●Practical Use of Enantiomeric Chiral Stationary Phases which can Reverse the Elution Order of Enantiomers

TN259E

[Abstract]

Most of SUMICHIRAL™ OA series use low-molecular-weight chiral selectors, therefore by using an "enantiomeric chiral stationary phase (reversed column)", the elution order of enantiomers can be reversed while maintaining the separation ability. On the other hand, with high molecular weight chiral selectors such as polysaccharides and proteins, the elution order cannot be reversed in principle, even if the elution order may be accidentally reversed depending on the measurement conditions.

[Practical advantages by reversing the elution order]

(1) Effective for trace analysis

When the trace enantiomer elutes first, it is not easily disturbed by the main component. Therefore, it is possible to develop an accurate chiral separation method by using the enantiomeric chiral stationary phase. Especially, it is effective for the detection limit of 0.5 % or less.

(2) Effective for preparative chromatography

The optical purity will be higher if the fraction of the enantiomer that elute first are taken.

(3) Effective for peak assignment

It is effective for identification of enantiomers by measuring the same sample by using both standard and reversal column (especially when there are many contaminating peaks such as a biological sample).

[Types of Chiral Stationary Phases (SUMICHIRAL™ OA)]

Standard column		Reversed column	
SUMICHIRAL™	Chiral components	SUMICHIRAL™	Chiral components
OA-2000	(R)-phenylglycine	OA-2000S	(S)-phenylglycine
OA-2500	(R)-1-naphtylglycine	OA-2500S	(S)-1-naphtylglycine
OA-3100	(S)-valine	OA-3100R	(R)-valine
OA-3200	(S)-tert-leucine	OA-3200R	(R)-tert-leucine
OA-3300	(R)-phenylglycine	OA-3300S	(S)-phenylglycine
OA-4000	(S)-valine (S)-1-(α-naphthyl)ethylamine	OA-4000R	(R)-valine (R)-1-(α-naphthyl)ethylamine
OA-4100	(S)-valine (R)-1-(α-naphthyl)ethylamine	OA-4100R	(R)-valine (S)-1-(α-naphthyl)ethylamine
OA-4400	(S)-proline (S)-1-(α-naphthyl)ethylamine	OA-4400R	(R)-proline (R)-1-(α-naphthyl)ethylamine
OA-4500	(S)-proline (R)-1-(α-naphthyl)ethylamine	OA-4500R	(R)-proline (S)-1-(α-naphthyl)ethylamine
OA-4600	(S)-tert-leucine (S)-1-(α-naphthyl)ethylamine	OA-4600R	(R)-tert-leucine (R)-1-(α-naphthyl)ethylamine
OA-4700	(S)-tert-leucine (R)-1-(α-naphthyl)ethylamine	OA-4700R	(R)-tert-leucine (S)-1-(α-naphthyl)ethylamine
OA-5000	(D)-penicillamine	OA-5000L	(L)-penicillamine
OA-6000	(L)-tartaric acid (R)-1-(α-naphthyl)ethylamine	OA-6000R	(D)-tartaric acid (S)-1-(α-naphthyl)ethylamine
OA-6100	(L)-tartaric acid, (S)-valine (S)-1-(α-naphthyl)ethylamine	OA-6100R	(D)-tartaric acid, (R)-valine (R)-1-(α-naphthyl)ethylamine

The structure of SUMICHIRAL™ OA-3100 and OA-3100R are shown in Fig. 1 as an example.

