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Handling Products

Chiral columns for enantiomer separation by HPLC

[SUMICHIRAL OA] *SUMICHIRAL is a trademark of Sumika Chemical Analysis Service, Ltd.

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 (R)-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-7100	β-cyclodextrin	*	RP
OA-7500	methyl-β-cyclodextrin	*	RP
OA-7600	methyl-α-cyclodextrin	*	RP
OA-7700	acetyl-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 series and 8000. On these phases, the elution order of enantiomer is inverted.
**NP : normal-phase mode, RP : reversed-phase mode

Standard column dimensions

Guard column	· 4.0 × 10 mm
Analytical column	· 4.6 × 250 mm 4.6 × 150 mm is also available for OA-8000. · 4.6 × 150 mm (for OA-5000, 6000, 6100) 4.6 × 50 mm is also available for OA-5000.
Preparative column	· 8.0 × 250 mm, 10 × 250 mm, 20 × 250 mm

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 attained.

Improved Pirkle Type 1

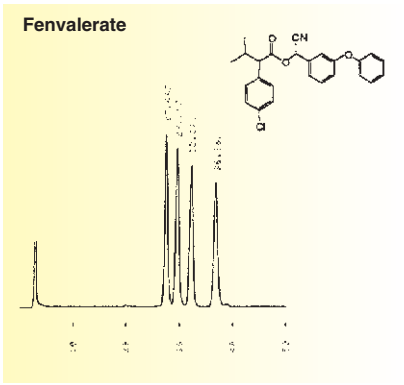
■ Amide Type: Asymmetric carbon atoms are bonded directly with CONH group

OA-2000 series have a 3,5-dinitrobenzoyl group as the π-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.

SUMICHIRAL OA-2000 series

<Pesticide>

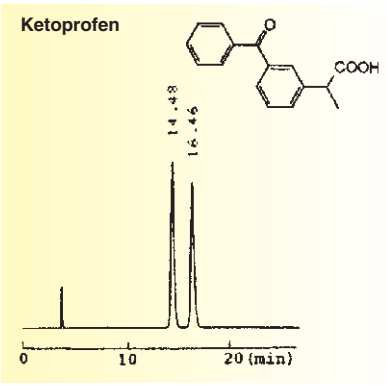
Fenvalerate



Column	: SUMICHIRAL OA-2000 (250×4.6 mm)
Mobile phase	: hexane/1,2-dichloroethane/ethanol (500/30/0.15)
Flow rate	: 1.0 mL/min
Detection	: UV at 230 nm

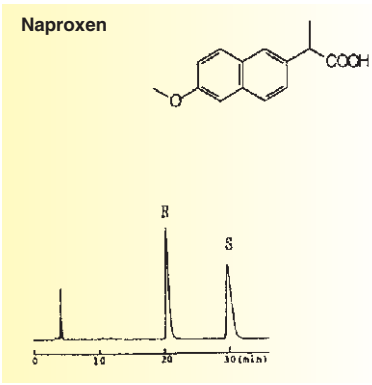
<Profen-drugs>

Ketoprofen



Column	: SUMICHIRAL OA-2500 (250×4.6 mm)
Mobile phase	: 0.03 mol/L ammonium acetate in methanol
Flow rate	: 1.0 mL/min
Detection	: UV at 254 nm

Naproxen



Column	: SUMICHIRAL OA-2500 (250×4.6 mm)
Mobile phase	: 0.05 mol/L ammonium acetate in methanol
Flow rate	: 1.0 mL/min
Detection	: UV at 254 nm

Improved Pirkle Type 1

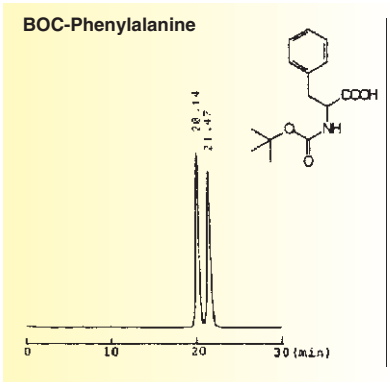
Urea Type: Asymmetric carbon atoms are bonded directly with NHCONH group

OA-3000 series have 3,5-dinitrophenylurea group as the π-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, as well as dansylamino acids. OA-3300 offers good direct separation for profen-drugs, acetyl-amino acids, BOC-amino acids and benzyl-amino acids.

