 1.0 mL/min
Temperature: 25 °C
Detection: UV at 230 nm
Injection: 2 μ L (1 mg/mL)

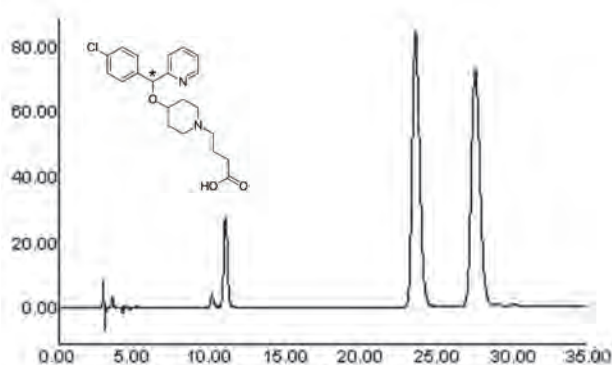
Atropine



Column: CHIRAL ART Cellulose-C (5 μ m) 250 x 4.6 mm ID
Part No.: KCN99S05-2546WT
Eluent: *n*-hexane / ethanol / ethanolamine (90/10/0.1)
Flow: 1.0 mL/min
Temperature: 25 °C
Detection: UV at 230 nm
Injection: 2 μ L (1 mg/mL)

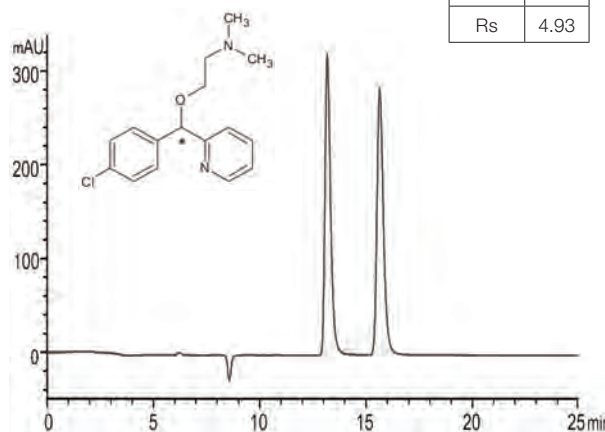
Applications Pharmaceuticals (APIs)

Bepotastine



Column: CHIRAL ART Amylose-SA (5 μ m) 250 x 4.6 mm ID
 Part No.: KSA99S05-2546WT
 Eluent: *n*-hexane / ethanol / 1,4-dioxane / trifluoroacetic acid / diethylamine (90/5/5/0.1/0.1)
 Flow rate: 1.0 mL/min
 Temperature: 25 $^{\circ}$ C
 Detection: UV at 260 nm
 Injection: 20 μ L (0.5 mg/mL)

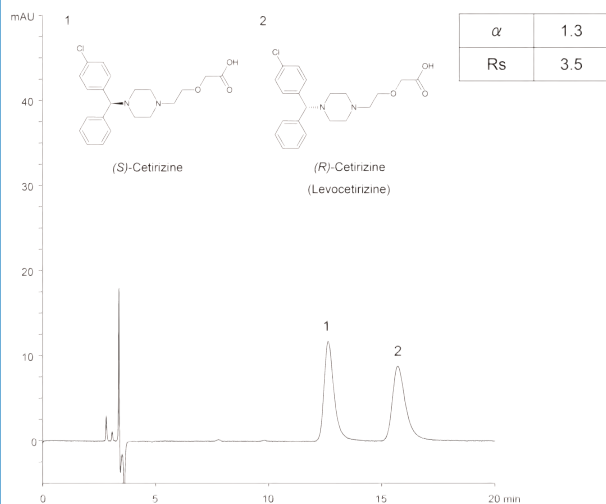
Carbinoxamine



α	1.34
R_s	4.93

Column: CHIRAL ART Amylose-SA (5 μ m) 250 x 4.6 mm ID
 Part No.: KSA99S05-2546WT
 Eluent: *n*-hexane / 2-propanol / diethylamine (90/10/0.1)
 Flow rate: 0.5 mL/min
 Temperature: 25 $^{\circ}$ C
 Detection: UV at 230 nm
 Injection: 5 μ L (1.0 mg/mL)

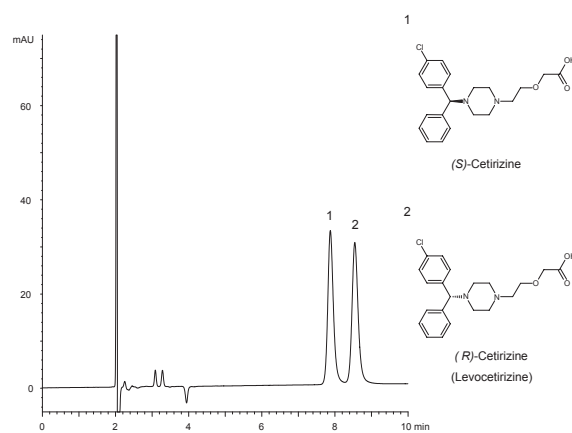
Cetirizine



α	1.3
R_s	3.5

Column: CHIRAL ART Cellulose-C (5 μ m) 250 x 4.6 mm ID
 Part No.: KCN99S05-2546WT
 Eluent: *n*-hexane / 2-propanol / formic acid / diethylamine (70/30/0.1/0.1)
 Flow: 1.0 mL/min
 Temperature: 25 $^{\circ}$ C
 Detection: UV at 230 nm
 Injection: 2 μ L (200 μ g/mL)

Cetirizine



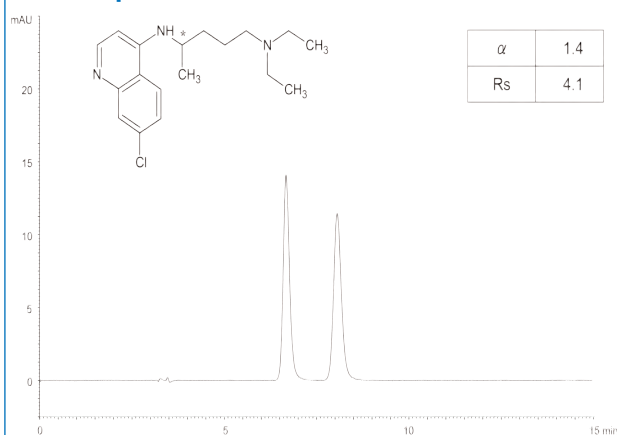
α	1.1
R_s	2.4

Column: CHIRAL ART Cellulose-SB (3 μ m) 150 x 4.6 mm ID
 Part No.: KSB99S03-1546WT
 Eluent: acetonitrile / formic acid / diethylamine (100/0.1/0.1)
 Flow rate: 1.0 mL/min
 Temperature: 25 $^{\circ}$ C
 Detection: UV at 230 nm
 Injection: 2 μ L (200 μ g/mL)

Applications

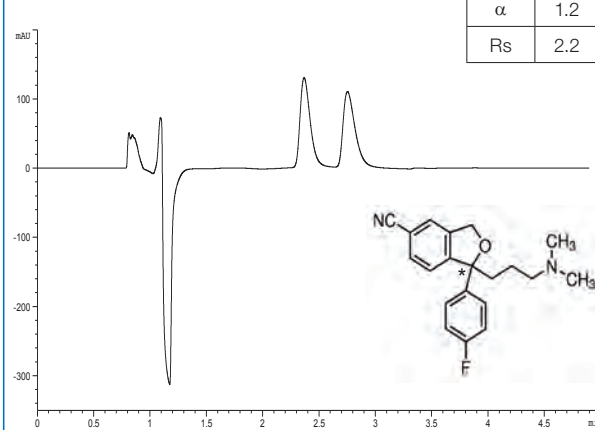
Pharmaceuticals (APIs)

Chloroquine



Column: CHIRAL ART Amylose-SA (5 μ m) 250 x 4.6 mm ID
 Part No.: KSA99S05-2546WT
 Eluent: methyl *tert*-butyl ether / ethanol / diethylamine (95/5/0.1)
 Flow rate: 1.0 mL/min
 Temperature: 25 °C
 Detection: UV at 344 nm
 Injection: 5 μ L (100 μ g/mL)

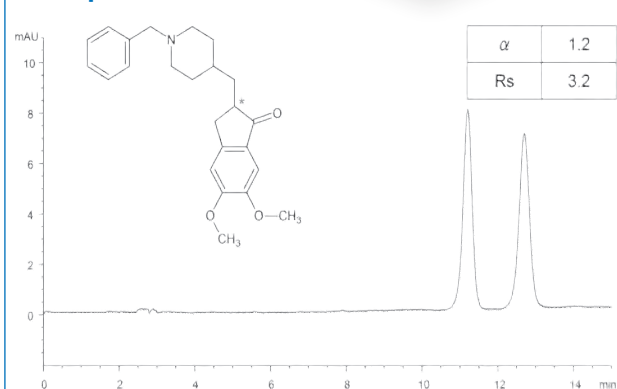
Citalopram



Column: CHIRAL ART Cellulose-C (3 μ m) 150 x 3.0 mm ID
 Part No.: KCN99S03-1503WT
 Eluent: *n*-hexane / 2-propanol / diethylamine (90/10/0.1)
 Flow rate: 1.0 mL/min
 Temperature: 10 °C
 Detection: UV at 220 nm
 Injection: 5 μ L (0.5 mg/mL)

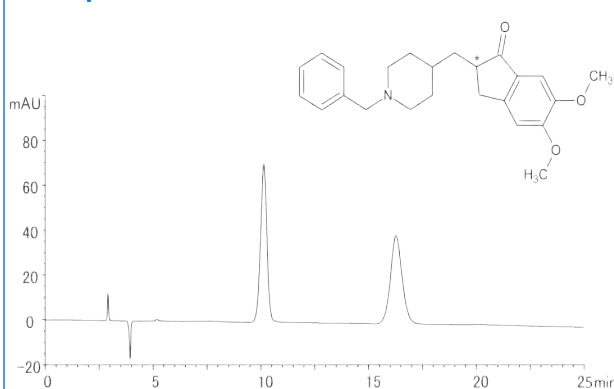
RP-Mode

Donepezil



Column: CHIRAL ART Cellulose-SB (5 μ m) 250 x 4.6 mm ID
 Part No.: KSB99S05-2546WT
 Eluent: 20 mM NH_4HCO_3 -diethylamine (pH 9.0) / acetonitrile (40/60)
 Flow rate: 1.0 mL/min
 Temperature: 25 °C
 Detection: UV at 254 nm
 Injection: 2 μ L (200 μ g/mL)

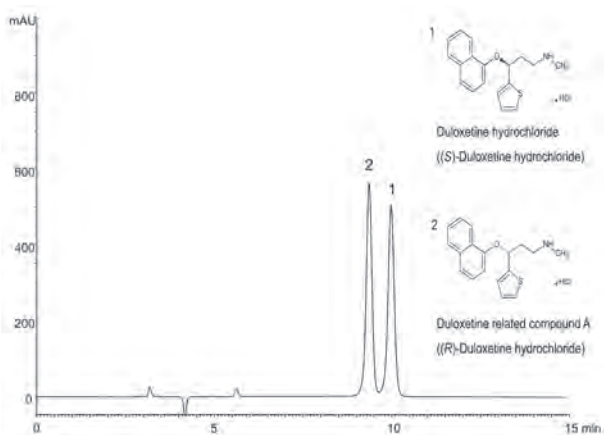
Donepezil



Column: CHIRAL ART Amylose-SA (5 μ m) 250 x 4.6 mm ID
 Part No.: KSA99S05-2546WT
 Eluent: *n*-hexane / 2-propanol / diethylamine (80/20/0.1)
 Flow rate: 1.0 mL/min
 Temperature: 25 °C
 Detection: UV at 230 nm
 Injection: 2 μ L (200 μ g/mL)

Applications Pharmaceuticals (APIs)

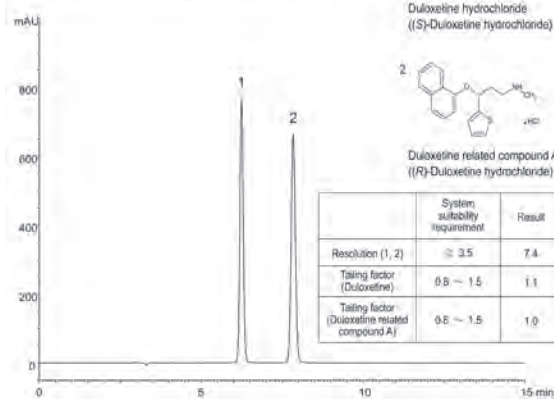
Duloxetine hydrochloride



Column: CHIRAL ART Amylose-C (5 μ m) 250 x 4.6 mm ID
Part No.: KAN99S05-2546WT
Eluent: *n*-hexane / ethanol / diethylamine (95/5/0.2)
Flow: 1.0 mL/min
Temperature: 30 $^{\circ}$ C
Detection: UV at 230 nm
Injection: 10 μ L (0.1 mg/mL)

Duloxetine hydrochloride

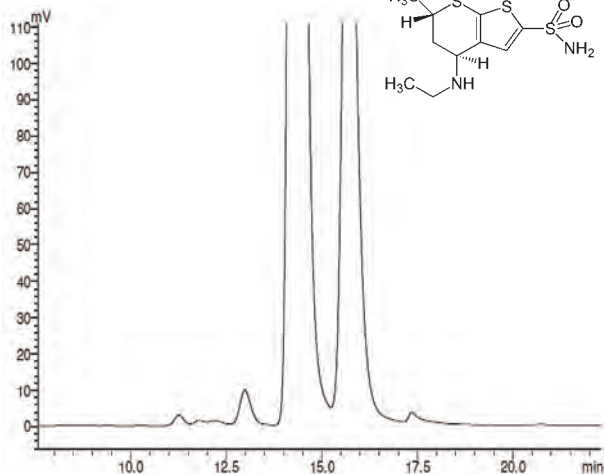
System suitability solution
(0.1 mg/mL Duloxetine hydrochloride,
0.1 mg/mL Duloxetine related compound A)



Column: CHIRAL ART Cellulose-C (5 μ m) 250 x 4.6 mm ID
Part No.: KCN99S05-2546WT
Eluent: *n*-hexane / ethanol / diethylamine (83/17/0.2)
Flow: 1.0 mL/min
Temperature: 40 $^{\circ}$ C
Detection: UV at 230 nm
Injection: 10 μ L

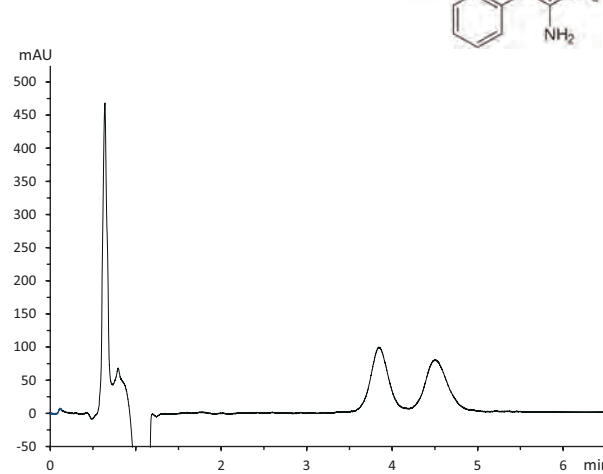
(The United States Pharmacopeia 37th; Limit of Duloxetine related compound A)

Dorzolamide



Column: CHIRAL ART Cellulose-SC (5 μ m) 250 x 4.6 mm ID
Part No.: KSC99S05-2546WT
Eluent: *n*-hexane / ethanol / diethylamine (80/20/0.1)
Flow rate: 1.0 mL/min
Temperature: 25 $^{\circ}$ C
Detection: UV at 254 nm
Injection: 20 μ L (0.25 mg/mL)

Amphetamine

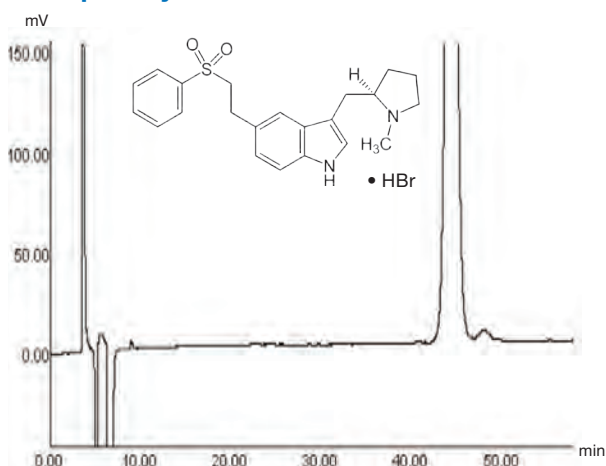


Column: CHIRAL ART Amylose-SA (3 μ m) 50 x 4.6 mm ID
Part No.: KSA99S03-0546WT
Eluent: Water + 0.1 % diethylamine / Methanol + 0.1 % diethylamine (55/45)
Flow rate: 1.0 mL/min
Temperature: 25 $^{\circ}$ C
Detection: UV at 210 nm
Injection: 10 μ L

Applications

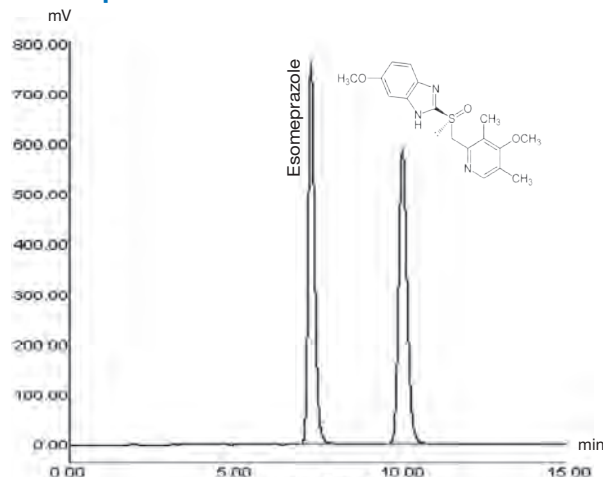
Pharmaceuticals (APIs)

Eletriptan hydrobromide



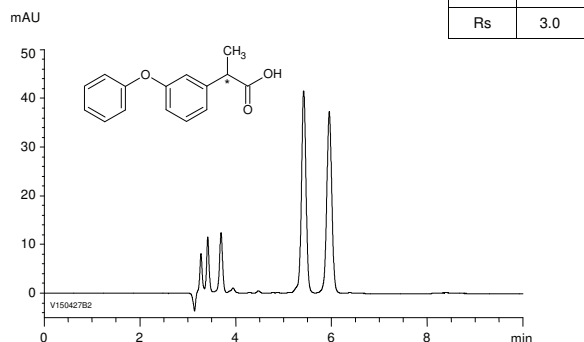
Column: CHIRAL ART Cellulose-SB (5 μ m) 250 x 4.6 mm ID
 Part No.: KSB99S05-2546WT
 Eluent: *n*-hexane / ethanol / trifluoroacetic acid / diethylamine (85/15/0.5/0.5)
 Flow rate: 0.8 mL/min
 Temperature: 10 °C
 Detection: UV at 223 nm
 Injection: 20 μ L (0.2 mg/mL)

Esomeprazole



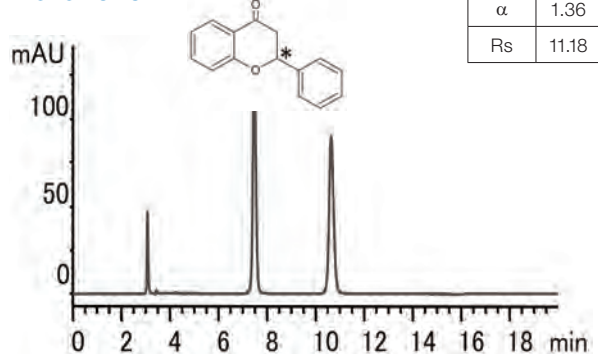
Column: CHIRAL ART Cellulose-SC 5 μ m (250 x 4.6 mm ID)
 Part No.: KSC99S05-2546WT
 Eluent: *n*-hexane / ethanol / diethylamine (60/40/0.1)
 Flow rate: 1.0 mL/min
 Temperature: 25 °C
 Detection: UV at 302 nm
 Injection: 20 μ L (0.3 mg/mL)

Fenoprofen



Column: CHIRAL ART Cellulose-SC (5 μ m) 250 X 4.6 mm ID
 Part No.: KSC99S05-2546WT
 Eluent: *n*-hexane / 2-propanol / TFA (90/10/0.1)
 Flow rate: 1.0 mL/min
 Temperature: 25 °C
 Detection: UV at 254 nm
 Injection: 10 μ L (0.1 mg/mL)

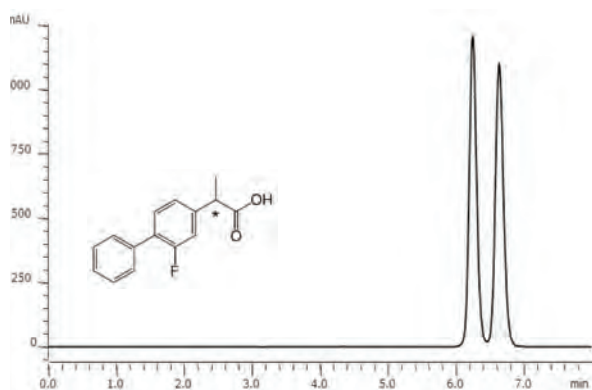
Flavanone



Column: CHIRAL ART Amylose-SA (5 μ m) 250 x 4.6 mm ID
 Part No.: KSA99S05-2546WT
 Eluent: *n*-hexane / 2-propanol / diethylamine (90/10/0.1)
 Flow rate: 1.0 mL/min
 Temperature: 25 °C
 Detection: UV at 254 nm
 Injection: 10 μ L (0.1 mg/mL)

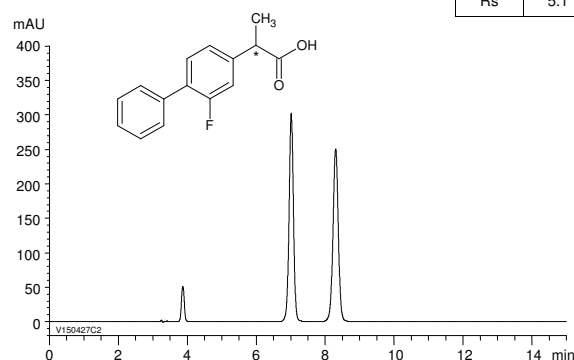
Applications Pharmaceuticals (APIs)

Flurbiprofen



Column: CHIRAL ART Cellulose-C (5 μ m) 250 x 4.6 mm ID
Part No.: KCN99S05-2546WT
Eluent: *n*-hexane / 2-propanol / TFA (95/5/0.1)
Flow rate: 1.0 mL/min
Temperature: 25 °C
Detection: UV at 254 nm
Injection: 5 μ L (1.0 mg/mL)

Flurbiprofen

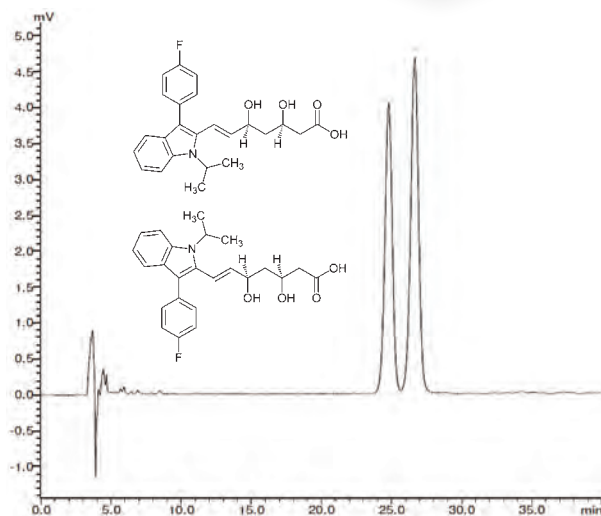


α	1.3
R_s	5.1

Column: CHIRAL ART Amylose-SA (5 μ m) 250 x 4.6 mm ID
Part No.: KCA99S05-2546WT
Eluent: *n*-hexane / 2-propanol / TFA (95/5/0.1)
Flow rate: 1.0 mL/min
Temperature: 25 °C
Detection: UV at 254 nm
Injection: 10 μ L (0.1 mg/mL)

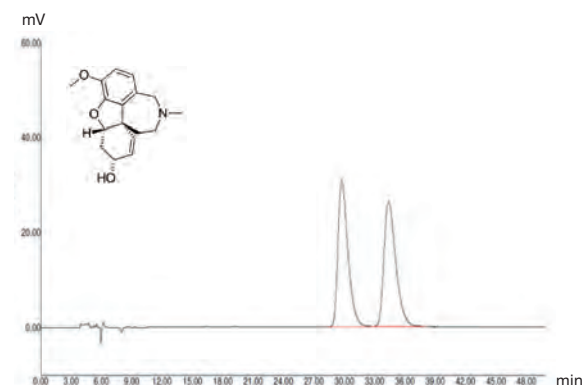
RP-Mode

Fluvastatin



Column: CHIRAL ART Cellulose-SB (5 μ m) 250 x 4.6 mm ID
Part No.: KSB99S05-2546WT
Eluent: water / acetonitrile / formic acid (65/35/0.1)
Flow rate: 1.0 mL/min
Temperature: 25 °C
Detection: UV at 300 nm
Injection: 20 μ L (5 mg/mL)

Galantamine

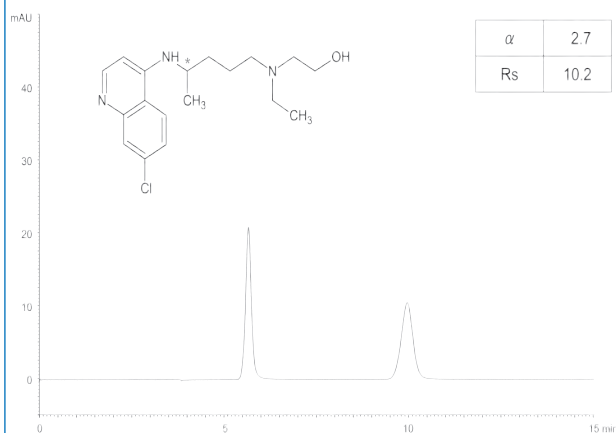


Column: CHIRAL ART Amylose-C (5 μ m) 250 x 4.6 mm ID
Part No.: KAN99S05-2546WT
Eluent: *n*-hexane / 2-propanol / propionic acid / diethylamine (90/9/1/0.2)
Flow rate: 0.8 mL/min
Temperature: 15 °C
Detection: UV at 289 nm
Injection: 20 μ L (0.5 mg/mL in ethanol)

