Column Care and Use Instructions
CHIRAL ART Cellulose-SJ
Immobilized type

1. Introduction

Thank you for purchasing a YMC high-performance liquid chromatography (HPLC) column. The CHIRAL ART Cellulose-SJ columns are designed for separating optical isomers (in normal/ reversed phase mode). The immobilized chiral selectors, polysaccharide derivatives, provide high compatibility with wide range of organic solvents, and superior separation and selectivity. With its advantages, CHIRAL ART Cellulose-SJ columns are suitable for separating a variety of chiral compounds.

CHIRAL ART Cellulose-SJ columns, which are manufactured under highly controlled conditions, must pass a series of stringent tests before being accepted for shipment. (Please refer to the column inspection report). To ensure optimal performance and durability of the column, please read these instructions carefully before using the columns.

2. Specifications

Item	CHIRAL ART Cellulose-SJ
Particle size	3, 5, 10, 20 µm
Chiral selector	Cellulose tris(4-methylbenzoate)
Type	Immobilized type
Separation mode	Normal Phase/ Reversed Phase [1]
Shipping solvent [1]	*n*-hexane/2-propanol (90/10)
Temp. range (°C)	0 – 40°C (Max. 25°C in pH 7 – 9)
Usable pH range	pH 2 – 9
Pressure limit [2]	30 MPa
Recommended flow rate [3]	4.6 mm I.D.: 0.5 – 1.0 mL/min (Max. flow rate: 3.0 mL/min) 10 mm I.D. : 2.5 – 5.0 mL/min (Max. flow rate: 15 mL/min)

1: After use in normal phase; if you intend to store the column for a long time, replace the mobile phase in the column with shipping solvent.

The initial use in reversed phase (aqueous); replace the shipping solvent with ethanol or 2-propanol before replace with the mobile phase for separation.

After use in reversed phase; the mobile phase should be replaced with ethanol before storing in the shipping solvent. For the mobile phase containing buffer salts/additives, the replacement process should be carried out with caution to prevent the precipitation of salt.

2: Avoid using a column repeatedly near the pressure limit or abrupt change in the pressure in order to prevent from shortening the column lifetime. The recommended operational pressure of the column is 25 MPa or less.

3: Adjust flow rate according to the recommendation in the table above to obtain the optimum results under the application. The repeated use at or near the upper limit of flow rate can reduce the column life time. When using column dimensions other than listed, adjust flow rate according to the cross-section area of the column.

2, 3: Pressure changes depending on column length, temperature, types of organic solvent etc. If pressure exceeds the upper limit, reduce flow rate to below the lower rate of recommended range.

3. Column installation

- The column endfitting is Waters style connection.
- Tubing must have flat ends and must bottom out in the column endfitting. Tubing must be connected to the column correctly to avoid creating a void between the column frit and tubing, which can cause a leak and result in poor column performance (e.g. peak tailing, loss of theoretical plate number).
- The correct direction of the solvent flow is indicated by an arrow on the column identification label.
- Do not disconnect a column from the LC system before the pressure drops to zero.

4. Mobile phase and sample solvent

- CHIRAL ART are suitable for any mobile phase commonly used in HPLC columns, from aqueous to non-aqueous solvents. The column can be used on both normal phase and reversed phase (aqueous mobile phase). We recommend that the column is dedicated to either phase. Frequent switch of modes between phases can cause extensive damage to the column. Please refer to the recommendation of the solvents in the table below.
- After replacing among solvents with difference in contained organic solvent or in pH value, sufficiently equilibrate the column with the mobile phase. Depending on the mobile phase composition, it maybe take over 100 (one hundred) column volumes running.
- Make sure of miscibility among the organic solvents. When switching the mobile phase from alkane/alcohol mobile phase to polar organic solvents (methanol, acetonitrile etc), flush the column with compatible solvent such as ethanol or 2-propanol for at least 10 (ten) column volumes beforehand. After that, sufficiently equilibrate the column with the mobile phase.
- Be careful of the solvent resistance of HPLC system and PEEK tubing when using them on normal phase mode.
- When a target compounds is ionic, addition of modifier listed below can improve peak shape and/or separation reproducibility. High concentrations of modifiers can result in reducing column lifetime. Add/reduce the modifiers according to the notes in the table.
- Whenever possible, the sample should be dissolved in the same composition as the initial mobile phase. Using a stronger solvent than mobile phase for sample dissolution may result in broad peaks and reducing the separability and reproducibility. In addition, before injection, please check the miscibility of the sample solvent and mobile phase in order to prevent the sample from precipitating on injection.
- In order to avoid blockage which can cause pressure increase, the sample solution should be filtered through a membrane filter (0.2 µm or smaller porosity).

【Recommended solvents for Normal phase】

	Acidic compounds	Basic compounds	Non-ionic compounds
Organic solvents	alkane (*n*-hexane or *n*-heptane), alcohols(methanol, ethanol, 2-propanol), acetonitrile, ethyl acetate, tetrahydrofuran (THF), dichloromethane, chloroform, methyl *tert*-butyl ether (MTBE)		
Modifiers	0.1%(Upper limit 0.5%) trifluoroacetic acid (TFA), acetic acid, formic acid, etc	0.1%(Upper limit 0.5%) diethylamine (DEA), butylamine, ethanolamine, etc	None
Composition ratio	Any ratio (those should be miscible)		

【Recommended solvents for Reversed phase】

	Acidic compounds	Basic compounds	Non-ionic compounds
Organic solvents	Acetonitrile, methanol, ethanol, 2-propanol, THF, etc		
Aqueous phase (Modifiers)	0.1%phosphoric acid, 0.1%formic acid, 50 – 100 mM phosphate buffer (pH2.0 – 3.5), etc	20 mM NH_4HCO_3-DEA buffer(pH9.0), etc	Water
Composition ratio	Organic solvent/ aqueous solution (10/90 – 100/0)		

5. Column cleaning (general method)

The column needs to be replaced when the cleaning methods below do not regenerate the column performance. To extend the column lifetime, especially for samples containing large amount of impurities, we recommend a sample pretreatment conducted carefully prior to introducing the sample to the column and /or a guard column to use with.

【Normal phase】

- Flush the column with the one of the organic solvents, which has the highest polarity among the composition of mobile phase with increased concentration (for example, for alkane/alcohol mobile phase, concentration of alcohol should be increased) to wash out the residual substances strongly retained on the column. For further cleaning, flush with 100%ethanol.
- When the mobile phase is containing acid or amine, replace with solvent containing neither of them (at the same ratio as the mobile phase), then wash as above procedure. Do not store the column with solvent containing modifiers even for a short period of time.

【Reversed phase】

- Flush the column with solution containing a higher ratio of organic solvent for washing out the compounds that have a great capacity for retention in the column after using mobile phases not containing buffer salts/additives. Usable concentration of organic solvent is up to 100%.
- When using mobile phase containing buffer salts/additives, first replace with a water/organic solution containing no buffer salts/additives (A ratio of water to organic solvent should be set at the same proportions as a mobile phase). Then flush the column in accordance with the method described above.

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