

High Performance Liquid Chromatography

# PRODUCTS CATALOG



**SHINWA CHEMICAL INDUSTRIES LTD.**

High performance liquid chromatography is a necessary method in the analytical separation. To perform high quality analysis, the new analytical method and devices including detector have been investigated by the effort of many chromatographer. The high performance analysis came to be achieved as a result.

SHINWA CHEMICAL INDUSTRIES LTD. offer the customer the column with excellent separation and reproducibility anytime and anywhere; ULTRON columns have made an effort doing a severe quality control through the production process.

The series of ULTRON are high quality controlled HPLC columns.

In order to satisfy your analytical requirement, we have many columns.

- 1) **ULTRON ES** series are columns for enantiomer separation in the field of medicine and so on.
- 2) **ULTRON VX** series are columns based on silica material for reversed- and normal-phase chromatography.
- 3) **ULTRON PS** series are polymer based columns for the analysis of food and so on.

The **STR** columns are packed with perfect spherical and pure silica synthesized finely. The **STR** series show excellent column performance and reproducibility in the separation for various samples.

Separation Mode	Column	Application
Chiral Separation Chromatography	ULTRON ES-OVM	Optical Isomers of Medicines, Pesticides
	ULTRON ES-PEPSIN	
	ULTRON ES-BSA	
	ULTRON ES-CD	
	ULTRON ES-PhCD	
Ion Exclusion Chromatography	ULTRON PS-80H	Organic Acids and Alcohols
Ligand Exchange Chromatography	ULTRON PS-80N	Monosaccharides, Disaccharides, Alditol
	ULTRON PS-80C	
	ULTRON PS-80P	
	ULTRON CI	Inositol
	ULTRON CL	Glucuronic Acid
Normal-phase Chromatography	ULTRON VX-SIL	Phosphorus Liquid
Reversed-phase Chromatography	ULTRON VX-ODS	Pharmaceutical Compounds, General Organic Substances, Food Additives, Pesticides, Fatty Acids and Catecholamines
	ULTRON VX-Octyl	
	STR ODS-II	
	STR ODS-M	

## HPLC Column For Enantiomer Separation

The **ULTRON ES** series are columns for enantiomer separation.

Columns which are packed with protein immobilized silica (**ULTRON ES-OVM**, **ULTRON ES-PEPSIN**, **ULTRON ES-BSA**) and chemically bonded cyclodextrin (**ULTRON ES-CD**, **ULTRON ES-PhCD**).

### ULTRON ES-OVM

#### Characteristics

Ultron ES-OVM is a chiral separation column immobilized with ovomucoid which is strong protein for denaturation. (US PATENT 6027648 Eisai Co., LTD.)

A wide range of chiral recognition.

No sample preparation for optical separation.

Aqueous mobile phase can be used in the separation .

A trace analysis can be performed (ng level) .

#### Applications

- Pharmaceutical Compounds, Pesticides and Organic Compounds

Column	Particle Size (µm)	Column Size Length × Inner Diameter (mm)
ULTRON ES-OVM (Narrow Bore)	5	150 × 2.0
ULTRON ES-OVM (for Analytical)		150 × 4.6
ULTRON ES-OVM (for Analytical)		150 × 6.0
ULTRON ES-OVM.G (Guard Column)		10 × 4.0
ULTRON ES-OVM (for Analytical)	10	250 × 4.6
ULTRON ES-OVM Prep (for Preparative)		250 × 20.0
ULTRON ES-OVM Prep.G (Guard Column for Preparative)		15 × 8.0
ULTRON ES-OVM (Two Guard Cartridges )	5	5 × 2.0
ULTRON ES-OVM (Two Guard Cartridges)		10 × 4.6
Holder for Guard Cartridge (with Adaptor)	For 5 × 2.0 mm column	
Holder for Guard Cartridge (with Adaptor)	For 10 × 4.6 mm column	

### ULTRON ES-PEPSIN

#### Characteristics

ULTRON ES-PEPSIN is an enantiomer separation column immobilized with pepsin which is the polypeptide dialytic enzyme of the pig stomach mucous membrane origin.

ULTRON ES-PEPSIN is effective for the enantiomer separation of amino alcohols such as  $\alpha$ -blocker medicines.

The sample preparation for optical isomer separation is not necessary.

Aqueous mobile phase can be used in the separation.

A trace analysis can be performed (ng level).

#### Applications

- Pharmaceutical Compounds, Pesticides and Organic Compounds

Column	Particle Size (µm)	Column Size Length × Inner Diameter (mm)
ULTRON ES-PEPSIN (for Analytical)	5	150 × 4.6
ULTRON ES-PEPSIN.G (Guard Column)		10 × 4.0

## ULTRON ES-BSA

### Characteristics

ULTRON ES-BSA is bovine serum albumin immobilized column for enantiomer separation.

ULTRON ES-BSA is performed an excellent enantiomer separation for acidic compounds such as arylpropionic acid drugs.

The sample preparation for optical isomer separation is not necessary.

Aqueous mobile phase can be used in the separation.

A trace analysis can be performed (ng level) .

### Applications

- Pharmaceutical compounds, Pesticides and Organic compounds

Column	Particle Size (µm)	Column Size Length × Inner Diameter (mm)
ULTRON ES-BSA (for Analytical)	7	150 × 4.6
ULTRON ES-BSA.G (Guard Column)		10 × 4.0

## ULTRON ES-CD

## ULTRON ES-PhCD

ULTRON ES-CD and ULTRON ES-PhCD are enantiomeric separation columns chemically bonded with -cyclodextrin (CD) and phenylcarbamated -cyclodextrin (PhCD), respectively.

### Characteristics

ULTRON ES-CD and ULTRON ES-PhCD are effective for the enantiomeric separation of hydrophobic cyclic compounds.

Mobile phase of both reverse-phase and normal-phase modes can be used for the separation.

A wide range of enantiomeric compounds can be separated with ULTRON ES-CD or ULTRON ES-PhCD.

The columns show excellent stability and durability.

### Applications

- Pharmaceutical compounds, Pesticides and Organic compounds

Column	Particle Size (µm)	Column Size Length × Inner Diameter (mm)
ULTRON ES-CD (Narrow Bore)	5	150 × 2.0
ULTRON ES-CD (for Analytical)		150 × 6.0
ULTRON ES-CD.G (Guard Column)		10 × 4.0
ULTRON ES-CD (Two Guard Cartridges)		5 × 2.0
ULTRON ES-CD (Two Guard Cartridges)		10 × 4.6
Holder for Guard Cartridge (with Adaptor)		For 5 × 2.0 mm column
Holder for Guard Cartridge (with Adaptor)	For 10 × 4.6 mm column	
ULTRON ES-PhCD (Narrow Bore)	5	150 × 2.0
ULTRON ES-PhCD (for Analytical)		150 × 6.0
ULTRON ES-PhCD.G (Guard Column)		10 × 4.0
ULTRON ES-PhCD (Two Guard Cartridges)		5 × 2.0
ULTRON ES-PhCD (Two Guard Cartridges)		10 × 4.6
Holder for Guard Cartridge (with Adaptor)		For 5 × 2.0 mm column
Holder for Guard Cartridge (with Adaptor)	For 10 × 4.6 mm column	

## HPLC Column For Organic Acid Analysis

### ULTRON PS-80H

ULTRON PS-80H is HPLC column packed with sulfonic acid type polystyrene cation exchange resin for the organic acid analysis.

#### Characteristics

ULTRON PS-80H is high speed and a high separation column by the ion suppression of the sample.

ULTRON PS-80H shows excellent reproducibility of the retention.

ULTRON PS-80H is durable because of the use of mechanical strong polymer gel.

#### Applications

- Aliphatic, Aromatic organic acid
- Alcohols, Aldehydes, Diols
- Monitoring of the fermentation

Column	Particle Size (µm)	Column Size Length × Inner Diameter (mm)
ULTRON PS-80H	10	300 × 8.0
		250 × 2.0
ULTRON PS-80H.G (Guard Column)		50 × 8.0

The maximum operation pressure : 4.0 MPa

The maximum operation temperature : 90

Range of pH in use : pH 2 - 6

## HPLC Column For Sugar And Sugar Alcohol Analysis

### ULTRON PS-80N

### ULTRON PS-80C

### ULTRON PS-80P

The ULTRON PS series are HPLC columns packed with sulfonic acid type polystyrene cation exchange resin for the sugar and the sugar alcohol analysis.

There are three types of PS-80N (Na type) , PS-80C (Ca type) and PS-80P (Pb type).

#### Characteristics

ULTRON PS series columns are effective for quantity analysis because saccharide is not adsorbed on the matrix.

ULTRON PS series columns use in aqueous mobile phase.

ULTRON PS series columns are durable because of the use of mechanical strong polymer gel.

#### Applications

- Oligosaccharides, Disaccharides, Monosaccharides
- Sugar alcohols
- Monitor of ferment hydrolysis of polysaccharide

Column	Particle Size (µm)	Column Size Length × Inner Diameter (mm)
ULTRON PS-80N	10	300 × 8.0
ULTRON PS-80N.L		500 × 8.0
ULTRON PS-80N.G (Guard Column)		50 × 8.0
ULTRON PS-80C		300 × 8.0
ULTRON PS-80C.G (Guard Column)		50 × 8.0
ULTRON PS-80P		300 × 8.0
ULTRON PS-80P.G (Guard Column)		50 × 8.0

The maximum operation pressure : 4.0 MPa (PS-80N, -80C, -80P)

6.0 MPa (PS-80N.L)

The maximum operation temperature : 80 (PS-80N, -80N.L)

90 (PS-80C, -80P)

Range of pH in use : pH 6 - 12 (PS-80N, -80N.L),

pH 6 - 7.5 (PS-80C, -80P)

## HPLC Column For Inositol In Health Drink

### ULTRON CI

ULTRON CI is a strong cation exchange polymer packed HPLC column for inositol.

#### Characteristics

ULTRON CI perform excellent qualitative analysis for inositol in health drink.

ULTRON CI shows good reproducibility in retention.

The polymer beads of ULTRON CI have mechanical strength.

The maximum operation pressure is 8.0 MPa.

The maximum operation temperature is 90 .

Column	Column Size Length × Inner Diameter (mm)
ULTRON CI	200 × 4.6

## HPLC Column For Glucuronic Acid In Health Drink

### ULTRON CL

ULTRON CL is a strong anion exchange polymer packed HPLC column for glucuronic acid.

#### Characteristics

ULTRON CL perform excellent qualitative analysis for glucuronic acid in health drink.

ULTRON CL shows good reproducibility in retention.

The polymer beads of ULTRON CI have mechanical strength.

The maximum operation pressure is 8.0 MPa.

The maximum operation temperature is 80 .

Column	Column Size Length × Inner diameter (mm)
ULTRON CL	150 × 4.0

## HPLC Column For Normal Phase (SIL)

### ULTRON VX-SIL

ULTRON VX-SIL is used high purity silica gel of SiO<sub>2</sub> 99.99% or more. Therefore, the sample adsorption with the metal oxide is decreased as much as possible.

The use of the spherical silica particles lead to reduce the column pressure drop and long life.

Particle Size	Pore Size	Specific Surface
5 µm	12 nm	300 m <sup>2</sup> /g

Column	Particle Size (µm)	Column Size Length × Inner Diameter (mm)
VX-SIL (for Analytical)	5	150 × 4.6
		250 × 4.6
		150 × 6.0
VX-SIL (for Preparative)	5	250 × 20.0
VX-SIL (Narrow Bore)	5	150 × 2.0
		250 × 2.0
		150 × 1.0
		250 × 1.0
VX-SIL (for Analytical)	10	150 × 4.6
		250 × 4.6
		150 × 6.0
VX-SIL (for Preparative)	10	250 × 20.0
		250 × 30.0
		250 × 50.0
VX-SIL (for Preparative)	15	250 × 4.6
VX-SIL (for Preparative)	15	250 × 20.0
		250 × 30.0
		250 × 50.0

### ULTRON VX-SIL.G (Guard Column)

Column	Particle Size (µm)	Column Size Length × Inner Diameter (mm)
VX-SIL.G (for Analytical)	5	10 × 4.0
VX-SIL.G (for Preparative)		15 × 8.0
VX-SIL.G (for Analytical)	10	10 × 4.0
VX-SIL.G (for Preparative)		15 × 8.0
VX-SIL.G (for Analytical)	15	10 × 4.0
VX-SIL.G (for Preparative)		15 × 8.0
VX-SIL (Two Guard Cartridges)	5	5 × 2.0
VX-SIL (Two Guard Cartridges)		10 × 4.6
Holder for Guard Cartridge (with Adaptor)	For 5 × 2.0 mm column	
Holder for Guard Cartridge (with Adaptor)	For 10 × 4.6 mm column	

## HPLC Column For Reversed Phase (ODS)

### ULTRON VX-ODS

**ULTRON VX-ODS** is reversed-phase column having monomeric octadecyl group. The bare silica of **ULTRON VX-ODS** is the same of **ULTRON VX-SIL**. Our excellent end-capping technology (secondary silylation) lead to the reduction of the influence of the residual silanol groups. We have three types (5, 10, and 15  $\mu\text{m}$ ) of the particle diameter. We also various column from 1 mm (narrow bore) to 50 mm (for preparative separations) in the inner diameter. Please select the column size according to the purpose.

Particle Size	Pore Size	Surface Area	Carbon Content
5 $\mu\text{m}$	12 nm	300 $\text{m}^2/\text{g}$	16 %

#### Reproducibility between column lots

**ULTRON VX-ODS** columns are cheked by the severe quality control every each manufacturing process.

The product passed many check point in the manufacturing process is **ULTRON VX-ODS**. The  $k'$  and value obtained with **ULTRON VX-ODS** shows the narrow difference between the batch and column lots. **ULTRON VX-ODS** shows excellent reproducibility and stability, in other test between column lots.

#### Stereoselectivity, distribution equilibrium

**ULTRON VX-ODS** which has monolayer of octadecyl group shows excellent stereoselectivity for the sample molecule. The distribution equilibrium is performed quickly under the gradient elution or at the exchange of the mobile phase used.

#### Pressure resistance

By the use of spherical silica gel, **ULTRON VX-ODS** shows the excellent the resisting pressure and even at fast flow rate of mobile phase, a stable separation is obtained.

Column	Particle Size ( $\mu\text{m}$ )	Column Size Length $\times$ Inner Diameter (mm)
VX-ODS (for Analytical)	5	150 $\times$ 4.6
		250 $\times$ 4.6
		150 $\times$ 6.0
VX-ODS (for Preparative)	5	250 $\times$ 20.0
VX-ODS (Narrow Bore)	5	150 $\times$ 2.0
		250 $\times$ 2.0
		150 $\times$ 1.0
		250 $\times$ 1.0
VX-ODS (for Analytical)	10	150 $\times$ 4.6
		250 $\times$ 4.6
		150 $\times$ 6.0
VX-ODS (for Preparative)	10	250 $\times$ 20.0
		250 $\times$ 30.0
		250 $\times$ 50.0
VX-ODS (for Analytical)	15	250 $\times$ 4.6
VX-ODS (for Preparative)	15	250 $\times$ 20.0
		250 $\times$ 30.0
		250 $\times$ 50.0



## HPLC Column For Normal Phase (ODS)

### ULTRON VX-ODS.G (Guard Column)

Column	Particle Size (µm)	Column Size Length × Inner Diameter (mm)
VX-ODS.G (for Analytical)	5	10 × 4.0
VX-ODS.G (for Preparative)		15 × 8.0
VX-ODS.G (for Analytical)	10	10 × 4.0
VX-ODS.G (for Preparative)		15 × 8.0
VX-ODS.G (for Analytical)	15	10 × 4.0
VX-ODS.G (for Preparative)		15 × 8.0
VX-ODS (Two Guard Cartridges)	5	5 × 2.0
VX-ODS (Two Guard Cartridges)		10 × 4.6
Holder for Guard Cartridge (with Adaptor)	For 5 × 2.0 mm column	
Holder for Guard Cartridge (with Adaptor)	For 10 × 4.6 mm column	

## HPLC Column For Reversed Phase (Octyl)

### ULTRON VX-Octyl

The earth environment is very important problem. We have to defend our earth from the atmospheric pollution, the contamination of the water, the soil pollution and the industrial waste pollution. The reduction of large amount of organic solvents is also needed in the HPLC analysis which can be performed for many samples in the various field. In order to overcome many problems mentioned above, octyl column modified with short alkyl chain than that of ODS column may be necessary and become popular. **ULTRON VX-Octyl** have a necessary characteristics to satisfy for such requirements.

A highly refined synthetic technology of ULTRON VX-ODS was applied to **ULTRON VX-Octyl**.

#### Characteristics

The column life has been greatly improved.

ULTRON VX-Octyl is very few in the difference between columns lots and shows excellent reproducibility.

ULTRON VX-Octyl save the analysis time compared with ODS and shows excellent separation.

The use of organic solvent is decreased.

Because distribution equilibrium can be achieved quickly and the adsorbed material can be eluted easily compared with ODS, The best separation can be obtained by the gradient elution.

#### Applications

· Pharmaceutical compounds, Pesticides, Chemical compounds, Food, Environmental compounds and others

Column	Particle Size (µm)	Column Size Length × Inner Diameter (mm)
ULTRON VX-Octyl (for Analytical)	5	150 × 4.6
		250 × 4.6
ULTRON VX-Octyl (for Preparative)		250 × 20.0
ULTRON VX-Octyl.G (Guard Column)		10 × 4.0
ULTRON VX-Octyl.G (Guard Column for Preparative)		15 × 8.0

## HPLC Column For Reversed Phase (STR ODS)

### STR ODS-II

#### Characteristics

The effect of the metal oxide is suppressed minimum because of the highly-purified silica gel as a base material of STR series.

STR series are durable column because of the use of mechanically strong silica gel.

STR series column is durable in acidic and basic mobile phase.

STR series are easy to operate and show high performance, because the analytical operation pressure is low.

The excellent end capping technology shows good peak shape for the basic substances and acidic compounds and for the samples which form complex with metal.

Column	Particle Shape	Particle Size	Pore Size	Specific Surface Area	Carbon Content
ODS-II	Spherical Porous Silica Gel	5 $\mu$ m	12 nm	320 m <sup>2</sup> /g	17 %

Column	Particle Size ( $\mu$ m)	Column Size Length $\times$ Inner Diameter (mm)	
STR ODS- (Narrow Bore)	5	150 $\times$ 2.0	
STR ODS- (Narrow Bore)		250 $\times$ 2.0	
STR ODS- (for Analytical)		100 $\times$ 4.0	
STR ODS- (for Analytical)		150 $\times$ 4.0	
STR ODS- (for Analytical)		250 $\times$ 4.0	
STR ODS- (for Analytical)		150 $\times$ 4.6	
STR ODS- (for Analytical)		250 $\times$ 4.6	
STR ODS- (for Analytical)		150 $\times$ 6.0	
STR ODS- (Guard Column)		10 $\times$ 4.0	
STR ODS- (Guard Column)		10 $\times$ 4.6	
STR ODS- (Guard Column)		10 $\times$ 6.0	
STR ODS- (for Preparative)		250 $\times$ 20.0	
STR ODS- (Guard Column for Preparative)		50 $\times$ 20.0	
STR ODS- PEEK (for Analytical)		150 $\times$ 4.6	
STR ODS- PEEK (for Analytical)		250 $\times$ 4.6	
STR ODS- PEEK (Guard Column)		10 $\times$ 4.6	
STR ODS- (Two Guard Cartridges)		5 $\times$ 2.0	
STR ODS- (Two Guard Cartridges)		10 $\times$ 4.6	
Holder for Guard Cartridge (with Adaptor)		For 5 $\times$ 2.0 mm column	
Holder for Guard Cartridge (with Adaptor)		For 10 $\times$ 4.6 mm column	

STR ODS-M

Column	Particle Shape	Particle Size	Pore Size	Specific Surface Area	Carbon Content
ODS-M	The Perfect and Spherical Porous Silica Gel	5 $\mu\text{m}$	10 nm	350 $\text{m}^2/\text{g}$	15 %

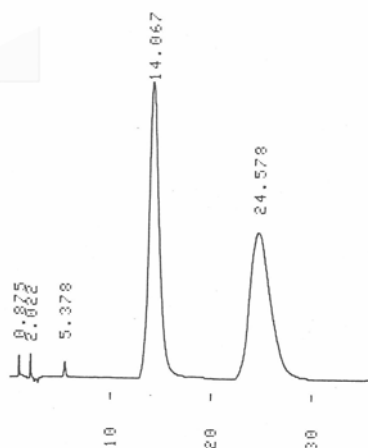
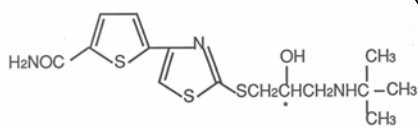
Column	Particle Size ( $\mu\text{m}$ )	Column Size Length $\times$ Inner Diameter (mm)
STR ODS-M	5	150 $\times$ 4.0
STR ODS-M		250 $\times$ 4.0
STR ODS-M		150 $\times$ 4.6
STR ODS-M		250 $\times$ 4.6
STR ODS-M		150 $\times$ 6.0
STR ODS-M		10 $\times$ 4.0
STR ODS-M		50 $\times$ 4.0

## Application Data

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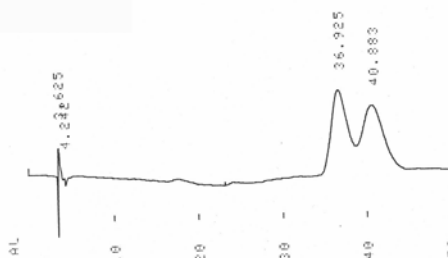
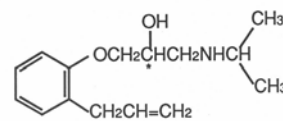
-blockers

**Arotinolol**



Column: ULTRON ES-OVM  
 Size: 150 mm x 4.6 mm I.D.  
 Mobile Phase: 20 mM KH<sub>2</sub>PO<sub>4</sub> (pH 6.0) / CH<sub>3</sub>CN = 100 / 5  
 Flow Rate: 1.0 mL/min  
 Temperature: 25  
 Detection: UV-220 nm

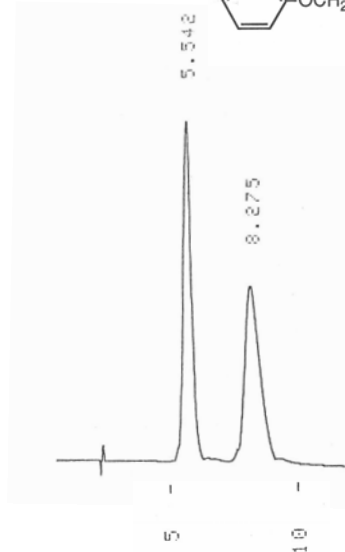
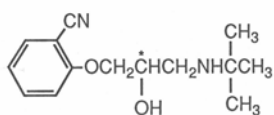
**Alprenolol**



Column: ULTRON ES-OVM  
 Size: 150 mm x 6.0 mm I.D.  
 Mobile Phase: 20 mM KH<sub>2</sub>PO<sub>4</sub> (pH 5.5) / CH<sub>3</sub>CN = 100 / 10  
 Flow Rate: 1.0 mL/min  
 Temperature: 25  
 Detection: UV-220 nm

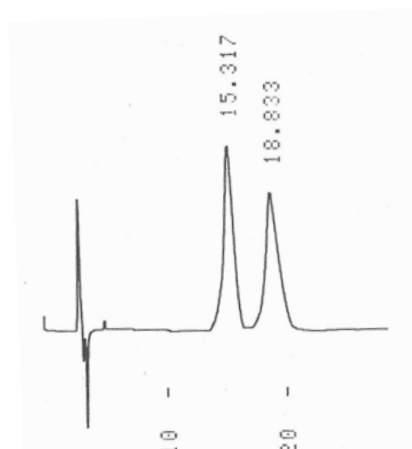
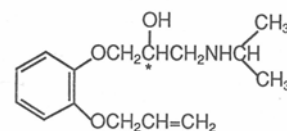
-blockers

**Bunitrolol**



Column: ULTRON ES-OVM  
 Size: 150 mm x 4.6 mm I.D.  
 Mobile Phase: 20 mM KH<sub>2</sub>PO<sub>4</sub> (pH 6.0) / C<sub>2</sub>H<sub>5</sub>OH = 100 / 3  
 Flow Rate: 1.0 mL/min  
 Temperature: 25  
 Detection: UV-220 nm

**Oxprenolol**

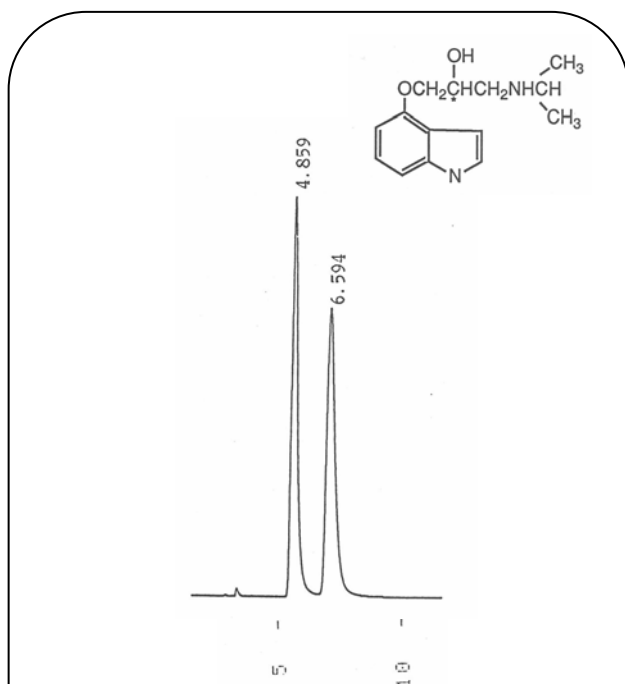


Column: ULTRON ES-OVM  
 Size: 150 mm x 6.0 mm I.D.  
 Mobile Phase: 20 mM KH<sub>2</sub>PO<sub>4</sub> (pH 6.0) / CH<sub>3</sub>CN = 100 / 10  
 Flow Rate: 1.2 mL/min  
 Temperature: 25  
 Detection: UV-220 nm

# ULTRON ES-OVM

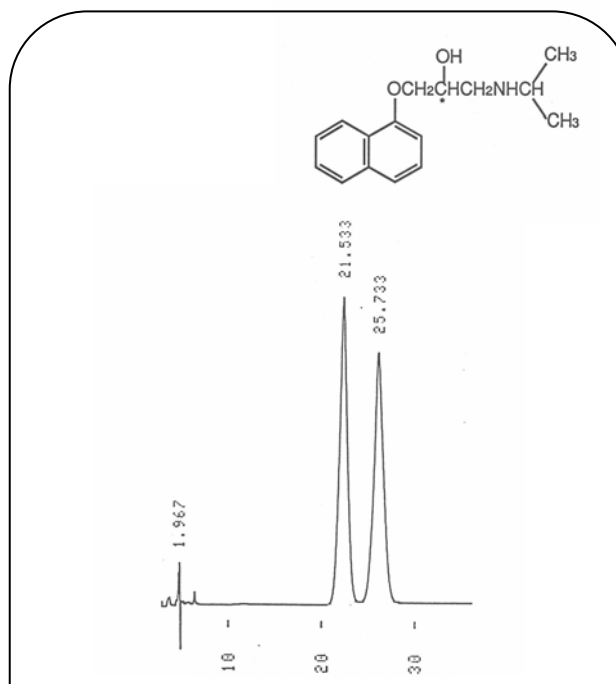
## -blockers

### Pindolol



Column: ULTRON ES-OVM  
 Size: 150 mm x 4.6 mm I.D.  
 Mobile Phase: 20 mM KH<sub>2</sub>PO<sub>4</sub> (pH 5.5) / C<sub>2</sub>H<sub>5</sub>OH = 100 / 30  
 Flow Rate: 1.0 mL/min  
 Temperature: 25  
 Detection: UV-220 nm

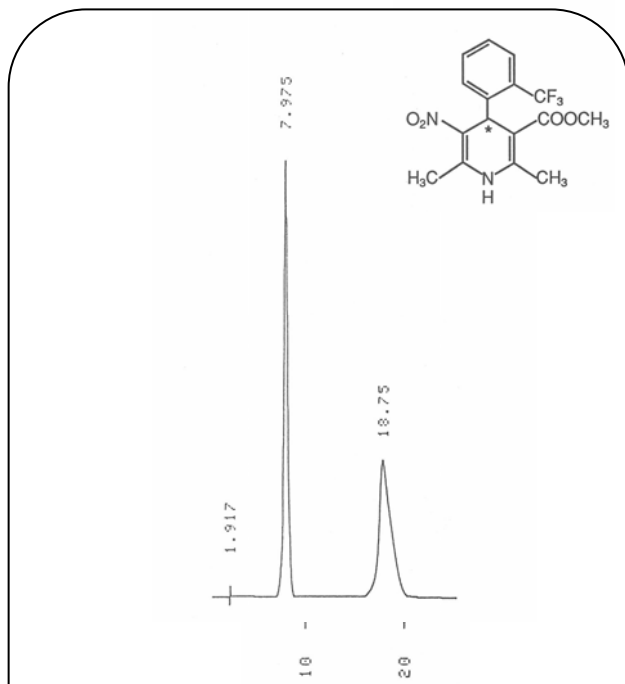
### Propranolol



Column: ULTRON ES-OVM  
 Size: 150 mm x 4.6 mm I.D.  
 Mobile Phase: 20 mM KH<sub>2</sub>PO<sub>4</sub> (pH 6.8) / CH<sub>3</sub>CN = 100 / 30  
 Flow Rate: 1.0 mL/min  
 Temperature: 25  
 Detection: UV-220 nm

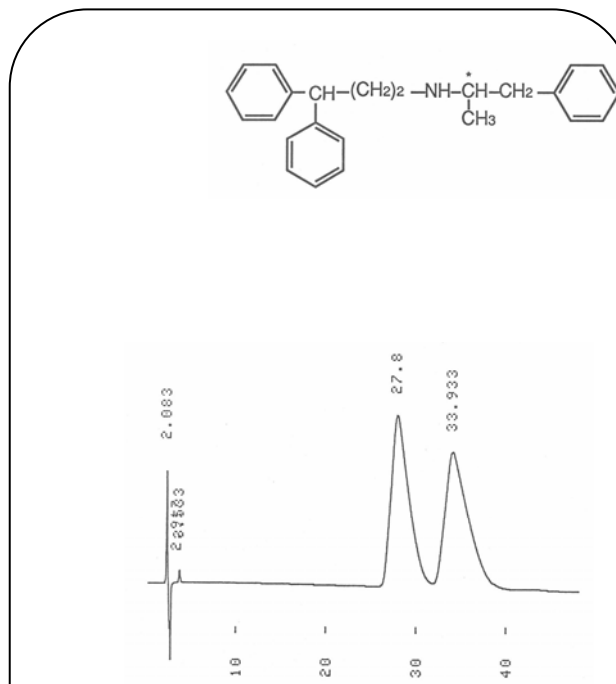
## Calcium Antagonists

### Bay K 8644



Column: ULTRON ES-OVM  
 Size: 150 mm x 4.6 mm I.D.  
 Mobile Phase: 20 mM KH<sub>2</sub>PO<sub>4</sub> (pH 4.6) / C<sub>2</sub>H<sub>5</sub>OH = 100 / 25  
 Flow Rate: 1.0 mL/min  
 Temperature: 25  
 Detection: UV-220 nm

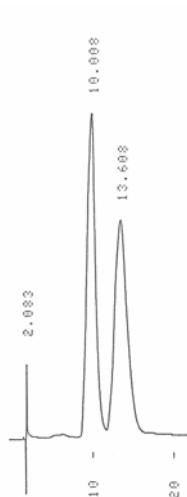
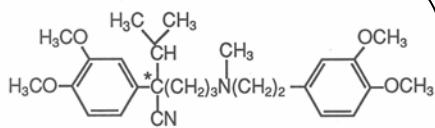
### Prenylamine



Column: ULTRON ES-OVM  
 Size: 150 mm x 4.6 mm I.D.  
 Mobile Phase: 20 mM KH<sub>2</sub>PO<sub>4</sub> (pH 5.0) / CH<sub>3</sub>CN = 100 / 15  
 Flow Rate: 1.0 mL/min  
 Temperature: 25  
 Detection: UV-220 nm

Calcium Antagonists

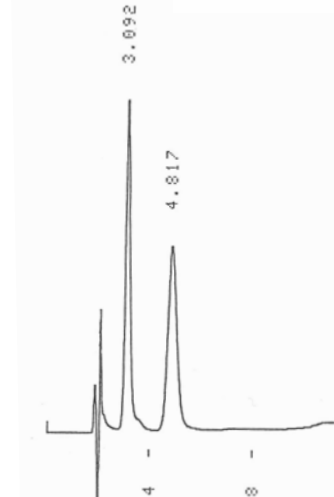
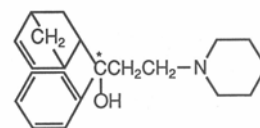
Verapamil



Column: ULTRON ES-OVM  
 Size: 150 mm x 4.6 mm I.D.  
 Mobile Phase: 20 mM KH<sub>2</sub>PO<sub>4</sub> (pH 4.6) / C<sub>2</sub>H<sub>5</sub>OH = 100 / 5  
 Flow Rate: 1.0 mL/min  
 Temperature: 25  
 Detection: UV-220 nm

Antiparkinsons

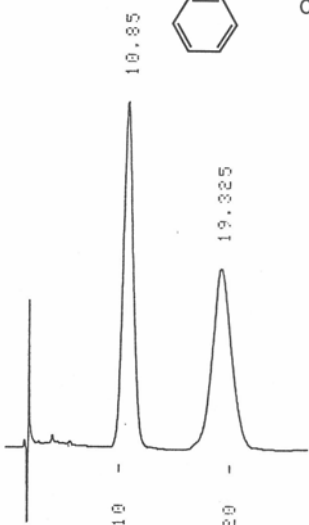
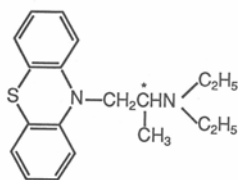
Biperiden



Column: ULTRON ES-OVM  
 Size: 150 mm x 4.6 mm I.D.  
 Mobile Phase: 20 mM KH<sub>2</sub>PO<sub>4</sub> (pH 4.6) / C<sub>2</sub>H<sub>5</sub>OH = 100 / 10  
 Flow Rate: 1.0 mL/min  
 Temperature: 25  
 Detection: UV-220 nm

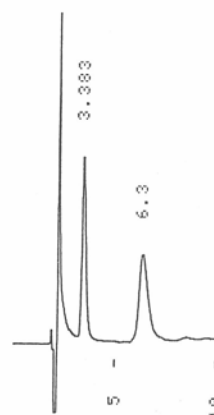
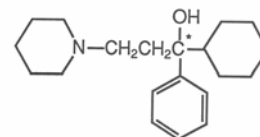
Antiparkinsons

Profenamine



Column: ULTRON ES-OVM  
 Size: 150 mm x 4.6 mm I.D.  
 Mobile Phase: 20 mM KH<sub>2</sub>PO<sub>4</sub> (pH 4.6) / C<sub>2</sub>H<sub>5</sub>OH = 100 / 25  
 Flow Rate: 1.0 mL/min  
 Temperature: 25  
 Detection: UV-220 nm

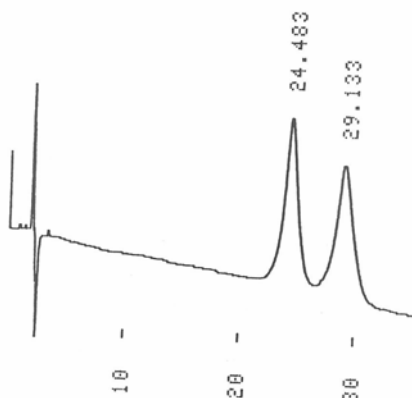
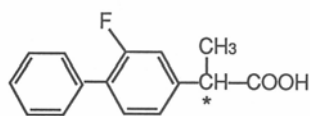
Trihexyphenidyl



Column: ULTRON ES-OVM  
 Size: 150 mm x 4.6 mm I.D.  
 Mobile Phase: 20 mM KH<sub>2</sub>PO<sub>4</sub> (pH 4.6) / C<sub>2</sub>H<sub>5</sub>OH = 100 / 10  
 Flow Rate: 1.0 mL/min  
 Temperature: 25  
 Detection: UV-220 nm

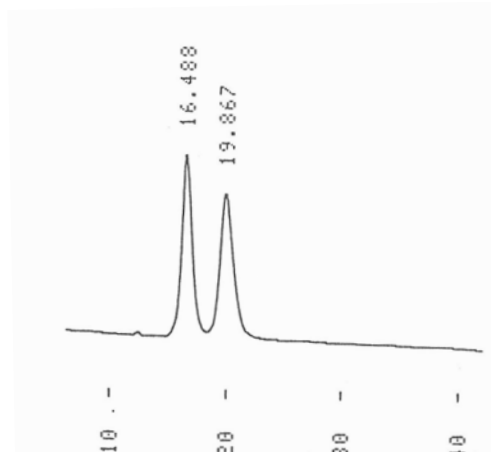
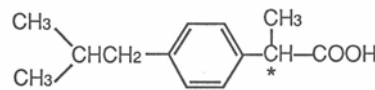
Antiinflammatoryes

Flurbiprofen



Column: ULTRON ES-OVM  
 Size: 150 mm x 4.6 mm I.D.  
 Mobile Phase: 20 mM KH<sub>2</sub>PO<sub>4</sub> (pH 3.0) / CH<sub>3</sub>CN = 100 / 10  
 Flow Rate: 1.0 mL/min  
 Temperature: 25  
 Detection: UV-220 nm

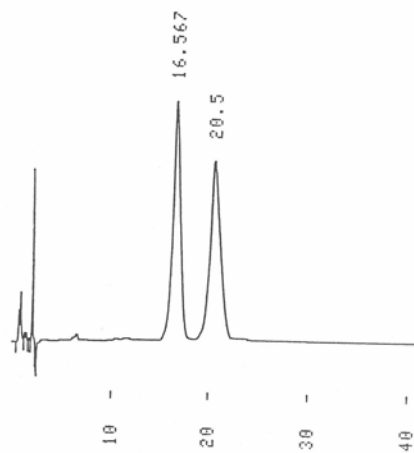
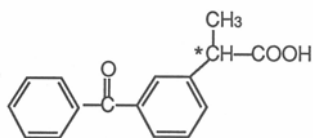
Ibuprofen



