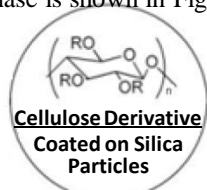


All ChiralCTCE columns have been passed the quality control tests. Please kindly refer to the "Certificate of Quality Control Analysis" for information about the testing results. The column was stored in Hexane/IPA (90:10, v/v) before delivery. Please carefully read this user manual before using the ChiralCTCE column.

1. Unique Characteristics for Cellulose-coated ChiralCTCE columns

ChiralCTCE columns are a new type of completely-substituted cellulose-coated silica particles-packed chiral columns. The ChiralCTCE particles were prepared through a specially-designed procedure by coating the cellulose derivatives onto the surface of the chemically-modified macroporous silica gel (2 μm , 3 μm , or 5 μm for analytical columns). The schematic chemical structure of the ChiralCTCE phase is shown in Figure (A).



- ChiralCTCE-1: R= Phenylcarbamate;
ChiralCTCE-2: R= 3,5-Dimethylphenylcarbamate;
ChiralCTCE-3: R=3-Chloro-4-methyl-phenylcarbamate;
ChiralCTCE-5: R= 3-Chloro-5-methyl-phenylcarbamate;
ChiralCTCE-7: R= 4-Methylbenzoate;
ChiralCTCE-8: R= 4-Methylphenylcarbamate;
ChiralCTCE-9: R= 4-Chloro-3-methyl-phenylcarbamate;

Figure (A). Schematic diagram of the ChiralCTCE phase

2. Application and Requirements

The ChiralCTCE columns can be used only under normal mobile phase conditions with some organic acidic or basic additives. A proper chiral guard column or a common Diol guard column can be used for ChiralCTCE column under normal phase conditions.

The ChiralCTCE column is stored in Hexane/IPA (90:10, v/v) upon delivery. It is strongly recommended to flush the column with compatible mobile phase to achieve a stable baseline under normal phase condition before final application in UPLC, HPLC, or SFC.

Non-typical solvents, e.g., Acetone, Chloroform, Dichloromethane, DMF, DMSO, 1,4-Dioxane, Ethyl acetate, THF, Toluene, etc., cannot be used to resolve samples and cannot be used as mobile phase additives.

High-quality sphere macroporous silica particles with pore size 500Å, 1000Å and above are used to manufacture the ChiralCTCE phases. Therefore, high column efficiency can be easily achieved on the ChiralCTCE columns.

As ChiralCTCE particles are cellulose derivative-coated chiral phases, they are designed only for normal phase conditions in HPLC, UPLC, and SFC. Typical mobile phases are mixtures of Hexane/IPA, or Hexane/EtOH, or Heptane/Butanol, or CO₂/EtOH, or CO₂/IPA, etc. with/without organic acidic or basic additives. The ChiralCTCE columns cannot be used under reversed-phase or other non-typical mobile phase conditions.

Please use cellulose-immobilized ChiralCE columns if other non-typical mobile phases or reversed-phase mobile phases are required for the chromatographic separations.

The column pressure for ChiralCTCE columns with 5 μm particles is quite low in HPLC and SFC. However, when using ChiralCTCE columns with 2 μm and 3 μm particles, low flow rate (e.g., 0.1-0.5 mL/min) should be applied when used in traditional HPLC with highly viscous mobile phases in order to avoid high back pressure. However, there is no special flow rate limitation for use in UPLC or SFC.

Flow direction:	Arrow direction on the label
Pressure:	< 860 bar (~12500 psi , 2 μm , 3 μm) < 460 bar (~7000 psi , 5 μm , HPLC)
Temperature:	0 – 40 °C
Guard column:	Chiral or standard Diol column
Mode:	HPLC, SFC, or UPLC

3. Care and Maintenance of the ChiralCTCE Columns

[1] It is strongly recommended to use guard columns to protect the ChiralCTCE columns;

[2] It'd be better to resolve samples in mobile phases and filter through 0.5 μm membrane before injection;

[3] The non-typical solvents, e.g., Acetone, Chloroform, Dichloromethane, DMF, DMSO, 1,4-Dioxane, Ethyl acetate, THF, Toluene, etc., cannot be used to resolve samples or to use as mobile phase additives in HPLC.

[4] A small amount (e.g., 1% to 2%) of Chloroform or Dichloromethane may be added into CO₂/EtOH or CO₂/IPA under certain SFC conditions.

[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 the chromatograph pump.

