ChiralTek
Solutions for Chiral Separations & SCEple Preparations

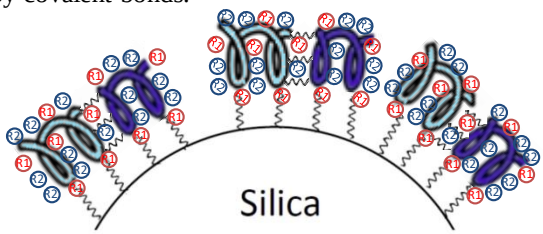
Short User Manual for ChiralCExCEy Columns

Please visit website http://chiraltek-column.com/Downloads.php for downloading the latest product manual and application notes for the ChiralCExCEy columns.

All ChiralCExCEy 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 column.

1. Unique Characteristics for ChiralCExCEy columns

ChiralCExCEy columns are the first type of tandem hetero-cellulose derivative-bonded silica particles-packed chiral columns. The ChiralCExCEy particles (as shown in Figure (A)) were prepared through a specially-designed procedure by immobilizing the novel type of complex selector, the tandem hetero-cellulose derivative (CExCEy), onto surface of high-quality porous silica (2μm, 3μm, 5μm, or 10μm). The column contains a unique complex chiral selector with two recognition moieties: the derivatized cellulose CEx and a different cellulose derivative CEy. The CEx was linked with CEy by covalent bonds.

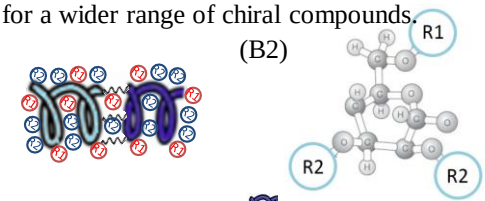


represents chemically-derivatized cellulose-x (CEx)
represents chemically-derivatized hetero-cellulose-y (CEy)
represents ChiralTek proprietary group R1
represents another functional group R2
represents a series of covalent bonds

Figure (A). Schematic diagram of ChiralCExCEy phase

Other manufacturers' columns contain a single type of chiral selector (e.g., single cellulose, or single amylose, etc). The ChiralCExCEy column contains tandem hetero-cellulose complex selector. Figure (B) shows the schematic structure of the CExCEy complex selector (B1) and the general glucose unit (B2) in the CExCEy selector. Novel space structure with extra chiral recognition sites is formed between CEx and CEy moieties. Due to the cooperative functioning of the CEx and CEy moieties, the ChiralCExCEy columns can provide different and generally better chiral separation abilities for a wider range of chiral compounds.

(B1) (B2)



: cellulose-x (CEx, x=1~12); : cellulose-y (CEy, y=1~12);

CE1: R2= Phenylcarbamate;
CE2: R2= 3,5-Dimethylphenylcarbamate;
CE3: R2= 3-Chloro-4-methyl-phenylcarbamate;
CE4: R2= 3,5-Dichlorophenylcarbamate;
CE5: R2= 3-Chloro-5-methyl-phenylcarbamate;
CE6: R2= (S)-α-Methylbenzylcarbamate;
CE7: R2= 4-Methylbenzoate;
CE8: R2= 4-Methylphenylcarbamate;
CE9: R2= 4-Chloro-3-methyl-phenylcarbamate;
CE10: R2= 5-Chloro-2-methyl-phenylcarbamate;
CE11: R2= 3-Chloro-2-methyl-phenylcarbamate;
CE12: R2= 4-Chlorophenylcarbamate.

Figure (B). Schematic diagram of CExCEy complex selector

2. Application and Requirements

The ChiralCExCEy 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 flushed with ethanol following by mobile phase until achieving a stable baseline signal. A common C18 guard column can be used for reversed-phase conditions and a Diol guard column can be used for normal phase conditions. If non-standard mobile phases are to be used, please contact ChiralTek for technical support.

When using ChiralCExCEy columns with 2μm and 3μm particles, low flow rate (e.g., 0.1-0.3 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 μm, 3μm)
	< 600 bar (~9000 psi , 5 μm, HPLC)
Temperature:	0 – 40 °C
Guard column:	ChiralCE, C18 or Diol column
Mode:	HPLC, SFC, or UPLC

3. Care and Maintenance of the ChiralCExCEy Columns

[1] It is strongly recommended to use ChiralCE, C18 or Diol guard columns to protect ChiralCExCEy columns;
[2] It'd better to resolve samples in mobile phases and filter through 0.5μm membrane before injection;
[3]The solvent in the ChiralCExCEy columns should be replaced with methanol (reversed phase conditions) or ethanol (normal phase conditions) if the columns need to be stored for over a week's time.
[4] The ChiralCExCEy columns can be easily cleaned by flushing with 100% methanol (reversed phase conditions) or 100% ethanol (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 the chromatograph pump.

