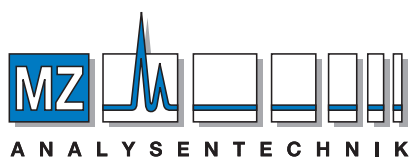


# Applications

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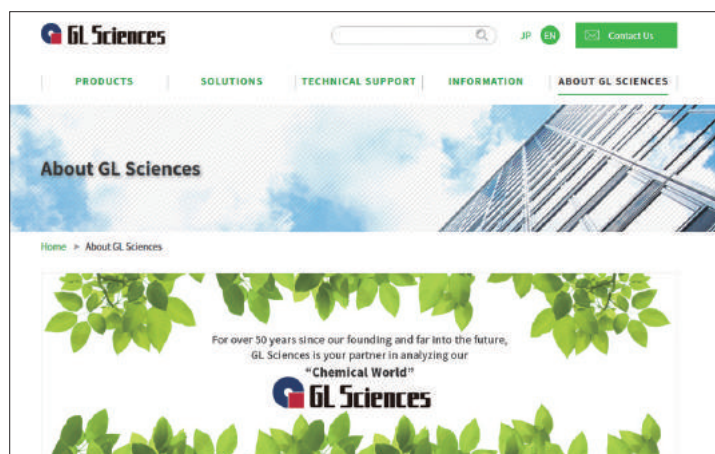
e-mail: [info@mz-at.de](mailto:info@mz-at.de)

[www.mz-at.de](http://www.mz-at.de)

## Visit our website

We provide with technical support on our website. You can browse through or search GL Sciences' online library of LC applications, featuring chromatograms with method, conditions, sorted by technique and compound class by InertSearch and Technical Note.

<https://www.glsciences.com/>



## InertSearch

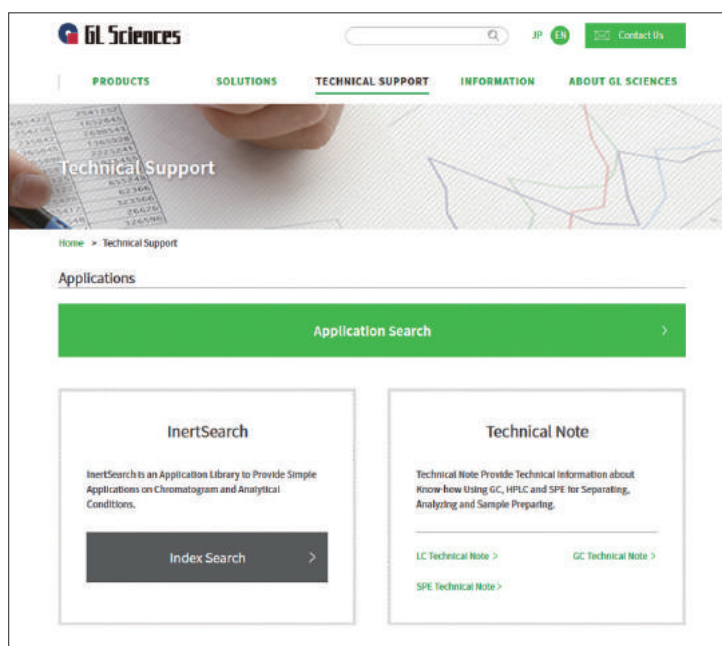
[https://www.gls.co.jp/technique/app/inert\\_search.html](https://www.gls.co.jp/technique/app/inert_search.html)

"InertSearch" is GL Sciences' onsite search engine for chromatographic data. A large number of chromatographic results of various analyses are available.

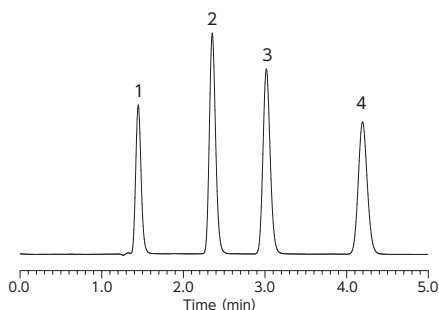
## Technical Note

[https://www.gls.co.jp/technique/app/lc\\_technical\\_note.html](https://www.gls.co.jp/technique/app/lc_technical_note.html)

"Technical Note" is a database of chromatographic results and useful information of various analyses. These files provide detailed explanation of each analysis which will help you greatly (e.g. method and instruction, chromatogram with analytic condition, chemical structure of compounds).

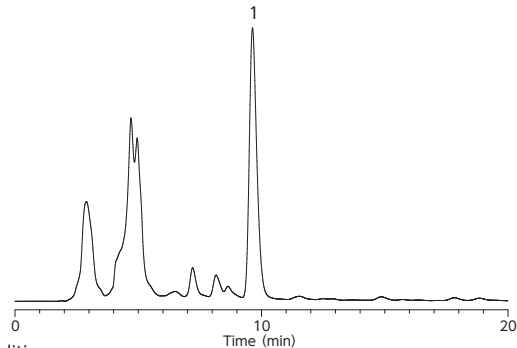


## Pharmacopeia

***p*-Hydroxybenzoic acid ethyl ester (JP)****Conditions**

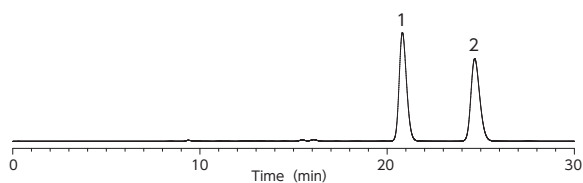
Column : Inertsil ODS-4 (5  $\mu$ m, 150  $\times$  4.6 mm I.D.)  
 Eluent : A) CH<sub>3</sub>OH  
 B) 50 mM KH<sub>2</sub>PO<sub>4</sub> in H<sub>2</sub>O  
 A/B = 13/7, v/v  
 Flow Rate : 1.3 mL/min  
 Col. Temp. : 35  $^{\circ}$ C  
 Detection : UV 272 nm  
 Injection Vol. : 10  $\mu$ L  
 Data Source : LC InertSearch No. LB097, LB098

Sample :  
 1. *p*-Hydroxybenzoic acid  
 2. *p*-Hydroxybenzoic acid methyl ester  
 3. *p*-Hydroxybenzoic acid ethyl ester  
 4. *p*-Hydroxybenzoic acid *n*-propyl ester

**Alycyrrhiza (JP)****Conditions**

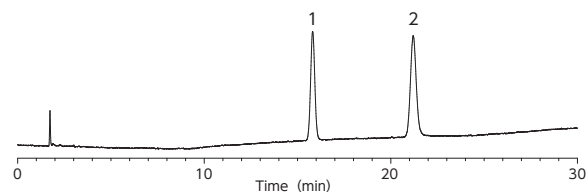
Column : InertSustain C18 (5  $\mu$ m, 150  $\times$  4.6 mm I.D.)  
 Eluent : A) CH<sub>3</sub>CN B) 2.1 % CH<sub>3</sub>COOH in H<sub>2</sub>O  
 A/B = 40/60, v/v  
 Flow Rate : 0.45 mL/min  
 Col. Temp. : 20  $^{\circ}$ C  
 Detection : UV 254 nm  
 Injection Vol. : 20  $\mu$ L  
 Data Source : LC InertSearch No. LB182

Sample :  
 1. Glycyrrhizic acid

**D-Mannitol (JP)****Conditions**

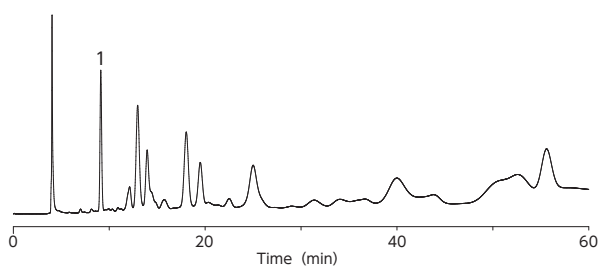
Column : HAMILTON HC-75 (Ca<sup>2+</sup>)  
 (9 mm, 300  $\times$  7.8 mm I.D.)  
 Eluent : H<sub>2</sub>O  
 Col. Temp. : 85  $^{\circ}$ C  
 Detection : RI (40  $^{\circ}$ C)  
 Injection Vol. : 20  $\mu$ L  
 Flow Rate : 0.5 mL/min  
 Data Source : LC Technical Note No. 147

Sample :  
 1. D-Mannitol  
 2. D-Sorbitol

**Polyvinyl alcohol-polyethylene glycol Graft copolymer****Conditions**

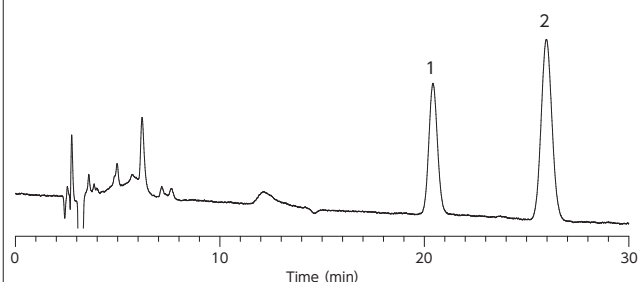
Column : InertSustain C18  
 (5  $\mu$ m, 250  $\times$  4.0 mm I.D.)  
 Eluent : A) H<sub>2</sub>O/CH<sub>3</sub>CN/CH<sub>3</sub>OH = 18/1/1, v/v/v  
 B) H<sub>2</sub>O/CH<sub>3</sub>CN/CH<sub>3</sub>OH = 10/9/1, v/v/v  
 Flow Rate : 1.0 mL/min  
 Col. Temp. : 30  $^{\circ}$ C  
 Detection : UV 205 nm  
 Injection Vol. : 10  $\mu$ L  
 Data Source : LC InertSearch No. LB228