Column: ULTRON ES-OVM  
 Size: 150 mm x 4.6 mm I.D.  
 Mobile Phase: 20 mM KH<sub>2</sub>PO<sub>4</sub> (pH 3.0) / CH<sub>3</sub>CN = 100 / 5  
 Flow Rate: 1.0 mL/min  
 Temperature: 25  
 Detection: UV-220 nm

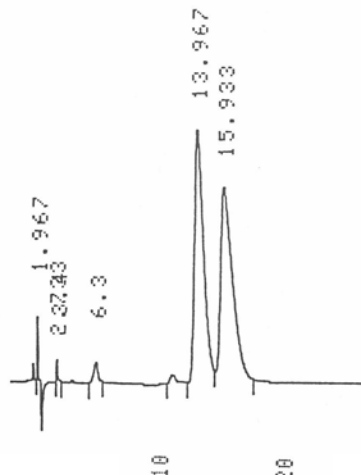
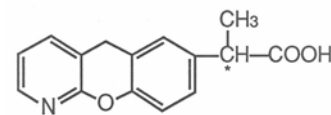
Antiinflammatoryes

Ketoprofen



Column: ULTRON ES-OVM  
 Size: 150 mm x 4.6 mm I.D.  
 Mobile Phase: 20 mM KH<sub>2</sub>PO<sub>4</sub> (pH 3.0) / CH<sub>3</sub>CN = 100 / 10  
 Flow Rate: 1.0 mL/min  
 Temperature: 25  
 Detection: UV-220 nm

Pranoprofen

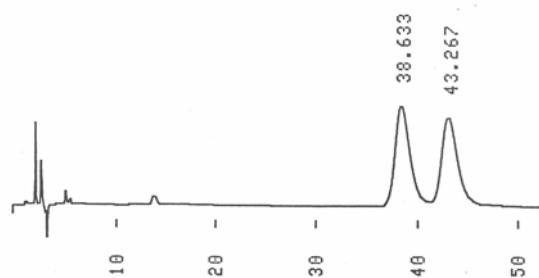
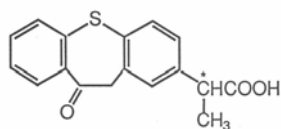


Column: ULTRON ES-OVM  
 Size: 150 mm x 4.6 mm I.D.  
 Mobile Phase: 20 mM KH<sub>2</sub>PO<sub>4</sub> (pH 3.0) / CH<sub>3</sub>CN = 100 / 8  
 Flow Rate: 1.0 mL/min  
 Temperature: 25  
 Detection: UV-220 nm



Antiinflammatoryes

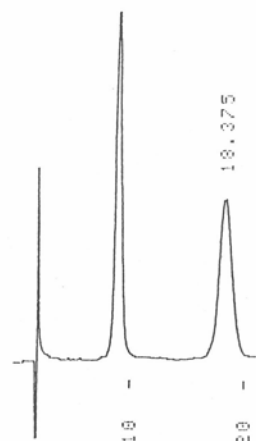
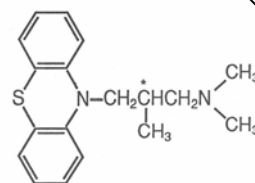
Zaltoprofen



Column: ULTRON ES-OVM  
 Size: 150 mm x 6.0 mm I.D.  
 Mobile Phase: 20 mM KH<sub>2</sub>PO<sub>4</sub> (pH 3.0) / CH<sub>3</sub>CN = 87 / 13  
 Flow Rate: 1.2 mL/min  
 Temperature: 25  
 Detection: UV-220 nm

Antihistamines

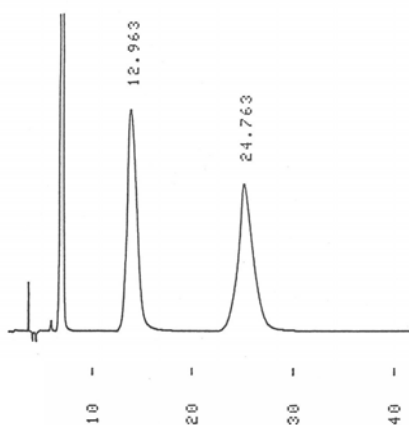
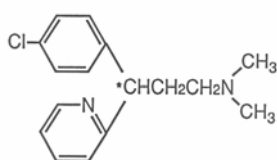
Alimemazine



Column: ULTRON ES-OVM  
 Size: 150 mm x 4.6 mm I.D.  
 Mobile Phase: 20 mM KH<sub>2</sub>PO<sub>4</sub> (pH 4.6) / C<sub>2</sub>H<sub>5</sub>OH = 100 / 25  
 Flow Rate: 1.0 mL/min  
 Temperature: 25  
 Detection: UV-220 nm

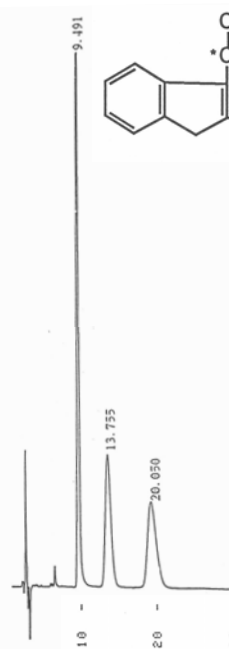
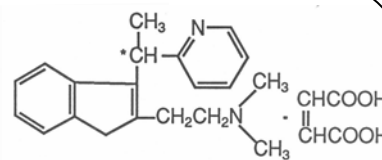
Antihistamines

Chlorpheniramine



Column: ULTRON ES-OVM  
 Size: 150 mm x 4.6 mm I.D.  
 Mobile Phase: 20 mM KH<sub>2</sub>PO<sub>4</sub> (pH 5.0) / CH<sub>3</sub>CN = 100 / 5  
 Flow Rate: 1.0 mL/min  
 Temperature: 25  
 Detection: UV-220 nm

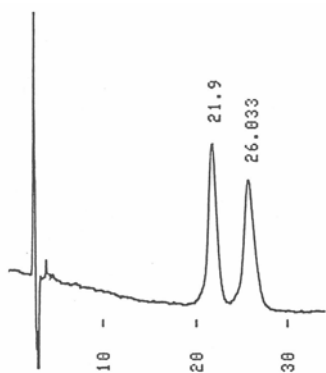
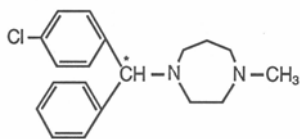
Dimethindene Maleate



Column: ULTRON ES-OVM  
 Size: 150 mm x 4.6 mm I.D.  
 Mobile Phase: 20 mM KH<sub>2</sub>PO<sub>4</sub> (pH 4.6) / CH<sub>3</sub>CN = 100 / 9  
 Flow Rate: 1.0 mL/min  
 Temperature: 25  
 Detection: UV-220 nm

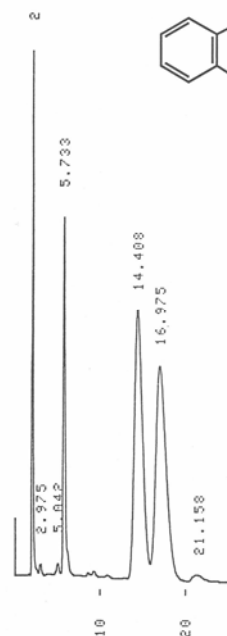
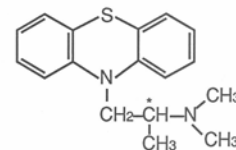
Antihistamines

Homochlorcyclizine



Column: ULTRON ES-OVM  
 Size: 150 mm x 6.0 mm I.D.  
 Mobile Phase: 20 mM KH<sub>2</sub>PO<sub>4</sub> (pH 4.6) / C<sub>2</sub>H<sub>5</sub>OH = 100 / 20  
 Flow Rate: 1.2 mL/min  
 Temperature: 25  
 Detection: UV-220 nm

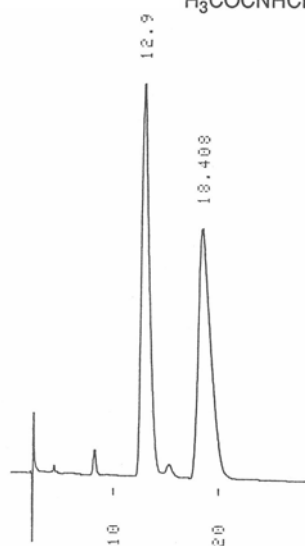
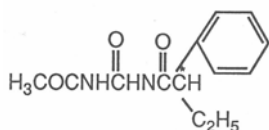
Promethazine



Column: ULTRON ES-OVM  
 Size: 150 mm x 4.6 mm I.D.  
 Mobile Phase: 20 mM KH<sub>2</sub>PO<sub>4</sub> (pH 3.0) / CH<sub>3</sub>CN = 100 / 5  
 Flow Rate: 1.0 mL/min  
 Temperature: 25  
 Detection: UV-220 nm

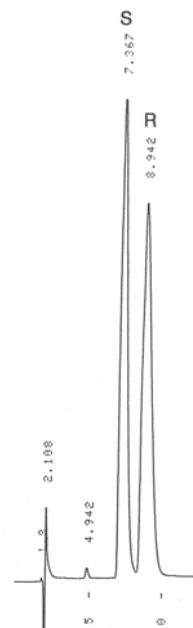
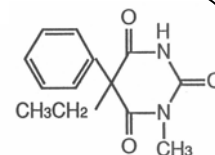
Anticonvulsants

Acetylpheneturide



Column: ULTRON ES-OVM  
 Size: 150 mm x 4.6 mm I.D.  
 Mobile Phase: 20 mM KH<sub>2</sub>PO<sub>4</sub> (pH 4.6) / C<sub>2</sub>H<sub>5</sub>OH = 100 / 7.5  
 Flow Rate: 1.0 mL/min  
 Temperature: 25  
 Detection: UV-220 nm

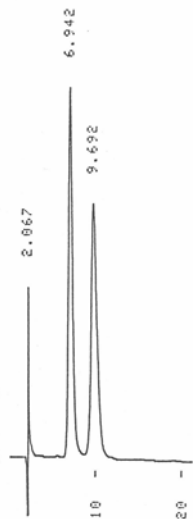
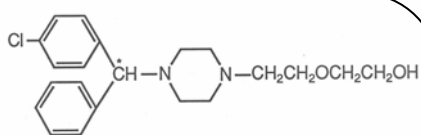
Mephobarbital



Column: ULTRON ES-OVM  
 Size: 150 mm x 4.6 mm I.D.  
 Mobile Phase: 20 mM KH<sub>2</sub>PO<sub>4</sub> (pH 4.6) / C<sub>2</sub>H<sub>5</sub>OH = 100 / 10  
 Flow Rate: 1.0 mL/min  
 Temperature: 25  
 Detection: UV-220 nm

Tranquilizers

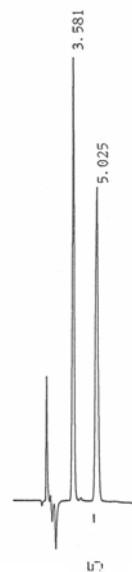
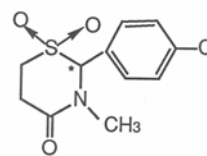
Hydroxyzine



Column: ULTRON ES-OVM  
 Size: 150 mm x 4.6 mm I.D.  
 Mobile Phase: 20 mM KH<sub>2</sub>PO<sub>4</sub> (pH 4.6) / CH<sub>3</sub>CN = 100 / 10  
 Flow Rate: 1.0 mL/min  
 Temperature: 25  
 Detection: UV-220 nm

Skeletal Muscle Relaxants

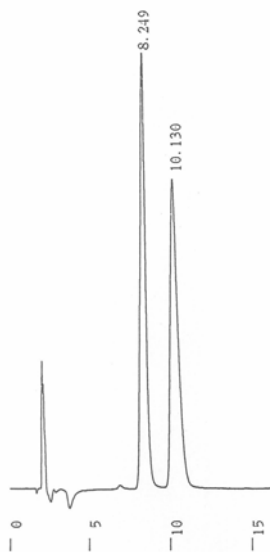
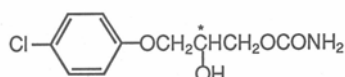
Chlormezanone



Column: ULTRON ES-OVM  
 Size: 150 mm x 4.6 mm I.D.  
 Mobile Phase: 20 mM KH<sub>2</sub>PO<sub>4</sub> (pH 4.6) / CH<sub>3</sub>CN = 100 / 10  
 Flow Rate: 1.0 mL/min  
 Temperature: 25  
 Detection: UV-220 nm

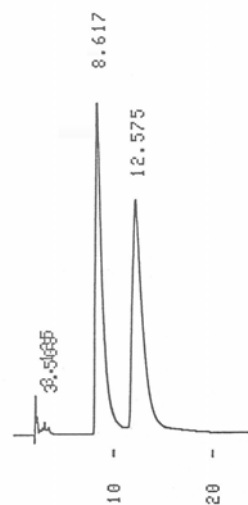
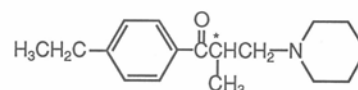
Skeletal Muscle Relaxants

Chlorphenesin



Column: ULTRON ES-OVM  
 Size: 150 mm x 4.6 mm I.D.  
 Mobile Phase: 20 mM KH<sub>2</sub>PO<sub>4</sub> (pH 5.5)  
 Flow Rate: 1.0 mL/min  
 Temperature: 25  
 Detection: UV-220 nm

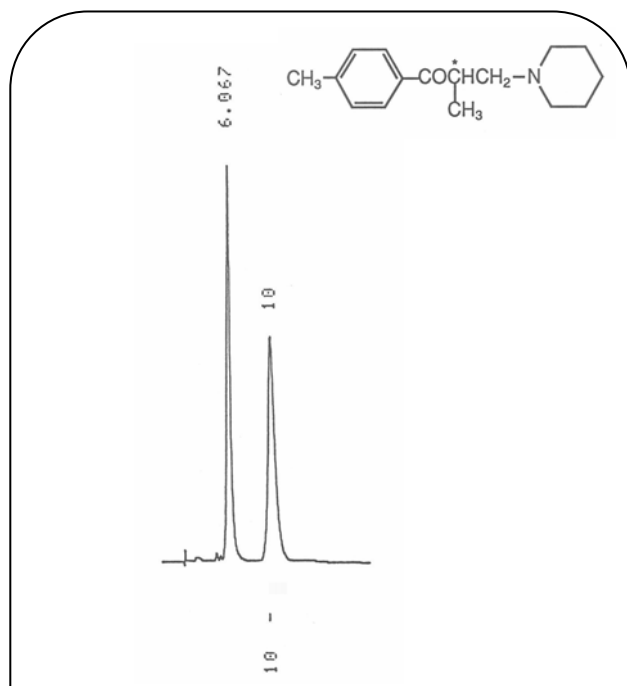
Eperisone



Column: ULTRON ES-OVM  
 Size: 150 mm x 4.6 mm I.D.  
 Mobile Phase: 20 mM KH<sub>2</sub>PO<sub>4</sub> (pH 5.5) / C<sub>2</sub>H<sub>5</sub>OH = 100 / 5  
 Flow Rate: 1.0 mL/min  
 Temperature: 25  
 Detection: UV-220 nm

Skeletal Muscle Relaxants

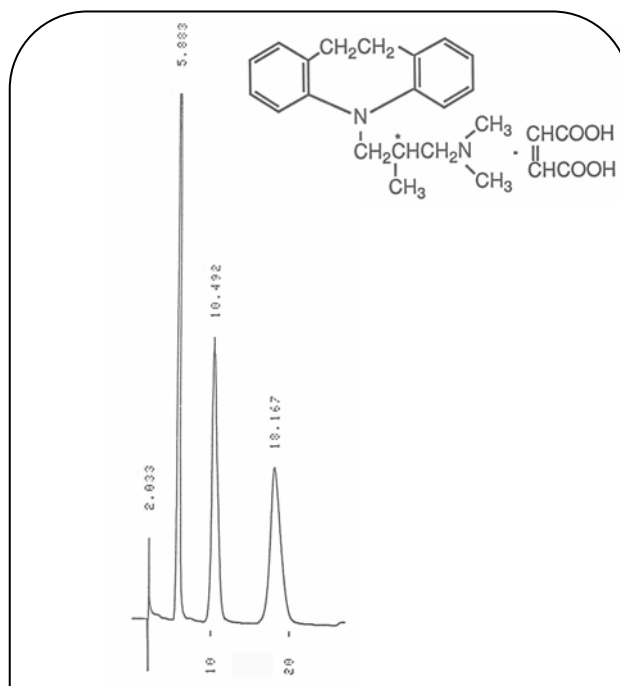
Tolperisone



Column: ULTRON ES-OVM  
 Size: 150 mm x 4.6 mm I.D.  
 Mobile Phase: 20 mM KH<sub>2</sub>PO<sub>4</sub> (pH 5.5) / C<sub>2</sub>H<sub>5</sub>OH = 100 / 10  
 Flow Rate: 1.0 mL/min  
 Temperature: 25  
 Detection: UV-220 nm

Antidepressants

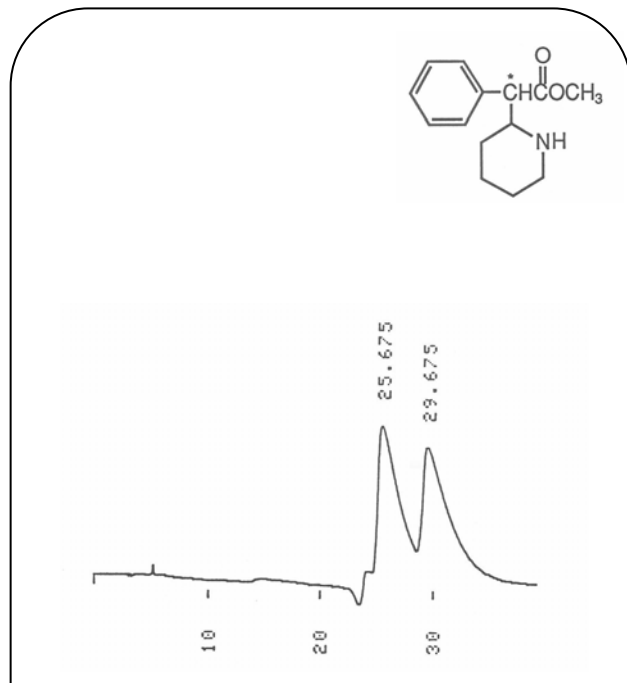
Trimipramine Maleate



Column: ULTRON ES-OVM  
 Size: 150 mm x 4.6 mm I.D.  
 Mobile Phase: 20 mM KH<sub>2</sub>PO<sub>4</sub> (pH 4.5) / C<sub>2</sub>H<sub>5</sub>OH = 100 / 30  
 Flow Rate: 1.0 mL/min  
 Temperature: 25  
 Detection: UV-220 nm

Central Nervous System Stimulants

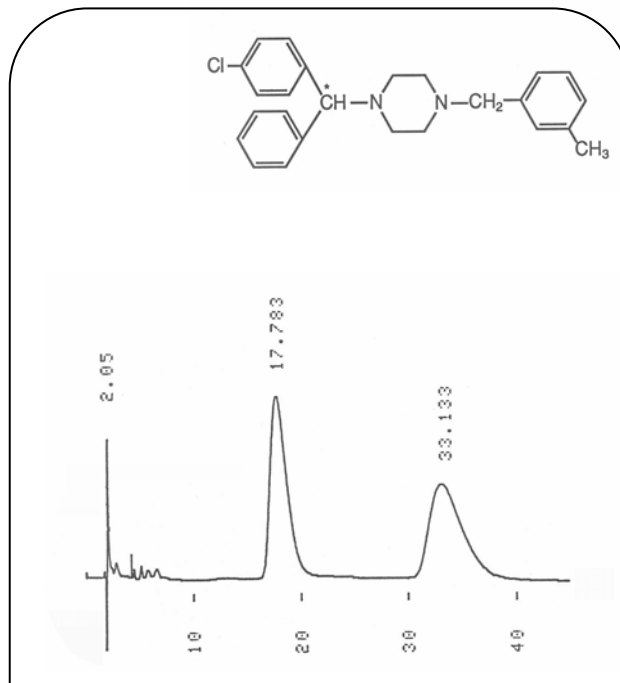
Methylphenidate



Column: ULTRON ES-OVM  
 Size: 150 mm x 4.6 mm I.D.  
 Mobile Phase: 20 mM KH<sub>2</sub>PO<sub>4</sub> (pH 5.7)  
 Flow Rate: 1.0 mL/min  
 Temperature: 25  
 Detection: UV-220 nm

Drugs Used in Vertigo

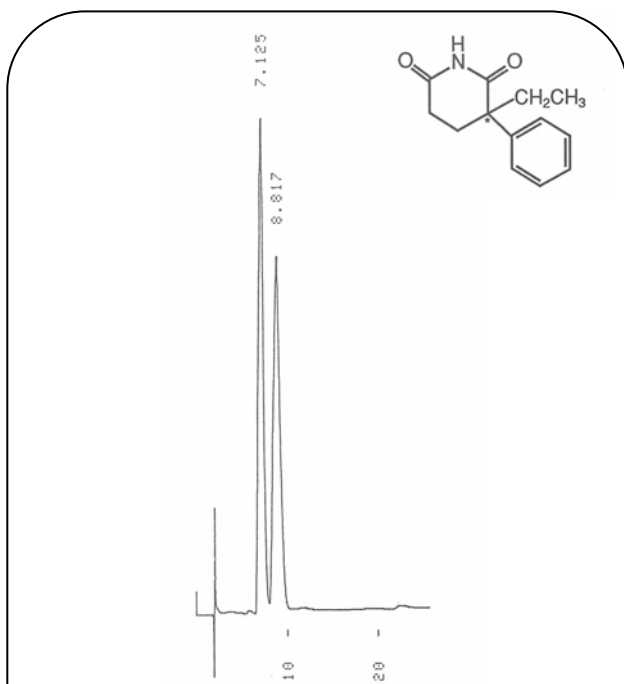
Meclizine



Column: ULTRON ES-OVM  
 Size: 150 mm x 4.6 mm I.D.  
 Mobile Phase: 20 mM KH<sub>2</sub>PO<sub>4</sub> (pH 4.6) / C<sub>2</sub>H<sub>5</sub>OH = 100 / 35  
 Flow Rate: 1.0 mL/min  
 Temperature: 25  
 Detection: UV-220 nm

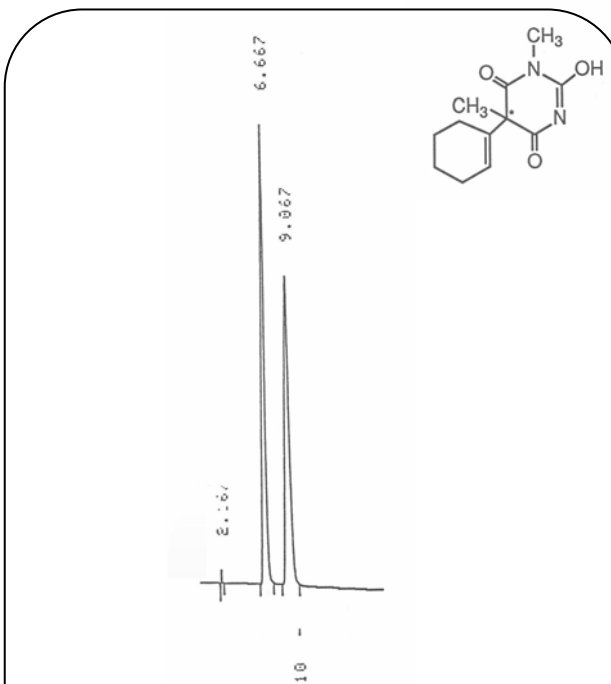
Hypnotics

Glutethimide



Column: ULTRON ES-OVM  
 Size: 150 mm x 4.6 mm I.D.  
 Mobile Phase: 20 mM KH<sub>2</sub>PO<sub>4</sub> (pH 4.6) / C<sub>2</sub>H<sub>5</sub>OH = 100 / 10  
 Flow Rate: 1.0 mL/min  
 Temperature: 25  
 Detection: UV-220 nm

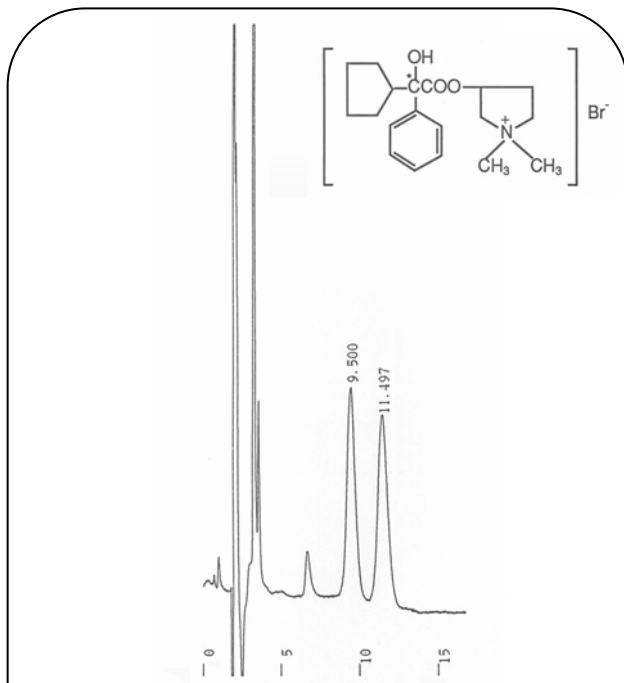
Hexobarbital



Column: ULTRON ES-OVM  
 Size: 150 mm x 4.6 mm I.D.  
 Mobile Phase: 20 mM KH<sub>2</sub>PO<sub>4</sub> (pH 6.0) / C<sub>2</sub>H<sub>5</sub>OH = 100 / 5  
 Flow Rate: 1.0 mL/min  
 Temperature: 25  
 Detection: UV-220 nm

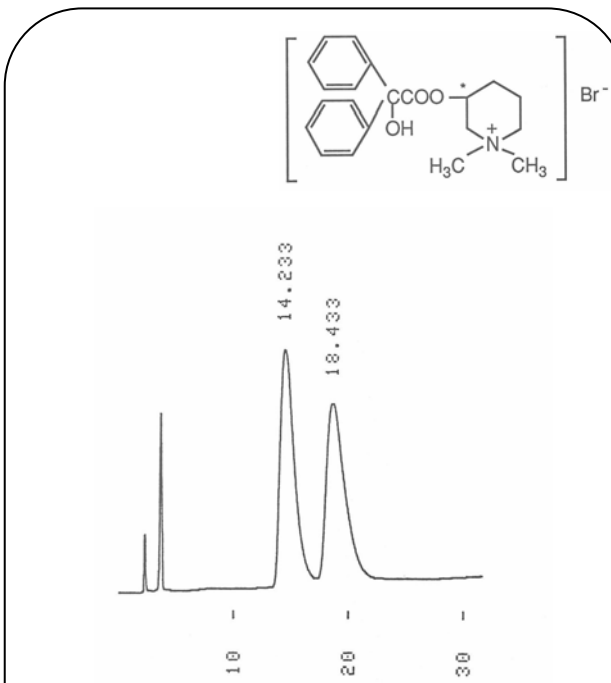
Anticholinergics

Glycopyrronium Bromide



Column: ULTRON ES-OVM  
 Size: 150 mm x 4.6 mm I.D.  
 Mobile Phase: 20 mM KH<sub>2</sub>PO<sub>4</sub> (pH 5.5) / C<sub>2</sub>H<sub>5</sub>OH = 100 / 2  
 Flow Rate: 1.0 mL/min  
 Temperature: 25  
 Detection: UV-220 nm

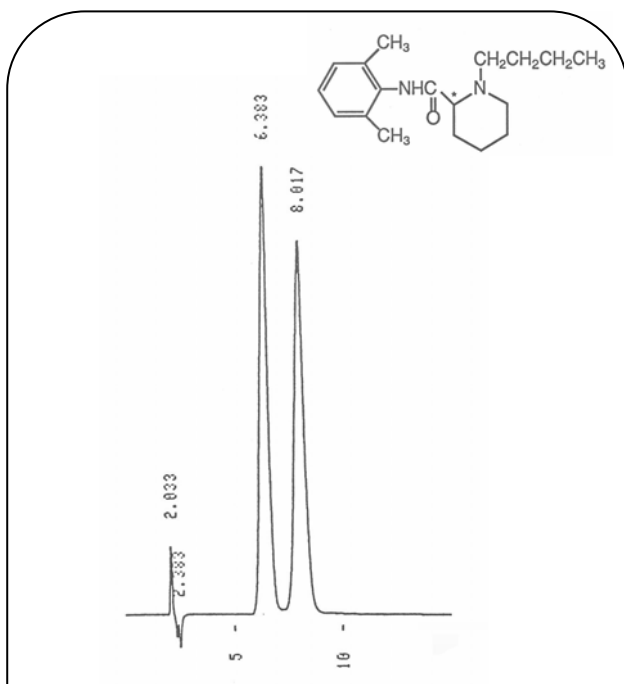
Mepenzolate Bromide



Column: ULTRON ES-OVM  
 Size: 150 mm x 4.6 mm I.D.  
 Mobile Phase: 20 mM KH<sub>2</sub>PO<sub>4</sub> (pH 4.6)  
 Flow Rate: 1.0 mL/min  
 Temperature: 25  
 Detection: UV-220 nm

Local Anesthetics

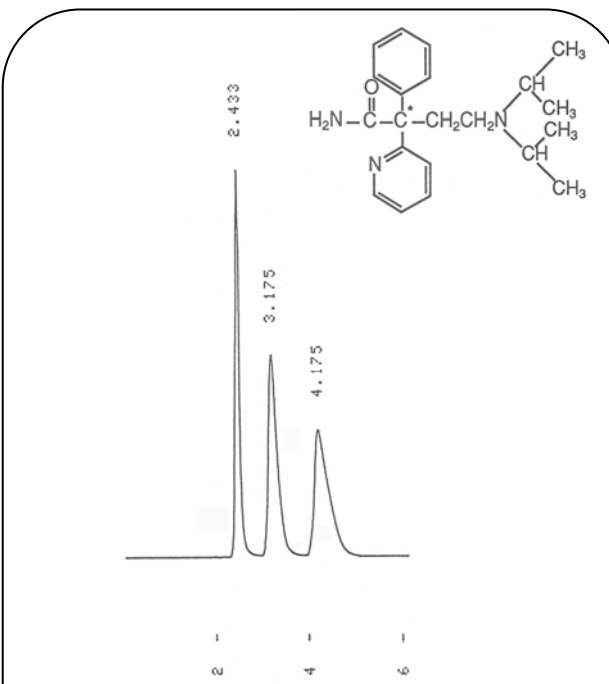
Bupivacaine



Column: ULTRON ES-OVM  
 Size: 150 mm x 4.6 mm I.D.  
 Mobile Phase: 20 mM  $\text{KH}_2\text{PO}_4$  (pH 5.5) /  $\text{CH}_3\text{CN}$  = 100 / 10  
 Flow Rate: 1.0 mL/min  
 Temperature: 25  
 Detection: UV-220 nm

Antidysrhythmics

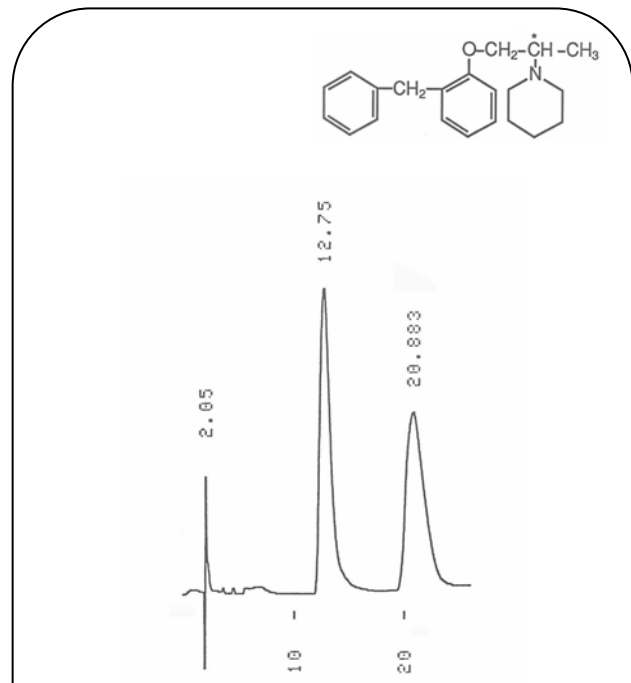
Disopyramid



Column: ULTRON ES-OVM  
 Size: 150 mm x 4.6 mm I.D.  
 Mobile Phase: 20 mM  $\text{KH}_2\text{PO}_4$  (pH 5.5) /  $\text{C}_2\text{H}_5\text{OH}$  = 100 / 10  
 Flow Rate: 1.0 mL/min  
 Temperature: 25  
 Detection: UV-220 nm

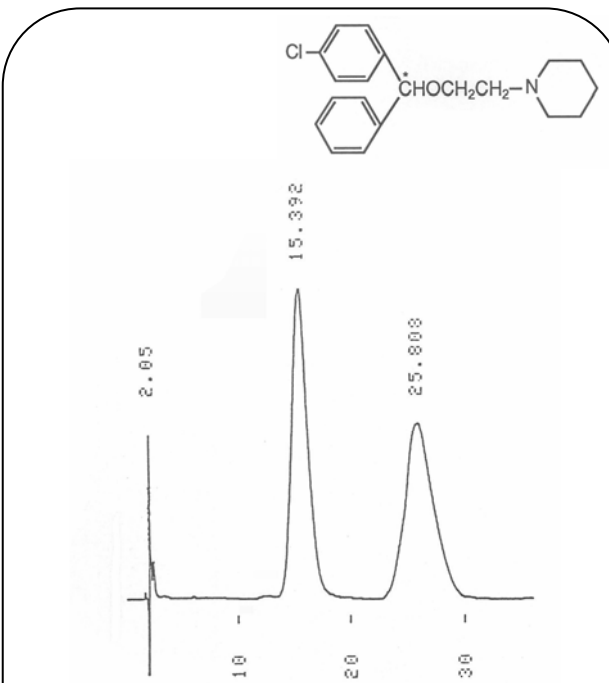
Antitussives

Benproperine



Column: ULTRON ES-OVM  
 Size: 150 mm x 4.6 mm I.D.  
 Mobile Phase: 20 mM  $\text{KH}_2\text{PO}_4$  (pH 4.6) /  $\text{C}_2\text{H}_5\text{OH}$  = 100 / 20  
 Flow Rate: 1.0 mL/min  
 Temperature: 25  
 Detection: UV-220 nm

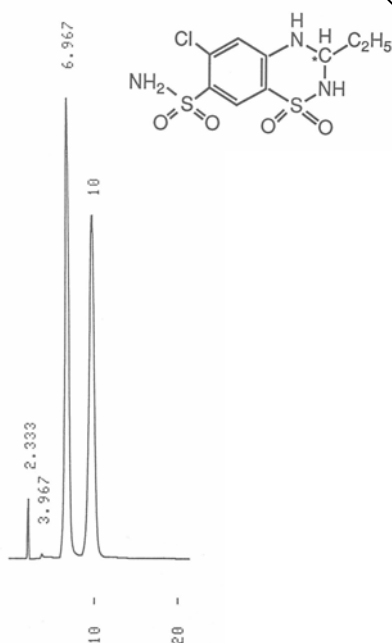
Cloperastin



Column: ULTRON ES-OVM  
 Size: 150 mm x 4.6 mm I.D.  
 Mobile Phase: 20 mM  $\text{KH}_2\text{PO}_4$  (pH 4.6) /  $\text{C}_2\text{H}_5\text{OH}$  = 100 / 15  
 Flow Rate: 1.0 mL/min  
 Temperature: 25  
 Detection: UV-220 nm

Diuretics

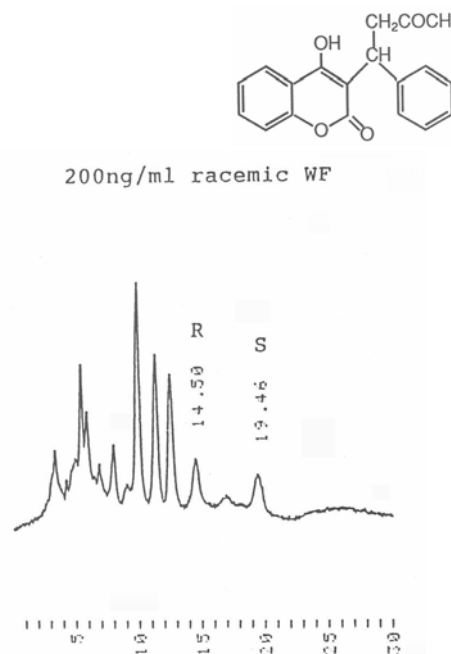
Ethiazide



Column: ULTRON ES-OVM  
 Size: 150 mm x 4.6 mm I.D.  
 Mobile Phase: 20 mM  $\text{KH}_2\text{PO}_4$  (pH 4.6)  
 Flow Rate: 1.0 mL/min  
 Temperature: 25  
 Detection: UV-220 nm

