

ChiralTek ChiralAM-5 Column Manual and Applications in HPLC& UPLC

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ChiralTek Pte Ltd
192 Westwood Crescent
Singapore 648559

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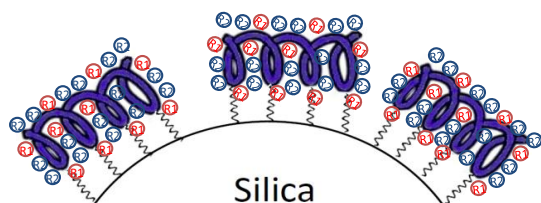
ChiralTek Pte Ltd always keeps the high standard to manufacture the chiral columns to ensure the high column efficiency, high reducibility, and high quality. However, ChiralTek Pte Ltd should not be liable for possible errors contained herein or for incidental or consequential damages in connection with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

ChiralTek Pte Ltd
192 Westwood Crescent
Singapore 648559

Novel ChiralAM Chiral Columns for UPLC and HPLC

2. Introduction

ChiralAM columns are a new type of chemically-modified amylose-bonded silica particles-packed chiral columns. The ChiralAM particles were prepared through a specially-designed one-step reaction procedure by bonding the different functional groups-substituted amylose onto surface of high-quality porous silica (2 μm , 3 μm or 5 μm for analytical columns). Therefore, high column efficiency can be easily achieved on the ChiralAM columns. As shown in Figure (A), the amyloses were anchored onto silica via covalent bonds.

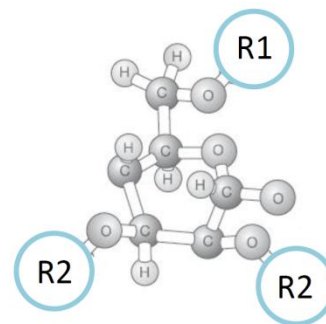


- represents chemically-modified amylose
 represents ChiralTek proprietary group R1
 represents another functional group R2
 represents spacer arm with sigma bonds
 ChiralAM-1: R2= Phenylcarbamate;
 ChiralAM-2: R2= 3,5-Dimethylphenylcarbamate;
 ChiralAM-3: R2= 3-Chloro-4-methyl-phenylcarbamate;
 ChiralAM-4: R2= 3,5-Dichlorophenylcarbamate;
 ChiralAM-5: R2= 3-Chloro-5-methyl-phenylcarbamate

Figure (A). Schematic diagram of the ChiralAM phase

The chemical structure of the chiral selectors of ChiralAM phases are different from other supplier's amylose-based phases. The typical structure of the bonded amylose selector unit in ChiralAM columns is showed in the following Figure (B). Since the novel ChiralAM phases from ChiralTek have higher content of the bonded amyloses and contain more types of functional groups, the ChiralAM columns can provide different and generally better chiral separation abilities than other supplier's amylose-bonded columns.

Due to the cooperative functioning of the ChiralTek proprietary chiral group R1 (as shown in Figure (B)) and the other common functional group R2, the ChiralAM columns can provide unique chiral separation abilities for a wider of chiral compound under multiple mobile phase conditions.



R1 is a ChiralTek proprietary chiral group;
R2 is another common functional group.

Figure (B). Typical structure of general chiral selector unit of the ChiralAM phases

ChiralTek provides five types of ChiralAM columns: phenylcarbamate amylose-immobilized silica particles-packed column (ChiralAM-1), 3,5-dimethylphenylcarbamate amylose-immobilized silica packed chiral column (ChiralAM-2), and 3-chloro-4-methyl-phenylcarbamate amylose-immobilized silica particles-packed chiral column (ChiralAM-3), 3,5-dichlorophenylcarbamate amylose-immobilized silica packed chiral column (ChiralAM-4), and 3-chloro-5-methyl-phenylcarbamate amylose-immobilized silica packed chiral column (ChiralAM-5). The photo of a widely-used ChiralAM-5 analytical column for HPLC & UPLC with dimension of 250mm \times 2.1 mm \times 3 μm is shown below.



Figure (C). Typical photo of an analytical ChiralAM-5 column for HPLC and UPLC

The ChiralAM columns can be used under multiple modes of mobile phase conditions: normal phase, reversed phase, and polar organic conditions.

Novel ChiralAM Chiral Columns for UPLC and HPLC

For use under reversed-phase conditions, the column 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 column need to be flushed with ethanol or isopropanol 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 ChiralAM columns with 2 μm or 3 μm 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 or SFC.

Flow direction:	Arrow direction on the label
Pressure:	< 860 bar (~12500 psi , 2 or 3 μm , HPLC & UPLC)
	< 600 bar (~9000 psi , 5 μm , HPLC & SFC)
Temperature:	0 – 40 °C
Guard column:	Standard C18 or Diol column
Mode:	HPLC, SFC, or UPLC

Figure (D) show a novel type of fast ChiralAM-5 column with dimension of 100 \times 4.6mm, 3 μm . 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 (E). Typical photo of a novel fast ChiralAM-5 column for HPLC to achieve UPLC-like separation

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



Figure (E). Typical photo of the semi-preparative and preparative ChiralAM-5 columns

Notes and applications

A wide range of chiral drug compounds were used to evaluate the enantiomeric separation performance of the ChiralAM-5 columns packed with 3 μm or 5 μm particles. Some of the typical chromatograms for those tests are shown in this notes and applications.

The chromatographic separations were performed on Agilent 1100 & 1200 HPLC-UV, Shimadzu LC20 HPLC-UV or Agilent 1290 UPLC-UV system under both normal and reversed phase conditions.

ChiralTek provides two types of screening kits: ChiralKit-1 (3 different types of analytical columns) and ChiralKit-2 (6 analytical columns). ChiralTek also provide free screening tests for chiral separation if customer can provide the test compounds with proper requirements.

3. Order Information for ChiralAM Columns

<i>Part Number</i>	<i>Type</i>	<i>Dimension</i>	<i>Description</i>
852-AM1-01	ChiralAM-1	2 μm , 120 \AA , 50 \times 2.1mm	2 μm Phenylcarbamate Amylose-1 immobilized analytical column
852-AM1-02	ChiralAM-1	2 μm , 120 \AA , 100 \times 2.1mm	2 μm Phenylcarbamate Amylose-1 immobilized analytical column
852-AM1-03	ChiralAM-1	2 μm , 120 \AA , 150 \times 2.1mm	2 μm Phenylcarbamate Amylose-1 immobilized analytical column
853-AM1-04	ChiralAM-1	3 μm , 120 \AA , 200 \times 2.1mm	3 μm Phenylcarbamate Amylose-1 immobilized analytical column
8553-AM2-01	ChiralAM-2	3 μm , 500 \AA , 50 \times 2.1mm	3 μm 3,5-Dimethylphenylcarbamate Amylose-2 immobilized analytical column
8553-AM2-02	ChiralAM-2	3 μm , 500 \AA , 100 \times 2.1mm	3 μm Dimethylphenylcarbamate Amylose-2 immobilized analytical column
8553-AM2-61	ChiralAM-2	3 μm , 500 \AA , 50 \times 4.6mm	3 μm Dimethylphenylcarbamate Amylose-2 immobilized analytical column
8553-AM2-62	ChiralAM-2	3 μm , 500 \AA , 100 \times 4.6mm	3 μm Dimethylphenylcarbamate Amylose-2 immobilized analytical column
8553-AM3-03	ChiralAM-3	3 μm , 500 \AA , 150 \times 21mm	3 μm 3-Chloro-4-methyl-phenylcarbamate Amylose-3 immobilized analytical column
8553-AM4-04	ChiralAM-4	3 μm , 500 \AA , 200 \times 2.1mm	3 μm 3,5-Dichlorophenylcarbamate Amylose-4 immobilized analytical column
8553-AM5-05	ChiralAM-5	3 μm , 500 \AA , 250 \times 2.1mm	3 μm 3-Chloro-5-methyl-phenylcarbamate Amylose-5 immobilized analytical column
8953-AM5-01	ChiralAM-5	3 μm , 1000 \AA , 50 \times 2.1mm	3 μm 3-Chloro-5-methyl-phenylcarbamate Amylose-5 immobilized analytical column
8953-AM5-02	ChiralAM-5	3 μm , 1000 \AA , 100 \times 2.1mm	3 μm 3-Chloro-5-methyl-phenylcarbamate Amylose-5 immobilized analytical column
8953-AM5-61	ChiralAM-5	3 μm , 1000 \AA , 50 \times 4.6mm	3 μm 3-Chloro-5-methyl-phenylcarbamate Amylose-5 immobilized analytical column
8953-AM5-62	ChiralAM-5	3 μm , 1000 \AA , 100 \times 4.6mm	3 μm 3-Chloro-5-methyl-phenylcarbamate Amylose-5 immobilized analytical column
8953-AM5-03	ChiralAM-5	3 μm , 1000 \AA , 150 \times 2.1mm	3 μm 3-Chloro-5-methyl-phenylcarbamate Amylose-5 immobilized analytical column
8953-AM5-04	ChiralAM-5	3 μm , 1000 \AA , 200 \times 2.1mm	3 μm 3-Chloro-5-methyl-phenylcarbamate Amylose-5 bonded analytical column

ChiralAM 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 ChiralAM 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

<i>Part number</i>	<i>Type</i>	<i>Column Dimension</i>	<i>Remarks</i>
8953-AM5-05	ChiralAM-5	3 μm, 1000Å, 250 × 21mm	3 μm 3-Chloro-5-methyl-phenylcarbamate Amylose-5 immobilized analytical column
8953-AM2-05	ChiralAM-2	5 μm, 1000Å, 250 × 4.6mm	5 μm 3,5-Dimethylphenylcarbamate Amylose-2 immobilized analytical column
8955-AM5-05	ChiralAM-5	5 μm, 1000Å, 250 × 4.6mm	5 μm 3-Chloro-5-methyl-phenylcarbamate Amylose-5 immobilized analytical column
7905-AM5-14	ChiralAM-5	5 μm, 1000Å, 200 × 10.0mm	5 μm 3-Chloro-5-methyl-phenylcarbamate Amylose-5 immobilized semi-preparative column
7905-AM5-25	ChiralAM-5	5 μm, 1000Å, 250 × 20.0mm	5 μm 3-Chloro-5-methyl-phenylcarbamate Amylose-5 immobilized preparative column
7910-AM5-25	ChiralAM-5	8 μm, 1000Å, 250 × 20.0mm	8 μm 3-Chloro-5-methyl-phenylcarbamate Amylose-5 immobilized preparative column
8933-SK1-61	ChiralKit-1	3 μm, 1000Å, 50 × 4.6mm	Screening Kit-1 (3 analytical columns)
8933-SK2-61	ChiralKit-2	3 μm, 1000Å, 50 × 4.6mm	Screening Kit-2 (6 analytical columns)

ChiralAM-5 Column Notes and Applications in HPLC and UPLC

Aminoglutethimide on ChiralAM-5 column

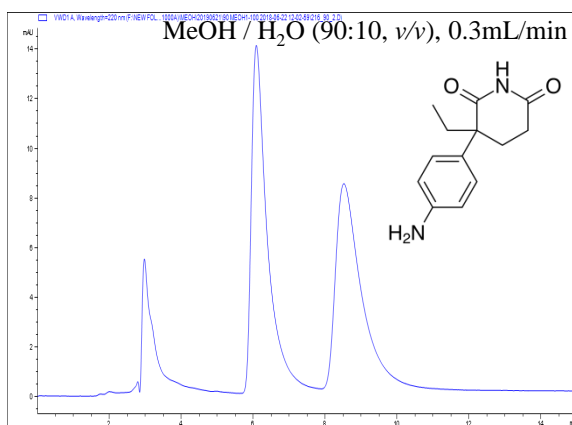


Figure (AM5)-1. Chiral separation of Aminoglutethimide on ChiralAM-5 column under reverse condition using MeOH/ H₂O as mobile phase

Column: ChiralAM-5
Dimension: 3 μm, 250 × 2.1 mm I.D.
Part No. 8953-AM5-05
LC Mode: HPLC (Agilent1200)
Flow rate: 0.3 mL/min
Detection: UV@220nm
Temperature: Ambient

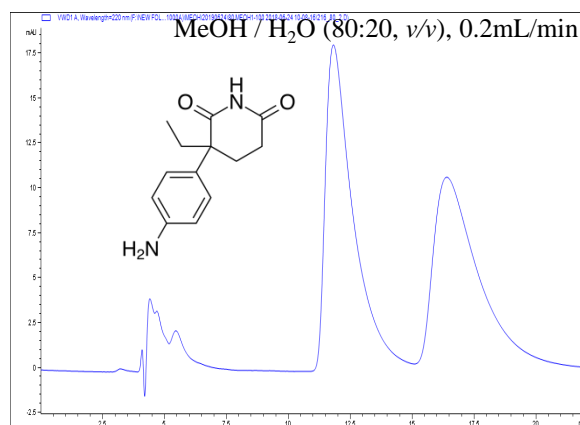


Figure (AM5)-2. Chiral separation of Aminoglutethimide on ChiralAM-5 column under reverse condition using MeOH/ H₂O as mobile phase

Column: ChiralAM-5
Dimension: 3 μm, 250 × 2.1 mm I.D.
Part No. 8953-AM5-05
LC Mode: HPLC (Agilent1200)
Flow rate: 0.3 mL/min
Detection: UV@220nm
Temperature: Ambient

ChiralAM-5 Column Notes and Applications in HPLC and UPLC

Anisoin on ChiralAM-5 column

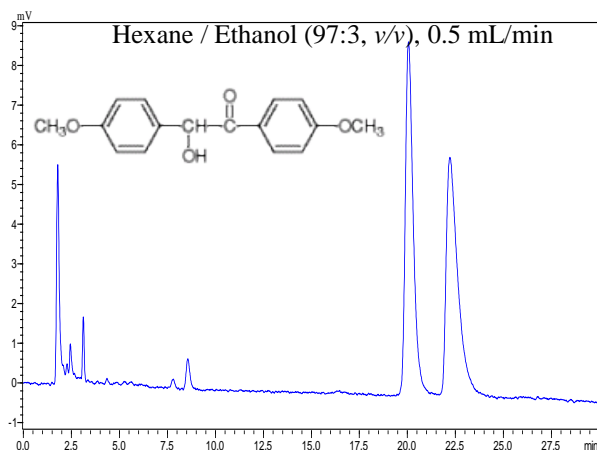


Figure (AM5)-3. Chiral separation of Anisoin on ChiralAM-5 column under normal phase conditions using Hexane/Ethanol as mobile phase.

