ChiralTek ChiralCTCE-2 Column Manual and Applications in HPLC& UPLC

Version 1.1
26 May 2020

ChiralTek Pte Ltd
192 Westwood Crescent
Singapore 648559

Context Directory

1. Copyright and Disclaimer Statement

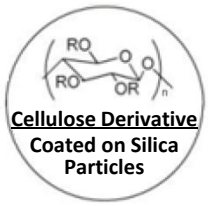
ChiralTek Pte Ltd always keeps the high standard to manufacture the chiral columns to ensure the high column efficiency, high reducibility, and high quality. However, ChiralTek Pte Ltd should not be liable for possible errors contained herein or for incidental or consequential damages in connection with the furnishing, performance, transportation, or use of any part of the chiral column products.

ChiralTek Pte Ltd
192 Westwood Crescent
Singapore 648559

ChiralCTCE Chiral Columns for UPLC and HPLC

2. Introduction

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 (2μm, 3μm, or 5μm for analytical columns). The schematic chemical structure of the ChiralCTCE phase is shown in Figure (A).



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;

Figure (A). Schematic diagram of the ChiralCTCE phase

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 CO_2/EtOH, or CO_2/IPA, etc. with/or 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 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.

The ChiralCTCE columns have many different types of dimension and configuration. Figure (B) show a new type of fast ChiralCTCE-2 column with dimension of 100 × 4.6mm, 3μm. The column head and column filter are specially designed to allow the column to be used in traditional HPLC to achieve UPLC-like fast separation with high resolution.

Figure (B). Typical photo a new type of ChiralCTCE-2 column for fast separation in traditional HPLC

ChrialTek provides analytical column with common dimension of 250 × 4.6mm, 5μm. ChiralTek also manufacture other dimension columns which can be used in both UPLC

ChiralCTCE Chiral Columns for UPLC and HPLC

and HPLC. The photo of a widely-used ChiralCTCE-2 analytical column for HPLC & UPLC with dimension of 250mm × 2.1 mm × 3μm is shown below.

Figure (C). Typical photo of an analytical ChiralCTCE-2 column

The column pressure for ChiralCTCE columns with 5μm particles is quite low in HPLC and SFC. However, when using ChiralCTCE columns with 2μm and 3μm 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, 3μm)
	< 460 bar (~7000 psi , 5 μm, HPLC)
Temperature:	0 – 40 °C
Guard column:	Chiral or standard Diol column
Mode:	HPLC, SFC, or UPLC

Besides the above analytical columns packed with 2μm or 3μm particles, varies of semi-preparative and preparative-scale columns packed with 5μm or 10μm particles are available as well. Figure (D) shows some typical semi-preparative and preparative-scale chiral columns from ChirlaTek.

Figure (D). Typical photo of the semi-preparative and preparative ChiralCTCE columns

Notes and applications

Some typtical chiral drug compounds were used to evaluate the enaniomeric separation performance of the ChiralCTCE-2 columns packed with 3μm or 5μm particles. Some of the typical chromatograms for those tests are shown in this notes and applications.

The chromatographic separations were performed on Agilent 1100 Agilent 1290 UPLC-UV system under normal phase conditions for coated chiral columns.

ChiralTek provides a type of screening kit: 803-SK1-61 (4 different types of analytical columns). ChiralTek also provide free screening tests for chiral separation if customer can provide the test samples.

3. Order Information for ChiralCTCE Columns

Part Number	*Type*	*Dimension*	*Description*
8022-CTCE2-01	ChiralCTCE-2	2μm, 1000Å, 50 × 2.1mm	2μm cellulose tris(3,5-dimethylphenyl-carbamate)-coated analytical column
8032-CTCE3-02	ChiralCTCE-3	2μm, 1000Å, 100 × 2.1mm	3μm cellulose tris(3-chloro-4-methyl-phenylcarbamate)-coated analytical column
8053-CTCE5-03	ChiralCTCE-5	3μm, 1000Å, 150 × 2.1mm	3μm cellulose tris(3-chloro-5-methyl-phenylcarbamate)-coated analytical column
8023-CTCE2-04	ChiralCTCE-2	3μm, 1000Å, 200 × 2.1mm	3μm cellulose tris(3,5-dimethylphenyl-carbamate)-coated analytical column
8023-CTCE2-05	ChiralCTCE-2	3μm, 1000Å, 250 × 2.1mm	3μm cellulose tris(3,5-dimethylphenyl-carbamate)-coated analytical column
8023-CTCE2-62	ChiralCTCE-2	3μm, 1000Å, 100 × 4.6mm	3μm cellulose tris(3,5-dimethylphenyl-carbamate)-coated analytical column
85023-CTCE2-61	ChiralCTCE-2	3μm, 500Å, 50 × 4.6mm	3μm cellulose tris(3,5-dimethylphenyl-carbamate)-coated analytical column
85023-CTCE2-62	ChiralCTCE-2	3μm, 500Å, 100 × 4.6mm	3μm cellulose tris(3,5-dimethylphenyl-carbamate)-coated analytical column
8033-CTCE3-62	ChiralCTCE-3	3μm, 1000Å, 100 × 4.6mm	3μm cellulose tris(3-chloro-4-methyl-phenylcarbamate)-coated analytical column
8025-CTCE2-05	ChiralCTCE-2	5μm, 1000Å, 250 × 4.6mm	5μm cellulose tris(3,5-dimethylphenyl-carbamate)-coated analytical column
8035-CTCE3-05	ChiralCTCE-3	5μm, 1000Å, 250 × 4.6mm	5μm cellulose tris(3-chloro-4-methyl-phenylcarbamate)-coated analytical column
8075-CTCE7-05	ChiralCTCE-7	5μm, 1000Å, 250 × 4.6mm	5μm cellulose tris(4-methylbenzoate)-coated analytical column
7025-CTCE2-14	ChiralCTCE-2	5μm, 1000Å, 200 × 10.0mm	5μm cellulose tris(3,5-dimethylphenyl-carbamate)-coated semi-preparative column
7025-CTCE2-25	ChiralCTCE-2	5μm, 1000Å, 250 × 20.0mm	5μm cellulose tris(3,5-dimethylphenyl-carbamate)-coated preparative column
7025-CTCE2-35	ChiralCTCE-2	5μm, 1000Å, 250 × 30.0mm	5μm cellulose tris(3,5-dimethylphenyl-carbamate)-coated preparative column
803-SK1-61	ChiralKit-1	3μm, 1000Å, 50 × 4.6mm	Screening Kit-1（4 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.

