High Performance Immobilized Chiral Column

DAICEL
The Best Solution for You

iCHIRAL-6

CHIRALPAK® IA-3 / IA
CHIRALPAK® IB-3 / IB
CHIRALPAK® IC-3 / IC
CHIRALPAK® ID-3 / ID
CHIRALPAK® IE-3 / IE
CHIRALPAK® IF-3 / IF

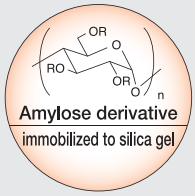
DAICEL CORPORATION

CHIRAL SELECTOR

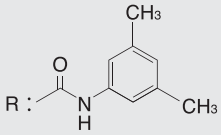
CHIRALPAK® IA-3/IA

Immobilized type column of CHIRALPAK® AD-H

CHIRALPAK® IA-3/IA are a polysaccharide-based column, immobilizing "amylose tris (3,5-dimethylphenylcarbamate)" to silica gel.



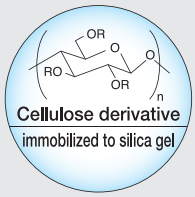
Amylose tris-
(3,5-dimethylphenylcarbamate)
immobilized to silica gel



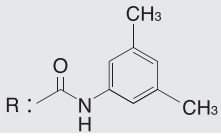
CHIRALPAK® IB-3/IB

Immobilized type column of CHIRALCEL® OD-H

CHIRALPAK® IB-3/IB are a polysaccharide-based column, immobilizing "cellulose tris (3,5-dimethylphenylcarbamate)" to silica gel.

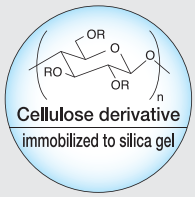


Cellulose tris-
(3,5-dimethylphenylcarbamate)
immobilized to silica gel

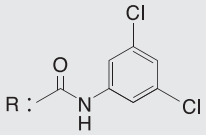


CHIRALPAK® IC-3/IC

CHIRALPAK® IC-3/IC are a polysaccharide-based column, immobilizing "cellulose tris (3,5-dichlorophenylcarbamate)" to silica gel.

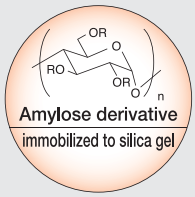


Cellulose tris-
(3,5-dichlorophenylcarbamate)
immobilized to silica gel

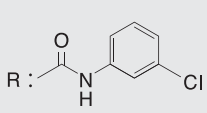


CHIRALPAK® ID-3/ID

CHIRALPAK® ID-3/ID are a polysaccharide-based column, immobilizing "amylose tris (3-chlorophenylcarbamate)" to silica gel.

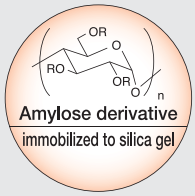


Amylose tris-
(3-chlorophenylcarbamate)
immobilized to silica gel

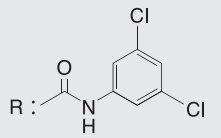


CHIRALPAK® IE-3/IE

CHIRALPAK® IE-3/IE are a polysaccharide-based column, immobilizing "amylose tris (3,5-dichlorophenylcarbamate)" to silica gel.

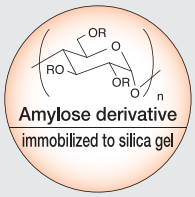


Amylose tris-
(3,5-dichlorophenylcarbamate)
immobilized to silica gel

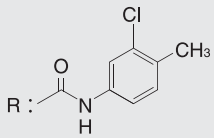


CHIRALPAK® IF-3/IF

CHIRALPAK® IF-3/IF are a polysaccharide-based column, immobilizing "amylose tris (3-chloro-4-methylphenylcarbamate)" to silica gel.



Amylose tris
(3-chloro-4-methylphenylcarbamate))
immobilized to silica gel



Reference Literature

CHIRALPAK® IA

Solvent versatility of immobilized 3,5-dimethylphenylcarbamate of amylose in enantiomeric separations by HPLC
Journal of Chromatography A, 1075(2005) 65-75

CHIRALPAK® IB

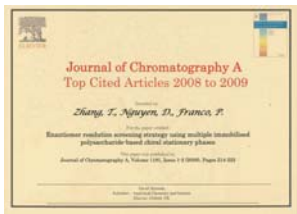
Cellulose 3,5-dimethylphenylcarbamate immobilized on silica : A new chiral stationary phase for the analysis of enantiomers
Analytica Chimica Acta 557(2006) 221-228

