

APPLICATION DATA

SFC

CHIRAL/ACHIRAL

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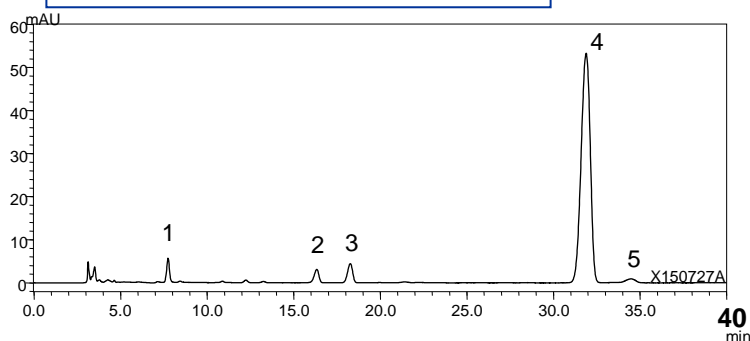
Method Development for Rapid SFC Analysis of Vitamin D3 and Related Compounds

T150727AE

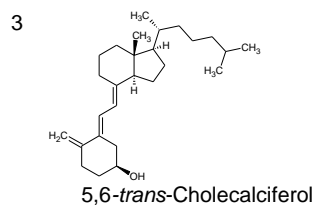
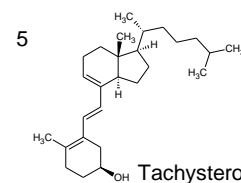
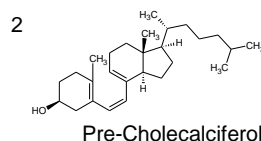
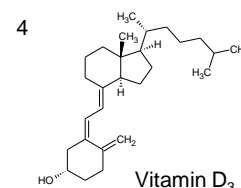
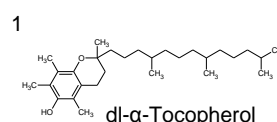
By utilizing the advantages of Supercritical Fluid Chromatography (SFC) such as high permeability and diffusibility, we could generally achieve higher resolution by SFC analysis in a shorter run time than by HPLC. Base line separation of Vitamin D3 (Cholecalciferol), three related compounds (Pre-cholecalciferol, 5,6-*trans*-Cholecalciferol, Tachysterol₃) and the antioxidant (α -Tocopherol) is achieved using an Alcyon SFC Triart Diol column under SFC conditions with shorter analysis time, which is one quarter the time for the normal phase HPLC method.

Alcyon SFC Triart Diol is based on organic/inorganic hybrid particle and has excellent chemical stability.

Normal Phase HPLC Method



Conditions	
Column	: YMC-Pack SIL (3 μ m, 12 nm) 250 X 4.6 mmI.D.
Eluent	: <i>n</i> -hexane/1-pentanol (1000/6)
Flow rate	: 1.0 mL/min
Temperature	: 25 °C
Detection	: UV at 254 nm
Injection	: 50 μ L



Sample :
 Concentrated cholecalciferol powder, thermally stressed (25 μ g/mL)
 Supplied by DSM Nutritional Products
 Intentionally prepared to cholecalciferol related compounds
 Not commercially available.

Development of SFC separation conditions

Procedure for Developing Separation Condition

1st STEP < Method Scouting >

[Column]

Alcyon SFC

- ① Triart Diol
- ② Triart PFP
- ③ Triart C18
- ④ SIL
- ⑤ CN

5 μ m, 150 X 4.6 mmI.D.

[Mobile phase]

- ① A) CO₂
B) methanol
- ② A) CO₂
B) ethanol
- ③ A) CO₂
B) 2-propanol

Composition : A/B (98/2)

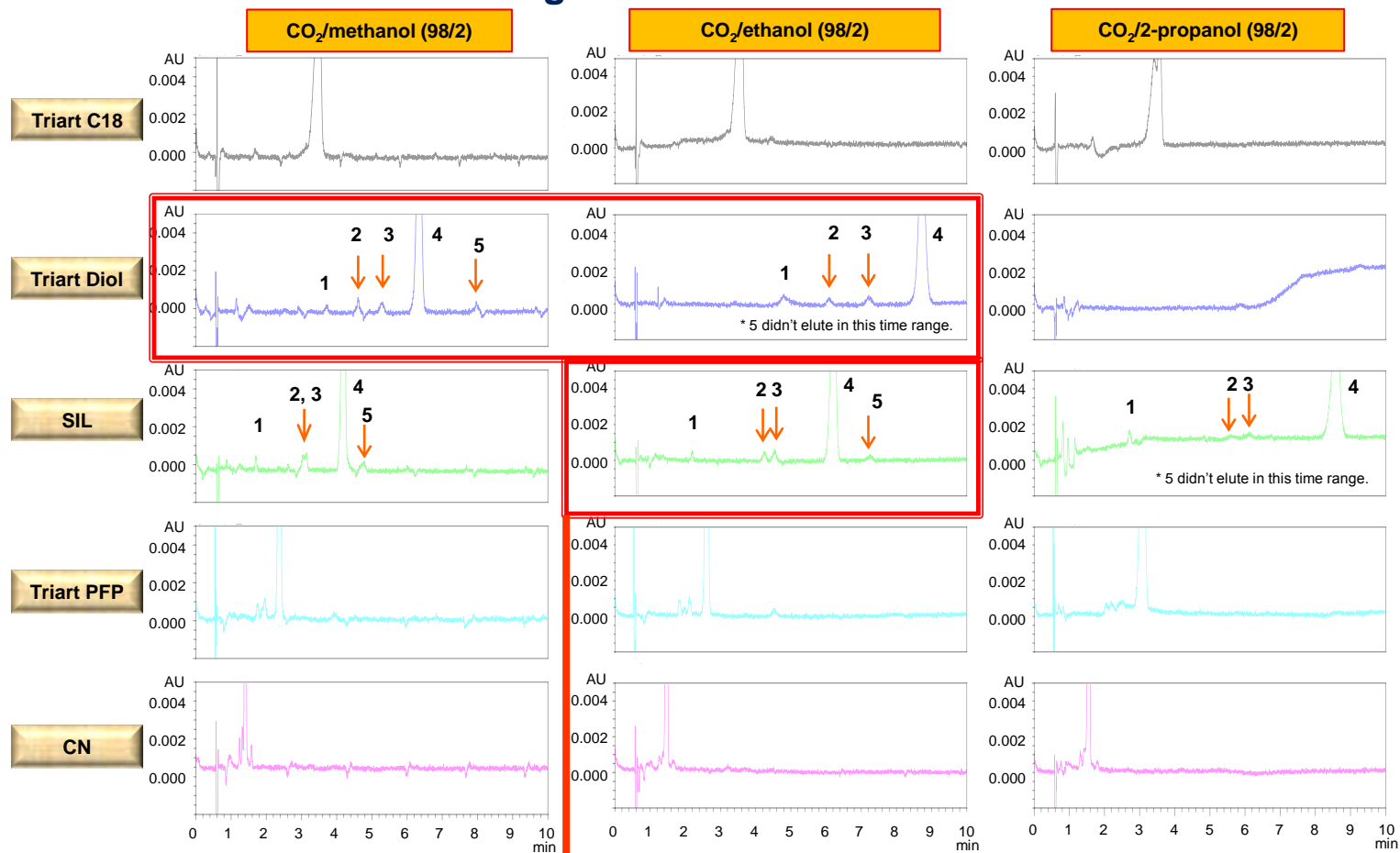
2nd STEP < Optimization >

[Items to be optimized]

- Modifier ratio
- Particle size of packing material (5 μ m \rightarrow 3 μ m)
- Column dimensions (150 X 4.6 mmI.D. \rightarrow 250 X 4.6 mmI.D.)
- Column temperature

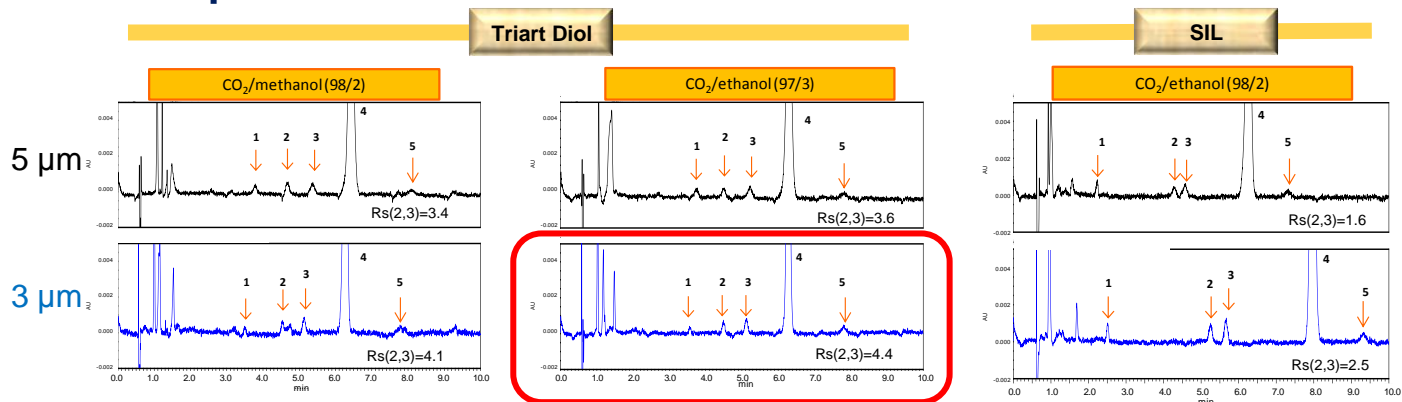
Flow rate	: 3.0 mL/min
Temperature	: 35°C
Detection	: UV (254 nm)
Back pressure	: 13.8 MPa (2000 psi)
Injection	: 10 μ L