Order Information

Part number	*Type*	*Column Dimension*	*Remarks*
7055-CTCE5-25	ChiralCTCE-5	5μm, 1000Å, 250 × 20.0mm	5μm cellulose tris((3-chloro-5-methyl-phenyl-carbamate)-coated preparative column
7055-CTCE5-35	ChiralCTCE-5	5μm, 1000Å, 250 × 30.0mm	5μm cellulose tris((3-chloro-5-methyl-phenyl-carbamate)-coated preparative column

Contact us:

ChiralTek Pte Ltd
192 Westwood Crescent
Singapore 648559

Tel: (65)-93656129; (86)-95040358310
Email: sales@chiraltek-column.com
support@chiraltek-column.com

ChiralCTCE-2 Column Notes and Applications in HPLC and UPLC

Aminoglutethimide on ChiralCTCE-2 column

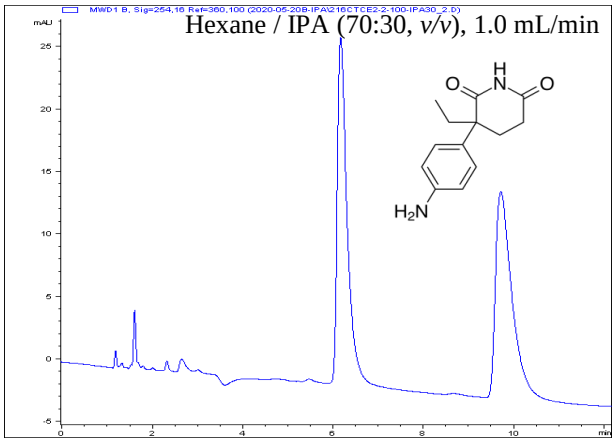


Figure (CTCE2)-1. Chiral separation of Aminoglutethimide on ChiralCTCE-2 column under normal phase condition using Hexane / IPA (70:30, *v/v*) as mobile phase

Column:	ChiralCTCE-2
Dimension:	3μm, 100 × 4.6 mm I.D.
Part No.	85023-CTCE2-62
LC Mode:	HPLC (Agilent1100)
Flow rate:	1.0 mL/min
Detection:	UV@220nm
Temperature:	Ambient

ChiralCTCE-2 Column Notes and Applications in HPLC and UPLC

Anisoin on ChiralCTCE-2 column

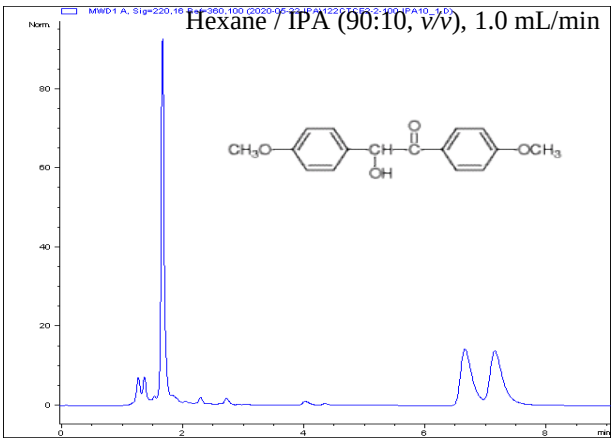


Figure (CTCE2)-2. Chiral separation of Anisoin on ChiralCTCE-2 column under normal phase condition using Hexane / IPA (90:10, *v/v*) as mobile phase

Column:	ChiralCTCE-2
Dimension:	3μm, 100 ×4.6 mm I.D.
Part No.	85023-CTCE2-62
LC Mode:	HPLC (Agilent1100)
Flow rate:	1.0 mL/min
Detection:	UV@220nm
Temperature:	Ambient

ChiralCTCE-2 Column Notes and Applications in HPLC and UPLC

Benzoin on ChiralCTCE-2 column

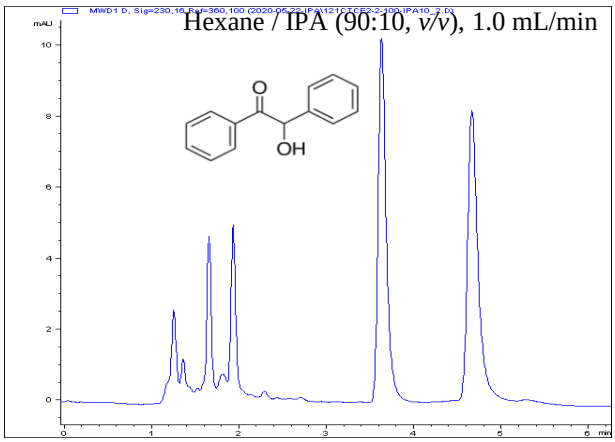


Figure (CTCE2)-3. Chiral separation of Benzoin on ChiralCTCE-2 column under normal phase condition using Hexane / IPA (90:10, *v/v*) as mobile phase

Column:	ChiralCTCE-2
Dimension:	3μm, 100 ×4.6 mm I.D.
Part No.	85023-CTCE2-62
LC Mode:	HPLC (Agilent1100)
Flow rate:	1.0 mL/min
Detection:	UV@210nm
Temperature:	Ambient

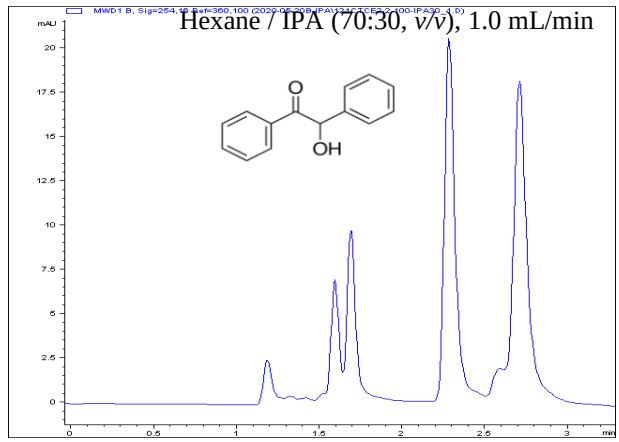


Figure (CTCE2)-4. Chiral separation of Benzoin on ChiralCTCE-2 column under normal phase condition using Hexane / IPA (70:30, *v/v*) as mobile phase

Column:	ChiralCTCE-2
Dimension:	3μm, 100 ×4.6 mm I.D.
Part No.	85023-CTCE2-62
LC Mode:	HPLC (Agilent1100)
Flow rate:	1.0 mL/min
Detection:	UV@220nm
Temperature:	Ambient

ChiralCTCE-2 Column Notes and Applications in HPLC and UPLC

Benzyl Mandelate on ChiralCTCE-2 column

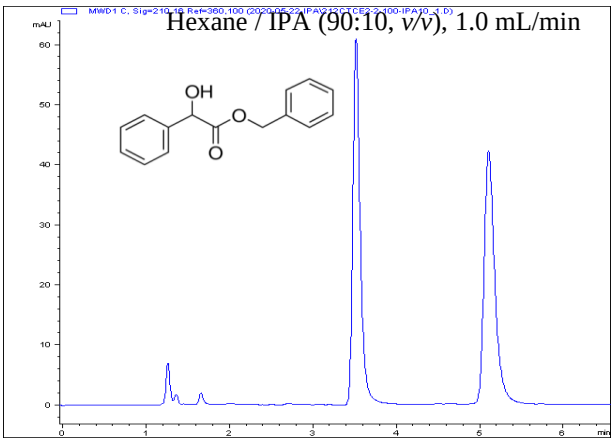


Figure (CTCE2)-5. Chiral separation of Benzyl Mandelate on ChiralCTCE-2 column under normal phase condition using Hexane / IPA (90:10, *v/v*) as mobile phase

Column:	ChiralCTCE-2
Dimension:	3μm, 100 ×4.6 mm I.D.
Part No.	85023-CTCE2-62
LC Mode:	HPLC (Agilent1100)
Flow rate:	1.0 mL/min
Detection:	UV@210nm
Temperature:	Ambient

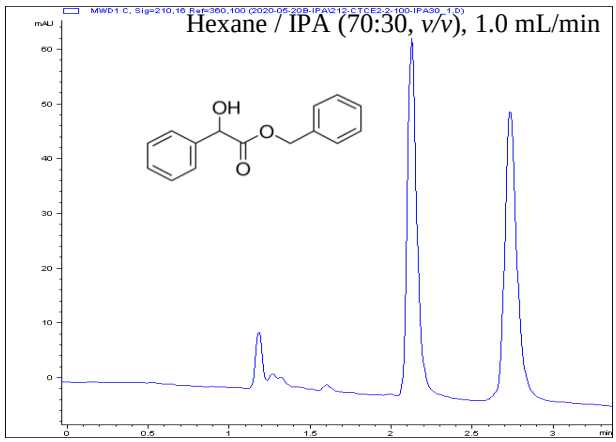


Figure (CTCE2)-6. Chiral separation of Benzyl Mandelate on ChiralCTCE-2 column under normal phase condition using Hexane / IPA (70:30, *v/v*) as mobile phase

