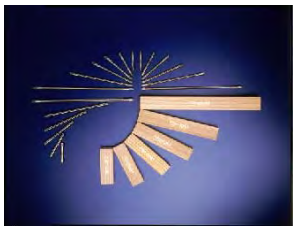
Technical Information

ON HPLC COLUMNS



Imtakt

HPLC TECHNICAL INFORMATION

Food Chemicals

MZ ANALYSENTECHNIK

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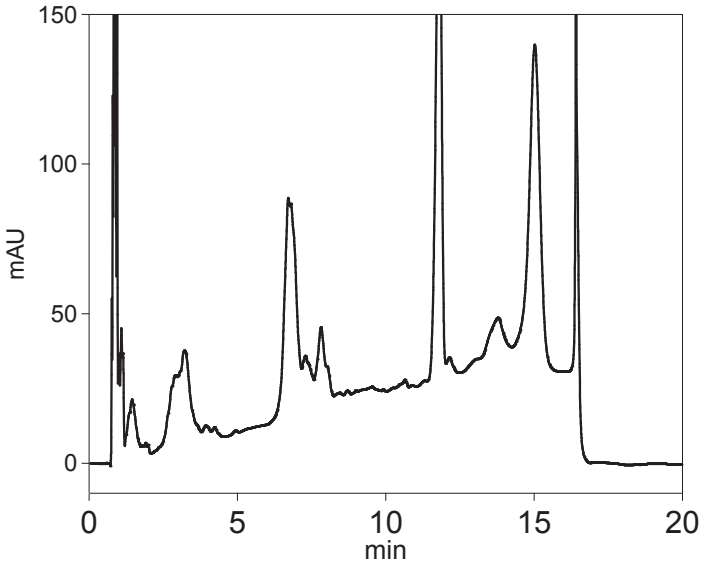
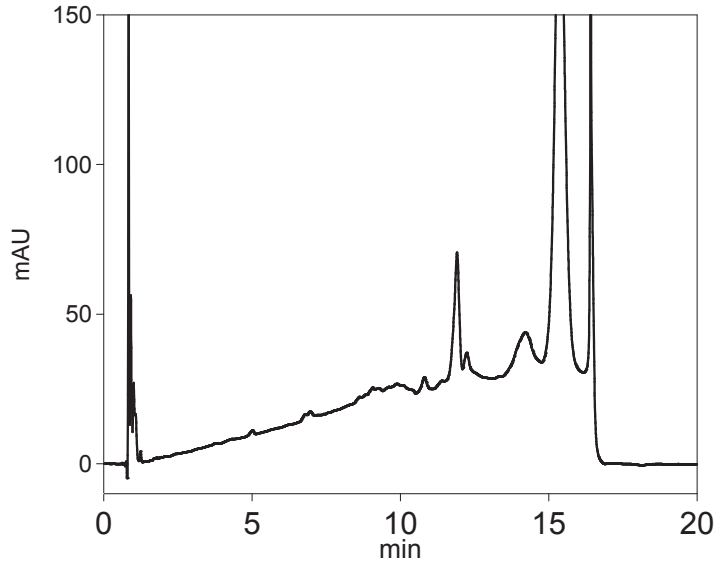
Cadenza CD-C18 75 x 4.6 mm Application

Olive Oil

extra virgin



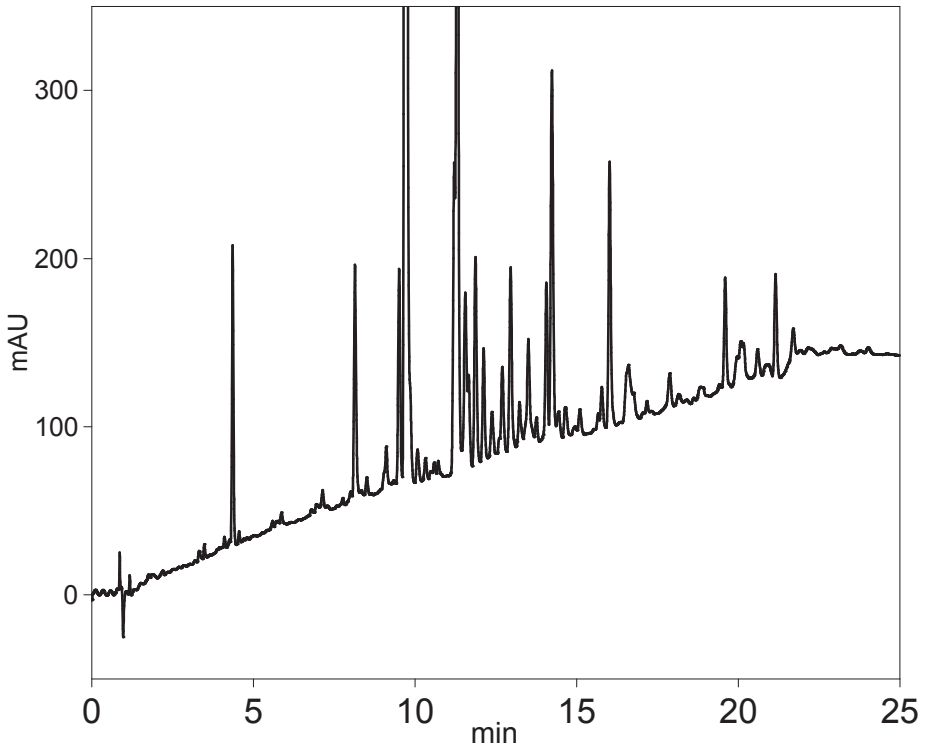
pure



Cadenza CD-C18
75 x 4.6 mm
A : water / formic acid
= 100 / 0.02
B : acetonitrile / formic acid
= 100/0.02
80-100%B (0-10min)
100%B (10-15min)
1.0 mL/min, 37 °C
UV at 210 nm, 2.1 MPa

Cadenza CD-C18 75 x 4.6 mm Application

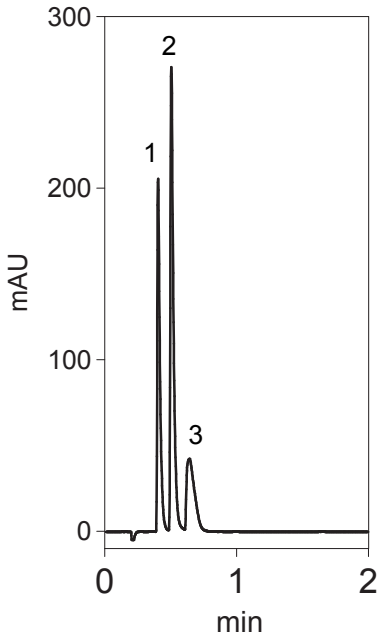
Pepper



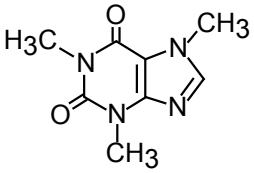
Cadenza CD-C18, 75 x 4.6 mm
A: water / formic acid = 100 / 0.1
B: ACN / formic acid =100 / 0.1
20 - 100 %B (0 - 20min)
100 %B (20- 25min)
1.0 mL/min, 37 °C
UV at 220 nm
6.3 MPa
THF extract of pepper powder
2.0 uL inj.

Presto FT-C18 30 x 4.6 mm Application

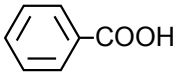
Food Additives



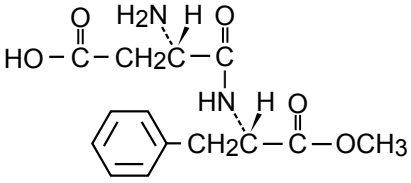
1 caffeine



2 benzoic acid



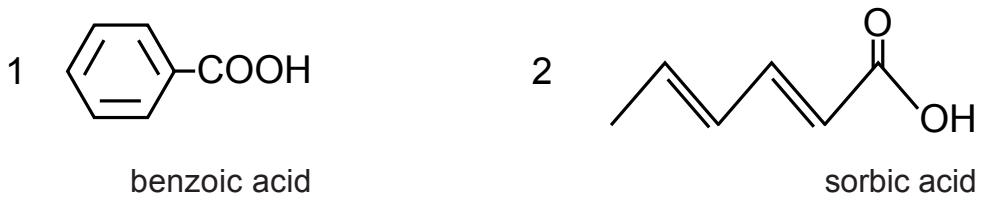
3 aspartame



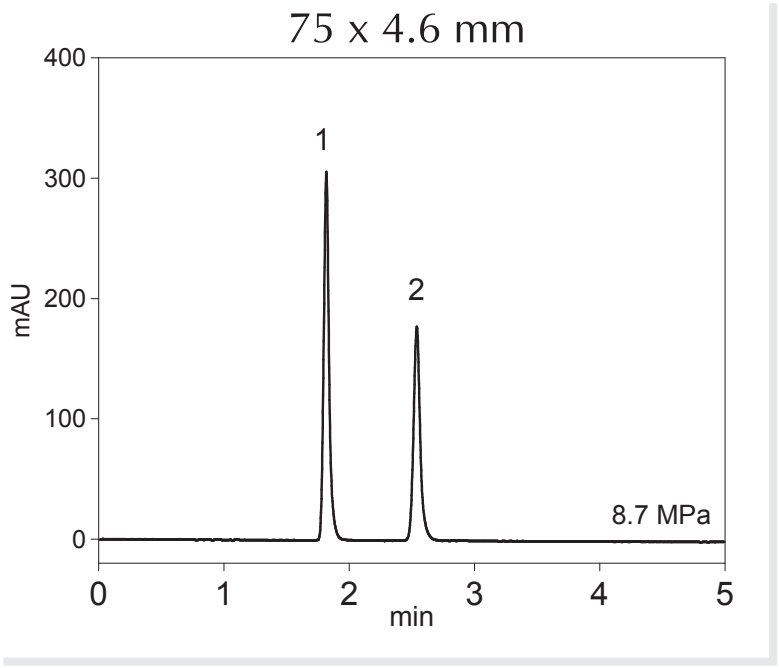
Presto FT-C18 , 30 x 4.6 mm
acetonitrile / water / TFA = 3 / 97 / 0.1
0.5 mL/min , 37 °C
10.5 MPa , UV at 220 nm

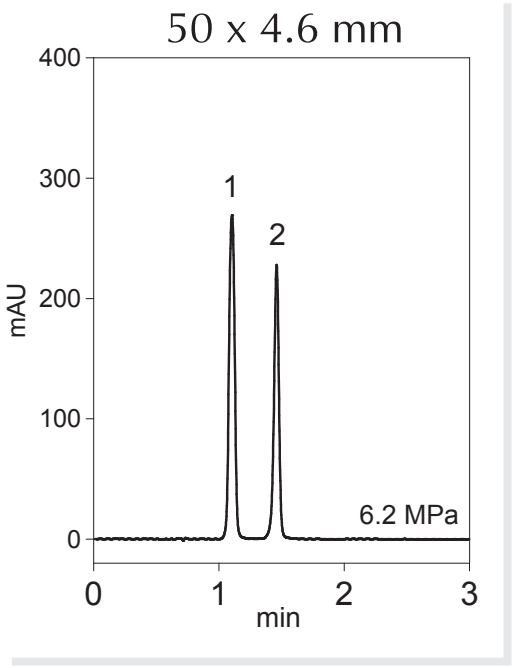
Cadenza CD-C18 75 x 4.6 mm 50 x 4.6 mm Application

Food Preservatives



benzoic acid sorbic acid



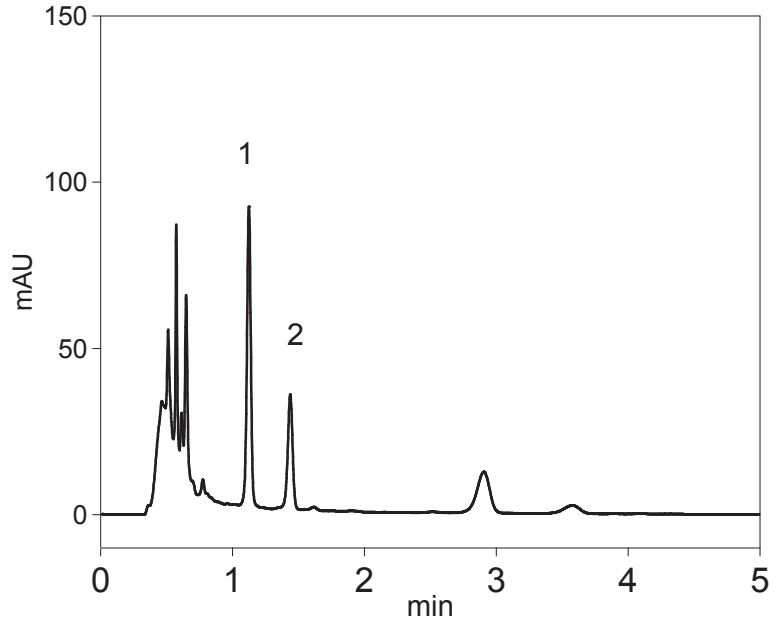


Cadenza CD-C18
methanol / 20 mM CH_3COONH_4 = 20 / 80
1.0 mL/min, 37 °C, UV at 230 nm
1. benzoic acid 0.5 mg/mL
2. sorbic acid 0.25 mg/mL 1.0uL inj.

Cadenza CD-C18 50 x 4.6 mm Application

Food Preservatives in Soy Sause

benzoic acid sorbic acid

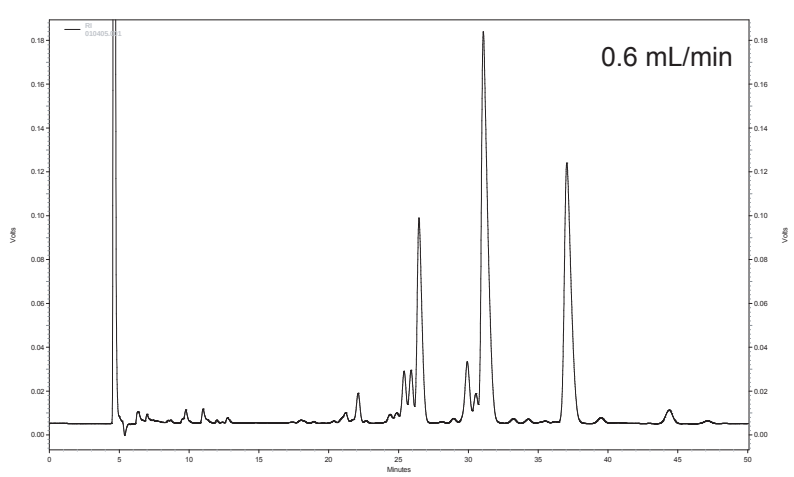


Cadenza CD-C18, 50 x 4.6 mm
methanol / 20 mM CH_3COONH_4 = 20 / 80
1.0 mL/min, 37 °C, 6.9 MPa
UV at 230 nm
2% soy sause solution in water
4.8 uL

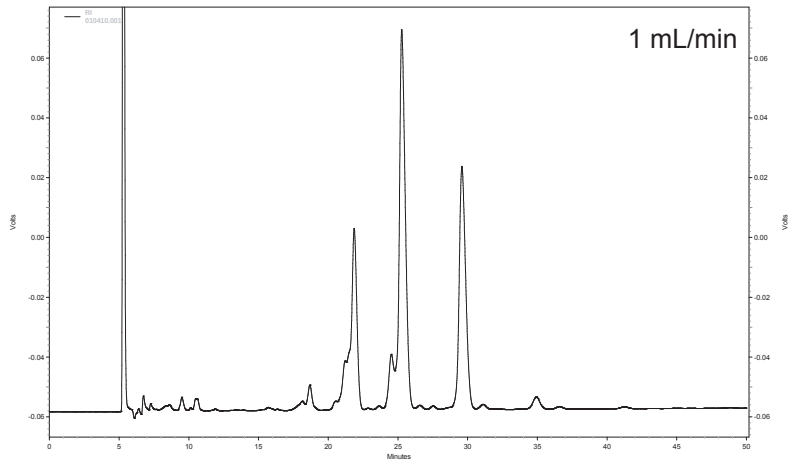
Cadenza CD-C18 250 x 4.6 mm Application

Triglycerides in Cacao Butter

Cadenza CD-C18 250 x 4.6 mm



Conventional ODS (5 um), (250 x 4.6 mm) x 2

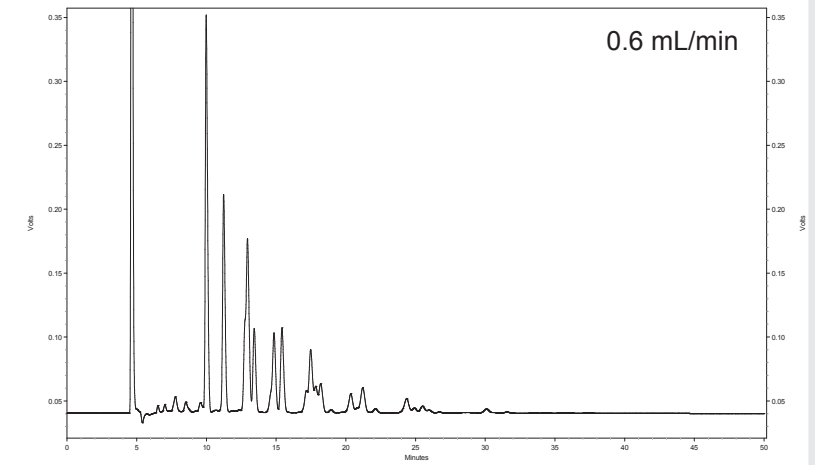


acetone / acetonitrile = 70 / 30
30 °C
RI

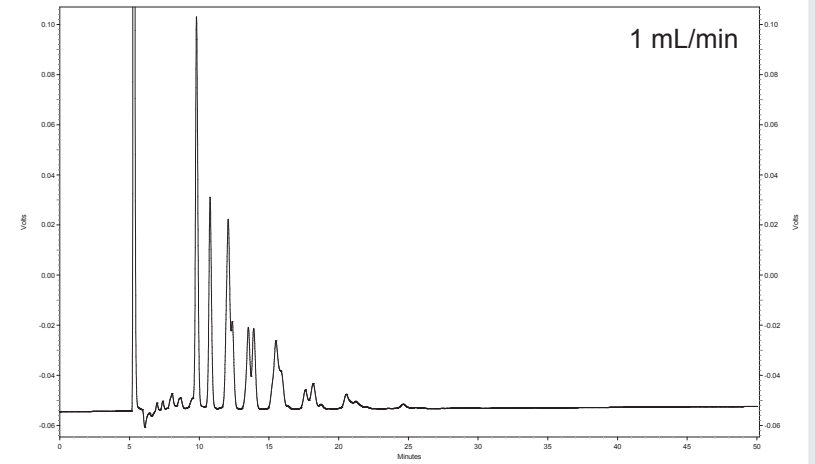
Cadenza CD-C18 250 x 4.6 mm Application

Triglycerides in Linseed Oil

Cadenza CD-C18 250 x 4.6 mm



Conventional ODS (5 um), (250 x 4.6 mm) x 2

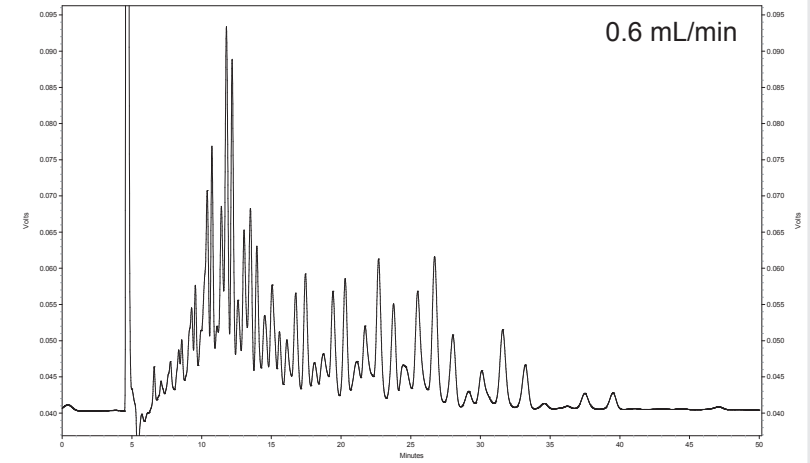


acetone / acetonitrile = 70 / 30
30 °C
RI

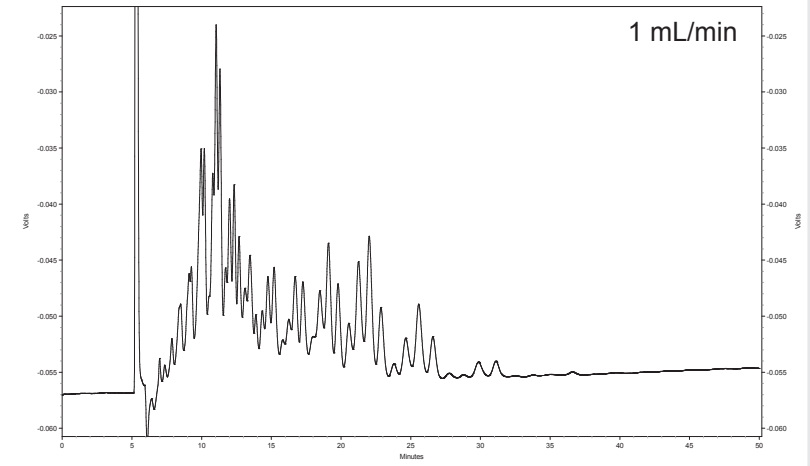
Cadenza CD-C18 250 x 4.6 mm Application

Triglycerides in Milk Fat

Cadenza CD-C18 250 x 4.6 mm



Conventional ODS (5 um), (250 x 4.6 mm) x 2

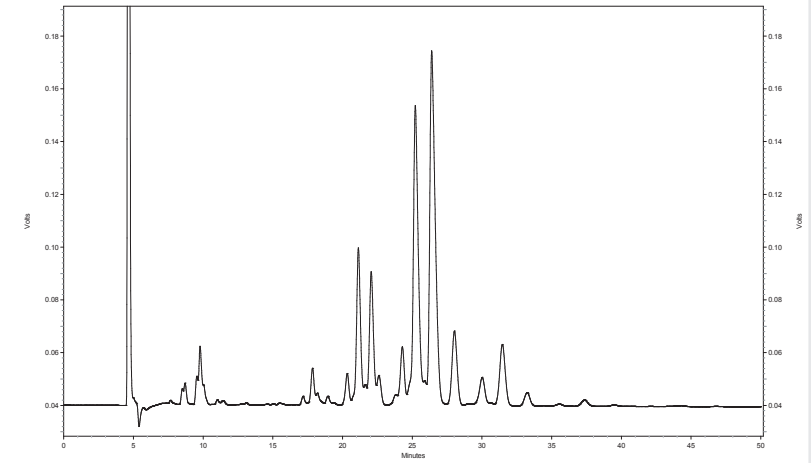


acetone / acetonitrile = 70 / 30
30 °C
RI

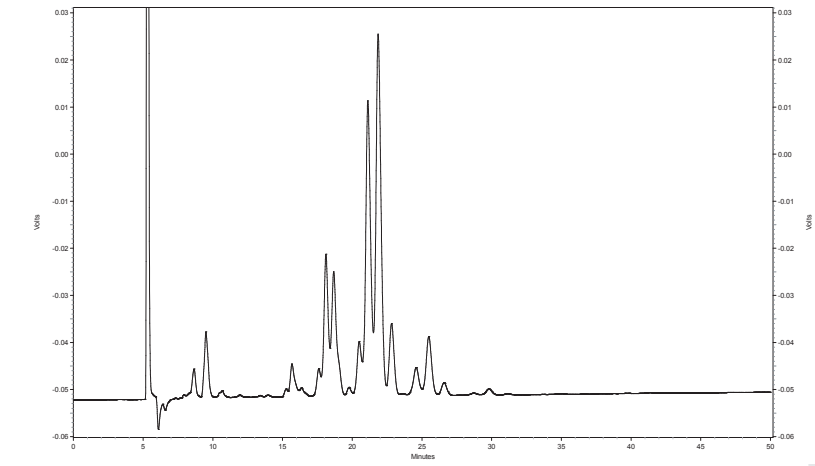
Cadenza CD-C18 250 x 4.6 mm Application

Triglycerides in Palm Oil

Cadenza CD-C18 250 x 4.6 mm



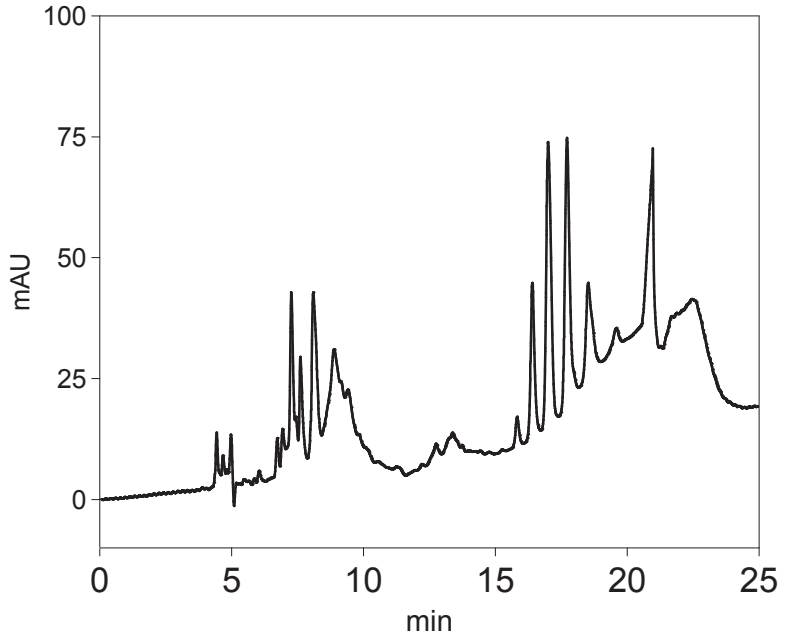
Conventional ODS (5 um), (250 x 4.6 mm) x 2



acetone / acetonitrile = 70 / 30
30 °C
RI

Cadenza CD-C18 250 x 4.6 mm Application

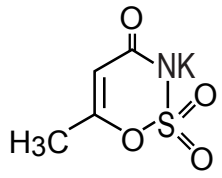
Lecithin, from Soybeans



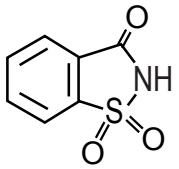
Cadenza CD-C18, 250 x 4.6 mm
A : ethanol / water / TFA = 90 / 10 / 0.1
B : cyclohexane / ethanol / TFA = 10 / 90 / 0.1
50 - 100%B (0 -10 min), 100%B (10 - 15 min)
0.5 mL/min, 37 °C, 13.9 MPa, UV at 210 nm

Cadenza CD-C18 75 x 4.6 mm Application

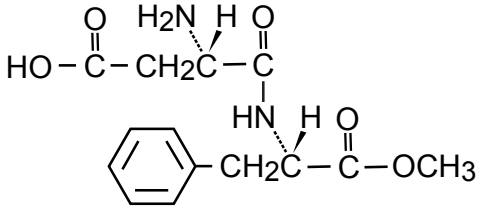
Low-Calorie Sweeteners

1 

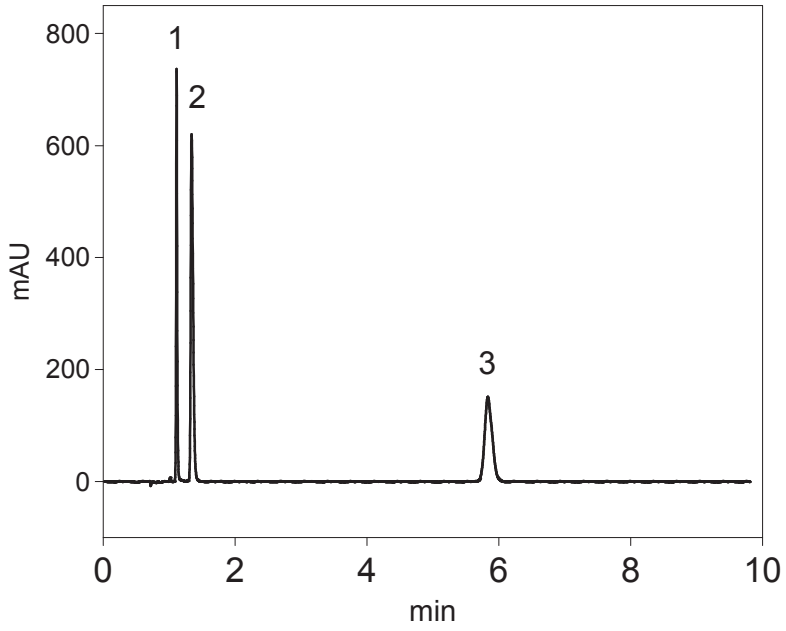
acesulfame K

2 

saccharin

3 

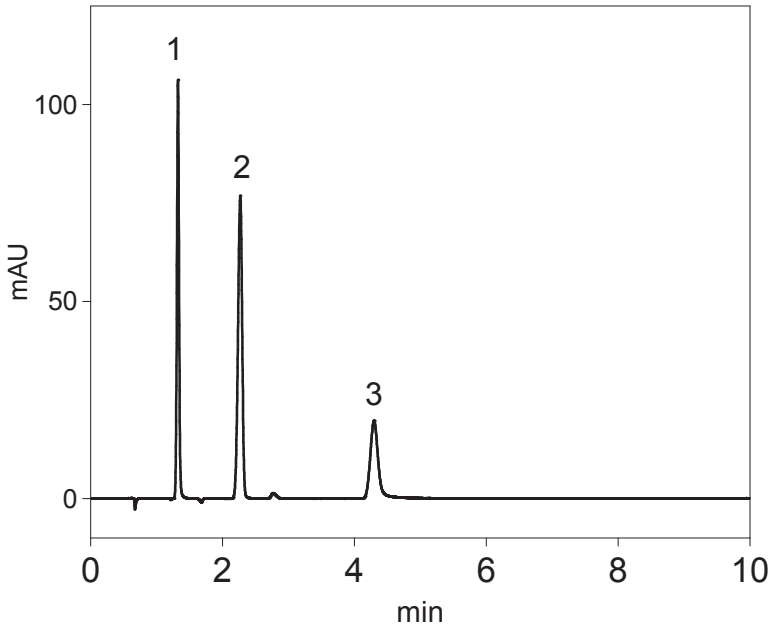
aspartame

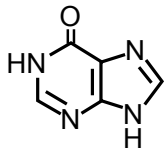


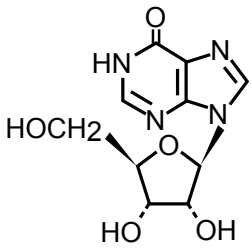
Cadenza CD-C18, 75 x 4.6 mm
ACN / 10mM ammonium formate = 13/87
1.0 mL/min, 37 °C, 6.7 MPa, UV at 210 nm
1.0 uL injection

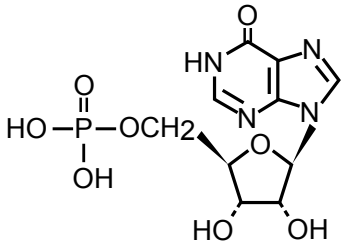
Cadenza CD-C18 | 75 x 4.6 mm | Application

Inosinic acid and metabolites



1. 
Hypoxanthine

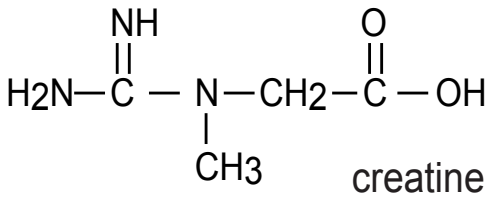
2. 
Inosine

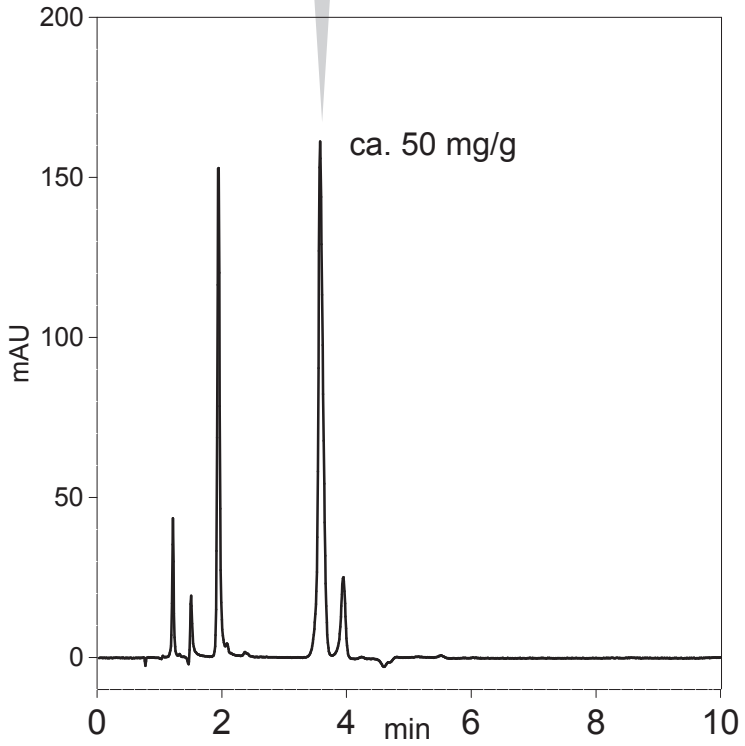
3. 
Inosine 5'-monophosphate

Cadenza CD-C18, 75 x 4.6 mm
IPA / 5mM dibutylamine acetate +
20mM ammonium acetate = 1 / 100
1.0 mL/min, 7.5 MPa, 37 °C, UV at 225 nm

Cadenza CD-C18 100 x 4.6 mm Application

Creatine in Chewing Gum

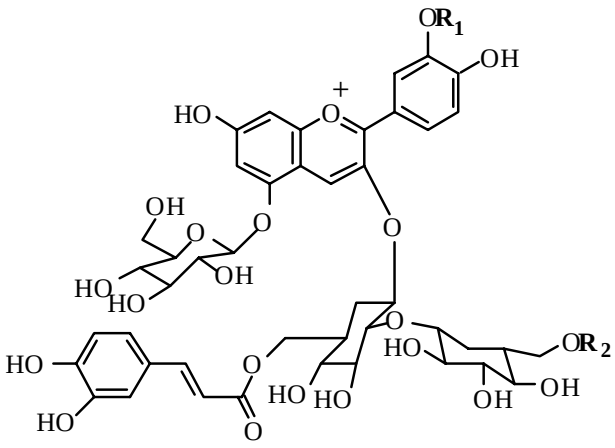




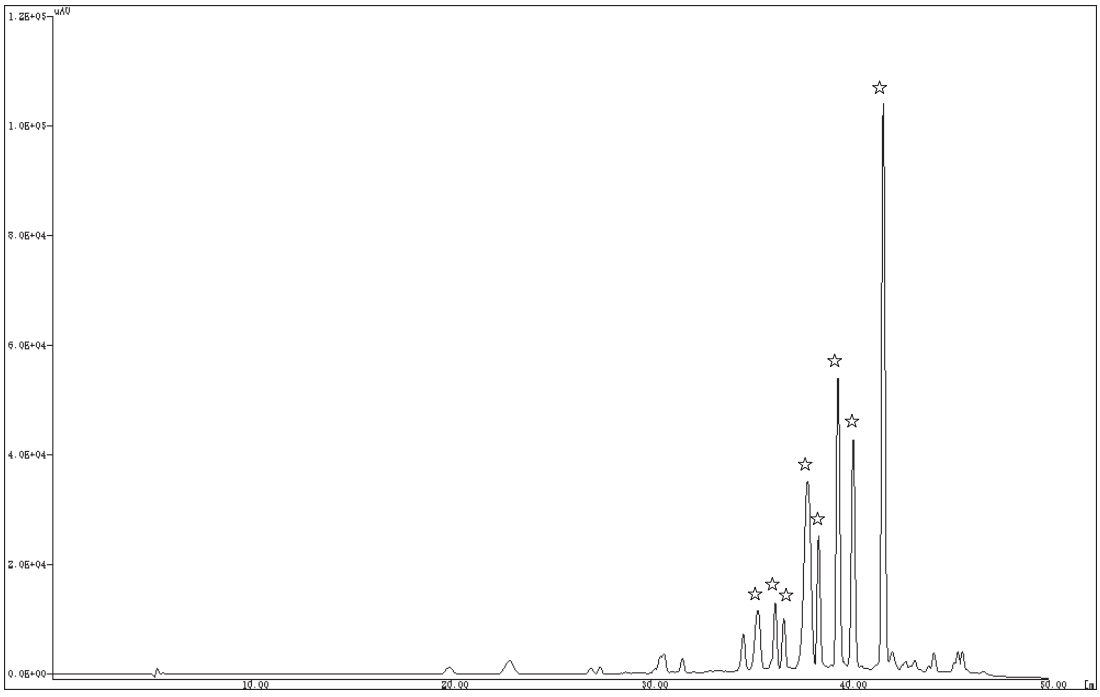
Cadenza CD-C18, 100 x 4.6 mm
acetonitrile / water / heptafluorobutyric acid = 5 / 95 / 0.1
1.0 mL/min, 37 °C, 8.5 MPa
UV at 210 nm