SUMICHIRAL OA-3000 series

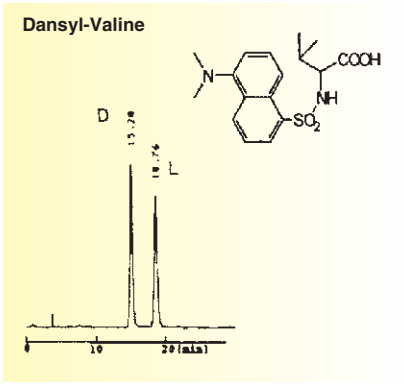
<Amino acid N-derivatives>

BOC-Phenylalanine



Column	: SUMICHIRAL OA-3300 (250×4.6 mm)
Mobile phase	: 0.01 mol/L ammonium acetate in methanol
Flow rate	: 0.6 mL/min
Detection	: UV at 254 nm

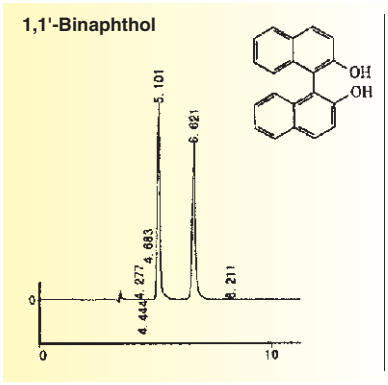
Dansyl-Valine



Column	: SUMICHIRAL OA-3200 (250×4.6 mm)
Mobile phase	: 0.01 mol/L ammonium acetate in methanol
Flow rate	: 1.0 mL/min
Detection	: UV at 254 nm

<Atropisomer>

1,1'-Binaphthol



Column	: SUMICHIRAL OA-3300 (250×4.6 mm)
Mobile phase	: hexane/2-propanol/methanol (70/20/10)
Flow rate	: 1.0 mL/min
Detection	: UV at 254 nm

Improved Pirkle Type 2

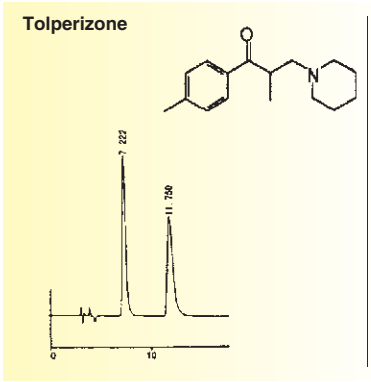
Two chiral centers at amine and amino acid are bonded with NHCONH group

OA-4000 series have a naphthyl group as the π-base, and two chiral centers at amine and amino acid group. By charge transfer, hydrogen bonding, etc., chiral discrimination is acheived, 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.