Column:	ChiralCTCE-2
Dimension:	3μm, 100 ×4.6 mm I.D.
Part No.	85023-CTCE2-62
LC Mode:	HPLC (Agilent1100)
Flow rate:	1.0 mL/min
Detection:	UV@210nm
Temperature:	Ambient

ChiralCTCE-2 Column Notes and Applications in HPLC and UPLC

Bifonazole on ChiralCTCE-2 column

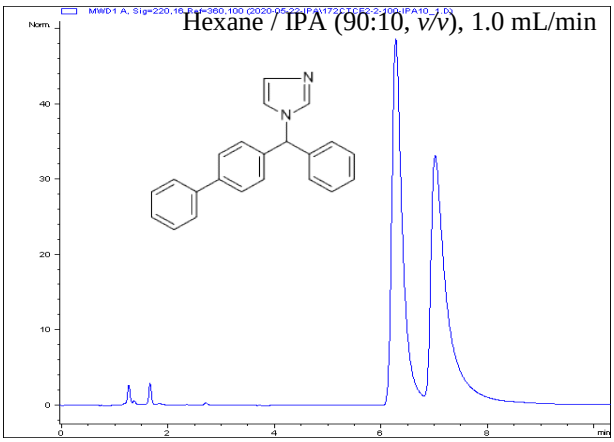


Figure (CTCE2)-7. Chiral separation Bifonazole on ChiralCTCE-2 column under normal phase condition using Hexane / IPA (70:30, *v/v*) as mobile phase

Column:	ChiralCTCE-2
Dimension:	3μm, 100 ×4.6 mm I.D.
Part No.	85023-CTCE2-62
LC Mode:	HPLC (Agilent1100)
Flow rate:	1.0 mL/min
Detection:	UV@220nm
Temperature:	Ambient

ChiralCTCE-2 Column Notes and Applications in HPLC and UPLC

Chlormezanone on ChiralCTCE-2 column

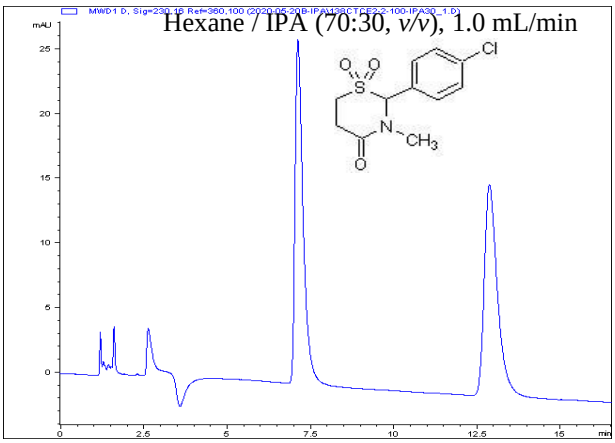


Figure (CTCE2)-8. Chiral separation of Chlormezanone on ChiralCTCE-2 column under normal phase condition using Hexane / IPA (70:30, *v/v*) as mobile phase

Column:	ChiralCTCE-2
Dimension:	3μm, 100 ×4.6 mm I.D.
Part No.	85023-CTCE2-62
LC Mode:	HPLC (Agilent1100)
Flow rate:	1.0 mL/min
Detection:	UV@220nm
Temperature:	Ambient

ChiralCTCE-2 Column Notes and Applications in HPLC and UPLC

3,5-Dinitro-N-(1-phenylethyl)benzamide on ChiralCTCE-2 column

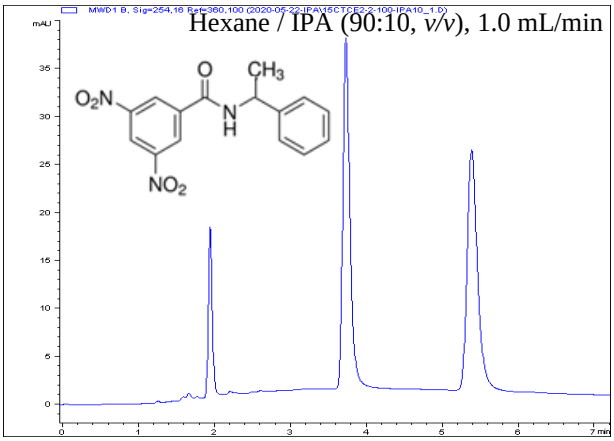


Figure (CTCE2)-9. Chiral separation of 3,5-Dinitro-N-(1-phenylethyl)benzamide on ChiralCTCE-2 column under normal phase condition using Hexane / IPA (90:10, *v/v*) as mobile phase

Column:	ChiralCTCE-2
Dimension:	3μm, 100 ×4.6 mm I.D.
Part No.	85023-CTCE2-62
LC Mode:	HPLC (Agilent1100)
Flow rate:	1.0 mL/min
Detection:	UV@254nm
Temperature:	Ambient

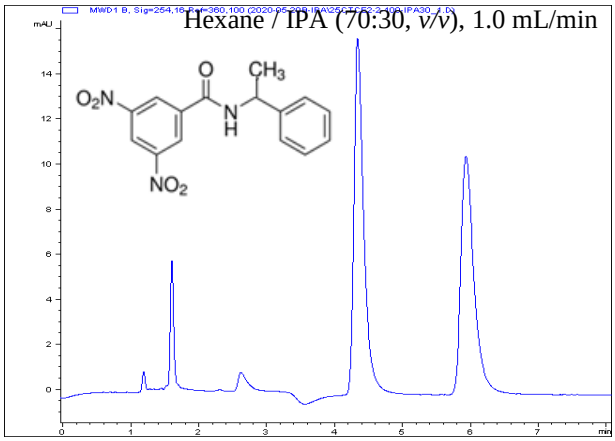


Figure (CTCE2)-10. Chiral separation 3,5-Dinitro-N-(1-phenylethyl)benzamide on ChiralCTCE-2 column under normal phase condition using Hexane / IPA (70:30, *v/v*) as mobile phase

Column:	ChiralCTCE-2
Dimension:	3μm, 100 ×4.6 mm I.D.
Part No.	85023-CTCE2-62
LC Mode:	HPLC (Agilent1100)
Flow rate:	1.0 mL/min
Detection:	UV@254nm
Temperature:	Ambient

ChiralCTCE-2 Column Notes and Applications in HPLC and UPLC

1,3-Diphenyl-2-propyn-1-ol on ChiralCTCE-2 column

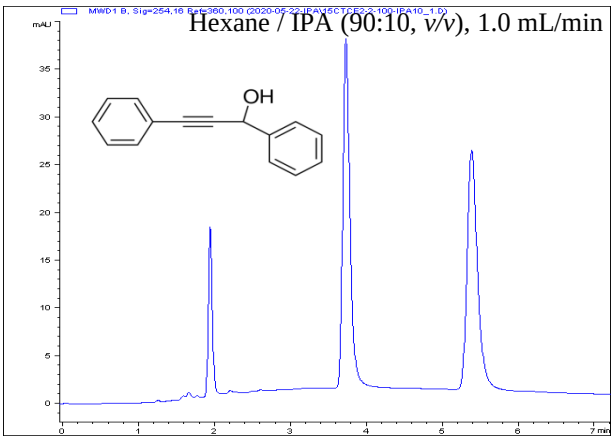


Figure (CTCE2)-11. Chiral separation of 1,3-Diphenyl-2-propyn-1-ol on ChiralCTCE-2 column under normal phase condition using Hexane / IPA (90:10, *v/v*) as mobile phase