Cadenza CD-C18 250 x 4.6 mm Application

Anthocyanins in Purple-Fleshed Sweet Potato



	R_1	R_2
YGM-1a	H	caffeic acid
YGM-1b	H	*p*-hydroxy benzoic acid
YGM-2	H	H
YGM-3	H	ferulic acid
YGM-4b	CH3	caffeic acid
YGM-5a	CH3	*p*-hydroxy benzoic acid
YGM-5b	CH3	H
YGM-6	CH3	ferulic acid

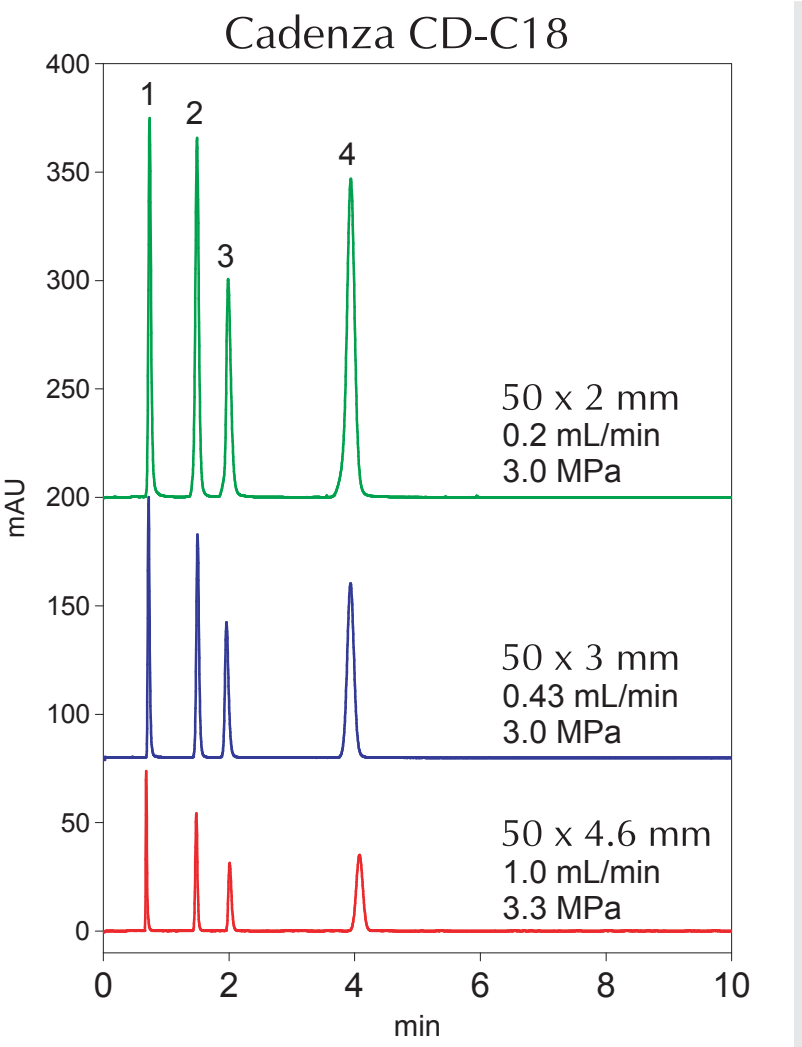


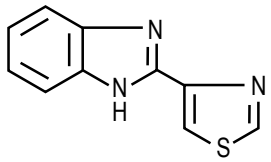
Cadenza CD-C18, 250 x 4.6 mm
5 - 25% acetonitrile / 0.1% TFA
0.75 mL/min, 35 °C
530 nm

Courtesy of Dr. T. Oki and Dr. I. Suda, KONARC / NARO

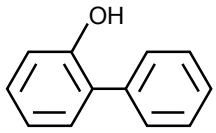
Cadenza CD-C18 50 x 2 mm 50 x 3 mm 50 x 4.6 mm Application

Fungicides for Citrus Fruits

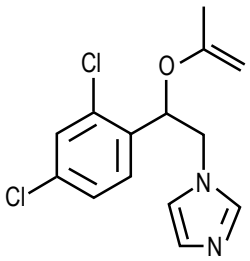




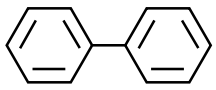
1
thiabendazole



2
o-phenylphenol



3
imazalil

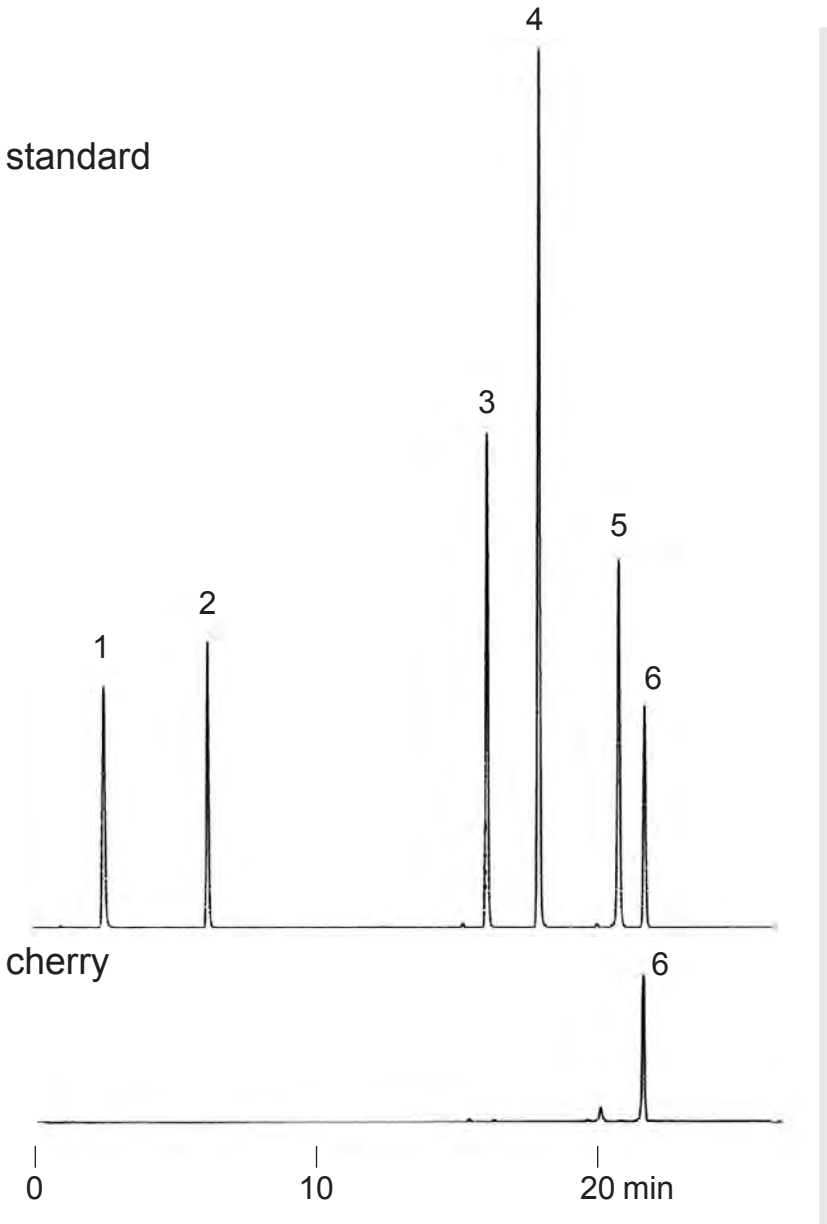


4
diphenyl

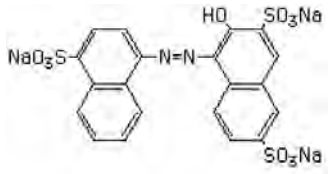
Cadenza CD-C18
5 mM CH_3COONH_4 / ACN = 40 / 60
37 °C, UV at 260 nm, 2.0 uL inj.

Cadenza CD-C18 75 x 4.6 mm Application

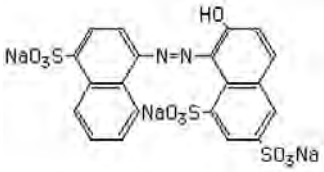
Food Dyes



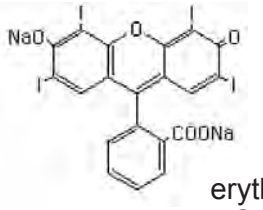
Cadenza CD-C18, 75 x 4.6 mm
A : 20mM AcONH4 / methanol = 90 / 10
B : 20mM AcONH4 / methanol = 20 / 80
0 - 100%B (0 - 20 min), 100%B (20 - 23 min)
1 mL/min, 30°C, VIS at 530 nm, 0.32 AUFS

1 

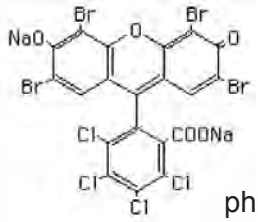
amaranth
C.I. 16185

2 

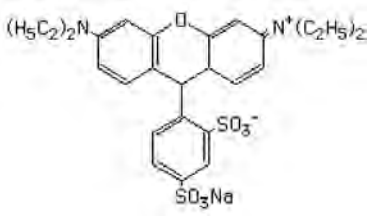
new coccine
C.I. 16255

3 

erythrosin B
C.I. 45430

4 

phloxine B
C.I. 45410

5 

sulfo rhodamine B
C.I. 45100

6 

rose bengal
C.I. 45440

Courtesy of S.Kuroda, Bio College Kyoto

Unison US-C18 150 x 4.6 mm Application

Purine Nucleotides

プリンヌクレオチド

1 Hypoxanthine

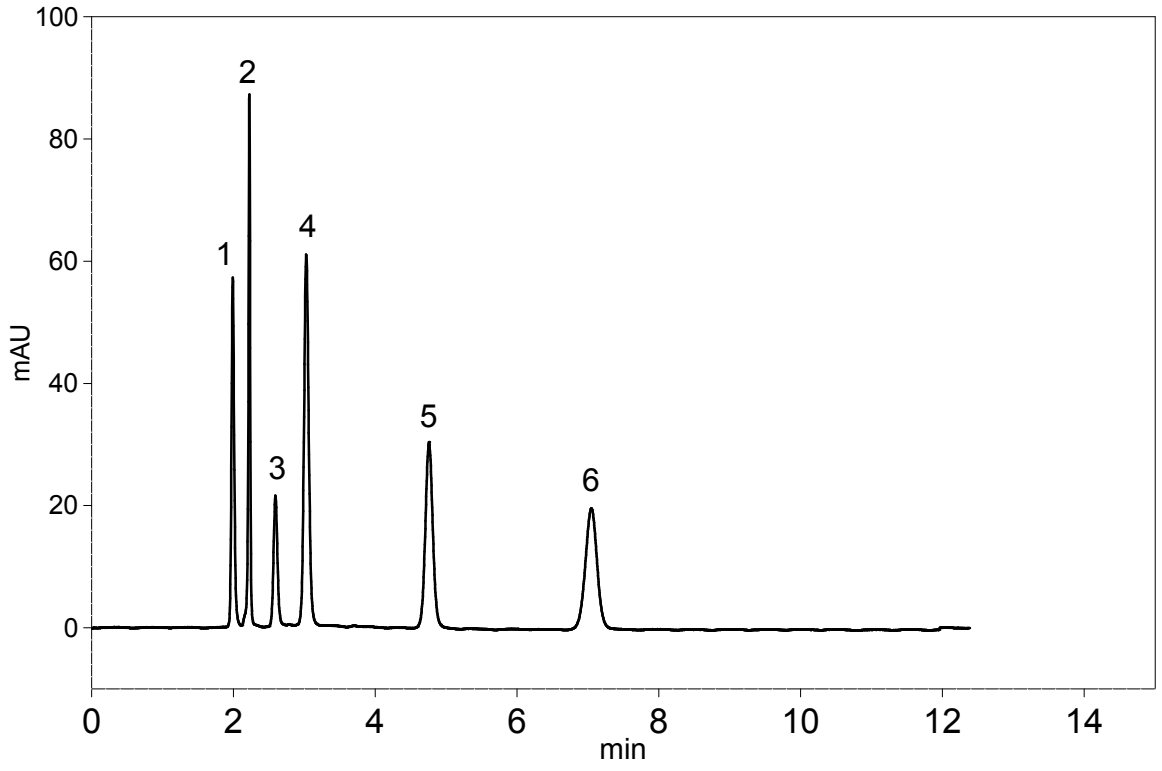
2 Inosine

3 Inosine 5'-monophosphate

4 AMP

5 ADP

6 ATP



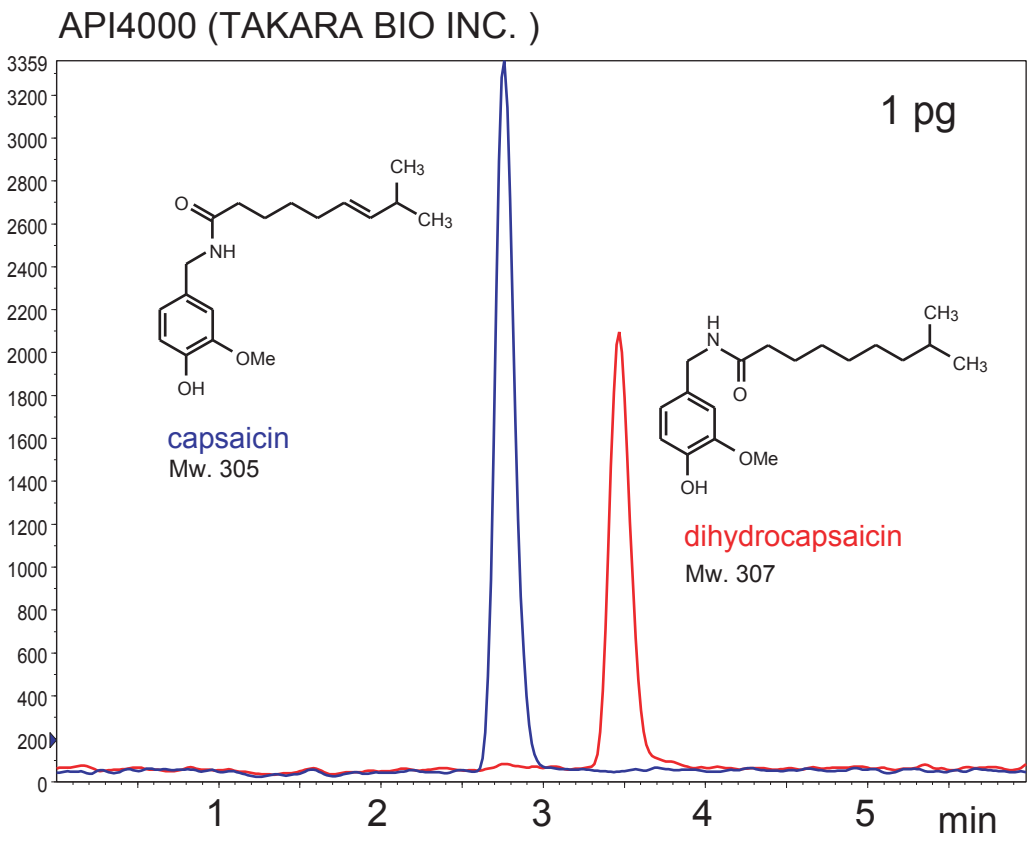
Unison US-C18, 150 x 4.6 mm
20 mM $(NH_4)_2HPO_4$ +10mM DBA-Acetate / ACN = 91 / 9
1.0 mL/min, 37 °C, 6.9 MPa, 260 nm, 2 uL (0.1-0.3ug)

Courtesy of Prof. Dr. K. Hosokawa , Hyogo Univ.

Cadenza CD-C18 100 x 2 mm Application

LC-MS Application for Capsaicins

LC–MSアプリケーション（唐辛子成分，カプサイシン）



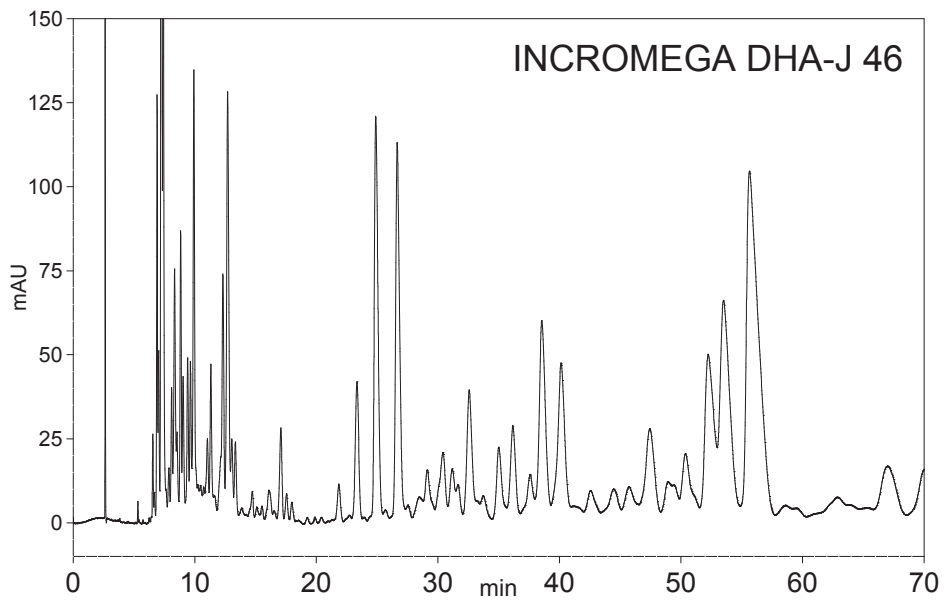
Cadenza CD-C18, 100 x 2 mm
0.1% acetic acid / 75% methanol, 0.2 mL/min, 40 °C, 5μL (200fg/μL)
API4000: ESI, MRM Positive
Q1/Q3:
capsaicin 306/137
dihydrocapsaicin 308/137

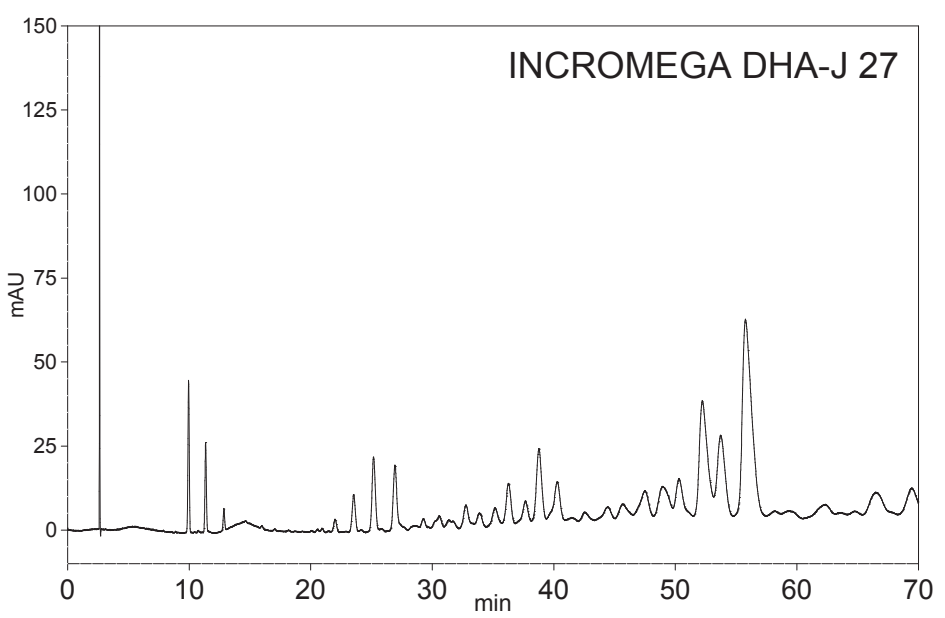
Courtesy of J.Watanabe, TAKARA BIO INC.

Cadenza CD-C18 250 x 4.6 mm Application

Purified Fish Oil including DHA Glycerides

精製魚油中の脂質（含DHAグリセリド）



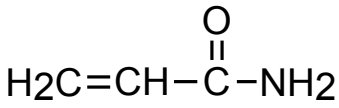


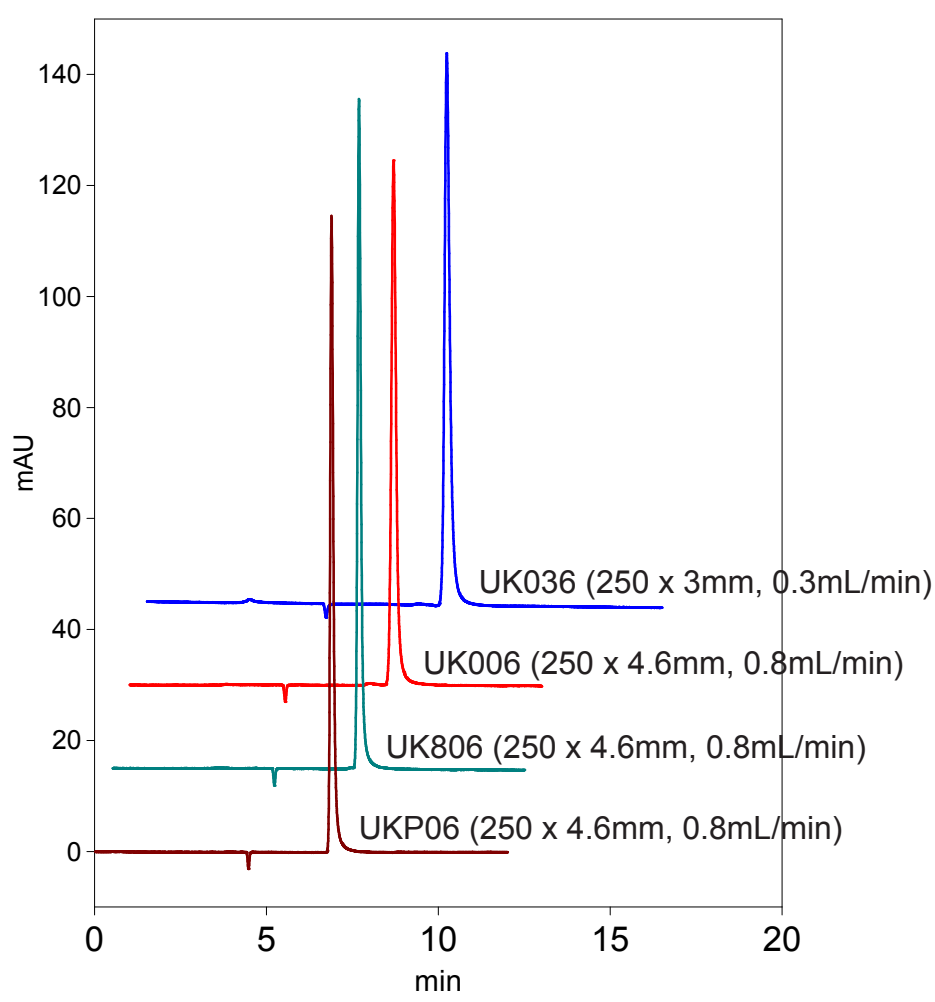
Cadenza CD-C18, 250 x 4.6 mm
acetonitrile / acetone = 70 / 30, 1.0 mL/min, 37 °C, 220 nm

Courtesy of Tsuji, Croda Japan

Unison UK-C18
Unison UK-C8
Unison UK-Phenyl 250 x 4.6 mm 250 x 3 mm Application

Acrylamide
アクリルアミド





water / formic acid = 100 / 0.1
37 °C, UV at 230 nm
acrylamide, 1mg/mL x 1uL

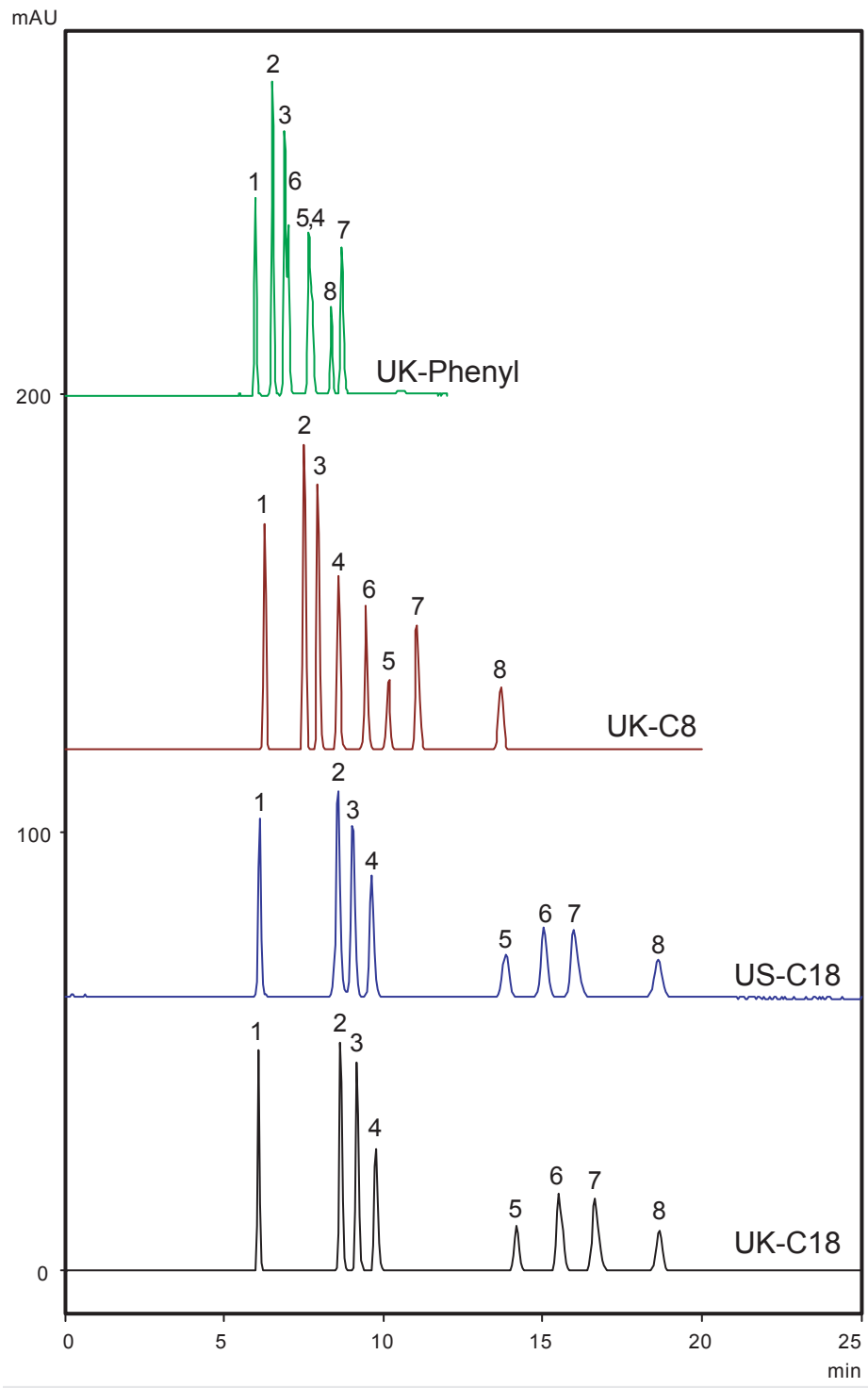
Unison UK-Phenyl
Unison UK-C8
Unison US-C18
Unison UK-C18

250 x 4.6 mm

Application

Organic Acids

有機酸

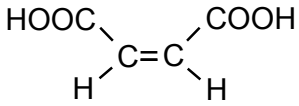


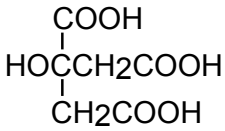
1 HCOOH
formic acid

2 $HOOCCH_2COOH$
malonic acid

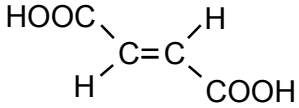
3 $CH_3CH(OH)COOH$
lactic acid

4 CH_3COOH
acetic acid

5 
maleic acid

6 
citric acid

7 $HOOC(CH_2)_2COOH$
succinic acid

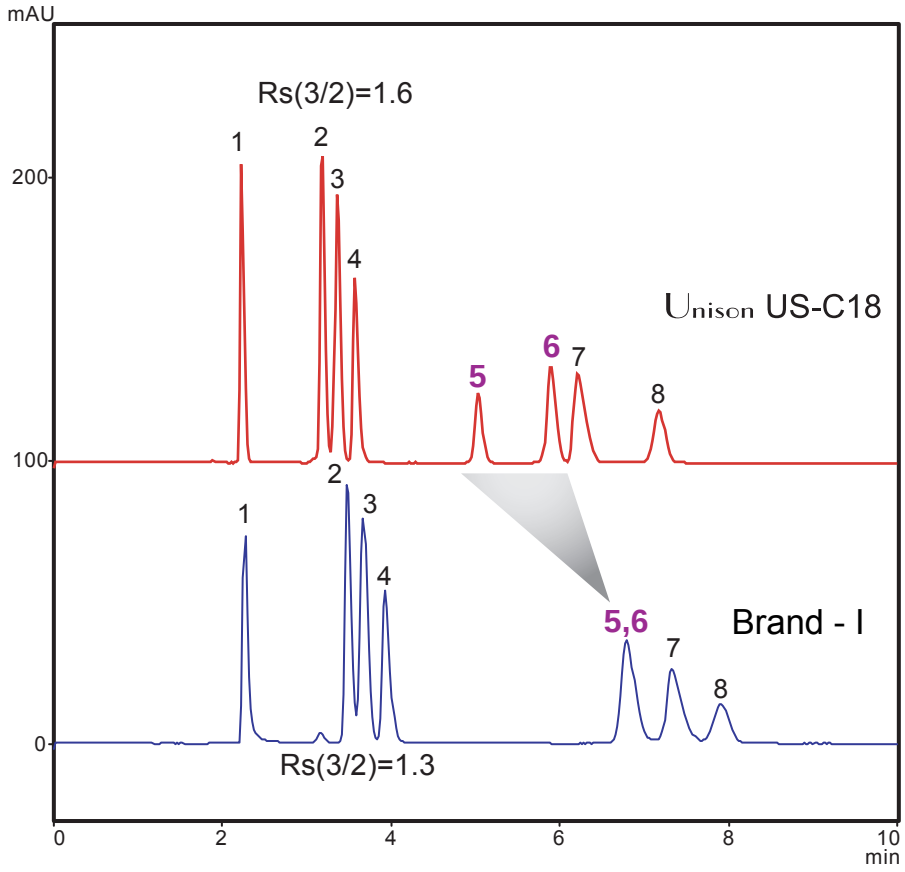
8 
fumaric acid

Unison, 250 x 4.6 mm
20 mM H_3PO_4
0.6 mL/min, 37 °C
UV at 210 nm

Unison US-C18 150 x 4.6 mm Application

Organic Acids

有機酸



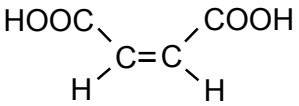
150 x 4.6 mm
20 mM H_3PO_4
1.0 mL/min, 37 °C, UV at 210 nm