CHIRALPAK® IC

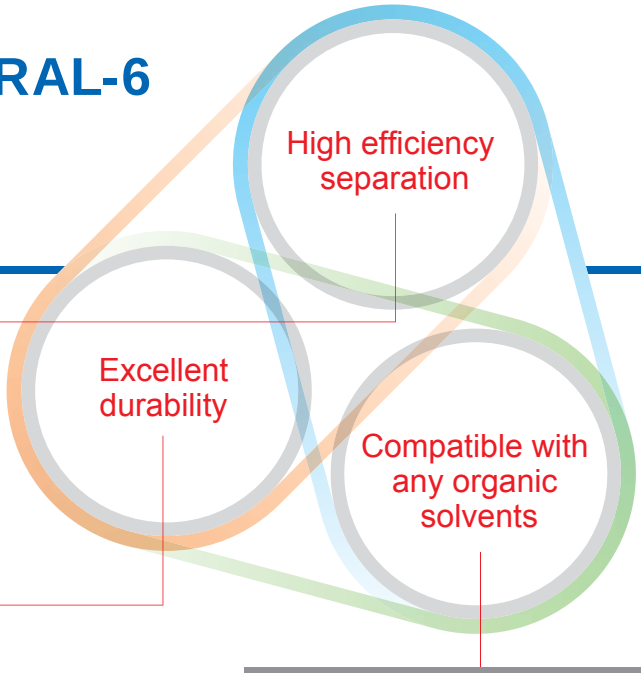
Cellulose tris(3,5-dichlorophenylcarbamate) immobilised on silica : A novel chiral stationary phase for resolution of enantiomers
Journal of Pharmaceutical and Biomedical Analysis 46(2008) 882-891

Screening with immobilized type columns

Common approaches for efficient method development with immobilised polysaccharide-derived chiral stationary phases
Journal of Chromatography B, 875(2008) 48-56
Enantiomer resolution screening strategy using multiple immobilised polysaccharide-based chiral stationary phases
Journal of Chromatography A, 1191(2008) 214-222



High resolution of *i*CHIRAL-6



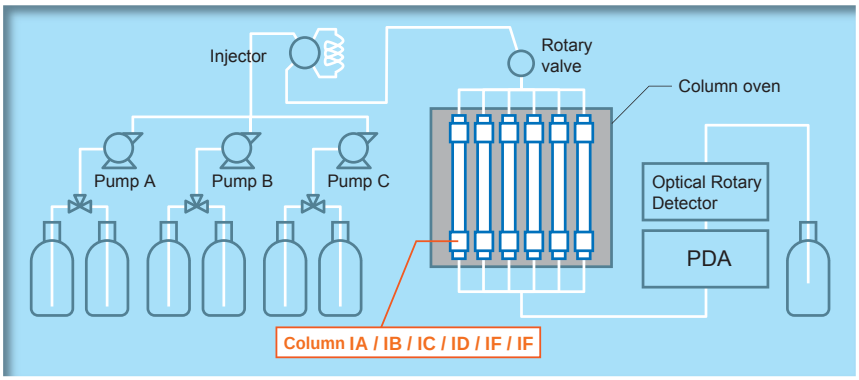
***i*CHIRAL-6** (CHIRALPAK® IA/IB/IC/ID/IE/IF) are complementary Chiral columns, which possess high resolution.
All of product grade is prepared for 3 µm CSP, so that the resolution can be improved.

***i*CHIRAL-6** are polysaccharide-based columns immobilized to silica gel, which possess the durability against alcohol/ether/ester/ halogen etc. solvent. Hence, the direct dilution of reaction mixture with mobile phase is possible. (Please see P5)

***i*CHIRAL-6** allow chromatographers to use essentially any organic solvent as mobile phases to develop the most challenging chiral separations. The productivity can be improved due to the selction of high-soluble solvent for the sample.

Example of column screening system

***i*CHIRAL-6** (CHIRALPAK® IA/IB/IC/ID/IE/IF) are complementary chiral columns, which possess high resolution.
You can find the suitable column for your compound over a short time, due to the addition of column changer to your HPLC system.



***i*CHIRAL-6** are immobilized type columns, and compatible with any organic miscible solvent combinations as mobile phase.
You can easily try various analytical conditions through the column screening system.

[Recommended mobile phase]

Primary screening condition

	1	2	3	4
Typical starting conditions	n-Hexane/IPA=80/20(v/v)	n-Hexane/EtOH=80/20(v/v)	MTBE/EtOH=98/2(v/v)	n-Hexane/CH_2Cl_2=50/50(v/v)
Advised optimization range	99/1 - 50/50(v/v)	99/1 - 50/50(v/v)	60/40 - 100/0(v/v)	85/15 - 0/100(v/v)