Applications

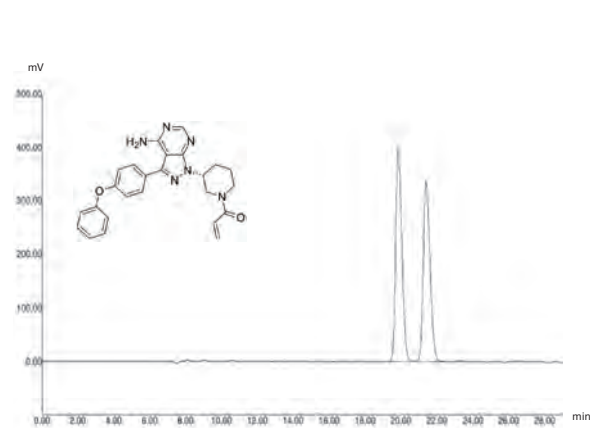
Pharmaceuticals (APIs)

Hydroxychloroquine



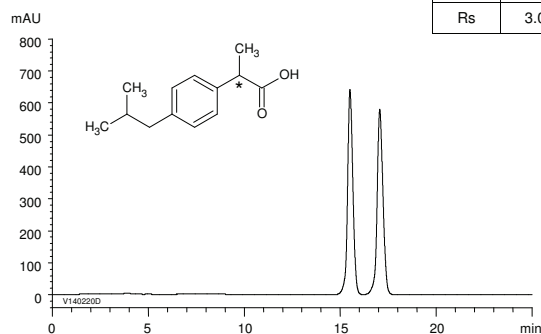
Column: CHIRAL ART Amylose-SA (5 μ m) 250 x 4.6 mm ID
 Part No.: KSA99S05-2546WT
 Eluent: methyl *tert*-butyl ether / ethanol / diethylamine (90/10/0.1)
 Flow rate: 1.0 mL/min
 Temperature: 25 °C
 Detection: UV at 344 nm
 Injection: 5 μ L (100 μ g/mL)

Ibrutinib



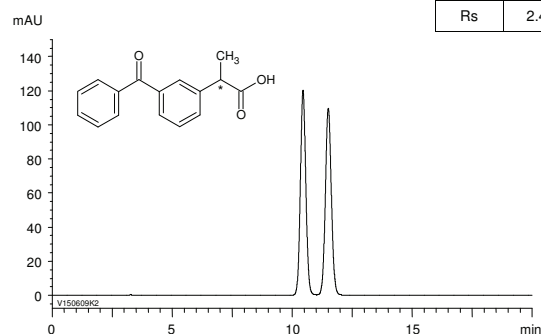
Column: CHIRAL ART Cellulose-C 5 μ m (250 x 4.6 mm ID)
 Part No.: KCN99S05-2546WT
 Eluent: *n*-hexane / 2-propanol (98/2)
 Flow rate: 0.5 mL/min
 Temperature: 15 °C
 Detection: UV at 210 nm
 Injection: 20 μ L (0.5 mg/mL)

Ibuprofen



Column: CHIRAL ART Cellulose-SB (5 μ m) 250 X 4.6 mm ID
 Part No.: KSB99S05-2546WT
 Eluent: *n*-hexane / 2-propanol / TFA (99/1/0.1)
 Flow rate: 1.0 mL/min
 Temperature: 25 °C
 Detection: UV at 220 nm
 Injection: 10 μ L (1 mg/mL)

Ketoprofen

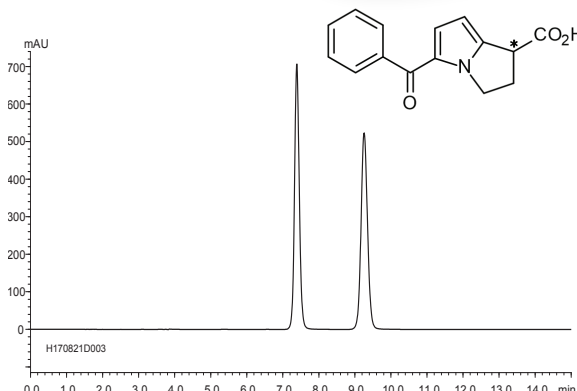


Column: CHIRAL ART Cellulose-SC (5 μ m) 250 X 4.6 mm ID
 Part No.: KSC99S05-2546WT
 Eluent: *n*-hexane / 2-propanol / TFA (90/10/0.1)
 Flow rate: 1.0 mL/min
 Temperature: 25 °C
 Detection: UV at 254 nm
 Injection: 10 μ L (0.1 mg/mL)

Applications Pharmaceuticals (APIs)

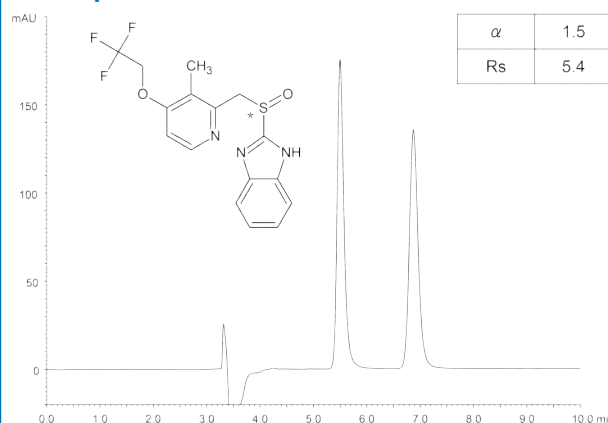
Using CHIRAL ART
Cellulose-SJ

Ketorolac



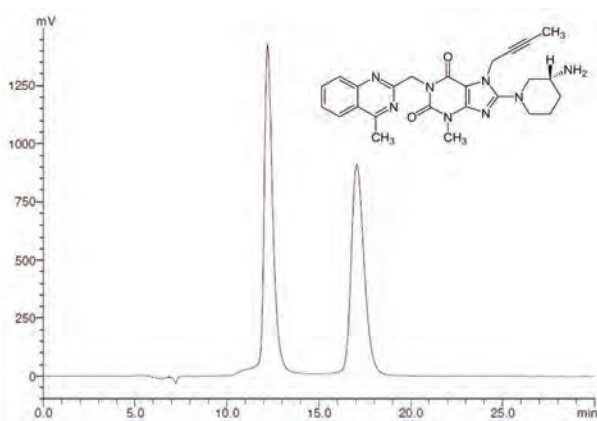
Column: CHIRAL ART Cellulose-SJ (5 μ m) 250 X 4.6 mm ID
Part No.: KSJ99S05-2546WT
Eluent: *n*-hexane / tetrahydrofuran / TFA (70/30/0.1)
Flow rate: 1.0 mL/min
Temperature: 25 °C

Lansoprazole



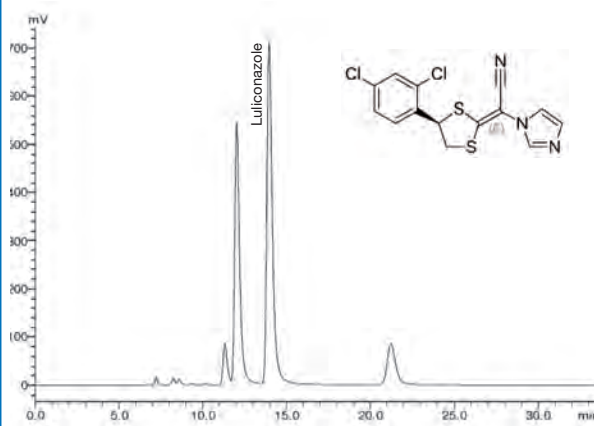
Column: CHIRAL ART Amylose-SA (5 μ m) 250 x 4.6 mm ID
Part No.: KSA99S05-2546WT
Eluent: ethyl acetate / ethanol / diethylamine (95/5/0.1)
Flow rate: 1.0 mL/min
Temperature: 25 °C
Detection: UV at 290 nm
Injection: 10 μ L (100 μ g/mL)

Linagliptin



Column: CHIRAL ART Amylose-C (5 μ m) 250 x 4.6 mm ID
Part No.: KAN99S05-2546WT
Eluent: ethanol / methanol / diethylamine (90/10/0.1)
Flow rate: 0.5 mL/min
Temperature: 30 °C
Detection: UV at 225 nm
Injection: 20 μ L (0.2 mg/mL)

Luliconazole

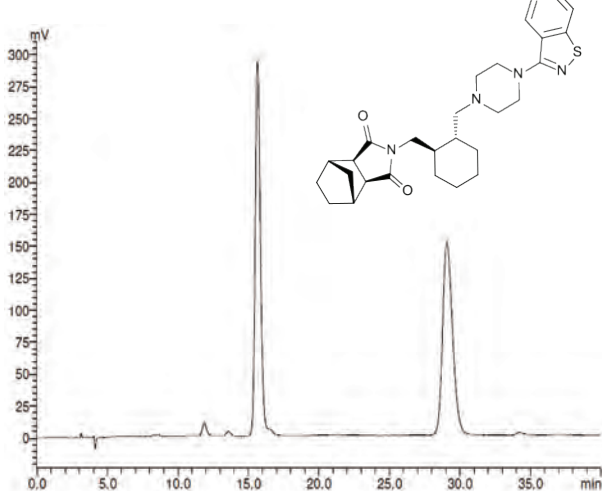


Column: CHIRAL ART Amylose-SA (5 μ m) 250 x 4.6 mm ID
Part No.: KSA99S05-2546WT
Eluent: methyl *tert*-butyl ether/2-propanol/diethylamine (80/20/0.1)
Flow rate: 0.5 mL/min
Temperature: 25 °C
Detection: UV at 295 nm
Injection: 20 μ L (0.1 mg/mL)

Applications

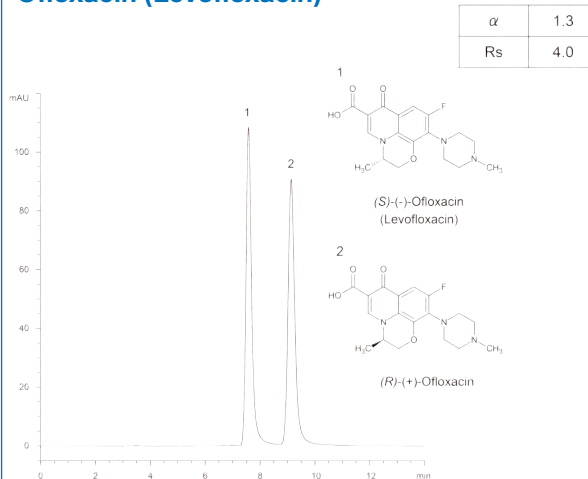
Pharmaceuticals (APIs)

Lurasidone



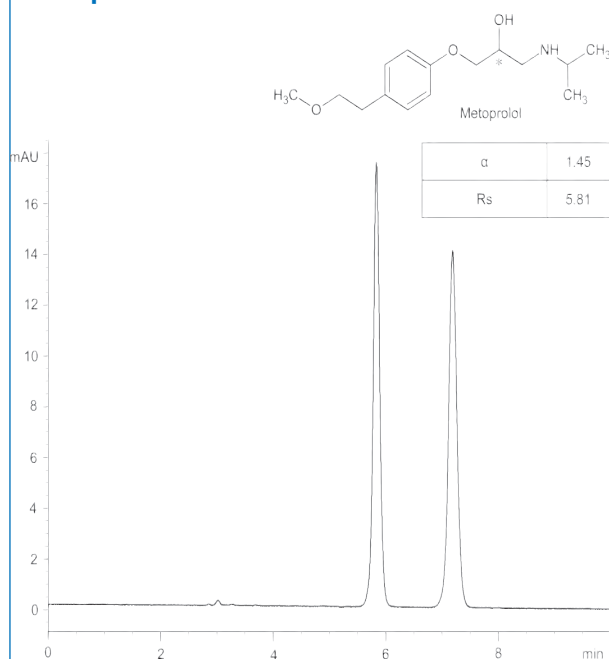
Column: CHIRAL ART Cellulose-SB (5 μ m) 250 x 4.6 mm ID
 Part No.: KSB99S05-2546WT
 Eluent: *n*-hexane / 2-propanol / diethylamine (90/10/0.2)
 Flow rate: 1.0 mL/min
 Temperature: 25 °C
 Detection: UV at 230 nm
 Injection: 20 μ L (0.5 mg/mL)

Ofloxacin (Levofloxacin)



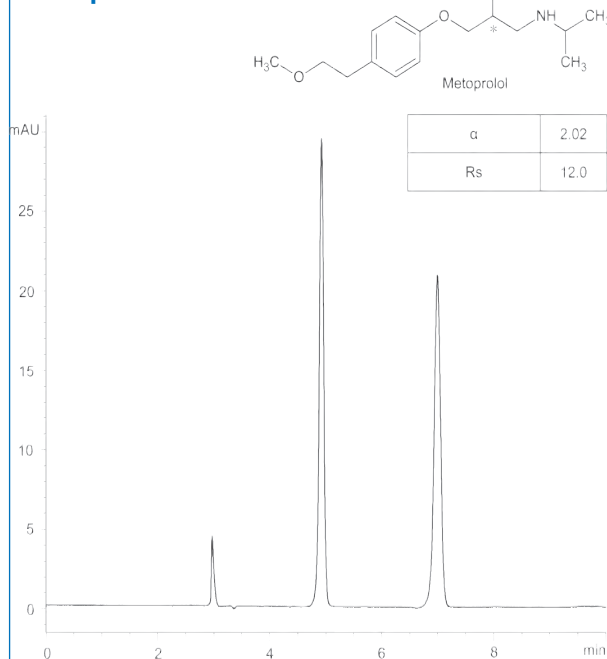
Column: CHIRAL ART Cellulose-SC (5 μ m) 250 x 4.6 mm ID
 Part No.: KSC99S05-2546WT
 Eluent: *tert*-butyl methyl ether / ethanol / acetic acid / ethylenediamine (50/50/0.1/0.1)
 Flow rate: 1.0 mL/min
 Temperature: 40 °C
 Detection: UV at 300 nm

Metoprolol



Column: CHIRAL ART Amylose-C (5 μ m) 250 x 4.6 mm ID
 Part No.: KAN99S05-2546WT
 Eluent: *n*-hexane / ethanol / ethanolamine (80/20/0.1)
 Flow: 1.0 mL/min
 Temperature: 25 °C
 Detection: UV at 254 nm
 Injection: 5 μ L (1 mg/mL)

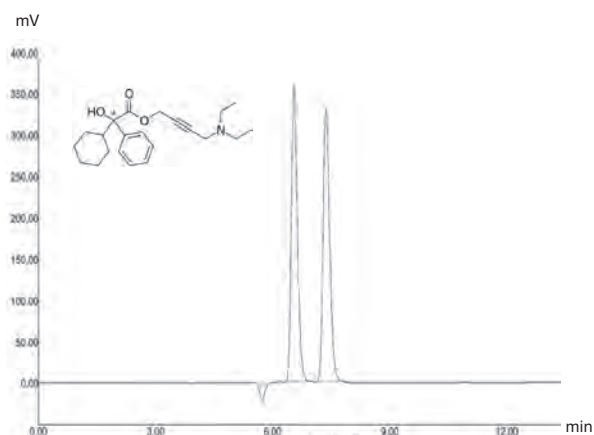
Metoprolol



Column: CHIRAL ART Cellulose-C (5 μ m) 250 x 4.6 mm ID
 Part No.: KCN99S05-2546WT
 Eluent: *n*-hexane / ethanol / ethanolamine (90/10/0.1)
 Flow: 1.0 mL/min
 Temperature: 25 °C
 Detection: UV at 254 nm
 Injection: 5 μ L (1 mg/mL)

Applications Pharmaceuticals (APIs)

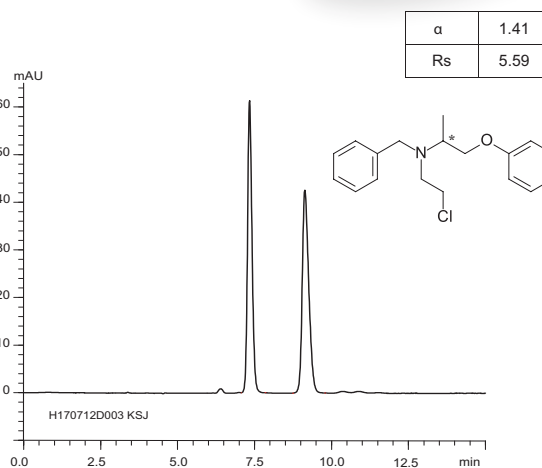
Oxybutynin



Column: CHIRAL ART Amylose-SA (5 μ m) 250 x 4.6 mm ID
Part No.: KSA99S05-2546WT
Eluent: *n*-hexane / 2-propanol / diethylamine (90/10/0.1)
Flow rate: 0.8 mL/min
Temperature: 25 $^{\circ}$ C
Detection: UV at 220 nm
Injection: 20 μ L (0.5 mg/mL)

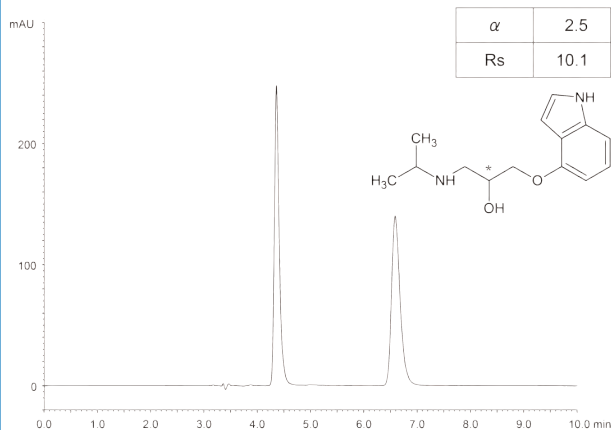
Phenoxybenzamine

Using CHIRAL ART
Cellulose-SJ



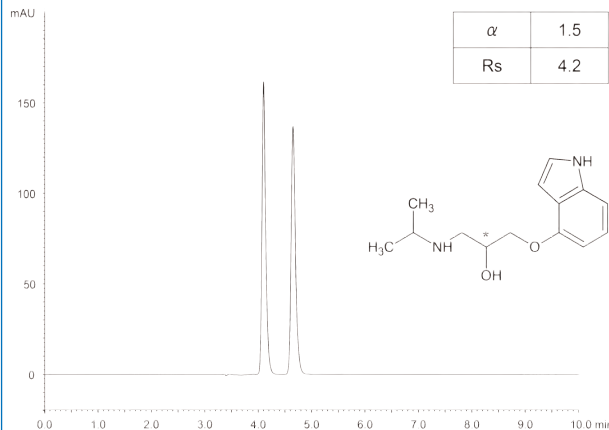
Column: CHIRAL ART Cellulose-SJ (5 μ m) 250 X 4.6 mm ID
Eluent: *n*-hexane / ethanol / diethylamine (95/5/0.1)
Flow rate: 1.0 mL/min
Temperature: 25 $^{\circ}$ C
Detection: UV at 270 nm
Injection: 5 μ L (1 mg/mL)

Pindolol



Column: CHIRAL ART Cellulose-SB (5 μ m) 250 x 4.6 mm ID
Part No.: KSB99S05-2546WT
Eluent: *n*-hexane / ethanol / diethylamine (40/60/0.1)
Flow rate: 1.0 mL/min
Temperature: 25 $^{\circ}$ C
Detection: UV at 265 nm
Injection: 10 μ L (100 μ g/mL)

Pindolol

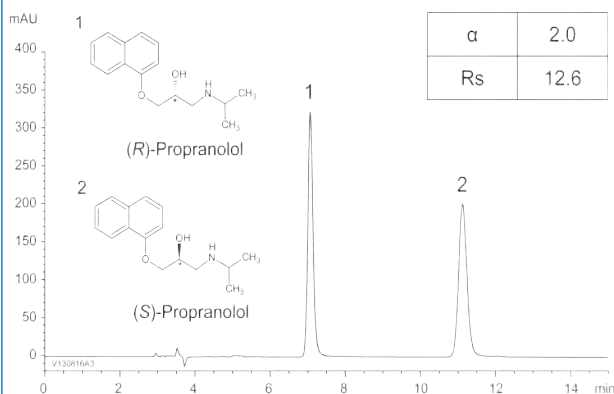


Column: CHIRAL ART Cellulose-SB (5 μ m) 250 x 4.6 mm ID
Part No.: KSB99S05-2546WT
Eluent: methanol / diethylamine (100/0.1)
Flow rate: 1.0 mL/min
Temperature: 25 $^{\circ}$ C
Detection: UV at 265 nm
Injection: 10 μ L (100 μ g/mL)

Applications

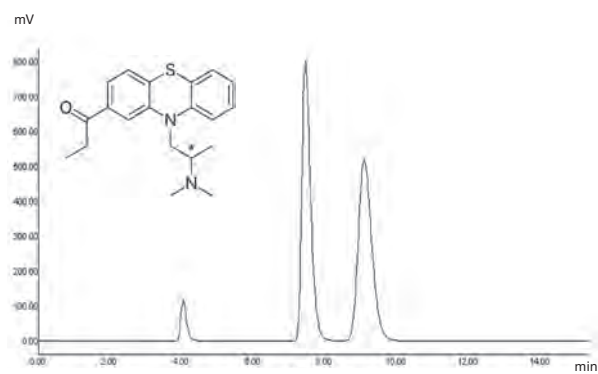
Pharmaceuticals (APIs)

Propranolol



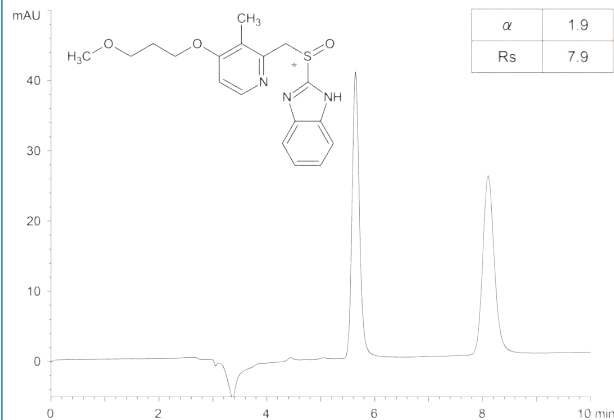
Column: CHIRAL ART Cellulose-C (5 μ m) 250 x 4.6 mm ID
 Part No.: KCN99S05-2546WT
 Eluent: *n*-hexane / 2-propanol / diethylamine (80/20/0.1)
 Flow: 1.0 mL/min
 Temperature: 25 °C
 Detection: UV at 230 nm
 Injection: 10 μ L (0.1 mg/mL)

Propiomazine



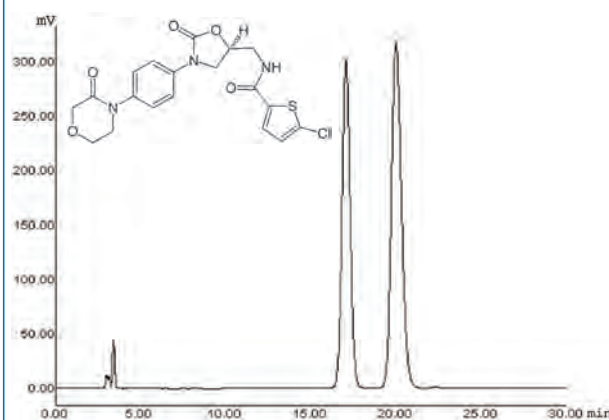
Column: CHIRAL ART Amylose-C 5 μ m (250 x 4.6 mm ID)
 Part No.: KAN99S05-2546WT
 Eluent: methanol / diethylamine (100/0.1)
 Flow rate: 0.7 mL/min
 Temperature: 25 °C
 Detection: UV at 254 nm
 Injection: 20 μ L (0.5 mg/mL)

Rabeprazole



Column: CHIRAL ART Cellulose-SC (5 μ m) 250 x 4.6 mm ID
 Part No.: KSC99S05-2546WT
 Eluent: ethyl acetate / 2-propanol / diethylamine (95/5/0.1)
 Flow rate: 1.0 mL/min
 Temperature: 25 °C
 Detection: UV at 290 nm
 Injection: 5 μ L (100 μ g/mL)

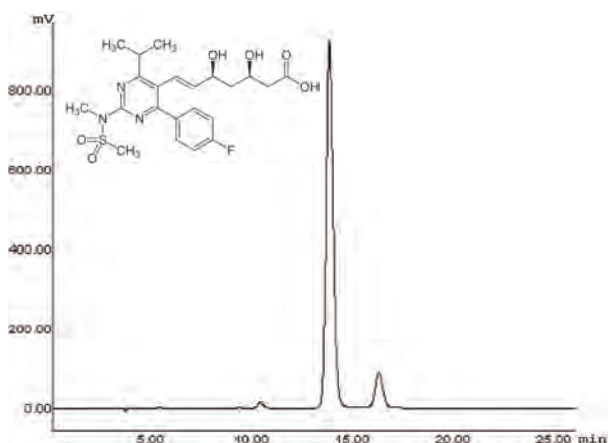
Rivaroxaban



Column: CHIRAL ART Cellulose-SB (5 μ m) 250 x 4.6 mm ID
 Part No.: KSB99S05-2546WT
 Eluent: *n*-hexane / ethanol / trifluoroacetic acid (50/50/0.1)
 Flow rate: 1.0 mL/min
 Temperature: 35 °C
 Detection: UV at 250 nm
 Injection: 20 μ L (0.5 mg/mL)

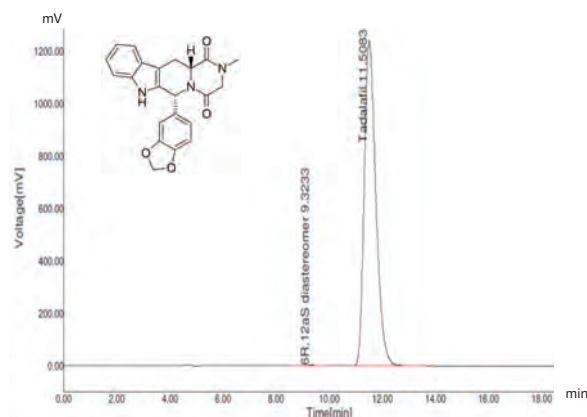
Applications Pharmaceuticals (APIs)

Rosuvastatin



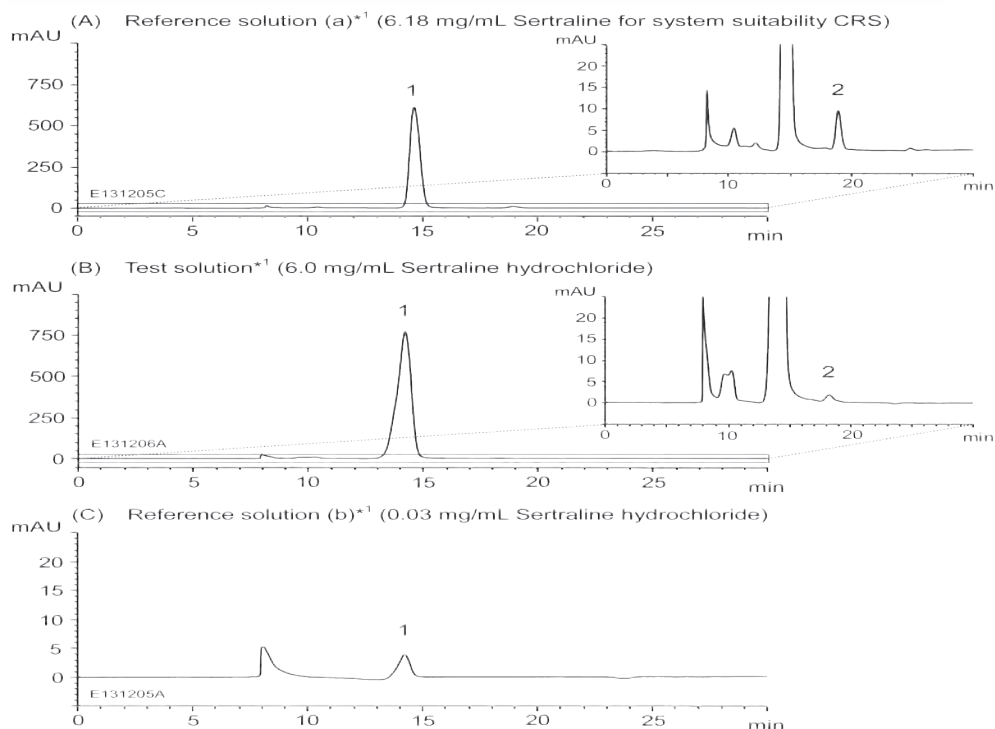
Column: CHIRAL ART Cellulose-SB (5 μ m) 250 x 4.6 mm ID
Part No.: KSB99S05-2546WT
Eluent: *n*-hexane / ethanol / trifluoroacetic acid (85/15/0.1)
Flow rate: 1.0 mL/min
Temperature: 25 $^{\circ}$ C
Detection: UV at 242 nm
Injection: 20 μ L (0.5 mg/mL)

Tadalafil



Column: CHIRAL ART Amylose-C (5 μ m) 250 x 4.6 mm ID
Part No.: KAN99S05-2546WT
Eluent: *n*-hexane / 2-propanol (50/50)
Flow rate: 0.75 mL/min
Temperature: 30 $^{\circ}$ C
Detection: UV at 222 nm
Injection: 10 μ L (0.5 mg/mL in *n*-hexane/2-propanol/acetonitrile (40/40/20))

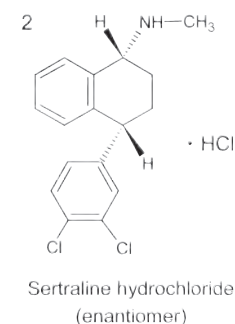
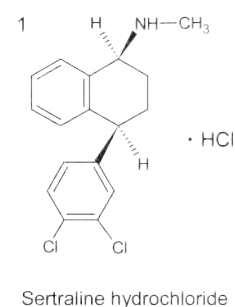
Sertraline hydrochloride (The European Pharmacopeia)



*1 Test solution and Reference solution were prepared from Sertraline hydrochloride supplied as a reagent for laboratory use.