1st STEP <Method Scouting>

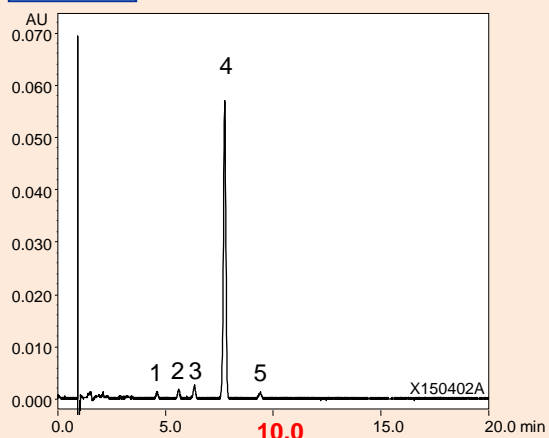


Modifier ratio and particle size optimization

2nd STEP <Optimization>



SFC



Fine tuning of the separation method from the condition using combination of Triart Diol 3 μm and CO₂/ethanol as a mobile phase was conducted. Column dimension, mobile phase composition and column temperature were optimized. The final condition and SFC chromatogram obtained with this new method are shown.

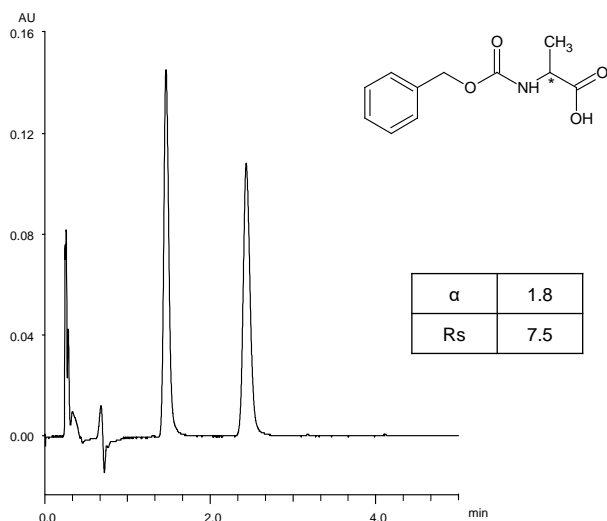
Condition	
Column	: Alcyon SFC Triart Diol (3 μm, 12 nm) 250 X 4.6 mm I.D.
Eluent	: CO ₂ /ethanol (96/4)
Flow rate	: 3.0 mL/min
Temperature	: 40°C
Detection	: UV at 254 nm
Back pressure	: 13.8 MPa (2000 psi)
Injection	: 20 μL

Chiral Compounds

N-CBZ-DL-アラニン

N-CBZ-DL-Alanine

T180717A

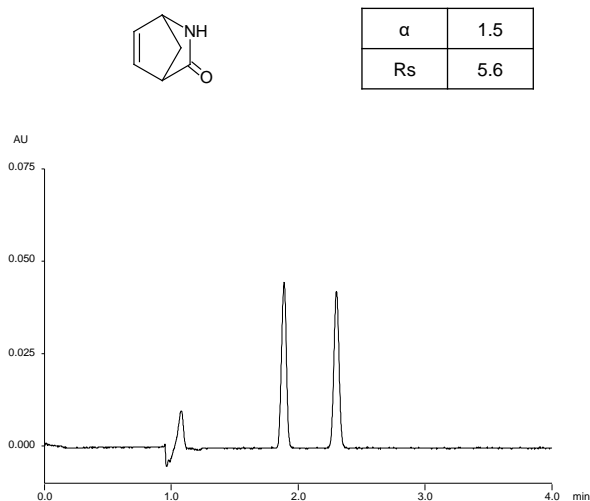


Column : Alcyon SFC CSP Amylose-C Neo (3 μ m)
50 X 3.0 mm I.D.
Eluent : CO₂/2-propanol containing 0.1% TFA (90/10)
Flow rate : 1.275 mL/min
Temperature : 35°C
Detection : UV at 215 nm
Back pressure : 13.8 MPa (2000 psi)
Injection : 2 μ L (1.0 mg/mL)

2-アゾビシクロ[2.2.1]ヘプト-5-エン-3-オン

2-Azabicyclo[2.2.1]hept-5-en-3-one (Vince lactam)

T180329E

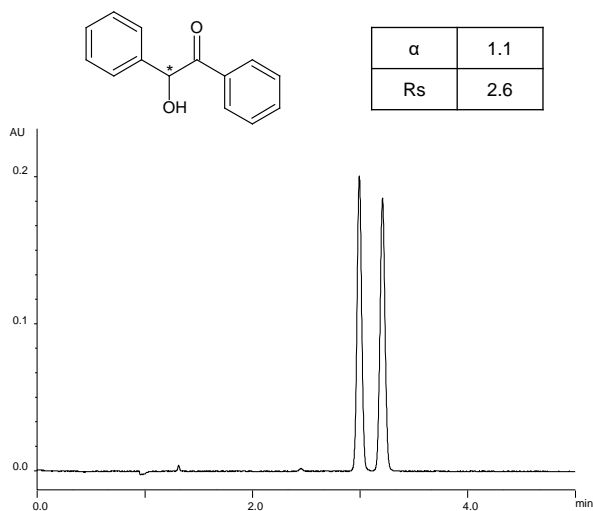


Column : Alcyon SFC CSP Cellulose-SC (5 μ m)
250 X 4.6 mm I.D.
Eluent : CO₂/methanol (90/10)
Flow rate : 3.0 mL/min
Temperature : 35°C
Detection : UV at 220 nm
Back pressure : 13.8 MPa (2000 psi)
Injection : 10 μ L (0.5 mg/mL)

ベンゾイン

Benzoin

T180319AR

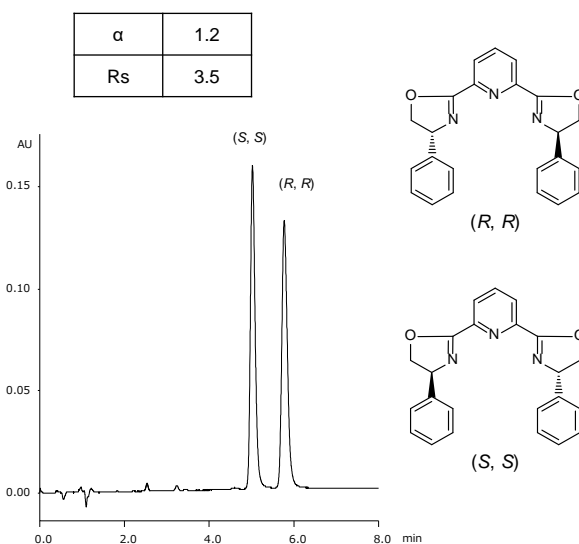


Column : Alcyon SFC CSP Cellulose-SJ (5 μ m)
250 X 4.6 mm I.D.
Eluent : CO₂/2-propanol (90/10)
Flow rate : 3.0 mL/min
Temperature : 35°C
Detection : UV at 254 nm
Back pressure : 13.8 MPa (2000 psi)
Injection : 2 μ L (1 mg/mL)

2,6-ビス(4-フェニル-2-オキサゾリン-2-イル)ピリジン

2,6-Bis(4-phenyl-2-oxazolin-2-yl)pyridine

T180406A

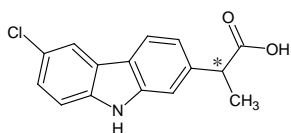


Column : Alcyon SFC CSP Cellulose-SB (5 μ m)
250 X 4.6 mm I.D.
Eluent : CO₂/methanol containing 0.1% diethylamine (70/30)
Flow rate : 3.0 mL/min
Temperature : 35°C
Detection : UV at 210 nm
Back pressure : 13.8 MPa (2000 psi)
Injection : 2 μ L (0.5 mg/mL)

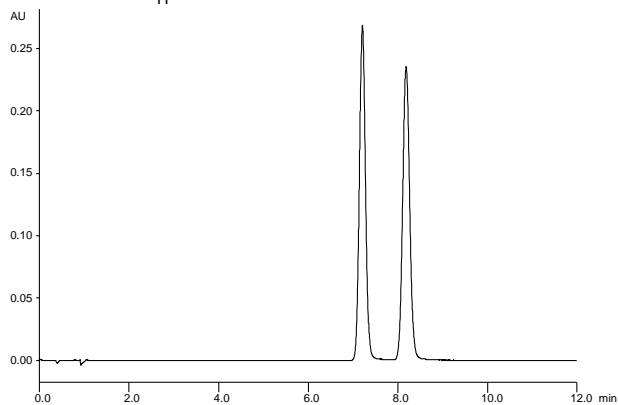
カルプロフェン

Carprofen

T180319U



α	1.2
Rs	3.7

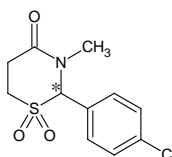


Column : Alcyon SFC CSP Cellulose-SJ (5 μ m)
250 X 4.6 mm I.D.
Eluent : CO₂/methanol (75/25)
Flow rate : 3.0 mL/min
Temperature : 35°C
Detection : UV at 230 nm
Back pressure : 13.8 MPa (2000 psi)
Injection : 2 μ L (1 mg/mL)