Sample :  
 1. 1-vinyl-2-pyrrolidone  
 2. Vinyl acetate

**Povidone (JP)****Conditions**

Column : Hamilton HC-75 (H<sup>+</sup>) 79642P  
 (9  $\mu$ m, 300  $\times$  7.8 mm I.D.)  
 Eluent : 0.1 % Perchloric acid in H<sub>2</sub>O  
 Flow Rate : 1.0 mL/min  
 Col. Temp. : 35  $^{\circ}$ C  
 Detection : UV 210 nm  
 Injection Vol. : 50  $\mu$ L  
 Data Source : LC InertSearch No. LB434

Sample :  
 1. Formic acid

**Tranexamic Acid (JP)****Conditions**

Column : InertSustain AQ-C18 (5  $\mu$ m, 250  $\times$  6.0 mm I.D.)  
 Eluent : A) CH<sub>3</sub>OH  
 B) Phosphate Buffer (pH = 2.5)  
 A/B = 40/60, v/v  
 Flow Rate : 1.4 mL/min  
 Col. Temp. : 25  $^{\circ}$ C  
 Detection : UV 220 nm  
 Injection Vol. : 20  $\mu$ L  
 Data Source : LC Technical Note No.92

Sample :  
 1. Tranexamic acid (200 mg/L)  
 2. 4-Aminobenzoic acid methyl ester (2 mg/L)

Reversed Phase  
Columns

HILIC Columns

Normal Phase  
Columns

SEC Columns

Ion Exchange  
ColumnsApplication  
Specific Columns

Guard Columns

Preparative Columns

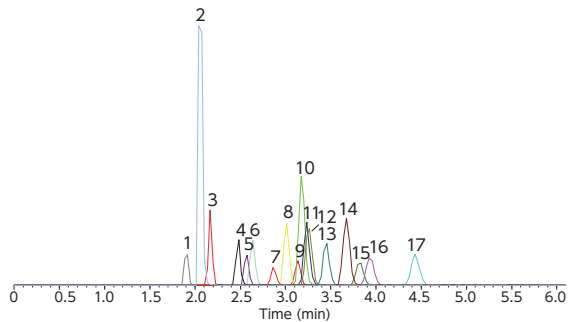
Capillary Columns

Applications

Cat. No. Index

## Pharmaceuticals

### Analysis of 17 Anti-depressant Drugs

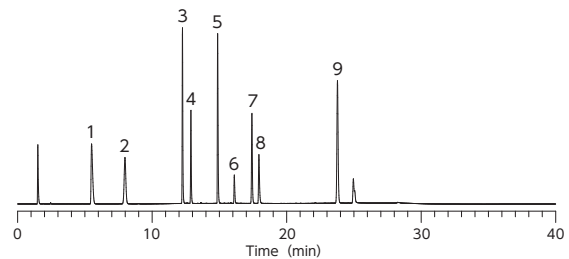


#### Conditions

Column : InertSustain C18 HP (3  $\mu$ m, 150  $\times$  2.1 mm I.D.)  
 Eluent : A) 0.1 % HCOOH in CH<sub>3</sub>CN  
 B) 0.1 % HCOOH in H<sub>2</sub>O  
 A/B = 2/98 - 0.5 min - 40/60  
 - 5.5 min - 40/60, v/v  
 Flow Rate : 0.4 mL/min  
 Col. Temp. : 40  $^{\circ}$ C  
 Detection : LC/MS/MS (4000 QTRAP : ESI, Positive, MRM)  
 Injection Vol. : 5  $\mu$ L  
 Data Source : LC InertSearch No. LA908

Sample :  
 1. Sulpiride 10. Imipramine  
 2. Milnacipran 11. Nortriptyline  
 3. Trazodone 12. Maprotiline  
 4. Mianserin 13. Amitriptyline  
 5. Amoxapine 14. Trimipramine  
 6. Doxepin 15. Fluoxetine  
 7. Paroxetine 16. Sertraline  
 8. Desipramine 17. Clomipramine  
 9. Fluvoxamine (100 ng/mL each)

### Analysis of 9 Drugs

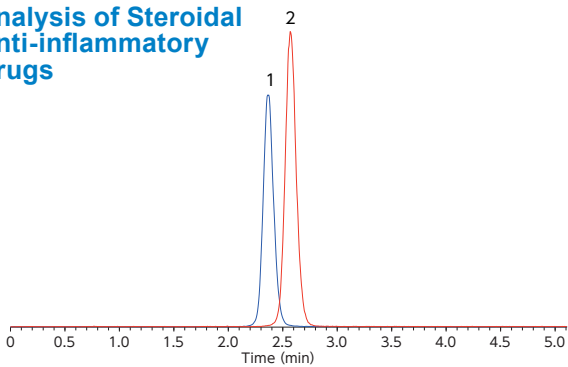


#### Conditions

Column : InertSustain C18 (3  $\mu$ m, 150  $\times$  4.6 mm I.D.)  
 Eluent : A) CH<sub>3</sub>CN  
 B) 10 mM KH<sub>2</sub>PO<sub>4</sub> in H<sub>2</sub>O (pH 7.0, 10 mM K<sub>2</sub>HPO<sub>4</sub> in H<sub>2</sub>O)  
 Flow Rate : 1.0 mL/min  
 Col. Temp. : 40  $^{\circ}$ C  
 Detection : UV 220 nm  
 Injection Vol. : 10  $\mu$ L  
 Data Source : LC InertSearch No. LB400

Sample :  
 1. Acetylsalicylic acid  
 2. Acetaminophen  
 3. Caffeine  
 4. Ranitidine  
 5. Ketoprofen  
 6. Berberine hydrochloride  
 7. Chlorpromazine  
 8. Dextromethorphan  
 9. Amitriptyline (50 mg/L each)

### Analysis of Steroidal Anti-inflammatory Drugs

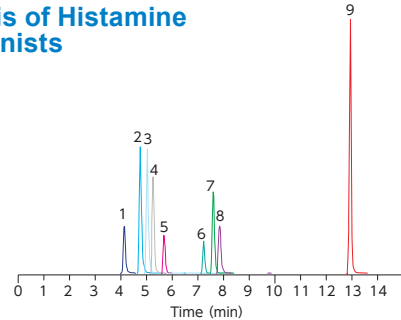


#### Conditions

Column : InertSustain Phenyl (2  $\mu$ m, 50  $\times$  2.1 mm I.D.)  
 Eluent : A) CH<sub>3</sub>OH/HCOOH = 100/0.05, v/v  
 B) H<sub>2</sub>O/HCOOH = 100/0.05, v/v  
 A/B = 40/60, v/v  
 Flow Rate : 0.6 mL/min  
 Col. Temp. : 40  $^{\circ}$ C  
 Detection : LC/MS/MS (4000 QTRAP : ESI, Positive, MRM)  
 Injection Vol. : 5  $\mu$ L  
 Data Source : LC InertSearch No. LB198

Sample :  
 1. Hydrocortisone  
 2. Prednisolone (0.1 mg/L each)

### Analysis of Histamine Antagonists

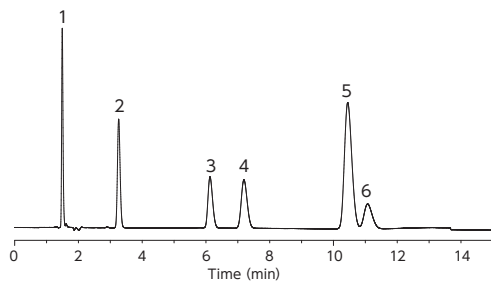


#### Conditions

Column : Inertsil ODS-4 (3  $\mu$ m, 150  $\times$  2.1 mm I.D.)  
 Eluent : A) CH<sub>3</sub>OH  
 B) 2 mM CH<sub>3</sub>COONH<sub>4</sub>  
 A/B = 40/60 - 10 min - 95/5  
 - 2 min - 95/5, v/v  
 Flow Rate : 0.2 mL/min  
 Col. Temp. : 40  $^{\circ}$ C  
 Detection : LC/MS/MS (4000 QTRAP : ESI, Positive, MRM)  
 Injection Vol. : 10  $\mu$ L  
 Data Source : LC InertSearch No. LA678

Sample :  
 1. Chlorpheniramine 6. Diphenylpyraline  
 2. Cinnarizin 7. Hydroxyzine  
 3. Clemastine 8. Promethazine  
 4. Difenedol 9. Triprolidine  
 5. Diphenhydramine (0.1 mg/L each)

### Analysis of $\beta$ -blocker

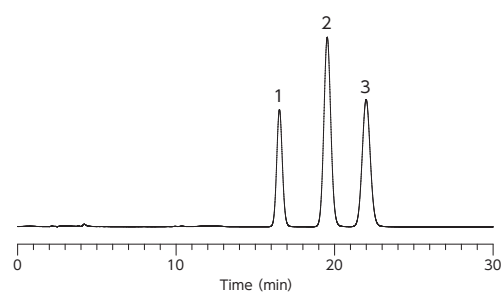


#### Conditions

Column : InertSustain AQ-C18 (5  $\mu$ m, 150  $\times$  4.6 mm I.D.)  
 Eluent : A) CH<sub>3</sub>CN B) 0.1 % H<sub>3</sub>PO<sub>4</sub> in H<sub>2</sub>O  
 A/B = 25/75, v/v  
 Flow Rate : 1.0 mL/min  
 Col. Temp. : 40  $^{\circ}$ C  
 Detection : UV 220 nm  
 Injection Vol. : 1  $\mu$ L  
 Data Source : LC InertSearch No. LB362

Sample :  
 1. Atenolol  
 2. Acebutolol  
 3. Oxprenolol  
 4. Labetalol  
 5. Propranolol  
 6. Alprenolol (100  $\mu$ g/mL each)

### Analysis of Nonsteroidal Anti-inflammatory Drug



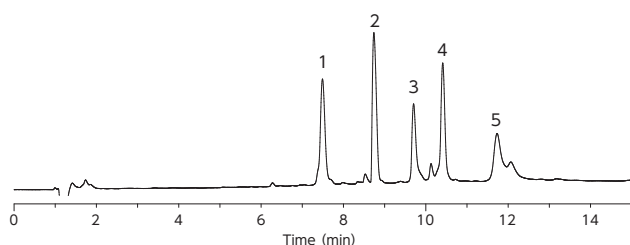
#### Conditions

Column : InertSustain Phenylhexyl (5  $\mu$ m, 150  $\times$  4.6 mm I.D.)  
 Eluent : A) CH<sub>3</sub>OH  
 B) 25 mM KH<sub>2</sub>PO<sub>4</sub> in H<sub>2</sub>O (pH = 3.0, H<sub>3</sub>PO<sub>4</sub>)  
 A/B = 60/40, v/v  
 Flow Rate : 0.8 mL/min  
 Col. Temp. : 40  $^{\circ}$ C  
 Detection : UV 230 nm  
 Injection Vol. : 5  $\mu$ L  
 Data Source : LC InertSearch No. LB421