4. Notice and Other Considerations

[1] A single ChiralCExCEy column can be used under normal phase, reversed phase, or polar organic mobile phase conditions. It is strongly recommended to use 100% ethanol or IPA as intermediate solvent when switching between different mobile phase conditions. Due to the high viscosity of the IPA, low flow rate of about 0.1~0.3 mL/min should be applied in traditional HPLC in order to avoid extreme high pressure. However, there is no flow rate limit 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 ChiralCExCEy column bed, they cannot be used as mobile phase additives or sample solution additives.
[5] The ChiralCExCEy columns can be used in SFC and SMB under different type of mobile phase conditions.

5. List of the typical ChiralCExCEy Columns with Different Specifications

Product List of typical ChiralCExCEy Columns from ChiralTek

Part Number	*Type*	*Dimension*	*Description*
892-CE2CE3-01	ChiralCE2CE3	2μm, 120Å, 50 × 2.1mm	2μm CE2CE3 immobilized column
892-CE2CE4-02	ChiralCE2CE4	2μm, 120Å, 100 × 2.1mm	2μm CE2CE4 immobilized column
892-CE2CE5-03	ChiralCE2CE5	2μm, 120Å, 150 × 2.1mm	2μm CE2CE5 immobilized column
893-CE3CE4-01	ChiralCE3CE4	3μm, 120Å, 50 × 2.1mm	3μm CE3CE4 immobilized column
893-CE3CE5-02	ChiralCE3CE5	3μm, 120Å, 100 × 2.1mm	3μm CE3CE5 immobilized column
8993-CE4CE5-61	ChiralCE4CE5	3μm, 1000Å, 50 × 4.6mm	3μm CE4CE5 immobilized column
8993-CE5CE6-62	ChiralCE5CE6	3μm, 1000Å, 100 × 4.6mm	3μm CE5CE6 immobilized column
8593-CE6CE7-03	ChiralCE6CE7	3μm, 500Å, 150 × 2.1mm	3μm CE6CE7 immobilized column
8593-CE8CE9-04	ChiralCE8CE9	3μm, 500Å, 200 × 2.1mm	3μm CE8CE9 immobilized column
8593-CE9CE11-05	ChiralCE9CE11	3μm, 500Å, 250 × 2.1mm	3μm CE9CE11 immobilized column
8995-CE9CE12-05	ChiralCE9CE12	5μm, 1000Å, 250 × 4.6mm	5μm CE9CE12 immobilized column
893-CE4CE5-04	ChiralCE4CE5	3μm, 120Å, 200 × 2.1mm	3μm CE4CE5 immobilized column
893-CE2CE3-05	ChiralCE2CE3	3μm, 120Å, 250 × 2.1mm	3μm CE2CE3 immobilized column
8993-CE2CE4-03	ChiralCE2CE4	3μm, 1000Å, 150 × 2.1mm	3μm CE2CE4 immobilized column
8993-CE2CE5-05	ChiralCE2CE5	3μm, 1000Å, 250 × 2.1mm	3μm CE2CE5 immobilized column
8993-CE3CE4-01	ChiralCE3CE4	3μm, 1000Å, 50 × 2.1mm	3μm CE3CE4 immobilized column
8993-CE3CE5-02	ChiralCE3CE5	3μm, 1000Å, 100 × 2.1mm	3μm CE3CE5 immobilized column
8993-CE4CE5-61	ChiralCE4CE5	3μm, 1000Å, 50 × 4.6m	3μm CE4CE5 immobilized column
8993-CE2CE3-62	ChiralCE2CE3	3μm, 1000Å, 100 × 4.6mm	3μm CE2CE3 immobilized column
8993-CE2CE4-03	ChiralCE2CE4	3μm, 1000Å, 150 × 2.1mm	3μm CE2CE4 immobilized column
8993-CE2CE5-04	ChiralCE2CE5	3μm, 1000Å, 200 × 2.1mm	3μm CE2CE5 immobilized column
8993-CE3CE4-05	ChiralCE3CE4	3μm, 1000Å, 250 × 2.1mm	3μm CE3CE4 immobilized column
8995-CE3CE5-05	ChiralCE3CE5	5μm, 1000Å, 250 × 4.6mm	5μm CE3CE5 immobilized column
8933-SK1-61	ChiralKit-1	3μm, 1000Å, 50 × 4.6mm	Screening Kit-1（3 analytical columns）
8933-SK2-61	ChiralKit-2	3μm, 1000Å, 50 × 4.6mm	Screening Kit-2（6 analytical columns）

ChiralCExCEy 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 ChiralCExCEy 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.