Oral Anticoagulants

Warfarin

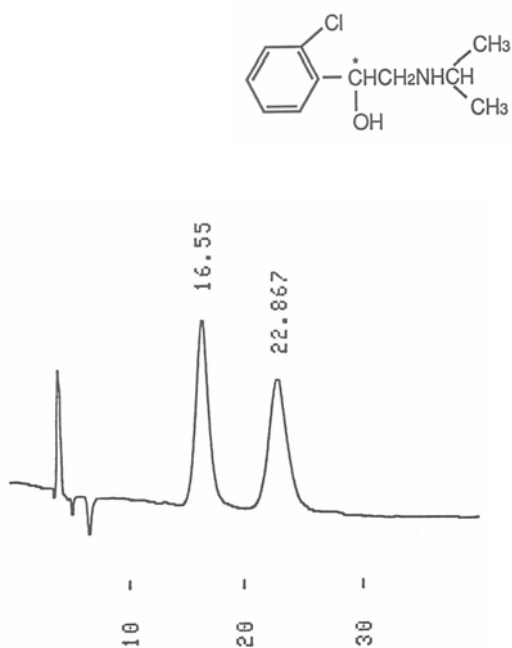


200ng/ml racemic WF

Column: ULTRON ES-OVM  
 Size: 150 mm x 4.6 mm I.D.  
 Mobile Phase: 20 mM  $\text{KH}_2\text{PO}_4$  (pH 3.0) /  $\text{CH}_3\text{CN}$  = 100 / 15  
 Flow Rate: 0.1 mL/min  
 Temperature: 25  
 Detection: UV-305 nm

Bronchodilators

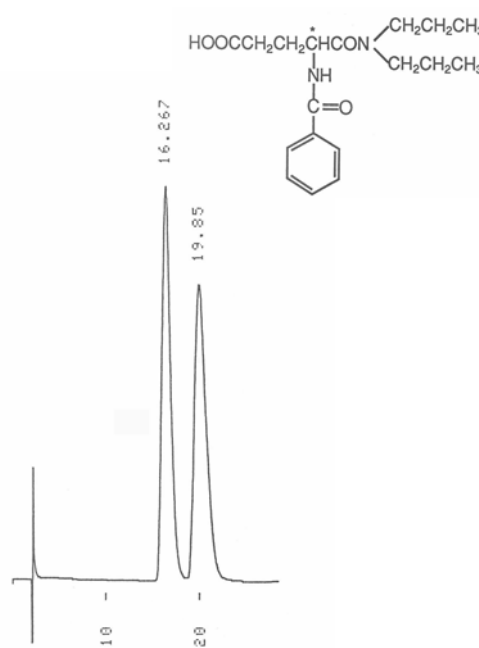
Clorprenaline



Column: ULTRON ES-OVM  
 Size: 150 mm x 4.6 mm I.D.  
 Mobile Phase: 20 mM  $\text{KH}_2\text{PO}_4$  (pH 5.5) /  $\text{C}_2\text{H}_5\text{OH}$  = 100 / 3  
 Flow Rate: 1.0 mL/min  
 Temperature: 25  
 Detection: UV-220 nm

Drugs in Peptic Ulcer

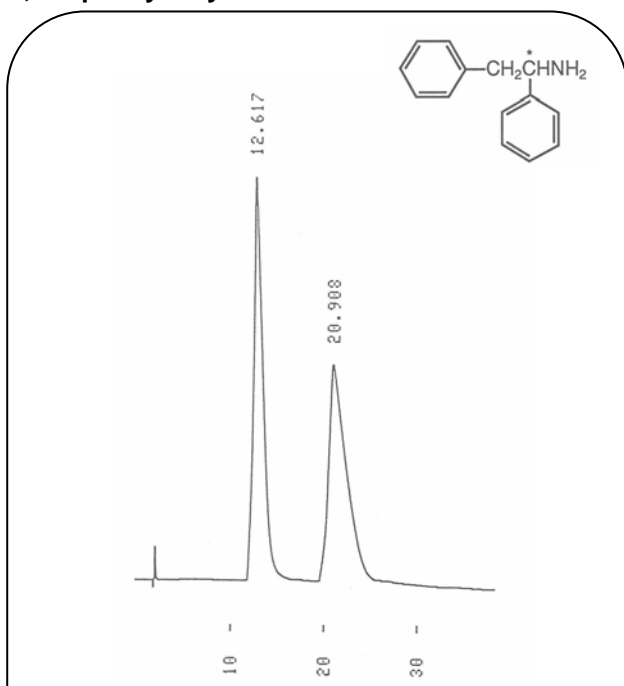
Proglumide



Column: ULTRON ES-OVM  
 Size: 150 mm x 4.6 mm I.D.  
 Mobile Phase: 20 mM  $\text{KH}_2\text{PO}_4$  (pH 4.6) /  $\text{C}_2\text{H}_5\text{OH}$  = 100 / 20  
 Flow Rate: 1.0 mL/min  
 Temperature: 25  
 Detection: UV-220 nm

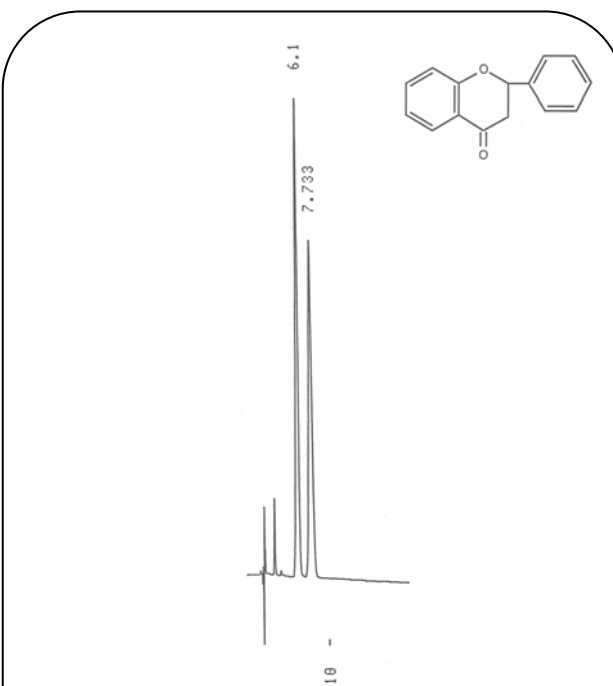
Others

1,2-Diphenylethylamine



Column: ULTRON ES-OVM  
 Size: 150 mm x 4.6 mm I.D.  
 Mobile Phase: 20 mM  $\text{KH}_2\text{PO}_4$  (pH 5.5)  
 Flow Rate: 1.0 mL/min  
 Temperature: 25  
 Detection: UV-220 nm

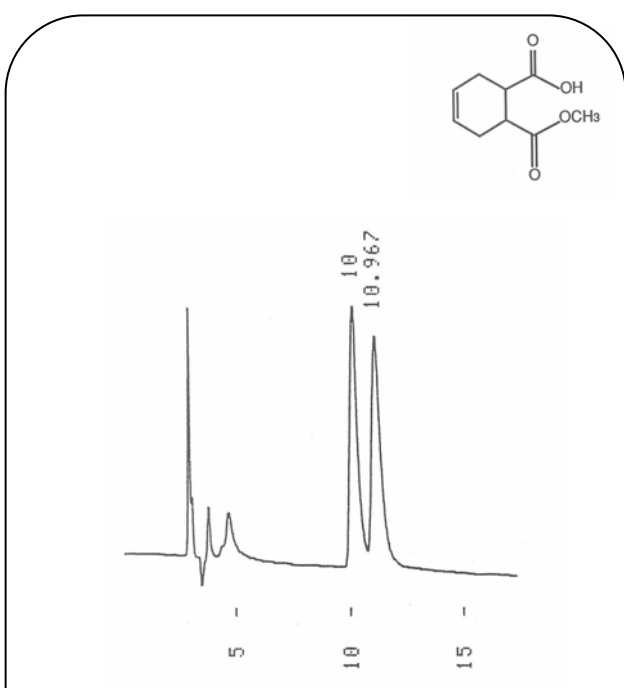
Flavanone



Column: ULTRON ES-OVM  
 Size: 150 mm x 4.6 mm I.D.  
 Mobile Phase: 20 mM  $\text{KH}_2\text{PO}_4$  (pH 4.6) /  $\text{CH}_3\text{CN}$  = 100 / 30  
 Flow Rate: 1.0 mL/min  
 Temperature: 25  
 Detection: UV-254 nm

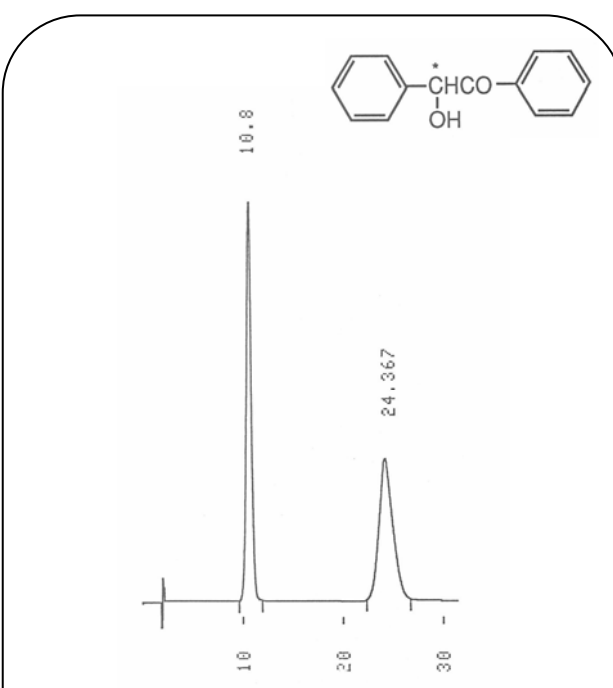
Others

(1S,2R)-1-Methyl-cis-1,2,3,6-tetrahydrophthalate



Column: ULTRON ES-OVM  
 Size: 150 mm x 4.6 mm I.D.  
 Mobile Phase: 20 mM  $\text{KH}_2\text{PO}_4$  (pH 4.0) /  $\text{CH}_3\text{CN}$  = 100 / 5  
 Flow Rate: 1.0 mL/min  
 Temperature: 25  
 Detection: UV-220 nm

Benzoin

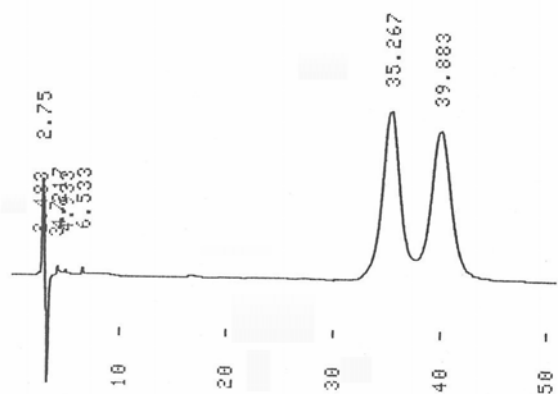
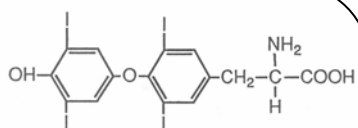


Column: ULTRON ES-OVM  
 Size: 150 mm x 4.6 mm I.D.  
 Mobile Phase: 20 mM  $\text{KH}_2\text{PO}_4$  (pH 4.6) /  $\text{C}_2\text{H}_5\text{OH}$  = 100 / 10  
 Flow Rate: 1.0 mL/min  
 Temperature: 25  
 Detection: UV-250 nm



Others

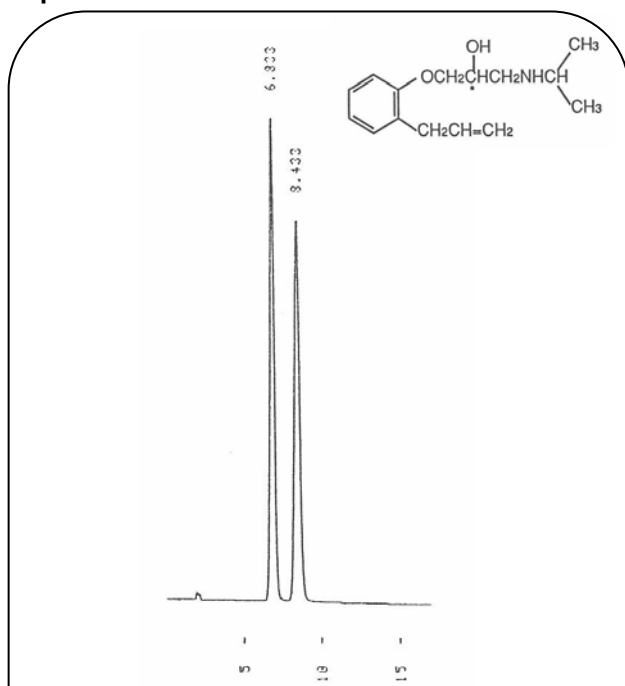
Thyroxine



Column: ULTRON ES-OVM  
 Size: 150 mm x 4.6 mm I.D.  
 Mobile Phase: 20 mM KH<sub>2</sub>PO<sub>4</sub> (pH 4.6) / CH<sub>3</sub>CN = 100 / 20  
 Flow Rate: 1.2 mL/min  
 Temperature: 15  
 Detection: UV-220 nm

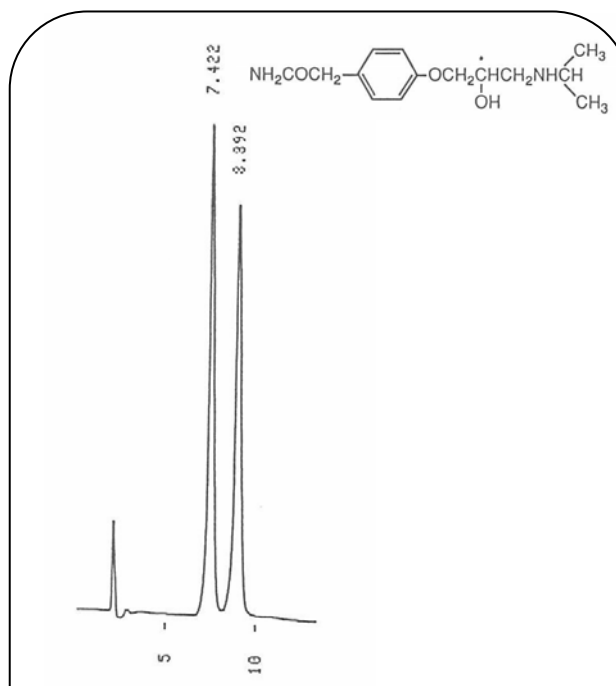
-Blockers

Alprenolol



Column: ULTRON ES-PEPSIN  
 Size: 150 mm x 4.6 mm I.D.  
 Mobile Phase: 20 mM KH<sub>2</sub>PO<sub>4</sub> (pH 5.0) / C<sub>2</sub>H<sub>5</sub>OH = 95 / 5  
 Flow Rate: 1.0 mL/min  
 Temperature: 25  
 Detection: UV-220 nm

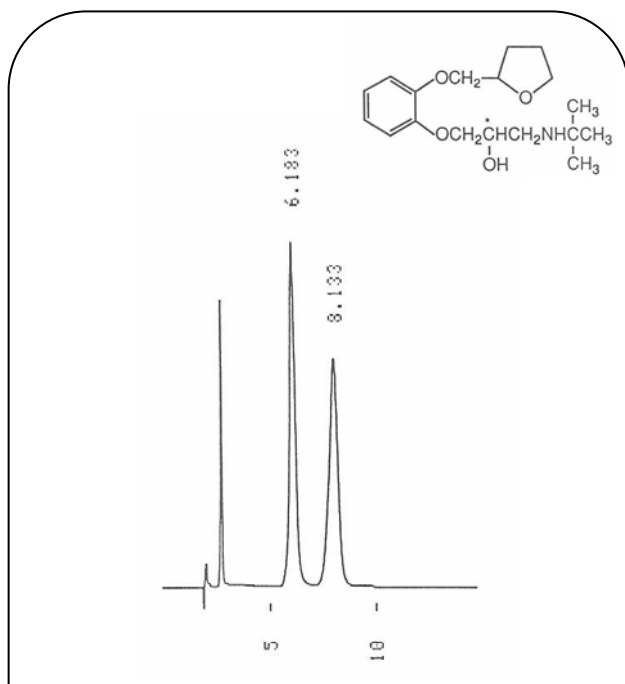
Atenolol



Column: ULTRON ES-PEPSIN  
 Size: 150 mm x 4.6 mm I.D.  
 Mobile Phase: 20 mM KH<sub>2</sub>PO<sub>4</sub> (pH 6.0) / C<sub>2</sub>H<sub>5</sub>OH = 99 / 1  
 Flow Rate: 1.0 mL/min  
 Temperature: 25  
 Detection: UV-220 nm

-Blockers

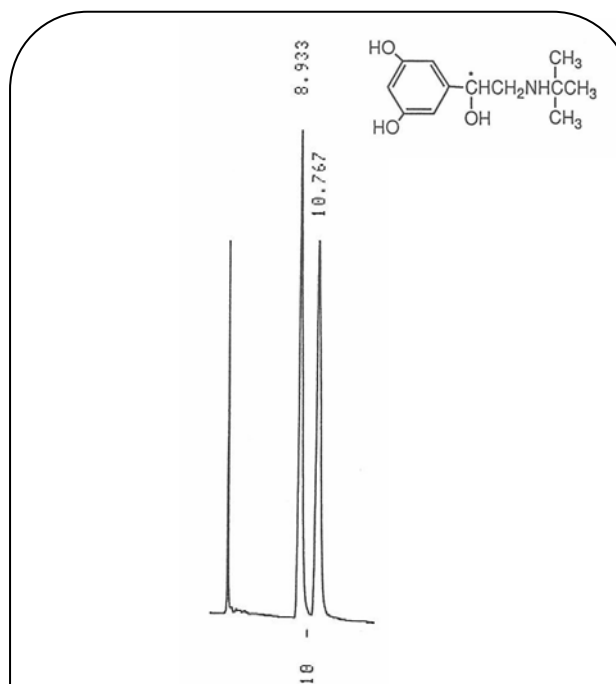
Bunitrolol



Column: ULTRON ES-PEPSIN  
 Size: 150 mm x 4.6 mm I.D.  
 Mobile Phase: 20 mM KH<sub>2</sub>PO<sub>4</sub> (pH 5.0) / C<sub>2</sub>H<sub>5</sub>OH = 95 / 5  
 Flow Rate: 1.0 mL/min  
 Temperature: 25  
 Detection: UV-220 nm

Bronchodilators

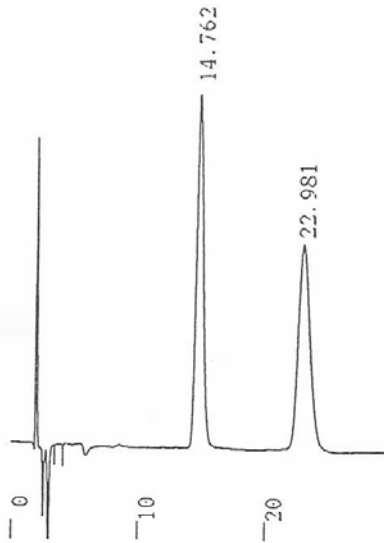
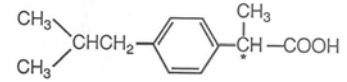
Terbutaline



Column: ULTRON ES-PEPSIN  
 Size: 150 mm x 4.6 mm I.D.  
 Mobile Phase: 20 mM KH<sub>2</sub>PO<sub>4</sub> (pH 6.0)  
 Flow Rate: 1.0 mL/min  
 Temperature: 25  
 Detection: UV-220 nm

Antiinflammatoryes

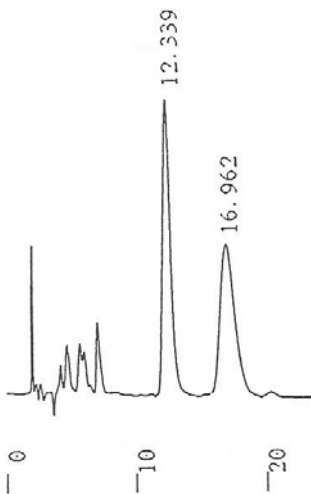
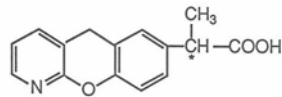
Ibuprofen



Column: ULTRON ES-BSA  
 Size: 150 mm x 4.6 mm I.D.  
 Mobile Phase: 20 mM KH<sub>2</sub>PO<sub>4</sub> (pH 7.0) / 1-Propanol / Caprylic Acid = 98 / 2 / 0.08  
 Flow Rate: 1.0 mL/min  
 Temperature: 25  
 Detection: UV-220 nm

Antiinflammatoryes

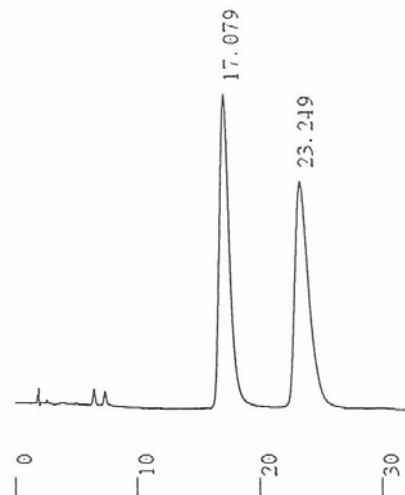
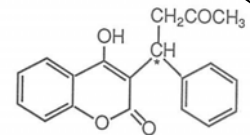
Pranoprofen



Column: ULTRON ES-BSA  
 Size: 150 mm x 4.6 mm I.D.  
 Mobile Phase: 20 mM KH<sub>2</sub>PO<sub>4</sub> (pH 7.0) / 1-Propanol / Caprylic Acid = 98 / 2 / 0.01  
 Flow Rate: 1.0 mL/min  
 Temperature: 25  
 Detection: UV-220 nm

Oral Anticoagulants

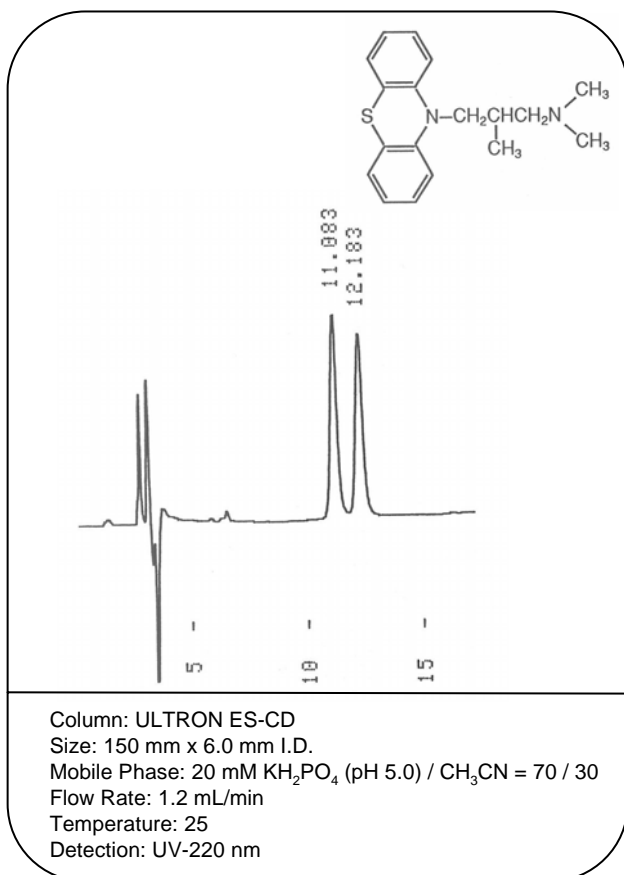
Warfarin



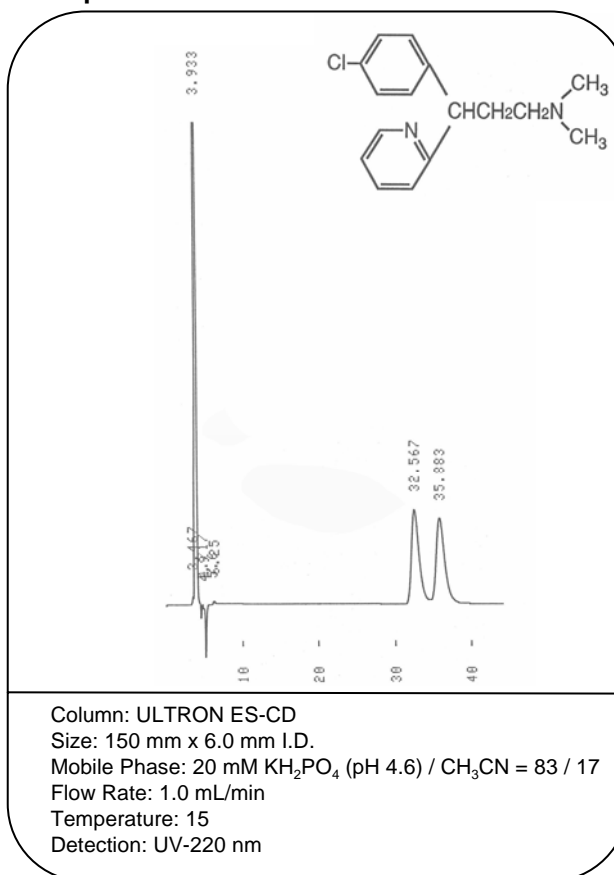
Column: ULTRON ES-BSA  
 Size: 150 mm x 4.6 mm I.D.  
 Mobile Phase: 20 mM KH<sub>2</sub>PO<sub>4</sub> (pH 7.0) / 1-Propanol / Caprylic Acid = 98 / 2 / 0.01  
 Flow Rate: 1.0 mL/min  
 Temperature: 25  
 Detection: UV-220 nm

Antihistamines

Alimemazine

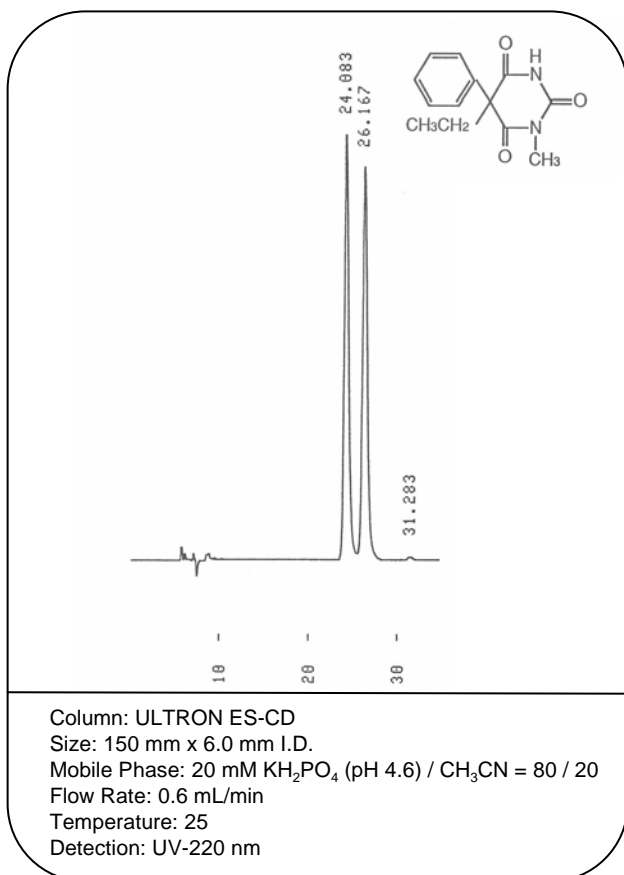


Chlorpheniramine



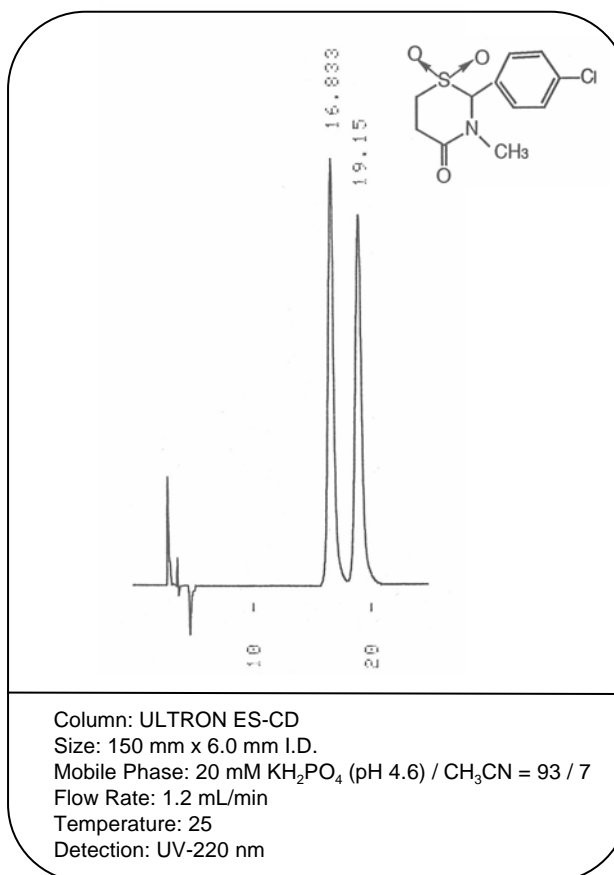
Anticonvulsants

Mephobarbital



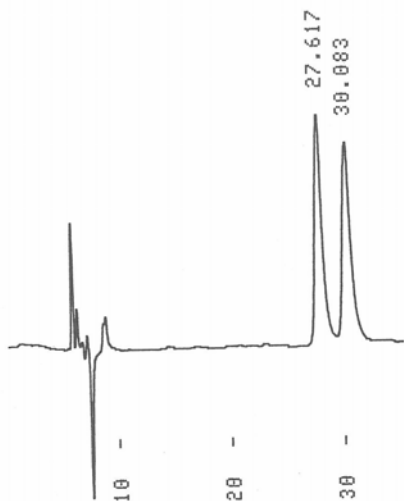
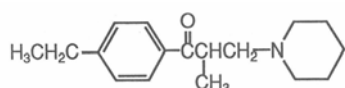
Skeletal Muscle Relaxants

Chlormezanone



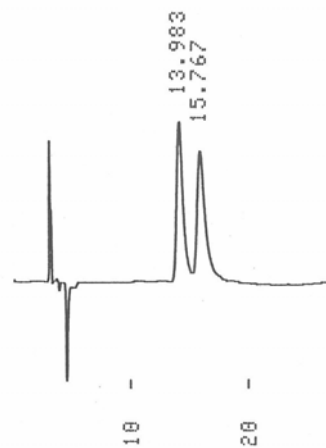
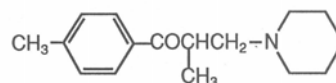
Skeletal Muscle Relaxants

Eperisone



Column: ULTRON ES-CD  
 Size: 150 mm x 6.0 mm I.D.  
 Mobile Phase: 20 mM KH<sub>2</sub>PO<sub>4</sub> (pH 4.6) / CH<sub>3</sub>CN = 80 / 20  
 Flow Rate: 0.6 mL/min  
 Temperature: 25  
 Detection: UV-220 nm

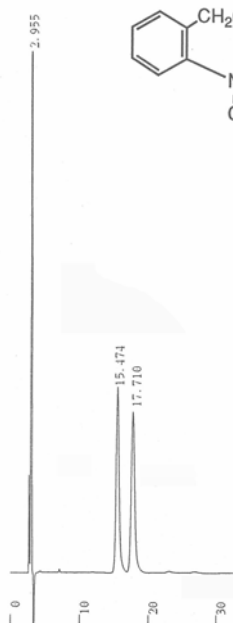
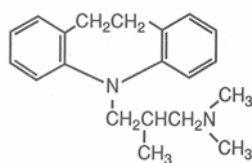
Tolperisone



Column: ULTRON ES-CD  
 Size: 150 mm x 6.0 mm I.D.  
 Mobile Phase: 20 mM KH<sub>2</sub>PO<sub>4</sub> (pH 4.6) / CH<sub>3</sub>CN = 85 / 15  
 Flow Rate: 1.2 mL/min  
 Temperature: 7  
 Detection: UV-220 nm

Antidepressants

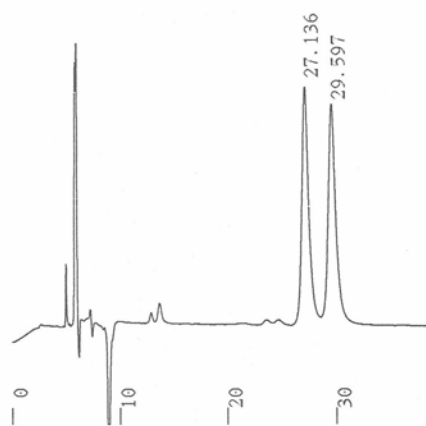
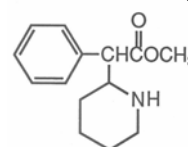
Trimipramine Maleate



Column: ULTRON ES-CD  
 Size: 150 mm x 6.0 mm I.D.  
 Mobile Phase: 20 mM KH<sub>2</sub>PO<sub>4</sub> (pH 4.6) / CH<sub>3</sub>CN = 75 / 25  
 Flow Rate: 1.2 mL/min  
 Temperature: 25  
 Detection: UV-220 nm

Central Nervous System Stimulants

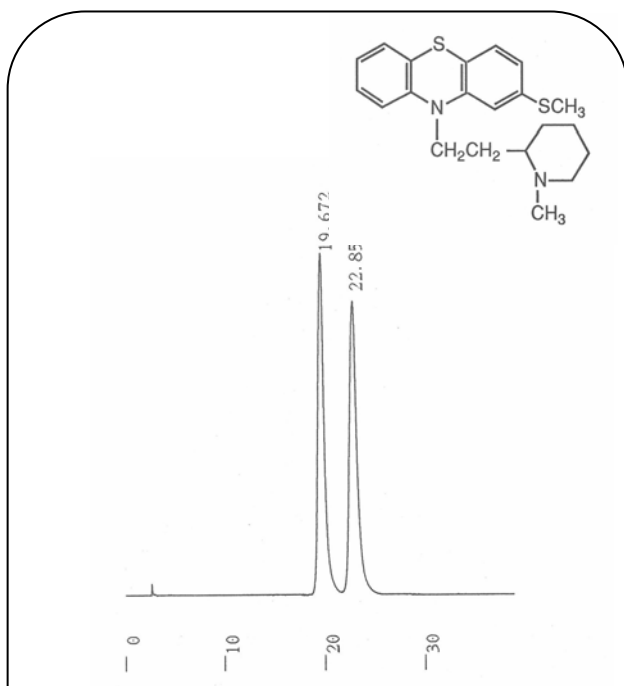
Methylphenidate



Column: ULTRON ES-CD  
 Size: 150 mm x 6.0 mm I.D.  
 Mobile Phase: 20 mM KH<sub>2</sub>PO<sub>4</sub> (pH 6.0) / CH<sub>3</sub>CN = 90 / 10  
 Flow Rate: 1.2 mL/min  
 Temperature: 25  
 Detection: UV-220 nm

Antipsychotic Drug

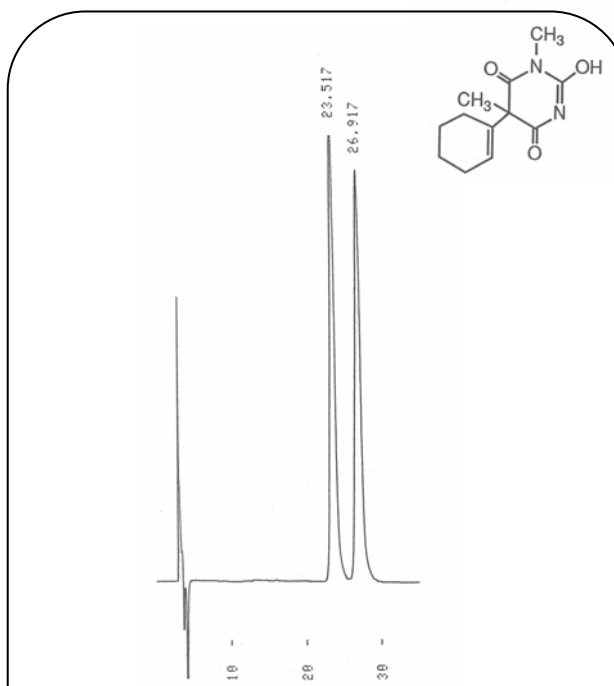
Thioridazine



Column: ULTRON ES-CD  
 Size: 150 mm x 6.0 mm I.D.  
 Mobile Phase: 20 mM KH<sub>2</sub>PO<sub>4</sub> (pH 4.6) / CH<sub>3</sub>CN = 75 / 25  
 Flow Rate: 1.2 mL/min  
 Temperature: 25  
 Detection: UV-220 nm

Hypnotics

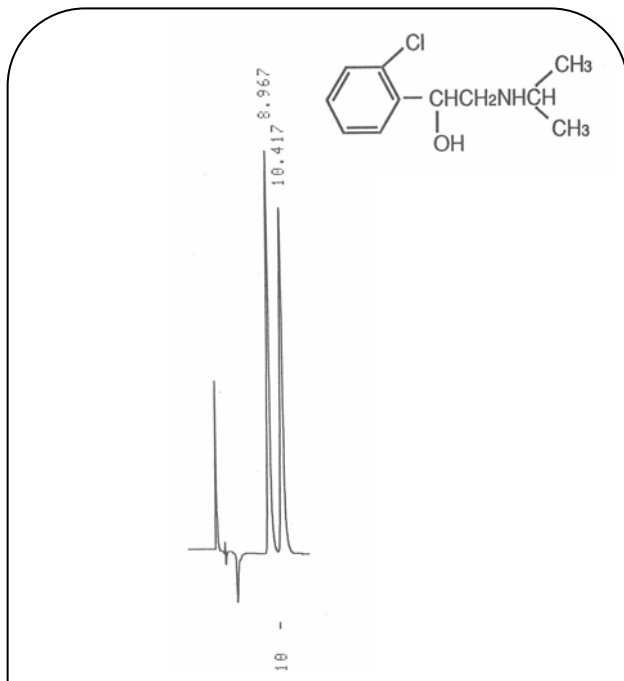
Hexobarbital



Column: ULTRON ES-CD  
 Size: 150 mm x 6.0 mm I.D.  
 Mobile Phase: 20 mM KH<sub>2</sub>PO<sub>4</sub> (pH 4.6) / CH<sub>3</sub>CN = 83 / 17  
 Flow Rate: 1.2 mL/min  
 Temperature: 25  
 Detection: UV-220 nm