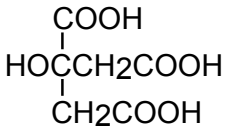
1 HCOOH
formic acid

2 $HOOCCH_2COOH$
malonic acid

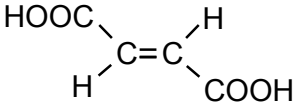
3 $CH_3CH(OH)COOH$
lactic acid

4 CH_3COOH
acetic acid

5 
maleic acid

6 
citric acid

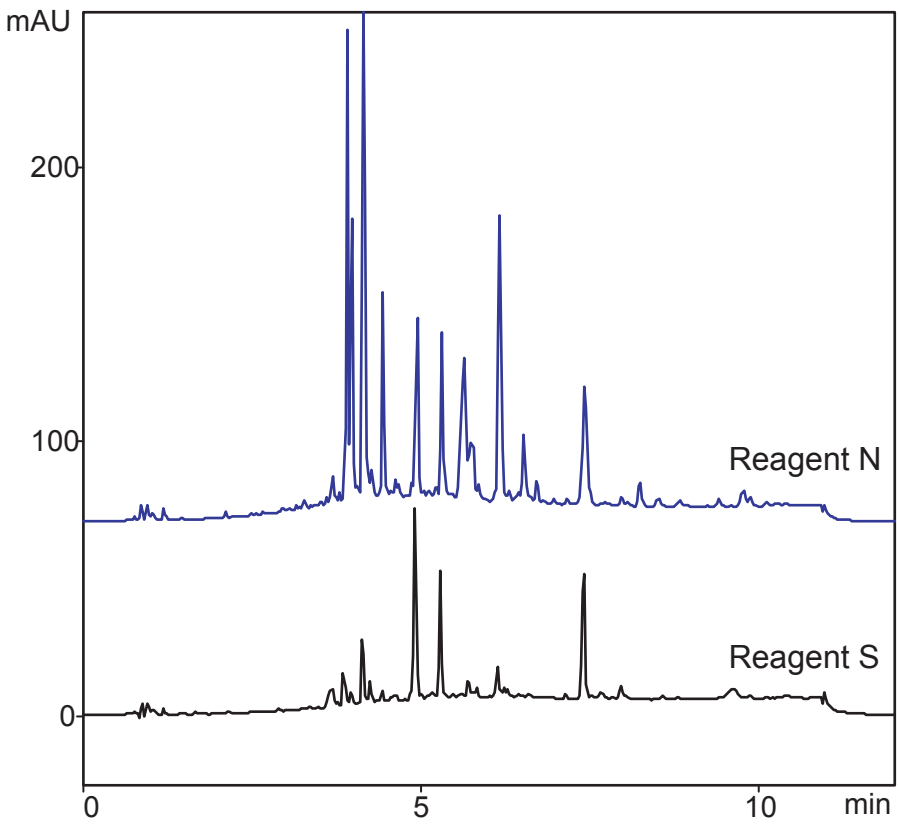
7 $HOOC(CH_2)_2COOH$
succinic acid

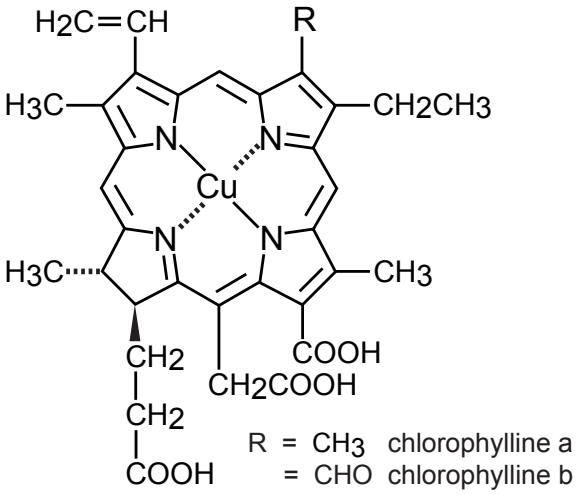
8 
fumaric acid

Unison UK-C18 75 x 4.6 mm Application

Cupper Chlorophylline

銅クロロフィリン





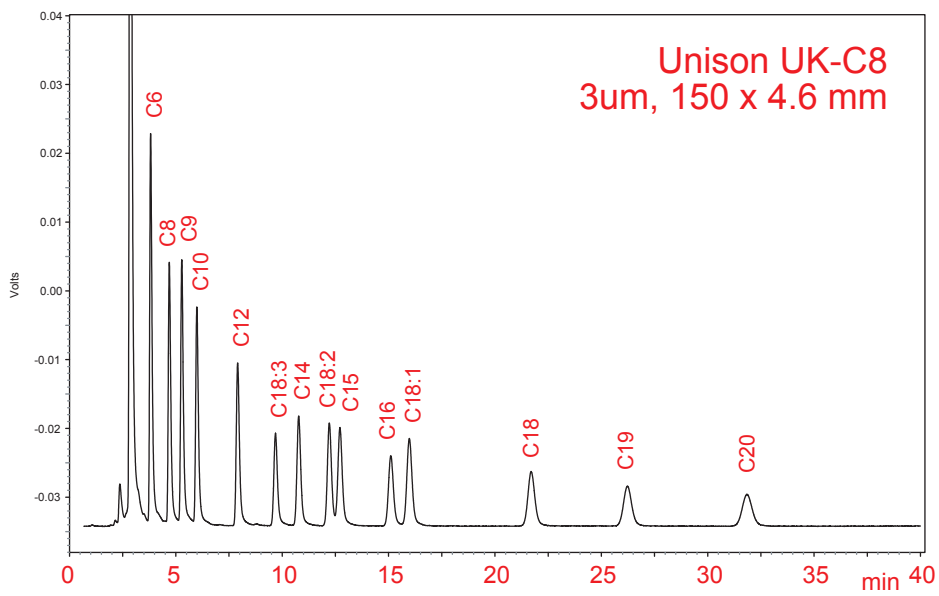
Unison UK-C18, 75 x 4.6 mm
A : 20mM Ammonium Acetate
B : ACN
20-80%B (0-10min)
1.0 mL/min, 37 °C
UV at 420 nm, 8.1 MPa

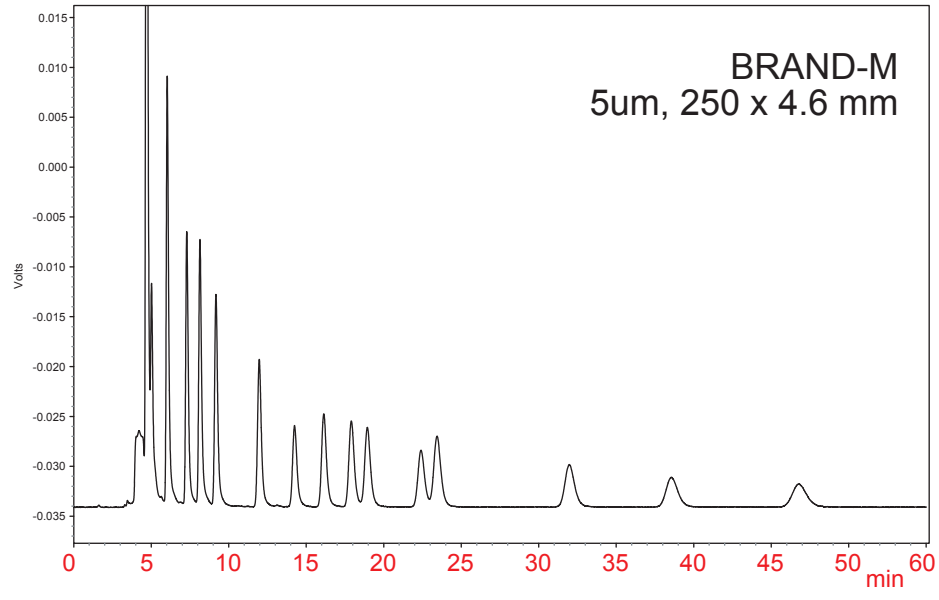
Unison UK-C8 150 x 4.6 mm Application

Fatty Acid ADAM Derivatives

脂肪酸のADAM誘導体

ADAM: 9-anthryldiazomethane





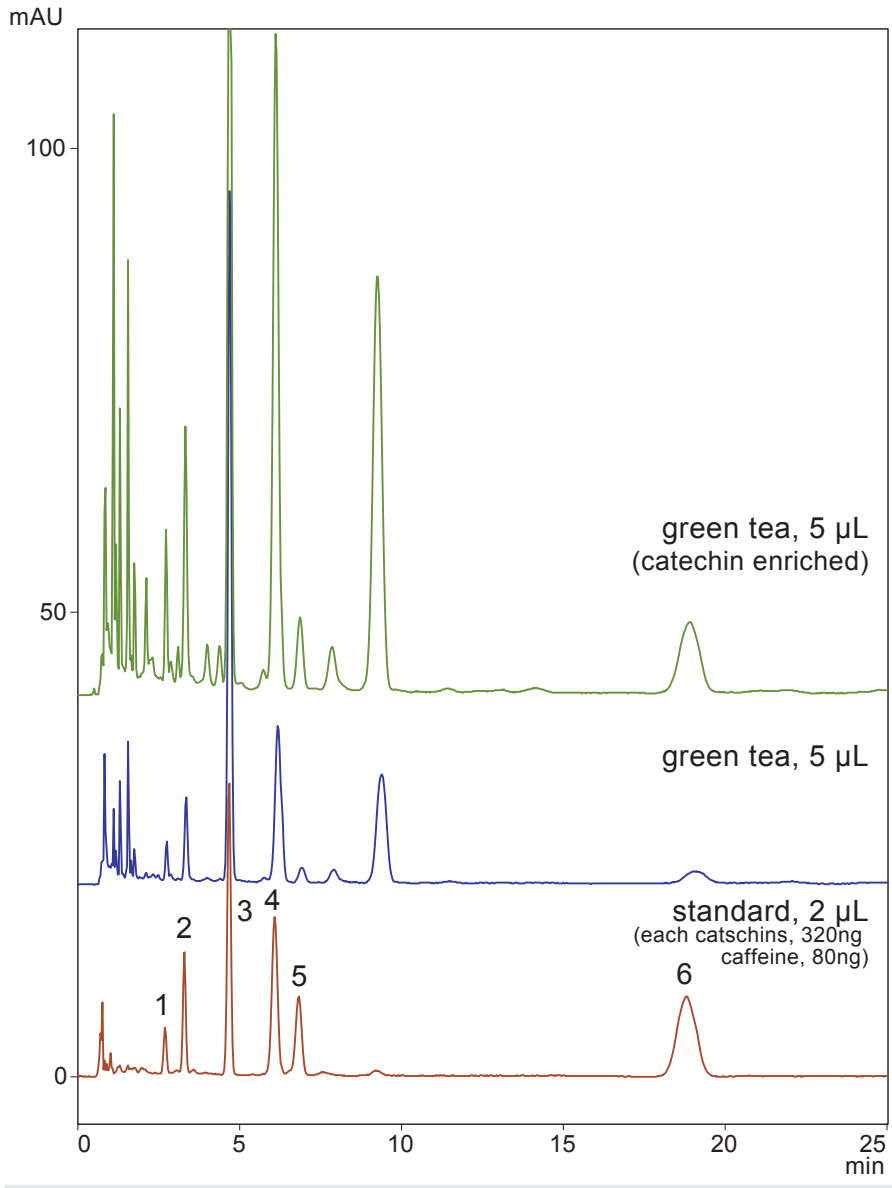
C6	caproic acid n-hexanoic acid
C8	caprylic acid n-octanoic acid
C9	pelargonic acid n-nonanoic acid
C10	capric acid n-decanoic acid
C12	lauric acid n-dodecanoic acid
C18:3	alpha-linolenic acid cis-9,12,15-octadecatrienoic acid
C14	myristic acid n-tetradecanoic acid
C18:2	linoleic acid cis-9,12-octadecadienoic acid
C15	pentadecanoic acid n-pentadecanoic aci
C16	palmitic acid n-hexadecanoic acid
C18:1	oleic acid cis-9-octadecenoic acid
C18	stearic acid n-octadecanoic acid
C19	nonadecanoic acid n-nonadecanoic acid
C20	arachidic acid eicosanoic acid

Unison UK-C8, 150 x 4.6 mm
water / acetonitrile = 15 / 85, 1.0 mL/min, 30 °C
FLS Ex365 nm, Em412 nm

Cadenza CD-C18 75 x 4.6 mm Application

Catechins in Green Tea

緑茶中のカテキン



1 epigallocatechin
EGC(-)

2 catechin
C(+)

3 caffeine

4 epigallocatechin gallate
EGCg(-)

5 epicatechin
EC(-)

6 epicatechin gallate
ECg(-)

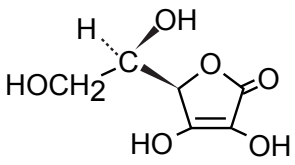
Cadenza CD-C18, 75 x 4.6 mm
1% acetic acid / methanol / acetonitrile = 85 / 10 / 5
1 mL/min, 37 °C, 280 nm, 10 MPa

Unison UK-Silica 150 x 4.6 mm Application

Ascorbic Acid Related Compounds

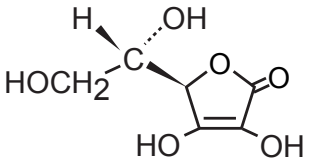
アスコルビン酸関連化合物

1



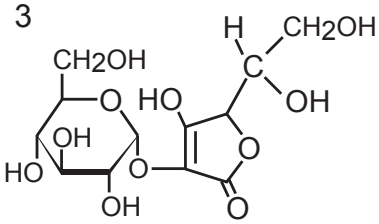
isoascorbic acid

2

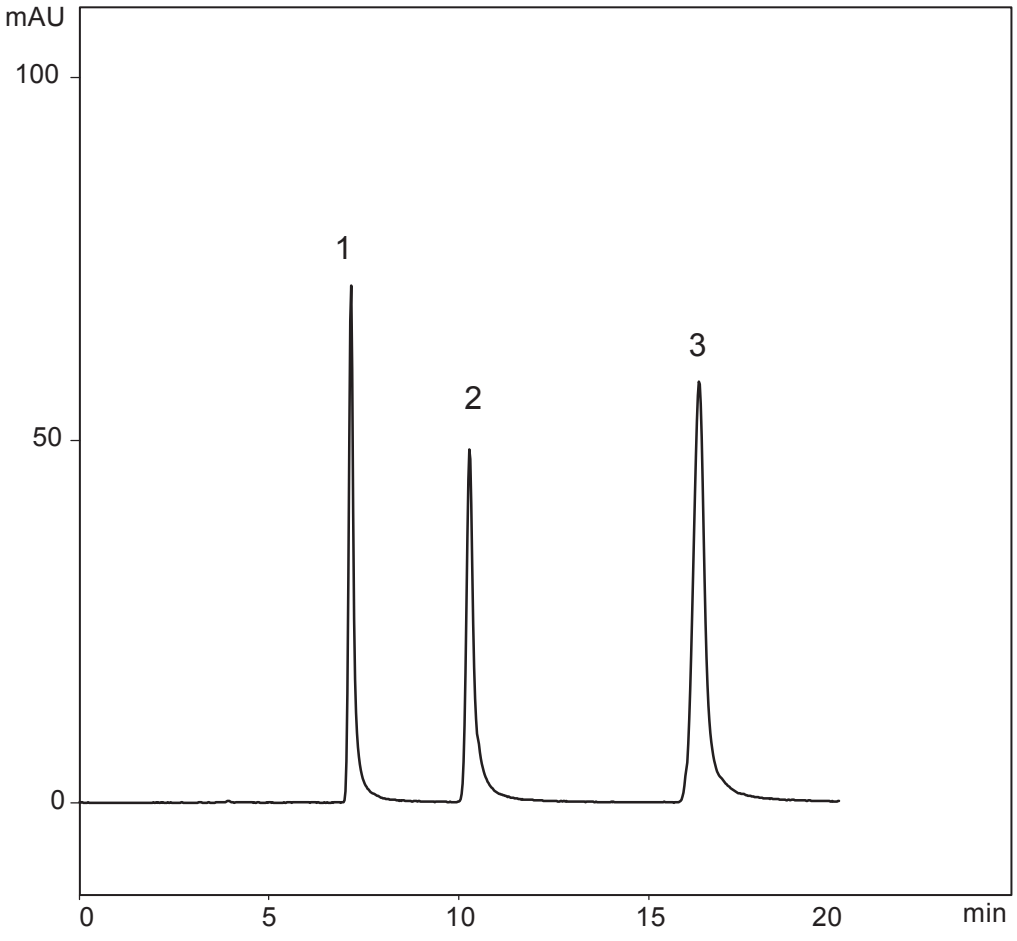


L-ascorbic acid

3



L-ascorbic acid 2-glucoside



Unison UK-Silica, 150 x 4.6mm
50mM ammonium acetate / acetonitrile = 10 / 90
0.8mL/min, 30 °C, 260 nm, 2 µg

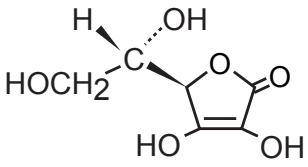
Unison UK-C18 75 x 4.6 mm
Unison US-C18 150 x 4.6 mm

Application

Ascorbic Acid Related Compounds

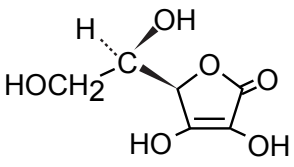
アスコルビン酸関連化合物

1



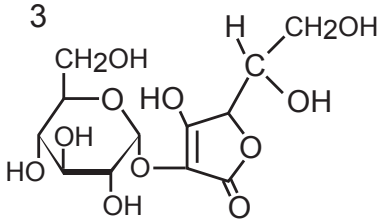
L-ascorbic acid

2

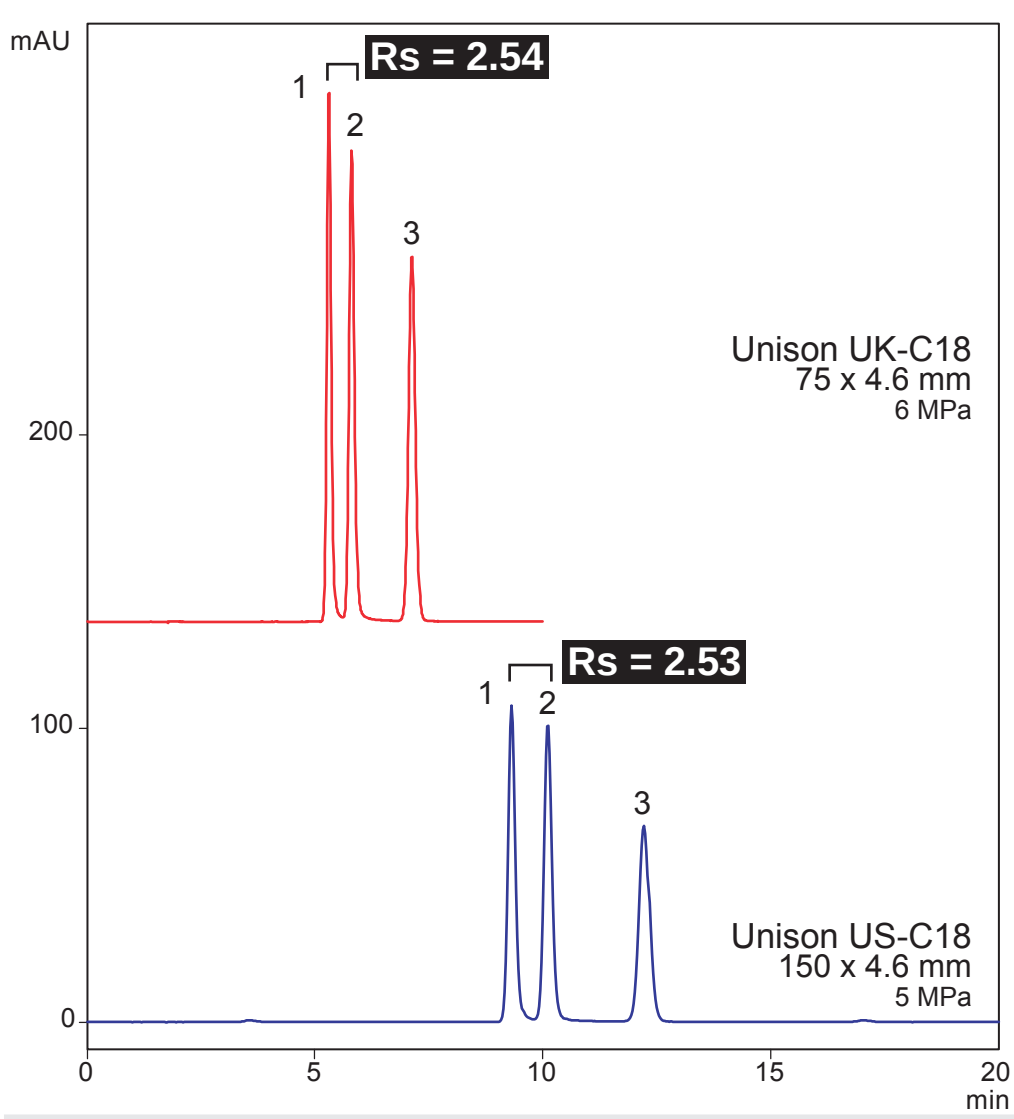


isoascorbic acid

3



L-ascorbic acid 2-glucoside



10mM dibutylammonium acetate
0.8mL/min, 30 °C, 260 nm, 2 µg

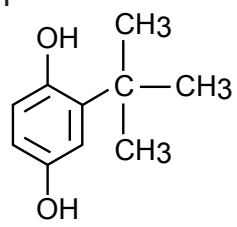
Unison UK-C8
Unison UK-C18
Unison UK-Phenyl

75 x 4.6 mm

Application

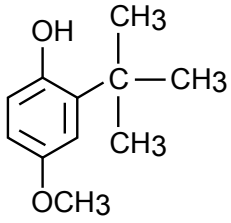
Antioxidants
酸化防止剤

1



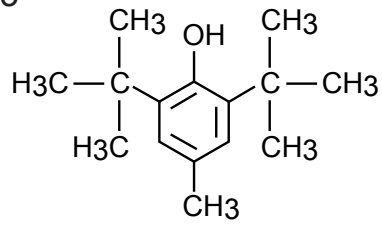
TBHQ (Butylhydroquinone)

2

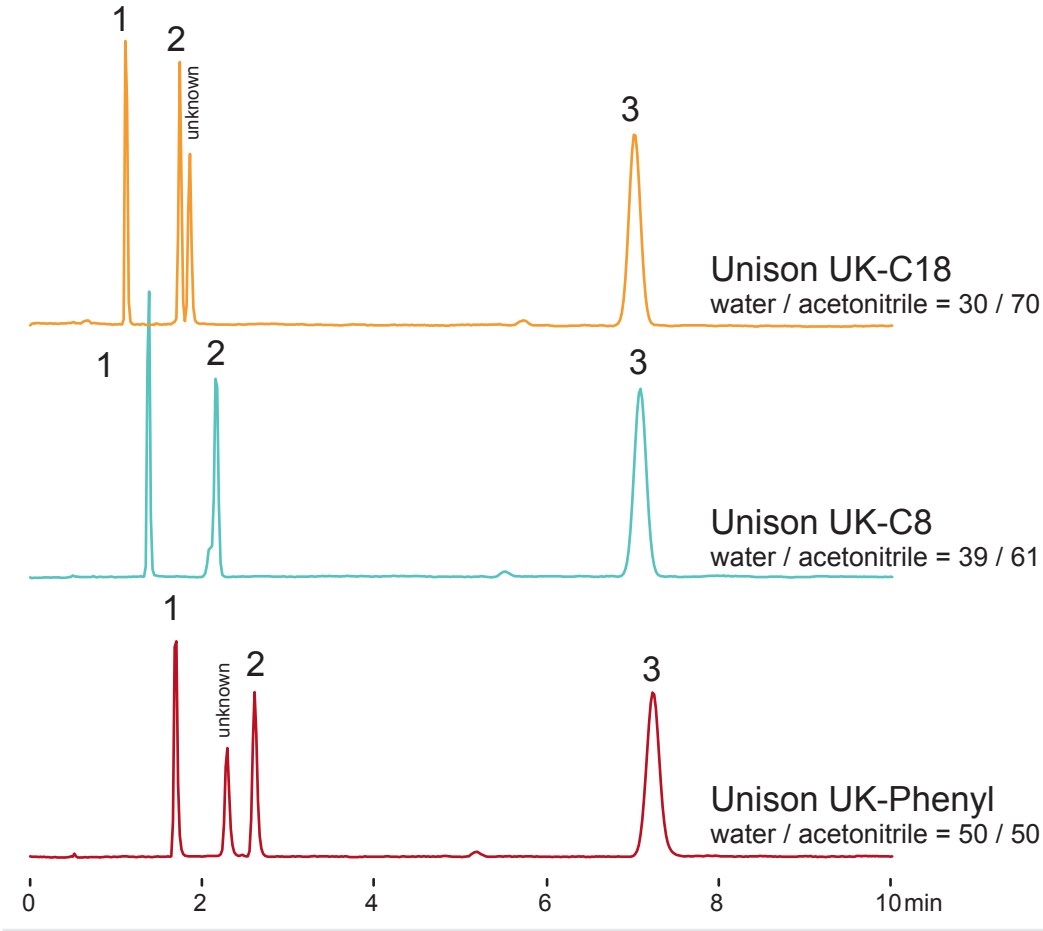


BHA (4-hydroxy-3-t-butylanisole)

3



BHT (Butylhydroxytoluene)



75 x 4.6 mm
1 mL/min, 37 °C, 260 nm

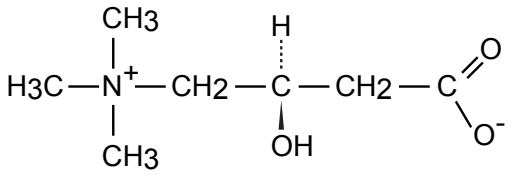
Unison UK-Silica
Unison UK-C18

150 x 3 mm
75 x 4.6 mm

Application

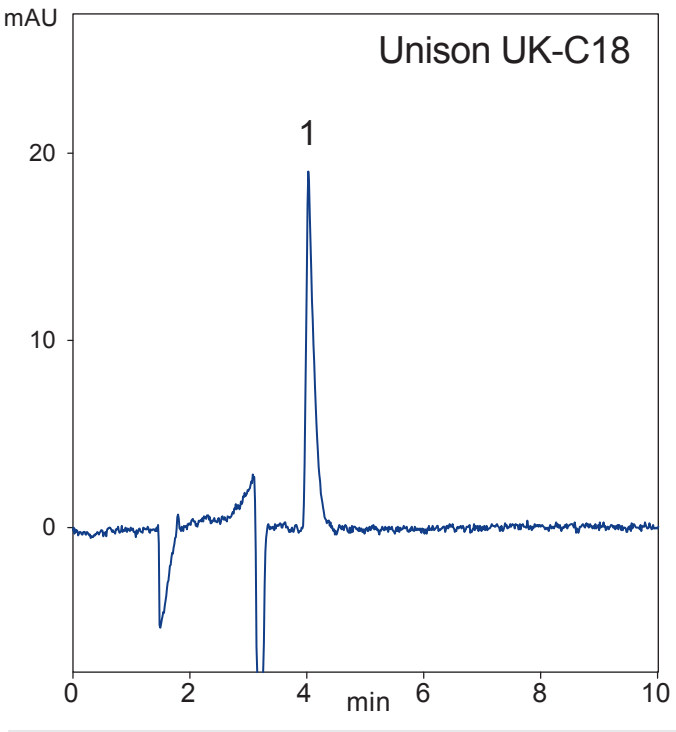
L-Carnitine

L-カルニチン



L-carnitine

Unison UK-Silica, 150 x 3 mm
acetonitrile / 50mM ammonium acetate
= 65 / 35, 0.5 mL/min (7MPa)
37 °C, 210 nm, 2μL(20μg)

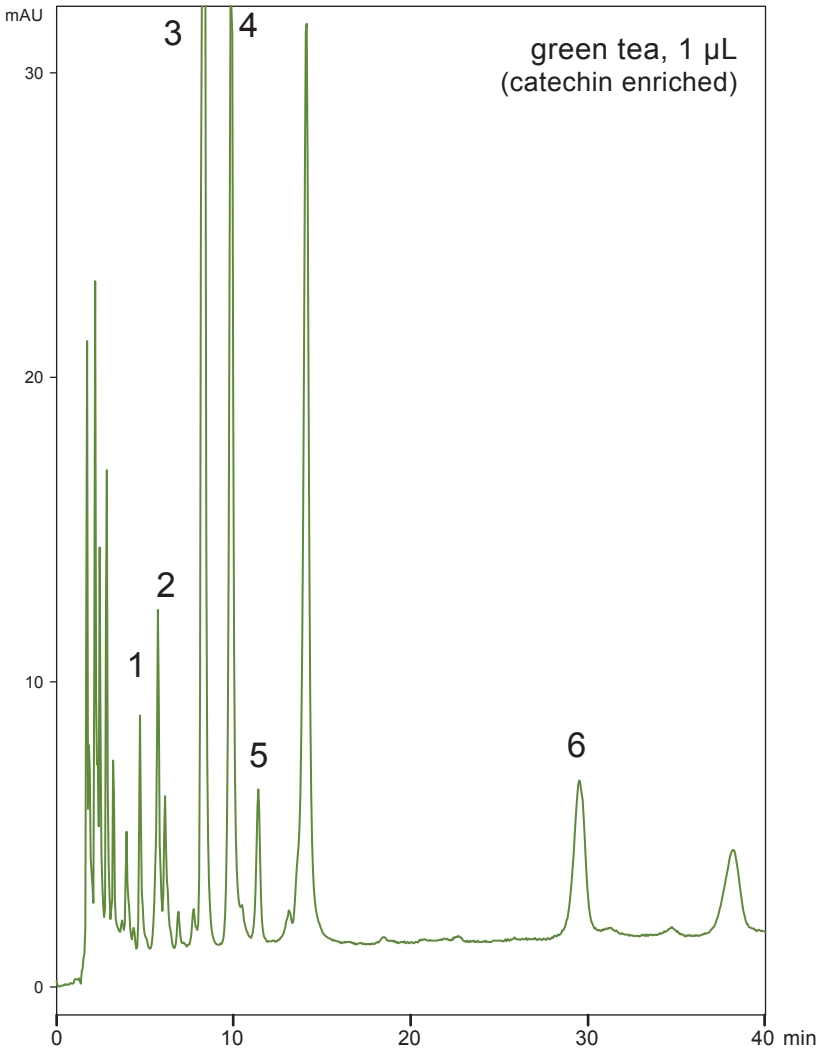


Unison UK-C18, 75 x 4.6 mm
water / heptafluoro-n-butyric acid
= 100 / 0.1, 1 mL/min (7MPa)
37 °C, 210 nm, 2μL(20μg)

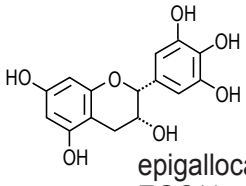
Cadenza CD-C18 150 x 2 mm Application

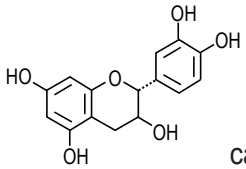
Catechins in Green Tea

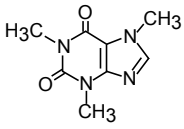
緑茶中のカテキン

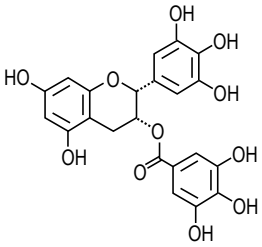


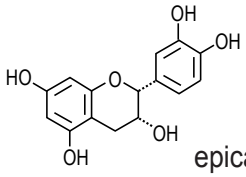
Cadenza CD-C18, 150 x 2 mm
1% acetic acid / methanol / acetonitrile = 85 / 10 / 5
0.2 mL/min, 37 °C, 280 nm

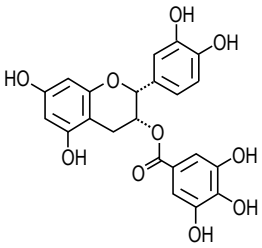
1 
epigallocatechin
EGC(-)

2 
catechin
C(+)

3 
caffeine

4 
epigallocatechin gallate
EGCg(-)

5 
epicatechin
EC(-)

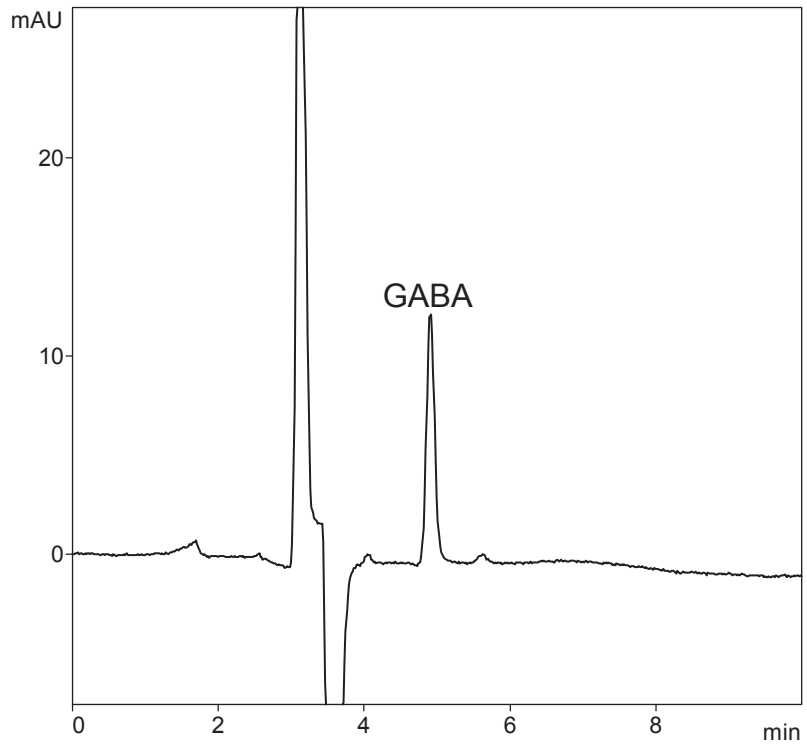
6 
epicatechin gallate
ECg(-)

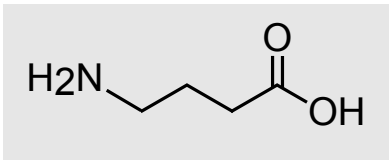
Unison UK-Silica 250 x 2 mm
Unison UK-C18 75 x 4.6 mm

Application

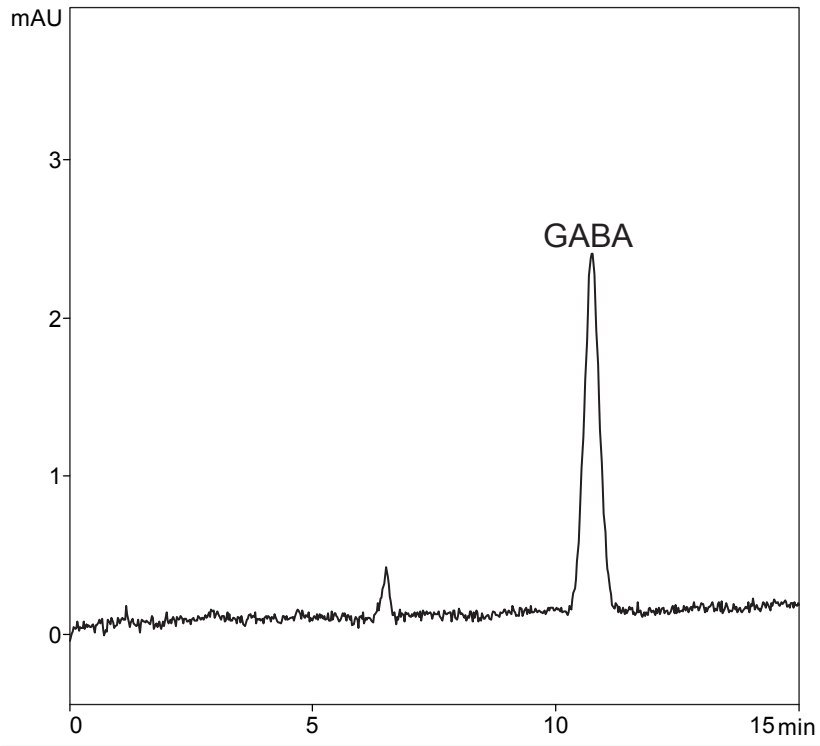
γ- Aminobutyric Acid (GABA)

γ -アミノ酪酸





Unison UK-Silica, 250 x 2 mm
acetonitrile / 20mM ammonium acetate = 50 / 50
0.2 mL/min, 37 deg.C
210 nm, 2 ug (2uL)