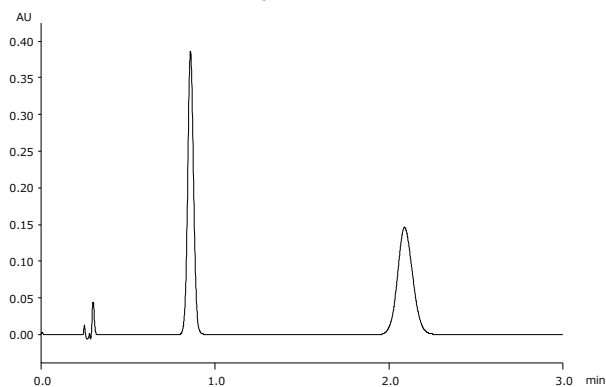
クロルメザノン

Chlormezanone

T180409O



α	1.0
Rs	11.2



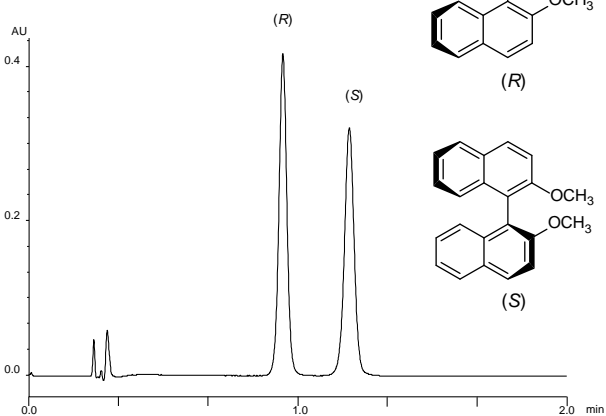
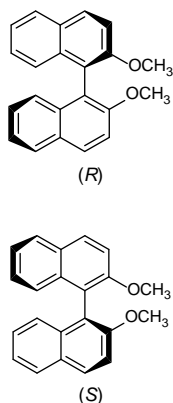
Column : Alcyon SFC CSP Amylose-SA (3 μ m)
50 X 3.0 mm I.D.
Eluent : CO₂/methanol (80/20)
Flow rate : 1.275 mL/min
Temperature : 35°C
Detection : UV at 230 nm
Back pressure : 13.8 MPa (2000 psi)
Injection : 0.7 μ L (1 mg/mL)

2,2'-ジメトキシ-1,1'-ビナフチル

2,2'-Dimethoxy-1,1'-binaphthyl

T180319X

α	1.4
Rs	4.2



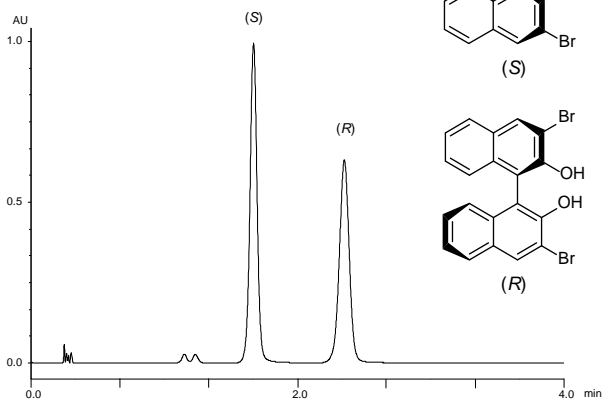
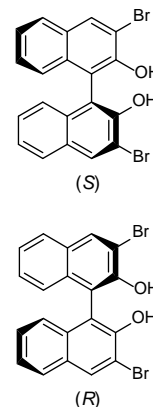
Column : Alcyon SFC CSP Cellulose-SJ (3 μ m)
50 X 3.0 mm I.D.
Eluent : CO₂/methanol (75/25)
Flow rate : 1.275 mL/min
Temperature : 35°C
Detection : UV at 230 nm
Back pressure : 13.8 MPa (2000 psi)
Injection : 0.7 μ L (0.15 mg/mL)

3,3'-ジブロモ-1,1'-ビ-2-ナフトール

3,3'-Dibromo-1,1'-bi-2-naphthol

T180320AD

α	1.5
Rs	6.0

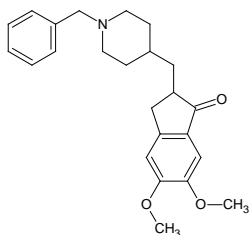
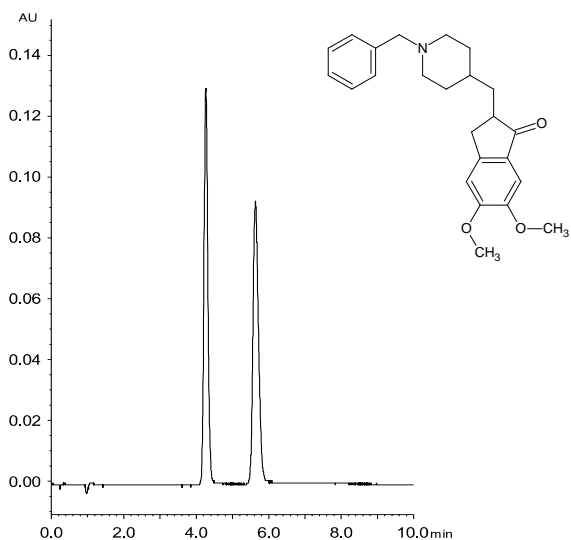


Column : Alcyon SFC CSP Cellulose-SJ (3 μ m)
50 X 3.0 mm I.D.
Eluent : CO₂/methanol/acetonitrile (75/12.5/12.5)
Flow rate : 1.275 mL/min
Temperature : 35°C
Detection : UV at 230 nm
Back pressure : 13.8 MPa (2000 psi)
Injection : 0.4 μ L (1 mg/mL)

ドネペジル

Donepezil

T150609I

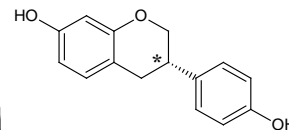
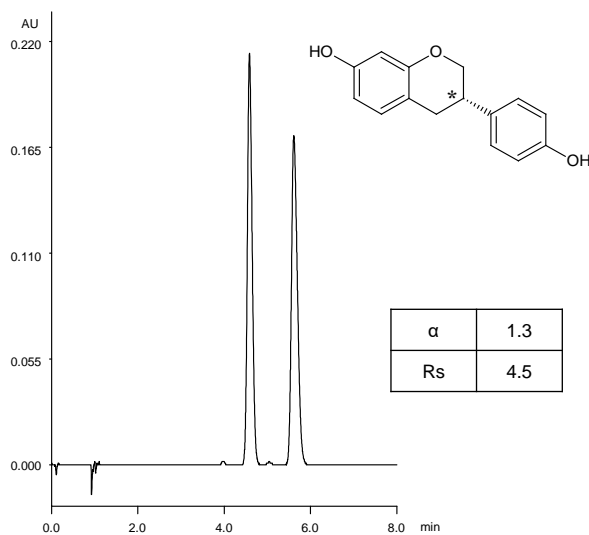


Column : Alcyon SFC CSP Cellulose-C (5 μ m)
250 X 4.6 mmI.D.
Eluent : CO₂/2-propanol containing 0.1% diethylamine
(70/30)
Flow rate : 3.0 mL/min
Temperature : 35°C
Detection : UV at 268 nm
Back pressure : 13.8 MPa (2000 psi)
Injection : 5 μ L (1.0 mg/mL)

エクオール

Equl

T180605A



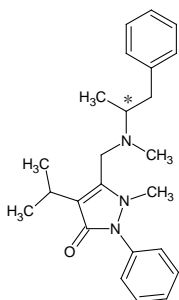
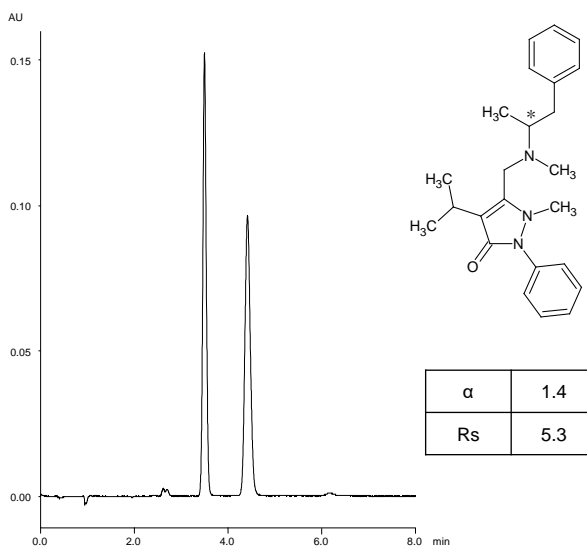
α	1.3
Rs	4.5