Column: CHIRAL ART Amylose-C (5 μ m) 250 x 4.6 mm ID
Part No.: KAN99S05-2546WT
Eluent: mixture*2 / *n*-hexane (70/30)
Flow: 0.4 mL/min

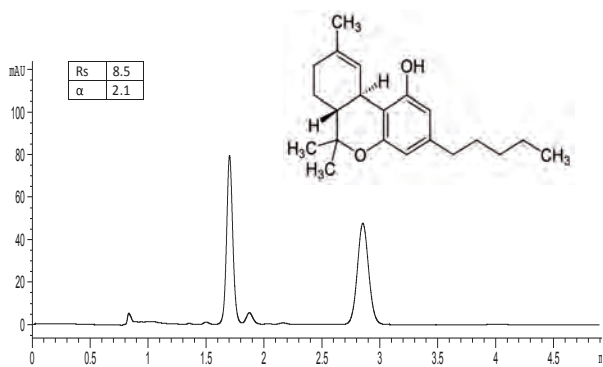
Temperature: 25 $^{\circ}$ C
Detection: UV at 275 nm
Injection: 20 μ L
(The draft for The European Pharmacopeia, Enantiomeric purity)



Applications

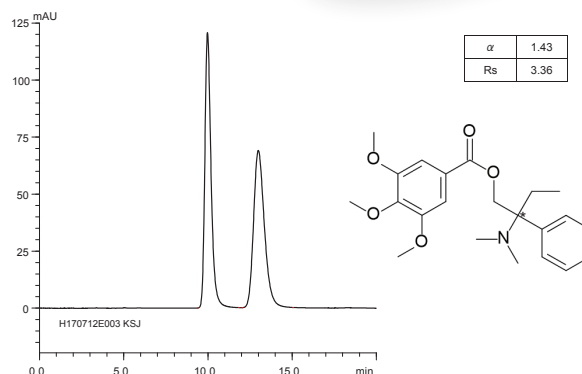
Pharmaceuticals (APIs)

Tetrahydrocannabinol



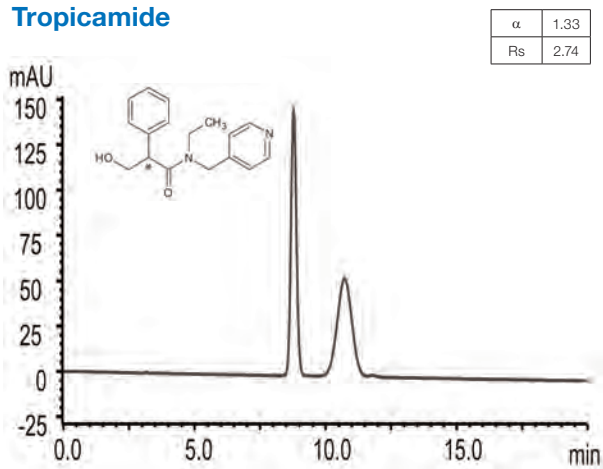
Column: CHIRAL ART Amylose-C (3 μ m) 150 x 3.0 mm ID
 Part No.: KAN99S03-1503WT
 Eluent: *n*-heptane / 2-propanol (92/8)
 Flow rate: 1.0 mL/min
 Temperature: 40 °C
 Detection: UV at 228 nm
 Injection: 10 μ L (50 μ g/mL)

Trimebutine



Column: CHIRAL ART Cellulose-SJ (5 μ m) 250 X 4.6 mm ID
 Part No.: KSJ99S05-2546WT
 Eluent: *n*-hexane / ethanol / diethylamine (95/5/0.1)
 Flow rate: 1.0 mL/min
 Temperature: 25 °C
 Detection: UV at 265 nm
 Injection: 5 μ L (1 mg/mL)

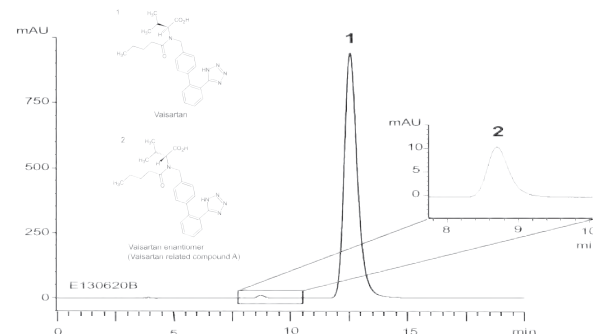
Tropicamide



Column: CHIRAL ART Cellulose-SC (5 μ m) 250 x 4.6 mm ID
 Part No.: KSC99S05-2546WT
 Eluent: *n*-hexane / ethanol / diethylamine (55/45/0.1)
 Flow rate: 1.0 mL/min
 Temperature: 25 °C
 Detection: UV at 254 nm
 Injection: 10 μ L (1.0 mg/mL)

Valsartan (The United States Pharmacopeia)

Test solution*
 (1.0 mg/mL Valsartan)



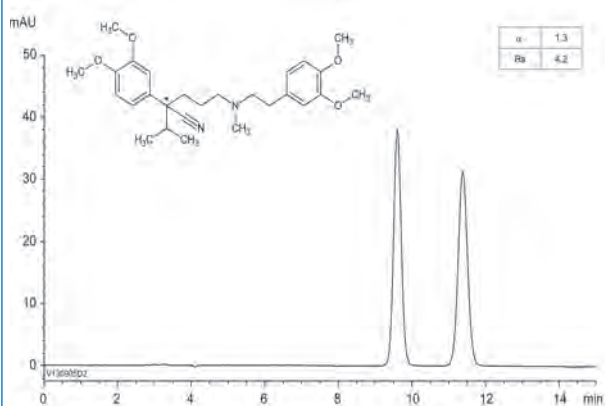
* Test solution was prepared from Valsartan supplied as a reagent for laboratory use.

Column: CHIRAL ART Cellulose-C (5 μ m) 250 x 4.6 mm ID
 Part No.: KCN99S05-2546WT
 Eluent: *n*-hexane / 2-propanol / trifluoroacetic acid (85/15/0.1)
 Flow: 0.8 mL/min
 Temperature: 25 °C
 Detection: UV at 230 nm
 Injection: 10 μ L

(The United States Pharmacopeia 34th, Related compounds)

Applications Pharmaceuticals (APIs)

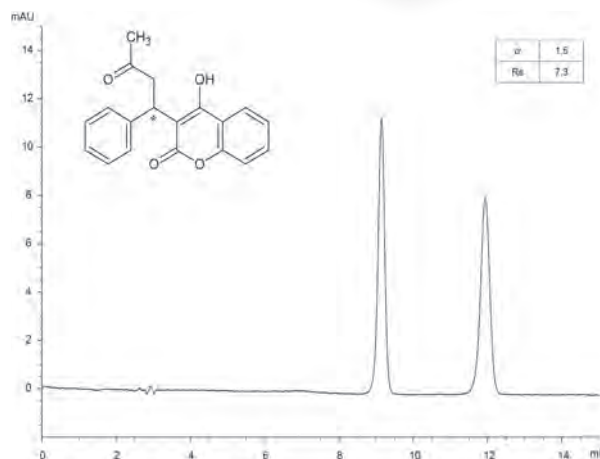
Verapamil



Column: CHIRAL ART Amylose-C (5 μ m) 250 x 4.6 mm ID
 Part No.: KAN99S05-2546WT
 Eluent: *n*-hexane / 2-propanol / diethylamine (90/10/0.1)
 Flow: 1.0 mL/min
 Temperature: 25 °C
 Detection: UV at 254 nm
 Injection: 10 μ L (1 mg/mL)

Warfarin

RP-Mode

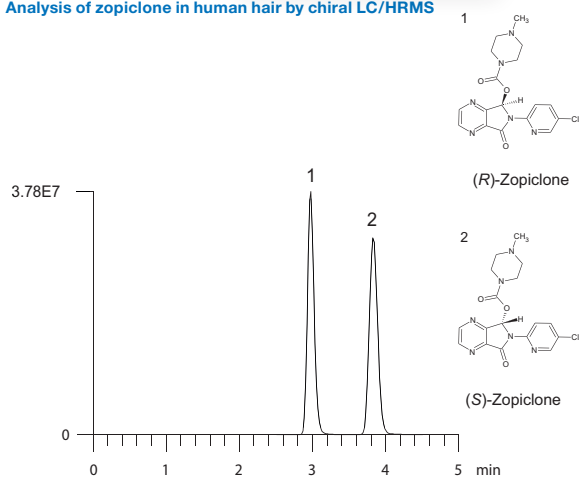


Column: CHIRAL ART Cellulose-SB (5 μ m) 250 x 4.6 mm ID
 Part No.: KSB99S05-2546WT
 Eluent: 20 mM phosphoric acid / acetonitrile (50/50)
 Flow rate: 1.0 mL/min
 Temperature: 25 °C
 Detection: UV at 254 nm
 Injection: 2 μ L (200 μ g/mL)

LC-MS

Zopiclone

Analysis of zopiclone in human hair by chiral LC/HRMS

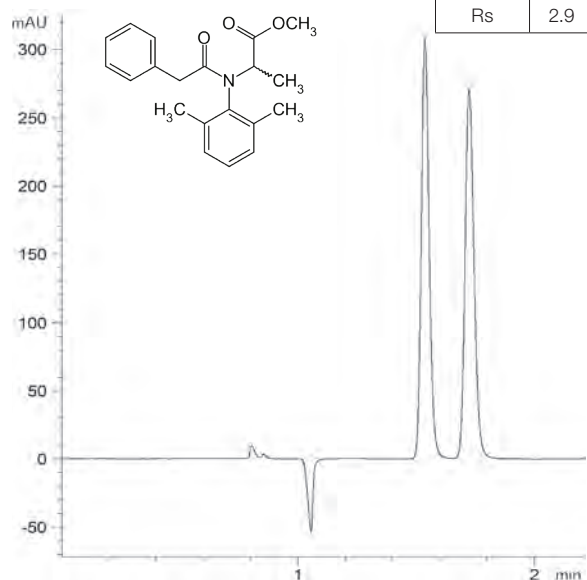


Column: CHIRAL ART Cellulose-SC (3 μ m) 150 x 2.0 mm ID
 Part No.: KSC99S03-1502WT
 Eluent: 10 mM ammonium bicarbonate (pH 8.0 with aqueous ammonia) / acetonitrile (25/75)
 Flow rate: 0.2 mL/min
 Temperature: 25 °C
 Detection: ESI, positive
 Injection: 10 μ L
 (Hair sample extracted by micropulverized extraction)
 Instrument: LC - UltimateTM 3000 liquid chromatograph (Thermo Fisher Scientific)
 HRMS - Q ExactiveTM mass spectrometer (Thermo Fisher Scientific)

Applications

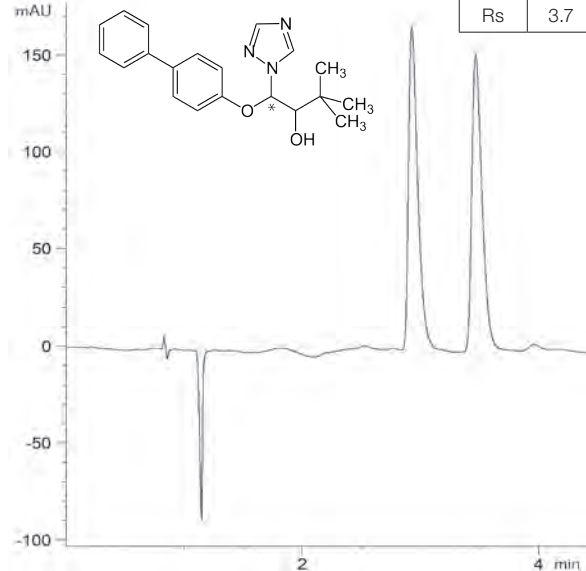
Pesticides

Benalaxyl



Column: CHIRAL ART Cellulose-C (3 μ m) 150 x 3.0 mm ID
 Part No.: KCN99S03-1503WT
 Eluent: *n*-hexane / 2-propanol / diethylamine (80/20/0.1)
 Flow rate: 1.0 mL/min
 Temperature: 25 °C
 Detection: UV at 220 nm
 Injection: 2 μ L (1.0 mg/mL)

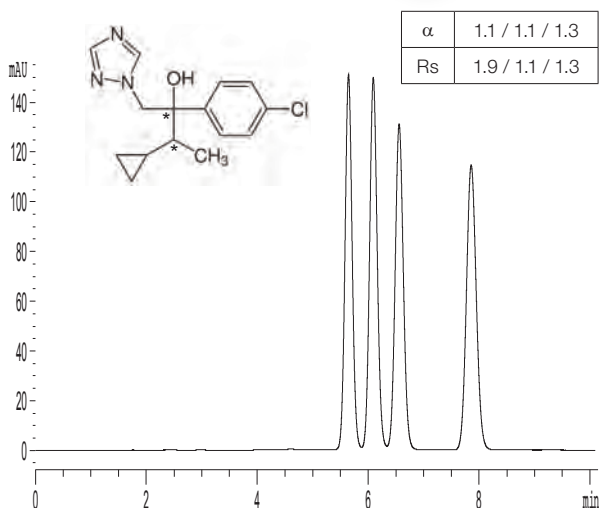
Bitertanol



Column: CHIRAL ART Cellulose-C (3 μ m) 150 x 3.0 mm ID
 Part No.: KCN99S03-1503WT
 Eluent: *n*-hexane / 2-propanol / diethylamine (95/5/0.1)
 Flow rate: 1.0 mL/min
 Temperature: 40 °C
 Detection: UV at 220 nm
 Injection: 5 μ L (1.25 mg/mL)

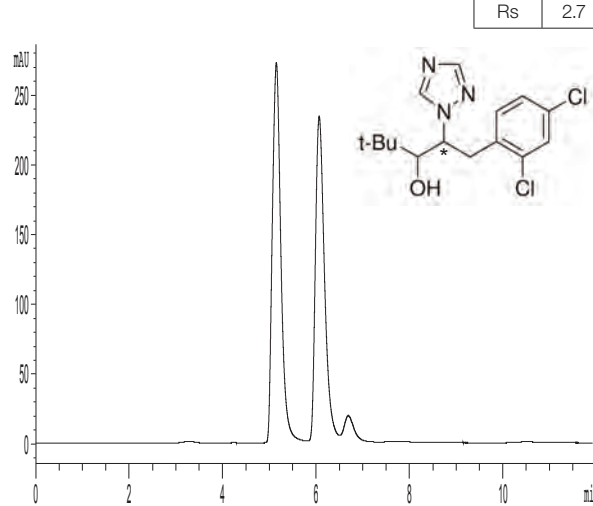
RP-Mode

Cyproconazole



Column: CHIRAL ART Cellulose-SC (5 μ m) 250 x 4.6 mm ID
 Part No.: KSC99S05-2546WT
 Eluent: water / acetonitrile (48/52)
 Flow rate: 1.2 mL/min
 Temperature: 25 °C
 Detection: UV at 220 nm
 Injection: 10 μ L (1 mg/mL)

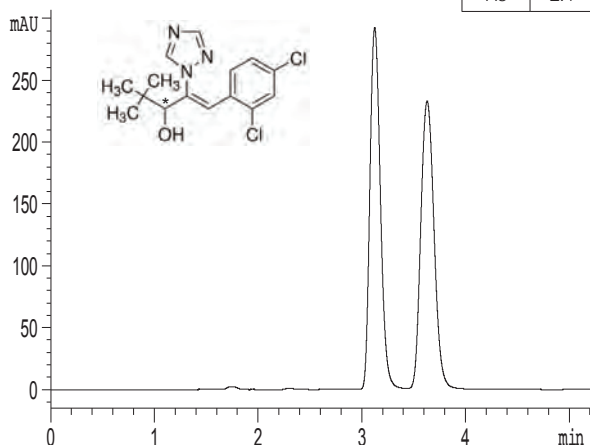
Diclobutrazole



Column: CHIRAL ART Cellulose-SB (5 μ m) 250 x 4.6 mm ID
 Part No.: KSB99S05-2546WT
 Eluent: *n*-hexane / 2-propanol / diethylamine (95/5/0.1)
 Flow rate: 0.7 mL/min
 Temperature: 10 °C
 Detection: UV at 220 nm
 Injection: 10 μ L (1 mg/mL)

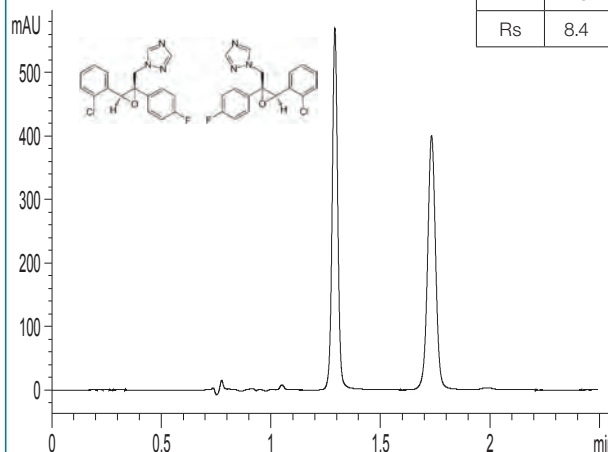
Applications Pesticides

Diniconazole



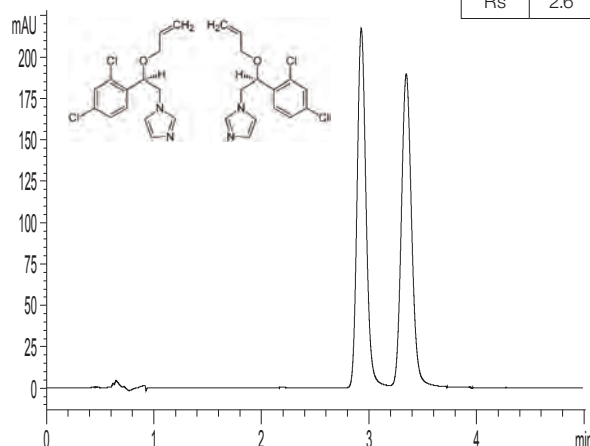
Column: CHIRAL ART Amylose-SA (3 μ m) 150 x 3.0 mm ID
 Part No.: KSA99S03-1503WT
 Eluent: *n*-hexane / ethanol (90/10)
 Flow rate: 0.5 mL/min
 Temperature: 25 °C
 Detection: UV at 220 nm
 Injection: 2 μ L (1 mg/mL)

Epoxiconazole



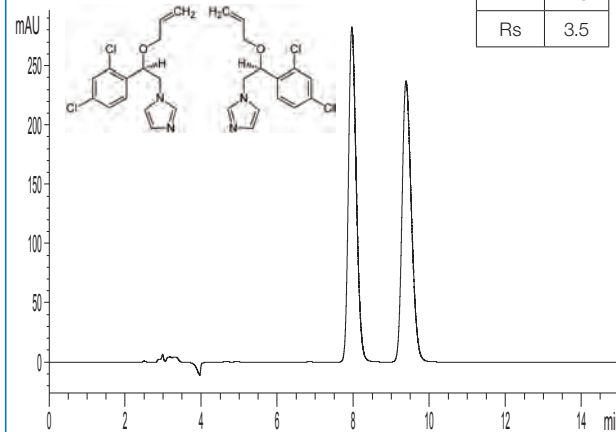
Column: CHIRAL ART Cellulose-SB (3 μ m) 150 x 3.0 mm ID
 Part No.: KSB99S03-1503WT
 Eluent: 20mM NH_4HCO_3 / acetonitrile / diethylamine (30/70/0.1)
 Flow rate: 1.0 mL/min
 Temperature: 25 °C
 Detection: UV at 220 nm
 Injection: 1 μ L (1 mg/mL)

Enilconazole



Column: CHIRAL ART Cellulose-SC (3 μ m) 50 x 4.6 mm ID
 Part No.: KSC99S03-0546WT
 Eluent: *n*-hexane / ethanol (90 / 10)
 Flow rate: 1.0 mL/min
 Temperature: 25 °C
 Detection: UV at 220 nm
 Injection: 1 μ L (1 mg/mL)

Enilconazole



Column: CHIRAL ART Cellulose-SJ (5 μ m) 250 x 4.6 mm ID
 Part No.: KSJ99S05-2546WT
 Eluent: water / methanol / diethylamine (25/75/0.1)
 Flow rate: 1.0 mL/min
 Temperature: 35 °C
 Detection: UV at 220 nm
 Injection: 10 μ L (1 mg/mL)

Using CHIRAL ART
Cellulose-SJ

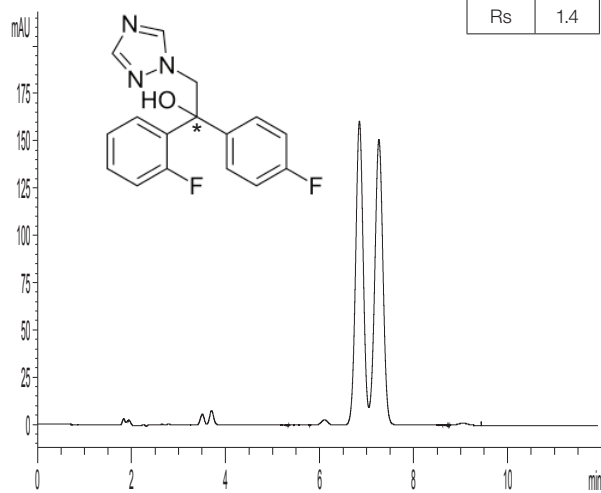
RP-Mode

Applications

Pesticides

RP-Mode

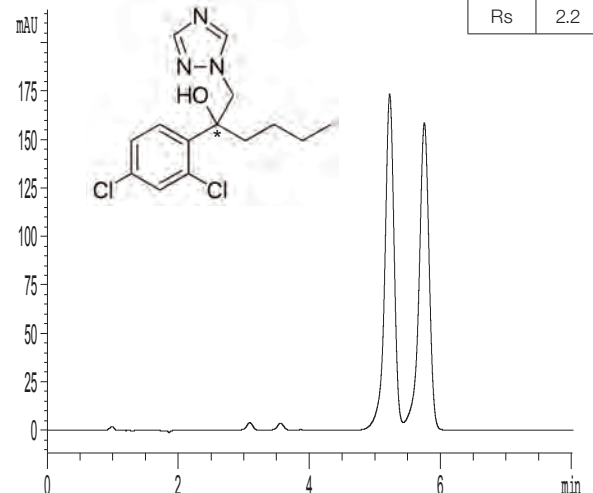
Flutriafof



Column: CHIRAL ART Cellulose-SB (5 μ m) 250 x 4.6 mm ID
 Part No.: KSB99S05-2546WT
 Eluent: 20 mM NH_4HCO_3 / acetonitrile / diethylamine (60/40/0.1)
 Flow rate: 1.5 mL/min
 Temperature: 25 $^\circ\text{C}$
 Detection: UV at 220 nm
 Injection: 5 μL (1mg/mL)

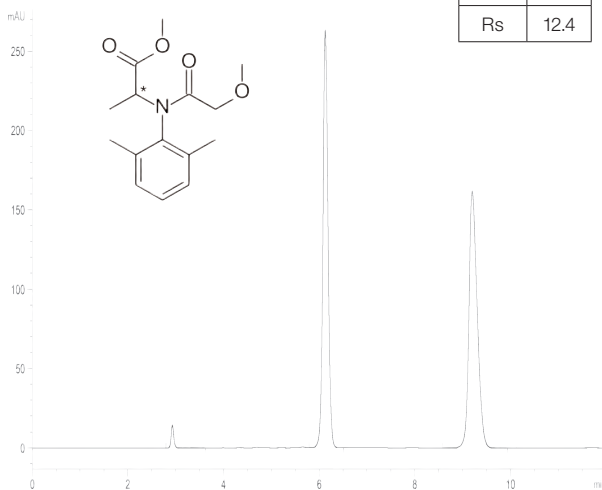
RP-Mode

Hexaconazole



Column: CHIRAL ART Cellulose-SC (3 μ m) 150 x 3.0 mm ID
 Part No.: KSC99S03-1503WT
 Eluent: 20 mM NH_4HCO_3 / acetonitrile / diethylamine (58/42/0.1)
 Flow rate: 0.8 mL/min
 Temperature: 40 $^\circ\text{C}$
 Detection: UV at 220 nm
 Injection: 3 μL (1 mg/mL)

