

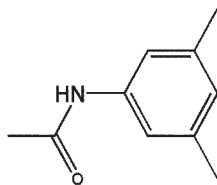
YMC

CHIRAL ART COLUMNS

YMC
India Pvt. Ltd.

Coated

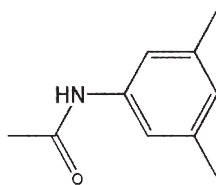
Chiral art Amylose C Neo



Amylose
tris (3,5-dimethylphenylcarbamate)
coated on silica-gel

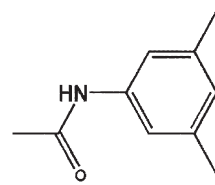
Immobilized

Chiral art Amylose SA



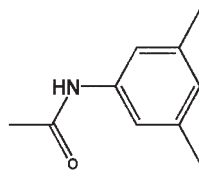
Amylose
tris (3,5-dimethylphenylcarbamate)
immobilized on silica-gel

Chiral art Cellulose SB



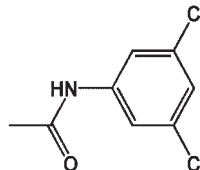
Cellulose
tris (3,5-dimethylphenylcarbamate)
immobilized on silica-gel

Chiral art Cellulose C



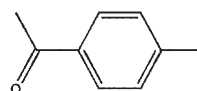
Cellulose
tris (3,5-dimethylphenylcarbamate)
coated on silica-gel

Chiral art Cellulose SC



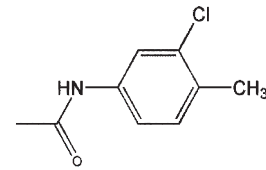
Cellulose
tris (3,5-dichlorophenylcarbamate)
immobilized on silica-gel

Chiral art Cellulose SJ



Cellulose
tris(4-methylbenzoate)
immobilized on silica-gel

Chiral art Cellulose SZ



Cellulose tris(3-chloro-4-
methylphenylcarbamate
immobilized on silica-gel

Features

1

Excellent
peak shape

2

Low column
bleeding

3

Wide usable
pH range

4

High-purity purification
utilizing recycling preparation

5

Effective for preparative
separation of enantiomers

6

High solvent
versatility

7

Extended packing
durability



Specialities of Immobilized Columns

The best screening Kit for wide range of chiral molecules, cis-trans, geometric and structural isomers.

Highly suitable in preparative grades, in large (multi kg) quantity separations.

Compatible for all chromatographic modes such as NP, PO, RP, HILIC and SFC.

Faster separation with high resolution

Excellent durability

Superior Equivalency Vs Other Makes

S.No.	YMC Phase	USP Class	Usable Chromatographic Mode*	Other Make	Other Make
1	CHIRAL ART Amylose C Neo	L51	NP/PO/RP/HILIC	CHIRALPAK AD-H/AD-RH	Lux Amylose-1
2	CHIRAL ART Cellulose C	L40	NP/PO/RP/HILIC	CHIRALCEL OD-H/OD-RH	Lux Cellulose-1
3	CHIRAL ART SA	L99	NP/NP-NS/PO/RP/HILIC	CHIRALPAK IA	Lux i-Amylose-1
4	CHIRAL ART SB		NP/NP-NS/PO/RP/HILIC	CHIRALPAK IB	
5	CHIRAL ART SC	L119	NP/NP-NS/PO/RP/HILIC	CHIRALPAK IC	Lux i-Cellulose-5
6	CHIRAL ART SJ		NP/NP-NS/PO/RP/HILIC	CHIRALCEL OJ/OJ-RH (Coated)	Lux Cellulose-3 (Coated)
7	CHIRAL ART SZ		NP/NP-NS/PO/RP/HILIC	CHIRALCEL OZ/OZ-RH (Coated) CHIRALPAK IM	Lux Cellulose-2 (Coated)

* NP: Normal Phase Mode

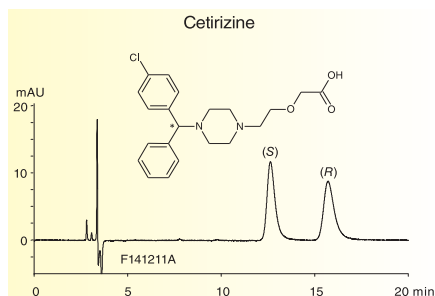
NP-NS: Normal Phase-Non-std Mode

PO: Polar organic Mode

RP: Reverse Phase Mode

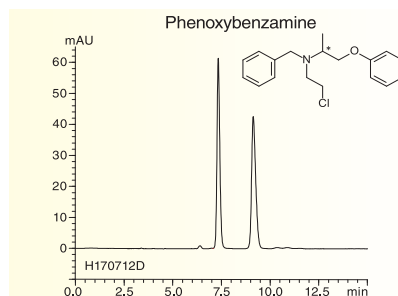
HILIC: Hydrophilic Interaction Liquid Chromatographic Mode