SUMICHIRAL OA-4000 series

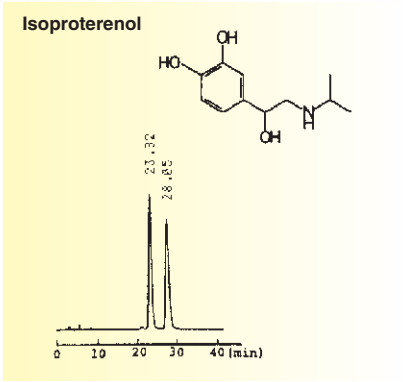
<Amine-type drugs>

Tolperizone



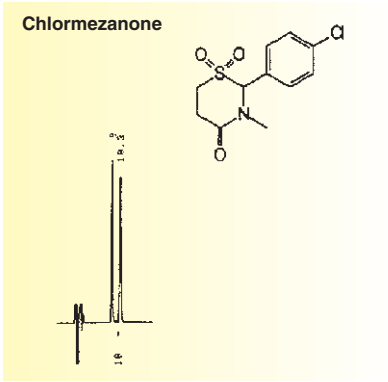
Column	: SUMICHIRAL OA-4500 (250×4.6 mm)
Mobile phase	: hexane/tetrahydrofuran/methanol/ trifluoroacetic acid (60/35/5/0.2)
Flow rate	: 1.0 mL/min
Detection	: UV at 254 nm

Isoproterenol



Column	: SUMICHIRAL OA-4900 (250×4.6 mm)
Mobile phase	: hexane/1,2-dichloroethane/methanol/ trifluoroacetic acid (240/140/20/1)
Flow rate	: 1.0 mL/min
Detection	: UV at 280 nm

Chlormezanone



Column	: SUMICHIRAL OA-4700 (250×4.6 mm)
Mobile phase	: hexane/2-propanol/methanol/ trifluoroacetic acid (80/15/5/0.2)
Flow rate	: 1.0 mL/min
Detection	: UV at 254 nm

Ligand exchange Type

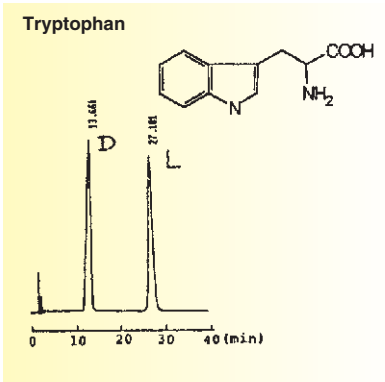
The chiral components are coated hydrophobically on ODS

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 or hydroxy acids but also copper-chelate forming compounds such as amino alcohols, diamines, dicarboxylic acids, aminolactames and dipeptides. Especially OA-5000 can be applied for extremely wide range, while OA-6100 is effective for β-amino acids, β-hydroxy acids and hydrophilic amin acids.

SUMICHIRAL OA-5000, OA-6000 series

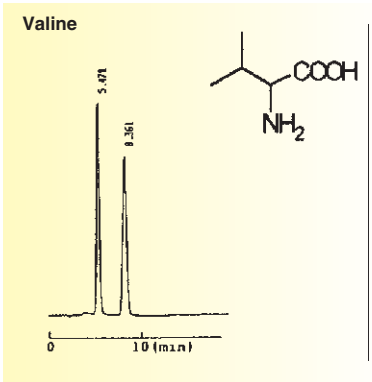
<Amino acids>

Tryptophan



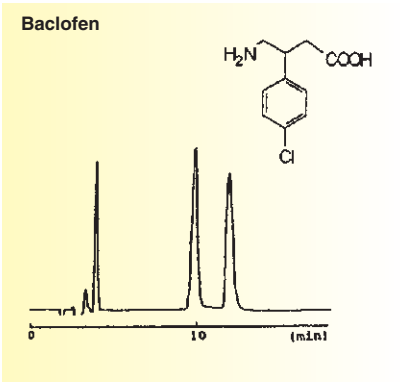
Column	: SUMICHIRAL OA-6100 (150×4.6 mm)
Mobile phase	: 2 mmol/L copper(Ⅱ) sulfate in [water/acetonitrile (90/10)]
Flow rate	: 1.0 mL/min
Detection	: UV at 254 nm

Valine



Column	: SUMICHIRAL OA-5000 (150×4.6 mm)
Mobile phase	: 2 mmol/L copper(Ⅱ) sulfate in [water/2-propanol (95/5)]
Flow rate	: 1.0 mL/min
Detection	: UV at 254 nm