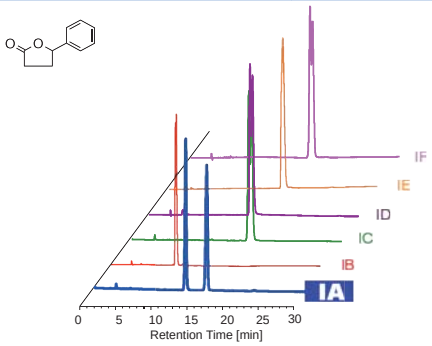
Secondary screening condition

	1	2	3	4	5
Typical starting conditions	n-Hexane/THF =70/30(v/v)	n-Hexane/Ethyl acetate =50/50(v/v)	n-Hexane/$CHCl_3$ =30/70(v/v)	CH_3CN/Alcohol (orTHF)=100/0(v/v)	MeOH/Another Alcohol =100/0(v/v)
Advised optimization range	95/5 - 0/100(v/v)	80/20 - 0/100(v/v)	85/15 - 0/100(v/v)	80/20 - 100/0(v/v)	0/100 - 100/0(v/v) : EtOH, IPA

High efficiency separation

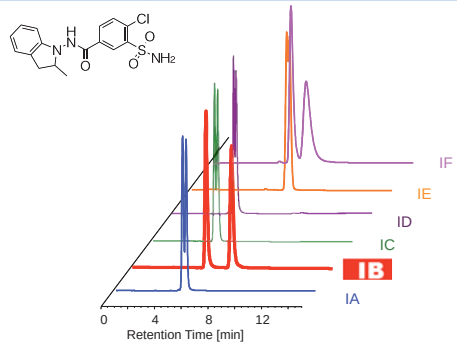
***i*CHIRAL-6** are immobilized choral columns, which possess high resolution.
The chiral selector of IA/IB/IC/ID/IE/IF possess each strong field for the resolution of compounds.
About 93% of success rate can be achieved by iCHIRAL-6 based on the result of 123 samples at our laboratory.

γ-Phenyl-γ-butyrolactone



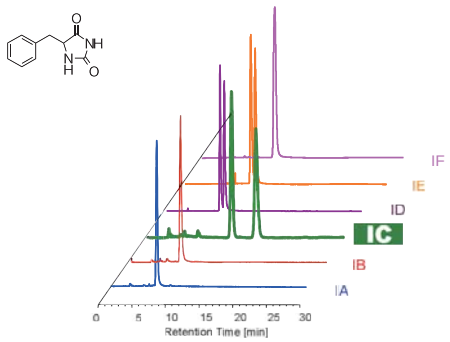
Column size : 4.6mmI.D.×250mmL
Mobile phase : n-Hexane/EtOH=90/10(v/v)
Flow rate : 1.0ml/min.
Temperture : 25°C
Detection : UV220nm

Indapamide



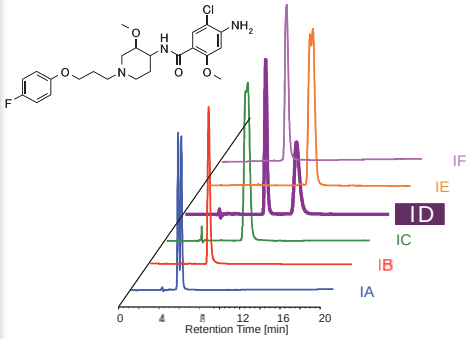
Column size : 4.6mmI.D.×250mmL
Mobile phase : n-Hexane/EtOH/DEA=50/50/0.1(v/v/v)
Flow rate : 1.0ml/min.
Temperture : 25°C
Detection : UV254nm

5-Benzylhydantoin



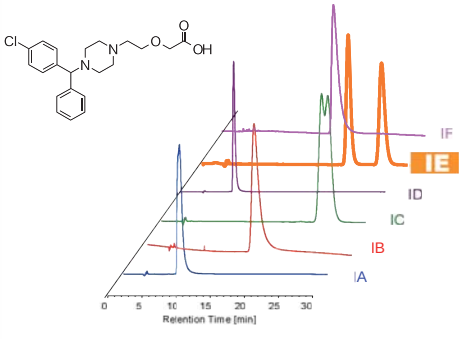
Column size : 4.6mmI.D.×250mmL
Mobile phase : n-Hexane/IPA=80/20(v/v)
Flow rate : 1.0ml/min.
Temperture : 25°C
Detection : UV220nm

Cisapiride



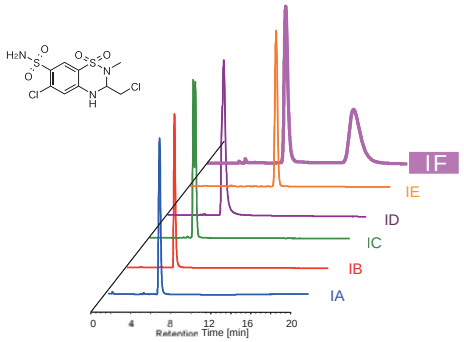
Column size : 4.6mmI.D.×250mmL
Mobile phase : n-Hexane/IPA/DEA=50/50/0.1(v/v/v)
Flow rate : 1.0ml/min.
Temperture : 25°C
Detection : UV254nm