Useful for separation of a wide range of chiral compounds

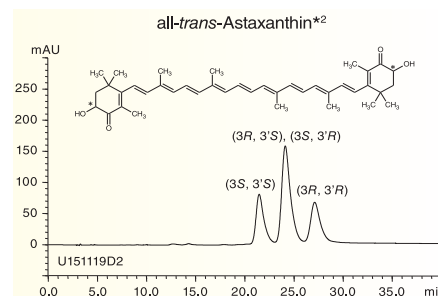


Column : CHIRAL ART Cellulose-C
5 μ m, 250 X 4.6 mmI.D.
Eluent : *n*-hexane/2-propanol/formic acid/DEA*¹
(70/30/0.1/0.1)
Flow rate : 1.0 mL/min
Temperature : 25°C
Detection : UV at 230 nm
Injection : 2 μ L (0.2 mg/mL)

*¹diethylamine



Column : CHIRAL ART Cellulose-SJ
5 μ m, 250 X 4.6 mmI.D.
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)

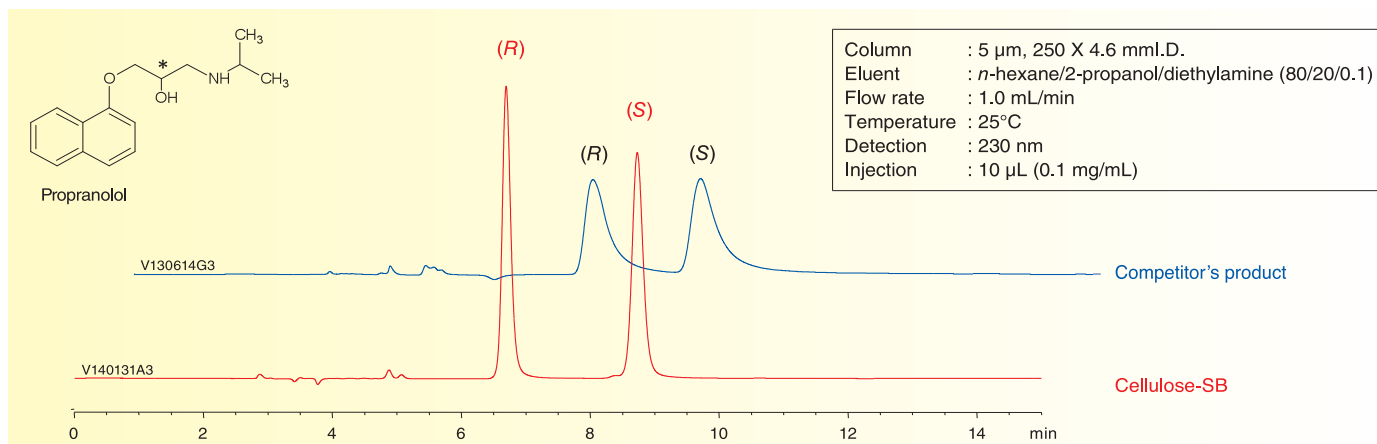


Column : CHIRAL ART Cellulose-SC
5 μ m, 250 X 4.6 mmI.D.
Eluent : *n*-hexane/THF (80/20)
Flow rate : 1.0 mL/min
Temperature : 25°C
Detection : VIS at 476 nm
Injection : 5 μ L (0.5 mg/mL)

*²Courtesy of Fuji Chemical Industry Co., Ltd.

