ChiralTek
Solutions for Chiral Separations & Sample Preparations

Short User Manual for ChiralCD Columns

Please visit English website http://chiraltek-column.com/Downloads.php or Chinese website http://cbook.antpedia.com/6755 for downloading the full product manual and application notes for the ChiralCD columns.

All ChiralCD columns have been passed the quality control tests. Please kindly refer to the "Certificate of Quality Control Analysis" for information about the testing results. The column was stored in IPA/MeOH (50:50, *v/v*) before delivery. Please carefully read this user manual before using the ChiralCD column.

1. Unique Characteristics for ChiralCD columns

ChiralCD columns are a series of new types of chemically-substituted cyclodextrin-bonded silica particles-packed chiral columns. The ChiralCD particles were synthesized by bonding a series of different functional groups-substituted α-, β-, or γ-cyclodextrins onto surface of high-quality porous silica (2 μm or 3 μm) gel particles by linking ChiralTek proprietary chiral spacer arms at the wider torus rim of the cyclodextrins as shown in the following Figure (A). Due to the multiple functional groups, e.g., halogen groups, hydroxyl groups, aromatic rings, and cyclodextrin moiety etc., available in the bonded stationary phases, the ChiralCD columns can be used under both normal phase and reversed-phase conditions. The chiralCD columns can use both standard and non-standard mobile phases in HPLC and UPLC.

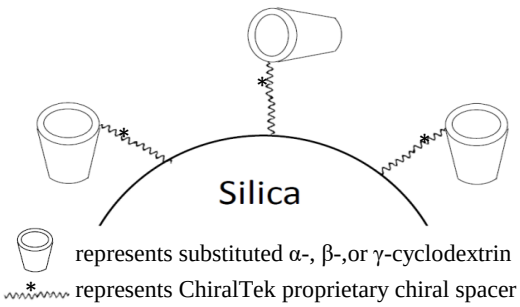

Figure (A). Schematic diagram of the ChiralCD phase

Since the ChiralCD columns are the first commercial available chiral columns by anchoring cyclodextrins through the less reactive secondary hydroxyl at the wider torus rim of the cyclodextrins, the ChiralTek proprietary chiral spacer arms can provide extra unique steric interactions with solutes when entering the cyclodextrin cavities through the wider torus rim. Therefore, enhanced chiral selectivity can be easily achieved on the ChiralCD columns. As the chemical structure of ChiralCD particles is different from other supplier's cyclodextrin-based particles (shown in Figure (B)) and the ChiralCD phase contain higher content of bonded cyclodextrins, the new ChiralCD columns can provide different and generally better separation abilities than other supplier's cyclodextrin-based columns.

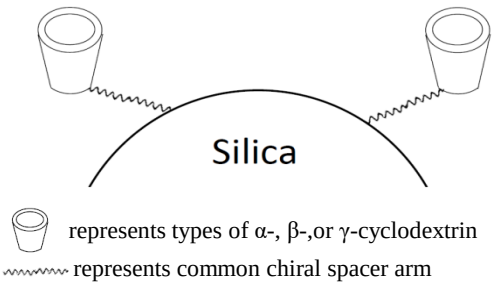

Figure (B). Schematic diagram of other supplier's cyclodextrin-bonded phase

2. Application and Requirements

The ChiralCD columns can be used under multiple modes of mobile phase conditions. For use under reversed-phase conditions, the columns need to be firstly flushed with methanol following by mobile phase until reaching a constant column pressure. Similarly, for use under normal phase conditions, the columns need to be firstly flushed with isopropanol following by mobile phase until achieving a stable baseline signal. A common standard C18 guard column can be used for reversed-phase conditions and a Diol guard column can be used for normal phase conditions.

Since packing particles and inner diameter (2 mm) of the ChiralCD columns are quite small, a low flow rate (e.g., 0.1 to 0.3 mL/min) should be applied when used in traditional HPLC with highly viscous mobile phases in order to avoid extreme high back pressure. However, there is no special flow rate limitation for use in UPLC.

Flow direction:	Arrow direction on the label
Pressure:	< 860 bar （~12500 psi ）
Temperature:	0 – 40 °C
Guard column:	Standard C18 or Diol column
LC mode:	HPLC or UPLC

3. Care and Maintenance of the ChiralCD Columns

[1] It is strongly recommended to use standard C18 or Diol guard columns to protect the ChiralCD columns;
[2] It'd better to resolve samples in mobile phases and filter through 0.5μm membrane before injection;
[3]The solvent in the ChiralCD columns should be replaced with Methanol (reversed phase conditions) or IPA (normal phase conditions) if the columns need to be stored for over a week's time.
[4] The ChiralCD columns can be easily cleaned by flushing with 100% methanol (reversed phase conditions) or 100% IPA (normal phase conditions) at a proper flow rate for 3 hours.
[5]When worked in high pressure conditions, it's strongly recommended to gradually decrease flow rate to ensure column pressure lower than 100 bar (~1450 psi) before switching off chromatograph pump.