Column : Alcyon SFC CSP Amylose-C Neo (5 μ m)
250 X 4.6 mmI.D.
Eluent : CO₂/methanol (70/30)
Flow rate : 3.0 mL/min
Temperature : 35°C
Detection : UV at 280 nm
Back pressure : 13.8 MPa (2000 psi)
Injection : 10 μ L (1 mg/mL)

ファンプロファゾン

Famprofazone

T180320K



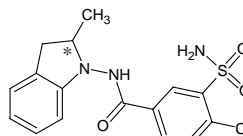
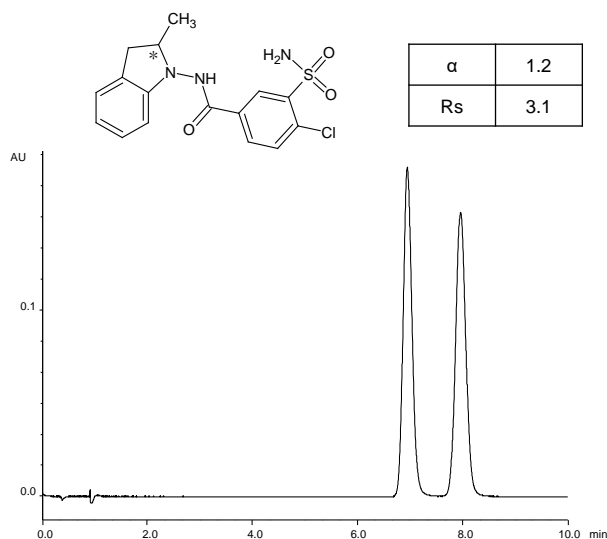
α	1.4
Rs	5.3

Column : Alcyon SFC CSP Cellulose-SJ (5 μ m)
250 X 4.6 mmI.D.
Eluent : CO₂/2-propanol containing 0.1% diethylamine
(85/15)
Flow rate : 3.0 mL/min
Temperature : 35°C
Detection : UV at 280 nm
Back pressure : 13.8 MPa (2000 psi)
Injection : 2 μ L (1 mg/mL)

インダパミド

Indapamide

T180319AZ



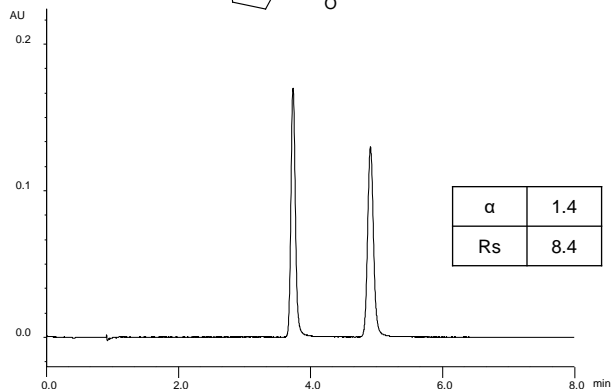
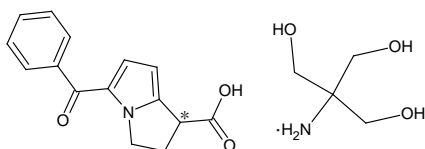
α	1.2
Rs	3.1

Column : Alcyon SFC CSP Cellulose-SJ (5 μ m)
250 X 4.6 mmI.D.
Eluent : CO₂/ethanol (75/25)
Flow rate : 3.0 mL/min
Temperature : 35°C
Detection : UV at 240 nm
Back pressure : 13.8 MPa (2000 psi)
Injection : 2 μ L (2 mg/mL)

ケトロラクトロメタミン

Ketorolac tromethamine

T180319I

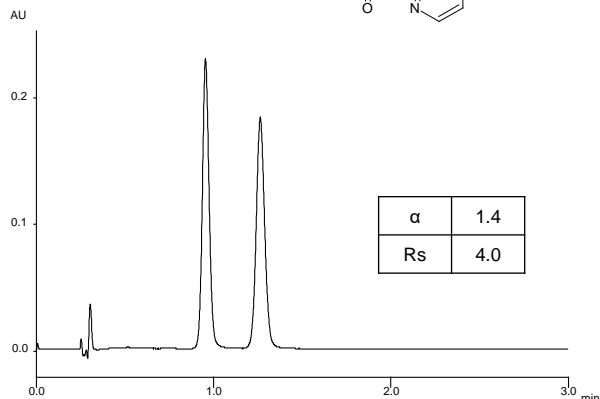
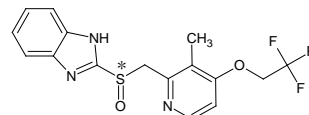


Column : Alcyon SFC CSP Cellulose-SJ (5 μ m)
250 X 4.6 mmI.D.
Eluent : CO₂/methanol (85/15)
Flow rate : 3.0 mL/min
Temperature : 35°C
Detection : UV at 305 nm
Back pressure : 13.8 MPa (2000 psi)
Injection : 2 μ L (1 mg/mL)

ランソプラゾール

Lansoprazole

T180410B

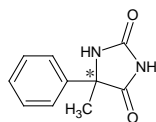


Column : Alcyon SFC CSP Cellulose-SC (3 μ m)
50 X 3.0 mmI.D.
Eluent : CO₂/methanol (80/20)
Flow rate : 1.275 mL/min
Temperature : 35°C
Detection : UV at 280 nm
Back pressure : 13.8 MPa (2000 psi)
Injection : 0.7 μ L (1 mg/mL)

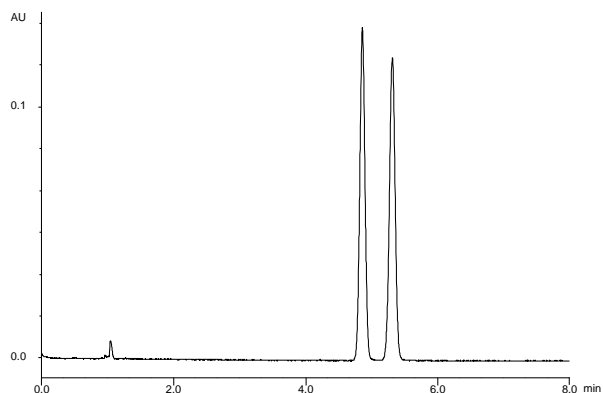
5-メチル-5-フェニルヒダントイン

5-Methyl-5-phenylhydantoin

T180320O



α	1.1
Rs	3.0

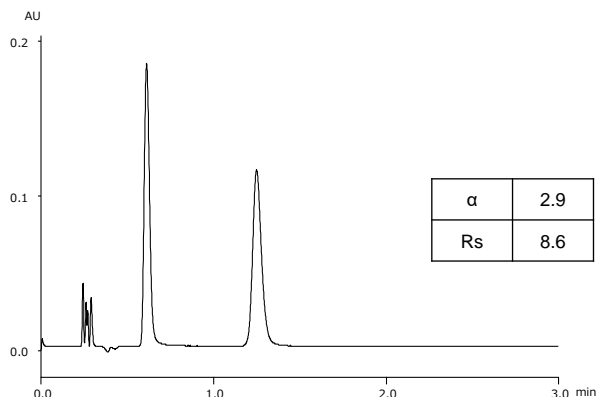
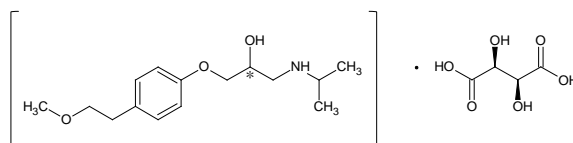


Column : Alcyon SFC CSP Cellulose-SJ (5 μ m)
250 X 4.6 mmI.D.
Eluent : CO₂/methanol/acetonitrile (90/5/5)
Flow rate : 3.0 mL/min
Temperature : 35°C
Detection : UV at 210 nm
Back pressure : 13.8 MPa (2000 psi)
Injection : 2 μ L (1 mg/mL)

メトプロロール酒石酸塩

Metoprolol tartrate

T180410C

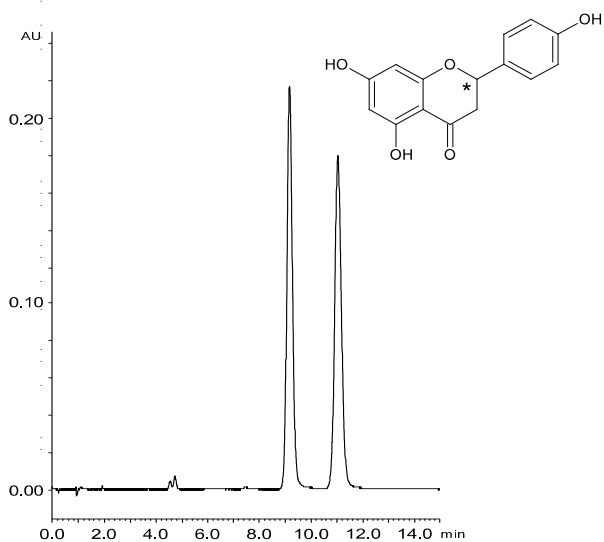


Column : Alcyon SFC CSP Cellulose-SJ (3 μ m)
50 X 3.0 mmI.D.
Eluent : CO₂/methanol containing 0.1% diethylamine
(85/15)
Flow rate : 1.275 mL/min
Temperature : 35°C
Detection : UV at 220 nm
Back pressure : 13.8 MPa (2000 psi)
Injection : 0.7 μ L (1 mg/mL)