Sample :  
 1. Ibuprofen  
 2. Diclofenac sodium  
 3. Indomethacin

## Biochemicals

### Protein

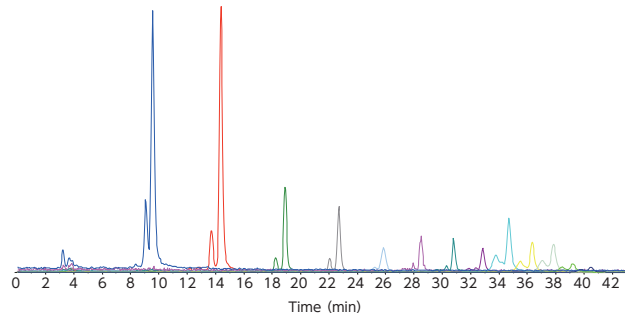


#### Conditions

Column : MonoCap C18 Fast-Flow (150 mm × 0.2 mm I.D.)  
 Eluent : A) 0.1 % TFA in CH<sub>3</sub>CN  
 B) 0.1 % TFA in H<sub>2</sub>O  
 A/B = 20/80 - 10 min - 60/40-15 min - 60/40  
 Flow Rate : 5 μL/min  
 Injection vol. : 0.3 μL  
 Col. Temp. : ambient  
 Detection : UV 210 nm

Sample :  
 1. Ibonuclease A  
 2. Insulin  
 3. Cytochrome C  
 4. Lysozyme  
 5. BSA

### PA-Glucose Oligomer

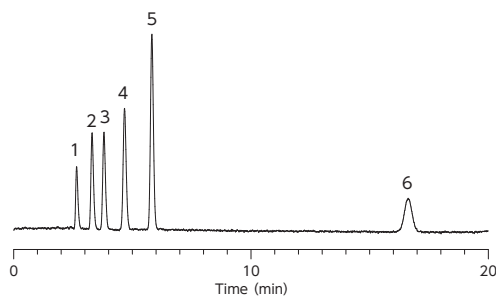


#### Conditions

Column : MonoCap Amide (250 mm × 0.2 mm I.D.)  
 Eluent : A) CH<sub>3</sub>CN  
 B) 10 mM CH<sub>3</sub>COONH<sub>4</sub> in H<sub>2</sub>O  
 A/B = 80/20 - 20 min - 60/40, v/v  
 Flow Rate : 2 mL/min  
 Col. Temp. : ambient  
 Detection : Nano-ESI  
 Injection vol. : 100 nL

Sample :  
 PA-Glucose oligomer

### Analysis of ATP related Compounds

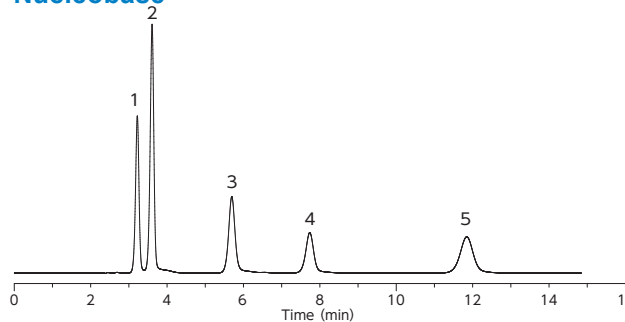


#### Conditions

Column : InertSustain AQ-C18  
 (5 μm, 150 × 4.6 mm I.D.)  
 Eluent : 50 mM K<sub>2</sub>HPO<sub>4</sub> in H<sub>2</sub>O  
 (pH 7.0, H<sub>3</sub>PO<sub>4</sub>)  
 Flow Rate : 1.0 mL/min  
 Col. Temp. : 40 °C  
 Detection : UV 260 nm  
 Injection Vol. : 1 μL  
 Data Source : LC InertSearch No. LB380

Sample :  
 1. Inosinic acid  
 2. Adenosine triphosphate  
 3. Adenosine diphosphate  
 4. Adenosine monophosphate  
 5. Hypoxanthine  
 6. Inosine  
 (5 mg/L each)

### Nucleobase

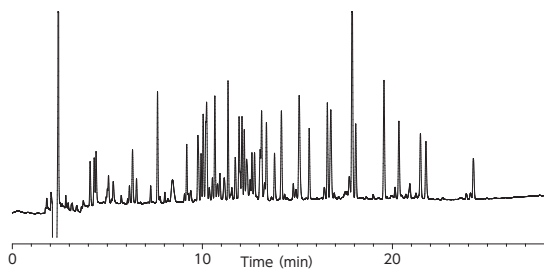


#### Conditions

Column : InertSustain Amide  
 (5 μm, 150 × 2.1 mm I.D.)  
 Eluent : A) CH<sub>3</sub>CN  
 B) 10 mM HCOONH<sub>4</sub> in H<sub>2</sub>O  
 A/B = 90/10, v/v  
 Flow Rate : 0.2 mL/min  
 Col. Temp. : 40 °C  
 Detection : UV 254 nm

Sample :  
 1. Tyamine  
 2. Uracil  
 3. Adenine  
 4. Cytosine  
 5. Guanine

### Analysis of BSA Digests

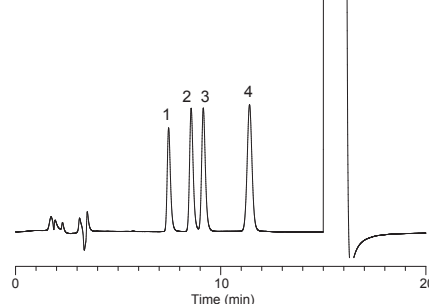


#### Conditions

Column : InertSustainSwift C18  
 (1.9 μm, 150 × 2.1 mm I.D.)  
 Eluent : A) 0.1% TFA in CH<sub>3</sub>CN  
 B) 0.1% TFA in H<sub>2</sub>O  
 A/B = 10/90 - 30 min - 50/50 - 0.1 min - 90/10  
 - 5 min - 90/10 - 0.1 min - 10/90 - 15 min  
 Flow Rate : 0.2 mL/min  
 Col. Temp. : 40 °C  
 Detection : UV 210 nm  
 Injection Vol. : 10 μL  
 Data Source : LC InertSearch No. LB438

Sample :  
 Tryptic Digest of BSA (0.5 mg/mL)

### Catecholamine in Urine



#### Conditions

Column : Inertsil ODS-4  
 (5 μm, 250 × 3.0 mm I.D.)  
 Eluent : A) Acetate-citrate buffer \*  
 B) CH<sub>3</sub>CN  
 A/B = 100/16, v/v  
 Flow Rate : 0.5 mL/min  
 Col. Temp. : 35 °C  
 Detection : ECD 800 mV vs. Ag/AgCl  
 Injection Vol. : 20 μL  
 Data Source : LC Technical Note No. 93

Sample :  
 1. Norepinephrine (NE)  
 2. Epinephrine (E)  
 3. 3,4-dihydroxybenzylamine (DHBA, I.S.)  
 4. Dopamine (DA)  
 (100 ng/mL in 0.1 % Acetic acid solution each)

\* : Acetate-citrate buffer :  
 Dissolve 0.82 g of anhydrous sodium acetate, 2.10 g of citric acid monohydrate and 0.50 g of sodium 1-octanesulfonate in 500mL of H<sub>2</sub>O.

Reversed Phase  
Columns

HILIC Columns

Normal Phase  
Columns

SEC Columns

Ion Exchange  
ColumnsApplication  
Specific Columns

Guard Columns

Preparative Columns

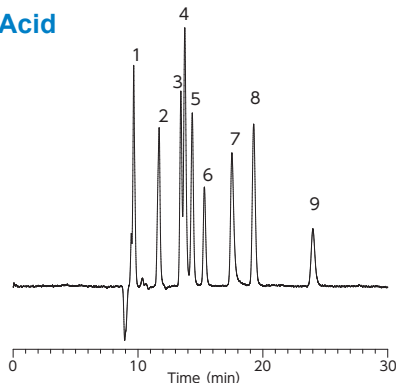
Capillary Columns

Applications

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## Foods

### Organic Acid

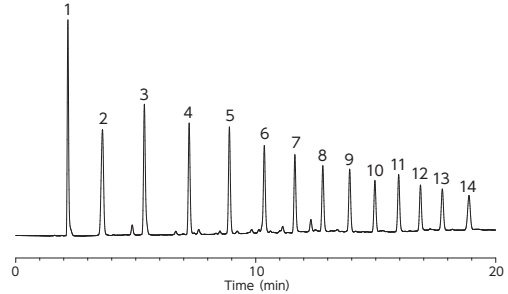


#### Conditions

Column : Inertsil Ph-3 (5  $\mu$ m, 250  $\times$  4.6 mm I.D.)  
 + Inertsil CX (5  $\mu$ m, 250  $\times$  4.6 mm I.D.)  
 Eluent : 3 mM HClO<sub>4</sub> in H<sub>2</sub>O  
 Reaction Reagent : 0.1 mM BTB + 30 mM Na<sub>2</sub>HPO<sub>4</sub> in H<sub>2</sub>O  
 Flow Rate : 0.5 mL/min  
 Col. Temp. : 35  $^{\circ}$ C  
 Detection : VIS 440 nm  
 Injection Vol. : 10  $\mu$ L  
 Data Source : LC Technical Note No. 24

Sample:  
 1. Phosphoric acid  
 2. Tartaric acid  
 3. Malic acid  
 4. Formic acid  
 5. Citric acid  
 6. Lactic acid  
 7. Acetic acid  
 8. Succinic acid  
 9. Pyroglutamic acid  
 (1 mg/mL each)