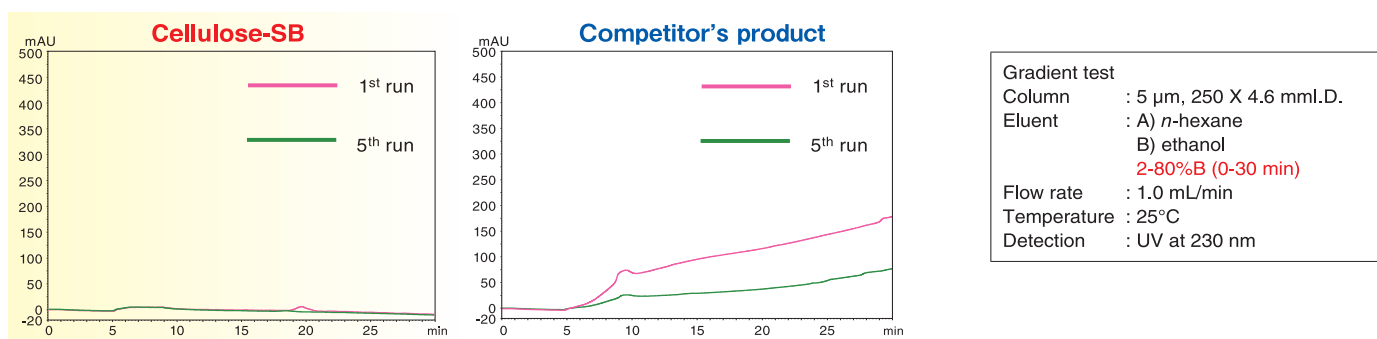
CHIRAL ART are suitable for separation of a wide range of compounds.

Excellent peak shape



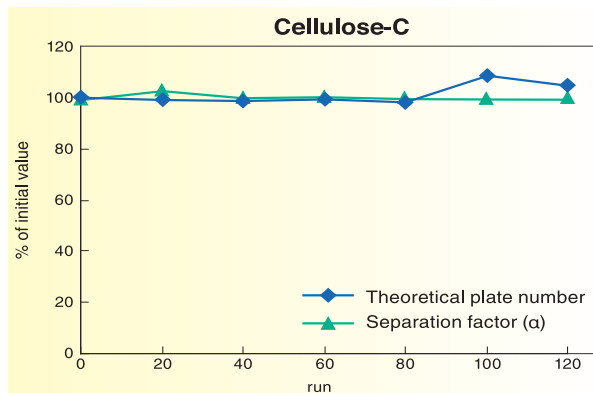
CHIRAL ART provide good peak shapes on ionic and metal coordination compounds.

Low column bleeding



CHIRAL ART immobilized type show remarkably reduced background signal under the typical gradient conditions. CHIRAL ART immobilized type offer excellent robustness on gradient analysis and highly sensitive analysis on LC/MS due to the very low ion suppression as well as a stable baseline.

Extended packing durability



Sequential gradient test

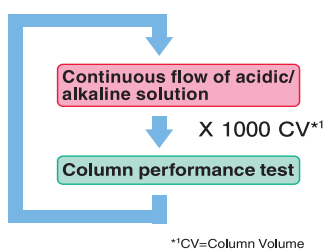
Column : 5 μ m, 250 X 4.6 mm I.D.
Eluent : A) *n*-hexane, B) ethanol
0-100%B (0-15 min)
Flow rate : 3.0 mL/min
Pressure : 10-30 MPa/run
Temperature : 37°C

Column performance test

Column : 5 μ m, 250 X 4.6 mm I.D.
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 have outstanding packed bed stability provided by using high-strength super wide pore silica and innovative packing technology. The column efficiency and selectivity are maintained even after the sequential gradient tests at a high flow rate (three times higher than normal flow rate) and under high pressure (rapid pressure change). CHIRAL ART are useful for shortening analysis time, (re-)equilibration time, or/and column cleaning time by increasing the flow rate. CHIRAL ART are also effective when using highly viscous solvents as a mobile phase on immobilized type columns.

Wide usable pH range (Immobilized type)



*CV=Column Volume

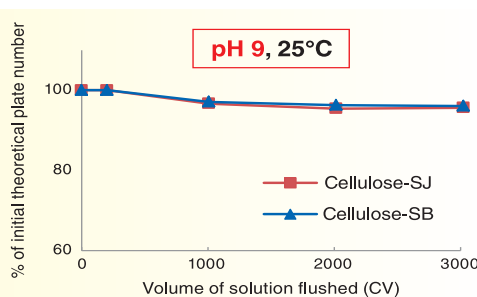
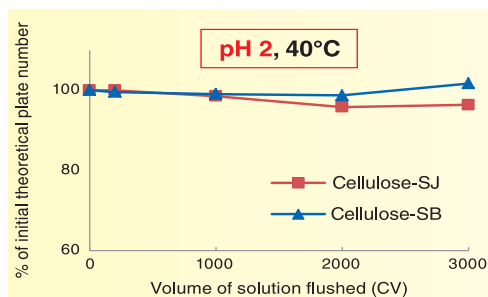
Continuous flow of acidic/alkaline solution

Column : 5 μ m, 50 X 4.6 mm I.D.
Eluent : Buffer/methanol (90/10)
Flow rate : 1.0 mL/min
[Acidic condition]
Buffer : 0.1% H₃PO₄ (pH 2)
Temperature : 40°C
[Alkaline condition]
Buffer : 20 mM NH₄HCO₃-DEA*² (pH 9)
Temperature : 25°C