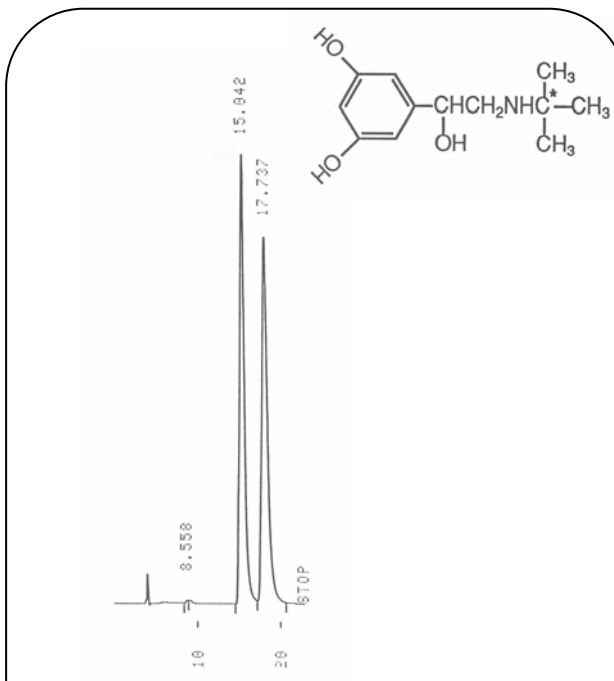
Bronchodilators

Clorprenaline



Column: ULTRON ES-CD  
 Size: 150 mm x 6.0 mm I.D.  
 Mobile Phase: 20 mM KH<sub>2</sub>PO<sub>4</sub> (pH 4.6) / CH<sub>3</sub>CN = 94 / 6  
 Flow Rate: 1.2 mL/min  
 Temperature: 25  
 Detection: UV-220 nm

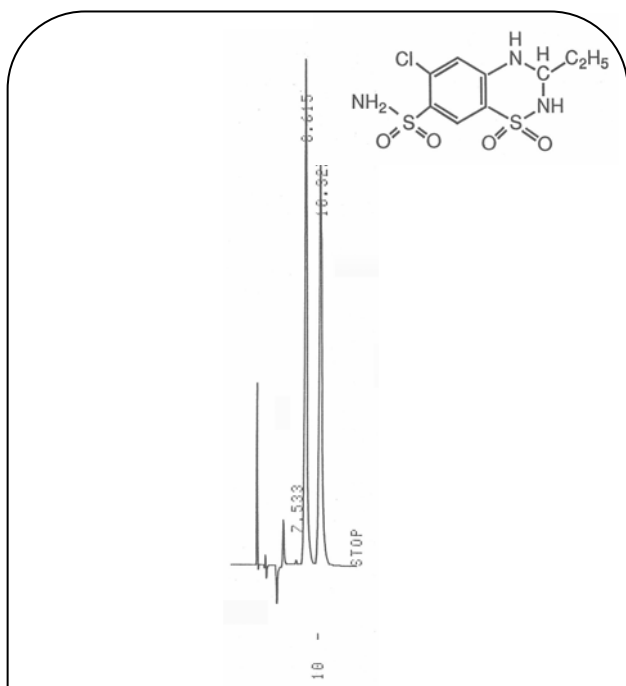
Terbutaline



Column: ULTRON ES-CD  
 Size: 150 mm x 6.0 mm I.D.  
 Mobile Phase: 20 mM KH<sub>2</sub>PO<sub>4</sub> (pH 6.0) / CH<sub>3</sub>CN = 99 / 1  
 Flow Rate: 1.2 mL/min  
 Temperature: 25  
 Detection: UV-220 nm

Diuretics

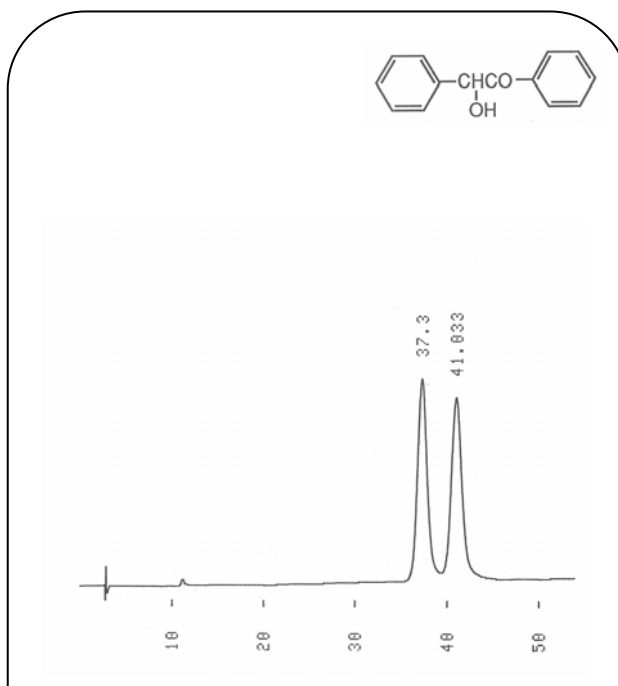
Ethiazide



Column: ULTRON ES-CD  
 Size: 150 mm x 6.0 mm I.D.  
 Mobile Phase: 20 mM KH<sub>2</sub>PO<sub>4</sub> (pH 4.6) / CH<sub>3</sub>CN = 92.5 / 7.5  
 Flow Rate: 1.2 mL/min  
 Temperature: 25  
 Detection: UV-220 nm

Others

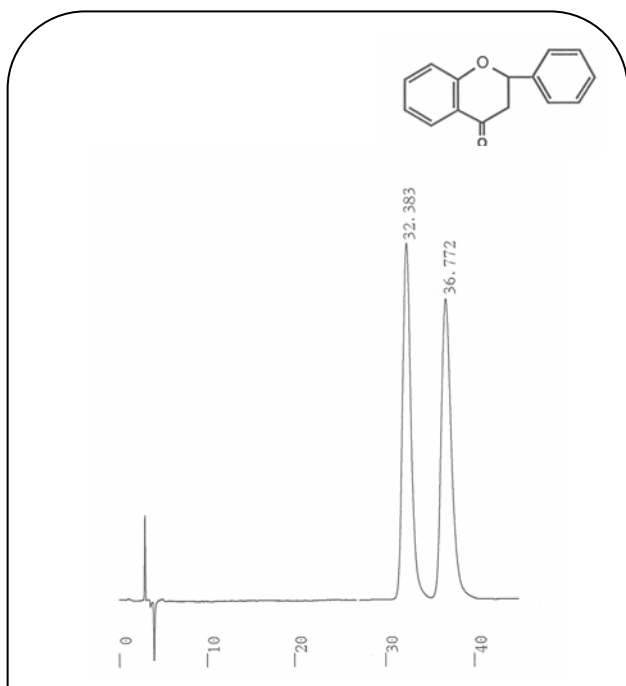
Benzoin



Column: ULTRON ES-CD  
 Size: 150 mm x 6.0 mm I.D.  
 Mobile Phase: 20 mM KH<sub>2</sub>PO<sub>4</sub> (pH 4.6) / CH<sub>3</sub>CN = 88 / 12  
 Flow Rate: 1.2 mL/min  
 Temperature: 25  
 Detection: UV-220 nm

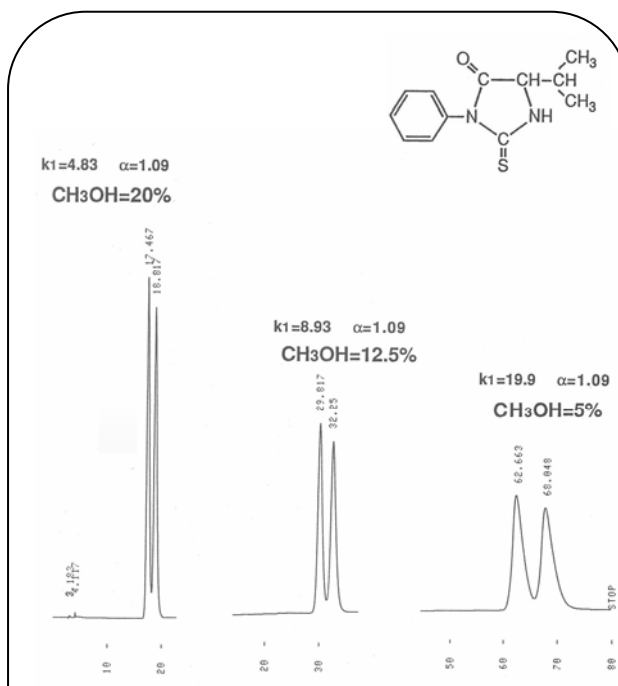
Others

Flavanone



Column: ULTRON ES-CD  
 Size: 150 mm x 6.0 mm I.D.  
 Mobile Phase: 20 mM KH<sub>2</sub>PO<sub>4</sub> (pH 4.6) / CH<sub>3</sub>CN = 80 / 20  
 Flow Rate: 1.2 mL/min  
 Temperature: 25  
 Detection: UV-220 nm

PTH-Valine



k<sub>1</sub>=4.83 α=1.09  
 CH<sub>3</sub>OH=20%

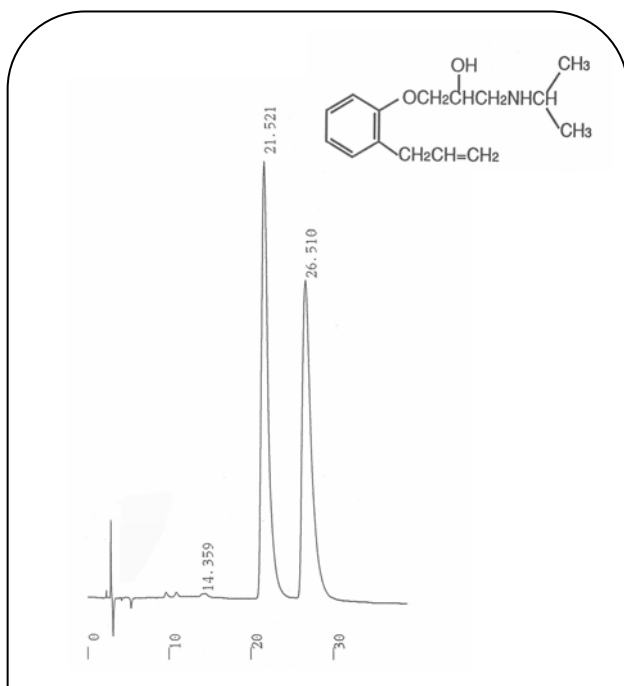
k<sub>1</sub>=8.93 α=1.09  
 CH<sub>3</sub>OH=12.5%

k<sub>1</sub>=19.9 α=1.09  
 CH<sub>3</sub>OH=5%

Column: ULTRON ES-CD  
 Size: 150 mm x 6.0 mm I.D.  
 Mobile Phase: 20 mM KH<sub>2</sub>PO<sub>4</sub> (pH 3.0) / CH<sub>3</sub>CN  
 Flow Rate: 1.2 mL/min  
 Temperature: 25  
 Detection: UV-220 nm

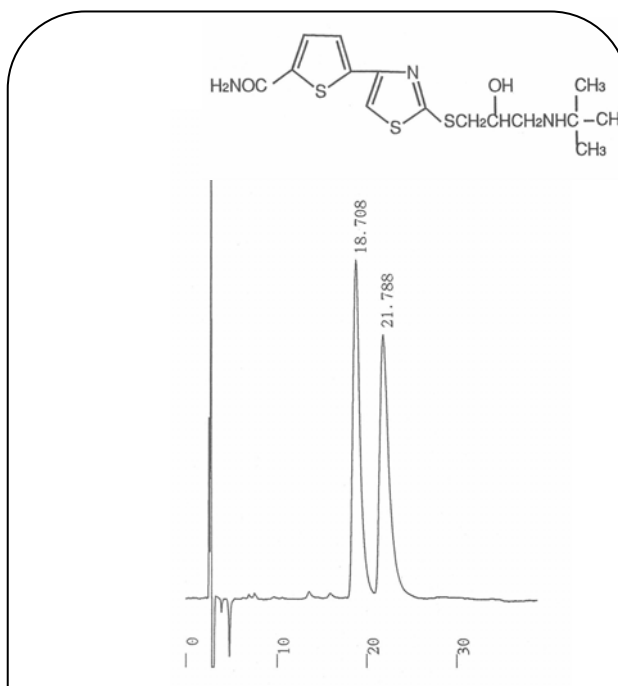
-Blockers

Alprenolol



Column: ULTRON ES-PhCD  
 Size: 150 mm x 6.0 mm I.D.  
 Mobile Phase: 20 mM KH<sub>2</sub>PO<sub>4</sub> (pH 4.6) / CH<sub>3</sub>CN = 80 / 20  
 Flow Rate: 1.2 mL/min  
 Temperature: 25  
 Detection: UV-220 nm

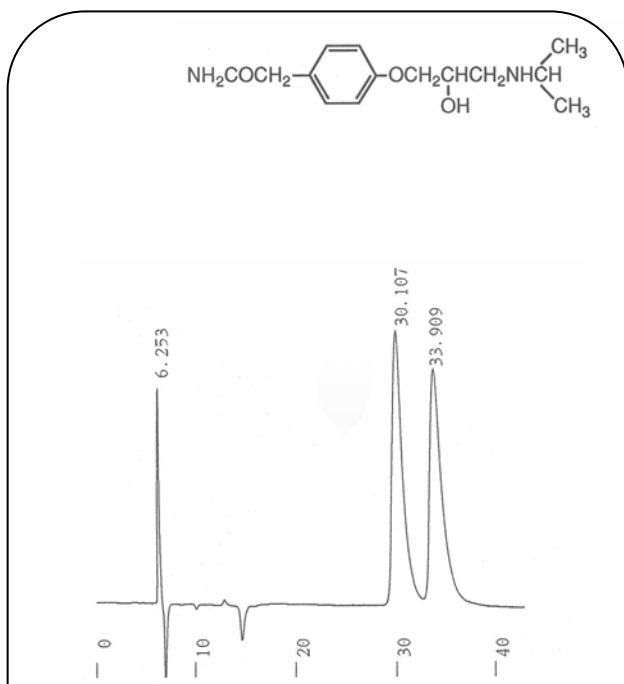
Arotinolol



Column: ULTRON ES-PhCD  
 Size: 150 mm x 6.0 mm I.D.  
 Mobile Phase: 20 mM KH<sub>2</sub>PO<sub>4</sub> (pH 4.6) / CH<sub>3</sub>CN = 75 / 25  
 Flow Rate: 1.2 mL/min  
 Temperature: 25  
 Detection: UV-220 nm

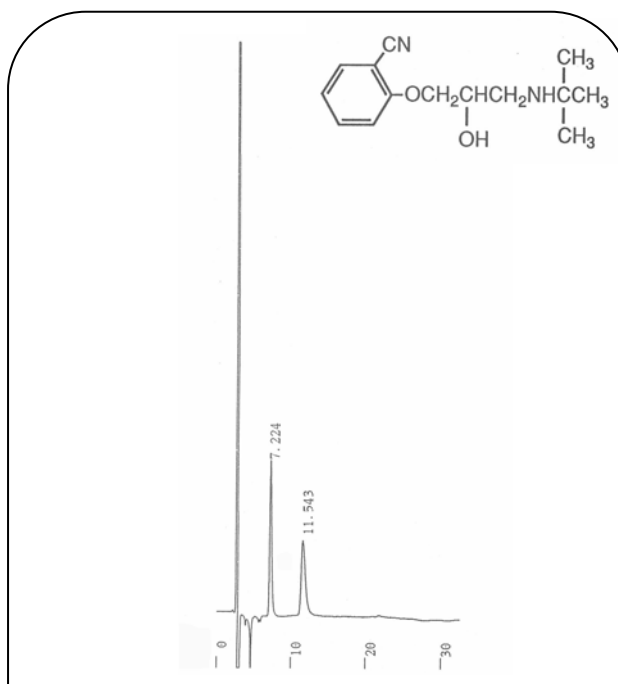
-Blockers

Atenolol



Column: ULTRON ES-PhCD  
 Size: 150 mm x 6.0 mm I.D.  
 Mobile Phase: 20 mM KH<sub>2</sub>PO<sub>4</sub> (pH 6.0) / CH<sub>3</sub>CN = 90 / 10  
 Flow Rate: 0.6 mL/min  
 Temperature: 25  
 Detection: UV-220 nm

Bunitrolol

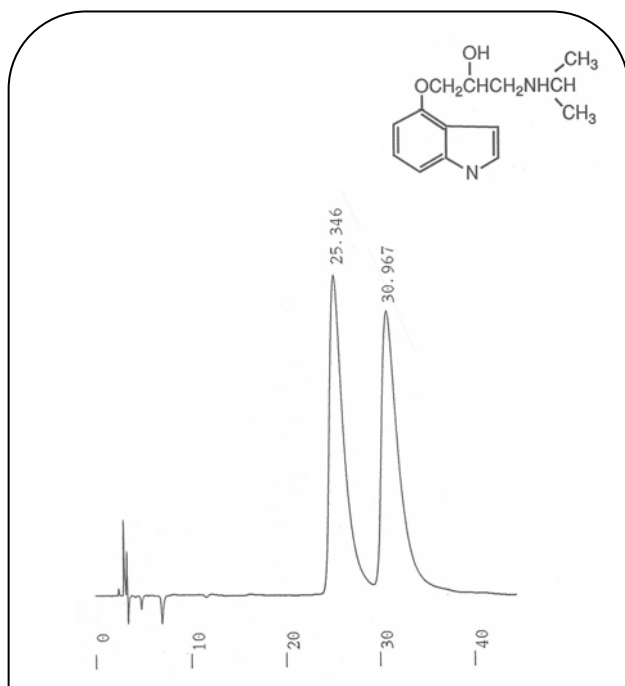


Column: ULTRON ES-PhCD  
 Size: 150 mm x 6.0 mm I.D.  
 Mobile Phase: 20 mM KH<sub>2</sub>PO<sub>4</sub> (pH 4.6) / CH<sub>3</sub>CN = 70 / 30  
 Flow Rate: 1.2 mL/min  
 Temperature: 25  
 Detection: UV-220 nm



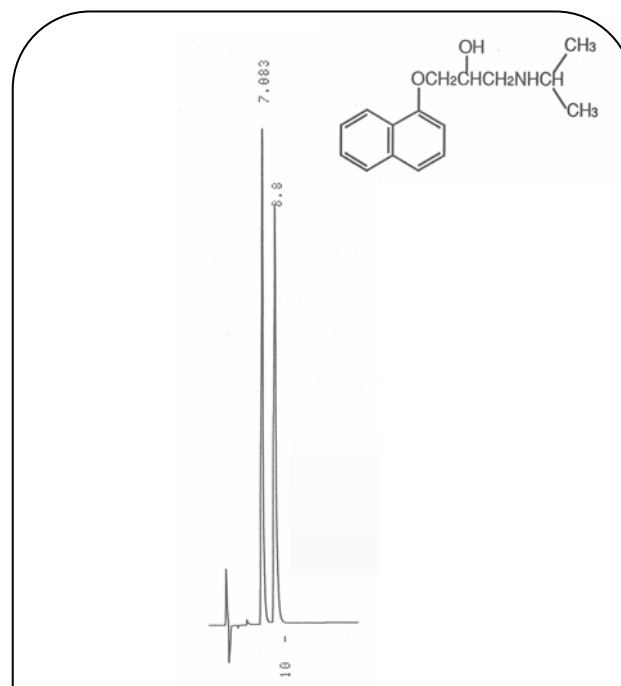
-Blockers

**Pindolol**



Column: ULTRON ES-PhCD  
 Size: 150 mm x 6.0 mm I.D.  
 Mobile Phase: 20 mM KH<sub>2</sub>PO<sub>4</sub> (pH 4.6) / CH<sub>3</sub>CN = 90 / 10  
 Flow Rate: 1.2 mL/min  
 Temperature: 25  
 Detection: UV-220 nm

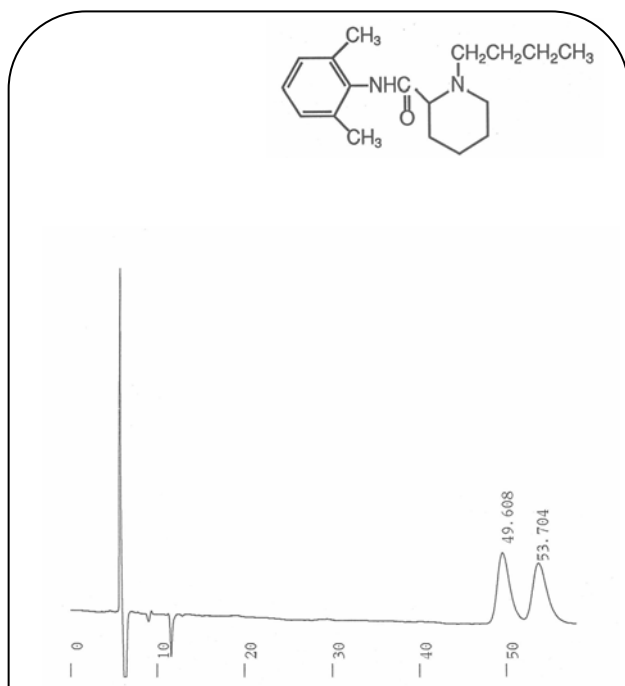
**Propranolol**



Column: ULTRON ES-PhCD  
 Size: 150 mm x 6.0 mm I.D.  
 Mobile Phase: 20 mM KH<sub>2</sub>PO<sub>4</sub> (pH 4.6) / CH<sub>3</sub>CN = 60 / 40  
 Flow Rate: 1.2 mL/min  
 Temperature: 25  
 Detection: UV-220 nm

Local Anesthetics

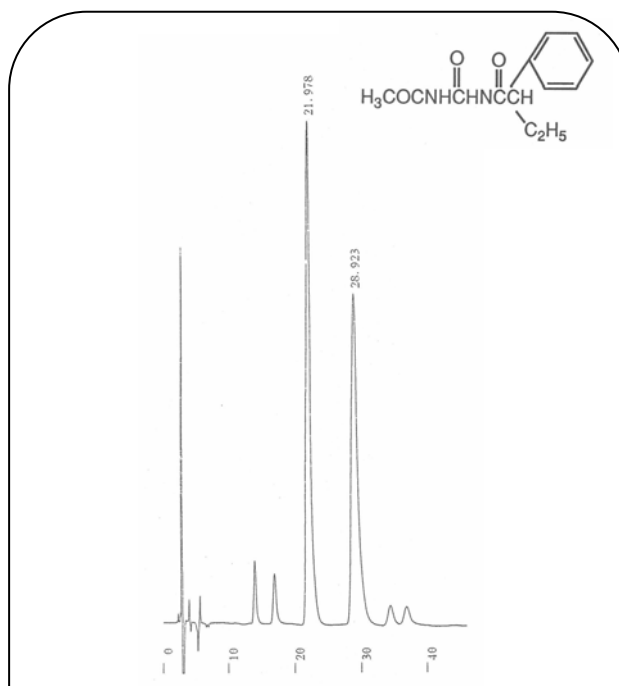
**Bupivacaine**



Column: ULTRON ES-PhCD  
 Size: 150 mm x 6.0 mm I.D.  
 Mobile Phase: 20 mM KH<sub>2</sub>PO<sub>4</sub> (pH 4.6) / CH<sub>3</sub>CN = 80 / 20  
 Flow Rate: 1.2 mL/min  
 Temperature: 25  
 Detection: UV-220 nm

Anticonvulsants

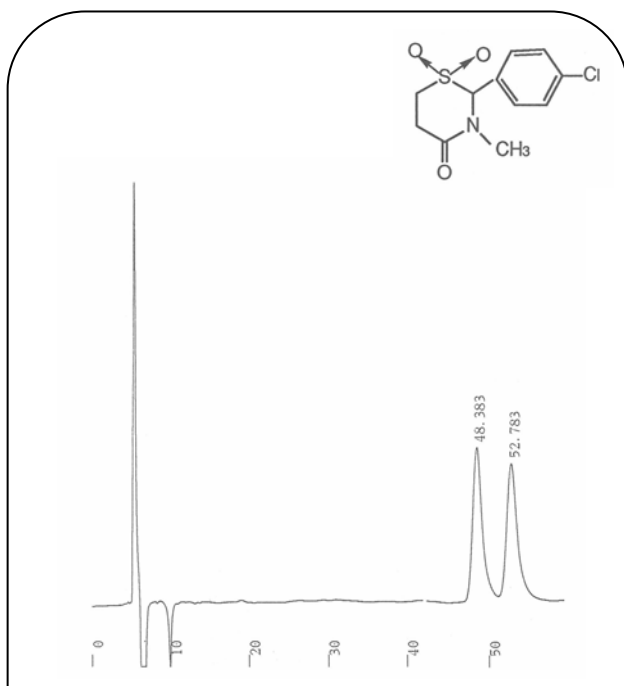
**Acetylpheneturide**



Column: ULTRON ES-PhCD  
 Size: 150 mm x 6.0 mm I.D.  
 Mobile Phase: 20 mM KH<sub>2</sub>PO<sub>4</sub> (pH 4.6) / CH<sub>3</sub>CN = 76 / 24  
 Flow Rate: 1.2 mL/min  
 Temperature: 25  
 Detection: UV-220 nm

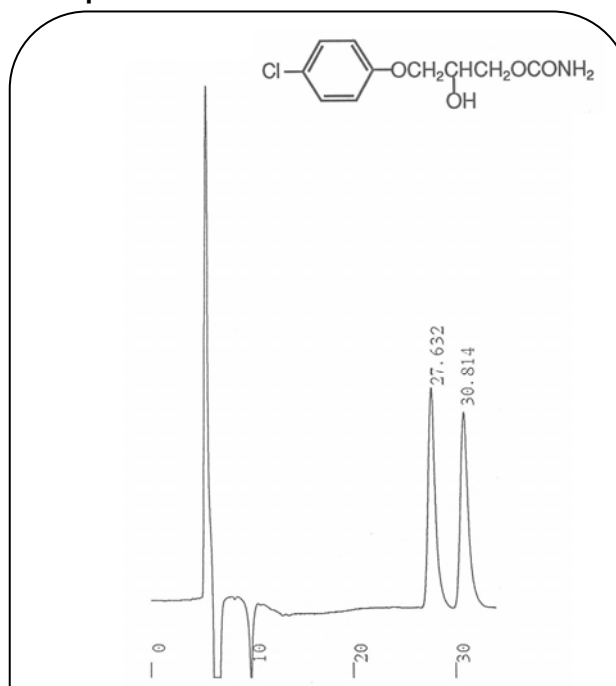
Skeletal Muscle Relaxants

Chlormezanone



Column: ULTRON ES-PhCD  
 Size: 150 mm x 6.0 mm I.D.  
 Mobile Phase: 20 mM KH<sub>2</sub>PO<sub>4</sub> (pH 4.6) / CH<sub>3</sub>CN = 70 / 30  
 Flow Rate: 0.6 mL/min  
 Temperature: 9  
 Detection: UV-220 nm

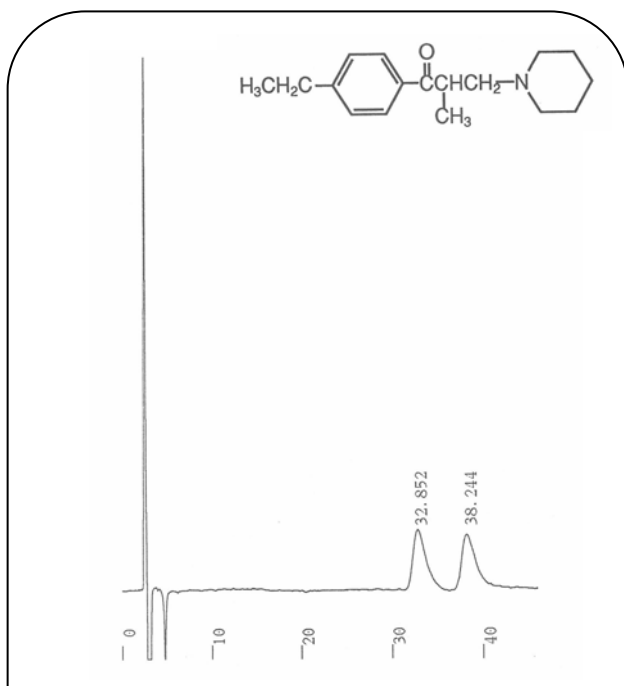
Chlorphenesin



Column: ULTRON ES-PhCD  
 Size: 150 mm x 6.0 mm I.D.  
 Mobile Phase: 20 mM KH<sub>2</sub>PO<sub>4</sub> (pH 4.6) / CH<sub>3</sub>CN = 70 / 30  
 Flow Rate: 0.6 mL/min  
 Temperature: 9  
 Detection: UV-220 nm

Skeletal Muscle Relaxants

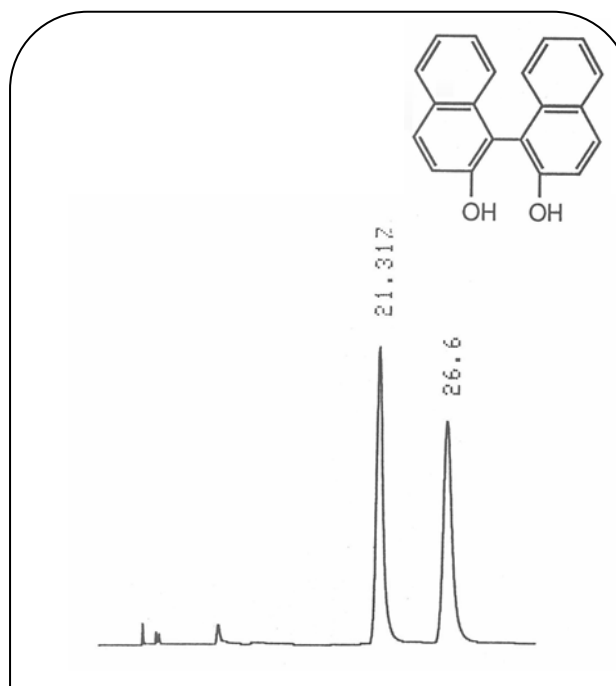
Eperisone



Column: ULTRON ES-PhCD  
 Size: 150 mm x 6.0 mm I.D.  
 Mobile Phase: 20 mM KH<sub>2</sub>PO<sub>4</sub> (pH 4.6) / CH<sub>3</sub>CN = 70 / 30  
 Flow Rate: 1.2 mL/min  
 Temperature: 9  
 Detection: UV-220 nm

Others

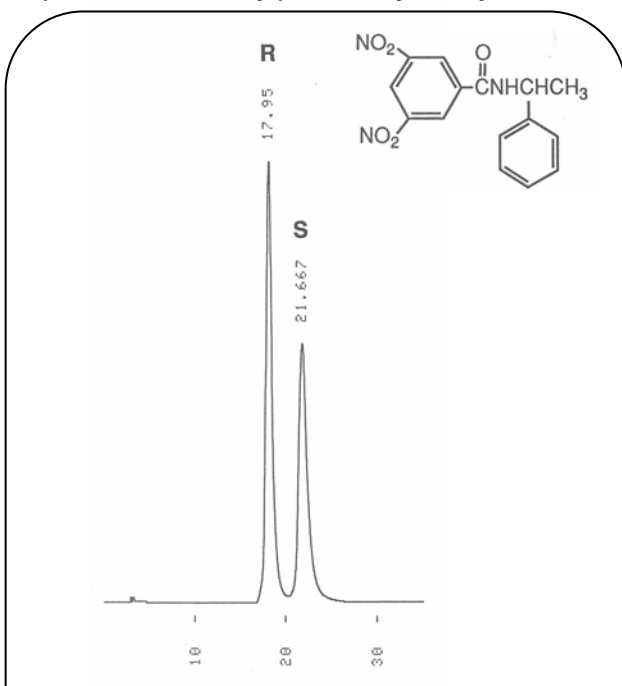
1,1'-Bi-2-naphthol



Column: ULTRON ES-PhCD  
 Size: 150 mm x 6.0 mm I.D.  
 Mobile Phase: Hexane / Dichloromethane/ Methanol = 75 / 25 / 5  
 Flow Rate: 1.2 mL/min  
 Temperature: 25  
 Detection: UV-254 nm

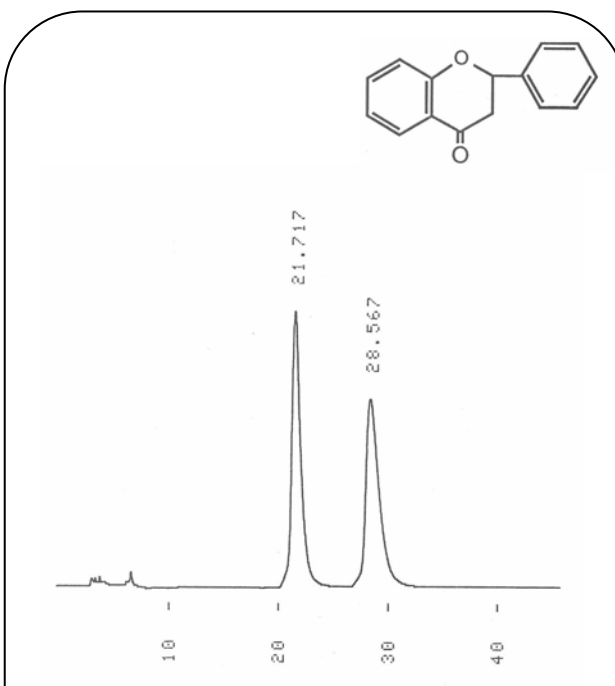
Others

N-(3,5-Dinitrobenzoyl)-*N*-methylbenzylamine



Column: ULTRON ES-PhCD  
 Size: 150 mm x 6.0 mm I.D.  
 Mobile Phase: Hexane / Ethanol = 85 / 15  
 Flow Rate: 1.0 mL/min  
 Temperature: 25  
 Detection: UV-254 nm

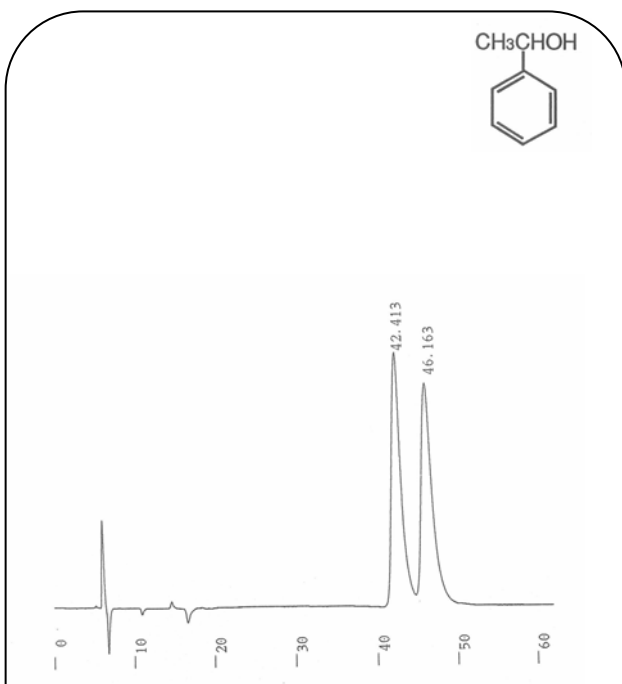
Flavanone



Column: ULTRON ES-PhCD  
 Size: 150 mm x 6.0 mm I.D.  
 Mobile Phase: Hexane / Ethanol = 99 / 1  
 Flow Rate: 1.0 mL/min  
 Temperature: 25  
 Detection: UV-254 nm

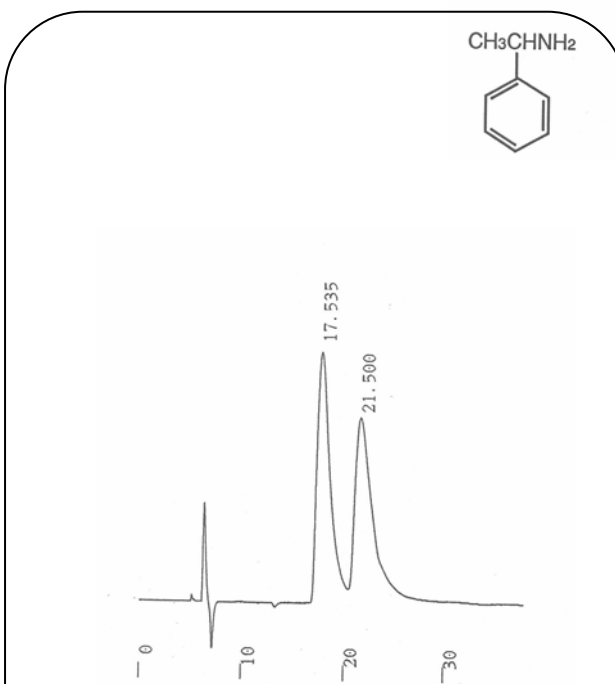
Others

*N*-Phenylethyl Alcohol



Column: ULTRON ES-PhCD  
 Size: 150 mm x 6.0 mm I.D.  
 Mobile Phase: 20 mM KH<sub>2</sub>PO<sub>4</sub> (pH 4.6) / CH<sub>3</sub>CN = 90 / 10  
 Flow Rate: 0.6 mL/min  
 Temperature: 15  
 Detection: UV-220 nm

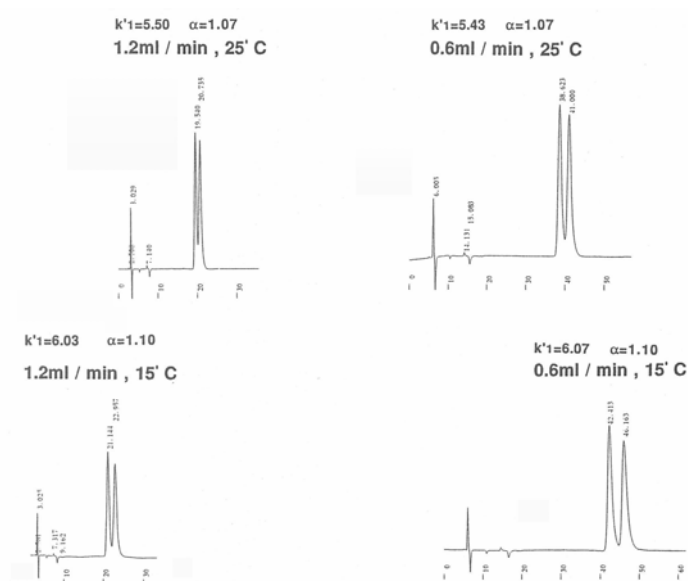
*N*-Phenylethylamine



Column: ULTRON ES-PhCD  
 Size: 150 mm x 6.0 mm I.D.  
 Mobile Phase: 20 mM KH<sub>2</sub>PO<sub>4</sub> (pH 4.6) / CH<sub>3</sub>CN = 95 / 5  
 Flow Rate: 0.6 mL/min  
 Temperature: 15  
 Detection: UV-220 nm