### Fatty Acid

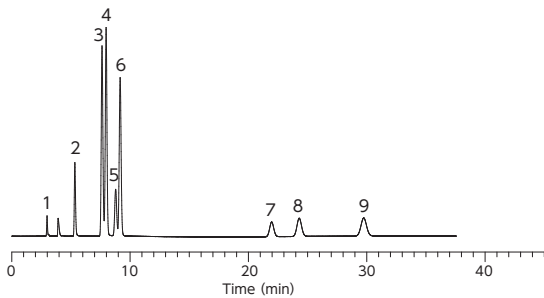


#### Conditions

Column : InertSustain C18  
 (5  $\mu$ m, 150  $\times$  4.6 mm I.D.)  
 Eluent : A) 0.1 % H<sub>3</sub>PO<sub>4</sub> in CH<sub>3</sub>CN  
 B) 0.1 % H<sub>3</sub>PO<sub>4</sub> in H<sub>2</sub>O  
 A/B = 10/90 - 15 min  
 - 90/10 - 10 min - 90/10, v/v  
 Flow Rate : 1.0 mL/min  
 Col. Temp. : 40  $^{\circ}$ C  
 Detection : UV 210 nm  
 Injection Vol. : 10  $\mu$ L  
 Data Source : LC InertSearch No. LA901

Sample :  
 1. Acetic acid (C2)  
 2. Propionic acid (C3)  
 3. Butyric acid (C4)  
 4. Valeric acid (C5)  
 5. Caproic acid (C6)  
 6. Enanthic acid (C7)  
 7. Caprylic acid (C8)  
 8. Pelargonic acid (C9)  
 9. Capric acid (C10)  
 10. Undecanoic acid (C11)  
 11. Lauric acid (C12)  
 12. Tridecanoic acid (C13)  
 13. Myristic acid (C14)  
 14. Pentadecanoic acid (C15)  
 (1 mg/mL each)

### Preservative · Sweetner

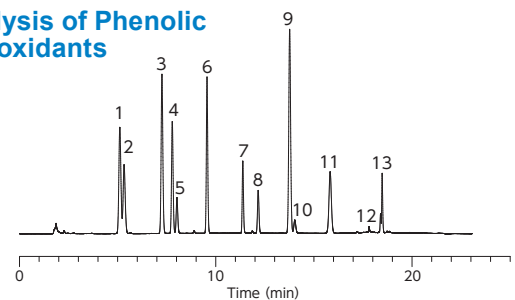


#### Conditions

Column : InertSustain Phenylhexyl  
 (5  $\mu$ m, 250  $\times$  4.6 mm I.D.)  
 Eluent : A) CH<sub>3</sub>CN  
 B) 0.1% H<sub>3</sub>PO<sub>4</sub> in H<sub>2</sub>O  
 A/B = 15/85, v/v  
 Flow Rate : 1.0 mL/min  
 Col. Temp. : 40  $^{\circ}$ C  
 Detection : UV 210 nm (GL-7452 PDA Detector)  
 Injection Vol. : 10  $\mu$ L  
 Data Source : LC InertSearch No. LB238

Sample :  
 1. Ascorbic acid  
 2. Acesulfame potassium  
 3. Saccharin sodium  
 4. Caffeine  
 5. Aspartame  
 6. p-Hydroxybenzoic acid  
 7. Sorbic acid  
 8. Benzoic acid  
 9. Dehydroacetic acid  
 (10 mg/L each)

### Analysis of Phenolic Antioxidants

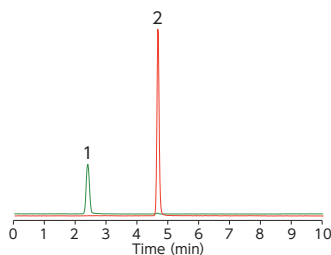


#### Conditions

Column : InertSustainSwift C18 HP  
 (3  $\mu$ m, 250  $\times$  4.6 mm I.D.)  
 Eluent : A) CH<sub>3</sub>CN/CH<sub>3</sub>OH = 1/1, v/v  
 B) 5 % CH<sub>3</sub>COOH in H<sub>2</sub>O  
 A/B = 30/70 - 2 min - 30/70 - 8 min  
 - 58/42 - 13 min - 58/42 - 15 min  
 - 100/0 - 18 min - 100/0 - 18.1 min  
 - 30/70 - 25 min - 30/70, v/v  
 Flow Rate : 1.0 mL/min  
 Col. Temp. : 40  $^{\circ}$ C  
 Detection : UV 280 nm  
 Injection Vol. : 10  $\mu$ L  
 Data Source : LC InertSearch No. LB405

Sample :  
 1. Propyl gallate (PG)  
 2. 3,4-Dihydroxybenzoic acid (DHBA)  
 3. 2,4,5-Trihydroxybutyrophenone (THBP)  
 4. Butyl gallate (BG)  
 5. tert-Butylhydroquinone (TBHQ)  
 6. Isoamyl gallate (IAG)  
 7. Nordihydroguaiaretic acid (NDGA)  
 8. Butylated hydroxyanisole (BHA)  
 9. 4-Hexylresorcinol (HR)  
 10. 4-Hydroxymethyl-2,6-di-tert-butylphenol (HMBP)  
 11. Octyl gallate (OG)  
 12. Dibutylhydroxytoluene (BHT)  
 13. Dodecyl gallate (DG) (10 mg/L each)

### Melamine

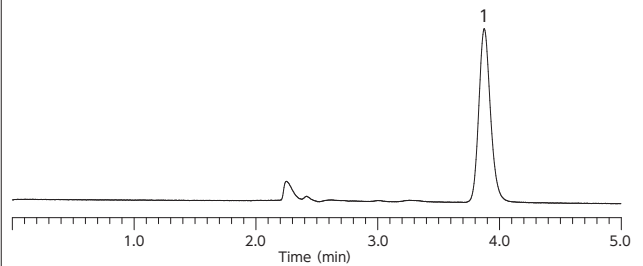


#### Conditions

Column : Inertsil HILIC (5  $\mu$ m, 150  $\times$  3.0 mm I.D.)  
 Eluent : A) CH<sub>3</sub>CN  
 B) 10 mM CH<sub>3</sub>COONH<sub>4</sub> in H<sub>2</sub>O  
 A/B = 90/10 - 0.5 min - 90/10  
 - 5.5 min - 50/50, v/v  
 Flow Rate : 0.5 mL/min  
 Col. Temp. : 40  $^{\circ}$ C  
 Detection : LC/MS/MS (4000 QTRAP : ESI, Positive, MRM)  
 Injection Vol. : 5.0  $\mu$ L  
 Data Source : LC Technical Note No.132

Sample :  
 1. Cyanoguanidine (20  $\mu$ g/L)  
 2. Melamine (10  $\mu$ g/L)

### Oxalic Acid



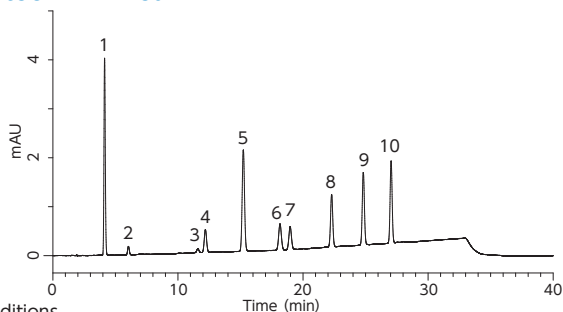
#### Conditions

Column : InertSustain Amide (5  $\mu$ m, 250  $\times$  4.6 mm I.D.)  
 Eluent : A) CH<sub>3</sub>CN  
 B) 30 mM Na<sub>2</sub>HPO<sub>4</sub> in H<sub>2</sub>O (pH 6.8)  
 A/B = 65/35, v/v  
 Flow Rate : 1.0 mL/min  
 Col. Temp. : 40  $^{\circ}$ C  
 Detection : UV 220 nm  
 Injection Vol. : 5  $\mu$ L  
 Data Source : LC InertSearch No.LB466

Sample :  
 1. Oxalic acid (100 mg/L)

## Foods

## Catechin in Tea

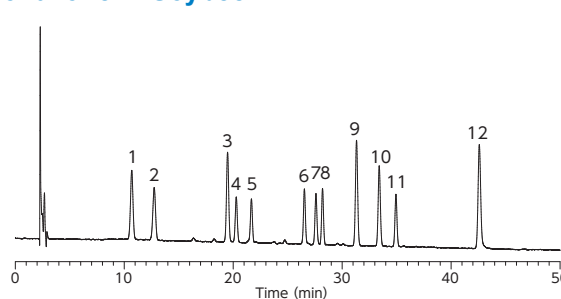


## Conditions

Column : InertSustain C18 (5  $\mu$ m, 150  $\times$  4.6 mm I.D.)  
 Eluent : A) CH<sub>3</sub>OH/CH<sub>3</sub>CN = 9/1, v/v  
 B) 0.1 % H<sub>3</sub>PO<sub>4</sub> in H<sub>2</sub>O (pH 2.1)  
 A/B = 10/90 - 15 min - 20/80 - 30 min  
 - 40/60 - 30.1 min - 10/90 - 40 min  
 - 10/90, v/v  
 Flow Rate : 1.0 mL/min  
 Col.Temp : 40 °C  
 Detection : UV 280 nm  
 Injection Vol. : 10  $\mu$ L  
 Data Source : LC Technical Note No. 145

Sample :  
 1. Gallic acid (GA)  
 2. Gallocatechin (GC)  
 3. Epigallocatechin (EGC)  
 4. Catechin (C)  
 5. Caffeine  
 6. Epigallocatechin gallate (EGCG)  
 7. Epicatechin (EC)  
 8. Gallocatechin gallate (GCG)  
 9. Epicatechin gallate (ECG)  
 10. Catechin gallate (CG) (1 mg/L each)