*diethylamine

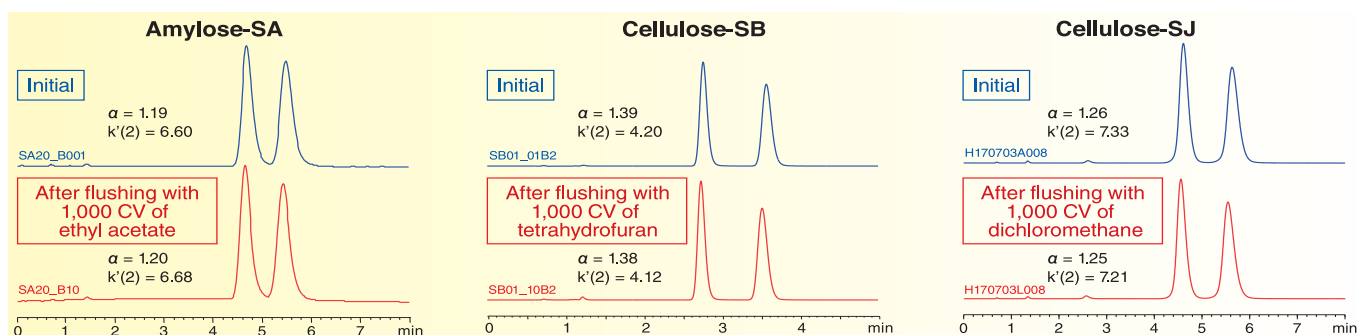
Column performance test

Column : 5 μ m, 50 X 4.6 mm I.D.
Eluent : methanol/water (70/30) for Cellulose-SJ
acetonitrile/water (30/70) for Cellulose-SB
Flow rate : 1.0 mL/min
Temperature : 25°C
Detection : UV at 254 nm
Sample : 1-(1-Naphthyl)ethanol for Cellulose-SJ
Benzoin for Cellulose-SB



CHIRAL ART immobilized type have excellent chemical stability and can be used across a wide pH range. CHIRAL ART also enable the robust analysis of ionic compounds requiring pH control of mobile phase in reversed-phase conditions.

High solvent versatility (Immobilized type)



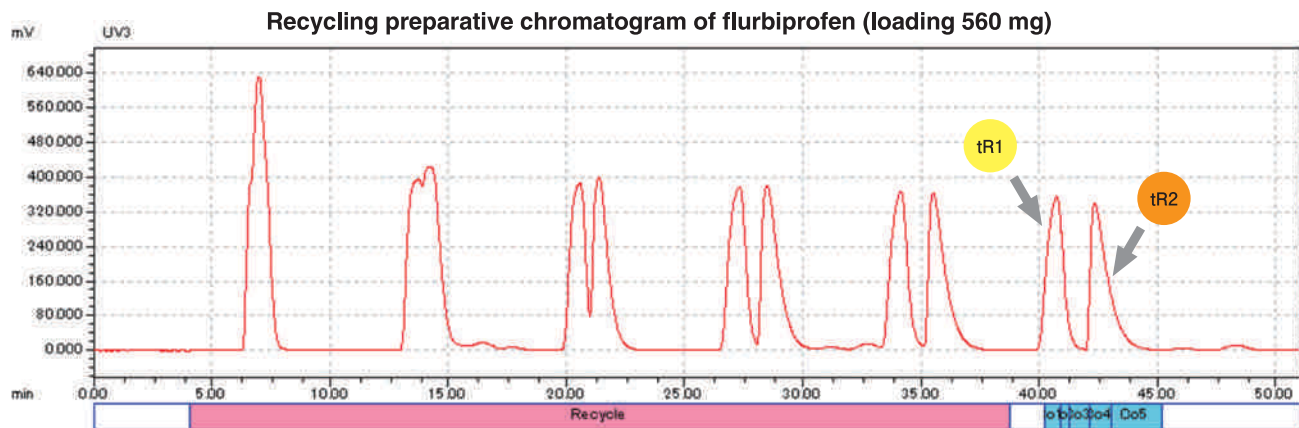
Retention rate of initial column performance (After flushing with 1,000 CV of each solvent at 40°C)

*CV=Column Volume

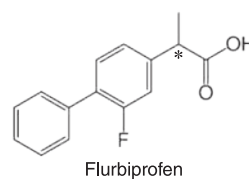
	Amylose-SA		Cellulose-SB		Cellulose-SJ	
	α	k'(2)	α	k'(2)	α	k'(2)
Ethyl acetate	100.3%	101.2%	100.0%	99.1%	99.3%	99.0%
Tetrahydrofuran	100.0%	100.0%	99.3%	98.0%	99.2%	99.7%
Dichloromethane	100.3%	100.6%	101.3%	99.6%	99.6%	98.4%

CHIRAL ART immobilized type have high solvent versatility. After flushing with various solvents, the losses of initial column performances were less than 2%.