Cetirizine

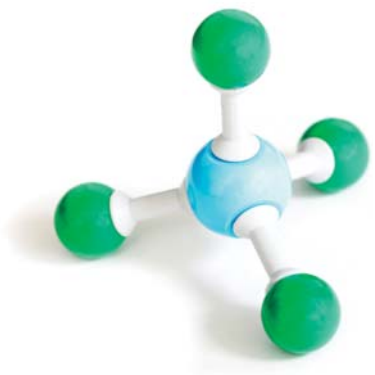


Column size : 4.6mmI.D.×250mmL
Mobile phase : n-Hexane/EtOH/AcOH/DEA=50/50/0.1/0.1(v/v/v/v)
Flow rate : 1.0ml/min.
Temperture : 25°C
Detection : UV230nm

Methyclothiazide

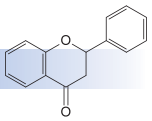


Column size : 4.6mmI.D.×250mmL
Mobile phase : n-Hexane/EtOH/DEA=50/50/0.1(v/v/v)
Flow rate : 1.0ml/min.
Temperture : 25°C
Detection : UV230nm

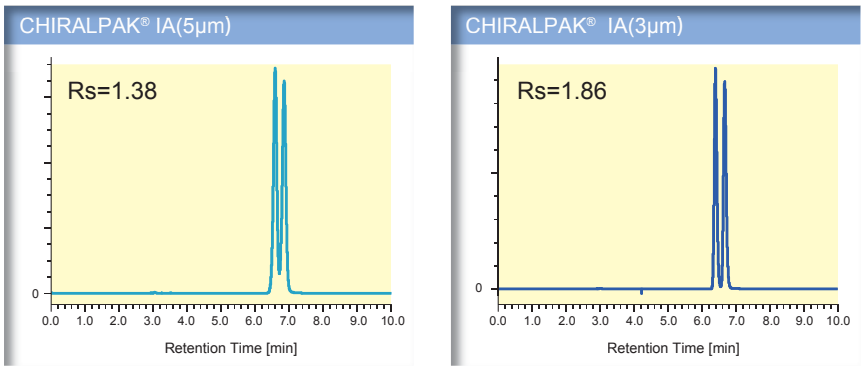


The partial separation can be improved to the baseline separation by using 3 μm CSP.

Application of Flavanone



Column size : 4.6mmI.D.×250mmL
Mobile phase : n-Hexane/IPA=90/10(v/v)
Flow rate : 1.0 mL/min.
Temperature : 25°C

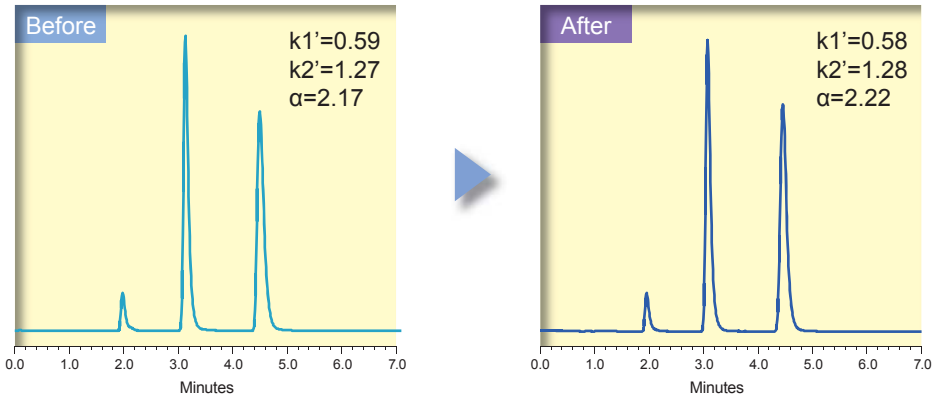


Excellent durability

All kinds of solvents usable for ODS chromatography can be used for iCHIRAL-6 as mobile phase.
No concern for damage caused by use of prohibited solvents due to misconduct.
Able to use the most appropriate solvent for the sample.

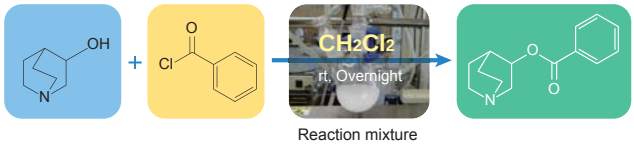
Durability test with CHIRALPAK ID

Measurement of trans-Stibene oxide before and after flow of THF, 256hours, 0.5ml/min, 40°C. (n-Hexane/IPA/=90/10, 1.0ml/min., 254mn, 25°C)

