

## Special Merits of SUMICHIRAL OA

1. The large number of theoretical plates of the columns offer high resolution.
2. The packing materials have chemical stability and the columns have long life.
3. The enantiomeric stationary phases give the inverse elution orders and so accurate determination of the optical purity and efficient preparation of the enantiomer are attained.

### Sumichiral OA Technical News

#### Improved Pirkie Type 1

#### Amide Type: Asymmetric carbon atoms are bonded directly with CONH group

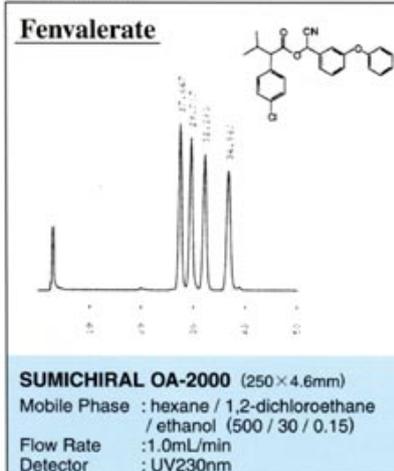
OA-2000 series have a 3,5-dinitrobenzoyl group as the  $\pi$ -acid and may interact with the solute molecule by charge transfer, hydrogen bonding, etc. The enantiomers of aromatic compounds, esters, carboxylic acids and alcohols may be directly separated on OA-2000 series. OA-2000 is especially effective for pyrethroidal esters, OA-2500 for carboxylic acids such as profen-drugs.

#### Urea Type: Asymmetric carbon atoms are bonded directly with NHCONH group

OA-3000 series have 3,5-dinitrophenylurea group as the  $\pi$ -acid and, in the reverse phase mode, promote chiral discrimination by charge transfer, hydrogen bonding, etc. In general OA-3000 series are effective for carboxylic acids, and especially for acetyl- and urethane-amino acids, dansylamino acids. OA-3300 offers good direct separation for profen-drugs, acetyl-amino acids, BOC-amino acids and penzyl-amino acids.

Main columns : SUMICHIRAL OA-2500, SUMICHIRAL OA-3300

#### < Pesticide >



<b>SUMICHIRAL OA-3500</b> (250 × 4.6mm)	<b>SUMICHIRAL OA-3200</b> (250 × 4.6mm)	<b>SUMICHIRAL OA-3300</b> (250 × 4.6mm)
Mobile Phase : 0.01mol/L ammonium acetate in methanol	Mobile Phase : 0.01mol/L ammonium acetate in methanol	Mobile Phase : hexane / 2-propanol / methanol (70 / 20 / 10)
Flow Rate : 0.6mL/min	Flow Rate : 1.0mL/min	Flow Rate : 1.0mL/min
Detector : UV254nm	Detector : UV254nm	Detector : UV254nm

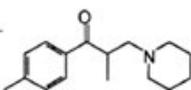
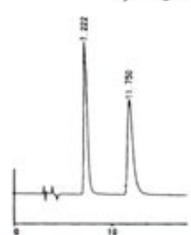
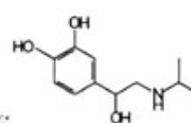
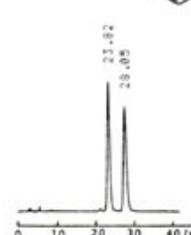
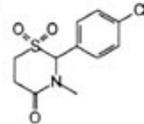
## Improved Pirkie Type 2

### Two chiral centers at amine and amino acid are bonded with NHCONH group

OA-4000 series have a naphthyl group as the  $\pi$ -base, and two chiral centers at amine and amino acid group. By charge transfer, hydrogen bonding, etc., chiral discrimination is achieved, and a wide variety of compounds such as pharmaceuticals of amine and amino alcohols, alcohols, esters and amides can be directly resolved in the normal phase mode. Amide and urethane derivatives of amines, alcohols, etc. can be resolved effectively.