## Isoflavone in Soybean

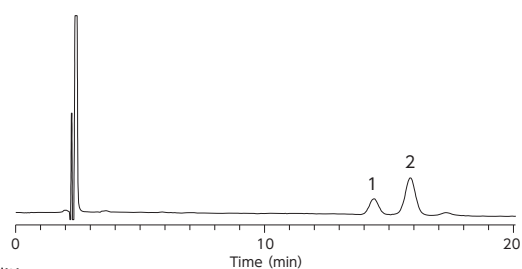


## Conditions

Column : Inertsil ODS-SP (5  $\mu$ m, 250  $\times$  4.6 mm I.D.)  
 Eluent : A) 0.1 % CH<sub>3</sub>COOH in CH<sub>3</sub>CN  
 B) 0.1 % CH<sub>3</sub>COOH in H<sub>2</sub>O  
 A/B = 15/85 - 8 min - 15/85 - 42 min - 35/65, v/v  
 Flow Rate : 1.5 mL/min  
 Col. Temp. : 35 °C  
 Detection : PDA 254 nm  
 Injection : 10  $\mu$ L  
 Data Source : LC Technical Note No. 66

Sample :  
 1. Daidzin (D)  
 2. Glycitin (GI)  
 3. Genistin (G)  
 4. 6'-o-Malonyldaidzin (MD)  
 5. 6'-o-Malonylglycitin (MGI)  
 6. 6'-o-Acetyldaidzin (AD)  
 7. 6'-o-Acetylglycitin (AGI)  
 8. 6'-o-Malonylgenistin (MG)  
 9. Daizein (De)  
 10. Glycitein (Gle)  
 11. 6'-o-Acetylgenistin (AG)  
 12. Genistein (Ge) (10 mg/L each)

## Carotene in Carrot Juice



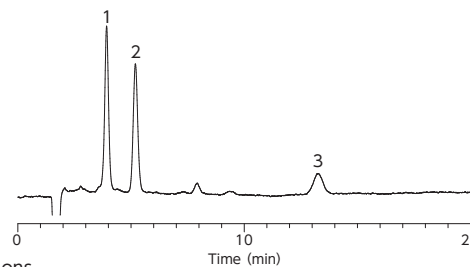
## Conditions

Column : Inertsil ODS-SP (5  $\mu$ m, 250  $\times$  4.6 mm I.D.)  
 Eluent : A) CH<sub>3</sub>OH  
 B) Ethanol  
 A/B = 90/10, v/v  
 Flow Rate : 1.0 mL/min  
 Col. Temp. : 40 °C

Detection : VIS 455 nm  
 Injection Vol. : 20  $\mu$ L  
 Data Source : LC Technical Note No.28

Sample :  
 1.  $\alpha$ -Carotene  
 2.  $\beta$ -Carotene

## Tetracycline



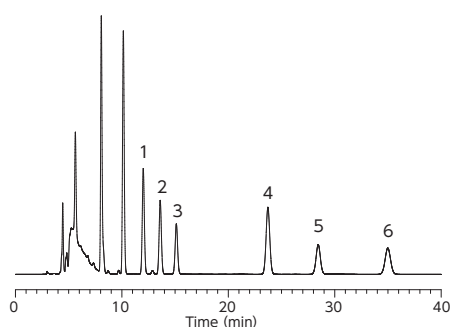
## Conditions

Column : InertSustain C18 (5  $\mu$ m, 150  $\times$  4.6 mm I.D.)  
 Eluent : A) CH<sub>3</sub>OH  
 B) Imidazole buffer\*  
 A/B = 20/80, v/v (Premix)  
 Flow Rate : 1.0 mL/min  
 Col. Temp. : 40 °C  
 Detection : FL Ex 380 nm Em 520 nm  
 Injection Vol. : 20  $\mu$ L

Sample :  
 1. Oxytetracycline  
 2. Tetracycline  
 3. Chlortetracycline (1 mg/L each)

\* Imidazole buffer :  
 Dissolve 68.08 g of imidazole, 0.37 g of disodium ethylenediaminetetraacetate and 10.72 g of magnesium acetate in 800 mL of H<sub>2</sub>O. Adjust to pH 7.2 with acetic acid and dilute this solution to 1,000 mL with H<sub>2</sub>O.

## Analysis of Non-volatile Corruption Amine



## Conditions

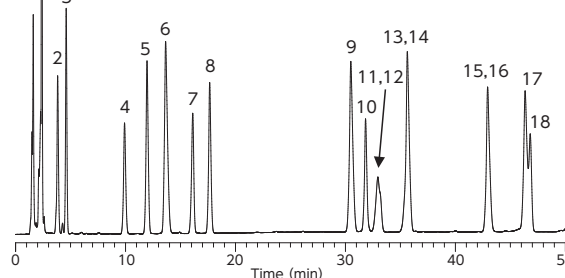
Column : Inertsil ODS-SP (5  $\mu$ m, 250  $\times$  4.6 mm I.D.)  
 Guard Column : Inertsil ODS-SP (5  $\mu$ m, 10  $\times$  4.0 mm I.D.)  
 Eluent : A) CH<sub>3</sub>CN B) H<sub>2</sub>O A/B= 65/35, v/v  
 Flow Rate : 1.0 mL/min  
 Col. Temp. : 40 °C  
 Detection : FL Ex 325 nm Em 525 nm  
 Injection : 10  $\mu$ L  
 Data Source : LC Technical Note No. 48

Sample :  
 1. Putrescine (5 mg/L)  
 2. Cadaverine (5 mg/L)  
 3. Histamine (100 mg/L)  
 4. 1,8-Diaminooctane (10 mg/L)  
 5. Tyramine (25 mg/L)  
 6. Spermidine (5 mg/L)

## Analysis of Food Dyes

## Conditions

Column : Inertsil ODS-3 (5  $\mu$ m, 150  $\times$  4.6 mm I.D.)  
 Eluent : A) CH<sub>3</sub>CN B) 10 mM Na<sub>2</sub>HPO<sub>4</sub> in H<sub>2</sub>O  
 A/B = 10/90 - 50 min - 35/65, v/v  
 Flow Rate : 1.0 mL/min  
 Col. Temp. : 40 °C  
 Detection : UV 270 nm  
 Injection Vol. : 10  $\mu$ L  
 Data Source : LC InertSearch No. LA509



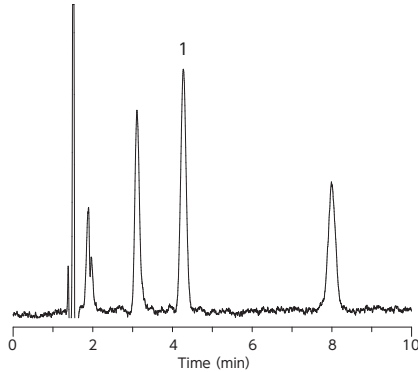
## Sample :

1. Tartrazine (Food Yellow No. 4, 7.6 mg/L)  
 2. Amaranth (Food Red No. 2, 3.8 mg/L)  
 3. Ingogocarmine (Food Blue No. 2, 7.6 mg/L)  
 4. New coccine (Food Red No. 102, 3.8 mg/L)  
 5. Sunset Yellow FCF (Food Yellow No. 5, 5.3 mg/L)  
 6. Naphthol Yellow S (7.6 mg/L)  
 7. Uranine (3.8 mg/L)  
 8. Allura red AC (5.3 mg/L)  
 9. Ponceau R (7.6 mg/L)  
 10. Ponceau SX (5.3 mg/L)  
 11. Orange I (5.3 mg/L)  
 12. Fast green FCF (Food Green No. 3, 3.0 mg/L)  
 13. Brilliant blue FCF (Food Blue No. 1, 3.0 mg/L)  
 14. Ponceau 3R (7.6 mg/L)  
 15. Erythrosine (Food Red No. 3, 5.3 mg/L)  
 16. Azure Blue VY (Sulfan blue, 3.0 mg/L)  
 17. Orange II (7.6 mg/L)  
 18. Acid red (Food Red No. 106, 3.0 mg/L)



## Environment

### Analysis of Non-ionic Surfactant

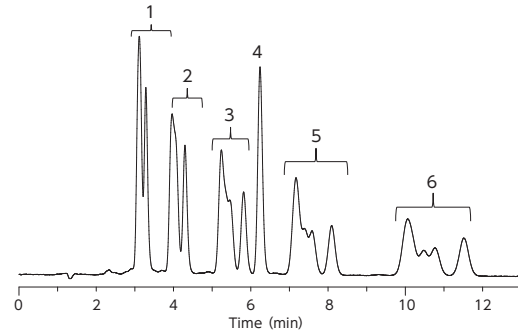


#### Conditions

Column : InertSustain C18 (5  $\mu$ m, 150  $\times$  4.6 mm I.D.)  
 Eluent : A) CH<sub>3</sub>OH B) 10 mM Na<sub>2</sub>B<sub>4</sub>O<sub>7</sub> in H<sub>2</sub>O A/B = 38/62, v/v  
 Flow Rate : 1.0 mL/min  
 Col. Temp. : 40  $^{\circ}$ C  
 Detection : UV 510 nm  
 Injection Vol. : 20  $\mu$ L  
 Data Source : LC InertSearch No. LA974

Sample :  
 1. Heptaoxyethylene dodecyl ether [Deriv.](0.002 mg/L)

### Analysis of Anionic Surfactant

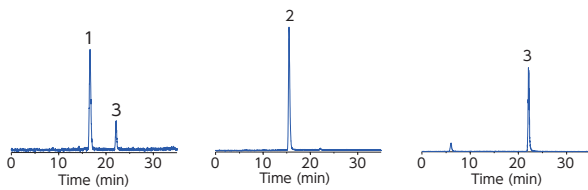


#### Conditions

Column : Inertsil ODS-3 (5  $\mu$ m, 150  $\times$  4.6 mm I.D.)  
 Eluent : 0.1 M NaClO<sub>4</sub> in CH<sub>3</sub>CN/H<sub>2</sub>O = 65/35, v/v  
 Flow Rate : 1.0 mL/min  
 Col. Temp. : 40  $^{\circ}$ C  
 Detection : FL Ex 221 nm Em 284 nm  
 Injection Vol. : 10  $\mu$ L  
 Data Source : LC Technical Note No. 102