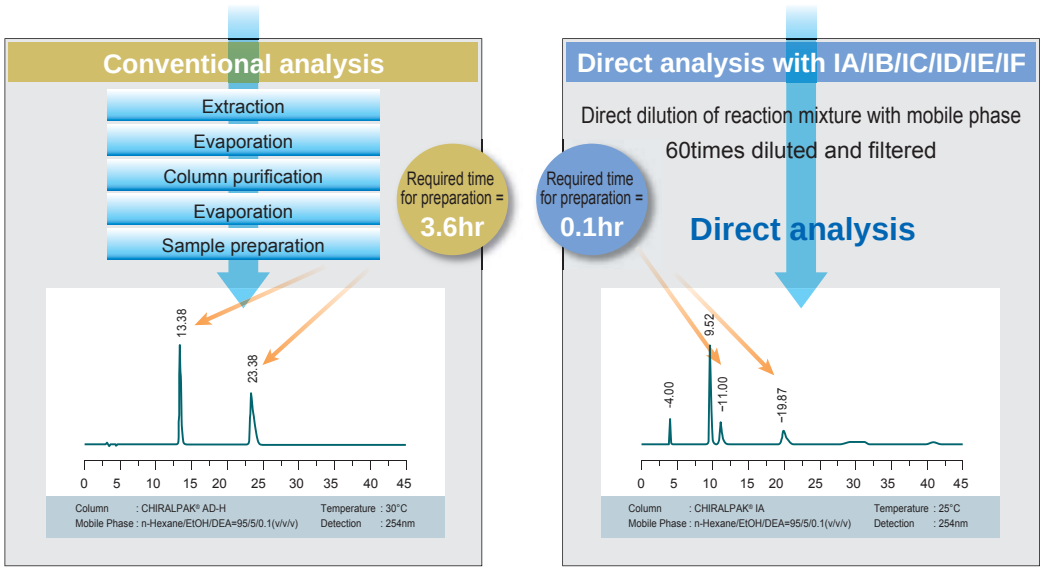


Usage example

You can save the work and the time for sample preparation due to the direct analysis from the organic miscible solvent combination.



Reaction mixture

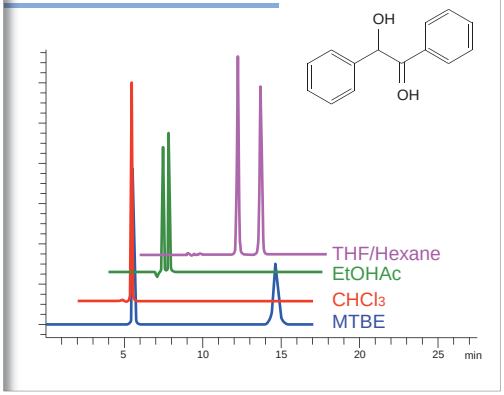


Compatible with any organic solvents

***i*CHIRAL-6** is immobilized chiral columns, which are compatible with any organic solvents. You can get more possibilities for success baseline separation because of the wide range of solvents mixtures.

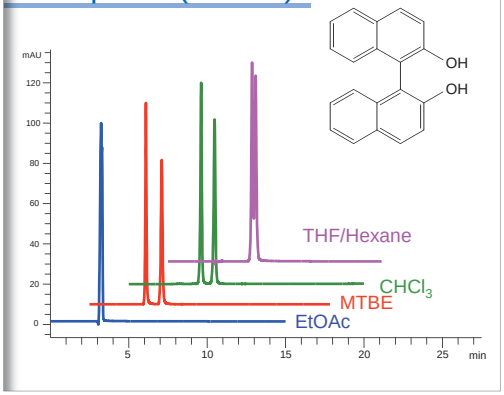
CHIRALPAK® IA

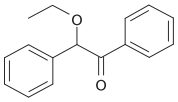
Benzoin



CHIRALPAK® IA

Binaphthol(BINOL)





Benzoin ethyl ether

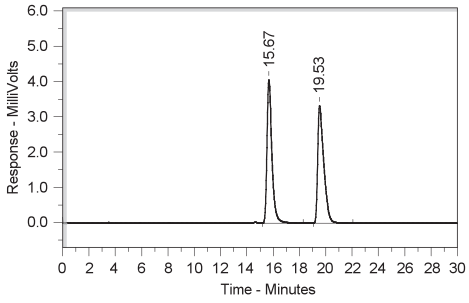
Productivity comparison between coated-type and immobilized-type

CHIRALPAK® AD-H

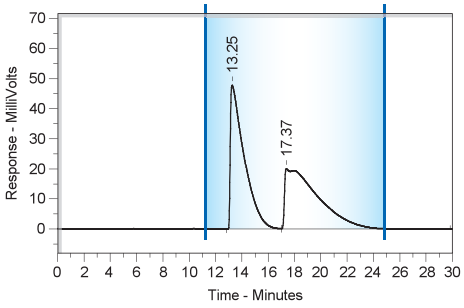
(4.6mmI.D.×250mmL)

Mobile phase : n-Hexane/IPA=200/1(v/v)