Column: ChiralAM-5
Dimension: 3 μ m, 250 \times 2.1 mm I.D.
Part No. 8953-AM5-05
LC Mode: HPLC (Shimadzu LC20)
Flow rate: 0.45 & 0.5 mL/min
Detection: UV@220nm
Temperature: Ambient

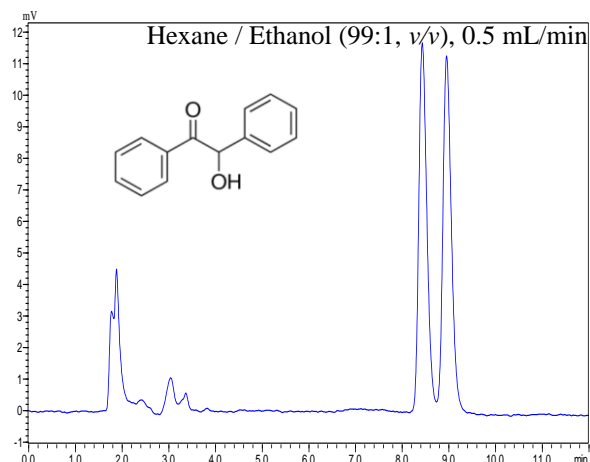
ChiralAM-5 Column Notes and Applications in HPLC and UPLC**Benzoin on ChiralAM-5 column**

Figure (AM5)-4. Chiral separation of Benzoin on ChiralAM-5 column under normal phase conditions using Hexane/Ethanol as mobile phase.

Column: ChiralAM-5
Dimension: 3 μ m, 250 \times 2.1 mm I.D.
Part No. 8953-AM5-05
LC Mode: HPLC (Shimadzu LC20)
Flow rate: 0.5 mL/min
Detection: UV@220nm
Temperature: Ambient

ChiralAM-5 Column Notes and Applications in HPLC and UPLC

Bicalutamide on ChiralAM-5 column

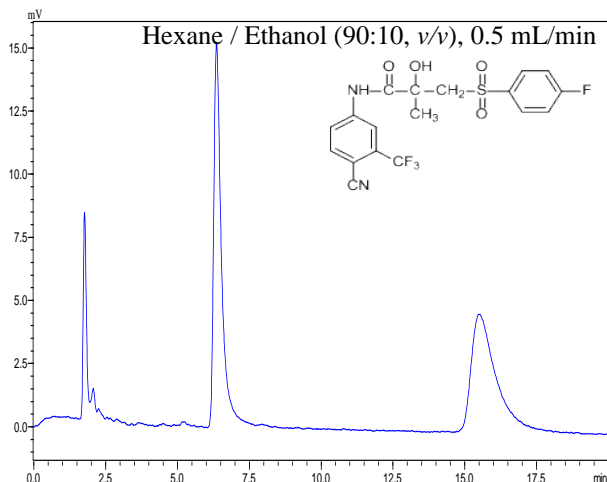


Figure (AM5)-5. Chiral separation of Bicalutamide on ChiralAM-5 column under normal phase conditions using Hexane/Ethanol as mobile phase.

Column: ChiralAM-5
Dimension: 3 μ m, 250 \times 2.1 mm I.D.
Part No. 8953-AM5-05
LC Mode: HPLC (Shimadzu LC20)
Flow rate: 0.5 mL/min
Detection: UV@220nm
Temperature: Ambient

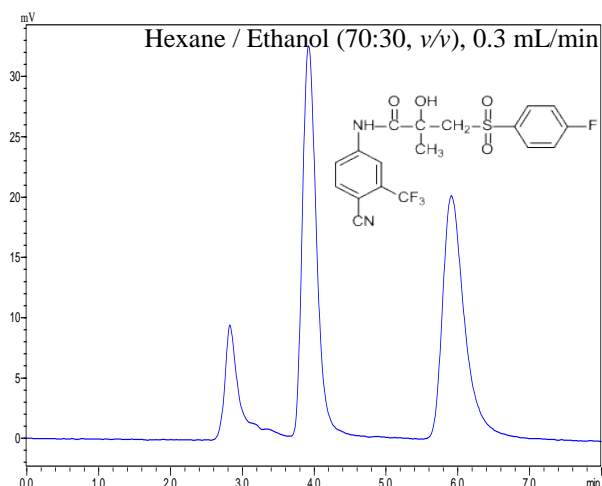


Figure (AM5)-6 Chiral separation of Bicalutamide on ChiralAM-5 column under normal phase conditions using Hexane/Ethanol as mobile phase.

Column: ChiralAM-5
Dimension: 3 μ m, 250 \times 2.1 mm I.D.
Part No. 8953-AM5-05
LC Mode: HPLC (Shimadzu LC20)
Flow rate: 0.3 mL/min
Detection: UV@220nm
Temperature: Ambient

ChiralAM-5 Column Notes and Applications in HPLC and UPLC

Bifonazole on ChiralAM-5 column

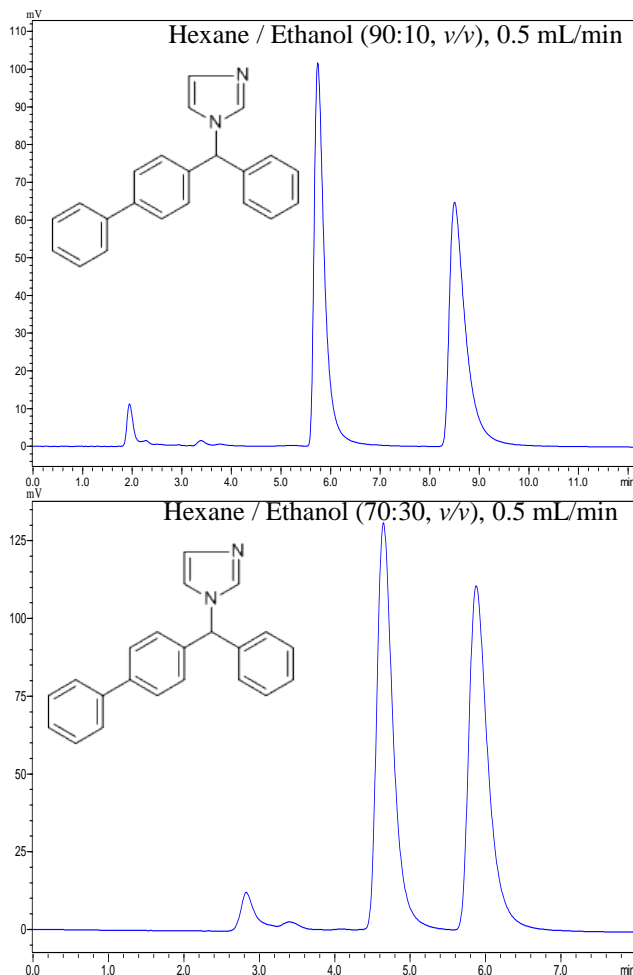


Figure (AM5)-7. Chiral separation of Bifonazole on ChiralAM-5 column under normal phase conditions using Hexane/Ethanol as mobile phase.

Column: ChiralAM-5
Dimension: 3 μ m, 250 \times 2.1 mm I.D.
Part No. 8953-AM5-05
LC Mode: HPLC (Shimadzu LC20)
Flow rate: 0.5 mL/min
Detection: UV@220nm
Temperature: Ambient

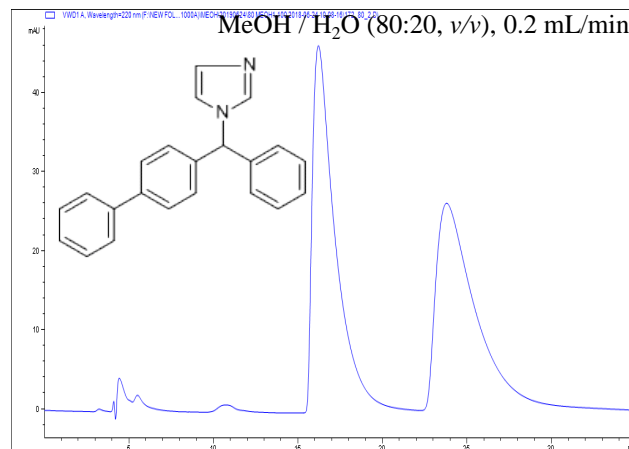


Figure (AM5)-8. Chiral separation of Bifonazole on ChiralAM-5 column under reverse phase conditions using MeOH / H₂O as mobile phase.

Column: ChiralAM-5
Dimension: 3 μ m, 250 \times 2.1 mm I.D.
Part No. 8953-AM5-05
LC Mode: HPLC (Agilent1200)
Flow rate: 0.2 mL/min
Detection: UV@220nm
Temperature: Ambient

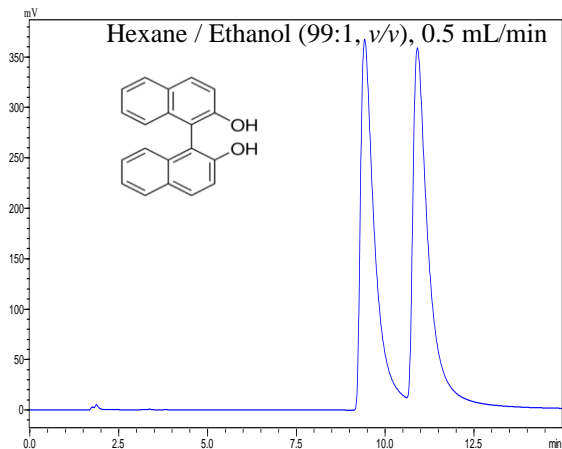
ChiralAM-5 Column Notes and Applications in HPLC and UPLC**1,1'-Bi-2-Naphthol on ChiralAMCE-5 column**

Figure (AM5)-9. Chiral separation of 1,1'-Bi-2-Naphthol on ChiralAM-5 column under normal phase conditions using Hexane/Ethanol as mobile phase.

Column: ChiralAM-5
Dimension: 3 μ m, 250 \times 2.1 mm I.D.
Part No. 8953-AM5-05
LC Mode: HPLC (Shimadzu LC20)
Flow rate: 0.5 mL/min
Detection: UV@220nm
Temperature: Ambient

ChiralAM-5 Column Notes and Applications in HPLC and UPLC

4-Chlorobenzoin on ChiralAM-5 column

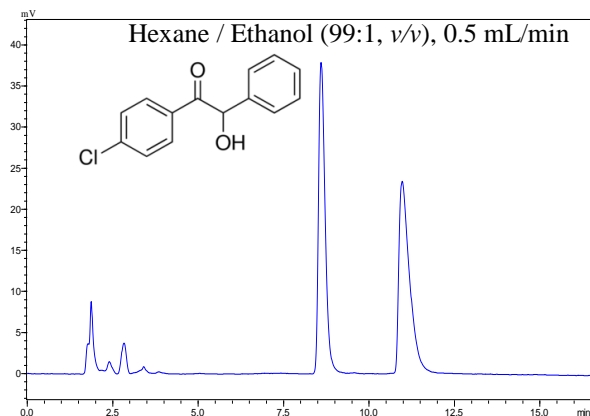


Figure (AM5)-10. Chiral separation of 4-Chlorobenzoin on ChiralAM-5 column under normal phase conditions using Hexane / Ethanol as mobile phase.