Column:	ChiralCTCE-2
Dimension:	3μm, 100 ×4.6 mm I.D.
Part No.	85023-CTCE2-62
LC Mode:	HPLC (Agilent1100)
Flow rate:	1.0 mL/min
Detection:	UV@254nm
Temperature:	Ambient

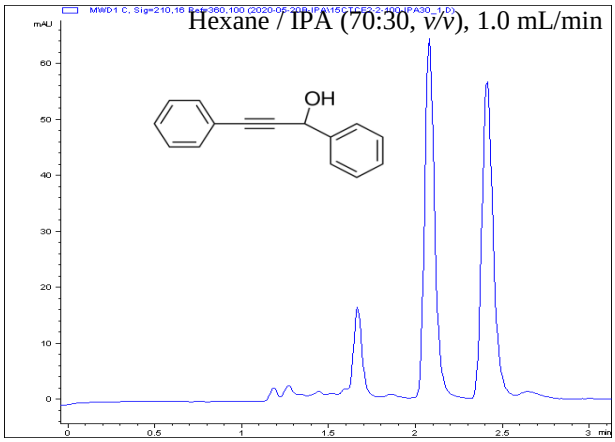


Figure (CTCE2)-12. Chiral separation 1,3-Diphenyl-2-propyn-1-ol on ChiralCTCE-2 column under normal phase condition using Hexane / IPA (70:30, *v/v*) as mobile phase

Column:	ChiralCTCE-2
Dimension:	3μm, 100 ×4.6 mm I.D.
Part No.	85023-CTCE2-62
LC Mode:	HPLC (Agilent1100)
Flow rate:	1.0 mL/min
Detection:	UV@220nm
Temperature:	Ambient

ChiralCTCE-2 Column Notes and Applications in HPLC and UPLC

Flavanone on ChiralCTCE-2 column

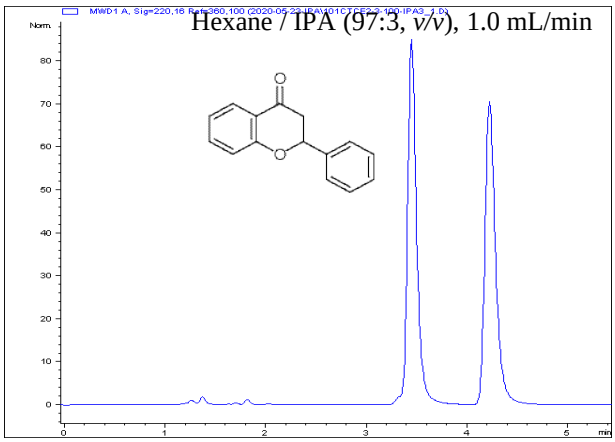


Figure (CTCE2)-13. Chiral separation of Flavanone on ChiralCTCE-2 column under normal phase condition using Hexane / IPA (97:3, *v/v*) as mobile phase

Column:	ChiralCTCE-2
Dimension:	3μm, 100 ×4.6 mm I.D.
Part No.	85023-CTCE2-62
LC Mode:	HPLC (Agilent1100)
Flow rate:	1.0 mL/min
Detection:	UV@220nm
Temperature:	Ambient

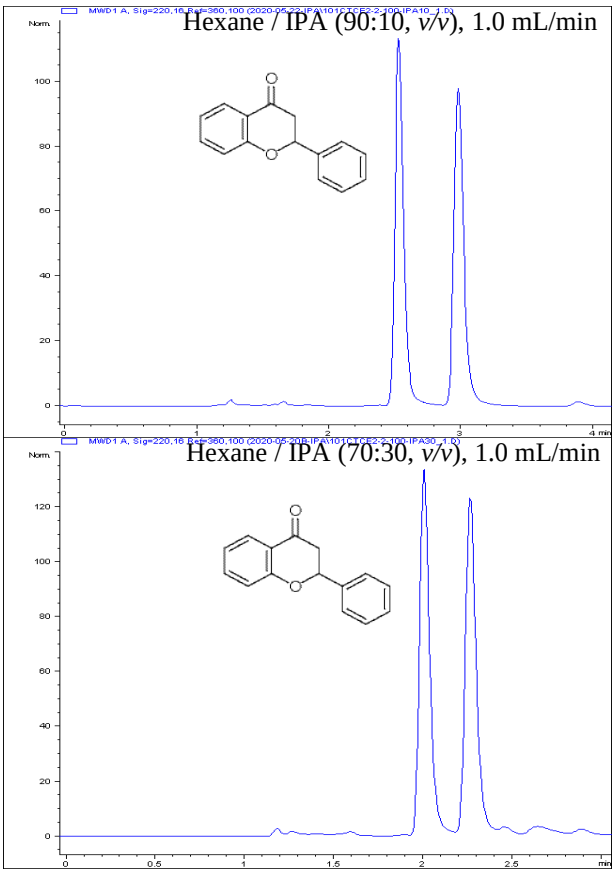


Figure (CTCE2)-14. Chiral separation of Flavanone on ChiralCTCE-2 column under normal phase condition using Hexane / IPA (90:10, *v/v*) and (70:30, *v/v*) as mobile phase

Column:	ChiralCTCE-2
Dimension:	3μm, 100 ×4.6 mm I.D.
Part No.	85023-CTCE2-62
LC Mode:	HPLC (Agilent1100)
Flow rate:	1.0 mL/min
Detection:	UV@220nm
Temperature:	Ambient

ChiralCTCE-2 Column Notes and Applications in HPLC and UPLC

Ketoconazole on ChiralCTCE-2 column

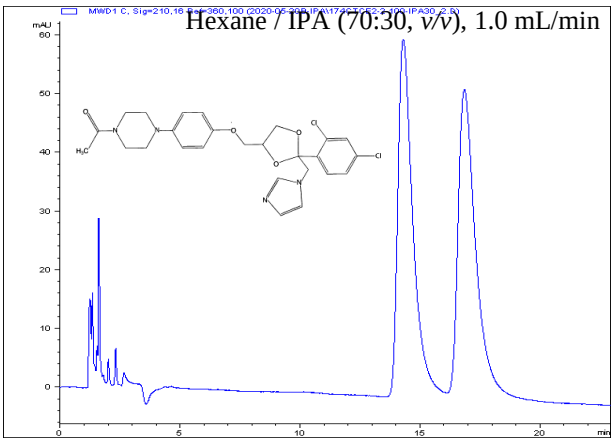


Figure (CTCE2)-15. Chiral separation of Ketoconazole on ChiralCTCE-2 column under normal phase condition using Hexane / IPA (70:30, *v/v*) as mobile phase

Column:	ChiralCTCE-2
Dimension:	3μm, 100 × 4.6 mm I.D.
Part No.	85023-CTCE2-62
LC Mode:	HPLC (Agilent1100)
Flow rate:	1.0 mL/min
Detection:	UV@210nm
Temperature:	Ambient