Normal injection volume for the analysis



Max injection volume of the analytical column



Flow rate : 1.0mL/min.
Temperature : 40°C

Injection volume : **0.47mg**
(47.0 mg / ml (Mobile phase), 10 ml)

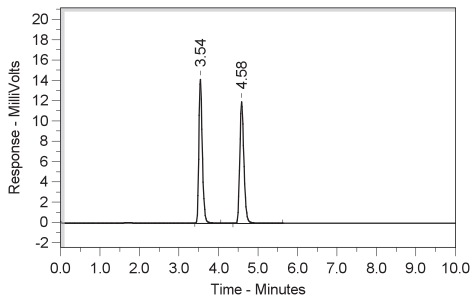
Injection cycle : **14min**

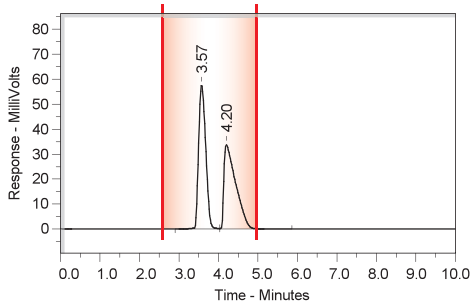
Productivity : **1.0mg/hr**

CHIRALPAK® IA

(4.6mmI.D.×250mmL)

Mobile phase : n-Hexane/EtOAc=40/60(v/v)





Injection volume : **16.4mg**
(656 mg / ml (Mobile phase), 25 ml)

Injection cycle : **2.5min**

Productivity : **196.8mg/hr**

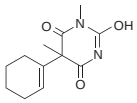
Approx 200 times

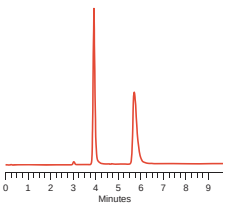
CHIRALPAK® IA

Hexobarbital

Conditions

Column : CHIRALPAK® IA 4.6mm I.D.×250mmL
Mobile Phase : **MTBE 100%**
Flow rate : 1.0ml/min.
Temperature : 25°C
Detection : UV230nm

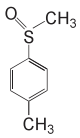


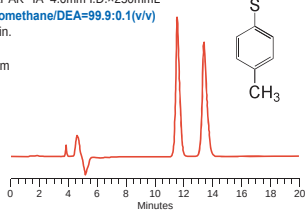


Methyl p-tolyl-sulfoxide

Conditions

Column : CHIRALPAK® IA 4.6mm I.D.×250mmL
Mobile Phase : **Dichloromethane/DEA=99.9:0.1(v/v)**
Flow rate : 1.0ml/min.
Temperature : 25°C
Detection : UV254nm

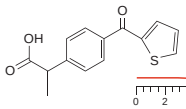


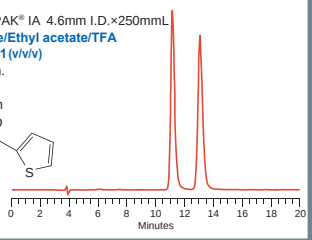


Suprofen

Conditions

Column : CHIRALPAK® IA 4.6mm I.D.×250mmL
Mobile Phase : **n-Hexane/Ethyl acetate/TFA =70/30/0.1 (v/v/v)**
Flow rate : 1.0ml/min.
Temperature : 25°C
Detection : UV254nm



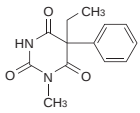


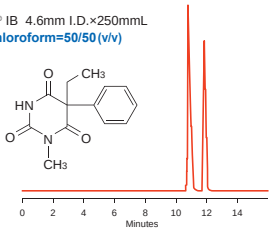
CHIRALPAK® IB

Mephobarbital

Conditions

Column : CHIRALPAK® IB 4.6mm I.D.×250mmL
Mobile Phase : **n-Hexane/Chloroform=50/50 (v/v)**
Flow rate : 1.0ml/min.
Temperature : 25°C
Detection : ELSD

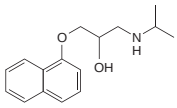


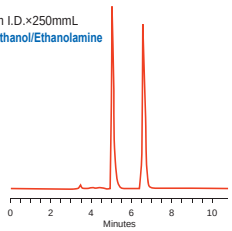


Propranolol

Conditions

Column : CHIRALPAK® IB 4.6mm I.D.×250mmL
Mobile Phase : **n-Hexane/Ethyl acetate/Ethanol/Ethanolamine =50/50/2/0.1(v/v/v/v)**
Flow rate : 1.0ml/min.
Temperature : 25°C
Detection : UV270nm

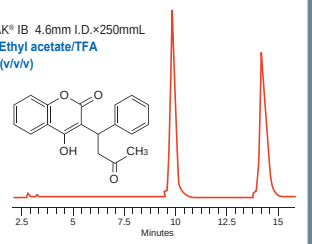




Warfarin

Conditions

Column : CHIRALPAK® IB 4.6mm I.D.×250mmL
Mobile Phase : **n-Hexane/Ethyl acetate/TFA =70/30/0.1 (v/v/v)**
Flow rate : 1.0ml/min.
Temperature : 25°C
Detection : UV200nm

