

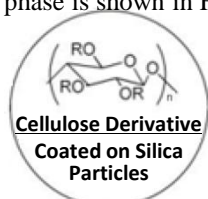
## Short User Manual for ChiralCTCE-R Columns

Please visit English website <http://chiraltek-column.com/Downloads.php> for downloading the full product manual and application notes for the ChiralCTCE-R columns.

All ChiralCTCE-R 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 ACN/H<sub>2</sub>O (40:60, v/v) before delivery. Please carefully read this user manual before using the ChiralCTCE-R column.

### 1. Unique Characteristics for Cellulose-coated ChiralCTCE-R columns

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



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

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

As ChiralCTCE-R particles are cellulose derivative-coated chiral phases, they are designed only for polar organic and reversed-phase conditions in HPLC and UPLC. Typical mobile phases are mixtures of MeOH/ACN, or MeOH/H<sub>2</sub>O, or ACN/H<sub>2</sub>O, etc. with/without organic acidic or basic additives. The ChiralCTCE-R columns cannot be used under normal phase or other non-typical mobile phase conditions.

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

Figure (A). Schematic diagram of the ChiralCTCE-R phase

### 2. Application and Requirements

The ChiralCTCE-R columns can be used only under polar organic and reversed-phase conditions with some organic acidic or basic additives. A proper chiral guard column or a common NH<sub>2</sub> or C18 guard column can be used for ChiralCTCE-R columns..

The ChiralCTCE-R column is stored in ACN/H<sub>2</sub>O (40:60, 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 or HPLC.

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.

The column pressure for ChiralCTCE-R columns with 5  $\mu$ m particles is quite low in HPLC. However, when using ChiralCTCE-R columns with 2  $\mu$ m and 3  $\mu$ m 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.

Flow direction:	Arrow direction on the label
Pressure:	< 860 bar (~12500 psi , 2 $\mu$ m, 3 $\mu$ m)
	< 460 bar (~7000 psi , 5 $\mu$ m, HPLC)
Temperature:	0 – 40 °C
Guard column:	Chiral or standard NH <sub>2</sub> or C18 column
Mode:	HPLC or UPLC

### 3. Care and Maintenance of the ChiralCTCE-R Columns

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

[2] It'd be better to resolve samples in mobile phases and filter through 0.5  $\mu$ m 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.0.01% to 0.1%) of organic acidic or basic additives and buffers can be used under certain mobile phase conditions. However, frequent changes of additives may shorten lifespan of the columns.

[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-R columns can only be used under polar organic and reversed-phase conditions with or without some organic acidic or basic additives. They cannot be used under normal phase or 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 normal phases are required for the chromatographic separations, another type of cellulose-immobilized ChiralCE columns or normal phase coating chiralCTCE columns should be used to replace the cellulose-coated ChiralCTCE-R columns.

#### 5. List of the ChiralCTCE-R Columns with Different Specifications

**Product List of Cellulose-coated ChiralCTCE-R Columns from ChiralTek**

<i>Part Number</i>	<i>Type</i>	<i>Dimension</i>	<i>Description</i>
8022-CTCE1R-01	ChiralCTCE-1R	2 $\mu$ m, 1000Å, 50 × 2.1mm	2 $\mu$ m tris(phenylcarbamate)-cellulose-coated reverse phase analytical column
8032-CTCE2R-02	ChiralCTCE-2R	2 $\mu$ m, 1000Å, 100 × 2.1mm	3 $\mu$ m tris(3,5-dimethylphenyl-carbamate)-cellulose-coated reverse phase analytical column
8053-CTCE3R-03	ChiralCTCE-3R	3 $\mu$ m, 1000Å, 150 × 2.1mm	3 $\mu$ m tris(3-chloro-4-methyl-phenylcarbamate)-cellulose-coated reverse phase analytical column
8023-CTCE7R-05	ChiralCTCE-7R	3 $\mu$ m, 1000Å, 250 × 2.1mm	3 $\mu$ m tris(4-methylbenzoate)-cellulose-coated reverse phase analytical column
8023-CTCE8R-62	ChiralCTCE-8R	3 $\mu$ m, 1000Å, 100 × 4.6mm	3 $\mu$ m tris(4-methylphenylcarbamate)-cellulose-coated reverse phase analytical column
85023-CTCE9R-61	ChiralCTCE-9R	3 $\mu$ m, 500Å, 50 × 4.6mm	3 $\mu$ m tris(4-chloro-3-methyl-phenylcarbamate)-cellulose-coated reverse phase analytical column
85023-CTCE2R-62	ChiralCTCE-2R	3 $\mu$ m, 500Å, 100 × 4.6mm	3 $\mu$ m tris(3,5-dimethylphenyl-carbamate)-cellulose-coated reverse phase analytical column
8033-CTCE3R-62	ChiralCTCE-3R	3 $\mu$ m, 1000Å, 100 × 4.6mm	3 $\mu$ m tris(3-chloro-4-methyl-phenylcarbamate)-cellulose-coated reverse phase analytical column
8025-CTCE2R-05	ChiralCTCE-2R	5 $\mu$ m, 1000Å, 250 × 4.6mm	5 $\mu$ m tris(3,5-dimethylphenyl-carbamate)-cellulose-coated reverse phase analytical column
8035-CTCE3R-05	ChiralCTCE-3R	5 $\mu$ m, 1000Å, 250 × 4.6mm	5 $\mu$ m tris(3-chloro-4-methyl-phenylcarbamate)-cellulose-coated reverse phase analytical column
8075-CTCE7R-05	ChiralCTCE-7R	5 $\mu$ m, 1000Å, 250 × 4.6mm	5 $\mu$ m tris(4-methylbenzoate)-cellulose-coated reverse phase analytical column
7025-CTCE2R-14	ChiralCTCE-2R	5 $\mu$ m, 1000Å, 200 × 10.0mm	5 $\mu$ m tris(3,5-dimethylphenyl-carbamate)-cellulose-coated reverse phase semi-preparative column
7025-CTCE2R-25	ChiralCTCE-2R	5 $\mu$ m, 1000Å, 250 × 20.0mm	5 $\mu$ m tris(3,5-dimethylphenyl-carbamate)-cellulose-coated reverse phase preparative column
7025-CTCE2-35	ChiralCTCE-2R	5 $\mu$ m, 1000Å, 250 × 30.0mm	5 $\mu$ m tris(3,5-dimethylphenyl-carbamate)-cellulose-coated reverse phase preparative column
803-SK1-61	ChiralKit-1	3 $\mu$ m, 1000Å, 50 × 4.6mm	Screening Kit-1 (3 analytical columns)

ChiralCTCE-R 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-R 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.