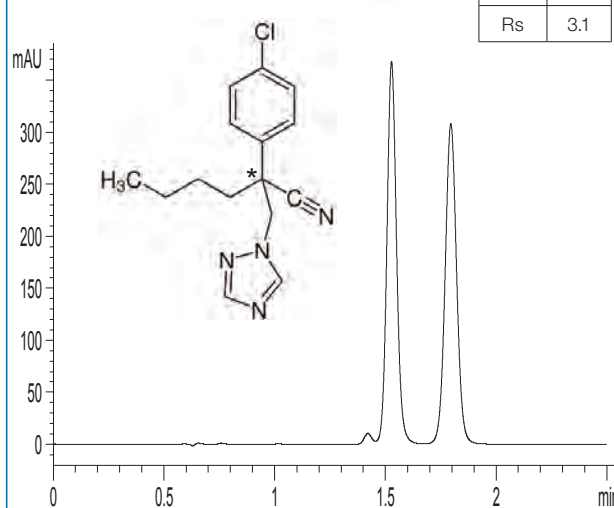
Metalaxyl



Column: CHIRAL ART Cellulose-SB (5 μ m) 250 x 4.6 mm ID
 Part No.: KSB99S05-2546WT
 Mobile Phase: THF / *n*-hexane (30/70, premixed)
 Flow Rate: 1 mL/min
 Detection: 230 nm
 Temperature: 25 $^\circ\text{C}$
 Injection: 20 μL (1 mg/mL dissolved in mobile phase)
 Sample: Metalaxyl (PESTANAL[®], Sigma-Aldrich)

RP-Mode

Myclobutanil



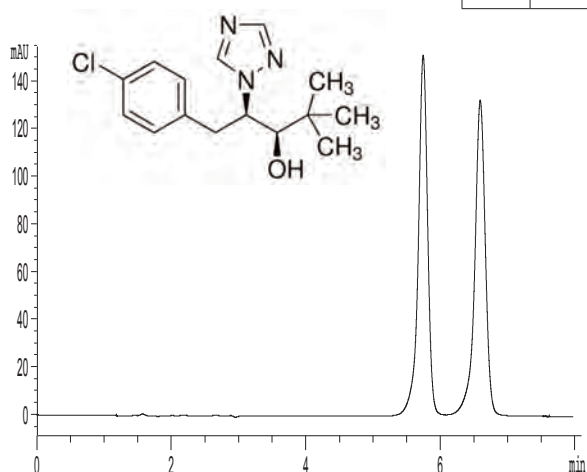
Column: CHIRAL ART Cellulose-SB (3 μ m) 50 x 4.6 mm ID
 Part No.: KSB99S03-0546WT
 Eluent: water / acetonitrile (45 / 55)
 Flow rate: 1.0 mL/min
 Temperature: 30 $^\circ\text{C}$
 Detection: UV at 220 nm
 Injection: 1 μL (1 mg/mL)

Applications

Pesticides

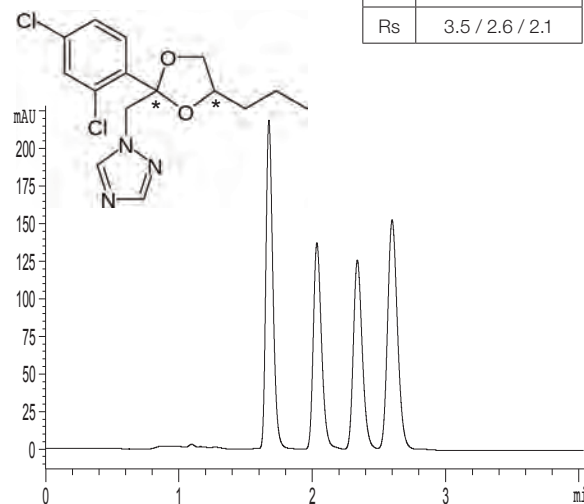
RP-Mode

Paclobutrazol



Column: CHIRAL ART Cellulose-SB (3 μ m) 150 x 3.0 mm ID
 Part No.: KSB99S03-1503WT
 Eluent: 20 mM NH_4HCO_3 / acetonitrile / diethylamine (60/40/0.1)
 Flow rate: 0.5 mL/min
 Temperature: 25 $^\circ\text{C}$
 Detection: UV at 220 nm
 Injection: 2 μL (1 mg/mL)

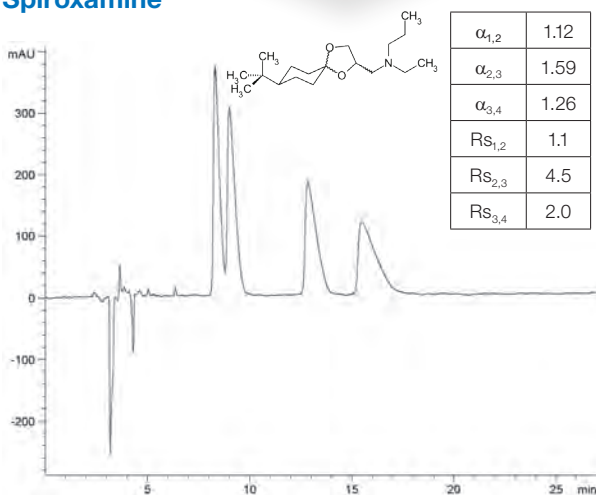
Propiconazole



Column: CHIRAL ART Cellulose-C (3 μ m) 150 x 3.0 mm ID
 Part No.: KCN99S03-1503WT
 Eluent: *n*-hexane / 2-propanol (75/25)
 Flow rate: 1.0 mL/min
 Temperature: 10 $^\circ\text{C}$
 Detection: UV at 220 nm
 Injection: 5 μL (1 mg/mL)

RP-Mode

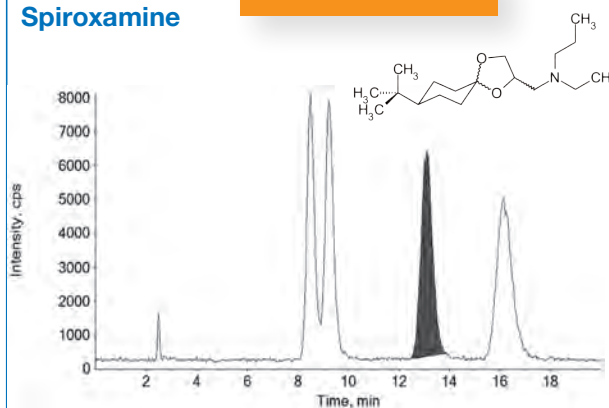
Spiroxamine



Column: CHIRAL ART Amylose-SA (3 μ m) 150 x 3.0 mm ID
 Part No.: KSA99S03-1503WT
 Eluent: water / ethanol / diethylamine (27.5/72.5/0.1)
 Flow rate: 0.25 mL/min
 Temperature: 30 $^\circ\text{C}$
 Detection: UV at 210 nm
 Injection: 10 μL (10 mg/mL)

LC-MS

Spiroxamine



By courtesy of Sven Stuke, Bayer AG, Division Cropscience

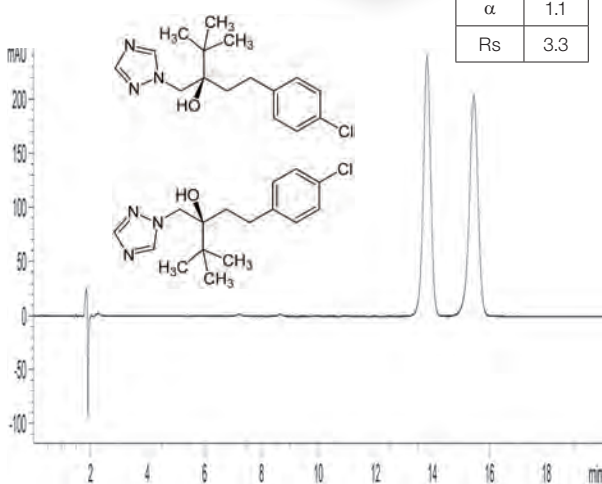
Column: CHIRAL ART Amylose-SA (3 μ m) 150 x 3.0 mm ID
 Part No.: KSA99S03-1503WT
 Eluent: A/B (25/75)
 A: water / ethanol +10 mM ammonium carbonate (90/10)
 B: water / ethanol +10 mM ammonium carbonate (10/90)
 Flow rate: 0.3 mL/min
 Temperature: 30 $^\circ\text{C}$
 Detection: ESI-MS/MS
 Injection: 1 μL (1 $\mu\text{g/L}$)
 post-column make-up via T-piece with 0.3 mL/min 1% formic acid in water/methanol 50/50.

Applications

Pesticides

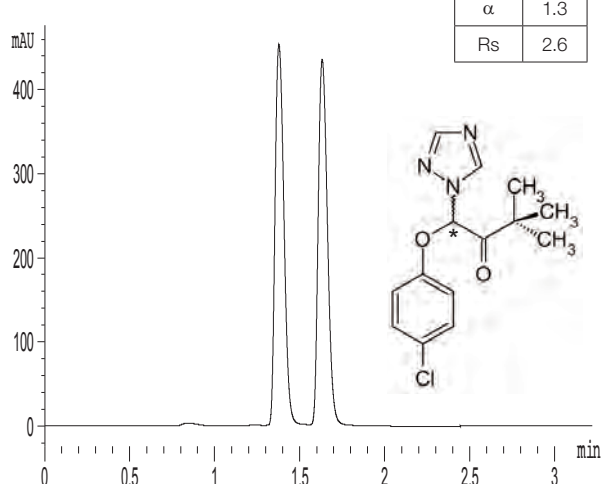
RP-Mode

Tebuconazole



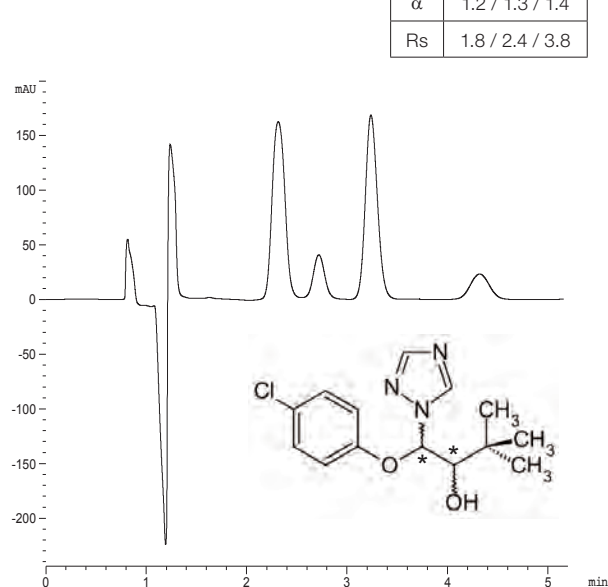
Column: CHIRAL ART Cellulose-SC (3 μ m) 150 x 3.0 mm ID
 Part No.: KSC99S03-1503WT
 Eluent: water / acetonitrile / formic acid (60/40/0.1)
 Flow rate: 0.43 ml/min
 Temperature: 25 °C
 Detection: UV at 220 nm
 Injection: 2 μ L (1 mg/mL)

Triadimefon



Column: CHIRAL ART Cellulose-C (3 μ m) 150 x 3.0 mm ID
 Part No.: KCN99S03-1503WT
 Eluent: *n*-hexane / 2-propanol / diethylamine (95/5/0.1)
 Flow rate: 1.0 mL/min
 Temperature: 40 °C
 Detection: UV at 220 nm
 Injection: 5 μ L (1.25 mg/mL)

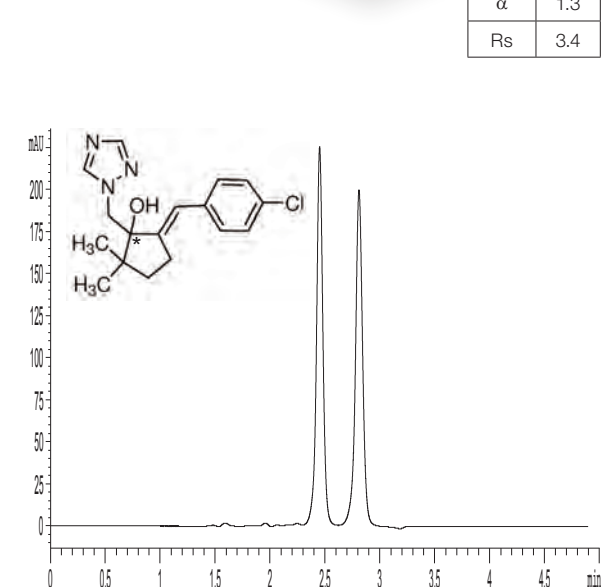
Triadimenol



Column: CHIRAL ART Amylose-C (3 μ m) 150 x 3.0 mm ID
 Part No.: KAN99S03-1503WT
 Eluent: *n*-heptane / ethanol / diethylamine (92/8/0.1)
 Flow rate: 1.0 mL/min
 Temperature: 25 °C
 Detection: UV at 220 nm
 Injection: 5 μ L (1 mg/mL)

RP-Mode

Triticonazole

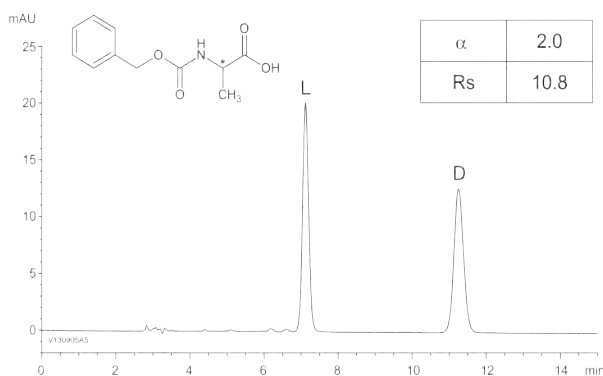


Column: CHIRAL ART Cellulose-SB (3 μ m) 150 x 3.0 mm ID
 Part No.: KSB99S03-1503WT
 Eluent: 20 mM NH_4HCO_3 / acetonitrile / diethylamine (70/30/0.1)
 Flow rate: 0.5 mL/min
 Temperature: 25 °C
 Detection: UV at 220 nm
 Injection: 2 μ L (1 mg/mL)

Applications

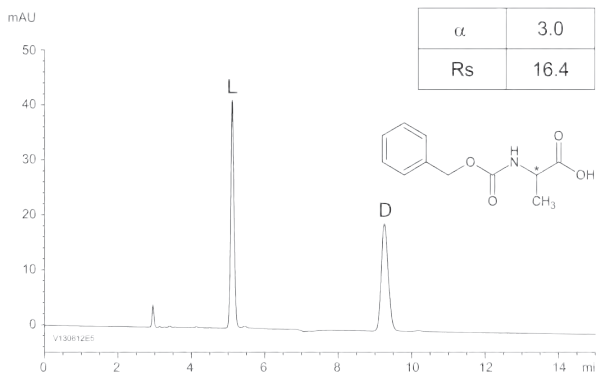
Amino Acids

N-CBZ-DL-Alanine



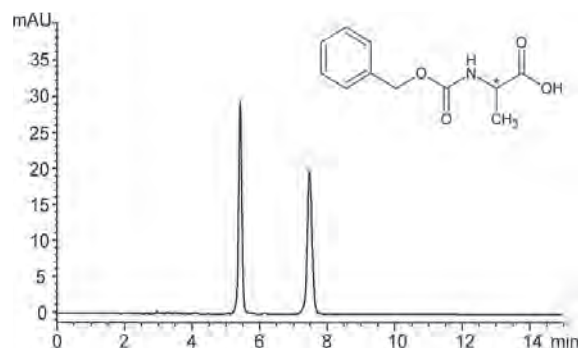
Column: CHIRAL ART Cellulose-C (3 μ m) 150 x 3.0 mm ID
 Part No: KCN99S03-1503WT
 Eluent: *n*-hexane / 2-propanol / diethylamine (90/10/0.1)
 Flow rate: 1.0 mL/min
 Temperature: 10 °C
 Detection: UV at 220 nm
 Injection: 5 μ L (0.5 mg/mL)

N-CBZ-DL-Alanine



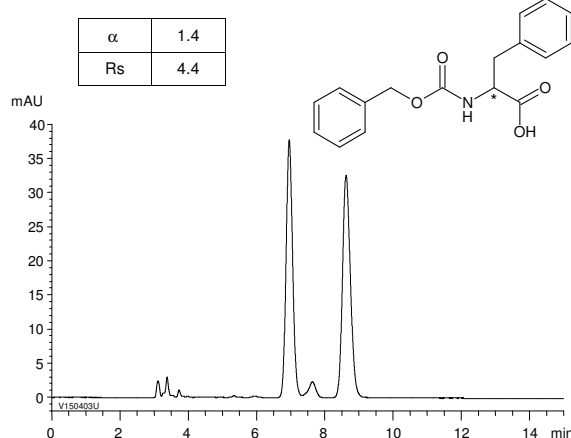
Column: CHIRAL ART Cellulose-C (5 μ m) 250 x 4.6 mm ID
 Part No.: KCN99S05-2546WT
 Eluent: *n*-hexane / 2-propanol / TFA (80/20/0.1)
 Flow: 1.0 mL/min
 Temperature: 25 °C
 Detection: UV at 254 nm
 Injection: 10 μ L (1 mg/mL)

N-CBZ-DL-Alanine



Column: CHIRAL ART Cellulose-SB (5 μ m) 250 x 4.6 mm ID
 Part No.: KSB99S05-2546WT
 Eluent: *n*-hexane / 2-propanol / TFA (80/20/0.1)
 Flow rate: 1.0 mL/min
 Temperature: 25 °C
 Detection: UV at 254 nm

N-CBZ-DL-Phenylalanine

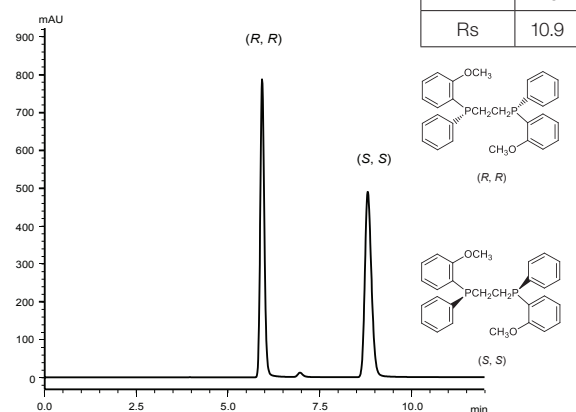


Column: CHIRAL ART Cellulose-SC (5 μ m) 250 X 4.6 mm ID
 Part No.: KSC99S05-2546WT
 Eluent: *n*-hexane / 2-propanol / TFA (80/20/0.1)
 Flow rate: 1.0 mL/min
 Temperature: 25 °C
 Detection: UV at 254 nm
 Injection: 10 μ L (1 mg/mL)

Applications

Specialties

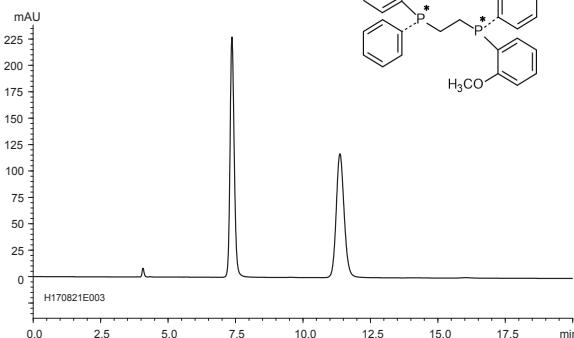
1,2-Bis[(2-methoxyphenyl)phenylphosphino]ethane



Column: CHIRAL ART Amylose-C Neo (5 μ m) 250 x 4.6 mm ID
 Part No.: KBN99S05-1546WT
 Eluent: *n*-hexane/2-propanol (90/10)
 Flow rate: 1.0 mL/min
 Temperature: 25 °C
 Detection: UV at 285 nm
 Injection: 10 μ L (0.5 mg/mL)

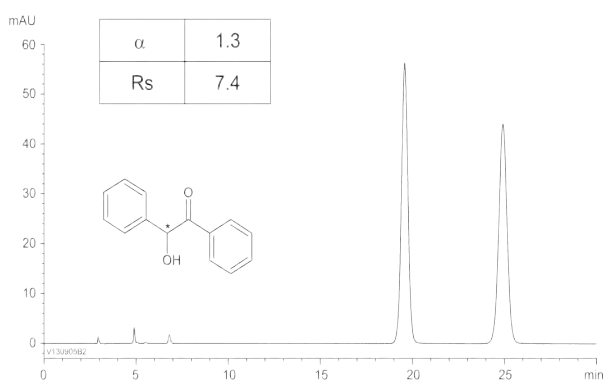
1,2-Bis[(2-methoxyphenyl)phenylphosphino]ethane (DIPAMP)

Using CHIRAL ART Cellulose-SJ



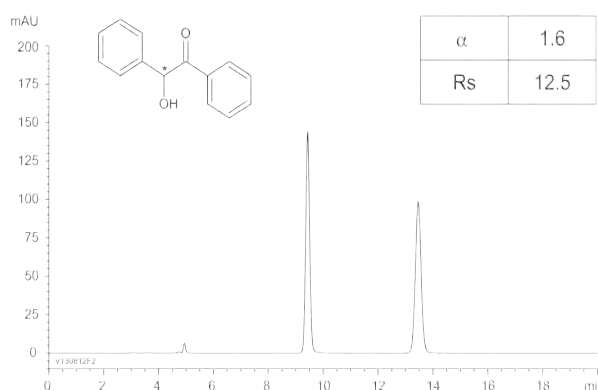
Column: CHIRAL ART Cellulose-SJ (5 μ m) 250 X 4.6 mm ID
 Part No.: KSJ99S05-2546WT
 Eluent: *n*-hexane / chloroform (80/20)
 Flow rate: 1.0 mL/min
 Temperature: 25 °C
 Detection: UV at 290 nm
 Injection: 5 μ L (1 mg/mL)

Benzoin



Column: CHIRAL ART Amylose-C (5 μ m) 250 x 4.6 mm ID
 Part No.: KAN99S05-2546WT
 Eluent: *n*-hexane / 2-propanol (90/10)
 Flow: 1.0 mL/min
 Temperature: 25 °C
 Detection: UV at 254 nm
 Injection: 10 μ L (0.1 mg/mL)

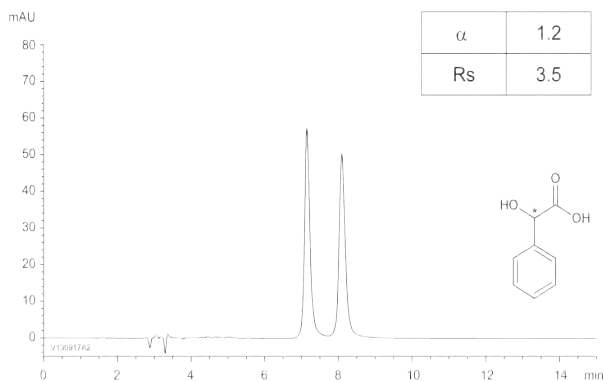
Benzoin



Column: CHIRAL ART Cellulose-C (5 μ m) 250 x 4.6 mm ID
 Part No.: KCN99S05-2546WT
 Eluent: *n*-hexane / 2-propanol (90/10)
 Flow: 1.0 mL/min
 Temperature: 25 °C
 Detection: UV at 254 nm
 Injection: 10 μ L (0.1 mg/mL)

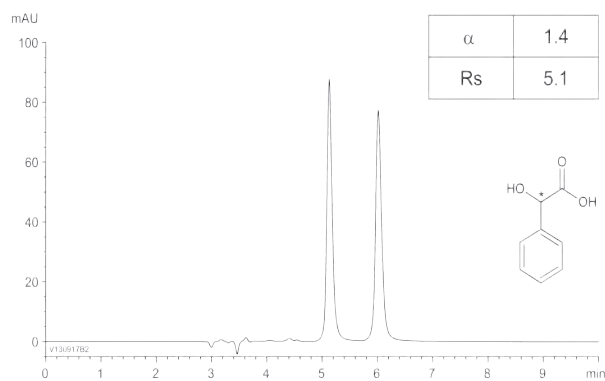
Applications Specialties

DL-Mandelic acid



Column: CHIRAL ART Amylose-C (5 μ m) 250 x 4.6 mm ID
 Part No.: KAN99S05-2546WT
 Eluent: *n*-hexane / 2-propanol / TFA (80/20/0.1)
 Flow: 1.0 mL/min
 Temperature: 25 °C
 Detection: UV at 254 nm
 Injection: 20 μ L (1 mg/mL)

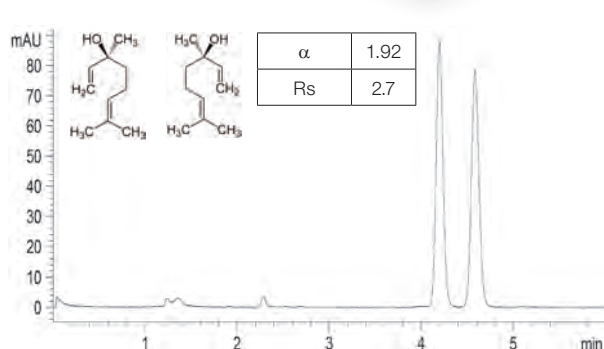
DL-Mandelic acid



Column: CHIRAL ART Cellulose-C (5 μ m) 250 x 4.6 mm ID
 Part No.: KCN99S05-2546WT
 Eluent: *n*-hexane / 2-propanol / TFA (80/20/0.1)
 Flow: 1.0 mL/min
 Temperature: 25 °C
 Detection: UV at 254 nm
 Injection: 20 μ L (1 mg/mL)