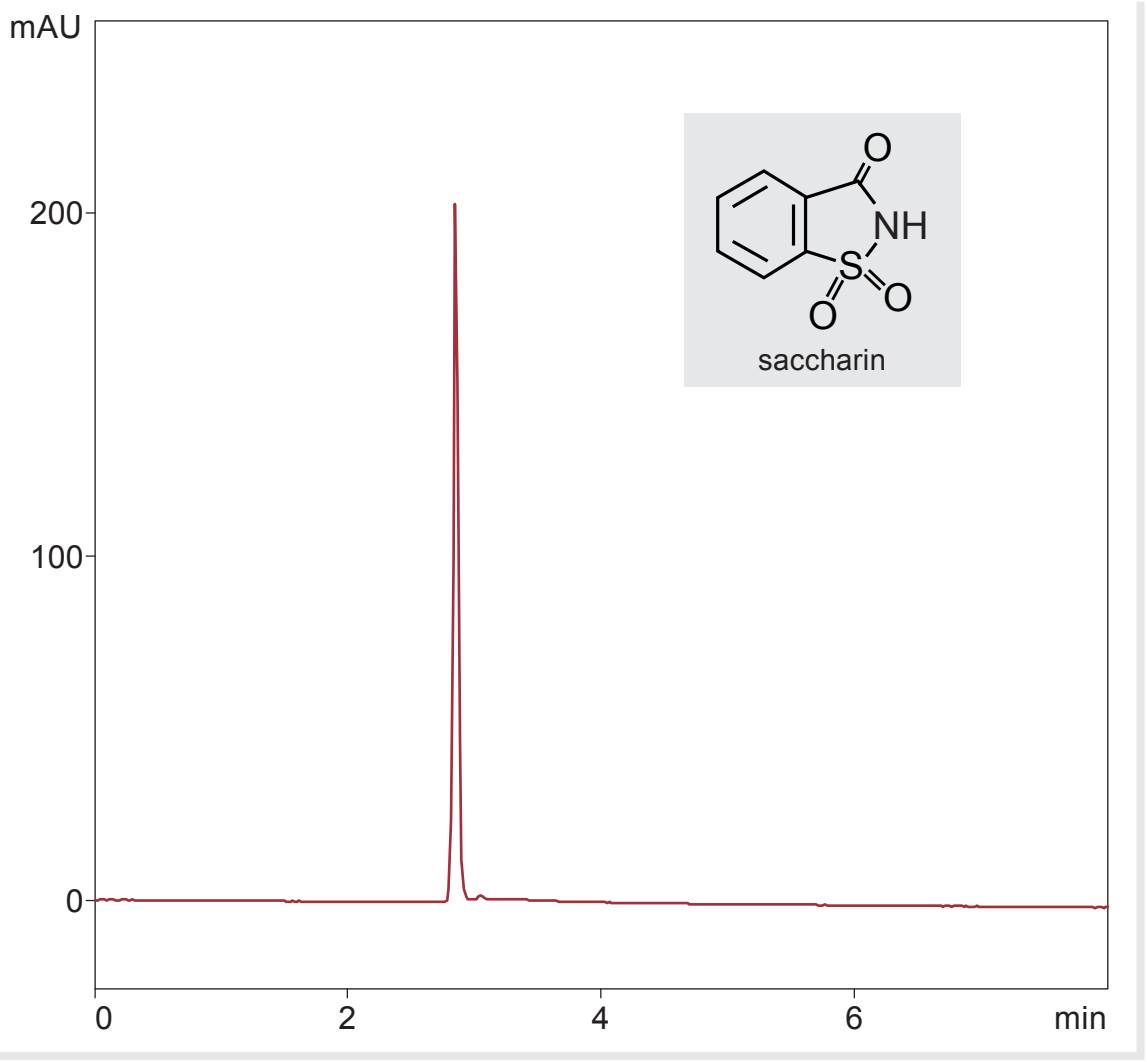


Unison UK-C18, 75 x 4.6 mm
10mM H3PO4 +
5mM sodium heptansulfonate
1 mL/min, 37 deg.C
210 nm, 5 ug (5uL)

Unison UK-Silica 250 x 3 mm Application

Saccharin

サッカリン

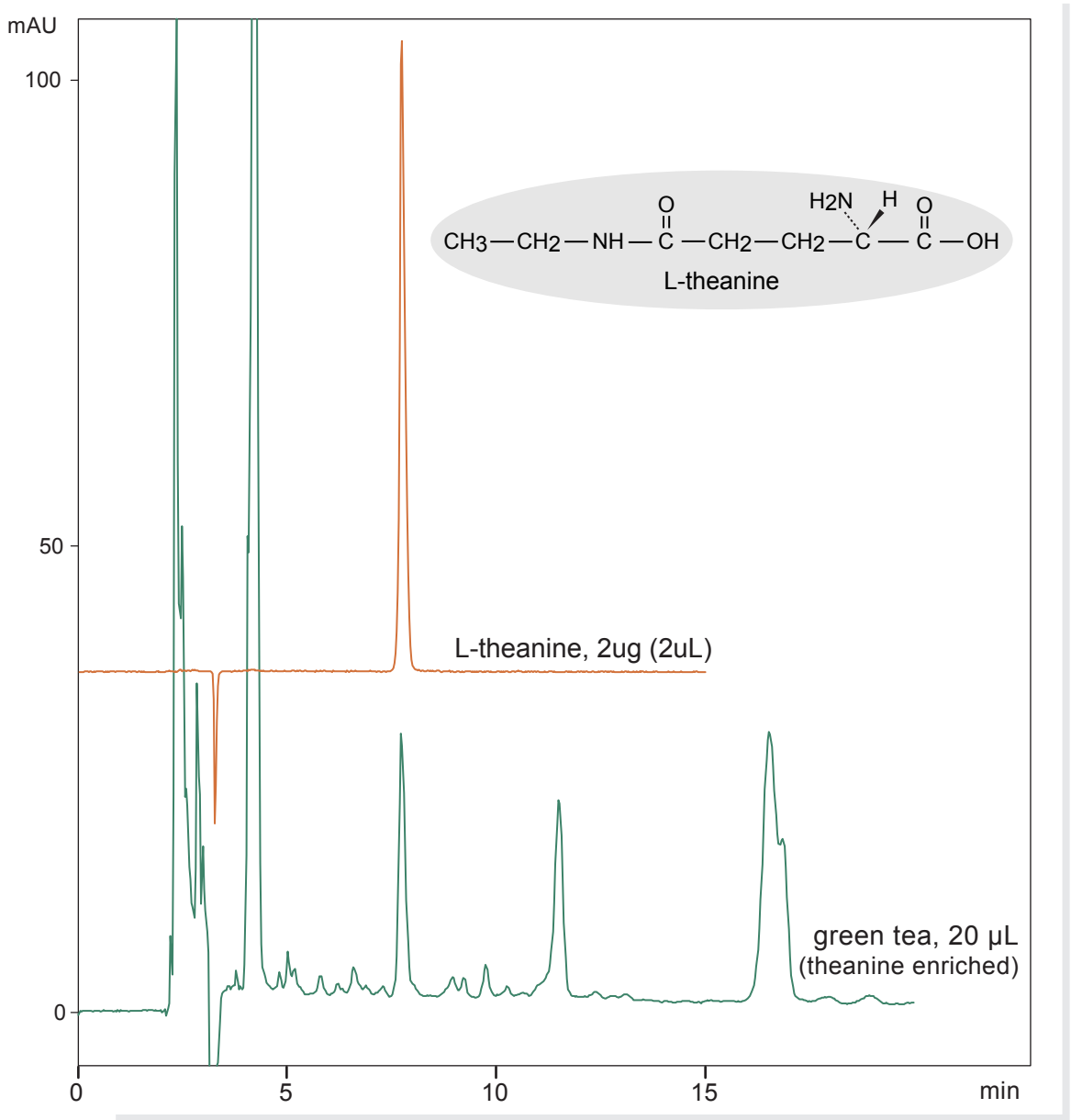


Unison UK-Silica, 250 x 3 mm
acetonitrile / water / TFA = 80 / 20 / 0.1
0.5 mL/min, 37 deg.C, 210 nm, 0.2 ug (0.2 uL)

Cadenza CL-C18 250 x 3 mm Application

Theanine in Green Tea

緑茶中のテアニン

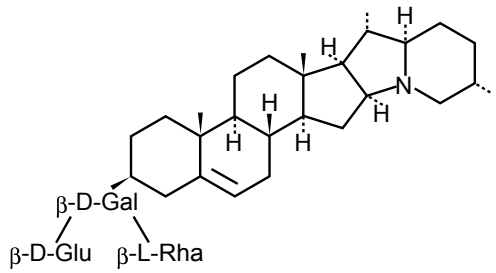


Cadenza CL-C18, 250 x 3 mm
water / trifluoroacetic acid = 100 / 0.1
0.5 mL/min (15MPa), 37 deg.C, 210 nm

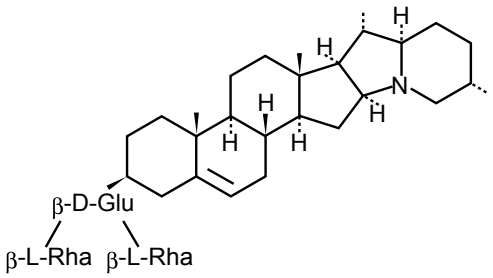
Cadenza CD-C18 75 x 2 mm Application

α- Solanine and α- Chaconine from Potato

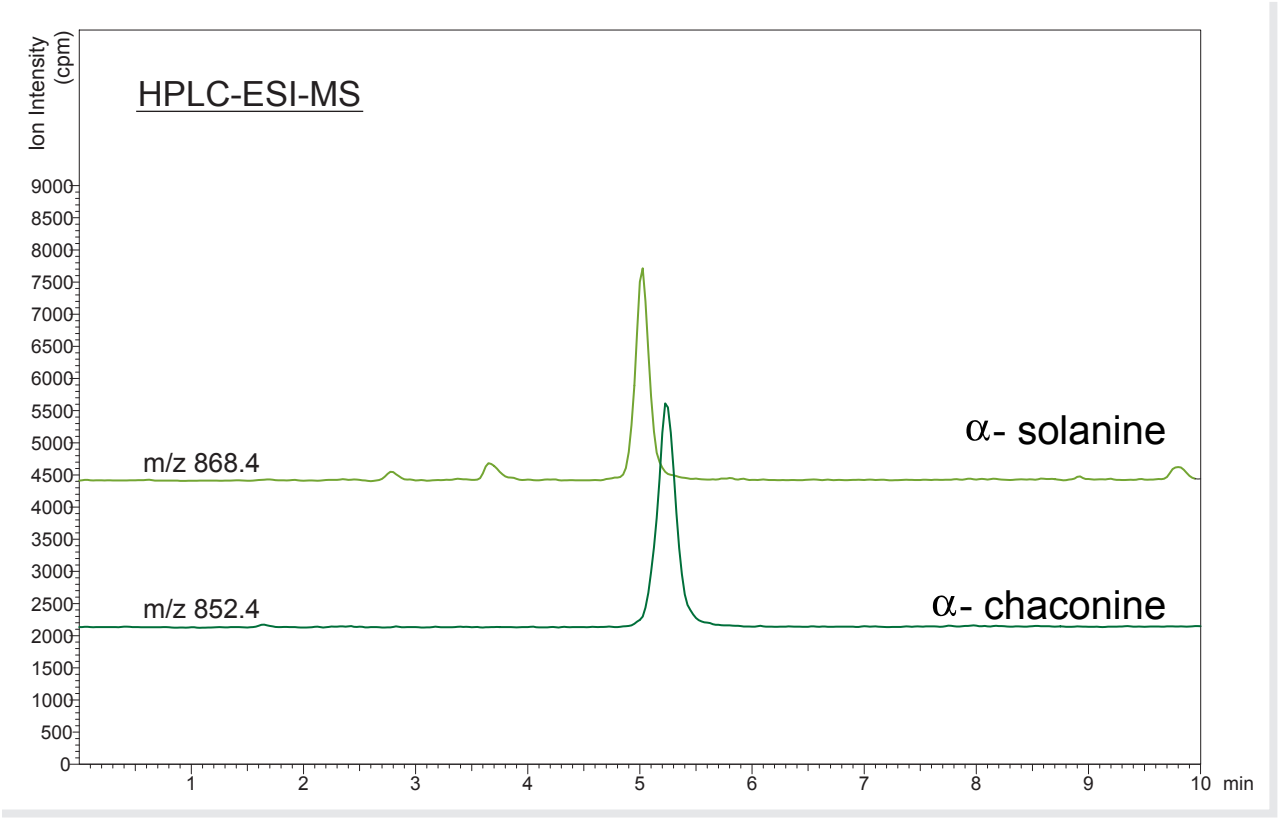
ジャガイモ中のα−ソラニンとα−チャコニン



α- solanine



α- chaconine



Cadenza CD-C18, 75 x 2 mm
0.1% trifluoroacetic acid / acetonitrile = 75 / 35
0.2 mL/min, 35 deg.C,
LCMS-2010A, ESI positive

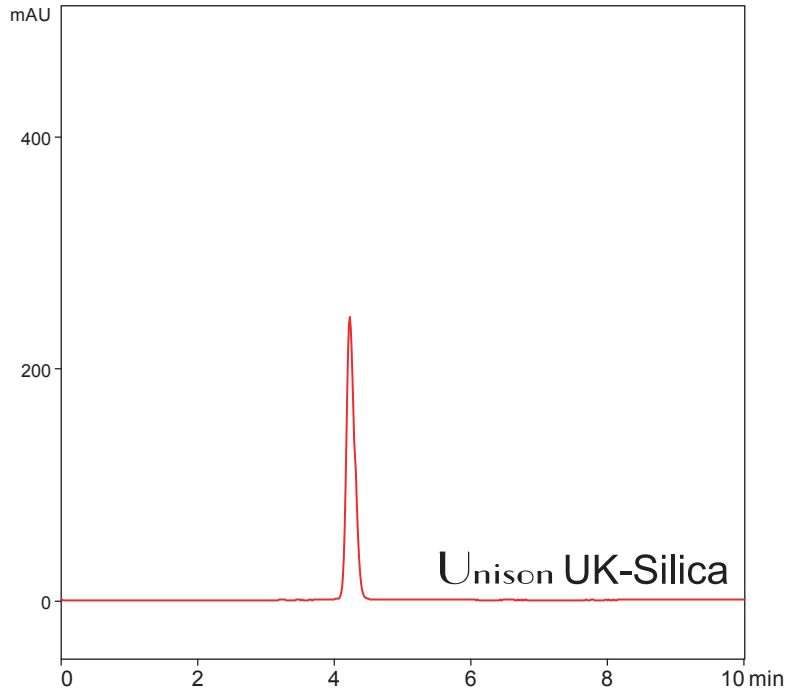
Courtesy of Dr. Fumio MATSUDA and Prof. Hisashi MIYAGAWA,
Department of Agriculture, Kyoto University.

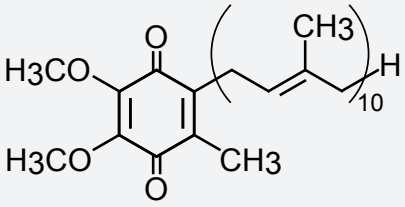
Unison UK-Silica
Unison UK-C8
Unison UK-C18
Cadenza CL-C18
Cadenza CD-C18

150 x 3 mm
75 x 3 mm

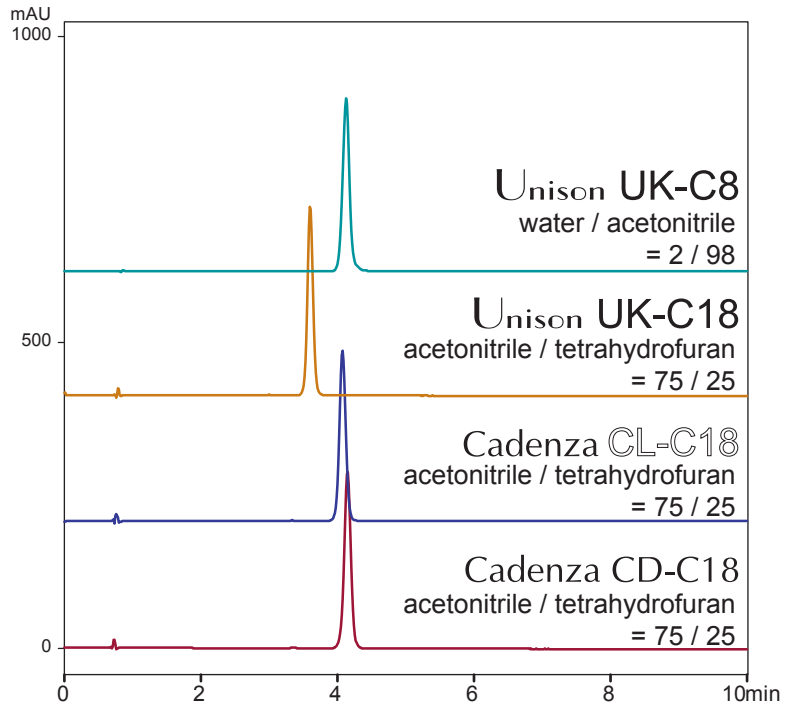
Application

Coenzyme Q10
コエンザイムQ10





Unison UK-Silica
150 x 3 mm
hexane / IPA = 998 / 2
0.5 mL/min, 37 deg.C
270 nm, 2ug (2uL)



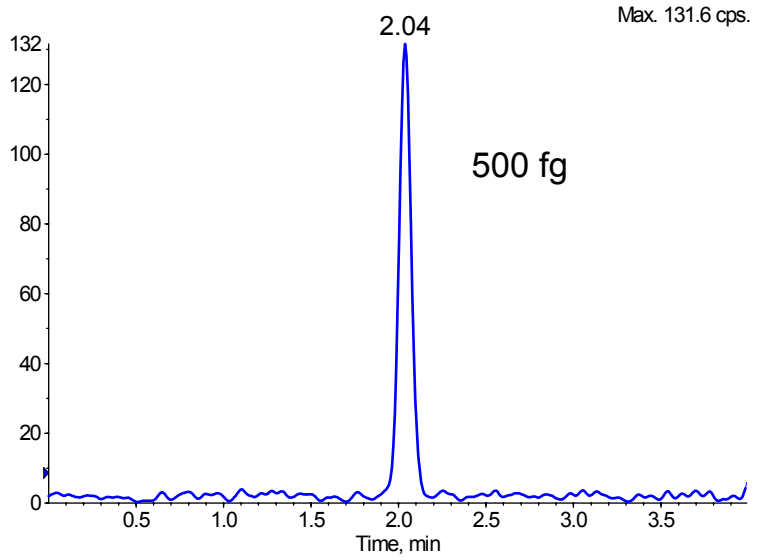
75 x 3 mm
0.5 mL/min, 37 deg.C
270 nm, 2ug (2uL)

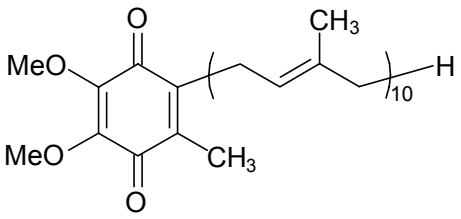
Unison UK-C8 75 x 3 mm Application

LC-MS Application for Coenzyme Q10

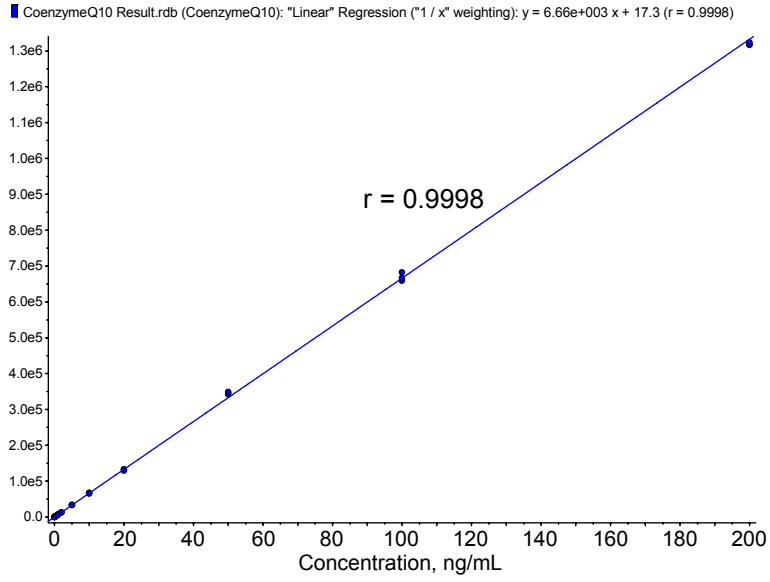
LC-MSアプリケーション（コエンザイム Q10）

API4000 (TAKARA BIO INC.)





Coenzyme Q10
Mw. 863.36



Unison UK-C8, 75 x 3 mm
0.1% formic acid / acetonitrile / isopropanol = 1 / 5 / 5
0.8 mL/min, 10 uL(50 fg/uL)
API4000: APCI, MRM Positive, Q1/Q3 : 863.5 / 197

Courtesy of J.Watanabe, TAKARA BIO INC.

Unison UK-Phenyl
Unison UK-C8
Unison UK-C18
Cadenza CD-C18

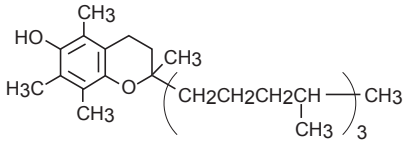
75 x 4.6 mm

Application

Fat-Soluble Vitamins

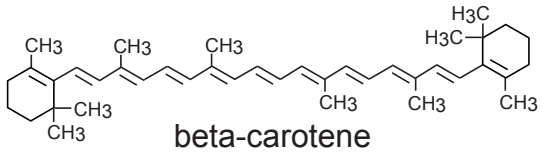
脂溶性ビタミン

1



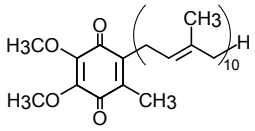
alpha-tocopherol

2



beta-carotene

3



coenzyme Q10

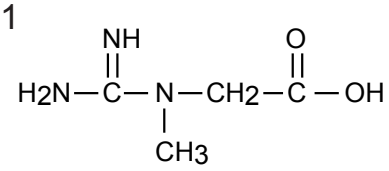
75 x 4.6 mm,
1 mL/min, 280 nm
37 degC, 2 uL (0.8-1.6ug)

Unison UK-C18 250 x 4.6 mm Application

Creatine Metabolites

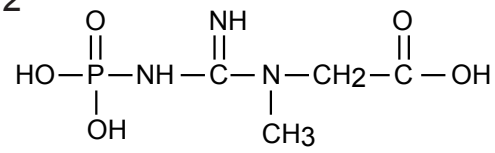
クレアチン代謝物

1



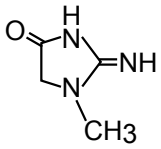
creatine

2

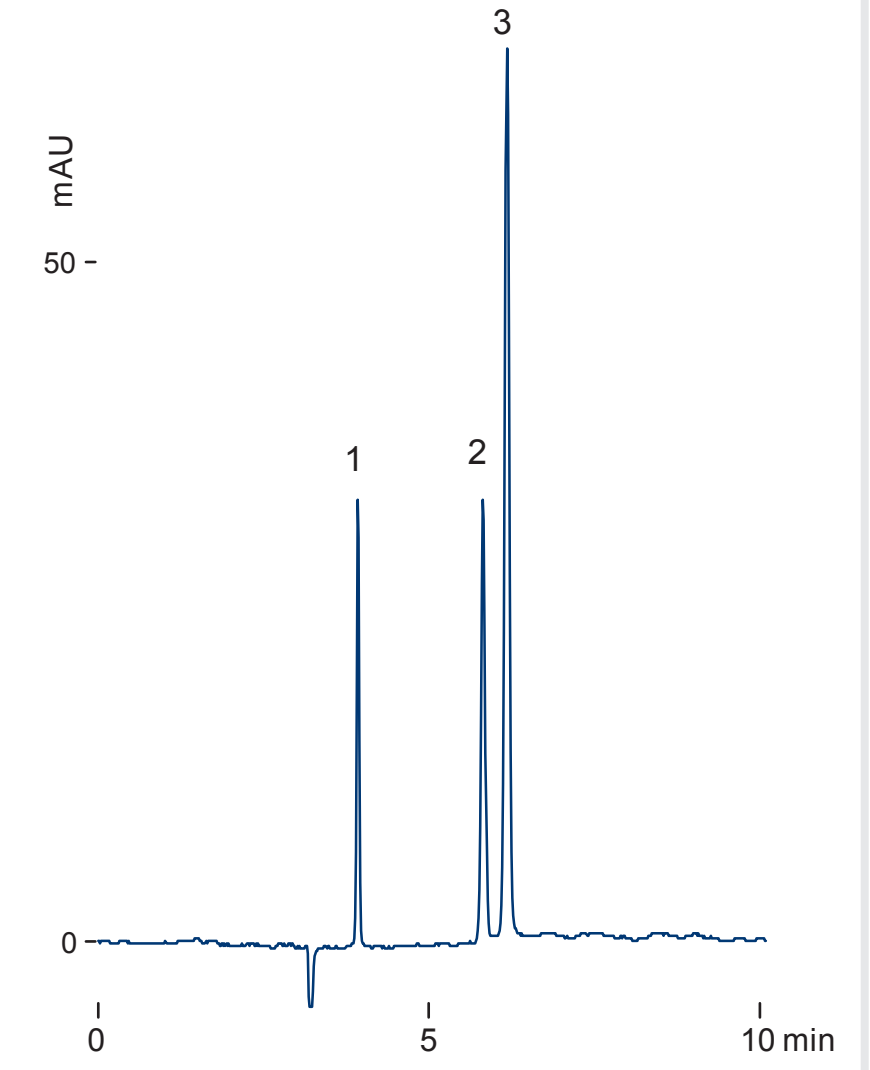


creatine phosphate

3



creatinine

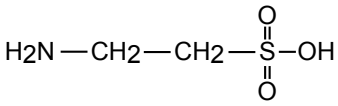


Unison UK-C18, 250 x 4.6 mm,
50mM HCOONH4 - 1mM dibutylammonium acetate,
0.8 mL/min (12MPa), 210 nm, 37 degC, 2 uL (0.1 ug)

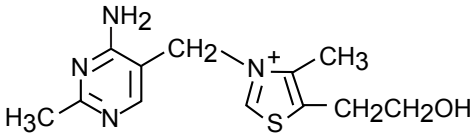
Unison UK-C18 75 x 4.6 mm Application

ELSD application - taurine and water-soluble vitamins

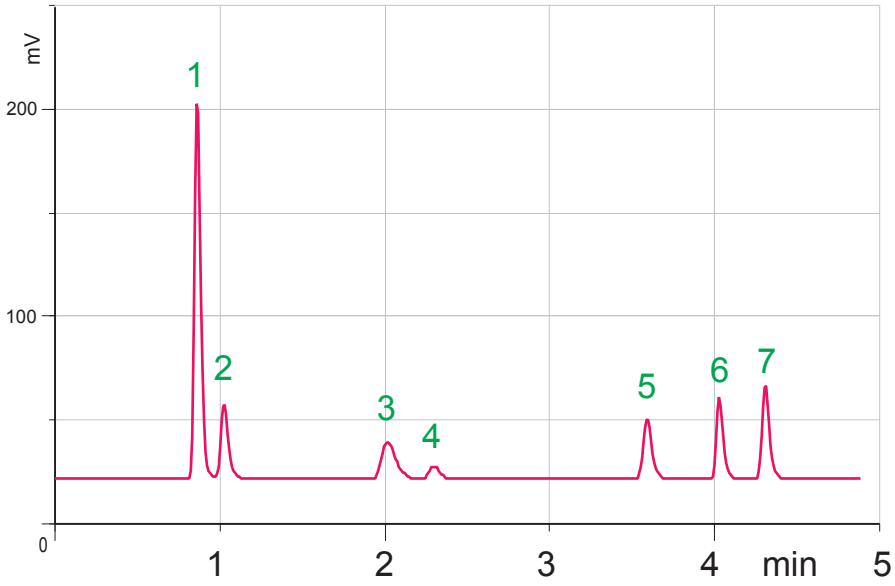
ELSD検出器によるタウリンと水溶性ビタミンの同時分析

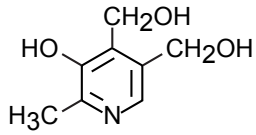


1 taurine

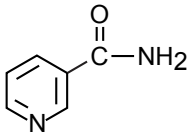


2 thiamine (B1)



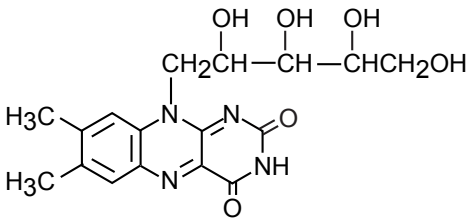


3 pyridoxine (B6)

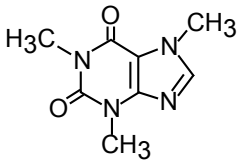


4 nicotinamide (B3)

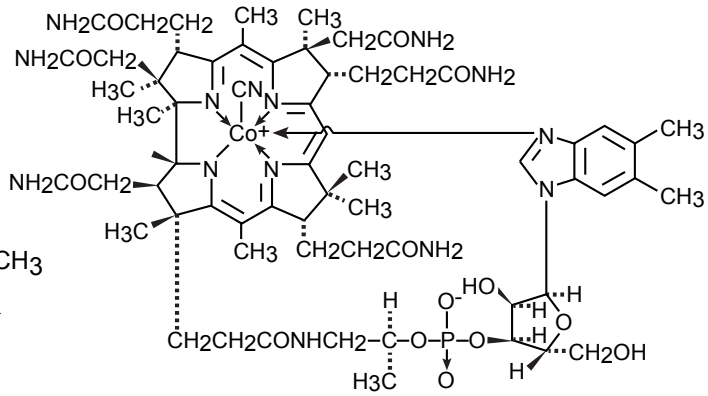
Unison UK-C18, 75 x 4.6 mm
A: 5mM HCOONH4
B: methanol
10-50%B (0-2min), 50%B (2-5min)
1 mL/min, 10uL(500ng), ELSD(SofTA)



7 riboflavin (B2)



6 caffeine



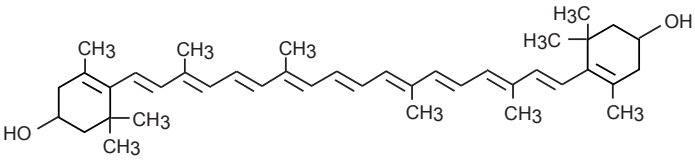
5 cyanocobalamin (B12)

Courtesy of Mr. Y.Sakai, M&S Instruments Trading Inc., Japan

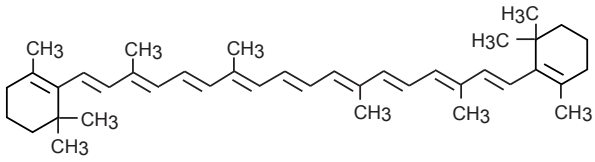
Unison UK-C18 100 x 4.6 mm Application

Chlorophyll and Carotenoid

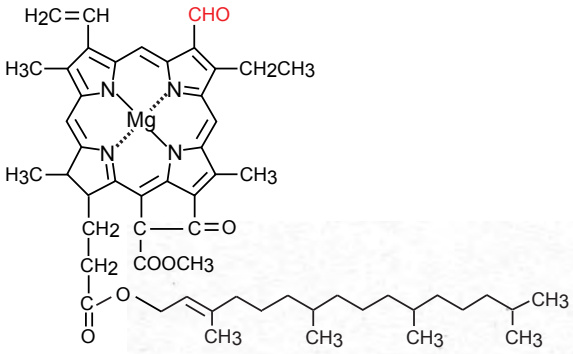
壬生菜アセトン抽出物中のクロロフィルとカロテノイド



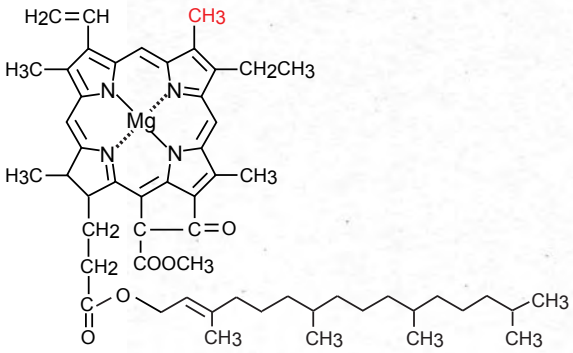
1 lutein (xanthophyll)



4 β-carotene



2 chlorophyll b



3 chlorophyll a

Unison UK-C18, 100 x 4.6 mm
A: methanol / water = 90 / 10, B: ethyl acetate
0-100%B (0-7min), 100%B (7min -), 1 mL/min, ambient, VIS 450 nm
acetone extracts from *Brassica campestris*

Courtesy of K. Nakanishi, Tokushima Prefectural Industrial Technology Center, Japan

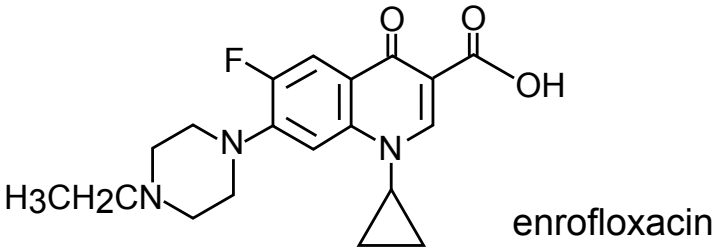
Cadenza CD-C18
Unison UK-C18
Cadenza CL-C18

75 x 3 mm

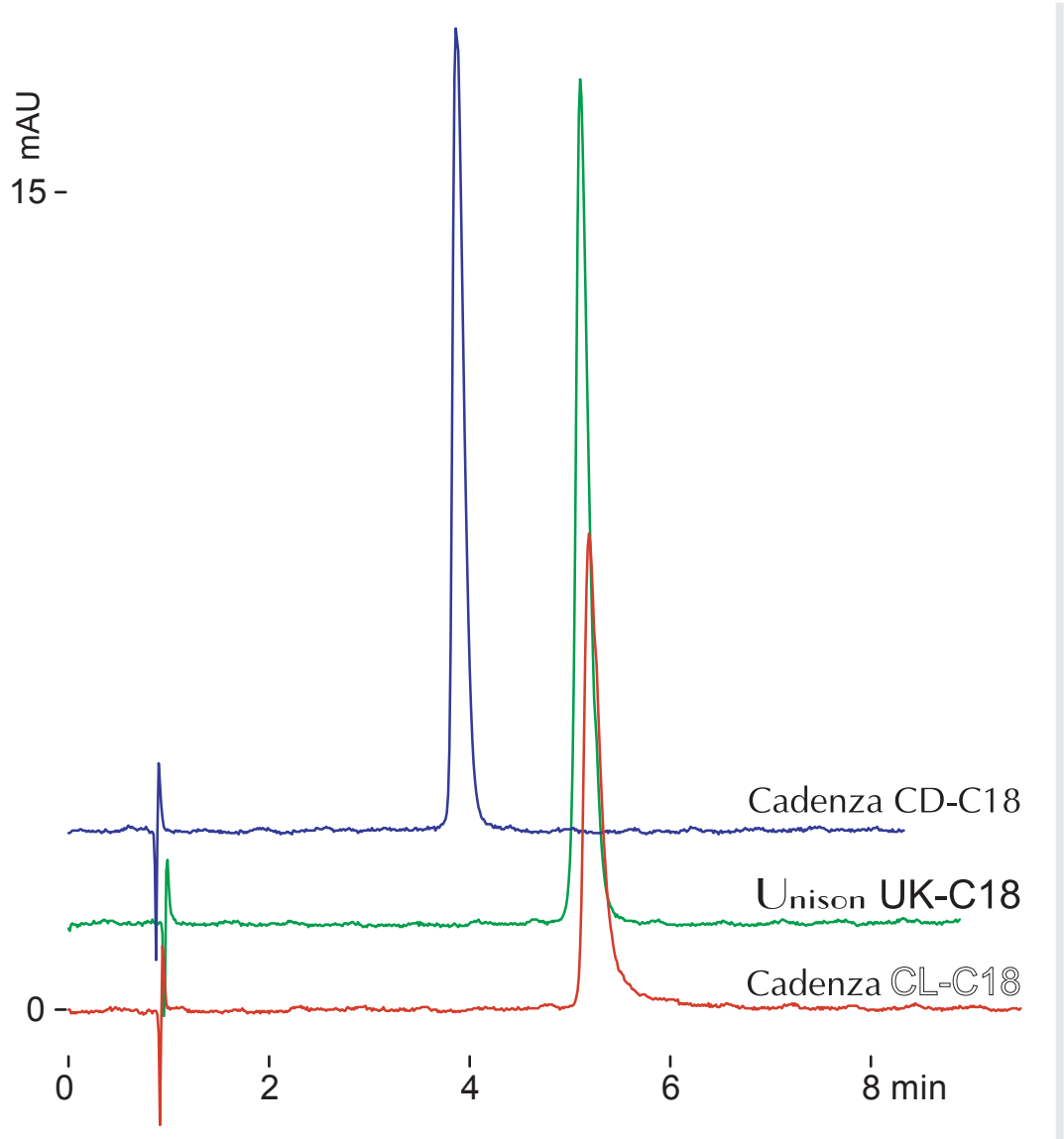
Application

Synthetic Antimicrobial (Enrofloxacin)