Others

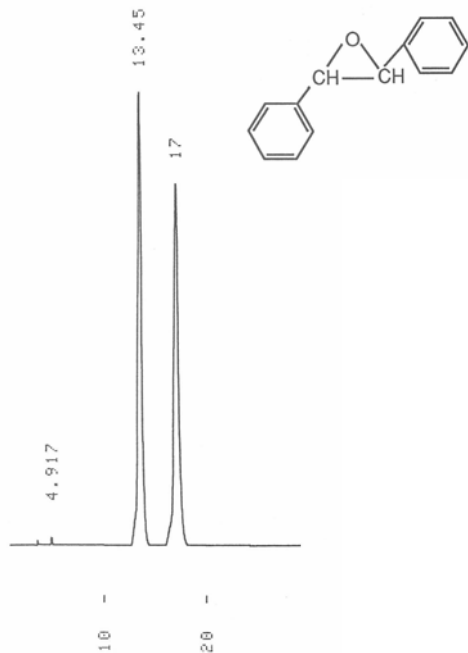
The Relationship Between Flow Ratio and Capacitor Ratio ( $k'$ ) of Column Temperature, Optics Recognition Ability ( )  
 -Phenylethylamine



Column: ULTRON ES-PhCD  
 Size: 150 mm x 6.0 mm I.D.  
 Mobile Phase: 20 mM  $\text{KH}_2\text{PO}_4$  (pH 4.6) /  $\text{CH}_3\text{CN}$  = 90 / 10  
 Detection: UV-220 nm

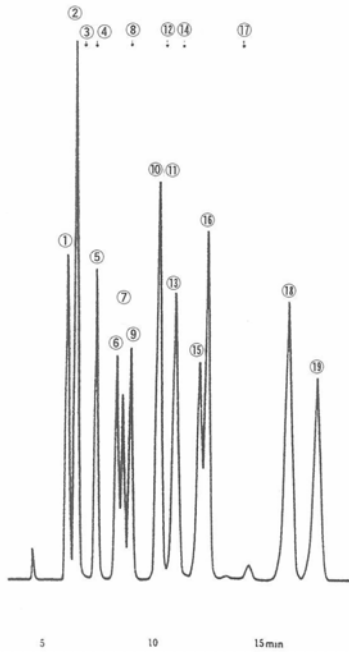
Others

trans-Stilbene Oxide



Column: ULTRON ES-PhCD  
 Size: 150 mm x 6.0 mm I.D.  
 Mobile Phase: Hexane / Methanol = 99.9 / 0.1  
 Flow Rate: 1.0 mL/min  
 Temperature: 25  
 Detection: UV-254 nm

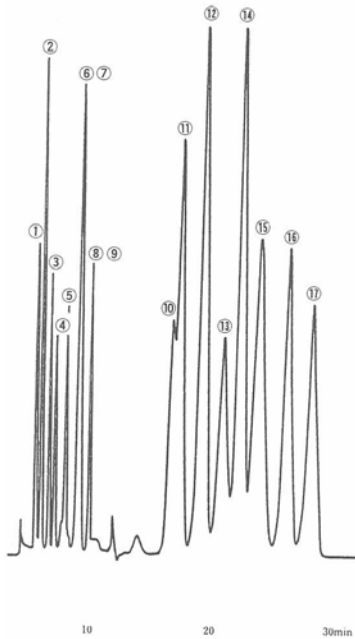
**Elution Position of The Aliphatic Organic Acid**



- Citric Acid
- Tartaric Acid
- Glyoxylic Acid
- Malic Acid
- Malonic Acid
- Succinic Acid
- Glycolic Acid
- Formic Acid
- Lactic Acid
- Acetic Acid
- Fumaric Acid
- Levulinic Acid
- Adipic Acid
- Pyroglutamic Acid
- Propionic Acid
- Acrylic Acid
- Pivalic Acid
- Methacrylic Acid
- Crotonic Acid

Column: ULTRON PS-80H  
 Size: 300 mm x 8.0 mm I.D.  
 Mobile Phase: HClO<sub>4</sub>aq. (pH2.1)  
 Flow Rate: 1.0 mL/min  
 Temperature: 60  
 Detection: UV-210 nm

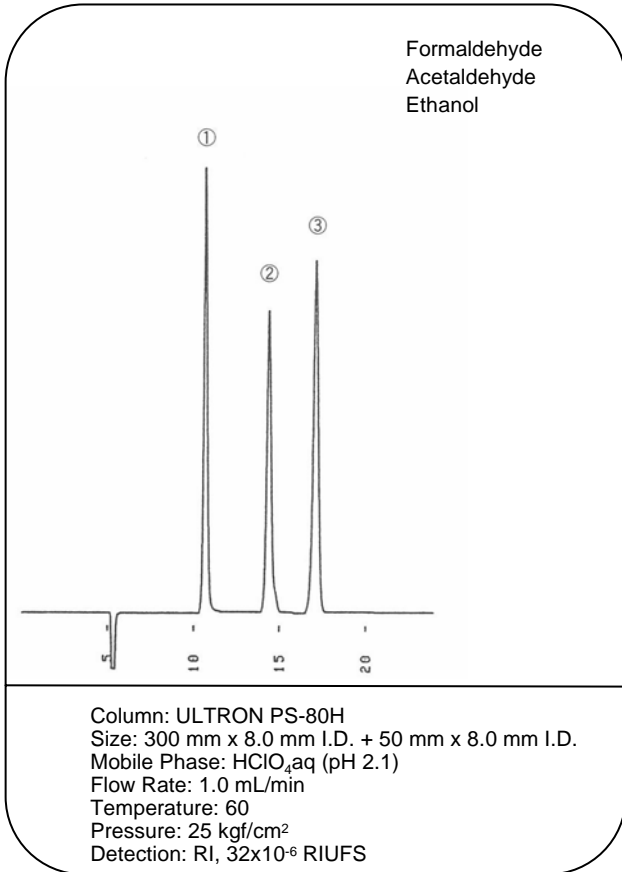
**Elution Position of The Aromatic Organic Acid**



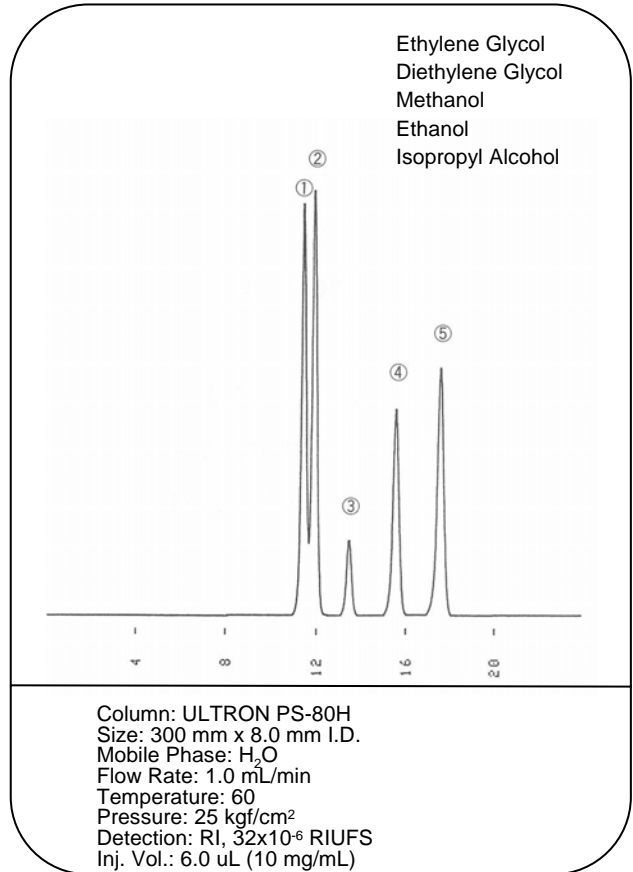
- Citric Acid
- Tartaric Acid
- Malonic Acid
- Succinic Acid
- Lactic Acid
- Acetic Acid
- Gallic Acid
- Propionic Acid
- o-Phthalic Acid
- Phenoxyacetic Acid
- m-Hydroxybenzoic Acid
- p-Hydroxybenzoic Acid
- Vanilic Acid
- Sorbic Acid
- Caffeic Acid
- Benzoic Acid
- o-Hydroxybenzoic Acid

Column: ULTRON PS-80H  
 Size: 300 mm x 8.0 mm I.D.  
 Mobile Phase: 10 % CH<sub>3</sub>CN Addition HClO<sub>4</sub>aq. (pH2.1)  
 Flow Rate: 1.0 mL/min  
 Temperature: 60  
 Detection: UV-210 nm

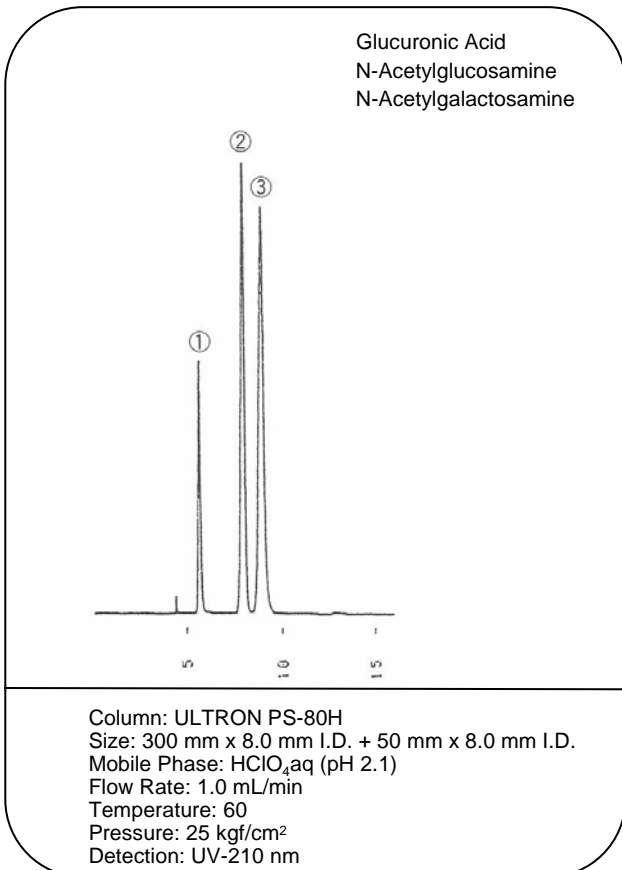
**Alcohols Aldehydes**



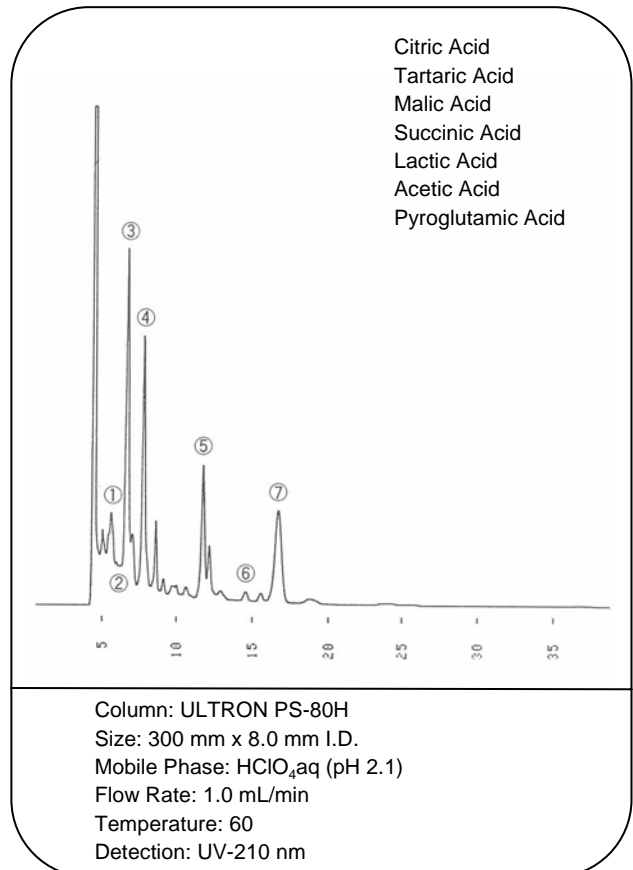
**Alcohols**



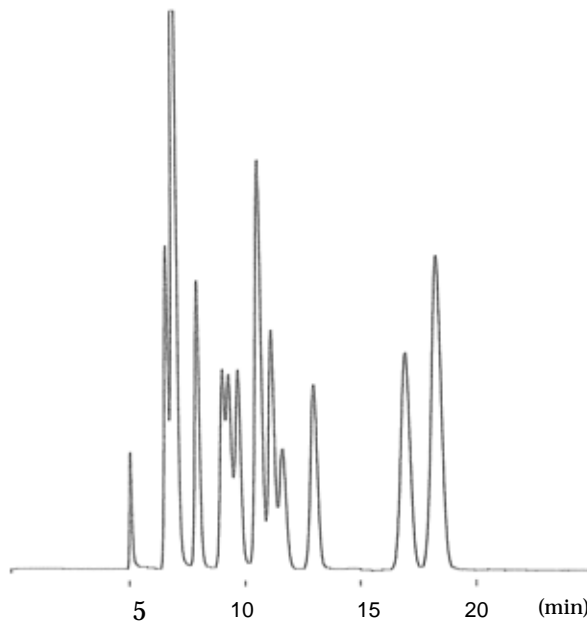
**Uronic Acid, Acetylation Amino Sugar**



**Analysis of The Soy Sauce**



Analysis of Aliphatic Organic Acid

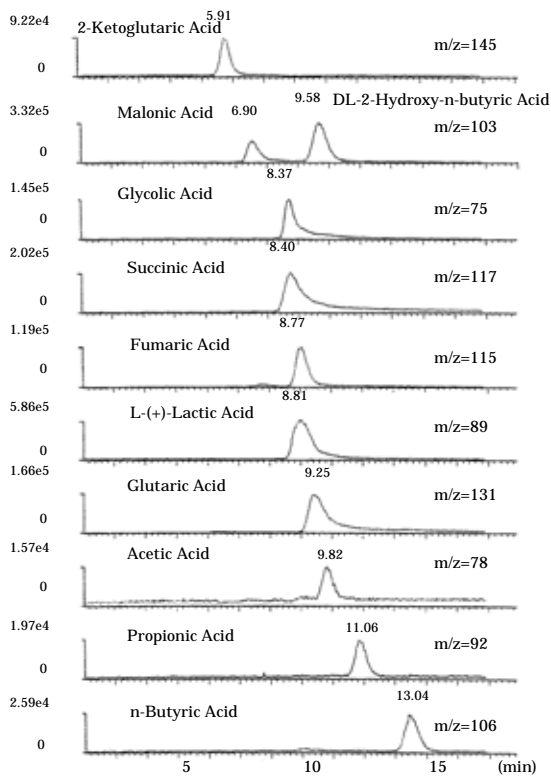


- Citric Acid
- Tartaric Acid
- Maleic Acid
- Malonic Acid
- Succinic Acid
- Glycolic Acid
- Lactic Acid
- Fumaric Acid
- Acetic Acid
- Adipic Acid
- Propionic Acid
- Methacrylic Acid
- Crotonic Acid

Column: ULTRON PS-80H  
 Size: 250 mm x 2.0 mm I.D.  
 Mobile Phase: HClO<sub>4</sub>aq (pH 2.1)  
 Flow Rate: 0.05 mL/min

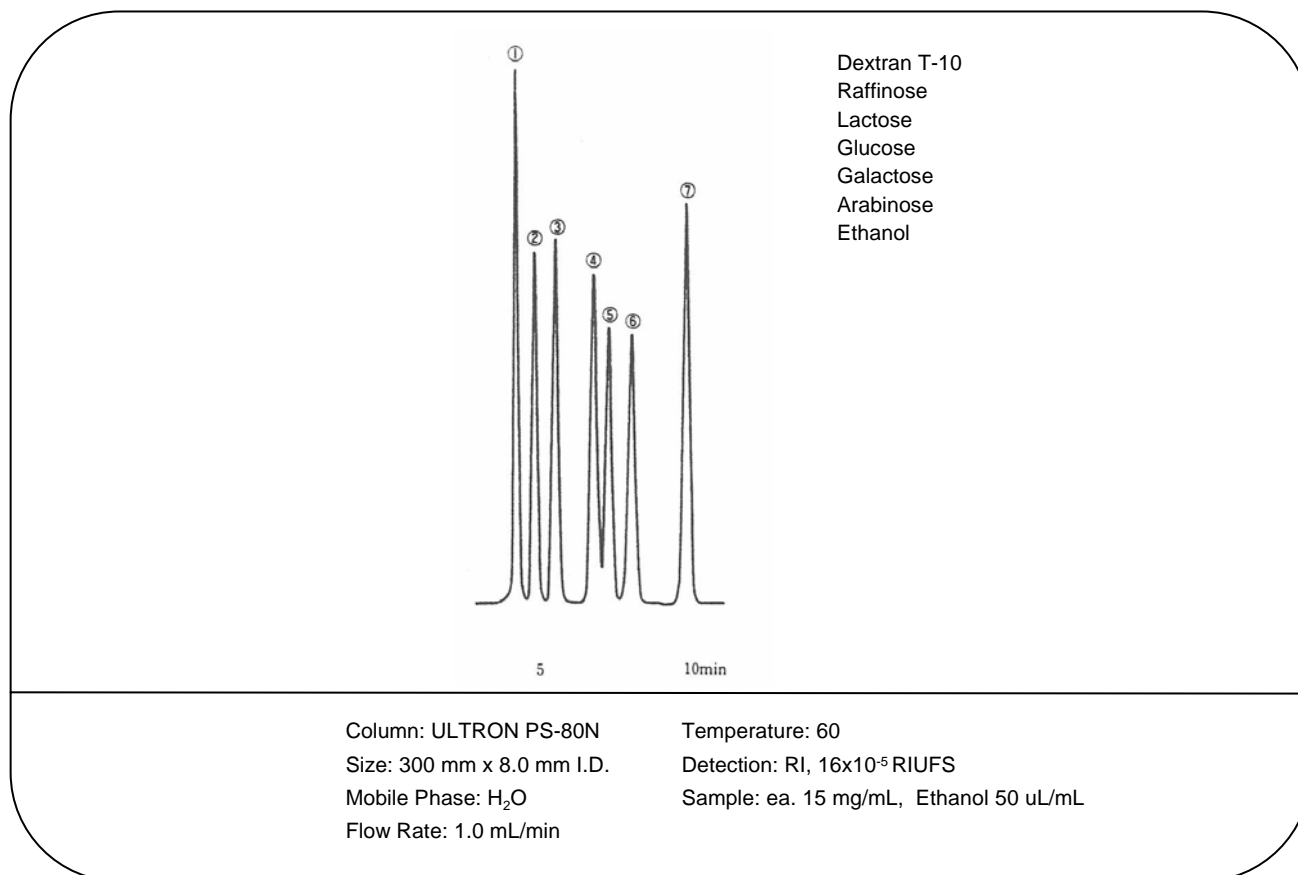
Temperature: 60  
 Press.:0.7 MPa  
 Injection Amount: 2.5 uL  
 Detection: UV-210 nm

Mass Chromatograms Obtained by TIC of 11 Carboxylic Acids.

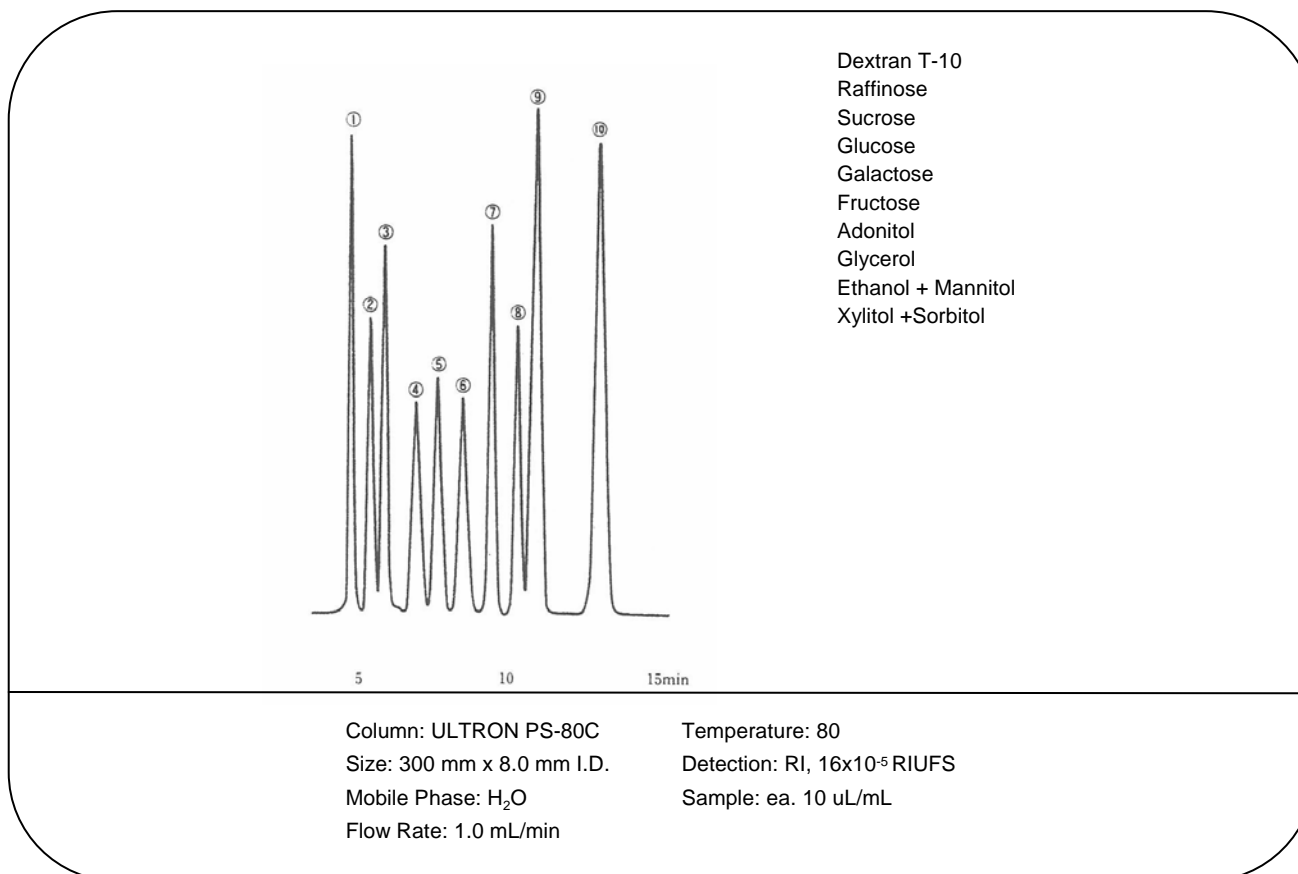


Column : ULTRON PS-80H  
 Dimensions : 250 mm L x 2.0 mm I.D.  
 Mobile Phase : 0.1% Formic Acid (pH 2.3)  
 Flow Rate : 0.07 ml/min  
 Temperature : 55  
 Detection : ESI Positive and Negative, Range: m/z 50 ~ 350

**Elution Position of Sugar and Sugar Alcohol for PS-80N**

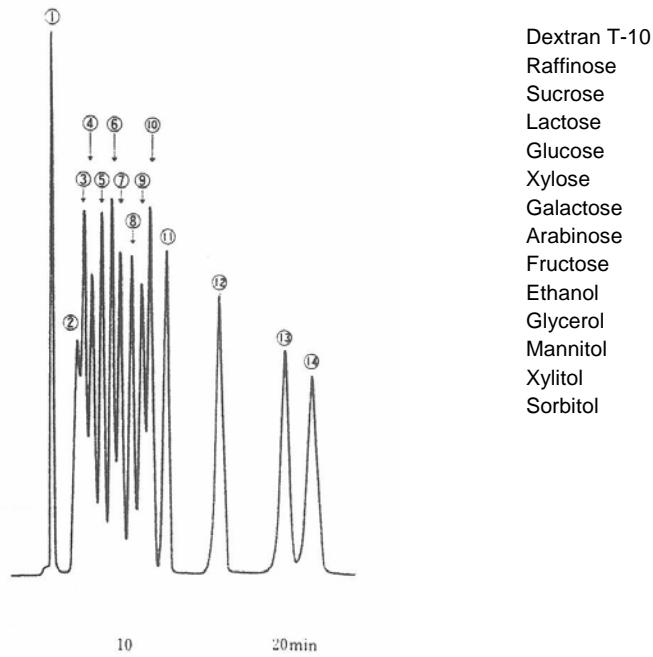


**Elution Position of Sugar and Sugar Alcohol for PS-80C**



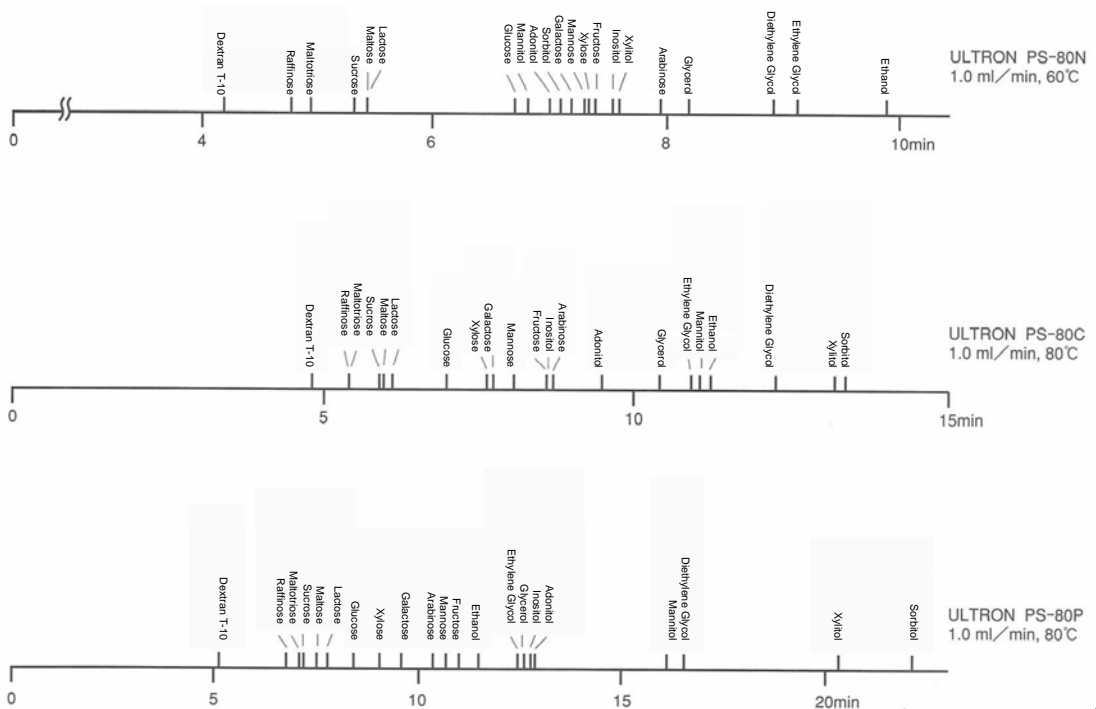


Elution Position of Sugar and Sugar Alcohol for PS-80P

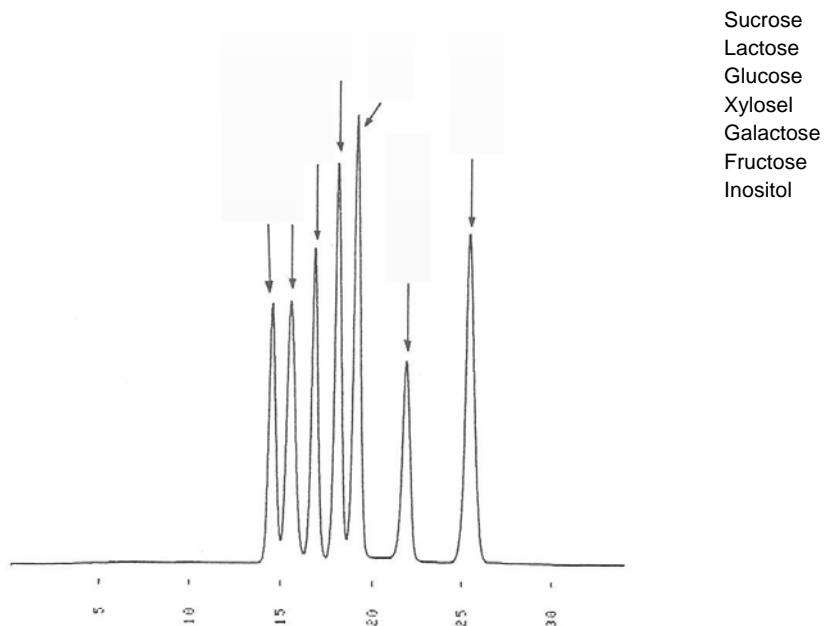


Column: ULTRON PS-80P      Temperature: 80  
 Size: 300 mm x 8.0 mm I.D.      Detection: RI, 16x10<sup>-5</sup> RIUFS  
 Mobile Phase: H<sub>2</sub>O      Sample: ea. 10 uL/mL  
 Flow Rate: 1.0 mL/min

Retention Index of The Standard Sample



**Sugar and Sugar Alcohol**



Column: ULTRON PS-80P

Size: 300 mm x 8.0 mm I.D. + 300 mm x 8.0 mm I.D.

Mobile Phase: H<sub>2</sub>O

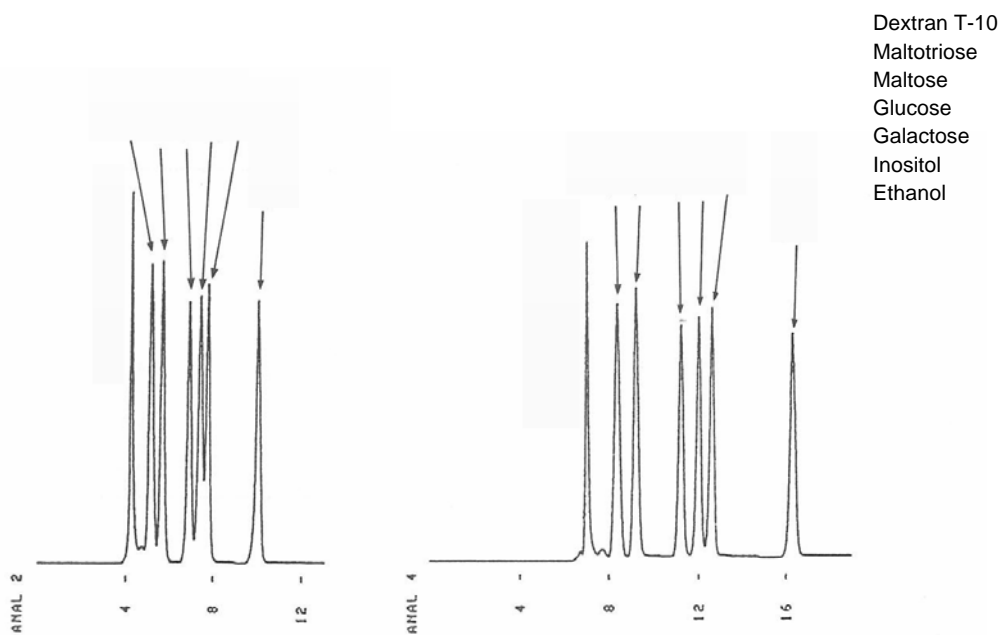
Flow Rate: 1.0 mL/min

Temperature: 80

Pressure: 20 kgf/cm<sup>2</sup>

Detection: RI, 16x10<sup>-5</sup> RIUFS

**Comparison of Retention Between PS-80N 300 mm x 8.0 mm and 500 mm x 8.0 mm**



Column: ULTRON PS-80N

Size: 300 mm x 8.0 mm I.D.

Mobile Phase: H<sub>2</sub>O

Flow Rate: 1.0 mL/min

Pressure: 20 kgf/cm<sup>2</sup>

Column: ULTRON PS-80N-L

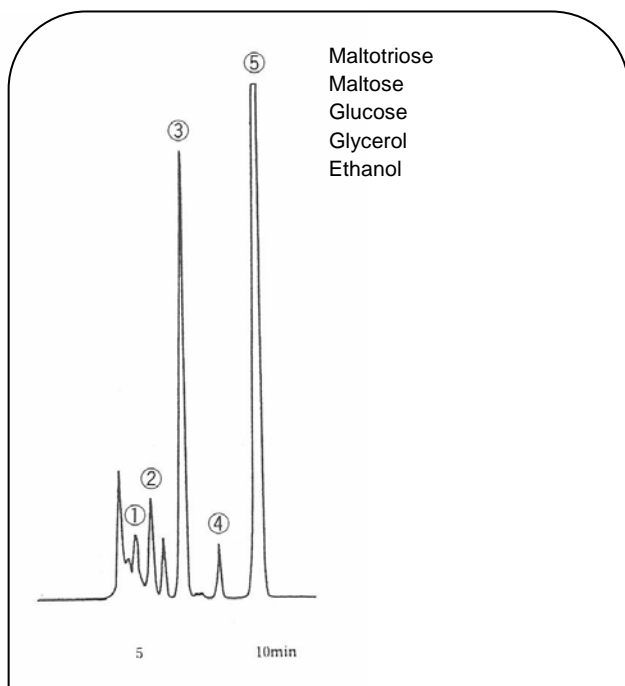
Size: 500 mm x 8.0 mm I.D.