4. Notice and Other Considerations

- [1] The ChiralCTCE columns can only be used under normal mobile phase conditions with or without some organic acidic or basic additives. They cannot be used under reversed-phase or other non-typical mobile phase conditions.
- [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] Non-typical solvents, e.g., Acetone, Chloroform, Dichloromethane, DMF, DMSO, 1,4-Dioxane, Ethyl acetate, THF, Toluene, etc., cannot be used to resolve samples and cannot be used as mobile phase additives in HPLC and UPLC.
- [5] If other non-typical mobile phases or reversed-phase mobile phases are required for the chromatographic separations, another type of cellulose-immobilized ChiralCTCE columns should be used to replace the cellulose-coated ChiralCTCE columns.

5. List of the ChiralCTCE Columns with Different Specifications

Product List of Cellulose-coated ChiralCTCE Columns from ChiralTek			
Part Number	Type	Dimension	Description
8022-CTCE1-01	ChiralCTCE-1	2 μm, 1000Å, 50 × 2.1mm	2 μm cellulose tris(phenylcarbamate)-coated analytical column
8032-CTCE2-02	ChiralCTCE-2	2 μm, 1000Å, 100 × 2.1mm	3 μm cellulose tris(3,5-dimethylphenylcarbamate)-coated analytical column
8053-CTCE3-03	ChiralCTCE-3	3 μm, 1000Å, 150 × 2.1mm	3 μm cellulose tris(3-chloro-4-methylphenylcarbamate)-coated analytical column
8023-CTCE5-04	ChiralCTCE-5	3 μm, 1000Å, 200 × 2.1mm	3 μm cellulose tris(3-chloro-5-methylphenylcarbamate)-coated analytical column
8023-CTCE7-05	ChiralCTCE-7	3 μm, 1000Å, 250 × 2.1mm	3 μm cellulose tris(4-methylbenzoate)-coated analytical column
8023-CTCE8-62	ChiralCTCE-8	3 μm, 1000Å, 100 × 4.6mm	3 μm cellulose tris(4-methylphenylcarbamate)-coated analytical column
85023-CTCE9-61	ChiralCTCE-9	3 μm, 500Å, 50 × 4.6mm	3 μm cellulose tris(4-chloro-3-methylphenylcarbamate)-coated analytical column
85023-CTCE2-62	ChiralCTCE-2	3 μm, 500Å, 100 × 4.6mm	3 μm cellulose tris(3,5-dimethylphenylcarbamate)-coated analytical column
8033-CTCE3-62	ChiralCTCE-3	3 μm, 1000Å, 100 × 4.6mm	3 μm cellulose tris(3,5-dimethylphenylcarbamate)-coated analytical column
8025-CTCE2-05	ChiralCTCE-2	5 μm, 1000Å, 250 × 4.6mm	5 μm cellulose tris(3,5-dimethylphenylcarbamate)-coated analytical column
8035-CTCE3-05	ChiralCTCE-3	5 μm, 1000Å, 250 × 4.6mm	5 μm cellulose tris(3-chloro-4-methylphenylcarbamate)-coated analytical column
8075-CTCE7-05	ChiralCTCE-7	5 μm, 1000Å, 250 × 4.6mm	5 μm cellulose tris(4-methylbenzoate)-coated analytical column
7025-CTCE2-14	ChiralCTCE-2	5 μm, 1000Å, 200 × 10.0mm	5 μm cellulose tris(3,5-dimethylphenylcarbamate)-coated semi-preparative column
7025-CTCE2-25	ChiralCTCE-2	5 μm, 1000Å, 250 × 20.0mm	5 μm cellulose tris(3,5-dimethylphenylcarbamate)-coated preparative column
7025-CTCE2-35	ChiralCTCE-2	5 μm, 1000Å, 250 × 30.0mm	5 μm cellulose tris(3,5-dimethylphenylcarbamate)-coated preparative column
803-SK1-61	ChiralKit-1	3 μm, 1000Å, 50 × 4.6mm	Screening Kit-1 (3 analytical columns)

ChiralCTCE columns with other dimensions are also available. This manual may not be updated on time, please visit English website <http://chiraltek-column.com/Downloads.php> for downloading the latest version of full product manual and application notes for ChiralCTCE columns. Please call an international phone number (+65)-93656129 to directly contact ChiralTek technical support team in Singapore. You also can call a special local phone number (+86)-95040358310 in the mainland of China to directly contact ChiralTek support team in Singapore.