●Selection Method of Chiral Stationary Phases

TN507E

[Abstract]

When developing a chiral separation method for HPLC, it is first necessary to select a chiral stationary phase and to search separation conditions. We will introduce how to select the chiral stationary phase suitable for the target compound, taking into consideration some points to be noted.

[Selection of Chiral Stationary Phases]

1. Clarification of analysis objectives and conditions

It is necessary to select a chiral stationary phase which can separate the enantiomer of the target compound. In doing so, it should be clarified the essential requirements and desirable conditions.

Ex.) Essential requirements : elution order, analysis time, for LC-MS (excluding non-volatile salt), etc.

Desirable conditions : reversed phase mode, normal phase mode, for small volume preparative use, etc.

2. Confirmation of specifications and selection of the column

Confirm the specifications of the chiral stationary phase (separation mode, target compounds, etc.) from catalogs, etc.(Table1).

Next, based on the selection scheme of the chiral stationary phase, the column is narrowed down based on the functional group of the target compound(Fig. 1).

Check if the separation mode in Table 1 is suitable for your purpose.

3. Decision of candidate columns

Select about three candidate columns that meet the required conditions with reference to the application data. Examine the separation conditions using the candidate columns.

Table 1 Specification of chiral stationary phases

Type of chiral stationary phase	Mode※	Main functional groups to be separated
＜Improved pirkle Type＞		
SUMICHIRAL™ OA-2000 series	NP・RP	Esters, Carboxylic acids
SUMICHIRAL™ OA-3000 series	RP	Carboxylic acids、*N*-substituted amino acids
SUMICHIRAL™ OA-4000 series	NP	Amines, Amino alcohols
＜Ligand exchange Type＞		
SUMICHIRAL™ OA-5000 series	RP	Amino acids, Hydroxy acids
SUMICHIRAL™ OA-6000 series	RP	
＜Host-guest Type＞		
SUMICHIRAL™ OA-7000 series	RP	Aromatic ketones, Amines, Alcohols, Esters
SUMICHIRAL™ OA-8000	NP・RP	Primary amines, Amino acids, Amino alcohols
＜Helical polymer Type＞		
SUMICHIRAL™ OA-SHELL P1	NP	Aromatic alcohols, Ketones, Lactones

※ NP : Normal phase mode RP : Reversed phase mode

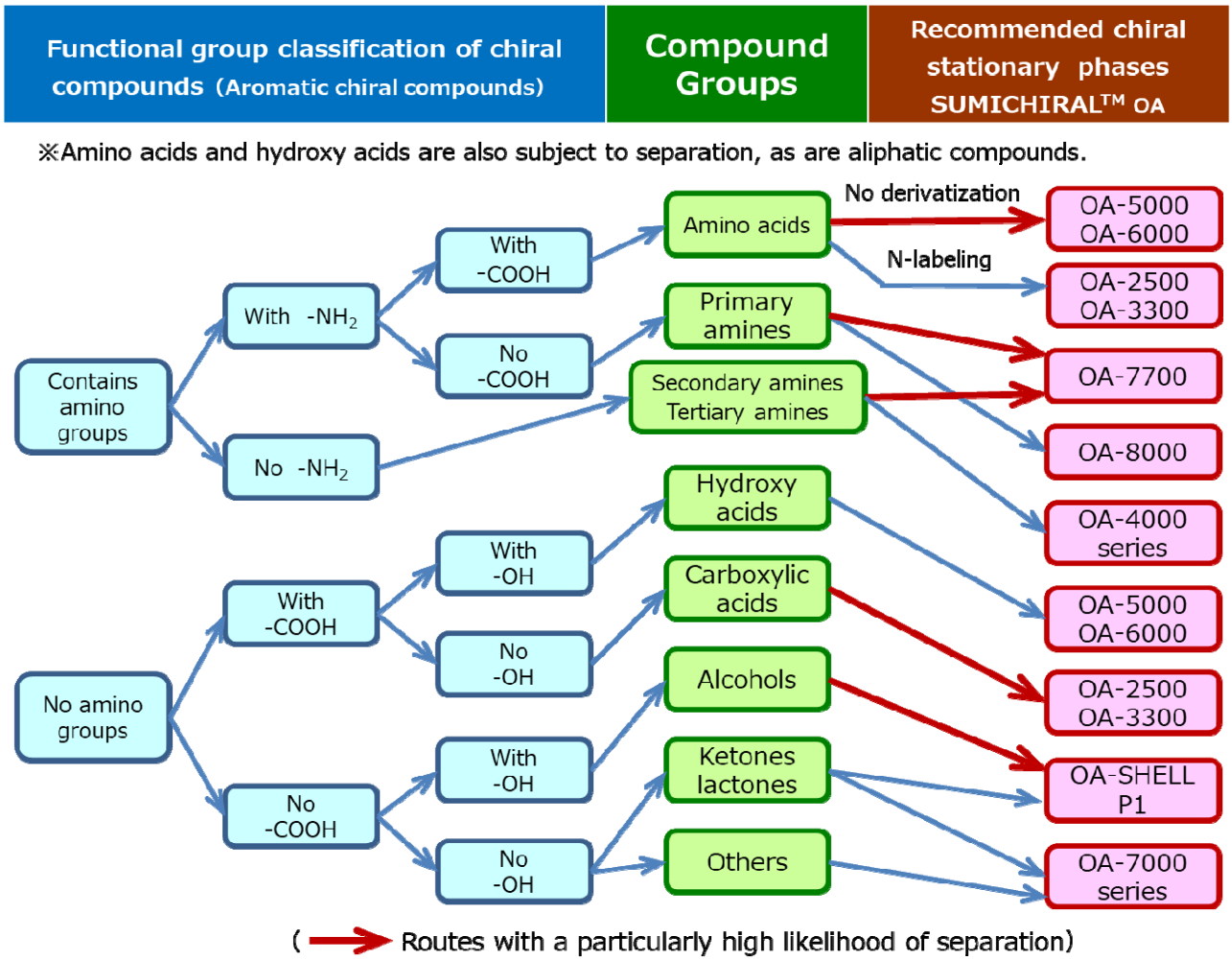

Fig. 1 Scheme for select of chiral stationary phases

4. Results of Separation Study

① If the separation is achieved, and requirements are met

⇒ Optimization of measurement conditions

② If the separation is not achieved, or If the separation is achieved but requirements are not met

⇒ Selection of next candidate columns

5. Selection of next candidate column

If another column in the same series as the candidate column has any separation data for the compound with same functional group of the target, that column will be the next candidate column.

SUMICHIRAL is a registered trademark.

We have published data to help you select a chiral stationary phase.

https://www.scas.co.jp/en/insrtuments-products-synthesis/hplc-column/sumichiral-database/

[Keywords]

Chromatography, Enantiomers, Condition studies, Chiral separation analysis