Mobile Phase: H<sub>2</sub>O

Flow Rate: 1.0 mL/min

Pressure: 35 kgf/cm<sup>2</sup>

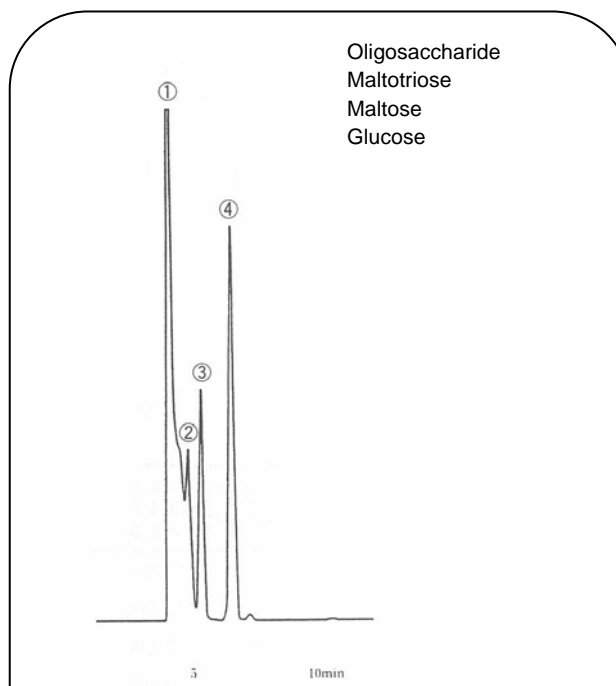
**Sake**



Maltotriose  
Maltose  
Glucose  
Glycerol  
Ethanol

Column: ULTRON PS-80N    Temperature: 60  
Size: 300 mm x 8.0 mm I.D.    Pressure: 22 kgf/cm<sup>2</sup>  
Mobile Phase: H<sub>2</sub>O    Detection: RI, 16x10<sup>-5</sup> RIUFS  
Flow Rate: 1.0 mL/min    Injection Vol.: 10 uL

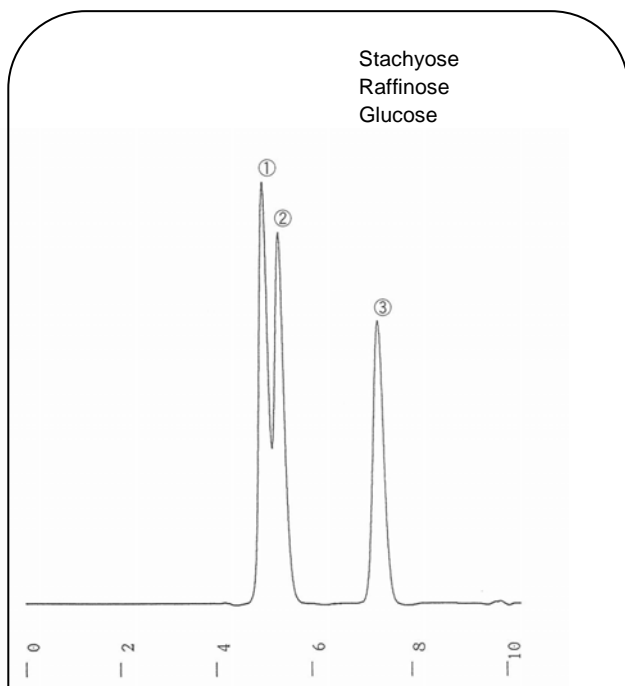
**Starch Syrup**



Oligosaccharide  
Maltotriose  
Maltose  
Glucose

Column: ULTRON PS-80N    Temperature: 60  
Size: 300 mm x 8.0 mm I.D.    Pressure: 22 kgf/cm<sup>2</sup>  
Mobile Phase: H<sub>2</sub>O    Detection: RI, 16x10<sup>-5</sup> RIUFS  
Flow Rate: 1.0 mL/min    Injection Vol.: 5 uL(25 mg/mL)

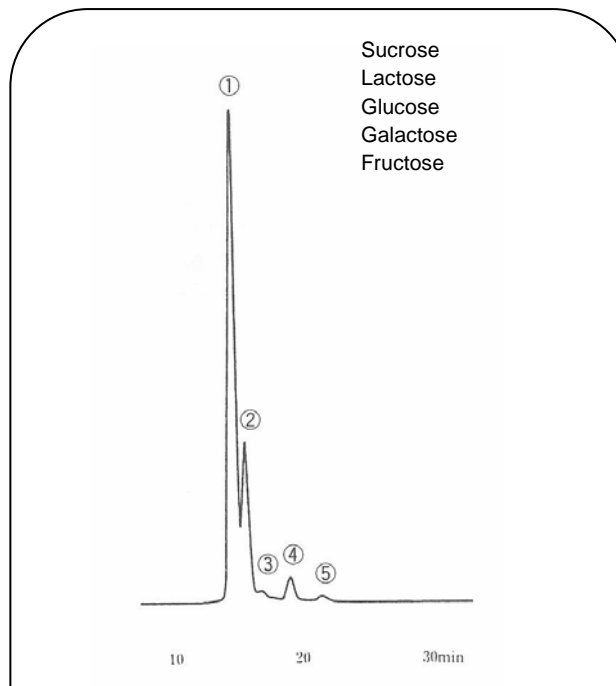
**Separation of Stachyose and Raffinose**



Stachyose  
Raffinose  
Glucose

Column: ULTRON PS-80N    Temperature: 60  
Size: 300 mm x 8.0 mm I.D.    Pressure: 25 kgf/cm<sup>2</sup>  
Mobile Phase: H<sub>2</sub>O    Detection: RI, 128x10<sup>-6</sup> RIUFS  
Flow Rate: 1.0 mL/min    Injection Vol.: 10 uL(2 mg/mL)

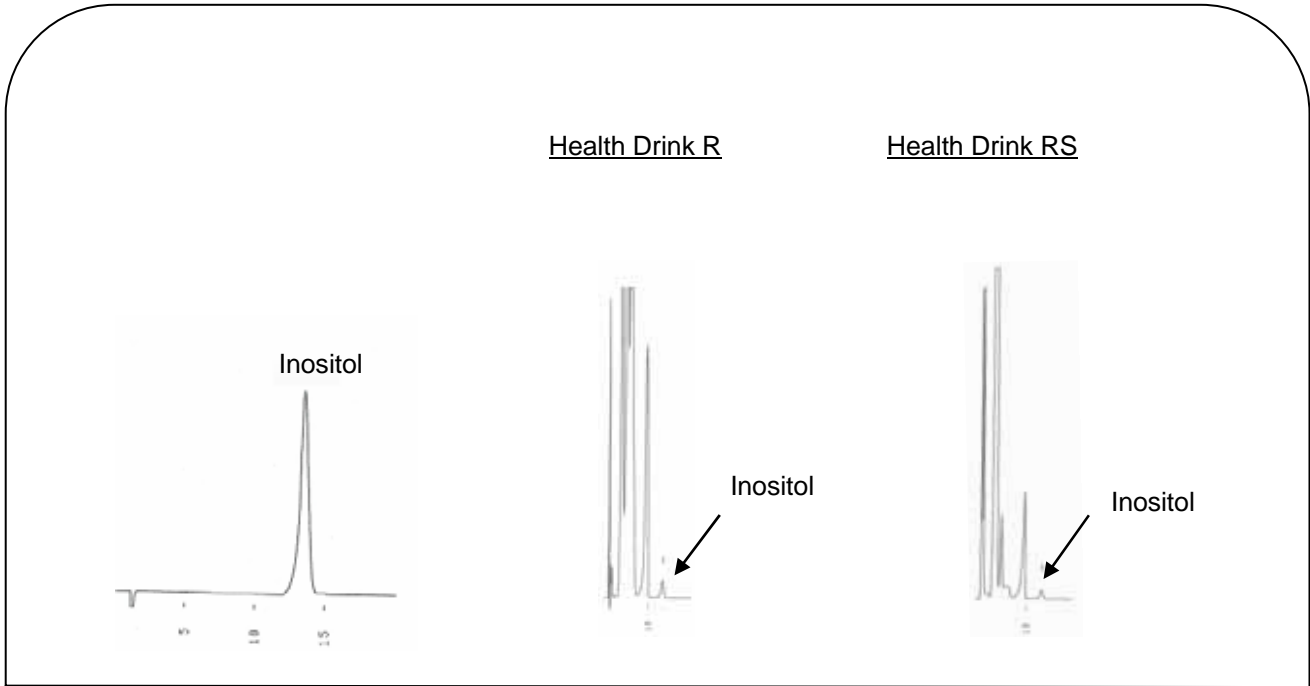
**Yoghurt Drink**



Sucrose  
Lactose  
Glucose  
Galactose  
Fructose

Column: ULTRON PS-80C    Temperature: 80  
Size: 300 mm x 8.0 mm I.D.    Pressure: 20 kgf/cm<sup>2</sup>  
Mobile Phase: H<sub>2</sub>O    Detection: RI, 8x10<sup>-5</sup> RIUFS  
Flow Rate: 0.5 mL/min    Injection Vol.: 10 uL

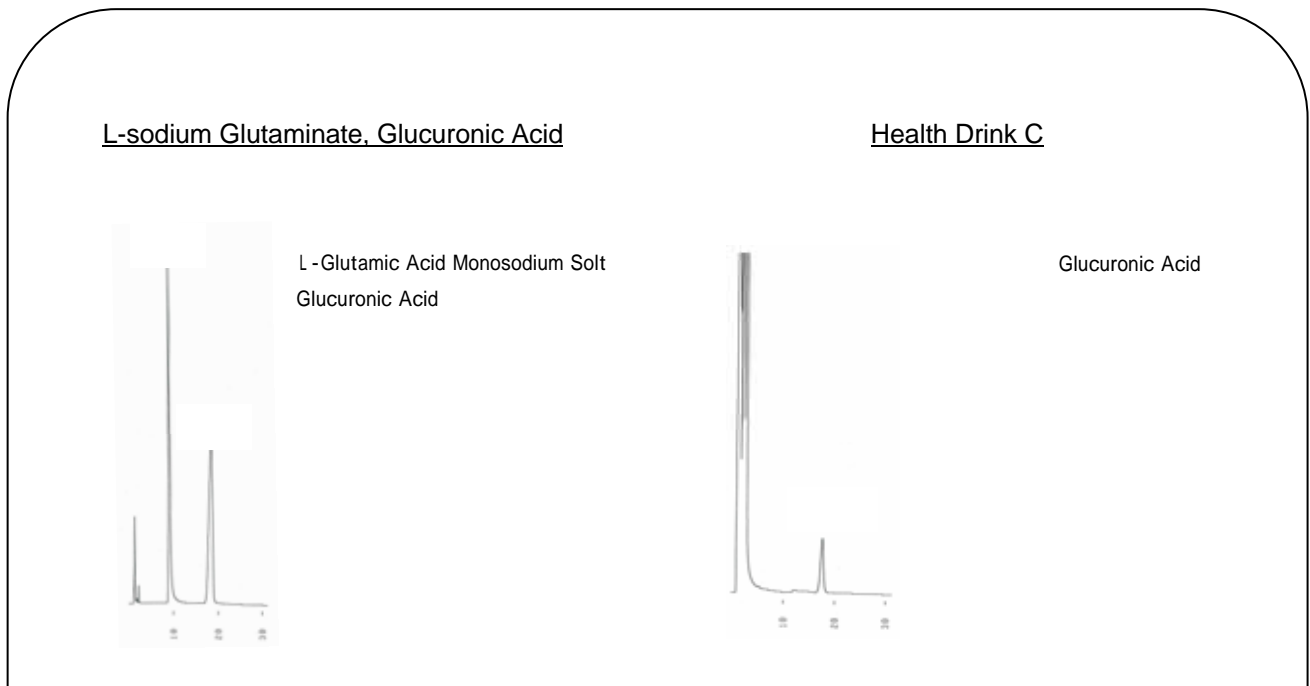
**Inositol in Health Drink**



Column: ULTRON CI  
 Size: 200 mm x 4.6 mm I.D.  
 Mobile Phase: CH<sub>3</sub>CN / H<sub>2</sub>O = 60 / 40

Flow Rate: 1.0 mL/min  
 Temperature: 40  
 Detection: RI

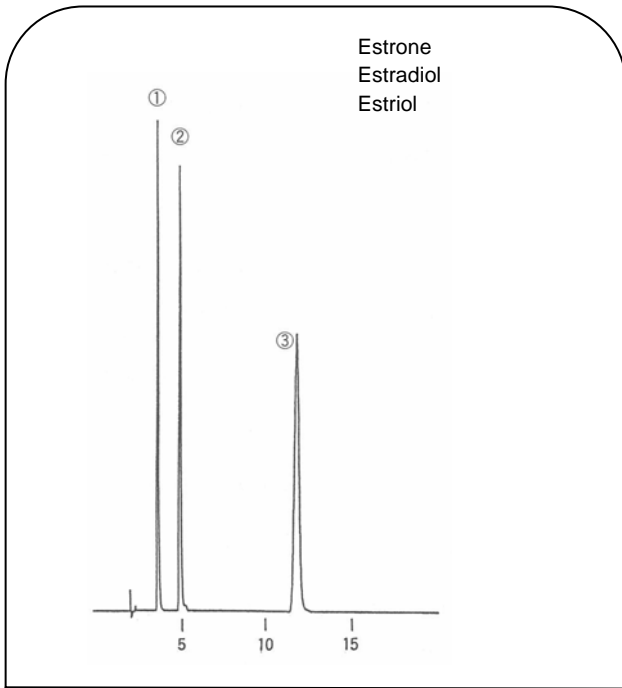
**Glucuronic Acid in Health Drink**



Column: ULTRON CL  
 Size: 150 mm x 4.0 mm I.D.  
 Mobile Phase: 20mM KH<sub>2</sub>PO<sub>4</sub>

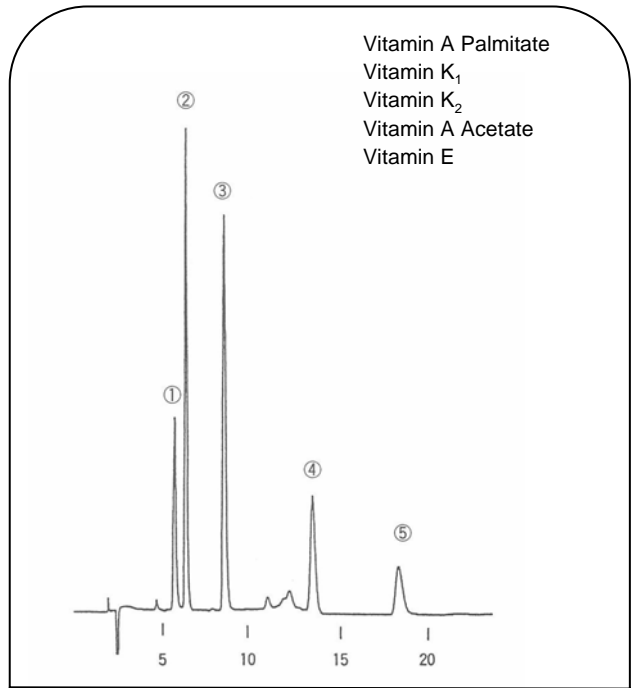
Flow Rate: 0.8 mL/min  
 Temperature: 70  
 Detection: UV-210 nm

**Female Sex Hormone**



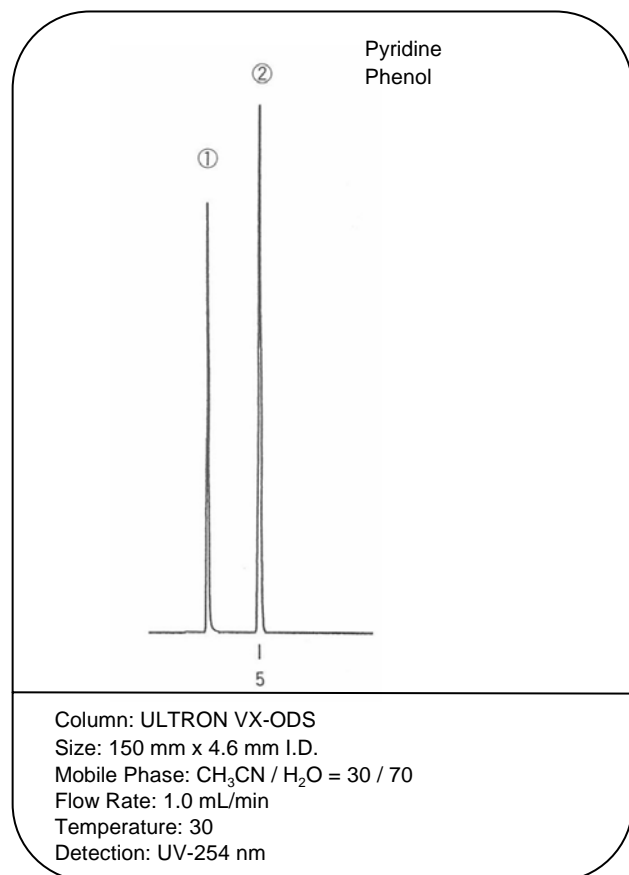
Column: ULTRON VX-SIL  
 Size: 150 mm x 4.6 mm I.D.  
 Mobile Phase: n-Hexane / Ethanol = 90 / 10  
 Flow Rate: 1.0 mL/min  
 Temperature: Ambient  
 Detection: UV-280 nm

**The Fat-soluble Vitamins**

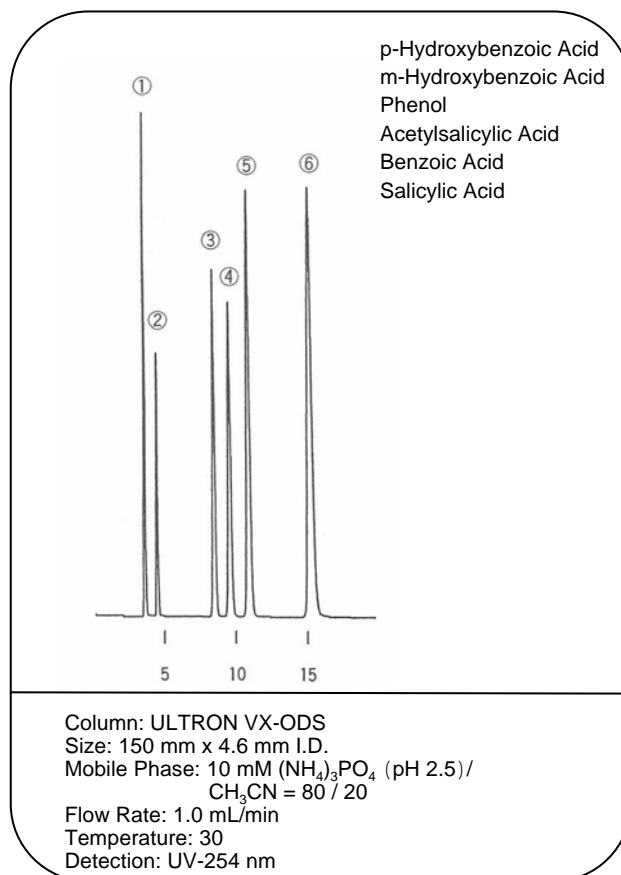


Column: ULTRON VX-SIL  
 Size: 150 mm x 4.6 mm I.D.  
 Mobile Phase: n-Hexane / Dichloromethane = 90 / 10  
 Flow Rate: 1.0 mL/min  
 Temperature: Ambient  
 Detection: UV-254 nm

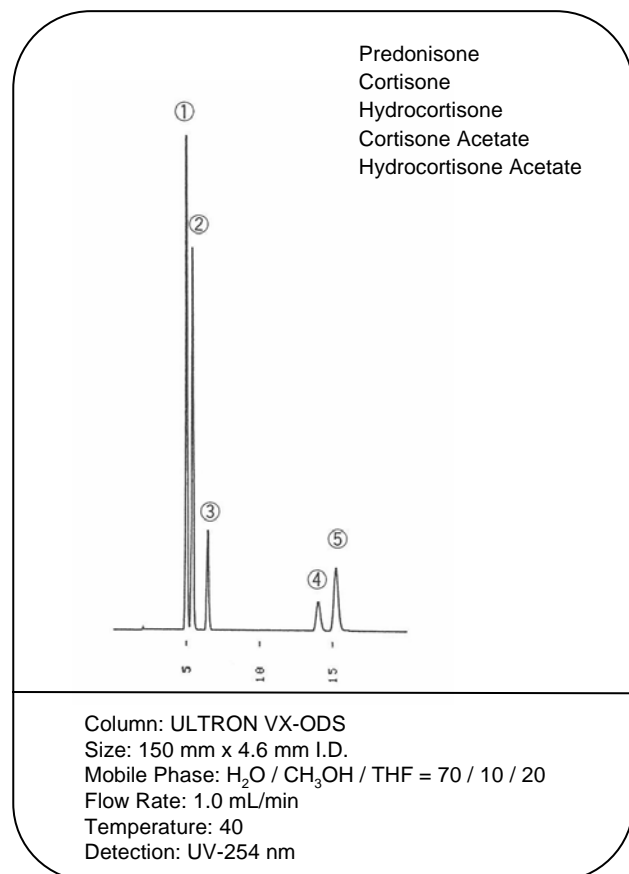
**Pyridine, Phenol Test**



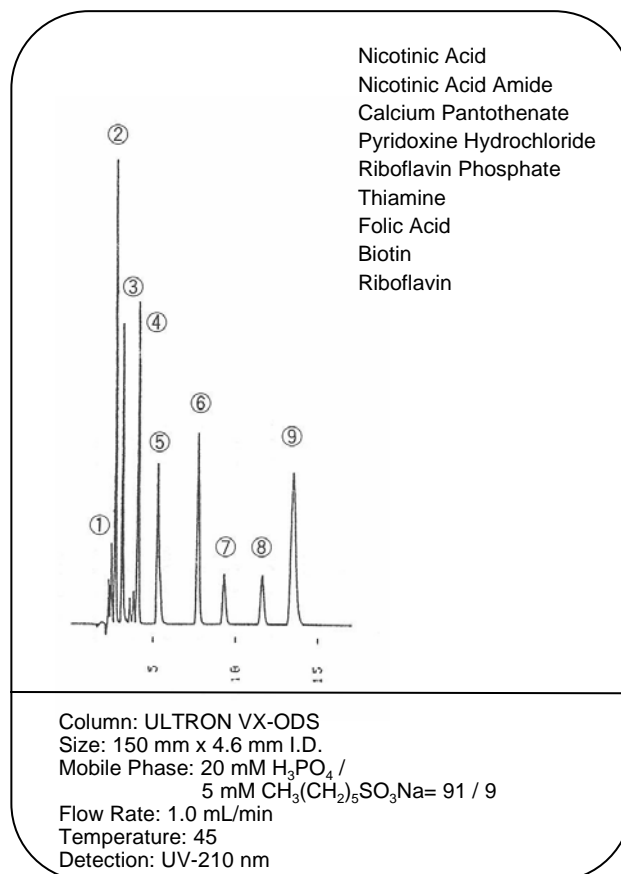
**Acidic Compounds**



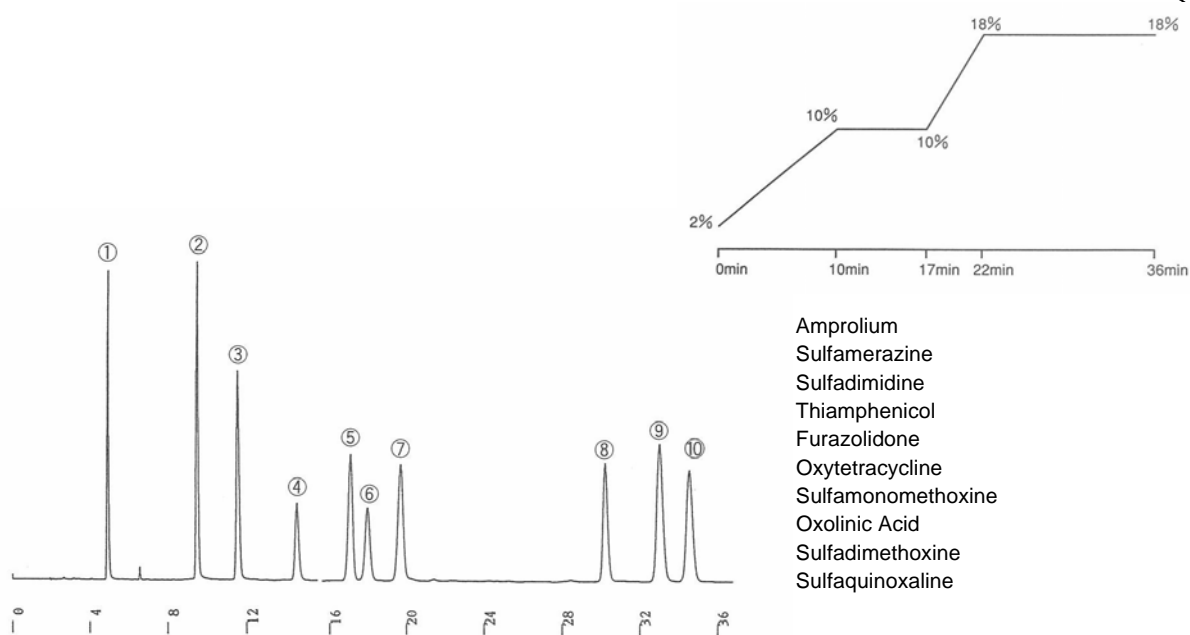
**Separation of The Steroid**



**The Water-soluble Vitamin**

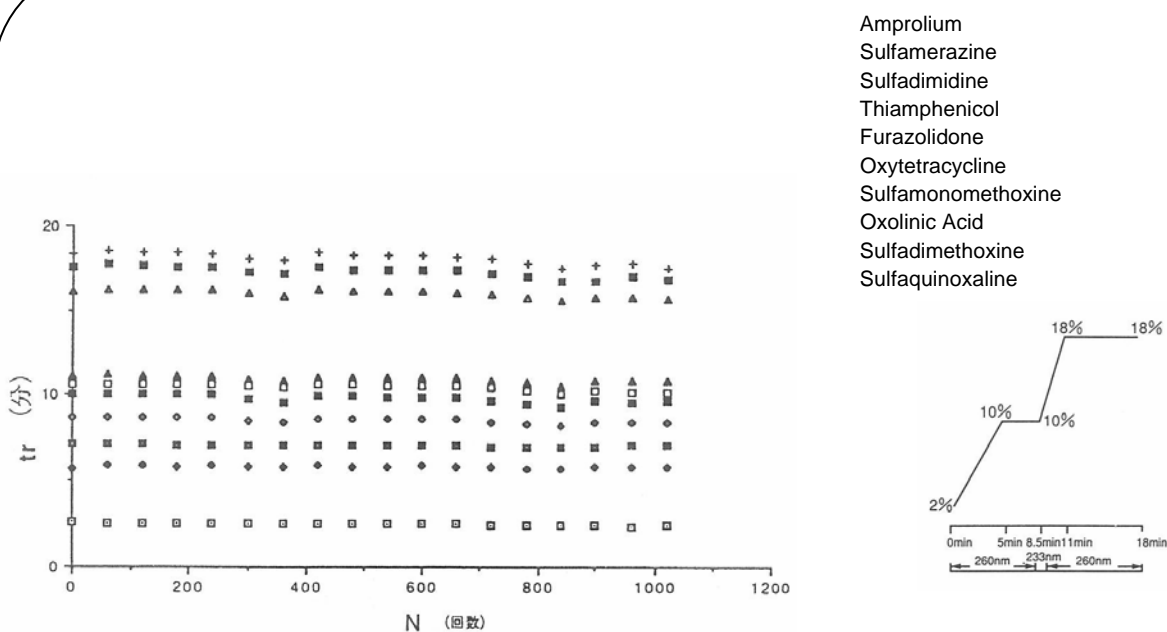


The Synthetic Antibacterial Medicine Simultaneity Analysis



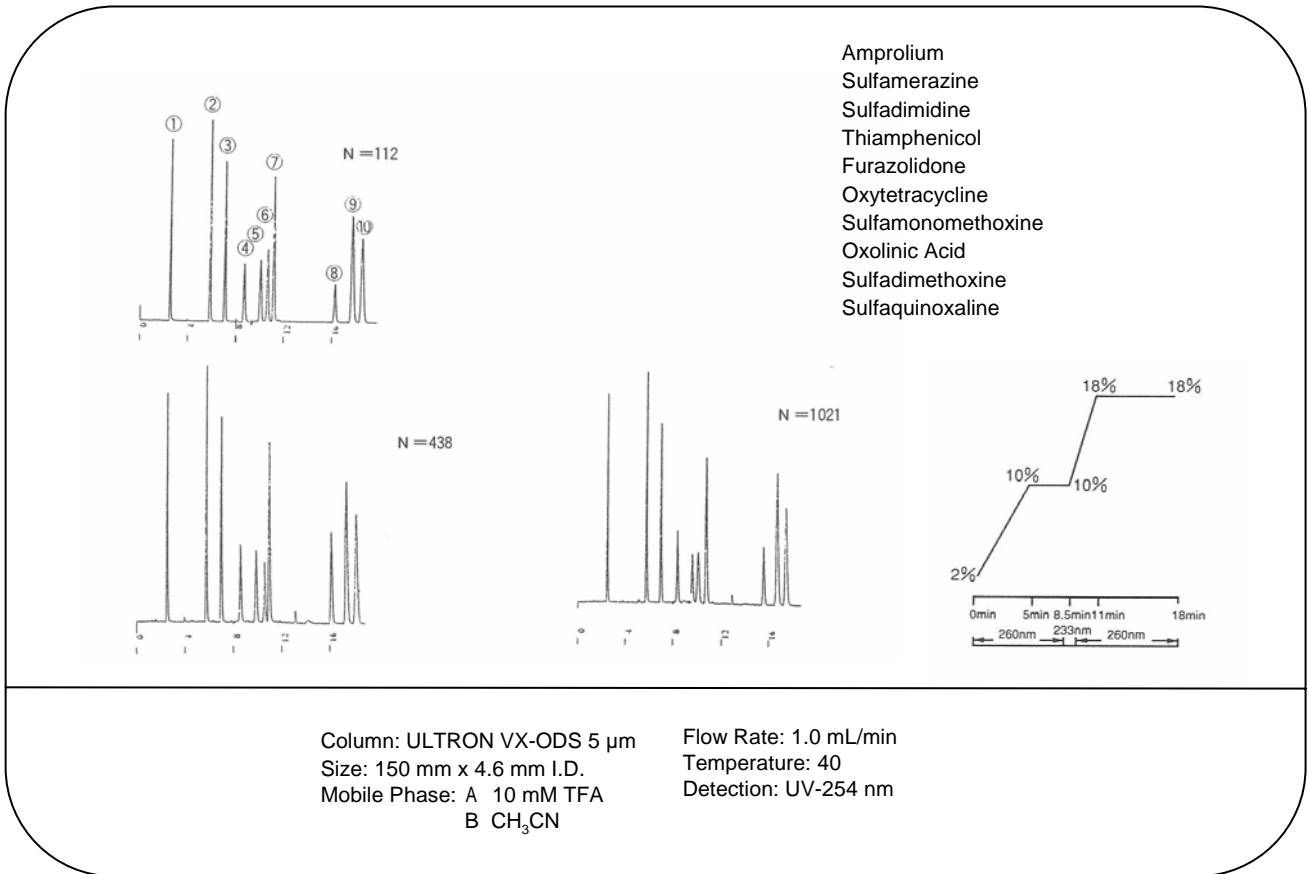
Column: ULTRON VX-ODS 5  $\mu$ m  
 Size: 150 mm x 4.6 mm I.D.  
 Mobile Phase: A 10 mM TFA  
                   B CH<sub>3</sub>CN  
 Flow Rate: 1.0 mL/min  
 Temperature: 40

Synthetic Antibacterial Medicine Repeat Test

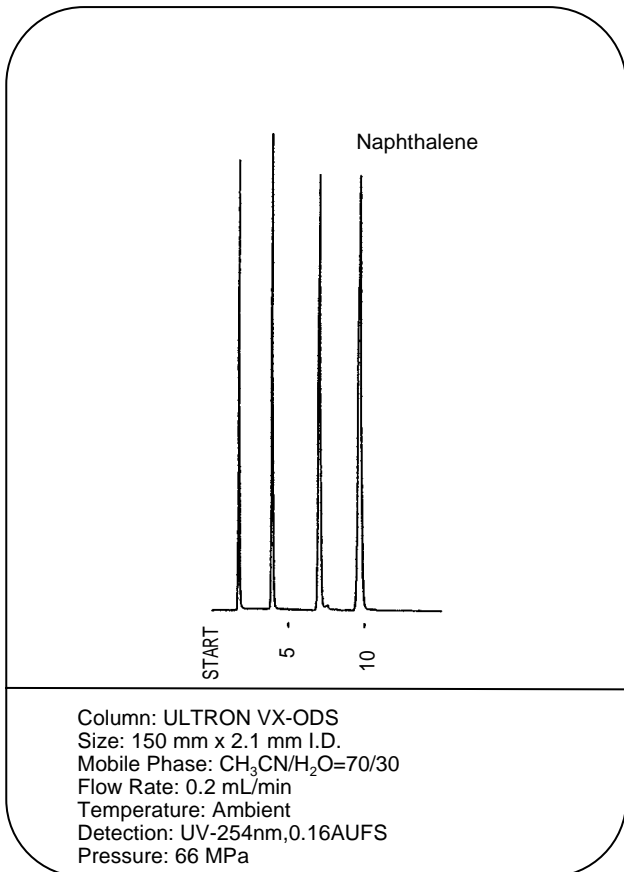


Column: ULTRON VX-ODS 5  $\mu$ m  
 Size: 150 mm x 4.6 mm I.D.  
 Mobile Phase: A 10 mM TFA  
                   B CH<sub>3</sub>CN  
 Flow Rate: 1.0 mL/min  
 Temperature: 40  
 Detection: UV-254 nm

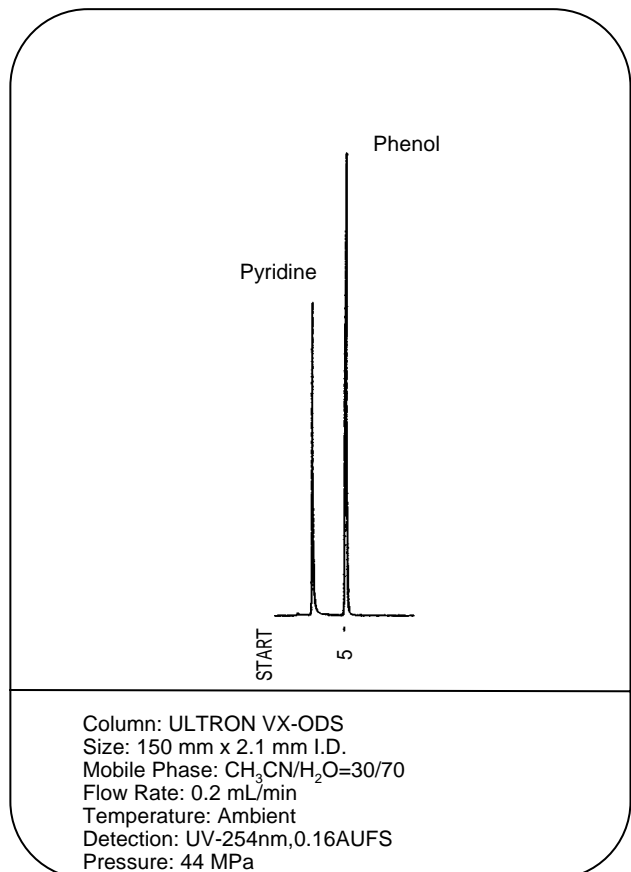
Chromatogram of The Repeat Test



Naphthalene

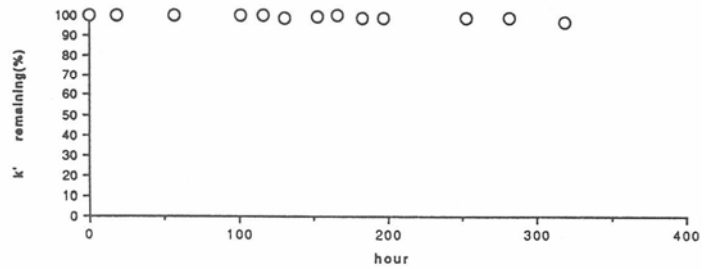
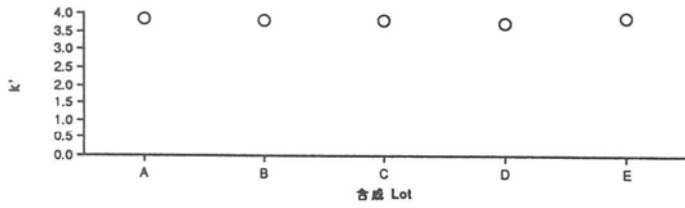


Pyridine, Phenol Test





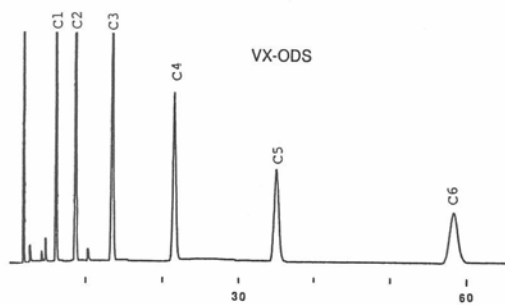
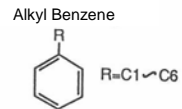
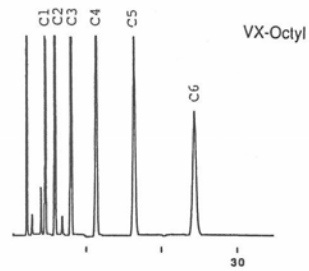
Life Test in Acidic Solution



Reproducibility  
Between Syntheses Lots  
Eluent Condition : 70 % Methanol  
Flow Rate : 1.0 ml/min 40  
Sample : Naphthalene

Life Test in Acidic Solution  
Mobile Phase :60 % Methanol, 0.1 %TFA(pH2.2)

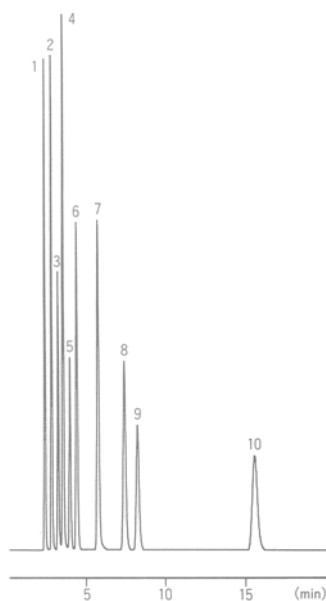
Comparison of Alkylbenzene in VX-Octyl and VX-ODS



Column: ULTRON VX-Octyl 5  $\mu$ m  
Size: 150 mm x 4.6 mm I.D.  
Mobile Phase: CH<sub>3</sub>OH/H<sub>2</sub>O

Flow Rate: 1.0 mL/min  
Temperature: 40  
Detection: UV-254 nm

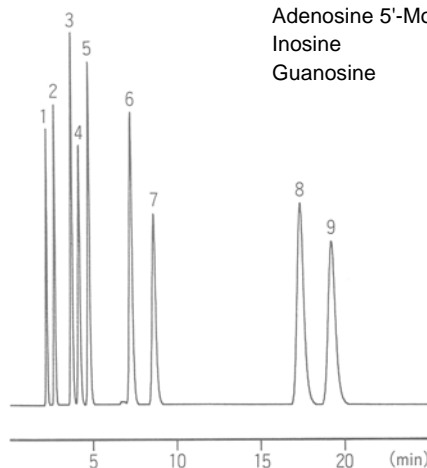
## Nucleic Acid Base, Nucleoside



Cytosine  
Uracil  
Guanine  
Adenine  
Cytidine  
Uridine  
Thymine  
Adenosine  
Guanosine  
Thymidine

Column: STR ODS-  
Size: 150 mm x 4.6 mm I.D.  
Mobile Phase: 0.1 M-Phosphate Buffer (pH2.1)  
0.2 M NaClO<sub>4</sub>  
Flow Rate: 1.0 mL/min  
Temperature: 50  
Detection: UV-260 nm (0.32 AUFS)

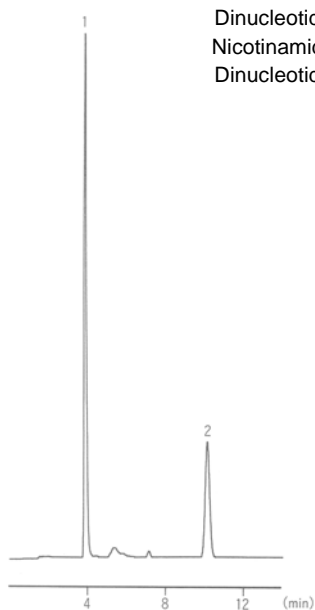
## Nucleoside, Nucleotide



Cytidine 5'-Monophosphate  
Uridine 5'-Monophosphate  
Guanosine 5'-Monophosphate  
Adenosine 5'-Triphosphate  
Cytidine  
Uridine  
Adenosine 5'-Monophosphate  
Inosine  
Guanosine

Column: STR ODS-  
Size: 150 mm x 4.6 mm I.D.  
Mobile Phase: 0.1 M KH<sub>2</sub>PO<sub>4</sub> (pH5.8)  
0.2 mM Na<sub>2</sub>SO<sub>4</sub>  
Flow Rate: 1.0 mL/min  
Temperature: Ambient  
Detection: UV-254 nm (0.32 AUFS)

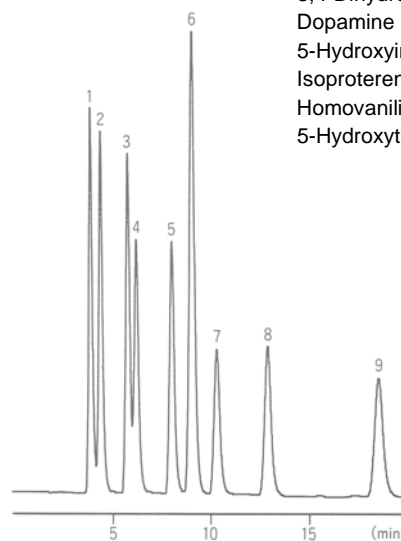
## NAD, NADH



Nicotinamide Adenine  
Dinucleotide Oxidized  
Nicotinamide Adenine  
Dinucleotide Reduced