ナリンゲニン

Naringenin

T150610AT

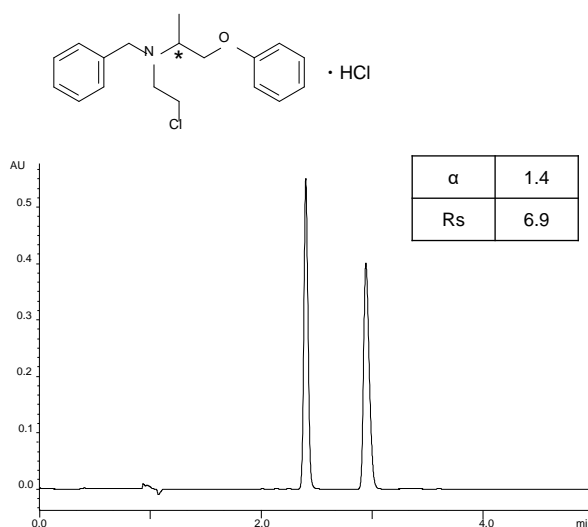


Column : Alcyon SFC CSP Cellulose-SB (5 μ m)
250 X 4.6 mmI.D.
Eluent : CO₂/2-propanol (80/20)
Flow rate : 3.0 mL/min
Temperature : 35°C
Detection : UV at 220 nm
Back pressure : 13.8 MPa (2000 psi)
Injection : 5 μ L (1.0 mg/mL)

フェノキシベンズアミン塩酸塩

Phenoxybenzamine hydrochloride

T180319AP

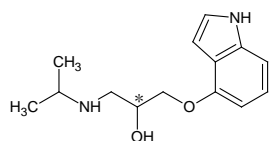


Column : Alcyon SFC CSP Cellulose-SJ (5 μ m)
250 X 4.6 mmI.D.
Eluent : CO₂/2-propanol (85/15)
Flow rate : 3.0 mL/min
Temperature : 35°C
Detection : UV at 210 nm
Back pressure : 13.8 MPa (2000 psi)
Injection : 2 μ L (2 mg/mL)

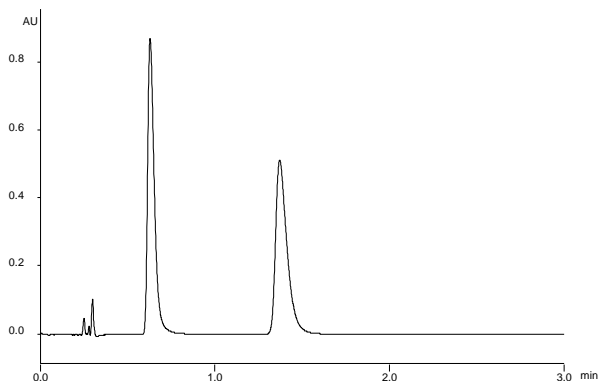
ピンドロール

Pindolol

T180405B



α	3.0
Rs	8.2

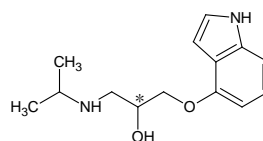


Column : Alcyon SFC CSP Cellulose-SB (3 μ m)
50 X 3.0 mmI.D.
Eluent : CO₂/methanol containing 0.1% diethylamine
(70/30)
Flow rate : 1.275 mL/min
Temperature : 35°C
Detection : UV at 215 nm
Back pressure : 13.8 MPa (2000 psi)
Injection : 0.7 μ L (1 mg/mL)

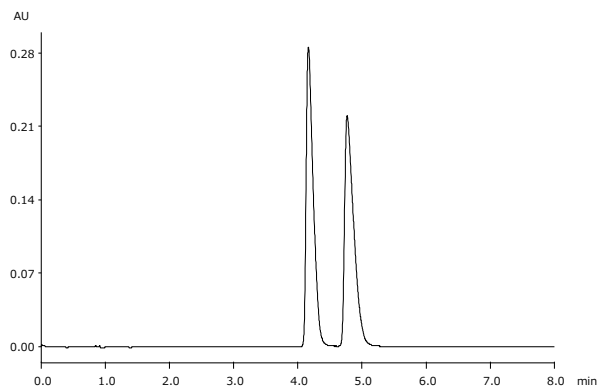
ピンドロール

Pindolol

T180330A



α	1.2
Rs	2.7

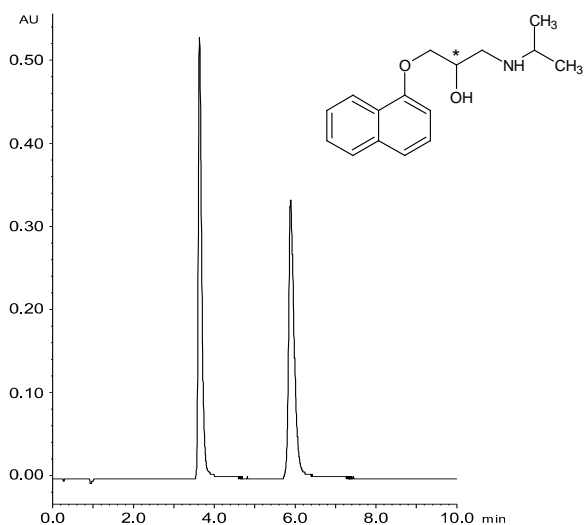


Column : Alcyon SFC CSP Cellulose-SJ (5 μ m)
250 X 4.6 mmI.D.
Eluent : CO₂/methanol containing 0.1% 2-aminoethanol
(75/25)
Flow rate : 3.0 mL/min
Temperature : 35°C
Detection : UV at 220 nm
Back pressure : 13.8 MPa (2000 psi)
Injection : 2 μ L (1 mg/mL)

プロプラノロール

Propranolol

T150609L

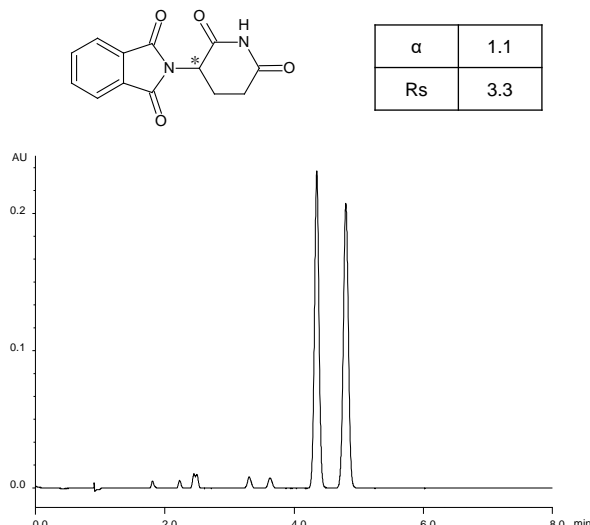


Column : Alcyon SFC CSP Cellulose-C (5 μ m)
250 X 4.6 mmI.D.
Eluent : CO₂/methanol containing 0.1% diethylamine
(80/20)
Flow rate : 3.0 mL/min
Temperature : 35°C
Detection : UV at 230 nm
Back pressure : 13.8 MPa (2000 psi)
Injection : 5 μ L (1.0 mg/mL)

(±) - サリドマイド

(±)-Thalidomide

T180319K

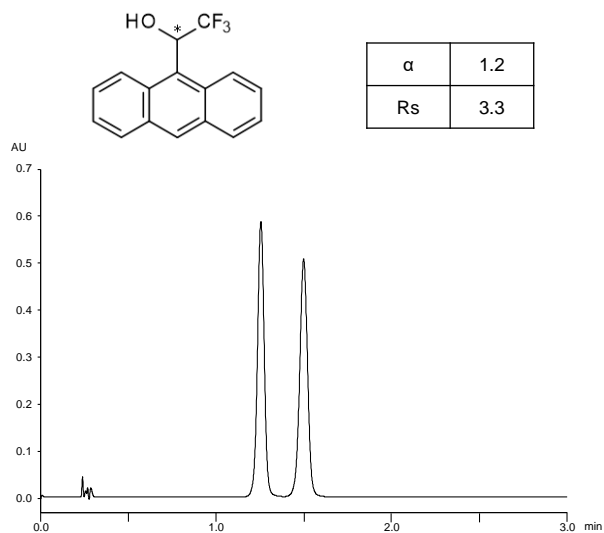


Column : Alcyon SFC CSP Cellulose-SJ (5 μ m)
250 X 4.6 mmI.D.
Eluent : CO₂/methanol (85/15)
Flow rate : 3.0 mL/min
Temperature : 35°C
Detection : UV at 220 nm
Back pressure : 13.8 MPa (2000 psi)
Injection : 2 μ L (0.5 mg/mL)