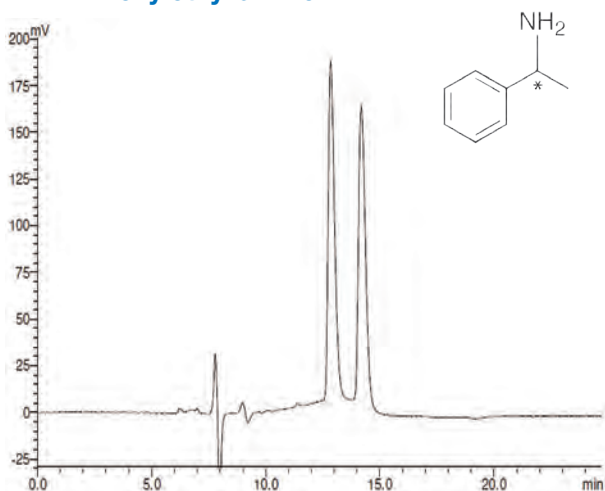
RP-Mode

Linalool



Column: CHIRAL ART Amylose-SA (3 μ m) 150 x 3.0 mm ID
 Part No.: KSA99S03-1503WT
 Eluent: water / acetonitrile (42/58)
 Flow rate: 0.4 mL/min
 Temperature: 35 °C
 Detection: UV at 210 nm
 Injection: 1 μ L (0.5 μ L/mL)

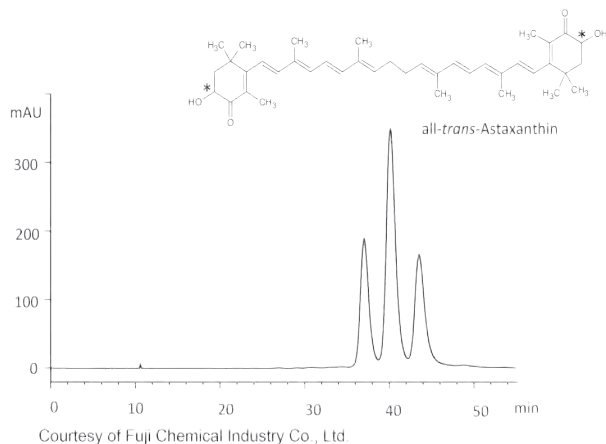
DL-1-Phenylethyl amine



Column: CHIRAL ART Cellulose-SB (5 μ m) 250 x 4.6 mm ID
 Part No.: KSB99S05-2546WT
 Eluent: *n*-hexane / 2-propanol / diethylamine (90/10/0.2)
 Flow rate: 0.5 mL/min
 Temperature: 25 °C
 Detection: UV at 220 nm
 Injection: 20 μ L (2.5 mg/mL)

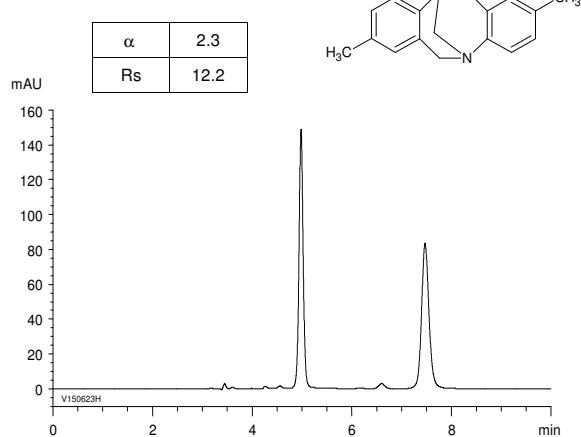
Applications Specialties

Astaxanthin



Column: CHIRAL ART Cellulose-SB (5 μ m) 250 x 4.6 mm ID
 Part No.: KSB99S05-2546WT
 Eluent: *n*-hexane / THF (85/15)
 Flow rate: 0.5 mL/min
 Temperature: 25 °C
 Detection: UV at 476 nm

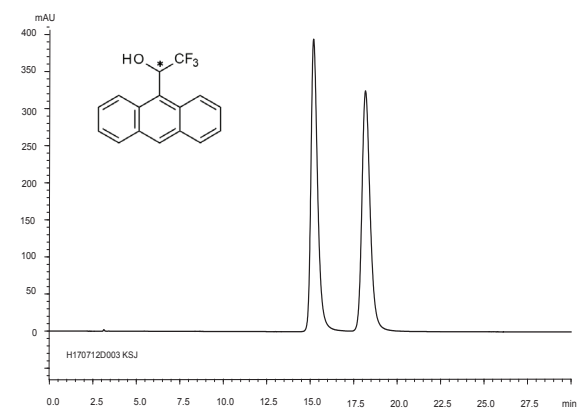
Troger's base



Column: CHIRAL ART Amylose-SA (5 μ m) 250 X 4.6 mm ID
 Part No.: KSJ99S05-2546WT
 Eluent: *n*-hexane / ethanol (90/10)
 Flow rate: 1.0 mL/min
 Temperature: 25 °C
 Detection: UV at 254 nm
 Injection: 10 μ L (0.1 mg/mL)

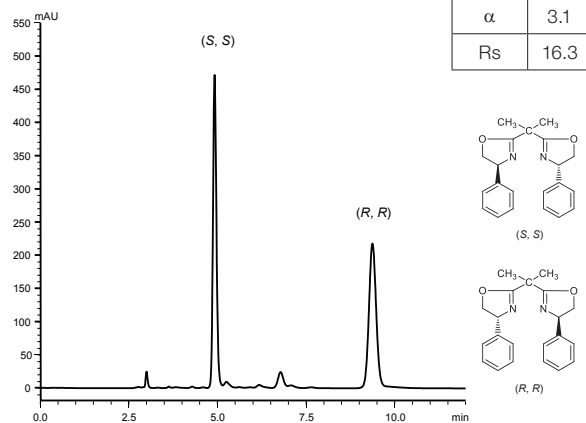
2,2,2-Trifluoro-1-(9-anthryl) ethanol

Using CHIRAL ART
Cellulose-SJ



Column: CHIRAL ART Cellulose-SJ (5 μ m) 250 X 4.6 mm ID
 Part No.: KSJ99S05-2546WT
 Eluent: *n*-hexane / tetrahydrofuran (90/10)
 Flow rate: 1.0 mL/min
 Temperature: 25 °C

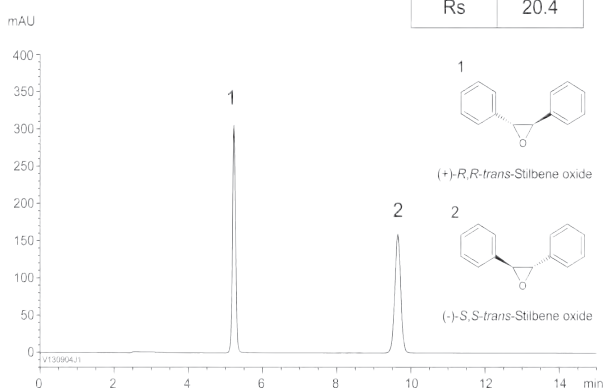
2,2'-Isopropylidenebis (4-phenyl-2-oxazoline)



Column: CHIRAL ART Amylose-C Neo (5 μ m) 250 x 4.6 mm ID
 Part No.: KCBN99S05-1546WT
 Eluent: *n*-hexane/2-propanol (70/30)
 Flow rate: 1.0 mL/min
 Temperature: 25 °C
 Detection: UV at 210 nm
 Injection: 10 μ L (0.1 mg/mL)

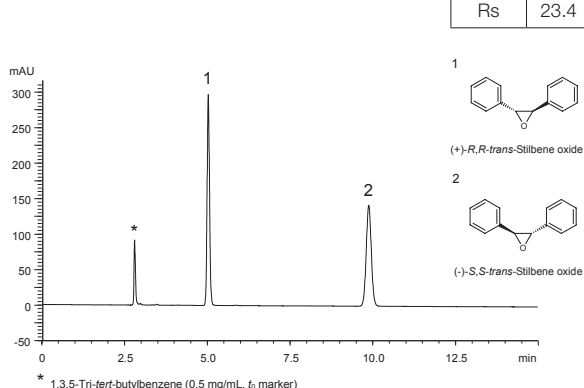
Applications Specialties

trans-Stilbene oxide



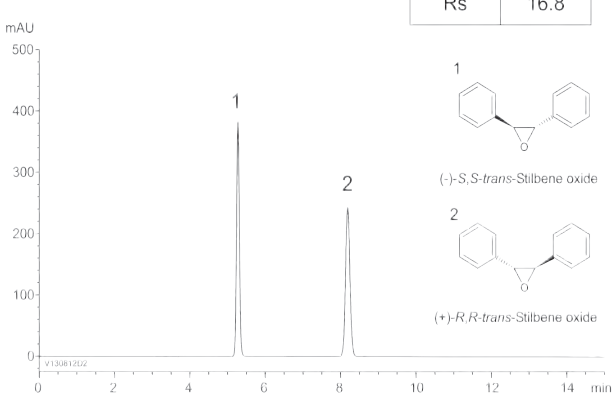
Column: CHIRAL ART Amylose-C (5 μ m) 250 x 4.6 mm ID
 Part No.: KAN99S05-2546WT
 Eluent: *n*-hexane / 2-propanol (90/10)
 Flow: 1.0 mL/min
 Temperature: 25 °C
 Detection: UV at 230 nm
 Injection: 5 μ L (0.1 mg/mL)

trans-Stilbene oxide



Column: CHIRAL ART Amylose-C Neo (5 μ m) 250 x 4.6 mm ID
 Part No.: KBN99S05-1546WT
 Eluent: *n*-hexane/2-propanol (90/10)
 Flow rate: 1.0 mL/min
 Temperature: 25 °C
 Detection: UV at 230 nm
 Injection: 5 μ L (0.1 mg/mL)

trans-Stilbene oxide



Column: CHIRAL ART Cellulose-C (5 μ m) 250 x 4.6 mm ID
 Part No.: KCN99S05-2546WT
 Eluent: *n*-hexane / 2-propanol (90/10)
 Flow: 1.0 mL/min
 Temperature: 25 °C
 Detection: UV at 230 nm
 Injection: 5 μ L (0.1 mg/mL)

High Performance Chiral Purifications with YMC-Actus CHIRAL ART (Semi-)Preparative Columns

How to obtain long lasting columns?

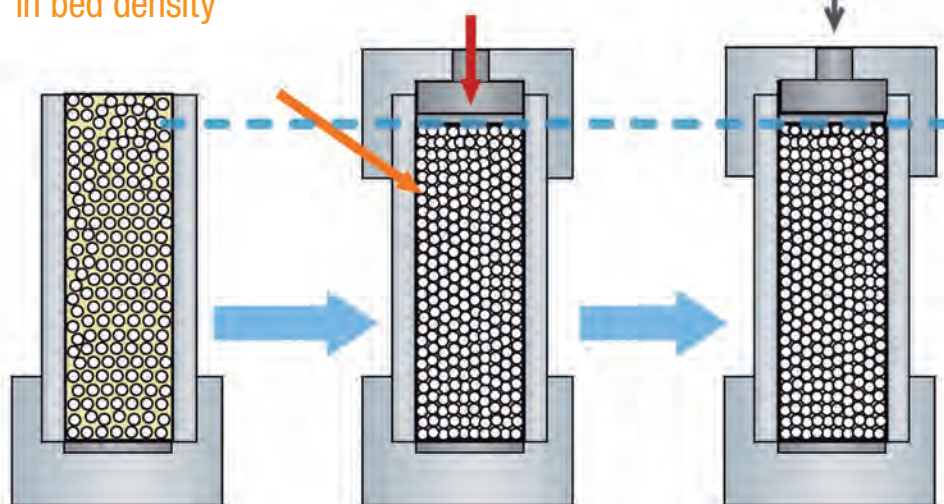
YMC-Actus series columns are semi-preparative HPLC columns that have excellent column stability and efficiency as a result of applying axial compression technology. YMC-Actus series columns show high stability under high flow rate or steep gradient conditions which are desirable for milligram scale preparative HPLC of various compounds.

YMC Actus Column Packing

10% increase
in bed density

Compressing

Flow

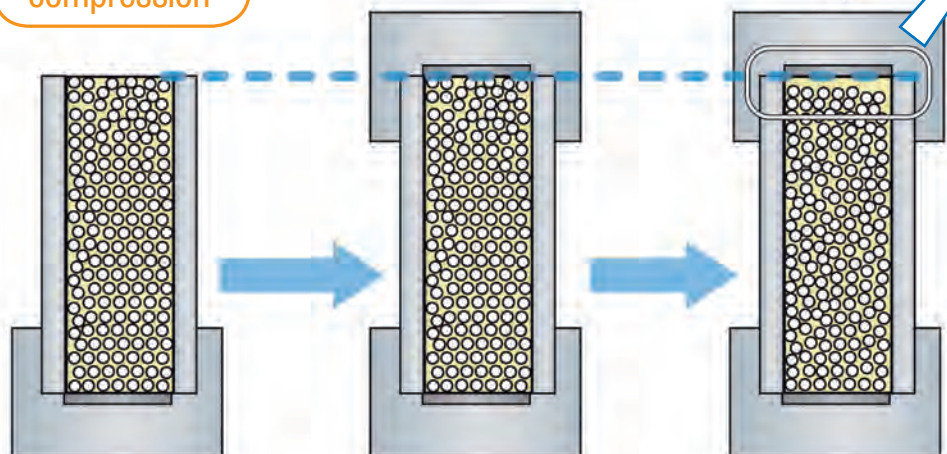


Void and crack

Conventional Column Packing

without
compression

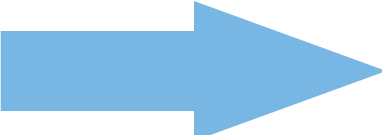
Flow



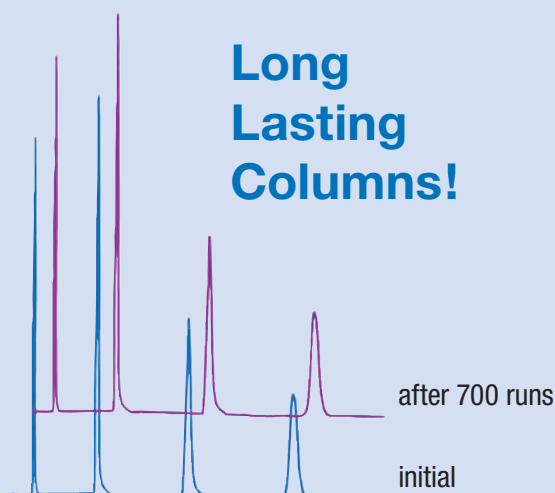
High Performance Chiral Purifications with YMC-Actus CHIRAL ART (Semi-)Preparative Columns

Uniformly high density packing is necessary for highly efficient and stable HPLC columns. DAC (Dynamic Axial Compression) columns are widely used for preparative separation in pilot or production scale. This allows uniformly high density packing and prevents formation of voids.

YMC-Actus series columns have been developed by applying this Axial Compression Technology to semi-prep column production. The column bed is compressed appropriately when attaching the inlet end assembly of the newly designed YMC-Actus hardware. It provides increased bed density (10% higher than conventional columns) and bed uniformity.



**Long
Lasting
Columns!**



Test conditions (standard RP)

(high-speed and high-pressure)

Column: 5 μ m, 50 x 20 mm ID

Eluent: A) water B) methanol

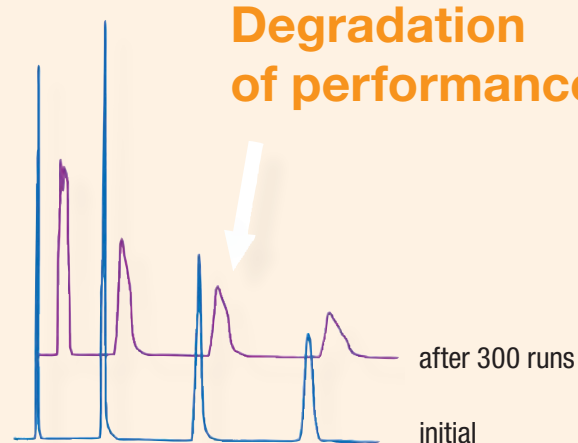
Gradient: 5%-95% B

Flow rate: 50 mL/min

Pressure: ~ 17 MPa



**Degradation
of performance**



High Performance Chiral Purifications with YMC-Actus CHIRAL ART (Semi-)Preparative Columns

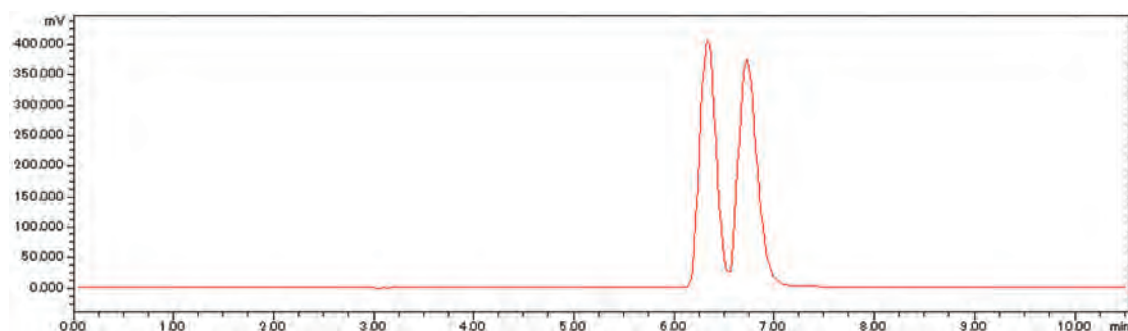
Cost efficiency

Rapid pressure changes under high-speed gradient conditions can lead to column degradation and loss of column performance. As with all YMC-Actus columns, a specific hardware and packing technology has been applied to these (semi-)preparative columns to provide a uniform packing density, which results in a longer lifetime than conventional semi-preparative columns.

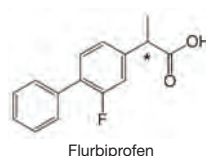
(Semi-)preparative CHIRAL ART columns are available only in YMC-Actus hardware. YMC-Actus CHIRAL ART columns offer outstanding efficiency without compromising resolution. Furthermore, YMC-Actus CHIRAL ART columns provide reliable results, even after exposure to severe, rapid gradient conditions and multiple injections.



High Loadability with YMC-Actus CHIRAL ART



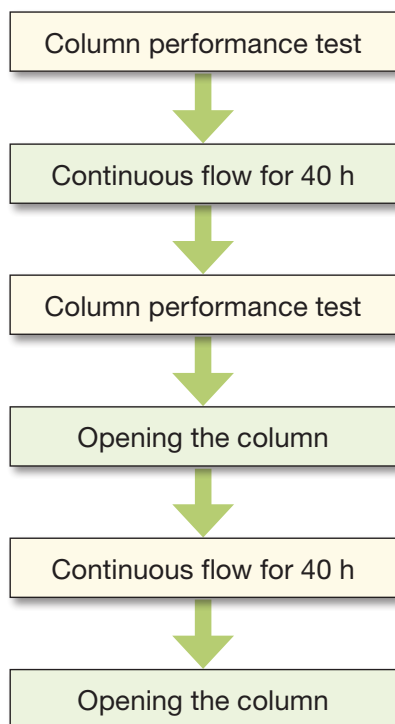
Column: YMC-Actus CHIRAL ART Cellulose-C (5 µm) 250 x 30 mm ID
 Part No.: KSC99S05-2530WX
 Eluent: *n*-hexane / 2-propanol / TFA (95/5/0.1)
 Flow rate: 45 mL/min
 Detection: UV 280 nm
 Injection: 585 µL (20 mg/mL)



Secured Hardware Stability of YMC-Actus CHIRAL ART

A study has been performed using the 50 mm ID YMC-Actus columns for 80 hours at a constant maximum column pressure. An initial column performance test and

after 40 hours was carried out. No significant changes in performance were observed after hours of continuous pressurisation.



Column continuous flow

Column: YMC-Actus SIL (12 nm, 5 µm)
250 x 50 mm ID
Part.-No.: SL12S05-2553DX
Eluent: *n*-hexane / ethanol (90/10)
Flow rate: 240 mL/min
Pressure: 200 bar
Temperature: ambient

Column performance test

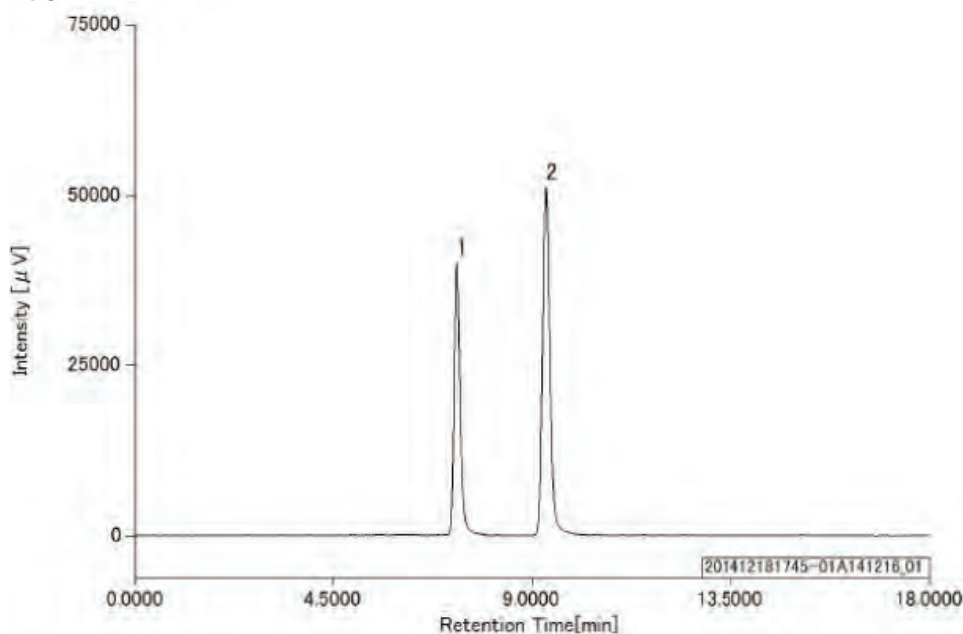
Column: YMC-Actus SIL (12 nm, 5 µm)
250 x 50 mm ID
Eluent: *n*-hexane / ethanol (90/10)
Flow rate: 50 mL/min
Temperature: ambient
Detection: UV at 254 nm
Sample: 1. Toluene (500 µL/mL)
2. Nitrobenzene (10 µL/mL)
Injection: 20 µL



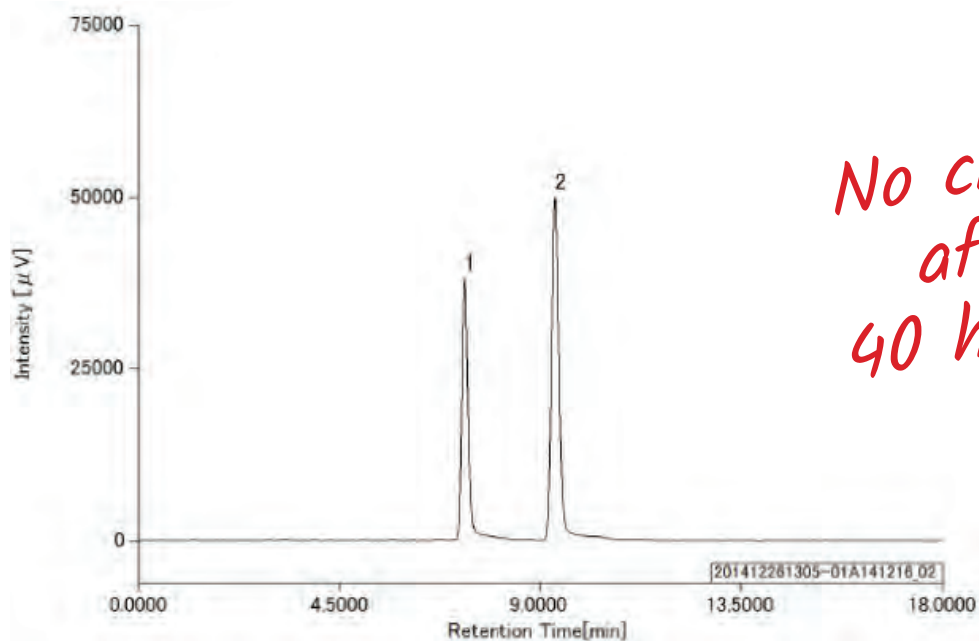
*YMC-Actus columns
remain stable
even after use
at maximum pressure!*

Secured Hardware Stability of YMC-Actus CHIRAL ART

Initial



After 40 hours



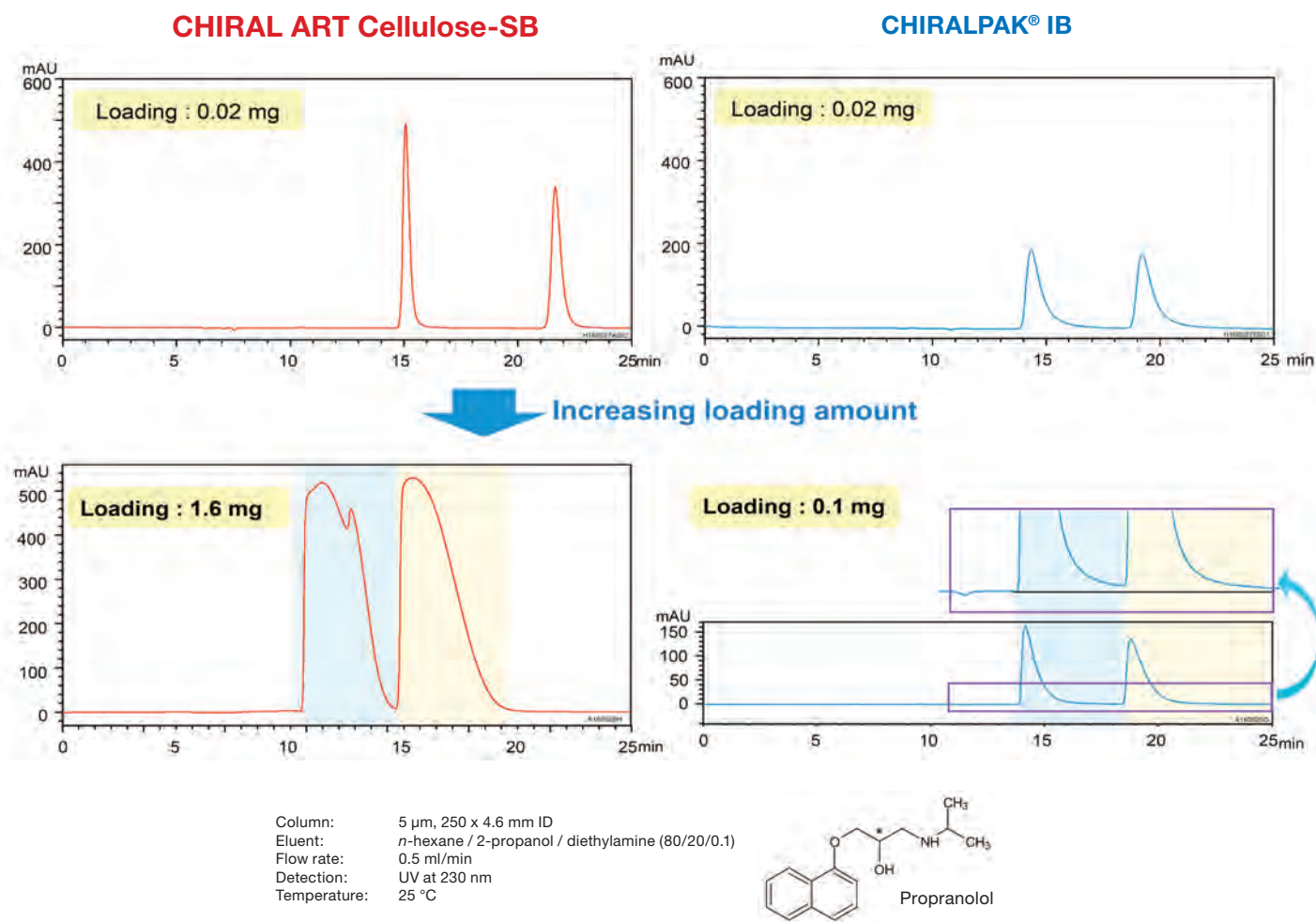
Step	Theoretical plate number N*	Tailing factor Tf*	Backpressure (bar)
Initial	16,093	1.18	20
After 40 h	15,693	1.16	22

*values for nitrobenzene (peak 2)

The inlet frit was inspected after 40 and 80 hours. On opening, neither frit distortion nor gel leakage was observed.