Sample :  
 1. Sodium Decylbenzenesulfonate(C10)  
 2. Sodium Undecylbenzenesulfonate(C11)  
 3. Sodium Dodecylbenzenesulfonate(C12)  
 4. Toluene  
 5. Sodium Tridecylbenzenesulfonate(C13)  
 6. Sodium Tetradecylbenzenesulfonate(C14) (1 mg/L each)

### Haloacetic Acids

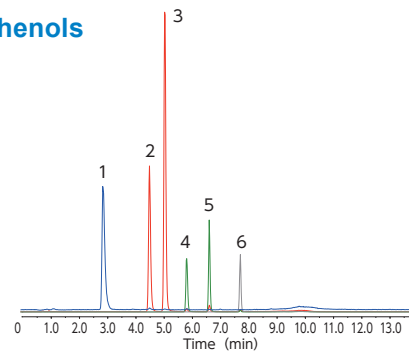


#### Conditions

Column : InertSustain C18 (3  $\mu$ m, 150  $\times$  4.6 mm I.D.)  
 Eluent : A) CH<sub>3</sub>OH B) 0.2 % HCOOH in H<sub>2</sub>O A/B = 5/95 - 38 min - 100/0 -12 min - 100/0, v/v  
 Flow Rate : 0.2 mL/min  
 Col. Temp. : 30  $^{\circ}$ C  
 Detection : LC/MS/MS (4000 QTRAP : ESI, Negative, MRM)  
 Injection Vol. : 100  $\mu$ L  
 Data Source : LC Technical Note No. 125

Sample :  
 1. Monochloroacetic acid (MCAA) (2  $\mu$ g/L)  
 2. Dichloroacetic acid (DCAA) (4  $\mu$ g/L)  
 3. Trichloroacetic acid (TCAA) (20  $\mu$ g/L)

### Chlorophenols

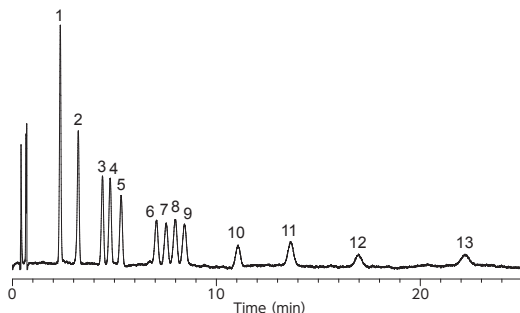


#### Conditions

Column : InertSustain C18 HP (3  $\mu$ m, 100  $\times$  2.1 mm I.D.)  
 Eluent : A) CH<sub>3</sub>OH, B) H<sub>2</sub>O A/B = 40/60-8 min-90/10-0.5 min-90/10-0.1 min-40/60-5 min, v/v  
 Flow Rate : 0.3 mL/min  
 Col. Temp. : 40  $^{\circ}$ C  
 Detection : LC/MS  
 Injection Vol. : 25  $\mu$ L  
 Data Source : LC Technical Note No. 149

Sample :  
 1. Phenol  
 2. 2-chlorophenol  
 3. 4-chlorophenol  
 4. 2,6-dichlorophenol  
 5. 2,4-dichlorophenol  
 6. 2,4,6-trichlorophenol (0.83  $\mu$ g / L each)

### DNPH Aldehydes

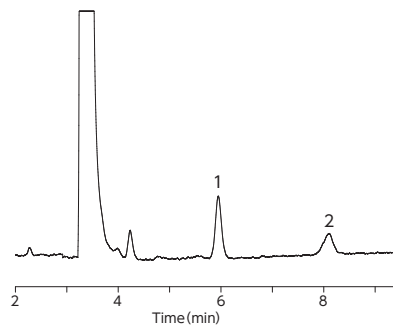


#### Conditions

Column : InertSustain C18 HP (3  $\mu$ m, 150  $\times$  3.0 mm I.D.)  
 Eluent : A) CH<sub>3</sub>CN B) THF C) H<sub>2</sub>O A/B/C = 35/10/55, v/v/v  
 Flow Rate : 1.5 mL/min  
 Col. Temp. : 40  $^{\circ}$ C  
 Detection : UV 360 nm  
 Injection Vol. : 10  $\mu$ L  
 Data Source : LC InertSearch No. LA962

Sample :  
 1. DNPH-Formaldehyde 8. DNPH-Methacrolein  
 2. DNPH-Acetaldehyde 9. DNPH-n-Butyraldehyde  
 3. DNPH-Acetone 10. DNPH-Benzaldehyde  
 4. DNPH-Acrolein 11. DNPH-m-Valeraldehyde  
 5. DNPH-Propionaldehyde 12. DNPH-m-Tolualdehyde  
 6. DNPH-Crotonaldehyde 13. DNPH-Hexanal  
 7. DNPH-Methylethylketone (150  $\mu$ g/L each)

### Formaldehydes in Water



#### Conditions

Column : InertSustain C18 (5  $\mu$ m, 150  $\times$  4.6 mm I.D.)  
 Eluent : A) CH<sub>3</sub>CN B) H<sub>2</sub>O A/B = 50/50, v/v  
 Flow Rate : 1.0 mL/min  
 Col. Temp. : 40  $^{\circ}$ C  
 Detection : UV 360 nm  
 Injection Vol. : 10  $\mu$ L

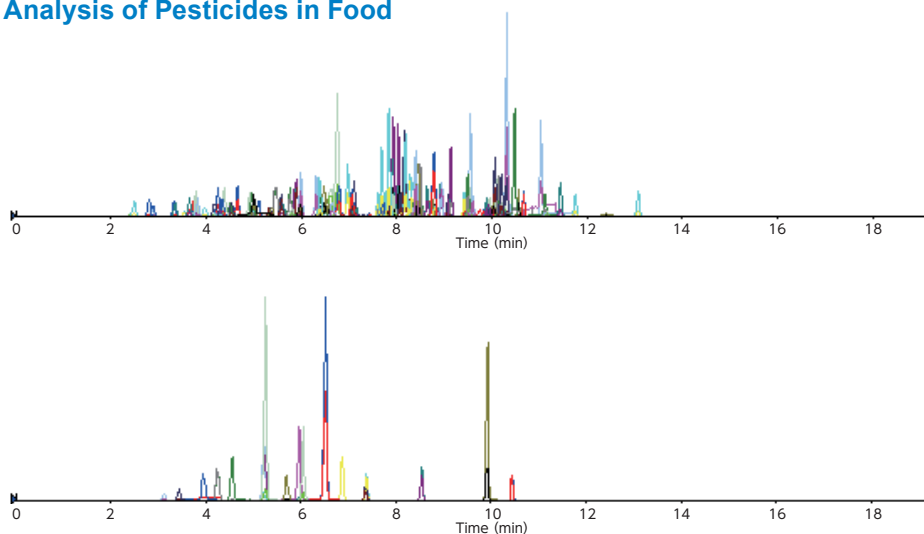
Sample :  
 1. DNPH-Formaldehyde  
 2. DNPH-Acetaldehyde (5  $\mu$ g/L each)



## Pesticides

## Analysis of Pesticides in Food

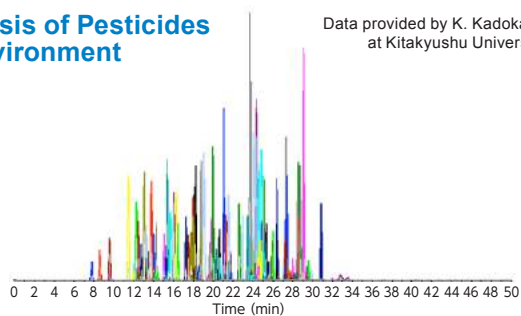
Data provided by AB Sciex



## Conditions

Column : InertSustain C18  
(2  $\mu\text{m}$ , 100  $\times$  2.1 mm I.D.)  
Eluent : A)  $\text{CH}_3\text{OH}$   
B) 2 mM  $\text{CH}_3\text{COONH}_4$  in  $\text{H}_2\text{O}$   
A/B = 5/95 - 0.5 min - 30/70 - 9.5 min  
- 95/5 - 5 min - 95/5, v/v  
Flow Rate : 0.3 mL/min  
Col.Temp. : 40  $^\circ\text{C}$   
Detection : LC/MS/MS  
(4000 QTRAP : ESI, MRM)  
Injection Vol. : 10  $\mu\text{L}$   
Data Source : LC Technical Note No. 129

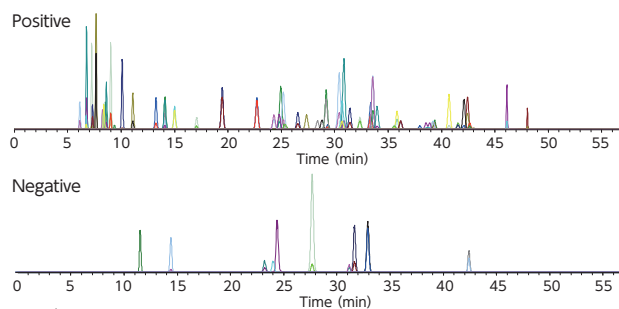
## Analysis of Pesticides in Environment

Data provided by K. Kadokami  
at Kitakyushu University

## Conditions

Column : Inertsil ODS-4 HP (3  $\mu\text{m}$ , 150  $\times$  2.1 mm I.D.)  
Eluent : A) 5 mM  $\text{CH}_3\text{COONH}_4$  in  $\text{CH}_3\text{OH}$   
B) 5 mM  $\text{CH}_3\text{COONH}_4$  in  $\text{H}_2\text{O}$   
A/B = 5/95 - 30 min - 95/5 - 20 min - 95/5, v/v  
Flow Rate : 0.3 mL/min  
Col. Temp. : 40  $^\circ\text{C}$   
Detection : LC/MS/MS (4000 QTRAP : ESI, Positive, MRM)  
Injection Vol. : 2.5  $\mu\text{L}$   
Data Source : LC InertSearch No. LA 843