Column: STR ODS-  
Size: 150 mm x 4.6 mm I.D.  
Mobile Phase: 10 mM NH<sub>4</sub>H<sub>2</sub>PO<sub>4</sub> (pH 2.6)  
Flow Rate: 1.0 mL/min  
Temperature: 40  
Detection: UV-260 nm (0.04 AUFS)

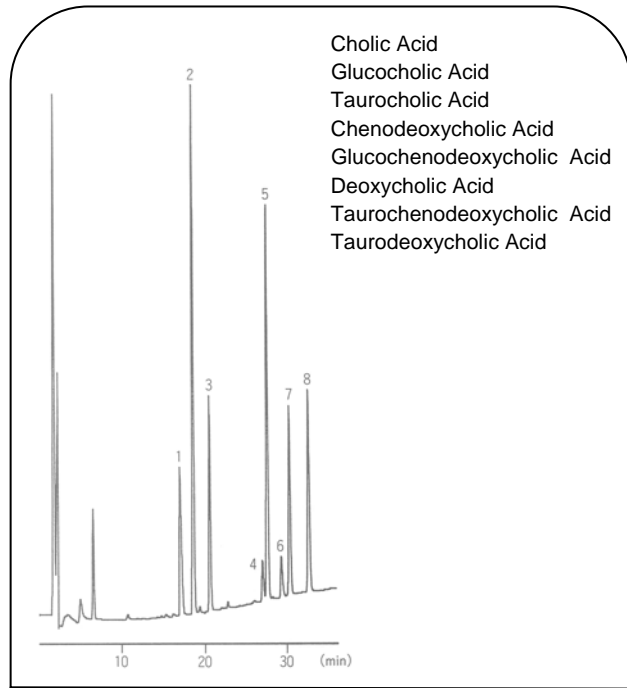
## Catecholamine



Norepinephrine  
Epinephrine  
Normetanephrine  
3,4-Dihydroxyphenylacetic Acid  
Dopamine  
5-Hydroxyindole-3-acetic Acid  
Isoproterenol  
Homovanillic Acid  
5-Hydroxytryptamine

Column: STR ODS-  
Size: 150 mm x 4.6 mm I.D.  
Mobile Phase: 0.1M Citric Acid, 0.1M Sodium Acetate(pH4)  
/ 17% CH<sub>3</sub>OH 1-Octane Sodium Sulphonate  
160mg/L EDTA 5mg/L  
Flow Rate: 1.0 mL/min  
Temperature: 25  
Detection: ECD, 800 mV, 10 nA

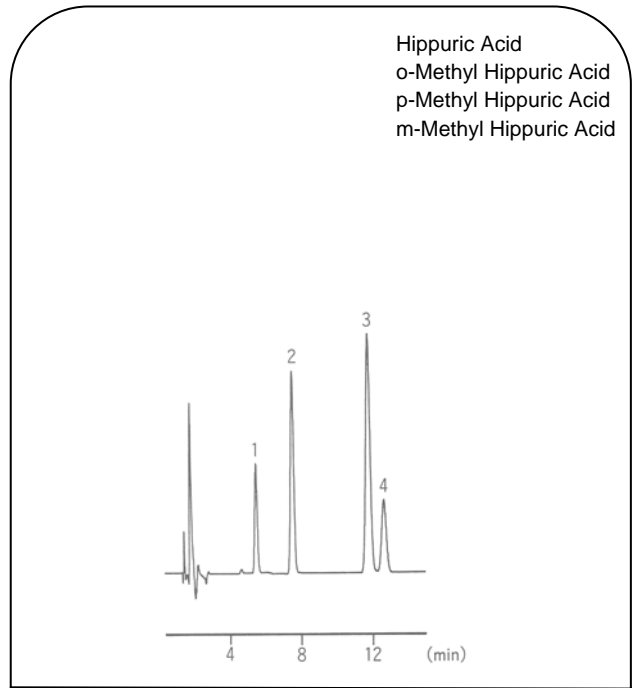
**Bile Acid**



- Cholic Acid
- Glucocholic Acid
- Taurocholic Acid
- Chenodeoxycholic Acid
- Glucochenodeoxycholic Acid
- Deoxycholic Acid
- Taurochenodeoxycholic Acid
- Taurodeoxycholic Acid

Column: STR ODS-  
 Size: 150 mm x 4.6 mm I.D.  
 Mobile Phase: CH<sub>3</sub>CN/30 mM (NH<sub>4</sub>)<sub>2</sub>HPO<sub>4</sub>  
 (pH 7.2 NH<sub>4</sub>H<sub>2</sub>PO<sub>4</sub>) A = 10/90, B = 50/50  
 30 % B 85 % B (55 min)  
 Flow Rate: 1.0 mL/min  
 Temperature: 40  
 Detection: UV-217 nm (0.02 AUFS)

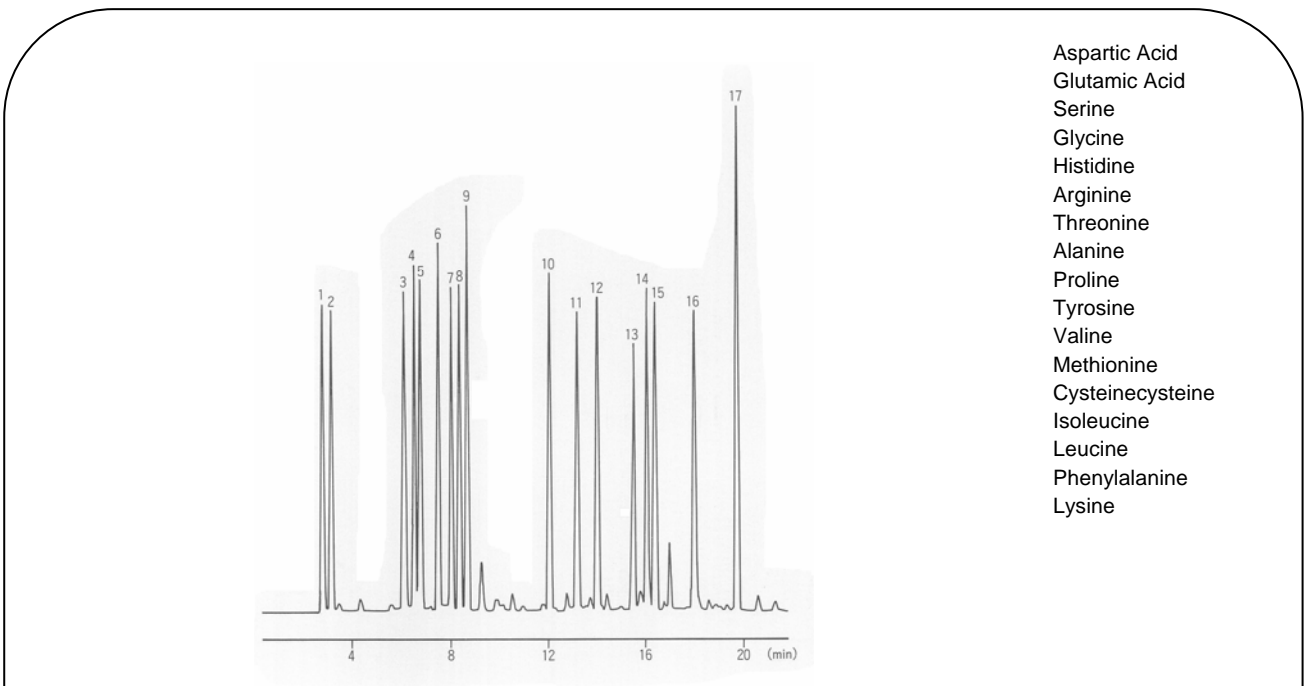
**Hippuric Acid**



- Hippuric Acid
- o-Methyl Hippuric Acid
- p-Methyl Hippuric Acid
- m-Methyl Hippuric Acid

Column: STR ODS-  
 Size: 150 mm x 4.6 mm I.D.  
 Mobile Phase: 20 mM-Phosphate Buffer (pH2.5)  
 10 mM -Cyclodextrin  
 CH<sub>3</sub>CN } 8  
 1  
 Flow Rate: 1.0 mL/min  
 Temperature: 50  
 Detection: UV-260 nm (0.02 AUFS)

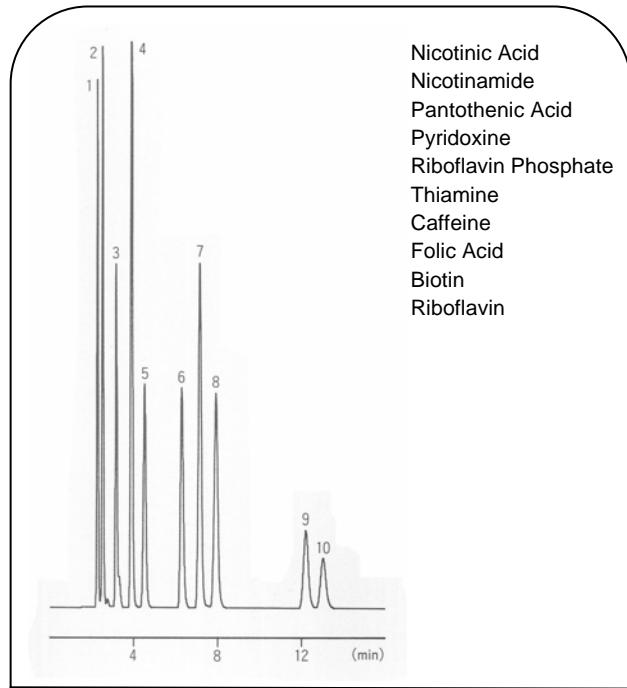
**Analysis of The PTC Amino Acid**



- Aspartic Acid
- Glutamic Acid
- Serine
- Glycine
- Histidine
- Arginine
- Threonine
- Alanine
- Proline
- Tyrosine
- Valine
- Methionine
- Cysteinecysteine
- Isoleucine
- Leucine
- Phenylalanine
- Lysine

Column: STR ODS-  
 Size: 150 mm x 4.6 mm I.D.  
 Mobile Phase: A: Sodium Acetate (pH 6.5) / CH<sub>3</sub>CN (93:7)  
 B: CH<sub>3</sub>CN / H<sub>2</sub>O (4:1)  
 0 % B 34 % B (18 min)  
 100 % B (18.01 min) 100 % B (23 min)  
 Flow Rate: 1.0 mL/min  
 Temperature: 40  
 Detection: UV-254 nm (0.04 AUFS)

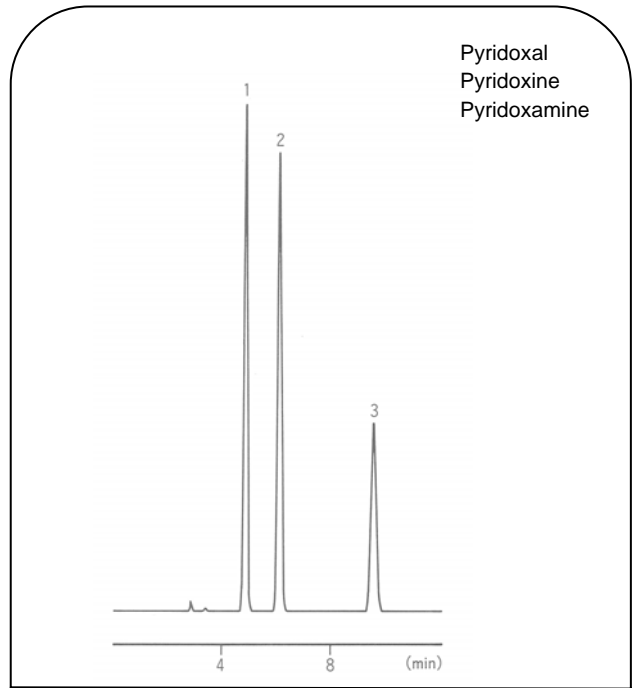
The Water-soluble Vitamin



- Nicotinic Acid
- Nicotinamide
- Pantothenic Acid
- Pyridoxine
- Riboflavin Phosphate
- Thiamine
- Caffeine
- Folic Acid
- Biotin
- Riboflavin

Column: STR ODS-  
 Size: 150 mm x 4.6 mm I.D.  
 Mobile Phase: 100 mM-Phosphate Buffer (pH2.1)  
 0.8 mM Octane Sodium Sulphonate } 9  
 CH<sub>3</sub>CN } 1  
 Flow Rate: 1.0 mL/min  
 Temperature: 40  
 Detection: UV-210 nm (0.16 AUFS)

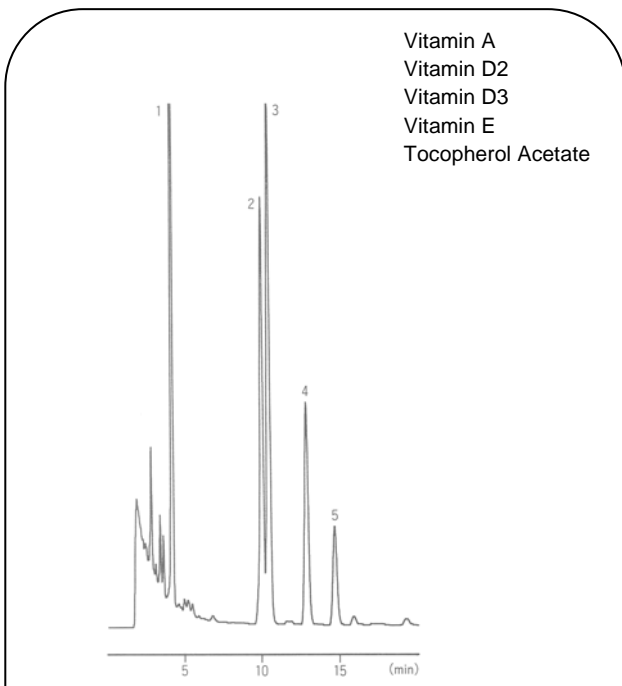
The Water-soluble Vitamin



- Pyridoxal
- Pyridoxine
- Pyridoxamine

Column: STR ODS-  
 Size: 150 mm x 4.6 mm I.D.  
 Mobile Phase: 100 mM-Phosphate Buffer (pH2.1)  
 50 mM Hexane Sodium Sulphonate } 9  
 CH<sub>3</sub>CN } 1  
 Flow Rate: 1.0 mL/min  
 Temperature: 45  
 Detection: UV-210 nm (0.04 AUFS)

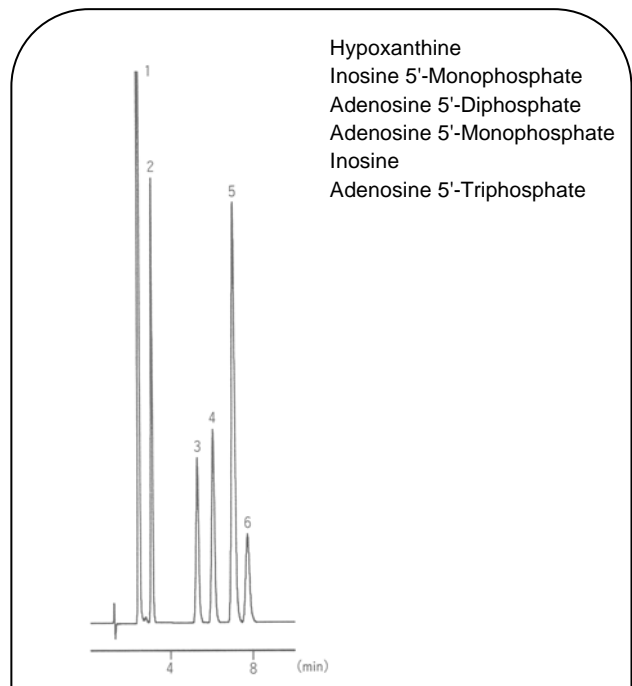
Fat-soluble Vitamin



- Vitamin A
- Vitamin D2
- Vitamin D3
- Vitamin E
- Tocopherol Acetate

Column: STR ODS-  
 Size: 150 mm x 4.6 mm I.D.  
 Mobile Phase: 100 % CH<sub>3</sub>CN  
 Flow Rate: 1.0 mL/min  
 Temperature: 40  
 Detection: UV-280 nm (0.08 AUFS)

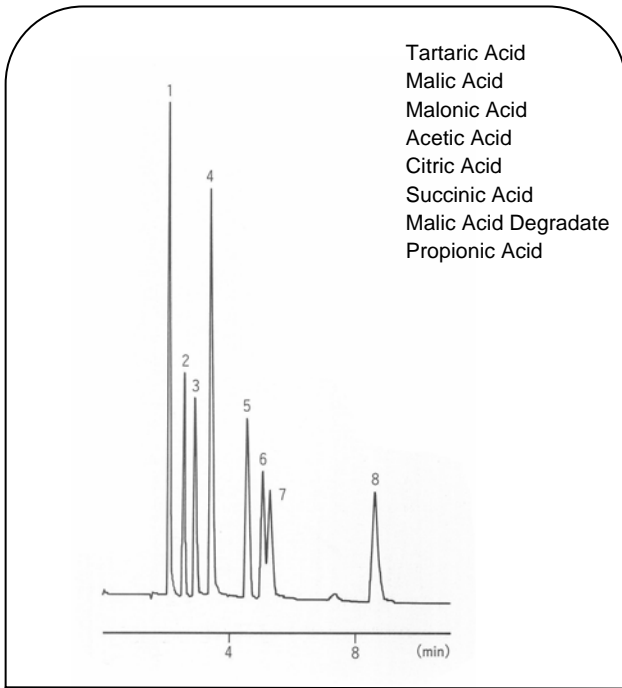
The Freshness K Value



- Hypoxanthine
- Inosine 5'-Monophosphate
- Adenosine 5'-Diphosphate
- Adenosine 5'-Monophosphate
- Inosine
- Adenosine 5'-Triphosphate

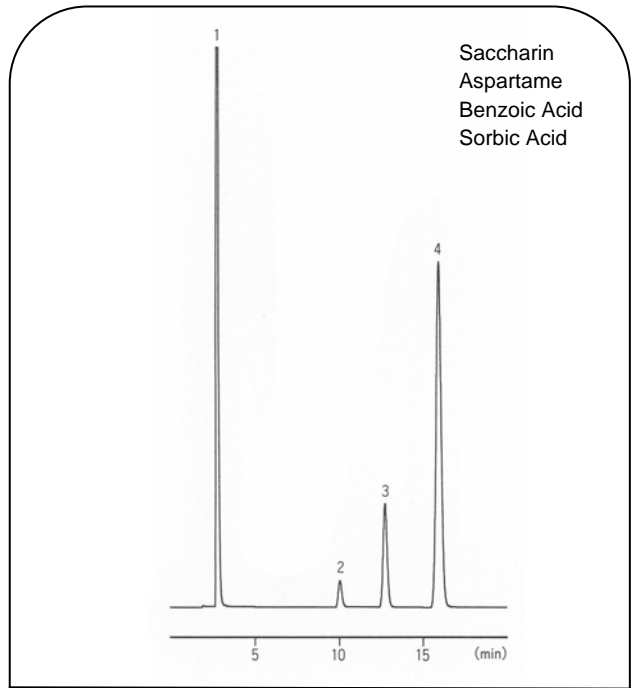
Column: STR ODS-  
 Size: 150 mm x 4.6 mm I.D.  
 Mobile Phase: 24mM 2-Diethylaminoethanol is contained  
 16mM Citric Acid Aqueous Solution  
 Flow Rate: 2.0 mL/min  
 Temperature: 40  
 Detection: UV-250 nm (0.04 AUFS)

**Organic Acids**



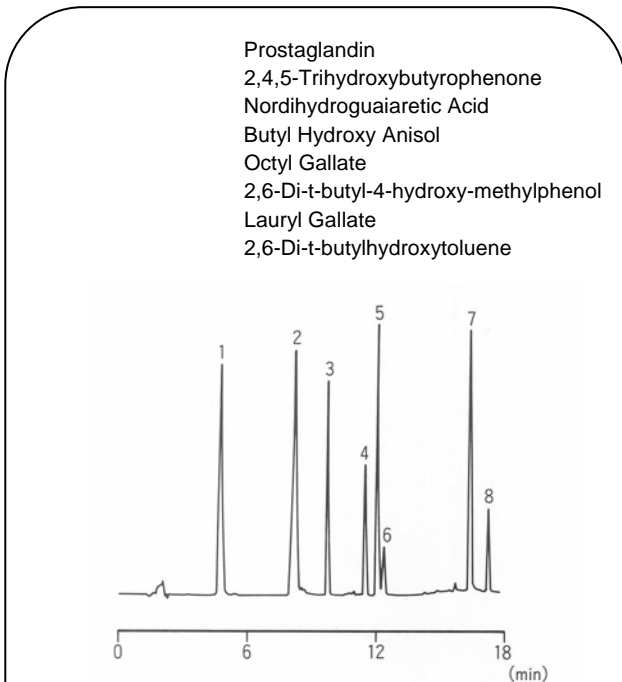
Column: STR ODS-  
Size: 150 mm x 4.6 mm I.D.  
Mobile Phase: 5mM NH<sub>4</sub>H<sub>2</sub>PO<sub>4</sub> (pH 2.4)  
Flow Rate: 1.0 mL/min  
Temperature: 40  
Detection: UV-210 nm (0.08 AUFS)

**Saccharin, Aspartame, Benzoic Acid, Sorbic Acid**



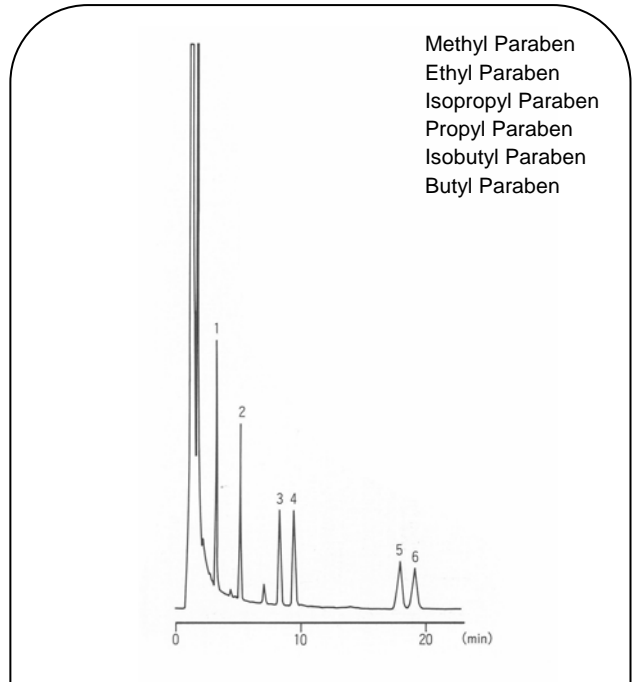
Column: STR ODS-  
Size: 150 mm x 4.6 mm I.D.  
Mobile Phase: 40 mM Acetate Buffer (pH4.0) 3  
CH<sub>3</sub>OH 1  
Flow Rate: 1.0 mL/min  
Temperature: 40  
Detection: UV-250 nm (0.16 AUFS)

**The Phenolic System Antioxidant  
(It is added to the edible oil of the marketing.)**



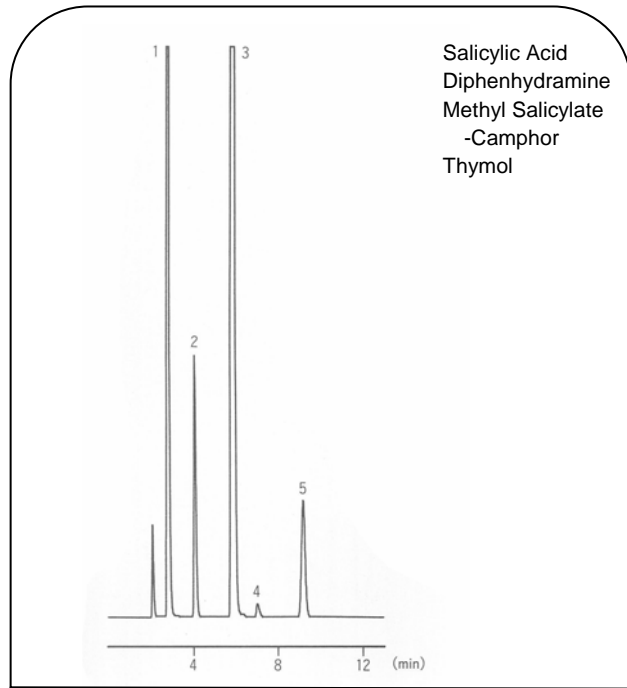
Column: STR ODS-  
Size: 150 mm x 4.6 mm I.D.  
Mobile Phase: A: 10 mM-Phosphate Buffer (pH2.6)  
B: CH<sub>3</sub>CN  
30 % B (4 min) 63 % B (4.01 min)  
63 % B (10 min) 90 % (10.01 min)  
90 % B (16 min) 30 % B (16.01 min)  
30 % B (25 min)  
Flow Rate: 1.0 mL/min  
Temperature: 40  
Detection: SPD-10A, 280 nm 2AU/V, AT = 7

**Paraben  
(It is added to the soy sauce of the marketing.)**



Column: STR ODS-  
Size: 150 mm x 4.6 mm I.D.  
Mobile Phase: 10 mM-Phosphate Buffer (pH2.6)  
CH<sub>3</sub>OH  
Flow Rate: 1.5 mL/min  
Temperature: 40  
Detection: SPD-10A, 270 nm 2AU/V, AT = 6

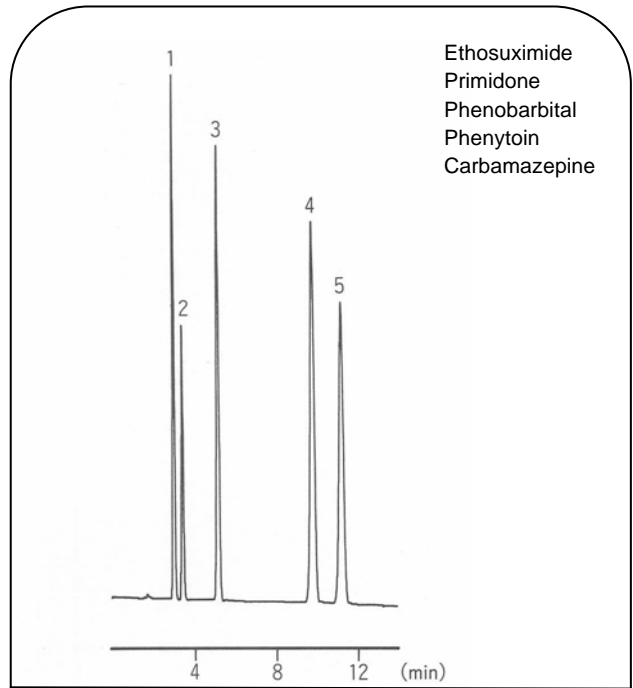
**The Component of The Anti-inflammatory Agent**



Salicylic Acid  
Diphenhydramine  
Methyl Salicylate  
-Camphor  
Thymol

Column: STR ODS-  
Size: 150 mm x 4.6 mm I.D.  
Mobile Phase: 10 mM-Phosphate Buffer (pH2.6)  
20 mM Heptane Sodium Sulphonate } 3  
CH<sub>3</sub>OH } 2  
CH<sub>3</sub>CN } 2  
Flow Rate: 1.0 mL/min  
Temperature: 45  
Detection: UV-210 nm (0.08 AUFS)

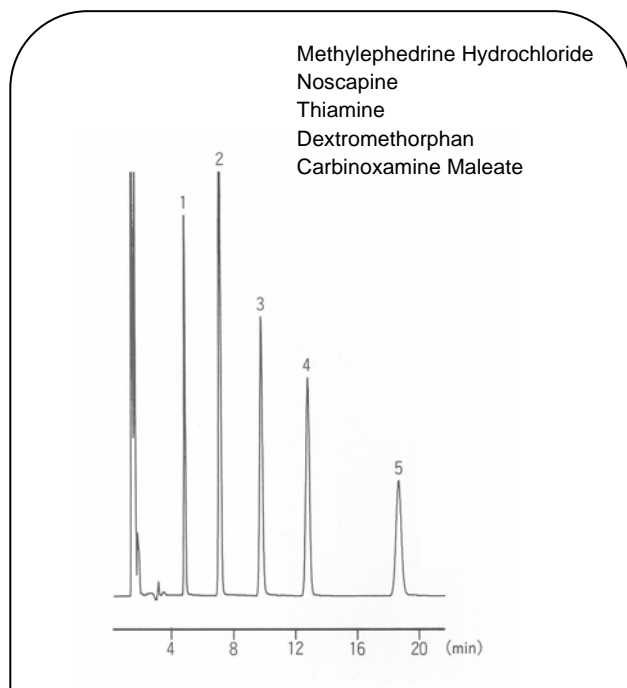
**Anticonvulsant Analysis**



Ethosuximide  
Primidone  
Phenobarbital  
Phenytoin  
Carbamazepine

Column: STR ODS-  
Size: 150 mm x 4.6 mm I.D.  
Mobile Phase: 100 mM Phosphoric Acid Buffer (pH4.0)  
/ CH<sub>3</sub>OH / CH<sub>3</sub>CN (4 / 2 / 1)  
Flow Rate: 1.0 mL/min  
Temperature: 40  
Detection: UV-250 nm (0.16 AUFS)

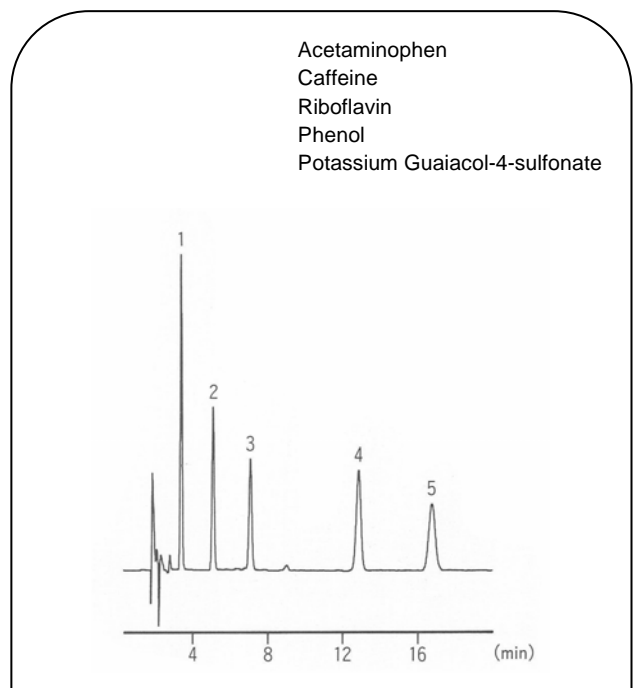
**The Component of The Cold Remedy**



Methylephedrine Hydrochloride  
Noscapine  
Thiamine  
Dextromethorphan  
Carbinoxamine Maleate

Column: STR ODS-  
Size: 150 mm x 4.6 mm I.D.  
Mobile Phase: CH<sub>3</sub>CN } 510  
H<sub>2</sub>O } 490  
H<sub>3</sub>PO<sub>4</sub> } 1  
0.5 % Sodium Dodecyl Sulfate  
Flow Rate: 1.0 mL/min  
Temperature: 50  
Detection: UV-210 nm (0.04 AUFS)

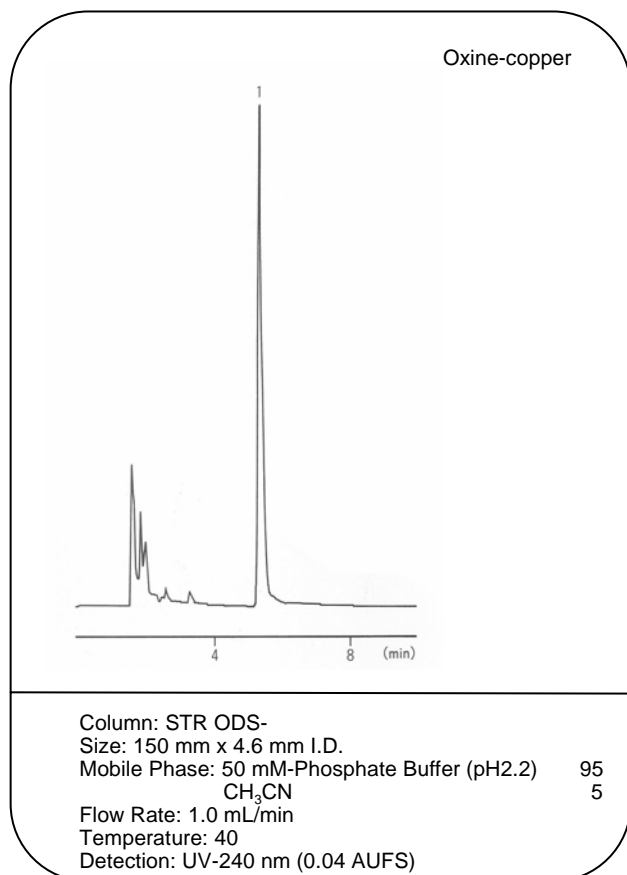
**The Component of The Cold Remedy**



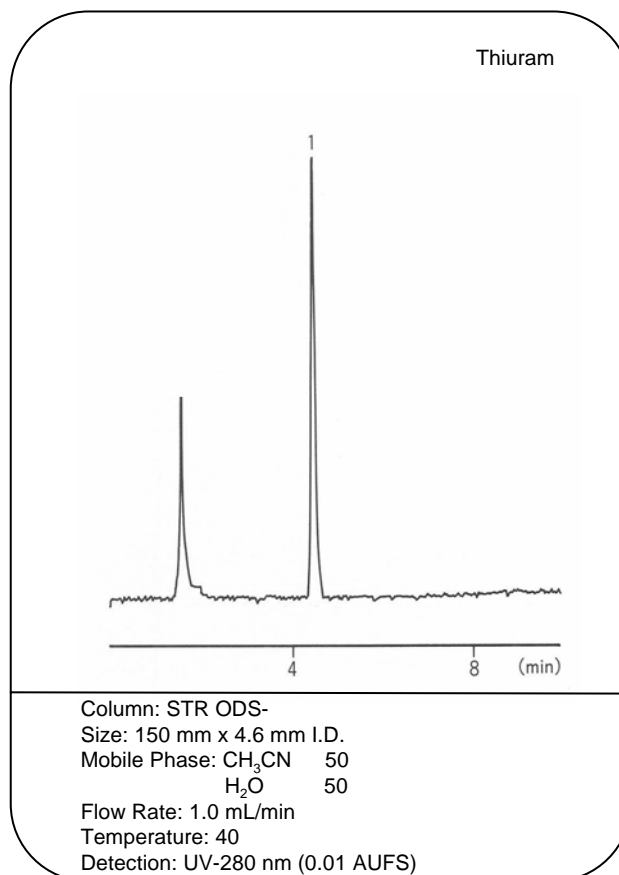
Acetaminophen  
Caffeine  
Riboflavin  
Phenol  
Potassium Guaiacol-4-sulfonate

Column: STR ODS-  
Size: 150 mm x 4.6 mm I.D.  
Mobile Phase: H<sub>2</sub>O } 15  
CH<sub>3</sub>CN } 2  
50 mM Tetrabutylammonium } 1  
(It is adjusted at pH=6 in The Phosphoric Acid)  
Flow Rate: 1.0 mL/min  
Temperature: 50  
Detection: UV-280 nm (0.01 AUFS)