Main columns : SUMICHIRAL OA-4700, SUMICHIRAL OA-4900

#### < Amine-type drugs >

<p><b>Tolperizone</b></p>   <p><b>SUMICHIRAL OA-4500</b> (250 × 4.6mm) Mobile Phase : hexane / tetrahydrofuran / methanol / trifluoroacetic acid (60 / 35 / 5 / 0.2) Flow Rate : 1.0mL/min Detector : UV254nm</p>	<p><b>Isoproterenol</b></p>   <p><b>SUMICHIRAL OA-4900</b> (250 × 4.6mm) Mobile Phase : hexane / 1,2-dichloroethane / methanol / trifluoroacetic acid (240 / 140 / 20 / 1) Flow Rate : 1.0mL/min Detector : UV280nm</p>	<p><b>Chlormezanone</b></p>   <p><b>SUMICHIRAL OA-4700</b> (250 × 4.6mm) Mobile Phase : hexane / 2-propanol / methanol / trifluoroacetic acid (80 / 15 / 5 / 0.2) Flow Rate : 1.0mL/min Detector : UV254nm</p>
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## Ligand exchange Type

### Amide Type: Asymmetric carbon atoms are bonded directly with CONH group

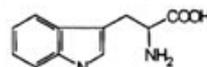
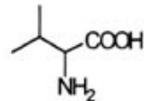
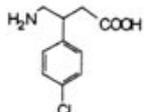
OA-2000 series have a 3,5-dinitrobenzoyl group as the  $\pi$ -acid and may interact with the solute molecule by charge transfer, hydrogen bonding, etc. The enantiomers of aromatic compounds, esters, carboxylic acids and alcohols may be directly separated on OA-2000 series. OA-2000 is especially effective for pyrethroidal esters, OA-2500 for carboxylic acids such as profen-drugs.

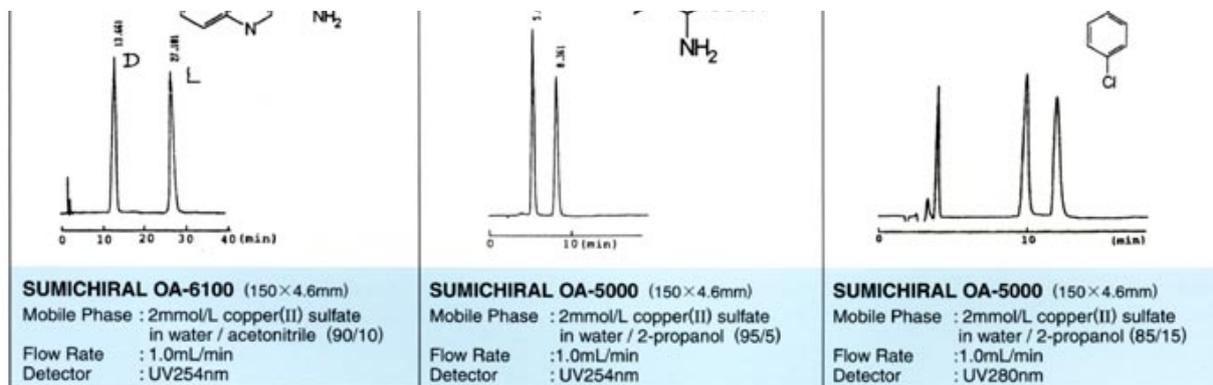
### The chiral components are coated hydrophobically on ODS

OA-5000 and 6000 series offer chiral discrimination by ligand exchange interaction in the reversed phase mode. The chiral ligands such as penicillamine (OA-5000) or tartaric acid derivatives (OA-6000 series) are coated on ODS silica, though the volume of organic solvents added to the mobile phase is limited. Mobile phases including Cu ++ ions are used in these columns. They are effective for direct enantiomer separation of not only amino acids, hydroxy acids but also copper-chelate forming compounds such as amino alcohols, diamines, dicarboxylic acids, aminolactams and dipeptides. Especially OA-5000 can be applied for extremely wide range, while OA-6100 is effective for  $\beta$ -amino acids,  $\beta$ -hydroxy acids and hydrophilic amin acids.