合成抗菌剤（エンロフロキサシン）



enrofloxacin



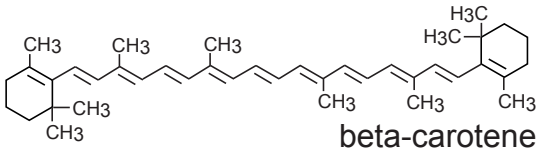
75 x 3 mm
water / ACN / HCOOH = 85 / 15 / 0.1
1mL/min, 37degC, 260nm, 1uL (0.1ug)

Unison UK-Silica 250 x 4.6 mm Application

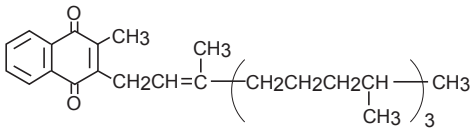
Fat-Soluble Vitamins

脂溶性ビタミン

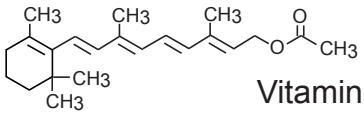
1 beta-carotene



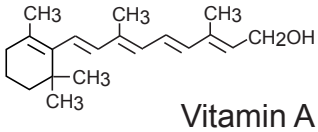
2 Vitamin K_1



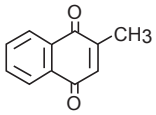
3 Vitamin A acetate



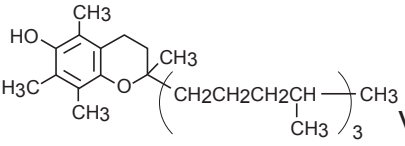
4 Vitamin A



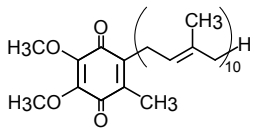
5 Vitamin K_3

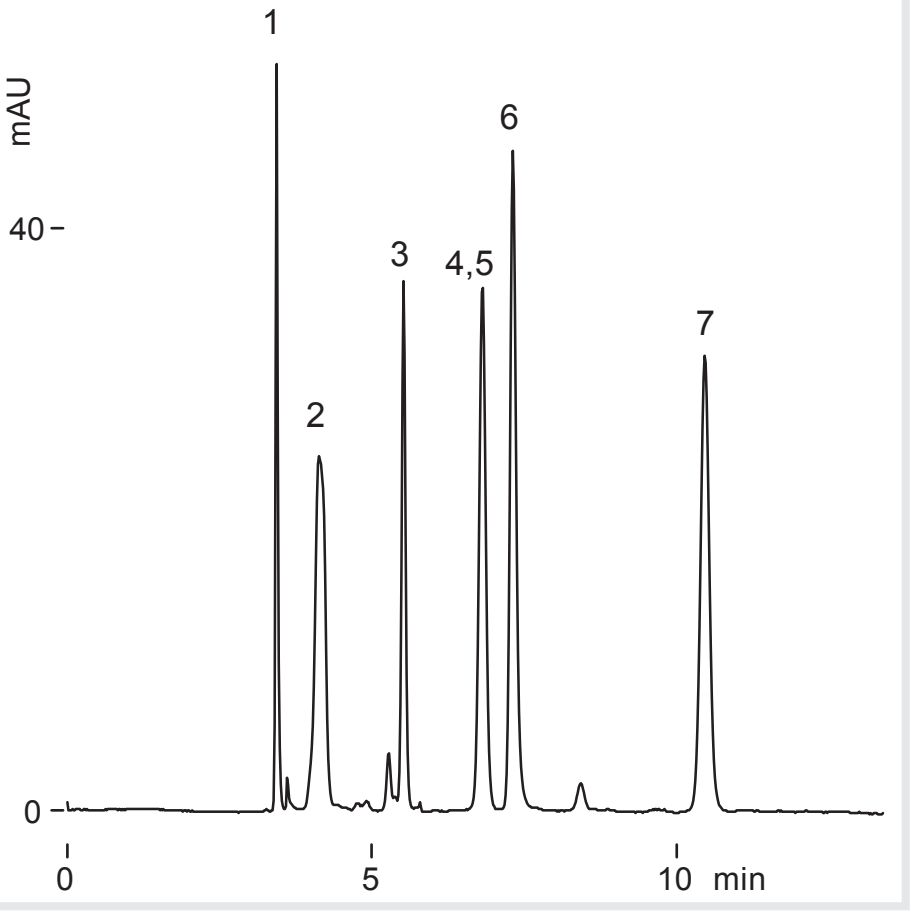


6 Vitamin E



7 coenzyme Q10





Unison UK-Silica, 250 x 4.6 mm
hexane / ethyl acetate / tetrahydrofuran = 97 / 2 / 1
1 mL/min, 37 deg.C, 280 nm, 2 uL(0.2-3ug)

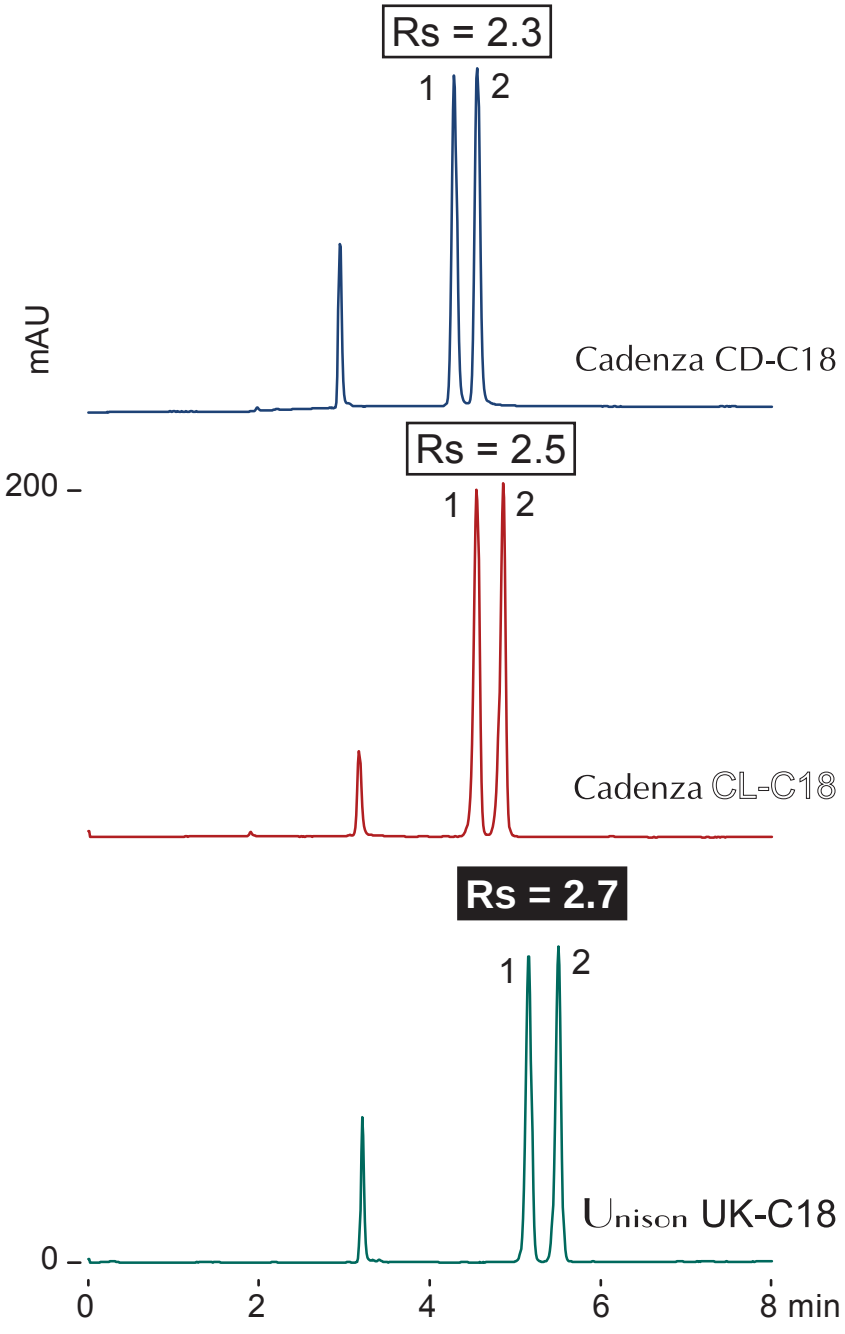
Cadenza CD-C18
Cadenza CL-C18
Unison UK-C18

250 x 4.6 mm

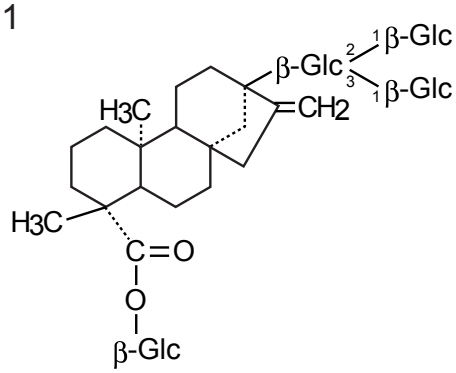
Application

Stevia Sweeteners

ステビア甘味料

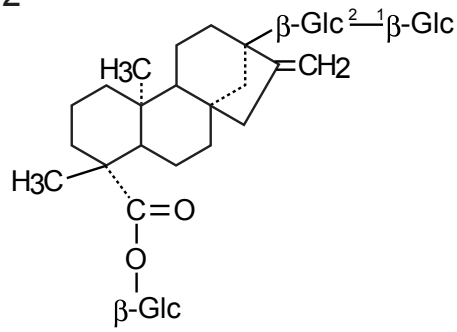


1



rebaudioside A

2



stevioside

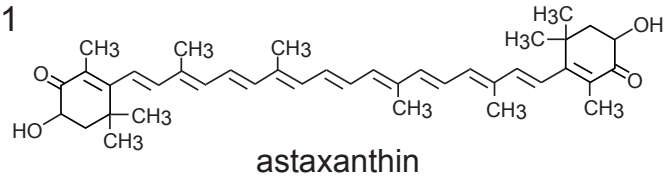
250 x 4.6 mm
water / acetonitrile = 62 / 38
0.8 mL/min (12-13MPa)
37 deg.C, 210 nm, 2 uL (4ug)

Cadenza CD-C18 150 x 4.6 mm Application

Carotinoids

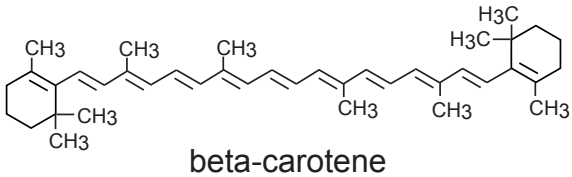
カロチノイド

1



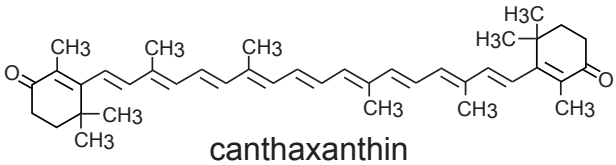
astaxanthin

3



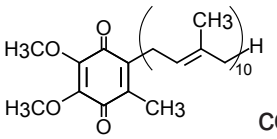
beta-carotene

2

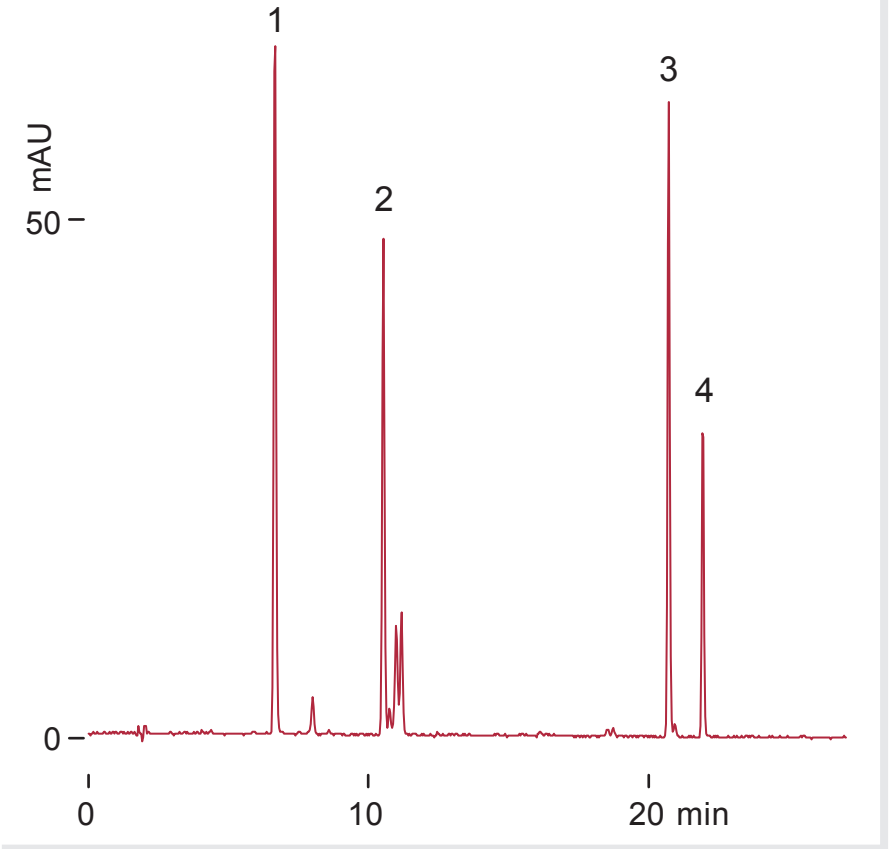


canthaxanthin

4



coenzyme Q10



Cadenza CD-C18, 150 x 4.6 mm
A: water / methanol = 50 / 50, B: tetrahydrofuran
40 - 80 %B (0-25min), 0.8 mL/min,
37 deg.C, 470 nm, 5uL (0.1-20 ug)

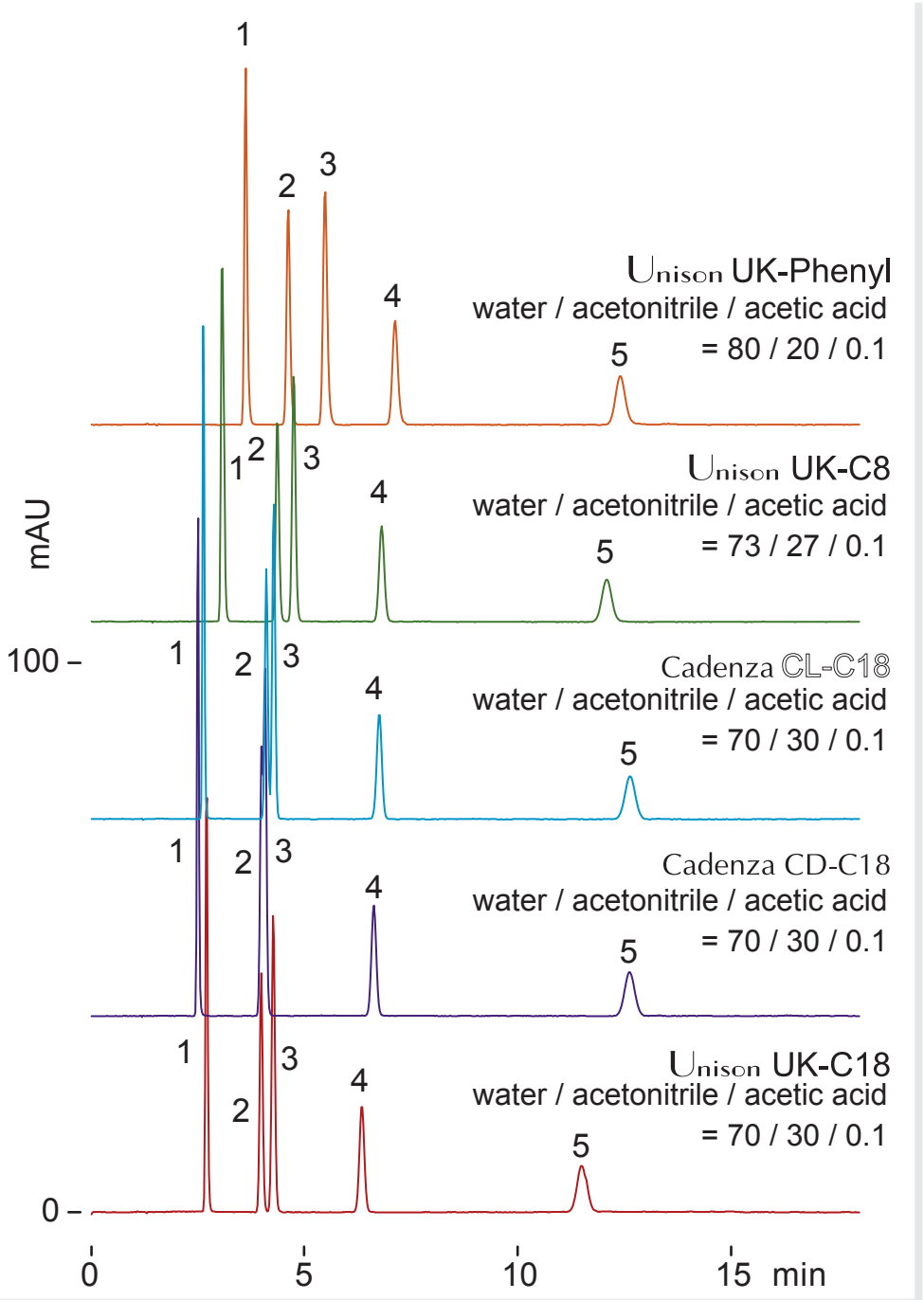
Unison UK-Phenyl
Unison UK-C8
Cadenza CL-C18
Cadenza CD-C18
Unison UK-C18

100 x 4.6 mm

Application

Vanillin and Guaiacol Derivatives

バニリン，グアヤコール誘導体



1 vanillin

2 guaiacol

3 ethylvanillin

4 4-methylguaiacol

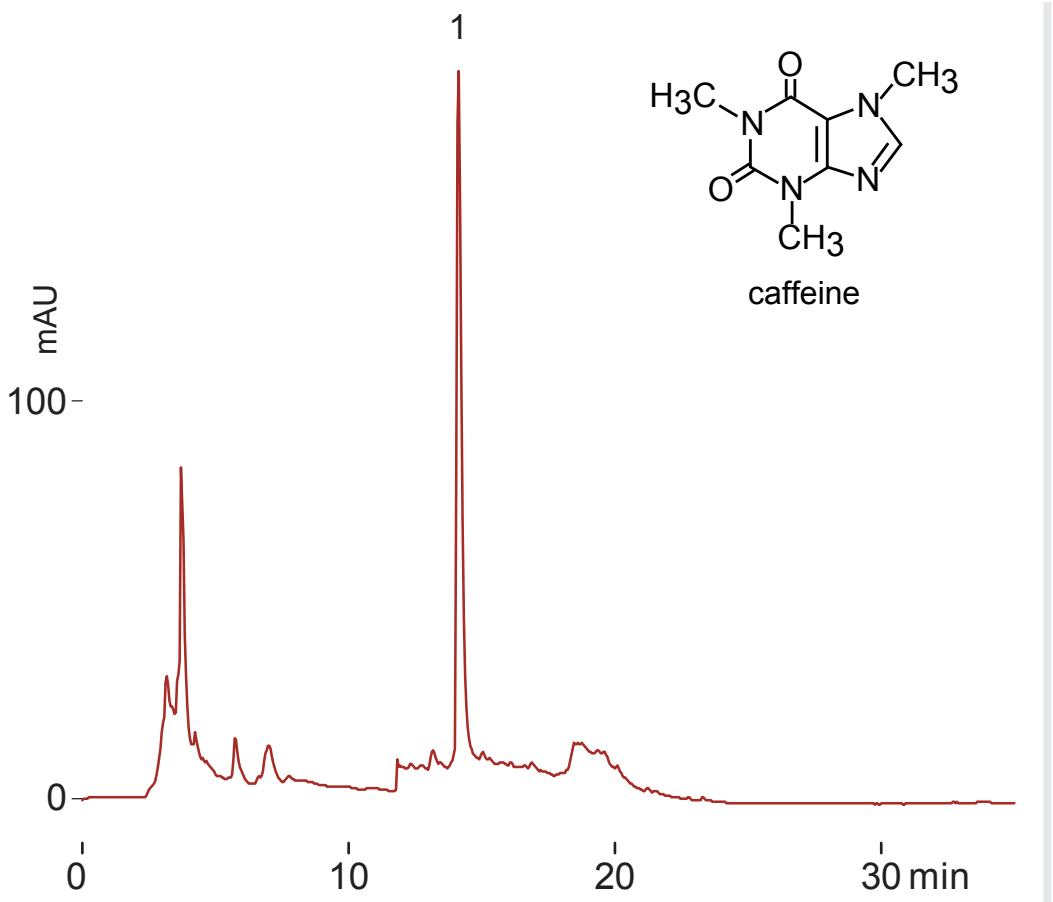
5 4-ethylguaiacol

100 x 4.6 mm, 1 mL/min, 37 degC, 260 nm, 2 uL (0.4-1ug)

Cadenza **HS-C18** 250 x 3 mm Application

Caffeine in the Caffe Latte

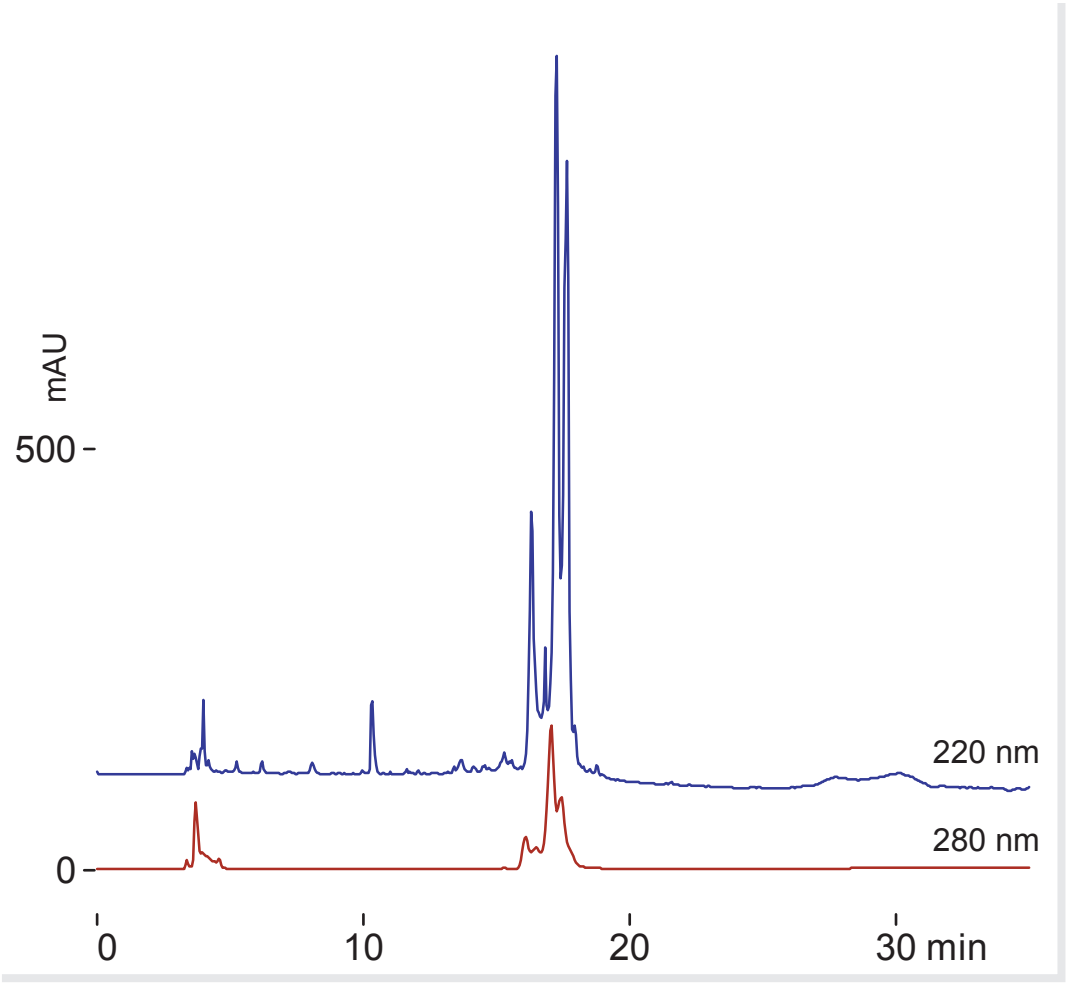
カフェラテ中のカフェイン



Cadenza HS-C18, 250 x 3 mm
A: 100mM ammonium acetate
B: acetonitrile
0-90%B(0-25min), 90%B(25-30min)
0.3 mL/min (15MPa), 37 deg.C
260 nm, 2 uL

Intrada WP-RP 250 x 3 mm Application

Bovine Milk
牛乳



Intrada WP-RP, 250 x 3 mm
A: water /trifluoroacetic acid = 100 /0.1,
B: acetonitrile /trifluoroacetic acid =100 /0.05
0-100%B (0-25min), 100%B(25-30min)
0.4 mL/min (12MPa), 37 deg.C, 5uL

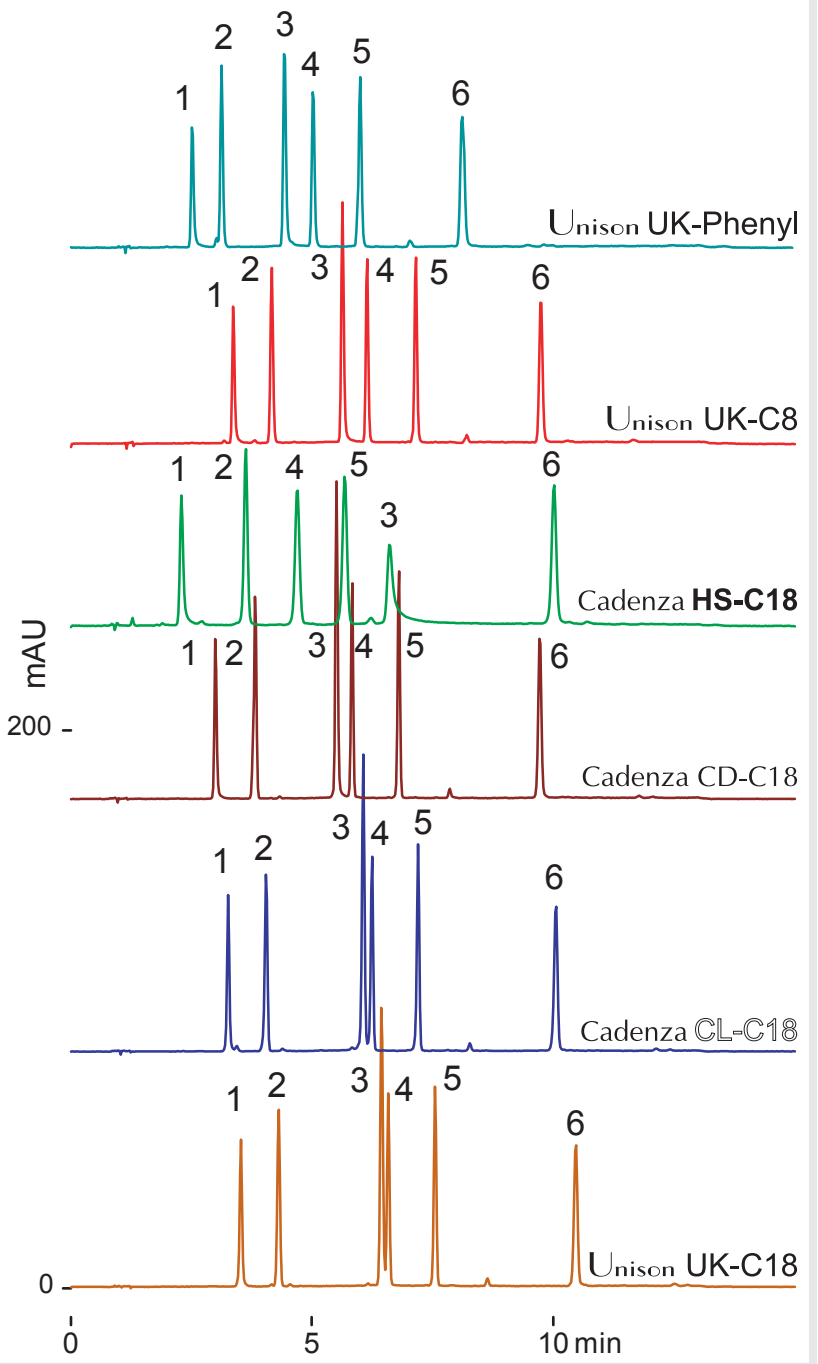
Cadenza CD-C18 Unison UK-Phenyl
Cadenza CL-C18 Unison UK-C8
Unison UK-C18 Cadenza **HS-C18**

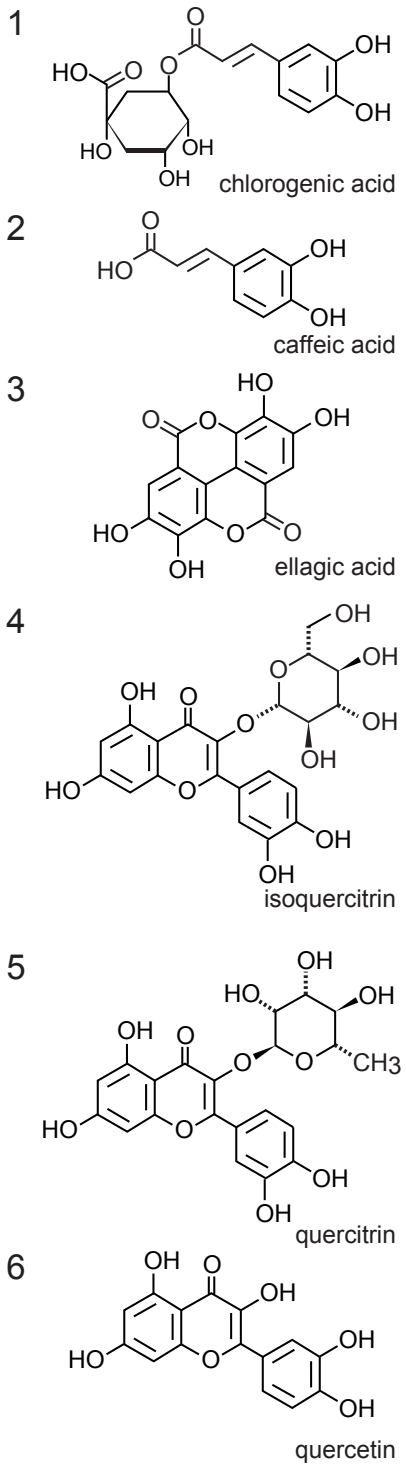
75 x 4.6 mm

Application

Polyphenol, Berry

ベリー類のポリフェノール



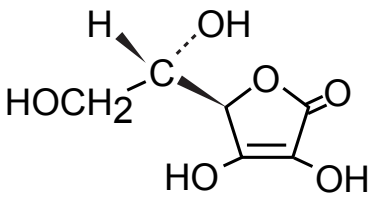


75 x 4.6 mm
A: water /trifluoroacetic acid = 100 /0.1
B: acetonitrile /trifluoroacetic acid = 100 /0.1
10-40%B (0-12min), 1 mL/min
37 deg.C, 260 nm, 2uL (0.1-0.8ug)

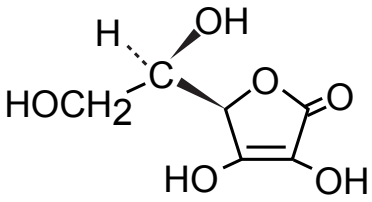
Unison UK-Amino 250 x 2 mm 150 x 2 mm Application

Ascorbic Acid and Erythorbic Acid

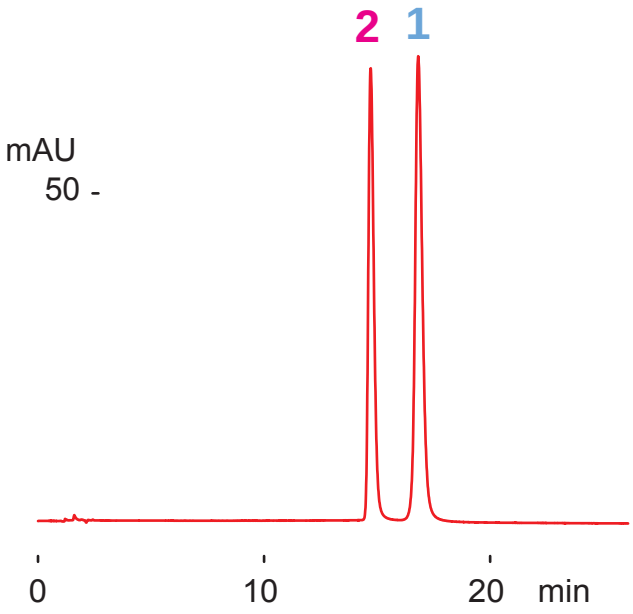
アスコルビン酸とエリソルビン酸



1 L-ascorbic acid (Vitamin C)

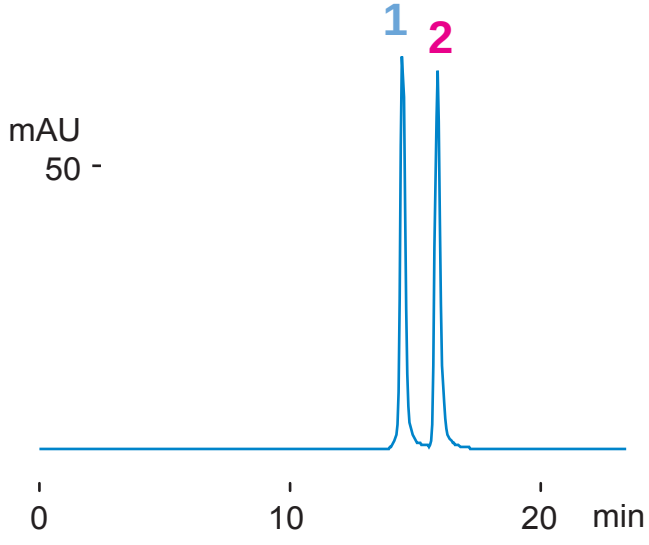


2 isoascorbic acid (erythorbic acid)



normal phase

Unison UK-Amino
150 x 2 mm
acetonitrile /water /acetic acid = 80 / 20 / 2
0.2mL/min (5MPa),
37deg.C, 260nm,
1uL(1.3ug)



anion exchange

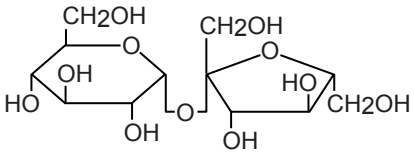
Unison UK-Amino
250 x 2 mm
water /acetic acid = 100 /0.5
0.2mL/min (14MPa),
37deg.C, 260nm,
0.2uL(0.5ug)