High purity preparative purification of chiral compound using recycling HPLC



Column : CHIRAL ART Cellulose-C
 5 μ m, 250 X 30 mmI.D.
 Eluent : *n*-hexane/2-propanol/TFA (95/5/0.1)
 Flow rate : 45 mL/min
 Detection : UV at 280 nm
 Injection : 560 mg



	Single column		Recycling	
	tR1	tR2	tR1	tR2
Enantiomeric purity (%ee)	>99	>97	>99	99
Yield (%)	87	74	89	90
Productivity (mg product/hr)	122	103	335	336
Solvent consumption (L/g-product)	22	26	2.0	2.0

Productivity : about 3 times higher

Solvent consumption : about 1/10

Productivity of single column preparation is estimated based on the stacking injection of the sample every 2.5 minutes

Above is the result of preparative separation of chiral compound, flurbiprofen. Recycling preparation can achieve high purity and high yield on purification of the compound which is difficult to optimize preparative separation conditions using a single column method. Recycling preparation greatly contributes to reduction of solvent consumption and costs on purification as mobile phase is circulated during recycling mode.

Ordering Information –Columns–

CHIRAL ART

Particle size (µm)	Column size inner diameter X length (mm)	Immobilized type					Coated type	
		Amylose-SA	Cellulose-SB	Cellulose-SC	Cellulose-SJ	Cellulose-SZ	Amylose-C Neo	Cellulose-C
3	2.0 X 75	KSA99S03-L502WT	KSB99S03-L502WT	KSC99S03-L502WT	KSJ99S03-L502WT	KSZ99S03-L502WT	KBN99S03-L502WT	KCN99S03-L502WT
	2.0 X 100	KSA99S03-1002WT	KSB99S03-1002WT	KSC99S03-1002WT	KSJ99S03-1002WT	KSZ99S03-1002WT	KBN99S03-1002WT	KCN99S03-1002WT
	2.0 X 150	KSA99S03-1502WT	KSB99S03-1502WT	KSC99S03-1502WT	KSJ99S03-1502WT	KSZ99S03-1502WT	KBN99S03-1502WT	KCN99S03-1502WT
	2.0 X 250	KSA99S03-2502WT	KSB99S03-2502WT	KSC99S03-2502WT	KSJ99S03-2502WT	KSZ99S03-2502WT	KBN99S03-2502WT	KCN99S03-2502WT
	3.0 X 50	KSA99S03-0503WT	KSB99S03-0503WT	KSC99S03-0503WT	KSJ99S03-0503WT	KSZ99S03-0503WT	KBN99S03-0503WT	KCN99S03-0503WT
	3.0 X 75	KSA99S03-L503WT	KSB99S03-L503WT	KSC99S03-L503WT	KSJ99S03-L503WT	KSZ99S03-L503WT	KBN99S03-L503WT	KCN99S03-L503WT
	3.0 X 100	KSA99S03-1003WT	KSB99S03-1003WT	KSC99S03-1003WT	KSJ99S03-1003WT	KSZ99S03-1003WT	KBN99S03-1003WT	KCN99S03-1003WT
	3.0 X 150	KSA99S03-1503WT	KSB99S03-1503WT	KSC99S03-1503WT	KSJ99S03-1503WT	KSZ99S03-1503WT	KBN99S03-1503WT	KCN99S03-1503WT
	3.0 X 250	KSA99S03-2503WT	KSB99S03-2503WT	KSC99S03-2503WT	KSJ99S03-2503WT	KSZ99S03-2503WT	KBN99S03-2503WT	KCN99S03-2503WT
	4.6 X 50	KSA99S03-0546WT	KSB99S03-0546WT	KSC99S03-0546WT	KSJ99S03-0546WT	KSZ99S03-0546WT	KBN99S03-0546WT	KCN99S03-0546WT
	4.6 X 75	KSA99S03-L546WT	KSB99S03-L546WT	KSC99S03-L546WT	KSJ99S03-L546WT	KSZ99S03-L546WT	KBN99S03-L546WT	KCN99S03-L546WT
	4.6 X 100	KSA99S03-1046WT	KSB99S03-1046WT	KSC99S03-1046WT	KSJ99S03-1046WT	KSZ99S03-1046WT	KBN99S03-1046WT	KCN99S03-1046WT
	4.6 X 150	KSA99S03-1546WT	KSB99S03-1546WT	KSC99S03-1546WT	KSJ99S03-1546WT	KSZ99S03-1546WT	KBN99S03-1546WT	KCN99S03-1546WT
	4.6 X 250	KSA99S03-2546WT	KSB99S03-2546WT	KSC99S03-2546WT	KSJ99S03-2546WT	KSZ99S03-2546WT	KBN99S03-2546WT	KCN99S03-2546WT
5	4.6 X 150	KSA99S05-1546WT	KSB99S05-1546WT	KSC99S05-1546WT	KSJ99S05-1546WT	KSZ99S05-1546WT	KBN99S05-1546WT	KCN99S05-1546WT
	4.6 X 250	KSA99S05-2546WT	KSB99S05-2546WT	KSC99S05-2546WT	KSJ99S05-2546WT	KSZ99S05-2546WT	KBN99S05-2546WT	KCN99S05-2546WT
	10 X 250	KSA99S05-2510WT	KSB99S05-2510WT	KSC99S05-2510WT	KSJ99S05-2510WT	KSZ99S05-2510WT	KBN99S05-2510WT	KCN99S05-2510WT
	20 X 250	KSA99S05-2520WX	KSB99S05-2520WX	KSC99S05-2520WX	KSJ99S05-2520WX	KSZ99S05-2520WX	KBN99S05-2520WX	KCN99S05-2520WX
	30 X 250	KSA99S05-2530WX	KSB99S05-2530WX	KSC99S05-2530WX	KSJ99S05-2530WX	KSZ99S05-2530WX	KBN99S05-2530WX	KCN99S05-2530WX