Column: ChiralAM-5
Dimension: 3 μ m, 250 \times 2.1 mm I.D.
Part No. 8953-AM5-05
LC Mode: HPLC (Shimadzu LC20)
Flow rate: 0.5 mL/min
Detection: UV@220nm
Temperature: Ambient

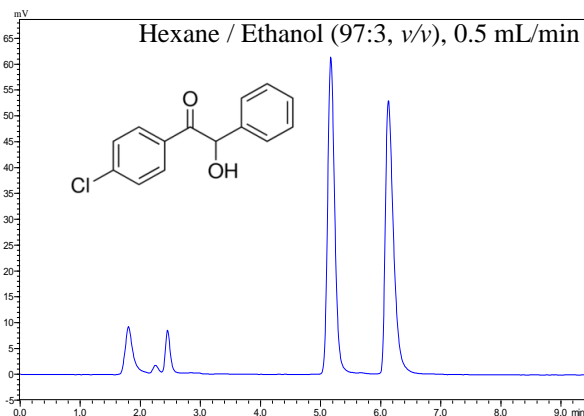


Figure (AM5)-11. Chiral separation of 4-Chlorobenzoin on ChiralAM-5 column under normal phase conditions using Hexane / Ethanol as mobile phase.

Column: ChiralAM-5
Dimension: 3 μ m, 250 \times 2.1 mm I.D.
Part No. 8953-AM5-05
LC Mode: HPLC (Shimadzu LC20)
Flow rate: 0.5 mL/min
Detection: UV@220nm
Temperature: Ambient

ChiralAM-5 Column Notes and Applications in HPLC and UPLC

Chlormezanone on ChiralAM-5 column

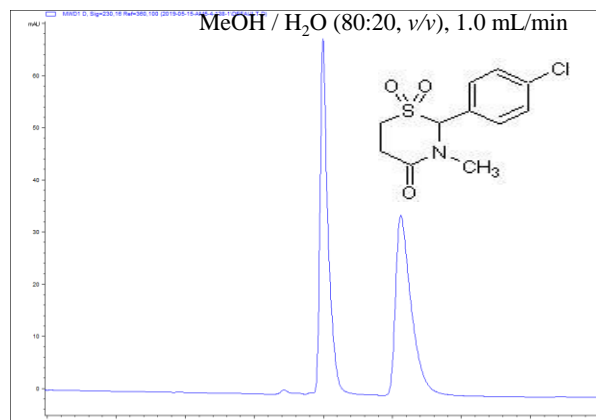


Figure (AM5)-12. Chiral separation of Chlormezanone on ChiralAM-5 column under reversed phase conditions using MeOH / H₂O as mobile phase.

Column: ChiralAM-5
Dimension: 5 μ m, 250 \times 4.6 mm I.D.
Part No. 8955-AM5-05
LC Mode: HPLC (Agilent1100)
Flow rate: 1 mL/min
Detection: UV@230nm
Temperature: Ambient

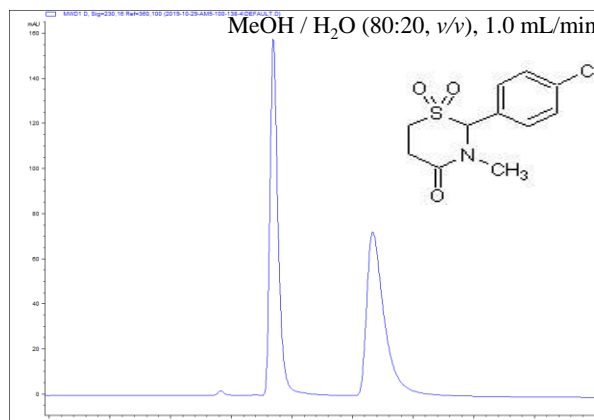


Figure (AM5)-14. Fast chiral separation of Chlormezanone on ChiralAM-5 column under reversed phase conditions using MeOH / H₂O as mobile phase.

Column: ChiralAM-5
Dimension: 3 μ m, 100 \times 4.6 mm I.D.
Part No. 8953-AM5-62
LC Mode: HPLC (Agilent1100)
Flow rate: 1 mL/min
Detection: UV@230nm
Temperature: Ambient

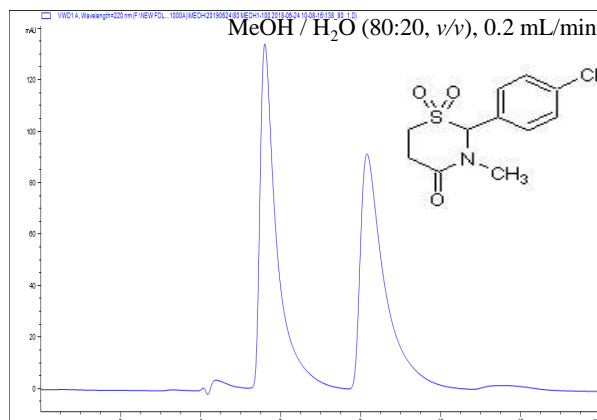


Figure (AM5)-13. Chiral separation of Chlormezanone on ChiralAM-5 column under reversed phase conditions using MeOH / H₂O as mobile phase.

Column: ChiralAM-5
Dimension: 3 μ m, 250 \times 2.1 mm I.D.
Part No. 8953-AM5-05
LC Mode: HPLC (Agilent1200)
Flow rate: 0.2 mL/min
Detection: UV@220nm
Temperature: Ambient

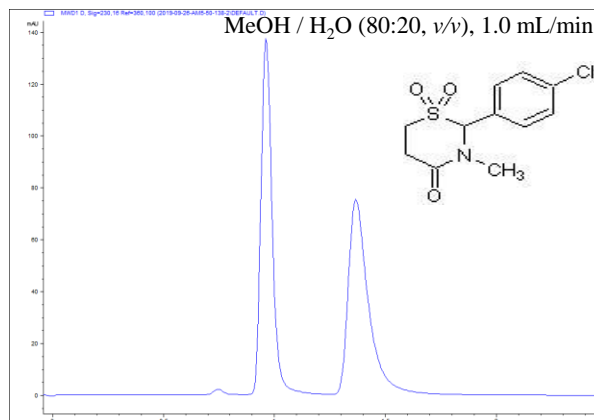


Figure (AM5)-15. Fast chiral separation of Chlormezanone on ChiralAM-5 column under reversed phase conditions using MeOH / H₂O as mobile phase.

Column: ChiralAM-5
Dimension: 3 μ m, 50 \times 4.6 mm I.D.
Part No. 8953-AM5-61
LC Mode: HPLC (Agilent1100)
Flow rate: 1 mL/min
Detection: UV@230nm
Temperature: Ambient

ChiralAM-5 Column Notes and Applications in HPLC and UPLC

Chlormezanone on ChiralAM-5 column

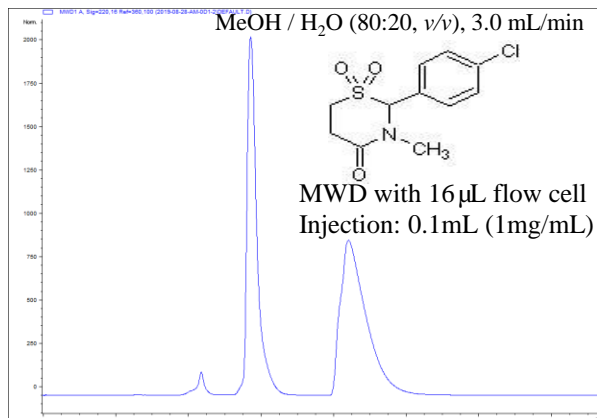


Figure (AM5)-16. Semi-preparative chiral separation of Chlormezanone on ChiralAM-5 column under reversed phase conditions using MeOH / H₂O as mobile phase.

Column: ChiralAM-5
Dimension: 5 μ m, 200 \times 10 mm I.D.
Part No. 7955-AM5-14
LC Mode: HPLC (Agilent1200)
Flow rate: 3.0 mL/min
Detection: UV@220nm
Temperature: Ambient

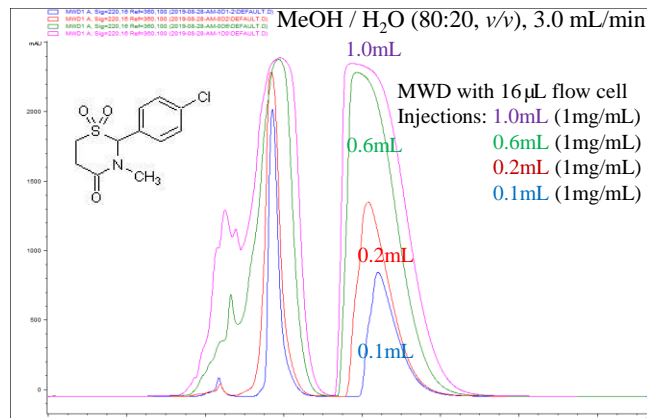


Figure (AM5)-17. Semi-preparative chiral separation of Chlormezanone on ChiralAM-5 column under reversed phase conditions using MeOH / H₂O as mobile phase.

Column: ChiralAM-5
Dimension: 5 μ m, 200 \times 10 mm I.D.
Part No. 7955-AM5-14
LC Mode: HPLC (Agilent1200)
Flow rate: 3.0 mL/min
Detection: UV@220nm
Temperature: Ambient

ChiralAM-5 Column Notes and Applications in HPLC and UPLC

Climbazole on ChiralAM-5 column

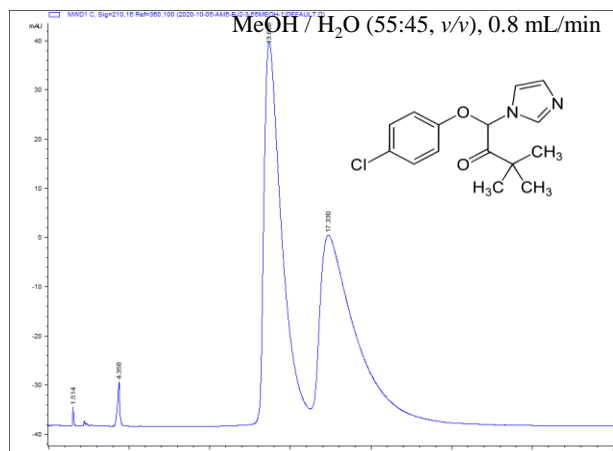


Figure (AM5)-17A. Chiral separation of Climbazole on ChiralAM-5 column under reversed phase conditions using MeOH / H₂O as mobile phase.

Column: ChiralAM-5
Dimension: 5 μ m, 250 \times 4.6 mm I.D.
Part No. 8955-AM5-05
LC Mode: HPLC (Agilent1200)
Flow rate: 0.8 mL/min
Detection: UV@210nm
Temperature: Ambient

ChiralAM-5 Column Notes and Applications in HPLC and UPLC

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

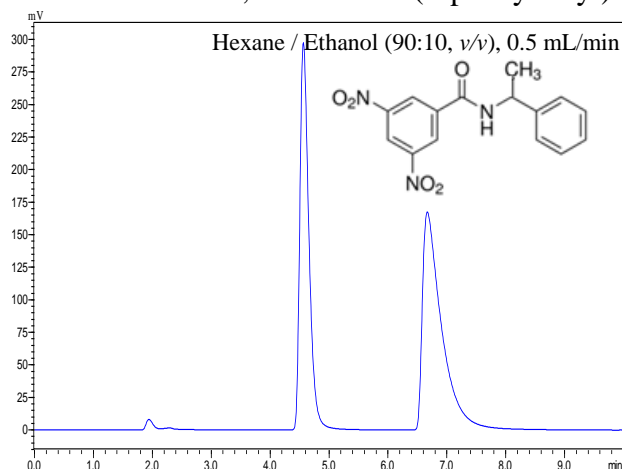


Figure (AM5)-18. Chiral separation of 3,5-Dinitro-N-(1-phenylethyl)benzamide on ChiralAM-5 column under normal phase conditions using Hexane / Ethanol as mobile phase.

Column: ChiralAM-5
Dimension: 3 μ m, 250 \times 2.1 mm I.D.
Part No. 8953-AM5-05
LC Mode: HPLC (Shimadzu LC20)
Flow rate: 0.5 mL/min
Detection: UV@220nm
Temperature: Ambient

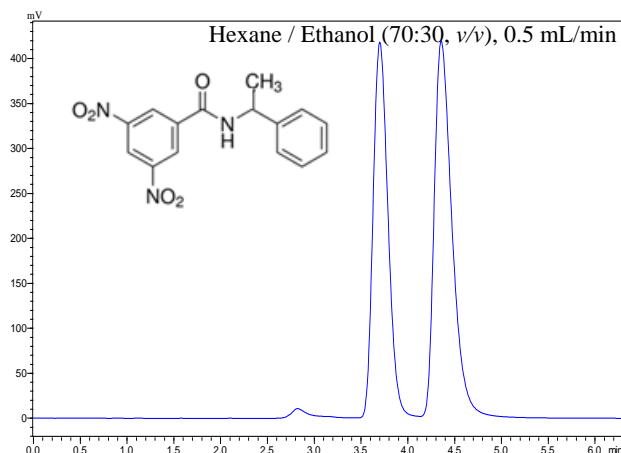


Figure (AM5)-18. Chiral separation of 3,5-Dinitro-N-(1-phenylethyl)benzamide on ChiralAM-5 column under normal phase conditions using Hexane / Ethanol as mobile phase.