Unison UK-Amino 250 x 4.6 mm Application

Sucrose and Lactose in Cafe au Lait

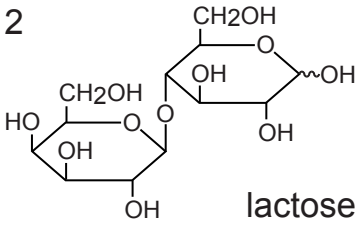
カフェオレ中のショ糖と乳糖

1

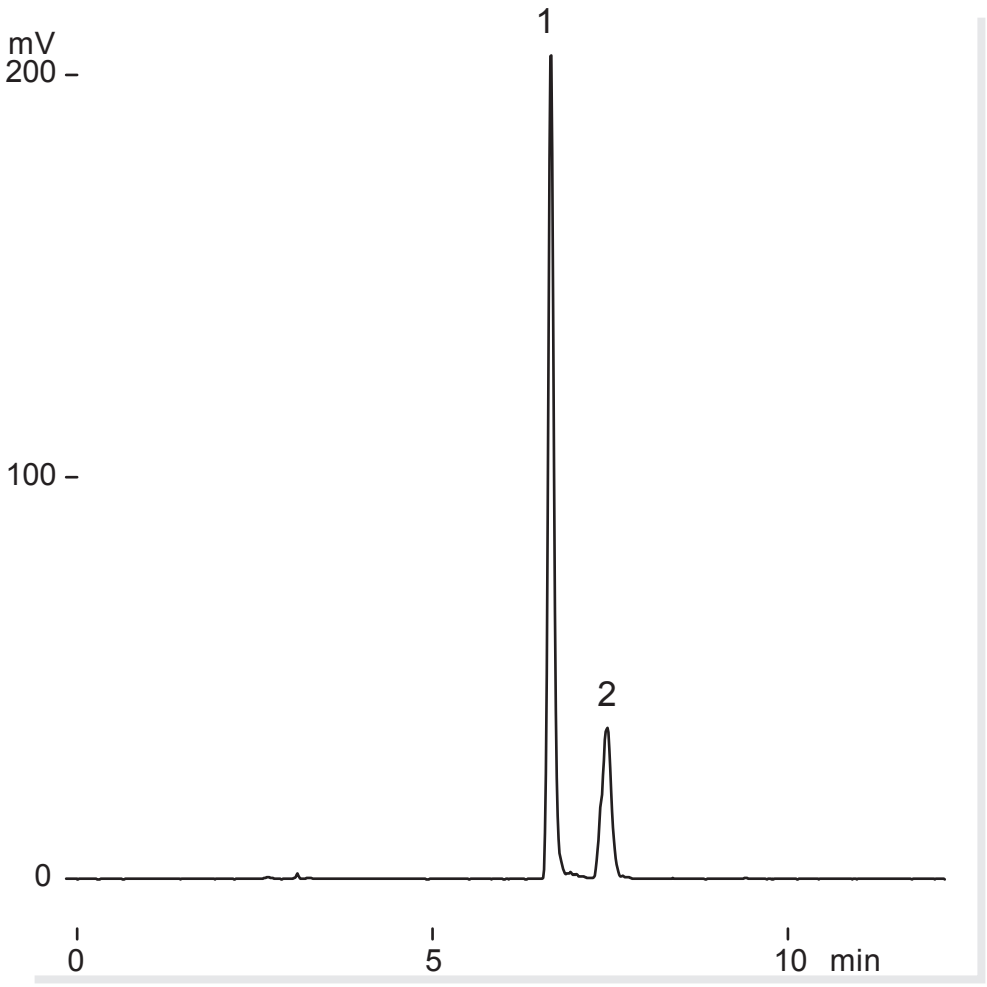


sucrose

2



lactose



Unison UK-Amino, 250 x 4.6 mm
acetonitrile / water = 75 / 25
1 mL/min (11 MPa), 37 deg.C
ELSD, 0.5 uL

Unison UK-Amino 250 x 3 mm Application

Mono-, Disaccharides and Sugar alcohols

単糖，二糖と糖アルコール

1 meso-erythritol

2 xylitol

3 D-fructose

4 D-sorbitol

5 D-galactose

6 D-glucose

7 sucrose

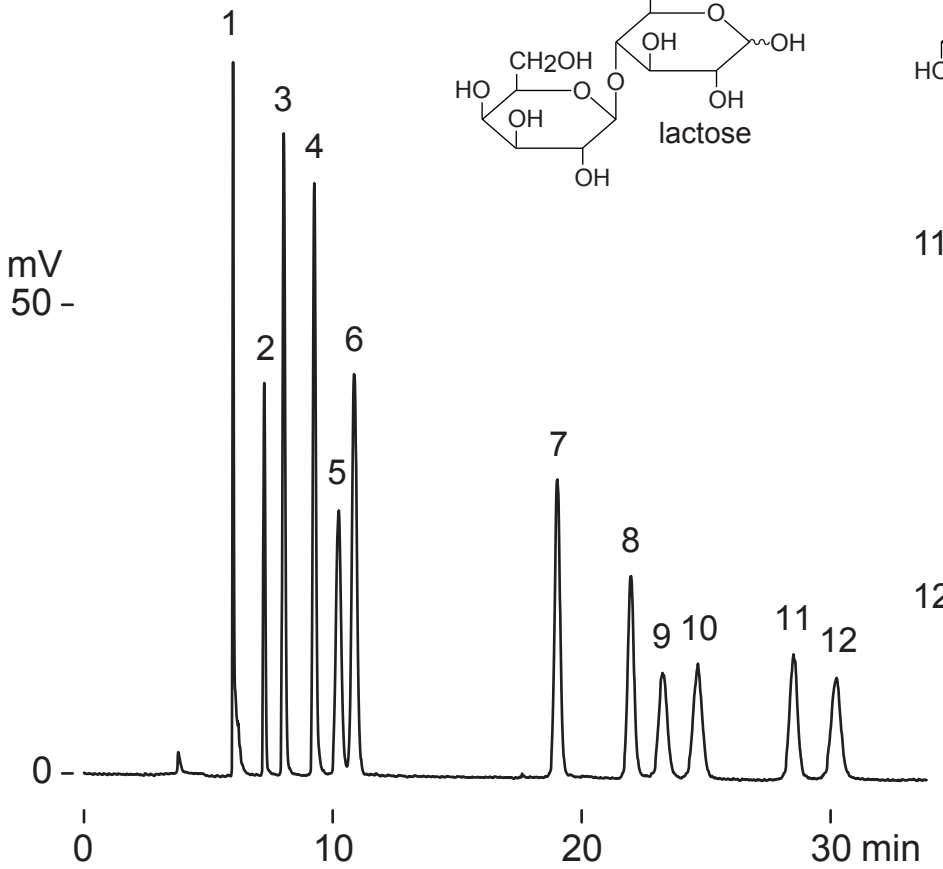
8 maltitol

9 lactose

10 maltose

11 trehalose

12 isomaltose



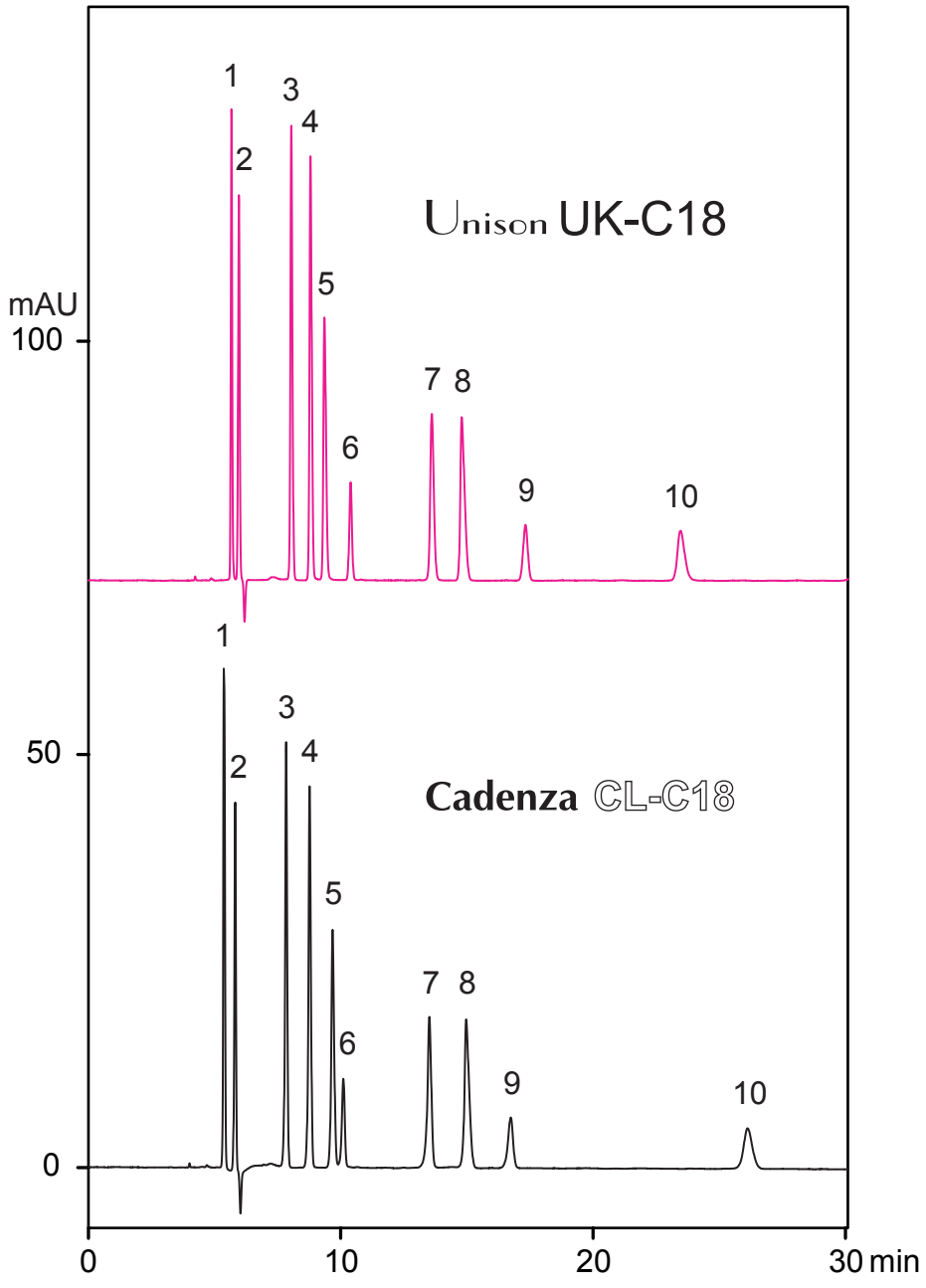
Unison UK-Amino, 250 x 3 mm
acetonitrile /water = 88 /12, 0.4 mL/min (5.3MPa), 60 deg.C, ELSD, 1.5 uL (0.8-4.6ug)

Unison UK-C18
Cadenza CL-C18

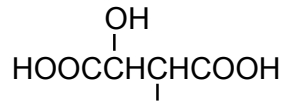
250 x 4.6 mm

Application

Organic Acids
有機酸



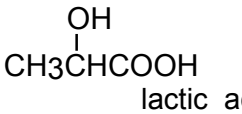
1 tartaric acid



2 HCOOH formic acid

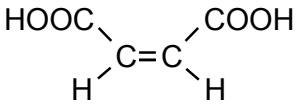
3 $HOOCCH_2COOH$ malonic acid

4 lactic acid

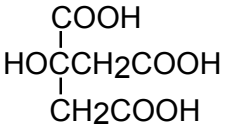


5 CH_3COOH acetic acid

6 maleic acid

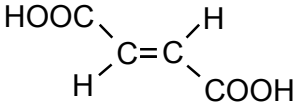


7 citric acid



8 $HOOC(CH_2)_2COOH$ succinic acid

9 fumaric acid



10 CH_3CH_2COOH propionic acid

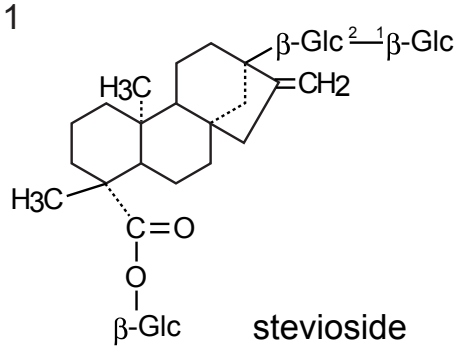
250 x 4.6 mm
water / trifluoroacetic acid = 100 / 0.1
0.6 mL/min, 37 deg.C, 210 nm, 1.4uL (0.01-7ug)

Unison UK-Amino 150 x 2 mm Application

Stevia Sweeteners

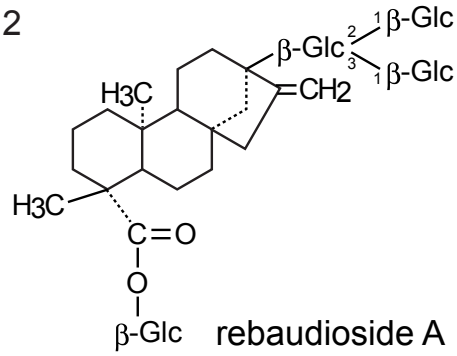
ステビア甘味料

1

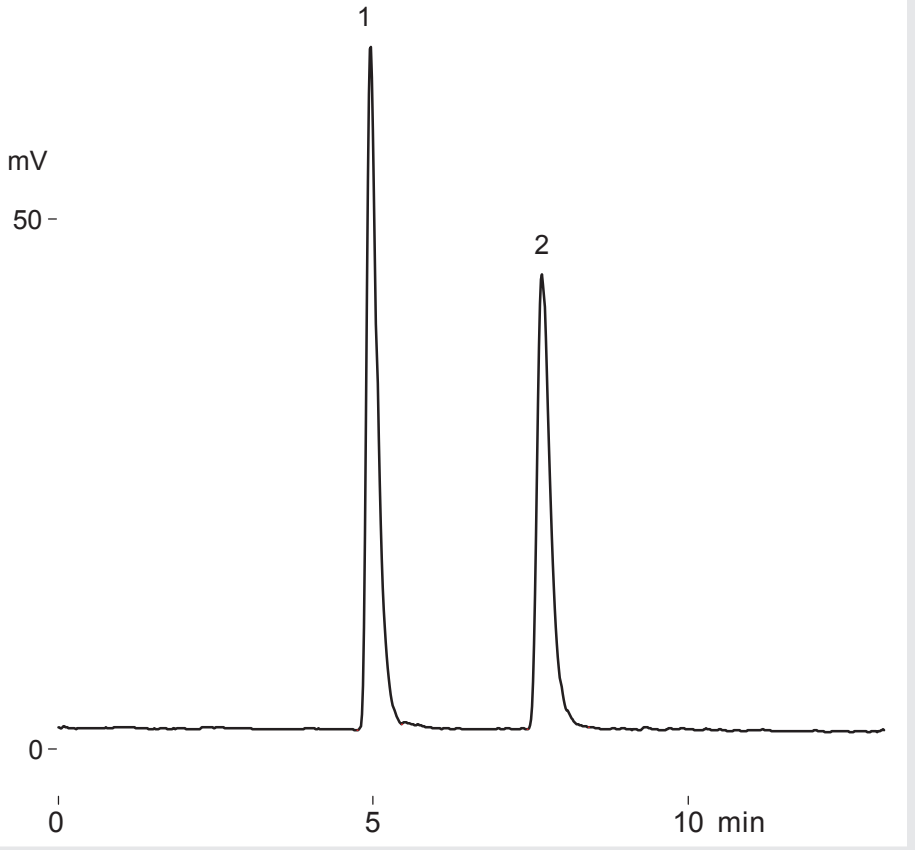


stevioside

2



rebaudioside A

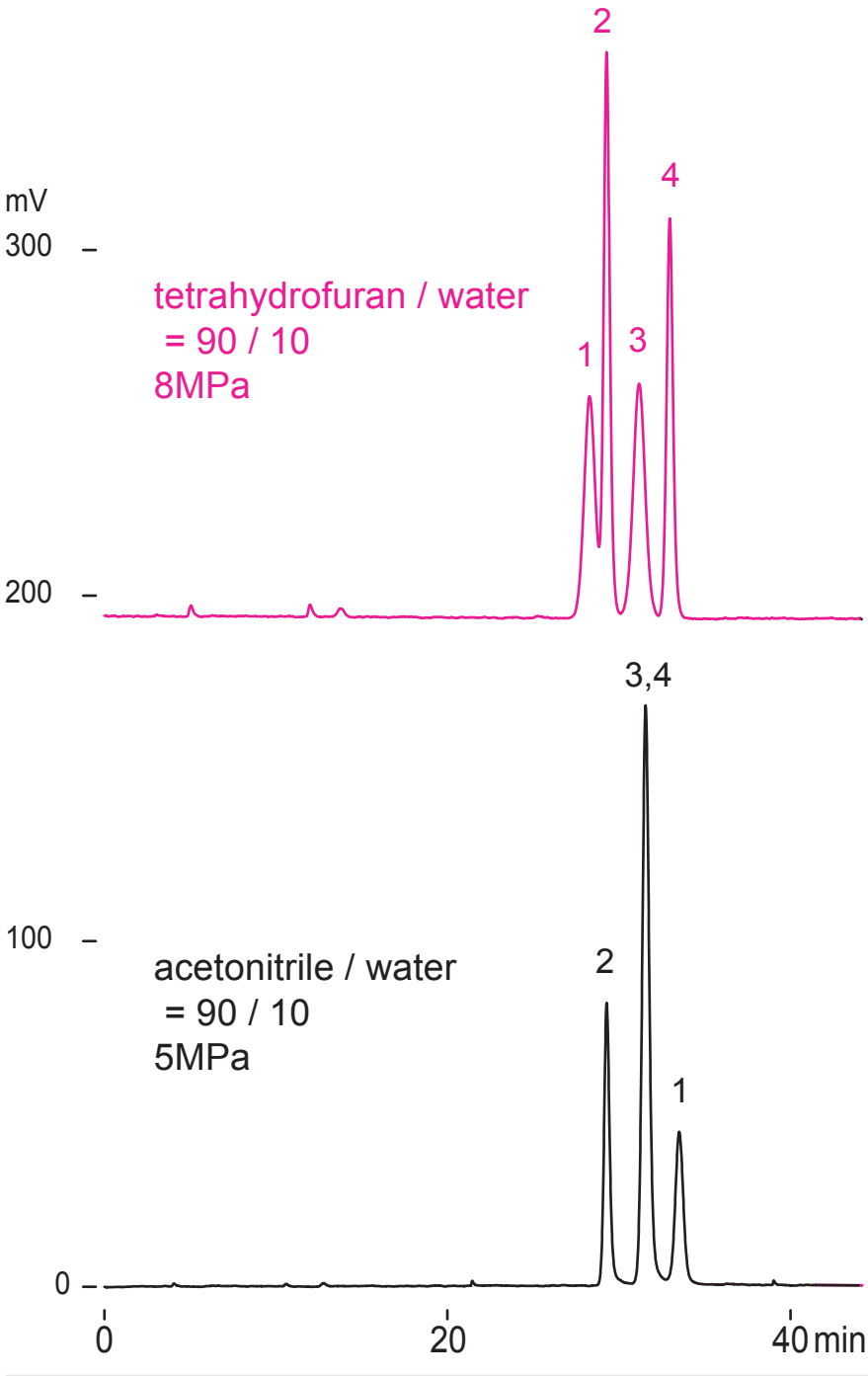


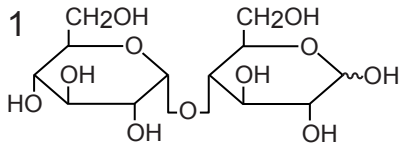
Unison UK-Amino, 150 x 2 mm
acetonitrile / water = 85 / 15
0.2 mL/min (4MPa), 37 deg.C
ELSD, 1 uL(2ug)

Unison UK-Amino 250 x 3 mm Application

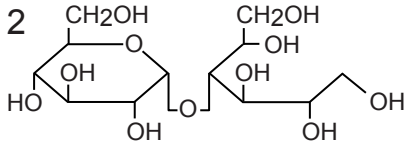
Maltose, Maltitol, Cellobiose, Cellobiitol

マルトース, マルチトール, セロビオース, セロビトール

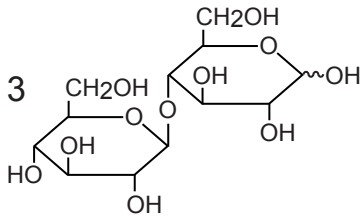




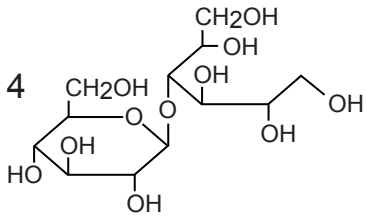
maltose



maltitol



cellobiose



cellobiitol

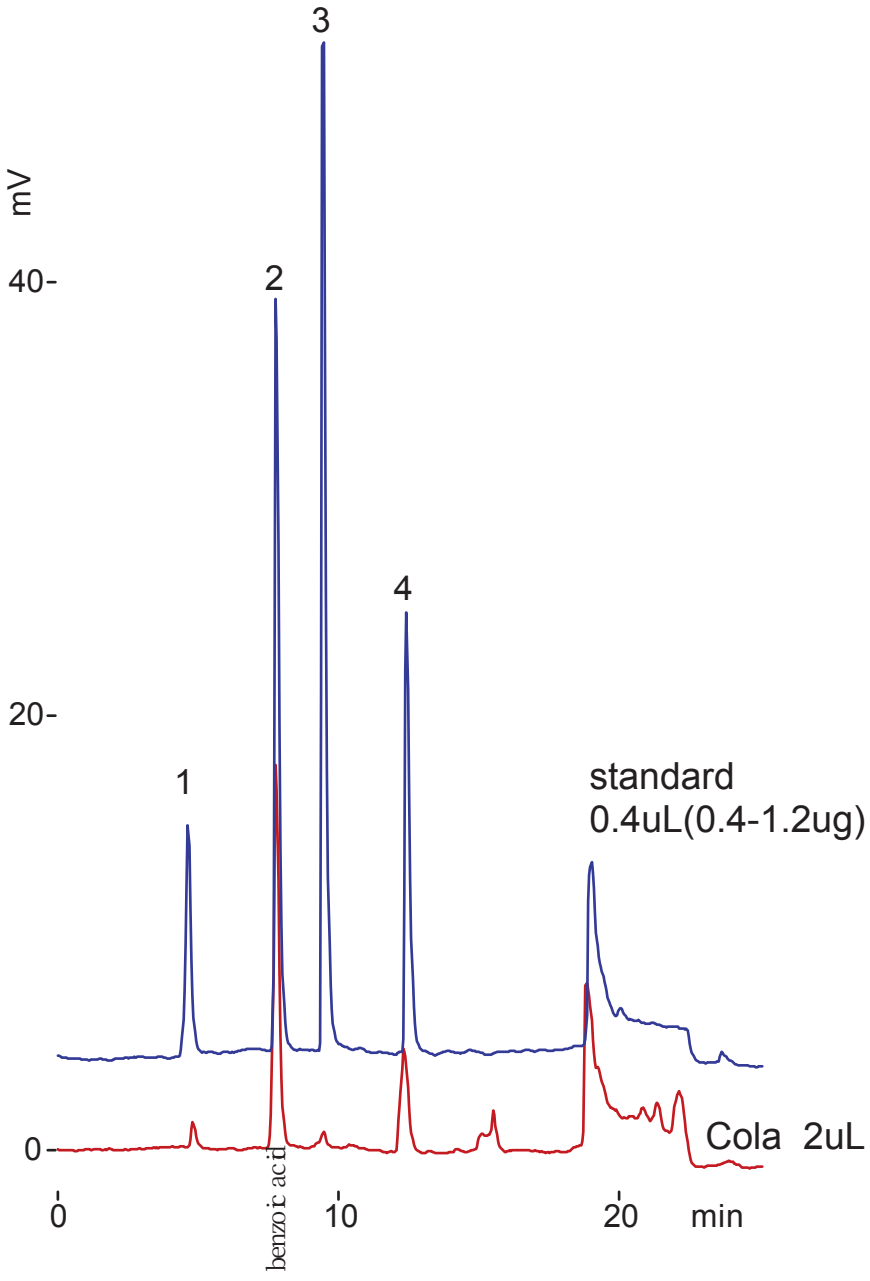
Unison UK-Amino, 250 x 3 mm
0.4 mL/min , 60 deg.C, ELSD, 0.8uL (2ug)

Courtesy of M.SUZUKI,Ph.D, NIKKEN FINE CHEMICALS CO.,LTD, JAPAN

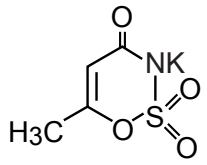
Unison UK-Amino 250 x 3 mm Application

Low-calorie Sweeteners in Cola Drink

コーラ飲料中の低カロリー甘味料

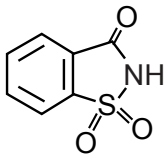


1



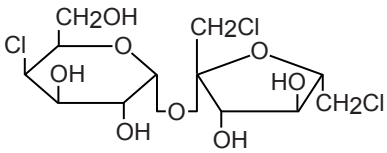
acesulfame K

2



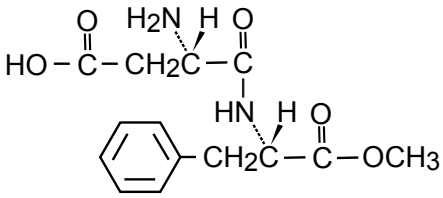
saccharin

3



sucralose

4



aspartame

Unison UK-Amino, 250 x 3 mm
A: acetonitrile, B: 50mM TFA-ammonium
2-30%B(0-15min), 90%B(15-18min), 90-2%B(18-20min)
0.4 mL/min (5MPa), 37 deg.C, ELSD

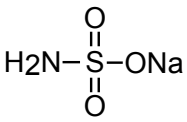
Unison UK-Amino
Unison UK-C18

50 x 3 mm

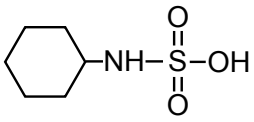
Application

Sulfamic acid, Cyclamic acid

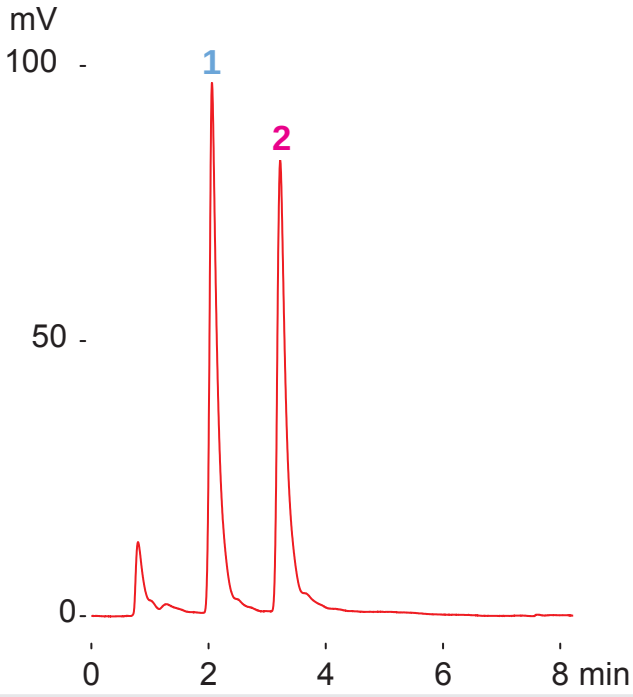
スルファミン酸，サイクラミン酸



1 sodium sulfamate
(aminosulfonic acid sodium salt)

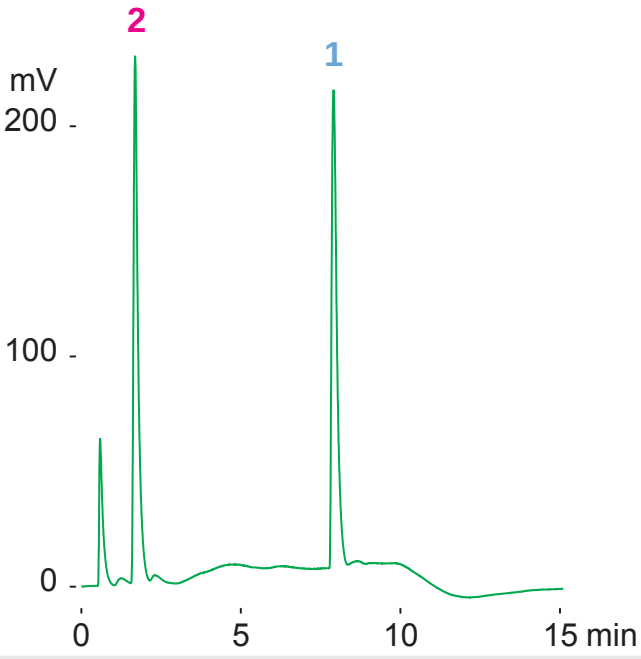


2 cyclamic acid
(N-cyclohexylsulfamic acid)



normal phase

Unison UK-Amino, 50 x 3 mm
acetonitrile /
10mM dibutylammonium acetate
= 60 / 40
0.4mL/min (3MPa), 37deg.C, ELSD
0.3uL (0.8ug)



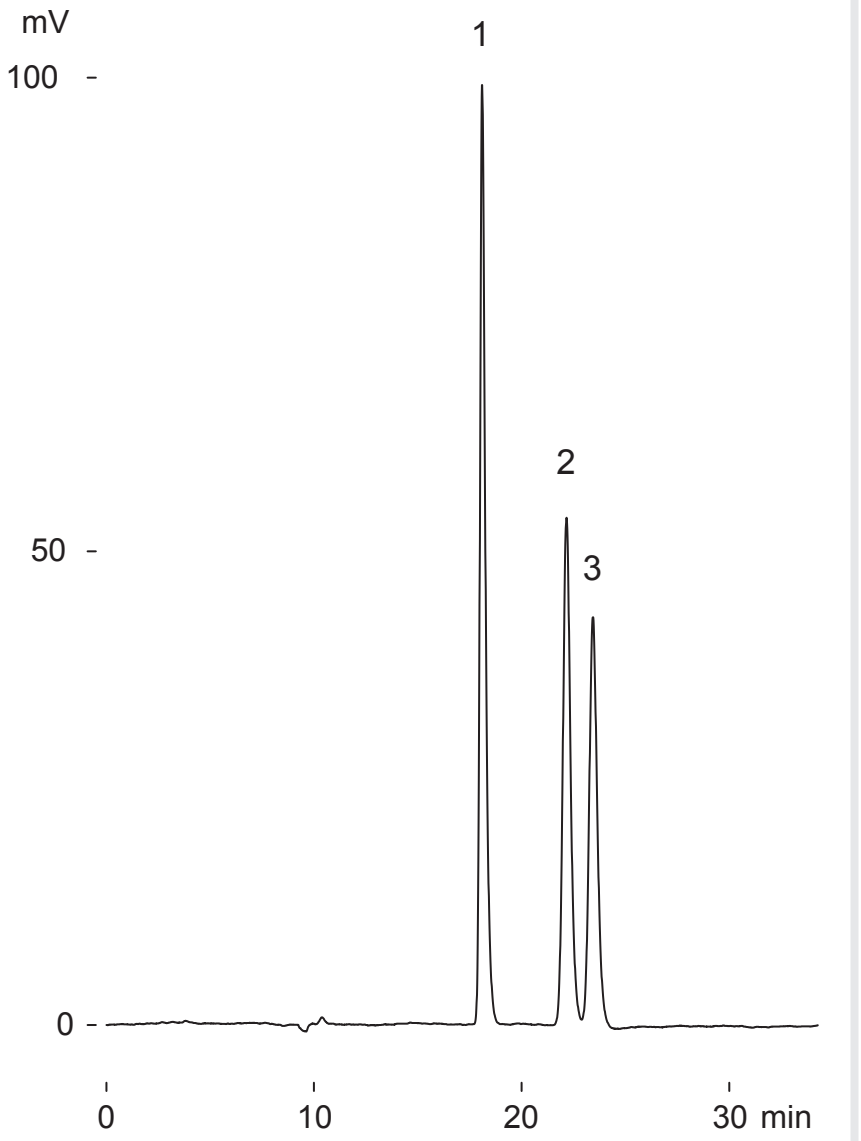
reversed phase

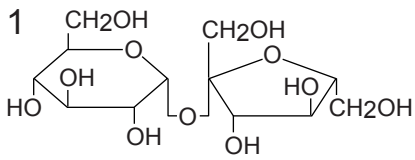
Unison UK-C18, 50 x 3 mm
A: 10mM dibutylammonium acetate
B: acetonitrile
3%B(0-0.5min), 3-25%B(3-8.5min)
0.4mL/min (4MPa), 37deg.C, ELSD
1uL (2.5ug)

Unison UK-Amino 250 x 4.6 mm Application

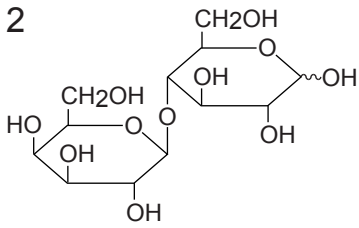
Sucrose, Lactose, Maltose

スクロース, ラクトース, マルトース

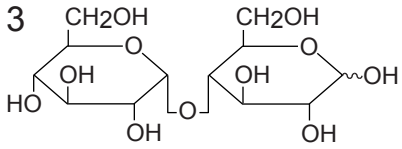




sucrose



lactose



maltose

Unison UK-Amino, 250 x 4.6 mm
acetonitrile / water = 87 / 13,
1 mL/min (6MPa), 60 deg.C, ELSD
2 uL (7ug)

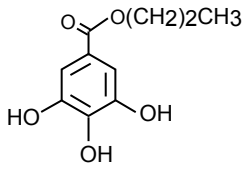
Cadenza CD-C18 50 x 2 mm
Cadenza 5CD-C18 150 x 4.6 mm

Application

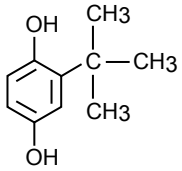
Antioxidants

酸化防止剤

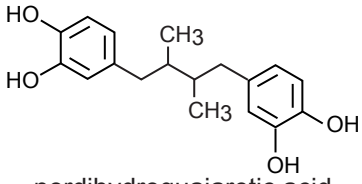
1 n-propyl gallate



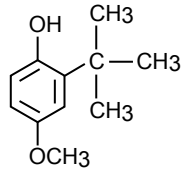
2 butylhydroquinone



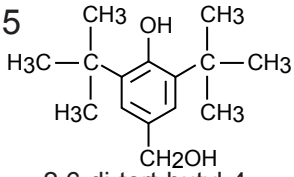
3 nordihydroguaiaretic acid



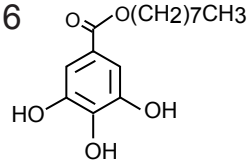
4 4-hydroxy-3-t-butylanisole



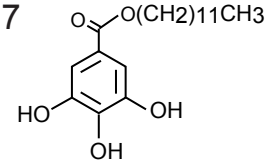
5 2,6-di-tert-butyl-4-hydroxymethylphenol