CHIRAL ART Guard cartridges

Particle size (µm)	Column size inner diameter X length (mm)	Immobilized type					Coated type	
		Amylose-SA	Cellulose-SB	Cellulose-SC	Cellulose-SJ	Cellulose-SZ	Amylose-C Neo	Cellulose-C
3	2.1 X 10	KSA99S03-01Q1GC	KSB99S03-01Q1GC	KSC99S03-01Q1GC	KSJ99S03-01Q1GC	KSZ99S03-01Q1GC	KBN99S03-01Q1GC	KCN99S03-01Q1GC
	3.0 X 10	KSA99S03-0103GC	KSB99S03-0103GC	KSC99S03-0103GC	KSJ99S03-0103GC	KSZ99S03-0103GC	KBN99S03-0103GC	KCN99S03-0103GC
	4.0 X 10	KSA99S03-0104GC	KSB99S03-0104GC	KSC99S03-0104GC	KSJ99S03-0104GC	KSZ99S03-0104GC	KBN99S03-0104GC	KCN99S03-0104GC
5	4.0 X 10	KSA99S05-0104GC	KSB99S05-0104GC	KSC99S05-0104GC	KSJ99S05-0104GC	KSZ99S05-0104GC	KBN99S05-0104GC	KCN99S05-0104GC
	10 X 10	KSA99S05-0110CC	KSB99S05-0110CC	KSC99S05-0110CC	KSJ99S05-0110CC	KSZ99S05-0110CC	KBN99S05-0110CC	KCN99S05-0110CC

*Guard cartridge holder required, part no. XPGCH-Q1 for 2.1-4.0 mmI.D. and XPCHPW1 for 10 mmI.D.