2,2,2-トリフルオロ-1-(9-アンスリル)エタノール

2,2,2-Trifluoro-1-(9-anthryl)ethanol

T180319XX

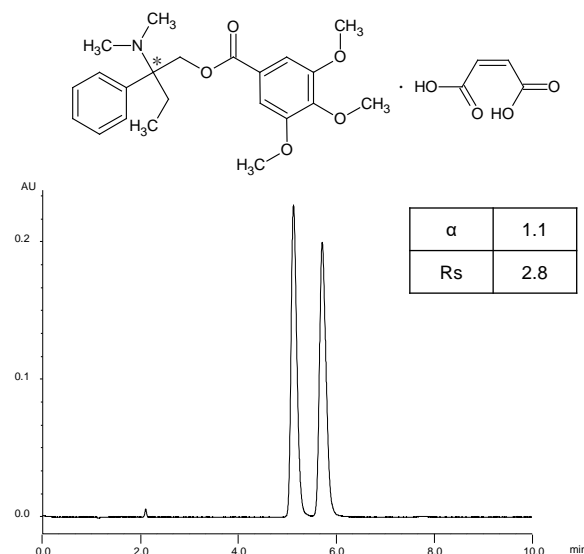


Column : Alcyon SFC CSP Cellulose-SJ (3 μ m)
50 X 3.0 mmI.D.
Eluent : CO₂/methanol (85/15)
Flow rate : 1.275 mL/min
Temperature : 35°C
Detection : UV at 254 nm
Back pressure : 13.8 MPa (2000 psi)
Injection : 0.7 μ L (0.5 mg/mL)

トリメブチンマレイン酸塩

Trimebutine maleate

T180320M

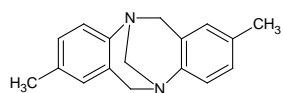


Column : Alcyon SFC CSP Cellulose-SJ (5 μ m)
250 X 4.6 mmI.D.
Eluent : CO₂/ethanol containing 0.1% diethylamine
(98/2)
Flow rate : 3.0 mL/min
Temperature : 35°C
Detection : UV at 260 nm
Back pressure : 13.8 MPa (2000 psi)
Injection : 2 μ L (5 mg/mL)

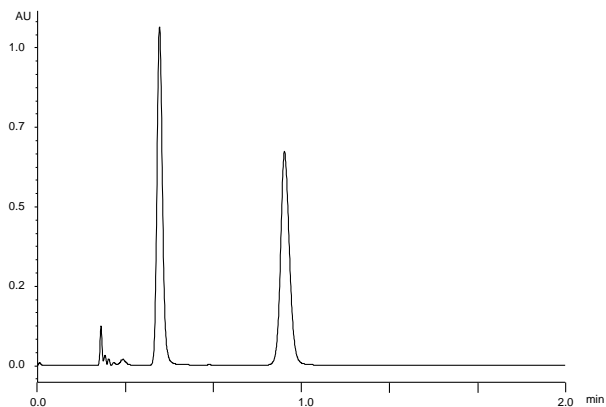
トレガー塩基

Troger's base

T180319Z



α	3.2
Rs	9.8

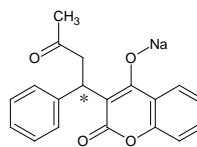


Column : Alcyon SFC CSP Cellulose-SJ (3 μ m)
 50 X 3.0 mm I.D.
 Eluent : CO₂/2-propanol (75/25)
 Flow rate : 1.275 mL/min
 Temperature : 35°C
 Detection : UV at 210 nm
 Back pressure : 13.8 MPa (2000 psi)
 Injection : 0.7 μ L (1 mg/mL)

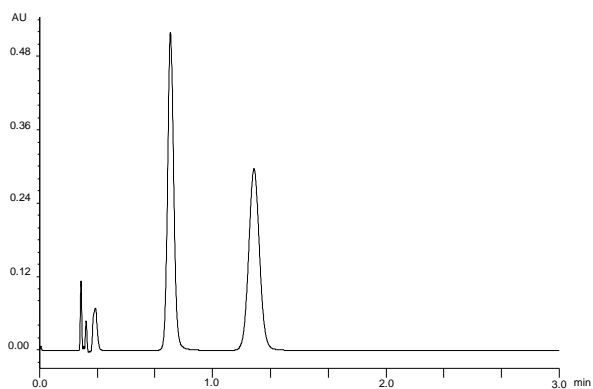
ワルファリンナトリウム塩

Warfarin sodium

T180319Y



α	2.0
Rs	5.5



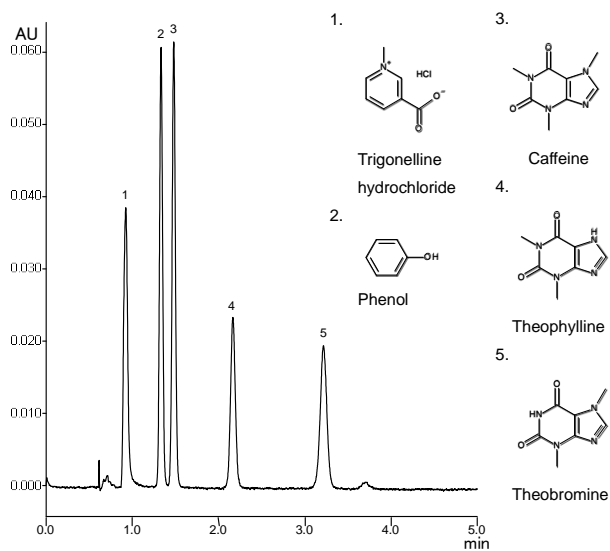
Column : Alcyon SFC CSP Cellulose-SJ (3 μ m)
 50 X 3.0 mm I.D.
 Eluent : CO₂/2-propanol (70/30)
 Flow rate : 1.275 mL/min
 Temperature : 35°C
 Detection : UV at 210 nm
 Back pressure : 13.8 MPa (2000 psi)
 Injection : 0.7 μ L (1 mg/mL)

Achiral Compounds

プリンアルカロイド

Purine alkaloids

X150626D

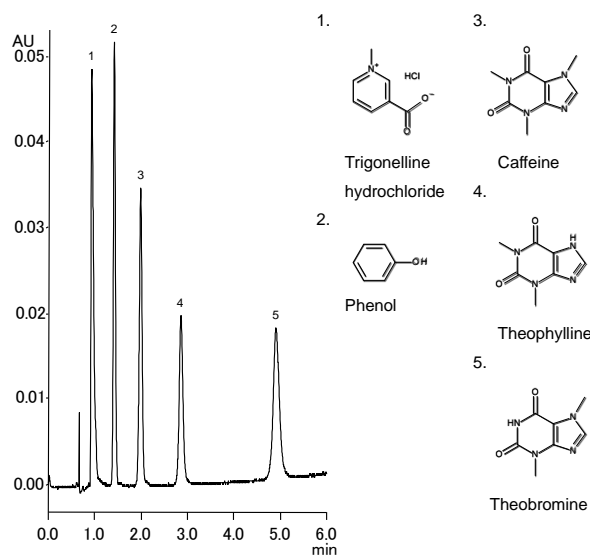


Column : Alcyon SFC Triart Diol (5 μ m, 12 nm)
150 X 4.6 mm I.D.
Eluent : CO₂/methanol (90/10)
Flow rate : 3.0 mL/min
Temperature : 40°C
Detection : UV at 230 nm
Back pressure : 13.8 MPa (2000 psi)
Injection : 5 μ L (0.085 mg/mL ~ 5.7 mg/mL)

プリンアルカロイド

Purine alkaloids

X150714A

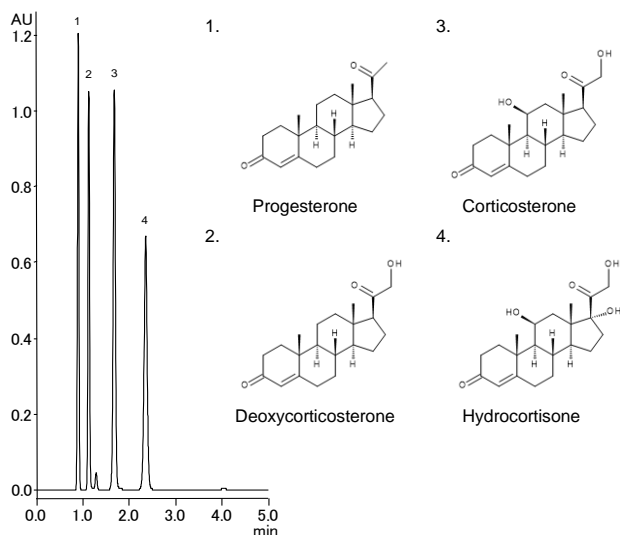


Column : Alcyon SFC Triart Diol (5 μ m, 12 nm)
150 X 4.6 mm I.D.
Eluent : CO₂/ethanol (90/10)
Flow rate : 3.0 mL/min
Temperature : 40°C
Detection : UV at 230 nm
Back pressure : 13.8 MPa (2000 psi)
Injection : 5 μ L (0.085 mg/mL ~ 5.7 mg/mL)