Efficient Purification Using YMC-Actus CHIRAL ART

Analytical scale loading studies



For the competitor's product, loading amount of more than 0.1 mg was not possible because the enantiomeric excess of the 2nd peak was already less than 98%ee with a loading amount of 0.1 mg.

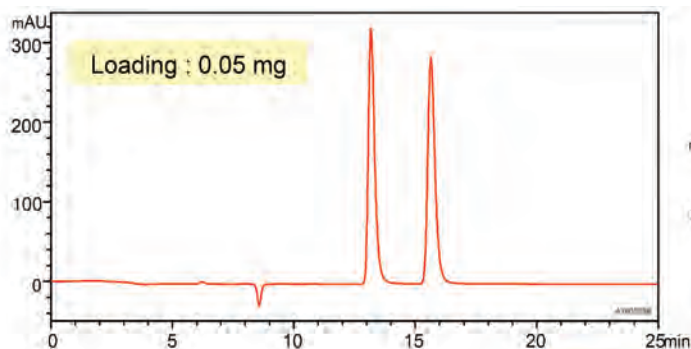
	CHIRAL ART Cellulose-SB		CHIRALPAK® IB	
	1 st peak	2 nd peak	1 st peak	2 nd peak
Enantiomeric excess	>99.9%ee	99.3%ee	>99.9%ee	97.9%ee
Recovery	99%	99%	99%	97%
Productivity (mg/h)*	3.1	3.3	0.3	0.3

*Calculated for repeated injections every 15 minutes (CHIRAL ART Cellulose-SB) and every 10 minutes (CHIRALPAK® IB).

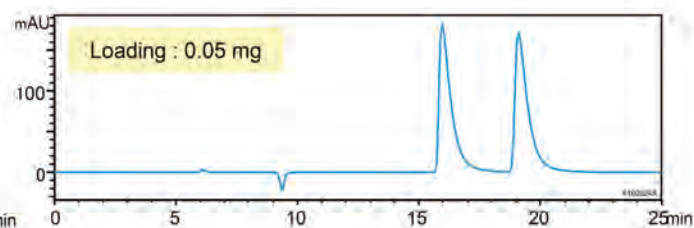
The calculated maximum loading amount on CHIRAL ART Cellulose-SB of 1.6 mg was 10 times larger than that obtained for the competitor's product due to the large differences in the peak shapes, even though the interval between repeat injections was higher!

Efficient Purification Using YMC-Actus CHIRAL ART

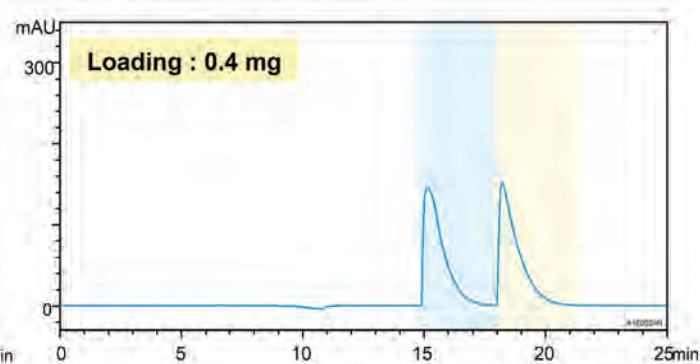
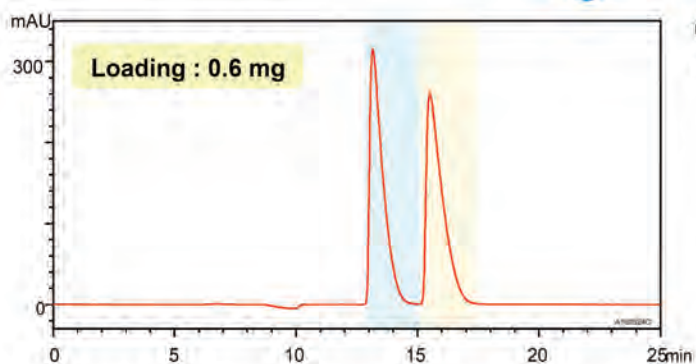
CHIRAL ART Amylose-SA



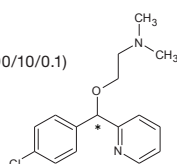
CHIRALPAK® IA



Increasing loading amount



Column: 5 μ m, 250 x 4.6 mm ID
 Eluent: *n*-hexane / 2-propanol / diethylamine (90/10/0.1)
 Flow rate: 0.5 ml/min
 Detection: UV at 230 nm
 Temperature: 25 °C



Carbinoxamine

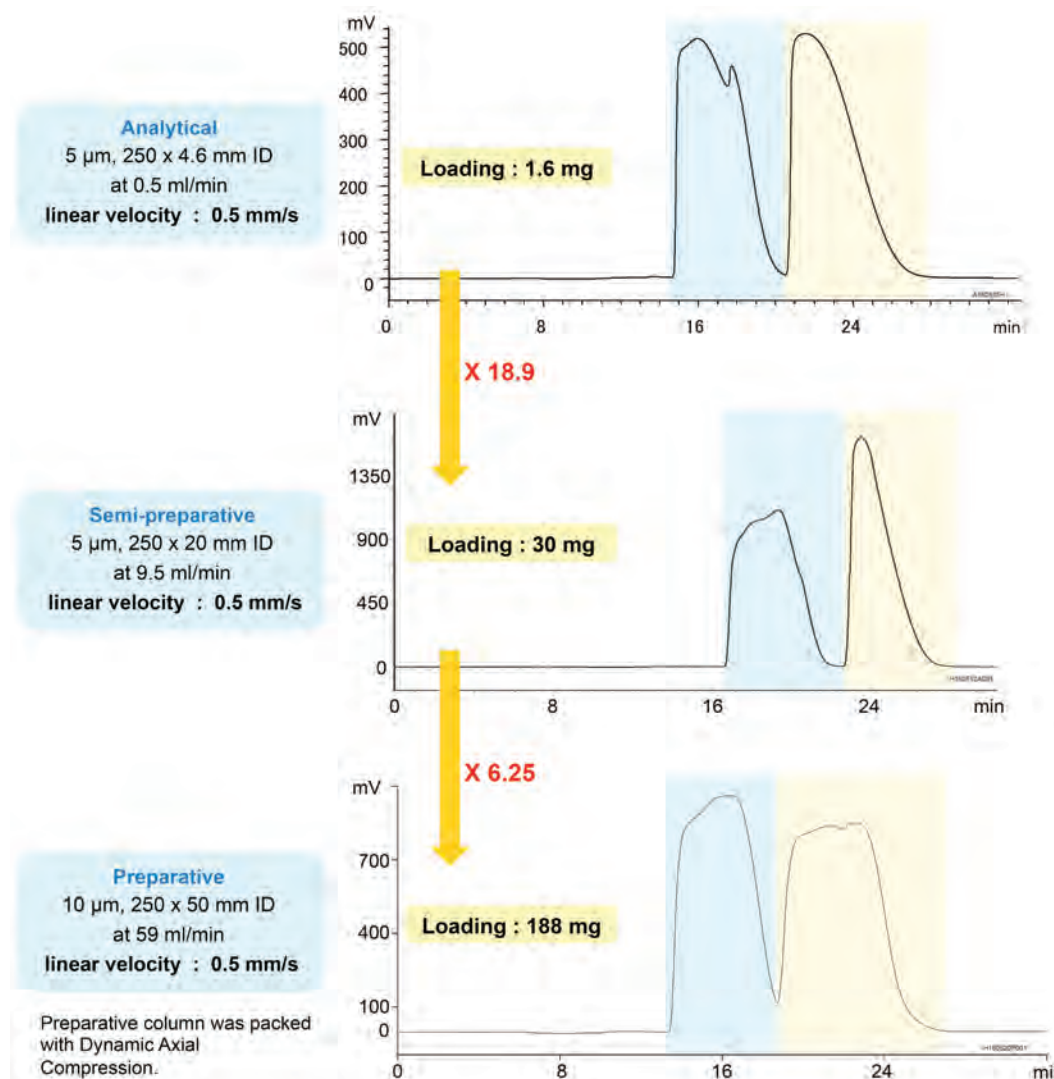
	CHIRAL ART Amylose-SA		CHIRALPAK® IA	
	1st peak	2nd peak	1st peak	2nd peak
Enantiomeric excess	>99.9% ee	99.4% ee	>99.9% ee	98.9% ee
Recovery	99%	99%	99%	98%
Productivity (mg/h)*	2.9	2.9	1.5	1.4

*Calculated for repeated injections every 6 minutes (CHIRAL ART Amylose-SA) and every 8 minutes (CHIRALPAK® IA).

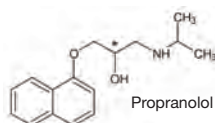
The calculated maximum loading amount on CHIRAL ART Amylose-SA was double that obtained for the competitor's product due to the good peak shape with no tailing, which also allowed increased productivity.

Efficient Purification Using YMC-Actus CHIRAL ART

Scale-up with YMC-Actus CHIRAL ART



Chiral
stationary phase: CHIRAL ART Cellulose-SB
Eluent: *n*-hexane / 2-propanol / diethylamine (80/20/0.1)
Detection: UV at 237 nm
Temperature: ambient



	Analytical 250 x 4.6 mm ID		YMC-Actus Semi-preparative 250 x 20 mm ID		Self-packed DAC Preparative 250 x 50 mm ID	
	1 st peak	2 nd peak	1 st peak	2 nd peak	1 st peak	2 nd peak
Enantiomeric excess	>99.9%ee	99.3%ee	99.9%ee	99.8%ee	99.1%ee	99.3%ee
Recovery	99%	99%	97%	99%	99%	94%
Productivity (mg/h)	3.1	3.3	58.6	62.4	366	390

Linear scale-up was performed using the appropriate scale-up factors. The Dynamic Axial Compression Column self-packed with CHIRAL ART Cellulose-SB 10 μ m can be easily and linearly scaled-up for a greater purification scale. The final productivity is 366 and 390 mg/h respectively for peak 1 and 2.

Chiral Separations in SFC Mode

Chiral SFC columns by YMC

2 options are available:

- **SFC compatible LC columns: CHIRAL ART (p. 4-15)***
- **SFC dedicated columns: Alcyon SFC CSP**

*A statement is available to confirm the usability in SFC mode.

CHIRAL ART LC columns are interchangeable between NP/RP mode and SFC mode with a simple solvent switch. All you need to do is flush your column with 10

column volumes of 100% isopropanol before switching to final conditions in the new mode. This applies to switching from LC to SFC and vice versa.

Specifications Alcyon SFC CSP columns

CHIRAL	Alcyon SFC Coated Polysaccharides		Alcyon SFC Immobilised Polysaccharides			
	Alcyon SFC CSP Amylose-C/Amylose-C Neo	Alcyon SFC CSP Cellulose-C	Alcyon SFC CSP Amylose-SA	Alcyon SFC CSP Cellulose-SB	Alcyon SFC CSP Cellulose-SC	Alcyon SFC CSP Cellulose-SJ
Particle size	3, 5 µm					
Chiral Selector	Amylose tris (3,5-dimethyl-phenylcarbamate)	Cellulose tris (3,5-dimethyl-phenylcarbamate)	Amylose tris (3,5-dimethyl-phenylcarbamate)	Cellulose tris (3,5-dimethyl-phenylcarbamate)	Cellulose tris (3,5-dichloro-phenylcarbamate)	Cellulose tris (4-methylbenzoate)
USP	L51	L40	L99	—	—	—
Shipping Solvent	2-propanol					
Usable pH-range	3.5 - 6.5	3.5 - 6.5	2.0 - 9.0	2.0 - 9.0	2.0 - 9.0	2.0 - 9.0
Temperature range	0-40°C					
Pressure limit	2.1, 3.0 and 4.6 mm ID: 30 MPa (4,350 psi) 10 and 20 mm ID: 20 MPa (2,980 psi)					

Product Line-up

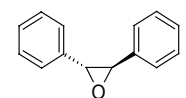
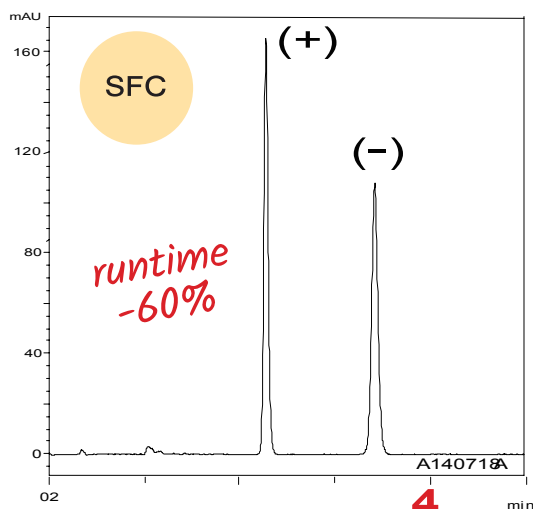
PRODUCT NAME	Particle size	Type	Alternative YMC LC product	Competitive product
Alcyon SFC CSP Amylose-C/Amylose-C Neo	3 µm 5 µm	Coated	CHIRAL ART Amylose-C/Amylose-C Neo	CHIRALPAK® AD-H (SFC), AD-3
Alcyon SFC CSP Cellulose-C			CHIRAL ART Cellulose-C	CHIRALCEL® OD-H (SFC), OD-3
Alcyon SFC CSP Amylose-SA		Immobilised	CHIRAL ART Amylose-SA	CHIRALPAK® IA (SFC), IA-3
Alcyon SFC CSP Cellulose-SB			CHIRAL ART Cellulose-SB	CHIRALPAK® IB (SFC), IB-3
Alcyon SFC CSP Cellulose-SC			CHIRAL ART Cellulose-SC	CHIRALPAK® IC (SFC), IC-3
Alcyon SFC CSP Cellulose-SJ			CHIRAL ART Cellulose-SJ	—

Properties of Alcyon SFC CSP Columns

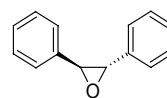
Alcyon SFC columns are specifically packed in SFC dedicated hardware, tested under SFC conditions and supplied with a test certificate under SFC conditions. The stationary phase used in Alcyon SFC columns is identical to that used in the corresponding CHIRAL ART columns.

Chiral Separations in SFC Mode

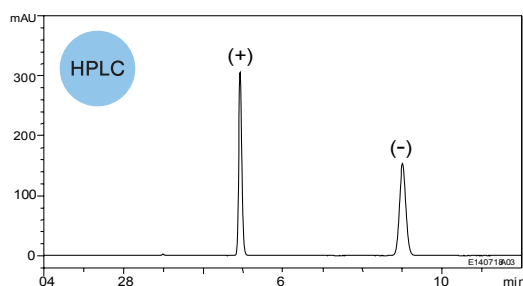
Fast separation with high resolution



(+)-R,R-trans-Stilbene oxide



(-)-S,S-trans-Stilbene oxide

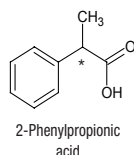
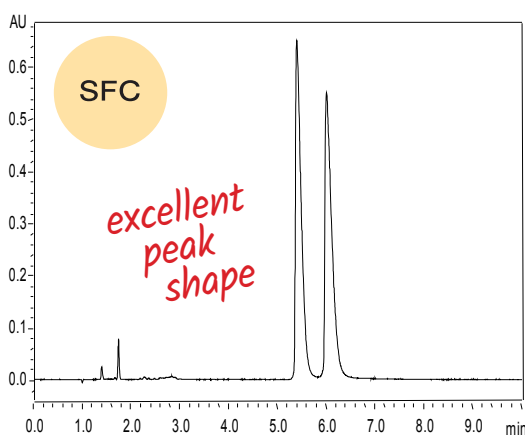


Column: **Alcyon SFC CSP Amylose-C** (5 μ m) 250 x 4.6 mm ID
 Part No.: KAN99S05-2546WTS
 Eluent: CO₂ / methanol (60/40)
 Flow: 3.0 mL/min
 Temperature: 40 °C
 Detection: UV at 220 nm
 Back pressure: 17.2 MPa (2500 psi)

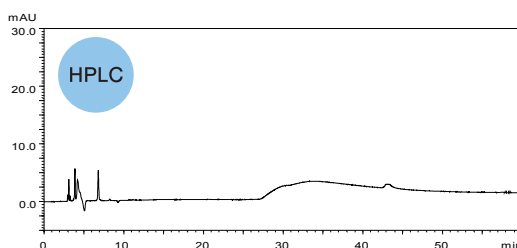
Column: **CHIRAL ART Amylose-C** (5 μ m) 250 x 4.6 mm ID
 Part No.: KAN99S05-2546WT
 Eluent: *n*-hexane / 2-propanol (90/10)
 Flow: 1.0 mL/min
 Temperature: 25 °C
 Detection: UV at 220 nm

Faster chiral separation of trans-stilbene oxide is achieved using supercritical fluid chromatography compared to HPLC as the separation mode. Lower viscosity and larger diffusion coefficients for supercritical fluid provide rapid separations of both chiral and achiral compounds.

Excellent peak shape using mobile phase without the addition of an acid



2-Phenylpropionic acid



Column: **Alcyon SFC CSP Cellulose-C** (5 μ m) 250 x 4.6 mm ID
 Part No.: KCN99S05-2546WTS
 Eluent: CO₂ / methanol (98/2)
 Flow: 3.0 mL/min
 Temperature: 35 °C
 Detection: UV at 220 nm
 Back pressure: 10.3 MPa (2000 psi)

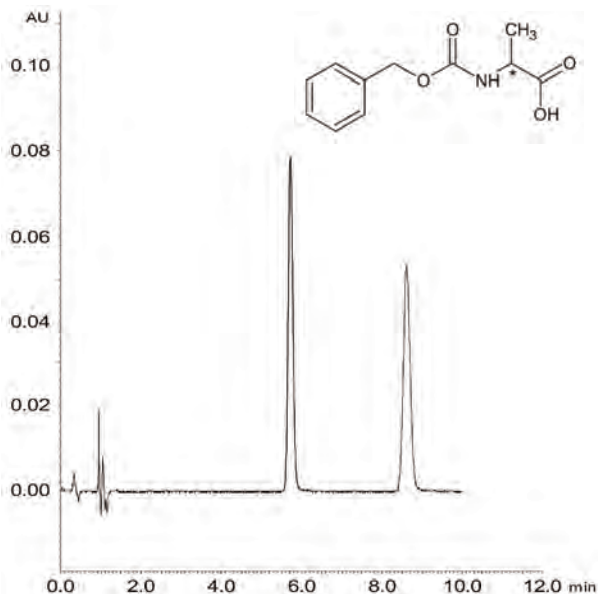
Column: **CHIRAL ART Cellulose-C** (5 μ m) 250 x 4.6 mm ID
 Part No.: KCN99S05-2546WT
 Eluent: *n*-hexane / 2-propanol (99/1)
 Flow: 1.0 mL/min
 Temperature: 25 °C
 Detection: UV at 220 nm

Excellent peak shape of 2-phenylpropionic acid is obtained using SFC chiral separation. Under HPLC conditions, the peak shape is very broad with mobile phase containing no additives such as an acid. With SFC, on the other hand, peak shapes are very good just with a mixture of CO₂ and methanol. It is thought that supercritical carbon dioxide acts as a weak acid.

Chiral Separations in SFC Mode

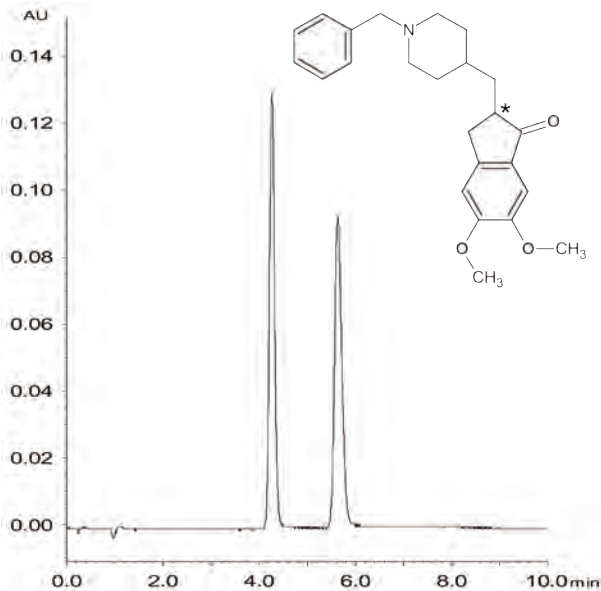
Applications

N-CBZ-DL-Alanine



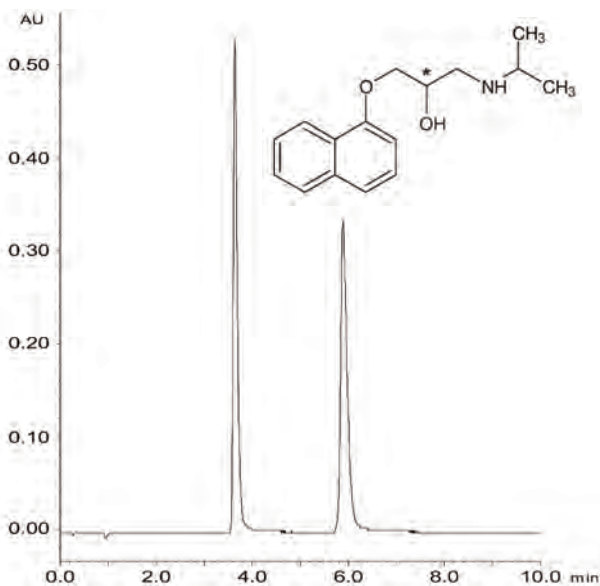
Column: Alcyon SFC CSP Amylose-C (5 μ m) 250 x 4.6 mm ID
Part No.: KAN99S05-2546WTS
Eluent: CO₂ / 2-propanol containing 0.1% TFA (90/10)
Flow rate: 3.0 mL/min
Temperature: 35 °C
Detection: UV at 215 nm
Backpressure: 13.8 MPa (2000 psi)
Injection: 5 μ L (1.0 mg/mL)

Donepezil



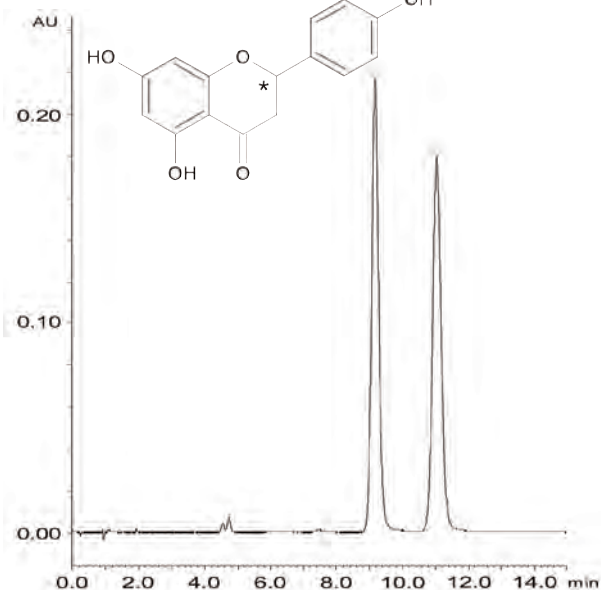
Column: Alcyon SFC CSP Cellulose-C (5 μ m) 250 x 4.6 mm ID
Part No.: KCN99S05-2546WTS
Eluent: CO₂ / 2-propanol containing 0.1% DEA (70/30)
Flow rate: 3.0 mL/min
Temperature: 35 °C
Detection: UV at 268 nm
Backpressure: 13.8 MPa (2000 psi)
Injection: 5 μ L (1.0 mg/mL)

Propranolol



Column: Alcyon SFC CSP Cellulose-C (5 μ m) 250 x 4.6 mm ID
Part No.: KCN99S05-2546WTS
Eluent: CO₂ / methanol containing 0.1% DEA (80/20)
Flow rate: 3.0 mL/min
Temperature: 35 °C
Detection: UV at 230 nm
Backpressure: 13.8 MPa (2000 psi)
Injection: 5 μ L (1.0 mg/mL)

Naringenin



Column: Alcyon SFC CSP Cellulose-SB (5 μ m) 250 x 4.6 mm ID
Part No.: KSB99S05-2546WTS
Eluent: CO₂ / 2-propanol (80/20)
Flow rate: 3.0 mL/min
Temperature: 35 °C
Detection: UV at 220 nm
Backpressure: 13.8 MPa (2000 psi)
Injection: 5 μ L (1.0 mg/mL)

Method Screening Strategy for Polysaccharide Phases

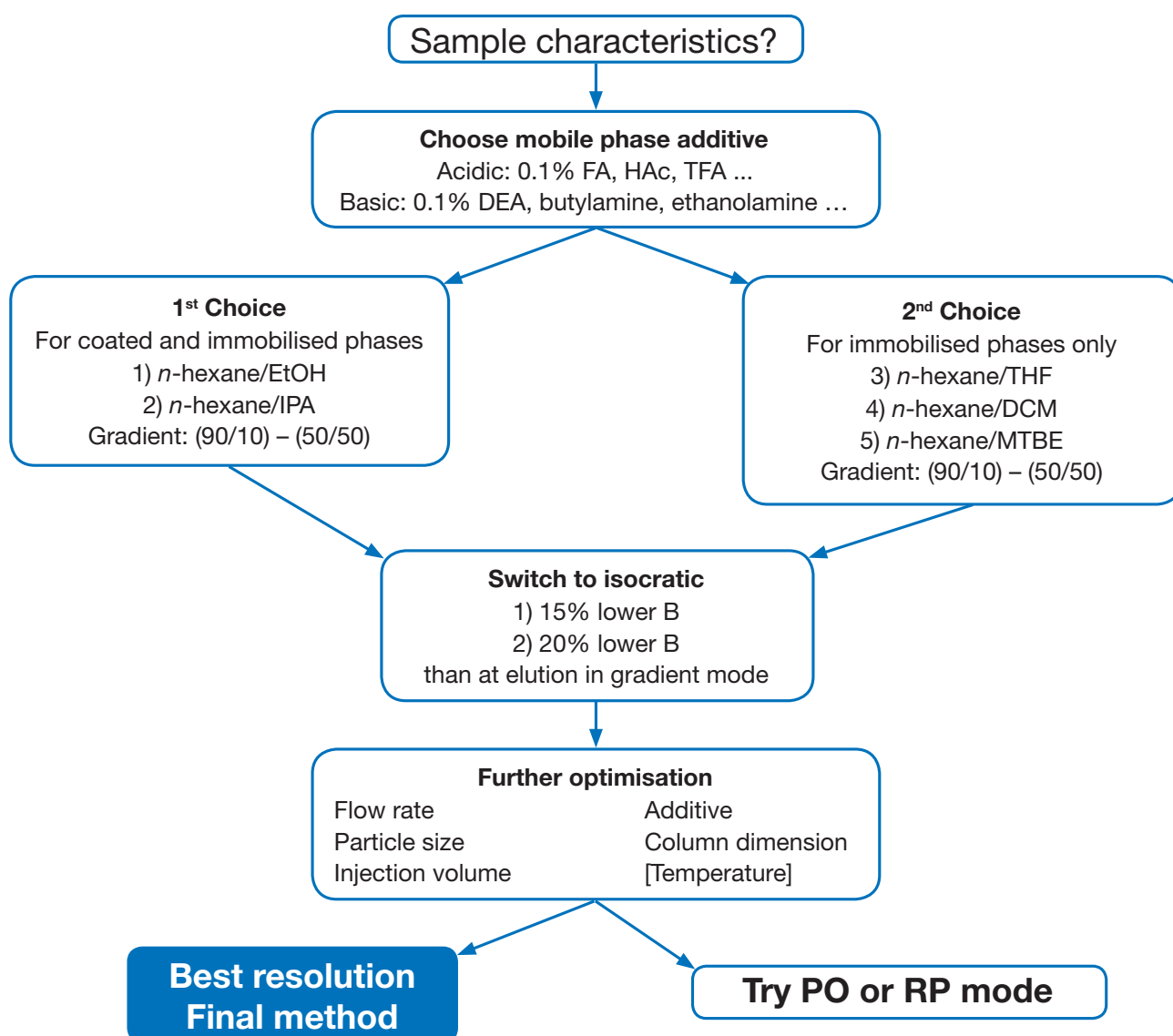
When NP mode, when RP mode?