Main columns : SUMICHIRAL OA-5000, SUMICHIRAL OA-6100

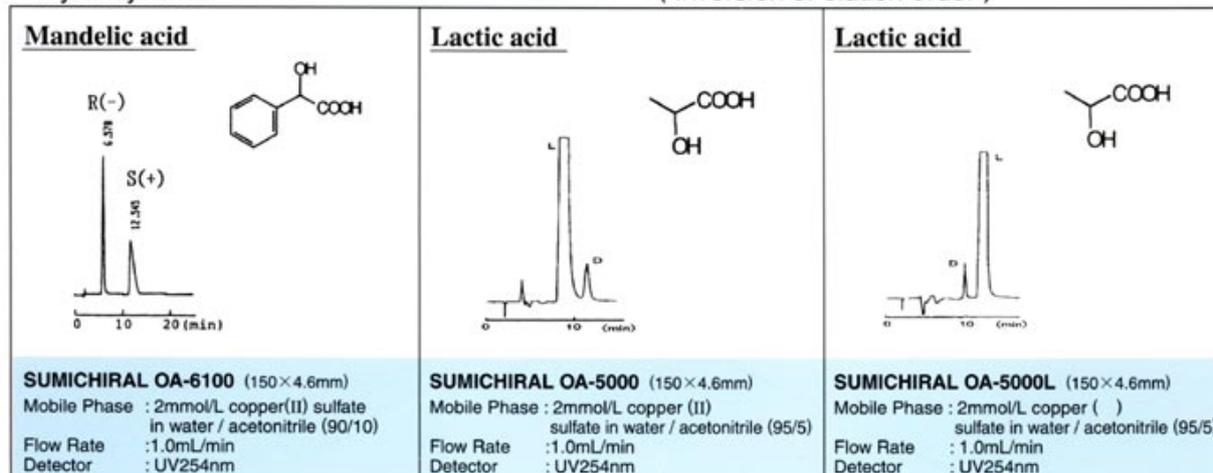
#### < Amino acids >

<p><b>Tryptophan</b></p>  	<p><b>Valine</b></p>  	<p><b>Baclofen</b></p>  
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&lt; Hydroxy acids &gt;

( Inversion of elution order )



## Host-guest Type

**Cyclodextrin bonded chiral stationary phase with novel spacer**

OA-7000 is a novel chiral stationary phase with  $\beta$ -cyclodextrin bonded to the silica gel via new type of spacer. A large number of racemates, including ketones, amines, and amino acid derivatives can be separated under reversed phase conditions.

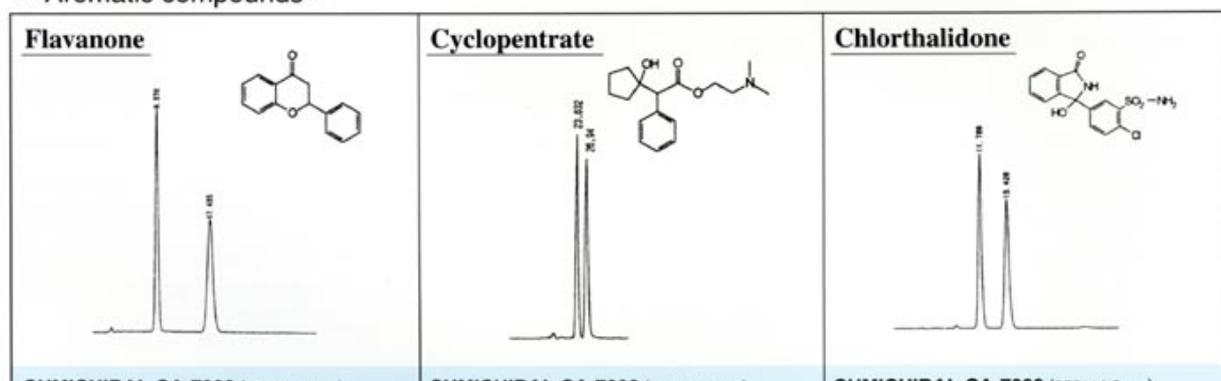
1. Sharp peaks and high theoretical plate numbers are obtained. Improved peak shape is due to the effect of hydrophilic spacer moiety which prevents secondary interactions between the silica gel and the sample molecules.
2. Popular reversed phase conditions can be used.