Column: ChiralAM-5
Dimension: 3 μ m, 250 \times 2.1 mm I.D.
Part No. 8953-AM5-05
LC Mode: HPLC (Shimadzu LC20)
Flow rate: 0.5 mL/min
Detection: UV@220nm
Temperature: Ambient

ChiralAM-5 Column Notes and Applications in HPLC and UPLC

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

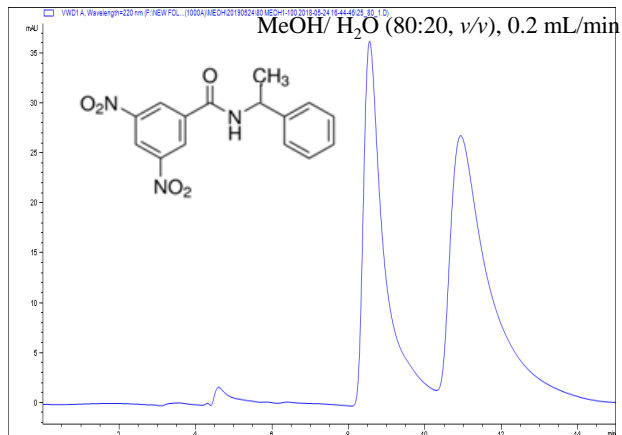


Figure (AM5)-20. Chiral separation of 3,5-Dinitro-N-(1-phenylethyl)benzamide on ChiralAM-5 column under reversed phase conditions using MeOH/ H₂O as mobile phase.

Column: ChiralAM-5
Dimension: 3 μ m, 250 \times 2.1 mm I.D.
Part No. 8953-AM5-05
LC Mode: HPLC (Agilent1200)
Flow rate: 0.2 mL/min
Detection: UV@220nm
Temperature: Ambient

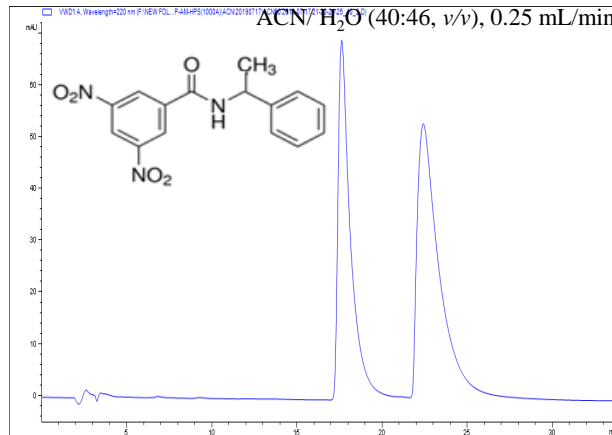


Figure (AM5)-21. Chiral separation of 3,5-Dinitro-N-(1-phenylethyl)benzamide on ChiralAM-5 column under reversed phase conditions using ACN/ H₂O as mobile phase.

Column: ChiralAM-5
Dimension: 3 μ m, 250 \times 2.1 mm I.D.
Part No. 8953-AM5-05
LC Mode: HPLC (Agilent1200)
Flow rate: 0.2 mL/min
Detection: UV@220nm
Temperature: Ambient

ChiralAM-5 Column Notes and Applications in HPLC and UPLC

Flavanone on ChiralAM-5 column

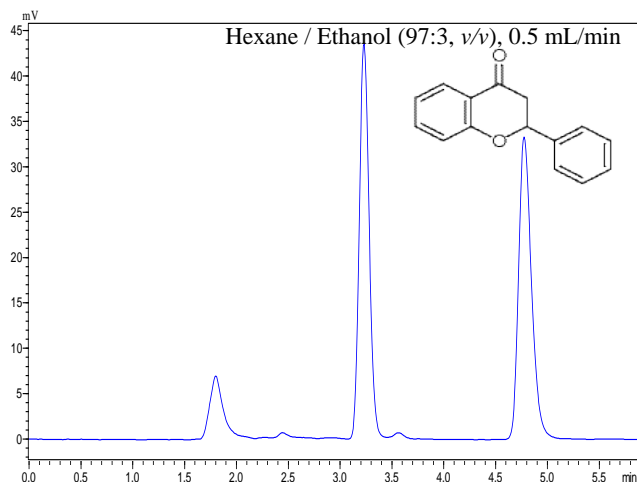


Figure (AM5)-22. Chiral separation of Flavanone on ChiralAM-5 column under reversed phase conditions using Hexane / Ethanol as mobile phase.

Column: ChiralAM-5
Dimension: 3 μ m, 250 \times 2.1 mm I.D.
Part No. 8953-AM5-05
LC Mode: HPLC (Shimadzu LC20)
Flow rate: 0.5 mL/min
Detection: UV@220nm
Temperature: Ambient

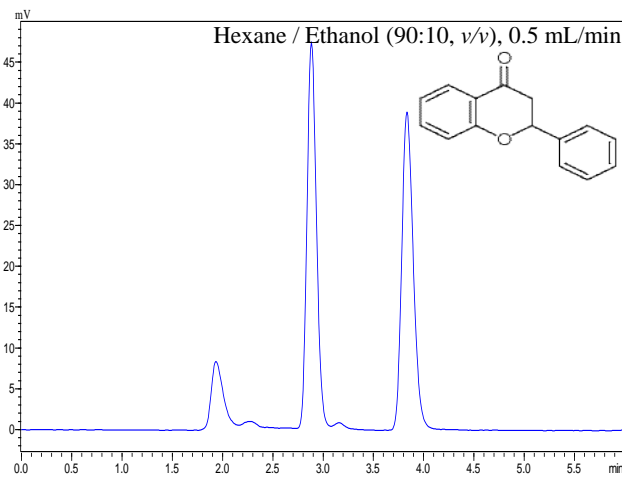


Figure (AM5)-23. Chiral separation of Flavanone on ChiralAM-5 column under reversed phase conditions using Hexane / Ethanol as mobile phase.

Column: ChiralAM-5
Dimension: 3 μ m, 250 \times 2.1 mm I.D.
Part No. 8953-AM5-05
LC Mode: HPLC (Shimadzu LC20)
Flow rate: 0.5 mL/min
Detection: UV@220nm
Temperature: Ambient

ChiralAM-5 Column Notes and Applications in HPLC and UPLC

Flavanone on ChiralAM-5 column

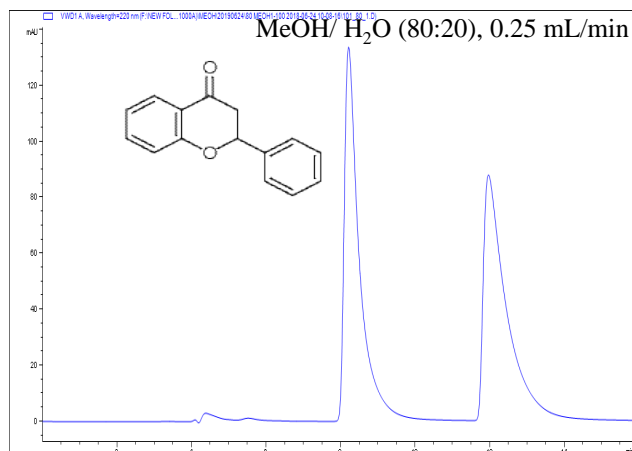


Figure (AM5)-24. Chiral separation of Flavanone on ChiralAMCE-5 column under polar organic mode using MeOH/ H₂O as mobile phase.

Column: ChiralAM-5
Dimension: 3 μ m, 250 \times 2.1 mm I.D.
Part No. 8953-AM5-05
LC Mode: HPLC (Agilent1200)
Flow rate: 0.25 mL/min
Detection: UV@220nm
Temperature: Ambient

ChiralAM-5 Column Notes and Applications in HPLC and UPLC

Furoin on ChiralAM-5 column

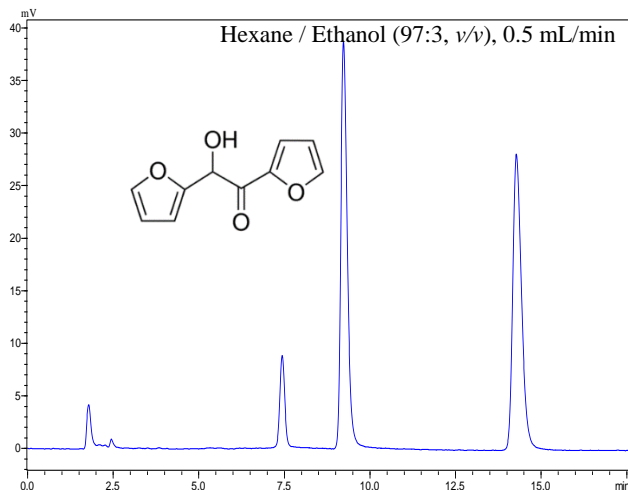


Figure (AM5)-25. Chiral separation of Furoin on ChiralAM-5 column under normal phase condition using Hexane / Ethanol as mobile phase.

Column: ChiralAM-5
Dimension: 3 μ m, 250 \times 2.1 mm I.D.
Part No. 8953-AM5-05
LC Mode: HPLC (Shimadzu LC20)
Flow rate: 0.5 mL/min
Detection: UV@220nm
Temperature: Ambient

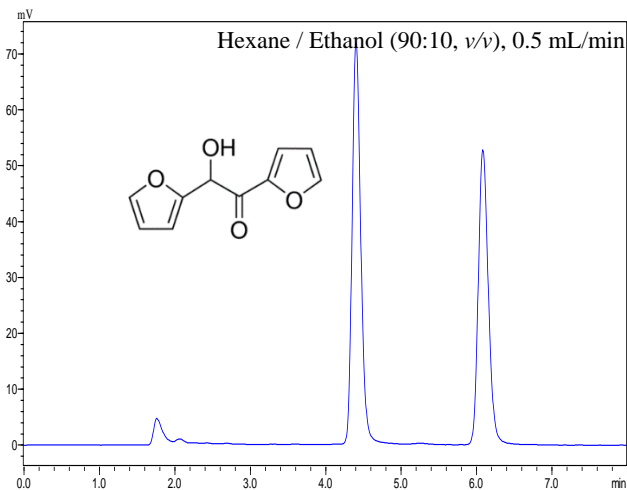


Figure (AM5)-26. Chiral separation of Furoin on ChiralAM-5 column under normal phase condition using Hexane / Ethanol as mobile phase.

Column: ChiralAM-5
Dimension: 3 μ m, 250 \times 2.1 mm I.D.
Part No. 8953-AM5-05
LC Mode: HPLC (Shimadzu LC20)
Flow rate: 0.5 mL/min
Detection: UV@220nm
Temperature: Ambient

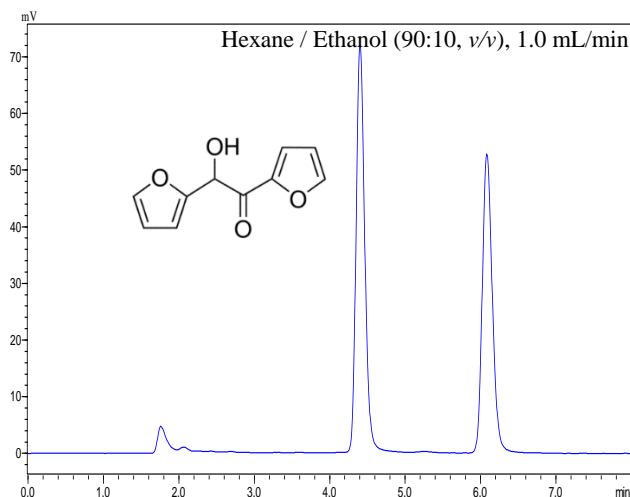
ChiralAM-5 Column Notes and Applications in HPLC and UPLC**Furoin on ChiralAM-5 column**

Figure (AM5)-27. Chiral separation of Furoin on ChiralAM-5 column under normal phase condition using Hexane / Ethanol as mobile phase.