CHIRAL ART columns can be used in NP and RP mode. Coated CHIRAL ART are dedicated for use in NP mode only, while immobilised CHIRAL ART columns can be operated in both modes. It is recommended to start screening in NP mode first as

the success rates are usually much higher. YMC's screening success rate in NP mode is >95%, while it is <5% only in RP mode.

However, beside the success rate there can be specific reasons for RP mode, e.g. use of MS as detection mode.

NP Screening Strategy



For Polar Organic (PO) mode, methanol, ethanol or mixtures of both can be used as well as acetonitrile or mixtures of methanol and acetonitrile. RP mode can only be applied to immobilised polysaccharide phases.

It is essential to make sure of the miscibility of the organic solvents. When switching from alkane/alcohol solvents to polar organic solvents (methanol, acetonitrile etc), run an

intermediate wash with at least ten column volumes of ethanol or 2-propanol.

It is important to remember that a column used with polar organic solvents (such as methanol/ethanol, methanol/acetonitrile) as a mobile phase should be dedicated to this specific mode of application.

Method Screening Strategy

Use of Screening Gradients

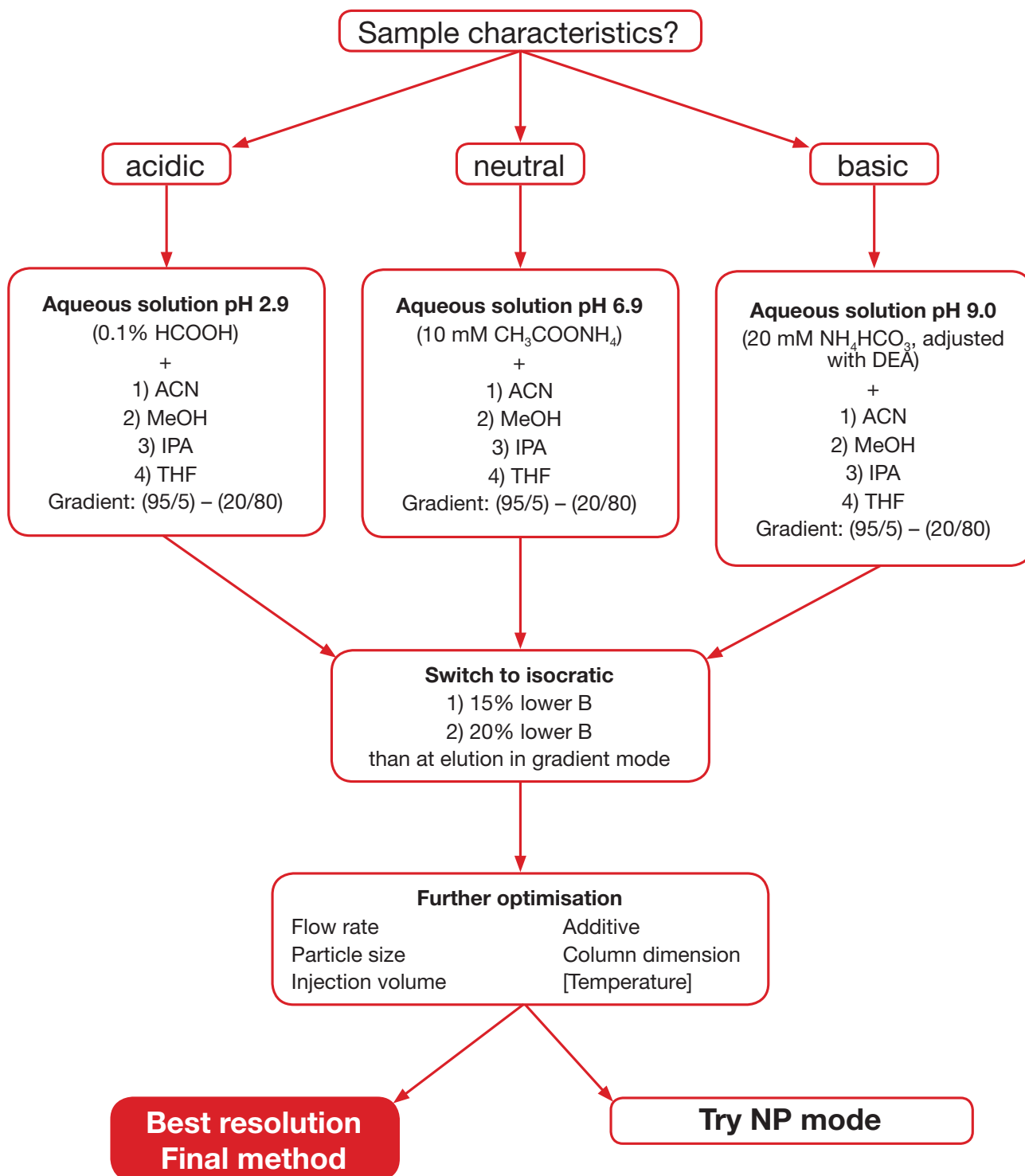
YMC recommends using a gradient based screening strategy as it is much faster than isocratic screening when using different mobile phase compositions.

Different strategies are recommended for each separation mode.

➔ For a more detailed overview on the different strategies, also refer to the whitepaper “*Chiral LC & SFC Method Development*” that can be downloaded from the YMC Europe homepage.

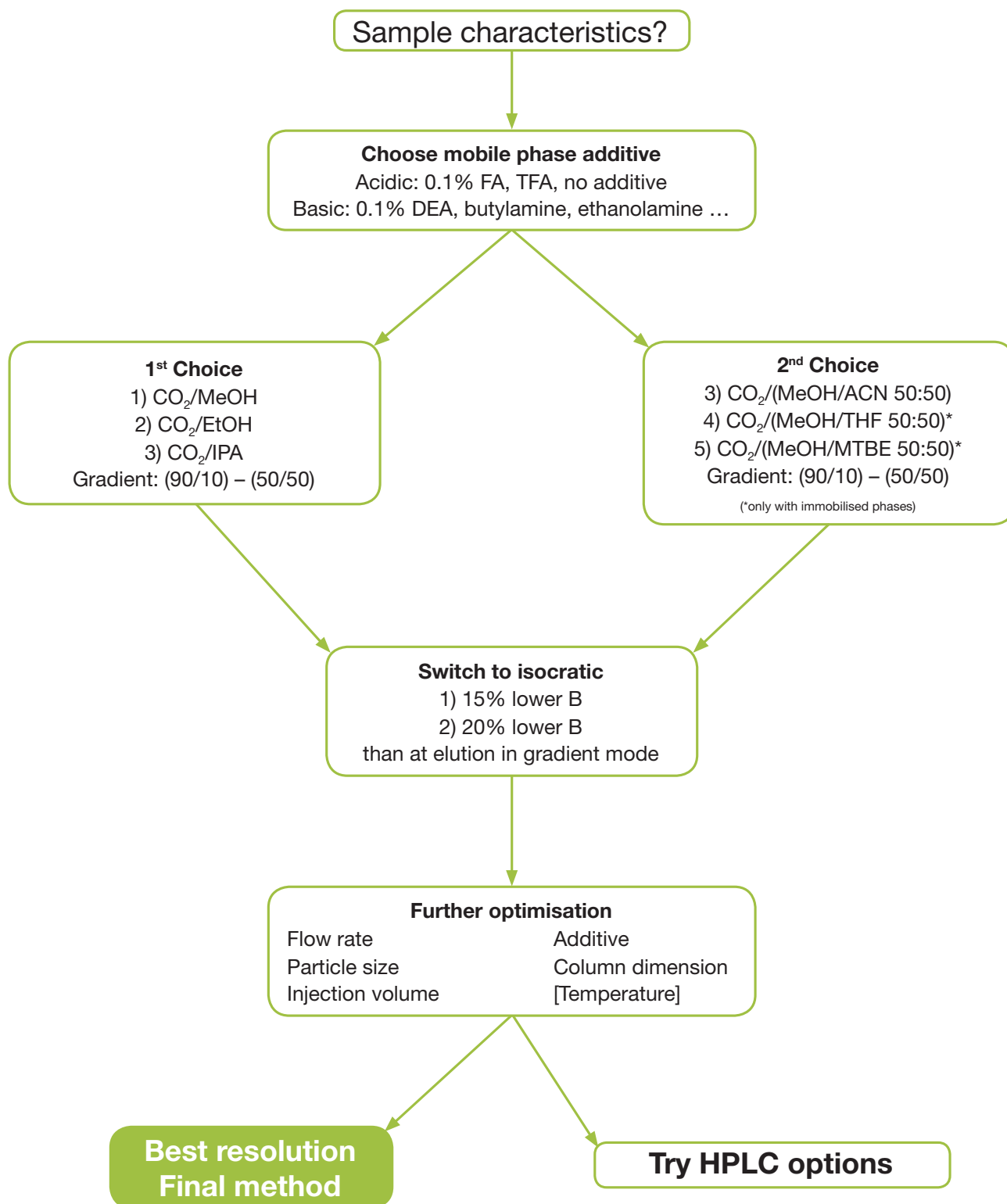
RP Screening Strategy

For immobilised stationary phases only



Method Screening Strategy

SFC Screening Strategy



Abbreviations used:

FA (formic acid); HAc (acetic acid); TFA (trifluoroacetic acid); DEA (diethylamine); EtOH (ethanol); IPA (2-propanol); THF (tetrahydrofuran); DCM (dichloromethane); MTBE (methyl *tert*-butyl ether); ACN (acetonitrile); MeOH (methanol)

How to Choose the Correct Chiral Column



YMC Database

A selection of chiral applications can be found at <http://ymc.de/applications.html>.

Here, you can search for chiral applications already known for your compounds.



Test Columns or Screening Kits

You can request a test column to initially test a chiral column before finally buy it if it works for your application. If the column is not suitable, simply return it without any further requirements.

Alternatively you can choose one of the YMC method development kits or request a customised screening kit with 3–6 different CHIRAL ART phases. You only need to contact your local YMC contact for details.

FREE Chiral Screening Service

- >90% success rate
- Rapid screening within a short period of time
- Screening according to your requirements: e.g. RP-mode, MS-compatibility etc.
- Screening on all available CHIRAL ART phases and further YMC CHIRAL phases if needed
- Results presented in a detailed report
- Confidentiality Agreements can be arranged as necessary



How to Choose the Correct Chiral Column

Your YMC Success Rate

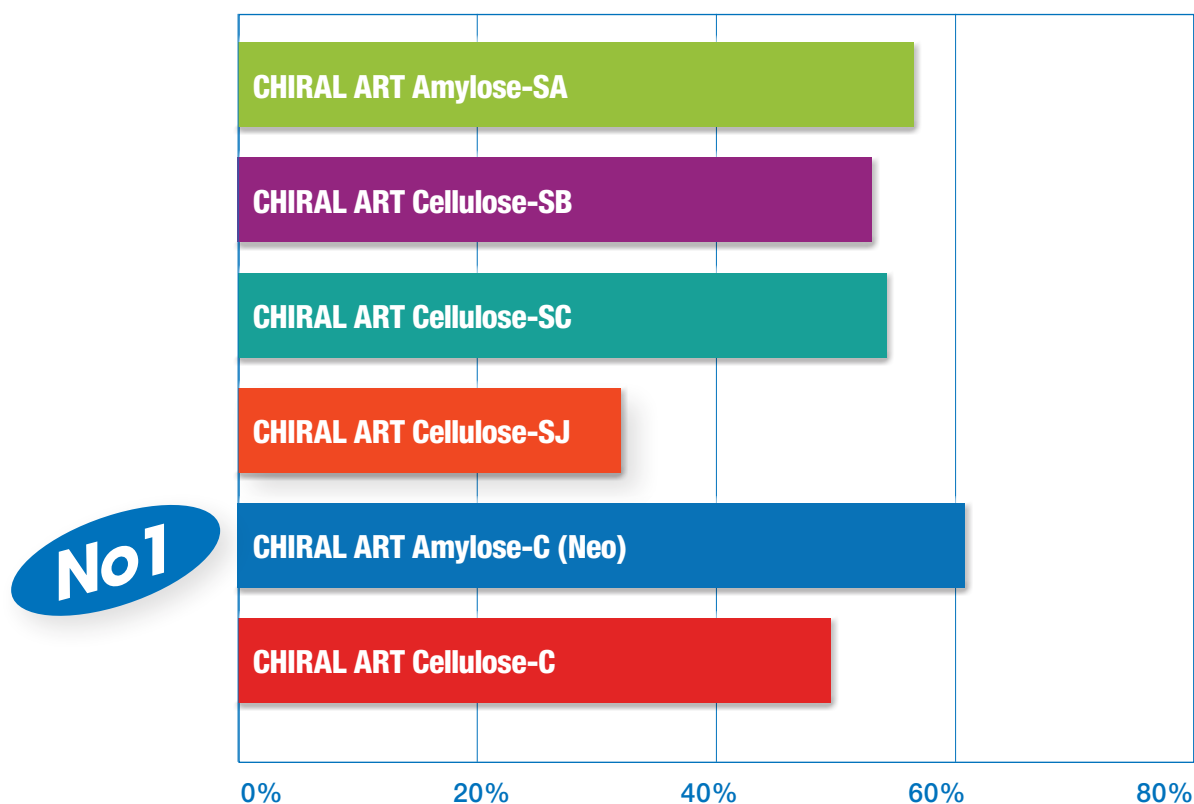
- Hit criteria : $R_s > 1.5$
- Hit database: compiled from more than 500 samples supplied for HPLC/SFC contract service
- The 6 CHIRAL ART phases can cover >90% of chiral separations
- About 95% of the LC applications are in NP/PO mode, while 5% are in RP mode

Method Development

- Method development based on phase screening
- According to your requirements

Preparative and Process Scale-Up

- Phase screening
- Preparative method development
- Small scale purification



Contract Purification of Chiral Compounds

In addition to chiral screening which can be carried out at our German or Japanese facilities, YMC now offer contract purification of chiral compounds at a range of scales and by different techniques.



Highly productive

Highly efficient preparative separation methods (recycling chromatography, SFC, SMB)



Highly reliable

Extensive expertise and excellent performance in scaling up of chromatographic purification



Cost competitive

Competitively priced YMC chiral packing materials used



Applicable to various scales

Equipped with dynamic axial compression columns with a maximum inner diameter of up to 1000 mm and HPLC systems with pumps up to a maximum flow rate of 50 L/min



GMP compliant purification service

Contract Purification of Chiral Compounds

Scale	several mg - tens of g			tens of g - several tons		
Location	Kyoto Research Laboratories			YMC Komatsu Works		
	System	Column ID	Purpose	System	Column ID	Purpose
Equipment	Preparative HPLC LC-Forte/R	20, 30 mm	Purification of trace impurities, recycling purification of enantiomers	Dynamic Axial Compression Columns + K-Prep system	100 – 1000 mm max. flow rate 0.5 – 50 L/min	Production-scale purification of enantiomers
	K-Prep LAB	50 mm	Single column purification with stacked injection			
	Preparative SFC	20, 30 mm	Preparative SFC purification of enantiomers	Large SMB (Planned)		Production-scale purification of API
	SMB	20, 30 mm	Continuous purification, Simulation for scaling up SMB processes			
						

YMC CHIRAL NEA(R)(S)

- *normal and reversed phase mode*
- *reversal of elution order*
- *nonpolar to medium polar compounds*
- *available in bulk quantities*



YMC CHIRAL NEA(R)(S)	Specification
Particle Size / μm	5
Pore Size / nm	30
Surface area / m^2g^{-1}	proprietary
Carbon content / %	proprietary
Recommended pH range	2.0 - 6.5 (reversed phase)

Properties

Although separation modes are chosen according to the purpose of separation, it is recommended to use one column dedicated for one separation mode in order to maximise the lifetime of the column.

In normal phase mode YMC CHIRAL NEA allows the separation of a wide range of non-polar to moderately polar compounds.

The separation mechanisms involve a combination of:

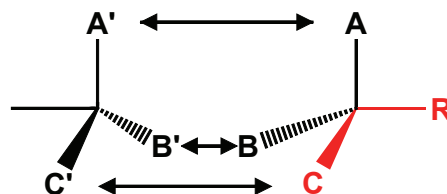
- π - π interactions
- hydrogen bonding
- dipole interactions
- steric effects.

For a successful separation at least three points of interaction between the CSP and the target compound must exist. Occasionally, for analytical separations, there may be a need to derivatise

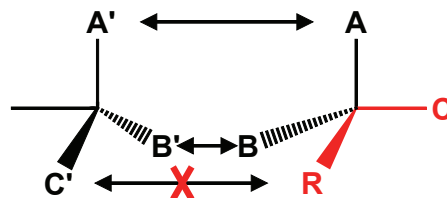
the sample with, for example π -donating groups such as dinitrobenzoyl, dinitrophenylurea or dinitrophenylcarbamate groups. In some cases, the increase in detectability can offset the disadvantages of derivatisation

Chiral Separation Mechanism

3 points of interaction: separation



2 points of interaction: no separation



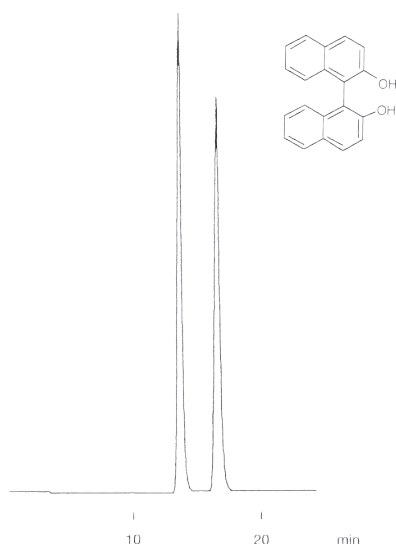
Column Care

The recommended pH range for using YMC CHIRAL NEA(R)(S) columns is 2.0-6.5. Remove acid and buffer salts before storage. Store the column in methanol/water = 50/50. If columns are affected by undesired contaminants or clogged inlet frits which cause back pressure increases, flush the column with THF in the opposite flow direction. For detailed information please refer to the "Column Care and Use Instructions" which can be downloaded from www.ymc.de/support-documentation.html.

YMC CHIRAL NEA(R)(S)

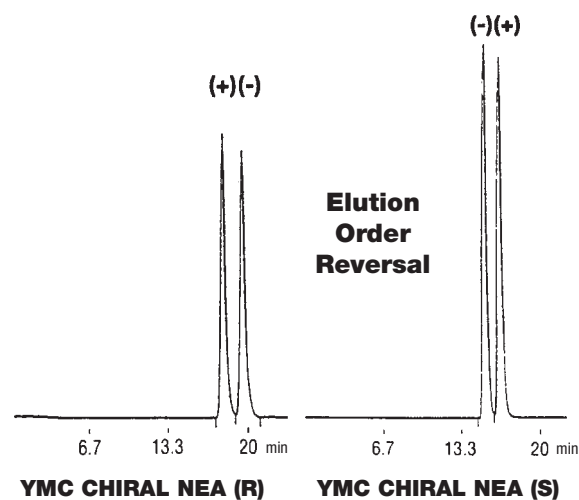
Applications used in normal phase mode

1,1'-Bi-2-Naphthol



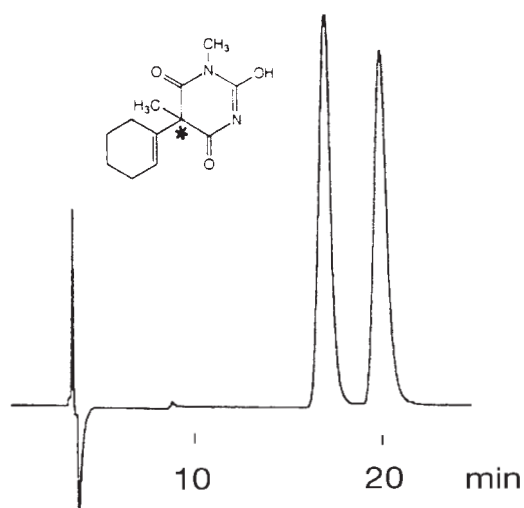
Column: YMC CHIRAL NEA (R) 250 x 4.6 mm ID
 Part No.: CR30S05-2546WT
 Eluent: *n*-hexane / dichloromethane / ethanol (70/30/2)
 Flow rate: 1.0 mL/min
 Temperature: 25 °C
 Detection: UV at 254 nm

2,2,2-Trifluoro-1-(9-anthryl) ethanol



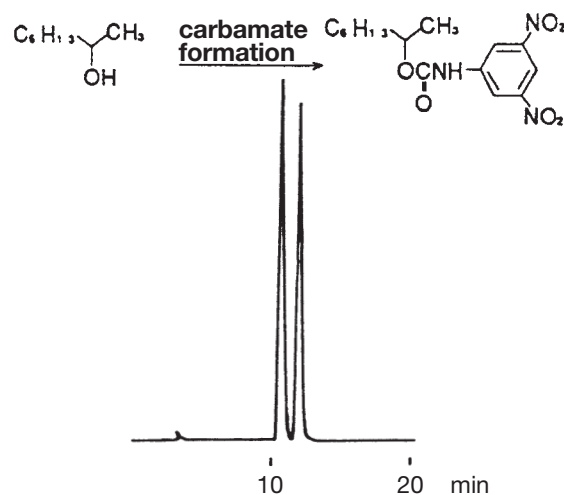
Column: YMC CHIRAL NEA (R) and YMC CHIRAL NEA (S) 250 x 4.6 mm ID
 Part No.: CR30S05-2546WT and CS30S05-2546WT
 Eluent: *n*-hexane / dichloromethane / ethanol (70/30/1)
 Flow rate: 0.5 mL/min
 Temperature: 25 °C
 Detection: UV at 254 nm

Hexobarbital



Column: YMC CHIRAL NEA (R) 250 x 4.6 mm ID
 Part No.: CR30S05-2546WT
 Eluent: *n*-hexane / CH₂Cl₂ / ethanol (90/10/2)
 Flow rate: 1.0 mL/min
 Temperature: ambient
 Detection: UV at 220 nm

1-Phenylethanol

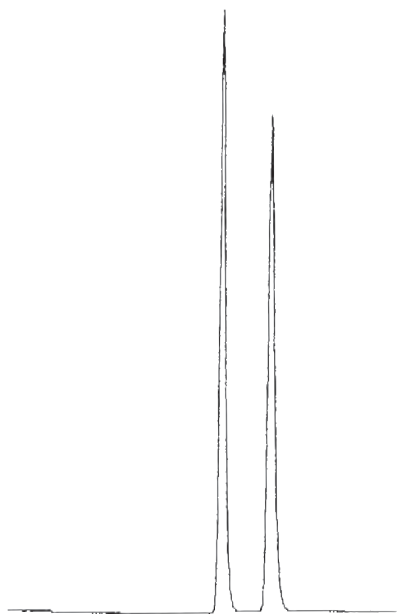


Column: YMC CHIRAL NEA (R) 250 x 4.6 mm ID
 Part No.: CR30S05-2546WT
 Eluent: *n*-hexane / CH₂Cl₂ / ethanol (90/10/5)
 Flow rate: 1.0 mL/min
 Temperature: 35 °C
 Detection: UV at 254 nm

YMC CHIRAL NEA(R)(S)

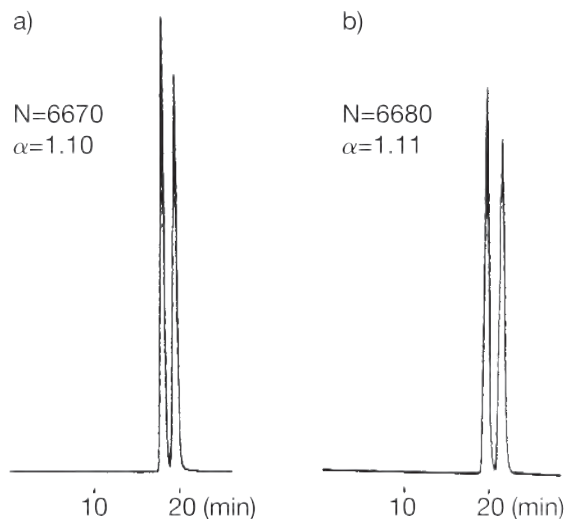
Applications used in reversed phase mode