4. Notice and Other Considerations

[1] The ChiralCD columns can be used under normal phase, reversed phase, and polar organic mobile phase conditions. It is strongly recommended to use 100% IPA as intermediate solvent when switching between different mobile phase conditions. Due to the high viscosity of the IPA, a low flow rate of about 0.1 mL/min should be applied in traditional HPLC in order to avoid extreme high pressure. However, there is no special flow rate limitation for UPLC.
[2]Diethylamine, butylamine, or amino ethyl alcohol (0.1%) can be used as mobile phase additives for basic compounds.
[3] Formic acid, acetic acid, or trifluoroacetic acid (0.1%) can be used as mobile phase additives for acidic compounds.
[4] Since the strong alkalic compounds (e.g., NaOH etc.) can cause damages to the ChiralCD column bed, they cannot be used as mobile phase additives or sample solution additives.

5. List of the ChiralCD Columns with Different Specifications

Product List of ChiralCD Columns from ChiralTek

Part number	*Type*	*Column Dimension*	*Remarks*
822-CD1-01	ChiralCD-1	2μm, 50 x 2mm	Type 1 substituted β-cyclodextrin-bonded column
822-CD1-02	ChiralCD-1	2μm, 100 x 2mm	Type 1 substituted β-cyclodextrin-bonded column
822-CD1-03	ChiralCD-1	2μm, 150 x 2mm	Type 1 substituted β-cyclodextrin-bonded column
822-CD1-04	ChiralCD-1	2μm, 200 x 2mm	Type 1 substituted β-cyclodextrin-bonded column
822-CD1-05	ChiralCD-1	2μm, 250 x 2mm	Type 1 substituted β-cyclodextrin-bonded column
823-CD1-01	ChiralCD-1	3μm, 50 x 2mm	Type 1 substituted β-cyclodextrin-bonded column
823-CD1-02	ChiralCD-1	3μm, 100 x 2mm	Type 1 substituted β-cyclodextrin-bonded column
823-CD1-03	ChiralCD-1	3μm, 150 x 2mm	Type 1 substituted β-cyclodextrin-bonded column
823-CD1-04	ChiralCD-1	3μm, 200 x 2mm	Type 1 substituted β-cyclodextrin-bonded column
823-CD1-05	ChiralCD-1	3μm, 250 x 2mm	Type 1 substituted β-cyclodextrin-bonded column
823-CD2-01	ChiralCD-2	3μm, 50 x 2mm	Type 2 substituted β-cyclodextrin-bonded column
823-CD2-02	ChiralCD-2	3μm, 100 x 2mm	Type 2 substituted β-cyclodextrin-bonded column
823-CD2-03	ChiralCD-2	3μm, 150 x 2mm	Type 2 substituted β-cyclodextrin-bonded column
823-CD2-04	ChiralCD-2	3μm, 200 x 2mm	Type 2 substituted β-cyclodextrin-bonded column
823-CD2-05	ChiralCD-2	3μm, 250 x 2mm	Type 2 substituted β-cyclodextrin-bonded column
823-CD3-01	ChiralCD-3	3μm, 50 x 2mm	Type 3 substituted γ-cyclodextrin-bonded column
823-CD3-02	ChiralCD-3	3μm, 100 x 2mm	Type 3 substituted γ-cyclodextrin-bonded column
823-CD3-03	ChiralCD-3	3μm, 150 x 2mm	Type 3 substituted γ-cyclodextrin-bonded column
823-CD3-04	ChiralCD-3	3μm, 200 x 2mm	Type 3 substituted γ-cyclodextrin-bonded column
823-CD3-05	ChiralCD-3	3μm, 250 x 2mm	Type 3 substituted γ-cyclodextrin-bonded column
823-CD4-01	ChiralCD-4	3μm, 50 x 2mm	Type 4 substituted α-cyclodextrin-bonded column
823-CD4-02	ChiralCD-4	3μm, 100 x 2mm	Type 4 substituted α-cyclodextrin-bonded column
823-CD4-03	ChiralCD-4	3μm, 150 x 2mm	Type 4 substituted α-cyclodextrin-bonded column
823-CD4-04	ChiralCD-4	3μm, 200 x 2mm	Type 4 substituted α-cyclodextrin-bonded column
823-CD4-05	ChiralCD-4	3μm, 250 x 2mm	Type 4 substituted α-cyclodextrin-bonded column

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