ステロイド

Steroids

X150803C

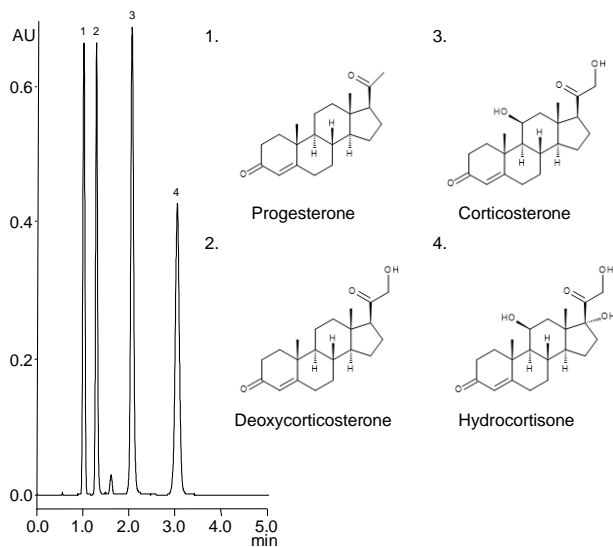


Column : Alcyon SFC Triart Diol (5 μ m, 12 nm)
150 X 4.6 mm I.D.
Eluent : CO₂/methanol (80/20)
Flow rate : 3.0 mL/min
Temperature : 40°C
Detection : UV at 254 nm
Back pressure : 13.8 MPa (2000 psi)
Injection : 5 μ L (0.8 mg/mL)

ステロイド

Steroids

X150801J

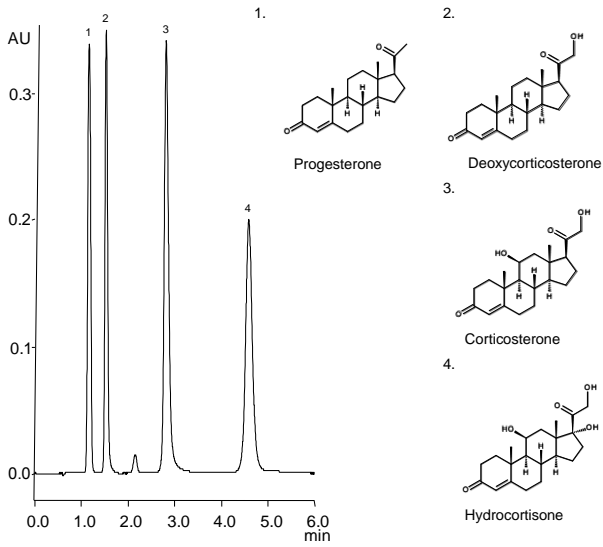


Column : Alcyon SFC Triart Diol (5 μ m, 12 nm)
150 X 4.6 mm I.D.
Eluent : CO₂/ethanol (80/20)
Flow rate : 3.0 mL/min
Temperature : 40°C
Detection : UV at 254 nm
Back pressure : 13.8 MPa (2000 psi)
Injection : 5 μ L (0.8 mg/mL)

ステロイド

Steroids

X150803P

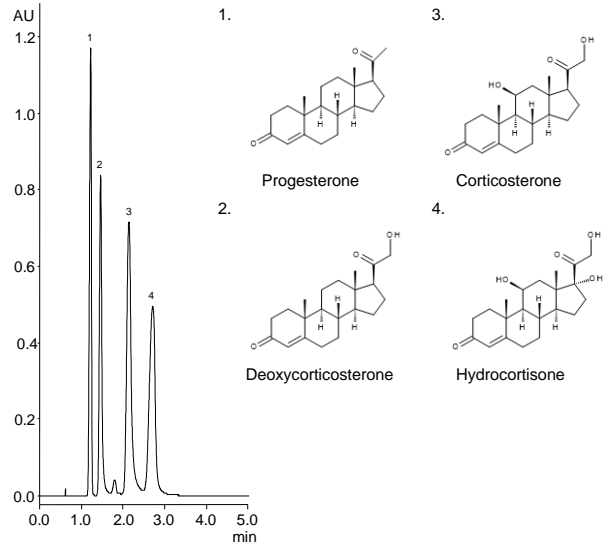


Column	: Alcyon SFC Triart Diol (5 μ m, 12 nm) 150 X 4.6 mmI.D.
Eluent	: CO ₂ /2-propanol (80/20)
Flow rate	: 3.0 mL/min
Temperature	: 40°C
Detection	: UV at 254 nm
Back pressure	: 13.8 MPa (2000 psi)
Injection	: 5 μ L (0.8 mg/mL)

ステロイド

Steroids

X150731E

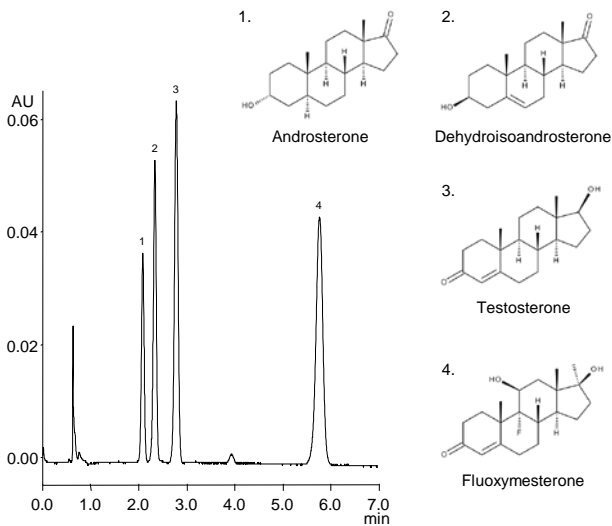


Column	: Alcyon SFC CN (5 μ m, 12 nm) 150 X 4.6 mmI.D.
Eluent	: CO ₂ /methanol (90/10)
Flow rate	: 3.0 mL/min
Temperature	: 40°C
Detection	: UV at 254 nm
Back pressure	: 13.8 MPa (2000 psi)
Injection	: 5 μ L (0.8 mg/mL)

男性ホルモン

Androgens

X150903A

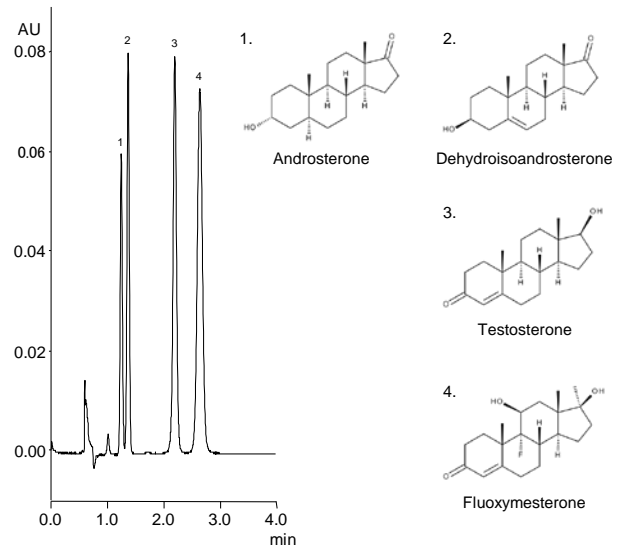


Column	: Alcyon SFC Triart Diol (5 μ m, 12 nm) 150 X 4.6 mmI.D.
Eluent	: CO ₂ /methanol (90/10)
Flow rate	: 3.0 mL/min
Temperature	: 40°C
Detection	: UV at 254 nm
Back pressure	: 13.8 MPa (2000 psi)
Injection	: 5 μ L (0.56 mg/mL ~ 6.7 mg/mL)

男性ホルモン

Androgens

X150903F

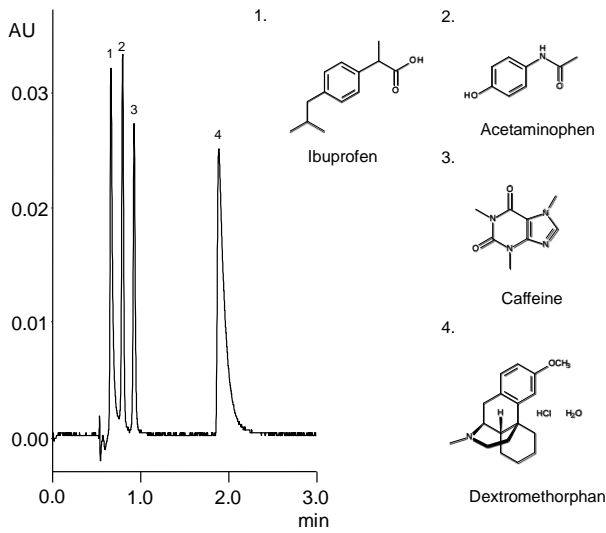


Column	: Alcyon SFC Triart PFP (5 μ m, 12 nm) 150 X 4.6 mmI.D.
Eluent	: CO ₂ /ethanol (90/10)
Flow rate	: 3.0 mL/min
Temperature	: 40°C
Detection	: UV at 254 nm
Back pressure	: 13.8 MPa (2000 psi)
Injection	: 5 μ L (0.56 mg/mL ~ 6.7 mg/mL)