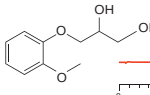


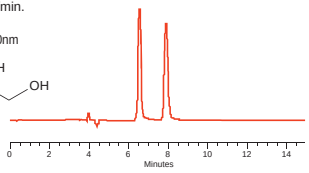
CHIRALPAK® IC

Guaifenesin

Conditions

Column : CHIRALPAK® IC 4.6mm I.D.×250mmL
Mobile Phase : **n-Hexane/Ethanol/DEA=80/20/0.1 (v/v/v)**
Flow rate : 1.5ml/min.
Temperature : 27°C
Detection : UV230nm

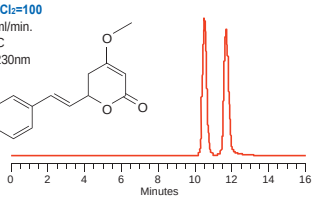




Kavain

Conditions

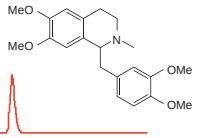
Column : CHIRALPAK® IC 4.6mm I.D.×250mmL
Mobile Phase : **CH_2Cl_2=100**
Flow rate : 1.0ml/min.
Temperature : 25°C
Detection : UV230nm

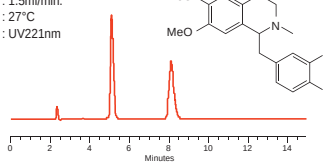


Laudanosine

Conditions

Column : CHIRALPAK® IC 4.6mm I.D.×250mmL
Mobile Phase : **MeOH/DEA=100/0.1(v/v)**
Flow rate : 1.5ml/min.
Temperature : 27°C
Detection : UV221nm



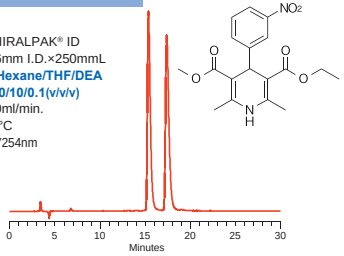


CHIRALPAK® ID

Nitrendipine

Conditions

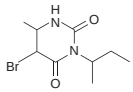
Column : CHIRALPAK® ID 4.6mm I.D.×250mmL
Mobile Phase : **n-Hexane/THF/DEA =90/10/0.1(v/v/v)**
Flow rate : 1.0ml/min.
Temperature : 25°C
Detection : UV254nm

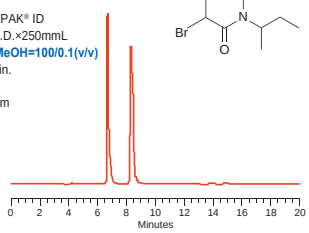


Bromacil

Conditions

Column : CHIRALPAK® ID 4.6mm I.D.×250mmL
Mobile Phase : **MTBE/MeOH=100/0.1(v/v)**
Flow rate : 1.0ml/min.
Temperature : 25°C
Detection : UV254nm

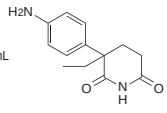


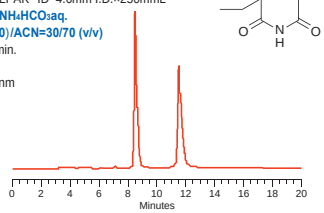


Aminoglutethimide

Conditions

Column : CHIRALPAK® ID 4.6mm I.D.×250mmL
Mobile Phase : **20mM NH_4HCO_3aq. (pH=9.0)/ACN=30/70 (v/v)**
Flow rate : 0.5ml/min.
Temperature : 25°C
Detection : UV254nm



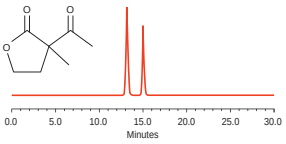


CHIRALPAK® IE

α-Acetyl-α-methyl-γ-butyrolactone

Conditions

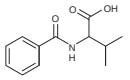
Column : CHIRALPAK® IE 4.6mm I.D.×250mmL
Mobile Phase : **n-Hexane/EtOH=80/20(v/v)**
Flow rate : 1.0ml/min.
Temperature : 25°C
Detection : UV220nm

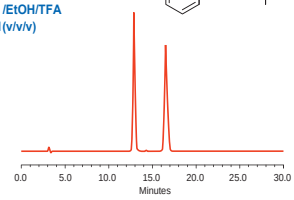


Bz-Valine

Conditions

Column : CHIRALPAK® IE 4.6mm I.D.×250mmL
Mobile Phase : **n-Hexane /EtOH/TFA =90/10/0.1(v/v/v)**
Flow rate : 1.0ml/min.
Temperature : 25°C
Detection : UV254nm