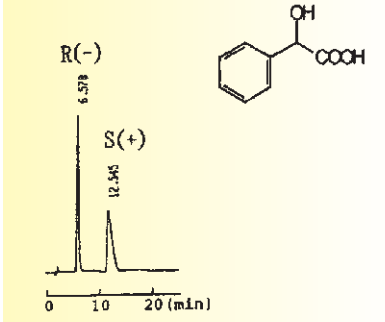
Baclofen



Column	: SUMICHIRAL OA-5000 (150×4.6 mm)
Mobile phase	: 2 mmol/L copper(Ⅱ) sulfate in [water/2-propanol (85/15)]
Flow rate	: 1.0 mL/min
Detection	: UV at 254 nm

<Hydroxy acids>

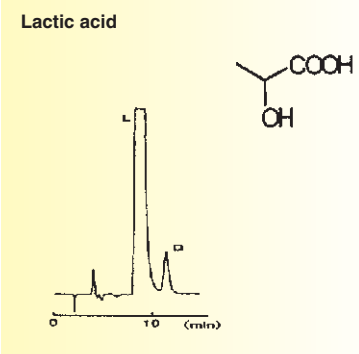
Mandelic acid



Column	: SUMICHIRAL OA-6100 (150×4.6 mm)
Mobile phase	: 2 mmol/L copper(Ⅱ) sulfate in [water/acetonitrile (90/10)]
Flow rate	: 1.0 mL/min
Detection	: UV at 254 nm

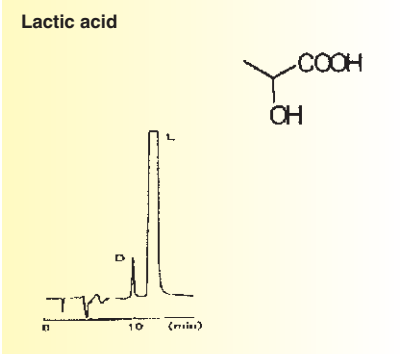
(Inversion of elution order)

Lactic acid



Column	: SUMICHIRAL OA-5000 (150×4.6 mm)
Mobile phase	: 2 mmol/L copper(Ⅱ) sulfate in [water/acetonitrile (95/5)]
Flow rate	: 1.0 mL/min
Detection	: UV at 254 nm

Lactic acid



Column	: SUMICHIRAL OA-5000L (150×4.6 mm)
Mobile phase	: 2 mmol/L copper(Ⅱ) sulfate in [water/acetonitrile (95/5)]
Flow rate	: 1.0 mL/min
Detection	: UV at 254 nm

Host-Guest Type

Cyclodextrin bonded chiral stationary phase with novel spacer

OA-7000 is a novel chiral stationary phase with β-cyclodextrin bonded to the silica gel via a 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.

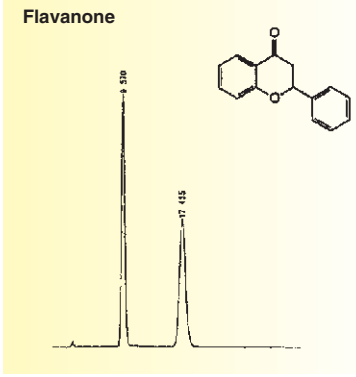
(2) Both reversed and normal phases can be used.

(3) Sharp peaks and high theoretical plate numbers are obtained.