1,1'-Bi-2-Naphthol



Column: YMC CHIRAL NEA (R) 250 x 4.6 mm ID
 Part No.: NR30S05-2546WT
 Eluent: acetonitrile / water (50/50)
 Flow: 1.0 mL/min
 Pressure: 80 bar
 Detection: UV at 235 nm
 Injection: 1.0 µL (2.8 mg/mL)
 Temperature: ambient

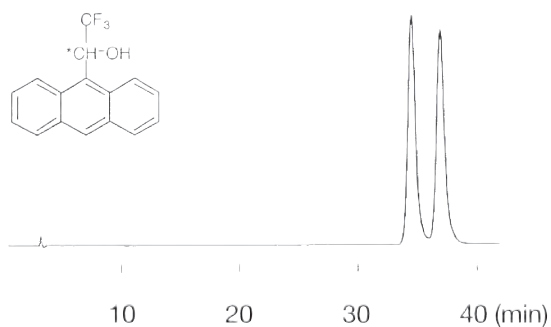
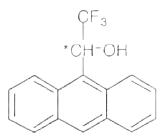
Propranolol · HCl



a)
 Column: YMC CHIRAL NEA (R) 250 x 4.6 mm ID
 Part No.: NR30S05-2546WT
 Eluent: acetonitrile / 0.5M NaClO₄ (40/60)
 Flow: 1.0 mL/min
 Temperature: ambient
 Time: 100 hours

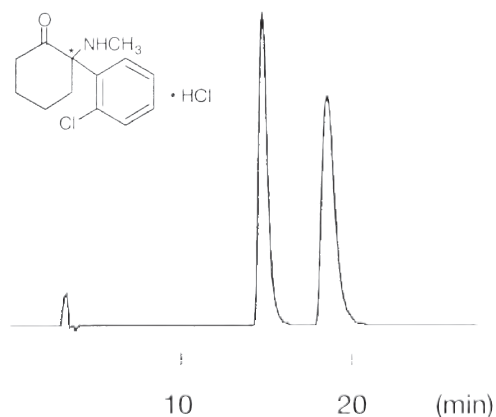
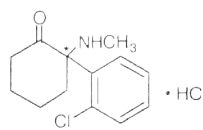
b)
 Eluent: acetonitrile / 0.5M NaClO₄ (40/60)
 Flow: 1.0 mL/min
 Temperature: ambient
 Detection: UV at 254 nm

2,2,2-Trifluoro-1-(9-anthryl)-ethanol



Column: YMC CHIRAL NEA (R) 250 x 4.6 mm ID
 Part No.: NR30S05-2546WT
 Eluent: acetonitrile / water (40/60)
 Flow: 1.0 mL/min
 Detection: UV at 254 nm
 Injection: 1.0 µL (0.14 mg/mL)
 Temperature: ambient

Ketamine · HCl



Column: YMC CHIRAL NEA (R) 250 x 4.6 mm ID
 Part No.: NR30S05-2546WT
 Eluent: acetonitrile / 0.5M NaClO₄ (40/60)
 Flow: 1.0 mL/min
 Detection: UV at 268 nm
 Injection: 10 µL (1.4 mg/mL)
 Temperature: ambient

YMC CHIRAL CD BR

- *reversed phase*
- *polar pharmaceuticals*
- *positional isomers*
- *water-soluble compounds*

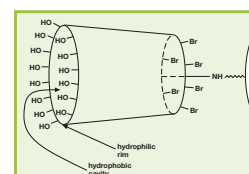
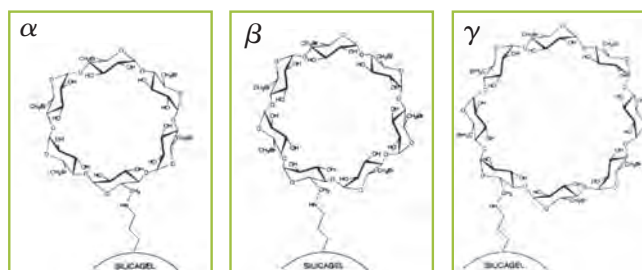


YMC CHIRAL CD BR	Specification
Particle Size / μm	5
Pore Size / nm	12
Surface area / m^2g^{-1}	proprietary
Carbon content / %	proprietary
Recommended pH range	3.5 - 6.5

Properties

YMC CHIRAL CD BR columns offer an alternative approach to enantioseparation. Covalent bonding of a bromide derivative of a cyclodextrin to YMC silica provides a novel CSP. The bromide derivative, in which the primary hydroxyl groups at carbon 6 are substituted for bromine, provides a different chiral selectivity to the 'normal'

cyclodextrins. These cyclodextrin bromide derivatives are used in reversed phase mode to separate a wide range of polar, water-soluble compounds. In addition they will separate, under similar conditions, positional isomers of substituted aromatic compounds.



β -CD BR

Column Care

The recommended pH range for using YMC CHIRAL CD BR columns is 3.5-6.5. Remove acid and buffer salts before storage. Store the column in methanol/water = 50/50. If columns are affected by undesired contaminants or clogged inlet frits which cause back pressure increases, flush the column with THF in the opposite flow direction. For detailed information please refer to the "Column Care and Use Instructions" which can be downloaded from www.ymc.de/support-documentation.html.

Ordering Information

CHIRAL ART Amylose-C

Phase dimension	Column ID [mm]	Column length [mm]			Guard cartridges* with 10 mm length
		50	100	150	
3 μ m	2	KAN99S03-0502WT	KAN99S03-1002WT	KAN99S03-1502WT	KAN99S03-01Q1GC (pack of 5)
	3	KAN99S03-0503WT	KAN99S03-1003WT	KAN99S03-1503WT	KAN99S03-0103GC (pack of 5)
	4.6	KAN99S03-0546WT	KAN99S03-1046WT	KAN99S03-1546WT	KAN99S03-0104GC (pack of 5)

Phase dimension	Column ID [mm]	Column length [mm]		Guard cartridges* with 10 mm length
		150	250	
5 μ m	2	KAN99S05-1502WT	KAN99S05-2502WT	KAN99S05-01Q1GC (pack of 5)
	4.6	KAN99S05-1546WT	KAN99S05-2546WT	KAN99S05-0104GC (pack of 5)
	10	KAN99S05-1510WT	KAN99S05-2510WT	KAN99S05-0110CC (pack of 2)
	20	KAN99S05-1520WX	KAN99S05-2520WX	KAN99S05-0120CC (pack of 2)
	30	KAN99S05-1530WX	KAN99S05-2530WX	KAN99S05-0130CC (pack of 2)
	50	KAN99S05-1553DX	KAN99S05-2553DX	KAN99S05-0553DXG

Alcyon SFC CSP Amylose-C

Phase dimension	Column ID [mm]	Column length [mm]			
		50	100	150	250
3 μ m	2.1	—	—	KAN99S03-15Q1WTS	—
	3	KAN99S03-0503WTS	KAN99S03-1003WTS	KAN99S03-1503WTS	—
	4.6	—	—	KAN99S03-1546WTS	KAN99S03-2546WTS

Phase dimension	Column ID [mm]	Column length [mm]	
		150	250
5 μ m	2.1	KAN99S05-15Q1WTS	—
	4.6	KAN99S05-1546WTS	KAN99S05-2546WTS
	10	—	KAN99S05-2510WTS
	20	—	KAN99S05-2520WTS

*Guard cartridge holder required, part no. XPGCH-Q1 (2.1, 3, 4 mm ID)
 XPCHSPW1 (10 mm ID)
 XPCHSPW2 (20 mm ID)
 XPCHSPW3 (30 mm ID)

*no holder required for 50 mm ID

Ordering Information

CHIRAL ART Amylose-C Neo

Phase dimension	Column ID [mm]	Column length [mm]			Guard cartridges* with 10 mm length
		50	100	150	
3 μ m	2	KBN99S03-0502WT	KBN99S03-1002WT	KBN99S03-1502WT	KBN99S03-01Q1GC (pack of 5)
	3	KBN99S03-0503WT	KBN99S03-1003WT	KBN99S03-1503WT	KBN99S03-0103GC (pack of 5)
	4.6	KBN99S03-0546WT	KBN99S03-1046WT	KBN99S03-1546WT	KBN99S03-0104GC (pack of 5)

Phase dimension	Column ID [mm]	Column length [mm]		Guard cartridges* with 10 mm length
		150	250	
5 μ m	2	KBN99S05-1502WT	KBN99S05-2502WT	KBN99S05-01Q1GC (pack of 5)
	4.6	KBN99S05-1546WT	KBN99S05-2546WT	KBN99S05-0104GC (pack of 5)
	10	KBN99S05-1510WT	KBN99S05-2510WT	KBN99S05-0110CC (pack of 2)
	20	KBN99S05-1520WX	KBN99S05-2520WX	KBN99S05-0120CC (pack of 2)
	30	KBN99S05-1530WX	KBN99S05-2530WX	KBN99S05-0130CC (pack of 2)
	50	KBN99S05-1553DX	KBN99S05-2553DX	KBN99S05-0553DXG

Alcyon SFC CSP Amylose-C Neo

Phase dimension	Column ID [mm]	Column length [mm]			
		50	100	150	250
3 μ m	2.1	—	—	KBN99S03-15Q1WTS	—
	3	KBN99S03-0503WTS	KBN99S03-1003WTS	KBN99S03-1503WTS	—
	4.6	—	—	KBN99S03-1546WTS	KBN99S03-2546WTS

Phase dimension	Column ID [mm]	Column length [mm]	
		150	250
5 μ m	2.1	KBN99S05-15Q1WTS	—
	4.6	KBN99S05-1546WTS	KBN99S05-2546WTS
	10	—	KBN99S05-2510WTS
	20	—	KBN99S05-2520WTS

*Guard cartridge holder required, part no. XPGCH-Q1 (2.1, 3, 4 mm ID)
 XPCHSPW1 (10 mm ID)
 XPCHSPW2 (20 mm ID)
 XPCHSPW3 (30 mm ID)
 *no holder required for 50 mm ID

Ordering Information

CHIRAL ART Cellulose-C

Phase dimension	Column ID [mm]	Column length [mm]			Guard cartridges* with 10 mm length
		50	100	150	
3 μ m	2	KCN99S03-0502WT	KCN99S03-1002WT	KCN99S03-1502WT	KCN99S03-01Q1GC (pack of 5)
	3	KCN99S03-0503WT	KCN99S03-1003WT	KCN99S03-1503WT	KCN99S03-0103GC (pack of 5)
	4.6	KCN99S03-0546WT	KCN99S03-1046WT	KCN99S03-1546WT	KCN99S03-0104GC (pack of 5)

Phase dimension	Column ID [mm]	Column length [mm]		Guard cartridges* with 10 mm length
		150	250	
5 μ m	2	KCN99S05-1502WT	KCN99S05-2502WT	KCN99S05-01Q1GC (pack of 5)
	4.6	KCN99S05-1546WT	KCN99S05-2546WT	KCN99S05-0104GC (pack of 5)
	10	KCN99S05-1510WT	KCN99S05-2510WT	KCN99S05-0110CC (pack of 2)
	20	KCN99S05-1520WX	KCN99S05-2520WX	KCN99S05-0120CC (pack of 2)
	30	KCN99S05-1530WX	KCN99S05-2530WX	KCN99S05-0130CC (pack of 2)
	50	KCN99S05-1553DX	KCN99S05-2553DX	KCN99S05-0553DXG

Alcyon SFC CSP Cellulose-C

Phase dimension	Column ID [mm]	Column length [mm]			
		50	100	150	250
3 μ m	2.1	—	—	KCN99S03-15Q1WTS	—
	3	KCN99S03-0503WTS	KCN99S03-1003WTS	KCN99S03-1503WTS	—
	4.6	—	—	KCN99S03-1546WTS	KCN99S03-2546WTS

Phase dimension	Column ID [mm]	Column length [mm]	
		150	250
5 μ m	2.1	KCN99S05-15Q1WTS	—
	4.6	KCN99S05-1546WTS	KCN99S05-2546WTS
	10	—	KCN99S05-2510WTS
	20	—	KCN99S05-2520WTS

*Guard cartridge holder required, part no. XPGCH-Q1 (2.1, 3, 4 mm ID)
 XPCHSPW1 (10 mm ID)
 XPCHSPW2 (20 mm ID)
 XPCHSPW3 (30 mm ID)
 *no holder required for 50 mm ID

Ordering Information

CHIRAL ART Amylose-SA

Phase dimension	Column ID [mm]	Column length [mm]			Guard cartridges* with 10 mm length
		50	100	150	
3 μ m	2	KSA99S03-0502WT	KSA99S03-1002WT	KSA99S03-1502WT	KSA99S03-01Q1GC (pack of 5)
	3	KSA99S03-0503WT	KSA99S03-1003WT	KSA99S03-1503WT	KSA99S03-0103GC (pack of 5)
	4.6	KSA99S03-0546WT	KSA99S03-1046WT	KSA99S03-1546WT	KSA99S03-0104GC (pack of 5)

Phase dimension	Column ID [mm]	Column length [mm]		Guard cartridges* with 10 mm length
		150	250	
5 μ m	2	KSA99S05-1502WT	KSA99S05-2502WT	KSA99S05-01Q1GC (pack of 5)
	4.6	KSA99S05-1546WT	KSA99S05-2546WT	KSA99S05-0104GC (pack of 5)
	10	KSA99S05-1510WT	KSA99S05-2510WT	KSA99S05-0110CC (pack of 2)
	20	KSA99S05-1520WX	KSA99S05-2520WX	KSA99S05-0120CC (pack of 2)
	30	KSA99S05-1530WX	KSA99S05-2530WX	KSA99S05-0130CC (pack of 2)
	50	KSA99S05-2553DX	KSA99S05-2553DX	KSA99S05-0553DXG

Alcyon SFC CSP Amylose-SA

Phase dimension	Column ID [mm]	Column length [mm]			
		50	100	150	250
3 μ m	2.1	—	—	KSA99S03-15Q1WTS	—
	3	KSA99S03-0503WTS	KSA99S03-1003WTS	KSA99S03-1503WTS	—
	4.6	—	—	KSA99S03-1546WTS	KSA99S03-2546WTS

Phase dimension	Column ID [mm]	Column length [mm]	
		150	250
5 μ m	2.1	KSA99S05-15Q1WTS	—
	4.6	KSA99S05-1546WTS	KSA99S05-2546WTS
	10	—	KSA99S05-2510WTS
	20	—	KSA99S05-2520WTS

*Guard cartridge holder required, part no. XPGCH-Q1 (2.1, 3, 4 mm ID)
 XPCHSPW1 (10 mm ID)
 XPCHSPW2 (20 mm ID)
 XPCHSPW3 (30 mm ID)
 *no holder required for 50 mm ID

Ordering Information

CHIRAL ART Cellulose-SB

Phase dimension	Column ID [mm]	Column length [mm]			Guard cartridges* with 10 mm length
		50	100	150	
3 μ m	2	KSB99S03-0502WT	KSB99S03-1002WT	KSB99S03-1502WT	KSB99S03-01Q1GC (pack of 5)
	3	KSB99S03-0503WT	KSB99S03-1003WT	KSB99S03-1503WT	KSB99S03-0103GC (pack of 5)
	4.6	KSB99S03-0546WT	KSB99S03-1046WT	KSB99S03-1546WT	KSB99S03-0104GC (pack of 5)

Phase dimension	Column ID [mm]	Column length [mm]		Guard cartridges* with 10 mm length
		150	250	
5 μ m	2	KSB99S05-1502WT	KSB99S05-2502WT	KSB99S05-01Q1GC (pack of 5)
	4.6	KSB99S05-1546WT	KSB99S05-2546WT	KSB99S05-0104GC (pack of 5)
	10	KSB99S05-1510WT	KSB99S05-2510WT	KSB99S05-0110CC (pack of 2)
	20	KSB99S05-1520WX	KSB99S05-2520WX	KSB99S05-0120CC (pack of 2)
	30	KSB99S05-1530WX	KSB99S05-2530WX	KSB99S05-0130CC (pack of 2)
	50	KSB99S05-1553DX	KSB99S05-2553DX	KSB99S05-0553DXG

Alcyon SFC CSP Cellulose-SB

Phase dimension	Column ID [mm]	Column length [mm]			
		50	100	150	250
3 μ m	2.1	—	—	KSB99S03-15Q1WTS	—
	3	KSB99S03-0503WTS	KSB99S03-1003WTS	KSB99S03-1503WTS	—
	4.6	—	—	KSB99S03-1546WTS	KSB99S03-2546WTS

Phase dimension	Column ID [mm]	Column length [mm]	
		150	250
5 μ m	2.1	KSB99S05-15Q1WTS	—
	4.6	KSB99S05-1546WTS	KSB99S05-2546WTS
	10	—	KSB99S05-2510WTS
	20	—	KSB99S05-2520WTS

*Guard cartridge holder required, part no. XPGCH-Q1 (2.1, 3, 4 mm ID)
 XPCHSPW1 (10 mm ID)
 XPCHSPW2 (20 mm ID)
 XPCHSPW3 (30 mm ID)
 *no holder required for 50 mm ID

Ordering Information

CHIRAL ART Cellulose-SC

Phase dimension	Column ID [mm]	Column length [mm]			Guard cartridges* with 10 mm length
		50	100	150	
3 μ m	2	KSC99S03-0502WT	KSC99S03-1002WT	KSC99S03-1502WT	KSC99S03-01Q1GC (pack of 5)
	3	KSC99S03-0503WT	KSC99S03-1003WT	KSC99S03-1503WT	KSC99S03-0103GC (pack of 5)
	4.6	KSC99S03-0546WT	KSC99S03-1046WT	KSC99S03-1546WT	KSC99S03-0104GC (pack of 5)

Phase dimension	Column ID [mm]	Column length [mm]		Guard cartridges* with 10 mm length
		150	250	
5 μ m	2	KSC99S05-1502WT	KSC99S05-2502WT	KSC99S05-01Q1GC (pack of 5)
	4.6	KSC99S05-1546WT	KSC99S05-2546WT	KSC99S05-0104GC (pack of 5)
	10	KSC99S05-1510WT	KSC99S05-2510WT	KSC99S05-0110CC (pack of 2)
	20	KSC99S05-1520WX	KSC99S05-2520WX	KSC99S05-0120CC (pack of 2)
	30	KSC99S05-1530WX	KSC99S05-2530WX	KSC99S05-0130CC (pack of 2)
	50	KSC99S05-1553DX	KSC99S05-2553DX	KSC99S05-0553DXG

Alcyon SFC CSP Cellulose-SC

Phase dimension	Column ID [mm]	Column length [mm]			
		50	100	150	250
3 μ m	2.1	—	—	KSC99S03-15Q1WTS	—
	3	KSC99S03-0503WTS	KSC99S03-1003WTS	KSC99S03-1503WTS	—
	4.6	—	—	KSC99S03-1546WTS	KSC99S03-2546WTS

Phase dimension	Column ID [mm]	Column length [mm]	
		150	250
5 μ m	2.1	KSC99S05-15Q1WTS	—
	4.6	KSC99S05-1546WTS	KSC99S05-2546WTS
	10	—	KSC99S05-2510WTS
	20	—	KSC99S05-2520WTS

*Guard cartridge holder required, part no. XPGCH-Q1 (2.1, 3, 4 mm ID)
 XPCHSPW1 (10 mm ID)
 XPCHSPW2 (20 mm ID)
 XPCHSPW3 (30 mm ID)
 *no holder required for 50 mm ID

Ordering Information

CHIRAL ART Cellulose-SJ

Phase dimension	Column ID [mm]	Column length [mm]			Guard cartridges* with 10 mm length
		50	100	150	
3 μ m	2	KSJ99S03-0502WT	KSJ99S03-1002WT	KSJ99S03-1502WT	KSJ99S03-01Q1GC (pack of 5)
	3	KSJ99S03-0503WT	KSJ99S03-1003WT	KSJ99S03-1503WT	KSJ99S03-0103GC (pack of 5)
	4.6	KSJ99S03-0546WT	KSJ99S03-1046WT	KSJ99S03-1546WT	KSJ99S03-0104GC (pack of 5)

Phase dimension	Column ID [mm]	Column length [mm]		Guard cartridges* with 10 mm length
		150	250	
5 μ m	2	KSJ99S05-1502WT	KSJ99S05-2502WT	KSJ99S03-01Q1GC (pack of 5)
	4.6	KSJ99S05-1546WT	KSJ99S05-2546WT	KSJ99S03-0104GC (pack of 5)
	10	KSJ99S05-1510WT	KSJ99S05-2510WT	KSJ99S05-0110CC (pack of 2)
	20	KSJ99S05-1520WX	KSJ99S05-2520WX	KSJ99S05-0120CC (pack of 2)
	30	KSJ99S05-1530WX	KSJ99S05-2530WX	KSJ99S05-0130CC (pack of 2)
	50	KSJ99S05-1553DX	KSJ99S05-2553DX	KSJ99S05-0553DXG

Alcyon SFC CSP Cellulose-SJ

Phase dimension	Column ID [mm]	Column length [mm]			
		50	100	150	250
3 μ m	2.1	—	—	KSJ99S03-15Q1WTS	—
	3	KSJ99S03-0503WTS	KSJ99S03-1003WTS	KSJ99S03-1503WTS	—
	4.6	—	—	KSJ99S03-1546WTS	KSJ99S03-2546WTS

Phase dimension	Column ID [mm]	Column length [mm]	
		150	250
5 μ m	2.1	KSJ99S05-15Q1WTS	-
	4.6	KSJ99S05-1546WTS	KSJ99S05-2546WTS
	10	-	KSJ99S05-2510WTS
	20	-	KSJ99S05-2520WTS

*Guard cartridge holder required, part no. XPGCH-Q1 (2.1, 3, 4 mm ID)
 XPCHSPW1 (10 mm ID)
 XPCHSPW2 (20 mm ID)
 XPCHSPW3 (30 mm ID)

*no holder required for 50 mm ID

Ordering Information

Normal Phase: YMC CHIRAL NEA(R)(S)

Phase dimension	Column ID [mm]	Column length [mm]				Guard cartridges* with 10 mm length [pack of 5]
		50	100	150	250	
30 nm 5 µm NEA(R)	4.6	CR30S05-0546WT	CR30S05-1046WT	CR30S05-1546WT	CR30S05-2546WT	CR30S05-0104GC
30 nm 5 µm NEA(S)	4.6	CS30S05-0546WT	CS30S05-1046WT	CS30S05-1546WT	CS30S05-2546WT	CS30S05-0104GC

*Guard cartridge holder required, part no. XPGCH-Q1

Reversed Phase: YMC CHIRAL NEA(R)(S)

Phase dimension	Column ID [mm]	Column length [mm]				Guard cartridges* with 10 mm length [pack of 5]
		50	100	150	250	
30 nm 5 µm NEA(R)	4.6	NR30S05-0546WT	NR30S05-1046WT	NR30S05-1546WT	NR30S05-2546WT	NR30S05-0104GC
30 nm 5 µm NEA(S)	4.6	NS30S05-0546WT	NS30S05-1046WT	NS30S05-1546WT	NS30S05-2546WT	NS30S05-0104GC

*Guard cartridge holder required, part no. XPGCH-Q1

a-CD BR: YMC CHIRAL CD BR

Phase dimension	Column ID [mm]	Column length [mm]				Guard cartridges* with 10 mm length [pack of 5]
		50	100	150	250	
12 nm 5 µm	4.6	DA12S05-0546WT	—	DA12S05-1546WT	DA12S05-2546WT	DA12S05-0104GC

*Guard cartridge holder required, part no. XPGCH-Q1

b-CD BR: YMC CHIRAL CD BR

Phase dimension	Column ID [mm]	Column length [mm]				Guard cartridges* with 10 mm length [pack of 5]
		50	100	150	250	
12 nm 5 µm	4.6	DB12S05-0546WT	—	DB12S05-1546WT	DB12S05-2546WT	DB12S05-0104GC

*Guard cartridge holder required, part no. XPGCH-Q1

g-CD BR: YMC CHIRAL CD BR

Phase dimension	Column ID [mm]	Column length [mm]				Guard cartridges* with 10 mm length [pack of 5]
		50	100	150	250	
12 nm 5 µm	4.6	DG12S05-0546WT	—	DG12S05-1546WT	DG12S05-2546WT	DG12S05-0104GC

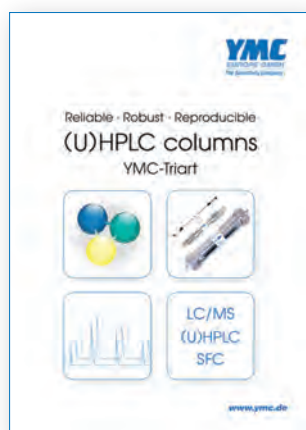
*Guard cartridge holder required, part no. XPGCH-Q1

Several other dimensions or particle sizes available. Check www.ymc.de/chiral-columns.html

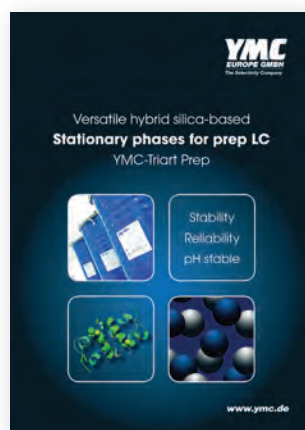
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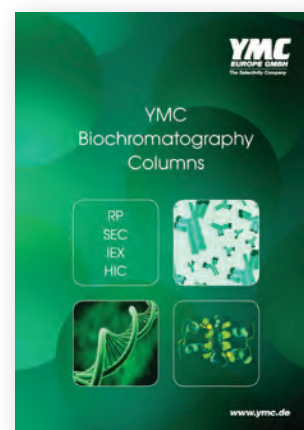
Other Brochures Available



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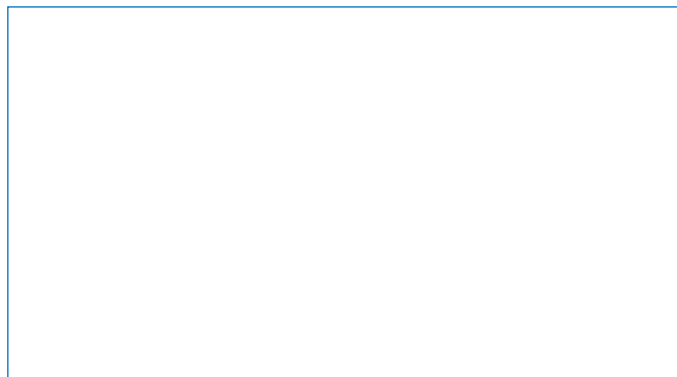


YMC-Triart Prep



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