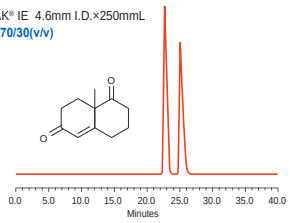




Wieland-Miescher ketone

Conditions

Column : CHIRALPAK® IE 4.6mm I.D.×250mmL
Mobile Phase : **H_2O/ACN=70/30(v/v)**
Flow rate : 0.5ml/min.
Temperature : 25°C
Detection : UV254nm

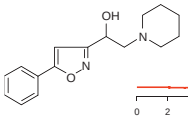


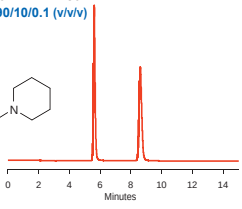
CHIRALPAK® IF

Perisoxal

Conditions

Column : CHIRALPAK® IF 4.6mm I.D.×250mmL
Mobile Phase : **MTBE/EtOH/TFA=90/10/0.1 (v/v/v)**
Flow rate : 1.0ml/min.
Temperature : 25°C
Detection : UV254nm

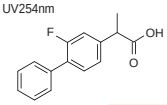


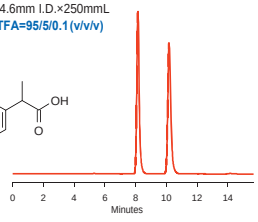


Flurbiprofen

Conditions

Column : CHIRALPAK® IF 4.6mm I.D.×250mmL
Mobile Phase : **n-Hexane/EtOH/TFA=95/5/0.1 (v/v/v)**
Flow rate : 1.0ml/min.
Temperature : 25°C
Detection : UV254nm

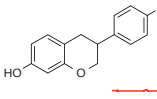


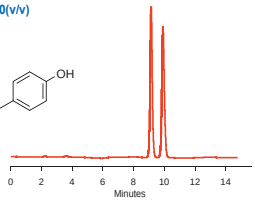


Equol

Conditions

Column : CHIRALPAK® IF 4.6mm I.D.×250mmL
Mobile Phase : **H_2O/ACN=60/40(v/v)**
Flow rate : 0.5ml/min.
Temperature : 25°C
Detection : UV220nm





*i*CHIRAL-6

*i*CHIRAL-6 for HPLC

	ID (mm)	Length (mm)	Particle size (μm)	Part Number CHIRALPAK® IA-3	CHIRALPAK® IB-3	CHIRALPAK® IC-3	CHIRALPAK® ID-3	CHIRALPAK® IE-3	CHIRALPAK® IF-3
Narrow bore type	2.1	150	3	80594	81594	83594	84594	85594	86594
	2.1	250	3	80595	81595	83595	84595	85595	86595
Analytical column	4.6	50	3	80522	81522	83522	84522	85522	86522
	4.6	100	3	80523	81523	83523	84523	85523	86523
	4.6	150	3	80524	81524	83524	84524	85524	86524
	4.6	250	3	80525	81525	83525	84525	85525	86525
Guard cartridge for analytical column *1,2	4	10	3	80511	81511	83511	84511	85511	86511

	ID (mm)	Length (mm)	Particle size (μm)	Part Number CHIRALPAK® IA	CHIRALPAK® IB	CHIRALPAK® IC	CHIRALPAK® ID	CHIRALPAK® IE	CHIRALPAK® IF
Narrow bore type	2.1	150	5	80394	81394	83394	84394	85394	86394
	2.1	250	5	80395	81395	83395	84395	85395	86395
Analytical column	4.6	150	5	80324	81324	83324	84324	85324	86324
	4.6	250	5	80325	81325	83325	84325	85325	86325
Guard column for semi-prep column	10	20	5	80337	81337	83337	84337	85337	86337
Semi-prep column	10	250	5	80335	81335	83335	84335	85335	86335
	20	250	5	80345	81345	83345	84345	85345	86345
Guard cartridge for analytical column *1,2	4	10	5	80311	81311	83311	84311	85311	86311
Prep column	50	500	20	80256	—	83256	—	—	—
Guard column for prep column	50	100	20	80253	—	83253	—	—	—

*1 : 3pcs/set *2 : You need guard cartridge holder when using guard cartridge.

*i*CHIRAL-6 for SFC

	ID (mm)	Length (mm)	Particle size (μm)	Part Number CHIRALPAK® IA/SFC	CHIRALPAK® IB/SFC	CHIRALPAK® IC/SFC	CHIRALPAK® ID/SFC	CHIRALPAK® IE/SFC	CHIRALPAK® IF/SFC
Semi-prep column	10	250	5	80435	81435	83435	84435	85435	86435
	20	250	5	80445	81445	83445	84445	85445	86445

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