ChiralCTCE-2 Column Notes and Applications in HPLC and UPLC

Lactic Acid on ChiralCTCE-2 column

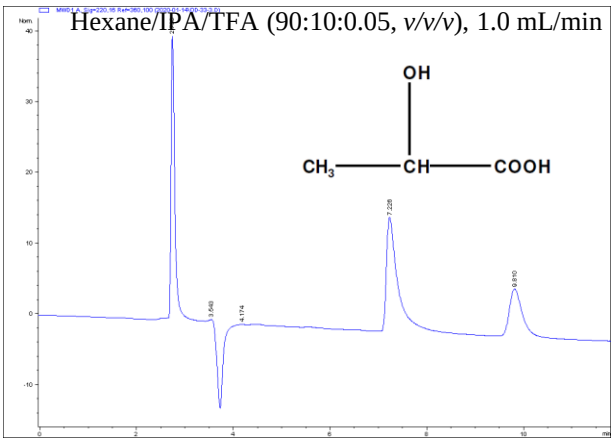


Figure (CTCE2)-16. Chiral separation of Lactic Acid on ChiralCTCE-2 column under normal phase condition using Hexane/IPA/TFA (90:10:0.05, *v/v/v*) as mobile phase

Column:	ChiralCTCE-2
Dimension:	5μm, 250 ×4.6 mm I.D.
Part No.	8025-CTCE2-05
LC Mode:	HPLC (Agilent1100)
Flow rate:	1.0 mL/min
Detection:	UV@220nm
Temperature:	Ambient

ChiralCTCE-2 Column Notes and Applications in HPLC and UPLC

Lansoprazole on ChiralCTCE-2 column

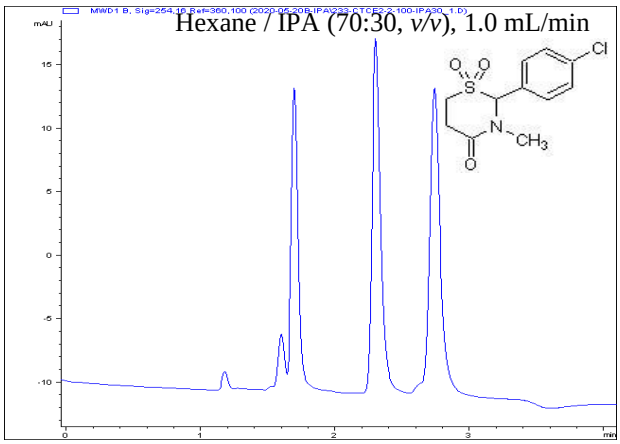


Figure (CTCE2)-17. Chiral separation of Lansoprazole on ChiralCTCE-2 column under normal phase condition using Hexane / IPA (70:30, *v/v*) as mobile phase

Column:	ChiralCTCE-2
Dimension:	3μm, 100 × 4.6 mm I.D.
Part No.	85023-CTCE2-62
LC Mode:	HPLC (Agilent1100)
Flow rate:	1.0 mL/min
Detection:	UV@254nm
Temperature:	Ambient

ChiralCTCE-2 Column Notes and Applications in HPLC and UPLC

6-Methoxyflavanone on ChiralCTCE-2 column

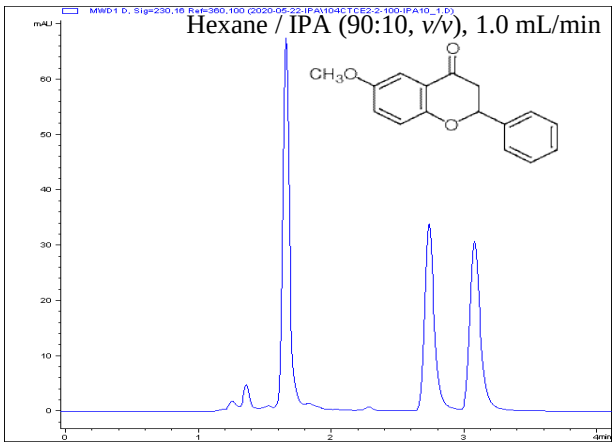


Figure (CTCE2)-18. Chiral separation of 6-Methoxyflavanone on ChiralCTCE-2 column under normal phase condition using Hexane / IPA (90:10, *v/v*) as mobile phase

Column:	ChiralCTCE-2
Dimension:	3μm, 100 ×4.6 mm I.D.
Part No.	85023-CTCE2-62
LC Mode:	HPLC (Agilent1100)
Flow rate:	1.0 mL/min
Detection:	UV@220nm
Temperature:	Ambient

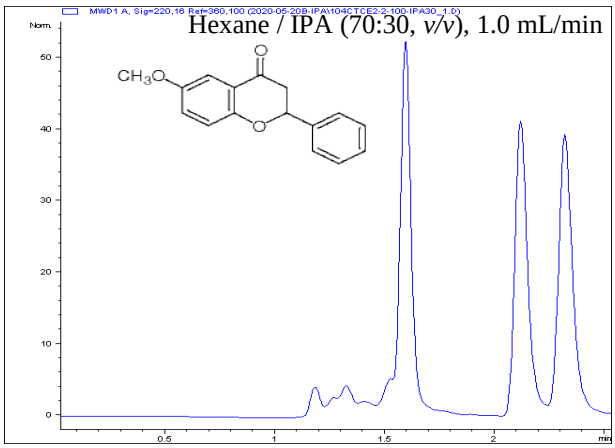


Figure (CTCE2)-19. Chiral separation 6-Methoxyflavanone on ChiralCTCE-2 column under normal phase condition using Hexane / IPA (70:30, *v/v*) as mobile phase

Column:	ChiralCTCE-2
Dimension:	3μm, 100 ×4.6 mm I.D.
Part No.	85023-CTCE2-62
LC Mode:	HPLC (Agilent1100)
Flow rate:	1.0 mL/min
Detection:	UV@220nm
Temperature:	Ambient

ChiralCTCE-2 Column Notes and Applications in HPLC and UPLC

215 1-(1-Naphthyl)ethanol on ChiralCTCE-2 column

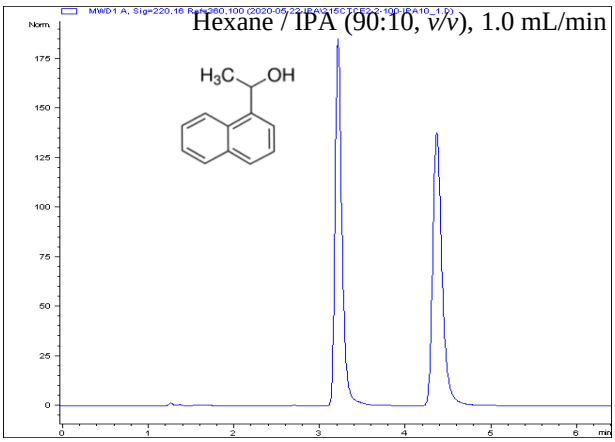


Figure (CTCE2)-20. Chiral separation of 1-(1-Naphthyl)ethanol on ChiralCTCE-2 column under normal phase condition using Hexane / IPA (90:10, *v/v*) as mobile phase

Column:	ChiralCTCE-2
Dimension:	3μm, 100 ×4.6 mm I.D.
Part No.	85023-CTCE2-62
LC Mode:	HPLC (Agilent1100)
Flow rate:	1.0 mL/min
Detection:	UV@210nm
Temperature:	Ambient