Column: ChiralAM-5
Dimension: 5 μ m, 250 \times 4.6 mm I.D.
Part No. 89535-AM5-05
LC Mode: HPLC (Shimadzu LC20)
Flow rate: 1.0 mL/min
Detection: UV@220nm
Temperature: Ambient

ChiralAM-5 Column Notes and Applications in HPLC and UPLC

Hesperetin on ChiralAM-5 column

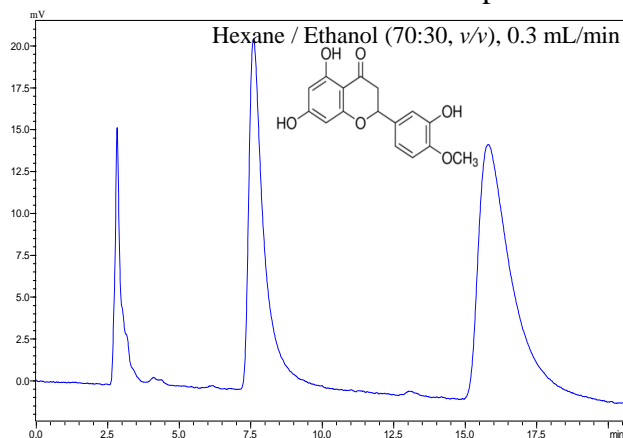


Figure (AM5)-28. Chiral separation of Hesperetin on ChiralAM-5 column under reversed phase conditions using Hexane / Ethanol as mobile phases.

Column: ChiralAM-5
Dimension: 3 μ m, 250 \times 2.1 mm I.D.
Part No. 8953-AM5-05
LC Mode: HPLC (Shimadzu LC20)
Flow rate: 0.3 mL/min
Detection: UV@220nm
Temperature: Ambient

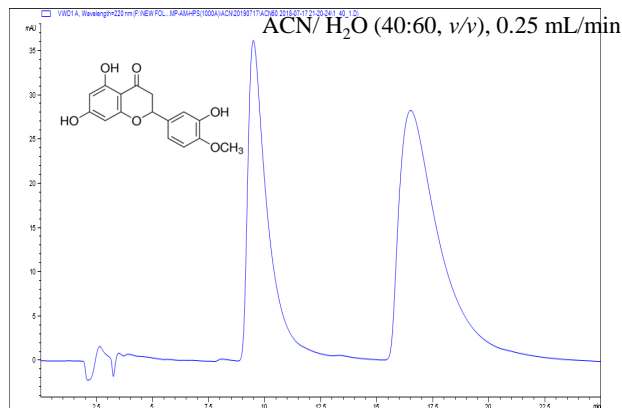


Figure (AM5)-29. Chiral separation of Hesperetin on ChiralAM-5 column under reversed phase conditions using ACN/ H₂O as mobile phases.

Column: ChiralAM-5
Dimension: 3 μ m, 250 \times 2.1 mm I.D.
Part No. 8953-AM5-05
LC Mode: HPLC (Agilent1200)
Flow rate: 0.25 mL/min
Detection: UV@220nm
Temperature: Ambient

ChiralAM-5 Column Notes and Applications in HPLC and UPLC

4'-Hydroxyflavanone on ChiralAM-5 column

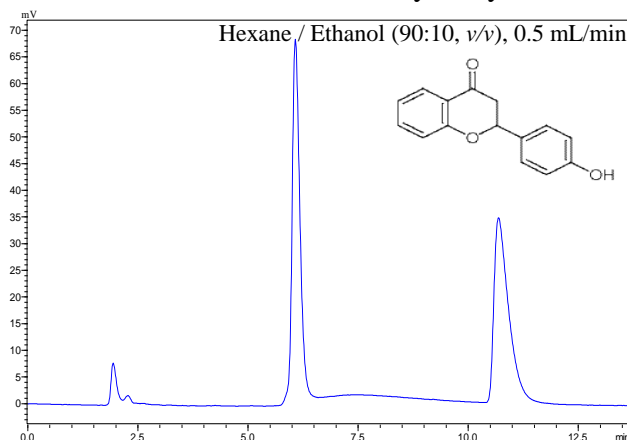


Figure (AM5)-30. Chiral separation of 4'-Hydroxyflavanone on ChiralAM-5 column under normal phase conditions using Hexane / Ethanol as mobile phases.

Column: ChiralAM-5
Dimension: 3 μ m, 250 \times 2.1 mm I.D.
Part No. 8953-AM5-05
LC Mode: HPLC (Shimadzu LC20)
Flow rate: 0.5 mL/min
Detection: UV@220nm
Temperature: Ambient

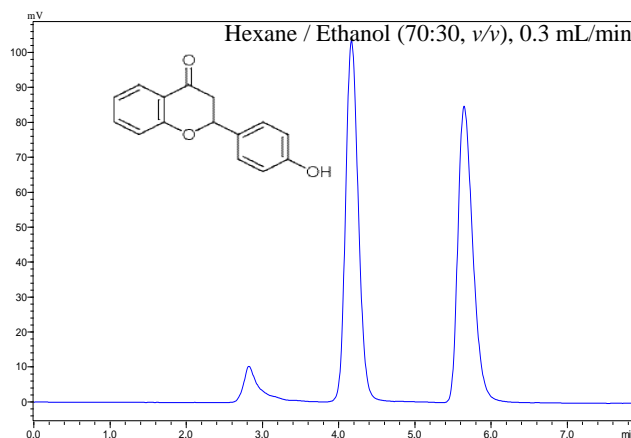


Figure (AM5)-31. Chiral separation of 4'-Hydroxyflavanone on ChiralAM-5 column under normal phase conditions using Hexane / Ethanol as mobile phases.

Column: ChiralAM-5
Dimension: 3 μ m, 250 \times 2.1 mm I.D.
Part No. 8953-AM5-05
LC Mode: HPLC (Shimadzu LC20)
Flow rate: 0.3 mL/min
Detection: UV@220nm
Temperature: Ambient

ChiralAM-5 Column Notes and Applications in HPLC and UPLC

4'-Hydroxyflavanone on ChiralAM-5 column

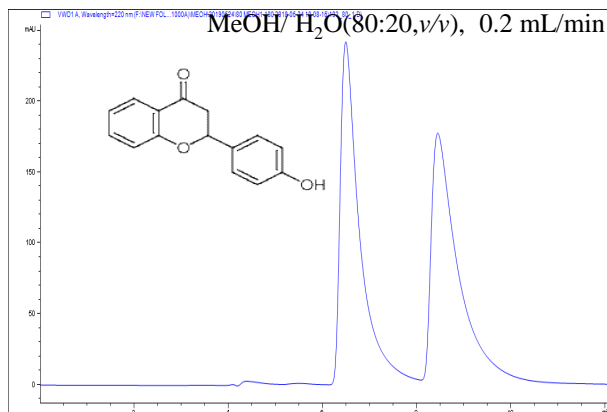


Figure (AM5)-32. Chiral separation of 4'-Hydroxyflavanone on ChiralAM-5 column under polar organic mode using MeOH/H₂O as mobile phase.

Column: ChiralAM-5
Dimension: 3 μm, 250 × 2.1 mm I.D.
Part No. 8953-AM5-05
LC Mode: HPLC (Agilent1200)
Flow rate: 0.25 mL/min
Detection: UV@220nm
Temperature: Ambient

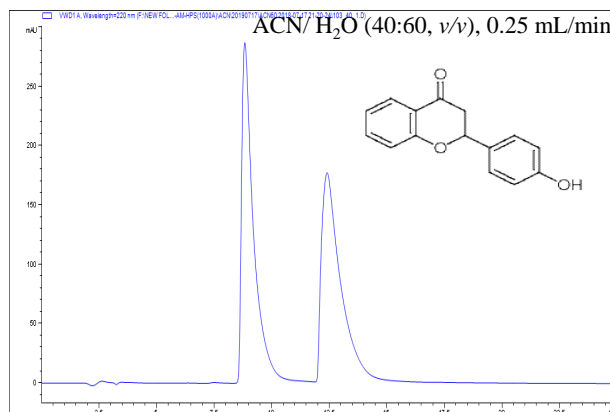


Figure (AM5)-33. Chiral separation of 4'-Hydroxyflavanone on ChiralAM-5 column under polar organic mode using ACN/H₂O as mobile phase.

Column: ChiralAM-5
Dimension: 3 μm, 250 × 2.1 mm I.D.
Part No. 8953-AM5-05
LC Mode: HPLC (Agilent1200)
Flow rate: 0.25 mL/min
Detection: UV@220nm
Temperature: Ambient

ChiralAM-5 Column Notes and Applications in HPLC and UPLC

2-Methoxy-2-phenylethanol on ChiralAM-5 column

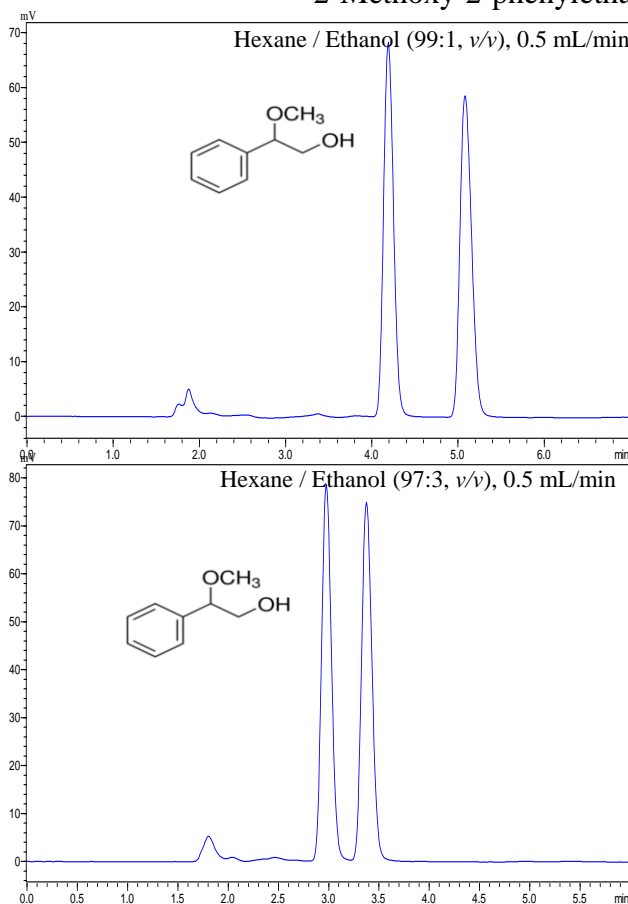


Figure (AM5)-34. Chiral separation of 2-Methoxy-2-phenylethanol on ChiralAM-5 column under normal phase condition using Hexane / Ethanol as mobile phases.

Column: ChiralAM-5
Dimension: 3 μ m, 250 \times 2.1 mm I.D.
Part No. 8953-AM5-05
LC Mode: HPLC (Shimadzu LC20)
Flow rate: 0.5 mL/min
Detection: UV@220nm
Temperature: Ambient

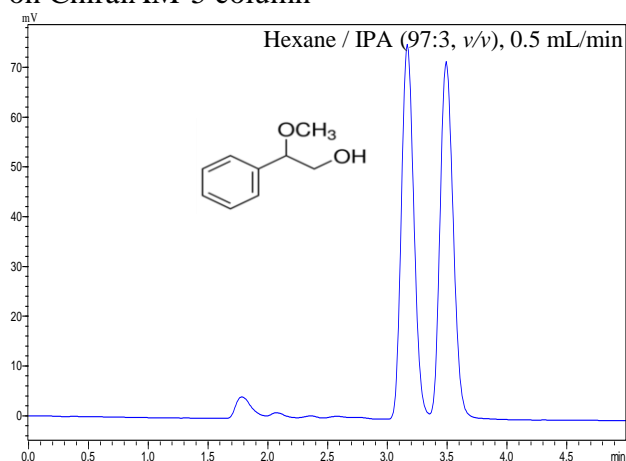


Figure (AM5)-35. Chiral separation of 2-Methoxy-2-phenylethanol on ChiralAM-5 column under normal phase condition using Hexane / IPA as mobile phases.