感冒薬

Ingredients in a cough/cold medication

X151117D

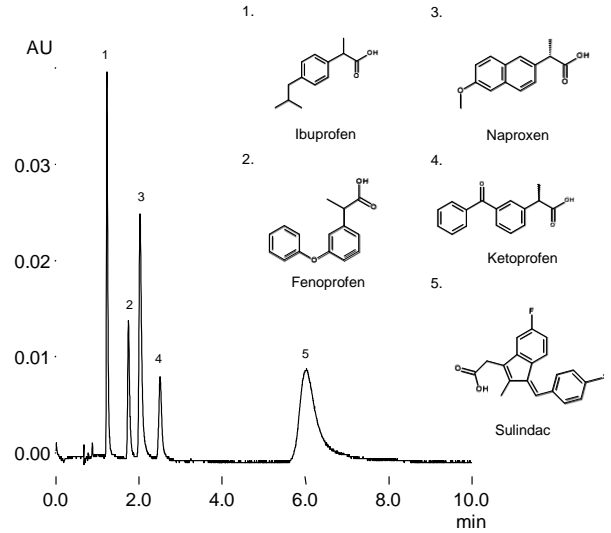


Column	: Alcyon SFC Triart PFP (5 μm, 12 nm) 150 X 4.6 mm.I.D.
Eluent	: CO ₂ /methanol containing 0.1% diethylamine (80/20)
Flow rate	: 3.0 mL/min
Temperature	: 40°C
Detection	: UV at 254 nm
Back pressure	: 13.8 MPa (2000 psi)
Injection	: 1 μL (0.044mg/mL ~ 5.32 mg/mL)

酸性非ステロイド性抗炎症薬

Acidic non-steroidal anti-inflammatory drugs

X151118F

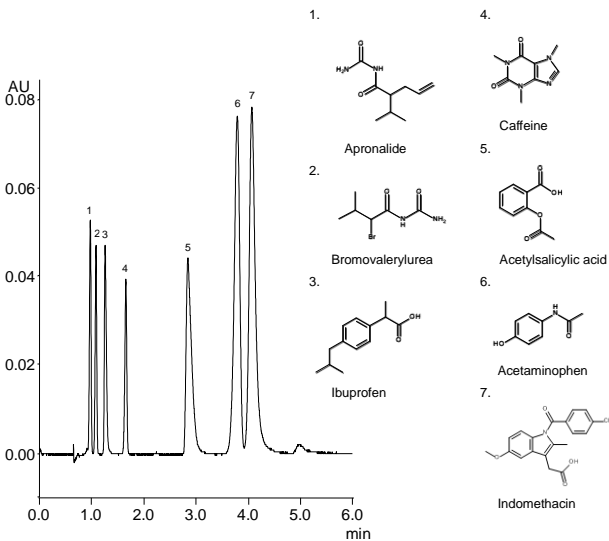


Column	: Alcyon SFC SIL (5 μm, 12 nm) 150 X 4.6 mm.I.D.
Eluent	: CO ₂ /methanol containing 0.1% diethylamine (90/10)
Flow rate	: 3.0 mL/min
Temperature	: 40°C
Detection	: UV at 254 nm
Back pressure	: 13.8 MPa (2000 psi)
Injection	: 1 μL (0.044mg/mL ~ 5.32 mg/mL)

解熱鎮痛薬成分

Analgesics

X151117L

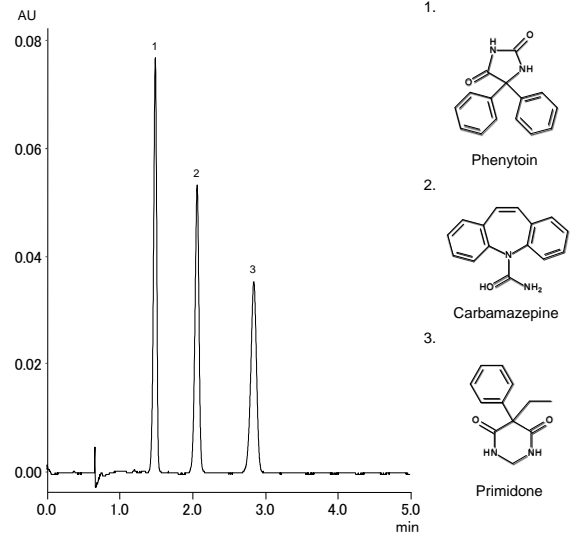


Column	: Alcyon SFC SIL (5 μm, 12 nm) 150 X 4.6 mm.I.D.
Eluent	: CO ₂ /methanol containing 0.1% diethylamine (90/10)
Flow rate	: 3.0 mL/min
Temperature	: 40°C
Detection	: UV at 254 nm
Back pressure	: 13.8 MPa (2000 psi)
Injection	: 5 μL (0.06 mg/mL ~ 4.17 mg/mL)

抗てんかん薬

Antiepileptics

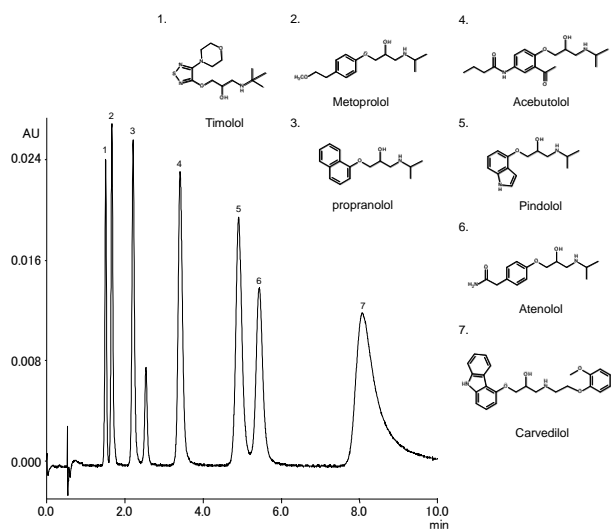
X160419E



Column	: Alcyon SFC SIL (5 μm, 12 nm) 150 X 4.6 mm.I.D.
Eluent	: CO ₂ /methanol containing 0.1% diethylamine (90/10)
Flow rate	: 3.0 mL/min
Temperature	: 40°C
Detection	: UV at 254 nm
Back pressure	: 13.8 MPa (2000 psi)
Injection	: 5 μL (0.11 mg/mL ~ 8.8 mg/mL)

β-遮断薬 β-Blocker

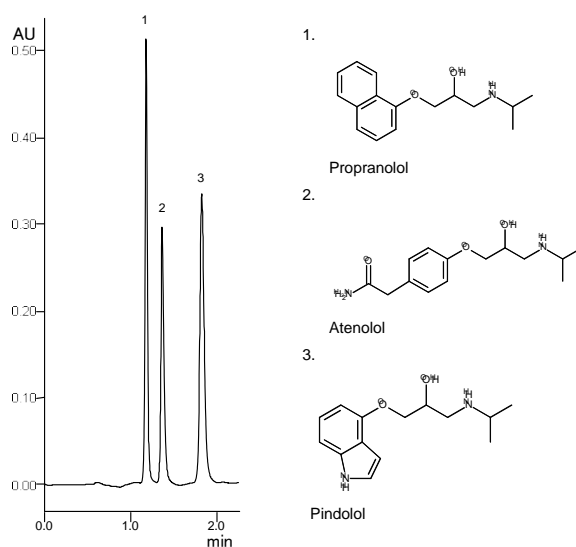
X160420B



Column	: Alcyon SFC Triart Diol (5 μm, 12 nm) 150 X 4.6 mmI.D.
Eluent	: CO ₂ /methanol containing 0.5% diethylamine (80/20)
Flow rate	: 3.0 mL/min
Temperature	: 40°C
Detection	: UV at 254 nm
Back pressure	: 13.8 MPa (2000 psi)
Injection	: 1 μL (0.25 mg/mL ~ 4.6 mg/mL)

β-遮断薬 β-Blocker

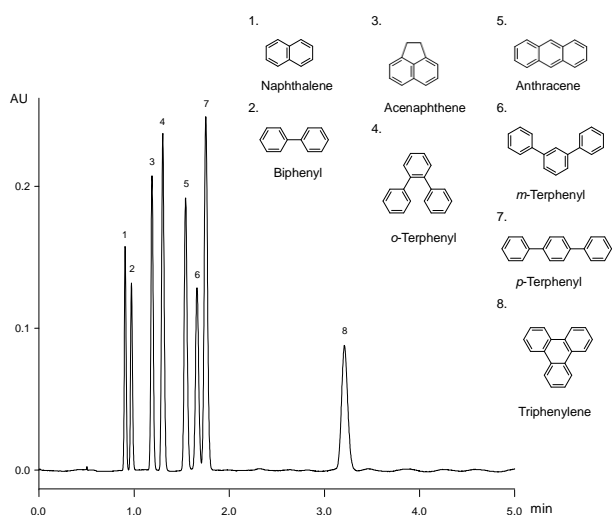
X150716C



Column	: Alcyon SFC CN (5 μm, 12 nm) 150 X 4.6 mmI.D.
Eluent	: CO ₂ /methanol containing 0.5% diethylamine (80/20)
Flow rate	: 3.0 mL/min
Temperature	: 40°C
Detection	: UV at 254 nm
Back pressure	: 13.8 MPa (2000 psi)
Injection	: 5 μL (1.25 mg/mL ~ 10 mg/mL)

多環芳香族系炭化水素 Polyaromatic hydrocarbons

X150825F



Column	: Alcyon SFC Triart C18 (5 μm, 12 nm) 150 X 4.6 mmI.D.
Eluent	: CO ₂ /methanol (95/5)
Flow rate	: 3.0 mL/min
Temperature	: 40°C
Detection	: UV at 254 nm
Back pressure	: 13.8 MPa (2000 psi)
Injection	: 2 μL (0.03 mg/mL ~ 1.0 mg/mL)

MEMO

Worldwide Availability

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www.ymc.de

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www.ymc.sg



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