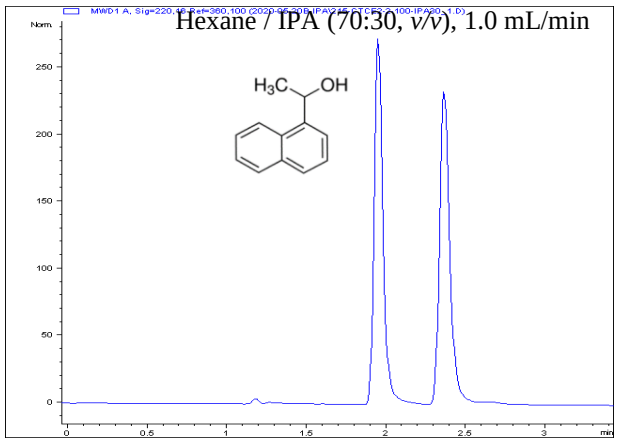


Figure (CTCE2)-21. Chiral separation of 1-(1-Naphthyl)ethanol on ChiralCTCE-2 column under normal phase condition using Hexane / IPA (70:30, *v/v*) as mobile phase

Column:	ChiralCTCE-2
Dimension:	3μm, 100 ×4.6 mm I.D.
Part No.	85023-CTCE2-62
LC Mode:	HPLC (Agilent1100)
Flow rate:	1.0 mL/min
Detection:	UV@220nm
Temperature:	Ambient

ChiralCTCE-2 Column Notes and Applications in HPLC and UPLC

Orphenadrine on ChiralCTCE-2 column

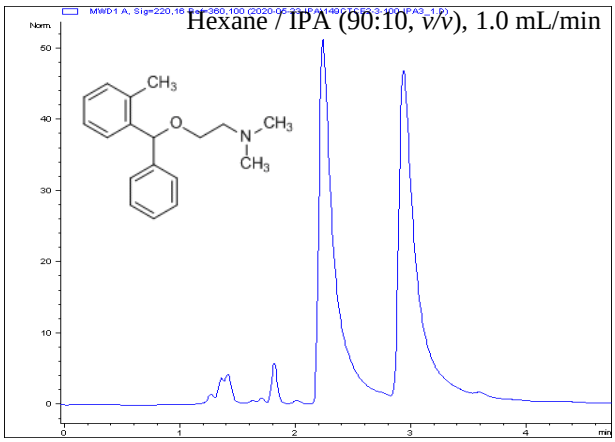


Figure (CTCE2)-22. Chiral separation of Orphenadrine on ChiralCTCE-2 column under normal phase condition using Hexane / IPA (90:10, *v/v*) as mobile phase

Column:	ChiralCTCE-2
Dimension:	3μm, 100 ×4.6 mm I.D.
Part No.	85023-CTCE2-62
LC Mode:	HPLC (Agilent1100)
Flow rate:	1.0 mL/min
Detection:	UV@220nm
Temperature:	Ambient

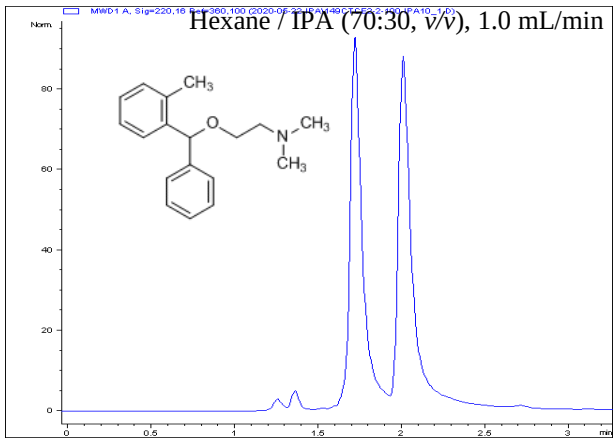


Figure (CTCE2)-23. Chiral separation Orphenadrine on ChiralCTCE-2 column under normal phase condition using Hexane / IPA (70:30, *v/v*) as mobile phase

Column:	ChiralCTCE-2
Dimension:	3μm, 100 ×4.6 mm I.D.
Part No.	85023-CTCE2-62
LC Mode:	HPLC (Agilent1100)
Flow rate:	1.0 mL/min
Detection:	UV@220nm
Temperature:	Ambient

ChiralCTCE-2 Column Notes and Applications in HPLC and UPLC

3-Phenylphthalide on ChiralCTCE-2 column

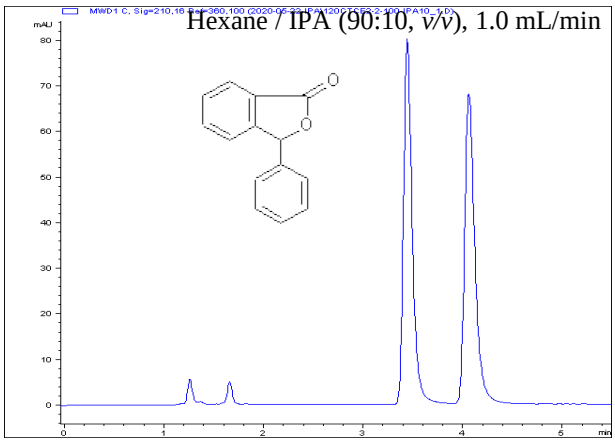


Figure (CTCE2)-24. Chiral separation of 3-Phenylphthalide on ChiralCTCE-2 column under normal phase condition using Hexane / IPA (90:10, *v/v*) as mobile phase

Column:	ChiralCTCE-2
Dimension:	3μm, 100 ×4.6 mm I.D.
Part No.	85023-CTCE2-62
LC Mode:	HPLC (Agilent1100)
Flow rate:	1.0 mL/min
Detection:	UV@210nm
Temperature:	Ambient

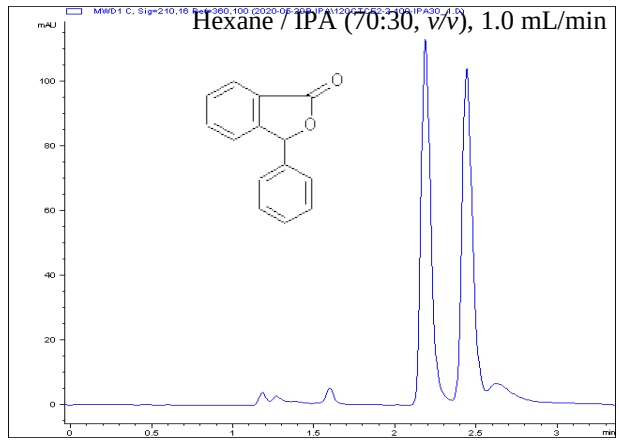


Figure (CTCE2)-25. Chiral separation 3-Phenylphthalide on ChiralCTCE-2 column under normal phase condition using Hexane / IPA (70:30, *v/v*) as mobile phase

Column:	ChiralCTCE-2
Dimension:	3μm, 100 ×4.6 mm I.D.
Part No.	85023-CTCE2-62
LC Mode:	HPLC (Agilent1100)
Flow rate:	1.0 mL/min
Detection:	UV@210nm
Temperature:	Ambient

ChiralCTCE-2 Column Notes and Applications in HPLC and UPLC

Praziquantel on ChiralCTCE-2 column

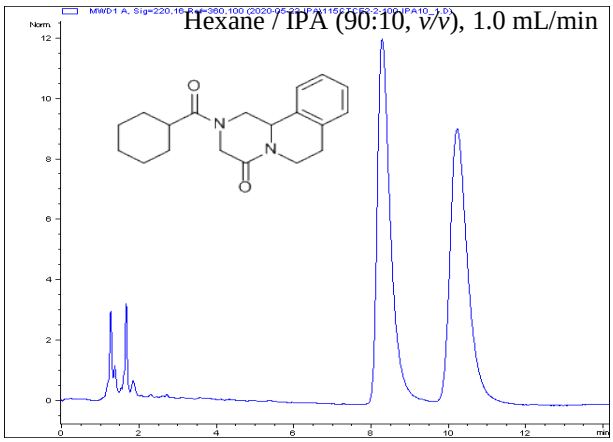


Figure (CTCE2)-26. Chiral separation of Praziquantel on ChiralCTCE-2 column under normal phase condition using Hexane / IPA (90:10, *v/v*) as mobile phase