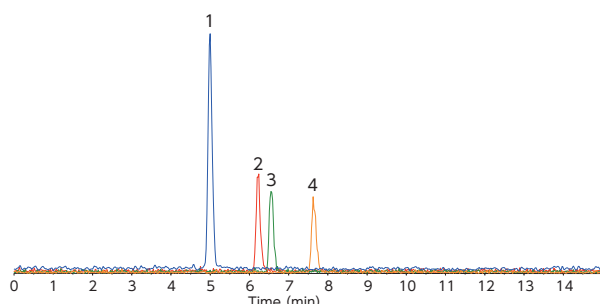
## Analysis of Pesticides in Water



## Conditions

Column : InertSustain C18 (3  $\mu\text{m}$ , 75  $\times$  2.1 mm I.D.)  
Eluent : A) 5 mM  $\text{CH}_3\text{COONH}_4$  in  $\text{CH}_3\text{OH}$  B) 5 mM  $\text{CH}_3\text{COONH}_4$  in  $\text{H}_2\text{O}$   
A/B = 5/95 - 4 min - 40/60 - 35 min - 75/25 - 5 min - 100/0 - 6 min, v/v  
Flow Rate : 0.15 mL/min  
Col.Temp. : 40  $^\circ\text{C}$   
Sample.Temp. : 5  $^\circ\text{C}$   
Detection : LC/MS/MS (4000 QTRAP : ESI, MRM)  
Injection Vol. : 100  $\mu\text{L}$   
Data Source : LC Technical Note No.135

## Pesticides

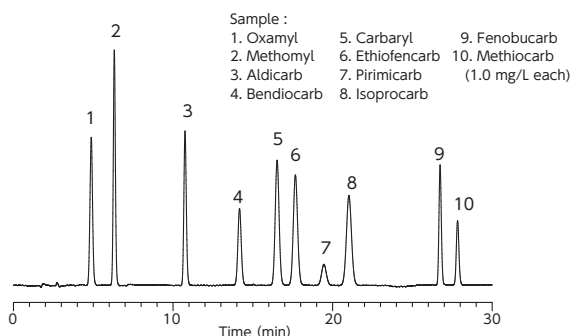


## Conditions

Column : InertSustain Phenyl (3  $\mu\text{m}$ , 150  $\times$  2.1 mm I.D.)  
Eluent : A) 0.1 %  $\text{HCOOH}$  in  $\text{CH}_3\text{CN}$   
B) 0.1 %  $\text{HCOOH}$  in  $\text{H}_2\text{O}$   
A/B = 40/60 - 10 min - 70/30 - 0.01 min - 40/60  
- 5 min - 40/60, v/v  
Flow Rate : 0.3 mL/min  
Col. Temp. : 40  $^\circ\text{C}$   
Detection : LC/MS/MS (4000 QTRAP : ESI, Positive, MRM)  
Injection Vol. : 5  $\mu\text{L}$   
Data Source : LC InertSearch No. LB077

Sample :  
1. Paclobutrazole  
2. Diniconazole  
3. Propiconazole  
4. Difenconazole  
(1  $\mu\text{g/L}$  each)

## Analysis of Carbamate Insecticides



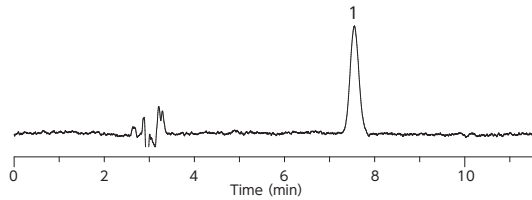
## Conditions

Column : InertSustain C18 (5  $\mu\text{m}$ , 250  $\times$  4.6 mm I.D.)  
Eluent : A)  $\text{CH}_3\text{OH}$  B)  $\text{H}_2\text{O}$   
A/B = 35/65 - 2 min - 35/65 - 0.1 min - 53/47 - 18.4 min - 53/47 - 0.1 min  
- 70/30 - 9.4 min - 70/30 - 0.1 min - 35/65 - 9.9 min - 35/65, v/v  
Reaction Reagent : OPA reagent  
Flow Rate : 1.0 mL/min  
Col. Temp. : 40  $^\circ\text{C}$   
Detection : FL Ex 339 nm Em 455 nm(0 - 18.5 min), Ex 312 nm Em 382 nm(18.6 - 20.1 min),  
Ex 339 nm Em 455 nm(20.2 - 30 min)  
Injection Vol. : 10  $\mu\text{L}$   
Data Source : LC InertSearch No. LA916

Sample :  
1. Oxamyl 5. Carbaryl 9. Fenobucarb  
2. Methomyl 6. Ethiofencarb 10. Methiocarb  
3. Aldicarb 7. Pirimicarb (1.0 mg/L each)  
4. Bendiocarb 8. Isoprocarb

## Vitamins

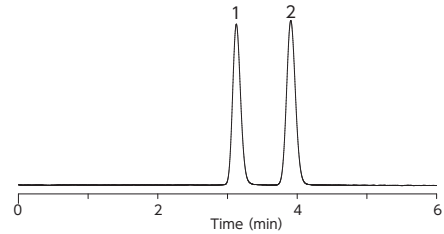
### Vitamin A



#### Conditions

Column : Inertsil ODS-3 (5  $\mu$ m, 250  $\times$  4.6 mm I.D.)      Sample :  
 Eluent : A) CH<sub>3</sub>OH      1. Retinol (50  $\mu$ g/L)  
           B) H<sub>2</sub>O  
           A/B = 95/5, v/v  
 Flow Rate : 1.0 mL/min  
 Col. Temp. : 40  $^{\circ}$ C  
 Detection : UV 325 nm  
 Injection Vol. : 20  $\mu$ L  
 Data Source : LC Technical Note No. 32

### Vitamin B1

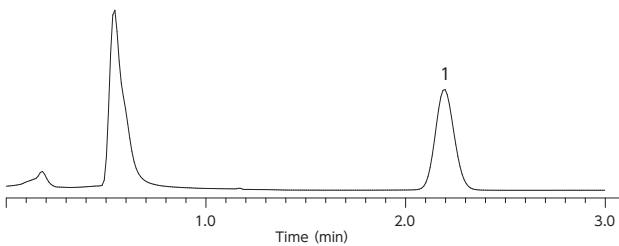


#### Conditions

Column : Inertsil ODS-3 (5 mm, 150  $\times$  4.6 mm I.D.)  
 Eluent : A) CH<sub>3</sub>OH  
           B) 0.01 M NaH<sub>2</sub>PO<sub>4</sub>,  
           0.15 M NaClO<sub>4</sub> in H<sub>2</sub>O (pH 2.2)  
           A/B = 1/9, v/v  
 Reaction Reagent : 0.05 w/v % potassium ferricyanide  
                           +15 w/v % NaOH, 0.4 mL/min  
 Flow Rate : 1.0 mL/min  
 Col. Temp. : 40  $^{\circ}$ C  
 Detection : FL Ex 375 nm Em 440 nm  
 Injection Vol : 20  $\mu$ L  
 Data Source : LC Technical Note No. 143

Sample :  
 1. Thiamine  
 2. Hydroxyethylthiamine (HET)  
 (50 mg/L each)

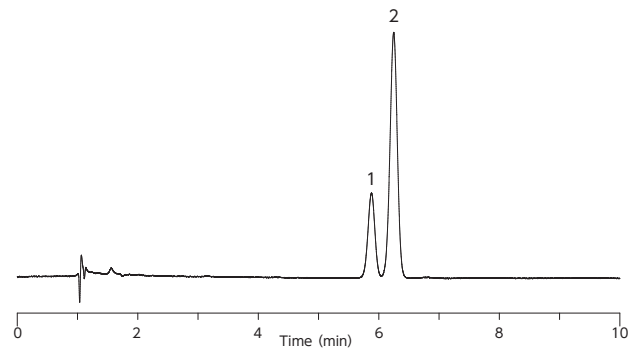
### Vitamin C



#### Conditions

Column : InertSustain Amide (5  $\mu$ m, 150  $\times$  3.0 mm I.D.)      Sample :  
 Eluent : A) CH<sub>3</sub>CN      1. Ascorbic acid  
           B) 0.1 % H<sub>3</sub>PO<sub>4</sub> in H<sub>2</sub>O  
           A/B = 87/13, v/v  
 Flow Rate : 0.8 mL / min  
 Col. Temp. : 40  $^{\circ}$ C  
 Detection : UV 243 nm  
 Injection Vol. : 2  $\mu$ L

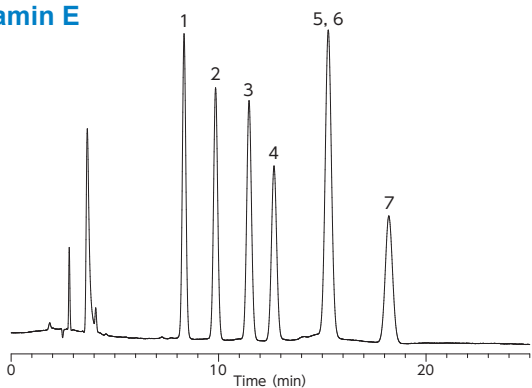
### Vitamin D2, D3



#### Conditions

Column : Inertsil ODS-HL (3  $\mu$ m, 150  $\times$  2.1 mm I.D.)      Sample :  
 Eluent : CH<sub>3</sub>OH      1. Vitamin D2  
 Flow Rate : 0.3 mL/min      2. Vitamin D3  
 Col. Temp. : 25  $^{\circ}$ C      (5 mg/L each)  
 Detection : UV 265 nm  
 Injection Vol. : 5  $\mu$ L  
 Data Source : LC InertSearch No. LB467