Column: ChiralAM-5
Dimension: 3 μ m, 250 \times 2.1 mm I.D.
Part No. 8953-AM5-05
LC Mode: HPLC (Shimadzu LC20)
Flow rate: 0.5 mL/min
Detection: UV@220nm
Temperature: Ambient

ChiralAM-5 Column Notes and Applications in HPLC and UPLC

6-Methoxyflavanone on ChiralAM-5 column

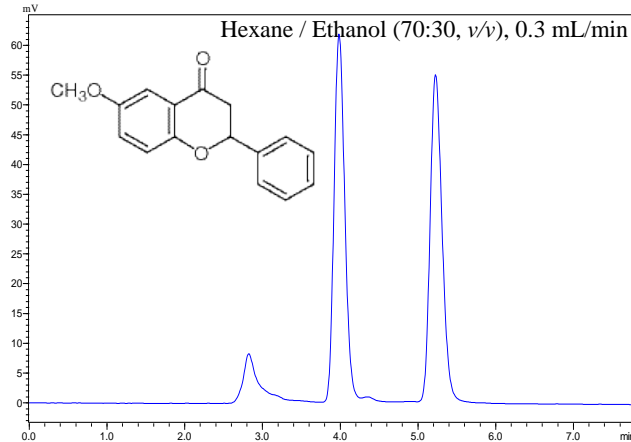
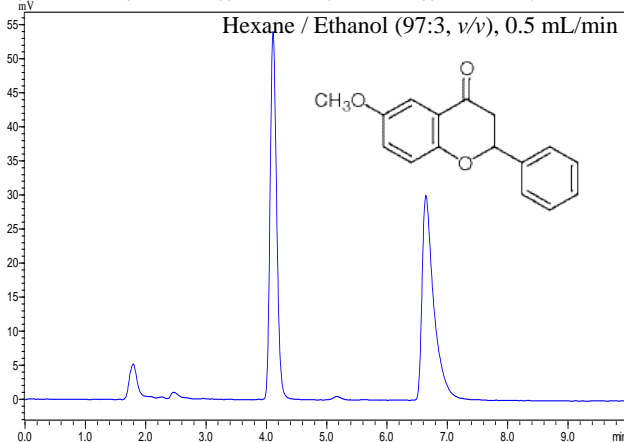
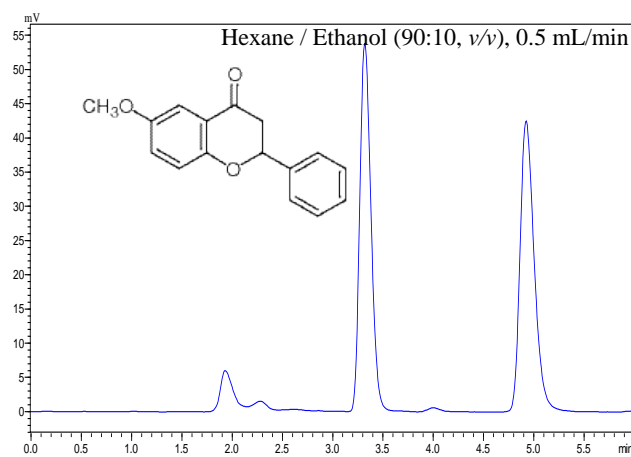
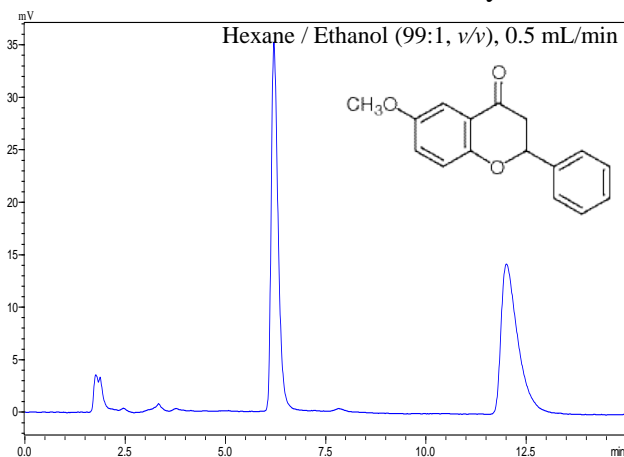


Figure (AM5)-36. Chiral separation of 6-Methoxyflavanone on ChiralAM-5 column under normal phase condition using Hexane / Ethanol as mobile phases.

Column: ChiralAM-5
Dimension: 3 μ m, 250 \times 2.1 mm I.D.
Part No. 8953-AM5-05
LC Mode: HPLC (Shimadzu LC20)
Flow rate: 0.5 mL/min
Detection: UV@220nm
Temperature: Ambient

Figure (AM5)-37. Chiral separation of 6-Methoxyflavanone on ChiralAM-5 column under normal phase condition using Hexane / IPA as mobile phases.

Column: ChiralAM-5
Dimension: 3 μ m, 250 \times 2.1 mm I.D.
Part No. 8953-AM5-05
LC Mode: HPLC (Shimadzu LC20)
Flow rate: 0.5 and 0.3 mL/min
Detection: UV@220nm
Temperature: Ambient

ChiralAM-5 Column Notes and Applications in HPLC and UPLC

6-Methoxyflavanone on ChiralAM-5 column

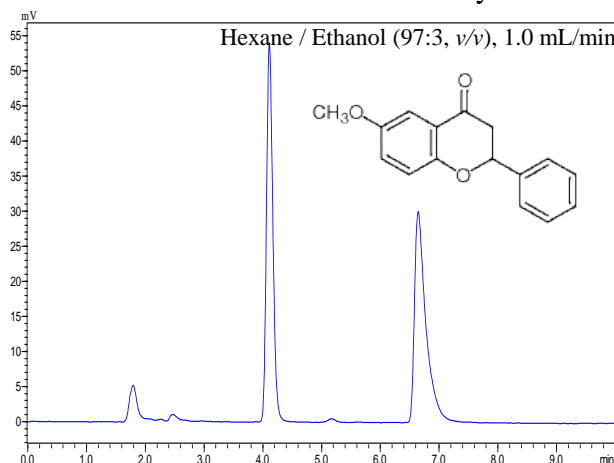


Figure (AM5)-38. Chiral separation of 6-Methoxyflavanone on ChiralAM-5 column under normal phase condition using Hexane / Ethanol as mobile phases.

Column: ChiralAM-5
Dimension: 5 μ m, 250 \times 4.6 mm I.D.
Part No. 8953-AM5-05
LC Mode: HPLC (Shimadzu LC20)
Flow rate: 1.0 mL/min
Detection: UV@220nm
Temperature: Ambient

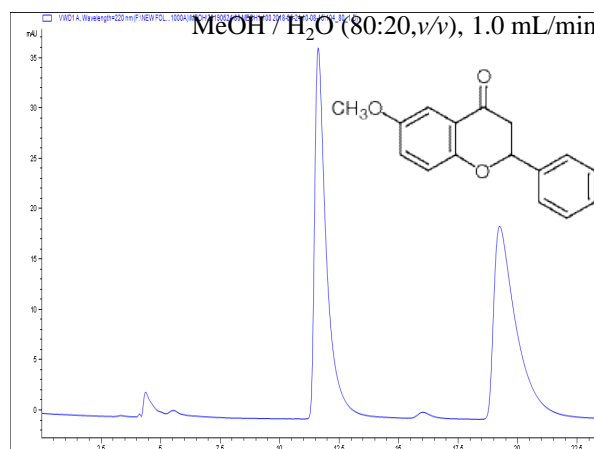


Figure (AM5)-39. Chiral separation of 6-Methoxyflavanone on ChiralAM-5 column under polar organic mode using MeOH/ H₂O as mobile phase.

Column: ChiralAM-5
Dimension: 5 μ m, 250 \times 4.6 mm I.D.
Part No. 8953-AM5-05
LC Mode: HPLC (Agilent1100)
Flow rate: 1.0 mL/min
Detection: UV@220nm
Temperature: Ambient

ChiralAM-5 Column Notes and Applications in HPLC and UPLC

6-Methoxyflavanone on ChiralAM-5 column

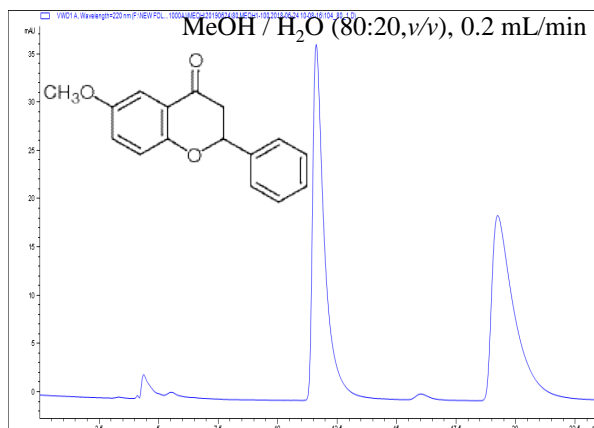


Figure (AM5)-40. Chiral separation of 6-Methoxyflavanone on ChiralAM-5 column under polar organic mode using MeOH/ H₂O as mobile phase.

Column: ChiralAM-5
Dimension: 3 μm, 250 × 2.1 mm I.D.
Part No. 8953-AM5-05
LC Mode: HPLC (Agilent1200)
Flow rate: 0.2 mL/min
Detection: UV@220nm
Temperature: Ambient

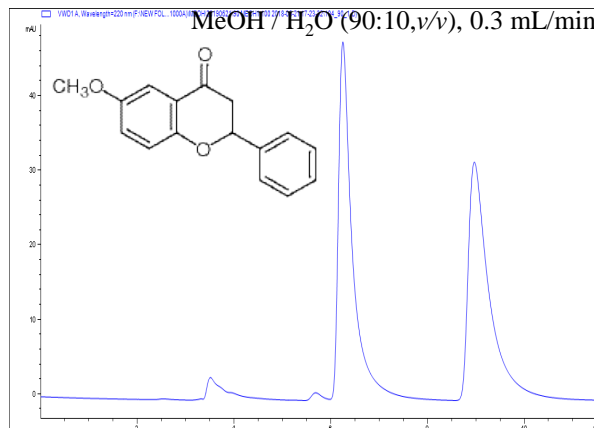


Figure (AM5)-41. Chiral separation of 6-Methoxyflavanone on ChiralAM-5 column under polar organic mode using MeOH/ H₂O as mobile phase.

Column: ChiralAM-5
Dimension: 3 μm, 250 × 2.1 mm I.D.
Part No. 8953-AM5-05
LC Mode: HPLC (Agilent1200)
Flow rate: 0.3 mL/min
Detection: UV@220nm
Temperature: Ambient

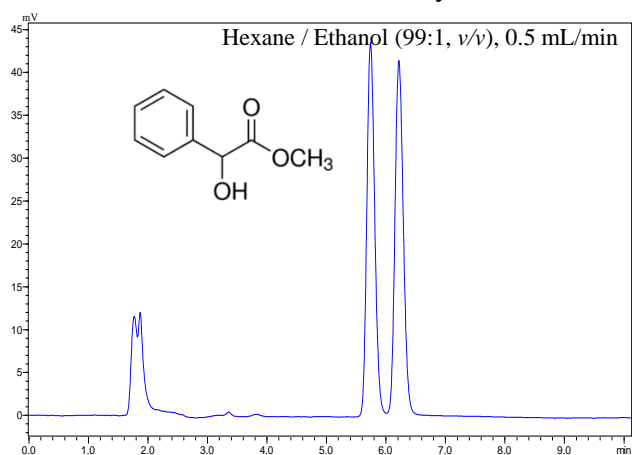
ChiralAM-5 Column Notes and Applications in HPLC and UPLC**Methyl mandelate on ChiralAM-5 column**

Figure (AM5)-42. Chiral separation of Methyl mandelate on ChiralAM-5 column under normal phase conditions using Hexane / Ethanol as mobile phases.

Column: ChiralAM-5
Dimension: 3 μ m, 250 \times 2.1 mm I.D.
Part No. 8953-AM5-05
LC Mode: HPLC (Shimadzu LC20)
Flow rate: 0.5 mL/min
Detection: UV@220nm
Temperature: Ambient

ChiralAM-5 Column Notes and Applications in HPLC and UPLC

Naringenin on ChiralAM-5 column

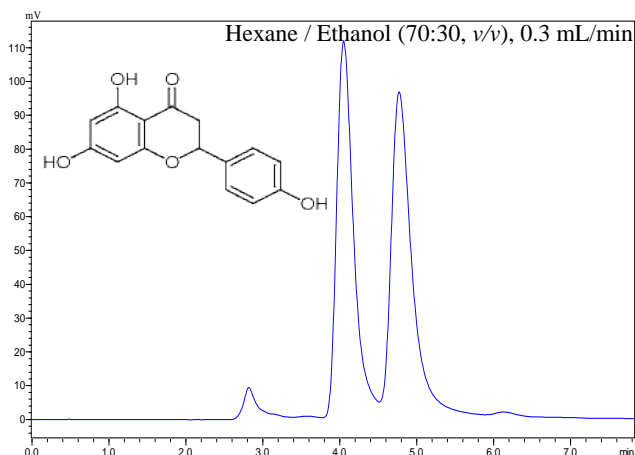


Figure (AM5)-43. Chiral separation of Naringenin on ChiralAM-5 column under normal phase condition using Hexane / Ethanol as mobile phase.

Column: ChiralAM-5
Dimension: 3 μ m, 250 \times 2.1 mm I.D.
Part No. 8953-AM5-05
LC Mode: HPLC (Shimadzu LC20)
Flow rate: 0.3 mL/min
Detection: UV@220nm
Temperature: Ambient

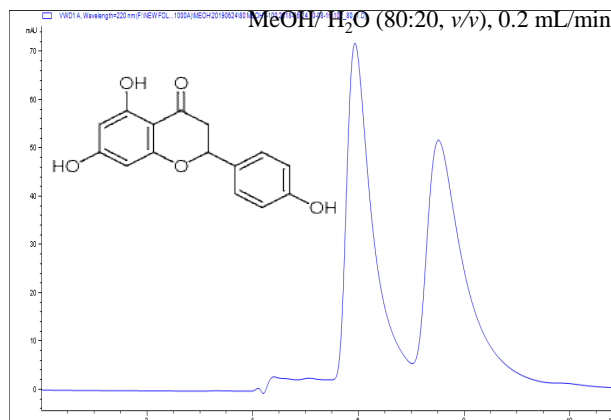


Figure (AM5)-44. Chiral separation of Naringenin on ChiralAM-5 column under reversed phase condition using MeOH/ H₂O as mobile phases.