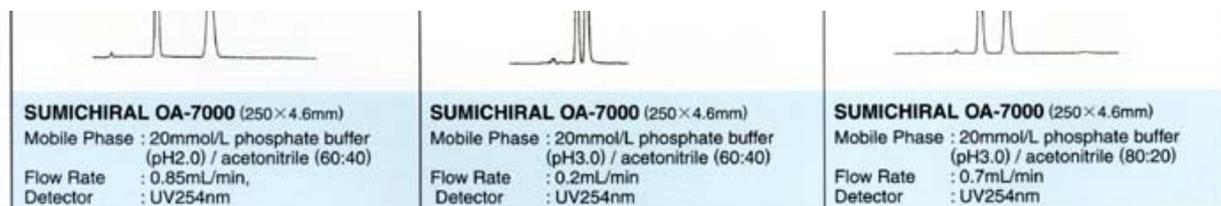
**Novel Chiral Stationary phase bonded with crown ether**

OA-8000 is a novel chiral stationary phase bonded with chiral crown ether to aminopropyl silica gel. This is very effective for enantiomer separations of amines, aminoalcohols and amino acids, especially for hydrophobic amines.

1. Stationary phase is covalent bond type and very stable.
2. Both reversed and normal phases can be used.
3. Sharp peaks and high theoretical plate numbers are obtained

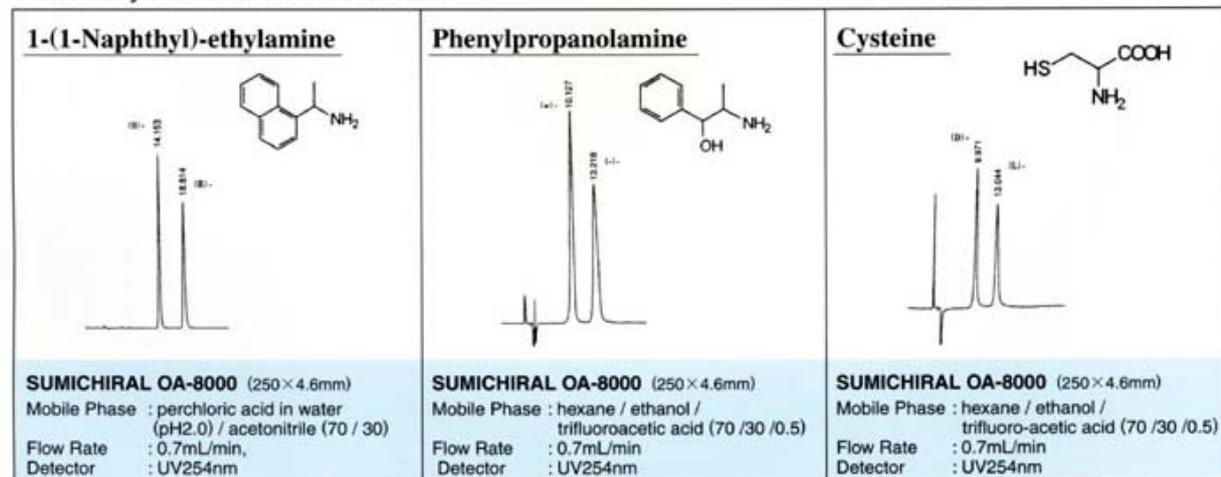
&lt; Aromatic compounds &gt;





&lt; Primary amine and aminoalcohol &gt;

&lt; Amino acid &gt;



### Sumichiral OA columns

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

**Notice:**

: Most popular phases

\* Enantiomeric stationary phases (inversed types) are available except for OA-4800, 4900, 7000 and 8000, and on these phases the elution order of enantiomer are inversed.