Column:	ChiralCTCE-2
Dimension:	3μm, 100 ×4.6 mm I.D.
Part No.	85023-CTCE2-62
LC Mode:	HPLC (Agilent1100)
Flow rate:	1.0 mL/min
Detection:	UV@220nm
Temperature:	Ambient

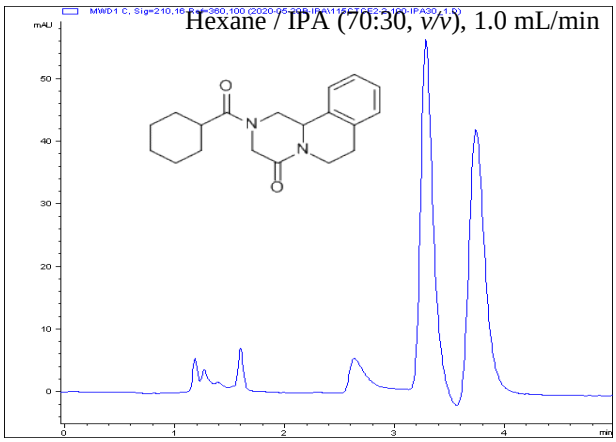


Figure (CTCE2)-27. Chiral separation Praziquantel on ChiralCTCE-2 column under normal phase condition using Hexane / IPA (70:30, *v/v*) as mobile phase

Column:	ChiralCTCE-2
Dimension:	3μm, 100 ×4.6 mm I.D.
Part No.	85023-CTCE2-62
LC Mode:	HPLC (Agilent1100)
Flow rate:	1.0 mL/min
Detection:	UV@210nm
Temperature:	Ambient

ChiralCTCE-2 Column Notes and Applications in HPLC and UPLC

Prilocaine on ChiralCTCE-2 column

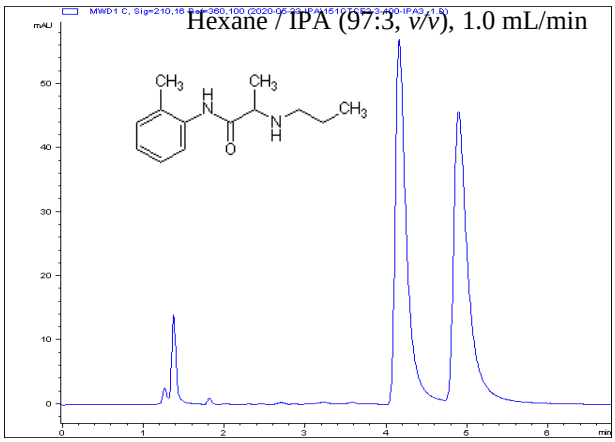


Figure (CTCE2)-28. Chiral separation of Prilocaine on ChiralCTCE-2 column under normal phase condition using Hexane / IPA (97:3, *v/v*) as mobile phase

Column:	ChiralCTCE-2
Dimension:	3μm, 100 ×4.6 mm I.D.
Part No.	85023-CTCE2-62
LC Mode:	HPLC (Agilent1100)
Flow rate:	1.0 mL/min
Detection:	UV@210nm
Temperature:	Ambient

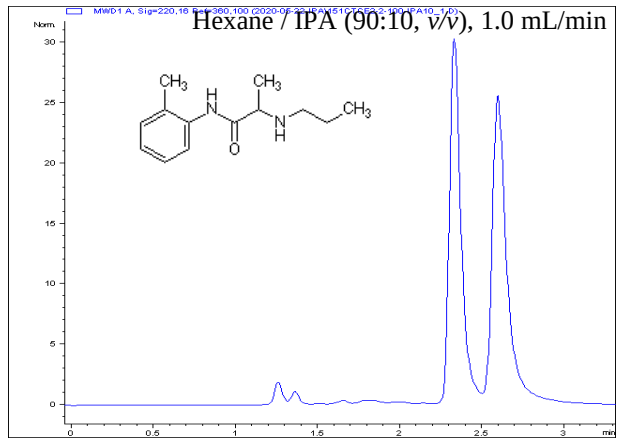


Figure (CTCE2)-29. Chiral separation Prilocaine on ChiralCTCE-2 column under normal phase condition using Hexane / IPA (90:10, *v/v*) as mobile phase

Column:	ChiralCTCE-2
Dimension:	3μm, 100 ×4.6 mm I.D.
Part No.	85023-CTCE2-62
LC Mode:	HPLC (Agilent1100)
Flow rate:	1.0 mL/min
Detection:	UV@220nm
Temperature:	Ambient

ChiralCTCE-2 Column Notes and Applications in HPLC and UPLC

Racecadotril on ChiralCTCE-2 column

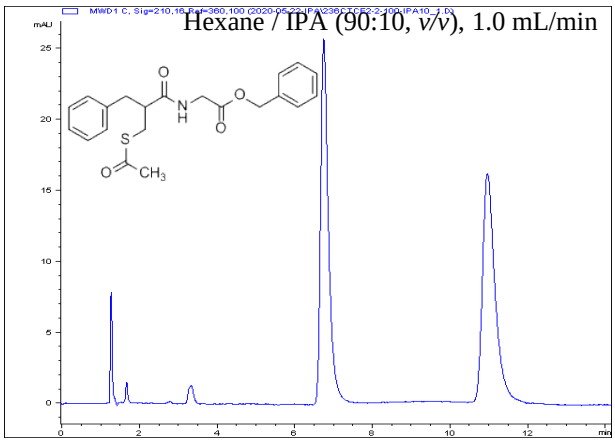


Figure (CTCE2)-30. Chiral separation of Racecadotril on ChiralCTCE-2 column under normal phase condition using Hexane / IPA (90:10, *v/v*) as mobile phase

Column:	ChiralCTCE-2
Dimension:	3μm, 100 ×4.6 mm I.D.
Part No.	85023-CTCE2-62
LC Mode:	HPLC (Agilent1100)
Flow rate:	1.0 mL/min
Detection:	UV@210nm
Temperature:	Ambient

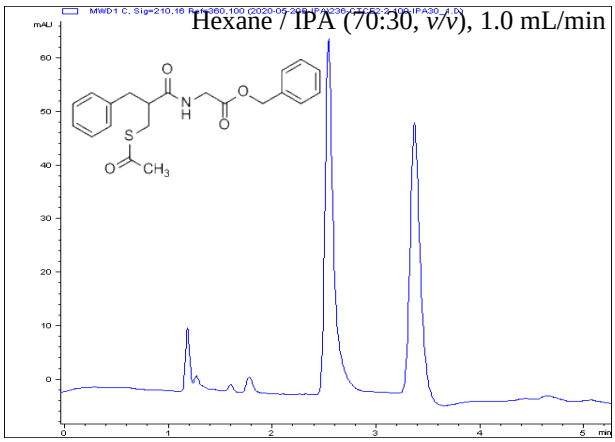


Figure (CTCE2)-31. Chiral separation of Racecadotril on ChiralCTCE-2 column under normal phase condition using Hexane / IPA (70:30, *v/v*) as mobile phase