Alcyon SFC CSP

Particle size (µm)	Column size inner diameter X length (mm)	Immobilized type					Coated type	
		Amylose-SA	Cellulose-SB	Cellulose-SC	Cellulose-SJ	Cellulose-SZ	Amylose-C Neo	Cellulose-C
3	2.1 X 150	KSA99S03-15Q1WTS	KSB99S03-15Q1WTS	KSC99S03-15Q1WTS	KSJ99S03-15Q1WTS	KSZ99S03-15Q1WTS	KBN99S03-15Q1WTS	KCN99S03-15Q1WTS
	3.0 X 50	KSA99S03-0503WTS	KSB99S03-0503WTS	KSC99S03-0503WTS	KSJ99S03-0503WTS	KSZ99S03-0503WTS	KBN99S03-0503WTS	KCN99S03-0503WTS
	3.0 X 100	KSA99S03-1003WTS	KSB99S03-1003WTS	KSC99S03-1003WTS	KSJ99S03-1003WTS	KSZ99S03-1003WTS	KBN99S03-1003WTS	KCN99S03-1003WTS
	3.0 X 150	KSA99S03-1503WTS	KSB99S03-1503WTS	KSC99S03-1503WTS	KSJ99S03-1503WTS	KSZ99S03-1503WTS	KBN99S03-1503WTS	KCN99S03-1503WTS
	4.6 X 150	KSA99S03-1546WTS	KSB99S03-1546WTS	KSC99S03-1546WTS	KSJ99S03-1546WTS	KSZ99S03-1546WTS	KBN99S03-1546WTS	KCN99S03-1546WTS
	4.6 X 250	KSA99S03-2546WTS	KSB99S03-2546WTS	KSC99S03-2546WTS	KSJ99S03-2546WTS	KSZ99S03-2546WTS	KBN99S03-2546WTS	KCN99S03-2546WTS
5	2.1 X 150	KSA99S05-15Q1WTS	KSB99S05-15Q1WTS	KSC99S05-15Q1WTS	KSJ99S05-15Q1WTS	KSZ99S05-15Q1WTS	KBN99S05-15Q1WTS	KCN99S05-15Q1WTS
	4.6 X 150	KSA99S05-1546WTS	KSB99S05-1546WTS	KSC99S05-1546WTS	KSJ99S05-1546WTS	KSZ99S05-1546WTS	KBN99S05-1546WTS	KCN99S05-1546WTS
	4.6 X 250	KSA99S05-2546WTS	KSB99S05-2546WTS	KSC99S05-2546WTS	KSJ99S05-2546WTS	KSZ99S05-2546WTS	KBN99S05-2546WTS	KCN99S05-2546WTS
	10 X 250	KSA99S05-2510WTS	KSB99S05-2510WTS	KSC99S05-2510WTS	KSJ99S05-2510WTS	KSZ99S05-2510WTS	KBN99S05-2510WTS	KCN99S05-2510WTS
	20 X 250	KSA99S05-2520WTS	KSB99S05-2520WTS	KSC99S05-2520WTS	KSJ99S05-2520WTS	KSZ99S05-2520WTS	KBN99S05-2520WTS	KCN99S05-2520WTS

*See pp.120-121 for details of Alcyon SFC CSP

Ordering Information –Packing Materials–

CHIRAL ART

Particle size (µm)	Immobilized type					Coated type	
	Amylose-SA	Cellulose-SB	Cellulose-SC	Cellulose-SJ	Cellulose-SZ	Amylose-C Neo	Cellulose-C
5	KSA99S05	KSB99S05	KSC99S05	KSJ99S05	KSZ99S05	KBN99S05	KCN99S05
10	KSA99S11	KSB99S11	KSC99S11	KSJ99S11	KSZ99S11	KBN99S11	KCN99S11
20	KSA99S21	KSB99S21	KSC99S21	KSJ99S21	KSZ99S21	KBN99S21	KCN99S21

*Inquire us for the Amylose-C

YMC

SUMI CHIRAL COLUMNS

SUMICHIRAL OA columns are high-performance chiral columns for enantiomer separation by HPLC. On SUMICHIRAL OA columns direct separation of various enantiomers can be realized effectively. Enantiomeric separation is achieved from the various diastereomeric interactions such as hydrogen bonding, charge transfer and host-guest interactions, etc. SUMICHIRAL OA columns are very useful for the accurate

determination of the optical purity and for the preparation of pure enantiomers of biologically active compounds such as pharmaceuticals, pesticides, and perfumes.

- Improved Pirkle Type
- Ligand exchange Type
- Host-guest Type

SUMICHIRAL OA

Standard type		Inverted type	Mode **
SUMICHIRAL	Chiral component	SUMICHIRAL	
OA-2000	(R)-phenylglycine	OA-2000S	NP
☆OA-2500	(R)-1-naphthylglycine	OA-2500S	RP
OA-3100	(S)-valine	OA-3100R	NP,RP
OA-3200	(S)-tert-leucine	OA-3200R	NP,RP
☆OA-3300	(R)-phenylglycine	OA-3300S	NP,RP
OA-4000	(S)-valine (S)-1-(α -naphthyl)ethylamine	OA-4000R	NP
OA-4100	(S)-valine (R)-1-(α -naphthyl)ethylamine	OA-4100R	NP
OA-4400	(S)-proline (S)-1-(α -naphthyl)ethylamine	OA-4400R	NP
OA-4500	(S)-proline (R)-1-(α -naphthyl)ethylamine	OA-4500R	NP
OA-4600	(S)-tert-leucine (S)-1-(α -naphthyl)ethylamine	OA-4600R	NP
☆OA-4700	(S)-tert-leucine (R)-1-(α -naphthyl)ethylamine	OA-4700R	NP
OA-4800	(S)-indoline-2-carboxylic acid (S)-1-(α -naphthyl)ethylamine	*	NP
☆OA-4900	(S)-indoline-2-carboxylic acid (R)-1-(α -naphthyl)ethylamine	*	NP
☆OA-5000	(D)-penicillamine	OA-5000L	RP
OA-6000	(L)-tartaric acid (S)-1-(α -naphthyl)ethylamine	OA-6000R	RP
OA-6100	(L)-tartaric acid, (S)-valine (S)-1-(α -naphthyl)ethylamine	OA-6100R	RP
☆OA-7000	β -cyclodextrin with novel spacer	*	RP
☆OA-8000	chiral pseudo 18-crown-6 ether	*	NP,RP