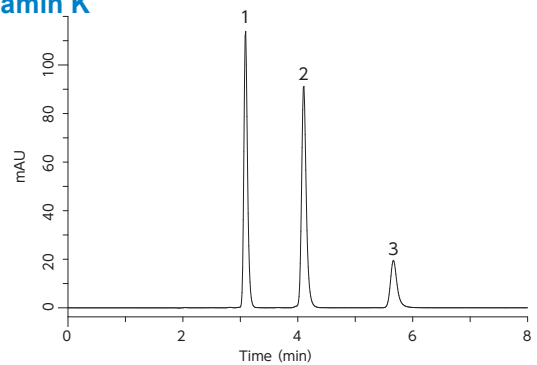
### Vitamin E



#### Conditions

Column : Inertsil ODS-HL  
 (5  $\mu$ m, 250  $\times$  4.6 mm I.D.)      Sample :  
 Eluent : CH<sub>3</sub>OH      1.  $\delta$ -Tocotrienol      5.  $\beta$ -Tocopherol  
 Flow Rate : 1.0 mL/min      2.  $\gamma$ -Tocotrienol      6.  $\gamma$ -Tocopherol  
 Col. Temp. : 30  $^{\circ}$ C      3.  $\alpha$ -Tocotrienol      7.  $\alpha$ -Tocopherol  
 Detection : UV 210 nm      4.  $\delta$ -Tocopherol      (10 mg/L each)  
 Injection Vol. : 5  $\mu$ L

### Vitamin K

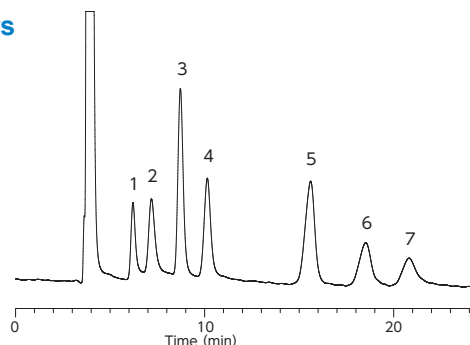


#### Conditions

Column : InertSustainSwift C8  
 (5  $\mu$ m, 150  $\times$  4.6 mm I.D.)      Sample :  
 Eluent : CH<sub>3</sub>CN      1. Vitamin K2 (MK-4)  
 Flow rate : 1.0 mL/min      2. Vitamin K1  
 Col. Temp. : 40  $^{\circ}$ C      3. Vitamin K2 (MK-7)  
 Detection : UV 270 nm      (50 mg/L each)  
 Injection Vol. : 5  $\mu$ L  
 Data Source : LC InertSearch No. LB468

## Others

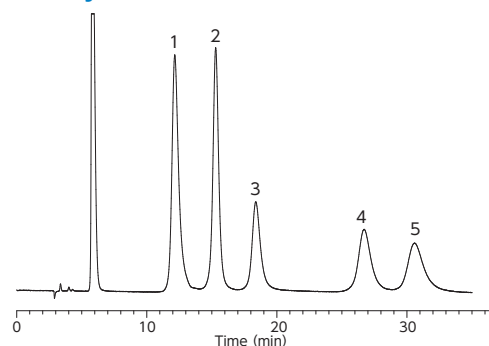
## Sugars



## Conditions

Column : InertSustain NH2 (5  $\mu$ m, 250  $\times$  4.6 mm I.D.) Sample :  
 Eluent : A) CH<sub>3</sub>CN B) H<sub>2</sub>O 1. Rhamnose  
 A/B = 85/15, v/v 2. Fucose  
 Flow Rate : 1.0 mL/min 3. Fructose  
 Col. Temp. : 40  $^{\circ}$ C 4. Glucose  
 Detection : RI 5. Sucrose  
 Injection Vol.: 10  $\mu$ L 6. Maltose  
 Data Source : LC InertSearch No. LB180 7. Lactose  
 (10 mg/mL each)

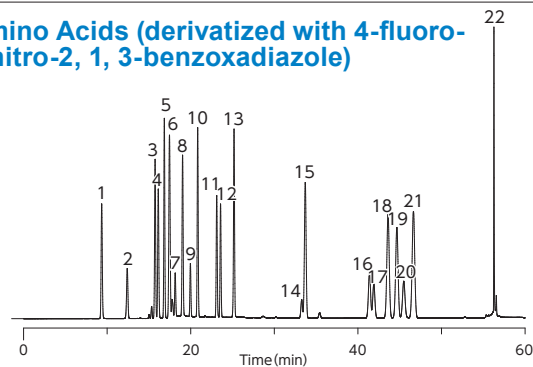
## Sugar analysis with ECD



## Conditions

Column : InertSphere Sugar-1 (5  $\mu$ m, 150  $\times$  4.6 mm I.D.) Sample :  
 Eluent : 100 mM NaOH\* in H<sub>2</sub>O 1. Fucose  
 Flow Rate : 0.5 mL/min 2. Glucose  
 Col. Temp. : 25  $^{\circ}$ C 3. Fructose  
 Detection : ECD Pulse Mode 4. Lactose  
 Injection Vol.: 10  $\mu$ L 5. Sucrose  
 Data Source : LC Technical Note No. 101 (10 mg/L each)

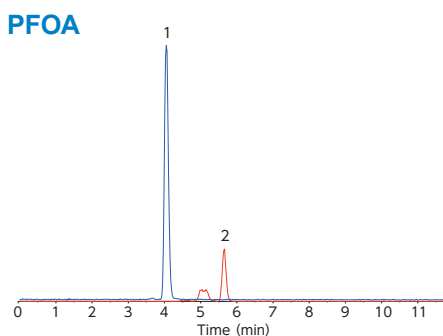
## Amino Acids (derivatized with 4-fluoro-7-nitro-2, 1, 3-benzoxadiazole)



## Conditions

Column : InertSustainSwift C18 Sample :  
 (5  $\mu$ m, 250  $\times$  4.6 mm I.D.) 1. NBD-Taurin 12. NBD-GABA  
 Eluent : A) 0.1 % TFA in CH<sub>3</sub>CN 2. NBD-Histidine 13. NBD-Proline  
 B) 0.1 % TFA in H<sub>2</sub>O 3. NBD-Glutamine 14. NBD-Methionine  
 A/B = 10/90 - 5 min - 10/90 - 20 min 4. NBD-Serine 15. NBD-Valine  
 - 30/70 - 50 min - 35/65 - 50.1 min 5. NBD-Arginine 16. NBD-Cystine  
 - 80/20 - 55 min - 80/20 - 55.1 min 6. NBD-OH 17. NBD-Ornithine  
 - 10/90 - 70 min - 10/90, v/v 7. NBD-Aspartic acid 18. NBD-Isoleucine  
 Flow Rate : 1.0 mL/min 8. NBD-Glycine 19. NBD-Leucine  
 Col. Temp. : 40  $^{\circ}$ C 9. NBD-Glutamic acid 20. NBD-Lysine  
 Detection : FL Ex 470 nm Em 530 nm 10. NBD-Threonine 21. NBD-Phenylalanine  
 Injection Vol.: 5  $\mu$ L 11. NBD-Alanine 22. NBD-Tyrosine  
 (50  $\mu$ mol/L each)  
 Data Source : LC InertSearch No. LB470

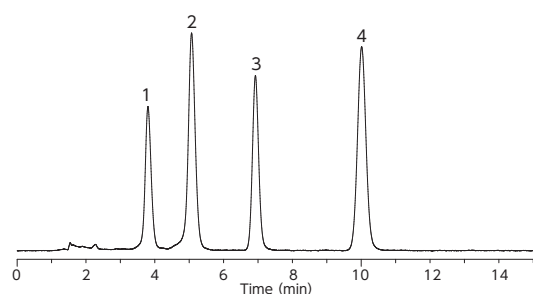
## PFOS · PFOA



## Conditions

Column : Inertsil ODS-4 Sample :  
 (3  $\mu$ m, 100  $\times$  2.1 mm I.D.) 1. PFOA (Perfluorooctanoic acid)  
 Eluent : A) 5 mM CH<sub>3</sub>COONH<sub>4</sub> in CH<sub>3</sub>OH 2. PFOS (Perfluorooctanesulfonic acid)  
 B) 5 mM CH<sub>3</sub>COONH<sub>4</sub> in H<sub>2</sub>O (1 mg/L each)  
 A/B = 60/40 - 8 min - 75/25 - 0.1 min  
 - 90/10 - 1.9 min - 90/10 - 0.1 min  
 - 60/40 - 4.9 min - 90/10, v/v  
 Flow Rate : 0.6 mL/min  
 Col. Temp. : 40  $^{\circ}$ C  
 Detection : LC/MS/MS (4000 QTRAP : ESI, Negative, MRM)  
 Injection Vol.: 2  $\mu$ L  
 Data Source : LC InertSearch No. LA864

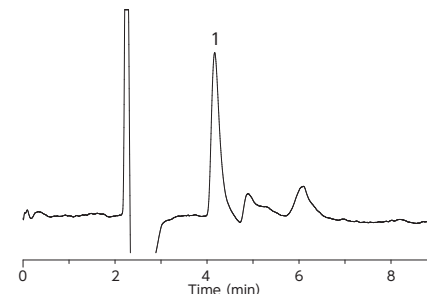
## Analysis of Pre-column Derivatized Aflatoxin



## Conditions

Column : InertSustain C18 (5  $\mu$ m, 150  $\times$  4.6 mm I.D.) Sample :  
 Eluent : A) CH<sub>3</sub>OH B) CH<sub>3</sub>CN C) H<sub>2</sub>O 1. Aflatoxin G1  
 A/B/C = 30/10/60, v/v/v (Premix) 2. Aflatoxin B1  
 Flow Rate : 1.0 mL/min 3. Aflatoxin G2  
 Col. Temp. : 40  $^{\circ}$ C 4. Aflatoxin B2  
 Detection : FL Ex 365 nm Em 450 nm (5 ng/mL each)  
 Injection Vol.: 20  $\mu$ L  
 Data Source : LC InertSearch No. LB107

## Hydrogen Peroxide



## Conditions

Column : Inertsil CX (5  $\mu$ m, 250  $\times$  4.6 mm I.D.) Sample :  
 Flow Rate : 0.8 mL/min 1. Hydrogen peroxide (H<sub>2</sub>O<sub>2</sub>)  
 Detection : ECD (10  $\mu$ g/L)  
 Injection Vol.: 100  $\mu$ L  
 Data Source : LC Technical Note No. 49