Column: ChiralAM-5
Dimension: 3 μ m, 250 \times 2.1 mm I.D.
Part No. 8953-AM5-05
LC Mode: HPLC (Agilent1200)
Flow rate: 0.2 mL/min
Detection: UV@220nm
Temperature: Ambient

ChiralAM-5 Column Notes and Applications in HPLC and UPLC

Ornidazole on ChiralAM-5 column

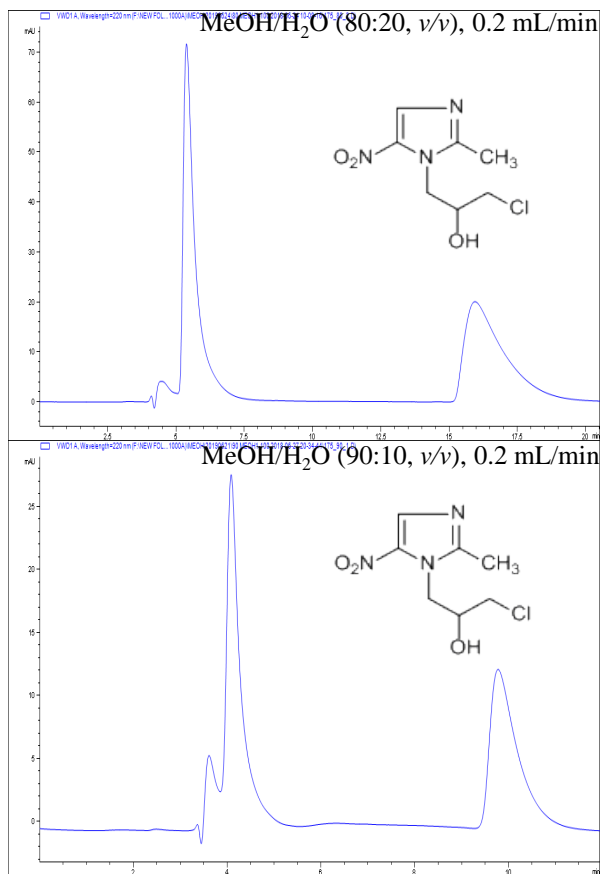


Figure (AM5)-45. Chiral separation of Ornidazole on ChiralAM-5 column under polar organic mode using MeOH / H₂O as mobile phases.

Column: ChiralAM-5
Dimension: 3 μ m, 250 \times 2.1 mm I.D.
Part No. 8953-AM5-05
LC Mode: HPLC (Agilent1200)
Flow rate: 0.2 mL/min
Detection: UV@220nm
Temperature: Ambient

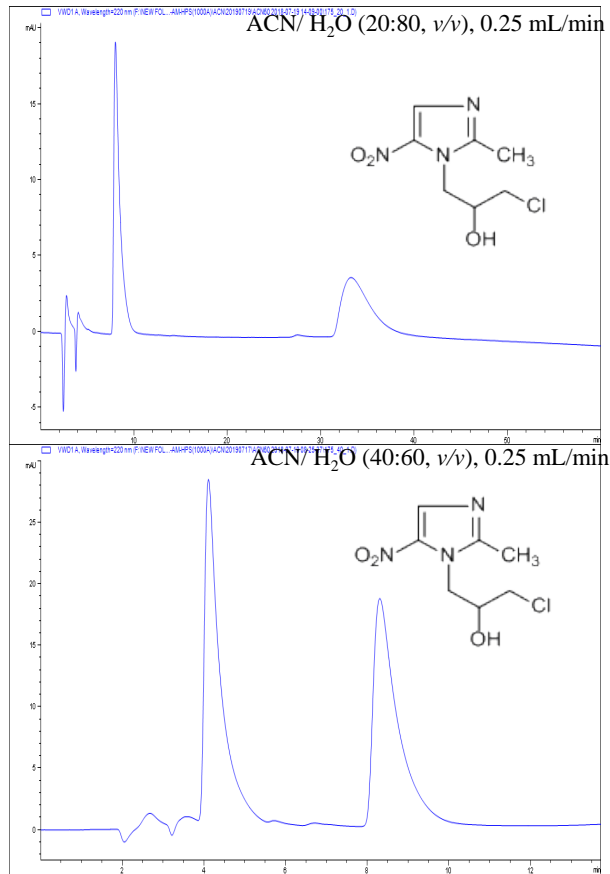


Figure (AM5)-46. Chiral separation of Ornidazole on ChiralAM-5 column under reversed phase condition using ACN/ H₂O as mobile phases.

Column: ChiralAM-5
Dimension: 3 μ m, 250 \times 2.1 mm I.D.
Part No. 8953-AM5-05
LC Mode: HPLC (Agilent1200)
Flow rate: 0.25 mL/min
Detection: UV@220nm
Temperature: Ambient

ChiralAM-5 Column Notes and Applications in HPLC and UPLC

2-Phenylcyclohexanone on ChiralAM-5 column

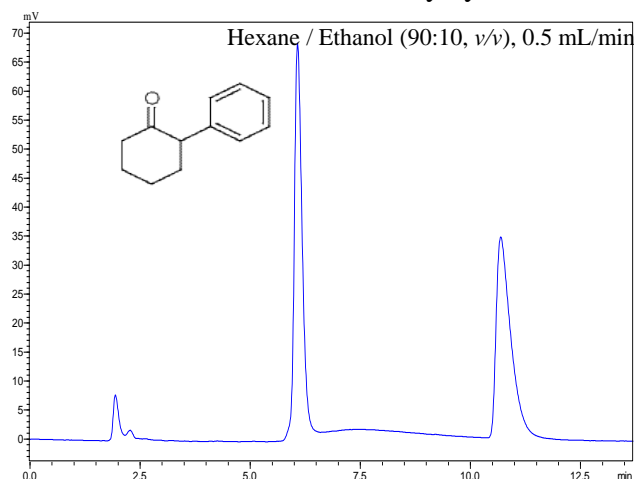


Figure (AM5)-47. Chiral separation of 2-Phenylcyclohexanone on ChiralAM-5 column under normal phase condition using Hexane / Ethanol as mobile phases.

Column: ChiralAM-5
Dimension: 3 μ m, 250 \times 2.1 mm I.D.
Part No. 8953-AM5-05
LC Mode: HPLC (Shimadzu LC20)
Flow rate: 0.5 mL/min
Detection: UV@220nm
Temperature: Ambient

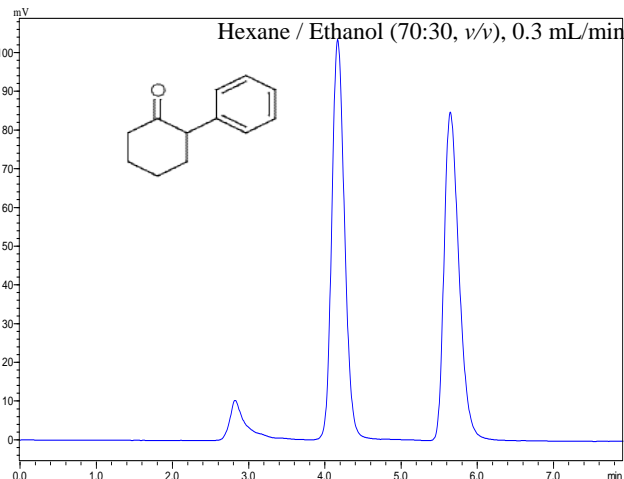


Figure (AM5)-48. Chiral separation of 2-Phenylcyclohexanone on ChiralAM-5 column under normal phase condition using Hexane / Ethanol as mobile phases.

Column: ChiralAM-5
Dimension: 3 μ m, 250 \times 2.1 mm I.D.
Part No. 8953-AM5-05
LC Mode: HPLC (Shimadzu LC20)
Flow rate: 0.3 mL/min
Detection: UV@220nm
Temperature: Ambient

ChiralAM-5 Column Notes and Applications in HPLC and UPLC

3-Phenylphthalide on ChiralAM-5 column

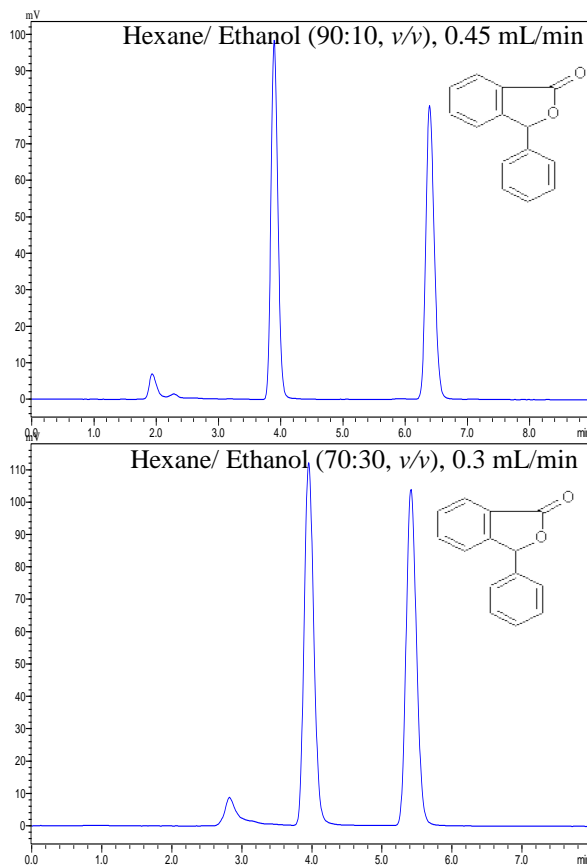
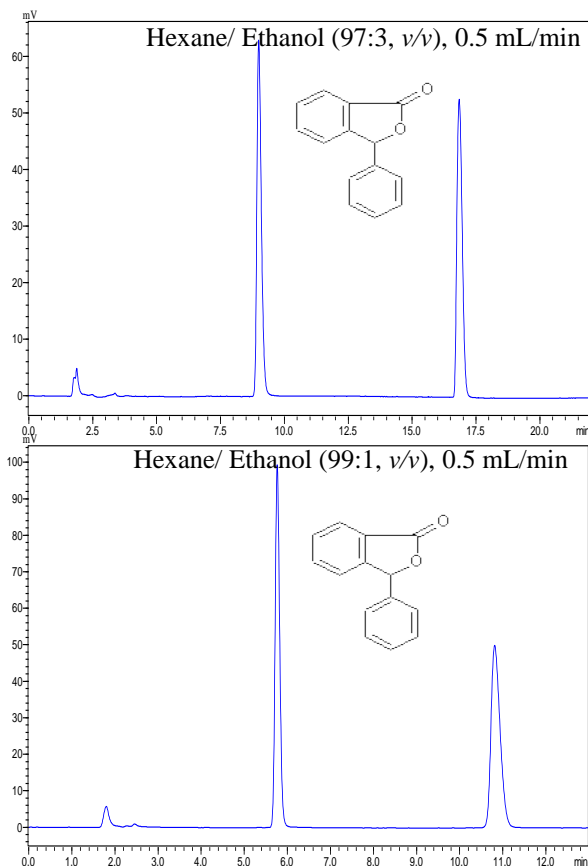


Figure (AM5)-49. Chiral separation of 3-Phenylphthalide on ChiralAM-5 column under normal phase condition using Hexane/ Ethanol as mobiles.

Column: ChiralAM-5
Dimension: 3 μ m, 250 \times 2.1 mm I.D.
Part No. 8953-AM5-05
LC Mode: HPLC (Shimadzu LC20)
Flow rate: 0.5 mL/min
Detection: UV@220nm
Temperature: Ambient

Figure (AM5)-50. Chiral separation of 3-Phenylphthalide on ChiralAM-5 column under normal phase condition using Hexane/ Ethanol as mobiles.