Column:	ChiralCTCE-2
Dimension:	3μm, 100 ×4.6 mm I.D.
Part No.	85023-CTCE2-62
LC Mode:	HPLC (Agilent1100)
Flow rate:	1.0 mL/min
Detection:	UV@220nm
Temperature:	Ambient

ChiralCTCE-2 Column Notes and Applications in HPLC and UPLC

Stilbene Oxide on ChiralCTCE-2 column

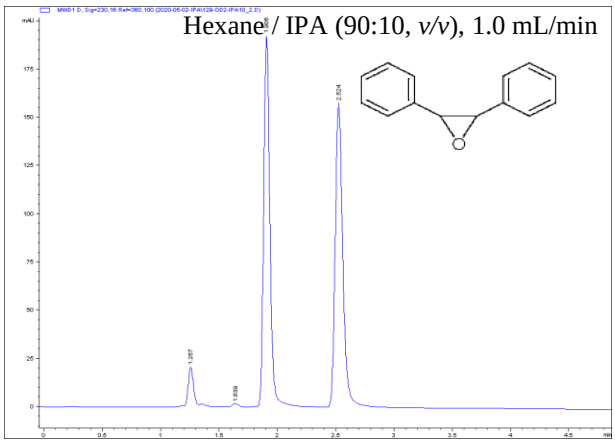


Figure (CTCE2)-32. Chiral separation of Stilbene Oxide on ChiralCTCE-2 column under normal phase condition using Hexane / IPA (90:10, *v/v*) as mobile phase

Column:	ChiralCTCE-2
Dimension:	3μm, 100 ×4.6 mm I.D.
Part No.	85023-CTCE2-62
LC Mode:	HPLC (Agilent1100)
Flow rate:	1.0 mL/min
Detection:	UV@210nm
Temperature:	Ambient

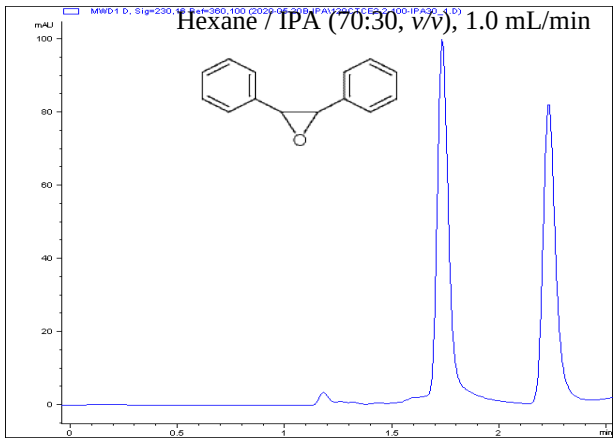


Figure (CTCE2)-33. Chiral separation of Stilbene Oxide on ChiralCTCE-2 column under normal phase condition using Hexane / IPA (70:30, *v/v*) as mobile phase

Column:	ChiralCTCE-2
Dimension:	3μm, 100 ×4.6 mm I.D.
Part No.	85023-CTCE2-62
LC Mode:	HPLC (Agilent1100)
Flow rate:	1.0 mL/min
Detection:	UV@220nm
Temperature:	Ambient

ChiralCTCE-2 Column Notes and Applications in HPLC and UPLC

129 Stilbene Oxide on ChiralCTCE-2 column

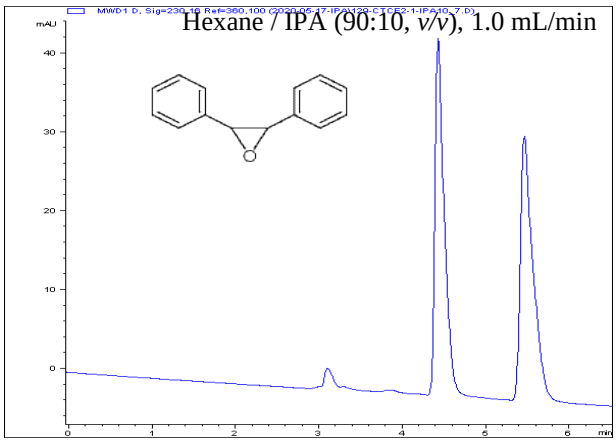


Figure (CTCE2)-34. Chiral separation of Stilbene Oxide on ChiralCTCE-2 column under normal phase condition using Hexane / IPA (90:10, *v/v*) as mobile phase

Column:	ChiralCTCE-2
Dimension:	5μm, 250 ×4.6 mm I.D.
Part No.	8025-CTCE2-05
LC Mode:	HPLC (Agilent1100)
Flow rate:	1.0 mL/min
Detection:	UV@210nm
Temperature:	Ambient

ChiralCTCE-2 Column Notes and Applications in HPLC and UPLC

2,2,2-trifluoro-1-(9-anthryl)ethanol on ChiralCTCE-2 column

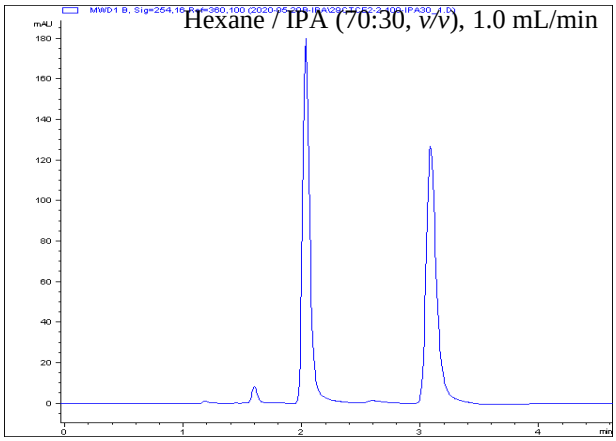


Figure (CTCE2)-35. Chiral separation 2,2,2-trifluoro-1-(9-anthryl)ethanol on ChiralCTCE-2 column under normal phase condition using Hexane / IPA (70:30, *v/v*) as mobile phase

Column:	ChiralCTCE-2
Dimension:	3μm, 100 × 4.6 mm I.D.
Part No.	85023-CTCE2-62
LC Mode:	HPLC (Agilent1100)
Flow rate:	1.0 mL/min
Detection:	UV@254nm
Temperature:	Ambient

ChiralCTCE-2 Column Notes and Applications in HPLC and UPLC

Troger`s Base on ChiralCTCE-2 column

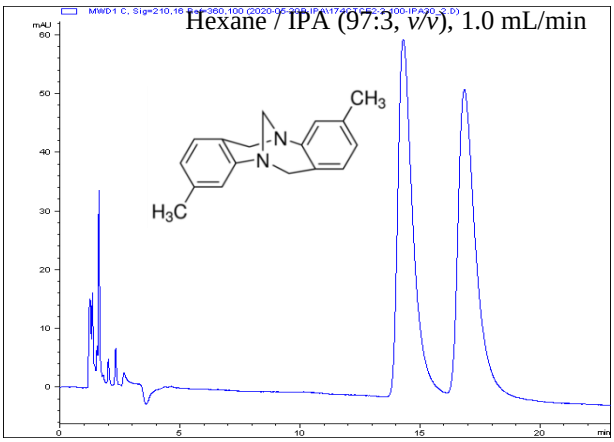


Figure (CTCE2)-36. Chiral separation of Troger`s Base on ChiralCTCE-2 column under normal phase condition using Hexane / IPA (97:3, *v/v*) as mobile phase

Column:	ChiralCTCE-2
Dimension:	3μm, 100 ×4.6 mm I.D.
Part No.	85023-CTCE2-62
LC Mode:	HPLC (Agilent1100)
Flow rate:	1.0 mL/min
Detection:	UV@210nm
Temperature:	Ambient