☆Most popular phases

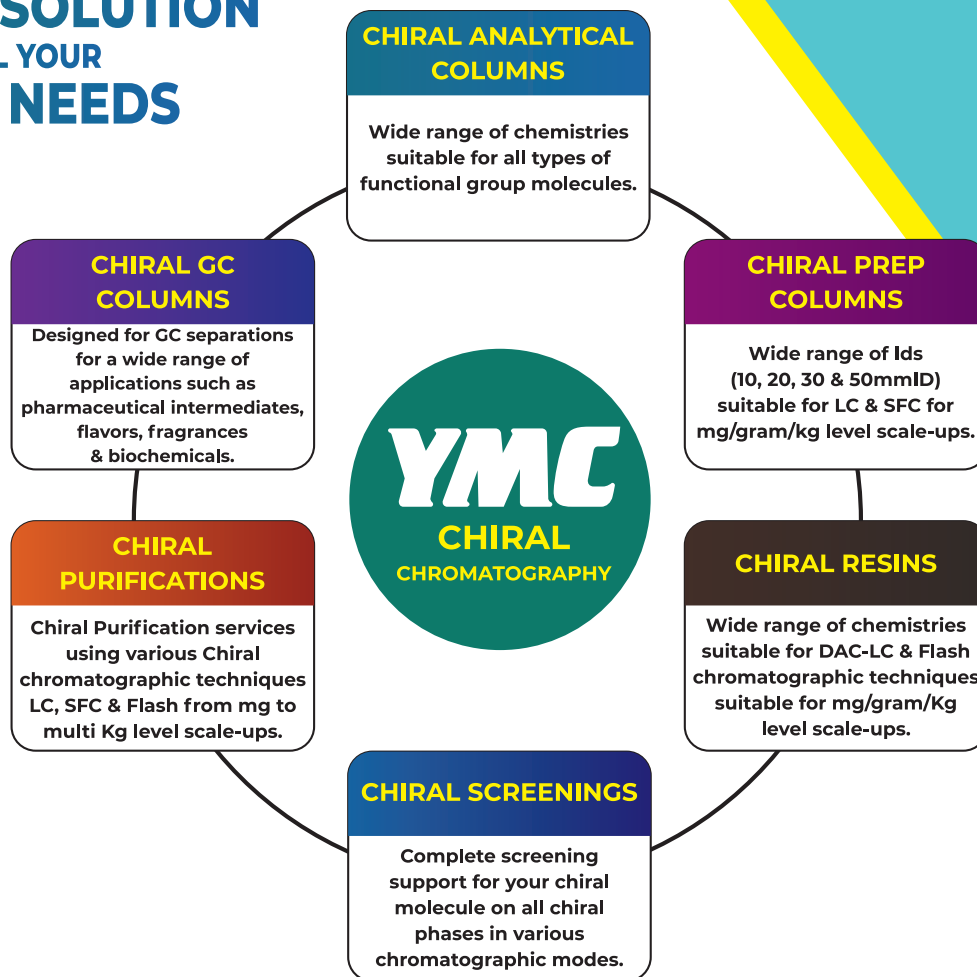
*Enantiomeric stationary phases (inverted types) are available with the exception of OA-4800, 4900, 7000 and 8000. On these phases, the elution order of enantiomer is inverted.

**NP : normal-phase mode, RP : reversed-phase mode

Special Merits of SUMICHIRAL OA

- The large number of theoretical plates of the columns offers high resolution.
- The packing materials have chemical stability and the columns have long life.
- The enantiomeric stationary phases give the inverse elution orders, resulting in accurate determination of the optical purity and efficient preparation of the enantiomer are.

ONE-STOP SOLUTION FOR ALL YOUR CHIRAL NEEDS



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