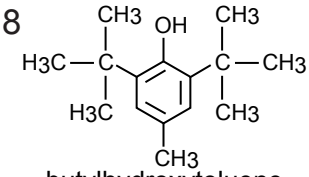
6 n-octyl gallate

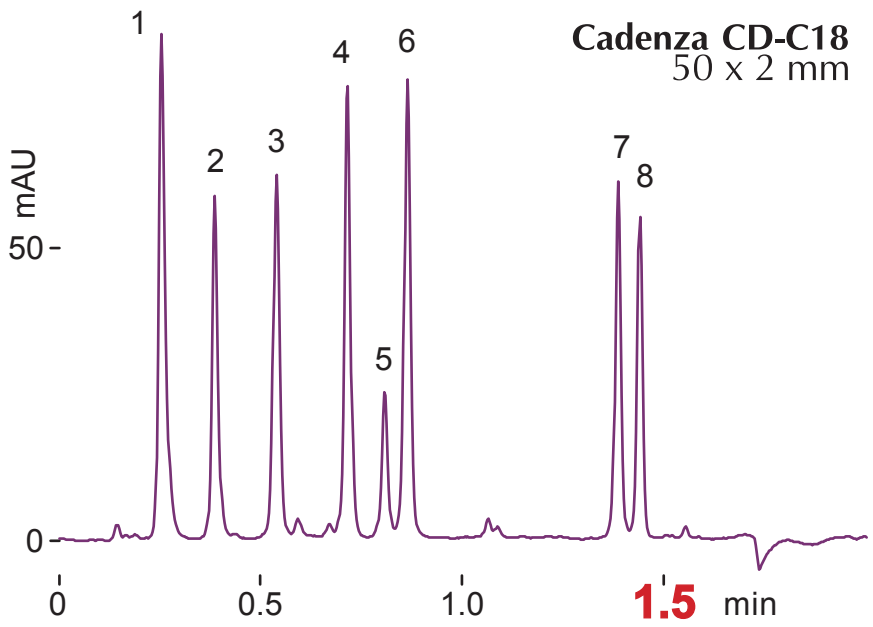


7 n-dodecyl gallate

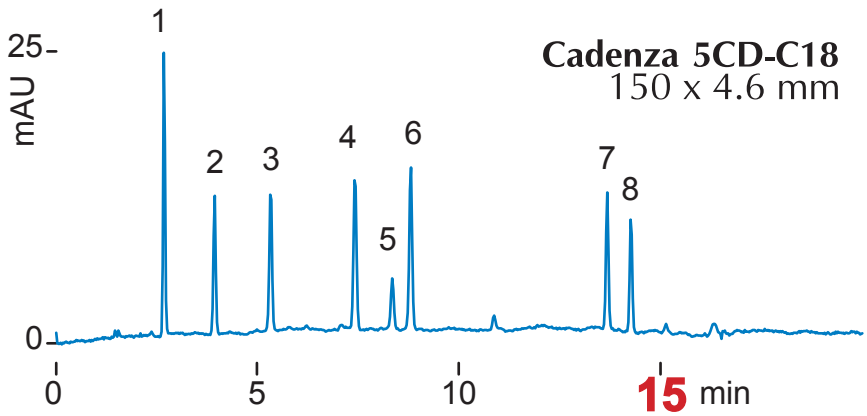


8 butylhydroxytoluene





Cadenza CD-C18
50 x 2 mm
A: water / MeOH / TFA
= 70 / 30 / 0.1
B: ACN / TFA = 100 / 0.1
30-60 %B (0-0.8min)
60-100 %B (0.8-1.5min)
0.8 mL/min (17MPa)
37 deg.C, 280 nm
1 uL (0.1-0.2ug)

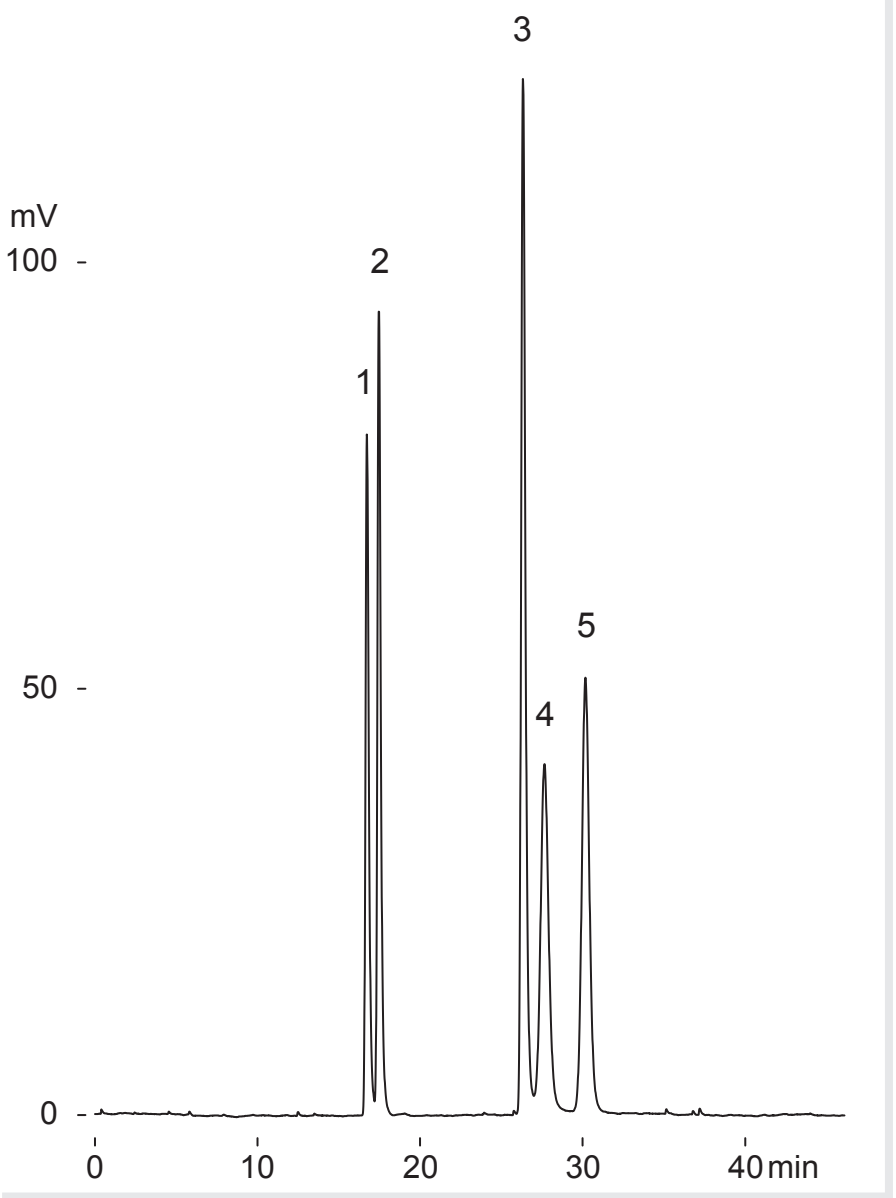


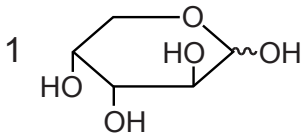
Cadenza 5CD-C18
150 x 4.6 mm
A: water / MeOH / TFA
= 70 / 30 / 0.1
B: ACN / TFA = 100 / 0.1
30-60 %B (0-8min)
60-100 %B (8-15min)
1 mL/min (6 MPa)
37 deg.C, 280 nm
1 uL (0.1-0.2ug)

Unison UK-Amino (250 x 3 mm) x 2 Application

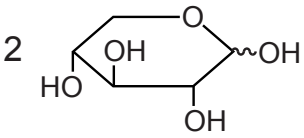
Arabinose, Xylose, Mannose, Galactose, Glucose

アラビノース, キシロース, マンノース, ガラクトース, グルコース

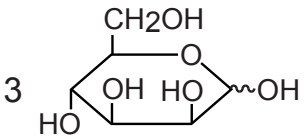




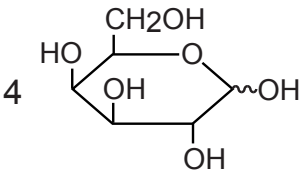
D-arabinose



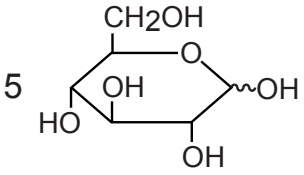
D-xylose



D-mannose



D-galactose



D-glucose

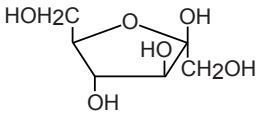
Unison UK-Amino, (250 x 3 mm) x 2
acetonitrile /water = 91 /9
0.4 mL/min(10MPa), 55 deg.C, ELSD
1.6 uL (3ug)

Unison UK-Amino (250 x 3 mm) x 2 Application

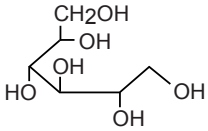
Mono-, Disaccharides and Sugar alcohols(2)

単糖，二糖と糖アルコール(2)

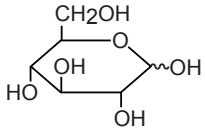
1 D-fructose



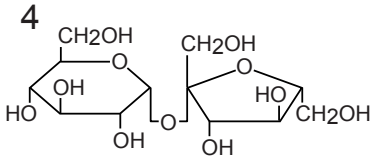
2 D-sorbitol



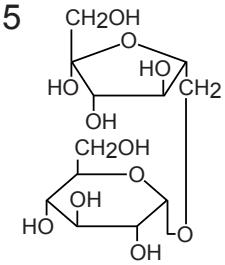
3 D-glucose



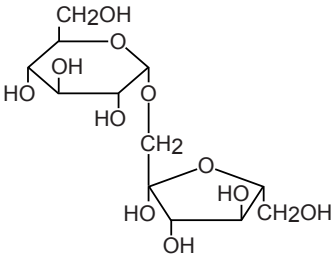
4 sucrose



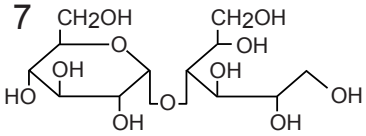
5 palatinose

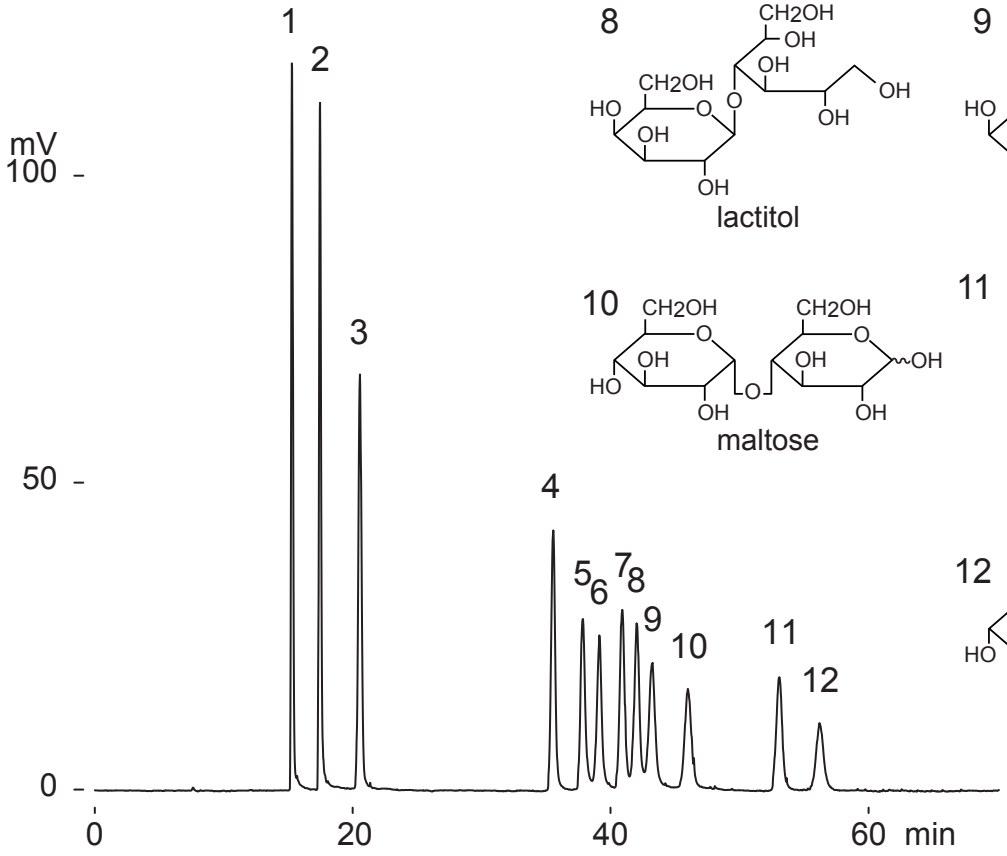


6 trehalulose



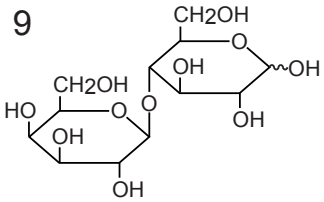
7 maltitol





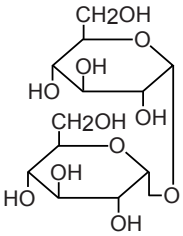
8 lactitol

9 lactose

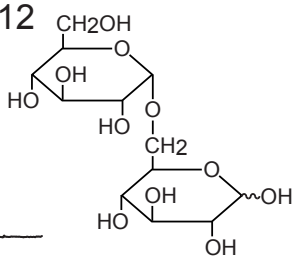


10 maltose

11 trehalose



12 isomaltose

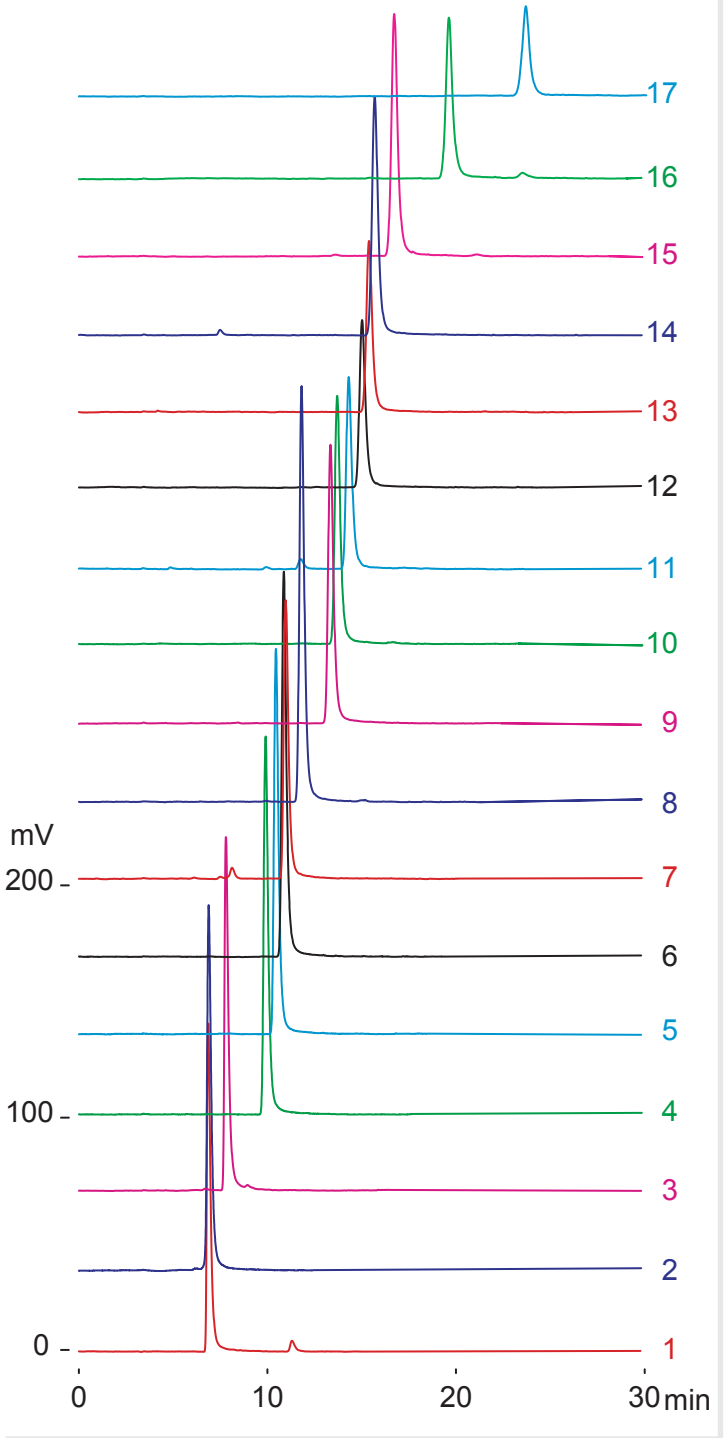


Unison UK-Amino, (250 x 3 mm) x 2
acetonitrile /water = 88 /12, 0.4 mL/min (10MPa), 62 deg.C, ELSD, 2 uL (1.7ug)

Unison UK-Amino 250 x 3 mm Application

Fructooligosaccharides

フラクトオリゴ糖



1 Glcα1-2Xylα1-2Fru
2-alpha-D-glucopyranosyl fructosylxyloside

2 Fruβ2-6Glc
6-beta-D-fructopyranosyl glucose

3 Glcα1-2Glcα1-6Fru
2^G-alpha-D-glucopyranosyl platinose

4 Glcα1-2Glcα1-2Fruβ1-2Fru
2-alpha-D-glucopyranosyl isokestose

5 Galβ1-4Glcα1-2Fruβ1-2Fru
1^F-beta-D-fructofuranosyl lactosucrose

6 Glcα1-2(Glcα1-2Fru)-6-Galα1
2^G-alpha-D-glucopyranosyl raffinose

7 Galβ1-6Glcα1-2Fruβ1-2Fru
1^F-beta-D-fructofuranosyl raffinose

8 Glcα1-2Glcα1-2Glcα1-2Fruβ1-2Fru
2(2-alpha-D-glucopyranosyl)$_2$ isokestose

9 Galβ1-4Glcα1-2Fruβ1-2Fruβ1-2Fru
1^F(1-beta-D-fructofuranosyl)$_2$ lactosucrose

10 Glcα1-2Glcα1-2(Glcα1-2Fru)-6-Galα1
2^G(2-alpha-D-glucopyranosyl)$_2$ raffinose

11 Glcα1-2Glcα1-2Glcα1-2Fruβ1-2Fruβ1-2Fru
2(2-alpha-D-glucopyranosyl)$_2$ nystose

12 Glcα1-2Glcα1-2Glcα1-2Glcα1-2Fruβ1-2Fru
2(2-alpha-D-glucopyranosyl)$_3$ isokestose

13 Glcα1-2(Glcα1-2Fru)-6-Galα1-6Galα1
2^G-alpha-D-glucopyranosyl stachyose

14 Galα1-6Galα1-6Glcα1-2Fruβ1-2Fru
1^F-beta-D-fructofuranosyl stachyose

15 Glcα1-2Glcα1-2Glcα1-2(Glcα1-2Fru)-6-Galα1
2^G(2-alpha-D-glucopyranosyl)$_3$ raffinose

16 Glcα1-2Glcα1-2(Glcα1-2Fru)-6-Galα1-6Galα1
2^G(2-alpha-D-glucopyranosyl)$_2$ stachyose

17 Glcα1-2Glcα1-2Glcα1-2(Glcα1-2Fru)-6-Galα1-6Galα1
2^G(2-alpha-D-glucopyranosyl)$_3$ stachyose

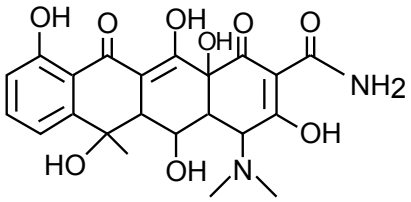
Unison UK-Amino, 250 x 3 mm
acetonitrile /water = 75 /25
0.4 mL/min (7MPa), 60 deg.C, ELSD, 1uL (0.5ug)

Courtesy of Prof. Norio Shiomi, Rakuno Gakuen University

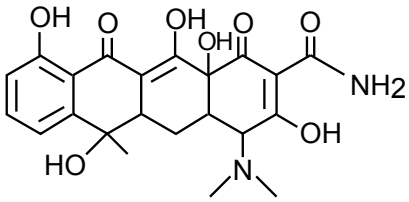
Cadenza CW-C18 150 x 4.6 mm Application

Tetracycline antibiotics

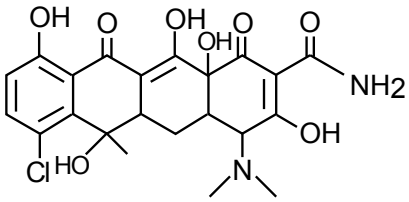
テトラサイクリン系抗生物質



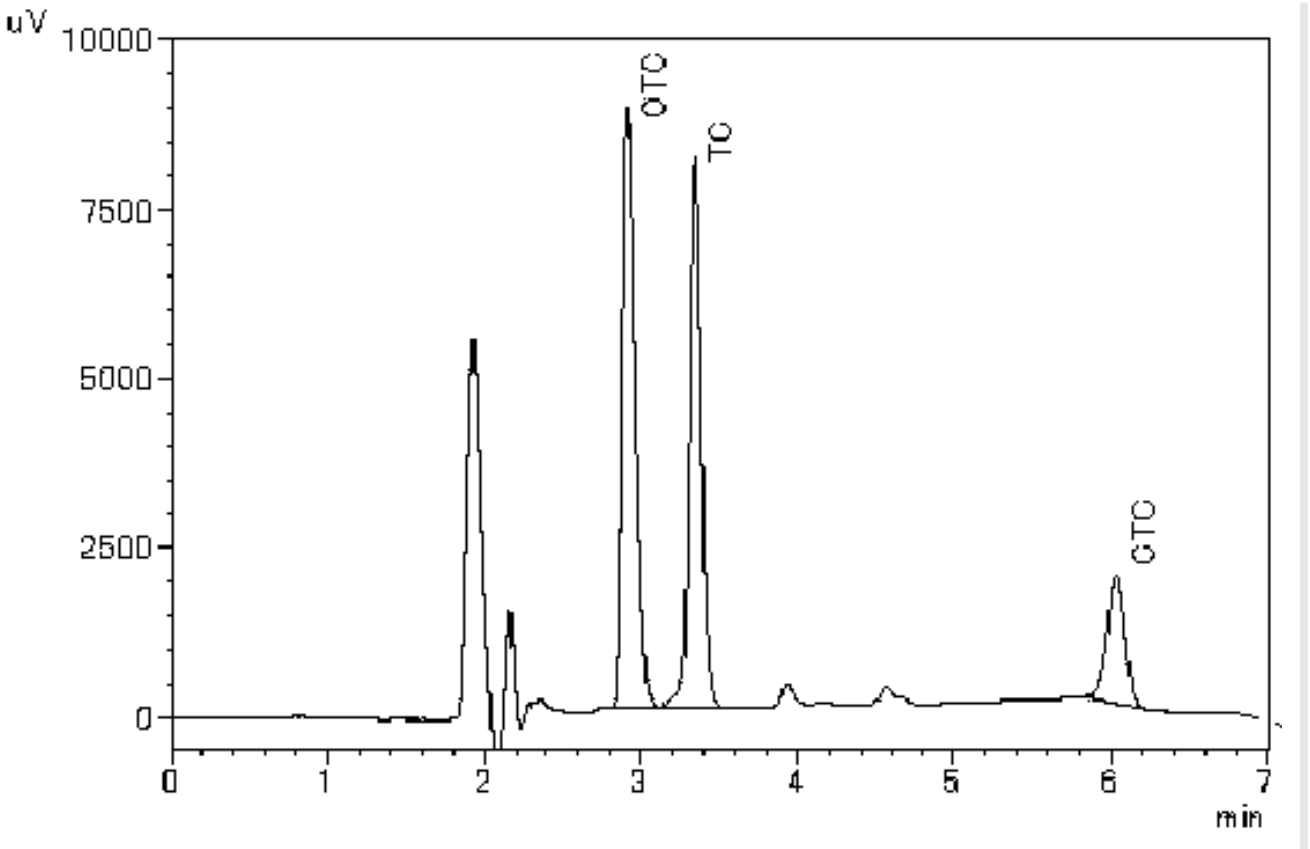
oxytetracycline (OTC)



tetracycline (TC)



chlortetracycline (CTC)

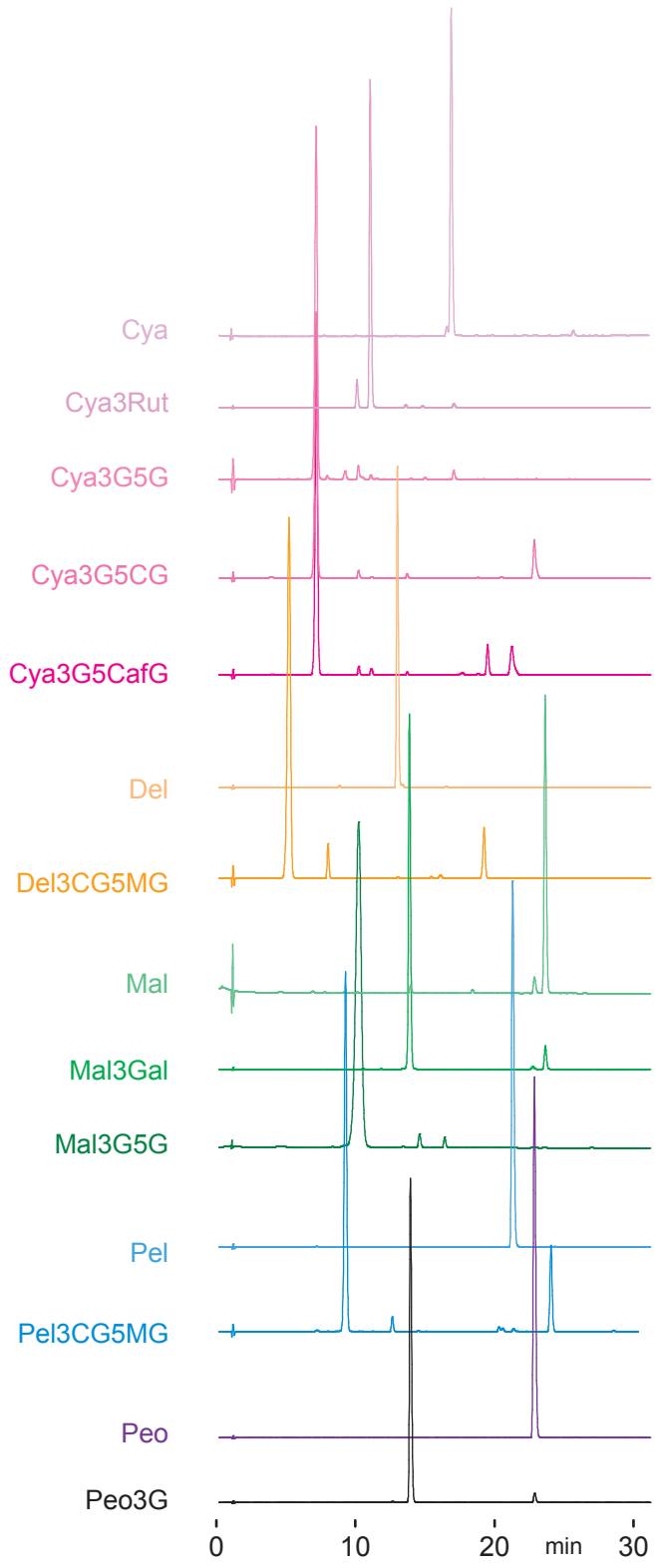


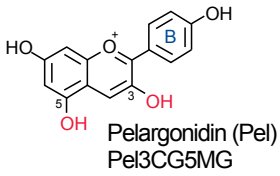
Cadenza CW-C18, 150 x 4.6 mm
water /acetonitrile /HCOOH = 80 /20 /0.1
1 mL/min, 40 deg.C, 260 nm, 20 uL (1ppm)

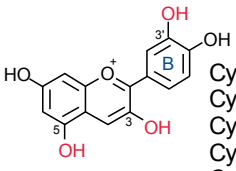
Courtesy of Mr. N. MAEDA, ASSOCIATION OF MEAT SCIENCE & TECHNOLOGY INSTITUTE

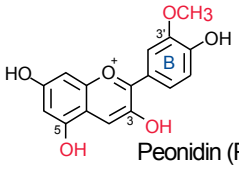
Cadenza CD-C18 75 x 4.6 mm Application

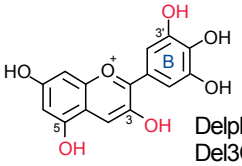
Anthocyanins
アントシアニン

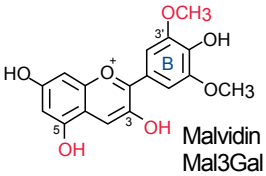


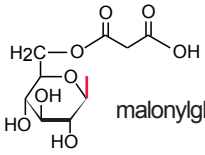

Pelargonidin (Pel)
Pel3CG5MG

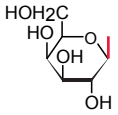

Cyanidin (Cya)
Cya3Rut
Cya3G5G
Cya3G5CG
Cya3G5CafG

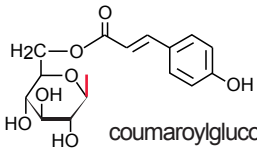

Peonidin (Peo)
Peo3G

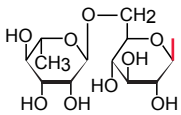

Delphinidin (Del)
Del3CG5MG

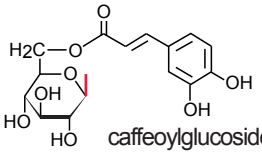

Malvidin (Mal)
Mal3Gal
Mal3G5G

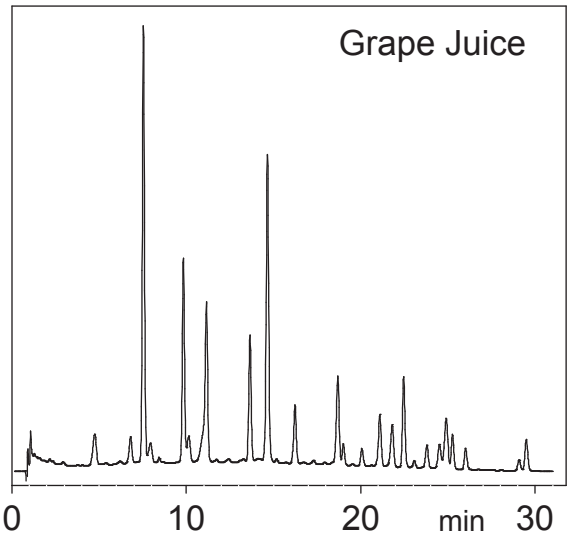

malonylglucoside (MG)


galactose
(Gal)


coumaroylglucoside (CG)


rutinose
(Rut)


caffeoylglucoside (CafG)



Cadenza CD-C18, 75 x 4.6 mm
A: 0.5% TFA
B: 0.5% TFA in
(water /AcOH /acetonitrile = 55 /25 /20)

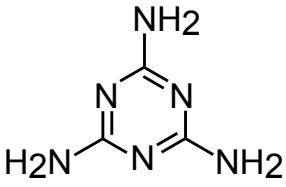
20 - 70 %B (0 - 30 min)
1 mL/min, 30 deg.C, 525 nm

Courtesy of Prof. Dr. K. Hosokawa, Hyogo Univ., Japan

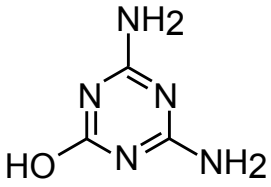
Unison UK-Amino 150 x 3 mm Application

LC-MS/MS: Melamine and Related Compounds

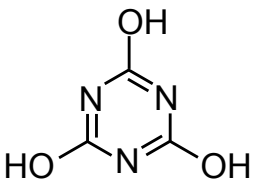
LC-MS/MS（メラミンと関連化合物）



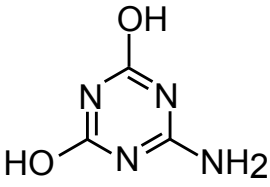
1. melamine



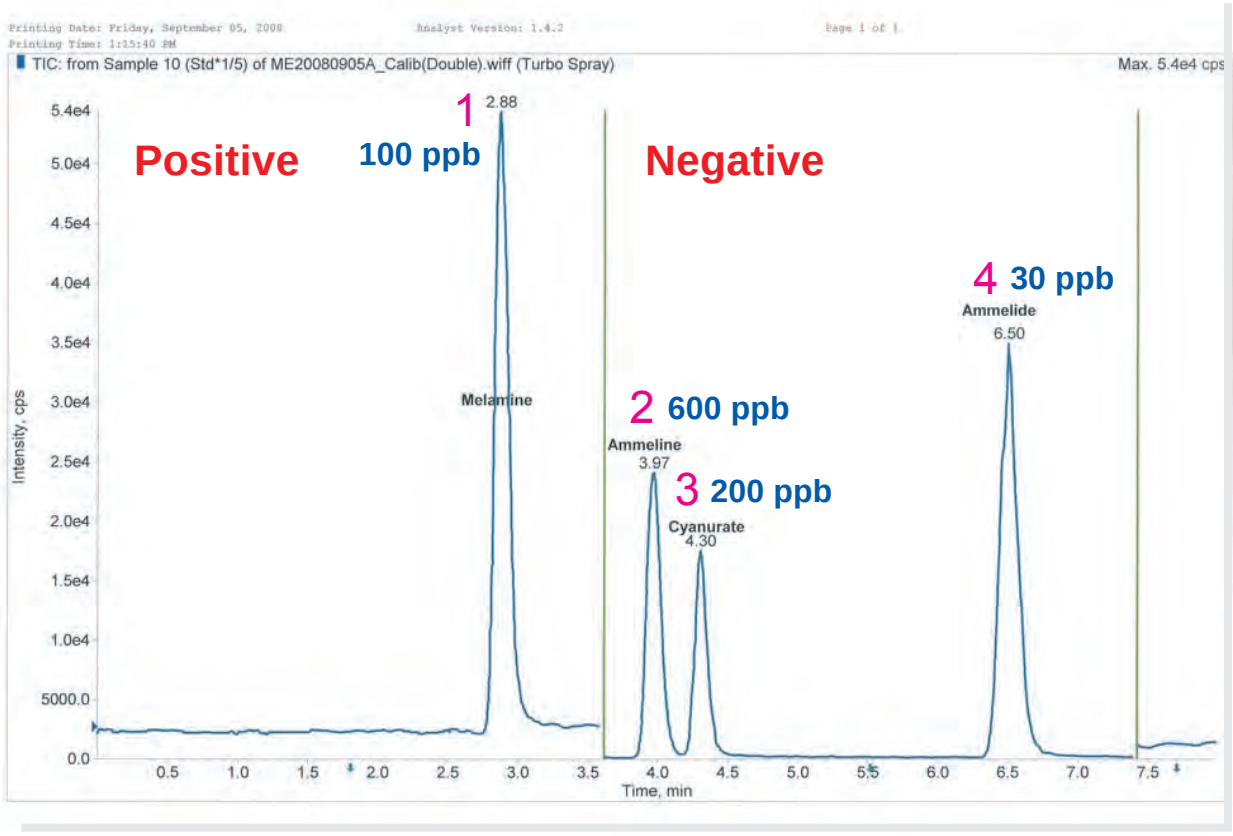
2. ammeline



3. cyanuric acid



4. ammelide



Unison UK-Amino, 150 x 3 mm
A: acetonitrile, B: 10mM ammonium acetate + 0.1% acetic acid
25%B (Isocratic)
0.4 mL/min (5.9MPa), 40 deg.C, 5uL