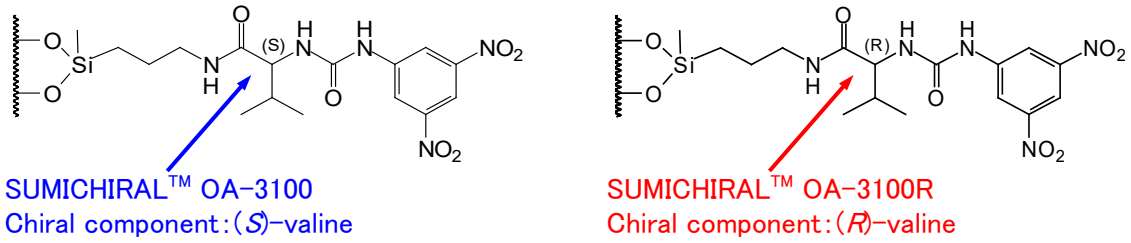
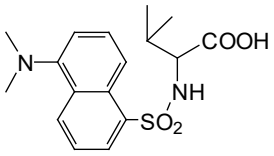


Fig. 1 The structure of SUMICHIRAL™ OA-3100 and OA-3100R

[Applications]

(1) *N*-Dansylvaline



Column : SUMICHIRAL™ OA-3300、OA-3300S
(4.6 mm i.d. × 250 mm)
Mobile phase : 0.01M ammonium acetate in methanol
Flaw rate : 1.0 mL/min
Detection : UV 254 nm

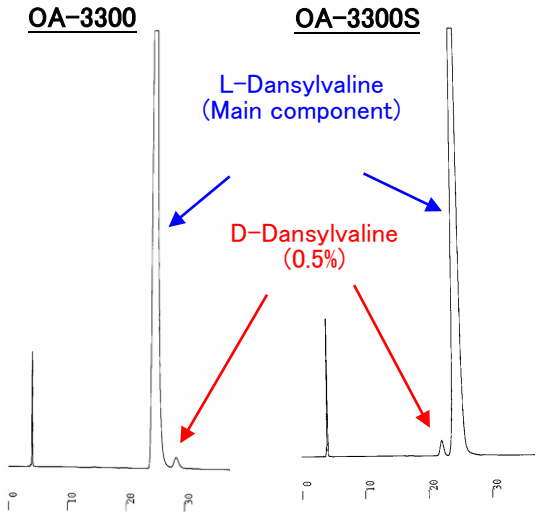
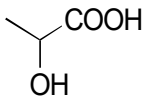


Fig. 2 Chiral separation chromatogram of *N*-Dansylvaline

(2) Lactic acid



Column : SUMICHIRAL™ OA-5000、OA-5000L
(4.6 mm i.d. × 150 mm)
Mobile phase :
2 mmol/L copper(Ⅱ) sulfate in water/2-propanol
(98/2)
Flaw rate : 1.0 mL/min
Detection : UV 254 nm

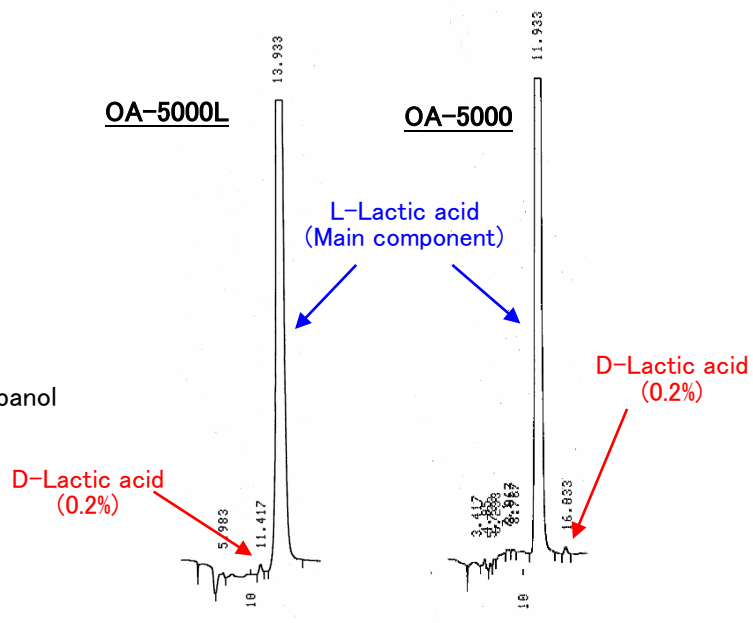


Fig. 3 Chiral separation chromatogram of Lactic acid