SUMICHIRAL OA-7000, OA-8000 series

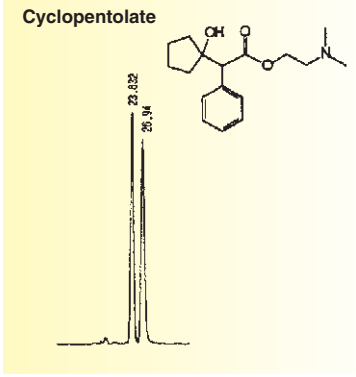
<Aromatic compounds>

Flavanone



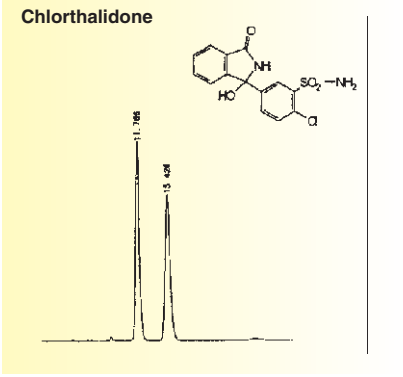
Column	: SUMICHIRAL OA-7000 (250×4.6 mm)
Mobile phase	: 20 mmol/L phosphate buffer (pH 2.0)/ acetonitrile (60:40)
Flow rate	: 0.85 mL/min
Detection	: UV at 254 nm

Cyclopentolate



Column	: SUMICHIRAL OA-7000 (250×4.6 mm)
Mobile phase	: 20 mmol/L phosphate buffer (pH 3.0)/ acetonitrile (60:40)
Flow rate	: 0.2 mL/min
Detection	: UV at 254 nm

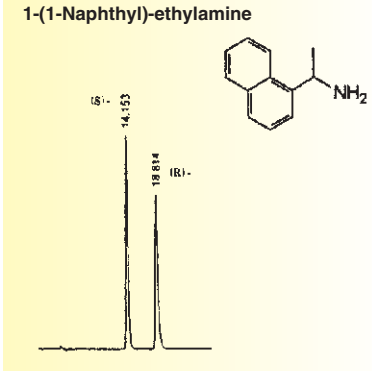
Chlorthalidone



Column	: SUMICHIRAL OA-7000 (250×4.6 mm)
Mobile phase	: 20 mmol/L phosphate buffer (pH 3.0)/ acetonitrile (80:20)
Flow rate	: 0.7 mL/min
Detection	: UV at 254 nm

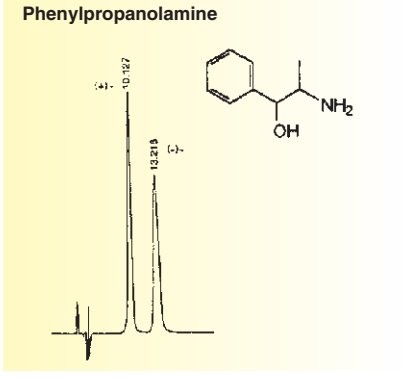
<Primary amine and aminoalcohol>

1-(1-Naphthyl)-ethylamine



Column	: SUMICHIRAL OA-8000 (250×4.6 mm)
Mobile phase	: perchloric acid in water (pH 2.0)/ acetonitrile (70/30)
Flow rate	: 0.7 mL/min
Detection	: UV at 254 nm

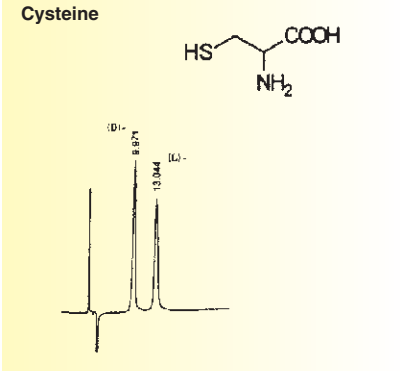
Phenylpropanolamine



Column	: SUMICHIRAL OA-8000 (250×4.6 mm)
Mobile phase	: hexane/ethanol/trifluoroacetic acid (70/30/0.5)
Flow rate	: 0.7 mL/min
Detection	: UV at 254 nm

<Amino acid>

Cysteine



Column	: SUMICHIRAL OA-8000 (250×4.6 mm)
Mobile phase	: hexane/ethanol/trifluoroacetic acid (70/30/0.5)
Flow rate	: 0.7 mL/min
Detection	: UV at 254 nm