\*\* NP normal phase mode, RP reversed phased mode

## Types of Sumichiral Column stationary phases

※ Please click the name for details

Classification		Name
Low molecular weight	Amide Type	SUMICIRAL OA - 2000 Series
	Urea Type	SUMICIRAL OA - 3000 Series SUMICIRAL OA - 4000 Series
	Ligand exchange Type	SUMICIRAL OA - 5000 Series SUMICIRAL OA - 6000 Series
	Host-guest Type	SUMICIRAL OA - 7000 Series SUMICIRAL OA - 8000

## Sumichiral OA Column series and dimensions

※ **Red colored letter's sizes** are the standard analytical columns.

Sumichiral OA-2000 Series ( 5 $\mu$ m )	I.D. (mm)	Length (mm)
Sumichiral OA-2000 Sumichiral OA-2000I Sumichiral OA-2000S Sumichiral OA-2000SI	4.0	10
		150
		250
		(300)
	4.6	50
		150
		250
	8.0	250
		(300)
	10.0	250
	20.0	250

Sumichiral OA-2500 Series ( 5 $\mu$ m )	I.D. (mm)	Length (mm)
Sumichiral OA-2500 Sumichiral OA-2500I Sumichiral OA-2500S Sumichiral OA-2500SI	(2.0)	(150)
		(250)
	4.0	10
		150
		250
	4.6	50
		150
	8.0	250
		250
	10.0	250
	20.0	250

Sumichiral OA-3000 Series ( 5 $\mu$ m )	I.D. (mm)	Length (mm)
Sumichiral OA-3100 Sumichiral OA-3100R Sumichiral OA-3200 Sumichiral OA-3200R Sumichiral OA-3300 Sumichiral OA-3300S	2.0	150
		250
	4.0	10
		150
		250
	4.6	50
		150
	8.0	250
		250
	10.0	250
	20.0	250

Sumichiral OA-4000 Series ( 5 $\mu$ m )	I.D. (mm)	Length (mm)
Sumichiral OA-4000 Sumichiral OA-4000R Sumichiral OA-4100 Sumichiral OA-4100R Sumichiral OA-4400 Sumichiral OA-4400R Sumichiral OA-4500 Sumichiral OA-4500R Sumichiral OA-4600 Sumichiral OA-4600R Sumichiral OA-4700 Sumichiral OA-4700R Sumichiral OA-4800 Sumichiral OA-4900	4.0	10
		150
		250
	4.6	50
		150
	8.0	250
		250
	10.0	250
	20.0	250

Sumichiral OA-5000 Series ( 5 $\mu$ m )	I.D. (mm)	Length (mm)
Sumichiral OA-5000 Sumichiral OA-5000L	4.0	10
		150
		250
	4.6	50
		150
	8.0	150
		250
	10.0	150
		250
	20.0	150

Sumichiral OA-6000 Series ( 5 $\mu$ m )	I.D. (mm)	Length (mm)
Sumichiral OA-6000 Sumichiral OA-6000R Sumichiral OA-6100 Sumichiral OA-6100R	4.0	10
		150
		250
	4.6	50
		150
	8.0	150
		250
	10.0	150
		(250)
	20.0	150

10.0	150
	250
20.0	150
	250

10.0	150 (250)
	150
20.0	150
	250

Sumichiral OA-7000 Series ( 5 $\mu$ m )	I.D. (mm)	Length (mm)
	2.0	(50)
		150
		250
Sumichiral OA-7000	4.0	10
Sumichiral OA-7100	4.6	150
Sumichiral OA-7500		250
	8.0	250
	10.0	250
	20.0	250

Sumichiral OA-8000 ( 5 $\mu$ m )	I.D. (mm)	Length (mm)
	2.0	50
		150
		250
	4.0	10
		150
Sumichiral OA-8000	4.6	50
		150
		250
	8.0	250
	10.0	250
	20.0	250