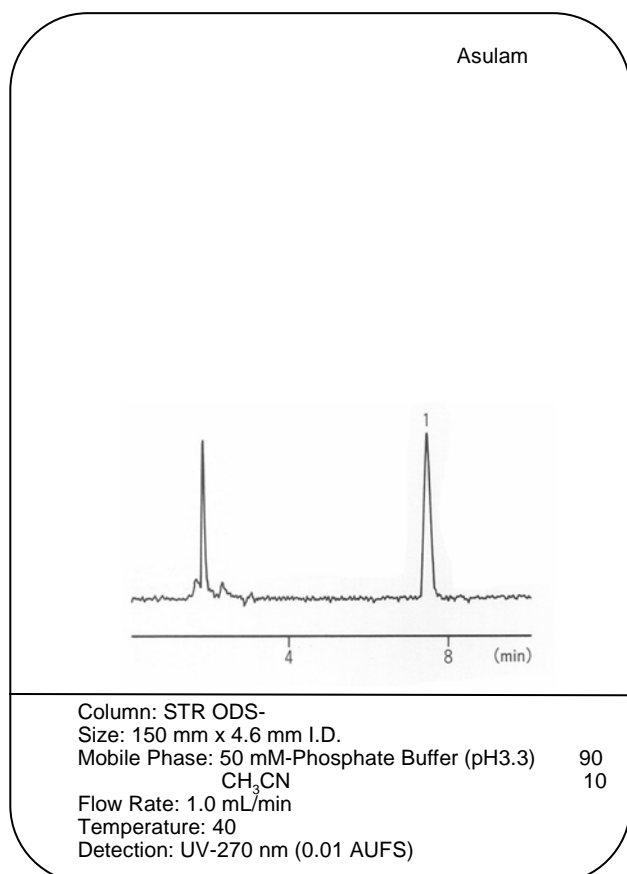
## Oxine Copper



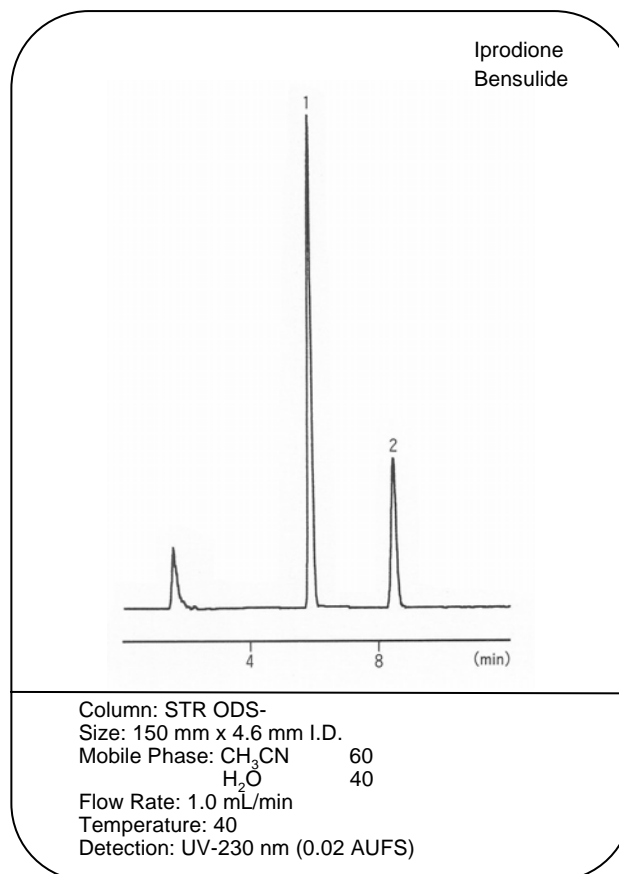
## Thiuram



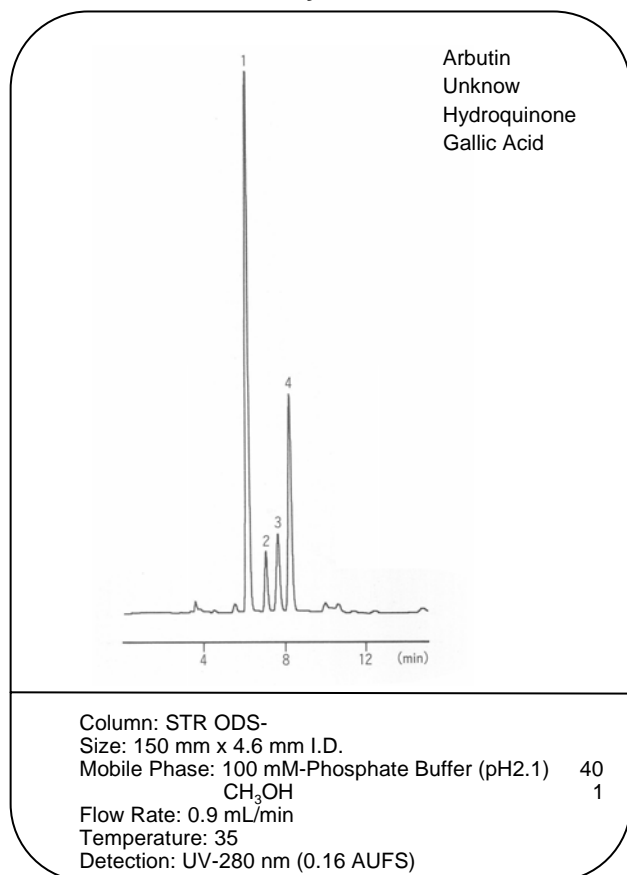
## Asulam



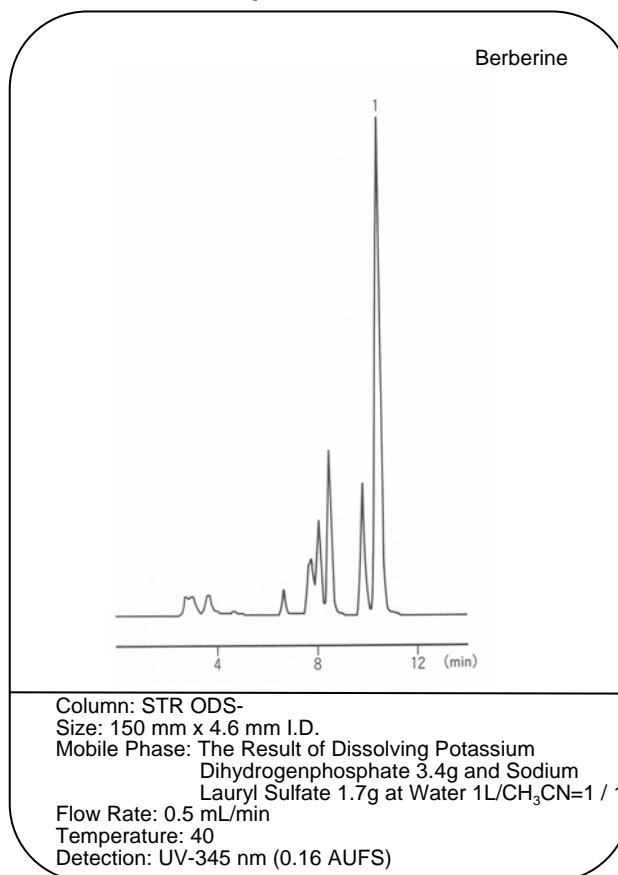
## Iprodione, Bensulide



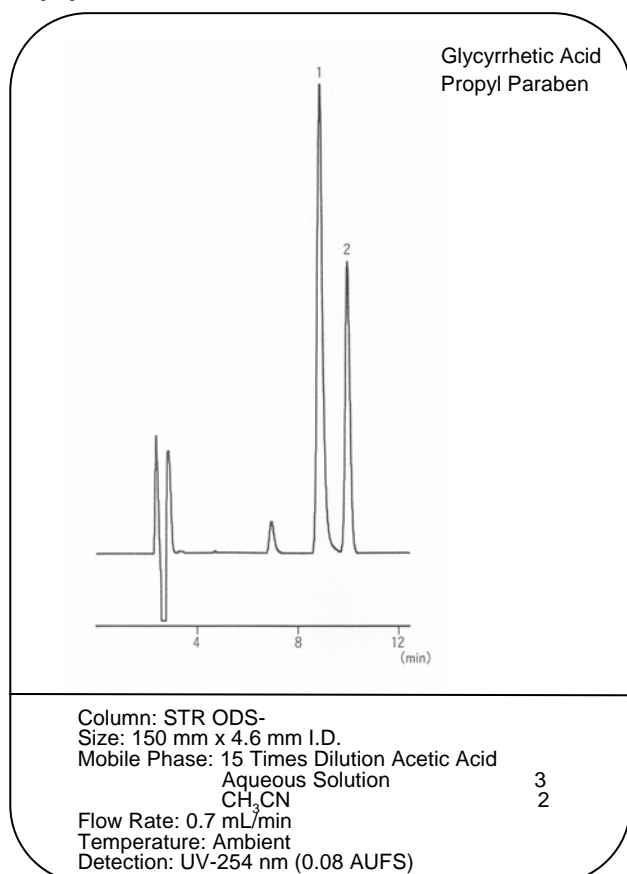
## Arbutin in The Bearberry Leaf End



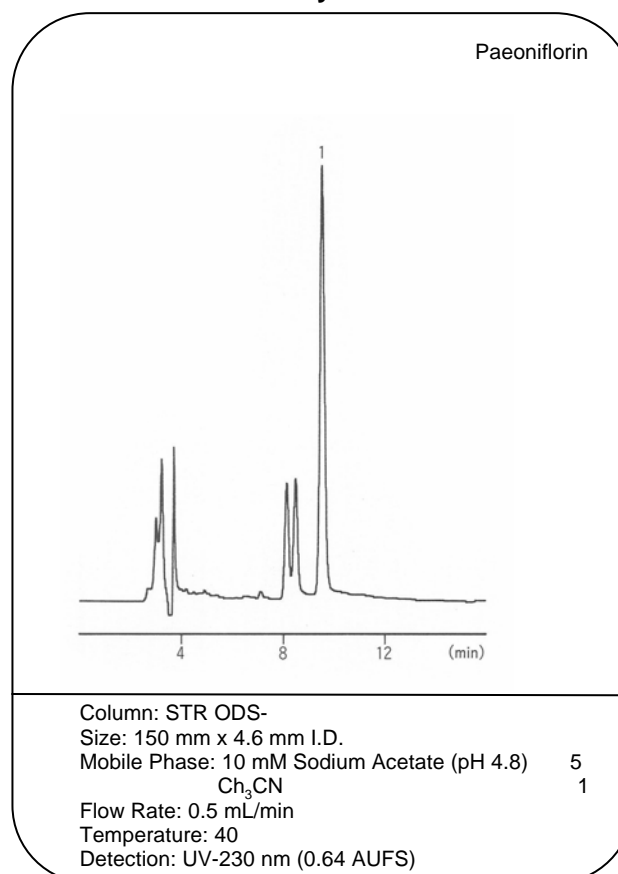
## Berberine in The Coptis End



## Glycyrrhizin in The Licorice End

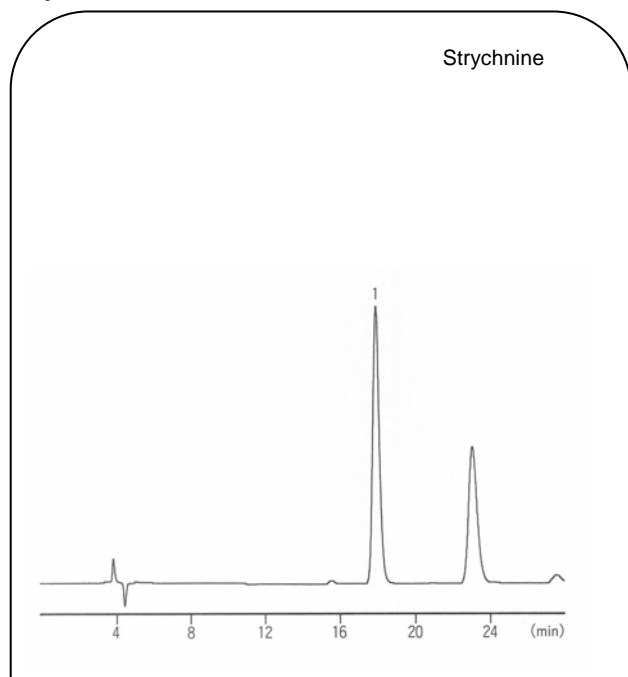


## Paeoniflorin in The Peony End



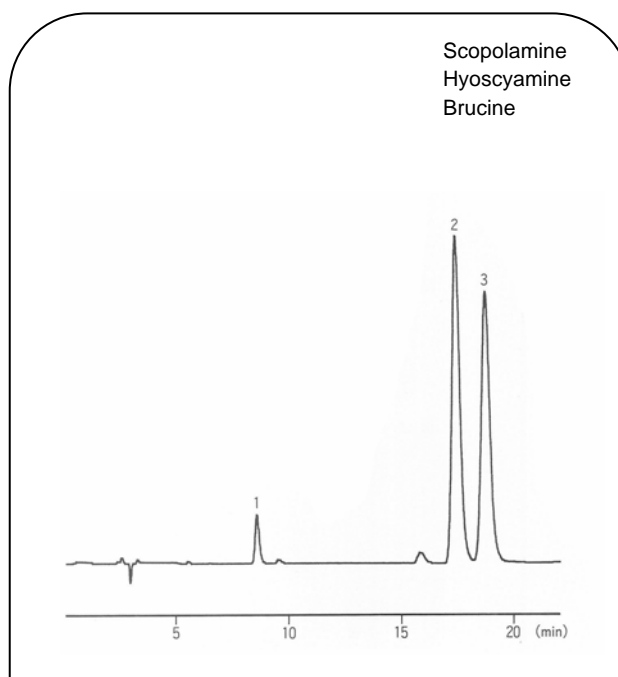


## Strychnine in Nux Vomica



Column: STR ODS-  
 Size: 150 mm x 4.6 mm I.D.  
 Mobile Phase: (The Result of Dissolving Potassium Dihydrogenphosphate 6.8g in Water 1000mL) / Acetonitrile/Triethylamine=45/5/1 The Result of Adjusting at pH=3 in The Phosphoric Acid  
 Flow Rate: 0.5 mL/min  
 Temperature: 40  
 Detection: UV-210 nm (0.16 AUFS)

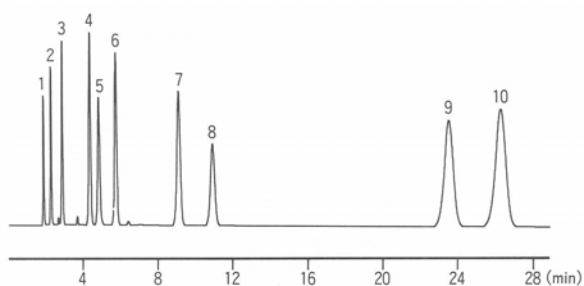
## Scopolamine and Hyoscyamus Niger Thiamine in The Rohto Extract



Column: STR ODS-  
 Size: 150 mm x 4.6 mm I.D.  
 Mobile Phase: The Liquid by Adding Water after It Dissolved Potassium Dihydrogenphosphate 6.8g at Water 900 mL and Added Triethylamine 10 mL, and after It Adjusted It in The Phosphoric Acid in pH3.5 as 1000mL/CH<sub>3</sub>CN=9/1  
 Flow Rate: 0.8 mL/min  
 Temperature: Ambient  
 Detection: UV-210 nm (0.16 AUFS)

**Nucleoside, Nucleotide**

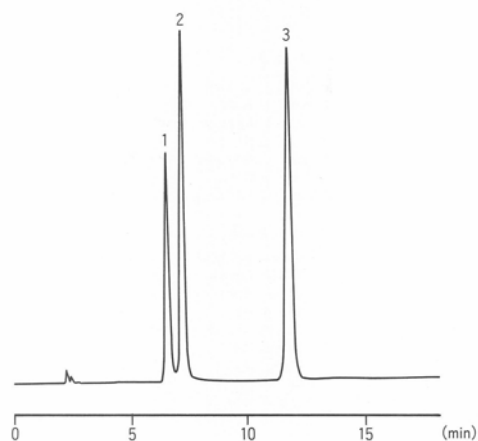
Cytidine 5 -Diphosphate  
 Cytidine 5 -Monophosphate  
 Uridine 5 -Monophosphate  
 Guanosine 5 -Monophosphate  
 Adenosine 5 -Triphosphate  
 Gytidine  
 Uridine  
 Adenosine 5 -Monophosphate  
 Inosine  
 Guanosine



Column: STR ODS-M  
 Size: 150 mm x 4.6 mm I.D.  
 Mobile Phase: 0.1 M  $\text{KH}_2\text{PO}_4$ , 20 mM  $\text{Na}_2\text{SO}_4$  (pH 5.8)  
 Flow Rate: 1.0 mL/min  
 Temperature: 30  
 Detection: UV-254 nm

**AMP, ADP, ATP**

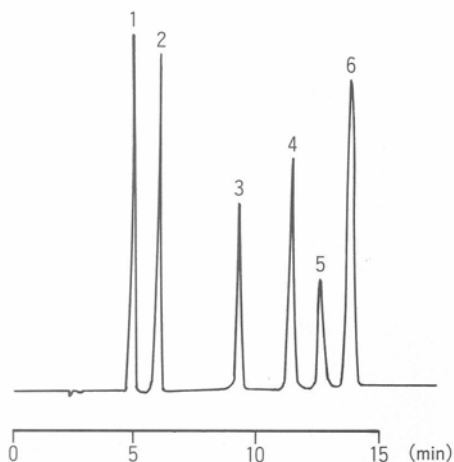
Adenosine 5 -Monophosphate  
 Adenosine 5 -Diphosphate  
 Adenosine 5 -Triphosphate



Column: STR ODS-M  
 Size: 150 mm x 4.6 mm I.D.  
 Mobile Phase: 30 mM 2-Diethylaminoethanol is contained  
 20 mM Citric Acid Aqueous Solution  
 Flow Rate: 0.8 mL/min  
 Temperature: 40  
 Detection: UV-260 nm

**The Freshness K Value**

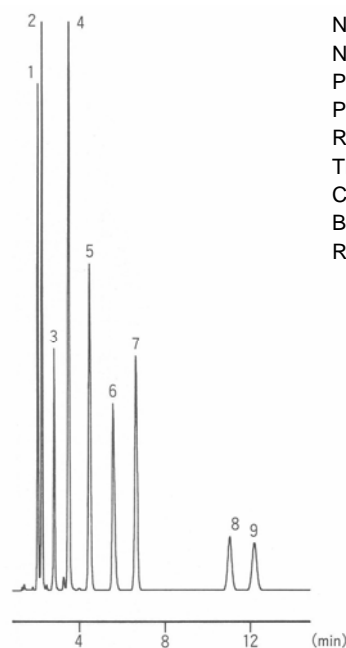
Hypoxanthine  
 Inosine 5 -Monophosphate  
 Adenosine 5 -Monophosphate  
 Adenosine 5 -Diphosphate  
 Adenosine 5 -Triphosphate  
 Isosine



Column: STR ODS-M  
 Size: 150 mm x 4.6 mm I.D.  
 Mobile Phase: 24 mM 2-Diethylaminoethanol is contained  
 16 mM Citric Acid Aqueous Solution  
 Flow Rate: 2.0 mL/min  
 Temperature: 40  
 Detection: UV-250 nm

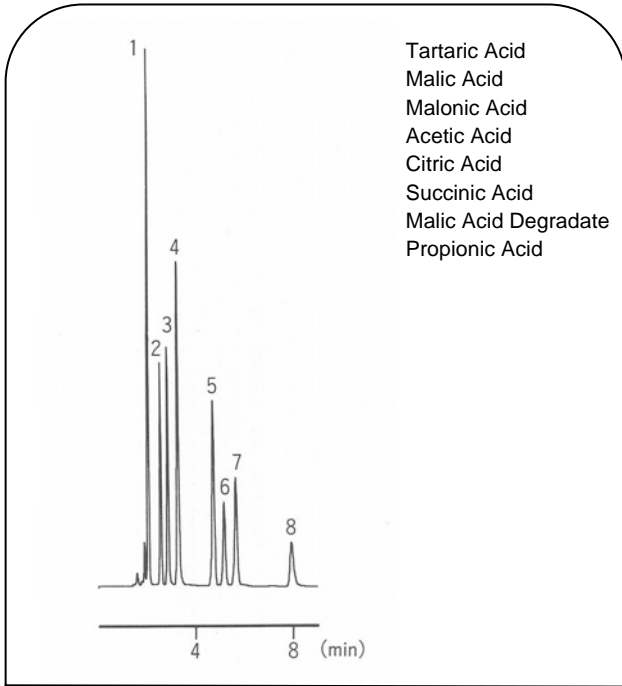
**The Water-soluble Vitamin**

Nicotinic Acid  
 Nicotinamide  
 Pantothenic Acid  
 Pyridoxine  
 Riboflavin Phosphate  
 Thiamine  
 Caffeine  
 Biotin  
 Riboflavin



Column: STR ODS-M  
 Size: 150 mm x 4.6 mm I.D.  
 Mobile Phase: 100 mM-Phosphate Buffer (pH2.1)  
 0.9 mM Octane Sodium Sulphonate } 9  
 $\text{CH}_3\text{CN}$  } 1  
 Flow Rate: 1.0 mL/min  
 Temperature: 40  
 Detection: UV-210 nm

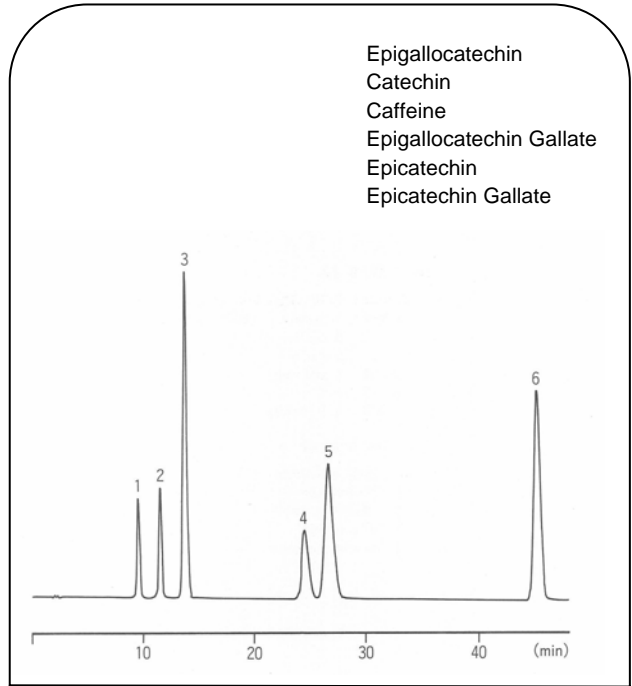
**Organic Acids**



Tartaric Acid  
Malic Acid  
Malonic Acid  
Acetic Acid  
Citric Acid  
Succinic Acid  
Malic Acid Degradate  
Propionic Acid

Column: STR ODS-M  
Size: 150 mm x 4.6 mm I.D.  
Mobile Phase: 10 mM NH<sub>2</sub>PO<sub>4</sub>  
(It is adjusted at pH=2.3 in The Phosphoric Acid)  
Flow Rate: 1.0 mL/min  
Temperature: 40  
Detection: UV-210 nm

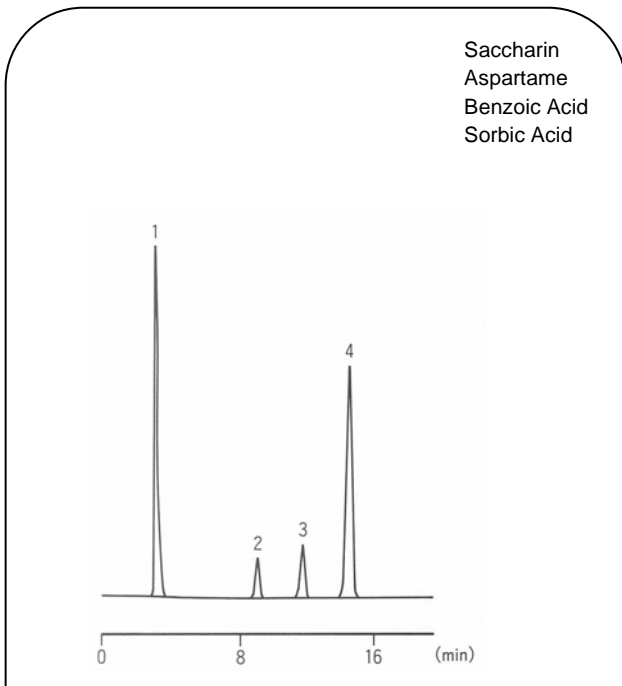
**Caffeine and Catechin**



Epigallocatechin  
Catechin  
Caffeine  
Epigallocatechin Gallate  
Epicatechin  
Epicatechin Gallate

Column: STR ODS-M  
Size: 150 mm x 4.6 mm I.D.  
Mobile Phase: A: 10 mM-Phosphate Buffer (pH2.6)  
B: CH<sub>3</sub>CN  
7 % B (7 min) 7 % B (30 min) 12 % B (30.01 min)  
12 % B (45 min) 50 % B (45.01 min)  
50 % B (50 min) 7 % B (50.01 min)  
7 % B (80 min)  
Flow Rate: 1.0 mL/min  
Temperature: 45  
Detection: UV-280 nm (0.64 AUFS)

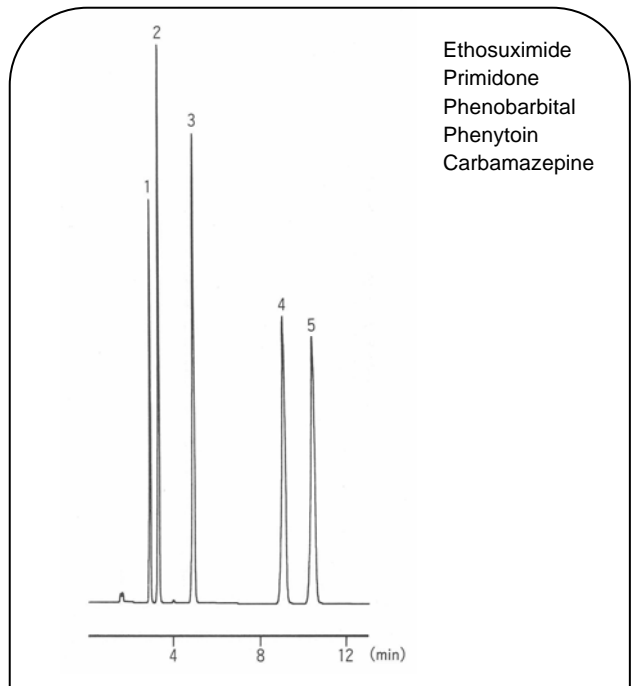
**Saccharin, Aspartame, Benzoic Acid, Sorbic Acid**



Saccharin  
Aspartame  
Benzoic Acid  
Sorbic Acid

Column: STR ODS-M  
Size: 150 mm x 4.6 mm I.D.  
Mobile Phase: 40 mM Acetate Buffer (pH4.0) 3  
CH<sub>3</sub>OH 1  
Flow Rate: 1.0 mL/min  
Temperature: 40  
Detection: UV-250 nm (0.32 AUFS)

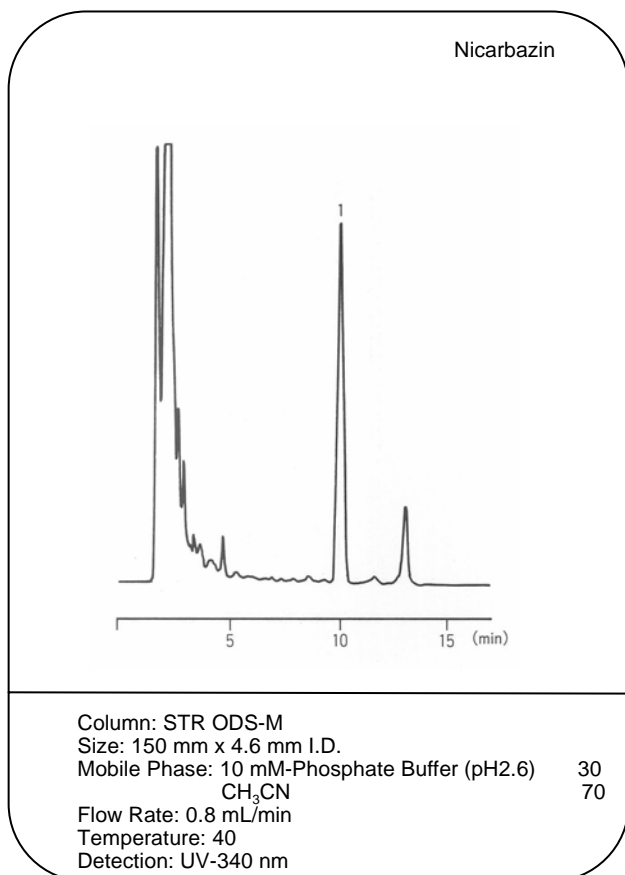
**AnticoNvulsant Analysis**



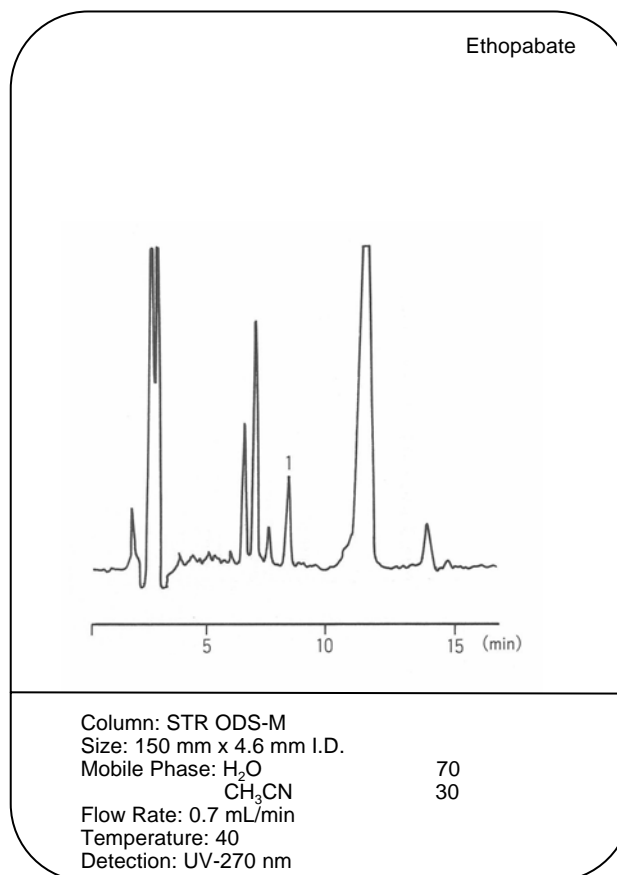
Ethosuximide  
Primidone  
Phenobarbital  
Phenytoin  
Carbamazepine

Column: STR ODS-M  
Size: 150 mm x 4.6 mm I.D.  
Mobile Phase: 100 mM-Phosphate Buffer (pH2.1) 4  
CH<sub>3</sub>OH 2  
CH<sub>3</sub>CN 1  
Flow Rate: 1.0 mL/min  
Temperature: 40  
Detection: UV-205 nm

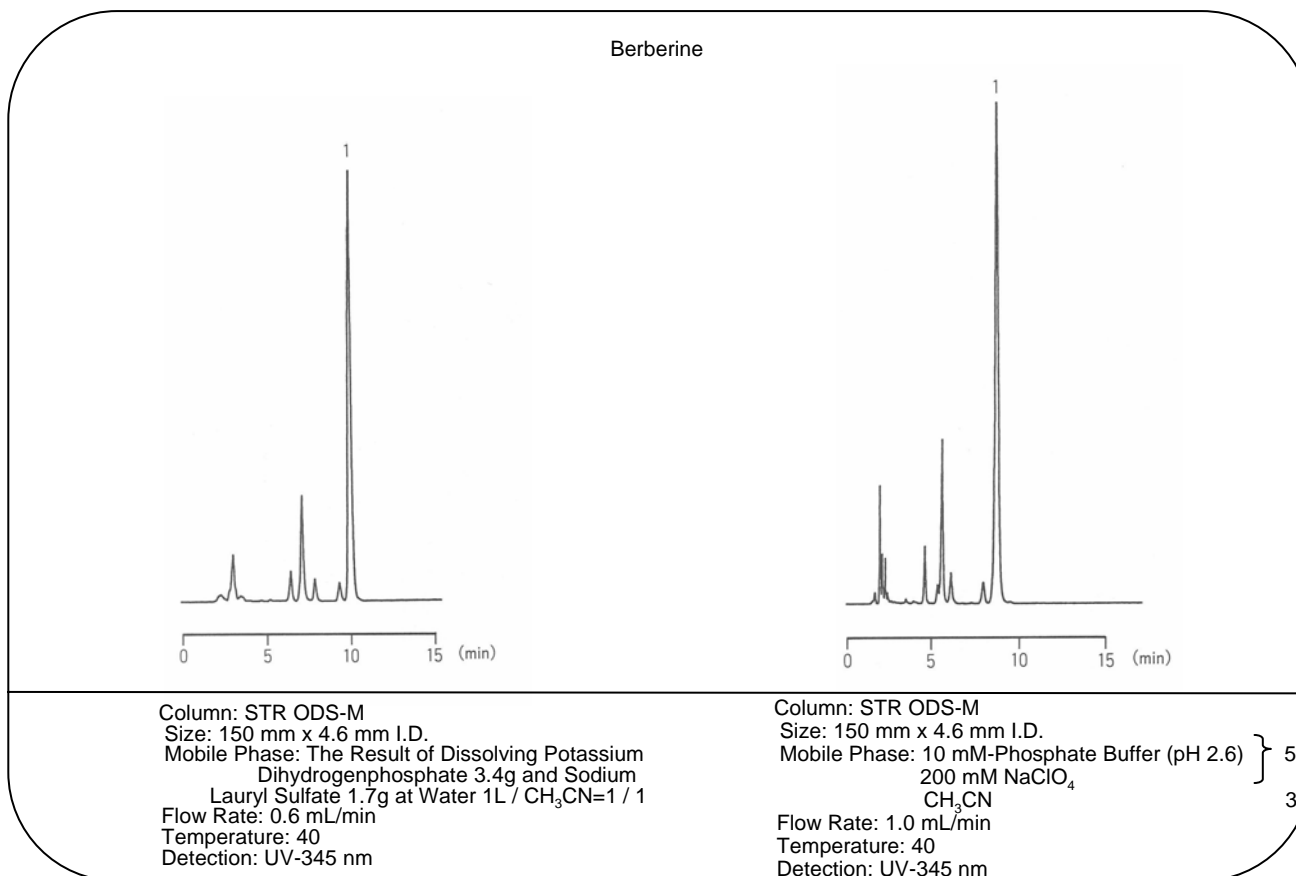
Nicarbazin



Ethopabate

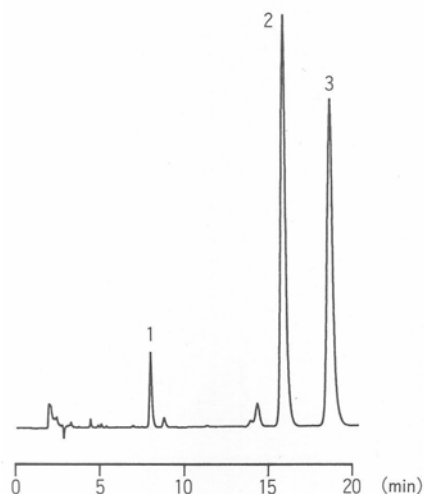


Berberine

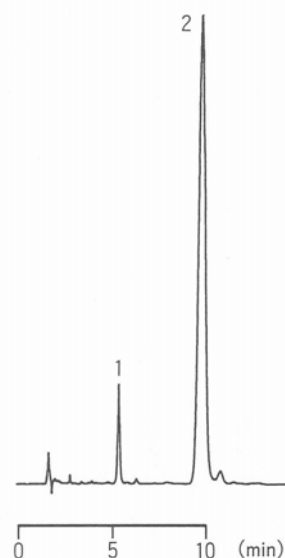


## Scopolanime, Hyoscyamine

Scopolanime  
Hyoscyamine  
Brucine



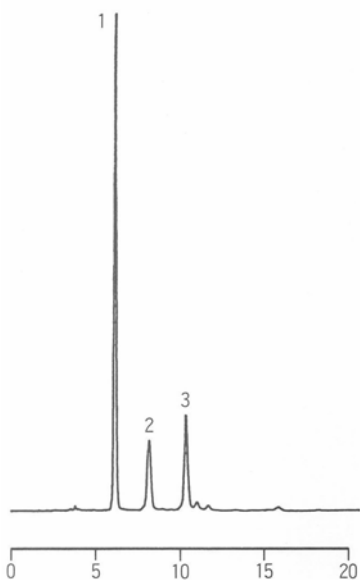
Column: STR ODS-M Size: 150 mm x 4.6 mm I.D.  
Mobile Phase: The Liquid by Adding Water after It  
Dissolved Potassium Dihydrogenphosphate  
6.8g at Water 900 mL and Added Triethylamine  
10 mL, and after It Adjusted It in The Phosphoric  
Acid in pH3.5 as 1000 mL / CH<sub>3</sub>CN = 9 / 1  
Flow Rate: 0.8 mL/min Temperature: ambient  
Detection: UV-210 nm



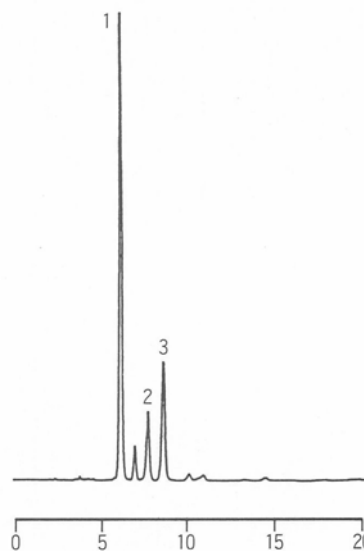
Column: STR ODS-M  
Size: 150 mm x 4.6 mm I.D.  
Mobile Phase: 10 mM-Phosphate Buffer (pH 2.6) } 3  
200 mM NaClO<sub>4</sub>  
CH<sub>3</sub>CN } 1  
Flow Rate: 1.0 mL/min  
Temperature: 40  
Detection: UV-210 nm

## Arbutin

Arbutin  
Hydroquinone  
Gallic Acid

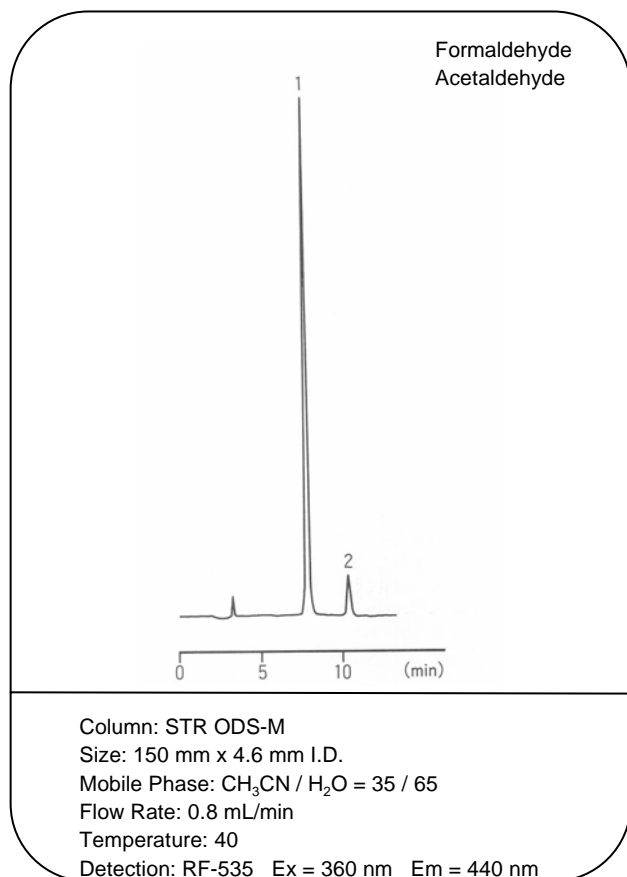


Column: STR ODS-M  
Size: 150 mm x 4.6 mm I.D.  
Mobile Phase: H<sub>2</sub>O / CH<sub>3</sub>OH / 0.1N-HCl = 94 / 5 / 1  
Flow Rate: 0.8 mL/min  
Temperature: Ambient  
Detection: UV-280 nm



Column: STR ODS-M  
Size: 150 mm x 4.6 mm I.D.  
Mobile Phase: 100 mM-Phosphate Buffer (pH 2.1)  
/ CH<sub>3</sub>OH = 40 / 1  
Flow Rate: 0.8 mL/min  
Temperature: 40  
Detection: UV-280 nm

## Aldehydes (1.3-Cyclohexanedione Derivatives)



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