Column: ChiralAM-5
Dimension: 3 μ m, 250 \times 2.1 mm I.D.
Part No. 8953-AM5-05
LC Mode: HPLC (Shimadzu LC20)
Flow rate: 0.45 and 0.3 mL/min
Detection: UV@220nm
Temperature: Ambient

ChiralAM-5 Column Notes and Applications in HPLC and UPLC

3-Phenylphthalide on ChiralAMCE-5 column

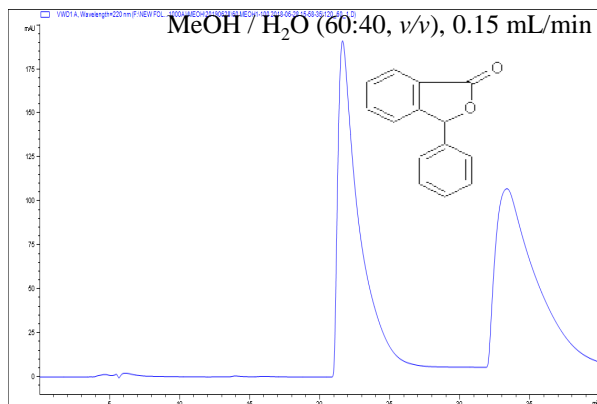


Figure (AM5)-51. Chiral separation of 3-Phenylphthalide on ChiralAM-5 column under reversed phase condition using of MeOH/ H₂O as mobile phase.

Column: ChiralAM-5
Dimension: 3 μm, 250 × 2.1 mm I.D.
Part No. 8953-AM5-05
LC Mode: HPLC (Agilent1200)
Flow rate: 0.15 mL/min
Detection: UV@220nm
Temperature: Ambient

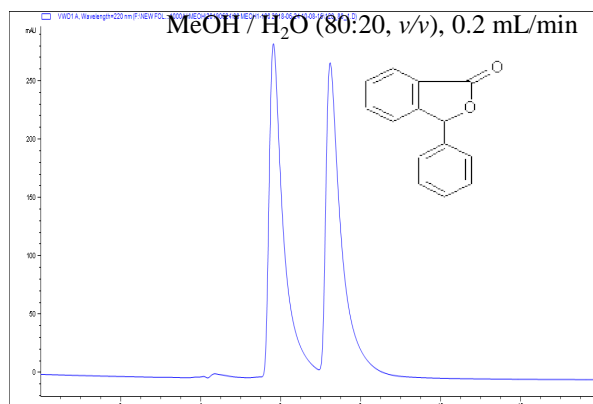


Figure (AM5)-52. Chiral separation of 3-Phenylphthalide on ChiralAM-5 column under reversed phase condition using of MeOH/ H₂O as mobile phase.

Column: ChiralAM-5
Dimension: 3 μm, 250 × 2.1 mm I.D.
Part No. 8953-AM5-05
LC Mode: HPLC (Agilent1200)
Flow rate: 0.2 mL/min
Detection: UV@220nm
Temperature: Ambient

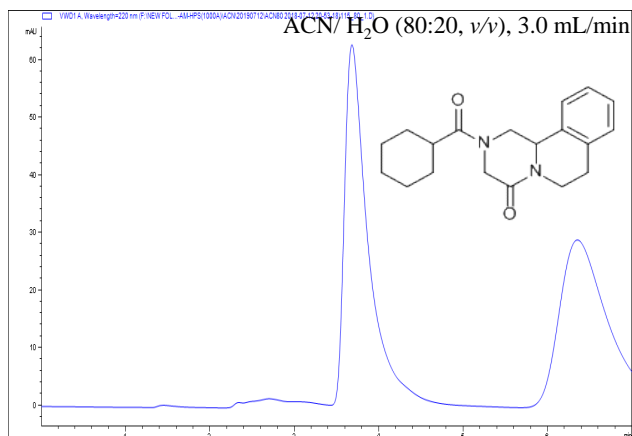
ChiralAM-5 Column Notes and Applications in HPLC and UPLC**Praziquantel on ChiralAM-5 column**

Figure (AM5)-53. Chiral separation of Praziquantel on ChiralAM-5 column under reverse phase conditions using ACN/ H₂O as mobile phase.

Column: ChiralAM-5
Dimension: 3 μ m, 250 \times 2.1 mm I.D.
Part No. 8953-AM5-05
LC Mode: HPLC (Agilent1200)
Flow rate: 0.35 mL/min
Detection: UV@220nm
Temperature: Ambient

ChiralAM-5 Column Notes and Applications in HPLC and UPLC

Thalidomide on ChiralAM-5 column

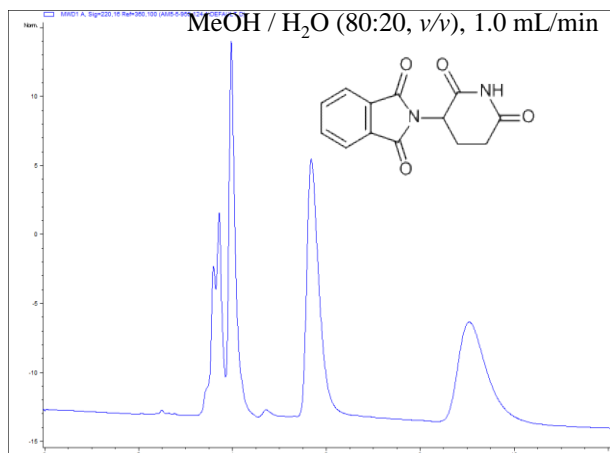


Figure (AM5)-54. Chiral separation of Thalidomide on ChiralAM-5 column under reversed phase condition using MeOH / H₂O as mobile phase.

Column: ChiralAM-5
Dimension: 5 μ m, 250 \times 4.6 mm I.D.
Part No. 8955-AM5-05
LC Mode: HPLC (Agilent1200)
Flow rate: 1.0 mL/min
Detection: UV@220nm
Temperature: Ambient

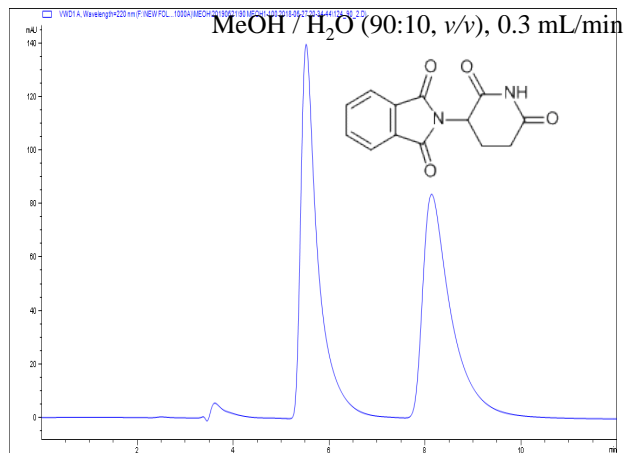


Figure (AM5)-55. Chiral separation of Thalidomide on ChiralAM-5 column under reversed phase condition using MeOH / H₂O as mobile phase.

Column: ChiralAM-5
Dimension: 3 μ m, 250 \times 2.1 mm I.D.
Part No. 8953-AM5-05
LC Mode: HPLC (Agilent1200)
Flow rate: 0.3 mL/min
Detection: UV@220nm
Temperature: Ambient

ChiralAM-5 Column Notes and Applications in HPLC and UPLC

Troger's Base on ChiralAM-5 column

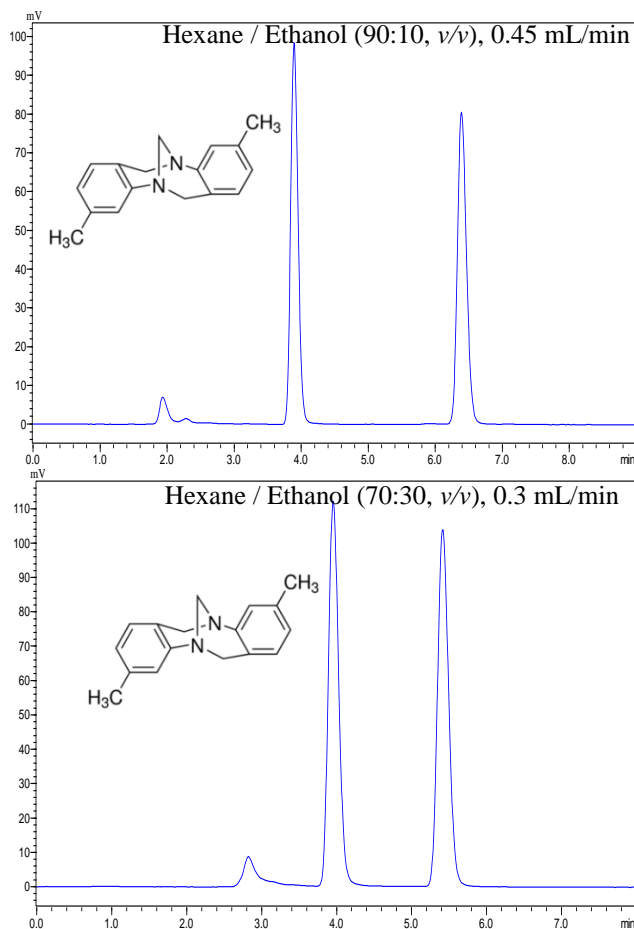
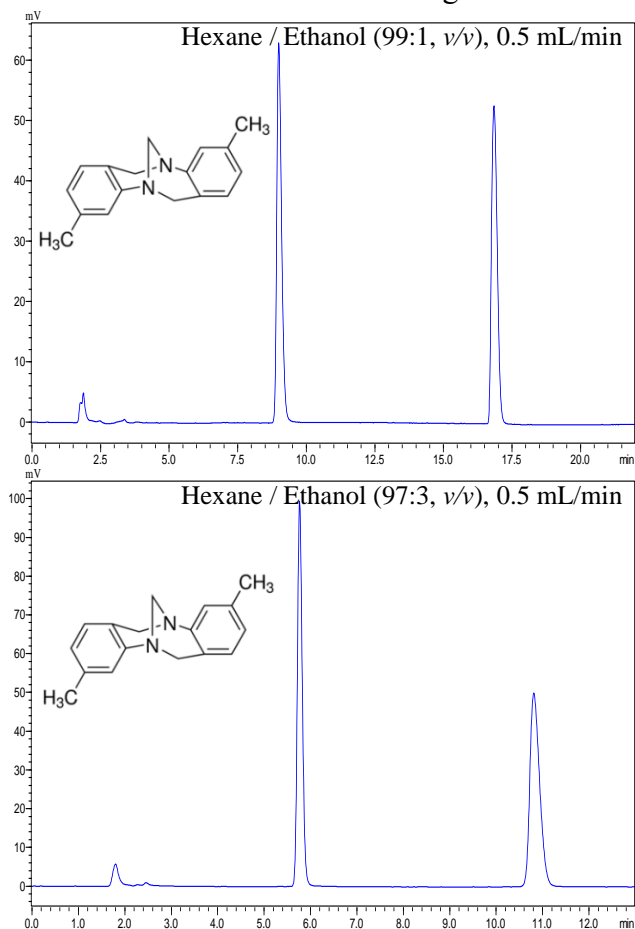


Figure (AM5)-56. Chiral separation of Troger's Base on ChiralAM-5 column under normal phase condition using Hexane / Ethanol as mobile phases.

Column: ChiralAM-5
Dimension: 3 μ m, 250 \times 2.1 mm I.D.
Part No. 8953-AM5-05
LC Mode: HPLC (Shimadzu LC20)
Flow rate: 0.5 mL/min
Detection: UV@220nm
Temperature: Ambient

Figure (AM5)-57. Chiral separation of Troger's Base on ChiralAM-5 column under normal phase condition using Hexane / Ethanol as mobile phases.

Column: ChiralAM-5
Dimension: 3 μ m, 250 \times 2.1 mm I.D.
Part No. 8953-AM5-05
LC Mode: HPLC (Shimadzu LC20)
Flow rate: 0.45 and 0.3 mL/min
Detection: UV@220nm
Temperature: Ambient

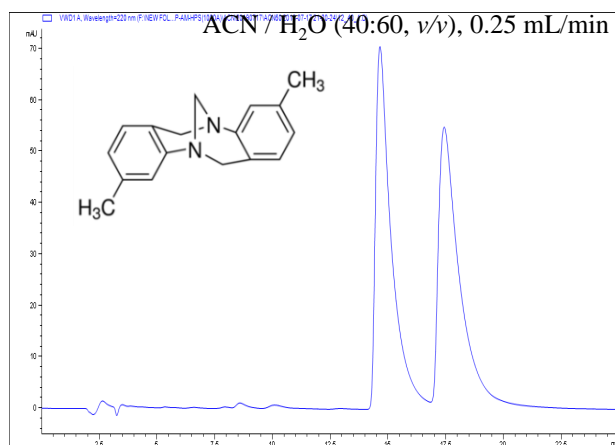
ChiralAM-5 Column Notes and Applications in HPLC and UPLC**Troger's Base on ChiralAM-5 column**

Figure (AM5)-58. Chiral separation of Troger's Base on ChiralAM-5 column under polar organic mode using ACN/ H₂O as mobile phase.

Column: ChiralAM-5
Dimension: 3 μ m, 250 \times 2.1 mm I.D.
Part No. 8953-AM5-05
LC Mode: HPLC (Agilent1200)
Flow rate: 0.25 mL/min
Detection: UV@220nm
Temperature: Ambient