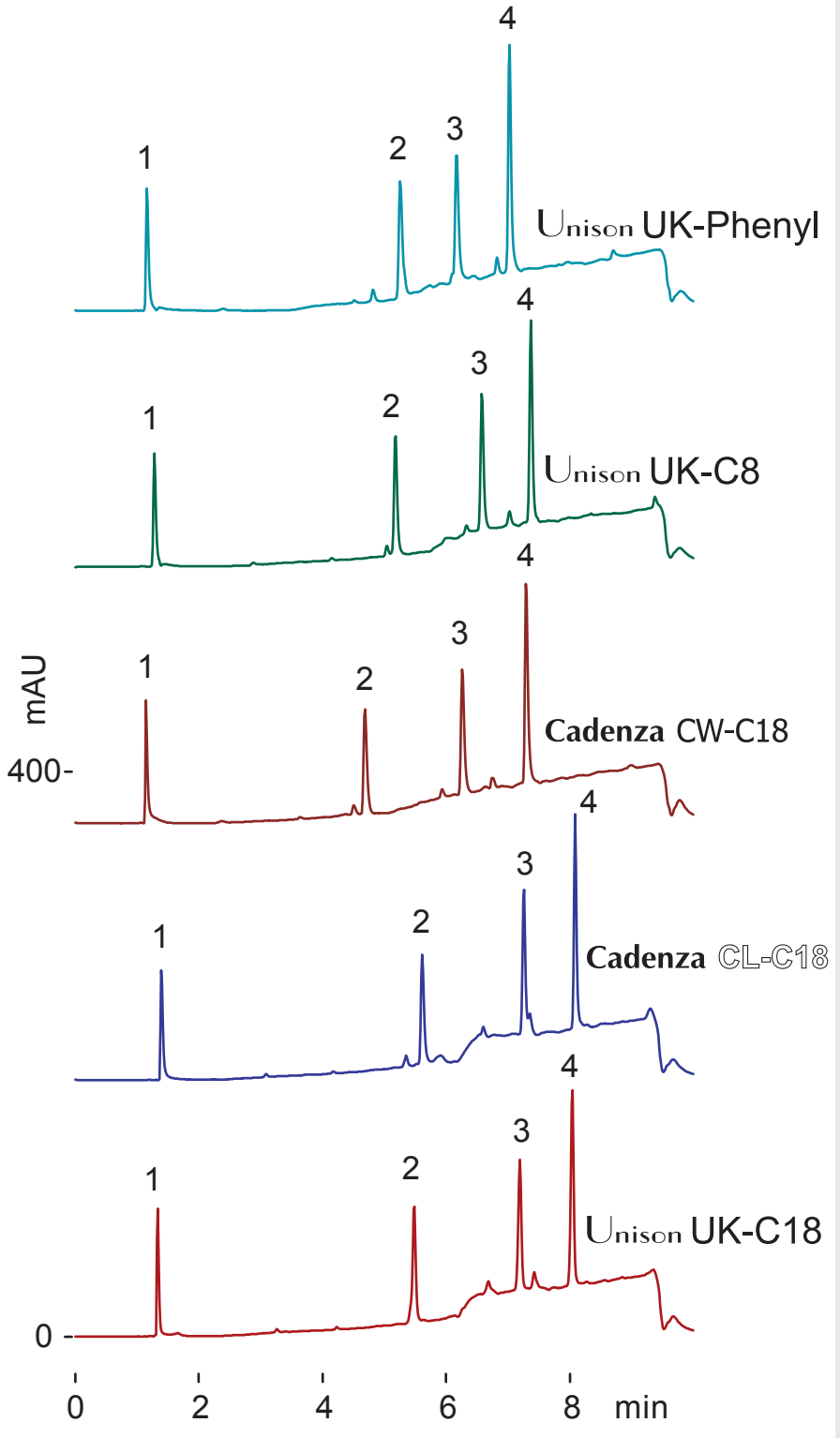
Unison UK-Phenyl
Unison UK-C8
Cadenza CW-C18
Cadenza CL-C18
Unison UK-C18

75 x 2 mm

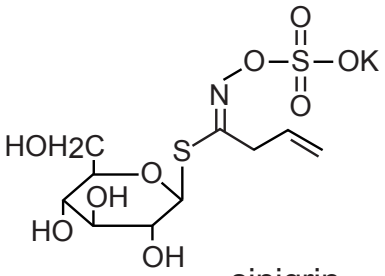
Application

Isothiocyanates of Brassicaceae (Cruciferae)

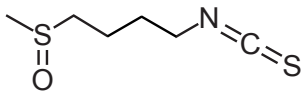
アブラナ科の辛味成分（イソチオシアネート類）



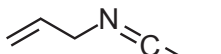
1 sinigrin



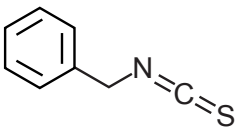
2 sulforaphane



3 allyl isothiocyanate



4 benzyl isothiocyanate



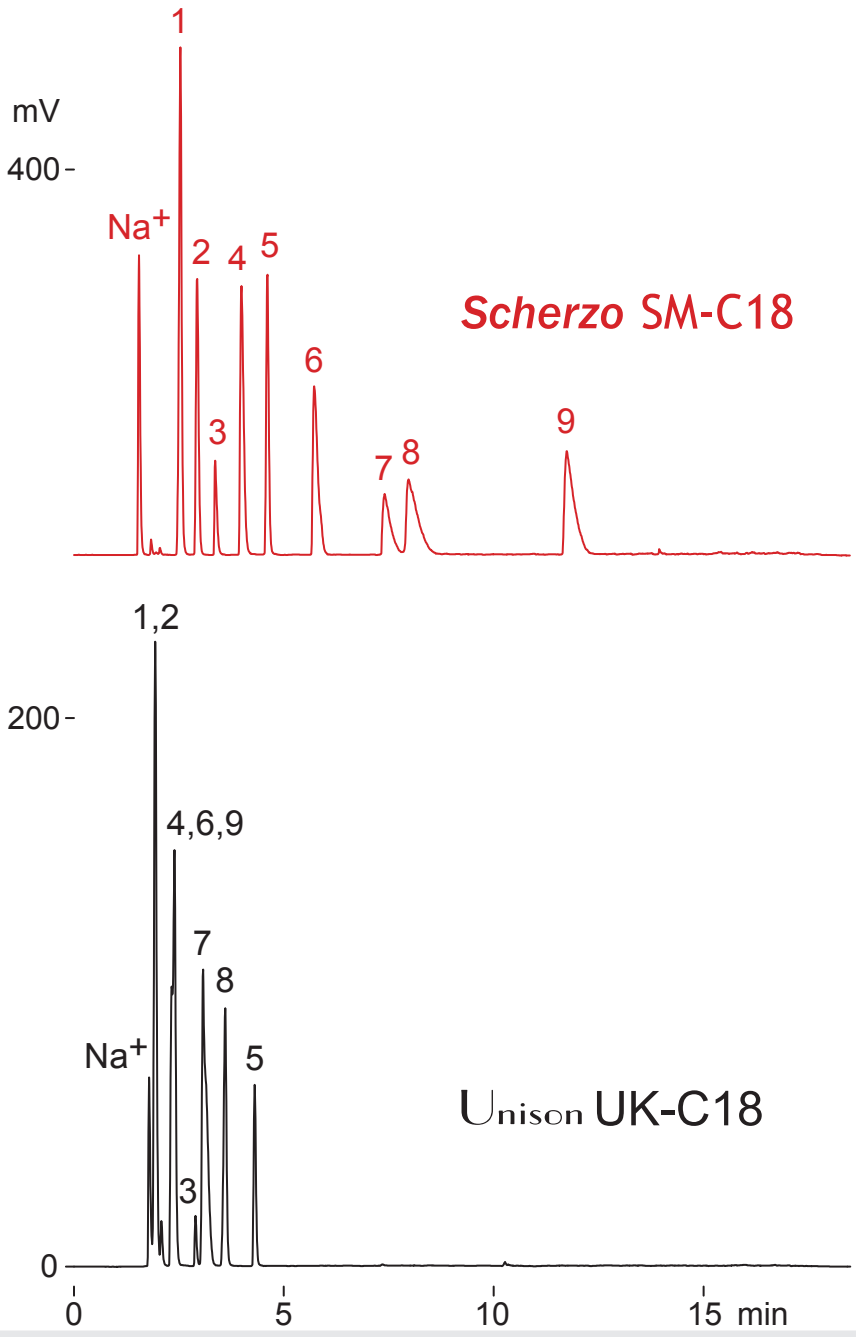
75 x 2 mm
A: water / TFA = 100 / 0.1
B: methanol / TFA = 100 / 0.1
0-100 %B (0-8min)
0.2 mL/min (4-5MPa)
37 deg.C, 250 nm
1 uL (0.5-1ug)

Scherzo SM-C18
Unison UK-C18

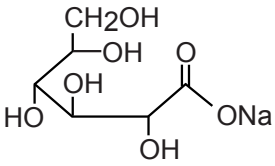
150 x 3 mm

Application

Organic acids
有機酸

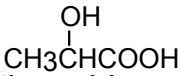


1 sodium gluconate

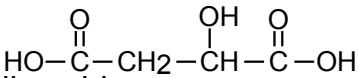


2 glyoxylic acid

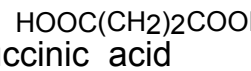
3 lactic acid



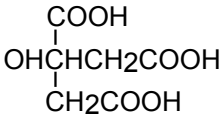
4 malic acid



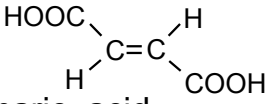
5 succinic acid



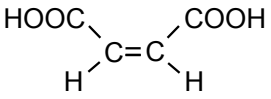
6 malonic acid



7 citric acid



8 fumaric acid



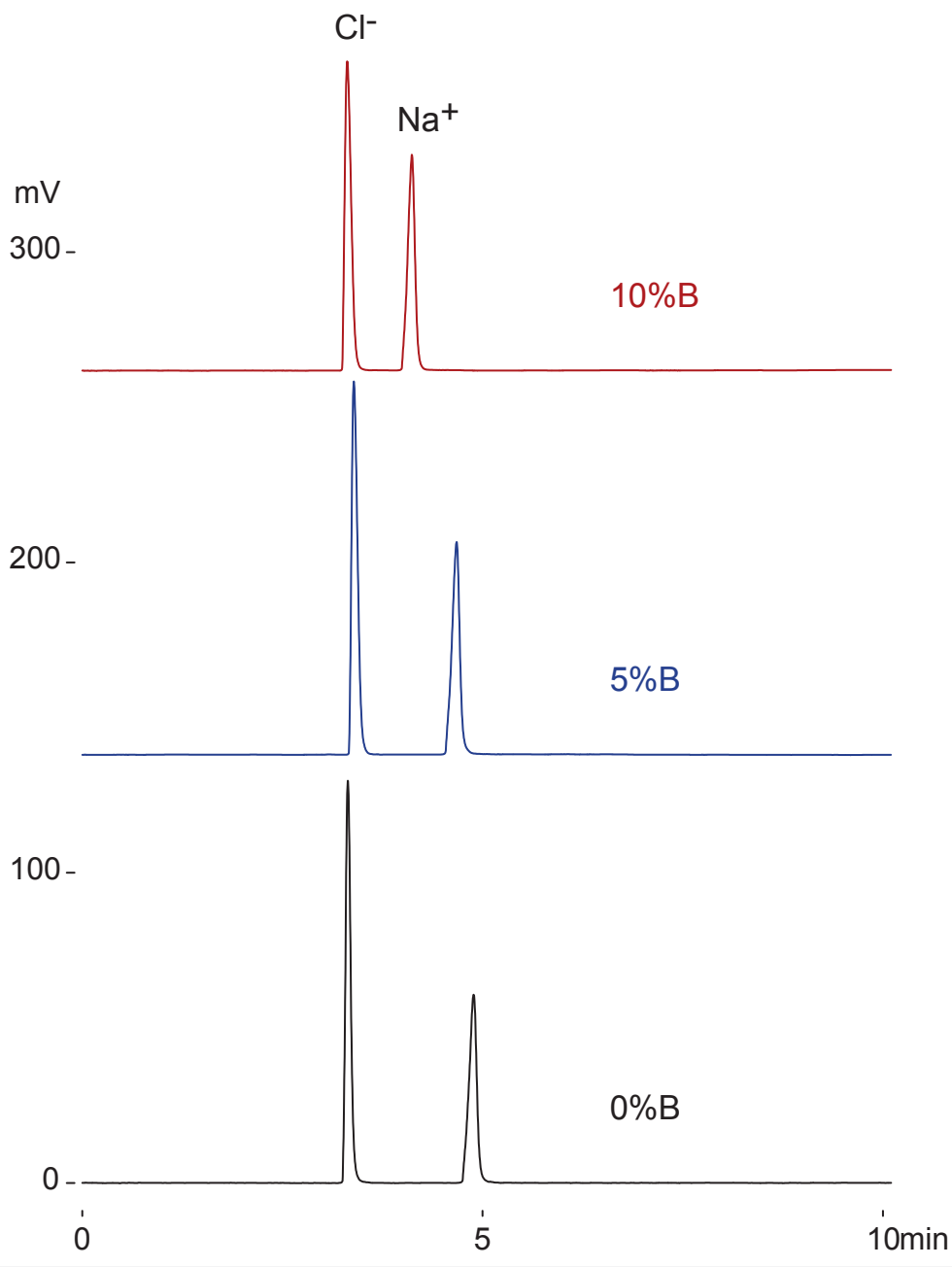
9 maleic acid

150 x 3 mm
A: 40mM formic acid / 40mM ammonium formate / acetonitrile = 80 / 20 / 1
B: 80mM formic acid / 80mM ammonium formate / acetonitrile = 56 / 14 / 30
0 - 100 %B (0-15min), 0.4 mL/min(8-9 MPa), 37 deg.C
ELSD (spray chamber 17deg.C, drift tube 42deg.C), 4 uL (1.6-22 ug)

Scherzo SM-C18 150 x 3 mm Application

Sodium chloride (NaCl)

食塩 (NaCl)



Scherzo SM-C18, 150 x 3 mm
A: 5mM ammonium formate, B: acetonitrile
0.4 mL/min (9-10 MPa), 37 deg.C
ELSD (spray chamber 20 deg.C, drift tube 45 deg.C)
1.6 uL (0.16ug NaCl)

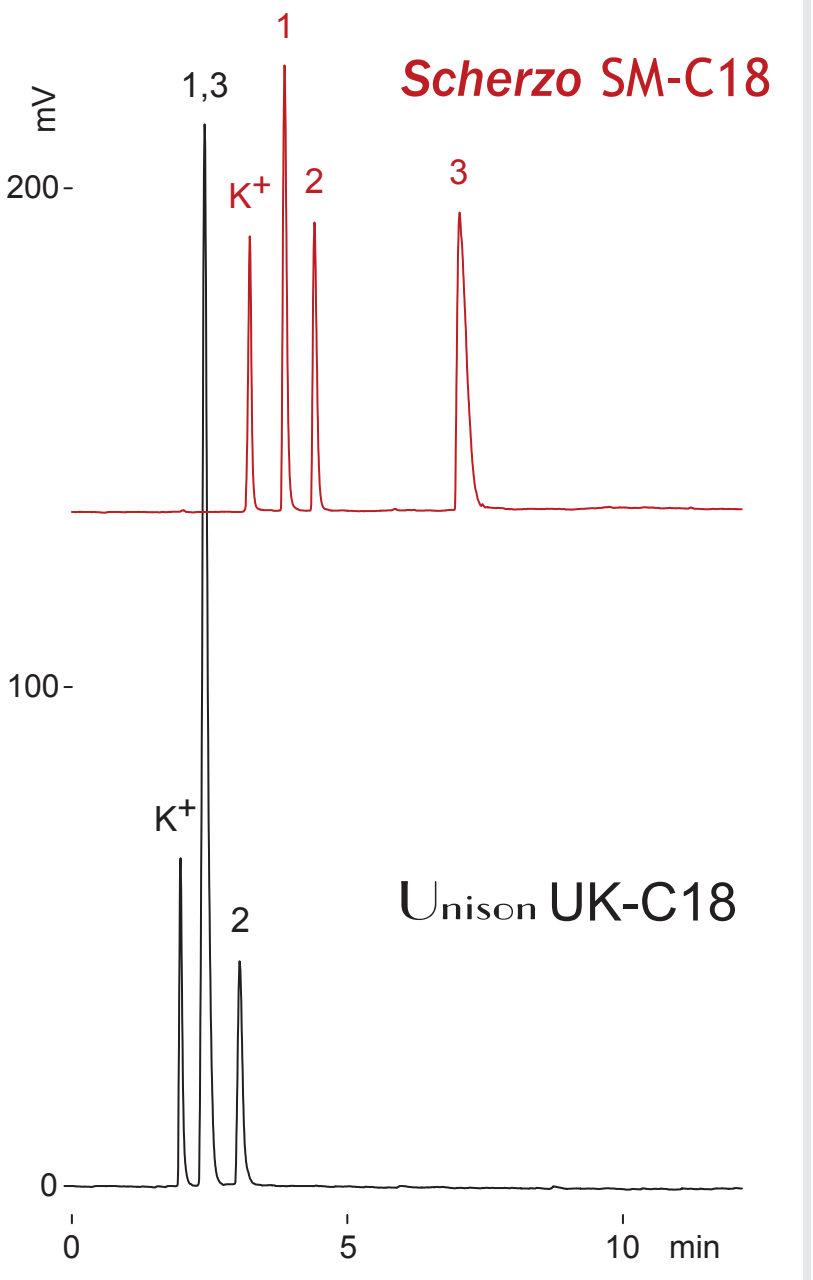
Scherzo SM-C18
Unison UK-C18

150 x 3 mm

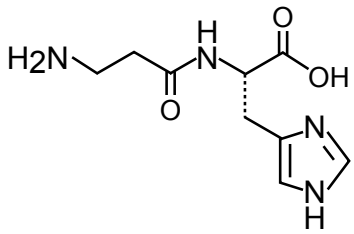
Application

Anserine and related compounds

アンセリンおよび関連化合物

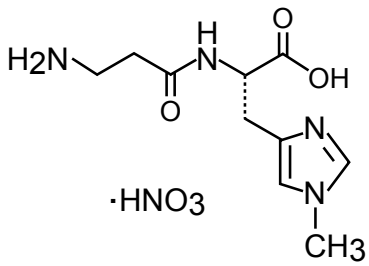


1



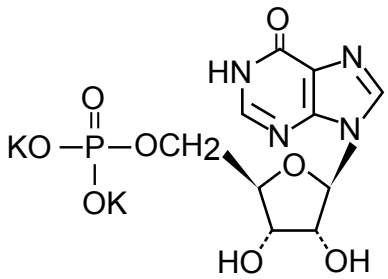
L- carnosine
(beta-alanyl-L-histidine)

2



L- anserine nitrate
(beta-alanyl-1-methyl-L
-histidine nitrate)

3



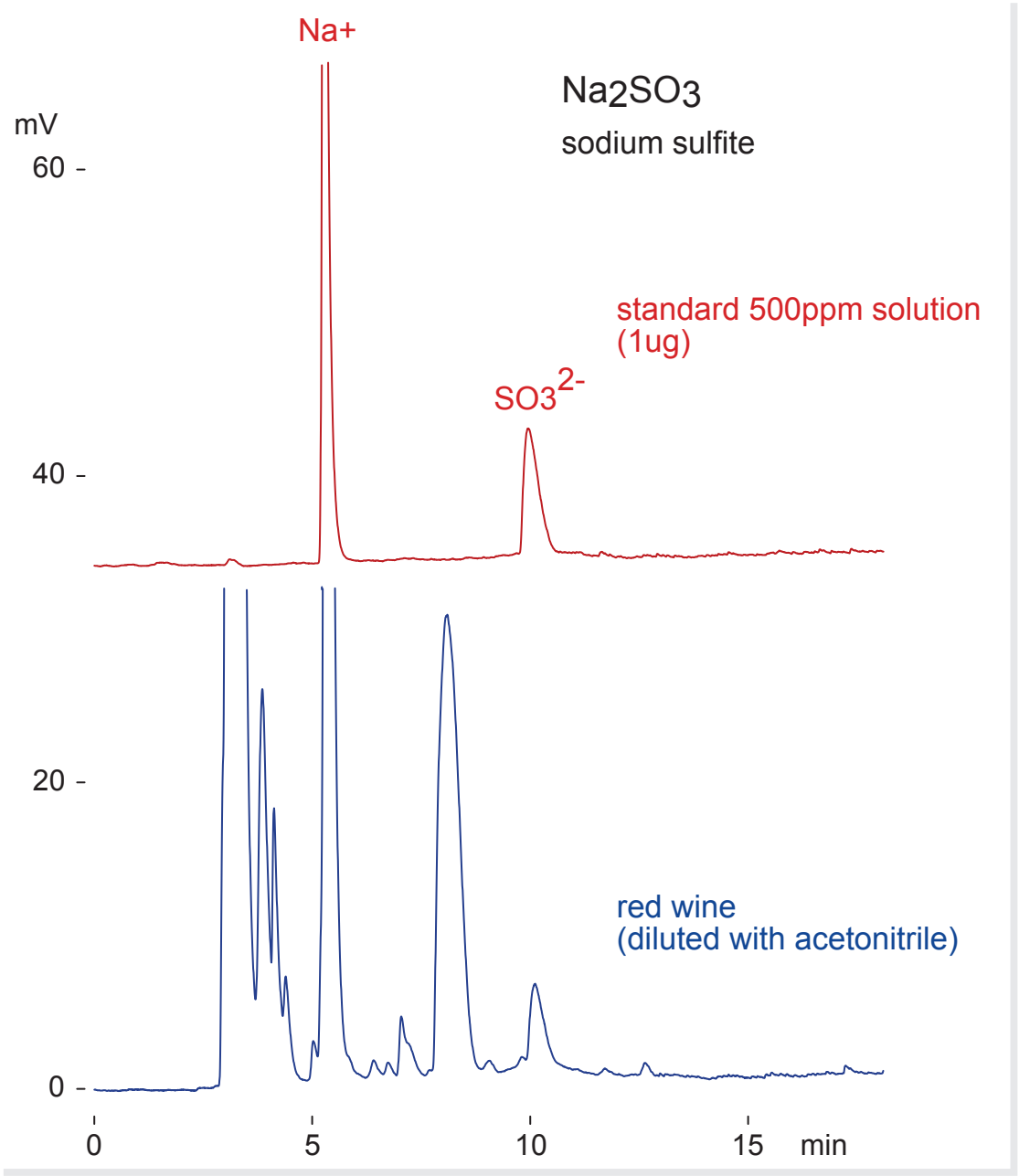
Inosine 5'-monophosphate
dipotassium

150 x 3 mm
A: 10mM ammonium acetate
B: 50mM ammonium acetate / acetonitrile = 80 / 20
0-100%B (0-10min), 0.4 mL/min (9MPa), 37deg.C
ELSD (spray chamber 50 deg.C, drift tube 100 deg.C)
5 uL (2-6ug)

Scherzo SM-C18 250 x 3 mm Application

Sodium sulfite in red wine

赤ワイン中の亜硫酸ナトリウム



Scherzo SM-C18, 250 x 3 mm
A: 5mM ammnoium acetate,
B: 100mM ammonium acetate / acetonitrile = 50 / 50
10-100 %B (0-15min), 0.4 mL/min (14MPa), 37 deg.C
ELSD (spray chamber 20 deg.C, drift tube 45 deg.C), 2 uL

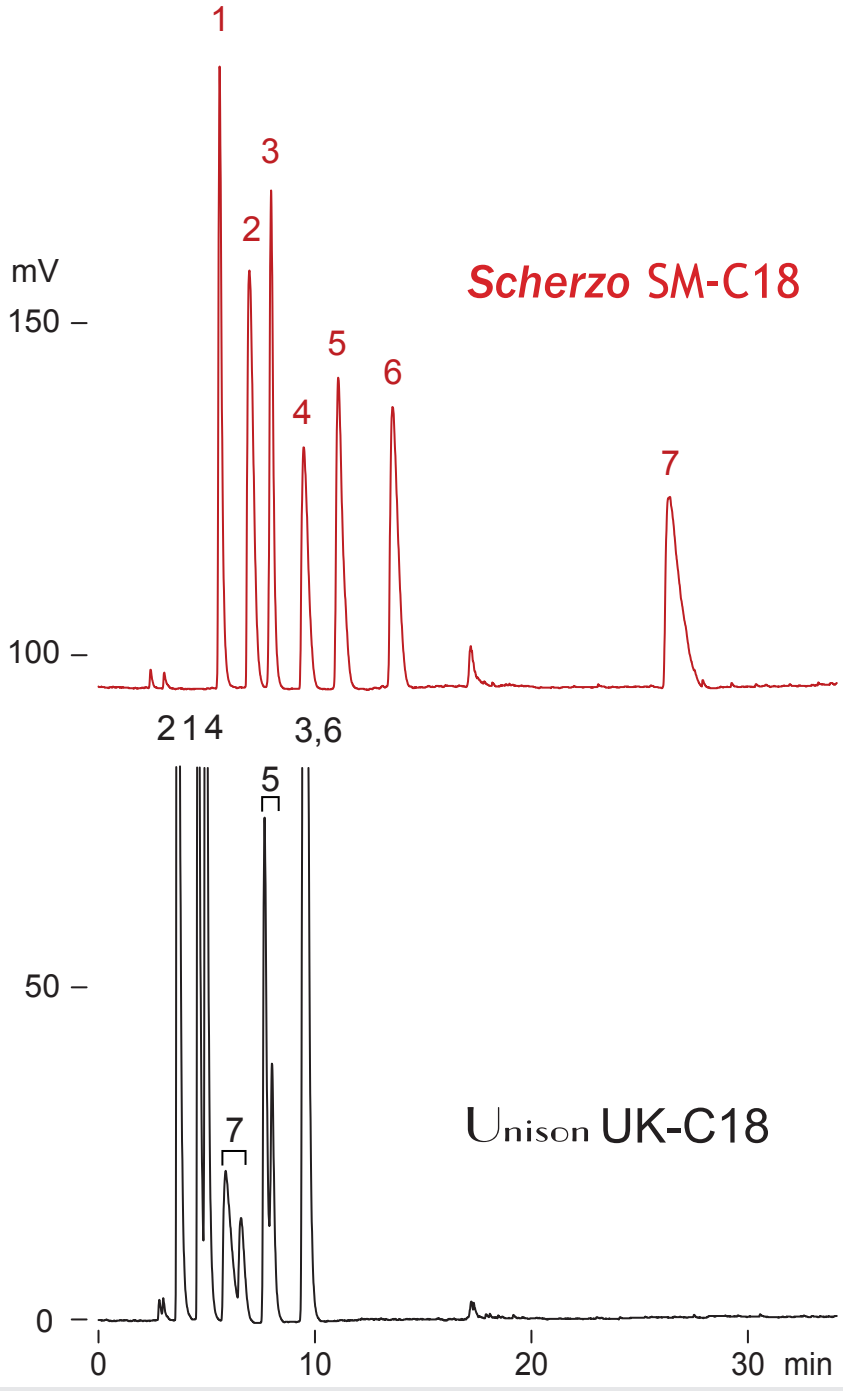
Scherzo SM-C18
Unison UK-C18

250 x 3 mm

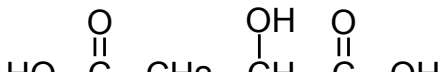
Application

Organic acids (2)

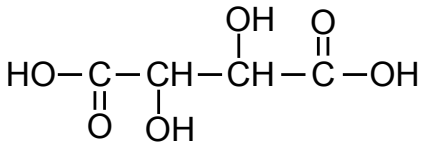
有機酸 (2)



1 malic acid



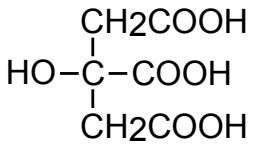
2 tartaric acid



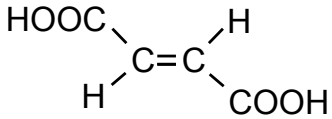
3 $HOOC(CH_2)_2COOH$
succinic acid

4 $HOOCCH_2COOH$
malonic acid

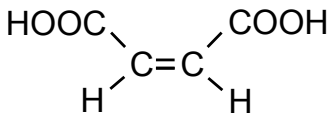
5 citric acid



6 fumaric acid



7 maleic acid

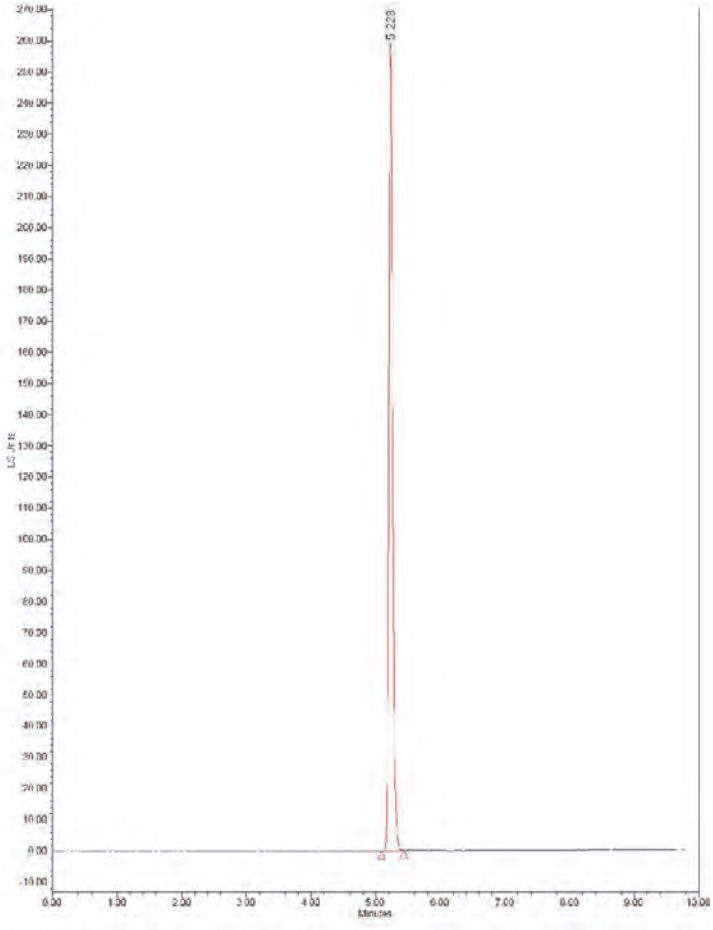


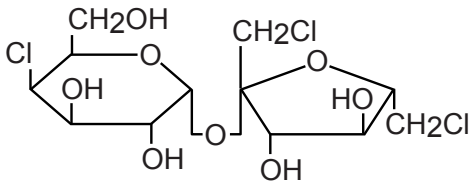
250 x 3 mm
A: water / formic acid = 100 / 0.3, B: acetonitrile / formic acid = 100 / 2
0-5 %B (0-13min), 50 %B (13-30min)
0.4 mL/min (13MPa), 37 deg.C
ELSD (spray chamber 19deg.C, drift tube 43deg.C), 4 uL (3.8-6.2 ug)

Unison UK-C18 250 x 4.6 mm Application

Sucralose by reversed-phase analysis

合成甘味料スクラロースの逆相分離





sucralose

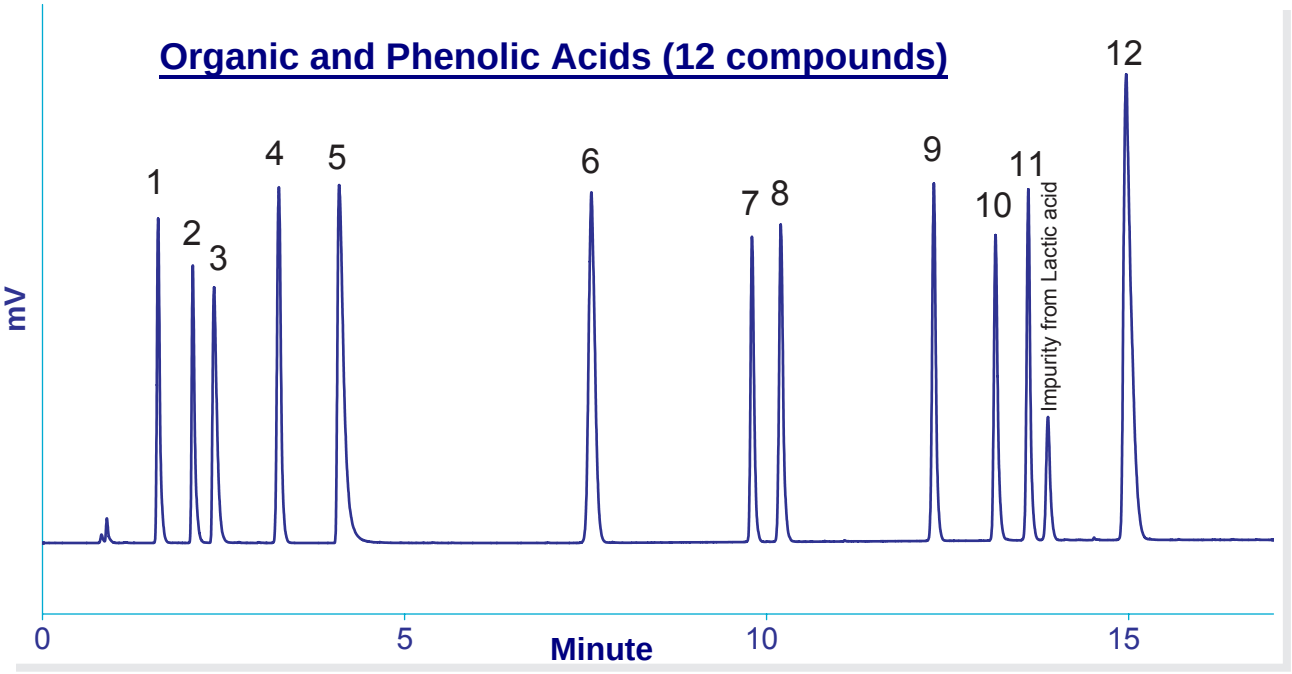
Unison UK-C18, 250 x 4.6 mm
A: water
B: acetonitrile
20%B (0-0.5min), 20-90%B (0.5-10min)
1.0 mL/min, 60 deg.C, ELSD

Courtesey of Tony Montanari, Ph.D., Perrigo Company of South Carolina - USA

Scherzo SM-C18 150 x 2 mm Application

Simultaneous HPLC/LT-ELSD Analysis of Organic and Phenolic Acids

LT-ELSDによる有機酸およびフェノール酸の一斉分析



	RT	%RSD (n=8)		LOD (S/N=3)
	Minutes	RT	Response	ng (o.c.)
1- Quinic acid	1.60	0.09	2.1	4.5
2- Malic acid	2.08	0.09	1.9	7.7
3- Tartaric acid	2.37	0.11	2.7	20.9
4- Succinic acid	3.27	0.20	2.2	9.0
5- Citric acid	4.11	0.25	1.3	25.3
6- Gallic acid	7.60	0.31	1.9	8.0
7- Lactic acid	9.81	0.18	2.4	55.9*
8- Protocatechuic acid	10.21	0.14	2.4	3.7
9- 4-HPAC	12.32	0.09	1.7	3.4
10- Chlorogenic acid	13.16	0.07	2.2	4.0
11- Syringic acid	13.62	0.07	3.0	2.3
12- Gentisic acid	14.97	0.06	1.9	6.2

* Semi-volatile compound

4-Hydroxyphenylacetic acid

Scherzo SM-C18, 150 x 2 mm
A: H2O + 0.3% HCOOH,
B: acetonitrile + 1% HCOOH
0%B (0-2 min), 0 - 20%B (2-10 min), 20%B (10-15 min)
0.3 mL/min, 30°C, 2uL
ELSD (SEDERE, France), SEDEX 90LT, 30°C, 3.5Bar

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